

AUDITORIUMS • STADIUMS • ARENAS • THEATRES • AIRPORT TERMINALS OUTDOOR VOICE WARNING SYSTEMS • INDUSTRIAL AND COMMERCIAL INSTALLATIONS

The exponential multicellular horn is the most efficient of all projectors for delivering top quality sound uniformly over a defined listening area. The unique excellence of the multicellular horn results from its distinctive design:

- (a) The multicellular horn consists of a number of individual horns assembled in various configurations to provide controlled angles of vertical and horizontal distribution for best sound coverage of any listening area.
- (b) Each horn or cell of the multicellular horn is a straight exponential trumpet through which sound can pass unimpeded. This is a distinct advantage over horns of the re-entrant or reflex type which severely attenuate the high frequencies and cause distortion due to sharp folds or bends in the sound passage.
- (c) The column speaker exercises control of sound only in the vertical plane, whereas the multicellular horn controls sound in both the vertical and horizontal planes thus providing the added advantage of restricting sound projection into reverberant side walls.
- (d) The re-entrant or reflex horn and the column speaker are handicapped by the fact that the beam width becomes steadily narrower as frequency increases, to a point where sound coverage in the critical high frequency range between 2,000 and 10,000 cycles shrinks to a narrow pencil of sound, in some cases only 15° to 30° wide.

In contrast, the beam width of the multicellular horn above the cross-over region and in the important mid- and high-frequency regions to 12,000 cycles and be-

yond, is independent of frequency. This entire portion of the frequency spectrum is uniformly distributed throughout the full angle of the horn.

- (e) The multicellular horn with its great undistorted power handling capacity (up to 400 watts) is unequaled by any other commercially available sound over large outdoor areas.

Altec multicellular horns will accommodate as many as four drivers of the 288 type for indoor use, or 730 and 290 type for outdoor use. The latter drivers and the 30546 angle adaptor in combination with a multicell horn constitutes a complete All-Weather system.

The multicellular horn was developed to insure the success of early talking pictures. Ordinary horns proved incapable of providing good quality coverage to every seat in large theatres, most of which were far from ideal acoustically. The folded horn was discarded in theatre work in 1934 and since that time the multicellular horn has remained the standard of excellence.

The 300 cycle cutoff multicellular horn is often used as a "one-way" speaker where voice only is to be reproduced, or where maximum intelligibility is required to penetrate high ambient noise levels, or for projection over long outdoor distances.

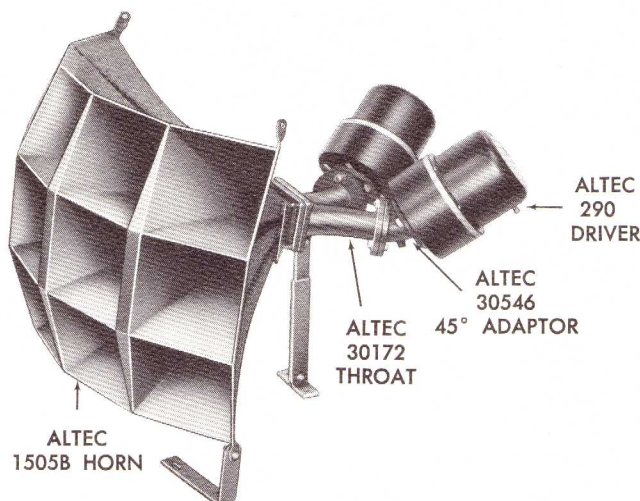
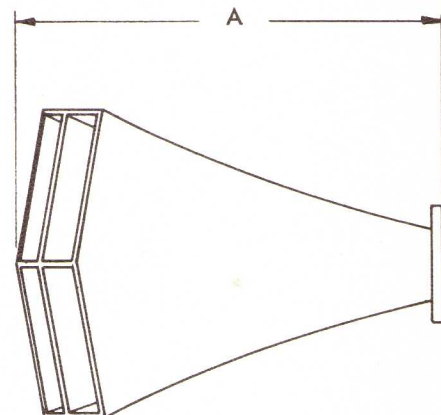
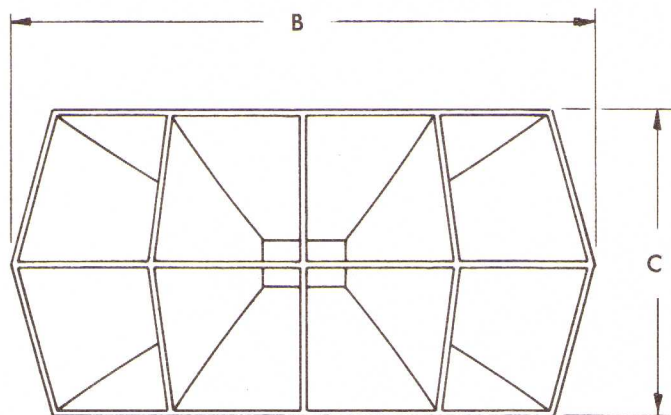
The 500 cycle multicellular horn with a 500 cycle crossover network and low frequency speakers, Altec 416A or 515B, are generally used for full range "two-way" loudspeaker systems such as Altec "Voice of the Theatre" systems for the reproduction of high quality voice and music.



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TYPICAL MULTICELLULAR HORN AND DRIVER COMBINATION

21216 adapter

30162 horn throat (single unit)

30166 horn throat (single unit)

30170 horn throat (double unit)

30172 horn throat (double unit)

30210 horn throat (single unit)

30546 45° weatherproof throat adapter

30619 90° throat adapter

30296 doghouse (supplied with models 1004, 1504, and 1804 only)

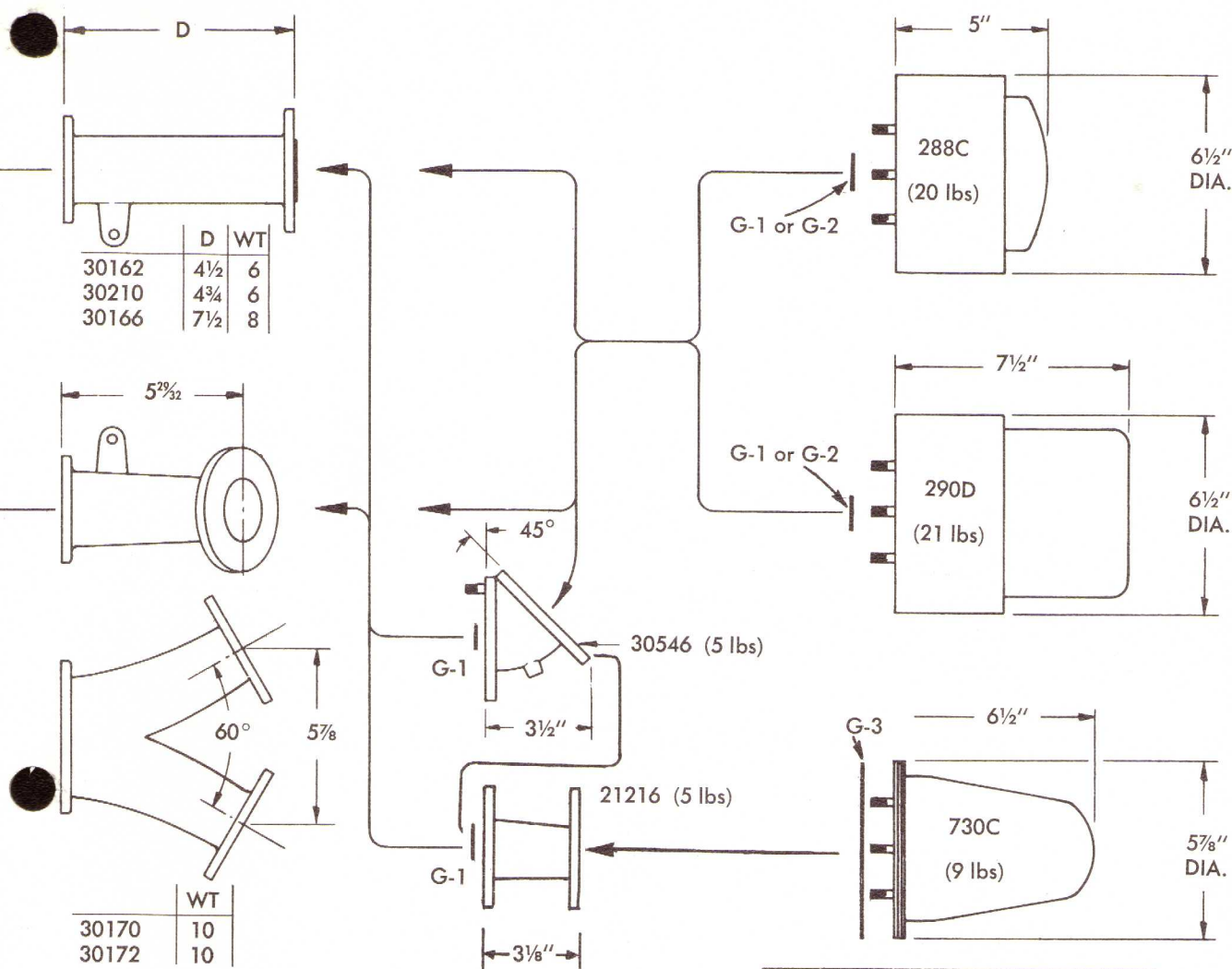
Multicellular Horns

HOW TO SELECT THE CORRECT MULTICELLULAR HORN FOR SPECIFIC AREA COVERAGE

Multicellular projectors are available in several configurations. The sound distribution pattern (angle) is determined by the cell arrangement. Each cell of a 500 cycle horn projects sound over an area of 20° square, or 400 square degrees per cell; a 400 cycle horn distributes sound over an area of 19° square per cell and a 300 cycle horn over an area of 17½° square per cell (203B horn — 20° square per cell). The sound distribution pattern, both horizontal and vertical, of a horn, is established by the total number of cells assembled in each plane.

Determine the area to be covered and, by reference to the chart on page 4 of this bulletin, select the horn having a distribution pattern which will most closely cover this area. To obtain full advantage of controlled distribution, no greater area of sound coverage should be provided than can be effectively used. Multicellular horns are composed of a group or stack of individual horns so that each small horn becomes a component part of the large horn assembly. All cells are fed from a common throat.

The partial spherical front achieved by grouping the cells allows each cell to contribute to the whole without overlap or confusion. In installations where speech only is to be projected, the projection ability of a 300 cycle horn can be increased by sharply cutting off the low frequency energy fed the horn an octave above the rated cutoff of the horn by use of an Altec N-500C network or the 15045A 70-volt line transformer. In this manner, the horn has an effective length considerably greater than its physical length. By selection of the proper cell configuration, the projected sound is fully controlled in both the vertical and horizontal plane and this feature proves useful in combating high reverberation and in minimizing or eliminating acoustic feedback. A 300 cycle horn in combination with a 500 cycle crossover network, will greatly aid in overcoming objectionable reverberation by giving the horn greater projection ability by restricting the radiation of the low frequencies, which are often undesirable in the masking of sound and contribute little or nothing to speech intelligibility.



GASKET REQUIREMENTS FOR ALL MULTICELLULAR HORNS AND ASSOCIATED PARTS

1. Connection of 288 or 290 Drivers to Adapter, Throat, or Horn.
 - a. When mounting an adapter, throat, or horn with a male fitting to a 288 or 290 Driver, a 20466 (0.02" thick, No. 1) gasket must be inserted between adapter, throat, or horn and the driver.
 - b. When mounting an adapter, throat or horn with a flush face to a 288 or 290 Driver, a 21270 (0.125" thick, No. 3) gasket must be inserted between adapter, throat, or horn and the driver.
 - c. When mounting a 203B Multicellular Horn to a 288 or 290 Driver, no throat is required. Insert a 21270 gasket between the 203B Horn and the driver. If an adapter is desired, rule a or b above apply.

2. Connection of 730C Driver to Adaptor.
When mounting the 730C Driver to the 21216 Adapter, use a 21263 (0.093" thick, No. 2) gasket between the driver and the adapter.

HORN	A	B	C	WT.
203B	31	32	17	22
803B	26 1/2	32	16 1/4	27
804B	23 1/2	32	16 1/4	25
805B	17 1/2	24 1/2	13	17
1003B	25 1/2	38	16 1/8	32
1004B	*20 1/2	38 1/2	16 1/4	30
1005B	17 1/4	30	13	20
1504B	*21	38 3/4	24	48
1505B	16 3/4	30 1/2	18 1/2	22
1803B	27 1/2	44	24	60
1804B	*23 1/2	44	24	58

*(Add 4" for throat adapter)
(Furnished)

GASKET SPECIFICATIONS

No.	Altec P/N	O.D.	I.D.	Thickness
1+	20466	2"	1.406"	0.02"
2++	21263	4"	1"	0.093"
3+	21270	2"	1.406"	0.125"

+ Supplied with drivers and adapters

++ Supplied with 730C Driver

NOTICE

We recommend that you obtain your Altec products from factory trained authorized Altec Sound Contractors and Distributors. This will assure you of proper installation, a continuing source of knowledgeable advice, service, and quick warranty protection.

MULTICELLULAR HORN PERFORMANCE CHART

Horn Model Number* (a)	Quantity of Drivers Used per Horn (b)	Driver Model Number (c)	Sound Pressure Level Full Power Each Driver** Measured at		Distribution Pattern (e)	Cutoff Frequency (f)	Cell Configuration	Throat Code Number ***
			30 feet (d)	100 feet (d)				
203B	1	288 290 730	118 db 121 db 111 db	108 db 111 db 101 db	20° x 40°	300 cps	1 x 2	(not required)
803B	1	288 290 730	115 db 118 db 108 db	105 db 108 db 98 db	35° x 70°	300 cps	2 x 4	30162
804B	2	288 290 730	118 db 121 db 111 db	108 db 111 db 101 db	35° x 70°	400 cps	2 x 4	30172
805B	1	288 290 730	113 db 116 db 106 db	103 db 106 db 96 db	40° x 80°	500 cps	2 x 4	30162
1003B	1	288 290 730	113 db 116 db 106 db	103 db 106 db 96 db	35° x 90°	300 cps	2 x 5	30210
1003B	2	288 290 730	116 db 119 db 109 db	106 db 109 db 99 db	35° x 90°	300 cps	2 x 5	30170
1004B	4	288 290 730	119 db 122 db 112 db	109 db 112 db 102 db	40° x 100°	400 cps	2 x 5	(2) 30170****
1005B	1	288 290 730	112 db 115 db 105 db	102 db 105 db 95 db	40° x 100°	500 cps	2 x 5	30210
1005B	2	288 290 730	115 db 118 db 108 db	105 db 108 db 98 db	40° x 100°	500 cps	2 x 5	30170
1504B	4	288 290 730	118 db 121 db 111 db	108 db 111 db 101 db	60° x 105°	400 cps	3 x 5	(2) 30170****
1505B	1	288 290 730	110 db 113 db 103 db	100 db 103 db 93 db	60° x 105°	500 cps	3 x 5	30166
1505B	2	288 290 730	113 db 116 db 106 db	103 db 106 db 96 db	60° x 105°	500 cps	3 x 5	30172
1803B	1	288 290 730	110 db 113 db 103 db	100 db 103 db 93 db	53° x 105°	300 cps	3 x 6	30166
1803B	2	288 290 730	113 db 116 db 106 db	103 db 106 db 96 db	53° x 105°	300 cps	3 x 6	30172
1804B	4	288 290 730	116 db 119 db 109 db	106 db 109 db 99 db	60° x 125°	400 cps	3 x 6	(2) 30170****

* Model code denotes number of cells and horn cutoff frequency. Example: 1504B = a 15 cell horn (3 rows of 5 cells per row) with cutoff frequency of 400 cps.

** Sound Pressure Level (SPL) as shown in column (d) is based or measured at 30 and 100 feet with full rated power applied to each driver as shown in column (b) and averaged uniformly over 600 to 2,400 cps. (see note 1.)

One 21216 Adapter required in addition to indicated throat for each 730 Driver used.

**** If only two drivers are desired on the 400-cycle horn, use two 30210 single throats in place of two 30170 double throats.

NOTE 1. Full power rating on

288 is 40 watts
290 is 100 watts
730 is 75 watts

NOTE 2. Driver units should be protected against low frequency by use of N500C Altec Network, or the 15045A Line Transformer.

NOTE 3. It is recommended that 30546 45-degree angle adapters be added to each driver for added weather protection in all outdoor installations.

NOTE 4. Sound Pressure Level Conversion Table

l) To increase SPL 3 db double the input power; to increase 6 db, quadruple the input power.

II) Each time distance of horn projection is doubled subtract 6 db SPL.

-ARCHITECTS AND ENGINEERS SPECIFICATIONS

(Note: Fill in proper values and numbers from Horn Performance Chart.)

The high-frequency horn shall be of the multicellular type, equipped with proper throat and adapters and (b) (c) compression driver or transducer. As specified elsewhere, it shall produce a uniform sound pressure field of (d) db at a distance of (select from d) feet with (Note 1) watts input power applied to each driver over a field of distribution of (e) uniformly averaged over the band of 600 to 2,400 cps. Single frequency measurements will not be acceptable under this specification. The low-frequency cutoff shall be (f) cps.

The horn shall be constructed of individual weatherproofed metal cells with a special damping material coating the external surfaces of each cell. The cells shall all be straight with an exponential expansion. Folded or re-entrant horns or horns fabricated of wood or other fibrous materials will not be acceptable. The horn shall be equipped with mounting brackets or facilities both on the front or mouth and on the appropriate cast throat. Any high frequency horn not meeting the above specifications shall be deemed unacceptable under these specifications.