



# 'COTSWOLD' SPEAKER SYSTEM KITS

## Assembled in a few hours

### SPECIAL FEATURES :

- ★ Three speakers covering the full frequency range from 30 to 20,000 cycles.
- ★ High flux 12" bass speaker with 2" speech coil and foam surround.
- ★ Independent level controls for treble and mid-range speakers.
- ★ Heavily lagged non-resonant enclosure made from  $\frac{3}{4}$ " veneered chipboard and 12 mm plywood lined with celotex.
- ★ Simple styling to harmonise with contemporary or traditional furnishing schemes.



Size: 26" wide  $\times$  23" high  $\times$  14 $\frac{1}{2}$ " deep  
+ 7" legs.

Both models are also available assembled or assembled and finished.



For larger rooms  
THE 'COTSWOLD'

For smaller rooms  
THE 'COTSWOLD' MFS  
(minimum floor space)



Both models are supplied "in the white", complete with all wooden parts pre-cut, speakers, crossover and controls, for finishing to your personal taste.

The 'COTSWOLD' Speaker Systems are designed for those who want the finest possible high fidelity reproduction from a minimum size enclosure. In order to obtain optimum results over the full frequency range three speakers are used. The bass unit has a large heavy cone necessary for the best performance at low frequencies whilst the treble speaker is fitted with a small diaphragm weighing but a few milligrams. Dividing the frequency range between three speakers also avoids intermodulation distortion between treble and bass.

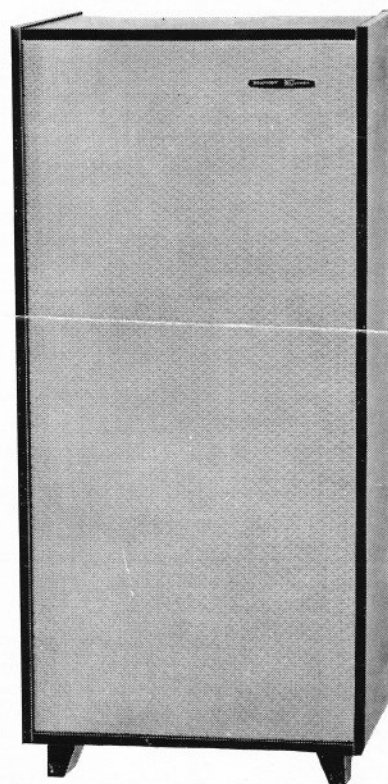
### 'COTSWOLD'

Although the Standard 'Cotswold' measures but 26" wide  $\times$  23" high  $\times$  14 $\frac{1}{2}$ " deep, the bass response extends to well below 30 cycles without colouration or 'boom.' This has been achieved without sacrificing efficiency by using a very high flux speaker in a critically damped enclosure utilising friction loading with a type of infinite baffle system. The stiffness of the air in the enclosure is used to control the bass response which is exceptionally smooth and free from distortion. The lack of colouration results in an absence of listening fatigue and the reproduction of speech is particularly realistic, being crisp, clear and well defined. The middle frequencies are handled by an 8"  $\times$  5" elliptical speaker which is completely enclosed to avoid intermodulation effects. The extreme high frequencies are fed to a high flux pressure unit which uses a low mass conical duralumin diaphragm with a phase corrector. The treble response extends to 20,000 cycles and is smooth and free from peaks which give the reproduction that spurious brilliance which can become extremely tiring. This extended high frequency response coupled with an outstanding transient performance helps to give a feeling of presence and realism and the wide angle sound distribution renders the 'Cotswold' ideal for stereo use. Level controls are fitted to the treble and mid-range speakers, allowing compensation for room acoustics etc.

### 'COTSWOLD' MFS

Measuring only 36" high  $\times$  16 $\frac{1}{2}$ " wide  $\times$  14" deep, this speaker system is almost identical in performance to the Standard 'Cotswold', but is specially designed to occupy a 'minimum floor space'. The compromises are small: mainly a slight reduction in output below 40 cycles with a smaller source area. It is particularly recommended to those who require the best possible results in small rooms.

The simple step-by-step procedure and large pictorial diagrams contained in the Instruction manuals make it exceptionally easy for anyone to assemble these models. No technical knowledge or special equipment is necessary, all the wooden parts are accurately pre-cut by machine, drilled where necessary and sanded smooth. They are left 'in the white' for final finish to individual taste. Special glue, sandpaper and all woodscrews are included in the kit. See details of construction overleaf. Special clamp nails are supplied with the standard model.



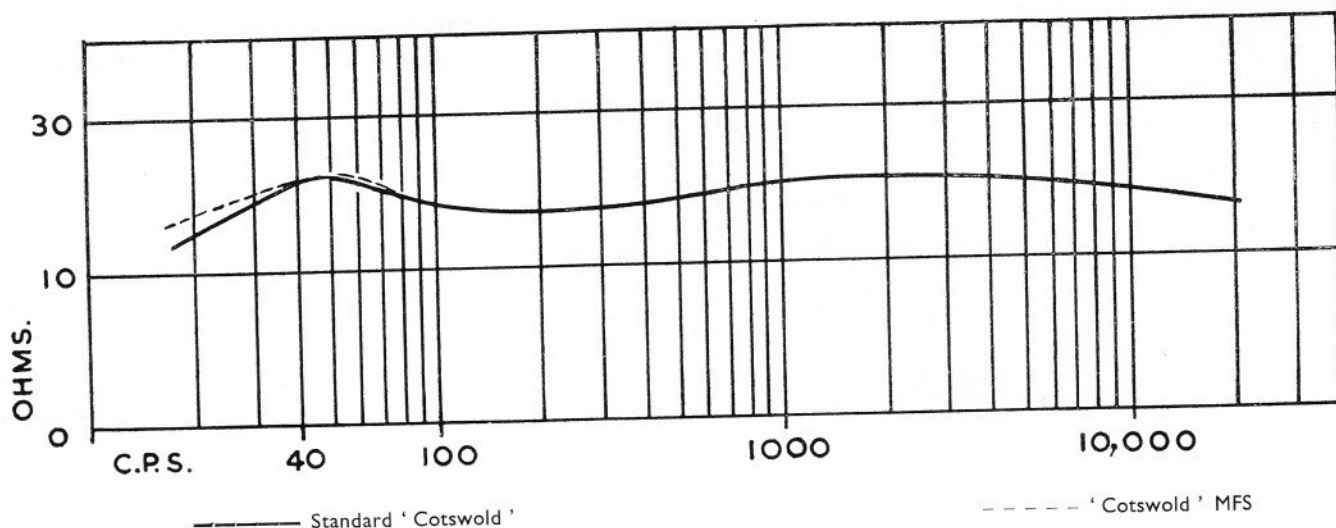
Size: 16 $\frac{1}{2}$ " wide  $\times$  36" high  $\times$  14" deep  
+ 2" legs.

Details of the full British Heathkit range sent free on request, from

# DAYSTROM LTD.,

## GLOUCESTER, ENGLAND

A member of the Daystrom Group, manufacturers of  
THE LARGEST-SELLING ELECTRONIC KIT-SETS  
IN THE WORLD



### IMPEDANCE CHARACTERISTIC

(taken with a high impedance source)

Note the unusual smooth curve and the absence of the secondary peak between 50 and 90 cycles which is a defect of the normal type of reflex enclosure. The small rise at the fundamental resonance of 45 cycles is easily absorbed by the inherent damping of a negative feed-back amplifier. For comparison, the impedance of an average 12" speaker in free air is between 180—250 ohms at the resonant frequency.

### SPECIFICATIONS (for both models)

Size—Standard 'Cotswold'	26" wide × 14½" deep × 23" high + 7" legs.
'Cotswold' MFS	16½" wide × 14" deep × 36" high + 2" legs.
Cabinet Materials	¾" veneered chipboard lined with Celotex and lagged, suitable for light or dark finish. The grille fabric is Tygan.
Weight assembled	61 lb.
Power Rating	25 watts programme material.
Frequency Range	30—20,000 cycles.
Dispersion angle	120 degrees.
Impedance	15 ohms.
Speakers :	
BASS	12" with curvilinear cone having a roll at the junction of the polyurethane foam surround which is far more effective termination than the normal use of foam plastic or plastic emulsion treatment.

The chassis is a heavy section aluminium casting with a large window area and the whole assembly is fully dustproof.

Flux	12,000 Gauss, total 160,000 Maxwells.
Speech Coil	2".
Resonance	27—30 cycles (in free air).
Cross-over Frequency	750 cycles (quarter wave section).

#### MID-RANGE

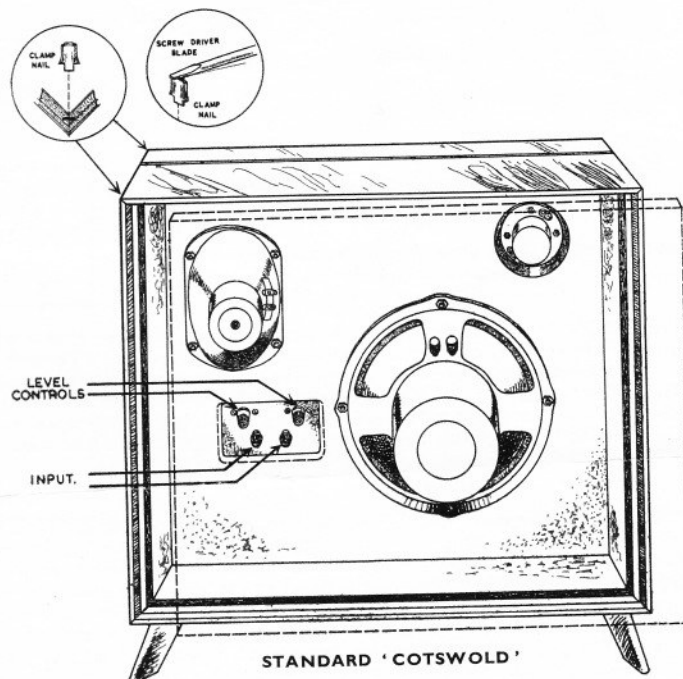
Size	8" × 5" elliptical, completely enclosed.
Flux	10,000 Gauss.
Speech Coil	1".
Frequency Range	750—6,000 cycles.

#### TREBLE

Size	2½" pressure unit with duralumin cone.
Speech Coil	¾".
Flux	17,000 Gauss.
Frequency Range	5,000 cycles to 20,000 cycles, capacitor coupling is used.

The Treble and Bass speakers are specially made to Heathkit specifications by Fane Acoustics and the Mid-Range by Goodmans Ltd.

See how the Heathkit clamp nail simplifies assembly!



**Ralph West** (*Hi-Fi News* - July 1960) says (of the standard 'Cotswold')

"... The immediate impression was excellent, and all further listening and tests agreed with the first impression. ... Nothing was ever missing, highest treble, deepest bass and yet all so very unobtrusive. In fact, one soon forgets all about the loudspeakers. ... Probably due to the fact that colouration is so very slight, large groups of singers were singularly striking and satisfying in stereo. ... The reviewer was very impressed and places this design amongst the top few and unhesitatingly recommends it to the most critical music lover.

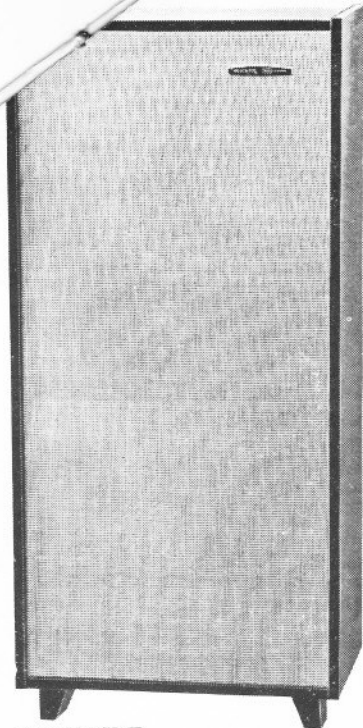
Millions of Heathkit instruments are in regular use all over the world. A high proportion of these have been successfully built by absolute novices. This is convincing proof of our claim that Heathkit equipment is the cheapest to buy, exceptionally good value for money, the easiest to assemble and a lasting pleasure to use. **No special equipment or knowledge is necessary.** The Heathkit Instruction Manual tells you in simple language exactly where every part goes and when and how to fix it. Numerous illustrations and large pictorials show each important stage of the assembly and the components so that you virtually cannot go wrong. **Catalogue of full range free from :—**

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HEATHKIT  
Cotswold MFS

## Space Saver

CLEMENT BROWN

SOME TIME AGO Daystrom Ltd introduced their Heathkit Cotswold speaker in kit form for home assembly. Still going strong, it is a medium-sized speaker occupying well over two square feet of floor-space; I know it well and consider it to be one of the best in its category. Later this firm added an alternative version known as the MFS (minimum floor-space), which occupies an area of  $16\frac{1}{2}$  in. by  $14\frac{1}{2}$  in. The height is 36 in., including the short legs on which the cabinet stands. The MFS and the original Cotswold model each cost £23 4s., and details are available from the Heathkit department of Daystrom Ltd, Gloucester.

I was anxious to learn whether the MFS was as good as its companion and, not having the time to work on a kit (my loss, now that I have seen this model), I borrowed an assembled sample from Daystrom. The results were first-rate, and I must say at once that solid value for money is offered. After all, £23 or so is the price of some 'bookshelf' speakers that cannot stand comparison with the Heathkit model. The MFS is a robust, high-quality speaker in which few compromises have been made. Enthusiasts with a little time to spare should get to work on a kit: even completely non-technical people who would run from the prospect of amplifier construction should be able to tackle a speaker. Everything is made easy; everything is supplied.

Good as it is, the MFS is basically simple, as befits a design which is intended for the home constructor. It is a vented

enclosure (the original Cotswold was a kind of infinite baffle) with more than the usual amount of damping: in fact the enclosed space is filled with loosely packed wadding. This pays off where smoothness of bass response is concerned—the effect on the impedance curve provides evidence—and I thought this was the most impressive aspect of the speaker's performance. The bass, with some reasonably clean output at 35 c/s, was unobtrusive and free from boominess. The rectangular vent faces the floor and is backed with a sheet of felt.

The top, bottom and sides of the cabinet are of  $\frac{1}{2}$ -inch plywood plus a lining of  $\frac{1}{4}$ -inch Celotex board; the baffle is  $\frac{3}{4}$ -inch chipboard; and the removable back, stiffened with a solid timber brace, is a  $\frac{3}{4}$ -inch sandwich of chipboard between wood facings. The result is a decidedly solid enclosure, less resonant than some costing nearly twice the price. As for external appearance, the close-grained veneer gives a discreet effect; the actual shade and degree of polish is of course determined by the purchaser. A light grey Tygan grille cloth is supplied.

The three drive units have been selected, and integrated in a smooth-acting wide-range system, with considerable skill and an obvious knowledge of musical requirements. The 12-inch Fane Acoustics bass unit has a large magnet (160,000 Maxwells total flux) and a free-air cone resonance under 30 c/s. Its cone construction is interesting in that there is a rolled edge in addition to a polyurethane foam surround; this device provides improved matching of cone to surround. The mid-range unit is a 8 by 5 inch Goodmans with a plasticised surround; it is connected via a quarter-section crossover filter and takes over its responsibilities at about 1,000 c/s. It is open-backed and has to be isolated from the pressures in the enclosure by a felt-lined wooden box. The bass unit, too, is protected for a different reason: a heavy cloth bag prevents the loose damping material from touching the cone.

High frequencies above about 5,000 c/s are handled by a Fane 2-inch pressure unit, coupled to the circuit by a capacitor. This is an efficient tweeter with its 17,000 gauss magnet and stiff, conical diaphragm of light alloy. Its outstanding feature is a curiously shaped diffuser, designed to smooth the treble output and spread it over a wide angle, and generally to enhance efficiency. Both the treble and middle outputs are adjustable: volume controls are situated at the back of the cabinet.

The MFS gave an over-all performance which was rather similar to that of the original Cotswold. This may seem an obvious point to make, since the same drive units are used in both versions; but the effect of the difference in shape and design of enclosure has to be remembered. Actually this is not a big effect, and there is only a small loss of firmness at the lowest frequencies; there is not much in it, and there is little cause for comment in a medium-sized room.

This leads me straight to the claim made in the Heathkit literature: the original Cotswold is for large rooms, but the MFS is for smaller ones—strictly on account of the difference in amounts of floor-space occupied. This seems fair enough at first thought; yet would not some people find a pair of quite hefty cabinets, each 3 ft high, a little disconcerting in a small room? This, of course, is for the individual purchaser to decide. What is more to the point, as far as I am concerned, is that the MFS really comes into its own in medium-sized and larger rooms (15 by 12 ft and above, in my view). Although I hesitate to say that the speaker would be wasted in a small room, I do consider that it has a 'big' performance. A pity to cramp its style.

It should be clear, then, that the MFS, although intended for home assembly, is in no way amateurish: rather it has professional features that would be found in quite expensive reproducers, and it gives a smooth, distinctly professional performance. The diffused treble output is a particularly good point (whatever the size of room), and the mid-frequency output is pleasingly free from unnatural emphasis, thanks to sensible crossover arrangements and choice of drive units. The actual amount of output can be adjusted. I must add that it would be a serious mistake to use a cheap amplifier just because a lot of loudspeaker has been obtained for a small outlay. It is necessary to use the best possible amplifier, with a fairly high damping factor, to secure the clean bass response of which the speaker is capable. In the Heathkit catalogue, the S-99 would be a good choice.

Since I have had the pleasure of hearing the MFS without the trouble of assembling it, I am not sure how any further comments on 'how easy it all is' will be received. Nevertheless the fact is that speaker assembly is both simpler and quicker than the construction of electronic components. There is no question of carpentry: all that is done at the works. The parts are machined and virtually finished, and the holes are drilled to take the screws. Only a very small amount of wiring and soldering is involved.

The most trivial odds and ends are supplied, but it is of course left to the constructor to provide a few simple tools—screwdriver, pliers, soldering iron and the like. The instruction manual, as is usual with Heathkit, gives detailed but clear directions for every stage of assembly and leaves nothing to chance.

I hope that these final words will encourage those who wonder whether they have it in them to create their own loudspeaker from an array of timber, screws and drive units! The do-it-yourself approach is sometimes more expensive in the long run, but in this instance it is safe to say that a small amount of trouble will secure a high-quality speaker—at a cost which bears little relationship to the audible results. The other Cotswold model should be investigated if it seems more appropriate to particular circumstances.