

SYSTEM IS SUPPLIED WITH GRILLE  
(NOT ILLUSTRATED)

#### SPECIFICATIONS

Frequency Response, Measured in Farfield Calculated to One Meter on Axis, Swept One-Third-Octave Pink Noise, Anechoic Environment (see Figure 1):

150-20,000 Hz

Recommended Crossover Frequencies:

160 Hz, 1,600 Hz

Efficiency:

25%

Long-Term Average Power Handling Capacity per EIA Standard RS-426A (see Power Handling section),

MB/HF: 600/150 watts

Short-Term Power Handling Capacity (10 milliseconds),

MB/HF: 2,400/600 watts

Maximum Long-Term Average Midband Acoustic Output:

180 watts

Sound Pressure Level at One Meter, Indicated Input Power, Anechoic Environment, Band-Limited Pink-Noise Signal, MB/HF,

1/1 Watt: 104/110 dB

600/150 Watts: 135/132 dB

2,400/600 Watts: 141/138 dB

Dispersion Angle Included by 6-dB-Down Points on Polar Responses, Indicated

One-Third-Octave Bands of Pink Noise, 600-20,000 Hz Horizontal (see Figure 3):

90° (+15°, -10°)

900-20,000 Hz Vertical (see Figure 3):

40° (+20°, -5°)

Directivity Factor  $R_0$  (Q), 600-20,000-Hz Median (see Figure 4):

17.9 (+3.0, -8.5)

Directivity Index  $D_i$ , 600-20,000-Hz Median (see Figure 4):

12.5 dB (+1.2 dB, -3.5 dB)

Distortion, 120 dB SPL at 1 Meter, Shaped Spectrum (see Figure 6),

Second Harmonic,

200 Hz: 1.3%

1,000 Hz: 1.6%

3,000 Hz: 6.3%

10,000 Hz: 4.9%

Distortion, 120 dB SPL at 1 Meter, Shaped Spectrum (see Figure 6),

Third Harmonic,

200 Hz: 0.4%

1,000 Hz: 1.6%

3,000 Hz: 0.6%

10,000 Hz: 0.3%

Transducer Complement,

MB: Two DL10X

HF: Two DH1A variant compression drivers

Impedance (MB/HF wired in parallel),

Nominal, MB/HF:

4 ohms/4 ohms

Minimum, MB/HF:

4 ohms/3 ohms

Input Connections:

Two Neutrik Speakon™ NL4MP

Enclosure Materials:

14-ply birch plywood

Finish,

Black Ozite Super TNT carpet

Hanging:

Two-point flying system

(tracks accept Aeroquip 32102 fittings)

Dimensions,

Height: 91.4 cm (36.0 in.)

Width: 57.2 cm (22.5 in.)

Depth: 76.2 cm (29.9 in.)

Net Weight:

97 kg (214 lb)

Shipping Weight:

102 kg (225 lb)

# Electro-Voice®

a MARK IV company

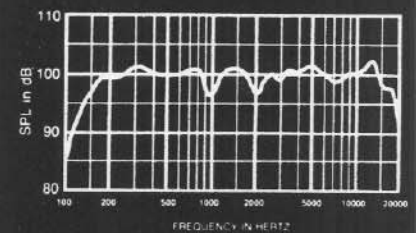


FIGURE 1  
Axial Frequency Response using  
Recommended Crossover, Equalization  
1 Watt/1 Meter into MB Section

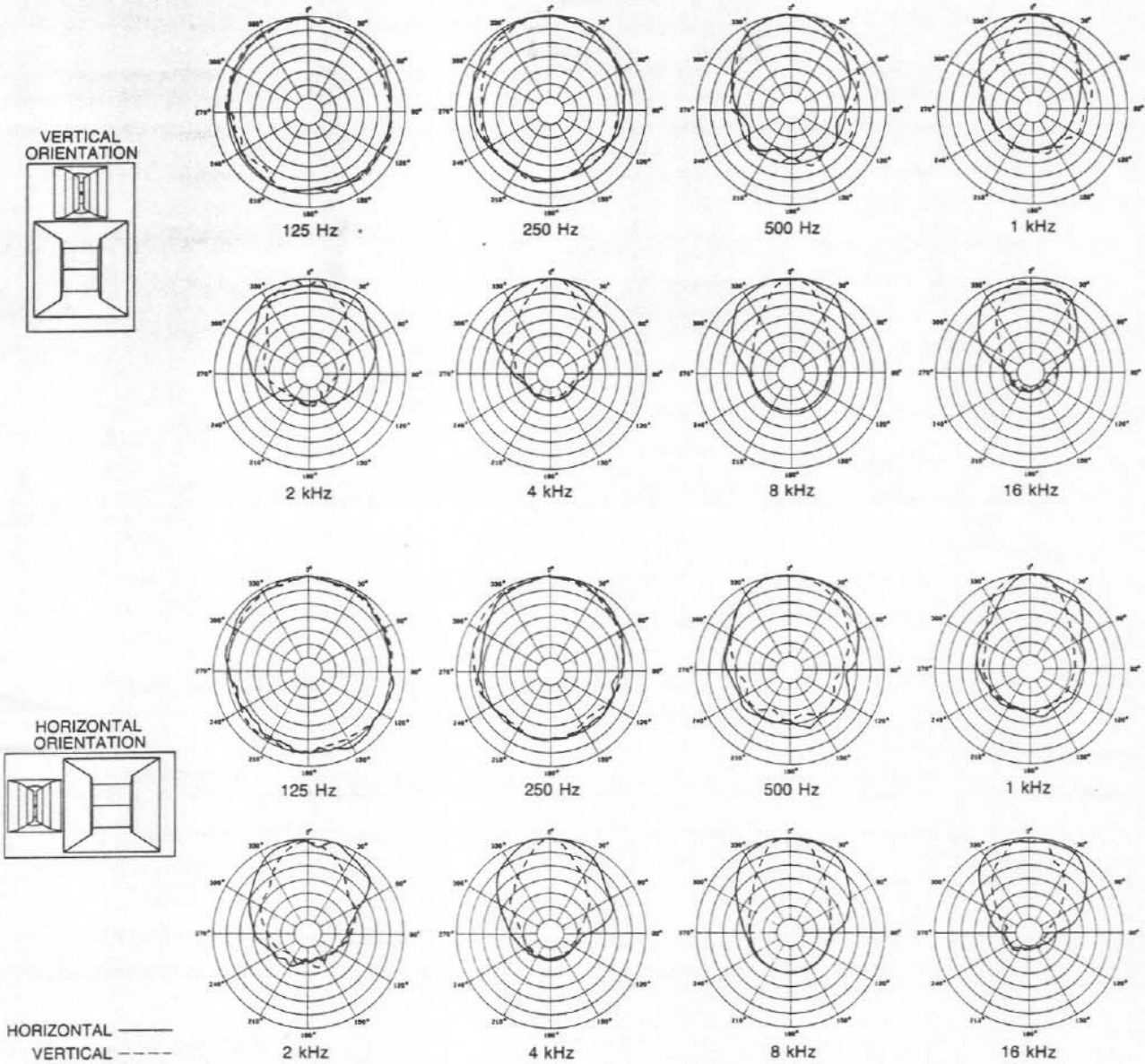
## Model MTH-2/94 Manifold Technology® Midbass/High-Frequency Sound Reinforcement System

#### DESCRIPTION

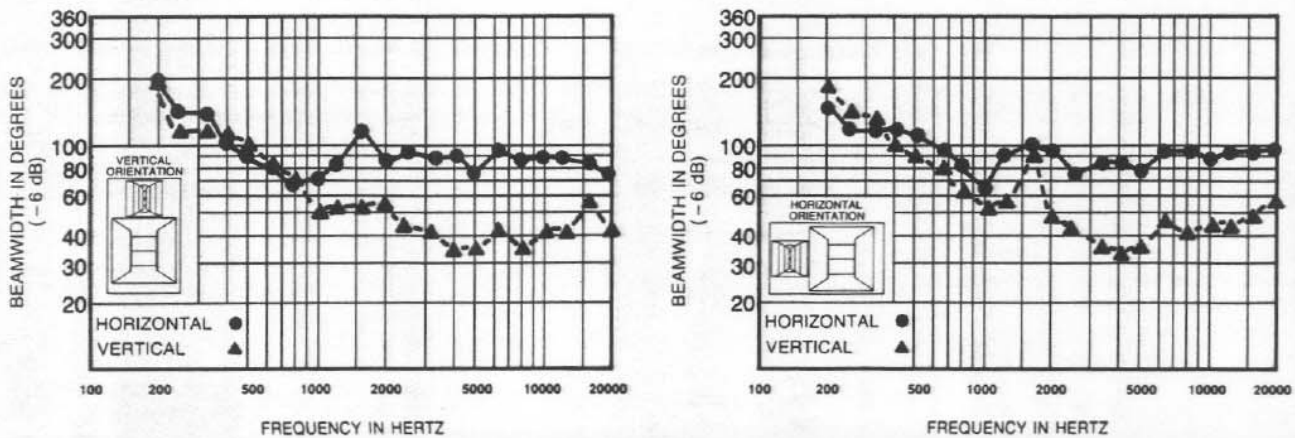
The Electro-Voice MTH-2/94 Manifold Technology® midbass/high-frequency loudspeaker system is designed for the touring-sound and permanent-installation markets. The MTH-2/94 is a two-way, active horn-loaded system with two drivers manifolded together in each frequency band. There are four drivers contained within the MTH-2/94's compact dimensions.

The midbass frequencies (160-1,600 Hz) are reproduced by two DL10X 10-inch drivers. The drivers are loaded by Electro-Voice's proprietary aperiodic phase plug (U.S. Patent No. 4,718,517) for extended upper end response. The phase plug automatically compensates for loudspeaker "beaming" — the tendency for higher frequencies to radiate from the center of the cone at a constantly narrowing coverage angle. The outputs of the two drivers are summed using Electro-Voice's patented Manifold Technology® (U.S. Patent No. 4,733,749) and fed directly into a new 90° x 40° fiberglass horn. The horn provides a wide and uniform coverage pattern with exceptional control and natural sound. A special feature of the horn is that it is structurally independent of the drivers. This makes it very easy to re-orient the horn to suit prevailing circumstances (see Horn Rotation section).

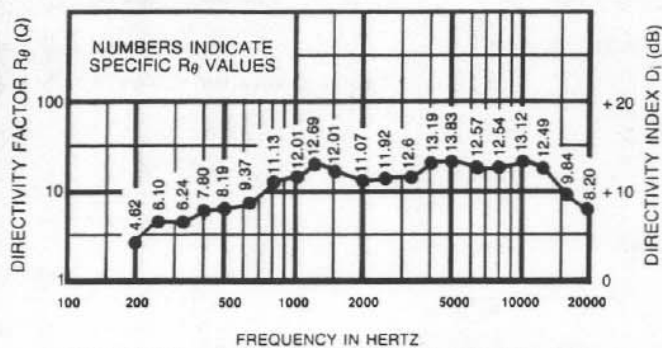
The higher frequencies (1,600-20,000 Hz) are reproduced by two modified DH1A compression drivers, manifolded on the MTA-22 (U.S. Patent No. 4,629,029) and mounted on a special modified HP94 90° x 40° constant-directivity horn. The HP series horn (U.S. Patent No. 4,685,532) features integral fiberglass-and-zinc construc-



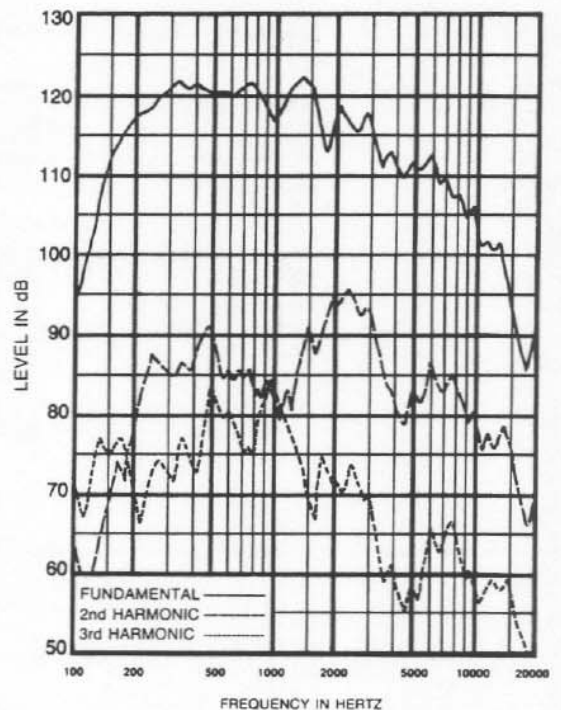
**FIGURE 2 — MTH-2/94 Polar Response**  
( $\frac{1}{3}$ -octave 4 volts at 20 feet nominal)



**FIGURE 3**  
**Beamwidth vs. Frequency**



**FIGURE 4 — MTH-2/94 Directivity Factor and Directivity Index vs. Frequency Response (composite of both orientations)**



**FIGURE 5 — Harmonic Distortion (120 dB SPL/1 meter using typical music frequency spectrum)**

tion, which helps eliminate unwanted vibrations and allows the construction of beamwidth control vanes — special waveguides in the horn throat — that correct for very-high frequency dispersion anomalies. The HP94 is also structurally independent of its drivers, allowing it to be easily removed and matched to the orientation of the midbass horn (see Horn Removal section).

The MTH-2/94 is designed to survive the rigors of the road. 14-ply birch plywood is used throughout the external cabinet. Electro-Voice's unique two-point flying system is installed as standard. The Aeroquip style tracks are recessed below the surface to prevent damage and mechanical interference (see Hanging section). The cabinet is covered in black Ozite Super TNT carpet, the most rugged available. A black, nylon cloth grille is supplied as standard.

When a more extended low-end response is needed, the MTH-2/94 can be used with the MTL-2 low-frequency loudspeaker system.

#### APPLICATIONS

The MTH-2/94 is designed with the professional end user in mind. Whether used in regional touring or fixed installations, the MTH-2/94 delivers versatile, high-level, low-distortion, wide-coverage performance. The relative lightweight and small volume of the MTH-2/94 belies the performance obtainable with Manifold Technology®. The compact dimensions also allow the construction of very tight arrays.

It is possible and often beneficial to use the MTH-2/94 as a stand alone device, for example in pure speech reproduction. But the MTL-2 low-frequency loudspeaker system has been designed to compliment the MTH-2/94 and produce a fully-integrated full-range sound system. Both cabinets are dimensionally identical and have matching hardware.

The dimensions of the MTH-2/94 were selected to allow efficient truck packing. All fittings and fixtures are recessed to allow easy packing and unobtrusive installations.

The 90° x 40° coverage pattern is independent of cabinet orientation. The midbass and high-frequency horns are mounted from the front and are independent of their respective drivers (see Horn Removal section). This means it is possible to use the MTH-2/94 either horizontally or vertically without losing the desired coverage pattern.

It is strongly recommended that when the MTH-2/94 is operated in isolation or with the MTL-2 that an XEQ-3 electronic crossover be used. The dedicated EQMT2/94 EQ modules should be used and the set up, described in the Electronic Crossover section, followed.

#### FREQUENCY RESPONSE

The MTH-2/94 frequency response was measured on axis in the far field in an anechoic environment using a swept one-third octave input (see Figure 1). The response has been normalized to one-watt.

one-meter into the midbass horn by implementing the inverse-square law. The system was set up following the recommendations in the Signal Processing section.

#### DIRECTIVITY

Directional information is provided for both horn orientations. Figure 2 illustrates the directional characteristics of the MTH-2/94. The measurements were taken in EV's large anechoic chamber at a distance of 20 feet using pink noise at selected one-third-octave bands. Crossover equalization and time delay were set, as recommended, in the Signal Processing section. Beamwidths are illustrated in Figure 3 and directivity factors  $R_{\theta}$  (Q) and directivity indexes  $D_i$  in Figure 4. These figures show how smooth and controlled the MTH-2/94 is over its entire operating range. AcoustaCADD™ data is available for the MTH-2/94.

#### DISTORTION

Distortion is greatly reduced using Manifold Technology®. Figure 5 illustrates this reduction in second and third harmonics. A frequency spectrum, typical of close-miked, rock music was used to measure distortion in the far field. The system was set up using the recommended crossover, EQ and time delay. The input level was selected to produce an equivalent sound pressure level in the midbass band of 120 dB at one meter.



## POWER HANDLING CAPACITY

To our knowledge, Electro-Voice was the first U.S. manufacturer to develop and publish a power test closely related to real-life conditions. First, we use a random noise input signal because it contains many frequencies simultaneously, just like real voice or instrument program. Second, our signal contains more energy at extremely high and low frequencies than typical actual program, adding an extra measure of reliability. Third, the test signal includes not only the overall "long-term average" or "continuous" level — which our ears interpret as loudness — but also short-duration peaks which are many times higher than the average, just like actual program. The long-term average level stresses the speaker thermally (heat). The instantaneous peaks test mechanical reliability (cone and diaphragm excursion). Note that the sine-wave test signals sometimes used have a much less demanding peak value relative to their average level. In actual use, long-term average levels exist from several seconds on up, but we apply the long-term average for several hours, adding another extra measure of reliability.

Specifically, the MTH-2/94 is designed to withstand the power test described in EIA Standard RS-426A. The EIA test spectrum is applied for eight hours. To obtain the spectrum, the output of a white noise generator (white noise is a particular type of random noise with equal energy per bandwidth in Hz) is fed to a shaping filter with 6-dB-per-octave slopes below 40 Hz and above 318 Hz. When measured with the usual constant-percentage analyzer (one-third-octave), this shaping filter produces a spectrum whose 3-dB-down points are at 100 Hz and 1,200 Hz with a 3-dB-per-octave slope above 1,200 Hz. This shaped signal is then divided into the two frequency bands of operation using the recommended crossover equalization and time delay. The midbass frequency amplifier was adjusted to deliver 600 watts into the 3.45-ohm EIA-equivalent impedance (45.5 volts true rms). Amplifier clipping sets instantaneous peaks at 6 dB above the continuous power or 2,400 watts peak (91.0 volts peak). The high frequency was adjusted to deliver 150 watts into 2.80 ohms EIA-equivalent impedance (20.5 volts true rms). Amplifier clipping sets instantaneous peaks at 6 dB above the continuous power or 600 watts peak (41.0 volts peak). This procedure provides a rigorous test of both thermal and mechanical failure modes.

## ELECTRONIC CROSSOVER

High efficiency constant-directivity horn/driver combinations exhibit a high-frequency power response rolloff. It is therefore necessary to provide some broad-band equalization for the MTH-2/94. Any one-third-octave equalization can then be used to correct the more subtle room- and array-related response anomalies.

The MTH-2/94 has been designed to be used with the MTL-2 and the XEQ-3 electronic crossover. A dedicated set of modules have been designed for the XEQ-3 to give maximum performance. The modules are called EQMT2/94. Full details of settings for the XEQ-3 are supplied with the modules.

## CONNECTIONS

The MTH-2/94 is equipped with two Neutrik Speakon™ NL4MP connectors. The connectors marked "INPUT" and "OUTPUT" are installed in parallel allowing additional MTH-2/94's to be attached. One mating Neutrik Speakon™ cable-end connector NL4FC is supplied with each system. These connectors are locking, self-polarizing and capable of conducting 30 amps rms.

If you experience any difficulty in obtaining cables, connectors or wiring accessories, the following companies can be contacted.

Neutrik USA, Inc.  
195-S3 Lehigh Ave.  
Lakewood, NJ 08701

Pro Co Sound, Inc.  
135 E. Kalamazoo Ave.  
Kalamazoo, MI 49007

Whirlwind Music Distributors, Inc.  
P.O. Box 1075  
Rochester, NY 14603

The midbass drivers are connected in parallel across the Neutrik socket and present a nominal 4-ohm load. The high-frequency drivers are also in parallel, and have a low-frequency protection capacitor and present a nominal 4-ohm load.

The pin arrangements are:

Pin 1 - = MB (-)  
Pin 1 + = MB (+)  
Pin 2 - = HF (-)  
Pin 2 + = HF (+)

## HANGING

The MTH-2/94 has been conceived to "fly" from the outset. It incorporates EV's exclusive two-point hanging hardware, permitting a wide range of aiming angles and maximum flexibility. The cabinet is reinforced and structurally sound allowing the MTL-2 and the MTH-2/94 to be combined to form tight arrays. The tracks are recessed to avoid box-to-box interference when flying and during transportation. The track mates with Aeroquip 32102 fittings.

A detailed flying manual is supplied with each system. Particular attention should be given to the safety aspects discussed. Electro-Voice accepts no responsibility if the cabinet is not used according to the recommendations given in the manual.

If the cabinet is to be permanently installed overhead, then Electro-Voice strongly recommends the removable grille to be removed or screwed firmly to the cabinet.

## HORN ROTATION

Place MTH-2/94 cabinet on flat surface with horns facing up. Remove grille by pulling black ribbons. Remove all screws from around both the horn's mouths. Lift the midbass horn and rotate through 90°. Lower horn back into cabinet. Make sure the rear flange of the horn is seated correctly. Repeat procedure with the high-frequency horn. Special care must be taken to locate and seal the rear flange into Electro-Voice's new proprietary sealing gasket.

Replace all screws, tighten down firmly but do not over tighten. It is also possible to re-orient the EV logo on the grille by removing the central screw, rotating the logo and replacing the screw. Replace the grille.

## DRIVER ACCESS

It is possible to access the high-frequency compression drivers by removing the cabinet handles. To access the midbass drivers it is necessary to remove the midbass horn and remove the manifold assembly. Full details of these procedures can be found in the Service Data sheet.

## WARRANTY (Limited)

Electro-Voice MT-2 Speakers and Speaker Systems (excluding active electronics) are guaranteed for five years from date of original purchase against malfunction due to defects in workmanship and materials. Electro-Voice MT-2 flying hardware (GS-1 and LS-1 rigging straps and enclosure-mounted flying hardware) is guaranteed for one year from date of original purchase against malfunction due to defects in workmanship and materials. Electro-Voice MT-2 speaker accessories (including RD-1 dolly) are guaranteed for one year from date of original purchase against malfunction due to defects in workmanship and materials. If such malfunction occurs, unit will be repaired or replaced (at our option) without charge for materials or labor if delivered prepaid to the proper Electro-Voice service facility. Unit will be returned prepaid. Warranty does not extend to finish, appearance items, burned coils, or malfunction due to abuse or operation under other than specified conditions, nor does it extend to incidental or consequential damages. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above exclusion may not apply to you. Repair by other than Electro-Voice or its authorized service agencies will void this guarantee. A list of authorized service centers is available from Electro-Voice, Inc., 600 Cecil Street, Buchanan, MI 49107 (AC/616-695-6831); and Electro-Voice West, 8234 Doe Avenue, Visalia, CA 93291 (AC/209-651-7777). Or Mark IV Audio Canada, Inc., 345 Herbert St., Gananoque, Ontario, Canada K7G 2V1 (AC/613-382-2141); Electro-Voice, S.A., Keltenstrasse 5, CH-2563 IPSACH, Switzerland (41)32-51-58-33; Electro-Voice, Ltd., 2-5-80 Izumi, Suginami-ku, Tokyo, Japan 168, (81)3-325-7900; Mark IV Vertriebs GmbH, Larchenstrasse 99, 6230 Frankfurt/Main 80, Germany (49)69-380-100; Electro-Voice Pty., 59 Waratah St., Kirrawee N.S.W. 2232, Australia (61)2-521-5322. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state or province to province.

Service and repair address for this product: Electro-Voice, Inc., 600 Cecil Street, Buchanan, Michigan 49107.

Specifications subject to change without notice.

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