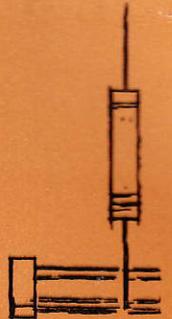
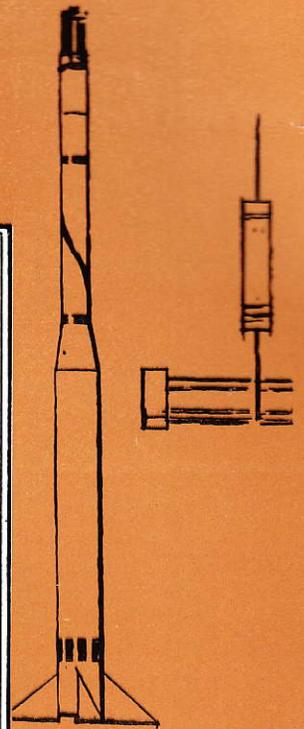
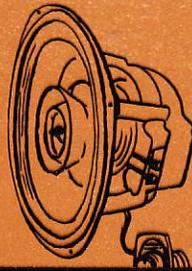
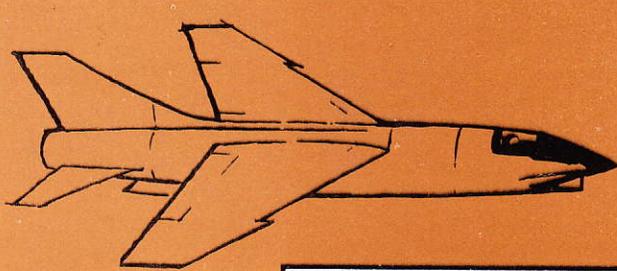


Your 1963 Guide to Component Stereo High Fidelity

UNIVERSITY

SPEAKERS & SPEAKER SYSTEMS
OF THE HIGHEST FIDELITY





The quality of UNIVERSITY HIGH FIDELITY SPEAKERS AND SPEAKER SYSTEMS is apparent in the attention paid to each and every part, both seen and unseen — from the delicate, precision requirements of University's speaker cone assemblies . . . to the rugged metal fabrication of the die-cast baskets and massive magnets . . . to the impeccable craftsmanship of UNIVERSITY cabinetry.

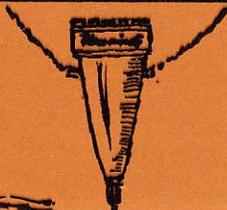
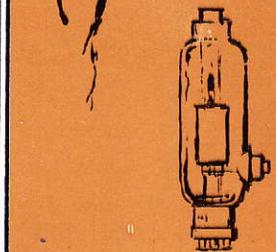
UNIVERSITY quality can also be heard and appreciated in the homes of discerning music lovers, leading concert artists, the audio laboratories of the U.S. Navy, concert halls . . . and in the listening rooms of leading high fidelity dealers. Here, you can also compare UNIVERSITY to all other brands and receive conclusive, **audible** proof of University's superiority.

30 exclusive patents in the field of electroacoustics — made possible by the vast research and development facilities of UNIVERSITY and



. . . stand as warranties that when you choose a UNIVERSITY . . . you choose the finest and most advanced product of its type.

*LING-TEMCO-VOUGHT INC. serves the nation and the world in the fields of high fidelity, radar, sonar, television, missile manufacturing, commercial and military aircraft, information-handling and other types of electronic systems for industrial, commercial and military applications.



contents

	PAGE
Your Guide to Component Stereo High Fidelity.....	3
Medallion XII Speaker System.....	4
Classic Mark II Speaker System.....	6
Classic Dual-12 Speaker System.....	9
Tips on How to Choose Your High Fidelity Speaker System.....	10

Bookshelf Speaker Systems.....	11
Companionette Speaker Systems.....	12
Mini-Flex Speaker System.....	13
Mini Speaker System.....	14
Progressive Speaker Expansion Charts.....	15
Wide-Range and Specialized Speakers.....	16
Outdoor Speakers, Underwater Speakers, Portable Powrpage Super Hailers.....	20

UNIVERSITY MODULAR MICROPHONES



University also makes a complete line of professional microphones — for radio broadcasting and TV, as well as for public address and home recording, amateur and Citizens Band radio. Write for illustrated and detailed brochure.



YOUR GUIDE TO COMPONENT STEREO HIGH-FIDELITY

“Just what are components?”

Components are simply the same elements you would find in any conventional radio-phonograph . . . record player, cartridge, radio tuner, amplifier and speaker . . . but with several very important differences. Components are custom-engineered products readily identifiable by brand name and performance rating. Further, you select them individually according to your personal preference and need. And when you connect them together, you've got a complete music system of the highest possible quality.

“Why are components best for music at home?”

You don't have to be an acoustical genius to appreciate the difference between sound reproduction you get from a conventional radio-phonograph and the breath-taking quality of reproduction you get from a high fidelity stereo component system. All you have to do is turn the dial and listen. Once you decide that you want the finest possible music reproduction in your home, you have only one choice . . . component equipment. In addition to getting the best sound, you also get the convenience and flexibility of placing your equipment where it *sounds* best and where it *looks* best . . . and the final result in both respects reflects the wisdom of your choice.

“What makes this difference?”

To be precise, the difference in home music equipment is in the sound waves each is capable of sending to our ears and that we recognize as music. In the concert hall, the *only* limitation on what we hear depends upon the sensitivity of our ears to the vibrations in the air created by the orchestra. These sound waves are actually measurable in terms of so many vibrations per second. The very lowest bass notes vibrate at about 15 cycles per second . . . the highest notes beyond 20,000 cycles.

Most of this response range is captured within the grooves of records or broadcast by FM stations. (AM broadcasting is limited to 5,000 cycles.) But how much of it you will hear at home depends upon the ability of your equipment to recreate and reproduce it. High fidelity stereo components are designed and engineered to bring *all* of this sound to you. Ordinary radio-phonographs simply do not have the power, the sensitivity, nor the necessary electronic engineering quality for this exacting task.

All this can be easily proven . . . either in the laboratory, or in a few minutes of your own comparative listening in the demonstration room of an audio specialist. If you've been considering the purchase of a conventional radio-phonograph, you certainly owe it to yourself to hear *the difference* before making what could be a considerable investment.



“In what other ways do components differ from ordinary-radio phonographs?”

In flexibility of placement, for one thing. Because you purchase only *performing* equipment, you're not forced to rearrange your room for a large piece of furniture that often serves no purpose but to conceal the inadequate audio equipment within.

Thus, you can install your handsomely styled components wherever you wish . . . either on book-shelves, tables, benches, or integrated within walls or built-ins. And, of course, you can always place them in cabinetry of your choice as well.

Apart from convenience, there are two very important *acoustic* reasons why your speakers should not be housed within the same cabinet as your other equipment. 1. For unrestricted full range reproduction the powerful vibrations of the speakers must be prevented from interfering with the movement of the tonearm on the record. (In one-piece phonographs this problem is “solved” by simply restricting the response range of the speakers. Result: less vibration, but only at the cost of the vital bass frequencies.) 2. For stereo, speakers must be placed sufficiently apart in order to achieve full effect and directionality in the listening area. The typical distance in the average room would be about 6 or 8 feet. Obviously, when a manufacturer places two speakers in a cabinet three or four feet wide, there's just no stereo, except perhaps for those sitting immediately in front of the unit. (continued on page 8)





he loves the sound...



...she loves the styles

A—French Provincial B—Contemporary C—Italian Provincial D—Swedish Modern E—Colonial

Acclaimed as the world's foremost compact speaker system of its kind...

THE UNIVERSITY MEDALLION XII 12" THREE-WAY SPEAKER SYSTEM

"...the true bass response extends all the way down and can be felt as well as heard."

— ELECTRONICS WORLD MAGAZINE

So stated *Electronics World*, one of the leading publications in the field of professional and advanced consumer electronics, based on a report prepared for them by the independent Hirsch-Houck Testing Laboratories. Again, with regard to lows, Hirsch-Houck wrote: "The harmonic distortion remains very low at the lowest frequencies, which indicates that the speaker can be 'pushed' harder to extend the low end without overload or break-up." Regarding transient response — the measure of a system's ability to respond to exciting and sudden bursts of sound — Hirsch-Houck stated: "Very good... little overhang... slight overshoot." In discussing the smoothness of its overall response, H-H reported that "There were no significant peaks or holes, even at the crossover frequencies."

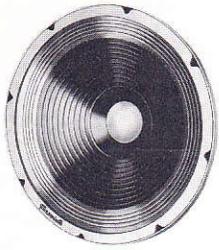
From the professionally-oriented pages of *Electronics World*, let us now turn to a high fidelity expert writing for the relative newcomer to high fidelity, Mr. Lynn Jackson of *The Houston Post*: "Its sound is excellent, all the way from the low, low bass up beyond the human ear's ability to hear." Lynn Jackson

also stated: "The Sphericon's smoothness goes far beyond human hearing — this means no tired ears after hours of listening." Said Don Langer of the *New York Post*: "... one of the best performances it has been my pleasure to hear."

Here, you have had but a sampling of what the experts think of the Medallion XII. But we want you to decide for yourself by hearing and comparing the Medallion XII to all other systems in its price range. If you demand magnificent sound at a moderate price... with undistorted bass... highs to beyond the limits of audibility — if you demand superb cabinetry and unique decor flexibility (with five interchangeable "Select-A-Style"® grille frames that snap on and off to match any decor) ... then you will certainly want the University Medallion XII.

Amplifier Requirements? Any amplifier capable of delivering a modest ten watts. **Dimensions?** Only 24" x 17" x 11¼" deep. Available with or without base — for use as highboy or lowboy. **Finishes?** Walnut, oiled walnut, fruitwood, mahogany and unfinished for custom installations. **Future Decor Problems?** Should you ever decide to change your decor at some later date, all you do is replace the inexpensive "Select-A-Style"® grille! **Styles?** Contemporary, Italian or French Provincial, Early American and Swedish Modern.

THE MEDALLION CUSTOM COMPONENTS



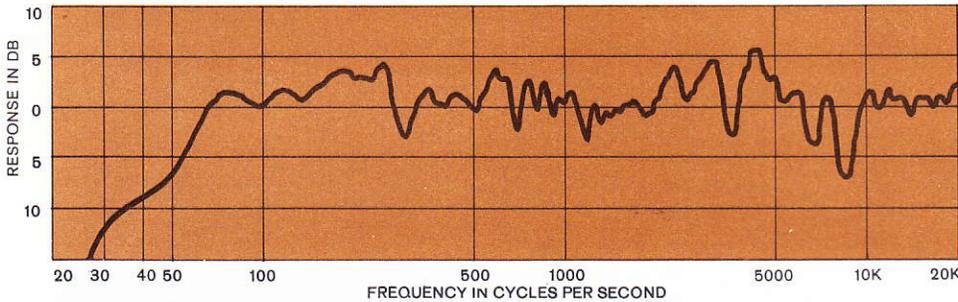
THE 12" WOOFER A "basso" of consummate artistry is this high compliance, premium quality woofer. Engineered specifically for the Medallion enclosure and its associated components, it provides truly phenomenal extended bass — as low as 25 cycles with less than 10% harmonic distortion, an achievement hitherto considered impossible even for a speaker system of relatively prodigious proportions. Power-handling capacity, 40 watts, music power, but it is of such high efficiency that optimum response is realized with amplifiers capable of no more than an undistorted ten-watt output.



THE C-8M MID-RANGE A specialized 8" direct radiator speaker for the reproduction of frequencies in the 500-5000 cycle range. Perfectly matching the efficiency and response characteristics of the woofer and Sphericon Super Tweeter, it provides excellent projection and dramatic "in person" presence of sound. Viscous treated, it rolls off unwanted high frequencies and "makes way" for the unique tonal purity of the Sphericon. Equipped with an airtight, sub-enclosure "basket" assembly, it also prevents distortion due to woofer-generated pressures inside the cabinet.



THE SPHERICON SUPER TWEETER Years ahead in design when first introduced, it is unmatched by competition and still acknowledged by audio engineers as the finest of its kind! The Sphericon provides unprecedentedly smooth response, well maintained up to 40,000 cps, with wide 120° dispersion in all planes for uniform highs in every part of your room. With its precisely engineered conoidal ring and spherical diffractor, the Sphericon produces smooth, on-axis response and, as in a concert hall, directs highs to the walls and ceiling, creating a most unusual degree of realism.



This is a graph of sound output vs. frequency for the Medallion XII, measured directly in front of the speaker in an anechoic chamber. It shows the response of the Medallion to be highly uniform over a wide frequency range, emphasizing neither bass, treble nor midrange, for smooth and natural sound free from coloration.



The only speaker system with "Select-A-Style"® grilles that snap in place to match any decor. *Rear left*, Early American; *rear right*, Italian Provincial; *front left*, Swedish Modern; *front right*, French Provincial; *center*, Contemporary grille and base.

"In my opinion, the University Classic Mark II justifies the substantial claims that the manufacturer has made for it. It is one of a limited group of speakers to which I would give an unqualified top notch rating."

Julian D. Hirsch, Hirsch-Houck Laboratories
(for the April 1962 issue of *HiFi/Stereo Review*)

The



... a superb combination of the finest in the art of cabinetry and the art of acoustics ...

COMPONENTS of the CLASSIC MARK II 15" 3-Way High Compliance Speaker System



HEAVY DUTY, HIGH COMPLIANCE 15" WOOFER:
Specially designed (bass only) diaphragm, thick and extremely rigid, with super-flexible suspension; big, high energy Uniferrox-7 magnet; massive, die cast frame.



DELUXE, SUPER-SMOOTH, DIRECT-RADIATOR MID-RANGE:
Specially designed 8" speaker in sealed sub-enclosure delivers uniform mid-range response, with reserve excursion and power handling capacity for lowest distortion.



FAMOUS SPHERICON SUPER TWEETER:
Unrivalled purity in the extreme high frequency range, with honey-smooth, peak-free response and superb dispersion for greatest naturalness. Spectacular range—to 40,000 cps!

TIMELESS BEAUTY AND THE SOUND OF REALITY



Classic Mark II

The new CLASSIC MARK II *belongs* to those who cannot be satisfied with second best. Its cabinetry is impeccable in every detail, designed by University's award-winning designer, Bernard Sharp, hand-crafted with the finest woods and veneers obtainable. And *Sound* — the sound of the new CLASSIC is the *sound of truth* . . . the realism of life in perfect reproduction.

The fine distinction between a good speaker system and a great one is its degree of freedom from coloration. In this respect, the CLASSIC is outstanding and distinguishable from all other speaker systems. Totally free from coloration, its sound is a "many splendored thing," with a range and richness of character as true as the music itself.

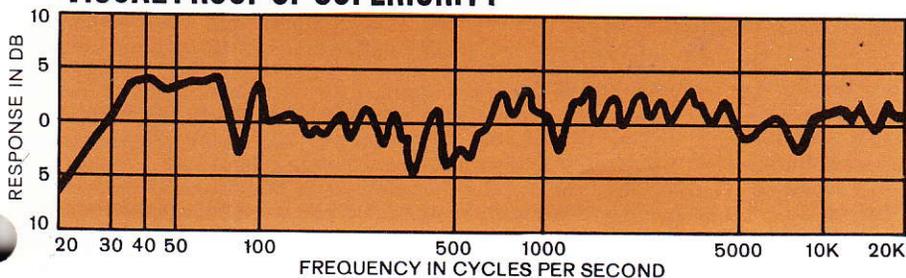
The CLASSIC can be a mighty sound, when the music calls for grandeur. It can also be lyrical, delicate. With equal felicity, it can respond to the most dazzling flights of symphonic frenzy *and* to the subtlest orchestral nuance. For the CLASSIC MARK II is a great and wonderful mirror of the world of sound — a mirror capable of reflecting the most expansive instrumental

pyrotechnics — fine enough to capture the most delicate textures of the voice and of solo instruments.

The CLASSIC MARK II is the "bridge" between the giant monaural speaker systems of yesterday and the compact stereo bookshelf types of today. Advancing the technology that produced the bookcase compacts, the new CLASSIC brings you that sense of presence and of spaciousness in sound which places you in the concert hall, but with a cabinet designed to fit *effortlessly* into modern environments. Though only 35" wide, the CLASSIC will lend magnificence to the most elegant interiors. Its simplicity of line and styling permits it to be perfectly integrated with other fine furniture, of *any* period. It is the CLASSIC, a name inspired by the timelessness of its design and the fidelity of its sound.

Visit your high fidelity dealer. Listen to the CLASSIC MARK II. Note the beautiful balance of its sound, the remarkable separation between orchestral instruments (a musical manifestation of low intermodulation distortion). Once you hear it, you will not be satisfied with any other speaker system.

VISUAL PROOF OF SUPERIORITY



This is the frequency response curve of the CLASSIC MARK II. For those who may be unfamiliar with this particular type of graph, it is the engineer's visual means of showing the response of the CLASSIC to be highly linear and uniform, over the widest frequency range. It is this uniformity which in part is responsible for the CLASSIC's freedom from coloration.

FREQUENCY RESPONSE: Virtually uniform, from below 20 cps to 40,000 cps. **POWER REQUIREMENTS:** Ten to sixty watts. **CROSSOVER:** Extra low — 150 cps, handled with very low distortion due to overhanging voice coil and high compliance of mid-range. Low crossover to mid-range and front deflector on woofer assure uniform dispersion. **IMPEDANCE:** Four and eight ohms. **CONTROLS:** Unique, wide-range Presence and Brilliance controls, adjustable without having to walk behind the cabinet. **CABINETRY:** Available in individually selected, richly grained oiled walnut. **DIMENSIONS:** 35" w., 28¼" h. (with legs), 17½" d.

"Where are components sold?"

Only at an authorized audio specialist, who is anything but a salesman in the usual sense. That is, he and his staff are all high fidelity and music enthusiasts. They know acoustics, they know their equipment and are genuinely interested in providing you with the right equipment for your home (at a price you can afford) . . . rather than having to sell you a "package."

Be quite frank when you go there. Ask whatever questions you have in mind. Tell them what you intend to spend, how simple or elaborate you want your system to be . . . and the audio specialist will guide you from there.



"What components would we need?"

For a program source, you can select either a record changer or turntable, plus cartridge . . . or a radio tuner (AM, FM, or stereo AM-FM). You may prefer to buy only the record player at first, and add the tuner later. In either case, you will need an amplifier, several models of which are available combined with tuners on single chassis. Finally, the speaker system . . . the most important component in terms of what your entire system will sound like.

"Why is the speaker system especially important?"

Because, while even a trained ear may sometimes have difficulty distinguishing between the other components, you will immediately detect a difference in the tone quality and musical character among speakers. You can best appreciate the reason for this when you understand the different task each component performs. First, the stylus in the phono tonearm responds mechanically to the contours of the recorded grooves, then converts these movements to electronic impulses and transmits them to the amplifier. Here, the signals are strengthened (amplified, but otherwise unmodified) until they can drive the speaker.

When the speaker is energized, its cone pulsates and creates the sound waves which you hear as music. How well you enjoy this music depends upon a number of factors:

1. The engineering quality of the speaker. This determines the accuracy with which it can respond to the signals it receives . . . whether they represent the soft pluck of a violin string, or the climactic fortissimo of full orchestra and chorus.

Inferior speakers are simply incapable of responding to either the very low or the very high frequencies, thereby robbing you of both the richness and brilliance that give music so much of its emotional impact. Further, poor speakers respond unevenly even within their limited response range, thereby introducing distortion and other deviations from natural sound. (If you've been uncomfortable after listening to your present radio for any length of time, you now know the reason . . . it's "listening fatigue.")

Component speakers are not mass-produced, but are custom-engineered to extremely close tolerances, like fine precision watches. Each speaker undergoes several individual tests of its ability to reproduce its full range without distortion and to measure up to the uncompromised standards of the electronics industry.

2. The suitability of the speaker cabinet, which is not just a box, but often calls for as much engineering design as the speaker

and is as important to the ultimate sound as the speaker itself. This is because every speaker requires a properly matched enclosure to enhance its resonant characteristics and to intensify, control and direct the sound waves it initiates into the room.

3. The acoustics of the listening room which, like the concert hall itself, contributes far more in reflective sound than is commonly realized—up to 90% in some locations.

4. Your experience in listening, which will soon increase your awareness and appreciation for the faithfulness of component performance. Since so much of listening is subjective, and not all listeners respond similarly to the same speaker, we have this final word of advice. (The same you will receive from any expert or your knowledgeable friends.) When you're at your audio specialist, listen carefully to a number of speakers which you otherwise find suitable in price, size and styling. If you do this, you are more certain to be satisfied, both at the outset and in the years to come.

"Of course, you hope we'll select University speakers..."

Not only hope so, but have good reason to believe you will. The best-selling high fidelity speaker of all time, for example, is the Model 6201, followed closely in popularity by the Model 312. University's progressiveness and technical skill have been known and respected throughout the high fidelity industry for over two decades. Among University's great "firsts" in engineering and design are these:

W-shape all-Alnico 5 Gold Dot Magnet for greater efficiency and control of distortion

Rim-centering for all voice coil assemblies to ensure precision alignment to tolerances of 1000th of an inch or more

Patented dual voice coil woofers and systems engineered for maximum efficiency for stereo reproduction

Bi-sectional assemblies for life-long adherence to original performance specifications

The patented Diffusicone element for more uniform dispersion of the mid-range and higher frequencies

Reciprocating-flare horn design for true wide-angle dispersion of the very high frequencies

University holds over 30 patents, reflecting the pioneering of its engineering and research departments, and assuring you of exclusive performance benefits seldom approached by conventional designs. The recently developed Sphericon Super Tweeter, for example, represents a major breakthrough in high frequency reproduction, with a response extending to the supersonic range of 40,000 cycles per second. This has never been possible before in any consumer speaker system . . . and it's exclusive with University.

"... or speaker systems."

University speaker systems have also enjoyed long and widespread acceptance among expert and newcomer alike. The most recent reason has been Radiation Resistance Loading, a major advance in the art of achieving outstanding bass in ultra-compact high compliance cabinets.

Besides their performance, you'll appreciate the looks of University speaker systems. Visually as well as aurally—your speaker system is the most prominent of all your components, and should serve as a fine piece of furniture in keeping with the entire decor of your listening room. As you will note on the following pages, University's cabinet designers appreciate this fully.

And for the do-it-yourselfer, pages 11 through 19 describe the world's broadest choice of wide-range speakers, woofers, tweeters and networks. Here, you can plan a speaker system to make use of cabinets you now have, to build with University's factory-assembled acoustically-engineered cabinets, to assemble your own kit, or to build the most elaborate of all possible systems.

In short, whatever you are likely to want or need as a guide to the speaker or speaker system best for you . . . you will find it within the pages to follow. (continued on page 10)





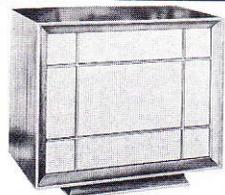
If not for the Classic Mark II . . .

this would be the finest speaker system of them all—



CLASSIC DUAL-12

. . . the 3-way system with two 12-inch speakers . . . PLUS!



For those who have been interested in high fidelity since its early days, the original Classic needs no introduction. Today, more than ten years after it was first introduced, this massive (and magnificent) speaker system is still being purchased by music lovers with sufficient space for it, and by theatre and concert hall owners.

THE CLASSIC MARK II, introduced in 1961, is the 'bridge' between the giant monaural speaker systems of yesterday and the compacts of today. Universally acclaimed by leading audio engineers and critics (awarded an "unqualified top notch rating" by Julian Hirsch, Hirsch-Houck Labs), the Mark II was designed to meet the demand for a 'big compact', but without compromising the fabulous (and "fabulous" is the only word for it) sound quality of the original Classic.

UNIVERSITY'S NEWEST CLASSIC—the Dual-12—by deviating from what is considered to be the norm in three-way system design, is less costly and even more compact, but a **Classic** nonetheless!

ACOUSTICALLY, it has been engineered to

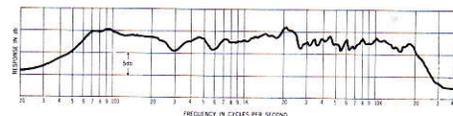
approach the performance of the Mark II to a greater extent than any other speaker system of its type. How? Essentially, by means of a radically new concept in the design and integration of its speakers. Instead of the conventional 3-speaker arrangement (12", 8" and tweeter), the Dual-12 has been equipped with TWO 12" SPEAKERS, plus a super tweeter! A 12" woofer provides distortion-free reproduction of the ultra-low frequencies; a 12" woofer/mid-range reinforces the woofer, assures smooth linear response by removing the 'peaks' and 'valleys' that cause those harsh and strident sounds heard in other systems, and reproduces the mid-range frequencies with unexcelled clarity. To provide phenomenal high frequency response (up to 40,000 cps!), the Dual-12 has been equipped with the most widely acclaimed of all super tweeters—the Sphericon!

VISUALLY, the Dual-12 is in the styling tradition of the Mark II, but narrower and higher...an elegant highboy crafted to display fully the rich, warm beauty of its individually selected walnut veneers. It **belongs** in the finest of homes, yet fits perfectly in rooms of extremely moderate dimensions. This is the Dual-12 — truly unique, truly a **Classic**!

SPECIFICATIONS

COMPONENTS:	12" high compliance, large-excursion woofer and 12" woofer/mid-range; plus the Sphericon Super Tweeter.
CROSSOVER NETWORK:	6 db/octave.
FREQUENCY RANGE:	25-40,000 cps.
IMPEDANCE:	4-8 ohms.
ENCLOSURE:	University's exclusive RRL tuned ducted enclosure for maximum efficiency with minimum power.
CABINET VOLUME:	2.7 cubic feet.
CONTROLS:	3-step mid-range, continuous tweeter.
POWER HANDLING CAPACITY:	50 watts integrated program material.
AMPLIFIER POWER REQUIREMENTS:	As little as 10 watts due to RRL enclosure design.
DIMENSIONS:	23¾" x 31¼" x 15½" deep (including legs).
FINISH:	Oiled Walnut.

FREQUENCY RESPONSE



Virtually uniform from 25 to 40,000 cps!



20-20,000 cycles per second . . . what it's like to hear them in your living room

The entire chain of components in your stereo high fidelity system has one final purpose: to create certain sound vibrations in your listening area. The closer these vibrations resemble those of the original program, the more "fidelity" the resulting sound will have. The relationship between sound waves, loudspeaker systems, and the human ear is therefore important to a better understanding of high fidelity sound reproducing systems.

Sound may be considered as a compression wave traveling through the molecules of air to the ear of the listener. The ear can hear from about 15 consecutive sets of vibrations (cycles) per second to over 16,000 cycles per second. The low end of this sound spectrum merges into vibrations *felt* by the body, rather than heard as sound. Ability to hear the upper end varies with the individual and age. Some persons have been observed whose hearing extends well beyond 20,000 cps; animal hearing (dogs, bat "radar," some insects) extends even beyond these limits.

OCTAVES Doubling any frequency produces its octave. Standard A is 440 cps; the A above it on the scale is 880 cps. The notes or scale intervals between the octave are chosen arbitrarily. Far Eastern music uses a different set of intervals which sounds as natural to oriental listeners as the Western scale sounds to us. But the frequency-doubling octave relationship is a physical fundamental. Ten octaves span the range of human hearing from 15 to 16,000 cps.

COMMUNICATIONS RANGE Standard A (440 cps) above middle-C makes a good starting point in consideration of sound, since most individuals can easily recall it to mind as the familiar note the orchestra makes when tuning up. Going down two octaves to 110 cps, and one octave up to 880 cps encompasses the *fundamental* tones of most human speech and song. Such tones, however, would be without character or *timbre*—the special qualities that distinguish one voice from another, or a violin from an oboe. These are contributed by the higher frequencies.

They also characterize the sharp explosives and transients which occur in consonants, as opposed to vowel sounds. Adding another octave and a half to the fundamentals—say to 2,500 cps—will in-

clude enough overtones to provide a telephone-like communications channel—adequate for voice, but unsatisfactory for music.

MORE HIGHS By adding another octave of response to the upper range to cover 110-5,000 cps, the response range of the ordinary radio or radio-phonograph is attained. Now the top fundamentals of almost every musical instrument can be reproduced, plus enough overtones to give music a fuller, more pleasing quality. But reproduction still does not sound natural. Applause and almost every sharp percussive sound almost muffled. Woodwind instruments cannot easily be identified. Some consonants are still not clear to the ear. The whole effect seems veiled, and there is also a noticeable deficiency in the bass range. The rhythm sections of the orchestra seem to fade away, making this type of sound reproduction not too satisfactory for dancing.

LOW BASS Bass notes on the piano, string bass, bassoon, tympani and organ reach down almost two more octaves to approximately 30 cps. This range is the "foundation" or support for the orchestra . . . creating the richness and power of the symphony, the beat of the dance band. Without these deep-down low frequencies, even beautifully smooth, extended treble will sound tinny—because it is out of balance. Good woofers, in enclosures designed to exploit their full bass potential, are therefore essential to any true high fidelity stereo system.

UPPER HIGHS The range above 5,000 cps contains the identifying harmonics of consonant sounds, hand clapping, footsteps, key jangling, many others. But most important, this range contains the upper harmonics of voice and instruments. These are the frequencies which add that brilliant, tingling *naturalness* to sound reproduction that the true music lover demands.

Tweeters must be able to reproduce such extremely high vibrations smoothly and evenly without introducing spurious peaks. And they must be able to disperse them throughout the listening area, since high frequencies ordinarily tend to "beam" and would not otherwise be heard in many off-side positions.

"PRESENCE" AND "BRILLIANCE" The ear is most sensitive to frequencies from 1,500 to 4,000 cps. Clearly defined, augmented reproduction in this range adds the illusion of "presence," a "you-are-there" quality to the sound. The higher overtones make music blossom into true naturalness, with sparkling brilliance. But here also is the range where sound absorption losses may be most pronounced, depending on room construction and furnishings.

That is why University loudspeaker systems and individual loudspeakers include level controls for "Presence" and "Brilliance." These make possible a *uniform* lowering or raising of the range—entirely different from the amplifier's "roll-off" type tone controls—and equally important for musical enjoyment and adjustment to room acoustics.

TIPS on how to choose your speaker system.

What do you need to know before going to see your University high fidelity dealer? Very little more than a general idea of how much you want to spend and how much space you can provide. Technical knowledge and ability? Very little more than the ability to turn on a switch. Many people, however, *like* to find out a little about a subject like this in advance, and with high fidelity it's both easy and fun.

Read the hi-fi magazines — *High Fidelity*, *HiFi/Stereo Review*, etc., as well as the special annuals; you will not remain a neophyte for long! Next, write to manufacturers for their literature. University will send you colorful brochures, detailed 'specs', as well as instruction sheets so you may learn how to build your enclosure, install and connect your speakers, even before you walk into a hi-fi store!

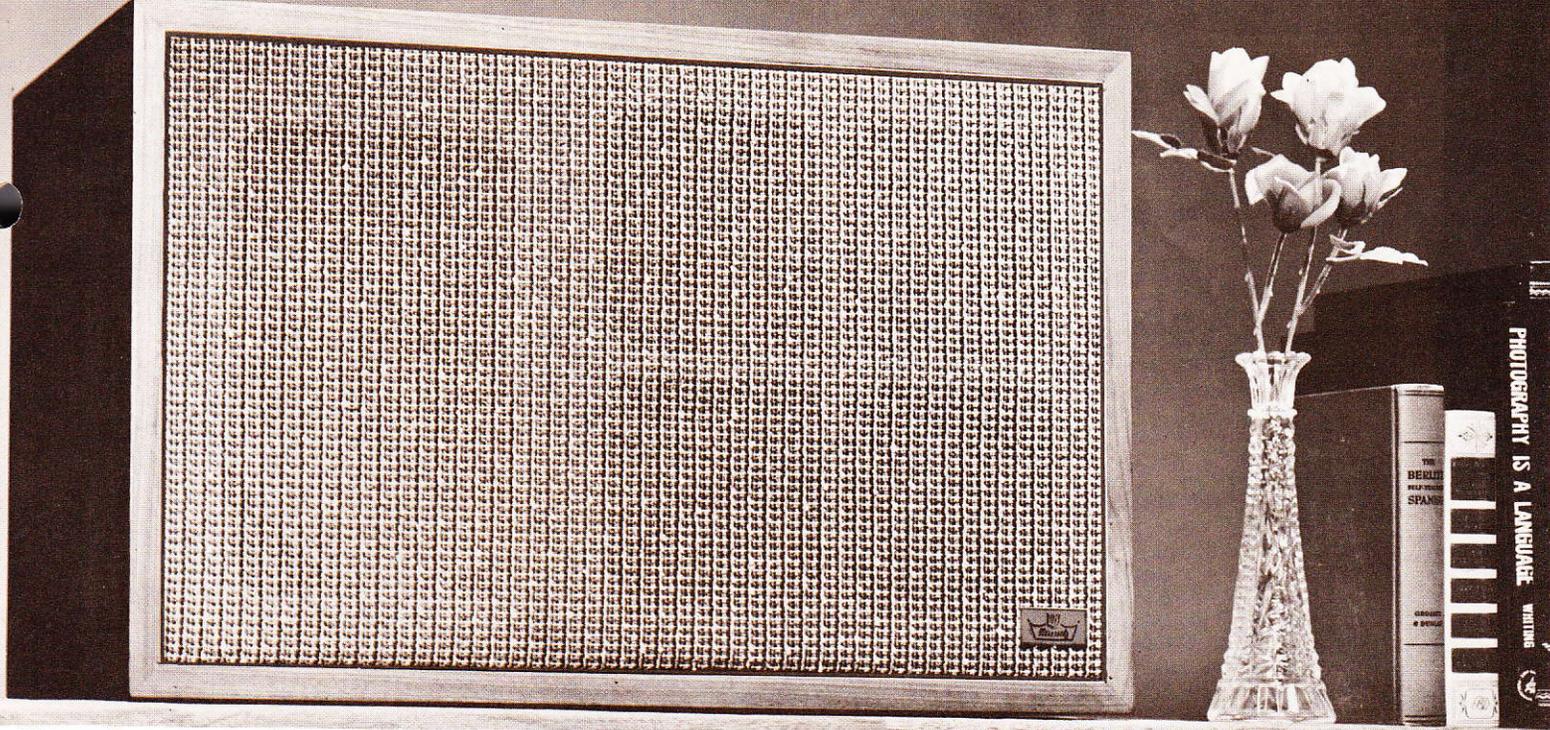
When you do finally visit your dealer, therefore, it need not be to find out anything about *hi-fi equipment* at all — but rather to find out about that last missing link — *yourself!* For in the last analysis, only *you* know what you like. How do you find out what you like? You *listen!*

Most dealers have switching systems which permit them to let you hear and compare various combinations of phono cartridges, amplifiers, tuners and speakers. ■ Listen to them with your own records, as well as your dealer's records. ■ Be sure to have him switch from one speaker system to another, in quick succession. ■ Test each one for clarity by trying to pick out the individual instruments of an orchestra. ■ Test extreme response by having your dealer switch from the bottom bass of an organ to the heights of the violin; test mid-range response by listening to voice solos. ■ Note the difference, if any, between the "acoustic decor" of the dealer's listening-room and your own. For example—if the dealer's room is sensibly carpeted and draped, the sound produced by the system you choose will be virtually identical to the sound it will produce in *your* listening-room, if similarly decorated. Allow for any acoustic decor differences that may exist, by remembering that an excessively draped and upholstered room will de-emphasize highs and make the bass sound somewhat dull; while a "hard" room—bare floors and walls, etc.—will make a speaker system sound overly brilliant.

Is that all there's to it? Of course. Follow these few simple "shopping" rules and you will be *certain* to choose the speaker system that's best for *you*. You do not need a degree in electronics. You *do* need a genuine love for music and a willingness to listen, to compare, and to have faith in the judgment of your ears. It is the only judgment that counts.

Last but not least, do not be influenced by "recommendations." Pick out the speaker system that sounds best to you. We hope it's University.

(continued on page 15)



The bookshelf speaker system comes of age . . .

UNIVERSITY RRL*

Balanced Sound Speaker Systems

The Senior II

The Senior II is a new RRL three-speaker system designed for those who prefer not to be deceived by exaggerated high or low frequency response (so impressive at first hearing but so fatiguing soon after!) Here is natural, *balanced* sound—lows, middle tones, highs . . . all in perfect harmony with the original performance. Again unlike ordinary bookshelf systems with their somewhat restricted sound quality, the sound of the Senior II is free and open. Its bass tones resound with authority; its mid-range will give you that uncanny "in person" feeling; its highs are transparent and pure, as only the Sphericon Super Tweeter, with its up to 40,000 cps range, can so effortlessly provide. One reason: exclusive RRL tuned cabinet matched to specially developed University components assure *maximum* sound output over the entire audible range, *minimum* (virtually immeasurable) distortion!

NOTE: University's new ultra-compacts may be used with amplifiers rated up to 30 watts per channel, BUT . . . unlike many costlier speaker systems . . . they will provide maximum full range performance with moderately priced, low power 10-watt amplifiers!

The Companion II is a new RRL three-speaker system for the music lover and audio purist who can appreciate realistic, "uncolored" sound, but must be dictated by a limited budget. The Companion II lets you hear the music—and *only* the music! Totally devoid of fatiguing cabinet sound, or false emphasis, it will outperform any other system in its price range. For proof, ask your dealer to let it "speak" for itself!

The S-80 is easily one of the most popular ultra-compact 2-way High-Efficiency speaker systems made. An ideal solution to extremely limited space and budget problems, either paired for stereo or as an 'add-on' to enjoy stereo with your present system, or as an extension system. *Low-power amplifier owners, please note:* the S-80 achieves optimum performance with as little as 5 watts!

SENIOR II COMPONENTS: new Ultra-Linear response 12" woofer, new 3½" mid-range and the universally top-rated Sphericon Super Tweeter. **FREQUENCY RESPONSE:** 30 to 22,000 cps. **IMPEDANCE:** 8 or 16 ohms. **CROSSOVER:** at 3000 cps. **CONTROLS:** adjustable Brilliance. **DIMENSIONS:** 25" x 15½" x 12½" deep. **FINISHES:** oiled walnut on all four sides, and unfinished. May be used anywhere, as highboy, lowboy, on a shelf, table or floor. **Shpg. wt.:** 44 lbs.

COMPANION II COMPONENTS: new Ultra-Linear response 10" woofer, new 3" mid-range and new 3½" tweeter. **FREQUENCY RESPONSE:** 35 to 18,000 cps. **IMPEDANCE:** 8 or 16 ohms. **CROSSOVER:** at 3000 cps. **CONTROLS:** adjustable Brilliance. **DIMENSIONS:** 24" x 13½" x 11½" deep. **FINISHES:** oiled walnut on all four sides and unfinished. **Shpg. wt.:** 30 lbs.

S-80 COMPONENTS: 8" woofer, 3½" mid-high frequency speaker and 6 db/octave crossover. **RESPONSE:** 45 to 14,000 cps. **FINISHES:** mahogany, walnut or fruitwood (also unfinished). **DIMENSIONS:** 21¾" x 11¼" x 9¼" deep. **Shpg. wt.:** 17 lbs.

RRL means Radiation Resistance Loading, a name chosen by University for a loudspeaker enclosure design which vastly increases the capabilities of the system at low frequencies. This design utilizes a tuned duct, proportioned so that in conjunction with the compliance (springiness) of the air in the enclosure . . . the air in the duct vibrates substantially "in step" with the cone over a wide range of bass frequencies. This increases the radiation resistance of the system as a whole, so that for a given distance of cone movement the speaker can move *more* air and produce *more* bass sound power. With *less* cone movement required, the motor system of the speaker can be designed so that for a given amount of amplifier power it produces more force to drive the cone thereby assuring maximum efficiency.



Above: The Companion II

Below: The S-80

