pioneer

5-INCH & 6½-INCH SQUAWKER

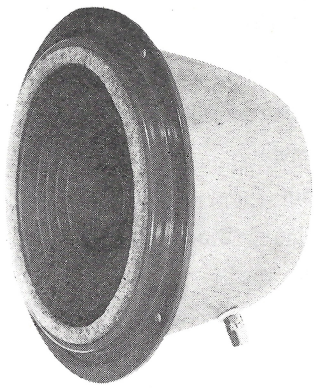
PM-12A PM-16B

In music both classic and jazz, the chief component of sound comprising that music is mid-range sound. Of all sound ranges human ear is most sensitive to mid-range sound, and peaks and dips in the mid-range sound are clearly recognizable upon hearing.

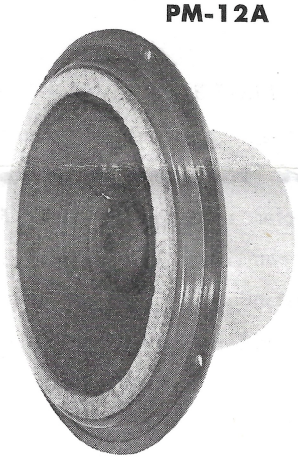
For this reason, a speaker assigned to the mid-range is required to have flat frequency characteristic, and also as recent woofer has improved performance, the efficency and directionality of squawker matching it is demanded. Although there are some excellent, highly efficient mid-range speakers such as high-grade multi-cellular horn-type speaker, since they are expensive, after all for amateurs cone type speakers are simple to use and convenient in size.

The Pioneer had on the market one kind each of horn-type and cone-type squawkers and has just announced the new style squawkers, **PM-12A** and **PM-16B.** These squawkers have especially excellent efficiency and directionality characteristic, and have a unique feature that the frame itself forms a hermetically sealed cabinet. Sufficient allowance is also made for input. Besides as they are inexpensive, they can be conveniently used for home as well as for business speaker systems.

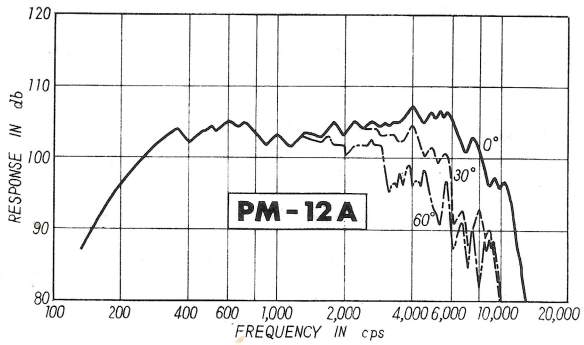
PM-12A is 5 inch in caliber while **PM-16B** is 6½ inch; after considering the characteristics of woofer and tweeter and required wattage, please choose the proper one to make up an excellent speaker system.

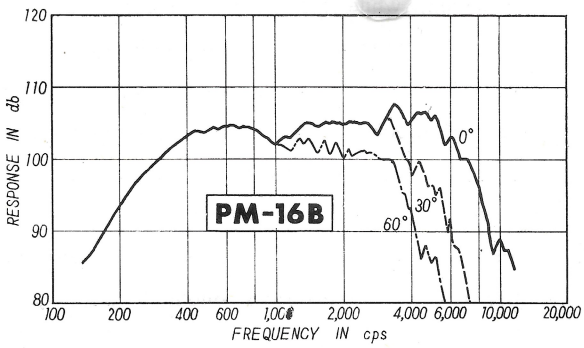


PM-12A



PM-16B





PIONEER ELECTRONIC CORPORATION

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SPECIFICATIONS

Model No.	PM-12A	PM-16B
Voice Coil Impedance:	8 or 16 ohms	8 or 16 ohms
Frequency Range:	400-9,000 cps.	400-6,000 cps
Power Input:	15 watts	25 watts
Sensitivity:	103 db/watt	104 db/watt
Crossover Frequency:	Low Range 500-800 cps	Low Range 500-800 cps
	High Range 2,000-6,000 cps	High Range 2,000-5,000 cps
Total Flux:	52,000 Maxwell	65,000 Maxwell
Flux Density:	12,600 gauss	10,400 gauss
Magnet weight:	224.8g (7.93 oz)	224.8g (7.93 oz)
Diameter:	6 inch	7 7/8 inch
Depth:	3 7/16 inch	3 7/8 inch
Mounting Diameter:	5 5/8 inch	7 3/8 inch
Baffle Open:	5 3/16 inch	6 13/16 inch
Weight:	1.4 kg (3.08 lbs)	1.6 kg (3.52 lbs)

USES OF PM-12A & PM-16B

The **PM-12A, PM-16B** is a mid-range speaker unit, and may be used in conjunction with PIONEER's **PW-38C (15″)**, **PW-30C (12″)**, or **PW-25C (10″)** woofer units, and **PT-2, PT-3, PT-4,** or **PT-01** tweeter units, to assemble 3-way speaker systems of outstanding performance.

The **PM-12A, PM-16B** may be used for a wide variety of applications, some of which are enumerated below:

1. Appreciation or reviewing of music;
2. Reception of high fidelity broadcast transmissions;
3. Reproduction of TV sound;
4. Monitoring in recording or broadcasting facilities;
5. Testing or surveying of audio equipment;
6. Reproduction of wide-range high fidelity broadcast transmissions;
7. For intercome systems requiring exceptionally high efficienecy speakers for clarity, or for tape recorders;

OUTSTANDING FEATURES OF MULTI-WAY SYSTEMS

1. Extension of the range of frequency reproduction is simplified, while the overall response becomes far smoother than systems using single speakers.
2. Sound distribution is vastly improved over that of single unit speaker systems, and the overall quality is less mechanical and becomes abundant in 'living presence'.
3. Intermodulation distortion or interference distortion —that serves to impair tonal quality—can be minimized.
4. As the frequency range handled by each individual unit is far less than that handled by a single unit speaker system, the designing is greatly simplified, and it becomes possible to use units with optimum frequency response, transient characteristics, and efficiency factors for the specific range, so the result is outstanding overall characteristics.

FEATURES OF PM-12A & PM-16B

1. CONES

Paper used for **PM-12A** and **PM-16B,** though of light weight, possesses not only proper internal loss but also high rigidity. Strict investigation on the shape of cone paper was especially carried out for the purpose of decreasing both violent irregularities in

response curves for the frequencies above the mid-range resonance and non-linear distortion.

2. OTHER VARIOUS CHARACTERISTICS

Particularly the outstanding transient response of the **PM-12A, PM-16B** is remarkable such performance is something quite novel when compared to cone type speakers manufactured heretofore; in rapidly fluctuating music—such as pulsive music like that produced by a piano—the speaker will reproduce the sounds exactly in accordance with the original waveforms.

As for efficiency, the two kinds of speakers maintain nearly the same level as any big caliber woofers or tweeters through the combination of a powerful magnetic circuit and light cone paper; and in combination with excellent speakers their composite characteristics, regardless of whichever one of the three—frequency, directionality or distortion—is taken, are such that they fully display the real worth of a 3-way system.

3. UNIQUE STRUCTURE

When a conventional cone-type squawker is to be mounted with a woofer in the same cabinet, the back of the squawker has to be covered with another case to avoid mutual interference, but since the yoke cap of **PM-12A** or **PM-16B** itself forms a hermetically-sealed cabinet, it can be used just as it is. And when it is to be used placed outside the cabinet, by having $11\frac{13}{16}$inch square board ready, it can be made to function satisfactorily as a mid-range speaker.

SUGGESTION FOR USING PM-12A & PM-16B

1. CROSSOVER FREQUENCIES

When the crossover frequencies of **PM-12A** or **PM-16B** are taken between 500—800 cps for the low frequency range and between 2,000—5,000 cps for the high frequency range, the best result will be attained. However the crossover frequencies can not be decided by the mid-range speaker alone. In selecting crossover frequencies, the characteristics of woofer, limit of piston action and distortion must be considered for the low range, while the directionality characteristics of tweeter as well as cut-off frequency must be taken into consideration for the high range. Accordingly, as the crossover frequencies depend on the woofer and tweeter to be combined, choose the most appropriate frequency within the crossover frequency range as designated for **PM-12A** or **PM-16B.**

2. SUGGESTED SPEAKER COMBINATIONS

Employing **PM-12A** or **PM-16B** in combination with various woofers and tweeters, all kinds of excellent 3-way systems can be designed and developed for use from private home to public auditoriums.

Some such examples of combinations using Pioneer speakers are given in the following, but these are only for your reference, and many other combinations in addition to these can be made according to purposes.

1.

Low Frequency Unit:	**PW-25C** (10″ Woofer)
Mid-Range Unit:	**PM-12A**
High Frequency Unit:	**PT-4** (Horn Type Tweeter)

2.

Low Frequency Unit:	**PW-30C** (12″ Woofer)
Mid-Range Unit:	**PM-12A**
High Frequency Unit:	**PT-3** (Horn Type Tweeter)

3.

Low Frequency Unit:	**PW-30A** (12″ Woofer)
Mid-Range Unit:	**PM-16B**
High Frequency Unit:	**PT-2** (Horn Type Tweeter)

4.

Low Frequency Unit:	**PW-38C** (15″ Woofer)
Mid-Range Unit:	**PM-16B**
High Frequency Unit	**PT-3** (Horn Type Tweeter)

3. NETWORK

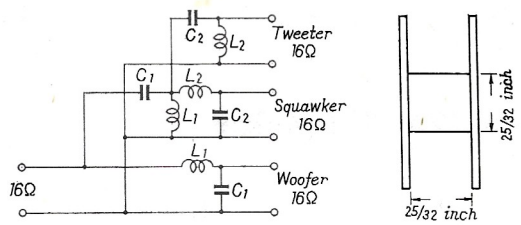
In order to make up an excellent 3-way system, a dividing network based on proper design and fabricated under meticulous supervision is necessary. When one of the three kinds of networks—**DN-5, DN-6** or **DN-7** recently placed on the market by the Pioneer—is utilized, a far gratifying result can be easily obtained. If all speakers in a combination happen to be of 8-ohm impedance, either **DN-5** or **DN-6** is suitable while

either **DN-5** or **DN-7** is satisfactory if they are all of 16-ohm impeadance.

4. HOME-MADE NETWORK

For those who make own networks, the data on constant-resistance parallel type with 12db per octave attenuation for 3-way system are listed below. The crossover frequency is 500 cps and 4,000 cps. The enamel-covered wire of 0.65 mm dia. and either oil-filled or metallizer condensers should be used.

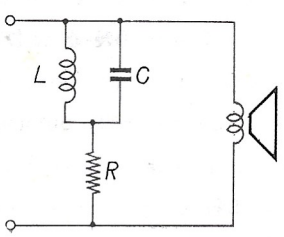
3 WAY NET WORK 12db/oct, 16ohms
crossover frequency 500, 4000 cps



C_1	C_2	Wind 0.65 mm E.C.W on the bobin shown up.	
		L_1	L_2
		590 T	240 T
14μF	1.76μF	7.3mH	0.9mH

5. COMPENSATING CIRCUIT

When **PM-12A** or **PM-16B** is used just as is by connecting it to a network, it introduces an impedance (having reactance), shifting the crossover frequency of speakers consequently causing irregularities in the characteristics near the crossover frequency sometimes. In orden to prevent such irregularities in the characteristics, a compensating circuit is inserted between the squawker and the network to make the network fully display its capacity. For this reason the use of compensating circuit is highly recommended.



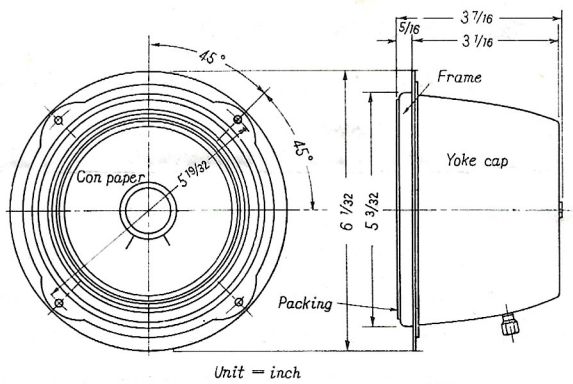
	C (μF)	L (mH)	R (Ω)
PM-12A	2.4	6.2	16
PM-16B	2.2	7	16

PRECAUTIONS FOR USE

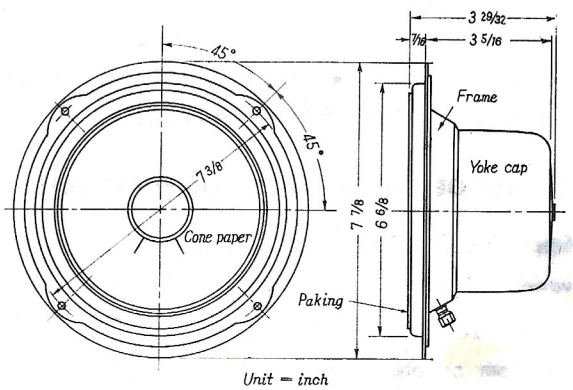
When uesing **PM-12A** or **PM-16B,** do not use it as it is, but use it either by mounting onto a 11 13/16 inch square baffle-board or by installing it together with a woofer in a cabinet. When it is used without a baffle-board, its low frequency level becomes lower, and sound balance may be impaired.

When the level of a speaker matches that of a woofer to be combined with it, there is nothing to be considered especially. However as the level of a woofer is generally lower, employ an attenuator for level adjustments. For the attenuator, either **AT-8A** or **AT-16A**—Pioneer products—are the most suitable.

MOUNTING



PM-12A



PM-16B