

AT895

Adaptive-array Microphone Systems



DELTA BEAM™

New Technology Enhances Audio Acquisition

Unique, groundbreaking optimization of acoustic, analog and digital design produces unmatched directional performance, operating versatility and ease of use.

AT895/MK
Mount Kit

AT895/RK
Remote Kit

Installation and Operation



AT895 Adaptive-array Microphone Systems

Installation and Operation

Warning: Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio TV technician for help.

Introduction

Thank you for choosing an AT895 Adaptive-array Microphone System. AT895 Systems incorporate a revolutionary DSP-controlled five-element microphone array that provides adaptive directional audio acquisition.

Utilizing Audio-Technica's proprietary DeltaBeam™ technology, the AT895 System manipulates and filters the output of the array by acoustical, analog and digital means. This process enhances the pickup of a sound source from a desired direction relative to unwanted background noise or interference, providing cancellation of up to 80 dB. Other benefits include minimized audibility of proximity effect, minimized nearfield effect on the low-frequency directionality of the array, and markedly reduced susceptibility to mechanical noise, wind noise and racking as compared to currently-available professional microphones.

The AT895 functions equally well for handheld interview use or long-range sound pickup – in the field, in the studio, or in security operations.

AT895 vs. Typical Shotgun Performance†

Compare acceptance angles (at 3 dB down):

Microphone	200 Hz	400 Hz	1 kHz	2 kHz	4 kHz	8 kHz
Shotgun	60°	60°	60°	50°	30°	20°
AT895	20°	20°	20°	20°	60°	50°

Compare polar patterns at 200 Hz:

Microphone	200 Hz Rejection at 90°/270°
Shotgun	15 dB
AT895	70 dB

Compare maximum off-axis rejection:

Microphone	Maximum Off-axis Rejection
Shotgun	30 dB
AT895	80 dB

† Compared to typical performance of a professional-quality 15.5" line + gradient microphone (measurement conditions: 1Pa at 0.5 m). Due to the adaptive nature of its digital processing, AT895 performance in actual field conditions will vary with the environment encountered.

Incorporated in the AT895 design are: DSDA-PRO™ software (U.S. Patent No. 5,825,898) by Lamar Signal Processing, Ltd., a wholly-owned subsidiary of Andrea Electronics Corporation; DeltaBeam™ (U.S. Patent pending) and MicroLine® technologies by Audio-Technica. "DSDA-PRO" is a trademark of Lamar Signal Processing, Ltd.; "DeltaBeam" is a trademark of and "MicroLine" is a registered trademark of Audio-Technica.

The Basic System

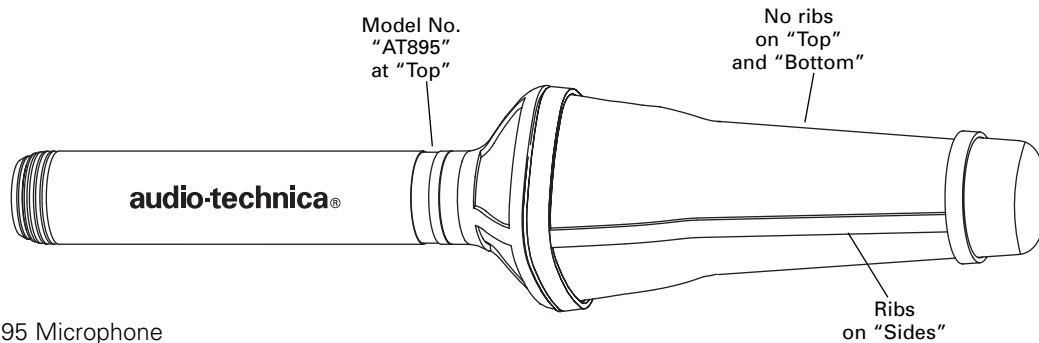


Fig. A AT895 Microphone

AT895 Microphone

The AT895 Microphone itself is "all analog," housing one Audio-Technica MicroLine® element, four A-T cardioid elements mounted in a co-planar diamond configuration, and five mic preamps. The five amplified analog signals from the microphone elements are sent individually down a special detachable cable to the AT895CP Control Pack.

AT895CP Control Pack

The AT895CP Control Pack provides all the power, Digital Signal Processing, and control for the AT895. Output from the Control Pack is analog at mic-level (-23 dBV).

The lightweight, sturdy metal housing accepts a quick-change, click-on Battery Housing for totally self-contained operation, if desired. The Control Pack also operates on external 12-14V DC — from an Anton/Bauer or similar-type battery source, or from an AC adapter — via an industry-standard 4-pin XLR-type connection.

Control features on the AT895CP are:

- Three-position Mode (pickup pattern) switch which provides Full-field Adaptive (●) Planar-adaptive (◐) and Line + Gradient (●) settings. (See page 5 for a full explanation of the Mode settings).
- Audio filter switch with Flat, High-pass and Band-pass settings.
- Monitor headphone jack with volume control.
- LCD battery condition indicator.
- Power switch with LED indicator.

Two System Configurations

The AT895 is available as the AT895/RK "Remote Kit" for field use, and as the AT895/MK "Mount Kit" for studio and fixed-install applications.

AT895/RK Remote Kit includes:

- **AT895MIC** Adaptive-array Microphone
- **AT895CP** Control Pack with attached belt clip
- **AT895BH** Click-on Battery Housing
- **AT895PG** Pistol-grip shock mount
- **AT895Z** Zeppelin-type windscreen
- **AT895C-10** Special 6-conductor shielded Cable, 10' long
- **AT895CC** Carrying Case

AT895/MK Mount Kit includes:

- **AT895MIC** Adaptive-array Microphone
- **AT895CP** Control Pack
- **AT895SC** Shock-mount Stand Clamp with 5/8"-27 threaded stud
- **AT895PS1** Multi-input AC Power Supply with "120V" IEC detachable power cord
- **AT895C-25** Special 6-conductor shielded Cable, 25' long

All components and accessories are interchangeable and available separately to augment systems or to use as "field spares." In addition, two accessory kits are available:

- **AT895CK** Conversion Kit adds the components needed for an AT895/MK system to function as an AT895/RK system.
- **AT895FBK** Fisher Boom Kit permits use of the AT895 on a Fisher boom.

(See page 7 for a complete listing of available system components and accessories.)

The AT895 Microphone and Control Pack are designed to operate as a system only. Do not attempt to use these components with other devices.

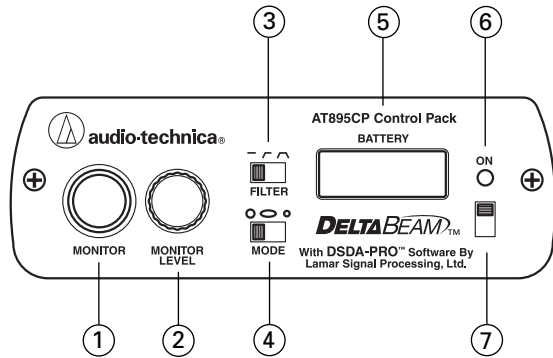


Fig. B Control Pack Front Panel

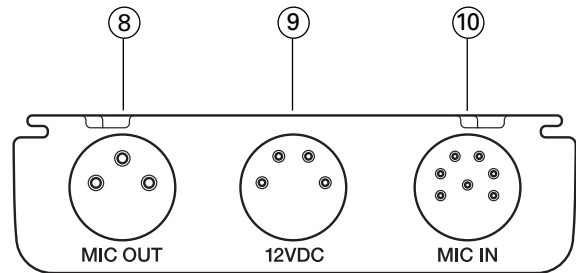


Fig. C Control Pack Rear Panel

Front Panel Controls and Functions (Fig. B)

1. MONITOR: 1/4" (6.3 mm) Monitor headphone jack; TRS type with signal on both Tip and Ring.
2. MONITOR LEVEL: Monitor headphone level control.
3. FILTER SWITCH: 3-position switch offers Flat (—) , High-pass (∩) and Band-pass (∩) settings.
4. MODE (PICKUP PATTERN) SWITCH: 3-position switch offers Full-field Adaptive (●) , Planar-adaptive (◐) and Line + Gradient (●) settings. (See page 5 for a full explanation of the Mode settings.)
5. LCD BATTERY CONDITION INDICATOR: Markers disappear as power remaining decreases. Functions only during 9V battery operation using the AT895BH.
6. POWER LED INDICATOR: Lights red when power is on.
7. POWER SWITCH: On/off switch controls DC power from all sources.

Rear Panel Functions (Fig. C)

8. BALANCED AUDIO OUTPUT JACK: 3-pin XLRM-type connector. Output is analog; the balanced signal appears across Pins 2 and 3. Output phase is "Pin 2 hot;" positive acoustic pressure produces positive voltage at Pin 2. Pin 1 is ground (shield). A standard 2-conductor shielded cable (not included) can be used to connect the AT895CP output to the associated electronics. Phantom power cannot be used, but if present will have no effect on the Control Pack.
9. DC POWER INPUT: 4-pin XLRM-type connector for an external 12-14V DC source from an Anton/Bauer or similar battery supply, or from an AC adapter. Wiring is industry-standard: V- on Pin 1, V+ on Pin 4, no connection to Pins 2 or 3.
10. MIC INPUT JACK: 7-pin XLRM-type connector accepts the special AT895C 6-conductor shielded cable used to connect the AT895 Microphone to the Control Pack.

Mode (Pickup Pattern) Settings

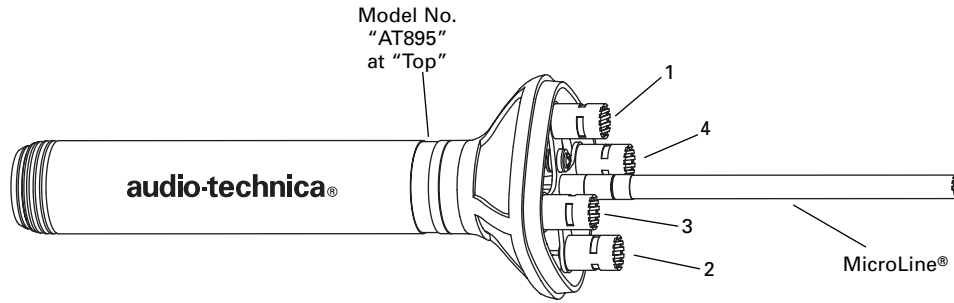


Fig. D AT895 Microphone Elements

The microphone array in the AT895 consists of one Audio-Technica MicroLine® element and four A-T cardioid elements mounted in a co-planar diamond configuration. A switch on the AT895CP Control Pack selects from three Mode (pickup pattern) options: two "adaptive" modes and one "non-adaptive" mode.

In the adaptive modes, signals from the MicroLine® element and either one pair (labeled 1 & 2 in Fig. D) or both pairs (1 & 2, 3 & 4) of the "corrective" cardioid elements are utilized. These signals are processed in the Control Pack by both analog and digital means to provide continuously-adapting rejection of off-axis sounds. This means that as the off-axis soundscape changes (either in intensity or directionality) the microphone system compensates for those changes. Even off-axis wind is interpreted as unwanted noise, and is suppressed.

Full-field adaptive Mode (o)

The Full-field adaptive mode provides the maximum directionality and off-axis rejection. Signals from the MicroLine® element and both pairs of cardioid elements are utilized.

Planar-adaptive Mode (◐)

In the Planar-adaptive mode, signals from the MicroLine® element and only the "vertical" pair of cardioid elements (1 & 2) are utilized. The resultant "elliptical" pickup pattern provides optimum rejection in one plane (tighter vertically, wider horizontally).

Understanding the correct orientation of the microphone is crucial for effective application of the Planar-adaptive mode. When the microphone is positioned with the Audio-Technica logos along the *sides* of the mic handle and the "AT895" on the name ring is "up" (as shown above and in Fig. A on page 3), maximum off-axis rejection occurs in the vertical plane of the pickup pattern only, while the horizontal pickup is non-adaptive. This produces a "horizontal ellipse" pickup pattern. (Of course, if the microphone is rotated 90 degrees, so the logos are at the "top" and "bottom" of the handle and the AT895 name ring marking is "sideways," the resulting pattern would be "tall" and adaptively "narrow.")

Line + Gradient Mode (O)

The Line + Gradient mode is non-adaptive, with only the signal from the MicroLine® element being utilized. (The cardioid elements and the adaptive circuitry are still functioning, but the "correcting" signals are not applied to the MicroLine® element's signal.)

Power Sources

The AT895CP Control Pack may be powered three different ways:

- From an AC adapter, using an industry-standard 4-pin XLR connection. (An AC power supply with 9V DC output is included in the AT895/MK System).
- From an Anton/Bauer or similar-type external 12-14V battery source.
- From three 9V batteries in a click-on AT895BH Battery Housing (included in the AT895/RK System) for completely self-contained operation.

AT895BH Battery Housing

Battery Selection and Installation

Always use fresh alkaline or lithium 9V batteries. For greatest reliability and longest operation, replace all three batteries at the same time, using identical types.

To open the battery tray, press down firmly on the tray release button until it clicks; then *lift the tray slightly* and slide it out. Insert three batteries, observing polarity as marked inside the battery compartment. Slide the battery tray closed, making certain it clicks shut. Due to current requirements of the system, always use three batteries.

Attaching the Battery Housing to the Control Pack

Slide the Battery Housing onto the Control Pack. When it is fully seated, the two release buttons at the bottom of the Battery Housing will click into place.

To remove the Battery Housing, simultaneously push both release buttons while sliding it down and off the Control Pack.

The Battery Housing may be in place when external power is used. The batteries will still be consumed, but at a slower rate, depending upon the external voltage. The batteries will also provide "back-up power" in case of external supply interruption.

AT895Z Zeppelin-Type Windscreen

The two sections of the AT895Z Zeppelin-type windscreen bayonet-latch together. To open the windscreen, rotate the rear section to the left (counter-clockwise, viewed from the rear), then pull the sections apart. Place the "nose" of the microphone in the foam recess provided in the front section. Slide the rear section of the windscreen over the handle of the mic until it reaches the front section, *making certain the mic's "nose" remains in its foam recess*. Engage the bayonet lugs on the windscreen and rotate the rear section fully to the right (clockwise). Once installed, the windscreen may be rotated on the microphone if desired.

AT895PG Pistol-Grip Shock Mount

For correct balance of the microphone and proper orientation of the elements, the microphone should be mounted in the AT895PG with the Audio-Technica logos visible between the rubber rings along the left and right sides. In use, the rubber rings should be positioned *behind* the Pistol-grip, above the user's forearm. (If the Zeppelin is to be used, the mic must be installed in it before mounting the mic in the Pistol-grip.)

Specifications[†]

Elements (5)	Fixed-charge back plate permanently polarized condenser
Pickup Pattern Modes	Full-field adaptive, Planar-adaptive, Line + Gradient
Frequency Response	60-12,000 Hz
High-pass Filter (Low-end Roll-off)	80 Hz, 18 dB/octave
Band-pass Filter	300-5,500 Hz, 6 dB/octave
Open Circuit Sensitivity	-23 dBV (70 mV) at 1 Pa*, 1 kHz
Output Impedance	450 ohms
Maximum Input Sound Level	117 dB SPL, 1 kHz at 1% T.H.D.
Noise, Typical (A-weighted)	24 dB
Dynamic Range (Typical)	93 dB, 1 kHz at Max SPL
Signal-To-Noise Ratio ¹	70 dB, 1 kHz at 1 Pa*
Monitor Headphone Output T.H.D., (Typical)	120 mW max. at 1 kHz, 1% into 20 ohm (each channel) stereo headphones
Monitor Headphone Jack	1/4" TRS, signal on both Tip and Ring
External Power Requirement	9-15V DC, 250 mA typical
Battery Requirement (AT895BH)	Three 9V (NEDA type 1604), not included
Battery Life, Typical (AT895BH)	Alkaline: 4-6 hours Lithium: 10-12 hours
Weight	
AT895 Microphone (less cable)	16.7 oz (473 g)
AT895CP Control Pack	10.0 oz (284 g)
AT895BH Battery Holder (with typical batteries)	7.6 oz (215 g)
AT895PG Pistol Grip	10.0 oz (284 g)
AT895Z Zeppelin Windscreen	5.0 oz (142 g)
Dimensions	
AT895 Microphone	14.00" (355.6 mm) long, 2.75" (69.9 mm) max. diameter, 1.18" (30.0 mm) handle diameter
AT895CP Control Pack	4.16" (105.7 mm) long, 3.34" (84.8 mm) wide, 0.98" (24.9 mm) high
AT895BH Battery Holder	4.13" (104.9 mm) long, 3.28" (83.3 mm) wide, 1.27" (32.3 mm) high
Output Connector (Control Pack)	Integral 3-pin XLRM-type
Cable	
AT895/RK	6-conductor shielded cable with XLR7F-type connectors 10' (3.0 m) long
AT895/MK	25' (7.6 m) long

[†] In the interest of standards development, A.T.U.S. offers full details on its test methods to other industry professionals on request.

* 1 Pascal = 10 dynes/cm² = 10 microbars = 94 dB SPL

¹ Typical, A-weighted, using Audio Precision System One.

System Components and Accessories

All AT895 components and accessories are interchangeable and available separately to augment systems or to be used as "field spares."

Basic System Components

- AT895MIC** Adaptive-array Microphone
AT895CP Control Pack with attached belt clip.

AT895 Microphone Accessories

- AT895PG** Pistol-grip shock mount. (3/8"-16 threaded metal insert in bottom of grip.)
AT895SC Shock-mount Stand Clamp with 5/8"-27 threaded stud for mounting the AT895 on a microphone stand.
AT895Z Zeppelin-type windscreens reduces on-axis wind noise while protecting the microphone.

AT895CP Control Pack Accessories

- AT895BH** Click-on Battery Housing holds three 9V batteries for self-contained AT895 operation.
AT895PS1 Switching Power Supply (90-263V AC input, 47-63 Hz), UL/CSA/TUV-approved, with detachable "120V" 3-pin IEC power cord. Output 9V DC regulated, 1.5A max. Attached output cable is 6'/1.8 m long, terminating in an XLR4F-type connector.
AT895RP Rack-mount plate for mounting one or two AT895CP Control Packs in a 1U 19" rack space.

Cables

- AT895C-xx** Special 6-conductor shielded cable with XLR7F-XLR7F connectors for use between the AT895 Microphone and AT895CP Control Pack. Available in 1.5'/0.4 m (C-1.5), 10'/3 m (C-10), 25'/7.6 m (C-25), 50'/15.2 m (C-50) and 100'/30.4 m (C-100) lengths. Custom lengths are available on special order from the A-T Service Department.

Conversion Kit

- AT895CK** Conversion Kit adds the components needed for an AT895/MK system to function as an AT895/RK system. Includes AT895BH Battery Housing, AT895PG Pistol-grip shock mount, AT895Z Zeppelin-type windscreens, AT895CC Carrying Case, AT895C-10 special 10'/3 m cable.

Fisher Boom Kit

- AT895FBK** Fisher Boom Kit adapts the AT895 for use with a Fisher boom. Includes mounting bracket adapter and special 30'/9.1 m cloth-covered cable.

Carrying Case

- AT895CC** All-weather, protective carrying case with pressure equalization vent, custom-fitted to hold all AT895/RK System components.

One-Year Limited Warranty

Audio-Technica brand products 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 our option, replaced with a new product of equal or superior value if delivered to A.T.U.S. or an Authorized Service Center, prepaid, together with the 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 use product in accordance with instructions. This warranty is void in the event of unauthorized repair or modification, or removal or defacing of the product labeling.

For return approval and shipping information, contact the Service Dept., Audio-Technica U.S., Inc., 1221 Commerce Drive, Stow, Ohio 44224.

Except to the extent precluded 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 this warranty expires.**

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

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



Audio-Technica U.S., Inc., 1221 Commerce Drive, Stow, Ohio 44224 330/686-2600 www.audio-technica.com
Audio-Technica Limited, Old Lane, Leeds LS11 8AG England 0113 277 1441

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