



PIONEER

WORLD-FAMOUS BRAND IN HI-FI REPRODUCTION

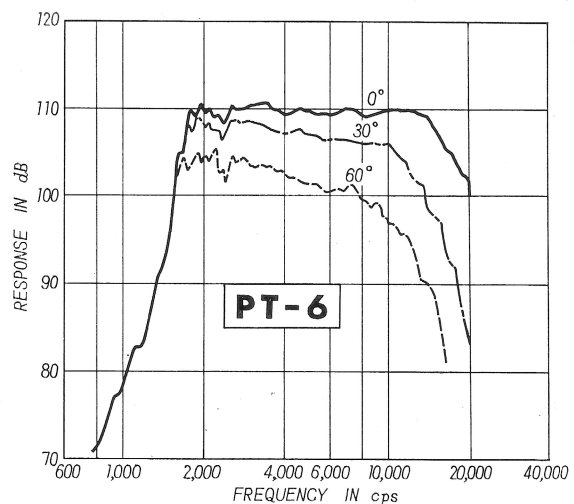
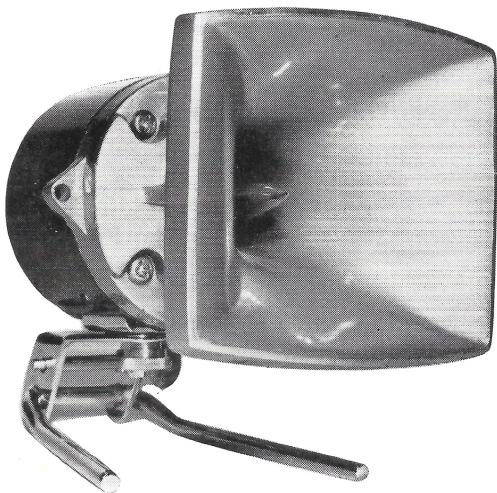
PROFESSIONAL HORN TWEETER

PT-6

Considering all factors including its surprisingly high efficiency, reduction of distortions of all kinds, attainment of natural tonal quality, etc., **PT-6** is a faultless speaker made exclusively for the high range; especially the improvements, from the standpoint of design and materials, in its vibratory system have made its high range characteristics the most remarkable—never attained up to the present time, and even during its trial production, it has attracted the attention of many an expert.

The uniformity of characteristics of **PT-6** resulting from the rational production processes and techniques fulfils the essential requirements for a speaker to be used in stereo systems; and in combination with our woofer of 8~15 inch diameter, two or three way system can be made up to get the ideal reproduction of sound.

As to its cost, being less expensive compared with the former tweeters, it is to be conveniently used in the future stereo systems.



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SPECIFICATIONS

Model No.	PT-6	Total Flux	32,500 maxwell
Voice Coil Impedance	8 or 16 ohms	Flux Density	14,400 gauss
Cutoff Frequency	1,500 cps	Crossover Frequency	Over 3,000 cps
Frequency Range	1,500~20,000 cps	Dimensions	3 $\frac{3}{8}$ (W) × 3 (H) × 4 $\frac{5}{16}$ (D) inch
Power Input	20 watts	Weight	800g (1.8 lbs)
Sensitivity	108 dB/watt		

USES OF PT-6

As described above, the model **PT-6** is a highly efficient horn type speaker for high frequency range especially designed for home Hi-Fi system, and although it is ideally suited for a typical stereo, it also has a wide variety of uses as shown in the following.

1. 45/45 stereophonic record reproduction; high quality playback of long-playing microgroove records;
2. Reproduction of FM high fidelity broadcasts;
3. Sound systems for record concerts;
4. Restaurants or nightclubs;
5. Monitoring in broadcasting facilities or recording studios;
6. Juke boxes;
7. Testing and examining of all types of audio components.

FEATURES OF PT-6

1. Equalizer and magnetic circuits

As an equalizer based on the unique design by the Pioneer is employed in **PT-6**, the realization of splendid frequency characteristic—uniform reproduction from 1,500 to 20,000 cps—unattainable by conventional horn-type tweeters is made possible.

Also because of its fine rise characteristic, not only the distortion near the crossover frequency is negligible but the transient characteristic is excellent, thereby imparting marvelous tonal quality to reproduced sound.

With the adoption of powerful magnetic circuits, as the efficiency of **PT-6** is high, getting the pressure level of sound output as much as 108 db, it can be matched with any kind of woofers.

2. Unique diaphragm and horn

Among the vibrating elements that determine the tone quality of a speaker for high frequency range, it is the diaphragm that plays the most vital part. The diaphragm employed in the model **PT-6** was developed by highly competent technical staff through years of research and is made by molding polyester resin film. It is light but tough, unaffected by both temperature

and moisture, not deformable, etc. ...in other words, it has all ideal characteristics, and consequently its tone quality is extraordinarily superb.

Besides, the horn which determines the performance of horn type tweeter is of delicate aluminum die-cast and of square, exponential shape, distinct and different from those now on the market.

3. Uniform frequency characteristic, Excellent directionality

The frequency characteristic of model **PT-6** as shown in the accompanying chart is highly efficient, the reproduction being smooth between 1,500 to 20,000 cps and both distortion and transient characteristics that influence the tone quality of a speaker is very excellent.

Since the model **PT-6** is of short horn, the directional frequency characteristic has an effective quality within a wide angle throughout the frequency range to be used; therefore it is possible to reproduce sound that gives a feeling of being actually present at rendition. In addition, since, for such a tweeter, its lower frequency

limit reaches quite farther down, it is suitable for a two-way speaker system.

4. Wider high frequency range

Hitherto it has been considered very difficult for a horn type speaker to extend upper limit of high frequency range, but in designing the model **PT-6** a special stress is made on improving the frequency characteristic of upper portion, and as a result it can reproduce unheard of exquisite high frequency sound.

5. Beautiful design compatible with

splendid function

A special mention must be made of the fact that in designing the model **PT-6**, there has been a close contact and cooperation between the design and technology departments in order to achieve a perfect matching of physical and functional beauties. As a consequence, the resulting unique form is the one that enables to demonstrate fully its capacity as a tweeter. Although the model **PT-6** is so designed as to be used mounted in a cabinet taking full advantage of its unique design.

INSTRUCTIONS FOR USE

In connection with woofers of all kinds, the model **PT-6** can be used to make multi-way systems.

● Assembling a speaker system

The cut-off frequency of the model **PT-6** is 1,500 cps. Although it gives the best performance in a two-way system, it also operates very satisfactorily in a three-way system. Two examples of the model **PT-6** used in Hi-Fi systems are shown.

Two-way systems

High Frequency Unit: **PT-6**

Low Frequency Unit: PW-20A, PW-25C
PW-30A, PW-30C

Crossover Frequency: 3,000 cps to 4,000 cps

Three-way systems

High Frequency Unit: **PT-6**

Mid-Range Unit: PM-12A, PM-16B, MH-300

Low Frequency Unit: PW-25C, PW-30A
PW-38C

Crossover Frequency: 600 cps & 4,000 cps

● How to select woofers

The **PT-6** units is exceptionally high quality unit, hence, in selecting woofers, care should be taken in the following points;

- a. The voice coil impedance should be 16 ohms or close to 16 ohms. A small difference is immaterial.
- b. The unit should not have any marked peaks or dips in the response, and distortion should be small.
- c. The transient characteristics should be very good.

This can be checked by first shorting the speaker terminals and then tapping the con. lightly; the cones of speaker units with good transient characteristics hardly move at all.

- d. The unit should be of a high efficiency ratio. The **PT-6** has very high efficiency ratio, hence, the level should be adjusted and matched to that of the woofer. If the efficiency ratio of the woofer is low, the results will be tantamount to diminishing the value of these high efficiency tweeters.

● Input power capacity

Although the allowable input of **PT-6** is 20 watts, when used in combination with a woofer it can endure fully an input far surpassing this level, provided it is momentary. However since the average input of ordinary voice is far less than what is called the peak input—being only about several per cent of the maximum value, be careful not to apply for a long while a single signal of high output level having neither peaks nor dips. Also if an input below 1,500 cps is applied, it may damage the speaker.

● Mounting

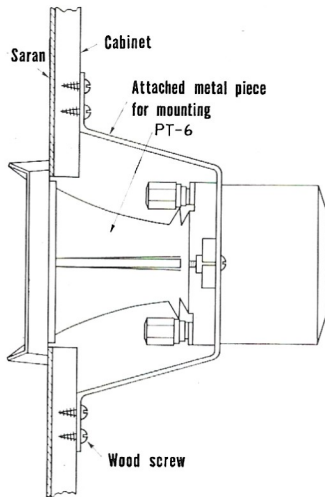
The mounting to a cabinet can be easily performed from the front of the cabinet by utilizing accessory metal pieces. When installing, cut out in the proper portion of the cabinet a square opening $2\frac{1}{2}$ inch \times $2\frac{1}{2}$ inch, and fix the speaker into the opening snugly. In this case, as the open end of the horn becomes a beautiful decoration just as is, no decorative frame is required. When placing it on top of the woofer cabinet, if a



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stand as shown on the first page is used, it serves as a fine accessory for the room, making good use of elegant design of the speaker.



● Level control

Because the **PT-6** has very high efficiency, if this is used without level control, generally the sound level becomes higher than that of the woofer, and may even impair the overall tonal quality. In order to gain uniform response and natural sound

reproduction, always use a level control, and adjust the tweeter level to the levels of the speakers used in conjunction with it. Often, even though high quality speaker units may be assembled together, the level control is apt to be ignored, but this does not do justice to the speakers. PIONEER manufactures model **AT-16A** level controls which are available for your use.

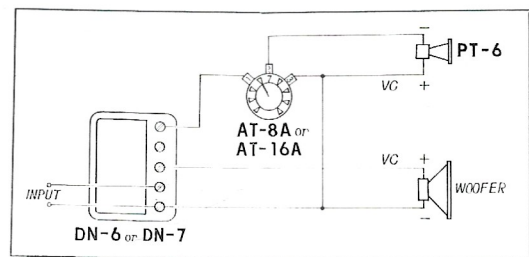
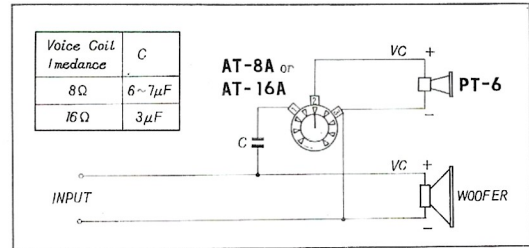
● Phase matching

When a tweeter and a woofer are not in phase, interferences occur near the crossover frequency, causing irregularities in characteristics and consequently sound becomes very offensive to the ear. When connecting the leads of a network to the terminals of voice coil, one has to keep in mind that the one marked "VC+" corresponds to the red mark of other Hi-Fi series. In matching polarities, it should be noted that for 6-db/oct. network, either + or - can be joined; and for 12-db/oct. network, connections should be made after + and - are reversed.

● Crossover network

It is desirable to choose a crossover frequency of over 3,000cps. For two-way system the best result is obtained when the PIONEER Model **DN-5**, **DN-6** or **DN-7** is used with the crossover frequency at 4,000 cps. Also for three-way system, above networks should be used. When the frequencies are to be divided simply by condensers alone without using a crossover network, a 2- μ F condenser—oil-filled, paper or metallized paper condenser—is to be inserted in series and then

connected to a woofer, thus preventing undesirable low frequency sound from reaching the tweeter.



The diagram shown previously illustrates the method of connecting two-way system using our network **DN-5**, **DN-6** or **DN-7**.

For three-way system, if another mid-range speaker and also a level control are provided, the necessary connections can be easily made.

● Home-made network

For those who make own networks, the data constant-resistance parallel type with 12 db per octave attenuation for two-way system are listed below. The crossover frequency is 3,000 cps or 4,000 cps. The enamel-covered wire of 0.85 to 1 mm dia. and either oil-filled or metallized-paper condensers should be used.

For example, when crossover frequency is chosen at 4,000 cps, two choke coils, made by winding enamel-covered wire of said size 205 times around a bobbin shown below, and two condensers of 1.7- μ F each should be connected just as shown in the illustration.

