

# Goodmans

## DIN 20

High Fidelity Loudspeaker Kit

## INSTRUCTION LEAFLET



# Goodmans

## DIN 20 Kit Instruction Leaflet

This kit has been designed to give the Do-It-Yourself enthusiast high fidelity reproduction at moderate cost. Provided care is taken excellent results will be obtained from the loudspeaker together with the satisfaction of having built it.

The loudspeaker system will give adequate domestic listening levels from amplifiers rated at 10 watts (per channel in the case of stereo equipment) but may be operated from higher power amplifiers.

### Technical Data

|                       |               |
|-----------------------|---------------|
| Frequency Range :     | 45-22,000 Hz. |
| Power Handling :      | 20 watts DIN. |
| Impedance :           | 4 ohms.       |
| Crossover frequency : | 4,000 Hz.     |

### Contents

This Kit contains all parts necessary to make a high fidelity loudspeaker system, except timber and other materials for the cabinet itself :

- 1 Bass Unit 204mm (8ins.) dia.
- 1 Dome Tweeter with 25.4mm (1in.) dia. diaphragm
- 1 Port Tube
- 1 Crossover Panel with colour coded leads
- 1 Terminal Board
- 1 Foam Gasket
- 1 Input lead complete with DIN plug/Spade terminals
- Acoustic foam pads
- Cabinet template (on bottom of box)
- Fixing screws

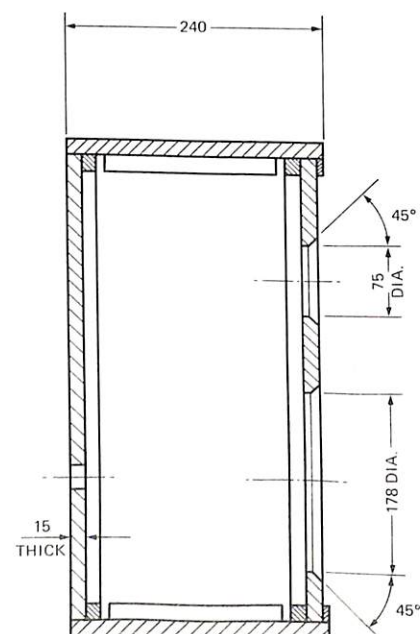
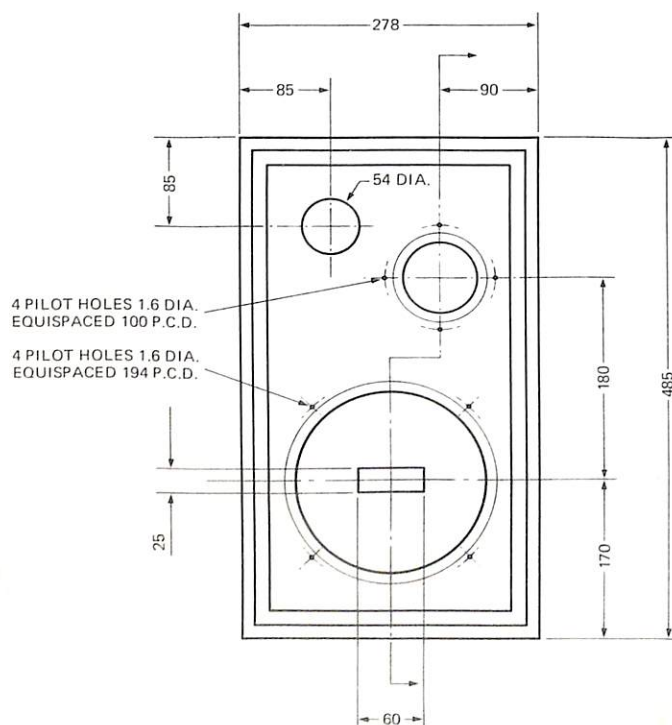
### BEFORE BEGINNING PLEASE READ THE FOLLOWING NOTES CAREFULLY.

Remember, before using proprietary materials, to read the makers instructions as this can save disappointment or even a minor disaster.

### Cabinet Construction

Illustrated below is a detailed drawing of the cabinet showing the construction with dimensions. A template for cutting the loudspeaker mounting baffle is printed on the bottom of the pack. It is essential for optimum results that the recommended cabinet is used.

The cabinet should be made from 15mm plywood or chipboard  $\frac{5}{8}$ " thick ( $\frac{3}{4}$ " is satisfactory but dimensions will need to be adjusted so that internal volume remains the same) and assembled by glueing and screwing into the 25mm (1") square battens as shown.



Dimensions in millimetres.

## Method of assembly

1. Cut first the four sides of the box and assemble them into a shell using blocks 18 or 25mm square and 145mm long ( $\frac{3}{4}$ " or 1" square  $\times$  5 $\frac{7}{8}$ " long) at each corner. Glue and screw into the corner blocks as it is not satisfactory to screw into the end grain of either plywood or chipboard.

2. Cut and fit the 'window frame' battens inside the front and back allowing space for the thickness of the front and back panels. Screws should be countersunk below the surface, the 'holes' filled with a filler (Plastic wood or similar) and sand-papered flush when dry.

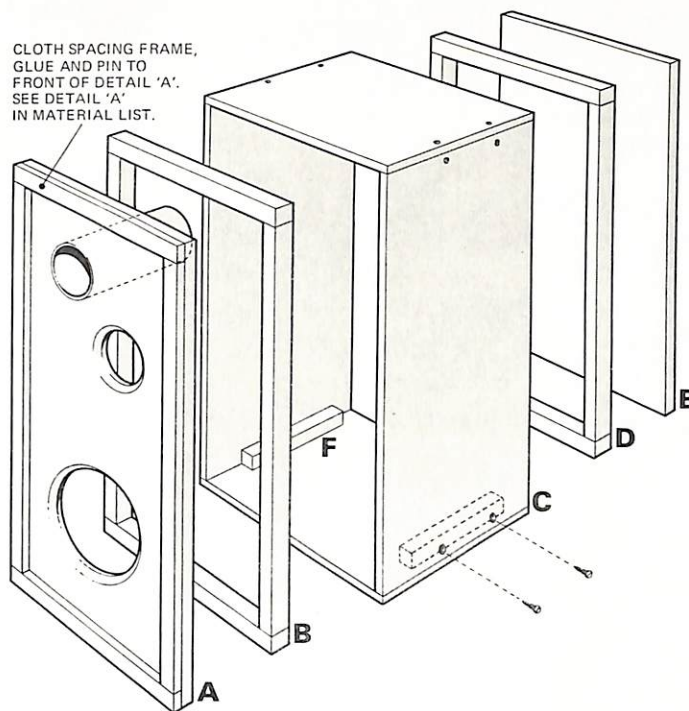
3. Cut the front panel, marking out the holes from the template printed on the pack which should be located centrally. Fit to the front of the front baffle the cloth stand-off frame which spaces the cloth off the board to prevent it flapping. Then glue into position the cardboard tube supplied, with the end flush with the front of the panel.

4. The front panel is now ready to be covered with loudspeaker grille. Do not use ordinary fabrics as they are not sufficiently 'transparent' and will muffle the sound. The cloth is fitted by wrapping it round Baffle A and fastening at the back. Use a quick-setting glue (Evostick, Bostik No. 1) and pins, or, better still, staples from an office stapler. Before doing this, the sides of the baffle should be trimmed to allow for the thickness of the cloth. Do not apply glue to the front of the baffle as it will penetrate the grille cloth and spoil its appearance. Check that the pattern is straight, and pull the material tight when fixing, so that it will not flap or buzz when the loudspeaker is in use.

5. Cut the rear panel and the slot in it, which accommodates the terminal board.

6. The sides of the box should be finished as desired; painted, stained or veneered and polished depending on personal skill. Extremely good results can be obtained with self adhesive vinyl covering (Contact, Fablon), which should not be stretched as it will shrink back after a time leaving uncovered seams.

7. The front baffle is fixed to the cabinet with screws passing through the front battens from inside the cabinet, having first drilled the screw clearance holes in the battens. Choose a screw of sufficient length that will hold the baffle firmly without penetrating the cloth.



| Part | Description    | Item        | Material  | Dimensions (mm) | Quantity |
|------|----------------|-------------|-----------|-----------------|----------|
| A    | Baffle         | Front Panel | Chipboard | 455 x 248 x 15  | 1        |
|      |                | Uprights    | Lath      | 405 x 25 x 12   | 2        |
|      |                | Horizontals | Lath      | 248 x 25 x 12   | 2        |
| B    | 'Window Frame' | Uprights    | Soft Wood | 405 x 25 x 25   | 2        |
|      |                | Horizontals | Soft Wood | 248 x 25 x 25   | 2        |
| C    | Main Assembly  | Sides       | Chipboard | 455 x 240 x 15  | 2        |
|      |                | Top/Bottom  | Chipboard | 278 x 240 x 15  | 2        |
| D    | 'Window Frame' | Uprights    | Soft Wood | 405 x 25 x 25   | 2        |
|      |                | Horizontals | Soft Wood | 248 x 25 x 25   | 2        |
| E    | Rear Panel     |             | Chipboard | 455 x 248 x 15  | 1        |
| F    | Fixing Blocks  | Top         | Soft Wood | 145 x 25 x 25   | 2        |
|      |                | Bottom      | Soft Wood | 145 x 25 x 25   | 2        |

N.B.: The dimensions quoted above are to a finished size; allowances therefore should be made when ordering materials.

**GRILLE CLOTHS** In case of difficulty in finding local stockists, the following companies can supply proprietary grille cloths either by mail order or to personal shoppers:

'Tygan' and 'Vynair' (from ICI):  
Nichols Acoustical Fittings, Bubwith, Selby, Yorkshire.

'Acoustone' Range:  
Unilet Products Ltd., Compton House, 35 High Street, New Malden, Surrey.

## Mounting the Units

The loudspeakers are mounted using the screws provided into the pilot holes which will locate the units. The foam gasket is used with the domed tweeter, the bass speaker is self sealing. When screwing down components tighten the screws evenly until they are firmly held; over-tightening could cause damage to the chassis or strip the screw in the wood.

The terminal board is screwed to the rear panel and it is convenient to fix the crossover unit to the inside of this using a block of wood as a spacer as seen in the drawing on the back page.

## Connecting the Speakers

There are 3 pairs of wires from the crossover unit. These are coded with coloured tape and are connected as follows:

Red — Bass Unit  
Green — Tweeter  
Black — Terminal Board

When connecting the wires to the terminal panel and speakers it is essential to observe the polarity of the connections — red wires to positive or red marked tags. When the speakers have been connected, the large foam pads are placed behind them, but must not obstruct the rear of the port tube or interfere with the Bass loudspeaker cone movement. Check also that the connecting wires are not pushed inside the chassis.

Before screwing the back panel to the enclosure it would be advisable to check that all is working. Connect the speaker to an amplifier and adjust the volume so that a quiet sound is heard from the speakers. Place the ear close to the tweeter and the bass units in turn to make sure they are working. Then disconnect, and screw the back panel into place.

## Connection to the Amplifier

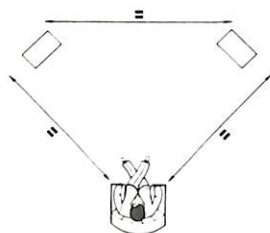
An input lead for the system is provided which has a DIN loudspeaker plug at one end and spade terminals at the other. Normally the DIN plug will be pushed into the socket at the rear of the cabinet. The spade terminal colour coded red will connect to the positive output terminal on the amplifier. If the amplifier has a DIN output socket the lead may be reversed and the spade terminals connected to the relevant screw terminals at the rear of the loudspeaker cabinet. For longer leads 3amp twin flex should be used.

When using 2 loudspeakers it is important that they operate 'in phase'. This means that when they are fed with a common signal both cones go in and out together which will be the case if all the wires are connected as detailed in the previous subsection.

To check the phasing of a stereo pair place the cabinets side by side and feed a mono signal into them simultaneously. Reverse the leads to ONE cabinet only, and note the effect on the bass response. The correct phasing will give the fuller sound.

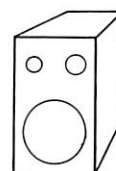
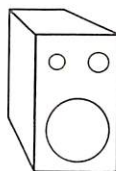
## Positioning the speakers for Stereo

To achieve the best reproduction of Stereo Sounds in your listening room your loudspeakers should be positioned thus:

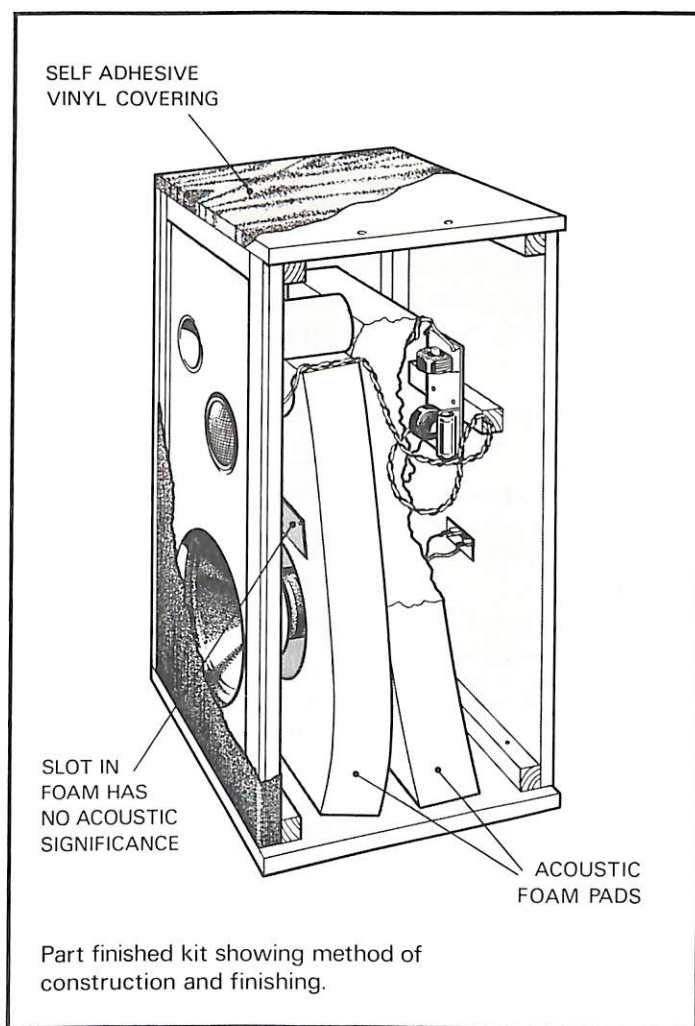
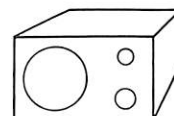
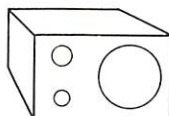


You, the listener, being about the same distance from the loudspeakers as they are from each other. In an oblong room, the speakers should be situated at the narrow end, because if they are too widely spaced, the sound separates, destroying the stereo image. The position of the speakers in your room will modify their overall performance, extreme corner placement, for instance, will increase the low frequency or bass response. Slight alteration in positioning will adjust the sound to your own preference.

The loudspeakers are normally used upright so that the high frequency unit is above the large bass driver.



But if you wish to use them horizontally, the speakers must then be used thus for symmetrical distribution of the extreme frequencies.



*Goodmans policy is one of continued progress and the right to change the specification is reserved.*

# Goodmans

Goodmans Loudspeakers  
Limited

Downley Road  
Havant Hampshire  
PO9 2NL England



### 8inch full range high fidelity loudspeaker

The TwinAxiom 8 is the smallest in the Axiom Range of full frequency, high fidelity, loudspeaker units.

The TwinAxiom 8 is capable of handling the full output of music programme material from amplifiers with 15 watt (RMS) rating, but the sensitivity is such that an adequate listening volume is obtained when used with equipment rated 4-5 watts. The recommended enclosure volume is 30 litres.

#### Specification

|                               |                                |
|-------------------------------|--------------------------------|
| Frequency Range:              | 40-18,000 Hz.                  |
| Power handling capacity:      | 15 Watts DIN.                  |
| Impedance:                    | 8 or 15 ohms.                  |
| Fundamental resonance:        | 35 Hz.                         |
| Flux density:                 | 13,500 Gauss.                  |
| Total flux:                   | 53,000 Maxwells.               |
| Recommended enclosure volume: | 30 litres (2,000 cu. ins.)     |
| Diameter, overall:            | 205 mm. (8 $\frac{1}{2}$ ins.) |
| Depth, overall:               | 107 mm. (4 $\frac{1}{4}$ ins.) |

#### Assembly Data

Baffle hole diameter: 170 mm. (6  $\frac{1}{8}$  ins.)  
 4 equally-spaced fixing holes in chassis 6.5 mm. ( $\frac{1}{4}$  in.) diameter  
 on a circle of 194 mm. (7  $\frac{7}{8}$  ins.) diameter.

Enclosure dimensions:

| A   | B   | C   | D               | E               |      |
|-----|-----|-----|-----------------|-----------------|------|
| 220 | 500 | 280 | 170             | 170             | mm.  |
| 9   | 20  | 11  | 6 $\frac{1}{8}$ | 6 $\frac{1}{8}$ | ins. |

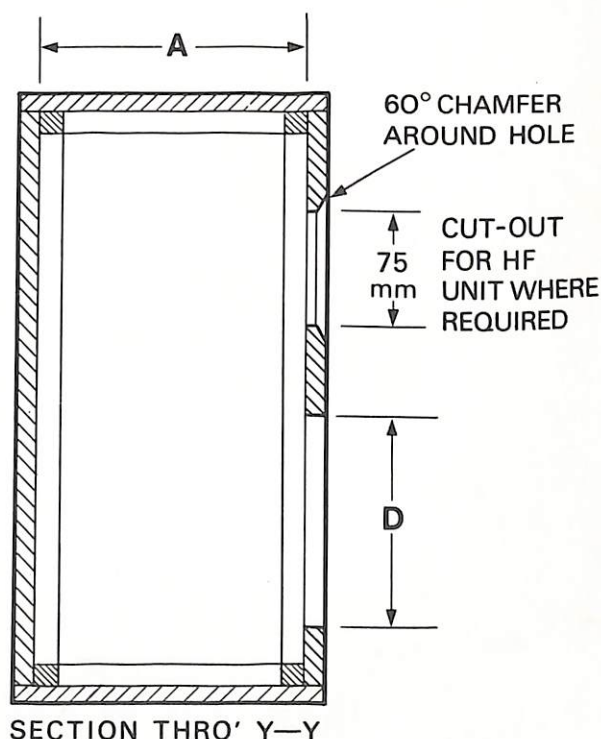
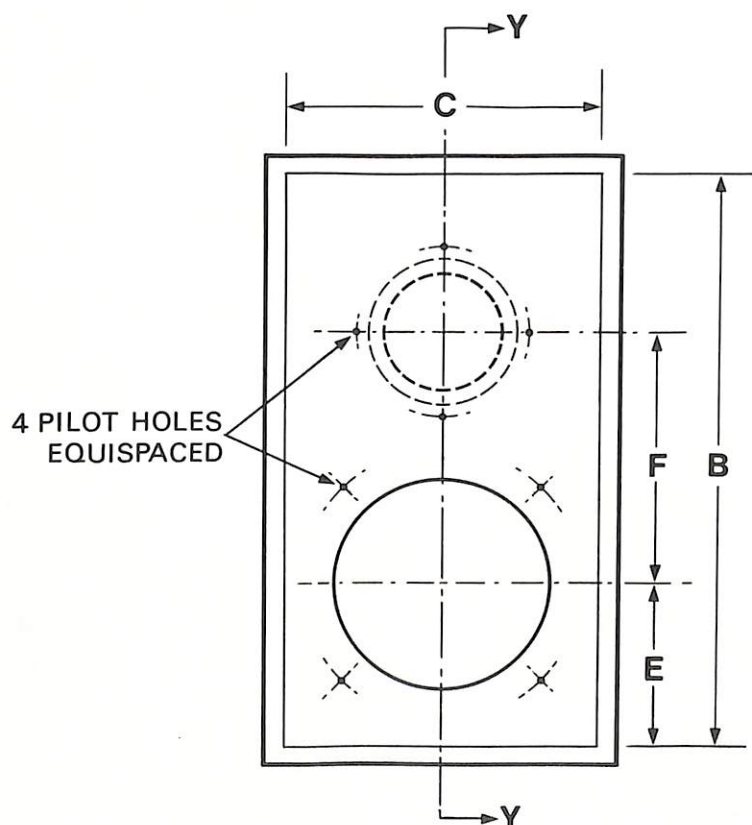
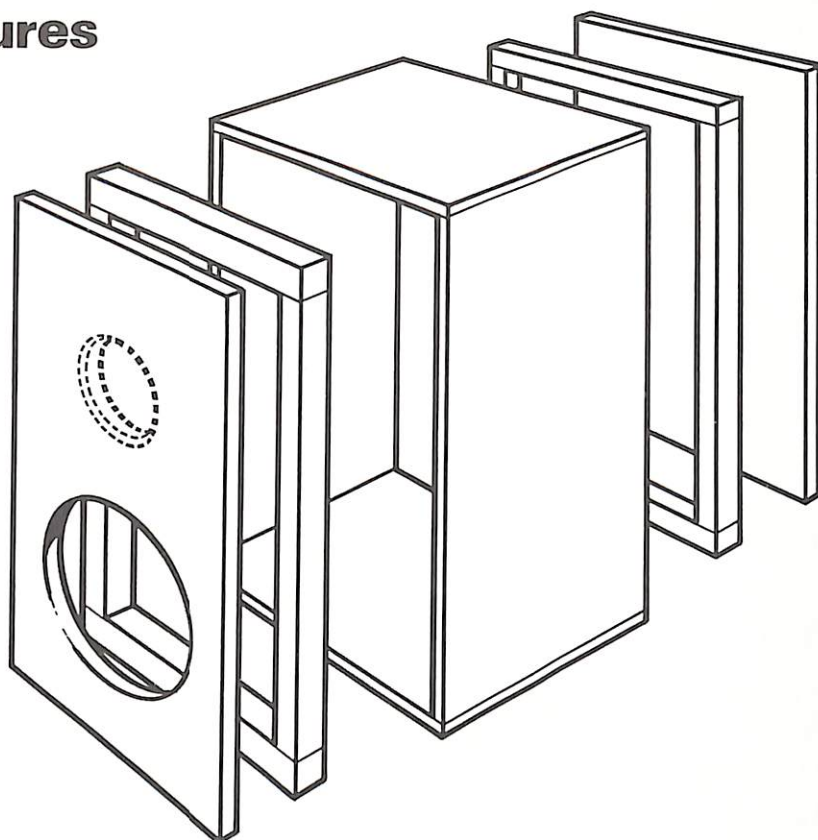
(for drawings see over)

# Recommended Enclosures

The loudspeaker enclosure(s) shown should be rigidly constructed from high density chipboard or plywood (not blockboard) at least  $\frac{3}{4}$ " thick screwed and glued together. All joints should be airtight.

The totally sealed enclosures should be *loosely* filled with layers of 2" thick fibreglass making sure that it does not interfere with the loudspeaker cone.

NOTE: Dimensions A B and C are shown as internal measurements to allow for choice of material thickness. The proportions can be varied but the volume must remain the same.



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## Goodmans

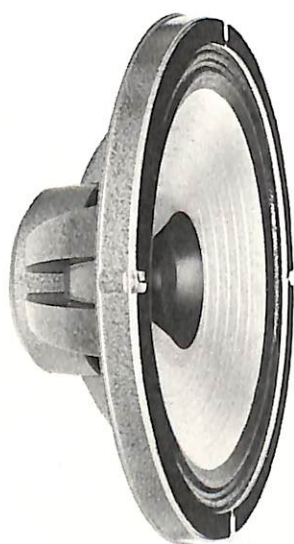
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# Goodmans

## Constructors' Range

### TwinAxiom 10



### 10 inch full range high fidelity loudspeaker

The TwinAxiom 10 is the choice of the man who can afford – and has the room for – a larger speaker than the TwinAxiom 8, but does not need, or has not the space for, one of the larger and more powerful 12" systems.

The TwinAxiom 10 is capable of handling the full output of music programme material from amplifiers with 15 watt (RMS) rating, but the sensitivity is such that an adequate listening volume is obtained when used with equipment rated 4-5 watts. The recommended enclosure volume is 45 litres.

#### Specification

|                               |                                 |
|-------------------------------|---------------------------------|
| Frequency range:              | 40–18,000 Hz.                   |
| Power handling capacity:      | 15 Watts DIN.                   |
| Impedance:                    | 8 or 15 ohms.                   |
| Fundamental resonance:        | 40 Hz.                          |
| Flux density:                 | 13,500 Gauss.                   |
| Total flux:                   | 53,000 Maxwells.                |
| Recommended enclosure volume: | 45 litres (3,000 cu. ins.)      |
| Diameter, overall:            | 266 mm. (10 $\frac{1}{2}$ ins.) |
| Depth, overall:               | 109 mm. (4 $\frac{1}{8}$ ins.)  |

#### Assembly Data

Baffle hole diameter: 216 mm. (8  $\frac{1}{2}$  ins.)  
4 equally-spaced fixing holes in chassis 6 mm. ( $\frac{1}{4}$  in.) diameter  
on a circle of 244 mm. (9  $\frac{3}{8}$  ins.) diameter.

Enclosure dimensions:

(for drawings see over)

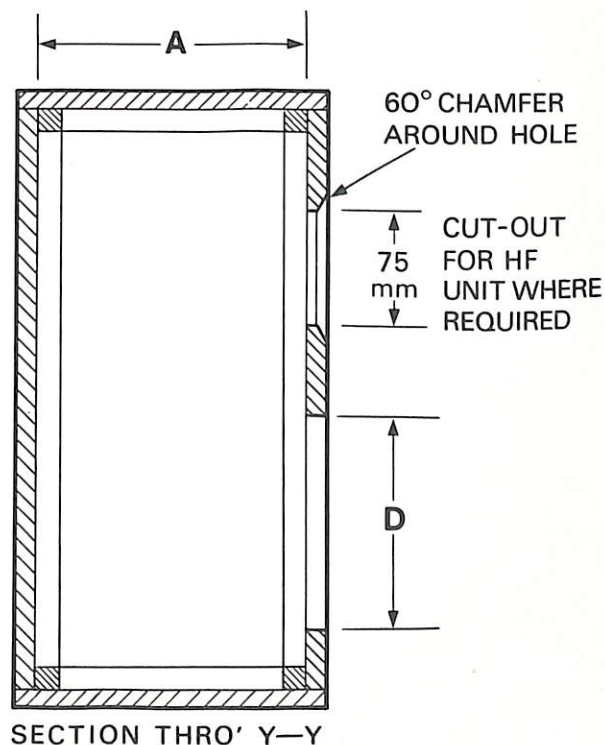
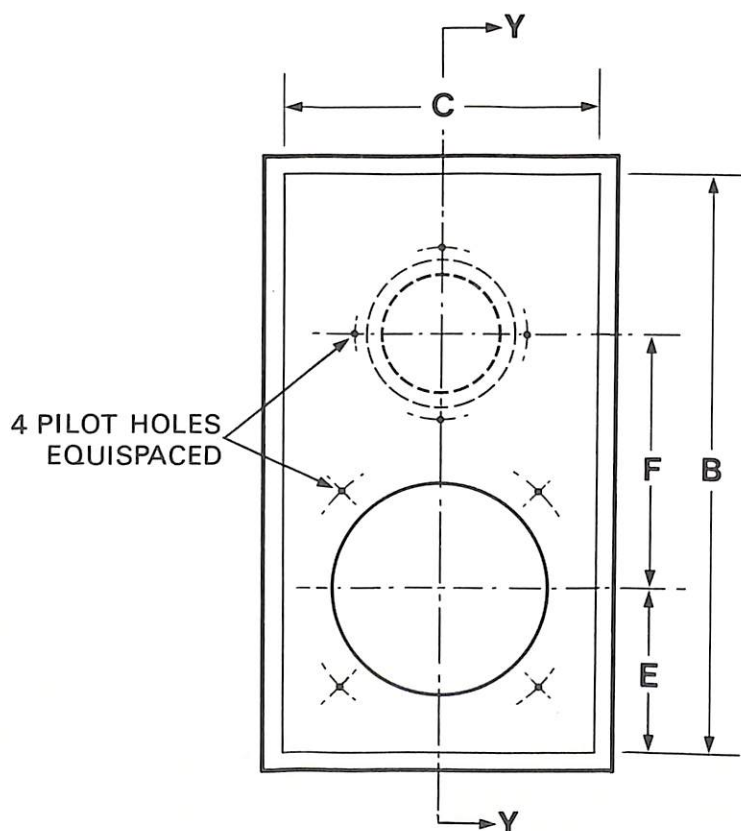
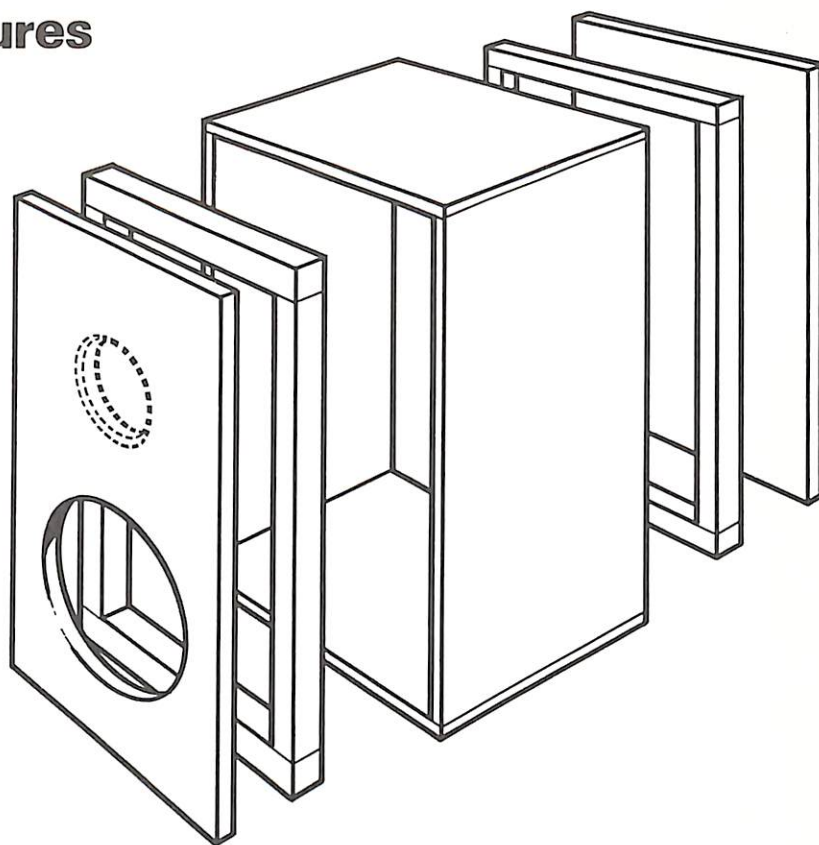
| A               | B   | C   | D               | E   |      |
|-----------------|-----|-----|-----------------|-----|------|
| 240             | 580 | 330 | 216             | 250 | mm.  |
| 9 $\frac{1}{2}$ | 23  | 13  | 8 $\frac{1}{2}$ | 10  | ins. |

# Recommended Enclosures

The loudspeaker enclosure(s) shown should be rigidly constructed from high density chipboard or plywood (not blockboard) at least  $\frac{3}{4}$ " thick screwed and glued together. All joints should be airtight.

The totally sealed enclosures should be *loosely* filled with layers of 2" thick fibreglass making sure that it does not interfere with the loudspeaker cone.

NOTE: Dimensions A B and C are shown as internal measurements to allow for choice of material thickness. The proportions can be varied but the volume must remain the same.



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## Goodmans

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Limited

Downley Road  
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PO9 2NL England

### Constructors' Range

#### 12 inch full range high fidelity loudspeaker

This model is the high power version of the well known range of Axiom 12 inch loudspeakers. It has been developed especially to suit the contemporary scene of discotheques and high power portable P.A. systems, where wide frequency range is vital without the complications of separate high frequency units. With a voice coil engineered for high heat dissipation it is able to handle continuously music powers of 40 Watts magnitude. The enclosure volume specified is for one loudspeaker: for increased output or power handling the units may be used in multiples, in which case the cabinet volume should be multiplied by the number of units fitted. All cabinets should be of the infinite baffle or "sealed box" type of construction.

#### Specification

|                               |                                                                                |
|-------------------------------|--------------------------------------------------------------------------------|
| Frequency range:              | 30-11,000 Hz.                                                                  |
| Power handling capacity:      | 40 Watts DIN.                                                                  |
| Impedance:                    | 8 or 15 ohms.                                                                  |
| Fundamental resonance:        | 35 Hz.                                                                         |
| Flux density:                 | 15,500 Gauss.                                                                  |
| Total flux:                   | 179,000 Maxwells.                                                              |
| Recommended enclosure volume: | PA Systems 40 litres (2300 cu. ins.)<br>Discotheques 60 litres (3600 cu. ins.) |
| (for one unit)                |                                                                                |
| Diameter, overall:            | 312 mm. (12 $\frac{1}{4}$ ins.)                                                |
| Depth, overall:               | 159 mm. (6 $\frac{1}{4}$ ins.)                                                 |

#### Assembly Data

Baffle hole diameter: 280 mm. (11 ins.)  
4 equally-spaced fixing holes in chassis 8 mm. (0.312 ins.) diameter  
on a circle of 298 mm. (11 $\frac{3}{4}$  ins.) diameter.

Enclosure dimensions:  
(for drawings see over)

| Discotheques  | A   | B   | C   | D   | E   |      |
|---------------|-----|-----|-----|-----|-----|------|
| 60 litres     | 254 | 700 | 330 | 279 | 254 | mm.  |
| 3600 cu. ins. | 10  | 28  | 13  | 11  | 10  | ins. |

| PA Systems    | A   | B   | C   | D   | E   |      |
|---------------|-----|-----|-----|-----|-----|------|
| 40 litres     | 230 | 500 | 330 | 279 | 203 | mm.  |
| 2300 cu. ins. | 9   | 20  | 13  | 11  | 8   | ins. |

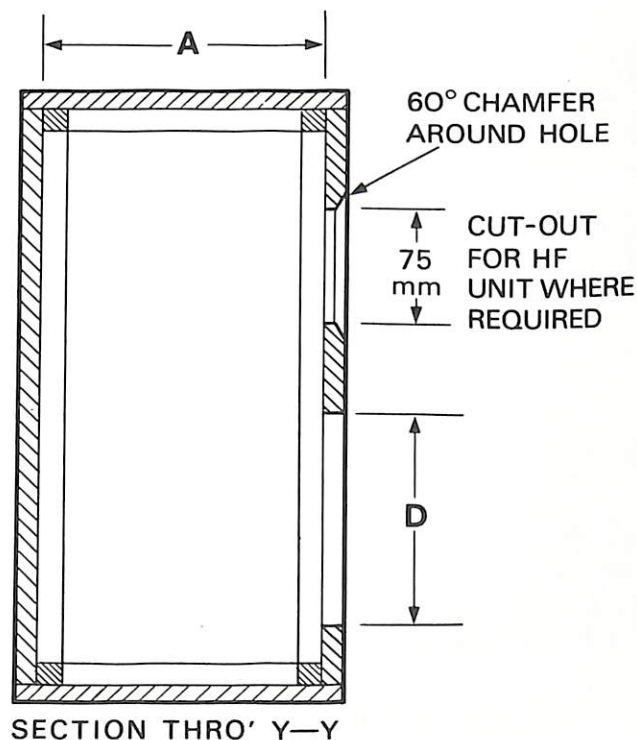
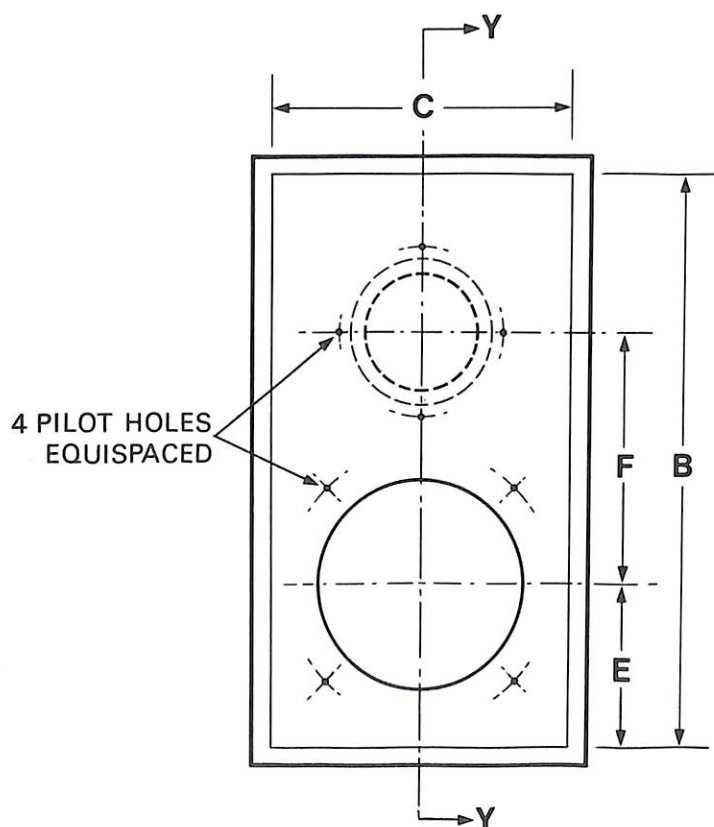
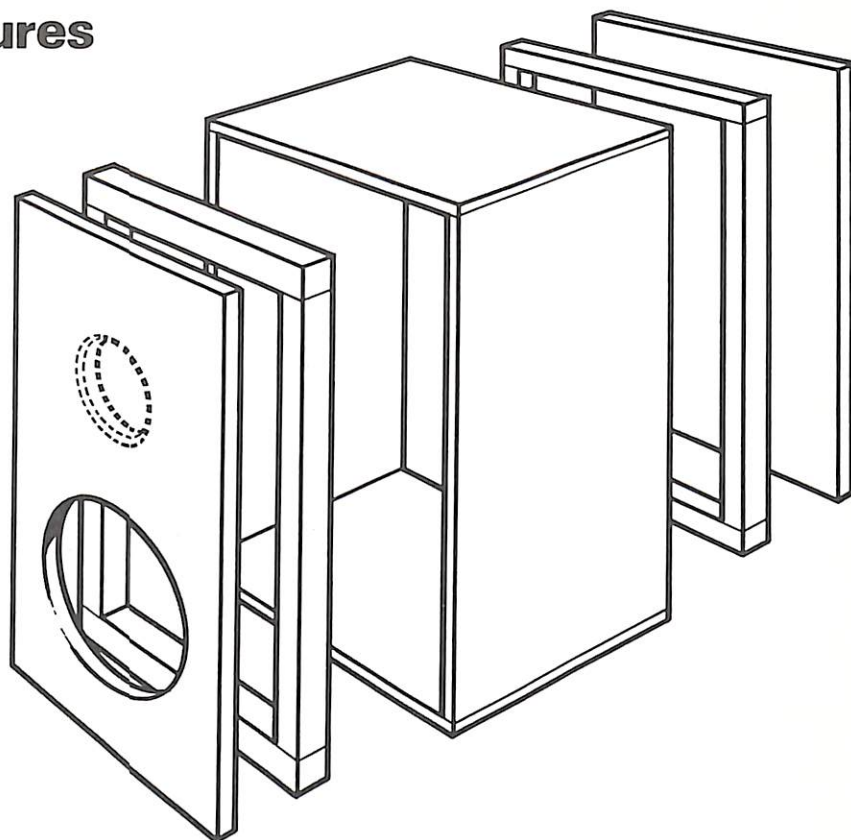


# Recommended Enclosures

The loudspeaker enclosure(s) shown should be rigidly constructed from high density chipboard or plywood (not blockboard) at least  $\frac{3}{4}$ " thick screwed and glued together. All joints should be airtight.

The totally sealed enclosures should be *loosely* filled with layers of 2" thick fibreglass making sure that it does not interfere with the loudspeaker cone.

NOTE: Dimensions A B and C are shown as internal measurements to allow for choice of material thickness. The proportions can be varied but the volume must remain the same.



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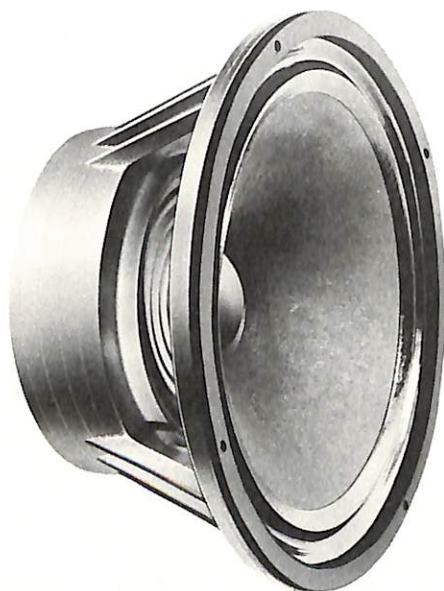
### Constructors' Range

#### 12 inch high fidelity bass loudspeaker

The Audiom 100 is a bass unit for use in two-way high fidelity loudspeaker systems. Its sensitivity and high frequency roll-off have been tailored to match the Axent 100, which incorporates its own crossover filter components.

A system incorporating these two drive units will handle 30 Watts DIN power rating, which corresponds to an undistorted music signal from the output of an amplifier rated at 30 Watts.

However, the Audiom 100 will handle signals up to 40 Watts if used with alternative high frequency components.



#### Specification

|                               |                                 |
|-------------------------------|---------------------------------|
| Frequency range:              | 35–3,000 Hz.                    |
| Power handling capacity:      | 30 Watts DIN.                   |
| Impedance:                    | 8 or 15 ohms.                   |
| Fundamental resonance:        | 35 Hz.                          |
| Flux density:                 | 10,000 Gauss.                   |
| Total flux:                   | 80,000 Maxwells.                |
| Recommended enclosure volume: | 50 litres. (3,200 cu. ins.)     |
| Diameter, overall:            | 312 mm. (12 $\frac{1}{4}$ ins.) |
| Depth, overall:               | 148 mm. (5 $\frac{3}{4}$ ins.)  |

#### Assembly Data

**Baffle hole diameter:** 280 mm. (11 ins.)  
4 equally-spaced fixing holes in chassis 8 mm. (0.312 ins.) diameter on a circle of 298 mm. (11 $\frac{3}{4}$  ins.) diameter.

#### Enclosure dimensions:

(for drawings see over)

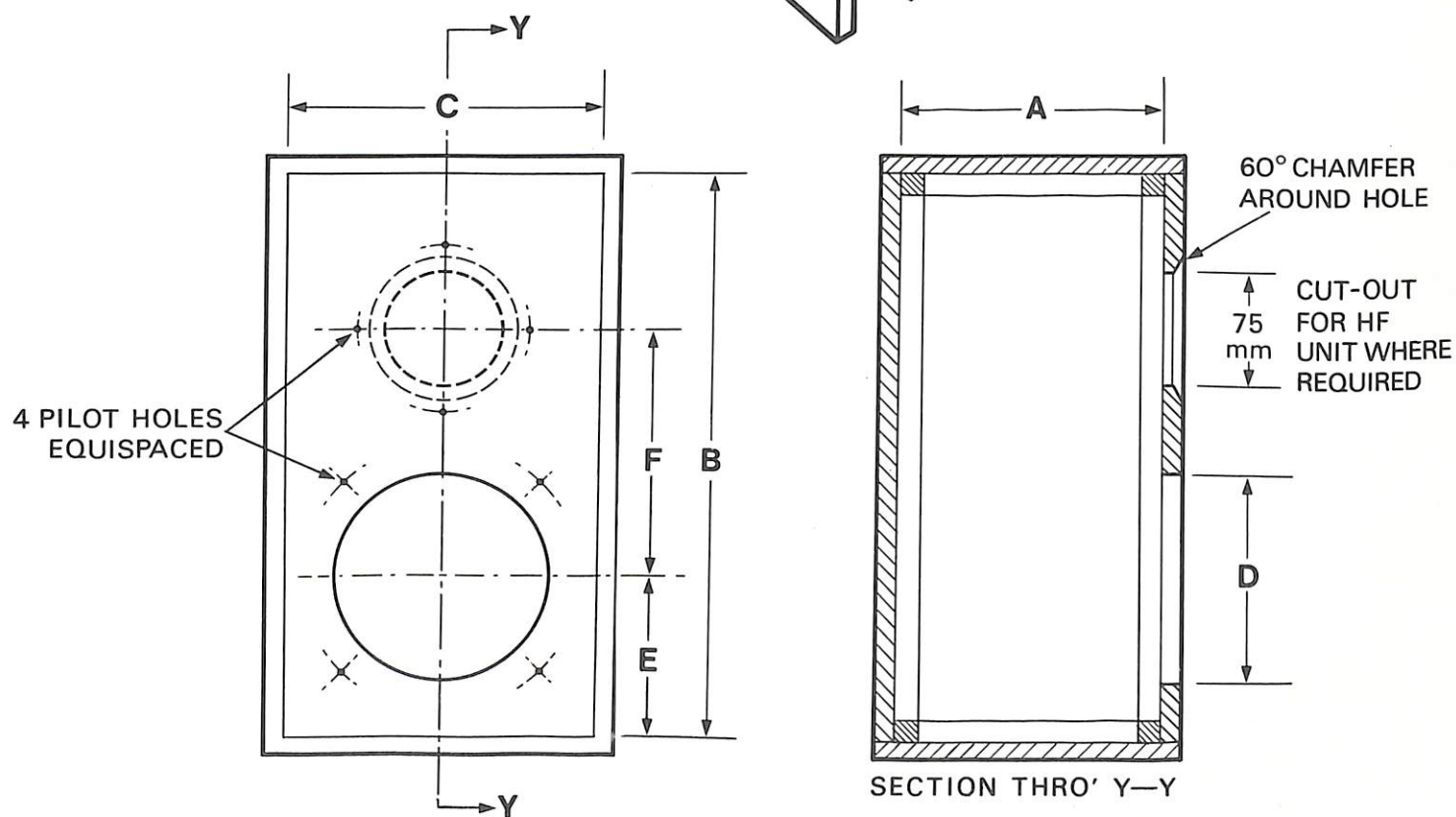
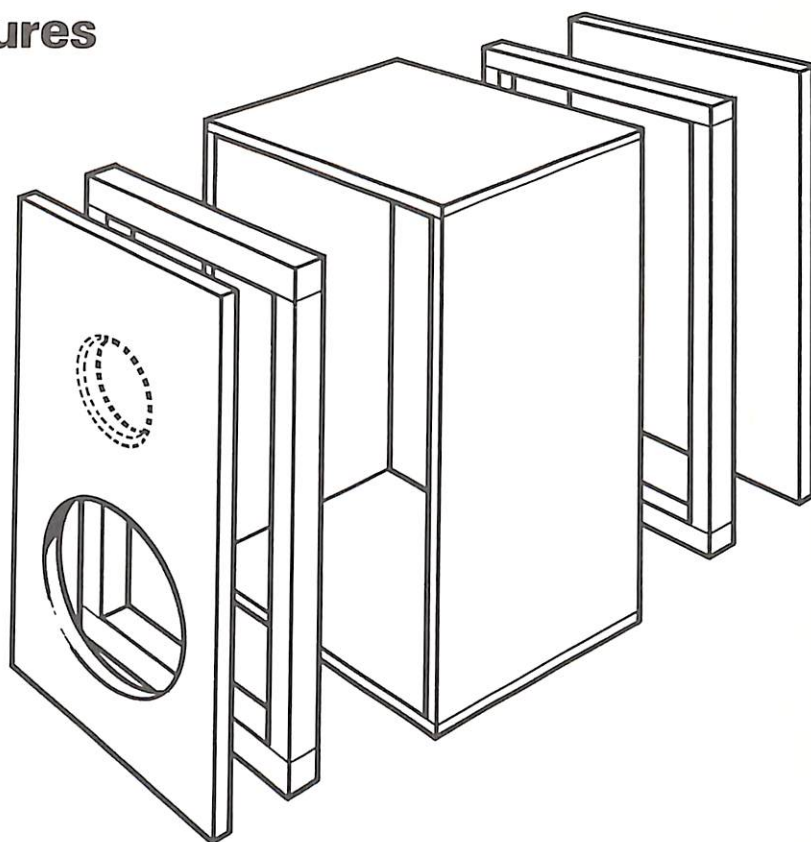
| A   | B   | C   | D   | E   | F   |      |
|-----|-----|-----|-----|-----|-----|------|
| 250 | 600 | 350 | 280 | 200 | 225 | mm.  |
| 10  | 23  | 14  | 11  | 8   | 9   | ins. |

# Recommended Enclosures

The loudspeaker enclosure(s) shown should be rigidly constructed from high density chipboard or plywood (not blockboard) at least  $\frac{3}{4}$ " thick screwed and glued together. All joints should be airtight.

The totally sealed enclosures should be *loose*ly filled with layers of 2" thick fibreglass making sure that it does not interfere with the loudspeaker cone.

NOTE: Dimensions A B and C are shown as internal measurements to allow for choice of material thickness. The proportions can be varied but the volume must remain the same.



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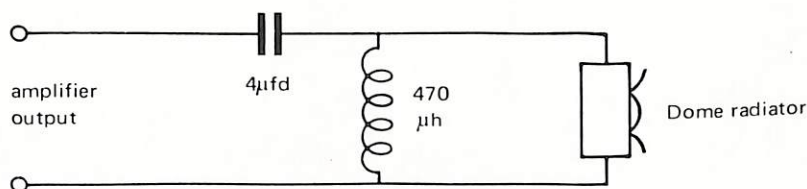


### Domed diaphragm high frequency direct radiator

This "state of the art" loudspeaker is capable of high frequency sound reproduction with negligible distortion.

The dome radiator is moulded from synthetic fabric with a stable, homogenous plastic coating and loading. This heavily damped mechanical system is tightly coupled and firmly controlled by its coil which operates in a very high flux magnet system. The dome operates within a phase correcting throat which improves the overall linearity of the phase/frequency response giving the finest possible transient performance.

The Axent 100 has a built-in filter network, (shown below) which cuts frequencies below 3,000 Hz. at a rate of 12dB/octave and protects the sensitive coil when operating in a full range system up to its maximum power of 30 watts.



### Specification

(to DIN Standards 45:500 and 45:573)

**Frequency Range:** typically 2,000–22,000 Hz.  $\pm 2$ dB.

**Maximum RMS input:** 3 Watts

**Power handling capacity:** for use in systems rated not more than 30 Watts.

**Impedance:** 8 ohms.

### Assembly Data

**Maximum dimension across corners:**

112 mm. (4  $\frac{3}{8}$  ins.)

**Baffle hole diameter:** 75 mm. (3 ins.) front mounted.

70 mm. (2  $\frac{3}{4}$  ins.) rear mounted.

4 equally-spaced fixing holes in chassis 4.8 mm. ( $\frac{3}{16}$  ins.) diameter on a circle of 100 mm. (3  $\frac{1}{2}$  ins.) diameter.

