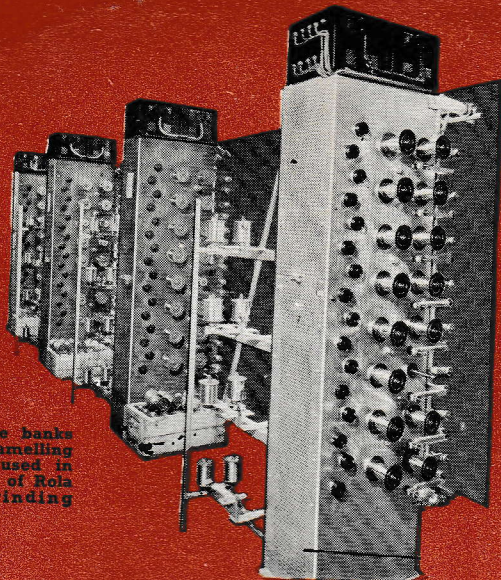




ROLA

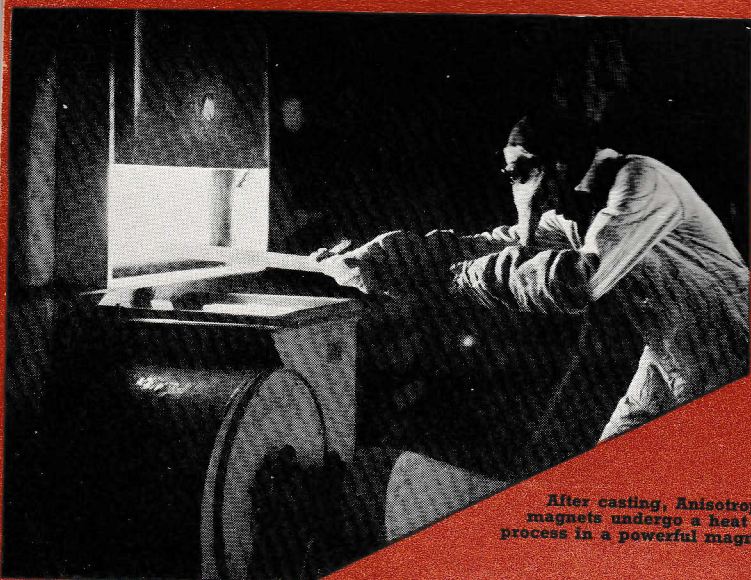
LOUD SPEAKER CATALOGUE



One of the banks of wire enamelling machines used in production of Rola magnet winding wires.



Rola loud speakers being put through the magnetiser prior to receiving their final production tests.

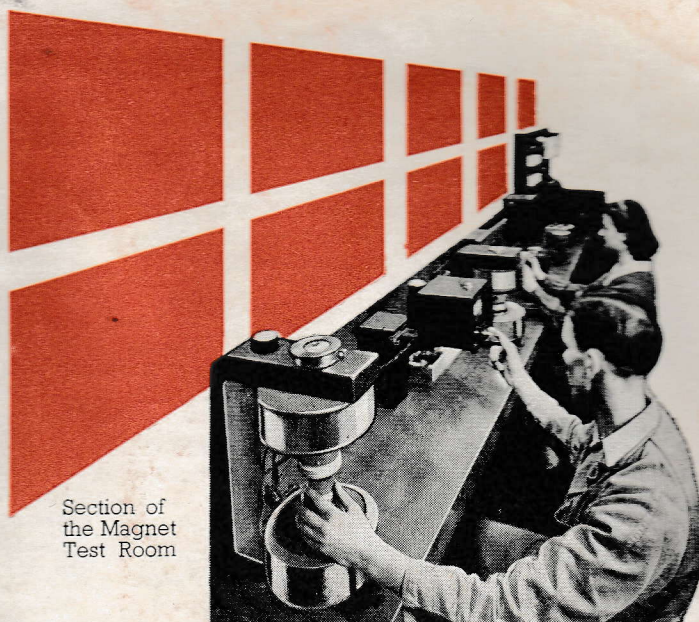


After casting, Anisotropic Alnico magnets undergo a heat treatment process in a powerful magnetic field.

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ROLA LOUDSPEAKER CATALOGUE



Section of
the Magnet
Test Room

FOR nearly two decades the Rola Company (Aust.) Pty. Ltd. has been manufacturing high quality loudspeakers for use in Australian radio receivers, radio gramophones and sound systems.

Since the first Australian made Rola loudspeaker came off the production line in 1931 more than 2,000,000 of them have been fitted in Australian radios. To-day 80 per cent. of these are Rola equipped.

Rola's pre-eminent position in the loudspeaker field has not been achieved by chance. It has been gained by skilled and far-sighted engineering design, access to the best overseas technical information, and the application of the mass production technique—needed to meet the demand for sound reproducers—to a precision job which calls for tolerances so close as 1/10,000th of an inch.

The Rola Company's boast that it makes "The World's Finest Loudspeaker" is no idle one.

From the casting of the magnet to the final test each loudspeaker is treated as a separate entity and its construction carefully supervised to maintain the rigid standards set down by Rola's designers and engineers.

As a result, the purchaser of any loudspeaker, in Rola's balanced range, from the tiny 3-inch type used in "personal portables" to the de luxe 12-inch auditorium type, gets with the Rola name a guarantee of superb workmanship and brilliant performance which is seldom equalled and is never bettered by any other loudspeaker.

—by—

SWAN ELECTRIC CO. LTD.
New Zealand Manufacturers of

"Rola"

PLEASE RETAIN FOR REFERENCE.

ANISOTROPIC ALNICO

... Heart of Modern Loudspeakers

THE heart of every permanent magnet loudspeaker is its magnet. Providing that other design requirements are fulfilled, the more powerful the magnet the better and more efficient is the loudspeaker.

Nature's own magnet, the Lodestone, was first discovered by the Chinese to whom legend ascribes its use, nearly 5,000 years ago, in the world's first compass.

However, it was not until the 19th century that physicists and metallurgists began the research which led to the development of the remarkable magnet alloys used to-day.

Prior to World War I the best magnets were those made from tungsten-steel and chromium-steel alloys, but during 1914-1918 cobalt-steel alloys were evolved.

Cobalt-steel magnets were used in the first Rola permanent magnet type loudspeakers. The magnets were large and costly, and, judged by modern standards, were inefficient. However, they were the best then available.

Continued research was responsible for the development, in the 1930's, of Alni and Alnico alloys whose energy content was twice as great as the cobalt types which preceded them. These magnets were used in the Rola PM type loudspeakers manufactured in the years preceding World War II.

THE outbreak of war gave added impetus to magnet research and from this came Anisotropic Alnico produced by heat treating a special Alnico Alloy in a powerful magnetic field. The resultant change in the alloy made it possible to produce a magnet whose magnetic properties in one direction were increased at the expense of those in other directions. This concentration of magnetism permitted the use of more compact and more powerful magnet assemblies for the Anisotropic Alnico alloy is from three times as effective a magnet material as Alnico.

Rola Company (Aust.) Pty. Ltd. was one of the first loudspeaker manufacturers in the world to realise the value of Anisotropic Alnico and to use it in its range of PM loudspeakers.

Anisotropic Alnico magnets so greatly improved the performance of Rola permanent magnet loudspeakers as to make this type more efficient than the electro-dynamic types with the result that the latter rapidly became obsolete.

An idea of the reduction in magnet weights which this new alloy made possible can be gained from the following:

The 5-inch pre-war model 5/7 which used a 7-ounce Alni magnet has been replaced with model 5C which has a 2½ ounce Anisotropic Alnico magnet.

The 6-inch model 6/12 which used a 12-ounce magnet has been replaced with model 6H which uses a 4½-ounce Anisotropic Alnico magnet.

The 8-inch model 8/20 which used a 20-ounce Alni magnet has been replaced with model 8M which uses an 8-ounce Anisotropic Alnico magnet.

THE lighter magnets made it possible to manufacture smaller and lighter loudspeakers than previously and this in turn helped set manufacturers to build better and more compact receivers.

Despite a more than 60 per cent reduction in magnet weight all the new Rola Anisotropic Alnico PM type loudspeakers are more efficient than their Alni magnet counterparts and better than the electro types they have superseded.

Most important of all, the use of Anisotropic Alnico magnets in Rola loudspeakers has made possible considerable reduction in manufacturing costs, which have been passed on in the form of reduced prices.

Though commodity prices have risen by 60 per cent, Rola loudspeakers are being sold to-day at prices lower than those fixed for equivalent types in the early part of 1941.

Development work on magnet alloys is being continued by Rola and as better materials are discovered they, too, will be incorporated in Rola loudspeakers, for the secret of Rola's pre-eminent position as loudspeaker manufacturers has been its readiness to evolve and employ new techniques and better materials in the construction of the World's Finest Loudspeakers.

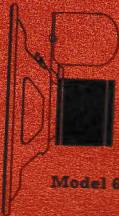
These sketches of Rola Loudspeakers are to scale, and indicate the relative sizes of the various models and their magnet dimensions.



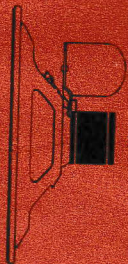
Model 3C



Model 6H



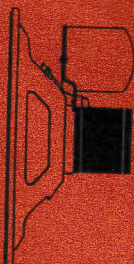
Model 6K



Model 8H



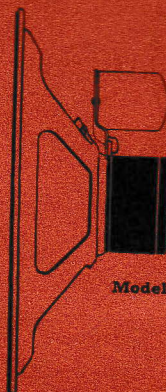
Model 8K



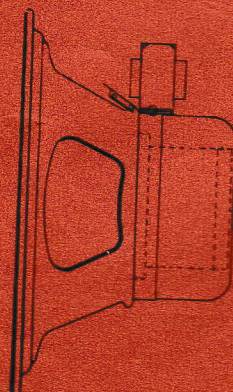
Model 8M



Model 8M (P.A. Type)



Model 12-O



Model 12R

WHY DOESN'T ROLA PUBLISH RESPONSE CURVES?

THIS question is often asked us by people who, though their ears tell them that our loudspeakers are good, feel that they would like their judgment confirmed by the squiggly lines which the loudspeaker curve tracer draws on the graph paper sheet.

It is an easy matter to take the response curve of an amplifier, but with a loudspeaker all that can be measured is the air pressure under specified conditions at some arbitrarily fixed point from the diaphragm.

Loudspeaker manufacturers like Rola take performance curves—plenty of them, too—in the research involved in the development of each new model. These curves are taken in a special sound-pressure room.

The sound pressure room is an important design tool for the loudspeaker manufacturer, but on their own, the curves taken in it are of little value to all but the design engineer who takes them, and even he uses them only for comparison purposes.

A loudspeaker's radiation of a given range of tones depends on the conditions under which it is used.

Furthermore, in actual service the loudspeaker is required to reproduce complex and rapidly changing combinations of audible frequencies instead of the single frequencies used when plotting response curves.

When these facts are taken into consideration it can be appreciated that a loudspeaker response curve taken in a heavily damped sound pressure room cannot provide a true picture of the acoustic performance of the same sound reproducer in the home.

What Rola engineers have been able to do with the aid of their sound-pressure room measurements is to evolve a range of loudspeakers which will give the best possible performance under the average conditions for which each particular type has been designed.

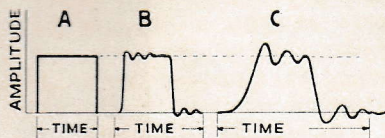
And that is the reason why Rola does not publish response curves.

Transient Response

FREQUENCY response is not the only yardstick by means of which

a loudspeaker's performance should be gauged. Of equal, and in some cases, greater importance is the facility with which the loudspeaker will respond to transients.

Two things convey expression in speech or music. One is frequency and the other variations of tone—in other words transients.



The sketch shows at (a) one type of transient would appear on an oscillograph screen and how it *should* be reproduced by a loudspeaker—sharply and quickly. At (b) is shown how it is reproduced by a loudspeaker having good transient response; and at (c) by a loudspeaker having poor transient response. With the latter type of loudspeaker the reaction builds up slowly and dies away in a series of small, damped oscillations. It can be appreciated that if the diaphragm movement in response to transient sounds is sluggish the loudspeaker will distort because the diaphragm will still be returning to the mean operating position when the next audio frequency impulse reaches the voice coil.

No matter how wide the range of audible sound which a loudspeaker will radiate, its reproduction will appear flat and lifeless if the transient response is poor. Good transient response, with the resultant brilliant and lifelike sound reproduction which characterises every Rola loudspeaker is obtained by careful design of the diaphragm and by the use of Anisotropic Alnico in a properly proportioned magnetic circuit.

Power Handling

THE third important feature of a loudspeaker is its power handling capacity—its capability of producing incremental increases in output for similar incremental increases in the audio frequency power fed to it.

There are three practical ways in



Taking a loudspeaker response curve

which a loudspeaker's power handling capacity may be stated. They are:

- the amount of power which it can handle with a minimum of distortion
- the amount it can handle without fear of mechanical breakdown but with an acceptable degree of distortion
- the maximum power which can be applied without wrecking the loudspeaker.

It is to be regretted that some loudspeaker manufacturers have made extravagant claims about the power handling capacity of their loudspeakers.

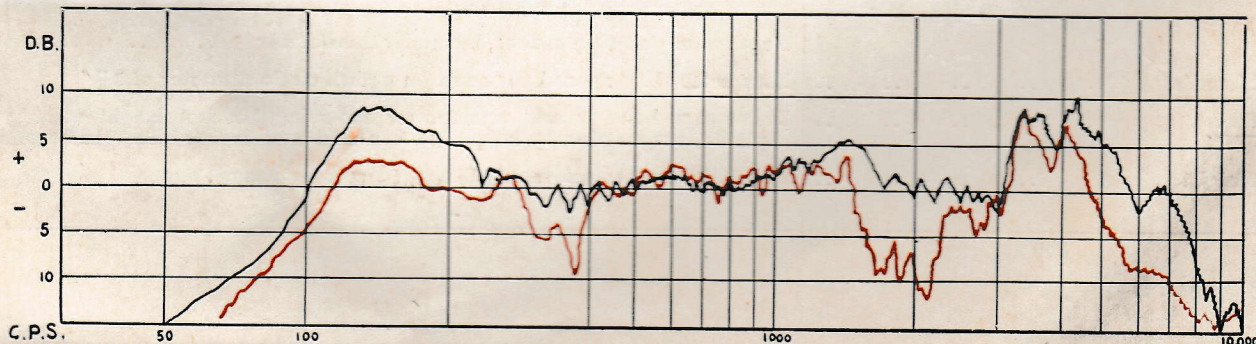
The basis on which each Rola loudspeaker is rated is the power which may be safely applied to the voice coil under continuous service conditions and operation in the mid-frequencies range, Condition (b).

Under intermittent service conditions, such as the reproduction of speech in public address equipment, considerably more than the listed powers can be applied to each loudspeaker.

At low frequencies the amount of audio power which any loudspeaker can handle safely is governed by the acoustic loading provided by the baffle and by the power capacity of the voice coil.

Rola loudspeakers will handle much more power than that at which they have been rated, but like any other loudspeaker, will distort badly under this condition.

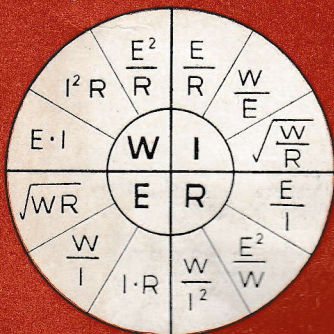
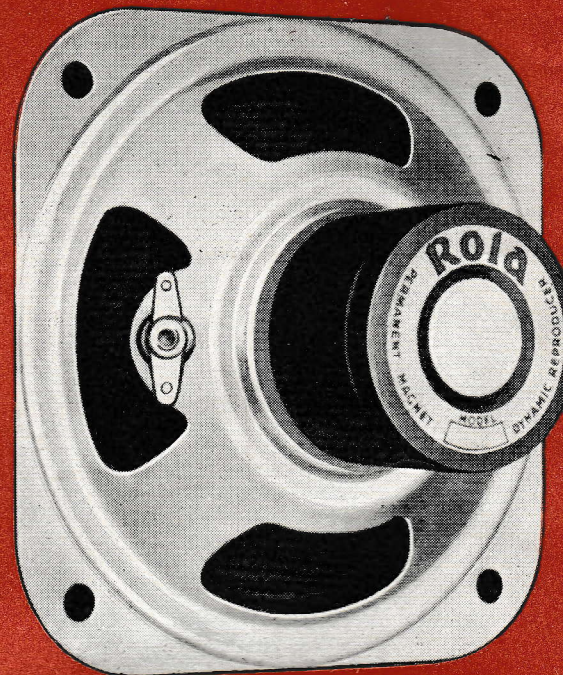
For best possible reproduction we suggest that the loudspeaker should be one able to handle twice as much power as that of the amplifier with which it is to be used. This may not always be economically practical, but is desirable for really high quality sound reproduction.



These two response curves were obtained from the same loudspeaker and under allegedly similar conditions. The one printed in red was taken in Rola's laboratory and the other by an overseas loudspeaker manufacturer.

ROLA MODEL 3^c

THIS was the first post-war model Rola loudspeaker to be made for the domestic radio receiver market. During the war Model 3C^{*} was supplied to the Services for use in walkie-talkie sets and proved itself in the jungles of New Guinea and the islands of the Pacific. In this model the use of Anisotropic Alnico magnet results in a much higher electro-acoustic output than that usually obtained from loudspeakers of this size and this makes possible the design of ultra-small and "personal portable" receivers. Model 3C can also be used in midget AC receivers and for amplifier monitoring. Inter-office communication systems have also been designed around the Model 3C.



Voltage, Current, Resistance and Power Calculator

TECHNICAL DATA

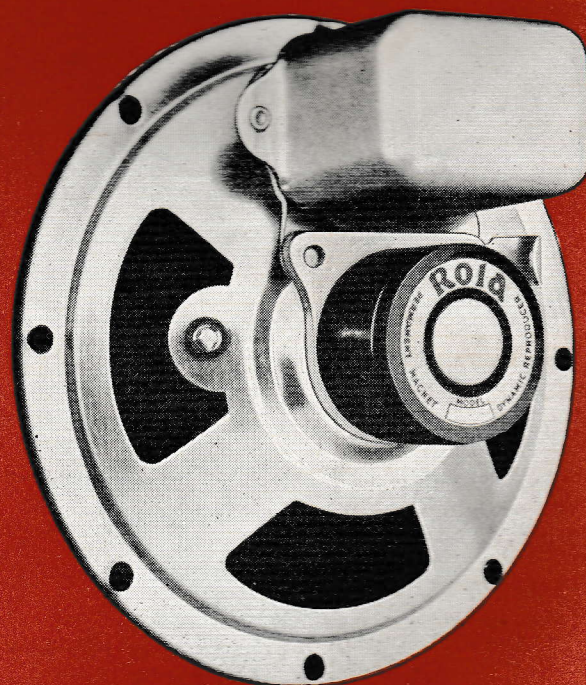
Power Handling Capacity5 watts max.
Fundamental Diaphragm Resonance	225-250 c.p.s. (F94 Cone).
Voice Coil Impedance	3.7 ohms at 400 cycles.
Transformer	"G" type isocore, attached, or detached for chassis mounting.
Principal Dimensions	Diaphragm Housing $3 \frac{9}{16}'' \times 3 \frac{9}{16}''$ Maximum overall height including transformer $4 \frac{1}{16}''$ Diameter of baffle opening $2 \frac{3}{4}''$ Diameter of voice coil $1 \frac{1}{8}''$ Depth from pad-ring to rear, including transformer $2 \frac{9}{32}''$
Mounting	Four holes .196" spaced 90° apart on a pitch circle diameter of $3 \frac{11}{16}''$
Finish	Diaphragm housing and transformer mounting bracket bright cadmium plated, magnet black, lacquered can and transformer silver lacquered.
Weight	6½ ozs. (without transformer), 8½ ozs. (with transformer).

ROLA MODEL 5^c

TECHNICAL DATA

Power Handling Capacity ..	2½ watts
Fundamental Diaphragm	
Resonance	130-140 c.p.s. (F90 Cone).
Voice Coil Impedance ..	3.7 ohms at 400 c.p.s.
Transformer	When model 5C is used in AC or AC/DC or vibrator operated receivers, it is supplied with a type E (non-Isocore) transformer attached. When used with battery operated receivers, the Isocore type D transformer should be used detached or type G attached. The use of this speaker with the E type transformer with battery operated receivers is not recommended and when used under these conditions is covered by restricted warranty only.
Principal Dimensions ..	Overall diameter of diaphragm housing 5"
	Diameter of baffle opening 4"
	Diameter of voice coil 1 1/8"
	Depth from pad-ring to rear including transformer 2 7/16"
Mounting	Eight holes each 1/8" equally spaced on a 4 1/8" pitch circle diameter, plus a mounting bracket fitted to the front plate. The mounting bracket has two slots to clear 1/8" screws at 1 1/4" centres.
Finish	Diaphragm housing, speaker mounting bracket and transformer clamp, bright cadmium plated, magnet black lacquered.
Weight	18 ozs. (with transformer).

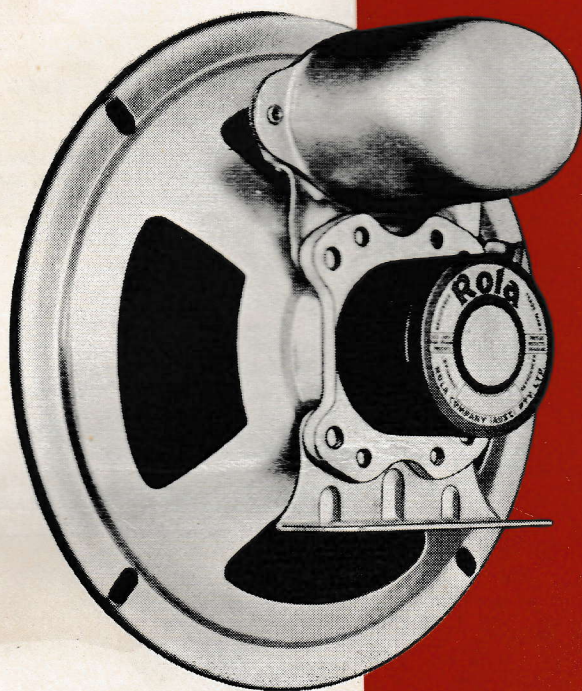
THE Model 5C is Australia's best known loudspeaker. It was primarily designed to replace 5-inch electro-dynamic loudspeakers in AC operated receivers and its success in this field is demonstrated by the fact that, to date, more than 250,000 Model 5C loudspeakers have been sold. In the Model 5C, the absence of a heat-radiating field winding has permitted manufacturers to produce more compact and more efficient receivers. Model 5C is also widely used in small portable amplifiers, in portable and car radio receivers and in many other applications where a compact loudspeaker is required. When used with the small Type G Isocore Transformer it has special application in battery portables.



REPLACEMENT INFORMATION

Model 5C can be used to replace Electro-dynamic types F4 and K5 and Permanent Magnet types F4PM, 5/4, 5/6, 5/7, 5/8, 5/9, 5/11, and 5/15. When it is used to replace Models F4 and K5 a Rola type 7/70 choke should be used in place of the field winding of the electro-dynamic type loudspeaker and the difference between the d.c. resistance of the choke and that of the old loudspeaker field made up with a wire-wound resistor of suitable watt rating.

ROLA MODEL 6^H



THIS loudspeaker has been designed principally for use in AC operated mantel and table model receivers, portable sound amplifiers, car radio receivers and battery and vibrator operated sets. However, its applications extend to multiple loudspeaker installations, such as those used in hotels and factories, where a relatively low level of sound is required from each loudspeaker and where clear reproduction of speech is essential. It covers a wider range of frequencies than the Model 5C and will deliver a greater acoustic output than the 5-inch type of loudspeaker.

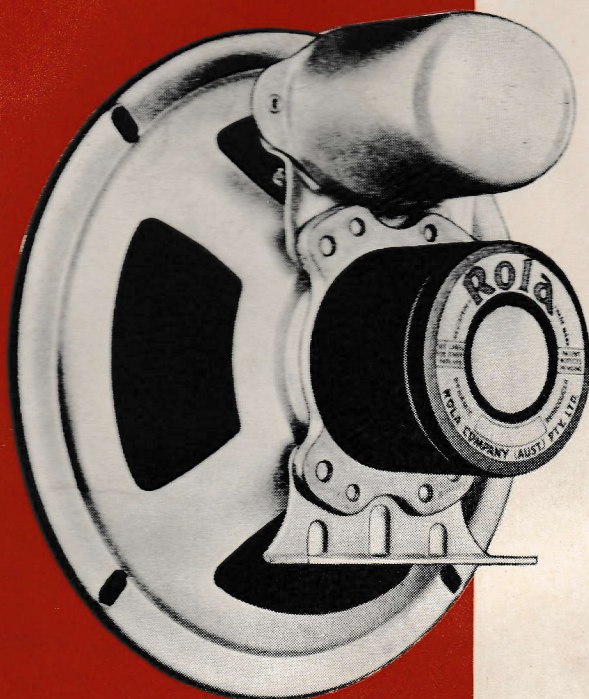
TECHNICAL DATA

REPLACEMENT INFORMATION

Model 6H can be used to replace Electro-dynamic types DP5B and F5B and Permanent Magnet types F5B PM, 6/8, 6/8, 6/11, and 6/12. When it is used to replace Models DP5B and F5B a Rola type 7/70 choke should be used in place of the field winding of the electro-dynamic loudspeaker and the difference between the d.c. resistance of the choke and that of the old loudspeaker field made up with a wire-wound resistor of suitable watt rating.

Power Handling Capacity	4 watts
Fundamental Diaphragm Resonance	110-120 c.p.s. (F81 Cone).
Voice Coil Impedance ..	3.7 ohms at 400 c.p.s.
Transformer	D type Isocore transformer, attached or detached for chassis mounting.
Principal Dimensions ..	Overall diameter of diaphragm housing 6 ⁹ / ₁₆ " Diameter of baffle opening 5 ¹ / ₂ " Diameter of voice coil 3 ³ / ₈ " Depth from pad-ring to rear, including transformer .. 3 ³ / ₈ "
Mounting	Four slots spaced 90° apart on a 6 ³ / ₁₆ " pitch circle diameter. Dimensions of the slots, 1 ³ / ₈ " × ³ / ₈ ". A speaker mounting bracket is fitted to the front plate. Two clearance holes for ¹ / ₈ " screws are provided at 2 ¹ / ₄ " centres.
Finish	Diaphragm housing bright cadmium plated ; magnet black lacquered and transformer can silver lacquered.
Weight	1 lb. 12 ozs. (with transformer).

ROLA MODEL 6^K



THIS is a highly efficient 6-inch loudspeaker intended specially for use in compact vibrator, battery operated, and car radio receivers where economy of audio power is an important requirement. Its Anisotropic Alnico magnet is larger in diameter and is deeper than that used in Model 6H. The resultant high concentration of flux in the air gap improves the transient response of Model 6K and this is one of the reasons why this model is often used in high quality AC receivers. The larger magnet also results in a 3dB increase in the electro-acoustic efficiency of Model 6K over that obtained in the model 6H. This means a virtual doubling of the sound obtained from a given input power, a very valuable aid to designers of battery and vibrator receivers.

TECHNICAL DATA

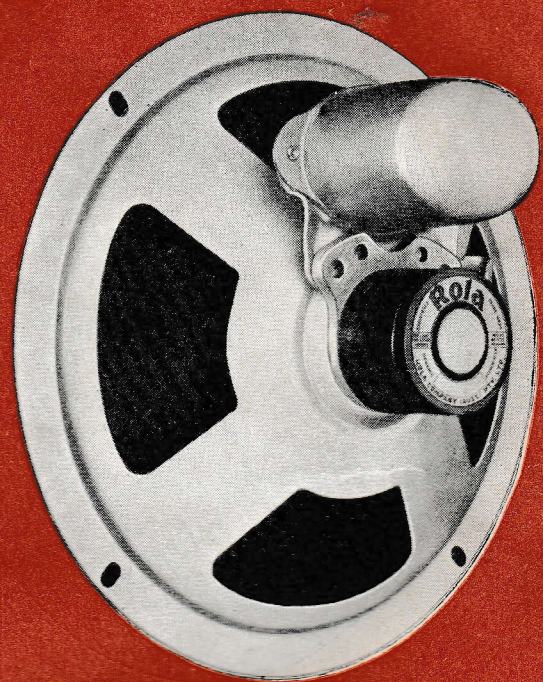
Power Handling Capacity	5 watts
Fundamental Diaphragm Resonance	110-120 c.p.s. (F81 Cone).
Voice Coil Impedance	3.7 ohms at 400 c.p.s.
Transformer	D. type Isocore transformer, attached or detached for chassis mounting.
Principal Dimensions ..	Overall diameter of diaphragm housing .. $6\frac{9}{16}$ " Diameter of baffle opening $5\frac{1}{8}$ " Diameter of voice coil $1\frac{1}{8}$ " Depth from pad-ring to rear, including transformer .. $3\frac{1}{8}$ "
Mounting	Four slots spaced 90° apart on a $6\frac{3}{16}$ " pitch circle diameter. Dimensions of the slots, $\frac{11}{16}$ " x $\frac{9}{32}$ ". A speaker mounting bracket is fitted on the front plate. Two clearance holes for $\frac{3}{16}$ " screws are provided at $2\frac{1}{4}$ " centres.
Finish	Diaphragm housing bright cadmium plated; magnet black and lacquered, transformer can silver lacquered.
Weight	2 lb. 6 ozs. (including transformer).

REPLACEMENT INFORMATION

Model 6K can be used to replace Model 6/15 because of its highly efficient Anisotropic Alnico magnet, will give a high acoustic output from a receiver than was obtained with the older Model 6/15 loudspeaker.

ROLA MODEL 8^H

THE power handling capacity of Model 8H is similar to that of the Model 6H, but the frequency response of the 8-inch loudspeaker is wider than that of the 6H. Thus, though its applications are similar to those of Model 6H, it finds special use in high quality AC operated mantel receivers. The extended frequency range of Model 8H, coupled with its electro-acoustic qualities, has been responsible for this loudspeaker's inclusion in some of the best of Australian made battery operated portables.



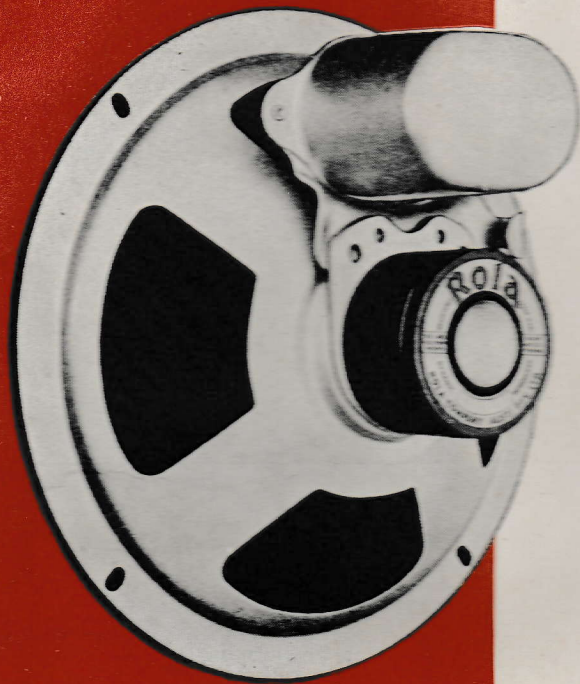
TECHNICAL DATA

REPLACEMENT INFORMATION

Model 8H can be used as a replacement for the electro-dynamic Model F8 and for the PM types, Model 8/11 and Model 8/15. When used to replace Model F8 a Type 14/60 choke will be needed and the difference between the resistance of this and that of the F8 field winding will need to be made up with a wire-wound resistance of suitable watt rating.

<u>Power Handling Capacity</u>	4 watts.
<u>Fundamental Diaphragm Resonance</u>	105-115 c.p.s. (F74 Cone).
<u>Voice Coil Impedance</u>	3.7 ohms at 400 c.p.s.
<u>Transformer</u>	Type D Isocore, attached or detached for chassis mounting.
<u>Principal Dimensions</u> ..	Overall diameter of diaphragm housing .. 8 $\frac{1}{8}$ "
	Diameter of baffle opening 7"
	Diameter of voice coil 3 $\frac{1}{4}$ "
	Depth from pad-ring to rear, including transformer .. 3 $\frac{1}{4}$ "
<u>Mounting</u>	Four slots spaced 90° apart on a 7 $\frac{1}{8}$ " pitch circle diameter. Dimension of the slots- $\frac{5}{16}$ " \times $\frac{7}{32}$ ". A speaker mounting bracket fitted on the front plate can be provided if required.
<u>Finish</u>	Diaphragm housing and transformer can silver lacquered, magnet black lacquered.
<u>Weight</u>	1 lb. 14 $\frac{1}{2}$ ozs. (with transformer).

ROLA MODEL 8^K



THE Model 8K permanent magnet type was designed for use in AC operated table and console model receivers and to replace 8-inch electro-dynamic type loudspeakers. In addition it finds a wide application in public address systems for factories, schools and similar establishments. Model 8K has an excellent frequency response and, used in conjunction with a correctly designed radio receiver or amplifier, gives balanced reproduction of both speech and music. Its compact design, inherent in all Rola Anisotropic Alnico permanent magnet type loudspeakers, makes Model 8K specially valuable to designers of table model radio receivers and is responsible for its adoption by many set manufacturers who previously were using smaller loudspeakers.

TECHNICAL DATA

Power Handling Capacity	5½ watts.
Fundamental Diaphragm Resonance	85-95 c.p.s. (F57 or F61 Cone).
Voice Coil Impedance	2 Ohms at 400 c.p.s.
Transformer	Type "C" Isocore, attached, or detached for chassis mounting.
Principal Dimensions ..	Overall diameter of diaphragm housing .. 8 1/16" Diameter of baffle opening .. 7" Diameter of voice coil .. 1" Depth from pad-ring to rear including transformer. 4"
Mounting	Four slots spaced 90° apart on a 7 13/32" pitch circle diameter. Dimensions of the slots - 5/16" x 7/32".
Finish	Diaphragm housing and transformer can silver lacquered, magnet black lacquered.
Weight	2 lb. 11 ozs. (including transformer).

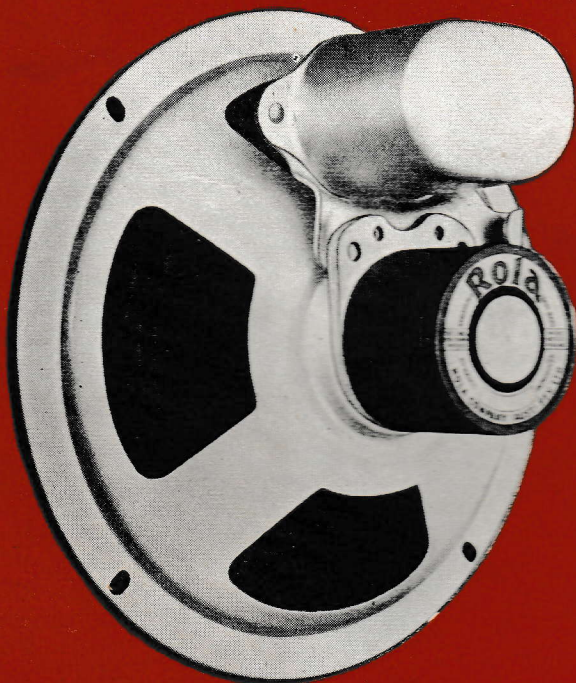
REPLACEMENT INFORMATION

This model can be used to replace the Model F6, Model K8 electro-dynamic loudspeakers, or the Model FR6 PM, Model 8/8 and Model 8/14 PM types. When used as a replacement for Models F6, and K8 replace the field winding with a Type 1 choke and a series resistor. The latter should be of wire-wound type and have a resistance which, combined with that of the choke, is equivalent to the field resistance of the loudspeaker being replaced.

ROLA MODEL 8^M

TECHNICAL DATA

Power Handling Capacity ..	7 watts.
Fundamental Diaphragm Resonance ..	85-95 c.p.s. (F61 Cone).
Voice Coil Impedance ..	2 ohms at 400 c.p.s.
Transformer ..	Type "C" Isocore attached, or detached for chassis mounting.
Principal Dimensions ..	Overall diameter of diaphragm housing 8 $\frac{1}{8}$ " Diameter of baffle opening 7" Diameter of voice coil 1" Depth from pad-ring to rear including transformer 4"
Mounting ..	Four slots spaced 90° apart on a 7 $\frac{13}{32}$ " pitch circle diameter. Dimensions of the slots- $\frac{5}{16}$ " \times $\frac{7}{32}$ ".
Finish ..	Diaphragm housing and transformer can silver lacquered, magnet black lacquered.
Weight ..	2 lb. 13 ozs. (including transformer).

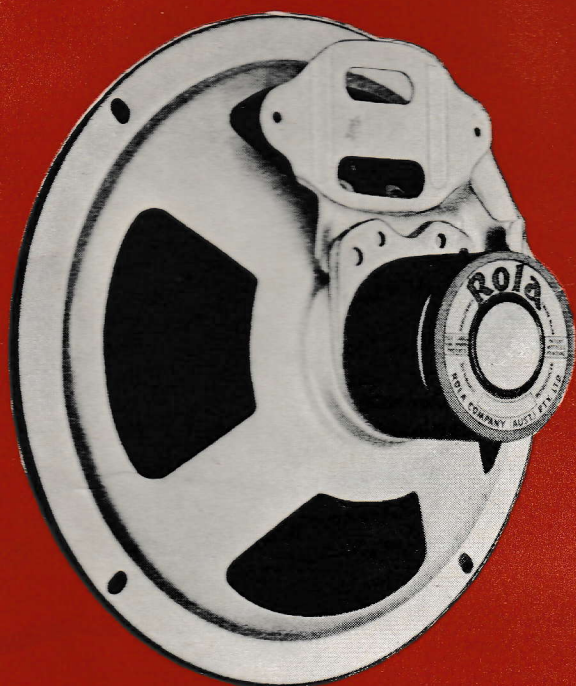


REPLACEMENT INFORMATION

Model 8M can be used as a replacement for the 8-inch PM type Models 8/20, 8/21, and GM8 in the PM series and Model K7 in the electro-dynamic series. When replacing Model K7 with a Model 8M a Type 14/60 choke and a series resistance of suitable value to simulate the original field coil resistance must be used. When the car radio type GM8 is replaced with Model 8M the field supply is not needed. The new loudspeaker is fitted under the dash baffle of the car.

THIS loudspeaker is similar in design to Model 8K but is fitted with a larger magnet. This results in a further increase in electro-acoustic efficiency and in still better transient response than that of Model 8K. For this reason Model 8M is specially recommended for use in battery or vibrator-operated console and table model radio receivers, in portable amplifiers, sound systems, and for other application where an 8-inch loudspeaker possessing higher-than-standard efficiency is needed.

ROLA MODEL 8^M (P. A. TYPE)



THIS special P.A. type Model 8M differs from the standard type only in the design of its cone. The cone in the P.A. type Model 8M has a fundamental resonance in the 120-130 c.p.s. region which makes the loudspeaker suitable for use with horns, flares and small baffles. The Model 8M (P.A. type) is intended solely for sound work and should never be used in radio receivers. The P.A. type Model 8M is supplied without transformer but with a mounting bracket which permits any of the large range of Rola Type "C" Isocore line-to-voice coil transformers to be fitted.

TECHNICAL DATA

Power Handling Capacity ..	7 watts.
Fundamental Diaphragm Resonance ..	120-130 c.p.s. (F63 Cone).
Voice Coil Impedance ..	2 ohms at 400 c.p.s.
Transformer ..	Supplied separately, see table on this page.
Principal Dimensions ..	Overall diameter of diaphragm housing .. 8 1/2" Diameter of baffle opening .. 7" Diameter of voice coil .. 1" Depth from pad-ring to rear, including transformer .. 4"
Mounting ..	Four slots spaced 90° apart on a 7 1/2" pitch circle diameter. Dimensions of the slots - 3/16" x 7/32"
Finish ..	Diaphragm housing and transformer mounting bracket silver lacquered ; magnet black lacquered.
Weight ..	1 lb. 12 1/2 ozs. (without transformer).

LINE-TO-VOICE-COIL TRANSFORMERS

The following range of line-to-voice-coil transformers which can be supplied with the Model 8M (P.A. type) loudspeaker will cover most sound system requirements. The transformers, type "C" Isocore, are provided with mounting lugs drilled to fit the mounting bracket on the transformer.

TYPE No.	IMPEDANCE (OHMS)	TYPE No.	IMPEDANCE (OHMS)
CHL84	500	CCL81	5,000
CHL84	600	CCL85	6,000
CGL86	1,000	CCL80	7,000
CFL80	1,500	CBL83	7,500
CFL80	2,000	CBL61	8,000
CEL88	2,500	CBL86	9,000
CEL82	3,000	CBL83	10,000
CDL80	3,500	CAL61	12,000
CDL85	4,000	CAL83	15,000
CDL81	4,500	CAL45	20,000
		CAL40	25,000

ROLA MODEL 12°



THIS new model Rola loudspeaker incorporates in its design an entirely new magnetic circuit in which fullest use is made of the latest magnet alloys.

Due to this radically new magnet system and to a specially designed diaphragm, the model 12-O is capable of outstandingly fine performance. Its frequency range is greater than that covered by standard recordings or broadcast by the best of the broadcasting stations, and its transient response is such as to give full brilliance and tonal realism to its sound reproduction. This new 12 inch Rola loudspeaker is revolutionary in both design and performance.

Model 12-O will find special application in high quality A.C. battery or vibrator operated radio receivers and in sound systems which call for a highly efficient loudspeaker capable of wide range reproduction.

[Available Shortly]

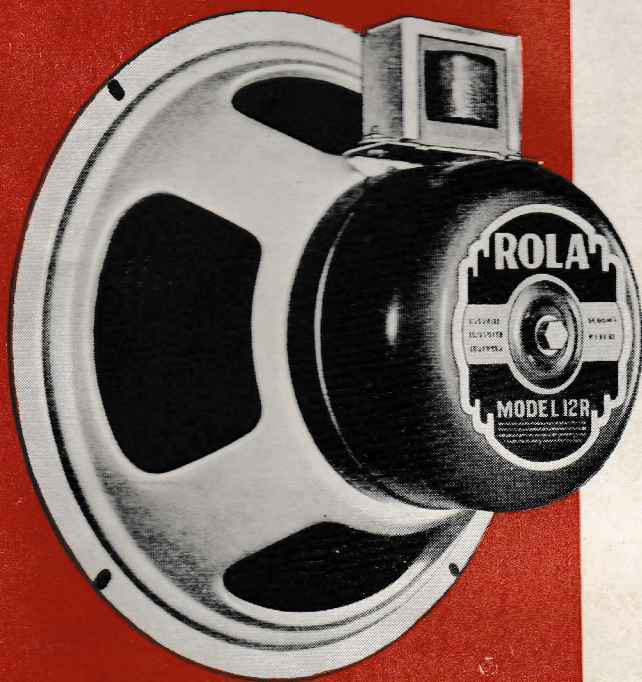
TECHNICAL DATA

REPLACEMENT INFORMATION

Model 12-0 can be used to replace the PM type Model 12/42 and the electro-dynamic Model K12. When Model 12-0 is used as a replacement for the K12 the field winding of the latter is replaced with a Type 14/60 choke and a series resistance of such value that, with the choke coil, the total DC resistance will equal that of the Model K12 field. In some cases more capacity will be needed in the filter circuit.

Power Handling Capacity ..	7 watts.
Fundamental Diaphragm Resonance ..	60-70 c.p.s. (F22 Cone).
Voice Coil Impedance ..	2 ohms at 400 c.p.s.
Transformer ..	Type "C" Isocore attached, or detached for chassis mounting.
Principal Dimensions ..	Overall diameter of cone housing .. 12 $\frac{1}{8}$ " Diameter of baffle opening .. 11" Diameter of voice coil .. 1 $\frac{1}{4}$ " Depth from pad-ring to rear, including transformer .. 5 $\frac{1}{8}$ "
Mounting ..	Four slots spaced 90° on 11 $\frac{1}{8}$ " pitch circle diameter. Dimensions of the slots, $\frac{1}{4}$ " x $\frac{1}{8}$ ".
Finish ..	Diaphragm housing and transformer can silver lacquered, magnet black lacquered.
Weight ..	4 lb. 15 ozs. (including transformer).

ROLA MODEL 12^R



MODEL 12R is the modern version of the famous G12 which for so long has been accepted as a standard in high quality sound reproducers. Its large Anisotropic Alnico magnet provides higher flux density than that which has previously been employed in 12-inch type PM loudspeakers and is equivalent to that provided by 18-watt excitation of the heavy-duty field winding in the electro-dynamic type G12. The wide frequency response and large power handling capacity of Model 12R make it an ideal loudspeaker for Auditorium use and for inclusion in de luxe console model radio receivers and gramophone combinations and juke boxes. It also has many applications in P.A. work and in the sound field in general.

[Available Shortly]

TECHNICAL DATA

<u>Power Handling Capacity</u> ..	15 watts.
<u>Fundamental Diaphragm Resonance</u>	80-60 c.p.s. (F21 Cone).
<u>Voice Coil Impedance</u> ..	8.4 ohms at 400 c.p.s.
<u>Transformer</u>	Type B.
<u>Principal Dimensions</u> ..	<div>Overall diameter of cone housing .. 12$\frac{1}{4}$"</div> <div>Diameter of baffle opening 11"</div> <div>Diameter of voice coil 1$\frac{1}{2}$"</div> <div>Depth from pad-ring to rear, including trans- former 6$\frac{1}{2}$"</div>
<u>Mounting</u>	Four slots spaced 90° on 11 $\frac{1}{4}$ " pitch circle diameter. Dimensions of the slots, $\frac{1}{4}$ " by $\frac{1}{8}$ ".
<u>Finish</u>	Diaphragm housing silver lacquered, magnet housing black lacquered.
<u>Weight</u>	11 lbs. (including transformer).

REPLACEMENT INFORMATION

Model 12R can be used as replacement for the M G12 electro-dynamic or the PM type Model PM. In the case of electro-dynamic type M G12 the field supply is no longer needed. However if the field winding is to be used as part of a filter network it must be replaced with a heavy duty choke resistor combination of same total resistance and current carrying capacity.

ROLA FILTER CHOKES

NOT the least of the many advantages accruing from the use of Rola Permanent Magnet Type loudspeakers is the elimination of the power-wasting field winding necessary with the electro-dynamic type loudspeaker.

When a P.M. type loudspeaker is used, the field winding normally used as part of the filter circuit for the receiver or amplifier is replaced with a filter choke. The resistance of this choke is only 1/5th that of the loudspeaker field required to give equivalent filtering and the voltage drop across it is thus reduced by 4/5th.

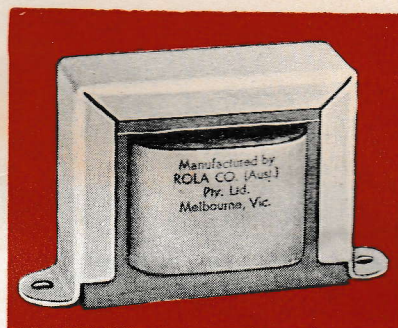
This means that a lower voltage power transformer may be used and that the lower rectified voltage which is applied to the filter condensers will provide an added safety factor for these components. Further, the elimination of the heat-radiating field permits more compact design in mantel type receivers and allows more power to be handled by the loudspeaker.

However, for satisfactory use of P.M. type loudspeakers

with AC operated receivers, it is essential that the filter chokes be correctly designed and that they possess sufficient inductance to provide adequate filtration. Rola makes two types of filter chokes. Though they have been developed specially to facilitate the replacement of electro-dynamic type Rola loudspeakers with the latest P.M. types, these chokes can be recommended for use in any AC receiver in which the current drain does not exceed 75mA. It should be borne in mind, however, that the inductance of any choke falls as the DC current flowing through its windings is increased.



The Type 7/70 Rola filter choke
Specifications of the two types of Rola filter chokes are as follows :



The Type 14/60 Rola choke

Type 14/60

Inductance 14 henries with 60mA. DC and 10 volts 100 cycles AC super-imposed.

DC Resistance (cold) 520 ohms.

Voltage Drop with 60mA. 31.2 volts.

Type 7/70

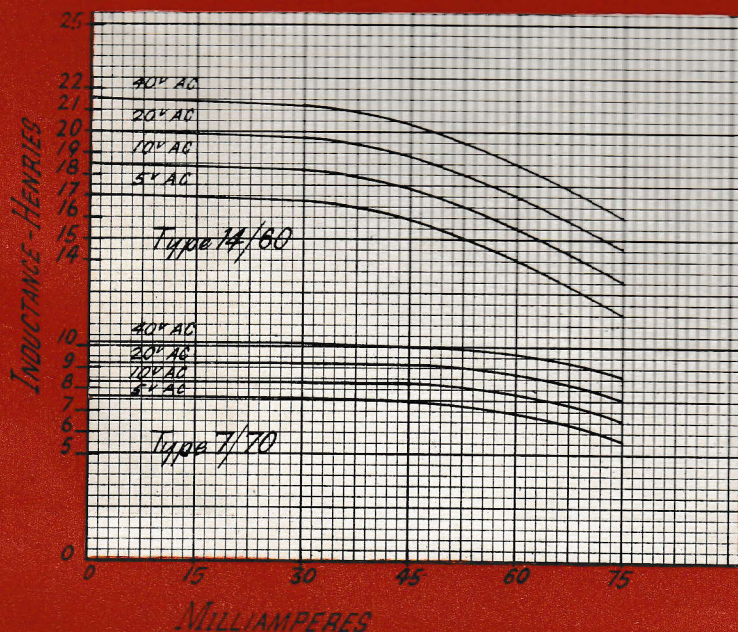
Inductance 7 henries with 70mA. DC and 10 volts 100 cycles AC super-imposed.

DC Resistance (cold) 320 ohms.

Voltage Drop with 60mA. 19.2 volts.

The performance of each type of Rola filter choke can be determined from the graph appearing at the foot of this page. It should be stressed that these chokes have been specially engineered for service with Rola P.M. type loudspeakers and that their operating characteristics are really those which are claimed for them.

Though the application of these chokes in filter circuits will depend largely upon the personal preference of the set designer, it will be found in general that a single type 7/70 choke will provide sufficient filtration for any set equipped with a loudspeaker having a cone up to 6 inches in diameter. The type 14/60 choke is recommended for use with larger loudspeakers. When a very high degree of filtration is needed two chokes may be used in a double section filter system. Such a filter will give better hum reduction than is possible with a filter system made up of the field winding of a 2,500 ohm K10 type electro-dynamic loudspeaker.



The two sets of curves in this graph show the inductance of the Rola filter chokes, Type 7/70 and Type 14/60, under varying conditions of D.C. current flow.

LOUDSPEAKER REPLACEMENTS

How to Select a New Rola Loudspeaker to Replace an Obsolete Model

The modern Rola loudspeaker is equipped with an Anisotropic Alnico permanent magnet and, in most cases, with an Isocore transformer. These features, plus sound design and precise workmanship, ensure brilliant and trouble-free performance. The table below lists the types of modern Rola loudspeakers which may be used as replacements for obsolete models. It includes those available up till August, 1948.

OBSOLETE SPEAKERS		NEW REPLACEMENT SPEAKERS		
MODEL	SIZE	MODEL	SIZE	CHOKE
F4 PM, 5/4, 5/6, 5/7, 5/8, 5/9, 5/11 5/15	5"	5C	5"	None
F4, K5	5"	5C	5"	7/70
F5B PM, DM6*, 6/6, 6/8, 6/11, 6/12	6"	6H	6"	None
DP5B, F5B	6"	6H	6"	7/70
6/15	6"	6K	6"	None
8" Permanent Magnet Models ..	8"	8K or 8M	8"	None
F6, F8, K8	8"	8K or 8M	8"	14/60
10" Electro-Dynamic Models ..	10"	10/42	10"	14/60
10" Permanent Magnet Models ..	10"	10/42	10"	None
12" Electro-Dynamic Models ..	12"	12-0	12"	14/60
12" Permanent Magnet Models ..	12"	12-0	12"	None
G12, G12 PM	12"	12R	12"	* *

* For Auto Radio Replacement—Speaker to be fitted in under dash baffle. Field supply no longer needed.
** No separate field supply required.

ROLA LOUDSPEAKER CLASSIFICATION

Every type of Rola loudspeaker fitted with an Anisotropic Alnico magnet is identified with a numeral and a letter. The numeral denotes the approximate diameter in inches of the cone housing. The letter indicates the relative acoustic translation efficiency of the loudspeaker as determined by the size of the magnet fitted to it. Each consecutive letter represents a rise of one decibel in sound output. All loudspeakers having the same letter possess the same translation efficiency but it should be clearly understood that the decibel ratings do not refer to an absolute level. They have been taken from an arbitrarily selected base.

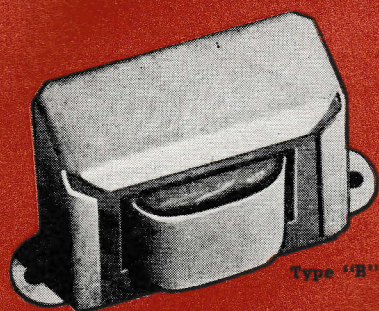
Thus all Rola loudspeakers designated by the same letter possess potentially equal acoustic efficiency; but their response characteristics vary according to the cone size and design.

The table gives a classification of current Rola loudspeakers together with the symbols of equivalent loudspeakers superseded by new models.

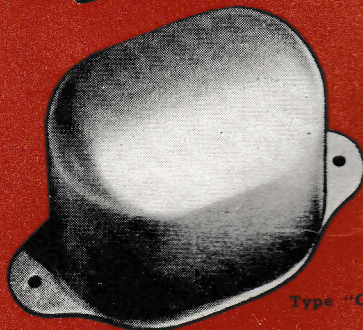
Decibels	Current Rola Loudspeakers						Superseded Equivalents
	Cone Size						
	3"	5"	6"	8"	10"	12"	
1 A 2 B 3 C							5/7, K5
4 D 5 E 6 F							
7 G 8 H 9 I			6H	8H			6/12, 6/11, F5B, F8

Decibels	Current Rola Loudspeakers						Superseded Equivalents
	Cone Size						
	3"	5"	6"	8"	10"	12"	
10 J 11 K 12 L			6K	8K			6/15, K8, 8/20
13 M 14 N 15 O					8M		8/21
						12-0	12/42
16 P 17 Q 18 R						12R	G12, G12PM

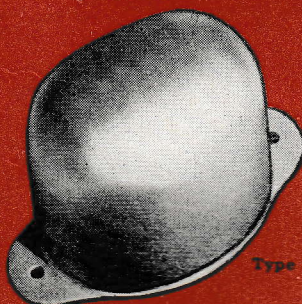
ROLA LOUDSPEAKER TRANSFORMERS



Type "B"



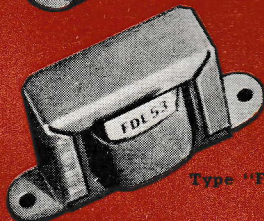
Type "C"



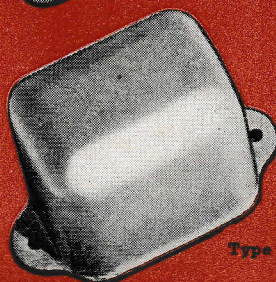
Type "D"



Type "E"



Type "F"



Type "G"

EACH type of Rola output transformer is designed to match a particular valve operated under a specified set of conditions. The two tables on the opposite page list the transformers needed to couple the different models of Rola loudspeakers to the various types of valves in current use and to older type valves for which replacement transformers may be needed.

THERE ARE SIX TYPES OF ROLA OUTPUT TRANSFORMERS. THEY ARE:

TYPE "B" Unsealed type designed to operate with 12R speaker with a voice coil impedance of 8.4 ohms. In the past, this transformer has been known as the G12 type.

TYPE "C" This is an Isocore transformer specially designed to prevent electrolysis taking place between the primary winding and the core. The winding and laminations are sealed into a streamlined metal can with which they have no electrical contact. This transformer is designed to operate with speakers having a voice coil impedance of 2 ohms.

TYPE "D" This also is an Isocore transformer somewhat smaller than Type C. It is normally supplied with type 6H and 8H speakers but it can be used detached with Model 3C, Model 5C, and other speakers with a voice coil impedance of 3.7 ohms. When 3C and 5C speakers (which are not normally supplied with Isocore transformers) are used with battery operated receivers, Type D transformers should be used detached.

TYPE "E" This is a compact unsealed transformer designed for use with Model 5C, when this speaker is used for AC receivers. It is not recommended for battery set operations. Under standard conditions, this transformer matches speakers with a voice coil impedance of 3.7 ohms. In the past, this transformer has been known as K5 type.

TYPE "F" This is an unsealed transformer of smaller dimensions than those of the Type E transformer. The Type F is designed to match loudspeakers having a voice coil impedance of 3.7 ohms and is intended for use with the Model 3C loudspeaker under special conditions. Its use in battery operated receivers is not recommended.

TYPE "G" This is a midget Isocore type transformer intended for use with Model 3C and Model 5C loudspeakers in battery receivers. Its secondary winding matches voice coils having an impedance of 3.7 ohms.

ROLA LOUDSPEAKER TRANSFORMER CODE

Push-Pull Operation	Operating Conditions	Plate Voltage	Nominal Load	Transformer Type	
				B	C
1F4	AB1	180	20,000ct		COL37
1J6	Class B Triode	135	10,000ct		COL53
2A3	Class A1 self bias	250	5,000ct	BTL50	CTL24
	Class AB1 self bias	300		BTL65	*
	Class AB1 fixed bias	300	3,000ct		
2A5	Class A1 Pentode self bias	250	14,000ct	BNL114	CNL55
	Class AB2 Pentode fixed bias	375	10,000ct	BOL109	*
6F6, 6F6GT, 6F6G	As for 2A5				
6L6, 6L6GT, 6L6G	Class A1 Pentode fixed bias	250	5,000ct	BPL126	*
	Class A1 Pentode fixed bias	270			
	Class A1 self bias	270	6,600ct	*	*
	Class AB1 fixed bias	360			
6V6, 6V6GT, 6V6G	Class AB1 Pentode	250	10,000ct	BOL109	COL53
		285	8,000ct	BOL124	*
19	As for 1J6				
42	As for 2A5				
45	Class A1	275	9,200ct	BSL46	CTL18
	Class AB2	275	3,200ct	BSL79	*
47	As for 2A5 class A1 Pentode self bias				
AL3	Class A Pentode	250	14,000ct	BOL90	CPL35
CL4	Class AB self bias Pentode	250	4,000ct	BRL73	*
EL2	Class AB self bias Pentode	250	8,000ct	BQL77	CRL31
EL3, EL3NG	Class AB fixed bias Pentode				
	As for AL3				
KL4	Class B Pentode	135	35,000ct	BNL69	CNL33

* Not recommended.

Single Ended Operation	Nominal Load	Transformer Type				
		B	C	D	E	G
1A5, 1A5GT, 1A5G	25,000		CBL32	DCL35	*	GAL56
1C5, 1C5GT, 1C5G	8,000		CDL38	DEL42	*	GCL67
1D4	15,000		CBB42	DCL46	*	
1D8, 1D8GT, 1D8G	12,000		CDL31	DEL34	*	GBL68
1L5, 1L5GT, 1L5G	As for 1D4					
1Q5, 1Q5GT, 1Q5G	As for 1C5					
1S4	8,000		CEL31	DFL33	*	GDL53
1S4	5,000		CFL31	DFL42	*	GDL68
2A3	2,500	BGG72	CHG29	*	*	
2A5	7,000	BAG178	CBG64	DBG96	EBG96	
3S4	5,000		CFL31	DFL42	*	GDL68
	8,000			DEL42	*	GCL67
3V4	10,000		CDL34	DEL37	*	GCL58
6F6, 6F6GT, 6F6G	As for 2A5					
6L6, 6L6GT, 6L6G	2,500	BCH198	CDH75	*	*	
6V6, 6V6GT, 6V6G	5,000	BBG169	CBG81	DCC87	ECG87	
42	As for 2A5					
47	7,000	BBG133	CBG64	DBG96	ECB70	
AL3	7,000	BAG178	CBG64	DBG96	*	
CL4	7,000	BAG178	CBG64	DBG96	ECG70	
EL2	8,000	BAG160	CBG61	DCC65	ECG65	
EL3, EL3NG	7,000	BAG178	CBG64	DBG96	*	

* Not recommended.

ROLA LINE TRANSFORMERS

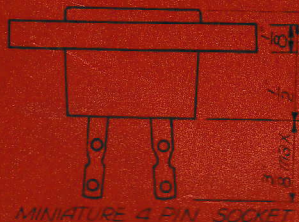
LOUDSPEAKER PLUG CONNECTIONS

SOME Rola loudspeakers will shortly be fitted with a miniature type 4-pin plug, mechanical details of which are set out below:

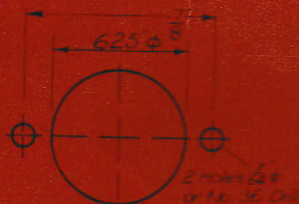
Following standard practise the connections to this plug are as follows:

- Pin 1—Always B (Red).
- Pin 2—Always Plate (Blue).
- Pin 3—Earth (if required) (Orange).
- Pin 4—In C.T. transformers 2nd plate (Brown).

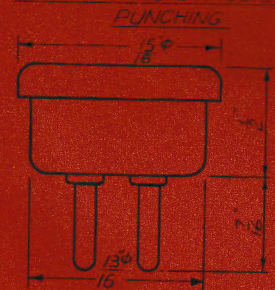
If feedback is being used and the transformer frame is not earthed, Pin 3 carries the finish of the transformer secondary (Green) and one voice coil lead (White) and Pin 4 carries the start of the transformer secondary (Black) and the other voice coil lead (Maroon).



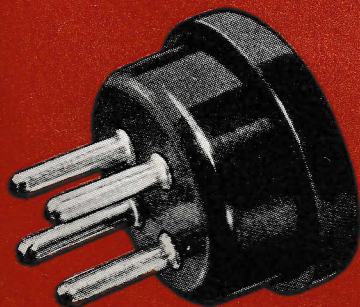
MINIATURE 4 PIN SOCKET



RECOMMENDED CHASSIS



MINIATURE 4 PIN PLUG



TO meet the requirements of sound system and Public Address system users Rola manufactures a range of line-to-voice-coil transformers to suit each of its loudspeaker types. Details of the transformers together with their type numbers and the impedance ranges which can be supplied are given below. The transformer impedances have been selected to cover all normal applications.

The type B transformers are non-isocore types having a secondary impedance of 8.4 ohms. They are intended for use with G12, G12 PM and 12R loudspeakers.

The type C transformer is an isocore transformer with a 2-ohm secondary. It is intended for use with loudspeakers having a 1-inch voice coil. Type D is an isocore transformer with a 3.7 ohm secondary intended for use with $\frac{3}{4}$ -inch, $\frac{5}{8}$ -inch and $\frac{1}{2}$ -inch voice coil loudspeakers. Type E is a non-isocore type with a 3.7 ohm secondary. It is intended for use with the 5C loudspeaker in AC operated installations.

All Rola transformers are supplied without mounting brackets. To mount the transformers to a speaker, drill out the rivets holding the existing transformer to the bracket and replace the transformer with screws. Never attempt to remove the transformer bracket from the speaker as this will inevitably cause damage to the speaker.

TRANSFORMER LEADS: The following lead lengths are standard:

Type B and C transformer—16"

Type D, E, and F transformers—8"

COLOUR CODE

Transformer primary—Start—Red if transformer primary untapped.

Brown or Blue if transformer primary tapped.

Transformer primary—Finish—Blue.

Transformer centre tap (if used)—Red.

The Blue lead is connected internally to the laminations in the isocore transformers unless the transformer is centre tapped, in which case the Red lead is so connected.

Connect Red tap to high voltage source (B+).

LINE TRANSFORMER CODES

Impedance Ohms	Type B	Type C	Type D	TYPE E	Impedance Ohms	Type B	Type C	Type D	Type E
500	BIL112	CHL84	DHL77	EHL77	5,000	BCL186	CCL61	DCL87	ECL87
600	BHL129	CHL84	DHL83	EHL83	6,000	BCL113	CCL66	DCL78	ECL78
1,000	BGL119	COL88	DOL82	EOL82	7,000	BCL102	CCL80	DCL70	ECL70
1,800	BFL123	CFL80	DFL85	EFL85	7,500	BFL128	CBL63	DBL89	EBL89
2,000	BFL104	CFL80	DFL71	EFL71	8,000	BFL124	CBL61	DBL85	EBL85
2,800	BEL119	CEL88	DEL83	EEL83	9,000	BEL116	CBL56	DBL80	EBL80
3,000	BEL108	CEL88	DEL78	EEL78	10,000	BEL109	CBL53	DBL74	EBL74
3,800	BDL122	CDL80	DDL86	EDL86	12,000	BAL124	CAL61	DAL86	EAL86
4,000	BDL114	CDL85	DDL78	EDL78	15,000	BAL110	CAL53	DAL74	EAL74
4,800	BDL106	CDL81	DDL72	EDL72	20,000	BAL93	CAL43	DAL63	EAL63
					25,000	BAL82	CAL40	DAL56	EAL56

Resistor and Condenser Codes

The following guide to the R.M.A. resistor and condenser colour code has been included for the convenience of the serviceman and the radio set builder.

The R.M.A. Colour Code gives values of resistance in ohms and capacitance in micro-microfarads correct to the first two integers, which is, in general, sufficiently accurate for most radio design work.

However, in some cases, such as a 1250 mmfd. condenser, the three digits may be indicated in the following manner:—The first two digits are indicated as usual; the third dot or ring is left blank. The remaining code appears in two dots or rings beside the blank. The dot or ring nearest the blank indicates the third digit, the other the number of ciphers. For example; 1250 mmfd. or 0.00125 mfd. condenser has; first dot, brown (1); second dot, red (2); third dot, green (5); fourth dot, brown (0).

R.M.A. CONDENSER COLOUR CODE
Value in Micromicrofarads

First Dot	First Digit	Second Dot	Second Digit	Third Dot	Remaining Digits
Black	0	Black	0	Black*	—
Brown	1	Brown	1	Brown	0
Red	2	Red	2	Red	00
Orange	3	Orange	3	Orange	000
Yellow	4	Yellow	4	Yellow	0,000
Green	5	Green	5	Green	0,000
Blue	6	Blue	6	Blue	000,000
Violet	7	Violet	7	Violet	0,000,000
Grey	8	Grey	8	Grey	0,000,000
White	9	White	9	White	000,000,000

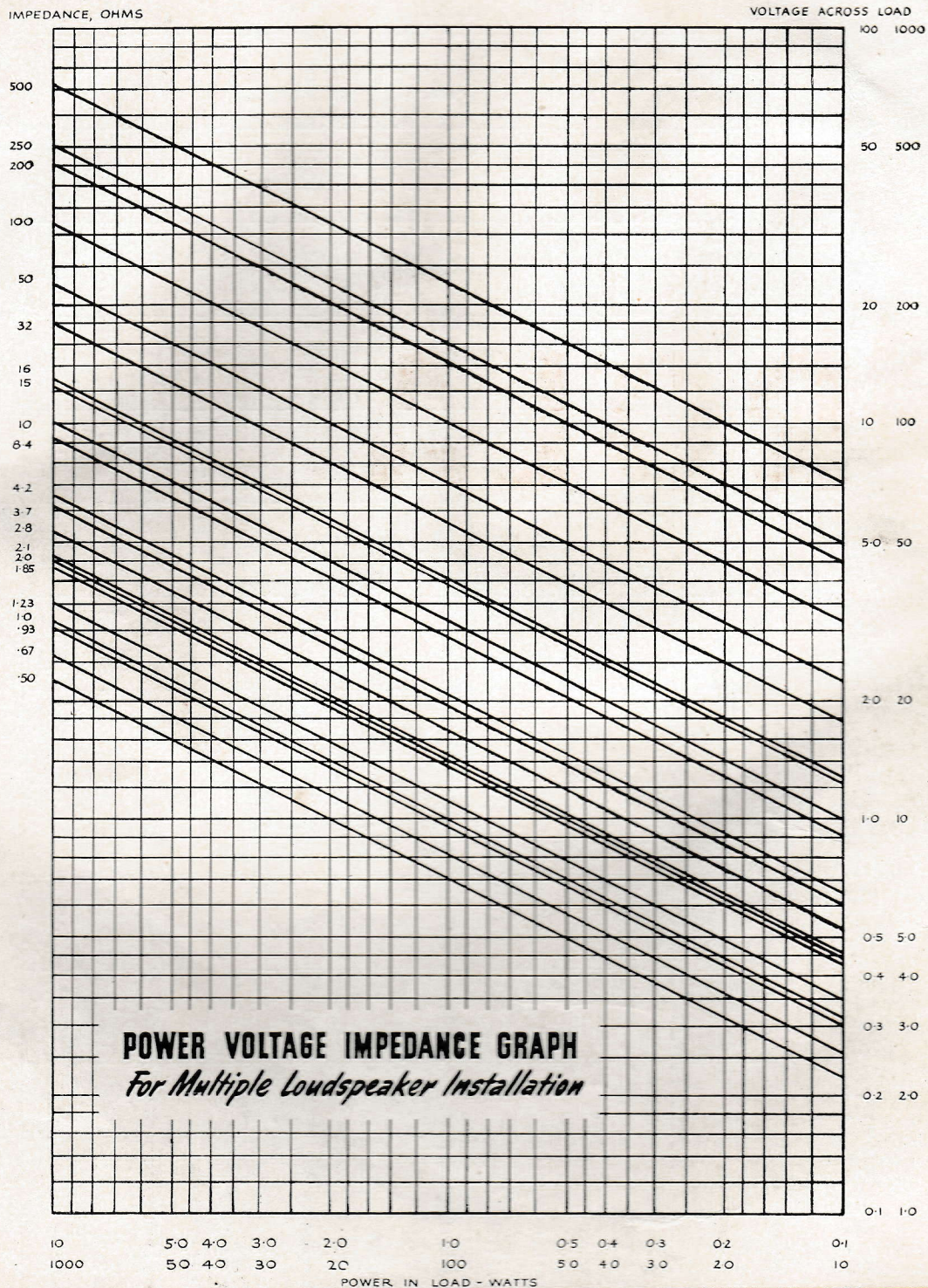
R.M.A. RESISTOR COLOUR CODE
Value in Ohms

Body Colour	First Digit	End Colour	Second Digit	Dot Colour	Remaining Digits
Black	0	Black	0	Black	—
Brown	1	Brown	1	Brown	0
Red	2	Red	2	Red	00
Orange	3	Orange	3	Orange	000
Yellow	4	Yellow	4	Yellow	0,000
Green	5	Green	5	Green	00,000
Blue	6	Blue	6	Blue	000,000
Violet	7	Violet	7	Violet	0,000,000
Grey	8	Grey	8	Grey	00,000,000
White	9	White	9	White	000,000,000

* Optional

PACKING SPECIFICATIONS OF ROLA SPEAKERS (Anisotropic Alnico Series)

MODEL	3C	3C Without Transformer	5C	6H	6K	001	8K	8M	8M (P.A. Type) Without Transformer	12-0	12R
MANUFACTURERS' TYPES											
Weight of speaker with transformer	lb. oz. 8½	lb. oz. 6½	lb. oz. 16	lb. oz. 1 12	lb. oz. 2 6	lb. oz. 1 14½	lb. oz. 2 11	lb. oz. 2 13	lb. oz. 1 12½	lb. oz. 4 15	lb. oz. 11
Number of speakers in folded slide	5	5	5	5	5	3	3	3	3		
Weight of speakers in folded slide	3 ¾	2 8	5 10	10	12 15	4 11½	9 5	9 11	6 6½		
Number of speakers in shipping pack	50	50	50	25	25	12	12	12	12	5	
Weight of shipping pack	32 ¾	26	57 lb. 23 12	54	66 lb. 8 oz.	20 15½	39 lb. 8 oz.	41 lb. 8 oz.	27 13½	33	8
Measurement of shipping pack	1'4"	11"	2'2" 11"	2'4"	2'4"	2'3"	2'3"	2'3"	2'3"	3'0"	11"
DISTRIBUTORS' TYPES											
Weight packed singly in carton			1 4	2 2	2 11½	2 6½	3 3	3 6	2 5	6 1	13 8
Number of speakers in shipping pack	20	20	10	10	10	10	10	10	10		
Weight of shipping pack	13 1½	10 12	12 lb. 8 oz.	21 12½	28 11½	26 4½	34 1½	35 15½	26 lb.		
Measurement of shipping pack	7"	5"	6"	1'5"	1'5"	2'1"	2'1"	2'1"	2'1"		



POWER, VOLTAGE, IMPEDANCE CALCULATOR

This Nomograph provides a rapid method of determining the power being fed to a loudspeaker network when the impedance of the latter and the voltage being delivered to it is known.

For example, if the voice coils of four Rola Type 8M loudspeakers are connected in parallel across a very low resistance line the load impedance is the impedance of one voice coil (2 ohms) divided by the number of voice coils (in this case, 5 ohms). The potential being fed to the line is 3 volts. Read across the 3 volt line to its point of intersection with the .5 ohm impedance curve and then read down to the Power scale which in this case shows that the power being fed to the four loudspeakers is 18 watts, i.e. 4.5 watts to each unit. For powers up to 10 watts use the inner set of figures on the Voltage and Power scales and for powers up to 1,000 watts read the outer sets of figures.

ROLA **WARRANTY**

ROLA COMPANY (AUST.) PTY. LTD. will make good or replace at the factory any Rola products which, by examination at the factory made within both ninety days from the date of sale and twelve months from the date of manufacture, are proved to the satisfaction of a representative of the Company to have failed to correspond with the description or to have been defective in material or workmanship. Save as aforesaid all conditions and warranties as to description, quality, state, condition, or fitness of the Company's goods are expressly negatived and the Company neither assumes or authorises any representative or other person to assume for it any other obligation or liability in connection with the sale of any goods manufactured by it.

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