

A Homebrew HORN for **TANNOY** Dual Concentric Loudspeakers

by ROY HILSLEY

Reviving a 1960s classic...

I consider myself to be very lucky. My father introduced me to hi-fi when I was a teenager. That was over forty years ago! In those days audio electronics and hi-fi was very much an experimenter's hobby and my father loved to put electronic components together to make all manner of things. He built our amps, tuner and speakers—first for mono and then stereo. He even built our first TV set!

The early hi-fi shows in England were held at the Hotel Russell in London and we would visit to look, see and hear the latest audio innovations. My father was a music lover and could play the piano. He knew what sounded natural. At one of the shows he was so impressed with the sound made by one particular manufacturer that he ordered a pair of the speakers at the show. They were Lowther Acoustas (with PM6A magnets). These little gems were fast and very dynamic and we lived with them for several years but Dad always complained that they lacked really deep bass.

We fired them up with a Beam Echo pre-amp and a home brew Mullard 5-10 amp. This was a push pull EL84 ultra linear design. Great sounding design (based on the Leak Stereo 20) which he used with these speakers for several years until the Lowther surrounds deteriorated and he got fed up with adjusting the magnet to prevent periodic voice coil interference.

He was by then firmly committed to the sound of horns and he decided to try another approach using Tannoy dual concentric drive units. These very novel speakers have a horn

loaded HF unit concentrically mounted within a large bass driver. They were made in three frame sizes: ten inch (called III LZ), twelve inch and a mighty fifteen inch unit and were supplied with a separate crossover. Tannoy units could be mounted in horn loaded or reflex cabinets and plans were available from Tannoy. My father bought two III LZ drivers for a horn loaded speaker project. Unfortunately, he never got 'round to building those speakers.

Many years passed and when I cleared out the old house, I came across these drivers and they captured my imagination. Those old units looked like new and yet were over 35 years old, but somehow the design looked right with the pepper pot drillings at the throat of the HF horn and the substantial cast frame.

I was at the start of the trail of audio simplicity and rebirth. I had owned typical hi-end British made transistor based hi-fi for many years and was listening to inefficient multi-driver speakers. They were, however, lifeless and had no



dynamics. Yes, I am sorry to say that I had become a victim of the press hype.

Dad had managed to collect all sorts of audio "junk" over the years and during the course of trading this at a vintage audio store in the UK I discovered that the industry was being revolutionized by the experimental amateurs again. Valves were back. Minimalist SE designs were advocated. Horns were being rediscovered. I discovered *Sound Practices*.

I started using a modern push pull valve amp for a while and then decided to build a pair of SE amps to my own design, 417A, 6J5GT transformer coupled to a VAIC 300B. Next came a home brew phono pre-amp (similar to the Siren Song) and what joy. The transition from high feedback transistor designs to no feedback valve designs revitalized my record collection and gave me so much more music and much more pleasure. The fun I had making changes then listening and making changes again.

After a while I became satisfied with the amps and I decided to try horn speakers. I started by trying a vintage pair of Lowther Acoustas. I loved the speed and life but soon became dissatisfied with the bass.

I decided to take up the project which my father had not managed to complete. I studied plans for the Acousta published in *SP* and I looked at the cross sectional plans of the well-respected Tannoy GRF enclosure published in old copies of *Hi-Fi News*. These designs gave me some ideas.

I wanted the efficiency and projection of horn loading, but with deeper bass, but I also wanted the cabinets to be dimensionally acceptable and wife friendly! The ideas crystallized into the cabinet shown in the photograph and illustrated in the sketch plans. The design is not theoretically founded on a particular horn flare. I adopted an empirical approach. I listened to, studied and measured other horns and based my design on what might look right and work. The plans are given as a basis for you to try a simple-to-build horn enclosure for Tannoy dual concentric units. You are free to experiment and improve or modify.

Cut the wood to the sizes shown. I used veneered plywood. There are two cabinet widths possible. One for the ten inch units and another for the twelve inch units. Assemble the top, bottom, rear and inner panels to a side panel. I used a "filler" type of fast-setting mastic glue. Do not glue the front baffle and remember to run internal speaker wires.

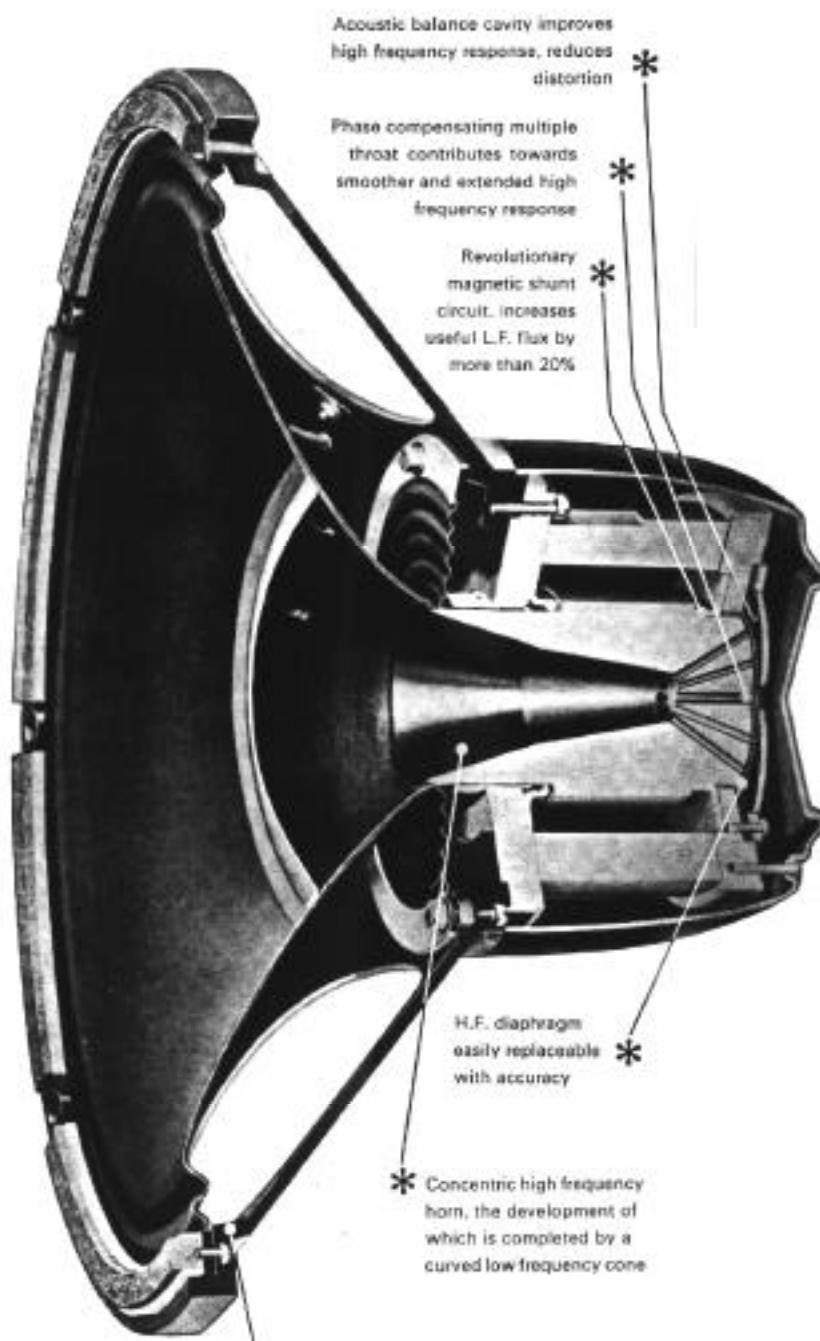
Make sure that the horn is airtight. Make the bass horn throat about half of the area of the bass cone. Glue liberally and smooth internal

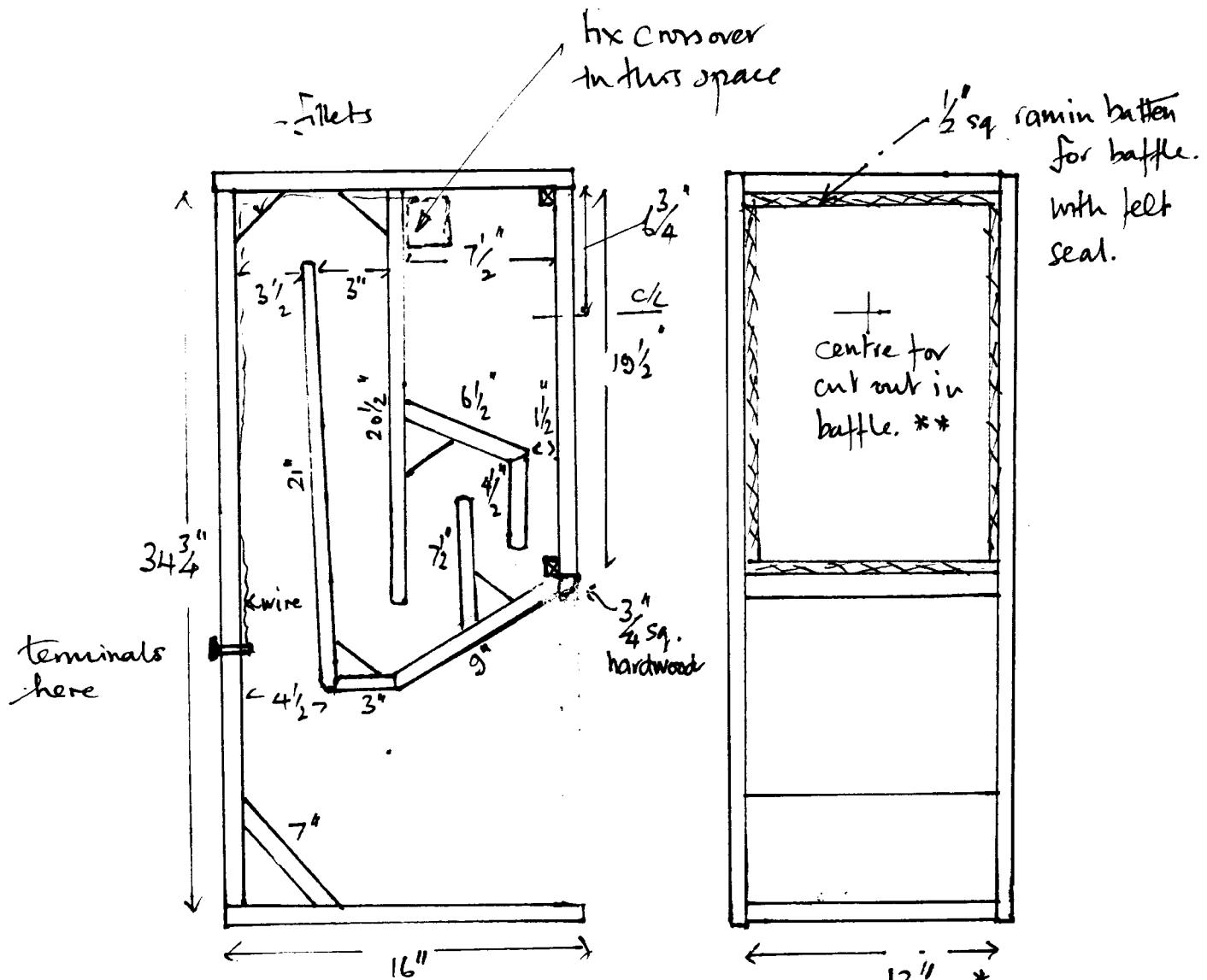
folds with glass paper (sand paper) as well as you can before you fix the second side panel. Make the front panel baffle airtight by using a gasket made of thin felt glued to the internal batten. Screw the baffle to the internal batten with about eight brass countersunk wood screws. Fit the crossover in the space shown on the plan. When construction is complete, sand down all external surfaces, oil and polish to suit.

When the glue is set and the polishing done fire them up—you will not be disappointed! You should be listening to deep tuneful bass with a solid image and good projection. The Tannoy HF horn will give you a clean midrange and top

end projection. These speakers are efficient so you can drive them with your 10 watt or so valve amps.

In comparison to the Acoustas, you will hear deeper bass without the characteristic mild "honk" which I think the Lowther cabinets have. These Tannoy horn speakers have less of a "hot seat" stage as an added benefit. They are not particularly sensitive in respect of placement and I turn them in just a little and use them about a foot from the wall for best effect in my room.





Materials

side panels = 18 mm

top, bottom, baffle = 14mm

Internal = 12 mm.

all fillets = 4 mm.

** cut out hole in
baffle 9" ϕ for 11" L7
11" ϕ for 12"

Plan for Homebrew Horn for Tammy Dual Concentric Speakers

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Tanno y "Monitor Gold" Specifications

Frequency response	23—20,000 Hz.	25—20,000 Hz.	27—20,000 Hz
Polar Distribution for 60° inc. Angle	-4dB at 10,000 Hz.	-3dB at 10,000 Hz.	-2dB at 10,000 Hz.
Power Handling Capacity	50 watts*	30 watts*	15 watts*
Impedance Via Crossover Network	8 ohms (5 ohms min.)	8 ohms (5 ohms min.)	8 ohms (5 ohms min.)
	"FIFTEEN"	"TWELVE"	"III LZ"
Flux Density L.F. Gap	13,500 gauss	11,500 gauss	10,000 gauss
Flux Density H.F. Gap	18,000 gauss	15,000 gauss	15,000 gauss
H.F. Voice Coil Diameter	2"	2"	2"
L.F. Voice Coil Diameter	2"	2"	2½"
Intermodulation Products	less than 2%	less than 2%	less than 2%
Bass Resonance	26 Hz.	28 Hz.	30 Hz.
Magnet Assembly Weight	13 lb.	7½ lb.	6½ lb.
Magnet Material	Ticonal G	Ticonal G	Ticonal G
Crossover Frequency	1,000 Hz.	1,000 Hz.	1,200 Hz.
Overall Diameter of Frame	15½"	12¾"	12½"
Overall Depth	9"	7½"	6½"
Fixing Holes P.C.D.	14½"	11¾"	11"
Weight: (Crossover network & Switch panel as separate units)	21 lb. 13 ozs. (crossover 4 lb.)	12 lb. (crossover 4 lb.)	10 lb. 4 oz. (crossover 3½ lb.)
Finish:	Cover	High impact plastic	High impact plastic
	Frame	Stove enamel	Stove enamel
	Magnet Assembly Parts	Cadmium plate	Cadmium plate

