



Direction Microphones

- 6804 Body Worn Array Microphone
- 6803 Clarifying Array Microphone
- 6802 Directional Microphone Array System
- 6806 Steerable Array Microphone

BODY-WORN ARRAY MICROPHONE

TSE 6804

The TSE 6804 picks up subjects directly behind you, while rejecting noise from all other directions. Even minimizes your own voice. It is completely concealed under normal clothing and fits like a shoulder holster. It comes complete with a digital recorder

FEATURES

- Discrete, highly directional microphone system
- 24 Microphones
- Outputs for headphones, Transmitter and recorder
- Effective pick-up range 10-12 feet
- Ideal for pub or restaurant type environment

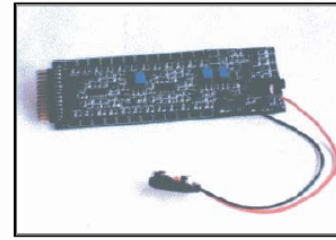
The unit works by creating a highly directional microphone pickup pattern from a collection of individual microphones. Each UNIT Processor Board takes up to 24 microphones to provide its directed mono audio output. A basic system is supplied with 12 microphones with the recommended minimum being 8 microphones. The primary pickup pattern is perpendicular to the line (or plane) of the microphone arrangement, with smaller patterns on either side (see illustration). Simply steer the pickup pattern in the direction of the subject and listen in real-time. Audio sources outside of the pattern are reduced; sources within the pattern are amplified. The UNIT is designed with audio quality as a primary criterion. Linear response, low-noise, dynamic range, frequency and spatial filtering, and careful component selection all went into the design of this state-of-the-art system.



CLARIFYING ARRAY MICROPHONE

TSE 6803

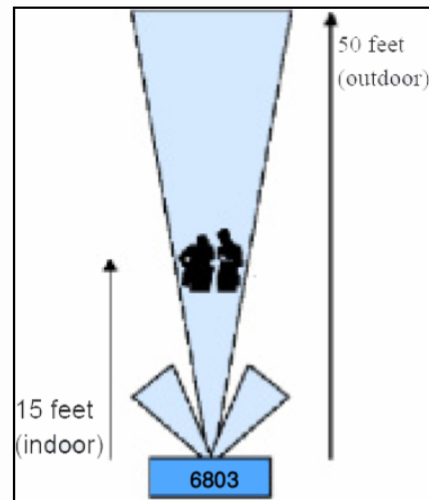
- Discrete, highly directional microphone system
- Ideal for remote indoor/outdoor audio collection
- Each board accepts 2 to 24 microphones
- Combines multiple boards for improved performance
- Works with headphones, recorders and transmitters
- Battery powered
- Simple to operate



The TSE 6803 Clarifying Array Microphone (CAM) is a unique and powerful audio collection device. No longer do you have to be in close proximity to subjects to discretely pick up conversations. Using the CAM, audio can be remotely captured even in noisy environments, such as restaurants and bars. Outdoors, audio can be captured from subjects more than 100 feet (33 meters) away, depending on the setup and surrounding noises. This makes the TSE 6803 ideal for situations where personnel safety is an issue. Being able to remotely monitor conversations frees an undercover officer from wearing equipment that could be detected.

The CAM works by creating a highly directional microphone pickup pattern from a collection of individual microphones. Each CAM Processor Board takes up to 24 microphones to provide its directed mono audio output. A basic system is supplied with 12 microphones with the recommended minimum being 8 microphones. The primary pickup pattern is perpendicular to the line (or plane) of the microphone arrangement, with smaller patterns on either side (see illustration). Simply steer the pickup pattern in the direction of the subject and listen in real-time. Audio sources outside of the pattern are reduced; sources within the pattern are amplified. The CAM is designed with audio quality as a primary criterion. Linear response, low-noise, dynamic range, frequency and spatial filtering, and careful component selection all went into the design of this state-of-the-art system.

The CAM Processor Board has a low-profile design to facilitate concealment. It can be powered by standard 9V, AA, or AAA disposable batteries for convenience; however, it can also operate with any 3 to 15 VDC power source. The flexible design of the board allows each to use up to 24 microphones to create the audio pickup pattern. The number and arrangement of the microphones determines the size, shape and gain of the pickup pattern, and thereby, the performance. This flexibility allows a single processor board to be used for widely varying operational scenarios simply by using a new microphone configuration. Multiple boards -- up to a maximum of 5 boards or 120 microphones -- can be combined to provide a narrower pickup pattern and/or greater distances for audio capture. Line, microphone and headphone audio outputs are available for recording, transmitting and real-time monitoring. Gamma offers an option for a small transmitter and in-ear receiver for discrete live monitoring and to assist in steering the pattern.



DIRECTIONAL MICROPHONE ARRAY SYSTEM

TSE 6802

Audio collection in large, open areas can often require pinpoint accuracy to isolate specific audio sources. Only TSE 6802 can deliver the technology to electronically steer multiple beams through a sound field collected by a fixed microphone array. Key features of the TSE 6802 system:



- Provides a high-gain electronic beam steering capability
- Steers three separate beams from one set of microphones
- Supports a wide variety of custom microphone arrays, handling up to 96 microphones on 16 channels of input
- Features a unique stereo beam mode for a natural listening experience
- Offers hardware and software based steering controls for maximum flexibility
- 3-D beam forming (azimuth, elevation, and distance) available under software control
- Can be used in real-time surveillance or post-processing of multi-track recordings

SPECIFICATIONS

ANALOG

Microphone Inputs	<ul style="list-style-type: none"> • Two 25-pin DSUB connector interfaces (Tascam format) • Supports 8 differential line level inputs per channel (16 channels total) • 25k ohm input impedance per channel
Bandwidth	<ul style="list-style-type: none"> • 7.5 kHz Analog Conversions • 24-bit stereo A/D and D/A Sigma-delta technology
Dynamic Range	<ul style="list-style-type: none"> • > 120 dB

DIGITAL PROCESSING

Microprocessor	<ul style="list-style-type: none"> • Four ADSP-21062 SHARC® processors for beam forming • One ADSP-21062 SHARC® processor for interface control and hosting
Beam-Forming	<ul style="list-style-type: none"> • Three beams (or one stereo beam and one mono beam) • Adjustable azimuth (0.1 degree increments) • Adjustable gain (1 dB increments) • Adjustable elevation (0.1 degree increments), software control only • Adjustable distance (0.5 meters to infinity), software control only • 30th order, digital low pass filters for fractional delays • Memory based sample delay lines (200 deep)
Memory	<ul style="list-style-type: none"> • Two 512K x 8 flash memory for program and coefficient storage
Computer Interface	<ul style="list-style-type: none"> • RS232 serial interface for system control

GENERAL

Enclosure	<ul style="list-style-type: none"> • 17 W x 3.5 H x 12 D inches black aluminum • Optional rack mount kit available
Power	<ul style="list-style-type: none"> • 90-264 VAC, 47-63 Hz at 2.5 A (max)

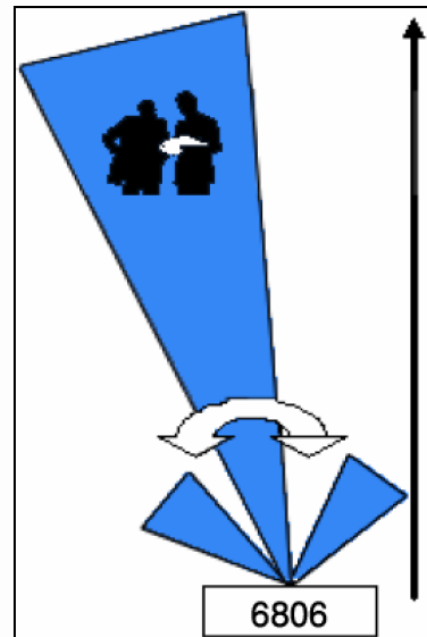
STEERABLE ARRAY MICROPHONE

TSE 6806

- Discrete, highly directional microphone system
- Pickup pattern can be electronically steered
- Ideal for tactical remote outdoor audio collection
- Expandable, modular design
- "Steer by ear" or sound field display (future upgrade option)
- Works with headphones, recorders and transmitters
- Battery powered
- Simple to operate

Gamma's new electronically steerable analog array microphone (SAM), is a powerful and flexible way to collect remote audio in tactical environments. It provides the discreteness and portability of the popular CAM and then adds the ability to steer the pickup pattern without physically moving the array. Audio can be captured from subjects in excess of 150 feet (46 meters) away, depending on the number of SAM boards and surrounding noises.

The SAM works by creating a highly directional audio pickup pattern from a collection of individual microphones.



The SAM is available in various sizes and configurations. Sizes start at 8 microphones and increase from there by 8 (i.e. 8, 16, 24 ...). The microphones are arranged in a line with the microphones equally spaced 2.5 inches (6.35 cm) apart. The pickup pattern's main lobe reaches out in an arc from the line of microphones, with smaller side lobe patterns on either side (see illustration). Audio sources outside of the pattern are reduced; sources within the pattern are amplified.

The SAM is comprised of microphones, processor boards (coming in matching pairs, each supporting four microphones), and a controller module. Additional optional upgrades are already being developed.

The SAM can be supplied in a small metal enclosure. Operation is intuitive - simply turn the knob to steer the beam and listen in real-time (see conceptual illustration below). Sensitivity, AGC, on/off, and headphone volume controls are available on the front panel.

The SAM operates from 9-18 VDC power, allowing it to work from a variety of sources, such as automobile lighter plugs and AC-to-DC converters. Line, microphone and headphone audio outputs are available for recording, transmitting and real-time monitoring.

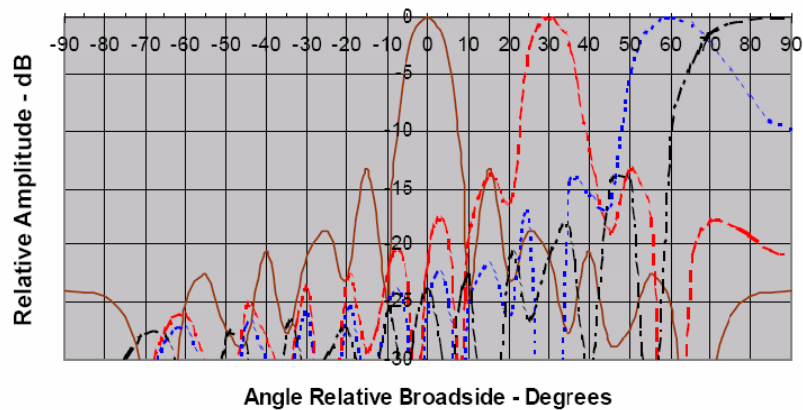
An optional sound field bar graph display will let you see from what angles the sounds are coming from - including the sounds from the subject - so you can 'see' where to steer the pattern even in the dark. An optional telephone interface module can allow the user to dial in (over a telephone circuit), remotely steer the beam (using DTMF keypad tones), and listen to the SAM audio output.

STEERABLE ARRAY MICROPHONE

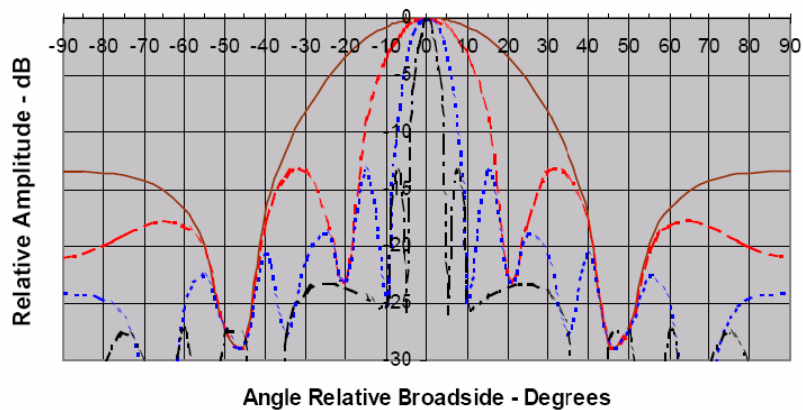
TSE 6806

The SAM is also available in a kit format (i.e. without a housing) to facilitate concealment and to allow the user to construct and control the microphone array to meet unique mission requirements. Shorter arrays are good for short range or general area coverage. Longer arrays are used for long range collections or in 'cluttered' situations where having a narrow pattern lets you pick out individual subjects or groups more easily.

Beam Patterns For a 24 Element Array With 2-Inch Uniform Spacing Steered to Angles of 0, 30, 60, and 90 Degrees at 1500 Hz



Broadside Beam Patterns For a 24 Element Array With 2-Inch Uniform Spacing at 375, 750, 1500, and 3000 Hz





If you would like further Information about ELAMAN,
or would like to discuss a specific requirement or project, please contact us at:

Elaman GmbH
German Security Solutions
Seitzstr. 23
80538 Munich
Germany

Tel: +49-89-24 20 91 80
Fax: +49-89-24 20 91 81
info@elaman.de
www.elaman.de