

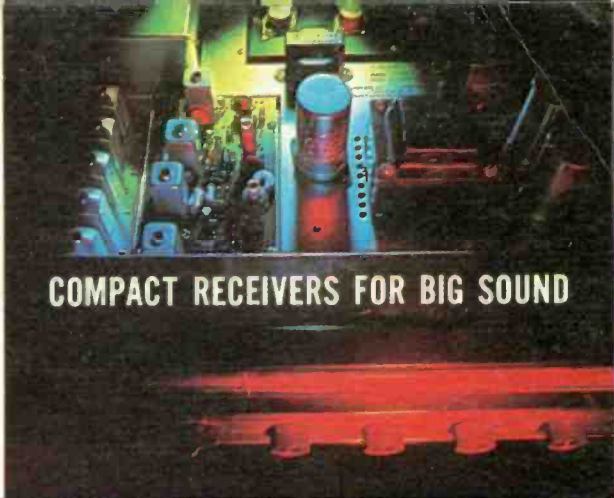
NEW EQUIPMENT GUIDE

1966 EDITION

stereo

PUBLISHED BY high fidelity MAGAZINE

ONE DOLLAR



COMPACT RECEIVERS FOR BIG SOUND

The experts discuss...

RECORD PLAYERS

TAPE RECORDERS

**TUNERS AND
ANTENNAS**

AMPLIFIERS

SPEAKERS

**SYSTEMS AND
INSTALLATIONS**



BRIAN CLIFT COLLEGE
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be one! costs about \$3.00 a month
more than a common stereo.



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INFORMATION

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Command
records
Command
CLASSICS
Command
TAPE



WORLD LEADER IN RECORDED SOUND WORLD LEADER IN RECORDED SOUND WORLD LEADER IN RECORDED SOUND

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12 new best selling Command
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ONLY \$2.98

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7 complete selections from 6
different William Steinberg Al-
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ONLY \$2.98



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THESE ALBUMS ARE NOT AVAILABLE IN STORES

The complete albums from which these selections were chosen are available at record stores. However, to obtain your Command Sampler Albums (which are not sold in stores), simply mail coupon today. You may select either the Popular or the Classical Album for only \$2.98 each. (Command Stereo Albums are sold nationally up to \$5.98 each.) If you wish, you can take advantage of an additional saving by ordering both albums for only \$5.00. Your albums will be shipped postpaid—Command pays all postage and handling. And, you may order as many albums as you wish, but don't delay... mail your order today!

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- DISCOTHEQUE DOLL (Keyboard Kaleidoscope)
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Gentlemen: Please send me the albums I have checked below. I understand Command pays all postage and handling costs.

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Enclosed is \$ _____ (Check or Money Order)

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Detailed illustrations and descriptions of all four models are found in the new 32-page Comparator Guide. For your complimentary copy, write Garrard, Dept. GY-1505, Westbury, New York 11591.

1966 EDITION

stereo

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A glossary.

Cover by Roy Lindstrom
Room photo: wall-hung furniture by Royal System



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SOMEDAY, THERE MAY BE OTHER FULLY AUTOMATIC TAPE RECORDERS LIKE THE NEW CONCORD 994



The 994 gives you automatic reversing Plays or records automatically three different ways Stops by itself where you want it to Threads itself automatically And, the 994 is available now!

With the transistorized 994, Concord introduces a new dimension to tape recording. Some might call it modernization, some might call it automation. We think of it as *convenience*—in playing, in recording, in starting and stopping, in threading, in hours of uninterrupted listening. You can't compare it to anything because the 994 is as different from the conventional stereo recorder as the old crank-type Gramophone is from the modern record changer.



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After all this, we didn't just stop in designing the 994. We kept going. As a result, the 994 offers superb performance and every conceivable feature required for your listening and recording pleasure. Here's a brief sample: three speeds with automatic equalization, four professional heads, two VU meters, digital tape counter, cue control, sound-on-sound, exclusive Concord Trans-A-Track recording, 15-watt stereo amplifier, professional record/monitoring system. The 994 may also be used as a portable PA system, with or without simultaneous taping.



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The 994 is priced under \$450.* An identical recorder, Model 990 comes without speakers or microphones and is priced under \$400.* Both are at your dealer's now. So why wait? Drop in for a demonstration and find out for yourself what *fully automatic tape recording by Concord* is all about! Or, for complete information, write Dept. S.

For Connoisseurs of Sound

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CONCORD 994

CONCORD ELECTRONICS CORPORATION, 1935 Armacost Avenue, Los Angeles, California 90025
IN CANADA: Magnasonic Industries, Ltd., Toronto/Montreal

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The New E-V 1178.

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ADC-40 Pritchard Tone Arm



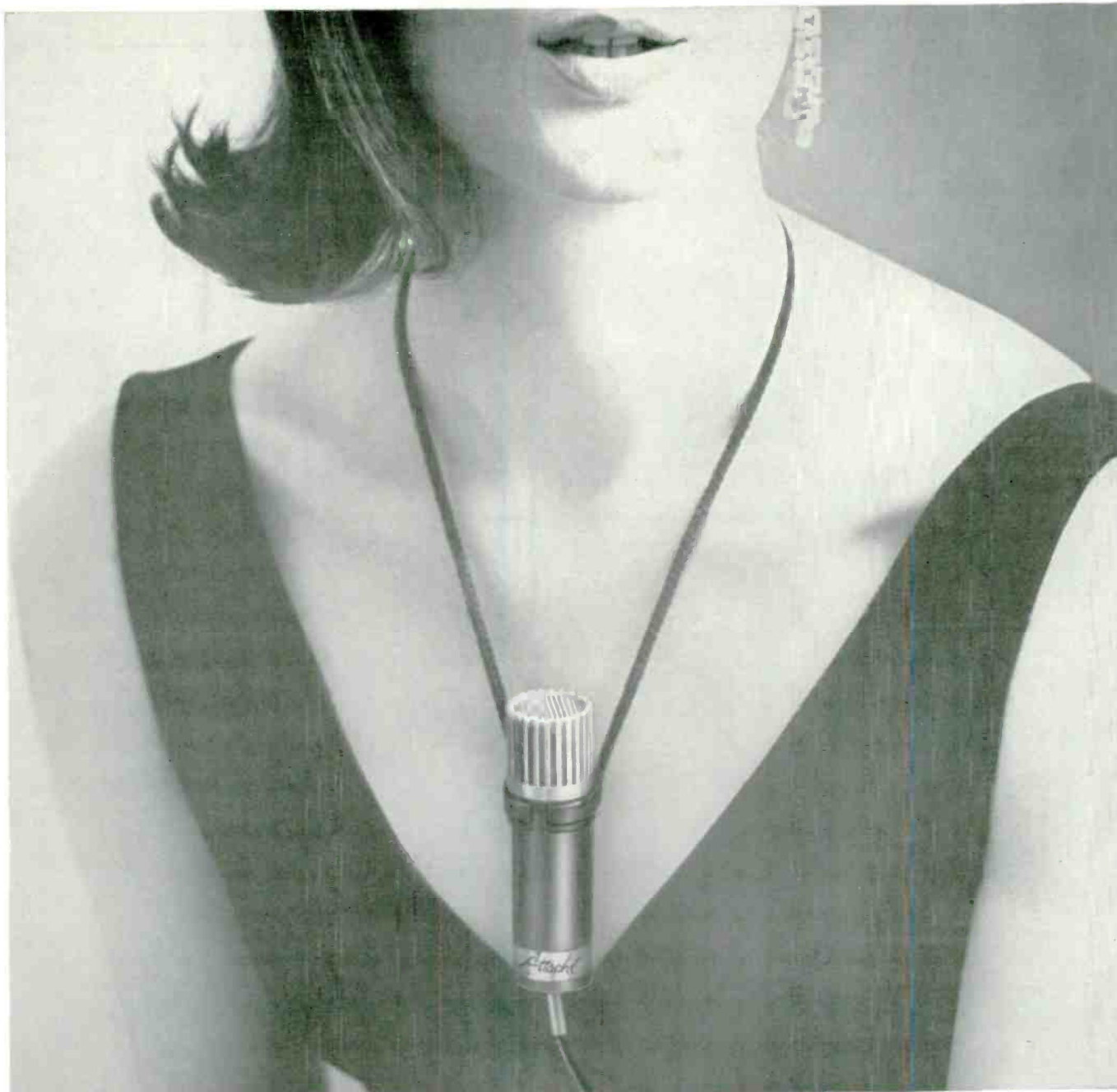
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UNIVERSITY SOUND
A DIVISION OF LTV LIND ALTEC, INC.



CIRCLE 53 ON READER-SERVICE CARD



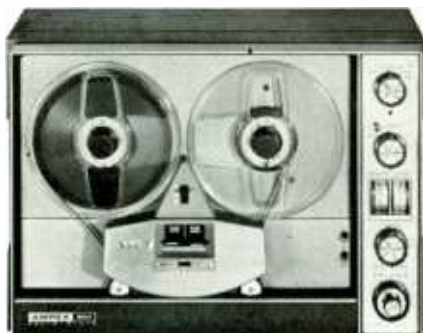
Shopping for
a tape recorder?
Here's all
you need to know:

Ampex is the one professionals use!

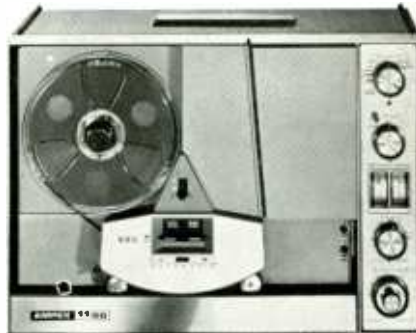
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ask anyone who knows

AMPEX

CIRCLE 3 ON READER-SERVICE CARD



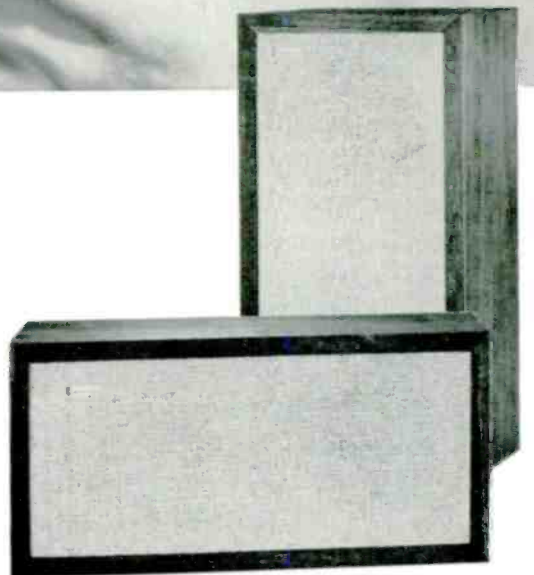
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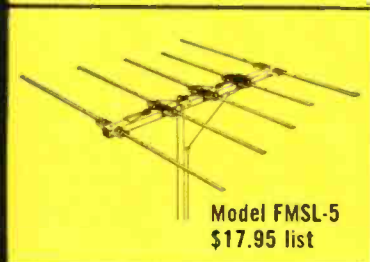


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\$24.90 list**

Featuring FINCO's Exclusive Gold Corodizing



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Discover the difference that a FINCO Antenna makes in FM sound. FINCO's maximum gain means a substantially greater signal over the full 88 to 108 MC band. Regardless of your location, you bring in more stations — with exacting station separation — free from multi-path reflections. Choose a superb FINCO FM Antenna, and get perfect FM sound.

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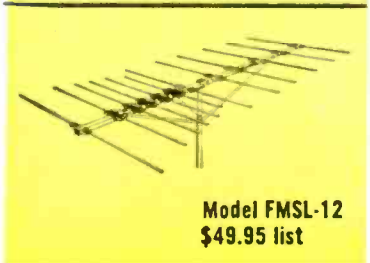
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Write for Bulletin #20-213, Dept. HF



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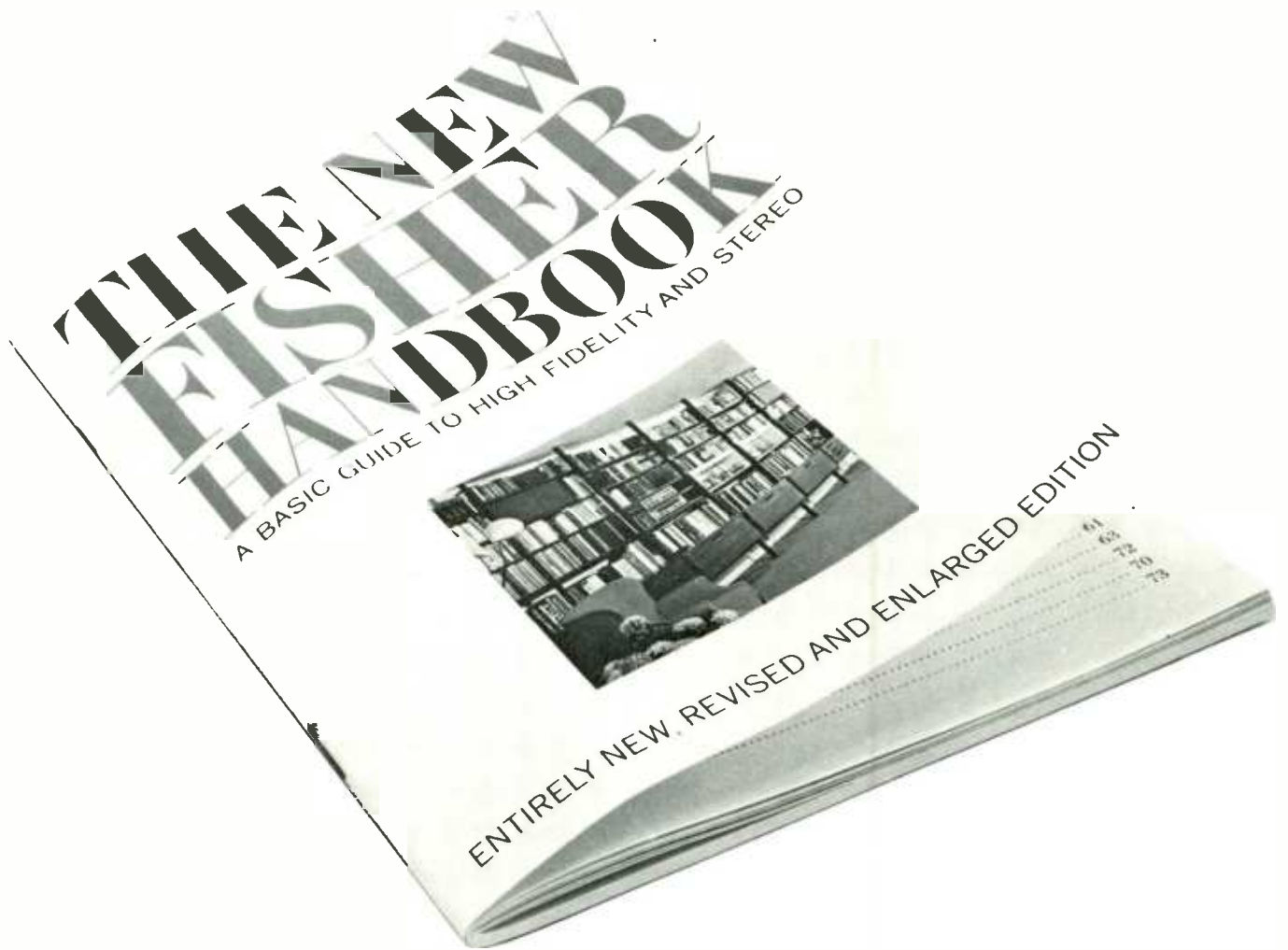
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For all these reasons, the only choice today for the perfectionist rests with either the world-renowned DUAL 1009, or the even more advanced DUAL 1019. Just some of the design and operating features of both models are presented here, to help you decide which one best meets your own requirements. If you had been considering anything but a Dual, we suggest you bring this guide with you to your authorized United Audio dealer. There you will find the comparison even more enlightening.



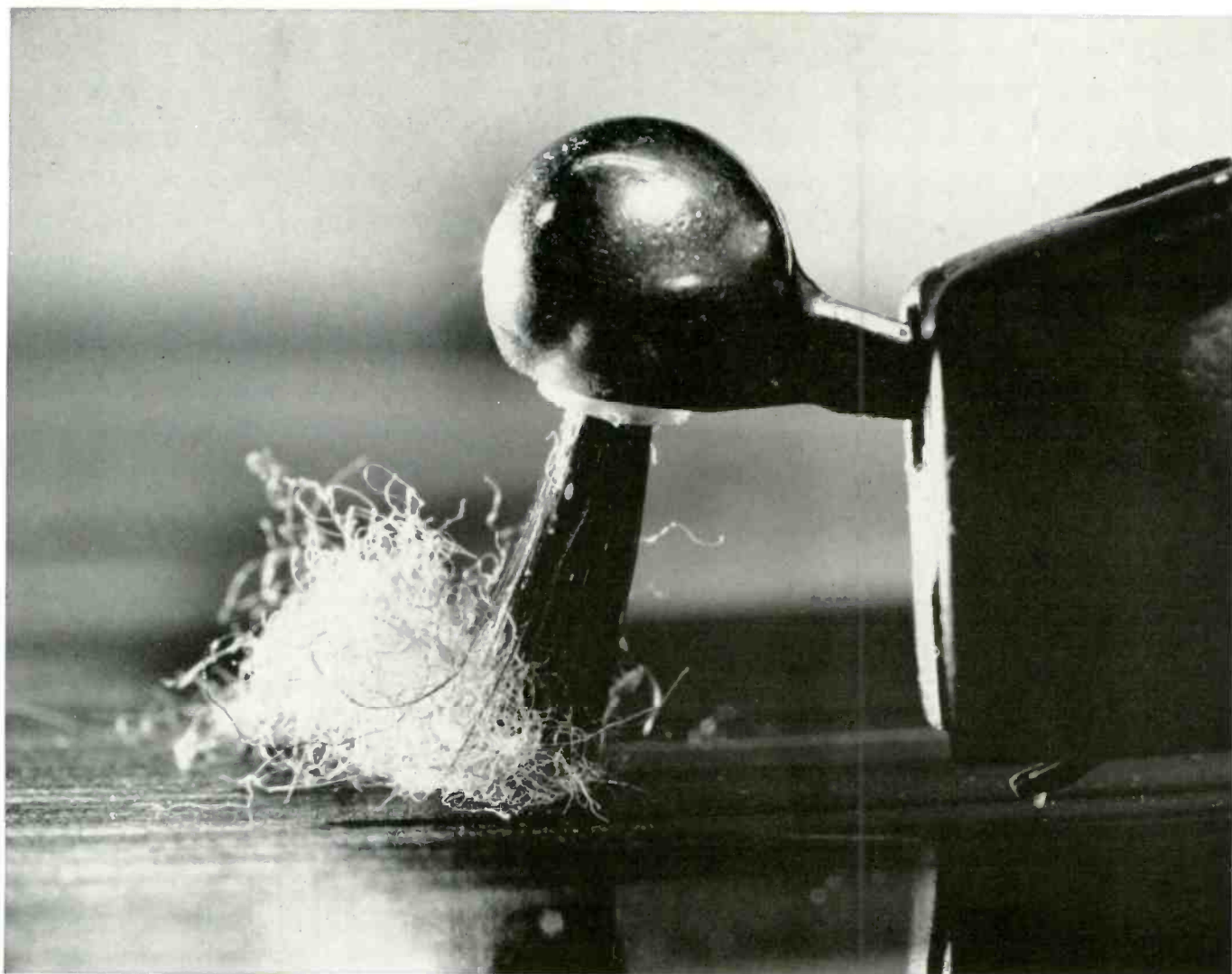
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You are looking at the world's only true **longhair** cartridge.

In this unretouched photograph, the long, black hair of the brush built into the new Stanton 581 is shown in action on a rather dusty record. Note that all the loose lint, fuzz and dust are kept out of the groove and away from the stylus. That's why the Longhair is the ideal stereo cartridge for your Gesualdo madrigals and Frescobaldi toccatas. Its protective action is completely automatic, every time you play the record, without extra gadgets or accessories.

The stem of the brush is ingeniously hinged on an off-center pivot, so that, regardless of the stylus force, the bristles never exert a pressure greater than 1 gram and always stay the right number of grooves ahead of the stylus point. The bristles provide just the right amount

of resistance to skating, too.

But even without the brush, the Stanton 581 Longhair is today's most desirable stereo cartridge. Like its predecessors in the Stanton Calibration Standard series, it is built to the uniquely stringent tolerances of Stanton professional audio products. Its amazingly small size and light weight (only 5 grams!) make it possible to take full advantage of the new low-mass tone arms. And its frequency response is factory calibrated within 1 db from 20 to 10,000 cps and within 2 db from 10,000 to 20,000 cps. Available with 0.5-mil diamond (581AA) or elliptical diamond (581EL); price \$49.50.

For free literature, write to Stanton Magnetics, Inc., Plainview, L.I., N.Y.

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The Magic of Stereo

AS WE ALL KNOW, the Space Age has arrived—and it has come in the field of sound reproduction too. To recorded music, stereo has added a spatial quality never before present even in the best of monophonic (single-channel) reproduction.

In recording, the “space” is captured by the use of several microphones, carefully chosen and deliberately placed for a desired effect. Effects vary with the nature of the program and the tastes of the conductor. In general, however, the idea is that each microphone picks up one particular instrument or group of players and, at the same time, a part of the sonic output of others. In addition, any number of microphones may be used to record the ambience of the studio or hall—the so-called room effects of the performing environment.

The resultant replica of the performance actually exists in discrete though related parts: each sound track, or channel, contains somewhat different sonic versions of the same event. Neither channel is in itself complete. Yet taken together, they comprise a fullness and roundness of sound that lend the breath of life to recorded music.

On playback of such material, the spatial quality of the program is maintained by the dual-functioning phono cartridge (or tape head), the twin channels of a stereo amplifier, and a pair of speaker systems. As the sound finally emerges into the listening room, a near-miracle occurs: sound emanates not only from the sound sources represented by the speakers, but from “non-sound” sources also—that is to say, from the space around and between the speakers. This phenomenon—sometimes described as “pushing the walls apart” or “enlarging the room”—creates an acoustical perspective that lends a sense of realistic spacing between various instruments and performers even as it provides a cohesiveness that unites everything. In a word, the sound is heard well throughout the room rather than confined to the area near the speaker cabinet.

While this sonic magic results from the use of more than one channel in recording and on playback, the extent to which the illusion succeeds, and the degree of long-lasting enjoyment it can offer to the musically oriented listener, depend largely on the quality and accuracy of the equipment used for producing it. There are different grades

of stereo just as there are of monophonic sound. The best grades are what we call “high fidelity”—characterized by low distortion (so that nothing is added to or taken from the original), wide frequency range (so that all the fundamental tones and overtones are preserved), and uniform response (so that no one part of the musical spectrum is emphasized or de-emphasized with respect to everything else). The equipment discussed and illustrated in this volume is designed to meet these basic requirements: it comprises the cream among the various types of stereo gear now available, or about to become so.

And this brings us to another aspect of the magic in stereo. At one time, the “best on the market” meant costly, bulky, often ungainly, and fairly complicated equipment offered by a small, somewhat arcane group of manufacturers known as the “high fidelity industry.” Things have changed. The same people are still manufacturing genuine high fidelity equipment, but their names and activities are no longer something of an insider’s trade secret, but real household bywords. More important, the product form has become more pleasing even while performance has been upgraded. The fact is, today’s finest stereo equipment comes in a greater variety and abundance—and at relatively lower cost—than comparable mono equipment of a decade ago. High fidelity stereo can be enjoyed as before from completely separate components—or from combination units (such as the increasingly popular receiver or tuner/amplifier), or, on a more modest but still high fidelity level, from modular systems in which a turntable is combined with an amplifier and sometimes a tuner as well.

These new trends in audio design stem directly from transistors and related solid-state circuit devices, which have brought cost down even as they have upgraded performance. At the same time, the familiar vacuum tube remains a definite part of the equipment scene, used either in combination with transistors or without them. The following pages explore this new world teeming with high quality equipment and make it abundantly clear that whether one prefers models using transistors or tubes, a system made of separates or one that is integrated and compact, the magic of high fidelity stereo is more readily available today than ever before.—N.E.



by I. L. GROZNY

A RECORD YEAR FOR RECORD PLAYERS

THE RECORD PLAYERS in the shops today are vastly better than those of a few years ago—better because they have been designed successfully to solve old problems in new ways. Take the matter of speed accuracy as a starter.

If the turntable spins too fast, the music grows sharp or shrill, the tempo frenetic; too slow, and the tempo sags, the pitch goes flat. Today's high-grade turntables—with their improved motors, transmissions, and balanced platters—have this problem licked. Many tables feature a built-in fine speed adjustment to correct any remaining pitch variations, or to tune the record's pitch to match that of home piano or organ, for harmonious play-alongs.

Actually, speed constancy is more important than speed accuracy: it takes a trained ear to detect a B major piece played in C or B flat, but *any* ear is offended by the slow variations known as "wow," or the fast, gargly ones called "flutter." Neither effect is likely to be detected on today's equipment, except in the event of a turntable out-of-order or a record badly warped.

The author is a long-time record collector and frequent contributor to this journal and to HIGH FIDELITY Magazine.

Spin your discs on machines built with modern precision

Rumble, a low-pitched growling noise, is the turntable designer's most intractable problem. Rumble originates as vibrations from shaky motors, worn bearings, or eccentric moving parts and can be transmitted along with the musical signal via the platter, cartridge, and tone arm right into the amplifier and speakers. There is more chance of hearing rumble in today's systems because of the improved low-frequency response of speakers and because stereo cartridges reproduce vertical as well as lateral rumble. How much rumble will be unobjectionable depends on the bass response of the speakers: make sure the table you buy is good enough for your present speakers or any you plan to trade up to soon.

Designing out the rumble is a matter of designing in refinement in bearings, motors, suspension, and isolation techniques. Some tables use two-piece platters: the outer section is isolated from the inner, driven platter by a cushion. Others add thick foam turntable mats for isolation. Another approach is to combine an ultralight platter with a quiet, "clock-type" motor. Sometimes rumble creeps into the recording process: if your turntable sounds rumbly, make sure the record isn't at fault by comparing it with another disc.

Acoustic feedback (where the speaker shakes the table, the table shakes the needle, and the needle sends the noise back through the speaker) and floor-shake are less troublesome today than might be thought possible in view of the light tracking forces now commonly used. Improved suspensions and well-balanced arms get much of the credit. Balanced arms also make turntable leveling less critical than in the past. Tilting a table which has a truly balanced arm will neither change the tracking force nor pull the arm across the record.

Side thrust, born of tone-arm geometry and stylus friction, is a force that tends to pull the stylus toward the center of the record. About 10% of the tracking force, side thrust makes little difference in mono reproduction; but in stereo it affects channel balance, and wears both stylus and record unevenly. Many of the latest arms, including separates and those integrated with a turntable, counteract this force by the use of weighted "bias compensators" or "antiskating" adjustments.

Today's arms are lighter, and have less inertia and lower pivot friction for better tracking at the lighter stylus pressures recommended for modern stereo cartridges. Indeed, such arms would be impractical without high-compliance cartridges. A stiff, low-compliance cartridge in a low-mass arm would set up a resonance in the audible range, where tones on the record could excite it into violent, chattering motion. Raise the mass or the compliance and the trouble disappears.

The arm has subsidiary resonances independent of the cartridge's compliance, which can cause frequency peaks or dips in the cartridge output. Tone arm designers solve this problem in several ways,



New Rek-O-Kut is manual turntable with integral arm, both sharing same suspension under plate.



Garrard AT60, offered by British Industries, is four-speed automatic with intermix feature.



Garrard A70 is four-speed automatic that has bias adjuster; bases for these units optional.



From RFS Industries comes the Balfour Princess, a new British-made compact four-speed automatic.



Another new British-made player is the BSR Model UA50 Minichanger; compact, four speeds, intermix.



Low-cost four-speed automatic, Model AC-33, is offered by Lafayette; has the intermix feature.



Bogen B62 is manual turntable with an integral arm; has a continuously variable speed control.



From United Audio, the latest Dual—Model 1019; has all features of Dual 1009 plus sophisticated bias adjustment; built-in cueing lever; stylus overhang control. Other Duals also are available.

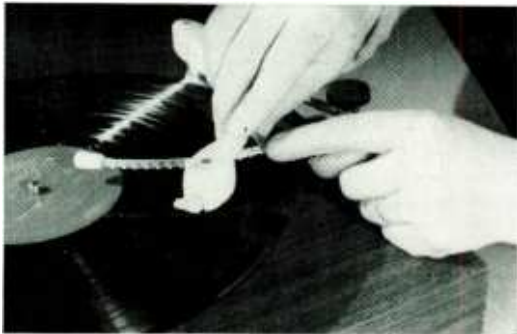
such as by packing hollow arms with nonresonant damping materials or carving them from wood.

The recording stylus that cuts the master record rides in a straight line from the outer edge to the center, describing a true radius. Thus, the cutter always vibrates exactly at right angles to the groove. Ideally, the stylus of a pickup used for playback should vibrate at the same angle, for minimum distortion, groove and stylus wear. However, the cutter was propelled across the disc by a screw on an overhead carriage. The pickup arm swings the pickup stylus in an arc across the record; it can only be perpendicular to the groove at a single point. At all other points, there is necessarily some degree of "tracking error."

For a straight arm, the point of zero tracking error would occur at the record's center, where there is no groove to track. By bending the pickup head so that it is at an angle to the axis of the arm, the designer moves the point of perfect tangency to some usable area along the groove. Furthermore, by shifting the arm's pivot a fraction of an inch toward the turntable center, so that the stylus overhangs that center slightly, and adjusting the arm's offset angle for its



Acoustic Research AR-XA turntable comes with integral arm, base, dust cover; manual, two-speed model with recently improved suspension; stylus overhang adjustment; controlled descent of arm.



Aurial pickup control comes in two models—for automatic and for manual turntables. Device permits precise cuing of records and lowering of pickup.



Elpa's PE-34 is four-speed manual with integral arm; has speed vernier control; base is optional.

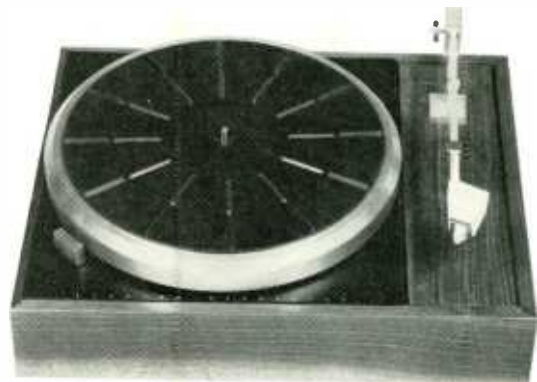
new position, the tracking error is further diminished. Shifting the area of minimum tracking error toward the crowded inner grooves—where tracking is most critical—decreases over-all distortion, even though the error at the outer grooves shows an increase by comparison.

Naturally, a small error in mounting the tone arm can upset all these careful calculations, and greatly increase distortion. Some tone arms contain an adjustment for making minor changes in mounting a cartridge to permit precise overhang settings for various makes. Others offer a compromise fixed setting suitable for most models. And at least one company has announced a turntable with an arm that moves the pickup straight across the record in an effort to side-step altogether the questions of tracking error and stylus overhang.

At one time, only huge, heavy, and fairly costly studio-type turntables—to which one could add a separately purchased arm (of the same, or alternate, manufacture)—represented the choice for the audio perfectionist. The preassembled automatic players simply were not built to the highest standards of precision. They had rumble, wow, and flutter as a

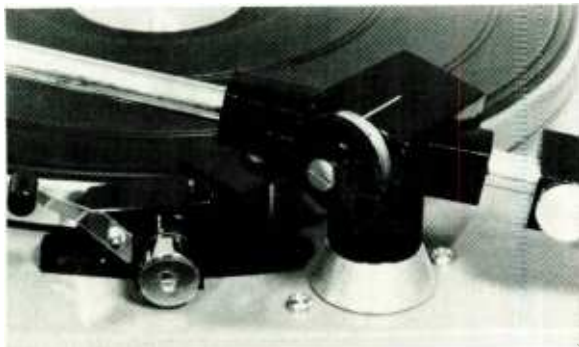
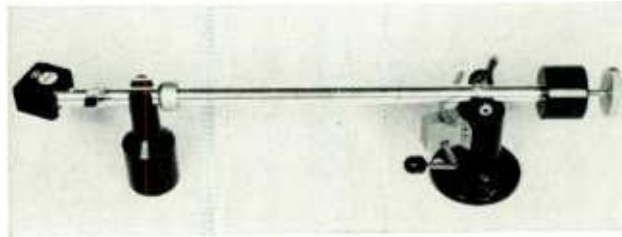
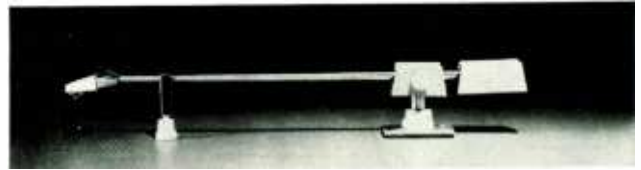


Marantz SLT-12 is two-speed manual with integral arm that is driven by gears and extends across true radius of record. Expected to become generally available some time in 1966. A model for use with other cartridges is also scheduled.



matter of course. Their tone arms were short, heavy, resonant monsters, that sometimes dragged their way across the grooves. Without the high, groove-devouring tracking weights (you measured them in ounces, not in grams) that then prevailed, the tone arm could not be hauled in against the resistance of the automatic trip mechanism. Tracking pressure, tracking angle, and sometimes even turntable speed varied widely between the first and last record of the stack. Certainly less than desirable for monophonic records, such machines just weren't in the running for handling stereo discs. Accordingly, the picture has changed and we now have a new breed of equipment, known today as the "automatic turntable." The best of them are every bit as good as some component arms and turntables. Speed is accurate and constant; rumble, low; wow and flutter, insignificant. Stylus tracking angle, more important now that 15° is becoming standard, varies only slightly from top to bottom of the record stack. New trip mechanisms and improved pivots free the arms to track and trip at fractions of a gram. Improved changer mecha-

At top of page, the Empire 488, a three-speed manual with Model 980 arm. Left column, top, the Benjamin Miracord 40H, a four-speed automatic with hysteresis-synchronous motor. Below, from Thorens via Elpa, the TD-150AB, a single-speed manual with platter and arm on a common suspension. This column, top, the latest Thorens TD-124, Series II: four-speed manual, vernier speed control, side-board mounting for tone arm. Arm shown is new Thorens. Directly below, the Stanton 800B; magnetically suspended single-speed platter plus Stanton arm and cartridge on side-board. Arm and cartridge each available separately as well.



At top, the Shure/SME arm; recent changes include new weight adjustment, choice of shells; arms now come assembled. To its right, the Euphonics arm with U-15 pickup installed; cartridge alone is available; system uses external signal source for generating voltage to feed to preamp. Center, the Decca/IMF arm and its cartridge; arm has a built-in cuing lever; cartridge alone available for use in other arms. Just above, the cuing device offered as an accessory for use in Miracord turntables. Above right, the Castagna arm offered by Scope for use with manual turntables: has magnetic suspension at its pivot, provisions for numerous adjustments, including tracking angle.

nisms lessen center-hole wear. And the arms are longer, more accurately balanced, and often use rubber-damped counterweights to minimize resonance. Thanks largely to these new arms, today's automatics are more vibration-resistant, and are unaffected by off-level installation. They permit cartridges to be more easily interchanged, or removed for examination and cleaning: their tracking weights may be dialed directly, without the need for extra gauges. With an interchangeable, short center spindle, this new type can be used as single-play tables, too. Their automatic set-down feature is especially useful, since lightweight pickups can slip so easily out of the hand.

Today's excellent automatics, then, do everything that the older automatics did, and more, but they do it much better, as well as many of the costlier separates used to. On the other hand, the improved separates offer a wide choice of turntable-arm combination possibilities to suit one's personal taste, and to permit the experimenter or perfectionist a unique kind of equipment option. For instance, one can install several arms around the same turntable, an

Representative sampling of modern stereo disc cartridges: from top, Euphonic U-15 uses silicon elements; Dynaco B&O Stereodyne III, a magnetic type; the Pickering V-15/AME-1, a magnetic with elliptical stylus; the Stanton Longhair Model 581, one of this company's calibration standard series fitted with a brush to keep groove and stylus clean; the Shure M55E, with elliptical stylus, essentially a lower-cost version of same company's V15 cartridge.



arrangement that can prove handy for dubbing sound effects (for instance, with a mixer to fade from one arm to the other, you can make a short "track" last forever, leapfrogging arms as you cross-fade their signals). More commonly, they're used for cartridge and arm comparisons, instant switching from one type of stylus to another. Owning separates also permits you, as technical advances—or your budget—warrant, to replace arm or table separately, so that your system always reflects "the state of the art"—a point of particular pride for many audiophiles.



Automatic or manual, preassembled or combined from separates, many of today's record players offer four speeds: 16 $\frac{2}{3}$, 33 $\frac{1}{3}$, 45, and 78 rpm. Of these four, the slowest is used for "talking books" and other nonmusical recordings; 78-rpm discs have not been made in the U.S.A. for years; 45 rpm has been largely for pop singles, although a few 12-inch stereo discs have been released at 45 rpm on a limited, almost experimental, basis. The speed of 33 $\frac{1}{3}$ rpm remains of course the standard for modern records, both mono and stereo. In fact, the record industry even now is considering 33 $\frac{1}{3}$ rpm as the ultimate standard for all discs, including 7-inch singles of pop material. For one who owns older records of the various speeds, the choice of a multispeed turntable would naturally be indicated; for the new buyer the speeds other than 33 $\frac{1}{3}$ rpm would of course be of marginal value.



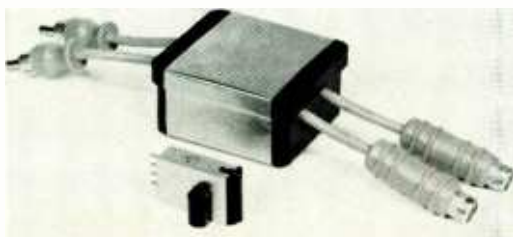
Cartridges

Whatever record player you choose, you'll need a device to convert the stylus motions into an electrical signal: a cartridge. There are several types with different design approaches used for generating the signal. What matters most—in any type—is the skill with which it was engineered and the care exercised in its manufacture. The big difference in today's cartridges will usually be found more in the stylus and its connections to the generating or modulating elements than in the elements themselves.

High compliance is a common—and necessary—feature of today's better cartridges. The higher the compliance, the more easily the stylus can follow



From top, the Empire 888; with elliptical stylus, the 888PE; with polished conical stylus, the 888P. Next, the Grado A elliptical stylus system that includes external signal booster. Center, the ADC 10E, new elliptical stylus pickup from Audio Dynamics. Next, the Ortofon, available with conical or elliptical stylus; signal booster built into rear section. Finally, the Sonotone Mark IV, a ceramic supplied with plug-in equalizers to suit signal for connecting to magnetic phono inputs.



the groove modulations at low tracking forces. Adequate compliance allows the cartridge to be tracked at 3 grams or less, for minimum record wear. That minimum, however, is only achieved by following manufacturers' instructions—just as too high a pressure digs the stylus into the groove walls, too low a pressure lets the stylus bounce around erratically within the groove: distortion and record wear increase in either case.

The compliant cartridges of today permit the use of lighter arms—and of lighter stylus masses, with less inertia to resist the high-frequency wiggles of the groove.

Styli now come in a variety of shapes and sizes. The old monophonic standards (3-mil styli for 78-rpm records and 1-mil for 33 and 45) have been superseded in general use by the 0.5-mil size for stereo discs, and 0.7-mil "compromise styli" for use with both mono and stereo.

A recent, though relatively costly, development is the elliptical stylus. Although designed primarily for stereo discs, this stylus also is recommended for mono microgroove recordings, inasmuch as it reduces the tracing distortion that results when a curved needle follows the track cut by the chisel-shaped recording stylus.

Another form of tracing distortion occurs when the reproducing stylus works at a vertical angle to the groove modulations that differs from the angle used by the cutter. The industry now seems agreed on a stylus angle of 15°, and most of today's cartridges conform to this standard.

With the trend to lighter arms, cartridges, and tracking weights, stylus wear has become a negligible problem. But styli do occasionally need replacement, and in most cases can be easily changed by the user. The owner of a sizable collection of older records should keep on hand a variety of styli, each suited for a particular kind of disc—including the 3-mil size needed for 78 rpms. In general, however, a good quality pickup fitted with a 0.7-mil stylus will do for stereo and fairly recent monophonic records. In a low-mass cartridge, the elliptical stylus will do even a little better.

by Len Buckwalter

TAPE RECORDERS AND ACCESSORIES

THE TAPE RECORDER has been called the world's single most entertaining and useful electromechanical device. The prospective buyer, facing the variety of models offered today, might also conclude that it is the most confusing. The hyphenated descriptions of basic types and features do not make matters easier, either. The buyer must ponder such terms as sound-on-sound, sound-with-sound, deck-with-electronics, four-track, reel-to-reel, three-head, reverse-play, and so on. A little time spent on "learning the language" may help clear up any confusion as to terms having to do with functions and forms of tape equipment.

A "complete recorder," to begin with, is a self-

**New features and improved performance
are found in the latest models**

contained tape system. Offering all the basic functions of record and playback, it consists of: the tape transport and head assembly; the associated electronics for making recordings; the circuitry for playing them back; and the power amplifier and speakers for listening to them directly. The speakers may be installed in the same case as everything else, or supplied separately housed; often they are part of a lid that fits over the unit.

Recorders also may be purchased in various degrees of completeness, requiring more or less auxiliary external equipment. For instance, many come without playback amplifiers and speakers; to listen to them, one must connect them into an existing playback system (all of today's high fidelity amplifiers have jacks for accepting such signals). A few are in completely "knock-down" format with separate transport unit and separate recording amplifiers that must be interconnected to the transport.

Finally, there is the "tape player"—a deck that plays previously recorded tapes but cannot make its own recordings, unless the owner adds recording head and recording amplifiers—something of more interest to the hobbyist and the professional than to the average owner. Obviously, one's choice of type of tape machine depends largely on personal interests and technical bent.

The physical format in which tape equipment comes does not necessarily determine its quality of musical performance. Excellent models can be found in all classes of equipment. One proviso that applies universally, of course, is that the best sound on playback, from any kind of tape equipment, can be had by jacking the machine into a high fidelity stereo system rather than relying simply on the relatively modest speakers that may be supplied with the recorder. These built-in speakers should be regarded only as an operating convenience, for such uses as monitoring when the machine is used outside the home or away from the main system.

One basic choice at time of purchase of tape equipment is the number of motors; all other things being equal, the more the better. When separate drives are used for various mechanical functions the result can be a transport extremely facile in operation and gentle on the tape. Separate motors for supply reel, take-up reel, and capstan drive pay off by lessening flutter and wow (mechanical disturbances which may become audible during a performance) as well as by improving other characteristics somewhat. The multimotor system, too, tends to have fewer rods and levers to wear out or get out of alignment. Whether this premium is worth the extra cost must be an individual decision. The home recordist can choose from models of professional-grade quality or more modest units which are well designed and capable of a performance creditable on all counts.

Many recent supplementary features are worth appraising for their ability to promote operating



Magnecord 1020 is recent entry from this company boasting styling of appeal to the home recordist.



Roberts 721 houses tape transport and twin preamp chassis in wrap-around that serves as carrying case.



Crown SS700 features push-button controls, built-in mixing, and takes reels up to 10½-inch size.

Broadcast engineer and technical writer, Len Buckwalter has been using tape equipment professionally and at home for years.

At left, the Sony 660, supplied with microphones and detachable speakers. Next, the Norelco 401 with four speeds; one speaker in recorder, another in cover of case. Below it, the Cipher 98; detachable wing speakers and microphones come with the machine. Bottom, a new Zenith; transport and electronics are housed in a walnut cabinet.



convenience or to improve the machine's functions.

Tape Lifter. This device, which holds tape away from the heads during high-speed operation (fast-forward and reverse) greatly extends head life. It also—without the need for you to turn down the level control—eliminates the annoying garble of sound while operating at high speed.

Recording Indicator. The quality of a recording depends largely on how much volume or level is impressed on the tape: the higher the amount the better, up to the point where distortion occurs. The record-level indicator is the guide. There are three common types of indicators: the flashing neon lamp, the magic-eye tube (which glows green), and the VU (volume-unit) meter. Although the meter is the most professional, its needle does not respond fast enough to indicate sudden peaks of sound which may spill into the region of distortion. (Professionals often get around this by relying also on a flashing lamp for indication of peaks.) The neon lamp and magic eye respond instantly to sudden changes in signal level but cannot provide specific numerical values of recording level. For most home use they are perfectly satisfactory. Actually, any of these devices can be useful, once the owner has some experience with a particular tape recorder using a particular type of tape. An additional advantage of the VU meter, however, is that it can serve as a built-in test instrument for making measurements of interest to the technically inclined recordist (such as head alignment and bias level).

Pause Lever. Often during a recording session it may be necessary to stop, then restart the tape. The very act of stopping the machine impresses on the tape a strong transient signal that is heard as a loud click during playback of program material. The pause lever eliminates this annoyance by arresting forward movement of the tape but leaving electronics undisturbed.

Counter. A footage counter enables you to locate quickly a particular section of a tape. The tape is run at high speed until the desired number (noted earlier during recording) appears in a window. A counter also can help you gauge the amount of tape used during any specific recording stint.

Tracks. The advent of stereo, and its need for two tracks simultaneously, has made the $\frac{1}{4}$ -track machine a virtual necessity. With the tape electronically split into four sections, playing time is double that of older $\frac{1}{2}$ -track arrangements. Although $\frac{1}{2}$ -track per-

Right, a Realistic model from Radio Shack; speakers are behind swing-out side panels. Next, a tape system module by General Electric; wall-mounted system includes tuner, controls, swing-out speakers. Below it, the Concord 555, supplied with mikes and detachable speakers. At bottom, the Magnecord 1028; deck and electronics, accepts up to 10½-inch-size tape reels.



formance traditionally offered somewhat better fidelity (higher signal-to-noise ratio), advances in the tape art (improved tapes and tape heads) have overcome any disadvantages of ¼-track operation.

Tape Speed. The history of tape speed is a story of decreasing numbers. From 30 inches per second, the acceptable high fidelity standard has dropped to 7½. Nearly all machines are also fitted for 3¾-ips operation, and, on the better models, fidelity is by no means only "half as good" as at 7½ ips. The slower speed, in any case, is most attractive when long playing time, rather than all-out sonics, is the important consideration.

Some recorders are equipped with 1⅞-ips speed. Offsetting relatively poor quality from the turtle-like pace of the tape is the incredibly long playing time—as much as eight hours from a 7-inch reel.

Tape Heads. The heads on a recorder have three functions: erase, record, and playback. In many popular-priced models, the record and playback are combined in the same head. A few models have appeared recently that use one head for all functions, including erase. This, the least expensive approach, tends to minimize any alignment problem between record and playback. A slight off-true position of the head is tolerable since the error is applied equally during record and playback.

This small advantage disappears when record and playback heads are physically parted into separate units, as is the case in higher-priced equipment. Slight misalignment of either head still is likely to cause a drop in high-frequency response—but if the machine is carefully maintained and aligned, the three-head system offers distinct benefits. For one, it allows a recording in progress to be monitored aurally. Thus quality can be checked continuously, and levels adjusted if distortion is heard. Also, the recordist is quickly apprised of whether the machine is actually recording. Another advantage of the multiple head setup is that it permits the recording of special echo effects. Since the playback head tracks slightly behind the record head, it produces a delayed signal which may be fed back into the recorder.

The options described above are available in a large cross section of tape equipment, and, in many instances, are included as "standard." In addition, there are special features—some destined for standardization, others probably to remain in the class of "fringe benefits."





Sound-on-Sound. This makes the one-man band, and a host of other novel functions, a reality for the home recordist, by permitting him to add additional audio signals to an existing recording. A singer, for example, can accompany himself in a duet, or a pianist can create the illusion of playing with four hands. The process is one of recording successive tracks—one upon another—for the desired multiple effect. It derives from a circuit arrangement in which one track feeds, and is recorded by, another track. With enough recording steps, it becomes feasible for one person to simulate a complete orchestra by repeatedly dubbing in instruments. The flaw in the system, however, is that with each successive dub, there is a slight quality deterioration in the material recorded earlier. It begins to prove troublesome after about three or four repetitions.

Sound-with-Sound. Arising from the stereo machine's simultaneous two-track operation are certain functions not possible with simpler equipment. One is a useful bit of automation to enhance a slide-projector showing. Instead of recording on both tracks, the machine holds one track in reserve. Voice, music, or sound effects, etc., to accompany each picture are impressed onto one track. The other track is then used to carry synchronizing signals which can change slides on suitable slide projectors.

A second application of sound-with-sound should hold some appeal for instrumental and vocal soloists. Accompaniment can be dubbed on one channel, solo on the other—each recording done at a different

At left above, the Criterion 1000B from Lafayette; speakers and deck housed in walnut cabinet; two mikes supplied. This column, top, the V-M Model 754; mikes and speakers included; deck contains an FM and AM tuner built in. Below it, the new Revox from Elpa; Swiss-made, accepts up to 10½-inch-size reels. At bottom, the EICO RP-100, a deck with electronics, available assembled or as a kit.



This column, top, the Wollensak 7200, new version of the automatic CBS Labs-3M cartridge system. Next, the Concord R-2000 with automatic reverse and remote control. Below it, the Ferrograph 424, a deck with electronics. Right, top, the Magnetophon 97 from Telefunken, supplied with carrying case and speakers. Below it, the Wollensak 5000 deck, available with or without many extras.

time. During playback, however, both channels are heard simultaneously. The same technique has proved valuable for language learning. The instructor prepares the tape by recording correct pronunciation on one track, with intervening pauses. This is played back by the student, who uses the remaining track to insert his response. The final tape is a composite of student and instructor, and provides ready comparison between them.

These features suggest a trend in today's tape equipment: a filtering down of professional-type features into machines designed primarily for home use. What's more, many of these features do not vastly increase production costs. Most of the required electronics have already been added as a consequence of stereo design. For example, sound-with-sound on a mono machine requires the addition of an amplifier. But to achieve it in stereo models, the manufacturer simply adds a switch. Perhaps when a machine is first purchased these features do not seem necessary—but they can prove worthwhile when the recordist's interests turn in new directions, often unpredictable in the beginning.

Portables

Most tape machines are "portable" only in the sense that their luggage-type cabinets enable the owner to carry them to, say, the local high school to record the band, or to a social event to play continuous music. But "portable"—in terms of really light weight and freedom from the need to plug the ma-



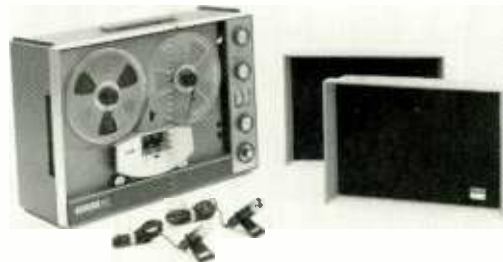
chine into an AC outlet—really applies to the cordless, or battery-operated machines. Once regarded as only a dictating instrument for the car-borne executive or as a handy carry-about unit in the toy class, this general type of tape machine shows signs of interesting growth—in the number of units now available as well as in performing ability.

There even is a sign of a “dual environment” tape recorder—a model which splits into a recorder section and an amplifier-speaker-power supply unit. Since the recorder portion is physically small, it can be carried about for truly portable or pocket operation. But in the home, the large companion unit makes available considerably higher amplifier power and speaker size, plus the possibility for operation on house current. Thus this machine provides a two-mode operation that may come to trigger a trend in the industry. This type is made possible of course by the transistor and other solid-state techniques.

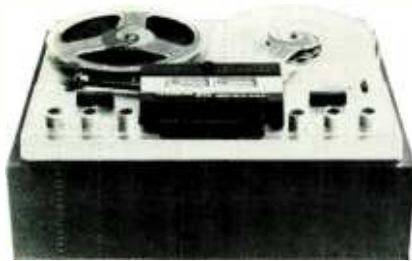
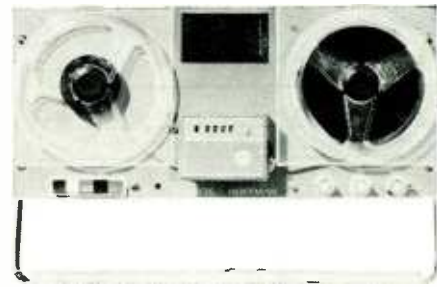
Another trend also is becoming apparent. There are now battery portables in the manufacture of which no effort has been made to shrink dimensions and weight down to a size suitable for holding in the hand. Rather, they are planned simply to permit freedom from the AC line. (They also operate on line current during home use.) These machines are typified by larger amplifiers, standard speeds, and complete stereo record and playback facilities. They offer definite possibilities for recording in the field with quality better than is possible with tiny, “roving-reporter” portables.

Auto Tape

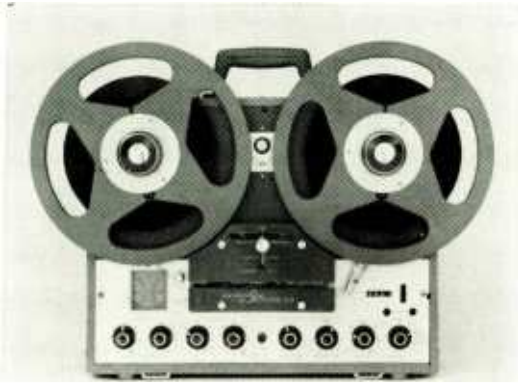
Yet another specialized area now actively under development is the cartridge-loaded tape player for under-dash mounting in the car. Its appeal is manifold: it is the only practical source for stereo listening over the road; it offers freedom of program choice (and from commercials); it overcomes the limited range of FM radio while traveling beyond the bounds of the city. Some of these units have been announced in walnut cases for use in the home, so that a certain compatibility between mobile and at-home program material is suggested. The auto-tape industry at present is suffering from growing pains. There is no technical standardization, and there are even two distinctly different and incompatible systems—one uses four-track; the other eight. Whether the two can coexist, or whether one will win out, remains to be seen.



Top, left column, the Viking 225, a transport featuring automatic reverse and available with different electronics. This column, top, the Knight KG-415 from Allied Radio: a deck and electronics sold in kit form. Below it, the Ampex 890, plays in reverse direction when directed to do so manually; comes with mikes and speakers that form part of case. Just below, the Dynaco Beocord 2000, available with or without speakers; features slide controls for level, mixing.



Left column, top, the Korting 4000, featuring a built-in tape duplicating device. Below it, the Uber 9000 from Martel, a deck with electronics. Next, the Truvox PD-100 offered by Benjamin: a British-made deck with built-in preamps. Directly left, the Tandberg 74B, with built-in speakers. This column, top, a new transport by Stancil-Hoffman; electronics are optional. Below it, the Sony 260, built-in speakers; supplied with mikes. Just below, a new deck with preamps by Crestmark; supplied with microphones; speakers are optional.



Above, the Newcomb TX-10, deck with record/play preamps; accepts up to 10½-inch-size reels. Upper right, a recent model from RCA Victor: includes mikes and detachable speakers that form part of carrying case. To the right, the Saxon 755, featuring miniature "console" styling.



MICROPHONES FOR THE HOME RECORDIST.

The microphone plays an important part in one of the tape machine's key functions—the recording of live sound. Microphones range in cost from a few dollars to more than the price of some recorders. Many home tape outfits come with a ceramic microphone—fine for routine or novelty recording but not measuring up to high fidelity standards (frequency response, especially, may be limited and uneven).

A significant step-up in quality is afforded by the dynamic microphone. Now included as standard equipment on some machines, the dynamic is probably the most popular type among amateur recordists. Still better quality recording is possible with a condenser mike, but high cost tends to remove it from applications other than professional. Another professional mike is the ribbon type. Its shortcoming, however, is that it is fragile and subject to wind damage when used outdoors. Thus the best all-around microphone, combining ruggedness with good frequency response, remains the dynamic.

Once basic type is determined, consider directionality, or pickup pattern. The omnidirectional mike responds equally well in all directions. Unless there is specific need, however, to record sounds from all directions (and full 360-degree sensitivity is rarely required), the omni is not the best sort, for it can pick up too much interfering noise. Another type,

the bidirectional, is also somewhat specialized. Due to narrow pickup in two opposite directions, it is good for such setups as an interview, where two people are sitting opposite each other.

Which all points to the most useful, general-purpose style of all, the cardioid (heart-shaped). It responds broadly over a wide sweep on one side, but is far less sensitive on the opposite. With this type, therefore, it is possible to record sound from a wide arc but still keep intruding noise at a minimum.

Impedance rating of the microphone is another consideration. If a recorder accepts only high-impedance microphones (true in most cases), select one to match it. High impedance is used when the mike cable does not run much over ten feet (otherwise hum and high-frequency loss occur in the system). A low-impedance mike cable may run any length. If the selected mike is rated at low impedance, it is easily connected to a high-impedance input of a tape machine by using a mike transformer in the cable, as close as possible to the machine's microphone input jack.

For stereo recording, the two mikes should be the same make and model. A typical setup for stereo might be two dynamic cardioid microphones separated experimentally until the most pleasing stereo effect is achieved.

Special Machines

In the search for more playing time and ease of handling, other special-type recorders have appeared. In one unit, the tape is contained within a handy cartridge operating at a speed of $3\frac{3}{4}$ ips. Its principal advantage is that threading, as in the standard reel-to-reel arrangement, is not required. Another machine not only utilizes cartridges but automatically plays them in succession, in the manner of a record changer. Tape speed in this instance is $1\frac{7}{8}$ ips and the machine can play automatically up to fifteen hours.

These special machines tend to insulate the owner from the tape mechanism. Whether this is good or bad depends on the individual. It is certainly a convenience to have tape threading between conventional reels eliminated—and also to have the need for changing reels done away with when continuous music is desired. But for some persons these factors may be offset by: a difficulty in editing tapes contained within a cartridge; a compromise in fidelity due to slower-than- $7\frac{1}{2}$ speed and, in the case of the tape-changer unit, a nonstandard tape form.

Another contender in the special-machine category is a completely new approach which uses a magnetic belt instead of conventional tape. Already being marketed in Europe, it was recently displayed by a leading American corporation to test local reaction. The system is based on a 4-inch-wide belt capable of bearing 162 tracks or 81 stereo pairs. As the belt rotates at $7\frac{1}{2}$ ips, it can record or play back up to thirty hours. The user turns a large dial to operate the mechanism, as well as to select desired portions of the program. If the system is adopted it will probably be integrated within a complete "music center," rather than offered as a separate high fidelity component.

One tape machine now being discussed as the next major trend in the home-entertainment field is the VTR, or video tape recorder. Not only will it record audio, but also TV images and, with the aid of an electronic camera, live pictures. Beginning as professional studio equipment priced at more than \$50,000, this machine now comes also in models in the \$1,000 category. It is probable that within the year some VTR units will be offered for \$500 or less.



At top of column, the Sharp RD-702, supplied in carrying case with two speakers. Next, the Rheem Califone 3170, deck with electronics; automatic reverse. Below it, one of the new OKI models—the 300D—from Chancellor, a deck with preamps; available also with speakers. Directly left, the Wollensak 1980: transport and two preamps are housed in a wrap-around that doubles as carrying case.

Accessories

As in any hobby field, there is an "after-market" line of items to abet the activities of the home tape recordist. Some are basic necessities, others are simply nice to have. In the first category is some kind of tape-splicing aid. Even if you never intend to do any elaborate editing, a time may come when a tape breaks and needs an accurate, snag-free splice. Tape splicers range from inexpensive little jigs which align the tape ends to more costly "editors" with built-in cutters and a feed reel of splicing tape. During any splicing job, have on hand leader tape, splicing tape and, perhaps, a grease pencil for marking the plastic surface of a reel.

Next in importance is a head demagnetizer, useful in preventing the machine's heads (which accumulate magnetism) from impressing noise onto tapes being recorded or played back. This instrument should be used about once a month. The procedure is simple and takes only minutes. At the same time, other service-type accessories can be used: a special cleaner which helps remove grit and other particles from parts in contact with tape; and a lubricant which reduces friction of heads against the tape.

Other accessory items can be selected according to individual taste or need. There are, for instance, gadgets that can ease the job of tape-threading; others that prevent the tape from spilling off the reel when stored. If tape is to be erased in quantity, a bulk eraser can do this job in seconds. A strobe kit will indicate whether the recorder's transport mechanism is driving the tape at correct speeds; test tapes are available for the advanced recordist who wishes to check and maintain head alignment. For achieving studio-type performance, a variety of sound mixers are sold; these simultaneously record several sound sources—microphone, discs, etc.—into the machine and at balanced levels.

The world of tape recorders is definitely expanding. Home equipment—while more functional and versatile—is also becoming more like professional in performance. And its popularity is on the increase. One industry leader has predicted: "In dollar terms, the tape recording business will equal or exceed that of record players, if not this year (1965), then certainly next."



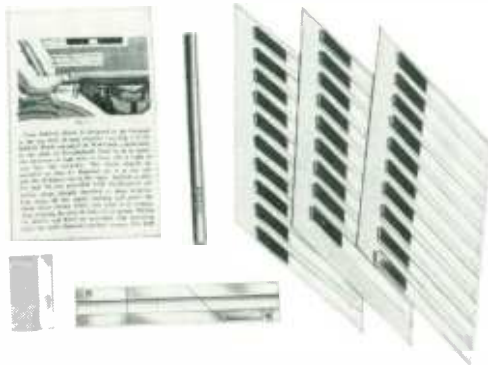
Top of left column, the Webcor Regent IV, Model 2520, supplied in carrying case with speakers. Below it, the Emerson Model SS544; carrying case houses two speakers. Next, the Ampex 1100 with automatic reverse play and self-threading take-up reel; available with or without speakers. At left, the Concertone 805—has automatic reverse for record and playback; two compact speakers.



Voice-matic by Kinematix converts any recorder to voice-actuated operation for easy control.



Low-cost mixer by Switchcraft permits mixing and fading from up to four channels, stereo or mono.



Editall splicing kit, from Elpa, includes cutting block, blade, splice tabs, marking pencil.



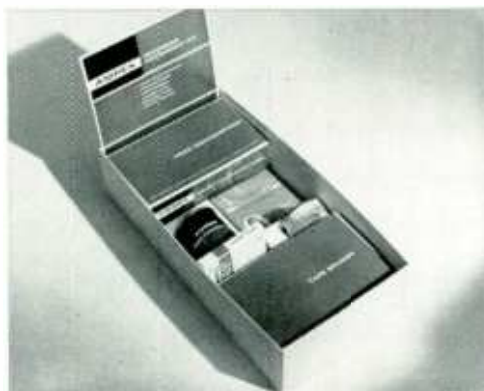
Greentree Electronics offers accessory kit TAK-100: includes many devices of use to recordist.



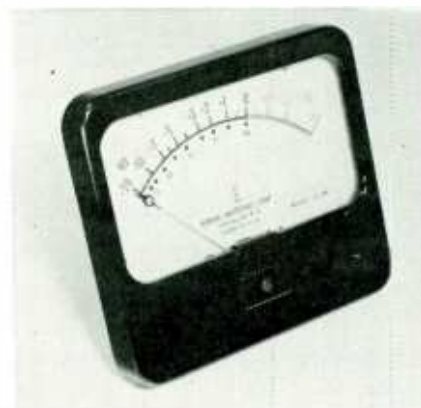
Ercona offers PML microphone and power supply, first low-cost condenser mike system announced.



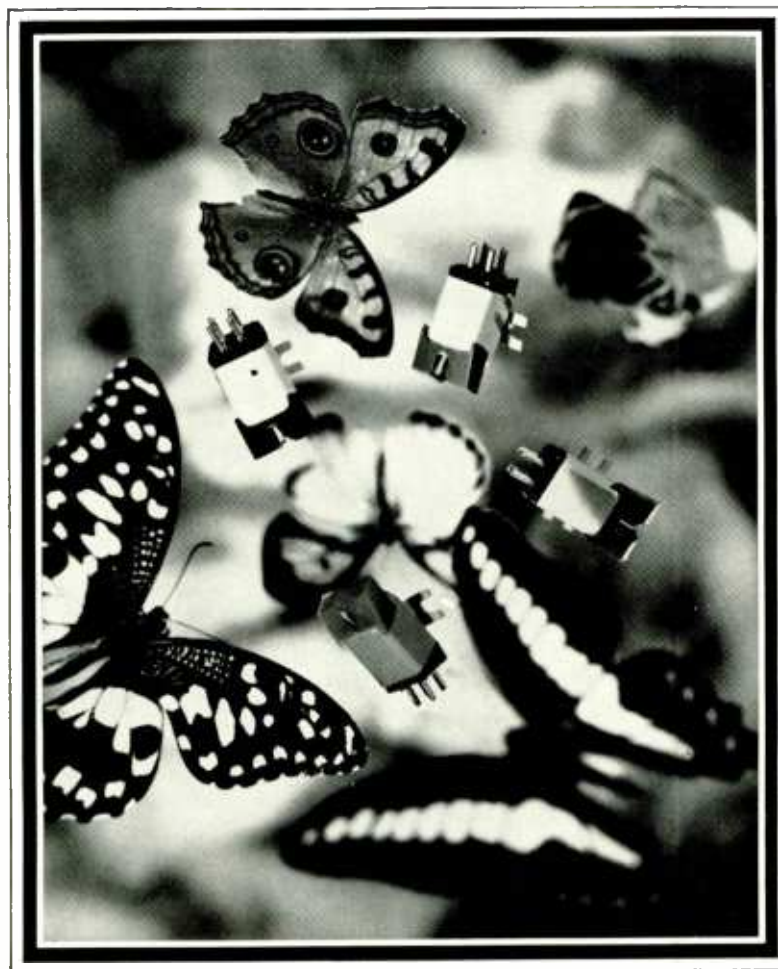
MikeAmp Model 1 by Marlboro Engineering connects into mike cable; adjusts for different impedances.



Ampex accessory kit includes head demagnetizer, cleaner, splicer, leader tape, splicing tape.



One of Robins Industries' newest accessories is a VU meter for patching into any tape recorder.



Capture natural sound with Pickering.

From the softest flutter of the woodwinds to the floor-shaking boom of the bass drum, natural sound begins with Pickering. Right where the stylus meets the groove.

Any of the new Pickering V-15 stereo cartridges will reproduce the groove, the whole groove and nothing but the groove. That's why a Pickering can't help sounding natural if the record and the rest of the equipment are of equally high quality.

To assure compatibility with *your* stereo equipment, there are four different Pickering V-15 pickups, each designed for a specific application. The new V-15AC-2 is for conventional record changers where high output and heavier tracking forces are required. The new V-15AT-2 is for lighter tracking in high-quality automatic turntables. The even more compliant V-15AM-1 is ideal for professional-type manual turntables. And the V-15AME-1 with elliptical stylus is the choice of the technical sophisticate who demands the last word in tracking ability.

No other pickup design is quite like the Pickering V-15. The cartridge weighs next to nothing (5 grams) in order to take full advantage of low-mass tone arm systems. Pickering's exclusive Floating Stylus and patented replaceable V-Guard stylus assembly protect both the record and the diamond. But the final payoff is in the sound. You will hear the difference.

PICKERING—for those who can hear the difference.

Pickering & Co., Plainview, L.I., N.Y.
CIRCLE 31 ON READER-SERVICE CARD

BY BOB MARX

NOT TOO LONG AGO, the size, weight, and complexity of an amplifier were clues to its quality—the bigger, the better! Things have changed over the past few years, thanks largely to the coming of transistors and concomitantly the elimination, in most amplifiers, of the bulky output transformer. Aside from a few models still designed along the older lines, most amplifiers offered today are compact, light in weight, and cool-running.

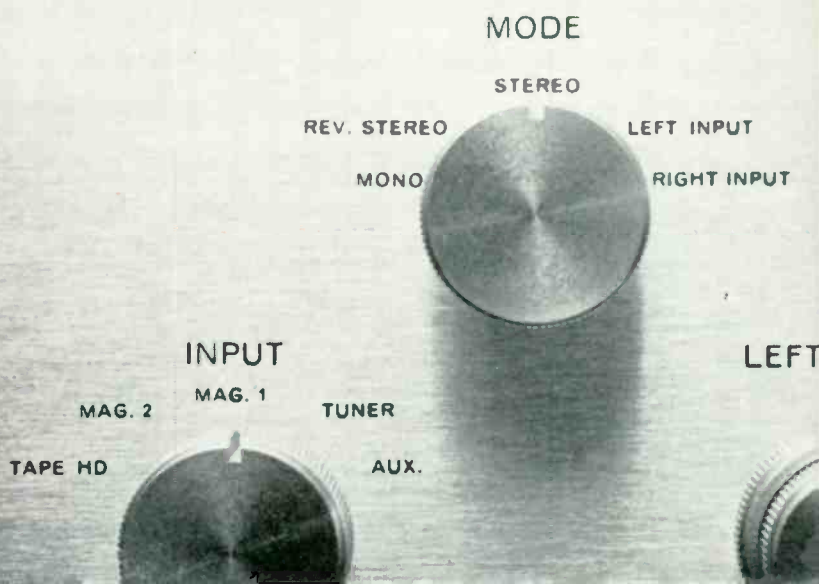
If the appearance of amplifiers has changed, their basic function in an audio system has not: this remains the demanding job of magnifying a very weak electrical signal to the strength needed to power a loudspeaker—and to do it without adding distortion to the original signal. In addition, the amplifier must provide the controls and signal jacks to fill its related role as the “nerve center,” the control station of the owner’s sound system.

Several factors are involved in the critical chores performed by an amplifier. To begin with, the signal fed to it may sometimes require amplification in a form somewhat different from its original one. If the signal comes from a magnetic phono cartridge, for instance, it requires reshaping (“equalization”) to compensate for the doctoring of treble and bass during the cutting of a record. That is, the bass that is rolled off during the cutting (to keep the swings of a record groove from becoming too wide for a stylus to follow) must on playback be restored to correct proportions. The treble boosted to help overcome surface noise must now be reduced to proper levels. Similarly, a form of reshaping is needed for a signal fed directly from the magnetic head of a tape recorder, since here again technical considerations

The author is a free-lance writer who has covered the audio scene for over ten years.

AMPLIFIERS **UP TO DATE**

A primer
on today's
stereo control and
power centers





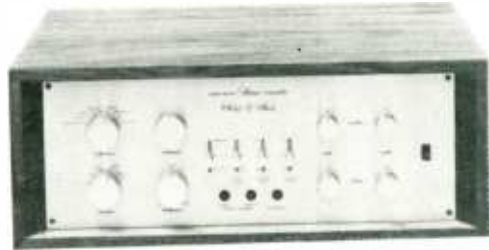
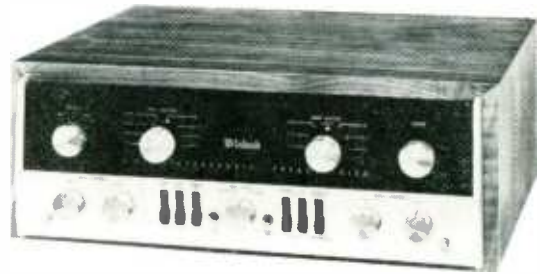
make necessary deliberate altering of the recorded signal to suit it to the tape medium.

In addition to equalization, original signals from either cartridge or tape head also require preamplification, to make them strong enough to be fed to the main section of an amplifier that eventually provides the push to drive a loudspeaker. Caring for this need, as well as for restoration of the signal strength always lost in various control functions, is the distinct role of the preamp/control center, which may be a separate piece of equipment, or (almost always the case now) integrated with the power amplifier on a single chassis. As a matter of convenience this section also contains the control circuitry.

Once a signal is passed on to a power amplifier circuit, it is given another marginal bit of strengthening and then is sent (by way of a driver or phase-inverter stage) to the output section, where heavy-duty tubes or transistors take over to provide the final prodigious boost in power. If the amplifier is of transistor design, the signal then goes directly (or via a simple coupling capacitor) to a loudspeaker. If the amplifier is a tube unit, the signal that leaves the final amplifying stage is of too high an electrical impedance to match the low-impedance voice-coil of a loudspeaker; it must be converted to the proper value by a fairly elaborate output transformer, which not only brings it down to the correct approximate range but supplies separate taps for exact matching of the usual speaker impedances—4, 8, and 16 ohms.

For stereo, of course, two separate signals must go

Left column, top, the KLH Model Sixteen integrated amplifier shown in its optional walnut case; below it, one of Acoustech's latest units, the Model VII integrated amplifier. Next, the SCA-35, a tube integrated amplifier by Dynaco; units from this company come wired or as kits. This column, top, the high-powered Harvard/Futterman H-3 basic amplifier: a tube, but transformerless, design. Next, the Acoustech VI preamp-control suited for use with any basic amplifier, and with special features for driving the Acoustech X electrostatic system. Below it, the solid-state Mattes SSP/200, a high-powered basic amplifier; finally, the Eric SA-40P, low-powered, low-cost, solid-state, compact integrated amplifier.



This column, top, the McIntosh MA-230, an integrated amplifier part tube and part transistor in design; below it, the Fisher TX-200, one of this company's recent solid-state integrated amplifiers. Next, the Stereomaster 260, one of several solid-state integrated amplifiers from H. H. Scott. Below it, new styling is found on another recent Scott solid-state integrated amplifier, the 299T. Right column, top, the C-22, one of two preamp-controls made by McIntosh; below it, the Marantz Model 7T, a transistorized preamp-control unit and this company's first solid-state component. Finally, a low-cost tube integrated amplifier in kit form, Model KT-645, one of many by Lafayette.

through the steps outlined above; the signals must be kept as identical to, and independent of, each other as possible on the way to two separate speaker systems. The stereo amplifier, then, is essentially two separate mono amplifiers sharing a common chassis and power supply.

Evaluation of amplifier performance is largely a matter of determining what spurious changes are introduced into the signal between input and output. It's possible, for instance, for amplifier circuitry to alter the shape of a musical waveform at certain frequencies. This is termed "harmonic distortion," and if severe adds an unnatural "brightness" or "hard quality" to the sound. Harmonic distortion also appears to encourage a second kind of distortion ("intermodulation"—or just "IM"), in which frequencies being reproduced together tend to add to and subtract from each other at random, producing "sum" and "difference" frequencies not harmonically related. This form of distortion is very audible and offensive, and adds nasality and spurious tones to the musical sound.

To these two basic kinds of distortion may be added some subtler maladies. One is a tendency of an amplifier to narrow the range of frequencies being reproduced, particularly at high power levels. A unit seriously afflicted with this problem may show signs of strain during its handling of large, complex musical scores. Often this will tend to limit the dynamic range of musical material—by clipping of orchestral crescendos or of heavy organ pedal tones.

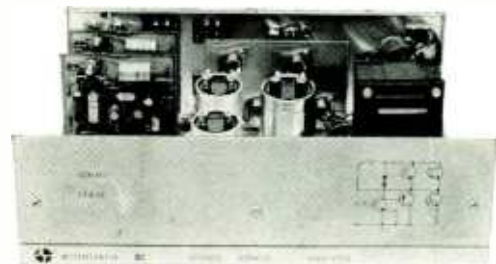
Another possible fault is sluggish handling of rapidly changing musical waveforms, shown by anything from a slight blurring of musical definition to a truly offensive sogginess in over-all sound quality.

Needless to say, a good amplifier displays such symptoms either not at all or to a very minor degree. Its harmonic distortion, for instance, is less than 1% at mid-frequencies at full rated power, and generally does not rise above 2% at the high and low extremes of the frequency range. IM distortion is also under 2% at full output, and, at so-called "average" listening levels, both IM and harmonic distortion generally measure below half a per cent. With an efficient amplifier, there is no compression of frequency or dynamic range unless the unit is pressed to the absolute limits of its rated power.

This last deliberately ambiguous statement is meant to be a bridge to what is perhaps the most important practical question you will have to ask when buying an amplifier: how much power do you need? In part, the answer is highly dependent on the speaker(s) you intend to use, since speakers vary in their efficiency and, to some extent, in their power-handling capabilities. As a practical matter, however, you can generally assume that the power termed adequate by a speaker manufacturer is the practical *minimum*, and that your choice is from the specified power upward.

Should you go upward? If your budget permits, the answer is yes. All things being equal (including the accuracy of various manufacturers' advertised power ratings), it is reasonably safe to assume that the higher the power the better. What you get with higher power is not loudness (the 30-watt amplifier is not twice as loud as the 15-watt unit). The advantage of the higher-powered unit is its ability to handle musical peaks without strain or compression. The audible result is a transparency that may actually make a higher-powered amplifier sound less strikingly loud on a crescendo than a lower-powered unit that is clipping somewhat unevenly. You can almost always be certain that a high-powered amplifier of good quality, compared to a lower-powered unit of equivalent quality, will offer audible improvement in definition and solidity of sound, which makes for over-all ease of listening. It is a good idea, then, to take the recommended minimum power of a speaker manufacturer, add a few watts to cover the increased size of your listening room over the "average," and then buy the most powerful amplifier you can afford. For the mathematically minded, a chart relating room size, speaker efficiency, and amplifier power is included in the article on speakers, on page 75.

Not too long ago, high power was obtained only from fairly bulky and costly separate chassis preamp and power amp. In a tube amplifier, higher power necessarily means bigger and more expensive output transformers, which in turn make it more practicable to have separate chassis. On the other hand, the transistor amplifier, needing no output transformers, does not call as compellingly for separate-chassis design; the only required increase in size along with power in a transistor unit comes about because of the



Top, the Model 1144 integrated amplifier, one of a new series of solid-state components offered by Electro-Voice and featuring very compact design. Next, the Grommes 3000 integrated amplifier, one of several new products from this company. Below it, the Pure Sonics Model 110 preamp-control; similar styling is found on other electronic audio gear by this company. Finally, the Aconstech XI, solid-state power amplifier kit; buyer may add preamp later.



A new entry by Olson Electronics is the Model AM-240 integrated amplifier shown at top. Below it is a recent Knight-Kit integrated amplifier offered by Allied Radio, the Model KG-895. Next shown is the Concerto A-9000, an integrated amplifier by DeWald, released by United Scientific Laboratories. Below this is Dynaco's latest, and its entry into solid-state electronics: the Model 60/60 power amplifier, kit form or wired, ready by mid-1966.

heat-sinks (the means of dissipating the heat of the output transistors), but this is nothing like the added bulk of a pair of heavy-duty output transformers in a tube amplifier.

Therefore you can obtain very high power in a single-chassis transistor amplifier, and for a reasonable cost per watt. The lower heat of transistor units also means that compactness need not be obtained at the expense of increased strain on electronic components or of increased noise. Of course for the ultimate in performance and control flexibility—even with transistor amplifiers—the costlier separate-chassis design approach may be necessary; but high power, and very clean performance, can be found in the integrated transistor unit to an extent rarely matched by integrated tube designs.

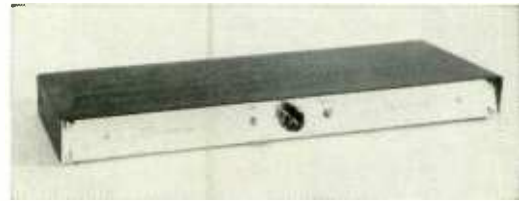
Worth noting is that transistor amplifiers have strengths and weaknesses somewhat different from those of tube units. In addition to higher power from a single-chassis design, transistors also have somewhat higher momentary peak-power capabilities. On the other hand, many (at least in the earliest stages of transistor technology) have tended toward somewhat higher IM distortion at low power levels. Some inexpensive transistor units also exhibit a spurious crispness or brightness that is actually distortion; unless you listen closely—as you should—in a showroom, this quality may masquerade as razor-sharp definition, and may lead you to take home a unit that sounds “spitty” in your living room and proves fatiguing after prolonged listening.

It is also worthwhile to check a transistor unit to see what, if any, means it has for protecting the output stage against short-circuiting. In some models (fortunately, very few now), shorting of the outputs may cause damage to the output transistors. If an amplifier does not incorporate any protection against this contingency, it should at least have some method of discouraging incorrect connections of speaker cables to the output terminals.

Once you have narrowed your choice to a few amplifiers with whose performance you are most pleased, your final decision for or against a particular unit may well be based on its control and convenience features. Here is a checklist, together with suggestions for evaluating them.

Tone Controls. The bass and treble controls on today's amplifiers can be used for making up for deficiencies in program material, in flattening out the response of a pickup, or matching a speaker to room acoustics. Ultimate flexibility is provided when each channel has its own, independent bass and treble controls. In an increasing number of amplifiers, however, treble and bass on both stereo channels are controlled simultaneously, with no adjustment of individual channels. This arrangement is generally satisfactory if you use matched or similar speakers on the two channels.

Loudness Compensation. The human ear tends to become relatively insensitive to frequency extremes—particularly low frequencies—as volume is lowered. Loudness compensation or contour controls are meant

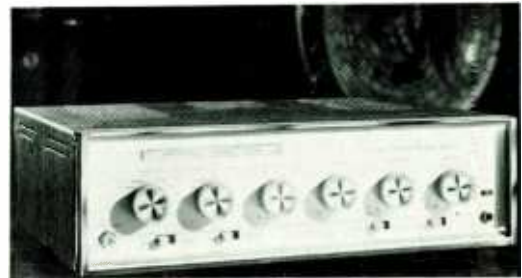


A bevy of amplifiers varying in features and cost: this column, top, the Bogen AT400 integrated amplifier; below it, Radio Shack's Model SAF-40; next, the Teeco Model 2225; following it, the Fisher KX-90 offered as a kit in the StrataKit series. Below this, the Kenwood KW-220 integrated amplifier, part solid-state. Next column, top, C/M Labs CC-1 preamp-control featuring push-button controls. Below it, the Crown SA 20-20, a very slim basic amplifier. Finally, the C/M Labs basic, Model 35D.

to restore audible balance at low volumes by adding prescribed proportions of bass and (to a lesser extent) treble. It is preferable to have either a variable amount of compensation or a relatively mild form of it that can be supplemented by the use of tone controls at your own discretion.

Tape Monitoring. An amplifier should have provisions for simultaneous and independent playback, during tape recording, of the signal put on tape from a record, broadcast, or other source. This is worthwhile even if your current recorder does not permit simultaneous playback of a signal being recorded: your next recorder may. The switch in question will, on most units, be labeled either tape monitor or source-tape.

Rumble and Scratch Filters. A good amplifier generally should have provisions for filtering the very high frequencies from older LPs or 78-rpm discs to reduce annoying background noise. If the amplifier is of moderate price and for use with an economy turntable or changer, it generally also will have—as it should—provisions for cutting down the rumble from a noisy turntable mechanism. The latter, however, is generally unnecessary (and missing) in an amplifier intended for a high-performance (and presumably rumble-free) system.



Inputs. At minimum, an amplifier should have inputs for magnetic cartridge, tuner, and one other source (such as a recorder). In most cases, the tape recorder input should be via the monitoring arrangement mentioned earlier. Some amplifiers also provide a tape head input for direct connection from the magnetic head of a recorder. Because of the chance for hum pickup and other problems, however, direct connection from the head is often unsatisfactory, and this feature (like the rumble filter) may very well be missing from a great many modern amplifiers. For proper operation of a loudness compensation control, some amplifiers provide rear-panel level controls that operate on the magnetic phono and other inputs. In a transistor unit, these controls may also prevent overloading by a source with a very high signal output; if level controls are not present on a transistor amplifier that interests you, check it with the associated equipment you plan to use.

Speaker Outputs. A transistor amplifier generally has only one set of speaker outputs for use with speakers of all impedances. A tube amplifier, however, generally has separate output taps labeled 4, 8, and 16 ohms. A few transistor amplifiers do not permit connection of 4-ohm speakers; if you intend to use a speaker of this impedance, check to make sure it's

Left column, top, the Bogen AT600 integrated amplifier. Below it, the Heath AA-22, available as a kit. Next shown is the J. B. Lansing SE-400, a power amplifier available with networks to match its output to specific speaker systems. This column, top, the Harman-Kardon SA-2000 integrated amplifier; below it, the H. H. Scott LK-60, sold in kit form. Next, one of Sherwood's recent units, the S-9000 integrated amplifier. All of these amplifiers are solid-state. Below this, the Fisher X-101-D, latest version of a tube amplifier, one of many offered by this firm.

permissible. Also worth noting is that some transistor amplifiers do not permit their two channels to be tied together for monophonic or center-channel operation, and that some do not have provision for operation of several speakers simultaneously.

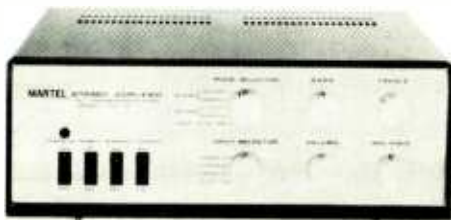
Headphone Output. For enjoyment of today's stereo headphones, and maximum convenience in using them, an amplifier should furnish a front-panel headset output designed to drive low-impedance (8- to 16-ohms) phones. There should also be either a switch to turn off your speakers when the headset is in use or an automatic drop in speaker volume (to a minimum point) when headphones are connected to the amplifier. If a transistor amplifier does not provide a separate headphone jack, check to see whether the standard three-connector headphone cable or junction box can be connected to the speaker outputs; since this involves interconnection of the two outputs, it may not be permissible with some transistor units.

Stereo/Mono Controls. The handling by an amplifier of two channels of sound has created a need for a few controls that mono amplifiers never had. The number and layout of such controls will vary among different stereo amplifiers, but at the least they should offer the facilities for channel balance and for combining the two channels into one. The balance control enables you to adjust the relative volume of sound from left and right speakers to compensate for differences in recorded material, in speaker efficiency, and in room acoustics, as well as in your own preference with respect to the listening position in a room. The combining control adds the two stereo channels and provides a mono signal—which is the recommended

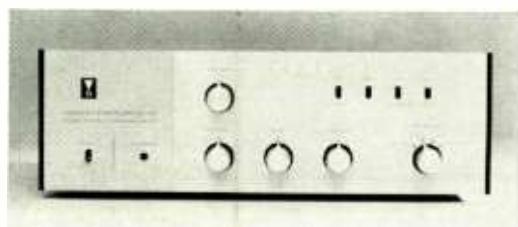
way to play mono records through a stereo system (it cancels the vertical response of the cartridge and thereby reduces the possibility of rumble pickup on mono discs). The monophonic mode combined with the channel balance control also is useful, when setting up a stereo system, in achieving an initial state of sonic balance in the room, as well as to check out each channel individually if trouble is suspected.

Other "stereo-type" controls may have particular appeal to individual listeners. Among these controls are channel-reverse, speaker phasing, and such refinements as ability to send left input signals to either or both channels, and so on. These features are, of course, nice to have—but not essential—and they do add somewhat to an amplifier's cost. Speaker phasing surely is important, but the need for a separate control for this purpose has lessened in recent years. For one thing, errors in program phasing found in some early stereo recordings rarely if ever occur these days. For another, most speaker systems now are supplied with hookup polarity indicated, and if one simply follows instructions when wiring from amplifier to speakers, phasing will be correct.

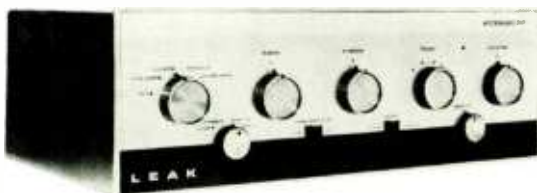
After you have made certain that an amplifier has the power and features you are looking for, what should you listen for during a demonstration? The objective is the same transparency and neutrality desirable in the performance of all audio equipment. Listen at length to hear which amplifier has the least assertive sound of its own, and then check it on demanding material such as orchestral crescendos and loud organ pedal notes. The amplifier that gives the least audible sign that it is operating at all is the one to take home.



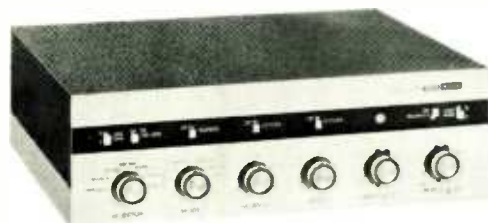
Martel Electronics of Los Angeles has introduced the Model A-7, a solid-state integrated amplifier.



Model SA600 is solid-state integrated amplifier, the first of its kind offered by J. B. Lansing.



The Stereo 30 amplifier is made by Leak of England; distributed in the U.S.A. by Ercona of N.Y.



EICO ST70 is tube design still featured by this company, available in kit form or factory-wired.



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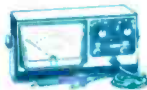
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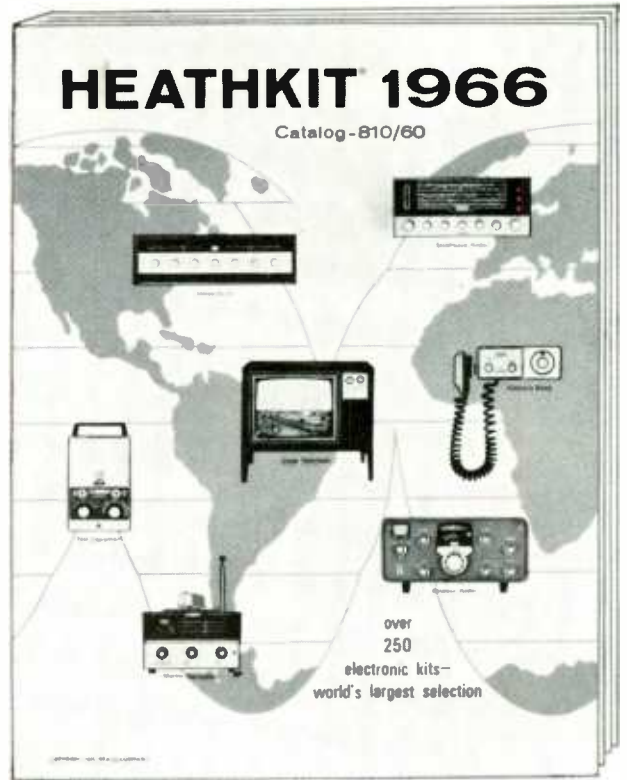
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Model	V-Vacuum Tube S-ALL-SILICON T-Germanium Transistor	Power (IHF) 2 channels 8 ohms Watts	Max. IM Distortion Below 10 watts	FM Sensitivity Microvolts	Price	Dollars/ Watt
Sherwood S-8800	S	100	0.10%	1.6	\$ 359.50	\$ 3.60
Altec 711	S	100	0.15%	2.2	378.00	3.78
Bogen RT 8000	T	70 (4!)	0.3%	2.5	319.95	4.57
Dyna FM-3, PAS-3, & S-70	V	90	0.1%	4.0	394.85	4.38
Fisher 600 T	V & T	120	1.6%*	1.8*	459.50	3.82
Harman-Kardon SR-900	T	75 (4!)	0.9%*	3.3*	429.00	5.61
McIntosh MR71 & MA230	V & T	88	0.25%*	1.8*	748.00	8.50
Marantz 8B, 7, & 10B	V	75*	0.2%*	2.0	1170.00	15.60
Scott 348	V & T	120 (4!)	0.5%	1.9	479.95	4.00

Figures above are manufacturers' published specifications except (*) which are published test findings.

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Although the amount of musical programming is enormous, FM no longer is strictly a good-music medium. It's not that there is less good music on the air nowadays—it's just that other types of programs also are being done in FM. The discriminating listener, of course, equipped with a good FM receiver, can pick his way across the dial, sampling what is offered and selecting what he wants. There are, today, more than 1,400 FM stations on the air—and many of them broadcast in stereo. The sound of FM, even in mono, can be eminently satisfying,

high fidelity sound, worthy of the attention of the serious listener.

Keeping pace with developments in the FM medium, the manufacturers of FM receiving equipment in recent years not only have perfected their sets in terms of sensitivity and low distortion, but have added the stereo facility. Today's FM stereo set can receive mono or stereo, whichever is being broadcast. An "FM set" may be a separate tuner combined with a separate amplifier, or a tuner and amplifier on the same chassis (a "receiver"). Either type, of course, must be connected to speakers (or headphones) to be heard. The type of setup you choose depends on your budget, the amount of avail-

Contributor to last year's edition of *Stereo*, the author is presently making an intensive study of FM equipment of all kinds.



able space, your own individual taste and creative desires—among other factors. Stereo FM receivers generally cost a bit less than separate tuners and amplifiers. One major manufacturer's 75-watt stereo receiver, for example, sells for \$395. The amplifier section alone may be had for \$299, while the FM stereo tuner sells separately for \$249.

Receivers have other advantages—they're but slightly larger than an amplifier or tuner alone, and they require only the addition of loudspeakers to produce music. Despite their myriad controls, they are—as many newcomers to audio find—simpler to operate than separate components. During the past two years, stereo receivers have taken a place among the most popular of audio components—as much the result of aggressive promotion by some large audio dealers as of their own high quality performance. A number of stores in New York, Chicago, Los Angeles, Washington, Philadelphia, and elsewhere have set up stereo systems including a stereo receiver, two loudspeakers, record changer and cartridge for very little more than the price of the receiver alone. The result, of course, has been a spurt in sales of receivers.

With all their virtues, and with the dramatic difference in price between receivers and separate components, why should anyone consider the latter? First of all, you may already own a good stereo amplifier. If you do, there's no need to buy another one as part of your FM equipment.

Left column, top, the Crestmark CPS-24 AM/FM stereo receiver; below it, the Electro-Voice 1177 receiver; next, the Fisher 440-T receiver; directly left, the Harman-Kardon SR-900 receiver. All these units require only the addition of loudspeakers or headsets for listening; all accept other program sources, such as record players and tape recorders. Just above, the Dynaco FM-3, a basic tuner for connecting to an external amplifier.

While separate tuners and amplifiers take up more shelf space than a single combination unit, they can be individually installed in spots where a larger or heavier piece of equipment wouldn't fit. The completely separate units also permit you to change or upgrade part of the system at a later date without duplicating what you now own. They also may be preferred by perfectionists, and by hobbyists who put their equipment to special uses. But for simple, no-fuss, high quality listening, today's better receivers are eminently qualified.

Tuner performance—whether in a separate tuner per se, or as part of a receiver—depends on the way the circuit meets some basic FM requirements. The front end, or RF section, largely determines the sensitivity of the tuner, the quality that enables it to pluck a weak signal out of the air and reject the noise which normally comes with it. Sensitivity is measured as the number of microvolts required by the tuner to achieve a given amount of quieting. The Institute of High Fidelity has standardized this measurement in terms of 30 decibels of quieting, representing about 3% total hum, noise, and distortion. Typically good IHF sensitivity ratings for today's tuners are 5 microvolts or less (the lower this figure, the more sensitive the tuner).

Sensitivity alone does not give the complete picture of tuner performance. For one thing, the ratings are based on extremely weak signals which make for a fairly rigorous test, but which are rarely



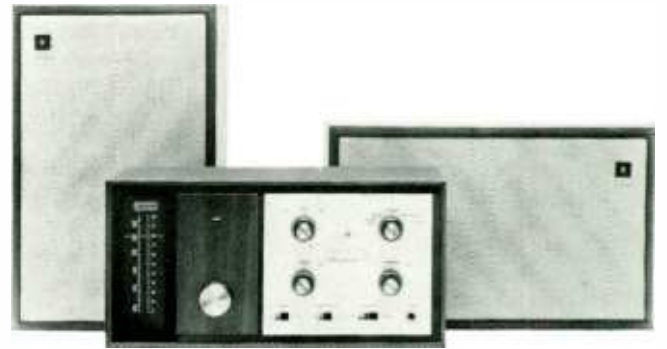
Directly above, the Scott LT-112, a stereo FM tuner in the Scott kit series for home assembly. Right column, top, the DeWald T-8000 tuner from United Scientific Laboratories. Below it, the Leak Trough Line 3 tuner from Ercona; next, the Heathkit AJ-14 tuner, very low in cost and requiring only a few hours to build; to the right, the KW-550, a new tuner by Kenwood. All these sets must be connected to an amplifier.



encountered in normal broadcasting. Moreover, the antenna used with any tuner can have as much effect on sensitivity as (or more effect than) slight differences in microvolt ratings. Finally, other characteristics such as distortion and capture ratio frequently are as vital as sensitivity itself in determining a tuner's ultimate performance.

After the RF signal has been tuned in and amplified in the front-end, it enters the IF, or intermediate frequency, section of the tuner. The IF stages largely determine tuner bandwidth or selectivity, the measure of rejection of interference from stations close in frequency to the desired one. This characteristic has become more important in recent years as the number of stations on the air has multiplied. To keep bandwidth wide enough to accept the full FM stereo signal and provide necessary amplification, the number of IF stages has lately been increased in the better tuners. For adequate ease of tuning and low distortion, the stereo tuner should be rated at a bandwidth of 200 kc or higher.

Left column, top, the Fisher TFM-200, a separate tuner; below it, a low-cost receiver, Model RA-665 from Olson. At top of this column, the Grommes 1000, a separate tuner. Below it, the popularly priced Lafayette LR-800 receiver. Directly below, an entry by V-M, the Model 1484 receiver. Most manufacturers offer sets for FM stereo only or, at additional cost, with AM reception also built in.



This column, top, the EV 1155, a separate tuner; below it, one of Bogen's latest receivers, Model RT8000; directly below, the Model 711A, a recent receiver by Altec Lansing. Right column, top, a receiver module by H. H. Scott, supplied with a pair of matching stereo speakers; below it, the McIntosh MR67 separate tuner. Walnut cases are optional, except in modules which include them.

After traveling through the IF amplifiers, which also contain a limiter stage (or stages) for clipping off certain kinds of interference, the signal enters the detector, which removes the RF carrier, leaving the audio and the ultrasonic signals which bear the stereo information. A wide-band detector usually is employed in this circuit to insure that signals will not become detuned and distorted due to the possible drifting of the front-end section. Ratings for detector bandwidth generally are upwards of one megacycle.

Following the detector is the multiplex section of the stereo tuner. It's here that the tuner unscrambles a complicated signal to create separate left and right channels. If only monophonic signals are received, this section is inactive, and the tuner functions as a mono set. Many tuners include a stereo indicator—a signal lamp, tuning eye, or meter—to give notice when a stereo program is being received. As a rule, multiplex or stereo signals require more careful tuning than do mono FM broadcasts to achieve maximum audible quality.

Antennas

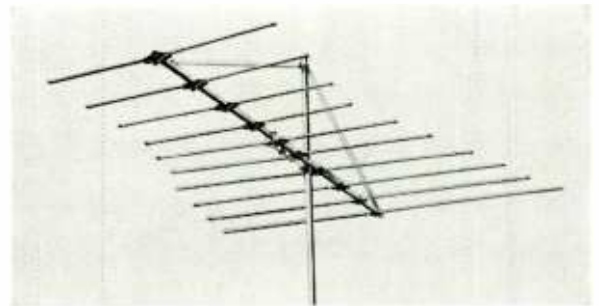
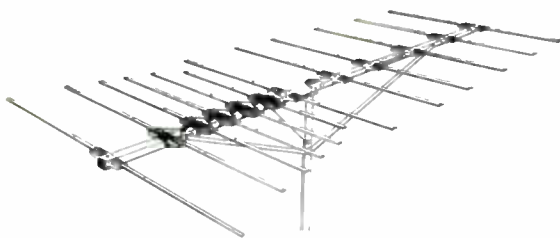
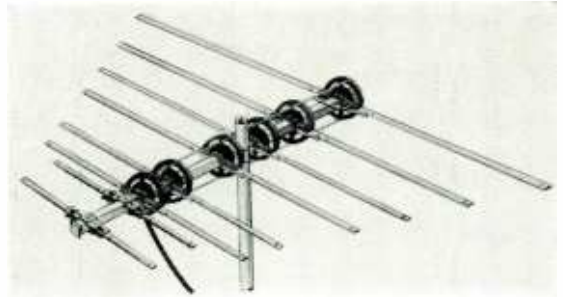
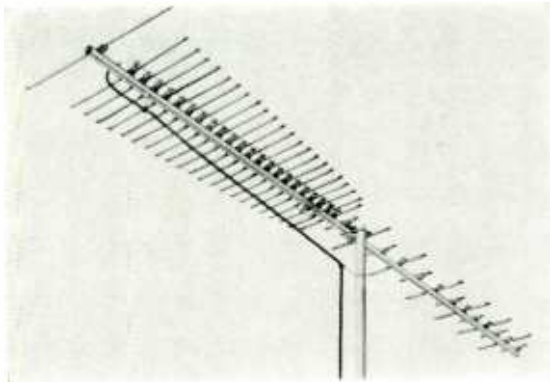
Advances in tuner design have been matched by improvement in antennas and related accessories. Back in 1956, most city dwellers didn't bother with roof-top antennas at all. Those who used any antenna simply tacked up the folded dipole supplied with their set—which generally proved adequate for mono reception of nearby stations. Some suburbanites and many smaller-town listeners, attempting to bring in distant stations more clearly, tried tapping their television antennas to serve the FM tuner as well.

Until the advent of stereo FM, this haphazard approach toward the antenna problem worked reasonably well. Of course, even prior to FM stereo, there were those listeners who used superior antennas designed specifically for the FM band—multielement arrays of varying complexity and size that enabled city dwellers to pick up weak suburban stations as well as all the local outlets, or suburban listeners to bring in the downtown stations strong and clear, or fringe-area dwellers to pull in stations over 200 miles away. Many FM fans sooner or later discovered that a proper antenna gave them as many as twice the number of stations their folded dipole had been able to bring in. One Brooklyn listener, screened from most uptown New York stations by the skyscrapers of Wall Street, wrote to an antenna manufacturer after he completed his roof-top installation: "Before I installed your antenna, we received only four stations really well. Such uptown stations as WQXR, WBAI, and WRVR were denied us. Since installing the antenna, we receive all of these clearly, plus stations like WEEX-FM in Easton, Pennsylvania (75 miles away) and WGHF in Brookfield, Connecticut (53 miles away)."

The coming of FM stereo brought the antenna question into even sharper focus, simply because many existing antennas—which may have been adequate for mono FM—weren't suitable for clear stereo reception. The need for an improved antenna arises from the nature of the FM stereo signal. An FM station, transmitting in stereo, is not permitted to use more power than it does for mono FM, yet the stereo signal is a lot more complex. As a result, the broadcasts don't carry as far as mono signals. At the same time, the added "stereo information" reduces the signal-to-noise ratio of the total FM carrier. Finally, the FM stereo transmission must be detected in a precise time sequence ("in phase"), often frustrated by the effects of multipath distortion, which is caused by signals bouncing off buildings or hills and thereby arriving at the receiver an instant later than the direct signal. This type of interference, responsible for "ghosts" in TV pictures, gives rise to severe distortion in FM stereo: anything from hash on one channel to loss of the stereo effect.

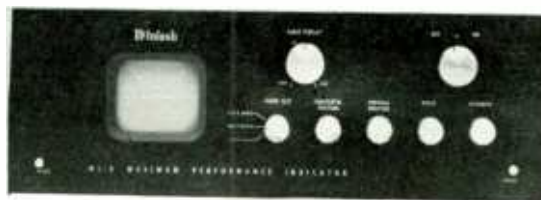
Of course, these problems are nonexistent as long as one is using a mono FM tuner, or a stereo tuner





Sampling of recent antennas includes, left column, top, the Channel Master Coloray, a compact outdoor dipole; below it, a JFD antenna rotator control box for remotely positioning an outdoor antenna; next, a 75-ohm cable kit from Jerrold for hookup between antenna and set. This column, top, the Winegard Planar-Grid, one of the largest antennas yet offered; below it, the new FMSL-12 by Finney. Right column, top, an 8-element Paralog antenna, Model PAX-60, from Jerrold; below it, a ten-element log-periodic, Model LPL-FM10, developed by JFD. At right, the FM/Q Super Mark I by Apparatus Development, showing two antennas stacked on same mast for increased pulling-in power.





A novel development of FM tuners is exemplified by the two units shown above. At left, the Marantz 10B, a separate tuner that features a built-in oscilloscope. Right, the Model MI-3 Maximum Performance Indicator by McIntosh, a separately housed oscilloscope. The use of the scope originally was intended to improve FM stereo reception by indicating visually the need for adjustment of the antenna. Now, it is apparent that the scope can serve also as a general purpose visual monitor for other program sources and for one's stereo system in general. It shows channel separation, phase relationships, and channel balance.

WHAT'S BEING BROADCAST?

FM stereo broadcasting, while most prevalent in large cities, is not confined to them and is beginning to reach into the hinterlands. Program material consists chiefly of commercial stereo discs or tapes and an occasional live pickup. An example of the latter was General Electric's Stereo Theatre, which offered dramatizations of works like Herman Melville's "Billy Budd" performed by such actors as Peter Ustinov—but it was atypical.

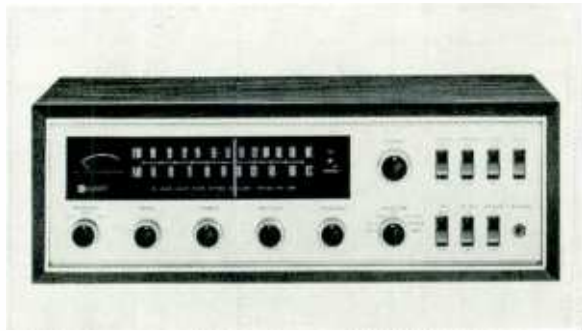
A factor which may affect future broadcast plans is the recent FCC ruling that FM stations owned by AM broadcasters in the nation's larger cities must create separate programs for at least half the time they're on the air. This new policy is a change from the older one of permitting AM broadcasters simply to duplicate their programs on FM. Under the old plan, many broadcasters made no extra charge to sponsors for their FM listeners, a fact which made it difficult for independent FM broadcasters to sell their own air time. The FCC ruling is expected to aid the smaller FM stations and to encourage all to develop new programs specifically for FM listeners. The quality and content of those programs may be determined largely by the public's expressions to the stations of taste and interests. At present, the FM programs available cover a wide range of subjects: they offer drama, opera, and symphonic music from here and abroad. FM in New York and Chicago can bring you college courses for credit in music, political science, or English literature. In Berkeley, California, or Los Angeles, it can offer you prolonged discussion of public issues. Along the Canadian border, it presents live concerts, drama, and "actualities" from Toronto, Montreal, London, or Paris. In some major cities, FM can even take you back to your childhood with reruns of "The Lone Ranger," "The Shadow," "Sherlock Holmes," or "The Green Hornet." No matter what your taste, somewhere there's an FM station catering to it.

Finding these stations listed in the local newspaper is not always possible, however, and so the

FM enthusiast—particularly the owner of sensitive equipment that can pull in stations beyond the nominal (and by now antiquated) 30-mile limit ascribed to FM broadcasts—would do well to arm himself with a comprehensive station guide that will help him log stations without regard to arbitrary geographical limits. An excellent one is the North American Radio-TV Station Guide, which lists all AM and FM radio and VHF and UHF television stations. Both AM and FM are tabulated by broadcasting frequency, by geographical location, and by call letters. In addition to the listing of locations of the television stations, the book contains individual maps showing the situations of stations using Channel 2 through 13 and a single map of the UHF stations. The Guide, written by Vane A. Jones, is published by Howard W. Sams & Co., Inc., and may be ordered from the Sales Department, 4300 W. 62nd St., Indianapolis, Indiana or purchased from your high fidelity dealer. This paperback costs \$1.95 and would seem to be a good investment.

Another authoritative source is the Broadcasting Yearbook, published in January of each year. This book (about 550 pages, and tab-indexed) contains, in addition to separate listings of all FM, AM, and TV stations by broadcasting frequency, geographical location, and call letters, information about such aspects of the broadcasting field as station addresses, names of managers, FCC rules, etc. The Yearbook can be ordered by mail from its publishers, Broadcasting Publications, Inc., 1735 De Sales St., N.W., Washington, D.C., and costs \$5.00.

Short-wave and DX listeners are probably familiar with White's Radio Log. Now incorporated in the hobbyist magazine Radio-TV Experimenter, the complete log is published in any three consecutive issues of the magazine throughout the year. The lists are updated at each subsequent publication. FM, AM, and TV stations are tabulated by frequencies, call letters, cities, and states, and there is, of course, a listing of world-wide short-wave stations. This publication may be purchased on newsstands (it's a bimonthly) or a subscription may be ordered from Radio-TV Experimenter, 505 Park Ave., New York, New York 10022: one-year, \$4.00; two-year, \$7.00; three-year, \$10.



switched to mono reception. But they can be quite serious in stereo, and stereo listening is after all the purpose of the new technique.

Assuming a reasonably good FM stereo set, then, tuned to a station within the legitimate reception range of one's particular locale, the only additional help that can be obtained is that provided by a modern FM antenna. Satisfactory performance of such an antenna is based on three main characteristics:

1. High gain. The higher the gain figure, the more signal the antenna will pick up. For example, an antenna with a gain of 12 db will pick up twice as much signal voltage as an antenna with 6-db gain. Each 6-db increase is equal to a doubling of received signal voltage.

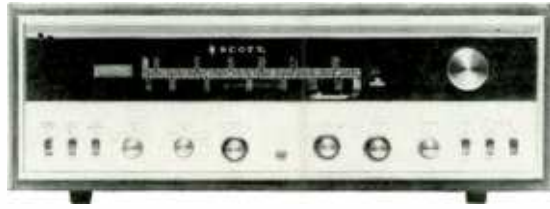
2. Clean lobes. In general, the higher an antenna's gain, the narrower its lobe or reception pattern—an important consideration in eliminating unwanted signals. The size of the antenna's rear lobes, in relation to its front lobe, is expressed in terms of front-to-back ratio. A high front-to-back ratio can help to minimize multipath distortion.

3. Flat response. Some antennas achieve extra gain by sacrificing response. This may do for mono, but can ruin stereo reception. Uneven response can result in phase shifts which reduce stereo separation. The new log-periodic design antennas are better in this respect than Yagis, although which type is superior all round cannot be stated definitely. Much depends on individual reception conditions in a specific locale.

If you're lucky enough not to have multipath problems in your neighborhood, you probably can get by with a nondirectional FM antenna, or even your outdoor TV antenna—if it is designed to include FM. In such a case you need a TV-FM splitter, a unit which sends FM signals to the FM tuner and TV signals to the TV set.

If, however, multipath distortion is a serious problem, the best solution is to use a highly directional FM antenna, oriented so as to pick up signals from one direction only, thereby rejecting any reflected signals. If the FM stations you want to hear are located in more than one direction in relation to your home, you'll also need a rotator to turn the antenna so as to aim it at the desired station. Rotators are used primarily in fringe TV areas to give rural viewers the maximum choice of TV program-

Left column, top, the Knight KN-376, a new popularly priced receiver from Allied Radio; below it, the SR-400, a low-cost entry by Harman-Kardon. Next, a separate tuner for FM stereo and AM, the Harman-Kardon ST-2000. Directly left, the Model 600-T receiver, a top-of-the-line model by Fisher.



This column, top, a low-cost basic tuner from Radio Shack, the Model TM-8D; below it, a new receiver by Kenwood, the Model TK-80; next, the EICO Model 3566, available in kit form or factory-wired. Right column, above, the Model 388 receiver, one of Scott's top-of-line sets; below it, a new separate FM stereo tuner from Bogen, Model FT60.

ning. The same hardware works for FM and can increase the usefulness of your receiver by providing you with the maximum choice of programming.

You also might consider using a booster, a small radio-frequency preamplifier for adding to the antenna. A booster can offer marked improvement for long lead-ins, say over 75 or 100 feet. Not only will the booster minimize line noises, but it will compensate for signal losses which occur over such lengths. Boosters also help to replace losses which may occur when the line gets wet. They are of distinct value, too, when several FM or TV sets are operating from a single antenna, since they can replace lost signal strength.

On the other hand, a booster can become overloaded by too strong an incoming signal. The overload causes distortion in all signals because the booster cannot be tuned to discriminate against the overloading signal. A booster should be used, therefore, only after one has determined that the strongest signals (from TV channels 6 or 7 as well as from FM stations) do not cause it to overload.

The lead-in that carries the signal from the antenna to the FM set also influences the quality of reception. For years the most popular lead-in has been "twin-lead"—the type which has served as an inexpensive and reliable means of doing the job for mono FM. Engineers have always known, however, that twin-lead has its faults. Changes in climate affect its performance. What's more, twin-lead can pick up radiation from automobile or electrical engines, and airplanes flying overhead create havoc by causing reflected signals. Twin-lead consists of two copper wires encased in a plastic strip. As



current (the FM or TV signal) flows through each wire, it creates electrostatic and electromagnetic fields, which extend out into the space around the two conductors. Almost anything can affect these fields—rain, a metal stand-off insulator, a metal window-sill, pipes, and so on. Everything that affects twin-lead fields changes its impedance and degrades its performance as a transmission line.

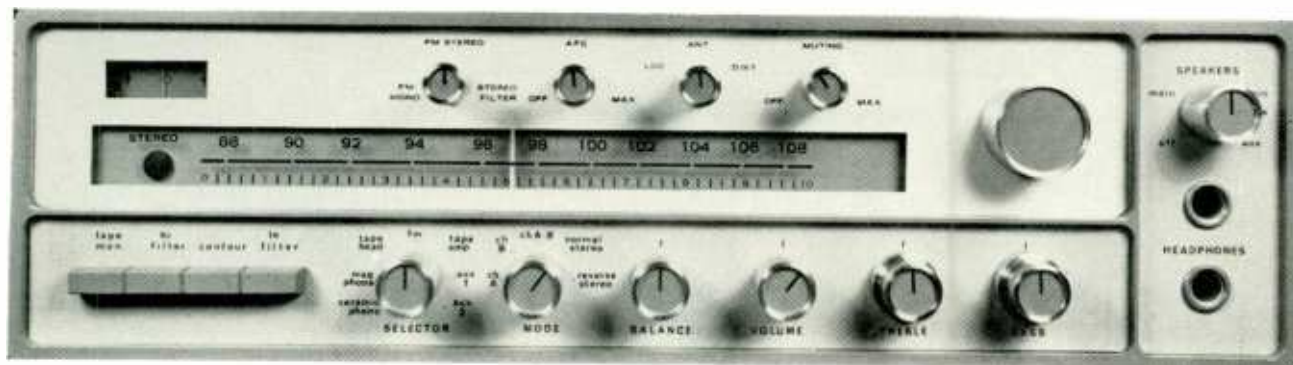
Two solutions to this problem have been introduced. Both are costlier than conventional twin-lead, but either is much superior. One is shielded twin-lead; the other is 75-ohm coaxial cable. Coaxial cable requires 75-ohm connections at both the antenna and the FM set. If these connections are not already provided, the existing 300-ohm terminals can be adapted by means of a small, low-cost “balun” transformer.

For very strong, local signals, an indoor “tunable” antenna (a dipole aided by a booster, or by a built-in adjustable network) often proves satisfactory. It is, of course, no match for the Yagi or the log-periodic types used outdoors.

Many areas in the U.S.A. are served by community antenna television systems which pipe TV programs into the home for a monthly fee. Some of them also include FM programming. Technically speaking, there is no reason why full-frequency FM cannot be handled by a cable inasmuch as these systems—designed to take care of the more-than-2-megacycle bandwidth of video—also can handle the narrower bandwidth required for FM stereo. Whether the programs thus provided are more satisfactory than those obtained by one's own antenna must, of course, be decided on an individual-taste basis.



Top, left, Trutone's Stradford 532, separate FM tuner; below it, left, The Plainsman, a recent receiver by Eric; to its right, the compact KLH Eighteen, a basic tuner. Below it, new styling is featured on the Sherwood S-8800 receiver; just below, the Knight-Kit KG-964 from Allied Radio, a receiver sold in wire-it-yourself form.



HOW TO USE A STEREO RECEIVER

The front panel of a stereo receiver presents a panoply of controls and indicators, which varies from model to model, depending on how an individual manufacturer solves the equation of features and physical format. Shown here is a "mock-up" of a receiver, the combined efforts of the editorial staff and of the industrial design firm of H. John Kretschmer Associates. While not identical to any actual set, it represents a composite of the features and controls likely to be found on today's models.

The large numbered dial, of course, is the FM station-tuning dial; the tuning knob is at the right. The meter above left of the dial aids in pinpointing a station: when the needle is centered, the station is correctly tuned. An alternate type of tuning meter shows maximum signal strength. Either is suitable. Some sets have both types of meters: tune one for maximum strength while the other is centered. When a stereo broadcast is received the indicator lamp on the FM dial glows; during mono reception, it remains unlit.

To the right of the signal meter are four FM controls. The FM mode selector chooses between monophonic or stereo FM reception; it also has a filter position which reduces noise on weak stereo signals. The AFC control is variable: when hunting for a station this control should be off; then it may be adjusted up to the point at which it "holds" the station. The antenna switch, in "distant" position, permits the tuner to operate at full RF gain; in "local" position, it reduces gain somewhat to avoid overloading the input circuits with strong local signals. The muting control may be adjusted to eliminate interstation tuning noise; inasmuch as it also reduces sensitivity, it should be used sparingly—set just to the position at which noise becomes unobjectionable but at which a weak station that you want to receive still can be heard.

Controls across the bottom of the receiver are those found on most high fidelity amplifiers. Here they include four push buttons and six knobs. From left to right: the tape monitor switch enables you to hear a tape while you are recording it, comparing it with the source material—assuming of course that the tape recorder's own circuits and head arrangements permit such comparison. The high filter reduces high-frequency noises, such as surface noise from old or worn records, or tape hiss. The contour switch may be used in conjunction with the volume control to introduce some bass boost, and often some treble boost as well, to compensate for an apparent loss of those tones at low listening levels. The low filter attenuates such low-

frequency disturbances as turntable rumble. Noise filters, incidentally, invariably cut out some of the musical signal along with the noise; ideally they should not be used, but at times they do clean up the sound.

The first knob at the bottom is the master program selector, with positions for external program sources and, of course, for FM. The position is used in conjunction with the small controls at the top, previously described.

The mode control permits you to listen to monophonic signals feeding the receiver, or to either half of a stereo source, or to normal stereo, or to reverse-channel stereo. The "A plus B" position is recommended for listening to mono records; it cancels the vertical response of the cartridge and thereby eliminates a possible source of rumble.

The channel balance control adjusts for equal sound from both left and right channels, to compensate for slight imperfections in program material, variations in loudspeaker output, and the vagaries of room acoustics.

The volume (also known as gain or level) control adjusts the over-all sound level. Actually, on a stereo set, this control consists of two separate controls, one for each channel, which are adjusted by a single knob—or, in a few instances, by separate knobs.

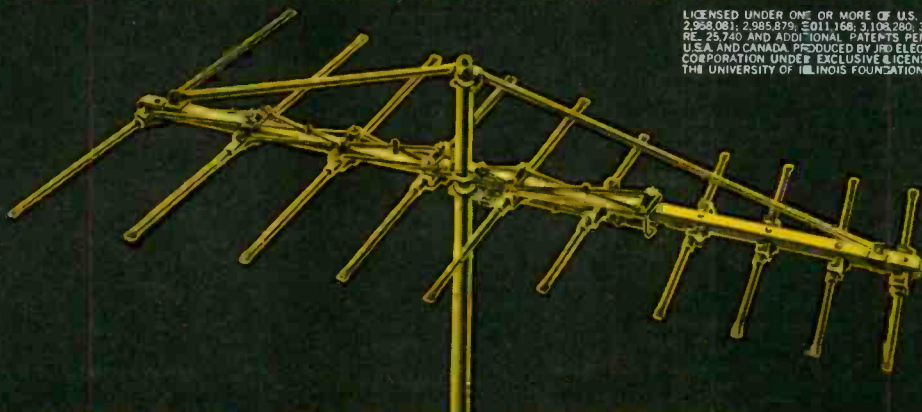
The treble tone control may be used to boost or to cut the high-end response, according to personal taste, speaker response, and listening conditions. The one shown here is a friction-coupled, dual-concentric type: it is actually two controls, one for each channel, but the pair may be used simultaneously or independently, as required. This type of control is costlier, naturally, than the single control for both channels at once. The latter type, while not as versatile, can prove quite adequate in many installations.

The bass tone control, which follows, does for the low frequencies what the treble control does for the highs. The nominal dividing frequency, from the standpoint of tone control effect, is 1,000 Hz (cps). Tones below this are the "bass"; tones above it, the "highs."

The speaker selector switch at the extreme right chooses between one set of speakers (the "main" pair) and another set, which may be installed in the same room or remotely, for listening in another part of the house. It also has a position for running all speakers at once, and another that cuts them all out—as for instance when listening over headphones without disturbing anyone. Two headphone jacks are provided—for a "his and her" sort of private listening session.

FM EXPERTS AGREE

ON THE JFD



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(WATTAGE)

Want not
(MUSICAL PURITY)

Let's consider *efficiency*... defined as "the quantity of sound obtained from a speaker system per amplifier watt". By itself, efficiency is not a measure of speaker quality... but it can be the factor which brings a better standard of performance to your entire music system. Wharfedales are described as "high efficiency speakers". This means: (1) They perform perfectly at low wattage. (2) They project a full rich sound from a relatively small enclosure. (Even the "large" W90 is a modest size.) (3) They provide more sound per amplifier dollar. You can buy lower powered versions of the amplifier of your choice, applying the savings to upgrade all of the components in your music system including the speakers. (4) They handle the highest power safely... without break-up or distortion. If you belong to the

"high power" amplifier school, note that the massive magnets which give these speakers their higher efficiency will keep your amplifier power under full control through any musical selection, by magnetic damping. And it is well to remember that high efficiency speaker systems certainly are indicated if you wish to realize the full advantages of the latest solid state circuitry.

Through greater efficiency, a Wharfedale speaker system can bring you substantial dividends in sound from a smaller investment in power than you may be contemplating. This is a valuable point to remember when ordering your components.

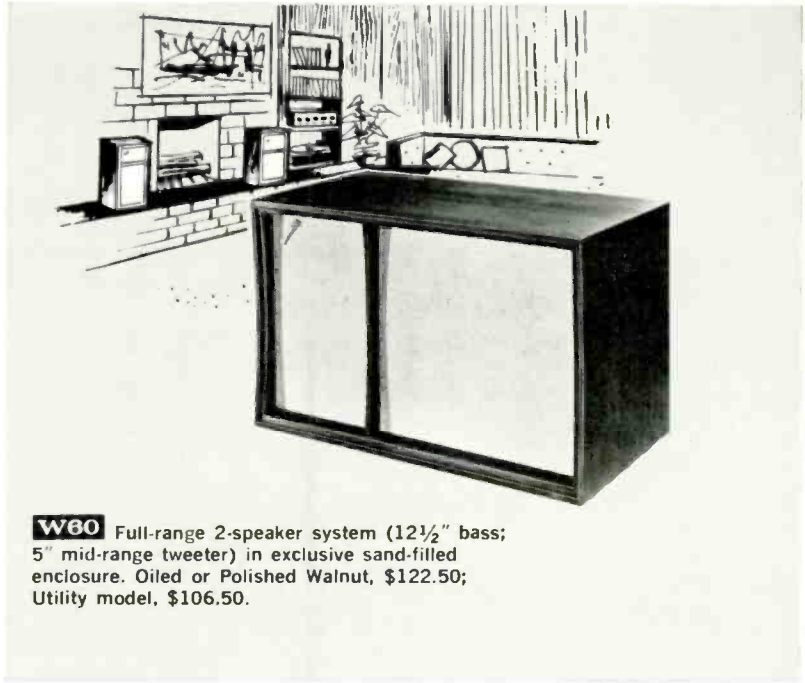
Wharfedale

For Comparator Guide with full specifications, write Wharfedale, Div. British Industries Corp., Dept. WY-1505, Westbury, New York 11591.

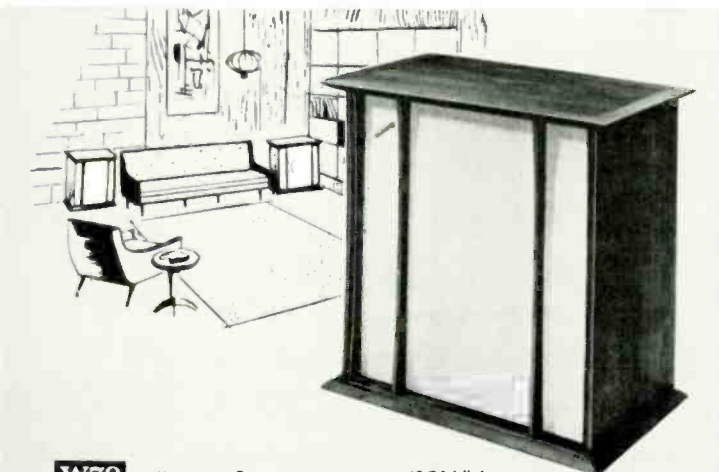


W90 shown on optional mounting base

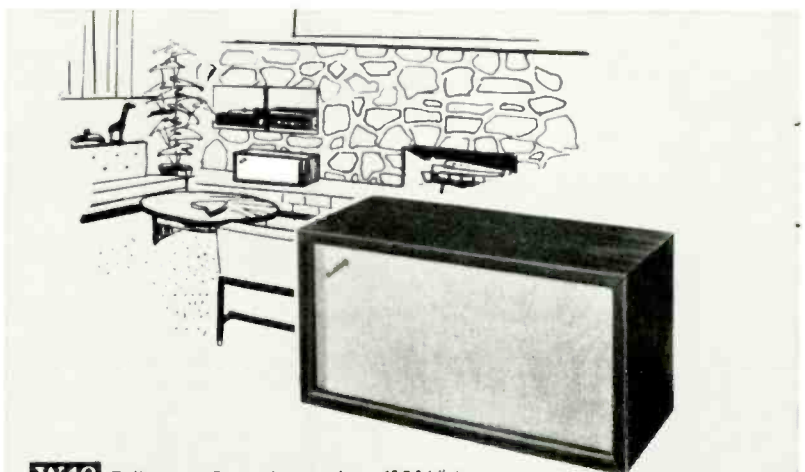
W90 6-speaker system (two 12½" bass; two 5½" mid-range; two Super 3 treble), superbly matched and integrated with a magnificent sand-filled enclosure. Oiled or Polished Walnut, \$272.50; Utility model, \$256.50.



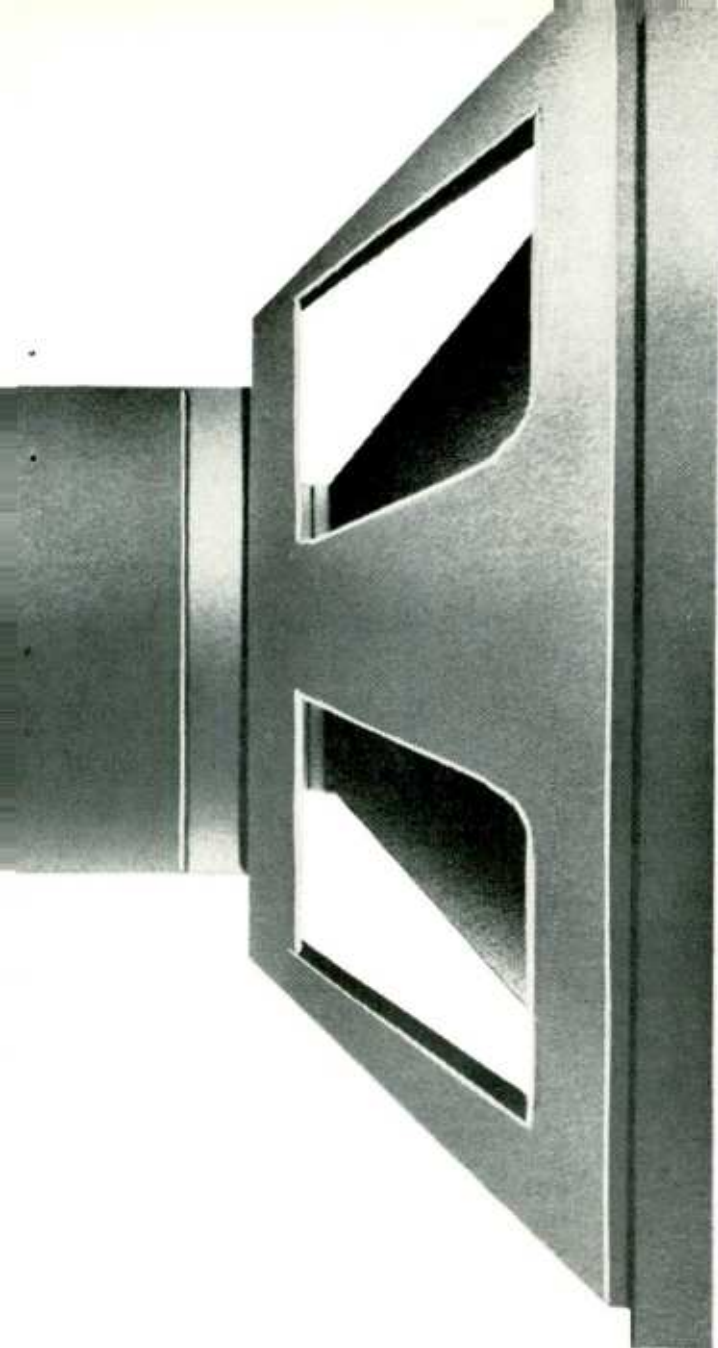
W60 Full-range 2-speaker system (12½" bass; 5" mid-range tweeter) in exclusive sand-filled enclosure. Oiled or Polished Walnut, \$122.50; Utility model, \$106.50.



W70 Full-range 3-speaker system (12½" bass; 10¼" mid-range; Super 3 treble) in exclusive sand-filled enclosure. Oiled or Polished Walnut, \$172.50; Utility model, \$153.50.



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by Leonard Feldman

SPEAKERS FOR 3-D SOUND

**There's a size
and shape for every
taste in stereo.**

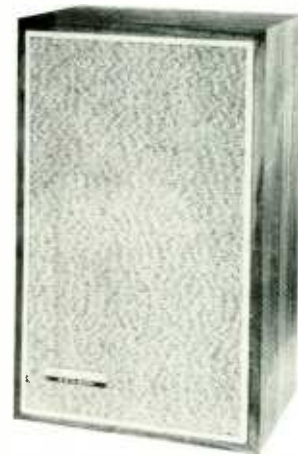
IN THE QUEST for lifelike stereo sound reproduction, high fidelitarians have found that the development of top-quality loudspeakers has played an important part in achieving the fine results evident today. In the last few years loudspeakers have undergone major changes. Compact designs have put in an appearance, the need for them due chiefly to the extra space demands of the second speaker system in stereo installations. Larger systems as well are in abundance—both styles have their partisans. Yet, for all the variations in size and appearance of models currently available, the objective of a loudspeaker system remains what it has always been: to reproduce sound with the least possible distortion. Whatever its size or style, the loudspeaker should contribute no sound of its own but should merely translate into sound the electrical signals fed to it by the amplifier.

The trend today is toward purchase of complete speaker systems rather than separate loudspeaker elements (drivers and crossover network) and suitable enclosures. Reasons for this tendency will be explained further on. For the moment, however, consideration will be given to the many variations in speaker element construction.

Most of the speakers sold today produce sound by the movement of a diaphragm, usually a paper cone activated by a moving coil (the "voice-coil") and magnet assembly. Aside from (or in some models, in addition to) molded paper, such materials as polystyrene foam and other plastics are used for

Mr. Feldman, a professional engineer and widely published author, was instrumental in setting up some of the earliest "live-versus-recorded" concert demonstrations.

Radio Shack's Electrostat-5, right, uses electrostatic tweeter and cone woofer; far right, this company's Solo-5, a low-cost compact system.



Low-slung floor-standing Frazier Del Mar II.



Criterion 50, one of many systems from Lafayette.

the cone. These materials are lighter and often more rigid than the more conventional paper and therefore can be molded into relatively flat shapes in keeping with the requirements for "thin" design. Any cone material, if not correctly incorporated into the over-all design of a speaker system, can introduce some coloration into the reproduced sound. Coloration, in general, may be loosely defined as any characteristic sound—quite apart from the desired signal—a loudspeaker cone imparts to the program. It is this quality which enables the listener to perceive differences between one loudspeaker system and another.

Many cone speakers are unable to reproduce the full audible range of tones. Larger cones (of the 10-, 12-, and even 15-inch-diameter variety) are most efficient in reproducing low, bass tones but are too large to vibrate well at the highest treble tones. Smaller cones do much better in reproducing high frequency tones, but are unable to do very much in the lower range. The solution, of course, has been to design something like a "choral ensemble" of loudspeaker elements—a suitable duet of low-frequency (woofer) and high-frequency (tweeter)—or even a trio, in which a midrange element is added for even greater efficiency and lower distortion. In such multiple speaker-element systems, devices known as "crossover networks" channel the desired groups of frequencies to the appropriate speaker elements.

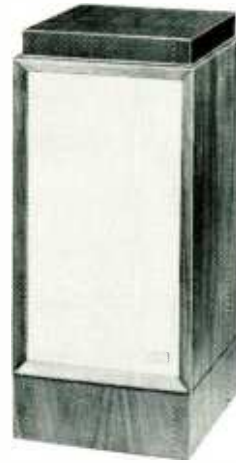
A different principle of generation of sound is embodied in the electrostatic type of loudspeaker element, essentially a sandwich of flat plates. The outer, stationary plates are perforated to allow sound waves created by the center, moving plate to reach the listener. This inner plate is actuated by electrical voltage charges (corresponding to the audio signal put out by the amplifier) rather than by electromagnetic energy. The electrostatic principle lends itself readily to tweeter construction. In addition, a few costly full-range versions have become available recently.

Yet a third sort of loudspeaker is the "induction" type. This one, again, is magnetic, but instead of a cone, its diaphragm is a flat panel of molded lightweight plastic. To this panel is laminated a form of printed-circuit flat copper coil. An enclosing magnetic field causes the entire panel to vibrate in synchronism with the amplifier's audio signal.

Electrostatic and induction speakers depend, in the main, on physical size for full bass reproduction. As a rule, the larger the system, or the more flat elements used, the deeper the bass. Dynamic cone speakers, of whatever diameter, rely for their bass reproduction on an enclosure. When a speaker cone vibrates back and forth in response to the amplifier signal, sound emanates from the rear as well as from the front of the cone. Unless the sound coming from the rear of the cone is prevented from interfering with the front sound



University's Mini-Flex, an ultrathin system.



The KSC-3, a compact but floor-standing model.



Floor-standing HS-3, made by Utah Electronics.

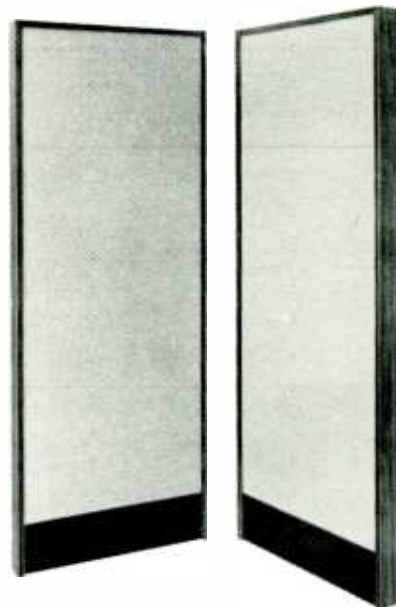


One of Heath's speaker systems, the AS-10.

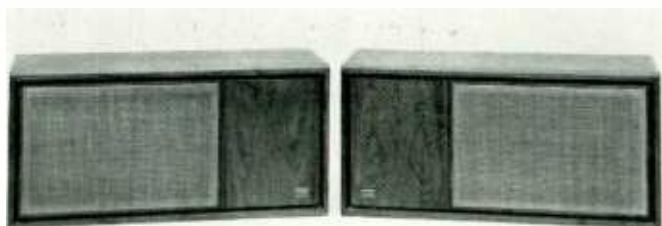
waves (or "baffled"), it will, in effect, cancel the front radiation, particularly at low frequencies. For this reason suitable speaker enclosures are as important to the over-all performance of a loud-speaker system as the speaker cones themselves.

One simple, though effective, form of enclosure is the infinite baffle: a completely closed and non-resonating box whose effect on the speaker waves may be compared to the influence an infinitely large surface would have. That is to say, such a box prevents sound from the rear of the speaker from coming around to interfere with the front vibrations. To be effective, the box must be large; otherwise the air within the box (which is totally sealed) will restrict the cone's movement and reduce its bass response. As a rule, the larger the conventional-cone speaker element, the larger must be the infinite-baffle enclosure. In practice, infinite baffle designs call for about 6 cubic feet of inside space to accommodate a 12- or 15-inch speaker.

Another popular type of enclosure is the bass reflex. In this design, the bass frequencies coming from the rear of the speaker are reversed in direction and allowed to emerge from an auxiliary opening in the cabinet—in phase with the front wave to reinforce over-all bass performance. The size of this opening, or "port," and its location must be carefully calculated if proper bass reinforcement is to be achieved. Incorrect "tuning" of the bass-reflex port can actually result in deteriorated, rather than



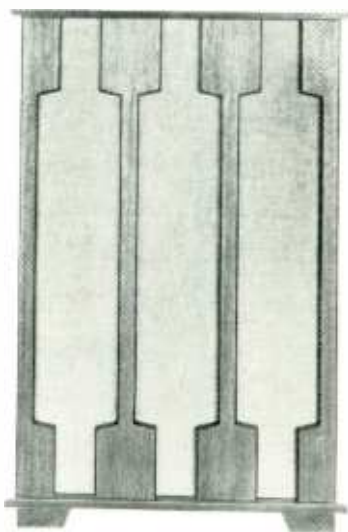
Aconstech X electrostatic pair, supplied with integrated power amplifiers. Similar-appearing electrostatic panels also are made by KLH.



A pair of 3010 systems, new compacts by Ampex.



The Argus X-5B, a new floor-standing system.



Bozak's huge B-4000; in addition to the design shown, a double-arch front also is available.



University's Mediterranean system is housed in floor-based octagonal enclosure with round top.

enhanced, bass response—a good reason for choosing such a system in preassembled form rather than trying to construct one yourself.

An effort to reduce the size of the bass reflex is seen in the "ducted port" approach. Here, a cylinder of proper dimensions is installed within the enclosure from the front port inward, to lengthen the path the rear sound waves must travel before reaching the port.

A third major class of enclosures—used with relatively stiff speakers—are horn-type systems, in which a long horn, fashioned from folded wooden sections, is "loaded" to the diaphragm of the speaker. Over-all dimensions are fairly large, although horn coupling permits the use of smaller-diameter cones with fairly high efficiency. Again, the complex and critical nature of a folded-horn design virtually rules it out for construction by the home handyman—such a system is best obtained factory-assembled.

All of the above approaches to integrated speaker-enclosure designs are based upon the use of fairly stiff cone speaker elements whose movements are confined to relatively short excursions. In the last decade an alternate approach to speaker system design—that of using soft-suspension speakers in fairly compact enclosures—has grown rapidly in popularity. Measuring about one cubic foot in volume, "acoustic suspension" systems produce powerful bass tones with a minimum of distortion. The secret lies chiefly in the method of construction of the speaker element: the small size of the enclosure actually complements the design of the bass driver. The cone of such a speaker has a very soft suspension which enables the cone to travel over great excursions to produce deep, clean bass. If such speaker elements were housed in any of the conventional enclosures previously discussed, the ease with which the cone moves would result in inertial movements, generally known as overhang or underdamping. Audibly, this would mean muddy, indistinct, or boomy bass. When these "soft suspension"



Newest Wharfedale system is the compact Model 30.

speakers are mounted in relatively small, totally sealed enclosures, the air trapped within provides the necessary stiffness absent in the mechanical construction of the speaker element itself. What's more, the air cushion often provides more linear or uniform motion of the cone than is achieved with purely mechanical suspensions. Thus, the small size of the enclosure is an advantage.

What with the abundance of air suspension systems one might question the need for larger speaker designs. Yet the popularity of larger systems has increased even as compact designs have become plentiful. Reasons may well be a matter of personal listening taste. From a purely technical standpoint, the acoustic suspension systems do, as a rule, require considerably more amplifier power than do stiff-suspension types: often five to ten times as much for an equivalent sound output. Another consideration might be the critical relationship between speaker and enclosure in an acoustic suspension system: such systems are invariably offered as complete systems only. Manufacturers feel that proper construction and sealing of these enclosures had best be left in their hands if full utilization of this principle is to be realized. Specific amplifier requirements for both basic types of speaker systems will be discussed shortly, since many other considerations besides type of speaker are involved.

Whatever the size of the speaker system, faithful reproduction of music demands top performance of the mid- and high frequency range as well as of the bass. High frequencies, in general, are notorious for their narrow directional characteristics. Thus, the listener sitting in line with the speaker system may actually hear exaggerated highs while a companion, seated off-center in the same room, may find the highs totally missing. Spreading the distribution of these tones therefore has become a design goal of speaker producers, who have found a host of approaches to the problem. In addition to "horn" and "acoustic lens" tweeters, manufacturers are produc-



J. B. Lansing Paragon is two complete speaker systems in unitized housing. Firm also offers smaller versions of this system and individual models.



A recent compact by Altec Lansing, the 845A Verde.

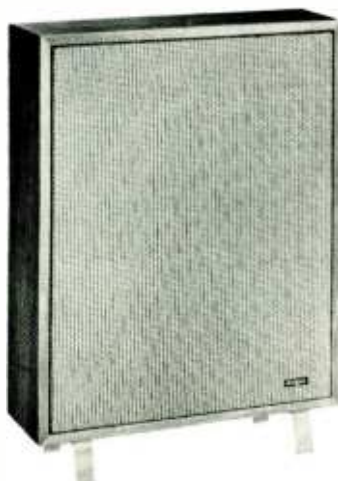


The 846A Valencia by Altec Lansing puts A-7 Voice of the Theatre system in new housing.

ing hemispherical dome tweeters and tweeters of new materials (such as polystyrene plastic) which form ultralight but extremely stiff cones. In some systems, several tweeters are mounted in an array to provide wide-angle treble dispersion, or face upward to "spray" the sound. And in at least one new design the tweeter is rotated by a silent electric motor to achieve 360-degree dispersion of highs. In general, the more omnidirectional the sound, the less critical is the listener's position in the room for perception of the spatial quality of stereo.

Aside from considerations of décor, enclosure size, and cost, the ultimate choice of a pair of loud-speaker systems for stereo is closely related to one's choice of power amplifier. As has been noted earlier, the larger types of speaker systems generally require less amplifier power for a given volume of sound than do the smaller, air-suspension models. Much

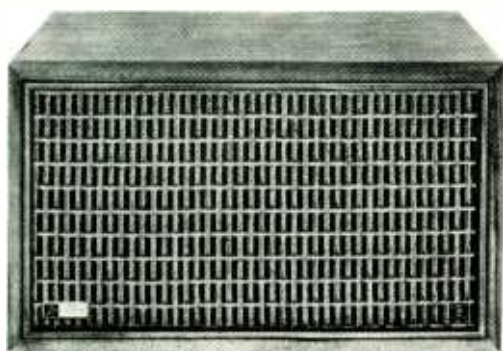
depends on the listener's preference, too. Some people want to duplicate dynamic musical passages at levels of sound equal to those experienced in the tenth row of a live symphonic concert (corresponding to about 110-db level in the accompanying chart). Others are content to listen at more moderate levels (or, if not content, at least do so out of neighborly consideration). Most dealers can tell you the relative efficiencies of speaker systems which they are offering for sale. Armed with this knowledge, and realizing what are your own preferences for level or volume (60 db represents background music, 80 db is equivalent to small orchestral or chamber music in medium halls, 100 db or more is "full blast" of a major symphony orchestra playing Wagner or Hindemith), you may find the accompanying chart helpful as a preliminary step in matching amplifier power to speaker requirements.



Argos TX-12 is slim, floor-standing model. Company also offers other popularly priced systems.



Largest Sherwood system is the SR-4 Tanglewood. This firm also offers smaller shelf-type models.



New Fisher compact, the XP-9. Company produces many systems, including kits and floor-based unit.



One of Electro-Voice's latest, the compact EV-7. Other EV systems include larger units, and kits.

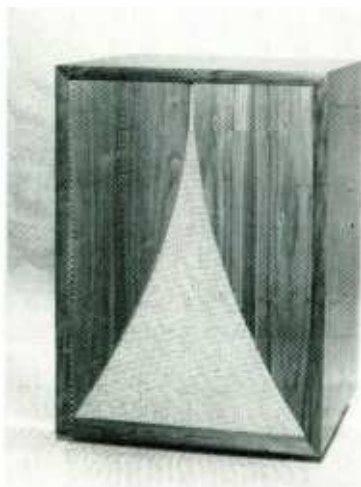
A word of caution is in order here. Most speaker specifications include a "maximum power" rating. This rating, in watts, is not to be confused with "required amplifier power." It is, rather, the maximum power which may be applied to the speaker for any length of time without actually damaging it.

Once you have narrowed your choice of systems to three or four, an ideal process is to have the salesman quickly switch from one system to the next while you listen attentively, deciding which sound pleases you most. (Of course it goes without saying that your judgment of sound will improve as you hear music live at concerts, for it is the sound of "live" music, after all, that stereophony is attempting to duplicate in your living room.) In making your evaluation, try to hear an assortment of musical selections (listening to the spoken voice is also often of great assistance, particularly if the voice is a

familiar one; distortion in the reproduction of a voice you are accustomed to is often more apparent than more subtle distortions occurring in less familiar musical recordings).

If, for reasons of economy or because of a personal bent for carpentry, you elect to purchase speaker elements only (to fit into your own enclosure), make certain that you leave the salesroom armed with the speaker manufacturer's own recommendations regarding suitable enclosures—and follow the instructions carefully.

Speaker performance can be greatly influenced by acoustic environment. For instance, most speaker systems will provide enhanced bass when placed in a corner of the room, since the three surfaces of floor and walls form a kind of extension horn that helps couple bass and room. The degree of liveness or reverberation of sound of a given system can be



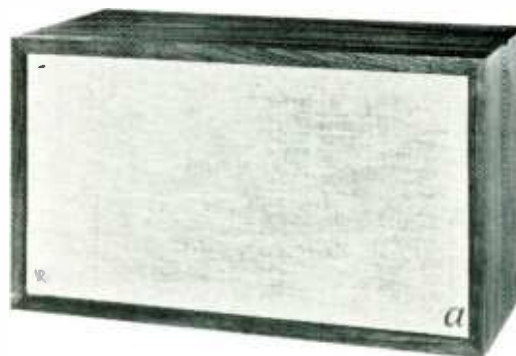
Karlson X-15 is available as complete speaker system, or as enclosure only; also in kit form.



Leonhardt LH-500 is circular-type speaker system; one of several offered by this company.



Largest system by Audio Dynamics is the ADC-18; company also offers smaller, lower-cost units.



Acoustic Research AR-2ax uses new midrange unit. Company also manufactures several other systems.

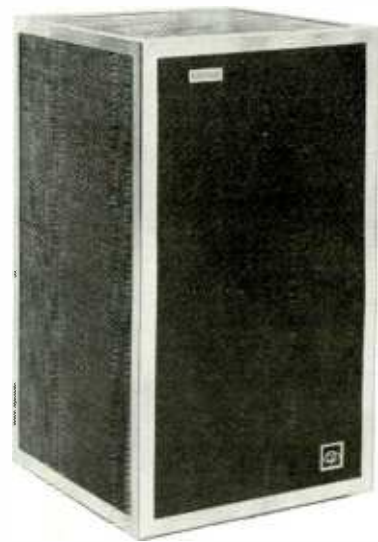


New Sonotone speaker is compact RM-2.



The British-made Quad, a full-range electrostatic.

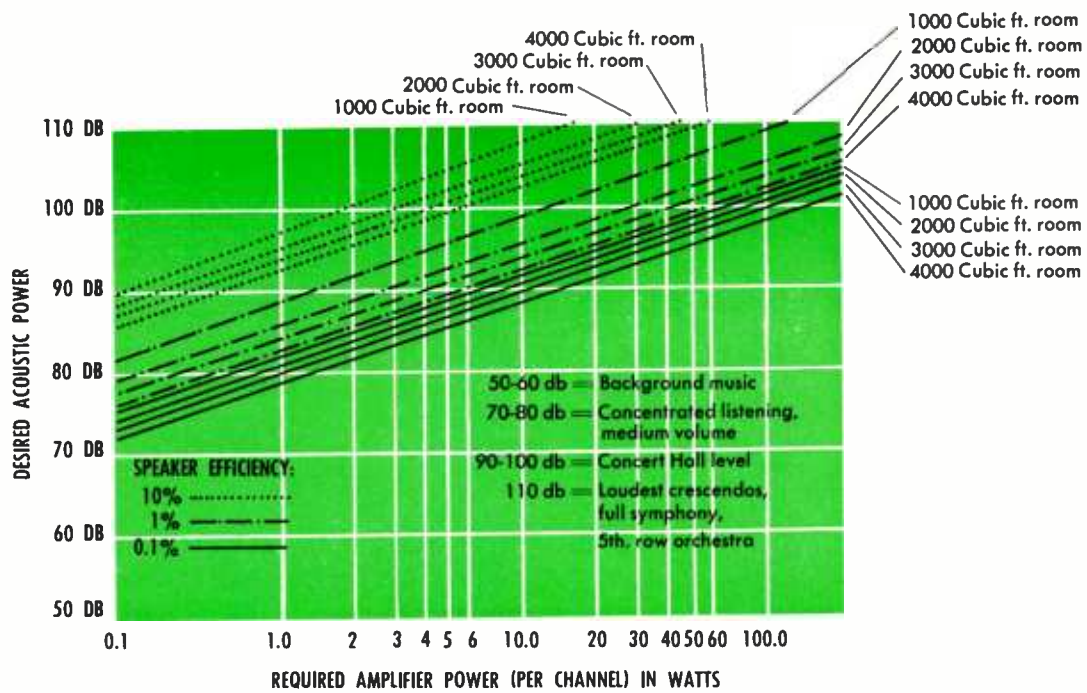
Novel twist in speaker design is rotating midrange and tweeter, shown in cut-away view of Circle-O-Phonic system. Housed version at right.



From Desopren of California comes the DS-300, claimed to be the smallest full-range horn made.



Electrostatic mid- and high-range units are used in Aconstica's circular table-top system and in this company's lampshade speaker.



Use this chart to estimate amplifier power needed for speakers of various efficiencies.

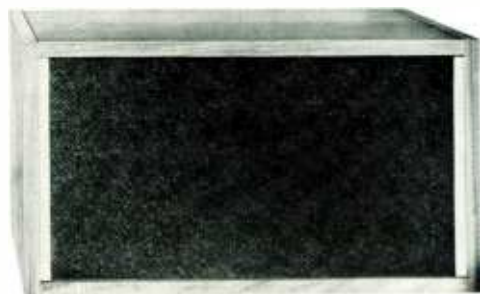
greatly influenced by room furnishings. For example, a heavily draped and carpeted room often seems to reduce a speaker's treble response; the high tones are literally absorbed by the soft surfaces. Conversely, the same system installed in a bare room, or one abounding in hard reflecting surfaces, may produce too much of the highs; the sound may even become harsh and shrill. Ideally, a salesroom designed to demonstrate the merits of loudspeaker systems should be furnished in much the same way as the average living room. Of course, if yours is not an average living room, you may expect your stereo speaker systems at home to sound somewhat different from what they did in the showroom. Fortunately, these variations can readily be compensated for by a variety of techniques—including proper placement or positioning of the speakers, moderate adjustment of tone control settings on amplifiers and even, in extreme cases, the addition or removal of draperies and soft reflecting surfaces.

Before attempting to place your speakers in their final locations, make sure they are correctly phased. That is, when the same sound (monophonic material) is fed to both systems, the diaphragms of both should move outward (and inward) together. If incorrectly connected (cones moving "out of phase"), a noticeable decrease in bass will occur, together with such other "anti-stereo" effects as exaggerated separation. To ascertain whether or not speakers have been connected for "in-phase" operation, first place them close together and play some monophonic material through the systems. Next, reverse the connections to the terminals of *one* and play the material again. If under these conditions there is a noticeable increase in over-all bass sound, your speaker systems are now properly phased. If there is an apparent decrease, the speakers were initially properly phased and the original connections should be restored.

Placement of speaker systems for optimum stereo listening is governed by two primary factors: the



Model 600-XL is new compact by Jensen. Company also offers other systems and separate drivers.



Benjamin 208 is low-cost compact for use with company's modular system, or for general use.



Low-cost stereo headset in Realistic series by Radio Shack.



Solo/Phone amplifier by Shure drives two pairs of headsets; connects directly to program source.



Superex ST-PRO headset features miniature woofer-tweeter setup and crossover network in each phone.

Stereo Headphones—Listening in Private

Private stereo listening, via headphones, has many enthusiasts—thanks largely to the improved models now available. They afford the ultimate in privacy (headphones don't spray any sound at all at the nonwearer), and a degree of stereo separation seldom achieved when listening to room-filling programs from loudspeaker systems. Stereo headsets are really built like miniature loudspeakers. Unlike their uncomfortable predecessors of early radio days, today's sets—made of lightweight materials and fitted with cushioning sponge or foam rubber—are quite comfortable. Moreover, the improved response of today's models can capture the fancy of the high fidelity enthusiast.

Most headsets are low-impedance types, so that they can be connected directly to the speaker terminals of an amplifier. Alternately, most latter-day stereo amplifiers are equipped with the necessary jack to enable you to plug in without even bothering about disconnecting the loudspeakers. Often, a switch is provided on the amplifier which enables you to select headset, speakers, or both. For older amplifiers, an inexpensive junction box (usually made available by the headset manufacturer) may be connected so that it can accomplish the switching to phones in much the same way as do the newer amplifiers. In using these junction boxes, check to make sure that they are compatible with your particular amplifier, especially if it

is transistorized. Some amplifiers require a four-wire system (two separate "ground" wires and two separate "hot" wires) whereas others may operate satisfactorily with only three (common "ground" wire for left and right channels). Finally, special amplifiers also are available designed expressly for headphone systems with no loudspeakers at all.

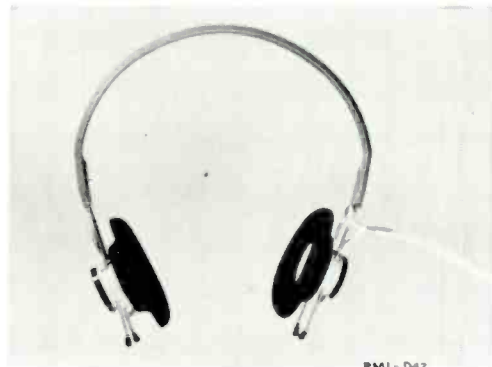
Many headset users after the first burst of enthusiasm become dismayed because they feel that the stereo effect is overemphasized. Of course they are correct that it is, since stereo recordings are made under the presumption that loudspeakers rather than headsets will be generally used for playback. To remedy the matter, some headphone manufacturers now offer a "cross-feed" device which feeds a bit of each channel into the other.

Two hints for headset devotees: if channels are reversed, don't reach for the amplifier controls—just turn the phones around! Too, don't develop the "headphone-shout," as you'll have a tendency to do. (It's practically impossible for you to judge the volume of your own voice in speaking while you are listening to music through phones.)

Finally, a word to the wives and families of headphone listeners: if you wish to attract the attention of your favorite music-lover, tap him on the shoulder. It's not that he's deliberately ignoring you—he just can't hear what you're saying.



Model SP-3 is one of several made by Koss. Company also is readying a new headphone amplifier.



PML-D42

Lightweight PML-D42 headset is made in Sweden; distributed in the U.S.A. by Ercona Corp., N.Y.



STC-1 by Lafayette is low-cost headphone amplifier; connects to program sources, drives two sets.



Recent entry by Jensen is Model HS-2; this firm also produces mixing networks and control boxes.



Latest model from Sharpe is the HA-660/PRO; each phone has its own adjustment for tonal balance.



Serenata is one of several sets by Telex; has knob on headband to adjust for wearing comfort.



Maximus 5 is one of several new systems in this series offered by UTC Sound; cut-away view shows relative placement of drivers; snap-off grille.



New feature of circular Empire Grenadier 8000P is removable stops to adjust bass. Company's 8200 is a compact using Empire acoustical lens.



Mark IV is one of several floor-standing models offered by Hartley; smaller systems also offered.

size of the room and the position of the listener or listeners. In an average room of more or less rectangular shape, speakers can be placed along any wall (either the long or short dimension, depending upon listeners' seating) about 8 to 12 feet apart, or forming an angle of at least 30 degrees to the listener. Less relative separation than this will tend to negate the desired stereo effect. On the other hand, overly separated speaker systems may exaggerate the stereo effect out of proportion and cause a so-called "hole-in-the-middle" effect. Of even greater importance than physical distance between speakers is overall sonic balance. Ideally, we strive toward a "uniform wall of sound" sensation, rather than the feeling of two "points of sound." When this ideal is finally achieved, one tends to forget the presence of the actual speakers and the music itself predominates.

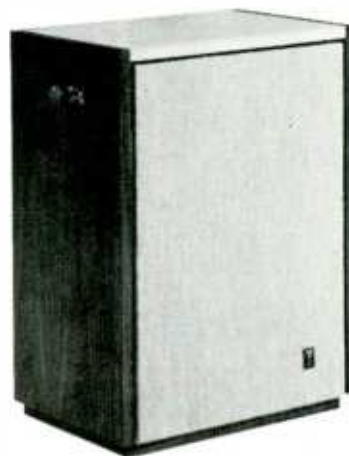
Tweeters should never be directed at nearby soft, draped surfaces lest the highs be swallowed up. If there is an apparent variation in high frequency performance of the channels because of differences in reflecting surfaces in the vicinity (and these objects cannot be moved), the problem may be solved by adjusting the system's high frequency level control (usually located on the rear of the speaker enclosure).

In the event that the room's dimensions or décor prevents you from listening at a position midway between the speakers, it is still possible to achieve proper stereo effect in one of two ways. The balance control of your amplifier can be rotated so that more sound is produced by the speaker system farther from you, or the closer system may be equipped with a speaker volume control (known as a speaker "pad") and its sound level reduced by means of this control.

If room dimensions indicate rather wide separation of loudspeaker systems, you may encounter an over-extreme stereo effect which prevents full enjoyment of the program material. The effect is often com-



The EMI/Scope 901 is a floor-standing system that houses the unusually large oval driver seen at left.



Marble top dresses up new J. B. Lansing Dorian; available with different drivers preinstalled.



Model ZL-6 is new compact, one of several systems by Isophon; distributed here by Gaston Johnston.



Speaker system kit by Nesbaminy uses electrostatic for midrange and highs; cone woofer for lows.



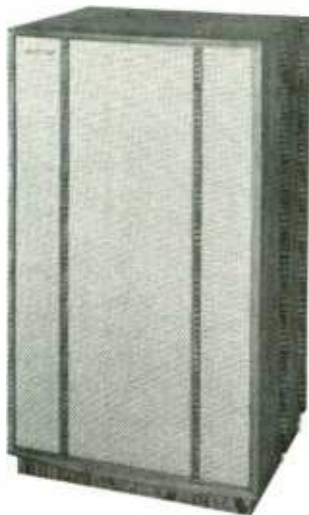
Leak Sandwich speaker system, distributed by Ercona; at right, interior view of system elements.





At right, the Klipschorn corner folded-horn system; at left, the Klipsch Cornwall for wall placement.

Newest system by KLH is Model Twelve, a floor-standing model. Company also makes many others.



Model GRF by Tannoy is huge floor-standing system employing 15-inch driver. Dalton is a smaller system using a 10-inch or 12-inch speaker.



pared with "two orchestras, playing the same material in two different rooms." Such a situation may dictate the use of a center-channel loudspeaker. In utilizing a "derived center channel" the objective is to feed a bit of the electrical signal of both left and right speaker systems, additively, to a third, center-channel loudspeaker. The speaker selected for this auxiliary duty need not be as capable of bass response as the two primary systems, for bass tones are inherently nondirectional and are therefore not contributing to this seeming deficiency. It should, however, be clean-sounding and of an over-all character and efficiency close to that of your two primary systems. Many amplifiers are equipped with extra terminals for connecting this third speaker system and some even have a separate volume control with which the sound level of the auxiliary speaker can be adjusted for a proper fill-in. Bear in mind that if too much sound is permitted to come from the center speaker, it may have the undesired result of actually reducing the stereo effect. If your amplifier is not equipped for center-channel connection, it may still be possible to derive a third-channel output, but this should only be attempted after contacting the amplifier manufacturer for recommended procedures. Improper connection of a derived-channel speaker (particularly in the case of some transistorized amplifiers) may damage the power output circuits.

Selecting the loudspeakers for a stereo system is, in many ways, more critical than choosing any other single component of your system. You may listen to many amplifiers through the same speaker system and detect hardly any difference, but you surely will hear differences if you compare speaker systems. Only you can judge which sound pleases you most. Fortunately there is a wealth of variety from which to choose, covering all types, sizes, and prices. A little care at the outset in choosing will reward you with the kind of sound you've always wanted in your living room.

Product by product Empire takes you into a new world of sound. Listen for a moment.



You're on the threshold of a new realm of excitement in music and sound. Empire has created for you the world's most perfect high fidelity components. Combining unparalleled sound with refreshing furniture styling.

The New Empire Grenadier 8000P—truly the most significant advance in stereophonic reproduction. Its exclusive "Dynamic reflex stop system" allows you to adjust the bass and treble response to suit your individual room acoustics. Empire's revolutionary die-cast divergent acoustic lens assures fuller frequency and separation, plus broader sound propagation. Lets you sit anywhere—hear everything.

The Empire Royal Grenadier 9000—classically designed, elegantly styled. Let the magic of this wide angle speaker system invade your presence with its majestic sound and richness of tone. Truly, one of the world's greatest speaker systems.

High Fidelity reported—"...and what a speaker... voices sounded quite natural with no coloration evident; orchestral music was balanced and full; transients came through cleanly; the organ sounded authentic. Overall, the sonic presentation was excellent."

No less perfect than the Grenadiers are the **Incomparable Troubadors**—complete record playback systems.

The famous Empire 398—outstanding! Too perfectly engineered for even a whisper of distortion... too handsomely finished to hide behind cabinet doors. **The Empire 498**—no larger than a record changer—tailor made for console or equipment cabinets.

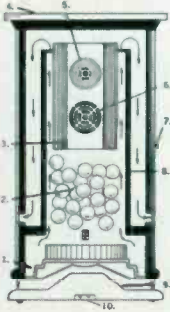
The Troubadors consist of the Empire 3 speed professional "silent" turntable... Empire 980 dynamically balanced arm with sensational dynalift... and the new Empire 888P "Living" cartridge featuring the exclusive magnetic cone stylus. No other cartridge can reproduce the entire musical range as precisely and with such clarity.

High Fidelity reported—"...the 888pe Living Cartridge offers the critical discophile one of the best sounding pickups available today."

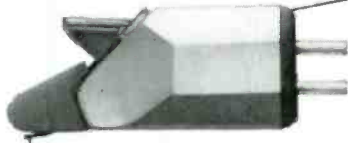
You, too, can enter Empire's new world of sound. Just go 'round to your Hi Fi dealer for a sound demonstration of the world's most perfect hi fidelity components... Empire Grenadiers, Troubadors and "Living" cartridges.



The New Empire Grenadier 8000P



- OUTSTANDING FEATURES**
1. 12 Inch mass loaded woofer with floating suspension, four inch voice coil and world's largest (18 lbs.) speaker ceramic magnet structure.
 2. Sound absorbent rear loading.
 3. Die-cast acoustic lens.
 4. Imported marble top.
 5. Ultra-Sonic dome tweeter.
 6. Full presence mid range radiator.
 7. Damped enclosure.
 8. Dynamic Reflex Stop System.
 9. Front loaded horn.
 10. Complete symmetry of design with terminals concealed underneath.



CIRCLE 108 ON READER-SERVICE CARD

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by Phoebe Eisenberg

Walls Of *cabinets of sound* Music

There *is* room for
stereo in every home . . .
and it *can* be
attractive.

SHALL WE AGREE that stereo is here to stay? Then we must also concede another *fait accompli*. Housing especially designed for audio equipment is not only here to stay but we're jolly glad to have it. Over the past few years "audio furniture"—be it a single cabinet, room divider, wall storage system, or elaborate built-in—has taken on an importance second only to that of the equipment itself. Components still set the pace for what must be housed, but the "how" of housing has taken on a style and color all its own. The evidence—in terms of new shapes and styles—is on display at many equipment centers and in most large, as well as some small, furniture outlets. One can hardly scan the main news section of our large city dailies without coming across an offering in this product area. And of course suitable housings expressly designed for audio installations are shown in catalogues issued both by manufacturers of high fidelity equipment and mail-order houses.

Just a few short years back the most efficient and good-looking setup would probably have entailed custom housing, often at great involvement, considerable cost, and sometimes frustration. Too often, the custom installation showed signs that there

"If my husband's stereo equipment could be organized," says the author, "anyone's can."



A stereo installation can be blended with general storage to form a useful and inviting part of the room. In this installation by Fisher, one of the cabinets below the bookshelves has been fitted with turntable and stereo receiver. A tape recorder sits on a shelf higher up. Speakers at top provide good sound front. Note ample record storage.

Stereo 200FM modular system by Benjamin offers turntable, tuner, and control amplifier in compact walnut and plexiglass housing that may be set down wherever convenient. Speakers are placed elsewhere.



At left is an unusually attractive setting at an audio dealer's which can inspire some planning ideas to take home. The business-like selector console and the turntable form a decorative piece at the Stereo Hi Fi Center, Gardena, Calif.

In this installation of RCA equipment, uprights bolted to the wall permit a wide variation of shelf arrangement to provide all manner of storage. Record player, tuner/amplifier, and two speakers may be placed wherever convenient.





The Furniture Craftsmen of Grand Rapids, Mich., offer a new low-boy ensemble. Three separate cabinets are used. The major center piece holds equipment in a variety of ways, features separate lift-up lids. Speaker enclosures are free-standing, may be placed next to the main cabinet.

was still much to be learned about constructing wrappings that wouldn't interfere with good sound: to please the eye was not always to please the critical ear of the audio purchaser. And it did seem in those days that milady had the eye, and husband the ear; not often could the two meet on common ground—except perhaps to disagree.

The over-all picture is more hopeful now. The newest trend is not just for old-type cabinets hopefully offered for audio use, but housing made specifically for the equipment. Thus, if stereo owners custom-build today—still a valid approach—they can do so with more prescience of what's required acoustically, and after they have seen what is available on the market that is not custom-built. Fortunately, what was once the trade secret of a few canny craftsmen is now the stock-in-trade of an entire industry. All the designers, it seems, are back at the drawing boards designing furniture with a purpose. There is still an active custom-building market but it is no longer obligatory for good sound compatible with good looks in a room. The new ready-made designs include a fine choice of cabinets, pole systems for all pockets and needs, room dividers to solve both storage and spatial problems, as well as modular units of all sizes and types of equipment. These new creations are both pleasing the public and profiting the industry. Designed with style and verve, helping to unify and organize a room, splashing everything nicely with a new boldness in color and shape, both the new audio equipment and its housing are truly meeting consumer needs head on.

So diverse are the possibilities in this area that we now have a new kind of audio furniture outlet. In New York City, for instance, Toujay Designs operates a "closed" furniture showroom to which



Used to help give the contemporary look, as shown on our cover, the Royal System's Cado units also fit nicely into a traditional décor.



Fisher 75 Custom Module comprises walnut-encased record player with built-in control amplifier and two matching speaker systems. Compact units can be placed in a number of ways.

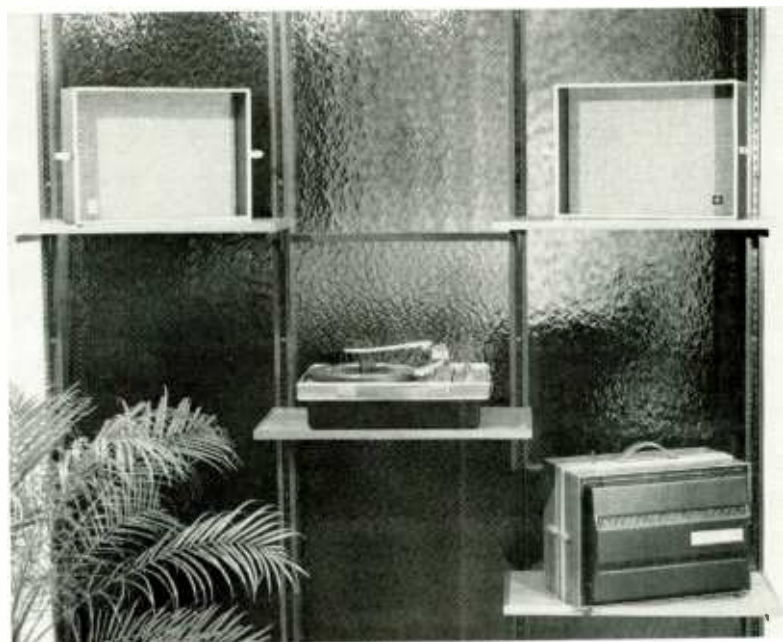
a customer may be referred, either by decorators or audio retailers, to select for his system a housing that really will fit his components. Toujay works closely with the audio dealers, and with the decorator (if one is employed) so that the final installation is an integrated entity. Many audio dealers themselves have set up simulated living rooms in their shops. The customer can sit at a console and, with a push-button device, switch back and forth between components he is considering. At Interiors and Sound, in New York City, the client can dial his equipment choice on a telephone-type selector devised by owner Jack Hardoff. The atmosphere in such surroundings is more comfortable, and quieter, than the audio jumble shops of years back.

The new aura that surrounds the buying of audio equipment and concomitantly its planning in terms of home installation has resulted from an increased awareness, by both the industry and consumer, of the special requirements of audio furniture. There are, as I see it, four of them, and they clearly define audio furniture, as distinguished from all other types. First, the furniture must house the equipment in such a way that it has adequate and constant protection—from external exposure as well as from casual knob-turners. Second, the audio components must be arranged logically to facilitate accessibility to the user, in terms of location of controls, placement of turntable, and so on. Third, components should be so placed as to assure their proper functioning: the turntable should be level and shock-mounted, the



Modular system by H. H. Scott features the record player and amplifier in a walnut case which also has room for a tuner that may be added later. Speakers in matching finish.

General Electric's modular system makes up into luggage-type package shown on shelf below: for installation in room, opens up into the three units shown on shelves.

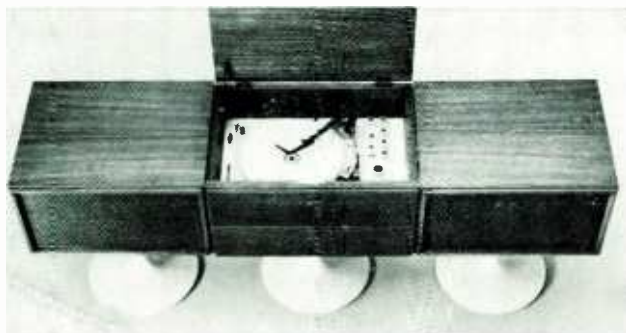




This chairside cabinet is the handiwork of Rear Admiral Robert S. Hatcher (ret.) of Monterey, Calif., using materials obtained from Craftsman Wood Service of Chicago. It houses turntable, tuner, and amplifier—as well as a cooling fan.



Twenty Plus by KLH is a modular system on sculptured pedestals. As shown here, the three basic units are grouped side by side to form a geometric pattern with respect to the vertical screen. The angular effect is softened by the free-form contemporary chair and the figured rug. Other arrangements are possible too, including using the system in traditional décor.



The Twenty Plus consists of three matched walnut pieces: two speaker systems and the equipment module which includes an automatic record player alongside a stereo tuner and amplifier.



Two views of a built-in custom installation by Allied Radio of Chicago. At left, the area in which the main components are used. All that is exposed is the record player and receiver, sitting on shelves behind folding doors. One of the stereo speaker systems may be seen recessed near ceiling. Photo above shows another area of the house serviced by two remote speakers in the wall which provide stereo here.



Scott components, in walnut cases, sit exposed atop a cabinet in this Spanish setting designed by Bernard E. Healy, N.S.I.D. Wires to speakers are hidden behind the equipment, under rugs.



In modular system by Crestmark, the record player is installed atop a stereo tuner/amplifier, and both units are housed in walnut and plexiglass. Matching speaker systems may be placed anywhere.

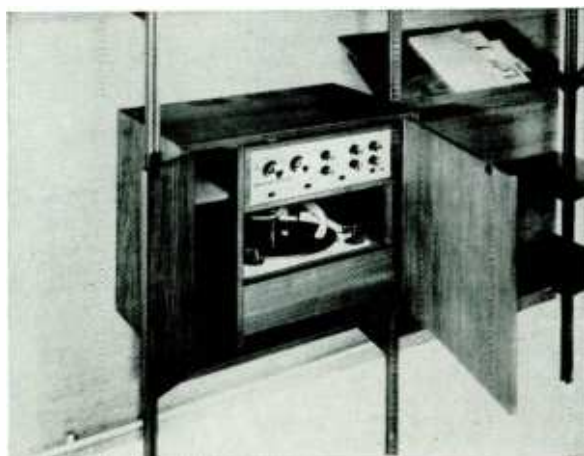
tone arm located correctly, chassis placed to avoid hum pickup, and adequate ventilation considered. Finally, all equipment should be accessible for servicing or parts replacement without the entire system having to be dismantled.

A cabinet or a wall storage system filling these specific needs is both furniture and an integral part of the sound system. The abundance of designs on today's market demonstrates that both roles can be filled—in a variety of styles and at many levels of cost.

A particularly encouraging aspect in the designing of the new audio furniture is the thought given to saving of space as well as to a freedom in arrangement never dreamed of several design-years back. One striking new concept is embodied in the Multi-



One of Barzilay's newest cabinets, designed by Jack Benveniste, is the Da Vinci Model 10E-D, part of the firm's Sarabande series. Both the equipment storage center piece and the flanking speaker enclosures are covered by folding doors that open for listening, provide a handsome front closed.



New cabinets designed for audio storage have been added to the Omni Line, a division of Aluminum Extrusions of Charlotte, Mich. The Omni system consists of uprights to which are fastened shelf and cabinet brackets that extend backward to the wall.

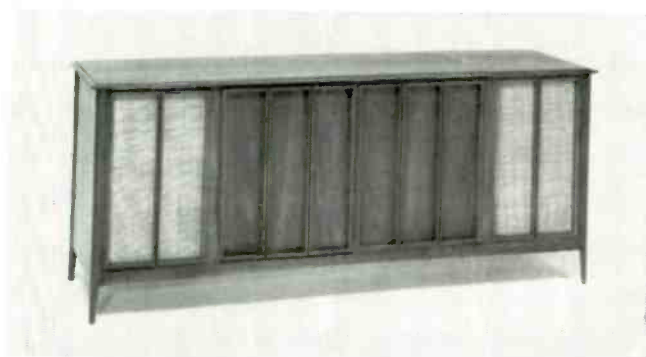
Cube system, which offers almost any combination of storage setup imaginable. Multi-Cube is made of basic units, available in walnut, teak, or rosewood. They can be stacked, hung from the wall, or placed in any number of combinations. The cubes are vented and can be fitted for all types of audio equipment. They are shown by Toujay in kit form or factory-assembled. Another fairly new company, Audio Originals, offers a larger-than-ever selection of cabinets as well as open shelves and "semicabinets." From an older source, Allied Radio, comes news of a free-standing cabinet and shelf system, certainly worth investigation in terms of practicality and realistic pricing. Called the Knight room-divider, it is adjustable in height and width. Barzilay has revised its Design One kit: both the equipment and the



From Marquette Corporation, Minneapolis comes this novel installation idea. Two cabinets contain a stereo record-playing system and a television set. The rear of the TV cabinet houses a second speaker system for stereo, and may be turned on its swivel base to hide the blank screen when not in use.



Modules by Sylvania are grouped attractively and functionally on "ladder-and-shelf" storage system which also holds books and other objects. Center equipment cabinet houses automatic turntable under lift-up lid, plus the amplifier and tuner. Note placement of two speakers.



Audio Originals of Indianapolis offers a growing line of cabinets for audio systems. Shown here is the Model 606-D, space for components and speakers.



matching speaker enclosures are larger than before—and still eminently attractive, in walnut. The Royal System offers wall arrangements ad infinitum. Their Danish-designed units come in teak, walnut, or rosewood and can be fitted into as large or confined an area as necessary. Similarly, the Omni System has kept abreast of audio demands: its storage system is augmented by a new arrangement of two-pole bays, which can be purchased individually or in any one of many different combinations. The shelves and cabinets are finished in oiled walnut. Omni has announced three new audio cabinets as well, designed especially for components. The cabinets are vented for air circulation and provide individual compartments for equipment with easy accessibility for installation and repair.

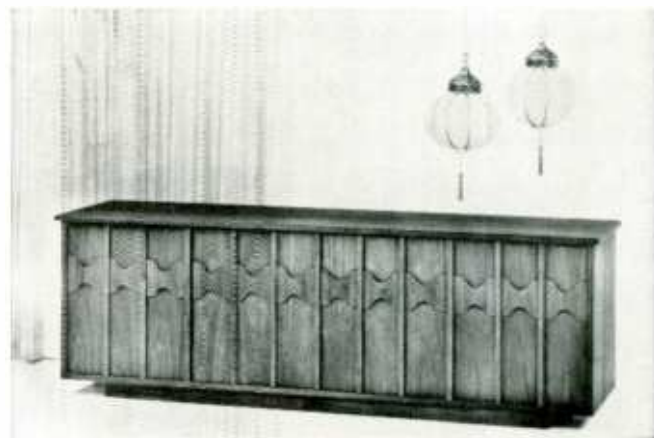
One obvious answer for apartment dwellers or all buyers with limited space is pole arrangements, which can be dismantled and rearranged quickly, yet look remarkably attractive. Since so many people still object strongly to seeing components out in



Installation of reader A. P. Harrison of Bondi, Australia employs cabinet crammed with equipment (above) but which closes to present neat front in room (left). Cabinet between the Quad electrostatic speakers houses a television set and a center-channel speaker. Some of the records made by Mrs. Harrison (professionally, pianist Clara Skriptschenko) are displayed on the rug.

the raw, even these pole installations have gone under cover—the new cabinets offered for use with them can hide all the knobs and wires and, at the same time, enhance attractiveness of the general décor of a room. Pole installations can be the answer to many a consumer's prayer this year, helping to avoid the complete open-shelf look, yet retaining the convenience of shelves in confined areas.

THE RECENTLY developed modular audio systems have a unique appeal. They represent a new meeting-ground of sound and design where well-constructed furniture comes as an integral part of the equipment. If this approach is considered a compromise system from a sonic standpoint, it is an efficient and well-constructed compromise, certainly more so than the package systems of yore. The new modular systems are made of high quality components by people who have the know-how of good audio—and they are pleasing to the eye. The formula is to house



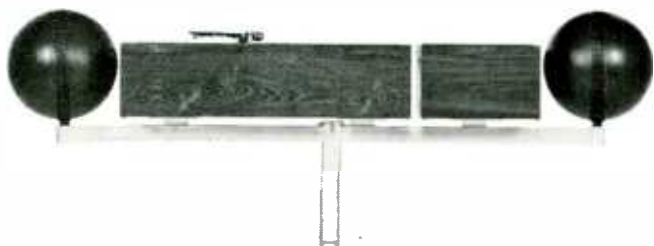
This cabinet, the Medallion No. 410, is one of many by Davrick of Covina, Calif. The top is solid; the front is covered by four doors. Space is provided for components, records, and two speaker systems.



In this Scott installation, receiver sits on cabinet with superstructure. Designed by H. R. Rubin, A.I.D., Contemporary Interiors, Brookline, Mass.



Harman-Kardon has brought out a modular system in which the tuner/amplifier faces upward on a sloping panel in front of automatic turntable.

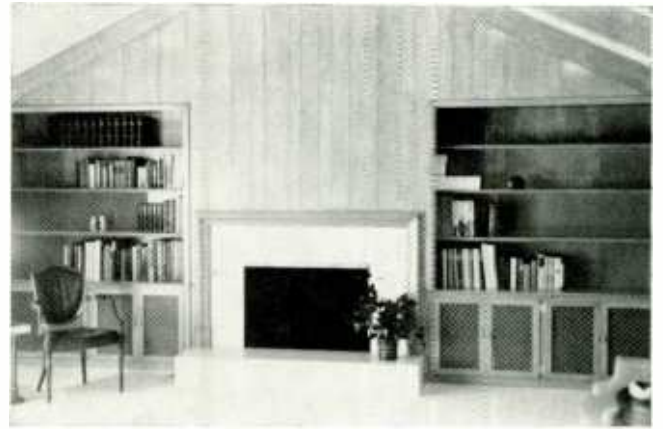
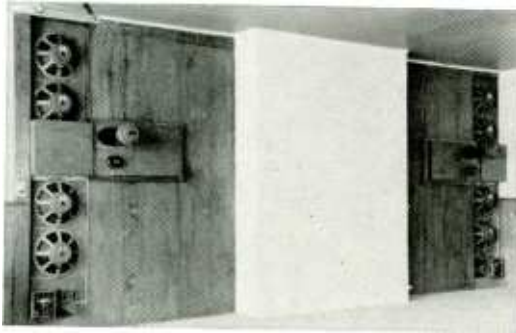


Project G2 by Clairtone is modular system with spherical speakers. Smaller walnut box holds records.



The Shure modular system, in walnut, houses turntable and amplifier in a lift-up lid cabinet. Like many others, this one also comes in luggage case.

From J. B. Lansing Sound comes this home installation by David Beatty of Kansas City, Mo. Wall between living room and garage forms a natural infinite baffle for dual arrays of stereo speakers. At right, the scene from inside the room; at left, four woofers and two high-frequency assemblies for each channel. Mr. Beatty likes his sound "big"!



the record player and transistor amplifier (sometimes a tuner too) in one walnut module; the two stereo speakers come in matching cabinets.

Modular systems are offered by such well-known high fidelity manufacturers as KLH, Fisher, Scott, Harman-Kardon, Benjamin, Electro-Voice, and Shure. EMI/Scope's system, while not in walnut, is attractive in black and chrome. One of the KLH numbers is available on brushed aluminum pedestals, completely different in appearance, and affords a unique means of combining pleasing décor with good sound in any room. The pedestals—supporting the walnut-housed equipment—can be arranged in many ways and combined with other furnishings. A unique two-cabinet combination stereophonic record player and television set has been introduced by Marquette Corporation to do away with the problem of a blank television screen. The TV is mounted in one of the cabinets to swivel on a base so that the screen is hidden when not in use. The reverse side of this cabinet houses one of a pair of stereo speaker systems; in the other cabinet are a record changer, amplifier, and the second stereo speaker. Modular systems, in general, can attract that large group of consumers wishing the convenience of a package and the good sound of high-performing equipment. A look at them makes it obvious that their manufacturers have provided a beautifully finished look to the cabinetry. Never before has quality electronics been integrated so happily with room-type housings.

Whatever choice this year's buyer makes, he is likely to get good workmanship along with good



Above, the enlarged version of the Design One kit by Jack Benveniste of Barzilay, Gardena, Calif. Center piece holds components and records. Two end pieces baffle speakers or may be used as the housings for preënclosed compact speaker systems.



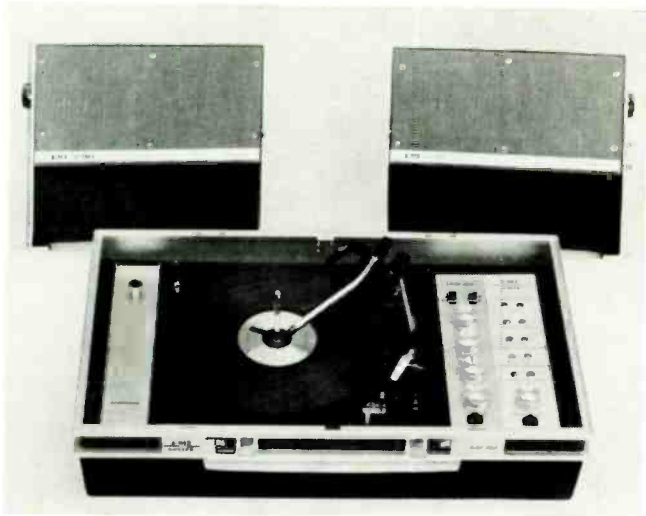
The Entertainer I is a modular system by Electro-Voice, in luggage-type housing. Equipment module contains record player and amplifier. Speakers are similar to outdoor systems by this company.



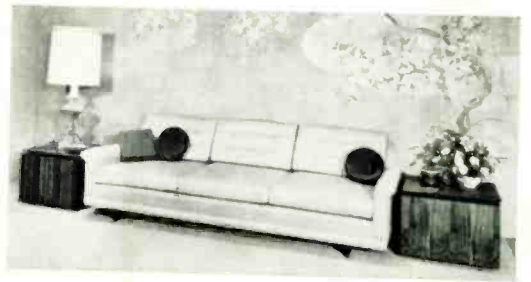
Directional "floating" wall units form the setting, designed by Rapids Furniture of Boston, for a Scott module sitting inconspicuously but handily at the end of a sofa. Speakers are placed on shelf fairly high up.



Reader Gary Gottlieb recently completed this installation. Equipment is housed in center cabinet of his own design; close-up at left shows how components are installed. Rotron fans keep units cool.



New modular system from EMI/Scope has input and output jacks alongside amplifier controls. Unit has mixing facility and special inputs for electric guitar. Speakers fit over module for carrying.



Multi-Cube system, designed by Jerry Joseph of Toujay Designs, New York City, is versatile storage plan. Cubes can house all types of audio gear, including speakers; may be grouped in a number of ways, two of which are shown above, to suit décor.



Installation of Richard Willson, recording engineer of Cleveland, Ohio boasts huge array of components housed in specially built cabinet, above; and three-channel speaker system, below. Bottom cabinet actually houses three separate speaker systems, each installed in its own acoustical enclosure.



looks and good sound. New construction techniques and materials, such as better-setting glues and denser plywoods, give assurance that cabinets will be solid, long-lasting, and less subject to warpage than those of past years.

A final point: with people newly conscious that several modes of décor may be successfully combined in one room, it is helpful to have a wide choice of storage units in terms of size, materials, and style. Color and imagination seem to be enjoying a resurgence in our homes; more than ever we now find it feasible and intriguing to combine the old and the new. No longer need our lovely old lamps and carpets and finely turned antiques hide out in some half-dark corner. They have come deservedly back into their own and can repose quite nicely alongside a contemporary storage wall or ultra-modern sound system—to the advantage of both. This renaissance in décor gives meaning to our rooms and is a good reflection on ourselves. We are lucky this year to be able to purchase on a buyer's market practical, well-designed sound systems to fit in easily with the rest of the home. Good design and good sound are definitely compatible; never before have function and art been quite so *en rapport*.

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- 5 Why is silicon IF circuitry needed for broadcast-standard FM reception?
- 6 What critical solid state circuit techniques guarantee superior multiplex performance?

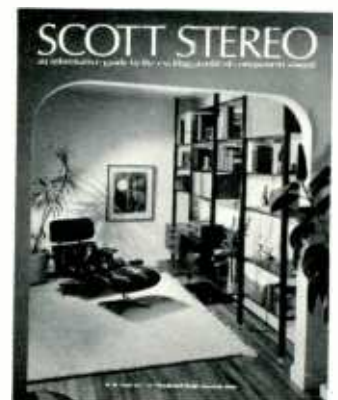
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Year's Best Recordings

The current and choice in discs and tapes, from reviews in High Fidelity Magazine.

Compiled by Peter G. Davis

ANON.: *Carmina Burana*. Andrea von Ramm (ms), Grayston Burgess (ct), Willard Cobb (t), Karlheinz Klein (b), Kurt Rith (b); Münchener Marienknaben; Ensemble of Ancient Instruments. Telefunken SAWT 9455-A. A delightful collection of medieval songs, worked out for performance with imagination that approaches genius. The performances are perfectly lovely. The singers are well trained.

ARNE: *Songs to Shakespeare Plays*. Maureen Forrester, contralto; Alexander Young, tenor; Vienna Academy Chamber Choir and Radio Orchestra, Brian Priest-

man, cond. Westminster WST 17075. From every standpoint this is a delectable record. Arne's tunes are sturdy, simple, sometimes naïve, and never less than lovely, and the way they are set forth by Miss Forrester and Mr. Young is a model of everything good singing of any kind of music (and words!) should be.

BACH: *Arias: St. John Passion: Es ist vollbracht; St. Matthew Passion: Buss' und Reu'; Erbarme dich; Christmas Oratorio: Bereite dich, Zion*. HANDEL: *Arias: Samson: O God of Hosts; Jephtha: Scenes of Horror; Messiah: O thou that tellest good tidings*. Maureen Forrester,

contralto; Solisti di Zagreb, Antonio Janigro, cond. Vanguard BGS 70669. You will encounter artistry on an awesome level on this superb record of baroque music. Miss Forrester not merely comprehends the import of this style; she is totally imbued with it.

BACH: *Art of the Fugue* (arr. Isaacs).

No mention has been made in most of the reviews here of the sound quality, since the recordings chosen for listing are generally excellent in this respect.

Members of Philomusica of London, George Malcolm, cond. Argo ZRG 5421/22 (two discs). The transcription heard here is one of the more impressive ones. The excellent players perform with warmth and fine tone.

BACH: *Brandenburg Concertos, S. 1046-1051; Concertos for Violin and Strings: in E, S. 1042; in A minor, S. 1041; Concerto for Two Violins and Strings, in D minor, S. 1043.* Susanne Lautenbacher, Dieter Vorholz, violins; Mainz Chamber Orchestra, Günter Kehr, cond. Vox SVBX 567 (three discs). The present set belongs somewhere near the bottom of the list with respect to cost, but far above that with respect to quality. It offers, in fact, enjoyable and well-recorded performances. The playing is spirited, the tempos are convincing.

BACH: *Cantata No. 80, Ein feste Burg; Motet, Jesu, meine Freude.* Antonia Fahberg (s), Margarethe Bence (c), Theophil Maier (t), Ulrich Schaible (bs); Figuralchor of the Stuttgart Memorial Church; Württemberg Chamber Orchestra, Helmut Rilling, cond. (in the Cantata). Stuttgart Hymnuskirchen; Stuttgart Bach Orchestra, Wilhelm Gerhard, cond. (in the Motet). Vox STPL 514150. Here is the best recording yet of the great *Reformation* Cantata. Miss Fahberg sings her fine aria with ringing confidence, in a steady voice and with lovely tone.

BACH: *Cantatas: No. 53, Schlage doch, gewünschte Stunde; No. 54, Widerstehe doch der Sünde; No. 169, Gott soll allein mein Herze haben.* Maureen Forrester, contralto; I Solisti di Zagreb, Antonio Janigro, cond. Vanguard BGS 70670. The lovely, vibrant voice of Maureen Forrester is displayed to good advantage in these cantatas for alto and orchestra. Janigro and his players accompany in lively fashion.

BACH: *Concerto for Two Violins and Strings, in D minor, S. 1043; Sonata for Two Violins and Continuo, in C, S. 1037.* VIVALDI: *Concerto grosso in D minor, Op. 3, No. 11.* Nathan Milstein, Erica Morini, violins; Chamber Orchestra. Angel S 36006. Two distinguished violinists, with the temperament of virtuosos, here turn in vibrant but controlled performances. The high spots on the disc are the beautifully sung slow movements.

BACH: *Ein musikalisches Opfer, S. 1079.* Members of European string quartets; Vienna Symphony Wind Group, Hermann Scherchen, cond. Westminster WST 17089. A first-rate performance of this masterwork, faithfully conveyed in first-rate sound. From start to finish the instruments sing beautifully, the balances are perfect and the tempos entirely convincing.

BACH: *Preludes and Fugues: in E flat, S. 552; in G, S. 541; in C minor, S. 546; in A minor, S. 543.* Helmut Walcha, organ. Archive ARC 73207. Walcha does justice to the majesty of these pieces in performances that are sober

and steady, free from flashy effects, and that promise to wear well.

BACH: *St. Matthew Passion, S. 244.* Elly Ameling (s), Marga Höffgen (c), Peter Pears (t), Fritz Wunderlich (t), Hermann Prey (b), Tom Krause (bs); Stuttgart Boys' Choir; Stuttgart Chamber Orchestra, Karl Münchinger, cond. London OSA 1431 (four discs). Münchinger adds, to knowledge and insight into the music, an ability to control singers as well as players and to get them all to join in conveying his interpretation of the score. All in all, a *St. Matthew* with many excellent things in it. The stereo is very effective in the double choruses and the sound in general is magnificent throughout.

BACH: *The Well-Tempered Clavier, Book 1.* Ralph Kirkpatrick, harpsichord. Deutsche Grammophon SLPM 138844/45 (two discs). Kirkpatrick's playing here is on the whole authoritative and masterly and his readings are not only plausible but frequently eloquent. The golden sound of this harpsichord has been beautifully caught by the engineers.

BACH, C. P. E.: *Concertos: for Cello and Orchestra, in A; for Flute and Orchestra, in D minor.* Robert Bex, cello; Jean-Pierre Rampal, flute; Huguette Dreyfus, continuo; chamber orchestra, Pierre Boulez, cond. Vox STPL 514170. The soloists play with incandescent virtuosity and impeccable taste in these poised, superbly balanced, and enlivening performances. The recorded sound is admirably full-bodied yet deliciously transparent.

BACH, C. P. E.: *Sonatas for Flute and Harpsichord (6).* Jean-Pierre Rampal, flute; Robert Veyron-Lacroix, harpsichord. Nonesuch H 71034. These gentle works bring forth the best Rampal has to offer, which is, of course, superb. Sound is clear, warm, and well-balanced.

BARTOK: *Dance Suite; Two Portraits, Op. 5; Seven Rumanian Dances.* Orchestre de la Suisse Romande, Ernest Ansermet, cond. London CS 6407. Music such as this engages the best in Ansermet's vivid coloristic sense, and he leads a trio of superb performances.

BARTOK: *Quartets for Strings (complete).* Juilliard String Quartet. Columbia D3S 717 (three discs). The Juilliard's interpretation of these great works is one of the most vivid and revealing. The engineers have been eager to catch, in full detail, every one of those curious Bartókian pizzicatos which bound off the fingerboard like pistol shots, every needle-shower of ponticello, every straw-fiddle effect of drone basses and tone without vibrato: the music's whole grand, dramatic urgency and mystery are marvelously communicated.

BARTOK: *Sonata for Two Pianos and Percussion.* DEBUSSY: *En blanc et noir; Six épigraphes antiques.* Robert and Gaby Casadesus, pianos; Jean-Claude

Casadesus and Jean-Paul Drouet, percussion. Columbia MS 6641. The Casadesus team approaches the Bartók work with tightly coiled rhythmic thrust and spare monochromaticism, making one conscious of a *sec* linearity. They play the Debussy even better today than they did ten years ago. Superb reproduction.

BEETHOVEN: *Concerto for Piano and Orchestra, No. 5, in E flat, Op. 73 ("Emperor"); Egmont Overture, Op. 84.* Julius Katchen, piano; London Symphony Orchestra, Pierino Gamba, cond. London CS 6397. Katchen is well suited to the music's extrovert bravura and his technical execution is often ravishing. Sonically, this is an exceptional disc.

BEETHOVEN: *Concerto for Piano and Orchestra, No. 5, in E flat, Op. 73 ("Emperor").* Mindru Katz, piano; Hallé Orchestra, Sir John Barbirolli, cond. Vanguard Everyman SRV 138SD. An impressive demonstration of young Mindru Katz's pianistic and musical abilities. The artist favors a clarion assertiveness and sharply defined attack, while his tonal and dynamic range is exceptionally varied. For economy *Emperors*, this disc heads the list.

BEETHOVEN: *Concerto for Piano, Violin, Cello, and Orchestra, in C, Op. 56.* BRAHMS: *Concerto for Violin, Cello, and Orchestra, in A minor, Op. 102; Trio for Piano and Strings, No. 2, in C, Op. 87.* Isaac Stern, violin; Leonard Rose, cello; Eugene Istomin, piano; Philadelphia Orchestra, Eugene Ormandy, cond. Columbia D2S 720 (two discs). The tone of the group is ripe and full, three richly colored instrumental lines projected with individuality and rhythmic force yet unified in style and manner.

BEETHOVEN: *Concertos for Piano and Orchestra.* Claudio Arrau, piano; Concertgebouw Orchestra, Bernard Haitink, cond. Philips PHS 5970 (five discs). There are many ways to play these masterpieces, but Arrau's versions are those of a master, and he is ably seconded by Haitink and a fine ensemble.

BEETHOVEN: *Piano Works: Albumblatt in A minor ("Für Elise"); Andante in F ("Andante favori"); Bagatelles, Op. 126; Ecossaises, in E flat; Rondos, Op. 51; Rondo in G, Op. 129 ("Rondo a capriccio"); Variations on "Nel cor più."* Wilhelm Kempff, piano. Deutsche Grammophon SLPM 138934. This is a disc to treasure: each work has a jewel-like proportion and prismatic translucency of tone. Fine, live-sounding reproduction.

BEETHOVEN: *Quartets for Strings: No. 1, in F, Op. 18, No. 1; No. 9, in C, Op. 59, No. 3 ("Rasumovskiy").* Lenox String Quartet. Dover HCRST 7003. The Lenox Quartet's disc debut in standard repertoire is an auspicious occasion: it would be hard to fault what is really an astonishingly exciting and perceptive interpretation. The sound is close-to and rather intimate, with pleasing separation in the stereo pressing.

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Aeolian-Skinner reverberation system corrects excessively dead acoustics in the chapel of Choate School, Wallingford, Connecticut. Duncan Phyfe, musical director of the school, describes the effect on live pipe organ and chorus as "so natural one is not aware of an electronic reverberation system."

Similar Aeolian-Skinner installations are operating in Christ Church, Cambridge, Massachusetts, and in St. John's Episcopal Church, Washington, D.C. AR speakers were chosen because of their lack of coloration, their undistorted, full-range bass, and their reliability.



AR-2a^x

(\$109-\$128)

Sound reinforcement system for the summer jazz concerts in the sculpture garden of New York's Museum of Modern Art. Live music had to be amplified without giving the sound an unnatural, "electronic" quality; AR speakers were chosen after testing many brands.



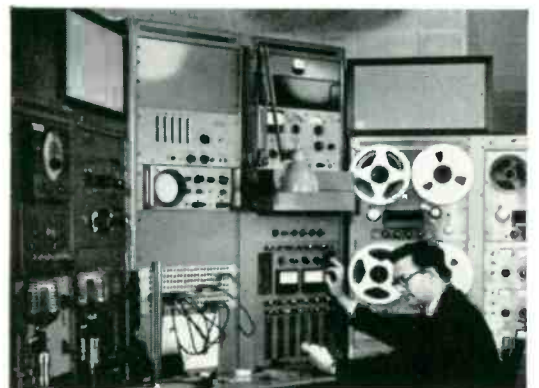
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One of the listening rooms in the Library & Museum of the Performing Arts at Lincoln Center in New York City. AR-3's were chosen for these rooms to achieve an absolute minimum of artificial coloration.



Experimental Music Studio of the University of Illinois. Dr. Hiller (seated) writes about the AR-3's, used as monitor speakers: "I wish all our equipment were as trouble free."

AR speakers and turntables are often used professionally, but they are primarily designed for natural reproduction of music in the home. Literature is available for the asking.

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BEETHOVEN: *Sonatas for Piano; No. 3, in C, Op. 2, No. 3; No. 23, in F minor, Op. 57 ("Appassionata")*. Artur Schnabel, piano. RCA Victor LSC 2812. Schnabel's *Appassionata* has become Beethoven's. The pianist has restudied the music completely, and this recording throughout reflects his newly found solidity and poise.

BEETHOVEN: *Sonatas for Piano; No. 5, in C minor, Op. 10, No. 1; No. 6, in F, Op. 10, No. 2; No. 7, in D, Op. 10, No. 3*. Glenn Gould, piano. Columbia MS 6686. This is inspired music making. Mr. Gould's fingers are up to anything he requires of them; one is immediately struck by the extraordinary vitality and intensity of these readings.

BEETHOVEN: *Symphonies; No. 1, in C, Op. 21; No. 2, in D, Op. 36*. Cleveland Orchestra, George Szell, cond. Epic BC 1292. Szell's account of No. 2 has a taut propulsion, a magnificent rhythmic poise, and a tonal sheen which always promises to burst into glowing song. No. 1 has impeccably tailored discipline, kinetic phrasing, and an articulate, incisive vehemence. We are given gorgeous, lean, realistic sound by Epic.

BEETHOVEN: *Symphony No. 4, in B flat, Op. 60*. WAGNER: *Siegfried Idyll*. London Symphony Orchestra (in the Beethoven). San Francisco Symphony Orchestra (in the Wagner). Pierre Monteux, cond. RCA Victor LSC 6166 (three discs). The Beethoven performance is absolutely first-class: a goodly amount of spectacular virtuoso orchestral playing is to be heard on this disc, making the performance one of the finest Beethoven Fourth available in stereo. Monteux's *Idyll* is a consummate interpretation.

BELLINI: *Norma*. Joan Sutherland (s), Marilyn Horne (ms), John Alexander (t), Richard Cross (bs), et al.; London Symphony Chorus and Orchestra. Richard Bonynge, cond. RCA Victor LSC 6166 (three discs). This *Norma* offers musical rewards of a very high order: Sutherland sings the role as no other soprano could today and in their duets Marilyn Horne matches her, note for note.

BERLIOZ: *Grande Messe des Morts, Op. 5 ("Requiem")*. Cesare Valletti, tenor; Temple University Choirs; Philadelphia Orchestra, Eugene Ormandy, cond. Columbia M2S 730 (two discs). Ormandy shows remarkable conscientiousness in his attempt to bring out every detail of the score in its proper proportions. This *Requiem's* unique combination of terror and compassion is not music for every day, but the genuinely special, truly hieratic occasion calls out for it.

BIZET: *Carmen*. Maria Callas (s), Andréa Guiot (s), Nicolai Gedda (t), Robert Massard (b), et al.; Choeurs René Duclos; Orchestre du Théâtre National de l'Opéra, Paris, Georges Prêtre, cond. Angel S 3650 (three discs). Callas' *Carmen* is compelling and magnetic. Angel has surrounded Mme. Callas with a

lively and idiomatic cast and the sound is splendid.

BLOCH: *Sonata for Violin and Piano, No. 1; Baal Shem*. Isaac Stern, violin; Alexander Zakin, piano. Columbia MS 6717. It is good to have the First Violin Sonata back on discs, especially in so magnificent a performance and so excellent a recording.

BOYCE: *Symphonies (8)*. I Solisti di Zagreb, Antonio Janigro, cond. Vanguard BGS 70668. The first textually sound version of these works so far, in performances fresh and unrestrained in their energy, crisp and true in their baroque style, filled with imagination and verve. Boyce has been called "England's most talented composer between Purcell and Elgar."

BRAHMS: *Chorale Preludes, Op. 122 (11)*. MOZART: *Fantasia for Mechanical Organ, in F minor, K. 608*. LISZT: *Prelude and Fugue on B-A-C-H*. Karl Richter, organ. Deutsche Grammophon SLPM 138906. Richter offers deeply probing, technically perfect performances. The sound of the organ is magnificent, captured with absolute naturalness.

BRAHMS: *Concerto for Piano and Orchestra, No. 2, in B flat, Op. 83*. Eugene Istomin, piano; Philadelphia Orchestra, Eugene Ormandy, cond. Columbia MS 6715. Istomin plays with splendid eloquence and Ormandy supports him with a rich-textured, creamy-smooth orchestral framework. Among the best of the present available versions.

BRAHMS: *Concerto for Violin and Orchestra, in D, Op. 77*. Christian Ferras, violin; Berlin Philharmonic Orchestra, Herbert von Karajan, cond. Deutsche Grammophon SLPM 138930. The sheer elegance, warmth, and breadth of Ferras' richly lyrical interpretation and Von Karajan's beautifully poised conducting put this disc into a class of its own. The recorded balance is extraordinarily close to concert hall realism.

BRAHMS: *Ein deutsches Requiem, Op. 45; Variations on a Theme of Haydn, Op. 56a*. Gundula Janowitz (s), Eberhard Wächter (b); Wiener Singverein; Berlin Philharmonic Orchestra, Herbert von Karajan, cond. Deutsche Grammophon SLPM 138928/29 (two discs). Von Karajan has perfected his conception of the *Requiem*, bringing us a superb realization of a difficult and elusive work.

BRAHMS: *Sextet for Strings, in B flat, Op. 18; Allegro from the "F. A. E. Sonata"*. Yehudi Menuhin and Robert Masters, violins; Cecil Aronowitz and Ernest Wallfisch, violas; Maurice Gendron and Derek Simpson, cellos (in the Sextet). Hephzibah Menuhin, piano (in the Allegro). Angel S 36234. This performance is replete with energy, big soaring phrases, bravura, and expressive force. In Angel's wide-spaced recording, all six voices ring out freely.

BRAHMS: *Sonatas for Clarinet and Pi-*

ano, Op. 120: No. 1, in F minor; No. 2, in E flat. David Glazer, clarinet; Frank Glazer, piano. Vox STDL 501210. Bravo to the brothers Glazer for the first really adequate edition of these somber and mellifluous Sonatas in over ten years. These are cultivated readings, characterized by intelligence and fine technique.

BRAHMS: *Symphony No. 3, in F, Op. 90; Variations on a Theme of Haydn, Op. 56a*. Cleveland Orchestra, George Szell, cond. Columbia MS 6685. The most refined of orchestral effects are achieved in a fashion that can be taken as a model of logic and clarity in musical statements.

BRITTEN: *Albert Herring*. Sylvia Fisher (s), April Cantelo (s), Catherine Wilson (ms), Johanna Peters (ms), Sheila Rex (c), Peter Pears (t), Edgar Evans (t), Joseph Ward (b), John Noble (b), Owen Brannigan (bs); English Chamber Orchestra, Benjamin Britten, cond. London OSA 1378 (three discs). The execution of the chamber orchestra is impeccable, Britten's leadership is vivacious and affectionate, and nearly everyone in the large cast manages to sing well and create an aurally believable character. The recording is splendid, beautiful in sound and expert in the use of stereophonic sound effects.

BRITTEN: *Cantata Misericordium, Op. 69; Sinfonia da Requiem, Op. 20*. Peter Pears (t), Dietrich Fischer-Dieskau (b); London Symphony Orchestra and Chorus (in the *Cantata*); New Philharmonia Orchestra (in the *Sinfonia*), Benjamin Britten, cond. London OS 25937. Britten's *Cantata* is a work of deep, simple, and poignant beauty; the orchestras in both works react beautifully to the composer's skillful baton.

BRITTEN: *Part Songs*. Elizabethan Singers; Wilfrid Parry, piano; Louis Halsey, cond. Argo ZRG 5424. Quite likely Britten was born with a feeling for chorus; no living composer can approach him in the variety and wonder of his choral writing; no Englishman since Purcell has set his own language so well. The singing is of a beauty almost beyond description and the recording is remarkable in the way it preserves the intimacy of the performances and the music itself.

BRITTEN: *Symphony for Cello and Orchestra, Op. 68*. HAYDN: *Concerto for Cello and Orchestra, in C*. Mstislav Rostropovich, cello; English Chamber Orchestra, Benjamin Britten, cond. London CS 6419. The ripeness, grandeur, and rich elaboration of Britten's music is superbly presented by the formidable combination of the composer and Rostropovich. The slow movement of the Haydn Concerto, pure genius and tremendous music, brings out the best in the genius of Rostropovich too.

BRUCKNER: *Symphony No. 3, in D minor*. Amsterdam Concertgebouw Orchestra, Bernard Haitink, cond. Philips PHS 900068. A work of great beauty

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and interest. Haitink overcomes the music's difficulties with impressive skill, while the Concertgebouw reveals its great traditional role as one of the true reservoirs of the authentic Bruckner style.

BRUCKNER: *Symphony No. 4, in E flat ("Romantic")*. Philharmonia Orchestra. Otto Klemperer, cond. Angel S 36245. Klemperer's latest version of this symphony is exceptionally well recorded. The sentimental quality of the more overtly romantic material is counterbalanced by the power and majesty of Klemperer's rugged strength.

BRUCKNER: *Symphony No. 6, in A*. New Philharmonia Orchestra. Otto Klemperer, cond. Angel S 36271. This Symphony is indeed an exceptional score. Klemperer's tense control accomplishes wonders in setting forth this discursive material logically and with a sense of cumulation. His performance throughout is taut, noble, and lit with deep inner conviction.

BRUCKNER: *Symphony No. 8, in C minor*. Berlin Philharmonic Orchestra, Eugen Jochum, cond. Deutsche Grammophon SLPM 138918/19 (two discs). The soaring lines build resolutely to the grand climactic pages. The skill and vigor that Jochum brings to Bruckner is complemented by the orchestra's high standards and the brilliant technical achievement of the engineering.

CHARPENTIER: *Epithalamium*. DELALANDE: *Concert d'Esculape*. LULLY: *Plaude, laetare Gallia*. Marcelle Croisier (s), Agnès Disney (s), Gladys Félix (s), Marguerite Paquet (c), Michel Lecocq (t), André Vessières (bs); Roger Blanchard Vocal Ensemble; Orchestra de la Société des Concerts du Conservatoire de Paris, Roger Blanchard, cond. Nonesuch H 71039. Fine performances of three little-known but fascinating works by French masters of the highest rank. In the *Epithalamium* the suave sound of the violins contrasts wonderfully with the bright tones of trumpets.

CHARPENTIER: "Music for Port-Royal." André Vessières, bass; Instrumental and Vocal Ensemble, Roger Blanchard, cond. Nonesuch H 71040. The music of Marc-Antoine Charpentier impresses with its unusual mélange of positive attributes: elegance and poise, sincerity and fervor, melodic beauty which emerges as clearly from rich textures as from those of slighter body. André Vessières is the velvety toned bass soloist in this program, standing out effortlessly from a shimmering background of strings and woodwind.

CHOPIN: *Ballades: No. 1, in G minor, Op. 23; No. 2, in F, Op. 38; No. 3, in A flat, Op. 47; No. 4, in F minor, Op. 52; Trois nouvelles études, Op. posth.* Vladimir Ashkenazy, piano. London CS 6422. Eloquent and poetical performances by a romanticist of exquisite sensitivity. Rarely is piano reproduction so full and yet so clear.

CHOPIN: *Ballades: No. 1, in G minor, Op. 23; No. 2, in F, Op. 38; No. 3, in A flat, Op. 47; No. 4, in F minor, Op. 52; Fantasy in F minor, Op. 49.* Peter Frankl, piano. Vox STPL 512620. These noble creations are played with exemplary architectural sweep and truly Beethovenian profundity coupled with extraordinary technical ability. This is the music exactly as Chopin wrote it.

CHOPIN: *Polonaises (16)*. Peter Frankl, piano. Vox SVUX 52024 (two discs). Frankl's performances are taut, analytical, and illuminating in their detail, played with exemplary technique. The filigree of the early, posthumously published Polonaises comes off particularly well in his delicately balanced, gently coloristic readings; but all of the playing has real quality.

CHOPIN: *Waltzes (15)*. Artur Schnabel, piano. RCA Victor LSC 2726. Rubinstein beguiles the listener with subtle and caressing nuance. These readings are simpler, yet more sophisticated, than those of his earlier performance of the same works.

COPLAND: *A Lincoln Portrait; Fanfare for the Common Man*. IVES: *Three Places in New England*. Adlai Stevenson, narrator; Philadelphia Orchestra, Eugene Ormandy, cond. Columbia MS 6684. Copland's music is marvelously well recorded and beautifully played. The thick, closely woven skein of the Ives is wonderfully aglow, surely the best recording this work has ever received.

DEBUSSY: *Images pour orchestre: No. 1, Gigue; No. 2, Ibéria; No. 3, Rondes de printemps; Le Martyre de Saint-Sébastien; Symphonic Fragments*. London Symphony Orchestra, Pierre Monteux, cond. Philips PHS 900058. Monteux's relationship with Debussy was deep, personal, and thus historical. There can be little question that this is the finest set of the *Images* now available; it is for performances such as the ones presented here that the phonograph was invented.

DEBUSSY: *La Mer; Prélude à l'après-midi d'un faune*. RAVEL: *Daphnis et Chloé; Orchestral Suite No. 2*. Berlin Philharmonic Orchestra, Herbert von Karajan, cond. Deutsche Grammophon SLPM 138923. Karajan's resilient and concise treatment of *La Mer* contains exquisite poetry. DGG's sound captures the vivid, glowing tones of the superb Berlin ensemble with stunning impact.

DEBUSSY: *Pelléas et Mélisande*. Erna Spoorenberg (s), Camille Maurane (t), George London (b), Guus Hoekman (bs), et al.; Orchestre de la Suisse Romande, Ernest Ansermet, cond. London OSA 1379 (three discs). A solidly cast and well-recorded performance that faithfully mirrors the opera's delicate balances. Ansermet is the master of this score; riches of instrumental detail emerge with beautiful, unforced clarity.

DELALANDE: *Quatrième Suite de Simphonies pour les Soupers du Roy*. MOU-

RET: *Première Suite de Fanfares; Seconde Suite de Simphonies*. Chamber Orchestra, Paul Kuentz, cond. Archive ARC 73233. A lively account of Delalande's delightful *musique de table*. The trumpet and horn playing here is brilliant and memorable.

DU MONT: *Magnificat; Nisi Dominus; Benedictus*. Various soloists: Philippe Caillard Choir; Jean-Philippe Caillard Orchestra, Louis Frémaux, cond. Musical Heritage Society MHS 608. The three "grand motets" presented here are elaborate compositions for soloists, chorus, strings, and organ. The soloists all sing well, the chorus is in unusually good form, and Frémaux keeps everything moving along smoothly.

DVORAK: *Quintet for Strings, in E flat, Op. 97; Sextet for Strings, in A, Op. 48*. Wolfgang Herzer, cello (in the Sextet); Richard Strabl, viola; European String Quartet. Westminster WST 17099. Both of these scores are perpetual delights, presented here in finely wrought interpretations—full of sturdy rhythm, pliant expressivity, and fine musicianly playing. The sonics are translucent and intimate with a subtle stereo separation.

DVORAK: *Rusalka*. Milada Subrtová (s), Alena Miková (s), Ivana Mixová (s), Marie Ovčáčiková (ms), Ivo Zidek (t), Jiří Joran (b), Eduard Haken (bs), et al.; Prague National Theatre Chorus and Orchestra, Zdenek Chalabala, cond. Artia ALPOS 89-D (four discs). One of the most lovable and touching of operas—beautiful through and through. Chalabala conducts with the sweep and dramatic bite the music calls for and he has an excellent cast to work with.

DVORAK: *Slavonic Dances, Op. 46, Op. 72; Carnival Overture, Op. 92*. Cleveland Orchestra, George Szell, cond. Columbia M2S 726 (two discs). These dances contain some of the most beautiful and effective tunes ever to emerge from the music of Central Europe. No Mozart symphony could evoke from Szell greater refinement in balance and color, sensitivity to phrasing and nuance. Under his baton these dances become miniature tone poems, written and played as works of love.

DVORAK: *Symphony No. 5, in E minor, Op. 95 ("From the New World")*. Vienna Philharmonic Orchestra, Istvan Kertesz, cond. London CS 6228. This is a taut, propulsive, dramatic performance combining melody with a sense of high voltage reminiscent of the Toscanini performances. There is excitement in this music and the sonics are exceptional.

FAURE: *Piano Music (complete)*. Evelyn Crochet, piano. Vox SVBX 5423/24 (six discs). The piquant humor of Fauré's music could not be more delightfully conveyed. Miss Crochet's work on these discs is ravishingly excellent and these interpretations could hardly be bettered.

FLOTOW: *Martha (excerpts)*. Anneliese Rothenberger (s), Hetty Plümacher (ms),

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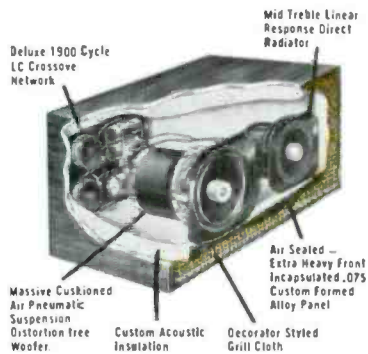
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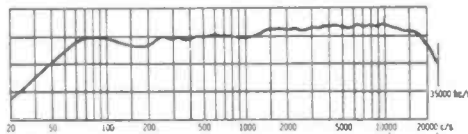
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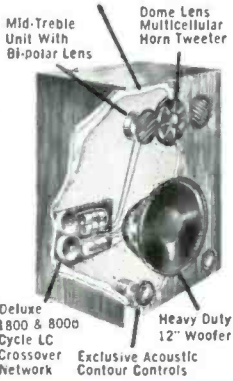


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Fritz Wunderlich (t), Gottlob Frick (bs), et al.: Chorus and Orchestra of the Berlin Municipal Opera. Berislav Klobucar, cond. Angel S 36236. This collection of well-performed highlights from this eminently excerptable opera is especially welcome. Fritz Wunderlich is particularly fine and Frick is also in splendid form. The orchestral and choral work has lots of lift and spirit.

GOMBERT: *Mass, Je suis déshérité.* CREQUILLON: *Caesaris auspiciis magni; Salve crux sancta.* SCHLICK: *Homage to Charles V; Maria zart.* Pierre Froidebise, organ (in the Schlick); Roger Blanchard Vocal Ensemble (in the Gombert and Crequillon). Nonesuch H 71051. The music heard here is all interesting, especially the Schlick. His *Homage* is a set of variations on two Gregorian fragments and has a stature not unlike that of Bach's *Musical Offering*. The Blanchard chorus performs in a properly straightforward manner and Pierre Froidebise plays on a Schnitger organ of great clarity and beauty of tone.

GOUNOD: *Messe solennelle à Sainte-Cécile.* Pilar Lorengar (s), Heinz Hoppe (t), Franz Crass (bs); Choeurs René Duclos; Orchestre de la Société des Concerts du Conservatoire de Paris, Jean-Claude Hartemann, cond. Angel S 36214. Recommended as a masterful example of effulgent romantic melodiousness. A strong performance.

HANDEL: *Preis der Tonkunst (Look Down, Harmonious Saint).* MOZART: *Exsultate, Jubilate, K. 165; Mass in C minor: Laudamus Te, K. 427.* SCHUBERT: *Salve Regina, in A, D. 676.* Teresa Stich-Randall, soprano; Chamber Orchestra of the Saar, Karl Ristenpart, cond. Westminster WST 17092. Teresa Stich-Randall is a magnificent musical artist, and this is the sort of repertory in which she operates with full freedom and imagination: the elegance of her phrasing, the brilliant command of fast-moving coloratura, and the purity of her musical inclinations outweigh minor shortcomings. The music itself is interesting.

HAYDN: *The Creation (Die Schöpfung).* Judith Raskin (s), John McCollum (t), Chester Watson (bs); Musica Aeterna Chorus and Orchestra, Frederic Waldman, cond. Decca DXSA 7191 (two discs). The Musica Aeterna Group continues its good work with this recording. Waldman seems keenly aware of the vitality and drama of the work and gets his orchestra and chorus to convey these qualities. The vocal soloists are all better than average.

HAYDN: *Quartets for Flute and Strings, Op. 5.* Jean-Pierre Rampal, flute; Trio à Cordes Français. Angel S 36226. Here is a performance of grace and style and wit from M. Rampal, and string playing in which these same qualities are also in evidence. The recording is very good.

HAYDN: *Quartets for Strings, Vol. 1 (Op. 1: No. 1, in B flat; No. 2, in E flat;*

Op. 20: No. 1, in E flat; No. 2, in C; No. 3, in G minor; No. 4, in D; No. 5, in F minor; No. 6, in A). Dekany Quartet. Vox SVBX 555 (three discs). If the promise of this first set is realized, the subsequent nine volumes in this series will be something to look forward to because the Dekany Quartet is a group of first-quality string players. On the technical side these records are splendid, with agreeable depth, vivid presence, and a nice stereo spread.

HAYDN: *Quartets for Strings, Vol. 2 (Op. 1: No. 3, in D; No. 4, in G; No. 5, in B flat; No. 6, in C. Op. 33: No. 1, in B minor; No. 2, in E flat; No. 3, in C; No. 4, in B flat; No. 5, in G; No. 6, in D).* Dekany Quartet. Vox SVBX 556 (three discs). Not since the days of the Schneider Quartet has there been a Haydn Quartet series with the scale and promise of this one. The elements of performance, engineering, musical discovery, and bargain price are combined to appeal to a wide audience.

HAYDN: *Quartets for Strings, Op. 54: No. 1, in G; No. 2, in C; No. 3, in E.* Allegri String Quartet. Westminster WST 17094. To write music of this type is the sure mark of genius. To capture its kaleidoscopic moods in performance is the mark of musicianship. The Allegri do it and they are beautifully recorded.

HAYDN: *Sonatas for Piano: No. 20, in C minor; No. 23, in F; No. 50, in C; Fantasy in C.* Paul Badura-Skoda, piano. Westminster WST 17077. This civilized sort of music has always been congenial to Badura-Skoda's lyrical, unobtrusive type of pianism, and on this disc he gives some splendid performances. The live, but crisp sound of the piano leaves nothing to be desired.

HAYDN: *Symphonies: No. 39, in G minor ("The Fist"); No. 73, in D ("La Chasse").* Esterhazy Orchestra, David Blum, cond. Vanguard VSD 71123. Young David Blum leads extremely fine performances of these major Haydn works. The finale to No. 39 is a particularly forceful achievement.

HAYDN: *Symphonies: No. 57, in D; No. 86, in D.* Cincinnati Symphony Orchestra, Max Rudolf, cond. Decca DL 710107. No. 86 is a beautiful and thoroughly mature work with an especially fine opening movement. Rudolf does it justice. No. 57 has a prestissimo finale which Rudolf plays with a light touch and ample wit.

HINDEMITH: *Concerto for Violin and Orchestra.* BARBER: *Concerto for Violin and Orchestra, Op. 14.* Isaac Stern, violin; New York Philharmonic, Leonard Bernstein, cond. Columbia MS 6713. The performance of the formidable Hindemith Concerto is the last word in polish, eloquence, brilliance, and color, and this is on the part of all concerned. The interpretation is as much a triumph for the orchestra as for the soloist.

IVES: *Symphony No. 4.* Members of

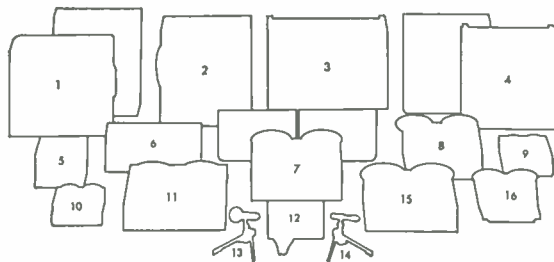
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the Schola Cantorum (New York); American Symphony Orchestra, David Katz and José Serebrier, associate conds.; Leopold Stokowski, cond. Columbia MS 6775. The opportunity a recording affords of hearing this symphony again and again is of utmost value in understanding the piece. The commanding stature of the music and the zest of the performers come through very well in this recording.

JANACEK: *Missa Glagolitica (Slavonic Mass)*. Evelyn Lear (s). Hilde Rössl-Majdan (ms). Ernst Häfliger (t). Franz Crass (bs); Bedřich Janáček, organ; Bavarian Radio Chorus and Symphony Orchestra, Rafael Kubelik, cond. Deutsche Grammophon SLPM 138954. Pagan, Christian, intensely personal. A thrilling, colorful essay, superbly recorded. Kubelik's performance is illuminated by a spirit of deep involvement with the music, yet balanced by a sure, over-all control.

KODALY: *Háry János: Suite and Two Arias: Dances of Galanta*. Olga Szönyi, soprano (in the Arias); London Symphony Orchestra, Istvan Kertesz, cond. London CS 6417. Kertesz conducts robust, idiomatic performances of both suites, as fine as any on records at the moment. The London Symphony plays with fire and the recording is spectacular.

LISZT: *Les Années de Pèlerinage* (complete). Aldo Ciccolini, piano. Pathé ASDF 772/74 (three discs). Ciccolini does this music proud: he is a true Liszt stylist, with bravura technique at his disposal and a fine coloristic gift. Other factors making for the complete triumph of these discs: superbly resonant recording with extra-wide dynamic range, and a marvelously full-toned piano.

LOUIS XIII: *Ballet de la Merlaison; Chanson "Tu crois O beau soleil"; Deux Psaumes*. **CHARPENTIER:** *Messe pour plusieurs instruments au lieu des orgues*. Le Groupe des Instruments Anciens de Paris, Roger Cotte, cond.; Ensemble Instrumental et Vocal, Jacques Chailley, cond. Pathé ASTX 329. The ballet music exhibits a Gallic charm; the performances of ballet and vocal music alike are spirited and authentic, while the harpsichord variations sound brilliant and impressive in the hands of Marcelle Charbonnier.

MAHLER: *Symphony No. 9, in D minor*. Berlin Philharmonic Orchestra, Sir John Barbirolli, cond. Angel S 3652 (two discs). Barbirolli treats the outer two movements in a true bel canto style and how he makes the music soar and sing! This eloquent interpretation is given equally fine sonics.

MARTINU: *Concerto for Oboe and Orchestra*. **STRAUSS:** *Concerto for Oboe and Orchestra*. František Hanták, oboe; Brno Philharmonic Orchestra, Martin Turnovsky, cond. (in the Martinů), Jaroslav Vogel, cond. (in the Strauss). Parliament PLPS 606. Two fine oboe concertos, both of our time, have been paired on this recording for individual effective-

ness and musical contrast. František Hanták's taste and virtuosity are first-class; and the Brno Philharmonic is highly adept under both conductors.

MENDELSSOHN: *Concerto for Violin and Orchestra, in E minor, Op. 64*. **SCHUMANN:** *Concerto for Violin and Orchestra, in D minor, Op. posth.* Henryk Szeryng, violin; London Symphony Orchestra, Antal Dorati, cond. Mercury SR 90406. Szeryng plays the little-known Schumann Concerto with cool restraint, superb polish, and flawless musicianship; his Mendelssohn too is a dream of a performance. Dorati supports both concertos with fleet delicacy.

MENDELSSOHN: *Piano Works* (selections). Helmut Roloff, piano. Odeon STO 80821. A generous cross section of the composer's best work is tastefully, indeed perceptively, played and beautifully recorded. Roloff is a most satisfying Mendelssohnian.

MONTEVERDI: *L'Incoronazione di Poppea*. Magda Laszlo (s), Lydia Marimpietri (s), Frances Bible (ms), Oralia Dominguez (c), Richard Lewis (t), Carlo Cava (bs), Walter Alberti (bs), et al.; Glyndebourne Festival Chorus; Royal Philharmonic Orchestra, John Pritchard, cond. Angel S 3644 (two discs). The performance is excellent, one of the finest in the Glyndebourne series: all the singers are equal to their tasks, the orchestral playing could not be better, the sound is nearly perfect, the balances exemplary.

MONTEVERDI: *Il Ritorno d'Ulisse in Patria*. Maureen Lehane (s), Margarethe Bence (ms), Gerald English (t), William Whitesides (t), Edward Wollitz (bs), et al.; Santini Chamber Orchestra, Rudolf Ewerhart, cond. Vox STDI.BX 5211 (three discs). This series of extracts provides a welcome addition to the flourishing discography of this composer's operas. Monteverdi's melodies are generally well projected by a highly competent cast. The stereo recording is very good.

MOZART: *Concertos for Violin and Orchestra: No. 1, in B flat, K. 207; No. 2, in D, K. 211*. Yehudi Menuhin, violin; Bath Festival Orchestra, Yehudi Menuhin, cond. Angel S 36231. Menuhin is songful throughout; in loud passages he can be vigorous without coarseness, in soft ones his tone is finely spun but never too thin. These concertos are well worth an occasional hearing, especially when played as beautifully as they are here.

MOZART: *Dances and Marches, Vol. 1*. Vienna Mozart Ensemble, Willi Boskovsky, cond. London CS 6412. These are charming and delightful pieces, music which is certainly a lot of fun to hear and play; Boskovsky and his group play zestfully and with good tone and ensemble.

MOZART: *Quartets for Piano and Strings: No. 1, in G minor, K. 478; No. 2, in E flat, K. 493*. Mieczysław Horowitzki, piano; Members of the Budapest

String Quartet, Columbia MS 6683. An up-to-date stereo recording of a first-class performance of both works. Horszowski is in excellent form here, as are his colleagues. The sound of the recording is intimate.

MOZART: *Quintet for Clarinet and Strings, in A, K. 581; Trio for Clarinet, Viola, and Piano, in E flat, K. 498.* Gervase de Peyer, clarinet; Members of the Melos Ensemble. Angel S 36241. These are beautiful performances, particularly of the Quintet, a reading that does full justice to the exquisite music. In both works the clarinet playing is smooth and musical.

MOZART: *Sonatas for Piano (complete).* Walter Klien, piano. Vox SVBX 5428/29 (six discs). As a perfectly clear, lucid, and honest documentation of the essentials of this masterful block of the piano literature, the present inexpensive albums can hardly be excelled; they even increase one's already great admiration for this fine artist. Happily, he has been given good reproduction.

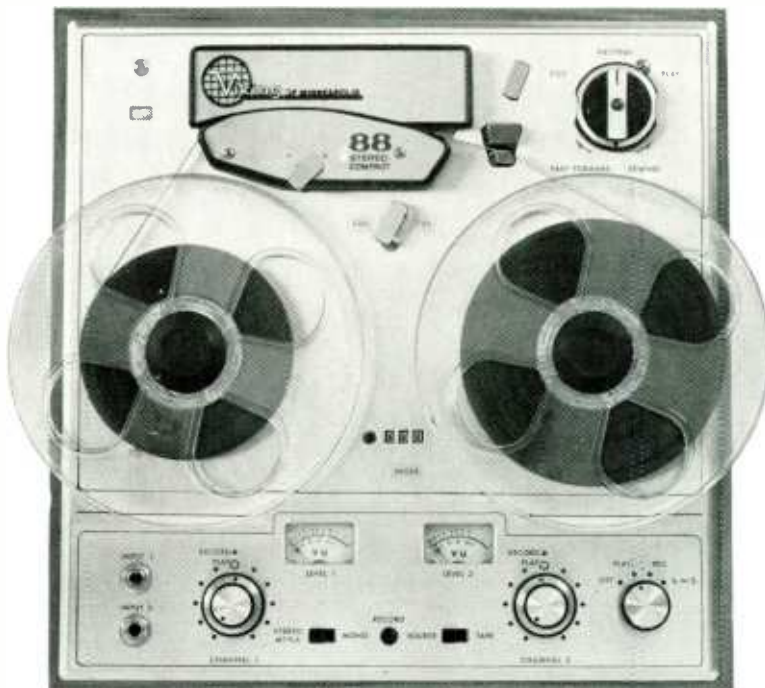
MOZART: *Symphonies: No. 31, in D, K. 297 ("Paris"); No. 34, in C, K. 338.* Philharmonia Orchestra, Otto Klemperer, cond. Angel S 36216. The festivity and bustle, the unexpected turns and progressions, as well as some learned contrapuntal writing are all splendidly conveyed by Klemperer and his fine orchestra. The stereo sound is particularly effective.

MOZART: *Symphonies: No. 35, in D, K. 385 ("Haffner"); No. 36, in C, K. 425 ("Linz"); No. 38, in D, K. 504 ("Prague"); No. 39, in E flat, K. 543.* Philharmonia Orchestra, Otto Klemperer, cond. Angel S 36128/29 (two discs). Otto Klemperer's performances grow ever more polished and here he is completely at the service of the composer's thought. The many musical felicities are caught in splendidly clear and lifelike sound.

MOZART: *Trios: for Piano, Violin, and Cello: No. 1, in B flat, K. 254; No. 2, in G, K. 496; No. 3, in B flat, K. 502; No. 4, in E, K. 542; No. 5, in C, K. 548; No. 6, in G, K. 564; for Piano, Clarinet, and Viola, in E flat, K. 498.* Günter Ludwig, piano, Walter Triebkorn, clarinet, Günter Lemmen, viola (in K. 498); Mannheim Trio (in the rest). Vox SVBX 568 (three discs). This inexpensive edition of all the piano trios of Mozart is very welcome. Individually, these artists are skilled and sensitive; they play together with spirit and precision, and each is alert to his proper place in the ensemble at every moment.

MOZART: *Die Zauberflöte.* Gundula Janowitz (s), Lucia Popp (s), Nicolai Gedda (t), Walter Berry (b), Gottlob Frick (bs), et al.; Philharmonia Chorus and Orchestra, Otto Klemperer, cond. Angel S 3651 (three discs). Klemperer's reading of the score is extremely satisfying, full of beauty and lucidity. The Philharmonia Chorus and Orchestra are up to their usual high level and the cast is exceptionally strong.

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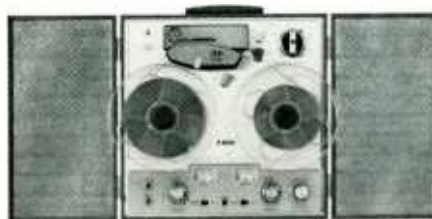


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MOZART: *Die Zauberflöte*. Evelyn Lear (s), Roberta Peters (s), Fritz Wunderlich (t), Dietrich Fischer-Dieskau (b), Franz Crass (bs), et al.; RIAS Chamber Chorus; Berlin Philharmonic Orchestra, Karl Böhm, cond. Deutsche Grammophon SLPM 138981/83 (three discs). This is a splendid production exceptionally well cast: Böhm's leadership is on the highest level—dramatic, balanced, clear. The stereo effects are well chosen and wonderfully executed.

NIELSEN: *Symphony No. 3, Op. 27 ("Espansiva")*. Royal Danish Orchestra, Leonard Bernstein, cond. Columbia MS 6769. What a strange and beautiful work this is! The performance is imaginative, beautifully shaped, witty, and eloquent and the Danish Orchestra responses are razor sharp to Bernstein's urging.

PAGANINI: *Concerto for Violin and Orchestra, No. 2, in B minor, Op. 7 ("La Campanella")*. **SAINT-SAENS:** *Concerto for Violin and Orchestra, No. 1, in A, Op. 20*. Ruggiero Ricci, violin; Cincinnati Symphony Orchestra, Max Rudolf, cond. Decca DL 710106. In both works Ricci displays a silvery, lustrous tone and a lean, assertive, bravura style. The orchestral accompaniments are beautifully regulated and the reproduction is ravishingly clear and detailed.

PAGANINI: *Sonata Concertata, for Guitar and Violin; Sonata for Violin and Guitar, Op. posth.; Grosse Sonate, for Guitar with Violin Accompaniment*. Marga Bäuml, guitar; Walter Klasinc, violin. Odeon STC 80696. All three works are a delight and they are played in a bold, free, bravura style, appropriately emphasizing projection rather than subtlety. The recorded sound is bright and full, with an ever so slight metallic edge which seems to suit the music.

PALESTRINA: *Masses: Sine nomine; Ecce ego Joannes*. Choir of the Carmelite Priory, London; John McCarthy, cond. Oiseau-Lyre SOL 269. The *Sine nomine* is a fine work, performed here in a flowing style with definite contrasts in tempo and dynamics which make for variety and maintain interest. Very good sound throughout.

PERGOLESI: *Stabat Mater*. Judith Raskin (s), Maureen Lehane (ms); Rossini Orchestra of Naples, Franco Caracciolo, cond. London OS 25921. This is a lovely performance of Pergolesi's sad, gentle masterpiece. The soloists here are excellent; both are exemplary in their treatment of vocal ornamentation.

POULENC: *Mass in G; Eight Motets*. Whitehart Chorale, Lewis Whitehart, cond. Lyrichord LLST 7127. The *Mass in G* may well be Poulenc's finest choral work, a rare and perfect thing—and this interpretation does full justice to it. The recording is excellent.

POULENC: *Sextet for Piano and Winds; Trio for Piano, Oboe, and Bassoon; Sonata for Flute and Piano*. Michel Debost, flute (in the *Flute Sonata*); Jacques

Fevrier, piano; Paris Wind Quintet. Angel S 36261. A wonderful reflection here of the two faces of Poulenc: the irreverent sauciness of the 1920s and '30s and the free songfulness of the *Flute Sonata*. Poulenc's compatriots do him credit in these performances.

POULENC: *Sonata for Clarinet and Piano; Sonata for Oboe and Piano; Aubade*. André Boutard, clarinet; Pierre Pierlot, oboe; Jacques Février, piano; Lamoureux Orchestra, Serge Baudo, cond. Nonesuch H 71033. All three pieces are beautifully performed, but there is something extra special about Pierlot's oboe playing. The recorded sound throughout is excellent, too.

PROKOFIEV: *Quintet for Winds and Strings, in G minor, Op. 39*. **SHOSTAKOVICH:** *Quintet for Piano and Strings, in G minor, Op. 57*. Lamar Crowson, piano; Members of the Melos Ensemble, Oiseau-Lyre SOL 267. Both these works are exceptionally fine. The performances are adept and imaginative, and have been recorded with a chamber music intimacy. All told, an exhilarating disc.

PROKOFIEV: *Symphony No. 3, in C minor, Op. 44; Le Pas d'acier, Op. 41; Suite*. Utah Symphony Orchestra, Maurice Abravanel, cond. Vanguard VSD 71122. The *Symphony*, in its record debut, turns out to be a fascinating, dazzling, and immensely spirited orchestral showpiece. Abravanel drives his orchestra hard, and gets taut, brilliant playing.

RACHMANINOFF: *Concerto for Piano and Orchestra, No. 2, in C minor, Op. 18; Rhapsody on a Theme of Paganini, Op. 43*. Gary Graffman, piano; New York Philharmonic, Leonard Bernstein, cond. Columbia MS 6634. This disc deserves to become a best seller; no finer modern performances of these standard pieces can be found. Stereo is well used, with excellent deployment of the various sections of the orchestra.

RAVEL: *Bolero; La Valse; Ma Mère l'Oye*. London Symphony Orchestra, Pierre Monteux, cond. Philips PHS 900059. Even in his old age, Monteux was the incomparable spokesman for French music. None of his innumerable admirers can afford to miss these characteristic examples of—and now precious memories to—his unique artistic personality.

RAVEL: *Concertos for Piano and Orchestra: in D, for the left hand alone; in G*. Monique Haas, piano; Orchestre National de Paris, Paul Paray, cond. Deutsche Grammophon SLPM 138988. A superbly authoritative disc. The surety and sheer light-handedness of Miss Haas's fleet-fingered statements almost defy description. Credit for the sophisticated understatement of this whole presentation must of course go also to M. Paray.

RIMSKY-KORSAKOV: *Scheherazade, Op. 35*. Erich Gruenberg, violin; London Symphony Orchestra, Leopold Stokowski, cond. London SPC 21005. A permanent

source of fascination. Stokowski and London's Phase 4 recording technique expose the music in incandescent illumination.

ROUSSEL: *Bacchus et Ariane, Op. 43: Symphonic Suite No. 2.* RAVEL: *Daphnis et Chloë: Symphonic Suite No. 2.* Chicago Symphony Orchestra, Jean Martinon, cond. RCA Victor LSC 2806. The Chicagoans and RCA Victor have achieved a highly natural warmth, glow, and glitter in this dazzling repertoire. It's good to have the Chicago Symphony back on records—and good to know that it is still setting sonic standards.

ROUSSEL: *Bacchus et Ariane: Suite; The Spider's Feast; Sinfonietta for String Orchestra.* Orchestre de la Société des Concerts du Conservatoire de Paris, André Cluytens, cond. Angel S 36225. *Bacchus et Ariane* is a handsome, glittering, preening, full-dress ballet score, full of vivid rhythms and magnificent color, and Cluytens brings out everything it contains. The *Sinfonietta* sweeps along in a marvelously tonic and invigorating fashion.

SAINT-SAENS: *Concerto for Cello and Orchestra, in A minor, Op. 33.* TCHAIKOVSKY: *Variations on a Rococo Theme, Op. 33.* Janos Starker, cello; London Symphony Orchestra, Antal Dorati, cond. Mercury SR 90409. Starker's razor-sharp, ultrabright cellism is coupled with brisk, no-nonsense conducting from Dorati, solid playing from the London Orchestra, and vivid close-to engineering from Mercury.

SCARLATTI, ALESSANDRO: *Il Giardino di amore.* Catherine Gayer, soprano; Brigitte Fassbänder, contralto; Munich Chamber Orchestra, Hans Stadlmair, cond. Archive ARC 73244. A most delectable evening's entertainment. The intelligent and musical contribution of Brigitte Fassbänder is one of the most notable features of this disc. Her intonation, like that of her partner Catherine Gayer, is impeccable; and when the two sing duets the effect is utterly bewitching. Stadlmair conducts with a flair for Scarlattian style, and his orchestra is superb.

SCARLATTI, DOMENICO: *Sonatas for Piano (12).* Vladimir Horowitz, piano. Columbia MS 6658. A dazzling exhibition of piano playing at times so perfect as to be almost impossible to believe.

SCHOENBERG: *Gurrelieder.* Inge Borkh (s), Hertha Töpper (ms), Herbert Schacht-schneider (t), Lorenz Fehenberger (t), Kieth Engen (bs), Hans Herbert Fiedler (narrator); Chorus and Orchestra of the Bavarian Radio, Rafael Kubelik, cond. Deutsche Grammophon SLP 138984/85 (two discs). All the massive requirements of this dramatic cantata are excellently well met in a recording of phenomenal range and fidelity. The set is a great achievement for Kubelik, who realizes at every turn the diversified coloration of Schoenberg's giant score.

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CIRCLE 29 ON READER-SERVICE CARD

Schoenberg, Vol. 3." Various soloists. CBC Symphony Orchestra, Robert Craft, cond. Columbia M2S 709. The emphasis here is upon the tonal works of the composer's early years and "neotonal" works of his final phase. Craft's work throughout this set is especially fine: indeed he quite surpasses himself in all the original works of Schoenberg. Recordings throughout are up to Columbia's very highest standard, and the set is accompanied by a fantastic book full of notes and analyses.

SCHUBERT: *Quintet for Piano and Strings, in A ("Trout").* Louis Kentner, piano; Members of the Hungarian String Quartet. Vox STPL 512690. A large-scaled, bright-eyed performance of the *Trout* for those listeners who want kinetic objectivity in place of Viennese languishing. Vox's stereo is well spread out.

SCHUBERT: *Sonata for Piano, No. 17, in D, Op. 53, D. 850; Impromptus, Op. 90, D. 899; No. 3, in G flat; No. 4, in A flat minor.* Clifford Curzon, piano. London CS 6416. Some of Schubert's most richly conceived piano writing is contained on this disc. The fragile, clarion ring of Curzon's tone is captured by the superb reproduction.

SCHUBERT: *Sonata for Piano, No. 19, in C minor, Op. posth., D. 958; Fantasia in C, Op. 15, D. 760 ("Wanderer").* Gary Graffman, piano. Columbia MS 6735. Graffman's technical prowess here is as staggering as ever, his phrasing just as controlled and intelligent; present also is a breadth and apparent personal involvement that heighten the significance of what he is interpreting.

SCHUBERT: *Sonatas for Violin and Piano: No. 1, in D; No. 2, in A minor; No. 3, in G minor.* Alexander Schneider, violin; Peter Serkin, piano. Vanguard VSD 71128. The two soloists present a delightful flow of Schubertian ideas with youthful bravura, wit, and song, all joined in happy exchange.

SCHUMANN: *Andante and Variations for Two Pianos, Two Cellos, and French Horn; Etude in the Form of a Canon, Op. 56, No. 4.* **MOZART:** *Sonata for Two Pianos, in D, K. 448.* Vladimir Ashkenazy and Malcolm Frager, pianos; Amaryllis Fleming and Terence Weil, cellos; Barry Tuckwell, horn (in the Schumann). London CS 6411. This new recording of the Schumann is most welcome. Ashkenazy and Frager make an impressive twosome, the very differences in their playing (the former romantic and nuanced, the latter more stout-toned and emphatic) adding to the communicative effect. Well-nigh perfect sonics.

SCHUMANN: *Noveletten, Op. 21* (complete). Beveridge Webster, piano. Dover HCRST 7002. Webster does handsomely by the music; with superb, resonant sound, this should be the standard edition of the complete Op. 21 for some years to come.

SIBELIUS: *Symphony No. 5, in E flat,*

Op. 82; Tapiola, Op. 112. Berlin Philharmonic Orchestra, Herbert von Karajan, cond. Deutsche Grammophon SLPM 138973. The orchestral work is glowing in timbre, polished to mirror-smooth refinement, and yet exciting to hear. Beautifully managed recording, with consummate stereo placement and spacious acoustics.

SIBELIUS: *Symphony No. 5, in E flat, Op. 82; Pohjola's Daughter, Op. 49.* Hallé Orchestra, Sir John Barbirolli, cond. Vanguard SRV 137SD. Noble, eloquent, and beautifully proportioned readings. The orchestral playing is elegant, and the sound rich and full-bodied.

STRAUSS, RICHARD: *Daphne.* Hilde Gueden (s), James King (t), Fritz Wunderlich (t), Paul Schoeffler (bs), et al.; Vienna State Opera Chorus; Vienna Symphony Orchestra, Karl Böhm, cond. Deutsche Grammophon SLPM 138956/57 (two discs). Some of Strauss's most lovable music in a live performance superb on nearly every count. Gueden's beautiful voice is a splendid match for the soaring, lingering vocal lines.

STRAUSS, RICHARD: *Der Rosenkavalier: Suite; Salomes Tanz; Till Eulenspiegels lustige Streiche, Op. 28.* Philadelphia Orchestra, Eugene Ormandy, cond. Columbia MS 6687. The fat, gorgeous orchestral tone of the Philadelphians is perfectly complemented by the sleek and resonant sonorities of Columbia's reproduction. The stereo is vividly three-dimensional with the music swirling all around you. In the *Rosenkavalier* Suite and the casual voluptuousness of the *Salome* dance, it is all quite ravishing to the ear.

STRAVINSKY: *The Firebird: Suite* (1945). **RIMSKY-KORSAKOV:** *Le Coq d'or: Suite.* Boston Symphony Orchestra, Erich Leinsdorf, cond. RCA Victor LSC 2725. One of the best things to come from Boston in the Leinsdorf seasons—a disc that serves as a testimonial to both the ensemble and the Dynagroove technique.

STRAVINSKY: *L'Histoire du soldat.* Jean Cocteau, Peter Ustinov, Jean-Marie Ferte; Chamber Ensemble, Igor Markevitch, cond. Philips PHS 900046. This performance (the only complete one on American-released records) is remarkable for its clarity, sharpness, and razor-edged objectivity. Everything is flawless—including the engineering.

STRAVINSKY: *Orpheus; Apollo.* Chicago Symphony Orchestra (in *Orpheus*); Columbia Symphony Orchestra (in *Apollo*), Igor Stravinsky, cond. Columbia MS 6646. *Orpheus* is a masterpiece of Stravinskian lyricism; *Apollo* sings and soars and tears your heart out in a performance unmatched by the more obviously dramatized interpretations.

STRAVINSKY: *The Rake's Progress.* Judith Raskin (s), Regina Sarfaty (ms), Alexander Young (t), John Reardon (b),

et al.: Royal Philharmonic Orchestra, Igor Stravinsky, cond. Columbia M3S 710 (three discs). For those who do not own a recording of this extremely important work, the new version is a necessity. The score's musical and dramatic riches are among the finest things in modern opera, and with the up-to-date stereo sound, the music emerges with a fresh lucidity and point.

STRAVINSKY: "Stravinsky Conducts Ballet Music." (*Jeu de cartes; Scènes de ballet.* Tchaikovsky-Stravinsky: *The Nutcracker: Bluebird pas de deux.*) Cleveland Orchestra (in *Jeu de cartes*); Columbia Symphony Orchestra (in *Bluebird*); CBC Symphony Orchestra (in *Scènes de ballet*), Igor Stravinsky, cond. Columbia MS 6649. The greatest recorded performance of that top-ranking masterpiece *Jeu de cartes*: the music spurts, jets, and overflows with wit, drama, and a sense of musical gamesmanship.

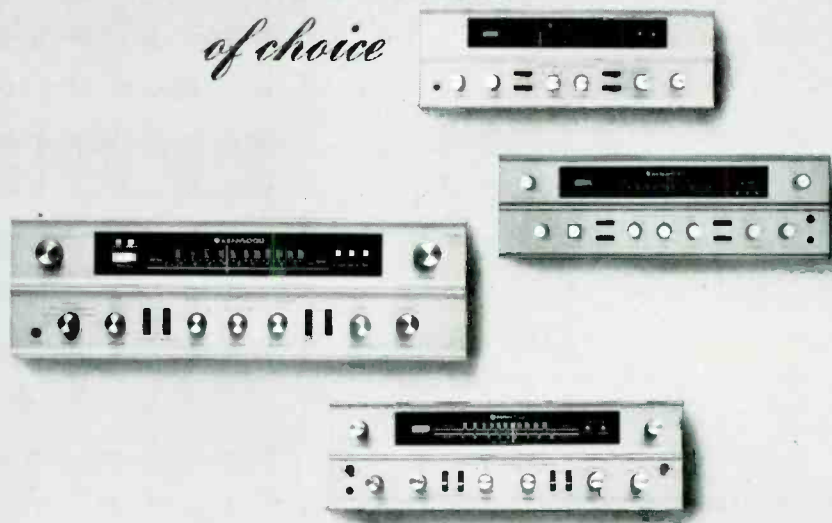
STRAVINSKY: "Stravinsky Conducts Favorite Short Pieces." (*Greeting Prelude; Dumbarton Oaks; Eight Instrumental Miniatures; Four Etudes for Orchestra; Circus Polka; Suites for Small Orchestra: No. 1; No. 2.*) Columbia Symphony Orchestra (in *Greeting Prelude*); Members of CSO (in *Concerto*); CBC Symphony Orchestra (in the *Etudes* and *Circus Polka*; Members of the CBCSO in *Miniatures* and *Suites*). Igor Stravinsky, cond. Columbia MS 6648. The marvelously witty and ingenious *Greeting Prelude* is alone worth the price of the record. The composer's own interpretation is, as always, lively and authoritative while the sound leaves nothing to be desired.

STRAVINSKY: "Stravinsky Conducts His Choral Music" (*Zvezdoliki; the Dove Descending Breaks the Air; Babel; A Sermon, a Narrative, and a Prayer.* Bach-Stravinsky: *Vom Himmel Hoch Variations*). John Colicos, narrator (in *Babel*); Shirley Verrett, mezzo; Loren Driscoll, tenor; John Horton, speaker (in *A Sermon, a Narrative, and a Prayer*); Festival Singers of Toronto; CBC Symphony Orchestra, Igor Stravinsky, cond. Columbia MS 6647. This splendidly recorded disc should put the Festival Singers of Toronto and the CBC Symphony on the world map; they richly deserve it. So far as interpretation is concerned, no one is likely to conduct Stravinsky more authoritatively than Stravinsky himself.

STRAVINSKY: *Symphony in Three Movements; Pulcinella Suite.* Philharmonia Orchestra, Otto Klemperer, cond. Angel S 36248. Klemperer's performance of the *Symphony* is exceptionally robust, full-bodied, and weighty. The *Pulcinella* music is beautifully played, with just the right appreciation of its eighteenth-century poetry and its modern satire.

TCHAIKOVSKY: *Concertos for Piano and Orchestra: No. 2, in G, Op. 44; No. 3, in E flat, Op. 75.* Gary Graffman, piano; Philadelphia Orchestra, Eugene Ormandy, cond. Columbia MS 6755. The *Second Concerto* is just as melodious as

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its predecessor and it is certainly written with equal ingenuity and far greater finesse. Gary Graffman is a formidable technician and a completely honest pianist, hurtling through the bristling pas-sagework with exceptional aplomb.

TELEMANN: *Music for Flute and Harpsichord. (Sonatas for Flute and Harpsichord: in F minor; in B minor. Trio Sonata for Flute, Harpsichord, and Continuo, in B flat. Concerto for Flute and Harpsichord, No. 1, in D.)* Jean-Pierre Rampal, flute; Robert Veyron-Lacroix, harpsichord. Nonesuch H 71038. Rampal and Veyron-Lacroix produce some of the most civilized and delightful sounds to be found anywhere in music today, and

they apply themselves to the charming works here with high style and culture.

TELEMANN: *Musique de table, Part 1. Concerto Amsterdam, Franz Brüggen, cond. Telefunken SAWT 9449/50 (two discs).* Each composition in this "production" offers material well worth hearing. The ensemble plays with admirable precision and dash and good tone. The sound is excellent, stereo especially effective in the trio, where the two violins are on separate channels.

TELEMANN: *Musique de table, Part 1. Schola Cantorum Basiliensis, August Wenzinger, cond. Archive ARC 73234/35 (two discs).* Archive's account of Part

I differs in some respects from Telefunken's but is no less stylishly or skillfully done. The two versions vary somewhat in the tempos of certain movements, and the added embellishments are of course not the same, but in general each reading is convincing on its own terms.

TELEMANN: *Quartets for Flute, Violin, Cello, and Basso Continuo: No. 1, in D; No. 2, in B minor; No. 6, in E minor.* Amsterdam Quartet, Telefunken SAWT 9448. These works are quite diverting, and the performances are skillful, energetic, and stylish: this is playing that commands rather than persuades. The balance of sound is fine.

VERDI: *Macbeth.* Birgit Nilsson (s), Bruno Prevedi (t), Giuseppe Taddei (b), Giovanni Foiani (bs), et al.; Chorus and Orchestra of Accademia di Santa Cecilia (Rome). Thomas Schippers, cond. London OSA 1380 (three discs). In Birgit Nilsson and Giuseppe Taddei, London has come up with a formidable pair, and the score proves a fine vehicle for Thomas Schippers' best points.

VERDI: *Requiem Mass.* Elisabeth Schwarzkopf (s), Christa Ludwig (ms), Nicolai Gedda (t), Nicolai Ghiaurov (bs); Philharmonia Chorus and Orchestra. Carlo Maria Giulini, cond. Angel S 3649 (two discs). Giulini's superb sense of shape and balance is impressive in its un-failing musicality and its determination to get through to both the letter and the spirit of every bar of the score. The soloists shine with an unchallenged brilliance in the ensembles, and execution on the part of the chorus and orchestra is stunning.

VERDI: *Rigoletto.* Renata Scotto (s), Carlo Bergonzi (t), Dietrich Fischer-Dieskau (b), et al.; Chorus and Orchestra of Teatro alla Scala. Rafael Kubelik, cond. Deutsche Grammophon SLP.M 138931/33 (three discs). As honest and moving a *Rigoletto* as we have ever had. A brilliant achievement on the part of Kubelik and Fischer-Dieskau.

VIVALDI: *The Four Seasons, Op. 8, Nos. 1-4.* Ruggiero Ricci, violin; Stradivarius Chamber Orchestra, Ruggiero Ricci, cond. Decca DL 79423. The fourteen Stradivari instruments gathered together for this recording produce a fine display of string tone. Ricci brings tremendous zest and bite to the solo part. Recorded sound is close and bright, and stereo spread is realistic.

WAGNER: *Götterdämmerung.* Birgit Nilsson (s), Claire Watson (s), Christa Ludwig (ms), Wolfgang Windgassen (t), Dietrich Fischer-Dieskau (b), Gottlob Frick (bs), et al.; Vienna State Opera Chorus; Vienna Philharmonic Orchestra. Georg Solti, cond. London OSA 1604 (six discs). The finest *Götterdämmerung* I can imagine in the here and now; Nilsson is stupendous, Windgassen has never been more impressive, Fischer-Dieskau commands an extraordinary dramatic sense, and the playing of the orchestra is beyond praise.



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RECITALS AND MISCELLANY

AMBROSIAN SINGERS AND PLAYERS: *The Cries of London; Music in Honor of Queen Elizabeth I.* Ambrosian Singers and Players, Denis Stevens, cond. Expériences Anonymes EAS 81. The London street cries include the saucy, syncopated *Pedlar's Song* by Morley and the remarkable work called *The Cries of London* by Richard Dering. Stevens treats instruments and voices as of equal importance, weaving a contrapuntal web in which one strand or another is sometimes sung.

LEONARD BERNSTEIN: *William Tell and Other Favorite Overtures* (Hérold, Thomas, Von Suppé, Rossini). New York Philharmonic, Leonard Bernstein, cond. Columbia MS 6743. This record is historic in the brilliance of its orchestral playing and conducting, the skill of its over-all production, the magic of its engineering.

MONTSERRAT CABALLE: *Song Recital* (Rodrigo and Montsalvatge). Montserrat Caballé, soprano; Miguel Zanetti, piano. Odeon ASD 833. Miss Caballé is clearly a very good artist: her voice is exceptionally beautiful in quality and quite individual in timbre, and she obviously has in abundance the musical gifts that set off truly distinctive singers from merely efficient ones. Genuinely sensitive accompaniment from Zanetti.

CARLOS CHAVEZ: *The Music of Mexico* (Chávez, Sandi, Galindo, Fóster). Mexican Chorus and Orchestra, Carlos Chávez, cond. Columbia LS 1016. This exciting album stands as the finest evocation of Mexico available. The fifth in Columbia's "Legacy Collection," it captures in word, picture, and sound the artistic ferment of present-day Mexico.

PAUL DOKTOR: *Solos for the Viola Player.* Paul Doktor, viola; John Wustman, piano. Westminster WST 17083. The full, dark solidity of Doktor's viola and the gracious sweep of his melodic phrases make this disc a most successful one. John Wustman is an excellent accompanist.

EVENSONG FOR ASH WEDNESDAY. Choir of King's College, Cambridge; David Willcocks, cond. Argo ZRG 5365. Argo's stereo recording renders the inimitable acoustics at King's College with wonderful fidelity. The most remarkable item is *Miserere* of Allegri. The ethereal, stratospheric notes of a choirboy topping a solo quartet have to be heard to be believed.

DIETRICH FISCHER-DIESKAU: *Recital* (Bach: *Cantata No. 56, Ich will den Kreuzstab gerne tragen.* Stölzel: *Cantata, Aus der Tiefe rufe ich.* Purcell: *In nomine.* Gibbons: *In nomine*). Dietrich Fischer-Dieskau, baritone; Festival Strings Lucerne, Rudolf Baumgartner, cond. Deutsche Grammophon SLP 138969.

Fischer-Dieskau spins out long legato phrases in this performance of one of Bach's most appealing solo cantatas, and in a dramatic and eloquent performance gives the Stölzel cantata considerable emotional impact.

TITO GOBBI: *The Art of Tito Gobbi* (*Operatic Arias; Classical Songs and Arias; Popular Songs; Romantic Songs*). Tito Gobbi, baritone; various accompanying performers. Odeon ASD 606/07 (two discs). Here is a group of four little recitals, each set up with its own appropriate instrumental grouping and ambience. Gobbi's unique dark timbre, his voice's unflinching rocklike steadiness and its richness in the lower and middle

ranges are unforgettable. Along with the voice, of course, goes an intelligence and interpretative sensitivity which set him apart.

MARILYN HORNE: *Operatic Recital* (Rossini, Donizetti, Meyerbeer, Mozart). Marilyn Horne, mezzo; Orchestra of the Royal Opera House, Covent Garden, Henry Lewis, cond. London OS 25910. Marilyn Horne is coming along rapidly, and a great deal of this record is ravishing. Her husband, Henry Lewis, partners her singing here with a vivid feeling for orchestral color.

VLADIMIR HOROWITZ: *Carnegie Hall Recital, May 9, 1965* (Bach-Busoni, Schu-



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mann, Scriabin, Chopin, Debussy, Moszkowski). Vladimir Horowitz, piano. Columbia M2S 728 (two discs). The living soul of Horowitz is immortalized here, and its vivid immediacy makes this album a priceless document.

IGOR KIPNIS: *English Harpsichord Music* (Clarke, Farnaby, Handel, Byrd, Purcell, and Bull). Igor Kipnis, harpsichord. Epic BC 1298. A concert full of wonderful musical delights. Igor Kipnis is one of the most imaginative musicians ever to approach the spirit of early keyboard music. A remarkable, important record.

LEONHARDT CONSORT: *Music for Consort in the Seventeenth Century*. Le-

onhardt Consort, Gustav Leonhardt, cond. Telefunken SAWT 9461. A pleasant posy of chamber works from the late Renaissance and early baroque. The playing is vital—the approach is clearly not archeological but aesthetic.

MONKS OF SOLESMES: *Selections from the Liturgy for Maundy Thursday*. Monks of Solesmes, Dom Joseph Gajard, cond. London OS 25832. This new album from Solesmes adds very considerably to the quantity and quality of recordings of the especially solemn and moving chants for Holy Week. The exceptional quality and beauty of the singing is emulated faintly here and there by birds within range of the microphone.

ERICA MORINI: *Italian Baroque Violin Recital*. Erica Morini, violin; Leon Pommer, piano. Decca DL 710102. A cerulean clarity of trills and ornaments, combined with an innocently sensuous cantilena, makes a recital of this kind doubly welcome—for the pleasure it offers, and the repertoire it reveals.

MUSIC FROM THE COLUMBIA-PRINCETON ELECTRONIC MUSIC CENTER (Music by Lewin-Richter, Mimaroglu, Avni, and Carlos). Turnabout TV 34004. This might well be termed the best collection that has so far come from the Columbia-Princeton Electronic Music Center, and the best things in it are a pair of compositions by the incredibly inventive Ilhan Mimaroglu.

MUSIC FROM NUREMBERG (Songs by Hans Sachs: songs and instrumental works from the Locheimer Liederbuch). F. Brückner-Ruggeberg, tenor; Rudolf Aue, baritone; Nuremberg Gambencollegium, Josef Ulsamer, cond. Archive ARC 735222. One of the best medieval programs to appear on disc within the last decade. Praise is due the singers for their clear enunciation and vivid interpretations and to the instrumentalists for their colorful accompaniment.

PETER PEARS/JULIAN BREAM: *Music for Voice and Guitar* (Britten, Walton, Seiber, and Fricker). Peter Pears, tenor; Julian Bream, guitar. RCA Victor LSC 2718. A fascinating disc, both as to the music selected and its performance. Pears is a singer of great expressive powers and unsurpassed musicality; Bream accompanies him with technical polish and exquisite taste.

RAFAEL PUYANA: *Baroque Masterpieces for the Harpsichord*. Rafael Puyana, harpsichord. Mercury SR 90411. The great set of variations by Rameau, in the grandeur and variety of its invention and in the splendor of the performance, is the most impressive accomplishment on this disc. A fine collection of unhackneyed works, well performed and recorded.

ARTUR RUBINSTEIN: *A French Program* (Chabrier, Fauré, Poulenc, Ravel). Artur Rubinstein, piano. RCA Victor LSC 2751. Most of the pieces here are new to the great pianist's recorded repertoire. All the music is presented with superb lilt and proportion, beautiful tonal coloring, and faultless articulation. No collector of piano music should be without this record.

JANOS STARKER: *Cello Recital* (Mendelssohn, Martinů, Chopin, Debussy, Bartók, Weiner). Janos Starker, cello; Gyorgy Sebok, piano. Mercury SR 90405. There is probably no cellist currently active who can draw the range of floating and resonant sounds even up into the top register as Starker can. He challenges memories of the fabled Feuermann. Gyorgy Sebok is an admirable partner.

RENATA TEBALDI: *Operatic Recital* (Verdi, Puccini, Ponchielli, Mascagni, and



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Cilea). Renata Tebaldi, soprano; New Philharmonia Orchestra, Oliviero de Fabritiis, cond. London OS 25912. The program is an interesting one and the voice's characteristic roundness and warmth are here, together with a lightness and freedom which has not been in Tebaldi's singing for several years. Everything is lingering and stately, very beautiful. De Fabritiis and the "new" Philharmonia further strengthen this release.

RONALD TURINI: *Piano Recital* (Hindemith, Liszt, Schumann, Scriabin). Ronald Turini, piano. RCA Victor LSC 2779. The first recording by the thirty-year-old, Canadian-born, Horowitz-tutored Ronald Turini shows him to be a talent of the first magnitude. All the performances here display clarity of texture, structure, and emotion.

CESARE VALLETTI: *French Art Songs* (Fauré, Szulc, Debussy, Duparc, and Hahn). Cesare Valletti, tenor; Leo Taubman, piano. RCA Victor LSC 2787. Valletti produces just the right vocal sound for this kind of program: light, clean, and floating. This is a cultivated, ardent, stylish recital.

SHIRLEY VERRETT: *Spanish Songs* (Falla, Nin, Granados, Obradors, Montsalvatge, and Turina). Shirley Verrett, mezzo; Charles Wadsworth, piano. RCA Victor LSC 2776. In a series of tingling and throbbing performances on this—her first major solo—record, Shirley Verrett upholds the high quality and promise

of her debut recital. Charles Wadsworth's extremely vivid work at the piano also should be given credit.

JON VICKERS: *Operatic Recital* (Ponchielli, Flotow, Verdi, Leoncavallo, Cilea, Giordano, and Puccini). Jon Vickers, tenor; Rome Opera House Orchestra, Tullio Serafin, cond. RCA Victor LSC 2741. A thrilling record. The singing radiates an aura of pure excitement brilliantly attuned to the nature of each aria.

ANDRE WATTS: *Piano Recital* (Chopin, Debussy, Haydn, Liszt). Andre Watts, piano. Columbia MS 6636. There is a prodigious ease, a tremendous fluency about the way young Andre Watts gets around the keyboard. His is a truly remarkable talent.

EARL WILD: *The Virtuoso Piano* (Herz, Godowsky, Rubinstein, Thalberg, Hummel, Paderewski). Earl Wild, piano. Vanguard VSD 71119. Earl Wild not only plays with a technical mastery that exhilarates and dazzles; he interprets with subtlety, elegance, humor, and depth. The six works here presented are great fun and are programmed with discriminating variety.

JOHN WILLIAMS: *Guitar Recital* (Bach, Albéniz, Tarrega, Turina, Llobet, Ponce, Sagreras). Columbia MS 6608. A wonderful disc. Williams has done everything for Bach that Bach could wish. The Spanish side of the disc has plenty of fire and brilliance.

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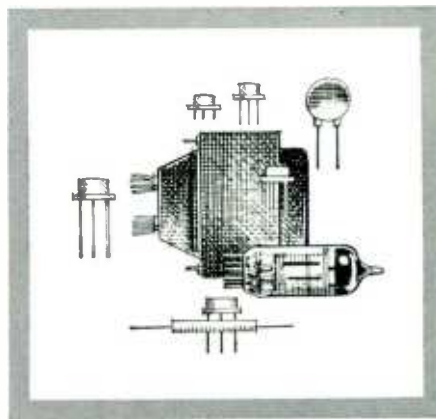
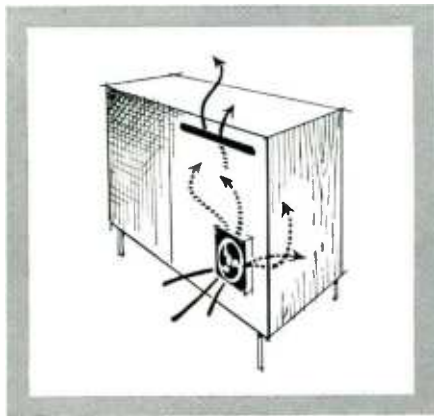
Charles Aznavour: "*His Love Songs in English.*" Reprise S-6157. Aznavour in French is a compelling performer; in English he is overpowering. His songs tell of honest, down-to-earth emotions. He is backed by superb arrangements by Sy Oliver, who conducts an orchestra that plays like a dream.

Bob Brookmeyer: "*And Friends.*" Columbia CS 9037. This deft meeting between Brookmeyer and a group of experienced, skillful, and sophisticated jazzmen has everything to recommend it—approach, individual performance, and total fulfillment.

Ray Brown—Milt Jackson. Verve 6-8615. A remarkable array of mature and brilliant jazz talent has been brought together to create this disc. The material is fresh and maintains an unusually high level of interest.

Damita Jo: "*This is Damita Jo.*" Epic 26131. A revealing and wide-ranging introduction to Damita Jo's recording debut. Such inventive originality, in combination with her inherent talent, suggests that this could be just the beginning for an interesting singing personality.

Wild Bill Davis and Johnny Hodges: "*Con-Soul and Sax.*" RCA Victor LSP



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3393. This disc belongs to Hodges and it is a beauty. Band after band is filled with his powdery, sinuous, and utterly inimitable playing. Davis' contributions are not to be slighted, however; his tasteful and swinging use of the organ provides an admirable background for Hodges.

Buddy De Franco—Tommy Gumina: *"The Girl from Ipanema."* Mercury 60900. Beautifully formed, reflective performances quite distinctive in tone and character. One of the most rewarding teams in contemporary jazz.

The DePaur Chorus: *"Dansé, Calinda!"* Mercury SR 90418. A refreshing recital

of the gay but biting creole dances of Louisiana. DePaur and his singers prove themselves without peer. *Magnifique!*

Marlene Dietrich: *"Marlene."* Capitol S 10397. Miss Dietrich's long familiar role as a superbly seductive singer of the throaty school is dropped here in favor of the "Grandma Marlene" image, and in these sentimental, folk-like, teen-age, and children's songs she is all freshness and light.

"Do I Hear a Waltz?" Elizabeth Allen, Sergio Franchi, and Original Cast. Columbia KOS 2770. Sondheim's lyrics have an astringent quality expressed with subtlety and wit. The music fondly recalls

the Rodgers and Hart days, and it is delightful to hear Rodgers writing once more in that bright style.

Herb Ellis—Charlie Byrd: *"Guitar/Guitar."* Columbia CS 9130. The charm of this disc lies in its duets: the two guitars twine their way through an interesting variety of pieces.

"Era of the Swing Trumpet." Mainstream S 6017. These trumpeters are superb, giving performances that are bristling examples of first-class small-group swing.

José Feliciano: *"The Voice and Guitar."* RCA Victor LSP 3358. Feliciano—a young (nineteen) blind Puerto Rican singer and guitarist—has already mastered and refined so much of a musician's art and an entertainer's skills that the effect is often dazzling. To hear so many varied talents coming from the same source borders on the incredible.

Ella Fitzgerald: *"Ella at Juan-Les Pins."* Verve 6-4065. Miss Fitzgerald was obviously in fine fettle on the evening of this live recorded performance—her gentle swinging, casual stylings have never been recorded to better advantage.

Sergio Franchi: *"Live at the Coconut Grove."* RCA Victor LSP 3310. Sergio Franchi is revealed here as a singer with an easy manner, considerable charm, finesse, and humor. From every point of view he seems to have made successfully the difficult transition from the "serious" field to pops.

Judy Garland and Liza Minnelli: *"At the London Palladium."* Capitol SWBO 2295 (two discs). Together in this album, Miss Garland, one of the great popular singers of our day, and Miss Minnelli, a daughter bred in her mother's singing image and standing on the edge of a very promising career of her own, exert a unique fascination.

John Gary: *"The Nearness of You."* RCA Victor LSP 3349. This collection highlights many of the wonderful things John Gary can do with a ballad, aptly displaying the warm resources of his voice.

Friedrich Gulda: *"From Vienna with Jazz."* Columbia CS 9051. Gulda brings to his piano playing the touch and temperament of a true virtuoso. One of the few totally successful attempts to cross-breed classical music and jazz.

Lena Horne: *"Feelin' Good."* United Artists 6433. Lena Horne's brashly sensuous projection shines out of this disc with neon brilliance; one of the great individualistic interpreters of popular music at her peak.

Fran Jeffries: *"Sex and the Single Girl."* M-G-M S 4268. The warm and easy dark-timbred voice of the multitimed Miss Jeffries sets off these performances—a distinctly superior disc from every aspect.

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"Three O'Clock in the Morning." Decca 74670. Kaempfert's work retains its sparkle in this, his thirteenth LP to be released here. A judicious choice of tunes is made attractive and inviting.

Yusef Lateef: "Live at Pep's." Impulse S 69. Lateef is a highly individual experimentalist whose work is invariably infused with tremendous vitality. Here he manages to be well off the beaten track and, at the same time, solidly in the hard-driving mainstream of jazz.

Rod Levitt Orchestra: "Insight." RCA Victor LSP 3372. At a time when jazz often seems to have lost its sense of direction, Levitt's swinging vitality is getting the music back on solid ground. The fine work on this second disc of his reinforces and extends the qualities apparent in his first.

Gunnar Lidberg: "A String of Scandinavian Pearls." London S 99354. These swinging renditions, played by a group of young Swedes, are brilliant not only because of the quality of improvisation, but because of the degree of subtlety with which it is accomplished. Lidberg is a superb jazz violinist and discovering him is an exhilarating experience.

"Mary Poppins." Julie Andrews, Dick Van Dyke, Original Cast Sound Track. Buena Vista S 4026. This disc is highlighted by the disarming presence of Julie Andrews who positively glows right through the record groove, vinyl disc, amplifiers, speakers, and all other mechanical barriers.

Kenneth McKellar: "Folk Songs from Scotland's Heritage." London International SW 99331. McKellar brings a flaming pride and deep understanding to the folk songs of his native heath. A superlative performance, superlatively recorded.

Joe Mooney: "The Greatness of Joe Mooney." Columbia CS 8986. Mooney plays and sings with exquisite simplicity and sensitivity on this disc. He is gifted with a musical perception that goes directly to the essence of each song.

The Newport Folk Festival—1964. Vanguard VSD 79180/86 (seven discs). These discs attest to the excellence of the 1964 Folk Festival (four concentrated days of folk artistry, attended by 70,000).

"Cole Porter Revisited." RIC S 3002. The emphasis here is on Porter's comedy material, and several long forgotten gems have been turned up. The very special spirit of the musical theatre of the Twenties and Thirties has been captured in these lively performances.

Jean Ritchie: "A Time for Singing." Warner Brothers WS 1592. Jean Ritchie occupies a premier place among practicing, authentic folk singers and this is unequivocally her finest recording to date.

"Harold Rome's Gallery." Betty Garrett,

Jack Haskell, Rose Marie Jun, Harold Rome. Columbia KS 6691. A unique disc that gives the mind and the eye, as well as the ear, something to consider. The recording contains twelve Rome songs along with twelve Rome paintings on the same themes.

Barbra Streisand: "My Name Is Barbra." Columbia CS 9136. Every new recording by Miss Streisand reveals her as a singer who continues to grow in her ability to conceive and project a variety of moods.

Clark Terry—Bob Brookmeyer Quintet: "Tonight." Mainstream 6043. Both the swingers and the ballads on this disc are played with a sense of joyous involve-

ment as refreshing as the very individual skills of each musician of the Quintet.

"Through the Years with Vincent Youmans." Evergreen S 6401/2 (two discs). The thirty-six songs here trace Youmans' career from his first musical (1921) to his last compositions (for the 1933 film *Flying Down to Rio*). This is the first organized, annotated survey of his work.

Nancy Wilson: "The Nancy Wilson Show." Capitol SKAO 2136. Miss Wilson has developed into a brilliant performer with a keen theatrical sense, a glittering style, and tremendous presence. This unique disc, recorded live, is an unqualified success.

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BRAHMS—Eleven Choral Preludes/Mozart: Fantasia, K.608/Liszt: Prelude and Fugue on B-A-C-H. Karl Richter, organ. LPM 18906; SLPM 138906. "Richter offers deeply probing, technically perfect performances. The sound of the organ is magnificent."

BRAHMS—German Requiem/Variations on a Theme of Haydn, Janowitz, Waechter/Karajan. LPM 18928/29; SLPM 138928/29. "Von Karajan has perfected his conception of the 'Requiem,' bringing us a superb realization of a difficult and elusive work."

BRUCKNER—Symphony No. 8 Berlin Philharmonic Orchestra/Jochum. LPM 18918/19; SLPM 138918/19. "The skill and vigor that Jochum brings to Bruckner is complemented by the orchestra's high standards and the brilliant technical achievement of the engineering."

JANACEK—Diary of One Who Vanished. Griffel, Haefliger/Kubelik. LPM 18904; Stereo SLPM 138904. "This cycle of twenty-one songs is one of the haunting masterpieces of the literature. The present superb performance will provide a shattering experience."

JANACEK—Slavonic Mass. Soloists, Chorus, and Orchestra of the Bavarian Radio/Kubelik. LPM 18954; SLPM 138954. "A thrilling, colorful essay, superbly recorded. Kubelik's performance is illuminated by a spirit of deep involvement with the music, yet balanced by a sure, over-all control."

MAHLER—Kindertotenlieder: Ruckert-Lieder. Fischer-Dieskau; Berlin Philharmonic/Boehm. LPM 18879; SLPM 138879. "The voice is beautifully recorded, with fine presence and projection, and stereo adds considerably to Boehm's fine orchestral accompaniments."

MOZART—"The Magic Flute." Lear, Peters, Wunderlich, Fischer-Dieskau, Crass/Boehm. LPM 18981/83; SLPM 138981/83. "This is a splendid production exceptionally well cast; Boehm's leadership is on the highest level—dramatic, balanced, clear. The stereo effects are well chosen and wonderfully executed."

SCHOENBERG—"Gurre Lieder." Borkh, Toepper, Schachtschneider/Kubelik. LPM 18984/85; SLPM 138984/85. "All the massive requirements of this dramatic cantata are excellently well met in a recording of phenomenal range and fidelity. The set is a great achievement for Kubelik."

SIBELIUS—Symphony No. 5/Tapiola/Karajan. LPM 18973; SLPM 138973. "The orchestral work is glowing in timbre, polished to mirror-smooth refinement, and yet exciting to hear. Beautifully managed recording, with consummate stereo placement and spacious acoustics."

STRAUSS—"Daphne." Gueden, King, Wunderlich, others/Boehm. LPM 18956/57; SLPM 138956/57. "Some of Strauss' most lovable music in a live performance superb on nearly every count. Gueden's beautiful voice is a splendid match for the soaring, lingering vocal lines, the sound is excellent."

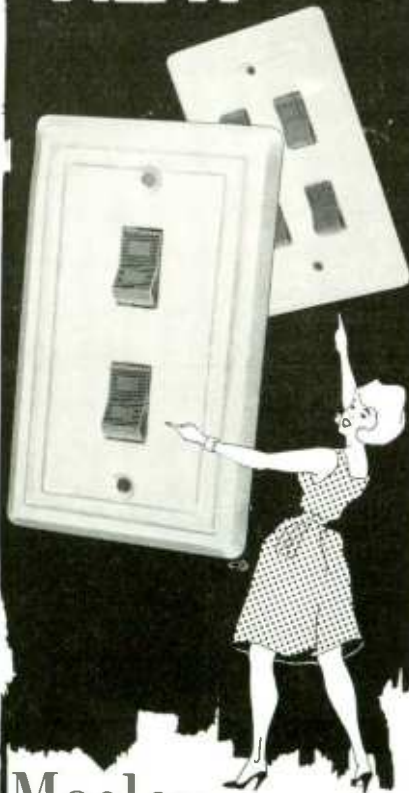
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RECORDED TAPES

The following reviews are of 4-track 7.5-ips stereo tapes in normal reel form.

BACH: *Mass in B minor*. Maria Stader (s), Hertha Töpfer (c), Ernst Häfliger (t), Dietrich Fischer-Dieskau (b), Kieth Engen (bs); Munich Bach Choir and Orchestra, Karl Richter, cond. Deutsche Grammophon R 3177. Every Bach lover can rejoice in the release of Richter's justly acclaimed performance of the Mass, boasting excellent soloists and superbly transparent and natural stereo recording.

BACH: *St. Matthew Passion, S. 244*. Elly Ameling (s), Marga Höffgen (c), Peter Pears (t), Fritz Wunderlich (t), Hermann Prey (bs), Tom Krause (bs); Stuttgart Boys' Choir; Stuttgart Chamber Orchestra, Karl Münchinger, cond. London LOV 90097 (two reels). Münchinger's performance is one of great poetic fervency and yet great restraint; the expansive warmth of his vocal and instrumental sonics is sheer balm both to one's ears and one's soul.

BEETHOVEN: *Symphonies: No. 1, in C, Op. 21; No. 2, in D, Op. 36*. Cleveland Orchestra, George Szell, cond. Epic FC 843. Szell's Beethoven Second is a miracle of matched musicianship and engineering. The endearing little First Symphony is played with no less taut assurance and the tape is flawlessly processed.

BERNSTEIN: *Fancy Free; Candide; Overture; On the Town: Three Dance Episodes; Prelude, Fugue, and Riffs*. Benny Goodman, clarinet; Columbia Jazz Combo (in the *Prelude, Fugue, and Riffs*); New York Philharmonic, Leonard Bernstein, cond. (in the other works). Columbia MQ 698. No other version of these pieces has enjoyed such incandescently vivid yet never too close recording, and no other conductor has led the *Fancy Free* ballet and *On the Town* dances with as relishable sauciness as the composer himself does.

BRAHMS: *Ein deutsches Requiem, Op. 45; Variations on a Theme of Haydn, Op. 56a*. Gundula Janowitz, soprano; Eberhard Wächter, baritone; Wiener Singverein (in the *Requiem*); Berlin Philharmonic Orchestra, Herbert von Karajan, cond. Deutsche Grammophon DGP 8928 (double play). In every respect the technology demonstrated on this tape either meets the best previous tape standards or sets new ones. Interpretation and performance are outstanding too.

BRITTEN: *Peter Grimes*. Claire Watson (s), Peter Pears (t), Owen Brannigan (bs), et al.; Chorus and Orchestra of the Royal Opera House (Covent Garden), Benjamin Britten, cond. London LOR 90083 (two reels). The performance is well-nigh ideal and the recording

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remains one of the outstanding triumphs of English Decca sound-stage technology.

BRITTEN: *Serenade for Tenor, Horn, and Strings, Op. 31; Young Person's Guide to the Orchestra, Op. 34.* Peter Pears, tenor; Barry Tuckwell, horn; London Symphony Orchestra, Benjamin Britten, cond. London LCL 80148. The evocative Serenade is even better here than the legendary original performance of pre-LP days. The beautifully transparent, warm, and floating stereo recording is matched by flawless tape processing.

DEBUSSY: *Pelléas et Mélisande.* Erna Spoorenberg (s), Camille Maurane (t), George London (b), et al.; Chorus of the Grand Théâtre (Geneva); Orchestre de la Suisse Romande, Ernest Ansermet, cond. London LOR 90091 (two reels). You cannot fail to be mesmerized by the sheer sonic radiance that glows in this truly miraculous taping. Ansermet and his orchestral players show their matchless sense of color nuance and the engineers have balanced and blended orchestra and voices flawlessly.

FALLA: *El Sombrero de tres picos.* Victoria de los Angeles (s); Philharmonia Orchestra, Rafael Frühbeck de Burgos, cond. Angel ZS 36235. Frühbeck's approach to the score is frankly balletic and there is much in this interpretation that is invigoratingly novel. The recording itself fairly crackles with electrical brilliance.

GILBERT & SULLIVAN: *The Yeomen of the Guard.* Elizabeth Harwood (s), Ann Hood (ms), David Palmer (t), John Reed (b), et al.; D'Oyly Carte Opera Chorus, Royal Philharmonic Orchestra, Sir Malcolm Sargent, cond. London LOH 90086 (double play). In this production we have a new standard for G & S reel excellence: exceptionally fine voices and an excitingly varicolored and virtuoso orchestral performance.

HANDEL: *Giulio Cesare* (excerpts). Joan Sutherland (s), Marilyn Horne (ms), Margreta Elkins (c), Monica Sinclair (c), Richard Conrad (t); New Symphony Orchestra of London, Richard Bonyngé, cond. London LOL 90087. Here is a wealth of well-varied excerpts from one of Handel's finest operas. Primarily a showcase for Miss Sutherland's Cleopatra, the release is also notable for Bonyngé's consistently vivacious and brightly colored accompaniments.

IVES: *Symphony No. 3, in B flat; Three Places in New England.* Eastman-Rochester Symphony Orchestra, Howard Hanson, cond. Mercury STC 90149. Acclaimed as one of the finest of all Ives disc recordings, this transfer fills a lamentable gap. Here is a real essential for every serious tape collection.

MAHLER: *Kindertotenlieder; Rückert Lieder.* Dietrich Fischer-Dieskau (b); Berlin Philharmonic Orchestra, Karl Böhm, cond. Deutsche Grammophon C 8879. The heart-twisting *Kindertoten-*

lieder and the scarcely less eloquent Rückert songs are most welcome to the tape catalogue. These songs are all magnificently sung by Fischer-Dieskau.

MAHLER: *Symphony No. 1, in D ("Titan").* London Symphony Orchestra, Georg Solti, cond. London LCL 80150. Solti's reading is relaxed, plastically contoured, and compassionate, yet never lacking in muscular strength. A really satisfactory version of the *Titan*.

MOZART: *Symphony No. 36, in C, K. 425 ("Linz"); Serenade for Strings, No. 13, in G, K. 525 ("Eine kleine Nachtmusik"); March No. 1, in C, K. 408.* Vienna Philharmonic Orchestra, Istvan Kertész, cond. London LCL 80146. Kertész's *Linz* is deliciously Mozartean in conception and execution. The aural attractions are irresistibly marked by a delectable clarity in inner-voice details and stereogenic antiphonies.

RAVEL: *Bolero; La Valse.* **DUKAS:** *L'Apprenti sorcier.* **HONEGGER:** *Pacific 231.* Orchestre de la Suisse Romande, Ernest Ansermet, cond. London LCL 80151. The program's prime attraction is its aural appeal: enchanting tonal qualities in the performances as well as the recordings.

RIMSKY-KORSAKOV: *Le Coq d'or; Suite.* **STRAVINSKY:** *The Firebird; Suite.* Boston Symphony Orchestra, Erich Leinsdorf, cond. RCA Victor FTC 2168. These are dynamic and glittering performances recorded in the flowing warmth of the Dynagroove sound. A superb vehicle for displaying both the atmospheric magic of stereo at its best and the variegated tonal palette of the Bostonians at theirs.

ROSSINI: *La Cenerentola.* Giulietta Simionato (ms), Ugo Benelli (t). Sesto Bruscantini (bs), et al.; Chorus and Orchestra of Maggio Musicale Fiorentino, Oliviero de Fabritiis, cond. London LOR 90084. The music is consistently entrancing: Simionato sings the title role beautifully, Benelli proves to be a happy lyric tenor discovery, and De Fabritiis conducts with relish.

ROUSSEL: *Bacchus et Ariane, Op. 43; Symphonic Suite No. 2.* **RAVEL:** *Daphnis et Chloë; Symphonic Suite No. 2.* Chicago Symphony Orchestra, Jean Martinon, cond. RCA Victor FTC 2196. This is a tape every audiophile will exult in. The Chicago Symphony under Martinon has mastered the Gallic idiom.

SAINT-SAËNS: *Concerto for Violin and Orchestra, No. 3, in B minor, Op. 61.* **VÍUXTEMPS:** *Concerto for Violin and Orchestra, No. 5, in A minor, Op. 37.* Arthur Grumiaux, violin; Lamoureux Orchestra, Manuel Rosenthal, cond. Philips PTC 900061. Others than fiddlers and fiddle specialists will find it hard to resist the graceful tenderness of the Saint-Saëns performance and the reel's magically floating and luminous stereo sonics and flawless processing.

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SCARLATTI, DOMENICO: *Sonatas* (12). Vladimir Horowitz, piano. Columbia MQ 697. We can rejoice here in what is not only flawlessly controlled pianism but pianism perfectly matched to the demands of the music itself. Choice of Scarlatti repertoire is fresh and well varied.

SCHUMANN: *Concerto for Piano and Orchestra, in A minor, Op. 54; Introduction and Allegro for Piano and Orchestra, in G, Op. 92*. Rudolf Serkin, piano; Philadelphia Orchestra. Eugene Ormandy, cond. Columbia MQ 707. For most collectors this taping of the Schumann favorite will jump to the very top of the list. The reel is outstanding for its impressively wide-range, wide-spread, and ringingly brilliant stereo recording; for the superbly contoured and colored tonal qualities of both solo and orchestral instruments; and as the first tape edition of the richly romantic Introduction and Allegro in G.

SIBELIUS: *Symphonies: No. 2, in D, Op. 43; No. 4, in A minor, Op. 63*. Orchestre de la Suisse Romande. Ernest Ansermet, cond. London LCK 80152 (double play). The Second Symphony is refreshingly free of the usual bombastic grandiloquence, fascinating in its spicy exploration of previously obscured details. The Fourth impresses one by its revelation of hitherto unsuspected scoring felicities.

SOLER: *Six Concertos for Two Keyboards*. Anton Heiler, organ and harpsichord; Erna Heiler, harpsichord. Vanguard VTC 1689. The highly stereogenic performances of these charming concertos on two keyboards are a sheer aural delight throughout.

STRAUSS: *Daphne*. Hilde Gueden (s), James King (t), Fritz Wunderlich (t), Paul Schoeffler (bs), et al.; Vienna State Opera Chorus; Vienna Symphony Orchestra. Karl Böhm, cond. Deutsche Grammophon DGH 8956 (double play). This novelty boasts a gracious charm all its own. Recorded live at Viennese production. May 1964.

STRAVINSKY: *Concerto for Violin and Orchestra, in D*. MOZART: *Concerto for Violin and Orchestra, No. 1, in B flat, K. 207*. David Oistrakh, violin; Lamoureux Orchestra. Bernard Haitink, cond. Philips PTC 900050. This is Oistrakh virtuosity at its most formidable best. Haitink's accompaniments are skillful.

STRAVINSKY: *L'Histoire du soldat*. Jean Cocteau, Narrator; Peter Ustinov, Devil; Jean-Marie Fertey, Soldier; Instrumental Ensemble. Igor Markevitch, cond. Philips PTC 900046. At last the first truly integral and complete recording of *Soldier's Tale*. Cocteau is ideal, pressed for honors by the incredibly versatile Peter Ustinov, while the instrumental septet plays with zestful assurance.

WAGNER: *Götterdämmerung*. Birgit

Nilsson (s), Claire Watson (s), Christa Ludwig (ms), Wolfgang Windgassen (t), Dietrich Fischer-Dieskau (b), Gottlob Frick (bs), et al.; Vienna State Opera Chorus; Vienna Philharmonic Orchestra, Georg Solti, cond. London LOU 90098. The first tape edition of the last of the *Ring* series is thoroughly satisfactory in almost every major respect, and in some of them incomparably exciting. Nilsson, Fischer-Dieskau, and Frick triumphantly meet the highest historical standards.

WAGNER: *Parsifal*. Irene Dalis (ms), Jess Thomas (t), George London (b), Hans Hotter (bs), et al.; Chorus and Orchestra of the Bayreuth Festival (1962). Philips 950 (three reels). This *Parsifal* can be one of the most poignant and profound experiences of one's musical life. The eloquent performance is especially notable for the grandeur and fervency of the chorus and orchestra.

JEAN-PIERRE RAMPAL: *Italian Flute Concertos* (4). Jean-Pierre Rampal, flute; Saar Radio Chamber Orchestra. Karl Ristenpart, cond. Epic EC 844. All the music here is fairly lightweight "barococo" entertainment, but connoisseurs will relish every bit of it in such expert performances. Concertos are by Pergolesi, Sammartini, Tartini, and Vivaldi.

ARTUR RUBINSTEIN: *A French Program*. Artur Rubinstein, piano. RCA Victor FTC 2188. A release to fascinate specialists in French piano music, an indispensable addition to every serious tape library. The Dynagroove recording—strong, clean, maybe a bit hard, but impressively authentic—is an ideal medium for the soloist's endless variety of tonal coloring.

"*Adventures in Flamenco*." Carlos Montoya, guitar. ABC-Paramount ABCT 1002. Montoya's zest is both enormous in itself and enormously infectious as he dashes off some of his best performances on records to date. The notably vivid recording is apparently closely miked in a dry acoustical ambience.

"*Bach's Greatest Hits*." The Swingle Singers. Philips PTC 600097. This novelty program is great fun. The lucidity of the performances themselves is well matched by that of notably transparent stereoisim.

"*Cheers*." Tessie O'Shea; Orchestra. Command C 872. Miss O'Shea's pure and sweet voice makes her straight ballads an aural delight. Her rowdier Cockney bits bring down the house. The accompaniments are admirably glib in their mastery of British music hall styles.

"*Command Performance*"; "*The New Elgart Touch*." Les and Larry Elgart and Their Combined Orchestras. Columbia C2Q 720 (double play). These fine arrangements serve as ideal media for the orchestras' distinctively pungent tonal qualities and consistently swinging

rhythmic vitality. Danceable, and listenable as well.

"The Definitive Jazz Scene." Vol. 1. Various orchestras. Impulse ITC 311. The best performances here are extremely good and the recording throughout is robust, open, and very markedly stereoistic.

"Fiddler on the Roof." Original Broadway Cast, Milton Green, cond. RCA Victor FTO 5032. The tape version of the show is thoroughly satisfying and heart-warming, marked by the persuasive charm of Jerry Bock's music, Zero Mostel's incomparable magnetism, and first-rate performances by the rest of the cast.

"Getz/Gilberto." Stan Getz, saxophone; João Gilberto, guitar and vocals; Antonio Carlos Jobim, piano. Verve VSTC 317. Delectable music makes this reel especially treasurable. The performers are superb.

"Golden Boy." Original Broadway Cast, Elliott Lawrence, cond. Capitol ZO 2124. The listener will certainly be gripped by the strikingly dramatic and original show scenes. Magnificent projections of personality by Sammy Davis, Jr.

"Hello, Dolly!" Louis Armstrong and the All Stars. Kapp KTL 41078. The fabulous Saichmo endows this program of current pop hits with an entirely fresh and pungent flavor. As a singing actor Louis is only now reaching his prime.

"In Europe." Miles Davis and His Quartet. Columbia CQ 645. Avant-garde jazz connoisseurs will surely welcome this tape as a jazz classic. Davis has never played with more éclat than he does here.

"It's My Way." Buffy Sainte-Marie. Vanguard VTC 1690. There are heady excitements here provided by this highly unusual folk singer. Even at her most agitated extremes she provides unforgettably moving experiences.

"More Music from Million Dollar Movies." Boston Pops Orchestra, Arthur Fiedler, cond. RCA Victor FTC 2192. Short pop film hits. Until you hear these performances you won't be able to imagine just how much genuine musical and sonic interest can be transfused into such familiar light materials.

"A Song Will Rise." Peter, Paul and Mary. Warner Brothers WSTC 1589. P, P, and M are more skillful and varied than ever in what must be their fifth tape program. There are several fine solos, and some ensemble pieces that are even better.

"Sound of the Great Bands in Latin." Glen Gray Casa Loma Orchestra. Capitol ZT 2131. Consistently fine solo and ensemble playing in this program, which ranks among the best in the series for its evocation of memorable old big-band hits. The Casa Loma studio recording series of performances in the styles of great bands is here carried on chiefly by arranger-conductor Larry Wagner.

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STEREO FROM A to Z

A Glossary

A-B test. Evaluating relative performance of two (or more) components or systems by quickly changing from one to the other. A-B test facilities are installed at most high fidelity dealers'.

AES. Audio Engineering Society. A professional group; the official association of technical personnel, scientists, engineers, and executives in the audio field.

Alignment. In tape recorders, the correct position of the gap in a tape head with respect to the magnetic tape for best response. In tuners, adjustments in various circuit stages that permit a full and undistorted signal to travel through the set.

Amplifier. An electronic device for magnifying (and usually too, controlling) electrical signals. High fidelity amplifiers consist of a preamplifier equalizer section plus a power or basic amplifier section. In an integrated amplifier, both sections are built on one chassis and made available as a single unit. Alternately, the two sections are available as separate units.

Antenna. A section of wire or a metallic device designed to intercept radio waves in the air and convert them to an electrical signal for feeding to a receiver. Under relatively difficult reception conditions, such as created by location, terrain, obstructions, and so on, an antenna — particularly for FM stereo — becomes fairly critical and should be one especially designed for its intended purpose.

Baffle. Although this term sometimes is used to designate the entire cabinet, or enclosure, that houses a loudspeaker it is — strictly speaking — the panel on which the speaker is mounted, usually the front panel of such an enclosure. The term derives from its original use in preventing or "baffling" the speaker's rear sound waves from interfering with its front waves.

Bass reflex. A type of speaker enclosure in which the speaker's rear wave is inverted and allowed to emerge from a critically dimensioned auxiliary opening or "port" to reinforce the bass tones.

Bias oscillator. A circuit in a tape recorder preamplifier that supplies a specified voltage to the recording head to prepare it electrically for its job of impressing an audio signal onto the magnetic tape.

Binaural. Two-channel sound in which each channel recorded is heard only through one ear. Microphones are spaced, in recording, to approximate the distance between a person's own ears. To hear the recording binaurally, the listener must use headphones. (Compare with Stereo, below.)

Booster. A small amplifier, especially

designed for increasing the strength of received broadcast signals, usually fed directly from the antenna and installed before the receiver.

Capstan. A rotating shaft, from the motor in a tape recorder, that helps move the tape at constant speed.

Cartridge. A record player cartridge, or pickup, is a voltage-generating device with a stylus assembly. A tape cartridge, or magazine, is a prepackaged reel of magnetic tape designed for use on a special kind of tape machine. A tape cartridge may be either prerecorded (for playback) or blank (for one's own recording).

Changer. A record changer plays several records in sequence automatically. It is an integrated unit, comprising a turntable and arm plus a record-stacking and -dropping mechanism.

Channel. A channel is a complete sound path. A single-channel, or monophonic system, has one channel. A stereophonic system has at least two full channels designated as "left" (A) and "right" (B). Monophonic material may be played through a stereo system; both channels will carry the same signal. Stereo material, if played on a monophonic system, will mix and emerge as a monophonic sound.

Channel separation. The electrical or acoustical difference between the left and right channels in stereo. Inadequate separation can lessen the stereo effect; excessive separation can exaggerate it beyond natural proportions.

Compliance. The ability of a pickup to respond to the wiggles along the walls of a record groove. There is, as yet, no industry standard for measuring compliance, although individual cartridge manufacturers have their own methods for doing so. Compliance is expressed in centimeters per dyne (cm/dyne).

Component. A high fidelity component is a specialized item of equipment designed to do a particular part of the work in a sound system. The term also designates any of the basic parts used in building electronic equipment, such as a resistor or capacitor, etc.

Constant amplitude. In disc recording, a relationship between the modulations or wiggles in the groove and the electrical signals making them so that the width of the groove (the excursions of the cutting stylus) is proportional to the amplitude, or power, of the signal. In playback, a similar relation between the recorded wiggles and the motion of the stylus so that the cartridge produces equal voltages regardless of frequency. Crystal and ceramic pickups have a constant amplitude characteristic on playback.

Constant velocity. In disc recording, a relationship between the wiggles in the groove and the electrical signals making them whereby the frequency of the signal determines the degree of excursion of the cutter. In playback, a similar relation between the recorded wiggles and the

motion of the stylus so that the cartridge produces voltages that vary in strength, or amplitude, as the frequency in the groove varies. Magnetic cartridges have a constant velocity characteristic and must be equalized by special networks during playback.

Crossover. A frequency at which other frequencies above and below it are separated. In a two-way speaker system, for instance, the crossover frequency is the point at which woofer and tweeter response is divided.

Crosstalk. Signal leakage between two channels.

Damping. Controlling of vibrations, response, or resonances which—if unchecked—would cause distortion.

Decibel. A numerical expression of acoustic or electrical ratios, such as the relative intensity of a sound or the relative strength of a signal. One to three decibels (db) has been assumed to be the smallest change in sound perceptible to the ear.

Diaphragm. The moving member of a loudspeaker, such as a cone, or an alternately shaped vibrating piece.

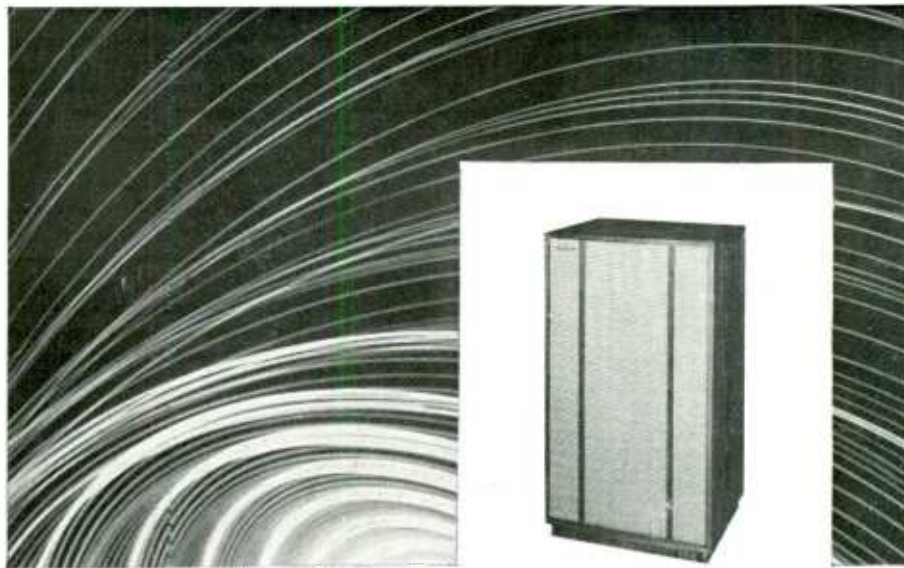
Distortion. Changes in the waveform of a signal so that a spurious element is added. All distortion is undesirable. Harmonic distortion disturbs the original relationship between a tone and other tones naturally related to it. Intermodulation distortion (IM) introduces new tones caused by mixing of two or more original tones. Phase distortion, or nonlinear phase shift, disturbs the natural timing sequence between a tone and its related overtones. Transient distortion disturbs the precise attack and decay of a musical sound. Harmonic and IM distortion are expressed in percentages; phase distortion in degrees; transient distortion is usually judged from oscilloscope patterns.

Dubbing. Copying a tape from a previously recorded version.

Efficiency. The ratio, expressed in percentage, of signal output to input; most often used to estimate the power needed to drive a loudspeaker.

Enclosure. An acoustically designed housing or structure for a loudspeaker; also, any cabinet for a component.

Equalization. Frequency manipulation to meet the requirements of recording, and an inverse manipulation on playback to get uniform response. Also known as compensation. In disc recording, the bass frequencies are deemphasized to restrict the movement of the cutting stylus to practicable proportions. The treble frequencies are boosted or preemphasized to overcome surface noise and to equalize the excursions of the cutting stylus to the width of the groove. The resultant curve of response is known as the recording characteristic and follows a pattern standardized by the RIAA. In playback, the inverse of this frequency characteristic must be introduced to the signal for ac-



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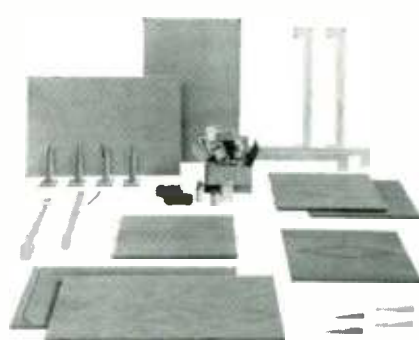
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curate response: suitable networks for doing so are built into all high fidelity amplifiers.

In tape recording, a similar process—though with different values of bass de-emphasis and treble boost—is used to meet the special requirements of the tape medium. During playback, the inverse of this characteristic must be introduced to the signal for accurate response. Suitable networks for tape playback are included in all tape equipment and in some high fidelity amplifiers. Networks for recordings are found only in preamplifiers designed expressly for use with tape recorders; such circuitry is not normally built into a regular high fidelity amplifier.

In FM broadcasting, a certain amount of treble boost is added to the audio signal to suit it to the transmission or carrier wave. This boost is equalized by a de-emphasis network that is built into all FM tuners.

Erase head. The magnetic assembly on a tape recorder that removes what has been previously recorded on a tape.

Fidelity. The degree of faithfulness to the original; accuracy and honesty in sound reproduction, implying minimum distortion and suitably wide and flat—i.e., uniform—frequency response.

Flutter. Rapid variations in the speed of a turntable or tape transport. When pronounced, flutter causes a wavering of musical pitch.

FM. The letters stand for "frequency modulation," a form of radio broadcasting in which an audio signal is impressed onto a very-high-frequency carrier wave so that the carrier's frequency is altered, but not its amplitude. FM is characterized by wide-range audio response and a great deal of freedom from noise. It is a high fidelity medium widely used for broadcasting high quality program material in both stereo and monophonic versions.

FM Stereo. FM broadcasting in which two channels of sound are transmitted, offering a signal similar to the stereo available from records and tapes. To hear FM stereo requires either a stereo FM tuner or a monophonic FM tuner fitted with an FM stereo adapter. The technical means for transmitting FM stereo is known as multiplexing.

Folded horn. A type of loudspeaker enclosure employing a horn-shaped passageway for aiding the bass response.

Four-track tape. Tape on which four separate sound paths are recorded. The use of four tracks permits stereo in both directions of tape movement, or alternately, monophonic recording across four times the length of a given tape. Also known as quarter-track.

Frequency. The rate of repetition in cycles-per-second (cps) or more recently, Hz, of musical pitch as well as of electrical signals. Low frequencies refer to bass tones; high frequencies to treble

tones. Frequency also applies to any alternating electrical energy, sound wave, or vibrating object.

Frequency response. The ability to reproduce a given range, or band, of frequencies. The generally accepted high fidelity range is 20 to 20,000 Hz, although some experts hold that wider ranges, if undistorted, can improve response even further.

Gain. The increase in signal provided by an amplifier, or by a stage in an amplifier.

Ground. A point in an electrical system that has zero voltage. Usually, the chassis of an electrical component is at ground potential and thus serves as the return path for signals as well as for power circuits. The shield in coaxial signal cable is, or should be, at ground potential to avoid hum pickup. Ground also designates the earth, literally, which is used as a return path for radio waves from an antenna. In British terminology "earth" is used to designate all ground connections.

Half-track tape. Magnetic tape on which half the width of the tape is used for one sound path. Also known as two-track tape. Such a tape provides stereo in one direction of tape travel, or mono sound in both directions.

Headphones. Small sound reproducers, superficially resembling miniature loudspeakers, set in a suitable frame for wearing about the head and listening to by close coupling to the ears. Recent headphones, improved greatly in fidelity, have become increasingly popular among audiophiles for private listening without disturbing others, as well as to prevent outside noises from interfering with the listening. Headphones are available in mono or stereo.

Hum. Noise from the power line, either its actual frequency or harmonics of it, that intrudes into the reproduced sound and mars listening quality.

IHF. The Institute of High Fidelity, the official association of the manufacturers and certain related organizations in the high fidelity field.

Impedance. The total opposition to the transfer of energy; thus, the load into which a circuit or electrical or acoustical device works.

Infinite baffle. A loudspeaker enclosure in which the speaker's rear sound waves are completely absorbed or dissipated.

Integrated. A type of design in which two or more basic components or functions are physically, as well as electrically, combined—usually on one chassis, such as an integrated amplifier.

Jack. A receptacle into which a mating connector may be plugged.

Kit. A prepared package of parts, with instructions, for assembling and/or wiring a component or chassis. Also, a small accessory item, such as a tape-cleaning kit.

Loudness control. A volume control, with special circuitry added to compensate for an apparent loss of tones at the extreme ends of the audio range when listening at soft volumes. A typical loudness control will boost the bass and—to a lesser extent—the treble.

Master. An original, or first special copy, of a recorded performance from which other copies may be made.

Mixing. Blending of two or more signals for special effects.

Monophonic. Single-channel sound. Formerly, and incorrectly, called monaural, which really means single-eared.

MRIA. The Magnetic Recording Industry Association, the official association of that branch of the audio field devoted to tape recording and tape equipment.

Multiplex. A technique for transmitting two or more signals on the same carrier frequency. See FM Stereo.

NAB. National Association of Broadcasters, the official association of the radio and television broadcasting industry. Formerly called the NARTB.

Needle-talk. Audible sounds from a record player pickup in the vicinity of the stylus.

Noise. Any extraneous sound or signal that intrudes into the original, as a result of environmental noise, distortion, hum, or defective parts and tubes in the equipment. The rushing sound or "white noise" heard between stations on an FM set is caused largely by the movement of molecules of air in the atmosphere.

Oscilloscope. A device that presents a graphic representation of an electrical signal; used for testing and measuring of equipment.

Peak. The maximum, instantaneous energy of a signal, or in the output of a device.

Phase. Any part of a sound wave or an electrical signal with respect to its passage in time. Two devices are said to be "in phase" when they furnish the same parts of a sound or signal simultaneously; they are "out of phase" to the extent that one leads, or lags behind, the other.

Pickup. A record player cartridge.

Playback head. The magnetic assembly on a tape recorder that responds to the recorded pattern on the tape, and develops a signal representing that pattern to feed to the preamplifier. In some tape machines, the playback and recording head are the same device; in others they are separate units.

Power. Electrical energy developed to do "work" such as the voltage from an amplifier used to drive a speaker. Also, acoustical energy, or sound pressure developed in a room by a speaker.

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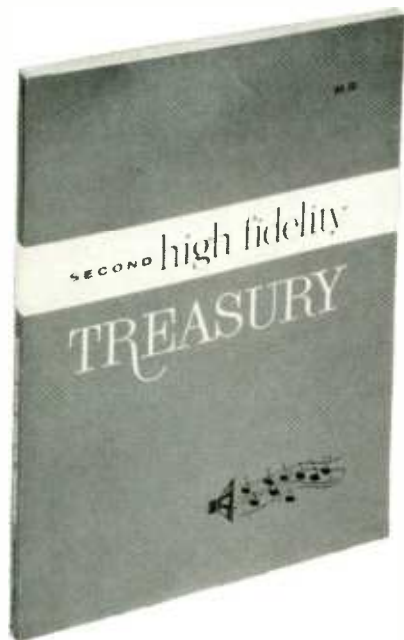
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Preamplifier. The first stages of an amplifying system in which low-level signals, as from a magnetic record player pickup or a tape head, are equalized and boosted. The succeeding stages comprise the power amplifier. A recording preamplifier is a special type, found in a tape recorder, where it furnishes the bias and erase voltages (q.v.) as well as gain and equalization for the signal fed to the recording head.

Printed circuit. Also known as etched circuit: a technique for wiring in which parts are mounted on a thin plastic board, and interconnected by conductive paths etched onto the board, rather than by wires.

Psychoacoustics. A relatively new branch of audio that concerns itself with personal and subjective factors in hearing and in evaluating the performance of high fidelity equipment.

Quarter-track tape. See Four-track tape.

Recording curve. See Equalization.

RIAA. Recording Industry Association of America, the official association of the disc recording field.

Rolloff. A gradual attenuation of a range of frequencies. Sometimes called a slope.

Room acoustics. The quality of a room that affects how sounds will be heard in it. Room acoustics are a function of the room's size, geometry, structural materials, and furnishings. A "live" room is one in which sounds are fairly reverberant; a "dead" room is one in which sounds are fairly absorbed. Striking a happy medium between the two extremes is generally a wise course for the high fidelity enthusiast.

Rotator. A device for turning a roof-mounted antenna in any direction for best reception of broadcast signals.

Rumble. Low-frequency noise from a turntable or tape transport.

Selectivity. A tuner's ability to distinguish between two different stations that are closely spaced on the dial.

Sensitivity. A tuner's ability to receive weak or distant signals.

Signal. Any electrical energy. In audio, an electrical replica of actual sound. In broadcasting, the carrier wave itself.

Signal-to-noise ratio. Often abbreviated as S/N ratio; the proportion of signal to undesired and extraneous noises in any device or its output. The higher the ratio, the better. Expressed in decibels.

Solid-state. Describes those electronic devices, such as transistors, that replace vacuum tubes.

Sound-on-sound. A method of tape recording in which an original sound track may be impressed with an added sound

track for special effects, such as one performer appearing to play two instruments, etc.

Stereo. Short for stereophonic sound; a multiple-channel sound system or recording in which each channel carries a unique version of the total original performance. When the channels are blended, acoustically, they re-create the breadth and depth of the original, adding a new dimension to reproduced sound. At least two channels are required for playback, although more than two may be used in recording.

Stylus. The metallic assembly that is inserted into a record player cartridge and engages the record groove. Formerly called needle. Only a diamond-tip stylus should be used for high fidelity playback.

Tape. Plastic ribbons, with one side coated metallicly to receive impressions from a recording head, or—if already recorded—to induce signals in a playback head. Tape is regularly wound on reels; recently it has also been packaged in magazines or cartridge form for use on special types of equipment.

Tape deck. The basic assembly of a tape recorder, consisting of the tape-moving mechanism (the tape transport) and a head assembly. Some decks also include recording and playback preamplifiers; these properly are called tape recorders. Some have playback-only preamplifiers; these have no standard name but are often called "tape players."

Tone arm. The pivoting arm of a record player that extends over a record and holds the cartridge in place. Wires run from the cartridge through the arm and down to the underside of the turntable mounting board, from which point they are connected by signal cables to the pre-amplifier.

Tone control. A means for adjusting the level of treble or bass frequencies with respect to the over-all level of sound.

Tracking. The following, by the stylus in a cartridge, of the wiggles in a record groove. Tracking error is the angular difference between the straight line, or radius, across a record made by the cutter in production and the arc described by a pivoting tone arm. Tracking force, or stylus force, is the downward pressure made by the stylus on the record; measured in grams.

Transducer. A device that changes one form of energy to another. A loudspeaker is a transducer in that it changes electrical impulses into sound. Antennas, microphones, tape heads, and record player cartridges also are transducers.

Transformer. A device that changes electrical energy from one value to another. A power transformer increases the power voltage from the nominal 115 volts AC supplied by the line to a value suited to operate the power supply in a set. An output transformer converts high-impedance tube energy to a low-impedance signal for driving a loudspeaker.

Transistor. A tiny chemical amalgam, of the semiconductor class, that functions as a vacuum tube.

Tuner. A radio, or TV, receiving circuit; a high fidelity component containing such circuits.

Turnover. See Equalization.

Turntable. The round platter on which a disc rests during cutting or playback. Also refers to the platter and its driving motor and associated parts, as a high fidelity component.

Tweeter. A high-frequency speaker specializing in treble reproduction.

Watt. A measure of electrical or acoustical power. The electrical wattage rating of an amplifier describes the power it can develop to drive a loudspeaker. Acoustical wattage describes the actual sound produced by a loudspeaker in a given environment. The two figures, in any given amplifier-speaker system, are necessarily very widely divergent inasmuch as the low efficiency of speakers necessitates their receiving relatively large amounts of amplifier power in order to produce satisfactory sound levels.

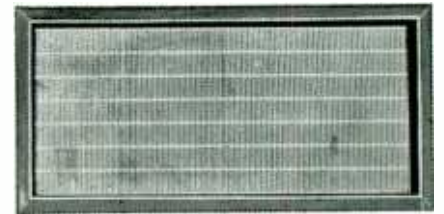
Woofers. A low-frequency speaker specializing in bass reproduction.

Wow. Slow, regular variations in the speed of a turntable or tape transport. If pronounced, wow causes audible variation in musical pitch.

Z. Symbol for Impedance (q.v.).

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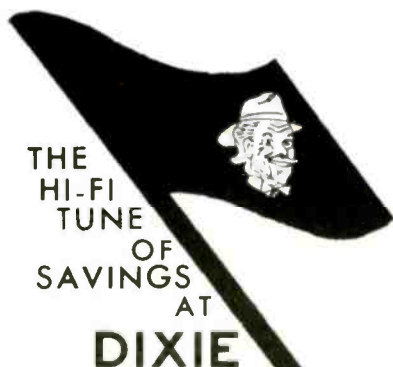
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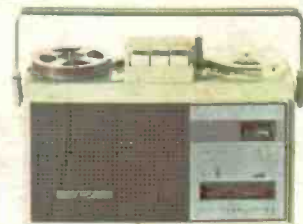
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