The Audio-Technica AT4071a is a transformerless, externally polarized line + gradient capacitor microphone. It has been specially created to meet the critical long-distance pickup demands of broadcasting, film/TV sound, professional recording and theatre sound reinforcement.

The AT4071a features a broad-band, linear on-axis frequency response, with maximum rejection of sounds from both the sides and the back of the microphone. Rear polar lobing, common in shotgun microphones, has been greatly reduced and the off-axis response remains highly uniform. The resultant lack of sound coloration on- and off-axis makes the AT4071a particularly useful for mixing dynamic action in film/TV audio as well as in "spot" mixing techniques in the music studio or theater.

The effective working distance of a directional microphone is determined in great part by its polar pattern and the uniformity of its off-axis response. These factors help determine the signal-to-ambient-noise ratio. Of course, the electronic signal-to-noise ratio also affects the usable mixing distance. This distance may be less than desired if the overall system signal-to-noise ratio is poor due to low microphone sensitivity or noisy electronics. The AT4071a provides extremely high output and a noise floor that is hardly measurable, much less audible. It may be used with confidence in distant mixing applications and even under the stringent demands of modern digital recording systems.

The AT4071a balanced output is direct-coupled. This results in a clean output signal, especially under high-output conditions. The microphone is totally free of the distortion associated with conventional transformer-coupled outputs.

The AT4071a sets new standards in small size and light weight. Overall length is 15.55" and it weighs just 5.5 oz. The AT4071a adds practically no noticeable weight to the end of a fish pole or the top of a minicam. Through the use of an advanced, proprietary Audio-Technica design, the interference tube of the AT4071a provides a narrow acceptance angle that would require a tube 50 percent longer using conventional technology.

Another unique Audio-Technica engineering innovation in the AT4071a provides additional benefits. An ordinary line microphone has its capsule positioned immediately at the rear of the interference tube. Audio-Technica engineers, however, have located the capsule entirely within the tube. Both the diaphragm and the side ports are exposed to the same acoustic environment.

One significant result of this unique capsule positioning is that the AT4071a is less sensitive to noise caused by wind turbulence or the "encounter" noise of panning action. The second benefit is a marked reduction in proximity effect. Recordings made at varying distances remain more consistent in response, making both production and editing quicker, easier, and less costly.

The AT4071a is also exceptionally resistant to mechanical or handling noise, thanks to careful control of structural resonances and the low mass of the capacitor diaphragm.

An integral second-order 150 Hz hi-pass filter may be selected to "roll-off" the low-frequency response, thereby attenuating unwanted low-frequency ambient noise such as from traffic or air-handling systems. The switch is located on the underside of the microphone case for out-of-sight and accidental activation.

The AT4071a is built from the inside out to withstand the rigorous conditions of field use. Construction-grade aluminum alloy is used in the forming of the dual-concentric cylindrical interference tube. Major component parts are machined with exacting precision and assembled in a nested technique that eliminates damage from inertial shift.

The AT4071a will operate in conjunction with any remote "phantom" or "simplex" power source supplying from 11 to 52 volts DC. This voltage not only powers the microphone's impedance converter, but is stepped-up to a higher voltage internally to polarize the capacitor element.

Architects and Engineers Specifications

The microphone shall have a frequency response of 30 to 20,000 Hz. Its capacitor element shall be of a DC bias design and shall obtain its polarizing voltage and impedance converter power from an external 11 to 52V DC "phantom" power source. The interference tube output circuit voltage shall be 89.1 mV at 1 kHz/1 Pascal. It shall have an output impedance of 100 ohms and its output shall be transformerless balanced.

The microphone shall operate on the wave interference principle with a lobar polar response above 500 Hz and shall employ a highly directional capacitor element to maintain its directivity below 500 Hz. The capacitor generating element shall be totally incorporated within the wave interference tube. The interference tube shall incorporate a series of passive acoustic radiator membranes arranged in a linear acoustic taper as part of its acoustic circuit. The phase shift occurring in this acoustic circuit shall act to enhance the lobar directional characteristic of the microphone at frequencies below the cutoff normally dictated by the tube length. The end of the tube opposite the capsule shall incorporate an acoustically-damped end cap that acts as a stabilizer of on-axis frequencies above 3 kHz.

The microphone housing shall be of lightweight, turned structural-grade aluminum alloy and have a diameter of 0.83" (21.0 mm), a length of 15.55" (395.0 mm), and a weight of 5.5 oz (155 g).

The Audio-Technica AT4071a is specified.

Unique Interference Tube Design

The ability to control low-frequency directivity in conventional "shotgun" microphones is limited by the length of their interference tube — the longer the tube, the more directional the microphone and the lower the frequencies over which the tube still exercises control. Below the effective cut-off frequency of the interference tube, line microphones depend on the directional capabilities of the microphone capsule mounted at the rear of the tube.

Audio-Technica has pioneered a unique approach to interference tube design in the AT4071a, breaking design restrictions which have long plagued engineers and restricted the performance of conventional shotgun microphones.

The sideporting system of the new Audio-Technica interference tube incorporates two acoustically-damped slots combined with an extremely narrow longitudinal side port. The latter acoustic aperture is terminated in a series of miniature membranes, arranged in an acoustic taper. Pressure changes in the narrow side port cause these membranes to vibrate at a specific band of frequencies into the tube. The taper is calculated to allow the lowest frequencies of the band passed to enter the tube at the narrowest point from the capacitor element and the higher frequencies of the band passed to enter close to the element.

Low-frequency sound waves arriving off-axis see this path into the interference tube as a series inductance and resistance. This LR combination causes an increase in phase shift of the frequency below the normal cut-off. The result is directivity equal to conventional line microphones with interference tubes 1.5 times the length of that on the AT4071a.
**Specifications**

- **ELEMENT**: Externally polarized (DC bias) capacitor
- **POLAR PATTERN**: Lobar
- **FREQUENCY RESPONSE**: 30-20,000 Hz
- **OPEN CIRCUIT SENSITIVITY (1 kHz)**: -21 dB (89.1 mV) ± 1 dB, re 1V at 1 Pa
- **IMPEDANCE**: 100 ohms balanced, transformerless
- **MAXIMUM INPUT SOUND LEVEL**: 124 dB SPL, 1 kHz at 1% T.H.D.
- **NOISE, TYPICAL (A-WEIGHTED)**: 12 dB SPL
- **DYNAMIC RANGE, TYPICAL**: 112 dB, 1 kHz at Max SPL
- **SIGNAL-TO-NOISE RATIO, TYPICAL**: 82 dB, 1 kHz at 1 Pa
- **HI-PASS FILTER (LOW-END ROLL-OFF)**: 150 Hz, 12 dB/octave
- **POWER REQUIREMENTS**: 11-52V DC phantom
- **CURRENT CONSUMPTION, TYPICAL**: 3.2 mA
- **WEIGHT (LESS CABLE AND CLAMP)**: 5.5 oz (155 g)
- **DIMENSIONS**: 15.55" (395.0 mm) long, 0.83" (21.0 mm) body diameter

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<tr>
<th><strong>ACCESSORIES FURNISHED</strong></th>
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<tr>
<td>Model AT8405 snap-in clamp for standard 5/16&quot;-27 threaded stands; protective carrying case; reticulated, open-cell foam windscreen.</td>
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1 In the interest of standards development, A.T.U.S. offers full details on its test methods to all the industry professionals on request.
2 1 Pascal = 10 dynes/cm² = 10 microns = 94 dB SPL
3 Measured at diaphragm
4 Using Audio Precision System One

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**Optional Accessories:**

- Model AT8202 adjustable in-line attenuator for use with low-impedance microphones.
- Model AT8314 2-conductor, shielded, vinyl-jacketed, broadcast-type cable with XLR-f type connector at microphone end, XLRM-type connector at equipment end. Available in 10', 20', 25', 30', 50' and 100' lengths.
- Model AT8407 universal "clothespin" stand clamp fits both tapered and cylindrical microphones.
- Model AT8415 shock mount for boom or stand operation.
- Model CP8506 4-channel 48V phantom power supply (AC powered).
- Model CP8508 single-channel 24V phantom power supply. (AC powered)

U.S. Patent No. 4,789,044

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**One-Year Limited Warranty**

Audio-Technica microphones and accessories purchased in the U.S.A. are warranted for one year from date of purchase by Audio-Technica U.S., Inc. (A.T.U.S.) to be free of defects in materials and workmanship. In event of such defect, product will be repaired promptly without charge or, at A.T.U.S.'s option, replaced, or new product of equal or superior value if returned to A.T.U.S. or an Authorized Service Center, prepaid. Product not returned with sales slip or other proof of purchase date. Prior approval from A.T.U.S. is required for return. This warranty excludes defects due to normal wear, abuse, shipping damage, or failure to one product in accordance with instructions. This warranty is voided if the product is altered, modified, repaired or unauthorized repair or modification.

For return approval and shipping information, contact the Service Department, Audio-Technica U.S., Inc., 1321 Commerce Drive, Stow, Ohio 44224.

Except to the extent prohibited by applicable state law, A.T.U.S. will have no liability for any consequential, incidental, or special damages; any warranty of merchantability or fitness for particular purpose expires when the warranty expires.

This warranty gives you specific legal rights, and you may have other rights which vary from state to state.

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Outside the U.S.A., please contact your local dealer for warranty information.