UNIVERSITY † MODULAR MICROPHONES †

for the professional

† Trademark

. . . with dynamic qualities

University MODULAR MICROPHONES bring new dimensions in quality and utility for hypercritical applications requiring the ultimate in full-range pick-up. They will fulfill all the strenuous requirements of general purpose professional soundcasting for TV, FM and high fidelity AM—from church to night club—from school to industrial P. A. They will answer every exacting need with unswerving performance, flexibility and durability, that within their class, defies comparison—and may well change your way of thinking about the selection, installation and use of high quality professional microphones.

FLEXIBILITY

Here, at last, is a fresh approach to the problem of application versatility—MODULAR FLEXIBILITY. University industrial designers and engineers have reexamined conventional microphone construction and have conceived a class of microphones* that offer total interchangeability between any microphone and all adapters. This gives long-term savings as well as improved versatility, for it permits adding suitable adapters as microphone requirements change—without buying additional microphones—or compromising quality to meet a price.

QUALITY

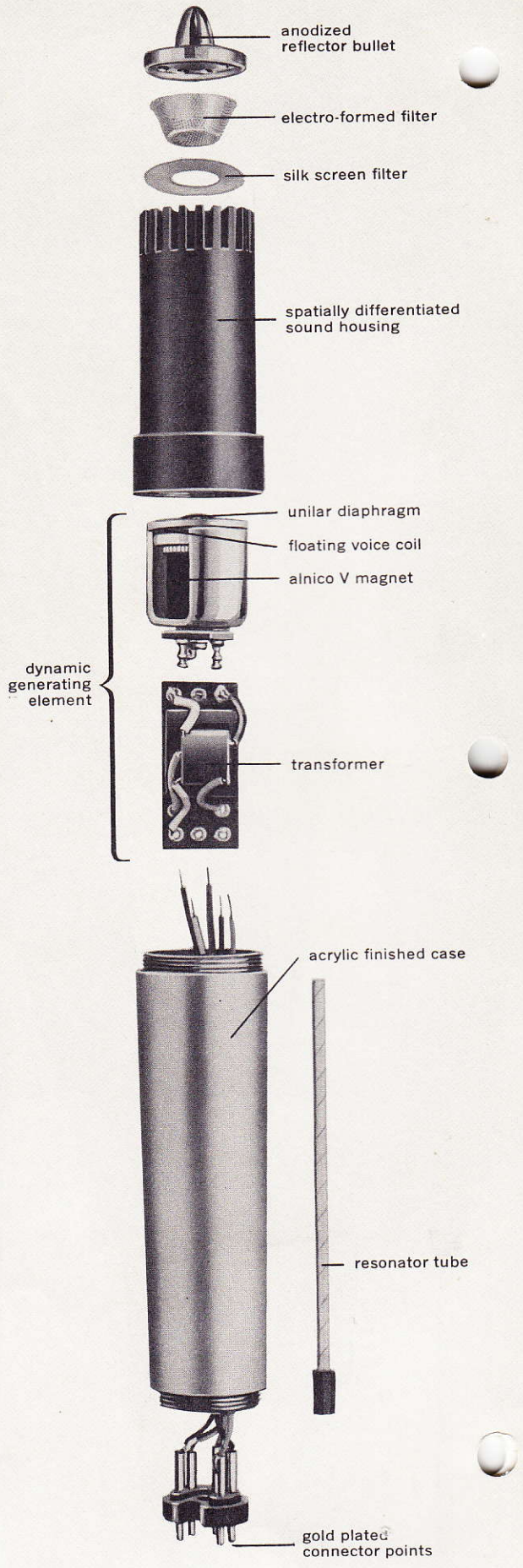
To ensure adherence to the listed specifications as befits equipment of this calibre, University has subjected every part—as well as the actual microphone in every stage of its construction—to the most stringent and uncompromising inspection and testing. This rare adherence to prototype standards guarantees that all University microphones of a given model are interchangeable without variation in sound quality—of especial importance in stereophonic applications.

While quality control can assure that one microphone is virtually the same as another, only the most durable and rugged parts can guarantee that frequency response and directional sensitivity characteristics remain unaffected throughout the life of the microphone. University microphones are exemplary in this respect. As one examines the features of the University microphone—from the almost destruction-proof diaphragm—to the gold-plated connector points—the use of the finest processes and elements chosen for their tenacity and immunity to change is immediately evident. Constancy in the most important area—*performance*—is the result.

STYLING

University's award-winning designers have styled these microphones—integrating function with form—so that every microphone reflects its progressive engineering with quiet good looks that make it a natural choice for any application. The matte black finish at the crown of each microphone is totally non-reflective, making it especially advantageous for TV and nightclub application where surface reflection must be held to a minimum. And the acrylic silver-grey finish of the basic shell has been so chosen that no matter what the setting, each University microphone blends suitably.

*Applies to Models 401, 402S, 501 and 502S



. . . dynamic performance

RESPONSE

All University professional microphones utilize a superb transducer cartridge which delivers breathtakingly lifelike high frequency response. The larger omni-directional models open new frontiers in uniformity and extension of bass range; lavaliers have low frequency characteristics tailored for the most natural response under their special conditions of use. The cardioid models span the complete frequency range, free from the drastic limitations of range and/or large departures from a flat frequency response characteristic associated with even the finest previous cardioids. And knowledgeable sound engineers will recognize that the consistently high front-to-back discrimination of these cardioid models is more than adequate for ease of placement and freedom from annoying feedback. Apart from their practical advantages, on a quality basis alone, University microphones must inevitably be the first choice of the critical user when definitive performance is required.

The High Frequency response range of the University microphone goes beyond anything that could be reasonably desired even on theoretical grounds, being undiminished in some models at 15,000 cycles and remaining truly effective to beyond 20,000 cycles. A key factor contributing to this superb performance is the exclusive Unilar diaphragm.

The Low Frequency response is correspondingly exceptional. For example, in many dynamic microphones, the bass range drops precipitously below 60 or 70 cycles. Low frequency performance in the University microphone has not in the least been sacrificed, and by criteria which are used in stating the response range of the most reputable broadcast microphones, the low frequency response of the University microphone is uniform to below 35 cycles; and all models have usable response even to the 20 cycle region.

Shown are two representative response curves. Individual microphones may, of course, differ slightly from this indicated response, but the difference will not be significant, and these curves can be referred to with confidence, particularly with regard to performance at frequency extremes. Good judgment should be exercised, in comparing these University curves with other published data which may, in some cases, be much less accurate reproductions of laboratory curves.

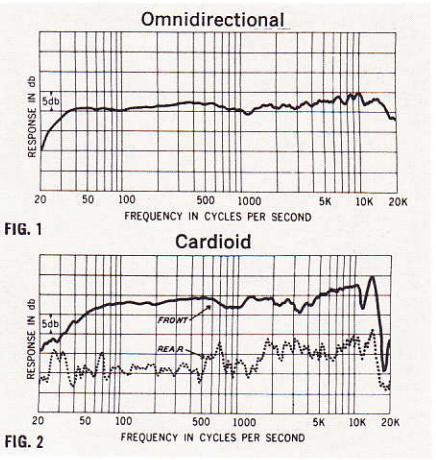


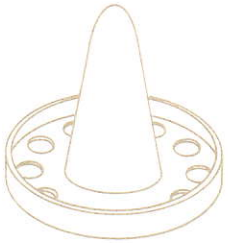
FIG. 1

FIG. 2

The above are *on*-axis curves, showing the response of the microphone to sounds travelling directly *toward* its diaphragm. In both curves there is a slight rise in response over the high frequency range. This is intentional, since curves with the sound source located at various points *off*-axis show somewhat less response in this range (although even at 180° the response at 10,000 cycles is down *only* 5 db from the midrange average). Thus,

(*continued on page 11*)

. . . and dynamic features



ANODIZED REFLECTOR BULLET

At the *top* of the University microphone is the highly polished surface of the reflector bullet—which maintains the omnidirectional pattern. And attached to the *base* of the bullet is a series of circular cutouts which further direct the receptivity of the sound impulses entering from the front.

ELECTRO-FORMED FILTER

Placed ahead of the diaphragm is, as its name implies, a specially engineered series of grilles which ensures definitive protection against foreign matter such as dust and iron filings—all of which may alter high frequency response. Two screens are used, one of silk, the other of electromesh (a type of metal screening so fine that it can be formed only by a selective plating process) ensuring positive deterrence against airborne particles. The unique mating of the two screens is most effective in preventing annoying wind noise and breath pops.

TANGENTIAL COMPLIANCE

In keeping with the requirement that everything which moves in the microphone be as small and light as possible, the outer portion of the diaphragm employs a special design refinement known as Tangential Compliance. A system of ribs—embossed into the outer portion of the diaphragm tangent to the voice coil—acts as long levers which counteract the stiffness at the outer circumference, so that, for a given force on the diaphragm, greater deflection results. By using ribs instead of annular rings, greater radial stiffness of the outer portion of the diaphragm gives improved control over the motion of this area with less chance of break-up and subsidiary resonances. At the same time, making the ribs tangential instead of simply radial increases the suspension compliance, because the ribbed portion nearest the voice coil need not be stretched circumferentially as the diaphragm is moved. Instead, the central part of the diaphragm rotates slightly as it moves back and forth, which has negligible effect upon the mechanical impedance in the frequency range of interest. The end result is that the necessary diaphragm suspension compliance is achieved with the least possible mass.

SPATIALLY DIFFERENTIATED SOUND HOUSING

The sound entrances at the crown of the microphones have been so designed that sound impulses entering from the sides are correctly distributed within the frontal chamber to take advantage of and enhance the directional characteristics of all University modular microphones.

(*continued on page 11*)

MODEL 401
Omni-Directional Dynamic Modular

Versatility of application makes this a highly desirable multi-purpose microphone for those who require optimum wide-range reproduction of music and voice. Ideally suited for every sound system application: broadcast, TV, church, school, commercial, industrial P.A. and the like.

SPECIFICATIONS

Frequency Response: 30-20,000 cps

Impedance: 30/50; 150/250; 20,000 ohms

Output Level: 30/50, 150/250 ohms;
—55 db/1 mv/10 dynes/cm²;
—148 db EIA sensitivity rating;
20,000 ohms, into high impedance input:
16 mv/10 dynes/cm²

Hum Reference: —120 db/.001 gauss

Dimensions: 1⅛″ maximum diameter
6⅜″ maximum length without adapter

Shipping Weight: 2 lbs.

Finish: acrylic silver-gray and non-reflecting black

Furnished with cloth carrying bag.

MODEL 402S
Omni-Directional Dynamic Modular Shock Mounted

Offers professional flexibility and styling in broadcasting, telecasting and recordings—group pickup, orchestras, public address, interviews. An all-around microphone with rugged internal shock mounting that makes it exceptionally well-suited to night-club application.

SPECIFICATIONS

Frequency Response: 30-20,000 cps

Impedance: 30/50; 150/250; 20,000 ohms

Output Level: 30/50, 150/250 ohms;
—55 db/1 mv/10 dynes/cm²;
—148 db EIA sensitivity rating;
20,000 ohms, into high impedance input:
16 mv/10 dynes/cm²

Hum Reference: —120 db/.001 gauss

Dimensions: 1⅛″ maximum diameter
8¾″ maximum length without adapter

Shipping Weight: 2¼ lbs.

Finish: acrylic silver-gray and non-reflecting black

Furnished with cloth carrying bag.

MODEL 401
Omni-Directional Dynamic Modular

Versatility of application makes this a highly desirable multi-purpose microphone for those who require optimum wide-range reproduction of music and voice. Ideally suited for every sound system application: broadcast, TV, church, school, commercial, industrial P.A. and the like.

MODEL 402S
Omni-Directional Dynamic Modular Shock Mounted

Offers professional flexibility and styling in broadcasting, telecasting and recordings—group pickup, orchestras, public address, interviews. An all-around microphone with rugged internal shock mounting that makes it exceptionally well-suited to night-club application.

MODEL SA10

Slide-on stand adapter for use with any complete assembly. Permits quick removal of microphone from stand to hand. Barrel section molded from high impact polystyrene; base is die-cast Zamak 3, machined with standard 5/8-27 thread.

Dimensions: 2⅞″ x 2″ x 1½″
Shipping Weight: ¼ lb.

MODEL PA10

Adapts modular microphones to receive the Model CA10, Cannon XLR-3-11C plug, or Amphenol 91-854 . . . all permitting quick disconnect.

Dimensions: 3⅛″ x 1″
Shipping Weight: ¼ lb.

MODEL CA10

Cannon XLR-3-11C plug complete with 18′ cable. Has push-action latch lock.

Dimensions: 2 1/16″ x ¾″
Shipping Weight: 1¼ lbs.

MODEL SSP10

Decorative stand adapter, for use wherever appearance is of prime importance. Connects directly to each basic microphone module. Includes on-off switch and receptacle for CA10, Cannon XLR-3-11C plug, or Amphenol 91-854. Permits tilting the microphone through a 90° arc. Mounts to any stand with standard 5/8-27 NPSM thread.

Dimensions: 3 7/16″ x 2¾″ x 1⅛″
Shipping Weight: ½ lb.

MODEL 501
Cardioid Dynamic Modular

Affords ultra-high discrimination against unwanted sound—virtually eliminating background noise. Performers can work a greater distance away due to the dependability and excellence of its directional characteristics—or extra-close without 'booming' or unwanted bass attenuation.

MODEL 502S
Cardioid Dynamic Modular Shock Mounted

Its directional characteristics yield superior results in noisy or reverberant locations, particularly when a discrete sound source is of primary interest. Features the unique University internal shock mounting arrangement which isolates it from spurious sound and eliminates extraneous noises.

MODEL SP10

Offers all advantages of PA10, with the addition of heavy duty positive action on-off slide switch.

Dimensions: 3⅛" x 1"
Shipping Weight: ¼ lb.

MODEL CC10

Provides most economical of all modular microphone assemblies. For use with any basic microphone module when neither switch nor quick-disconnect is required. Includes integral 18' cable.

Dimensions: 1 13/16" x 1"
Shipping Weight: 1¼ lbs.

MODEL DS10

Heavy cast iron desk stand with handsome crackle black non-reflecting finish. Perfectly balanced to prevent tipping of even largest microphones. Quick-action knurled lock washer. Accommodates all microphones with standard 5/8-27 thread, as well as University SA10 and SSP10 stand adapters.

Dimensions: 4½" x 7⅞" x 4⅝"
Shipping Weight: 3½ lbs.

MODEL 501
Cardioid Dynamic Modular

Affords ultra-high discrimination against unwanted sound—virtually eliminating background noise. Performers can work a greater distance away due to the dependability and excellence of its directional characteristics—or extra-close without 'booming' or unwanted bass attenuation.

SPECIFICATIONS

Frequency Response: 30-16,000 cps

Impedance: 30/50; 150/250; 20,000 ohms

Output Level: 30/50, 150/250 ohms;
—54 db/1 mv/10 dynes/cm²;
—147 db EIA sensitivity rating;
20,000 ohms into high impedance input;
17 mv/10 dynes/cm²

Hum Reference: —120 db/.001 gauss

Dimensions: 1½″ maximum diameter
6⅜″ maximum length without adapter

Shipping Weight: 2¼ lbs.

Finish: acrylic silver-gray and non-reflecting black

Furnished with cloth carrying bag.

MODEL 502S
Cardioid Dynamic Modular Shock Mounted

Its directional characteristics yield superior results in noisy or reverberant locations, particularly when a discrete sound source is of primary interest. Features the unique University internal shock mounting arrangement which isolates it from spurious sound and eliminates extraneous noises.

SPECIFICATIONS

Frequency Response: 30-16,000 cps

Impedance: 30/50; 150/250; 20,000 ohms

Output Level: 30/50, 150/250 ohms;
—54 db/1 mv/10 dynes/cm²;
—147 db EIA sensitivity rating;
20,000 ohms into high impedance input:
17 mv/10 dynes/cm²

Hum Reference: —120 db/.001 gauss

Dimensions: 1¾″ maximum diameter
7⅜″ maximum length without adapter

Shipping Weight: 2½ lbs.

Finish: acrylic silver-gray and non-reflecting black

Furnished with cloth carrying bag.

MODEL 401
Omni-Directional Dynamic Modular

Versatility of application makes this a highly desirable multi-purpose microphone for those who require optimum wide-range reproduction of music and voice. Ideally suited for every sound system application: broadcast, TV, church, school, commercial, industrial P.A. and the like.

MODEL 402S
Omni-Directional Dynamic Modular Shock Mounted

Offers professional flexibility and styling in broadcasting, telecasting and recordings—group pickup, orchestras, public address, interviews. An all-around microphone with rugged internal shock mounting that makes it exceptionally well-suited to night-club application.

(*continued from page 5*)

Thus, equipped with a minimum number of basic University modular microphones and adapters, the sound engineer can take changing requirements in stride.

It works as simply as this:

As you've seen, the basic microphone module consists of the transducer cartridge and matching transformer, wired and mounted in the main microphone case. Any one of 4 interchangeable adapters (see previous page) may be chosen to complete the microphone assembly to your diverse and exact needs.

To effect an impedance change, all that need be done is connect the gold-plated push-on connectors of the adapter to the proper pin on the base of the module. The adapter is then screwed solidly to the module—with instant impedance change *without* tools, rewiring or soldering!

Here are some advantages that accrue from this years-ahead engineering concept:

BUDGET BUYERS SATISFIED

Look at what might have occurred to a budget-conscious buyer before University's modular flexibility had been developed. He would have had to buy two inferior microphones to get the features he needed at a price he could afford to pay. Today, with modular flexibility, one need never compromise quality to meet a price! In fact, with this feature, a long term saving is gained, for suitable adapters can be added as microphone requirements change . . . without having to buy a new microphone. And if, in the future, a microphone with a different directional characteristic is required, all that need be done is purchase a basic University microphone module. All the previous adapters automatically fit.

LOCATION WORK FACILITATED

To the location users of microphones, which include many recording and radio studios, as well as outdoor recording enthusiasts, modular flexibility is truly a boon. Now, the technical, recording engineer, or even an announcer can take a mike from a floor or desk stand and in two shakes convert it to a hand-held street mike. And when at the location, if an impedance or accessory change proves necessary, it's done as quickly! With some astute pre-planning, any studio or station can keep their microphone supply to an absolute minimum—obsoleting the older method of keeping special location mikes idle until they're called into use.

MODEL 403L
Omni-Directional Dynamic (TV Lavalier)

An ultra-compact lavalier microphone for use wherever unobtrusiveness and freedom of movement are required. It is ideal for soundcasting applications in nightclubs, churches, school and location broadcasting of AM, FM and television.

SPECIFICATIONS

Frequency Response: 60-20,000 cps

Impedance: 30/50; 150/250 ohms

Output Level: —55 db/1 mv/10 dynes/cm$_2$ —148 db EIA sensitivity rating: 16 mv/10 dynes/cm^2

Hum Reference: —120 db/.001 gauss

Dimensions: 1 3/32″ maximum diameter 3⅜″ maximum length

Shipping Weight: 2¼ lbs.

Finish: antique bronze

Furnished with adjustable neck cord and clip, integral 25 foot flexible plastic cable and cloth carrying bag.

MODEL 404L
Omni-Directional Dynamic (Broadcast Lavalier)

This premium quality lavalier microphone fulfills all the critical requirements of a professional broadcast microphone and incorporates every feature of the larger omni-directional professional microphones. And though designed to compensate for bass overemphasis due to chest resonances, it provides a natural sound when hand-held or desk stand mounted.

SPECIFICATIONS

Frequency Response: 50-20,000 cps

Impedance: 30/50; 150/250; 20,000 ohms

Output Level: 30/50 and 150/250 ohms: —55 db/1 mv/10 dynes/cm^2 —148 db EIA sensitivity rating; 20,000 ohms into high impedance input; 16 mv/10 dynes/cm^2

Hum Reference: —120 db/.001 gauss

Dimensions: 1⅛″ maximum diameter 5⅝″ maximum length

Shipping Weight: 2¼ lbs.

Finish: antique bronze

Furnished with adjustable neck cord and clip, integral 25 foot flexible cloth-covered cable and cloth carrying bag.

. . . dynamic performance (*continued from page 3*)

with a distributed sound source such as an orchestra, and the mixture of direct and reflected sound normally present in a concert hall or studio, *net* response is essentially flat, clear and luminous.

DIRECTIONALITY

University has further pushed ahead the boundaries of microphone performance with enhanced directional characteristics. This is most dramatically evident in the case of the cardioid models, for while a dynamic microphone of normal construction tends—by its nature—to be omni-directional, the design of a good cardioid dynamic microphone is far more difficult.

As can readily be seen in the accompanying polar curves, the cardioid pickup pattern is well-realized, and at high frequencies (dotted curve) the directionality becomes very sharp indeed. The most special and unique achievement, however, is the positive maintenance of these characteristics over the entire frequency range —as shown in the cardioid response curve, figure 2. Previous directional microphones, while in some cases exhibiting very good pickup patterns at certain frequencies, have not delivered comparable front-to-back discrimination at other frequencies and/or have had decidedly inferior (actual) response curves—all resulting in poor response at about 8,000 cycles, *or* pronounced roughness in some frequency range, *or* thin bass. The new University cardioids have none of these deficiencies, and perform outstandingly by all of the above standards.

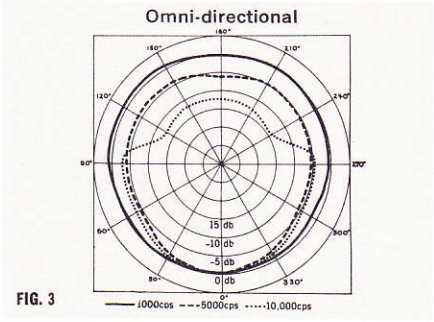


FIG. 3

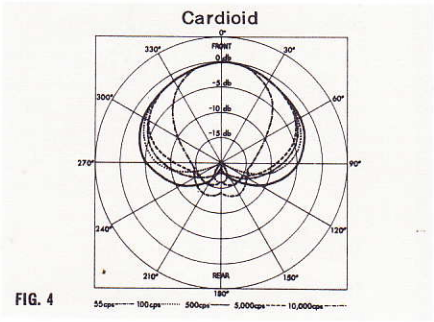
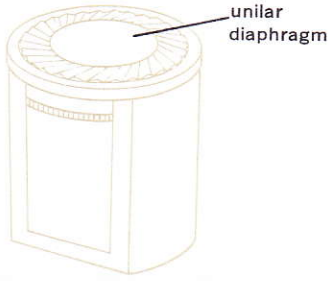


FIG. 4

Polar curves (figs. 3 and 4) show response versus the angle from which the sound comes—instead of versus the frequency as in the more familiar type of response curve shown in figures 1 and 2. The distance toward or away from the center of the graph corresponds to the up-and-down direction on the usual response curve graph. Thus, for sounds coming toward the microphone at a 90° angle, the graph shows the response at 5,000 cycles (dashed curve) as down 5 db compared to the response to sound coming from directly in front of the microphone—because the dashed line is 5 db closer to the center at 90° than it is at 0°.

. . . and dynamic features (*continued from page 3*)



EXCLUSIVE UNILAR DIAPHRAGM

Unilar polyester film is the finest material so far discovered for microphone diaphragms. It possesses essential *conflicting* physical properties such as lightness with great rigidity. This combination of properties is of critical importance in maintaining sensitive response at the highest frequencies. And as smoothness over this range is affected by the internal damping within the diaphragm material itself, it should be noted that Unilar also excels in this highly important area. As a result, these microphones mirror perfectly the subtle crispness of the original with an unparalleled essence of realism.

In view of the above, it might be imagined that a material capable of reflecting the subtle nuances of music so sensitively should be delicate. Yet, just the opposite is the case. Unilar has astonishing immunity to both high and low temperature extremes, humidity and many corrosive elements. And beyond this excellent overall stability, Unilar can withstand extreme physical stress as well; if deformed, as it might be by the nearby explosion of a gun, for example, it springs back to its original shape! It can be said that the Unilar diaphragm material symbolizes the essence of the University line —in practical terms, and in the most elusive facets of response and sensitivity.

GOLD PLATED CONNECTOR POINTS

University has made certain—to the nth degree—that no obscure malfunctions shall be permitted to mar the final performance of any microphone. To this end —and because of the extremely small voltages and currents involved, as well as the fact that non-soldered connections could cause problems if suitable precautions were not taken—University employs gold plated push-on connectors and pins on all modules and adapters. The mechanical integrity of the push-on connectors is such as to make them almost infallible, and a perfect electrical contact is assured through the use of this gold-plating. No aimless frill, this, but a vital feature, since gold is the finest conductor of electricity and has chemical stability not quite equalled by any other material.

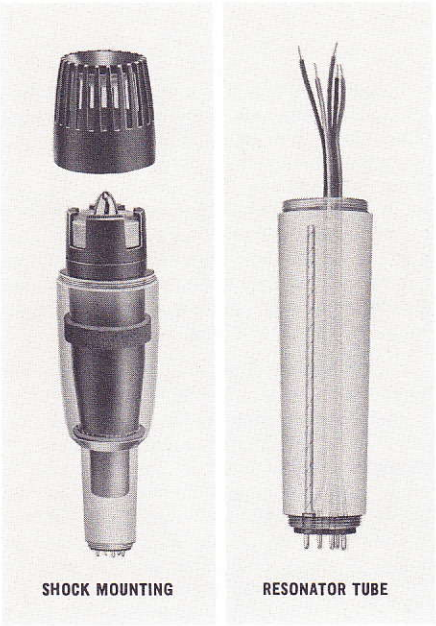
SHOCK MOUNTING

Up till now, the only way one could shock mount a dynamic microphone in this class would be to purchase cumbersome, complicated and expensive shock mountings. Rather than fitting out a microphone with difficult-to-handle shock mountings, University has provided two of their microphones (Models 401 & 501) with like shock-mounted models—the 402S and the 502S. The shock mounting is accomplished by containing the sensitive internal elements of the microphone in an inner aluminum case which floats, vibration-free, on polystyrene foam ribs within the outer shell. This integral shock mounting gives more widespread benefits than

(*continued on back cover*)

(*continued from page 11*)

ordinary shock mounting—which is limited to isolation of the microphone from seismic types of vibration when screwed to a stand. Now, the generating element is isolated from spurious sounds originating at the microphone case *itself*, such as when a performer handles the microphone, or if it is being passed around.



SHOCK MOUNTING

RESONATOR TUBE

RESONATOR TUBE

Just as in speaker cabinet design, where ducted ports are used to permit proper tuning of the speaker resonances for improved bass reproduction—in a similar manner, University microphones have specially designed resonator ports which tune the bass response pickup to the microphone cartridge for impeccable bass response. And every adapter that screws into the base of each basic module has also been designed so that the ducted effect remains constant.

ACRYLIC FINISHED CASE

Past masters at the art of finishing, University goes beyond the generally considered adequate "finish" of each microphone, and has completed the case in the same meticulous manner as their famous weatherproof outdoor speakers. They start with an electrolytically deposited plating on the shell to give its surface a fine etch for superior adhesion; this is followed by several coats of the finest outdoor lacquer, spraying and then baking to a hard peel-proof enamel finish that can withstand years of exposure to almost any element and any type of handling.

. . . and for dynamic commercial requirements

MODEL 70*
Omni-Directional Dynamic

Fulfills all the strenuous and exacting requirements for a general-purpose low-cost dynamic microphone. Its rugged construction and exceptionally wide frequency response make it ideal for general soundcasting applications in churches, schools, industrial and commercial public address installations—improving home tape recordings and up-grading ham broadcasting rigs. And, in the general purpose field it offers performance, durability and flexibility that set an entirely new standard of quality per dollar. Its low frequency response is excellent—approaching that of University professional models, and substantially exceeding that of other omni-directional dynamic microphones in its price range; the high range extends to a usable limit in the 18,000 cycle region. Resultant treble and high frequency characteristic is clear and free from harshness or stridency.

**Model 71 also available with on-off slide switch.*

SPECIFICATIONS

Frequency Response: 50-14,000 cps

Impedance: 30/50; 20,000 ohms

Output Level: 30/50 ohms:—50 db/1 mv/10 dynes/cm²; —143 db EIA sensitivity rating; 20,000 ohms into high impedance input; 28 mv/10 dynes/cm²

Hum Reference: —120 db/.001 gauss

Dimensions: 1 5/32″ maximum diameter
6″ maximum length

Shipping Weight: 2¼ lbs.

Finish: acrylic silver-gray and non-reflecting black
Furnished with integral 15 foot 3-conductor shielded cable, Model SA10 slide-on stand adapter and cloth carrying bag.

Over 25 years of experience in electroacoustics have led to the development of the University microphone. As the world's largest manufacturer of public address and high fidelity transducers, and as a major supplier to the military, University is in a unique position to understand the special requirements of the sound industry. Thus was conceived—and now produced—this remarkable new line of microphones that not only set a new standard of broadcast performance, but that can be custom-fitted to your own needs. University, the leader in sound, is now the pacemaker in microphones.

AVAILABLE FROM:

UNIVERSITY™

UNIVERSITY LOUDSPEAKERS, INC. White Plains, N. Y.
A Division of Ling-Temco Electronics, Inc.

78A163 Printed in U. S. A.