



**Fostex**

RP Technology Microphones

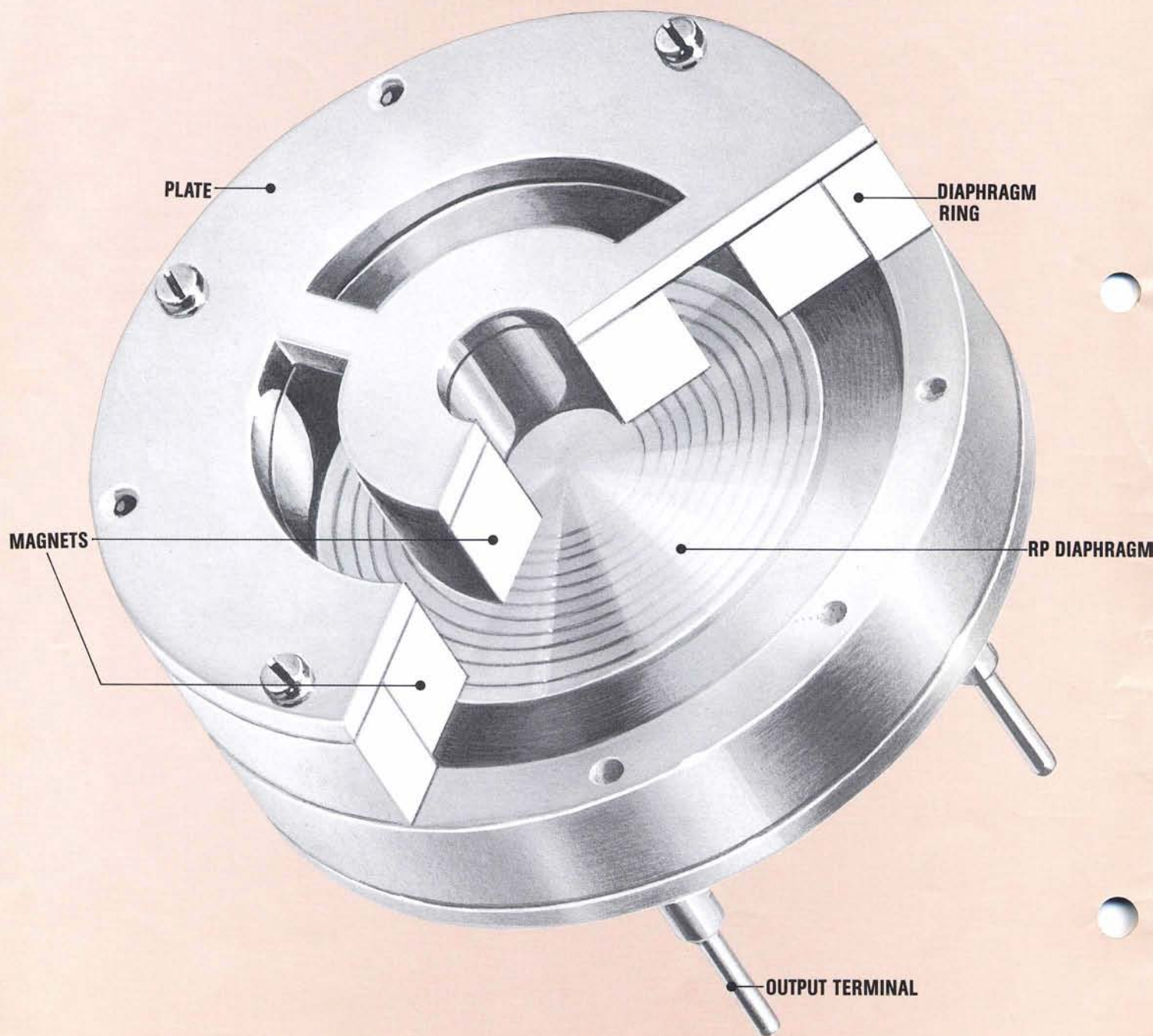


# RP Technology

RP stands for Regulated Phase, a patented technology which has been under development by Fostex engineers for the past ten years. This unique transducer design has produced a family of microphones that exhibit extremely low distortion, excellent transient response and wide dynamic range.

In the RP system, a flat, thin diaphragm is driven with absolute phase uniformity, in true piston motion. Utilizing integrated circuit manufacturing techniques, a very fine aluminum coil is etched directly onto a surface of an extremely thin polyester film diaphragm. This assembly is then suspended in a powerful magnetic field, formed of magnet pairs which have opposing polarities. Rare earth, samarium cobalt magnets produce a magnetic flux density ten times that of Alnico, which fact contributes to the very fast transient response of the RP element.

Simplicity of design and impeccable construction techniques produce a family of microphones for the complete range of professional applications — in the studio, on the air, or up on stage.



# A CAREFUL BLENDING OF DESIGN ELEMENTS GIVES THE FOSTEX RP MIC. THE WARMTH OF A RIBBON, THE CLARITY OF A CONDENSER AND THE DURABILITY OF A DYNAMIC.

## RP Technology

Very simply, Fostex RP microphones are unlike any other microphones in the world. To date, more than twenty international patents have been awarded to this remarkable transducer technology. If you work in the world of audio recording/reproducing, you owe it to yourself and your clients to audition the Fostex RP microphones.

## The Best of All Worlds

Fostex RP Technology combines the attributes of ribbon, condenser and dynamic types, while avoiding all the limitations of traditional microphone design. Fostex engineers collaborated with NHK, Japan, one of the world's largest and most demanding broadcasting networks, to develop these world class transducers.

## Ribbon Microphones

In the early days of broadcasting, ribbon microphones were enormously popular because of their "natural" sound. Announcers and radio performers especially liked their conversational neutrality, because they could then use their own practised vocal skills to achieve desired effects. Ribbon mics "didn't get in the way." Unfortunately, the ribbon elements were just too delicate to hold up to constant use.

## Condenser Microphones

Condensers were among the first types of mics developed specifically for critical sound recording and broadcasting applications. There are some distinct advantages with this design.

- Low mass diaphragm. Faster response time than heavier dynamic elements. Better tracking of transient response and better definition of harmonics.
- Phantom powering. Permits the inclusion of a mic preamp inside the capsule, thereby avoiding an extra power supply. Higher output level, better signal-to-noise ratio.
- Pattern flexibility. When you start with a bi-directional pick-up pattern, all polar patterns are generated more effectively. Condensers offer tightly controlled response, both on and off axis.

There are some trade-offs, however, and they include cost (usually expensive), size (usually large, bulky), and the need for external or phantom powering.

## Dynamic Microphones

Dynamic microphones were designed to offer

a reliable alternative to the condenser designs, and they have their own advantages:

- Rugged. Great for use on the road.
- Inexpensive. A low-cost alternative to condensers.
- No need for an extra power supply or source. But then, along come the trade-offs:
- Higher distortion and a lower overload point.
- Best pattern design is the omni. Other patterns have poor control.
- Higher diaphragm mass results in poorer high frequency response.

## Fostex RP Microphones

A careful blending of all the classic microphone design benefits, without the corresponding trade-offs. That's what Fostex RP Technology delivers. In the studio, on the air, or on stage.

Soon after their introduction, the Fostex mics were being called "Printed Ribbon" Microphones, so fondly did their warmth resemble the beautiful but frail ribbon mics of yesteryear. (The reference to 'printed' is to one patented aspect of Fostex RP Technology, wherein the voice coil is etched directly onto the diaphragm.)

But the reference to 'ribbon' carried a negative connotation regarding durability. However Fostex RP Mics have a history which verifies a ruggedness quotient equal to, or better than, the very best dynamics.

In the RP system, a flat, thin diaphragm is driven with absolute phase uniformity, in true piston motion. 80% lighter than the typical dynamic element, the RP element has the fast transient response of a condenser.

Fostex RP Microphones use a magnetic design in place of the polarizing voltage design of a condenser. The advantage of this fact can be seen in the ability of the RP design to be applied to any polar pattern, with full integrity.

The basic RP pattern is bi-directional, or 'Figure-8'. The acoustic air mass load is the same, in fact, on both sides of the diaphragm. (A little horn-blowing is in order here — even the very best condensers do not have this true front-to-back symmetry.)

Given this reciprocal pick-up pattern as a basic building block, the RP design can be predictably controlled all the way from a stereo mic to a super cardioid.

The very high magnet flux on the surface of the RP diaphragm produces outstanding control, reduces diaphragm break-up and results in lower distortion overall. Fostex RP mics have less than 0.2% THD at 130 dB SPL — a figure unmatched by some of the finest condensers.

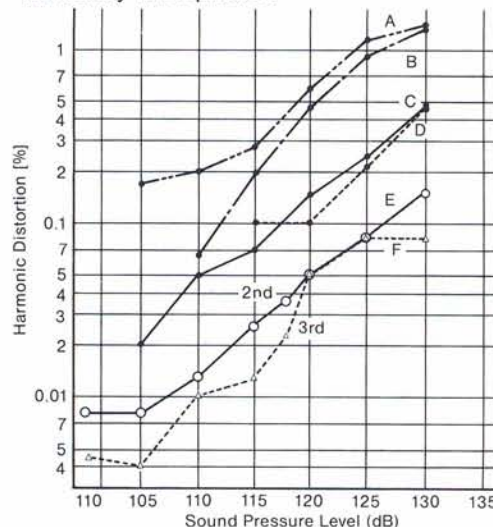
Surprisingly, this kind of performance and reliability is readily affordable. Fostex RP mics are about half or less the cost of world class condensers, and about the same as the best dynamics available.

Finally, of course, there is the sound. Something you really must audition first-hand, because all else is secondary. The rest of this brochure contains specific information on the various models of Fostex RP Microphones, and the applications for which they were designed.

We hope you will find it useful. We also hope you'll take the time to listen to these remarkable microphones. Because we trust you'll know the truth when you hear it.

## LOWER DISTORTION

The patented Fostex RP design permits capsule construction which has identical front/back response. This design reduces second harmonic distortion to almost unmeasurable levels, lower than some of the best condenser microphones. At 100 dB, RP microphones have less than 0.01% distortion, equal to many high quality electronics. At 130 dB SPL, RP mics have less than 0.2% distortion. The high magnetic flux, the flat diaphragm and the spiral voice coil all contribute to complete diaphragm control at all SPL levels. This patented design results in operating levels so high, they are normally associated only with laboratory microphones.



HARMONIC DISTORTION vs. SOUND PRESSURE LEVEL

- A: Bi-directional Condenser Microphone
- B: Uni-directional Condenser Microphone
- C: Omni-directional Moving coil Microphone
- D: Uni-directional Condenser Microphone
- E: Bi-directional RP Microphone
- F: Bi-directional RP Microphone



# THE FOSTEX M/S Stereo Microphone

Model M22RP is a Mid/Side Stereo Microphone. It is a unique tool for broadcasters, recording engineers – anyone who requires an exact perspective on an acoustic environment.

FOSTEX

MS STEREO MICROPHONE

# Model M22RP A "MUST ADD" TO YOUR MIC LOCKER.



## XY Stereo Microphones

The M/S design must not be confused with the XY design. If you took two mics, taped them together at the bases, angled them apart and pointed them at a sound source, you would be employing the principles of the XY stereo mic. You would also encounter two major problems. First, comb-filtering or phase cancellation effects. These will vary, depending on (a) the distance the two mics are spaced apart, and (b) how far they are from the sound source, but these phase irregularities will occur. This problem severely limits the use of the XY microphone for broadcasting because the broadcast signal must be stereo/mono compatible. The second problem inherent in the XY design is its inability to adjust the stereo spread, which limits its flexibility for recording.

## M/S Stereo Microphones

In this design, the process of generating the stereo signal is accomplished by the addition and subtraction of Mid and Side signals. The M22RP has two capsules. The Mid capsule is a cardioid element in the front of the mic which picks-up the on axis signal (mono). Its signal is  $L + R$ . The Side capsule is a bi-directional element, positioned  $90^\circ$  in relation to the cardioid element, which picks-up the Left and Right signals at the same time, but out of phase with each other. This signal is  $L - R$ . By combining these two signals, you can decode from  $180^\circ$  stereo all the way to mono—without any phase irregularities. The Left channel is made by adding the MID (L

+ R) to the SIDE (L - R), thus cancelling R:  
 $(L + R) + (L - R) = (L + L) + (R - R) = 2L = \text{Left}$

The Right channel is made in the same manner, except that the MID (L + R) is now added to the out of phase SIDE (-L + R), thus cancelling L:

$(L + R) + (-L + R) = (L - L) + (R + R) = 2R = \text{Right}$

The stereo signal produced by these combinations is equivalent to matched cardioid microphones placed  $180^\circ$  apart.

If no SIDE signal is added, the result is pure mono. As incremental amounts of SIDE signal are added, the stereo separation increases to a maximum of  $180^\circ$  when the MID and SIDE signals are of equal strength.

One major benefit of this design is that you can adjust the stereo spread before committing the sound to tape; or, you can record the MID and SIDE signals on separate tracks and reconstruct the stereo perspective later on.

Another advantage is that when you sum Left and Right, you have no comb filtering or phase cancellation effects. Summing simply removes the SIDE signals from the equations:

$L = (L + R) + (L - R)$

$R = (L + R) + (-L + R)$

$L + R = \text{Mono}$

$(L + R) + (L - R) + (L + R) + (-L + R)$

$2(L + R) = \text{Mono}$

This aspect is very important for broadcast applications. AM Stereo, FM Stereo and TV Stereo are all received in mono at many locations. With the Fostex M22RP, Mono summing

may occur anywhere in the audio chain with complete phase integrity.

Thus the M22RP is really three microphones in one. In addition to the interaction between the two elements, each may be used separately. The MID element alone is the equivalent of the Fostex M11RP, an excellent cardioid microphone. The SIDE element alone is the same as that in the Fostex M88RP, a highly versatile bi-directional, or Figure-8 mic.

## M22RP Applications

The Fostex M22RP is ideal for broadcasters. Not only in the studio for stereo announcing and interviewing, but also for ENG and on-location work. An external power supply is not required, so the M22RP fits anywhere a single channel mic goes.

The M22RP is, of course, exceedingly well-suited for the recording studio, and thanks to its rugged construction, does equally well on the road. It has been used very successfully on instruments like drums, pianos and vibes, which normally require more than one mic, and therefore create phasing problems.

With the current trend toward stereo imaging, the Fostex M22RP is an invaluable creative tool. Fully mono compatible, the M22RP can deliver the exact degree of stereo separation which you deem appropriate.

Before you buy a pair of matched condensers, consider the Fostex M22RP Stereo Microphone. The fact that it's the only M/S Stereo Mic of its kind ought to prompt you to give it a listen.



## Model M11RP



This model has the smoothest cardioid pattern in the RP series. Very careful attention has been focused upon the frequency response of this mic: extended and extremely flat. The M11RP is an ideal vocal mic for the broadcast or recording studio. Due to its low distortion at high output levels, the M11RP is also very well suited for kick drums.

There is a three position low frequency roll-off switch which allows you to compensate for varying degrees of the proximity effect.

The M11RP is complete with an integral isolation-mounting to reduce vibration-generated noise.

## Model M51RP



This model, arguably, is the first studio-quality vocal microphone rugged enough to take the rigors of the road. The low distortion characteristics of the RP design can now be used on the stage as well as in the studio.

In the excitement of a concert setting, with the ambient crowd noise, inaccurate dynamic mic response is tolerable (desireable, even, to some ears). In the studio, it is not. And for really demanding vocalists, like Geddy Lee of Rush, it is not acceptable on stage, either.

This absolute clarity and lack of distortion must be heard to be appreciated. The smoothness of the response, particularly in the important midrange frequencies, is startling in its transparency.

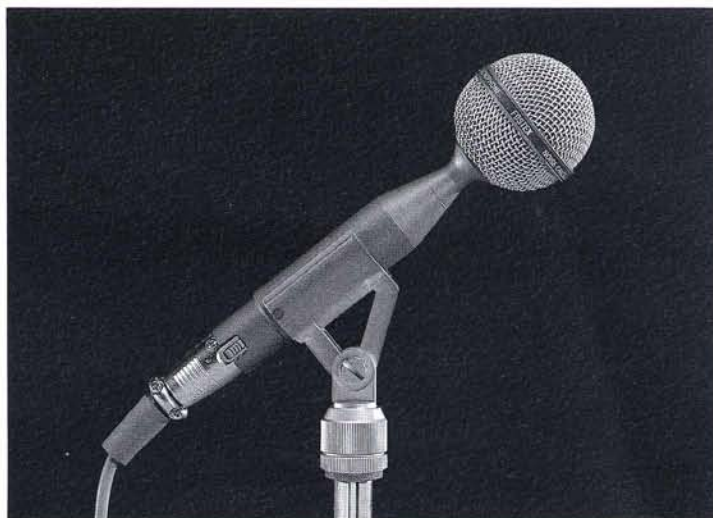
Before you cut your next vocal track, or pack up for your next road tour, audition the mic that can handle both jobs with same high quality results. The M51RP Vocal Mic from Fostex.

# Model M20RP



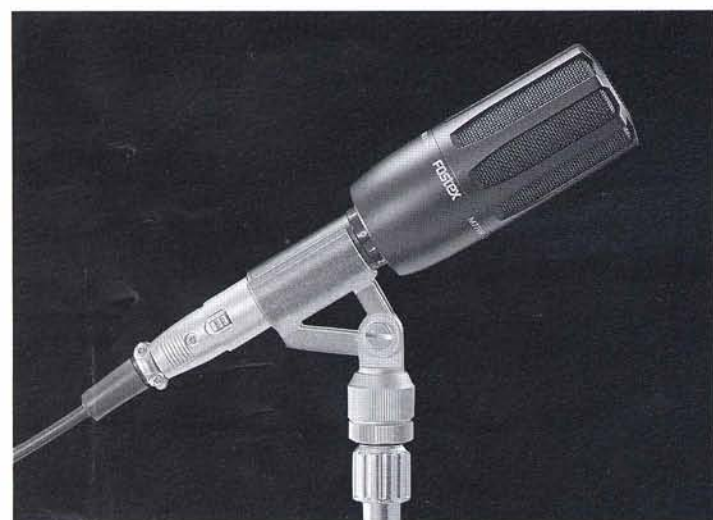
The new trimmed down, less expensive version of the popular M22RP, this M/S Stereo microphone is a great all-purpose recording tool. Location recording becomes far less of a chore because of the lightweight design of M20RP. Stereo digital sampling is easy with the M/S design because you have greater control over imaging. The M20RP is great as an overhead for stereo drums and is excellent on all acoustic instruments.

# Model M85RP



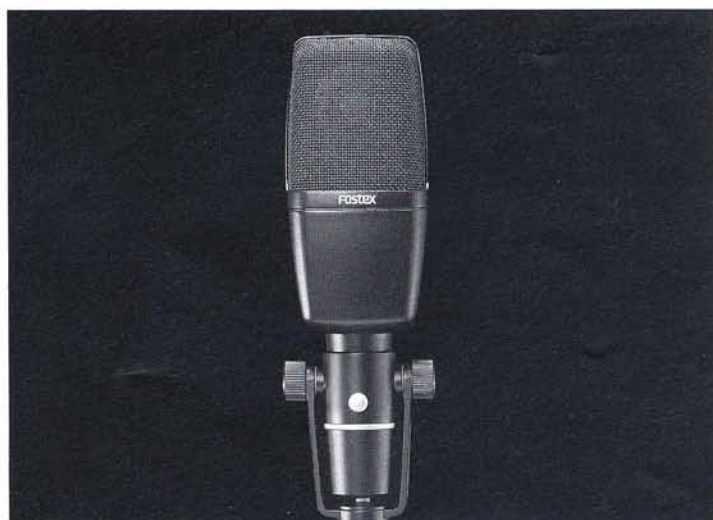
Here's the premier noise-canceling near-field microphone designed for those critical jobs where side and background noise are unwanted. The M85RP is a super hyper-cardioid microphone which picks up the sound directly in front and extremely close. Especially effective in isolating the snare from the hi-hat, the M85RP is equally effective as an interview/commentator mic in live applications with high levels of ambient noise. You can even record a singer-guitarist with one M85RP for the voice, another for the guitar, with amazing separation.

# Model M77RP



This cardioid microphone has an excellent reputation as an instrument microphone and as one of the best kick and snare drum microphones available. It has been used on many major albums on kick drum, bass amplifier, acoustic bass and cello. There is a three-position equalizer switch which tailors the response to the job at hand. In the "O" position, there is a slight midrange presence. Here, the M77RP is very similar to the M55RP and can even be used on vocals. In the "1" position, the midrange presence remains, but a low cut filter is inserted to reduce low frequency response, thereby compensating for the proximity effect. In the "2" position, the midrange presence and the low cut filter are removed to produce a very flat cardioid mic, similar to the M11RP, for accurate instrument recording. A tip from the field: for exceptionally flat and accurate response in the "2" position, the top cover is removed to expose the capsule.

# Model M88RP



In this model, the bi-directional capsule is used in its purest form. Since there is no need to delay sound, or to allow phase cancellation effects to taper the sound pattern, the bi-directional design is the smoothest and most uncolored. Obviously, the rear pick-up pattern must be dealt with; but in the studio, controlling sound is everything. In most acoustically dry environments, the rear pattern can be left alone, producing a slight, pleasing ambience. A most useful feature of bi-directional microphones is the very deep notch in response 90° off axis. A cardioid mic, theoretically, has very little rear pick-up; but in practice, some frequencies almost always defy the theory. The bi-directional design, in both theory and practice, has a deep notch 90° off axis—at all frequencies. Thus you can position a bi-directional mic to be highly discriminating in the presence of many sound sources.

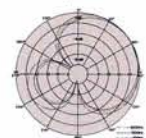
# RP Technology Microphones

## M22RP

### Specifications

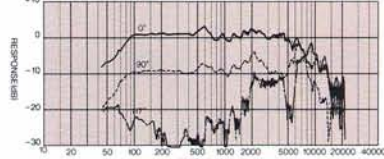
● **Type:** Printed Ribbon ● **Polar Pattern:** (M) Uni-directional; (S) Bi-directional  
 ● **Frequency Range:** 40 ~ 18000 Hz ● **Output Impedance:** 600 ohms ● **Sensitivity:** Open Circuit Voltage: -51 dB (0 dB=V/Pa) Output Level: -54.8 dBm (0 dBm=1 mW/Pa) EIA Microphone Rating GM: -148 dB ● **Hum Pick Up Level:** 6 dB SPL Under (dB/10<sup>-7</sup>T) ● **Wind Noise:** 40 dB SPL Under ● **Output Connector:** XLR5-11 ● **Phase:** (M) 2 - ⊕ 3 - ⊖; (S) 4 - ⊕ 5 - ⊖ ● **Finish:** Die-Cast Aluminum Alloy, Black Finish ● **Dimensions:** φ70 × 245 mm ● **Net Weight:** 730 g

Polar Response Pattern



M + S (L) M - S (R)

Frequency Response



## M20RP

### Specifications

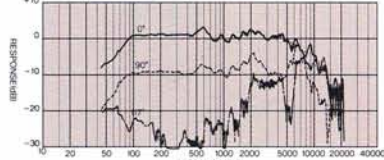
● **Type:** Printed Ribbon ● **Polar Pattern:** (M) Uni-directional; (S) Bi-directional  
 ● **Frequency Range:** 40 ~ 18000 Hz ● **Output Impedance:** 600 ohms ● **Sensitivity:** Open Circuit Voltage: -51 dB (0 dB=V/Pa) Output Level: -54.8 dBm (0 dBm=1 mW/Pa) EIA Microphone Rating GM: -148 dB ● **Hum Pick Up Level:** 6 dB SPL Under (dB/10<sup>-7</sup>T) ● **Wind Noise:** 40 dB SPL Under ● **Output Connector:** XLR5-11 ● **Phase:** (M) 2 - ⊕ 3 - ⊖; (S) 4 - ⊕ 5 - ⊖ ● **Finish:** Die-Cast Aluminum Alloy, Black Finish ● **Dimensions:** φ70 × 245 mm ● **Net Weight:** 730 g

Polar Response Pattern



M + S (L) M - S (R)

Frequency Response

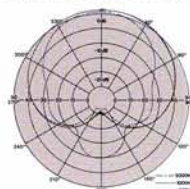


## M11RP

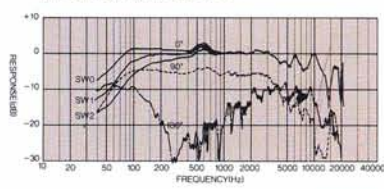
### Specifications

● **Type:** Printed Ribbon ● **Polar Pattern:** Uni-directional  
 ● **Frequency Range:** 40 ~ 18000 Hz ● **Output Impedance:** 600 ohms ● **Sensitivity:** Open Circuit Voltage: -51 dB (0dB = V/Pa) Output Level: -54.8 dBm (0dBm = 1 mW/Pa) EIA Microphone Rating GM: -148 dB ● **Hum Pick Up Level:** 4 dB SPL Under (dB/10<sup>-7</sup>T) ● **Wind Noise:** 49 dB SPL Under ● **Output Connector:** XLR-3-12C ● **Phase:** 2 - ⊕; 3 - ⊖ ● **Finish:** Die-Cast Zinc Alloy, Black Finish ● **Dimensions:** 67 × 63 × 179 mm (W, D, H) ● **Net Weight:** 580 g

Polar Response Pattern



Frequency Response

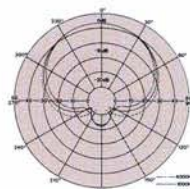


## M51RP

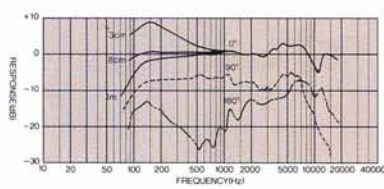
### Specifications

● **Type:** Printed Ribbon ● **Polar Pattern:** Uni-directional  
 ● **Frequency Range:** 80 ~ 20,000 Hz ● **Output Impedance:** 250 ohms ● **Sensitivity:** Open Circuit Voltage: -58 dB (0dB = V/Pa) Output Level: -58 dBm (0dBm = 1 mW/Pa) EIA Microphone Rating GM: -149 dB ● **Hum Pick Up Level:** 2 dB SPL Under (dB/10<sup>-7</sup>T) ● **Wind Noise:** 47 dB SPL Under ● **Output Connector:** XLR/A3F ● **Phase:** 2 - ⊕; 3 - ⊖ ● **Finish:** Die-Cast Zinc Alloy, Black Finish (non reflective) ● **Dimensions:** φ50 mm × 171 mm (dia × length) (2in × 6<sup>3</sup>/<sub>4</sub>in) ● **Net Weight:** 290 g (10.2 oz)

Polar Response Pattern



Frequency Response

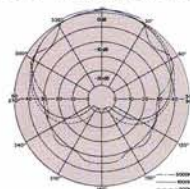


## M77RP

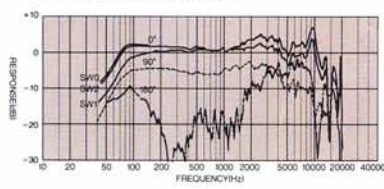
### Specifications

● **Type:** Printed Ribbon ● **Polar Pattern:** Uni-directional  
 ● **Frequency Range:** 40 ~ 18000 Hz ● **Output Impedance:** 250 ohms ● **Sensitivity:** Open Circuit Voltage: -56 dB (0dB = V/Pa) Output Level: -56.0 dBm (0dBm = 1 mW/Pa) EIA Microphone Rating GM: -147 dB ● **Hum Pick Up Level:** 0 dB SPL Under (dB/10<sup>-7</sup>T) ● **Wind Noise:** 49 dB SPL Under ● **Output Connector:** XLR-3-12C ● **Phase:** 2 - ⊕; 3 - ⊖ ● **Finish:** Die-Cast Aluminum Alloy, Black Finish ● **Dimensions:** φ45 × 172 mm ● **Net Weight:** 360 g

Polar Response Pattern



Frequency Response

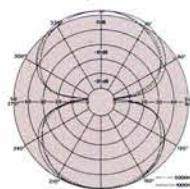


## M88RP

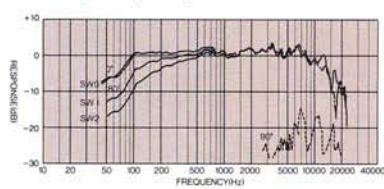
### Specifications

● **Type:** Printed Ribbon ● **Polar Pattern:** Bi-directional  
 ● **Frequency Range:** 40 ~ 18000 Hz ● **Output Impedance:** 600 ohms ● **Sensitivity:** Open Circuit Voltage: -52 dB (0dB = V/Pa) Output Level: -55.8 dBm (0dB = V/Pa) EIA Microphone Rating GM: -149 dB ● **Hum Pick Up Level:** 2 dB SPL Under (dB/10<sup>-7</sup>T) ● **Wind Noise:** 45 dB SPL Under ● **Output Connector:** XLR-3-12C ● **Phase:** 2 - ⊕; 3 - ⊖ ● **Finish:** Die-Cast Aluminum Alloy, Black Finish ● **Dimensions:** 52 × 46 × 136 mm (W, D, H) ● **Net Weight:** 330 g

Polar Response Pattern



Frequency Response

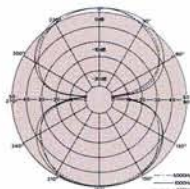


## M85RP

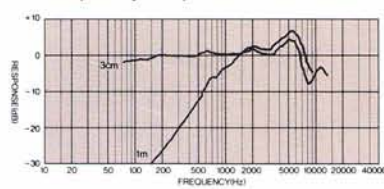
### Specifications

● **Type:** Printed Ribbon ● **Polar Pattern:** Bi-directional ● **Frequency Range:** 50 ~ 12000 Hz ● **Output Impedance:** 600 ohms ● **Sensitivity:** Open Circuit Voltage: -56 dB (0 dB=V/Pa) Output Level: -60 dBm (0 dBm=1 mW/Pa) EIA Microphone Rating GM: -153 dB ● **Hum Pick Up Level:** -10 dB SPL Under (dB/10<sup>-7</sup>T) ● **Wind Noise:** 38 dB SPL Under ● **Output Connector:** XLR-3-12C ● **Phase:** 2 - ⊕; 3 - ⊖ ● **Finish:** Die-Cast Aluminum Alloy, Black Finish ● **Dimensions:** φ52 × 163 mm ● **Net Weight:** 280 g

Polar Response Pattern



Frequency Response



## ACCESSORIES

- **M11RP:** Carrying Case
- **M22RP:** Window Screen  
Matrix Box P400  
Trunk P351
- **M77RP:** Mic Holder  
Carrying Case
- **M88RP:** Hanger P303  
Carrying Case P350

\* Specifications subject to change without notice.