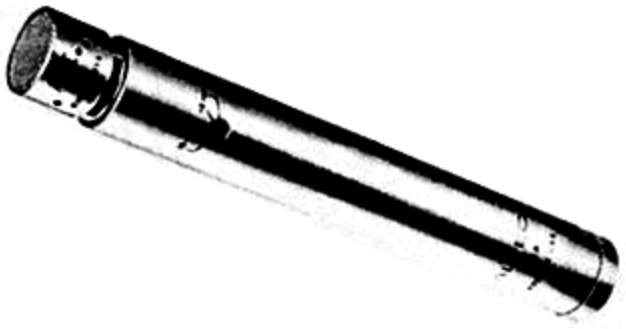
ALTEC

M53 AND M54 CONDENSER MICROPHONE SYSTEMS

OPERATING INSTRUCTIONS



GENERAL DESCRIPTION

The Altec M53 and M54 are solid-state condenser microphone systems designed to operate with any existing microphone preamplifier having 150 to 250 ohms input impedance and 12V to 50V dc at less than 5 mA. The M53 and M54 systems are identical except for their cartridges. The M53 system is supplied with the 42A cardioid cartridge; the M54 with the 43A omnidirectional cartridge. Obtaining an extra cartridge can provide dual pickup pattern convertibility, resulting in a highly versatile, quality microphone.

Both systems include a 201A Base, 177A Wind/Pop Screen, and 189A Slip-On Holder.

SPECIFICATIONS

Type:	Phantom-powered condenser microphone
Pickup Pattern —	
M53:	Cardioid
M54:	Omnidirectional
Frequency Response —	
M53:	20 Hz to 20,000 Hz
M54:	20 Hz to 15,000 Hz
Maximum Output:	– 3.0 dBm, 20 Hz to 20,000 Hz
Average Front-to-Back Discrimination (M53):	20 dB
Sensitivity:	– 40 dBm, adjustable in 8 dB steps to – 72 dBm
Output Impedance:	150 ohms
Noise Level:	Better than – 129 dBm (lowest gain setting) Better than – 107 dBm (highest gain setting)
Harmonic Distortion:	Typically less than 0.1% up to – 10 dBm output, 100 Hz to 10,000 Hz
Power Requirements:	12V to 50V dc at less than 5 mA (can be supplied by Altec 1588C Microphone Preamplifier)
Maximum Ambient Operating Temperature:	55°C (131°F)
Connector:	XLR3-12 on 201A Base
Pin Connection:	1 — shield, phantom power negative 2 — signal, black, phantom power positive 3 — signal, white, phantom power positive (use pin 2 *or* 3 power, *not* both)
Size:	0.75" (1.91 cm) diameter by 5.8" (14.7 cm) long (201A Base with 42A or 43A microphone cartridge installed)
Weight (Base and Cartridge):	3.4 oz. (95 gm)
Finish:	Nonreflective satin chrome microplate
Accessories (Supplied):	177A Wind/Pop Screen 189A Slip-On Holder
Accessories (Optional):	178A Windscreen 179A Shockmount with 41076-1 Cable Clip 184A Cable Set; 25-foot cable with XLR3-11C and XLR3-12 connectors attached 1588C Microphone Preamplifier

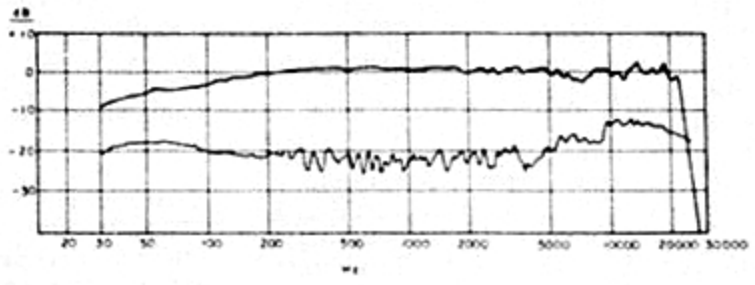


Figure 1. M53 System Frequency Response (Showing Front-to-Back Discrimination)

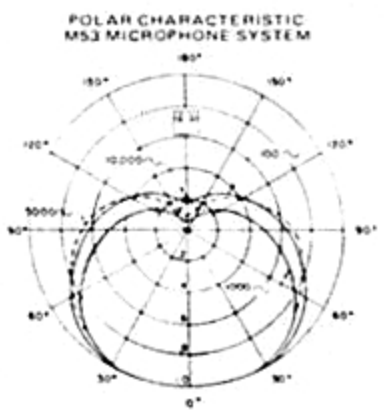


Figure 2. M53 Polar Characteristics

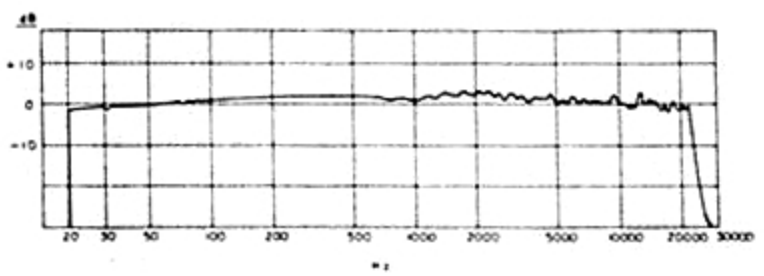


Figure 3. M54 System Frequency Response

Specifications and components subject to change without notice. Overall performance will be maintained or improved.

ALTEC
SOUND PRODUCTS DIVISION

1515 S. Manchester Ave., Anaheim, Calif. 92803

42-02-044801-01

CABLE SET (OPTIONAL ACCESSORY)

The 184A Cable Set consists of a 25-foot length of two-wire shielded and jacketed microphone cable equipped with one XLR-12 and one XLR3-11C connector. The cable may be used between the base and the preamplifier, or in multiples as extensions. Up to 1000 feet of cable may be inserted between the preamplifier and the base.

42A AND 43A MICROPHONE CARTRIDGES

The 43A microphone cartridge used in the M54 system is similar to the 42A, except that it has an omnidirectional pickup pattern. The 42A microphone cartridge is a single diaphragm, directional (cardioid) type. The microphone produces voltages in response to sound pressure because of the variations in capacity between a moving diaphragm and a stationary electrode connected to a source of polarizing voltage passed through high resistance. The biasing potential of the microphones is −60 volts. The output is proportional to the diaphragm displacement. The capacitance of the condenser is approximately 30 pF.

To achieve a uniform cardioid characteristic, the sound pressure acting on the backside of the diaphragm passes through a multiple acoustic phase-shifting network. This network allows optimum phase shift adjustment over the entire frequency range. To provide maximum sensitivity, the diaphragm is made of very thin aluminized Mylar® . The movement of the diaphragm is resistance-controlled by the thin air film between the diaphragm and backplate.

® Mylar is a registered trademark of DuPont.

CAUTION

The 42A and 43A microphone cartridges are precision elements, and normal care should be exercised in handling. The microphone units should be kept dry and free from dirt.

Figure 4. 43A Omnidirectional and 42A Cardioid Microphone Elements

201A BASE

Contained within the 201A Base is an extremely advanced state-of-the-art circuit (Registered U.S. Patent No. 3,913,024). Among its unique design characteristics is an ultra-high-frequency (megacycle range) oscillator, used to establish the −60 volt bias for the microphone element; its degenerative feedback loop utilizes capacitive rather than resistive coupling. The majority of the sophisticated circuitry is used to operate the oscillator and control the field effect transistor (FET) and cartridge with extreme stability. The FET and associated circuitry convert the very high impedance of the microphone element to an impedance level suitable for proper coupling to a low-impedance load, through a

MICROPHONE OPERATING POWER

The M53 and M54 microphone systems require 12V to 50V dc at less than 5 mA for operation. This power is used by the 201A Base to supply the −60 volts operating bias voltage for the cartridge. The power is automatically supplied when using an Altec 1588C Microphone Preamplifier, which is an encased unit designed to plug into the octal sockets at the electrical front end of Altec mixers.

If the 1588C is not used, care must be exercised to correctly supply power. Incorrect power connection may result in damage to the microphone and preamplifier power supply. Cannon connector pin 1 is always regarded as negative (ground) for power connections. The positive voltage is to be applied to pin 2 or pin 3 with respect to pin 1. *Do not connect supply voltage across pins 2 and 3. This will result in equipment damage.*

177A WIND/POP SCREEN

The 177A Wind/Pop Screen has been developed for the M53 and M54 microphone systems. It is extremely effective in wind noise and 'Pop' elimination. The 177A windscreen will attenuate wind noise approximately 24 dB without deteriorating the HF response or discrimination.

The 'Pop' or explosive sound produced by most people when pronouncing the letter 'P', and sometimes 'B', in certain words, is effectively reduced with the 177A windscreen, thus ensuring optimum close proximity performance.

WINDSCREEN INSTALLATION

The 177A Windscreen is made of open cell foam. It is secured to the cartridge and base by tightness of fit only. No threads or setscrews are used to secure the windscreen.

To install the windscreen, align its opening over the top of the cartridge and push down on the windscreen with a slight twisting motion. To remove the windscreen, reverse this procedure.

189A SLIP-ON HOLDER

The 189A Slip-On Holder, made of high-impact-resistant Cycolac plastic, grips the 201A Base and provides a light streamlined swivel attachment with 5/8"-27 thread which may be attached to a floor or desk stand. The 189A holds the microphone securely, yet permits immediate release for maximum flexibility of microphone usage. It is not necessary to disconnect the cable assembly when removing the microphone from the holder.

179A SHOCKMOUNT (OPTIONAL ACCESSORY)

The 179A Shockmount insulates the microphone effectively from mechanical noises transmitted through the floor stand or microphone boom. It is equipped with 5/8"-27 threads to mount the 189A Slip-On Holder. In order to prevent cable noise, the cable is inserted into the 41076-1 Cable Clip. The clip is placed on the threads on top of the microphone stand, and held in place by screwing the shockmount firmly in

MICROPHONE POSITIONING

A cardioid microphone's maximum sensitivity is on its frontal area, which should be aimed at the source. An omnidirectional microphoneis sensitive to sounds in a 360-degree spherical pattern, and may be used with sound sources to its front or side.

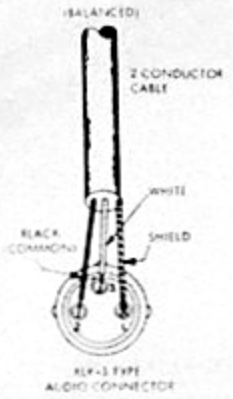


Figure 5. Microphone Cable Connection

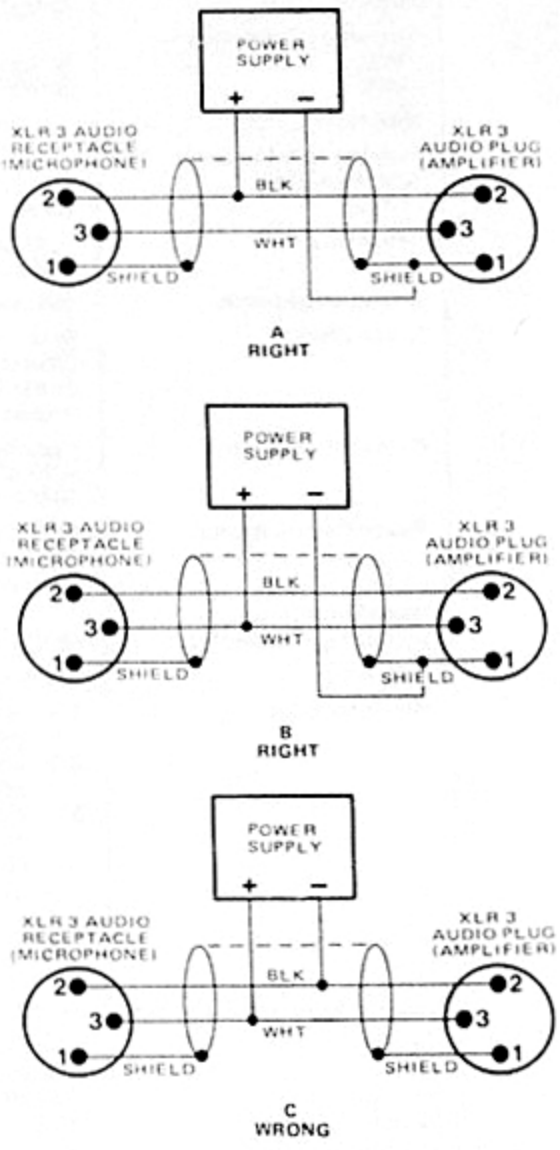


Figure 6. Power Supply Connections

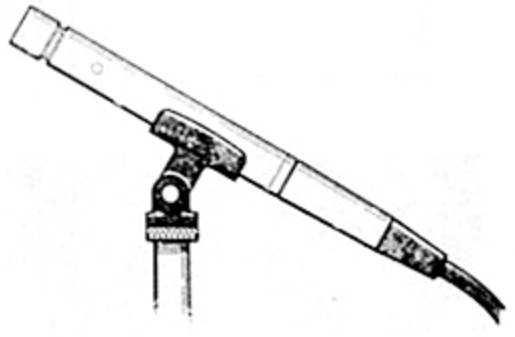


Figure 7. Snap-on Holder

ALTEC
SOUND PRODUCTS DIVISION

M53
CARDIOID CONDENSER MICROPHONE SYSTEM

DESCRIPTION

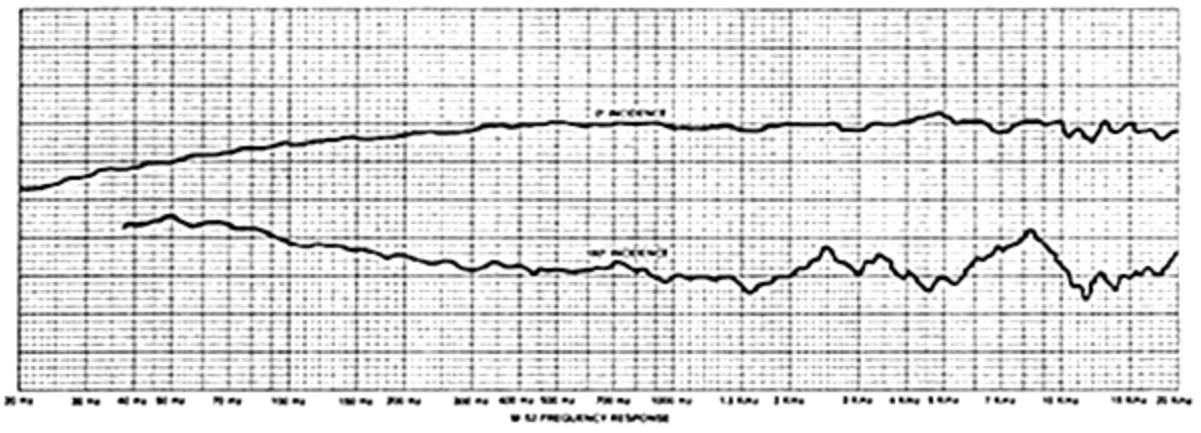
The ALTEC M53 Cardioid Condenser Microphone System features extremely wide and smooth frequency response, low noise level, and high sensitivity. The M53 consists of four ALTEC components: Model 42A Cardioid Condenser Microphone Cartridge, Model 201A* Base, Model 177A Windscreen and Model 191A Slip-On Holder. Power for the 201A microphone base is by phantom supply, and can range from 12V to 50V dc at less than 5 milliamperes (mA).

The heart of the system is the 42A cardioid cartridge assembly, which provides smooth, wide-range response with excellent rejection of signals 180° off axis. The 201A Base features a five-position input pad which allows the output of the M53 system to be adjusted over a 32 dB range, making it adaptable to virtually any signal level application. The M53 system is ideal in critical sound reinforcement systems as well as in recording and broadcast service.

*The 201A Base is Registered under U.S. Patent No. 3,913,024

SPECIFICATIONS

Type:	Cardioid condenser microphone system
Frequency Response:	Uniform from 20 Hz to 20 kHz (see Figure 1)
Sensitivity:	−40 dBm (Ref.: 10 dynes/cm²) Adjustable to −72 dBm in −8 dB steps with internal switch
Average Front-to-Back Discrimination:	20 dB
Output Impedance	150 ohms
Pickup Pattern:	Cardioid
Noise Level:	Greater than −129 dBm equivalent input noise (low gain setting) Greater than −107 dBm (high gain setting)
Maximum Output:	−3.0 dBm, 20 Hz to 20 kHz
Harmonic Distortion:	Typically less than 0.1% THD for output levels up to −10 dBm, 100 Hz to 10 kHz
Operating Temperature Range:	Up to 55°C (131°F)
Power Requirements:	12V to 50V dc at less than 5 mA
Connectors— 201A:	XLR3-12
Dimensions— 42A only:	0.75" (1.91 cm) diameter x 0.875" (2.22 cm) long
42A combined with 201A:	0.75" (1.91 cm) diameter x 5.8" (14.8 cm) long
Weight:	3.4 ounces (96.4 gm)
Finish— 201A:	Nonreflective satin chrome microplate
Components:	1 ALTEC 42A Cardioid Condenser Microphone Cartridge 1 ALTEC 191A Slip-On Holder (½"-20 threads) 1 ALTEC 177A Windscreen 1 ALTEC 201A Base
Accessories (must be ordered separately):	1588C Microphone Preamplifier 1 ALTEC 179A Shockmount with 1 ALTEC 41076-1 Cable Clip (optional kit) 178A Windscreen



ARCHITECT'S AND ENGINEER'S SPECIFICATIONS

The microphone system shall be the cardioid condenser type with solid-state circuitry, and shall be capable of operating from a 12V to 50V dc, 5 mA, phantom source. The microphone system shall consist of a microphone cartridge, a base housing the microphone circuitry, a slip-on holder and a windscreen. The microphone base shall contain a five-position, screwdriver-adjustable pad that adjusts the output level of the system in 8 dB increments.

The microphone system shall meet the following criteria. Frequency response, uniform from 20 Hz to 20 kHz. Sensitivity; −40 dBm, adjustable in −8 dB increments to −72 dBm* (Ref.: 10 dynes/cm²). Average front-to-back discrimination, 20 dB. Output impedance, 100 ohms. Noise level; greater than −129 dBm equivalent input noise in the low gain setting, greater than −107 dBm equivalent input noise in the high gain setting. Maximum power output; −3.0 dBm, 20 Hz to 20 kHz. Operating temperature range, up to 55°C (131°F). Dimensions; 0.75" diameter x 0.875" long (42A only), 0.75" diameter x 5.8" long (42A with 201A). Weight, 3.4 ounces. Finish (201A), nonreflective satin chrome microplate.

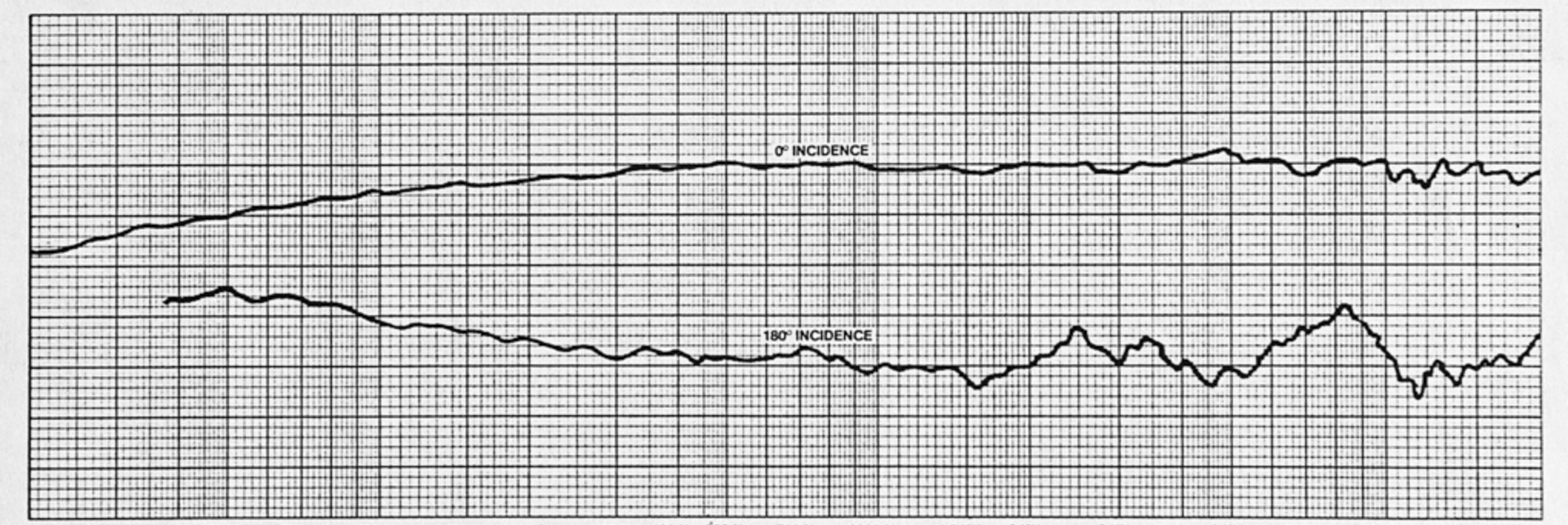
The cardioid microphone system shall be the ALTEC Model M53.

ALTEC
SOUND PRODUCTS DIVISION
1515 SOUTH MANCHESTER AVENUE, ANAHEIM, CALIFORNIA 92803

LITHO IN U.S.A. 276-5K

SPECIFICATIONS

Type:	Cardioid condenser microphone system
Frequency Response:	Uniform from 20 Hz to 20 kHz (see Figure 1)
Sensitivity:	−40 dBm (Ref.: 10 dynes/cm^2) Adjustable to −72 dBm in −8 dB steps with internal switch
Average Front-to-Back Discrimination:	20 dB
Output Impedance	150 ohms
Pickup Pattern:	Cardioid
Noise Level:	Greater than −129 dBm equivalent input noise (low gain setting) Greater than −107 dBm (high gain setting)
Maximum Output:	−3.0 dBm, 20 Hz to 20 kHz
Harmonic Distortion:	Typically less than 0.1% THD for output levels up to −10 dBm, 100 Hz to 10 kHz
Operating Temperature Range:	Up to 55°C (131°F)
Power Requirements:	12V to 50V dc at less than 5 mA
Connectors— **201A:**	XLR3-12
Dimensions— **42A only:**	0.75″ (1.91 cm) diameter x 0.875″ (2.22 cm) long
42A combined with 201A:	0.75″ (1.91 cm) diameter x 5.8″ (14.8 cm) long
Weight:	3.4 ounces (96.4 gm)
Finish— **201A:**	Nonreflective satin chrome microplate
Components:	1 ALTEC 42A Cardioid Condenser Microphone Cartridge 1 ALTEC 191A Slip-On Holder (½″-20 threads) 1 ALTEC 177A Windscreen 1 ALTEC 201A Base
Accessories (must be ordered separately):	1588C Microphone Preamplifier 1 ALTEC 179A Shockmount with 1 ALTEC 41076-1 Cable Clip (optional kit) 178A Windscreen



M-53 FREQUENCY RESPONSE

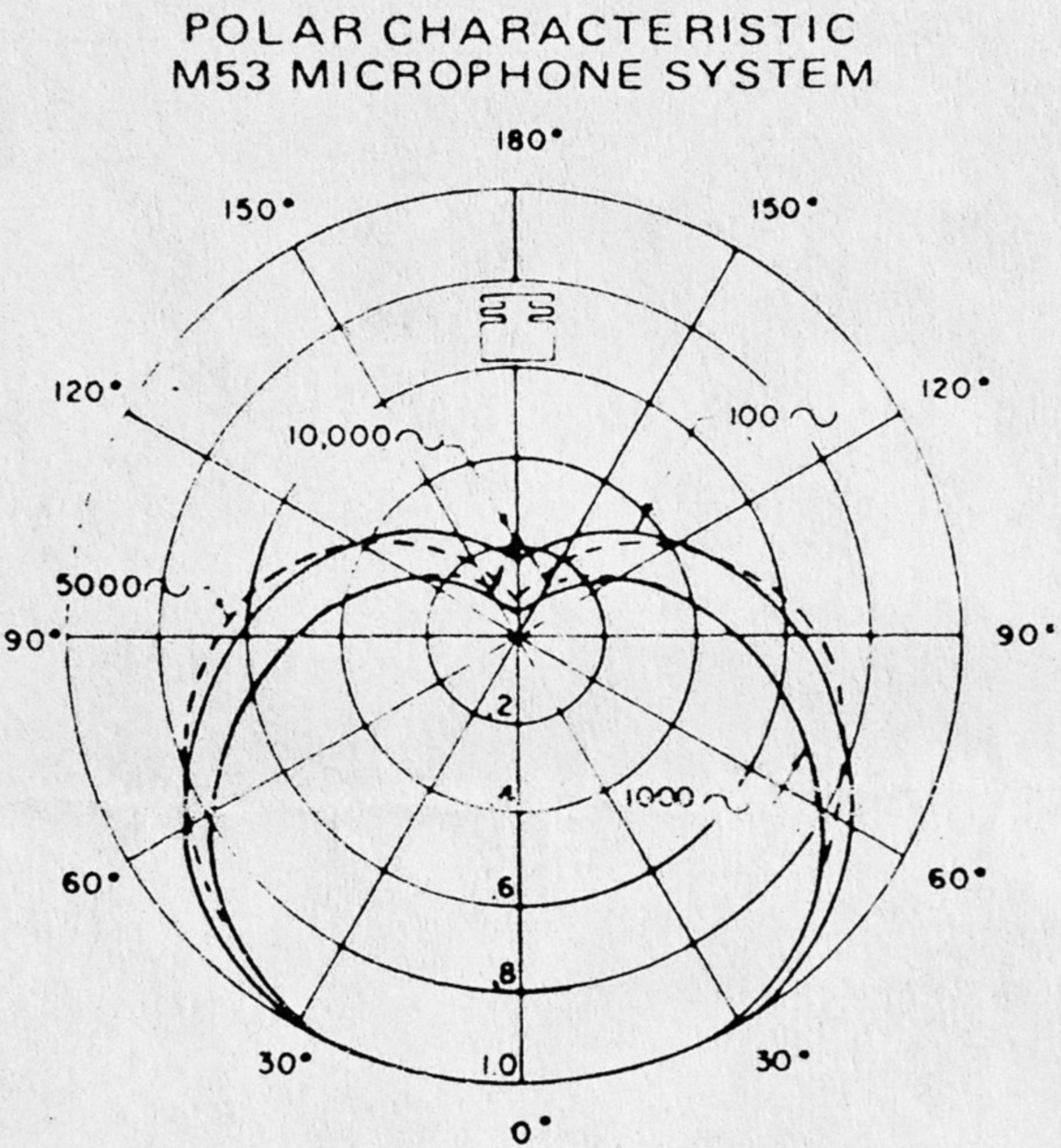


Figure 2. M53 Polar Characteristics