Audiofan

THE MAGAZINE
FOR THE
HI-FI ENTHUSIAST

JANUARY 1966 VOL. 2 NO. 1 FIFTY CENTS

MICRO ELECTRONICS
HOME VIDEO TAPE
AUTO TAPE PLAYERS
STEREO TV SOUND
PULSE AMPLIFIERS

Hi-Fi WAVE OF THE FUTURE
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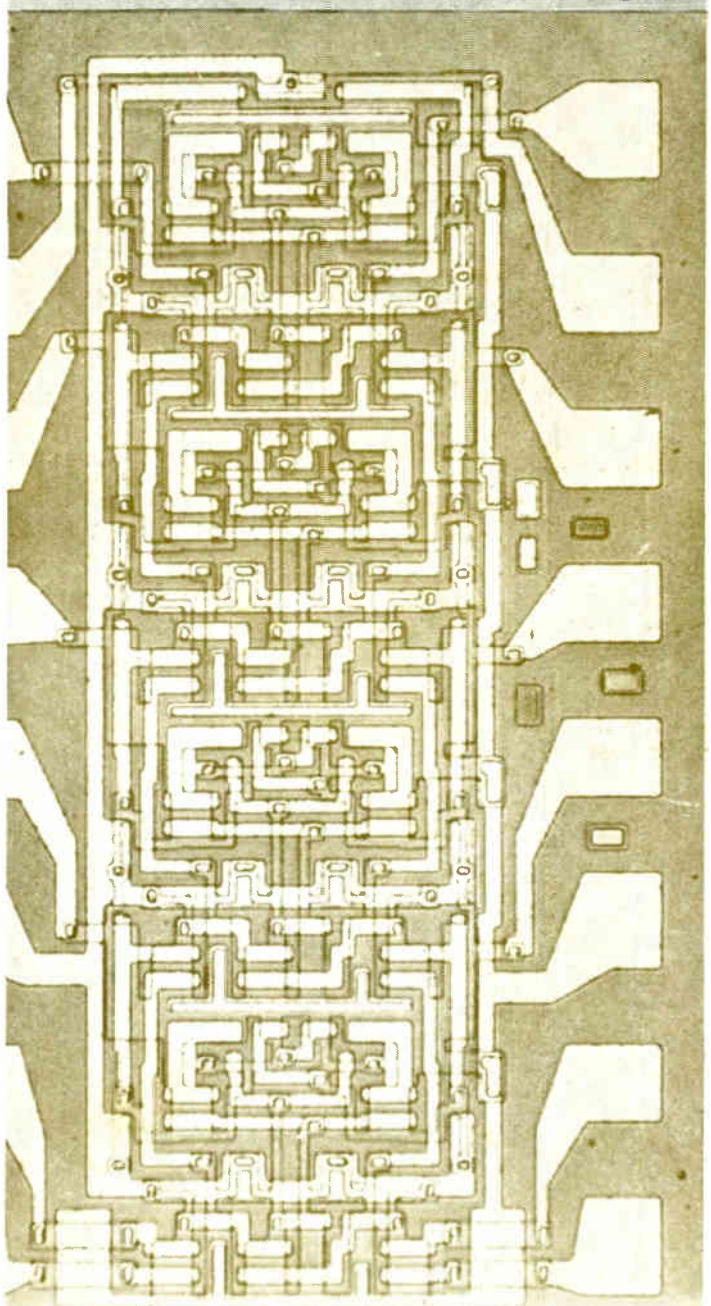
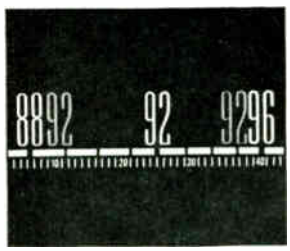
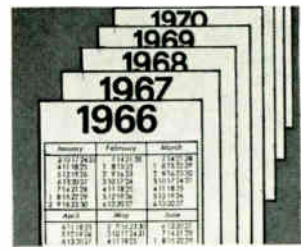


Only Scott can put these exclusive features in a receiver



No chance of signals from strong local stations popping up where they don't belong on the dial and blotting out the more distant stations you want to hear! The 342 incorporates revolutionary new field effect transistor circuitry for maximum tuner sensitivity with virtually no cross-modulation, no drift, no more problems caused by changing tube characteristics. Scott is the first, and only, manufacturer to use this important advance in solid state design.

You can forget about shorted connections burning out expensive transistors because Scott engineers did not! The 342 is designed to withstand these common problems: accidental shorting of speaker terminals, subjecting the input to a high level transient signal, or operating the amplifier section without a load. Special quick-acting fuses protect both your expensive speakers and the transistors themselves.



Scott uses silicon power transistors in the 342. Silicon is more costly than germanium, but far superior in terms of ruggedness, reliability, and resistance to overload, heat and aging. The silicon transistors in the 342 output circuitry provide instantaneous power for even the most extreme music dynamics. This Scott circuit achieves extremely low distortion at low power levels . . . makes all your listening so much more enjoyable.

And Scott puts them all in a receiver under $300

The new 65-watt Scott 342 solid state FM stereo receiver gives you the features, the quality, the reliability, the magnificent sound you've come to expect from Scott . . . and at a price less than $300!

Costing less than ordinary vacuum tube equipment, this no-compromise solid state unit incorporates the popular features of the most expensive Scott components .

Output and driver transformers, major sources of distortion and diminished power, are eliminated from Scott's radically new solid-state amplifier design. As a direct result of transformerless output design, the Scott 342 has high frequency response superior to separate stereo components costing far more.

The Scott 342 includes these important features found in the most expensive Scott components: tape monitor switching, speaker switching with provision for remote speaker selection, switched front panel stereo headphone output, front panel stereo balance switch, individual clutched bass, treble, and volume controls for each channel, fully automatic stereo switching and many more.

THE 342 FM STEREO RECEIVER . . . Usable Sensitivity, 2.7 μv; Harmonic Distortion, 0.8%; Drift, 0.02%; Frequency Response, 18-25,000 cps ±1 db; Music Power Rating per channel, 32½ watts; Cross Modulation Rejection, 85 db; Stereo Separation, 35 db; Capture Ratio, 6.0 db; Selectivity, 40 db.

Scott . . . where innovation is a tradition

SCOTT®

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EDITORIAL

have a slice of birthday cake!

First year birthdays or anniversaries are invariably special milestones. So it is with AUDIOFAN, which celebrates its first year, going on two, with this issue.

Without being maudlin about it, it *is* an important event. With 12 issues under our belts, we can look back to see where we've been and plan our 1966 hi-fi course accordingly, making modifications here and there in response to readers' comments and suggestions. So don't take your letters lightly . . . *we don't!*

We've learned much from hi-fiers' correspondence which, in only one year, numbers in the thousands. Our market research staff runs responses through a computer, you should know, so that we have a clear picture of what you, the reader, like and dislike. Most readers applauded our heavy emphasis on hi-fi equipment rather than on music.

When one audiofan after another tells us they particularly liked the "straight from the shoulder" article on Vacuum Tubes vs. Solid State, you can be sure that similar articles will be put in the works. And when articles or departments fail to draw enthusiastic responses we don't hesitate to drop them. ("Harry, The Hi-Fi Repairman" was dropped due to insufficient reader support, for example.)

In sum, audiofan friends, we're grateful to you for your help in molding AUDIOFAN into the kind of magazine you want. Thanks.

THE EDITORS

Letters

Send your audio questions, problems, comments and suggestions to the Editor, AUDIOFAN 25 West 45th St. New York, N.Y. 10036

help!

DEAR AUDIOFAN:
In your November 1965 issue you had a report on New York's 1965 Hi-Fi Show and showed an illustration of an auto dashboard display with a mount for a Norelco portable recorder. Can you tell me whether the mount is by Norelco?
J. W. Klages
Columbus, Ohio

Yes, the mount is made by Norelco. It's a wireless oscillator that permits the recorder to play through an existing AM auto radio's audio amplifier section.—Ed.

DEAR AUDIOFAN:
We have just purchased some new 12-inch speakers and were interested in building some baffles, specifically the Karlson baffle, but so far have not been successful in finding any plans. Perhaps you know of some source.
David Wright
Atlanta, Ga.
Try K.R.C. Corporation, P.O. Box 117, W. Hempstead, N.Y.—Ed.

DEAR AUDIOFAN:
Will you please recommend to me a book in which I can learn the basics about setting up a set of components for record playing and FM reception in a "fringe area." I want to get a complete FM receiving setup with the correct sensitivity for our area and multiple speakers of sufficient quality, but not extravagantly more than my middle-aged hearing can appreciate.
D. L. Monroe
Asbestos, P. Q., Canada

To our knowledge, there aren't any texts devoted to fringe area FM reception. Many books do, however, cover the subject briefly. Why not discuss your problem with a local audio dealer. He is most likely to be familiar with reception requirements in your area. No doubt a reasonably sensitive FM tuner, say, at least 3 microvolts at 30 db quieting, will help reception. A good antenna is of highest importance. Insofar as your hearing is concerned, all adults lose some high frequency hearing capability as they grow older. But you'll hear more highs nevertheless if they're strong enough and dispersed well. The criterion here is your pocketbook. —Ed.

bouquets

DEAR AUDIOFAN:
Rarely do I become excited over an article on high fidelity. Your article in the October Audiofan on "Transistors vs. Tubes" was the rarity and I must take this opportunity to commend you for a splendid job. You gave readers an inside, factual view of transistors and succeeded in revealing information that was up to now known and understood by only a few well informed enthusiasts.
Lee Kuby
Garden City, N.Y.
Thanks.—Ed.

puzzled

DEAR AUDIOFAN:
I noticed your request in the October issue of AUDIOFAN for descriptions and photos of readers' high fidelity systems. I am a bit puzzled however. The title you use for that particular section of your magazine is "Profile of an Audiofan." Yet you are calling this "Hi-Fi on a Pedestal." Will this be an altogether different section of the magazine?
Robert De Salvo
Franklin Square, N.Y.

"Hi-Fi on a Pedestal" was an invitation to readers to submit photos and descriptions of their equipment. $10 will be paid for those chosen for publication, not necessarily in "Profile of an Audiofan."—Ed.

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5 years or 50,000 miles*

no break-in period–

no oil changes–

no grease jobs–

no thousand mile check ups

A new guarantee for an outstanding new compact loudspeaker. The 1965 Jensen Model PR-200 is an engineering triumph. The "power plant" within the beautifully crafted oiled walnut cabinet is a skillfully engineered 3-speaker, 3-way system with a 12-inch woofer.

Three famous, exclusive Jensen loudspeakers faithfully reproduce every sound in the 25 to 20,000 cycle frequency range. Contemporary wrap-around fabric of textured rattan compliments the beauty and sophistication of fine Jensen craftsmanship.

For the analytically minded write to the Technical Service Department for a full explanation of the 50,000 mile guarantee.

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Suggested resale price $179.50
See your Jensen hi-fi dealer.

This product carries The JENSEN
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JENSEN LOUDSPEAKERS

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This is the AT60, quite possibly the "best buy" among automatic turntables, considering how much this excellent unit has to offer. There's a true dynamically balanced tone arm of the most advanced tubular aluminum construction . . . a precision stylus force adjustment . . . an arm system which could track flawlessly at ½ gram . . . a balanced, heavy cast turntable . . . and the other outstanding features shown below. Then . . . consider that the AT60 sells not for $100.00, or even more . . . but for $59.50 . . . and you will begin to realize that a record-playing instrument of such calibre at this modest price could have been developed only by Garrard. More than 50 years of leadership, supported by the great advantages of established volume, substantial manufacturing facilities, and vast engineering resources . . . combine to make the AT60 the exceptional purchase which it is.

Tubular, dynamically-balanced counterweight-adjusted tone arm—same type and construction as on the highest priced automatic turntables and popular separate arms.

Built-in stylus force adjustment and pressure gauge, legible from top for precision setting to fractions of a gram.

Automatic anti skating control eliminates the natural side pressure on the stylus which often causes distortion and rapid record wear with ordinary tone arms.

Heavy cast, balanced, oversized turntable.

Two spindles—a convenient short spindle for playing single records manually; an interchangeable center drop spindle for automatic play when desired. Spindles remove for safety and convenience when taking records off the turntable.

Super sensitive trip, with Dupont Delrin® to offset friction, operates with any high compliance pickup at correct minimal tracking force.

Double-shielded Laboratory Series® 4 pole shaded motor designed exclusively for the AT60.

Lightweight cutaway shell and finger lift.

Ultra-compact—fits easily into any record changer space. Only 15⅝" left to right, 13¼" front to rear, 4⅞" above and 2⅞" below motor board.

Important reading:
32-page Comparator Guide detailing all Garrard models. Write for complimentary copy to Garrard, Dept. GA-2096, Westbury, New York 11591.

Garrard®
WORLD'S FINEST

January 1966
Vol. 2, No. 1

Audiofan

A ST. REGIS PUBLICATION

Features

Departments

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■ **Slow speed (3¾ ips) pre-recorded tapes were strengthened recently** when Ampex Stereo Tape added 42 new albums to their library. Have no fear, though, hi-fiers. 7½ ips has not been forsaken. It's still the standard for maximum fidelity. The recent 3¾ ips additions are in the pop music and spoken word end of things, where longer playing time and lower cost can be taken advantage of without much noticeable difference in sound quality. Ampex says they will continue to issue classical recordings at the higher 7½ ips speed because its dynamic range and other sound quality needs are greater.

■ **Bootleg recordings get the boot in New York.** The Attorney General's office has fined some half-dozen companies up to $1,000 this year, for either pirating recordings from major label companies or for mislabeling records to make it appear that a certain artist was the star of a record when the artist was not. Other practices under investigation include counterfeiting of hit records and pirating works and names of artists without their permission.

■ **The thickness of magnetic tape continues to become smaller and smaller** to give miniature tape recorder owners longer playing time. A quadruple-play magnetic tape, called *Micro-Media* 25, for example, plays up to 16 hours on a standard 3¼" reel. This is figured on four mono tracks at 1⅞ ips. The 0.25 mil tape comes in 1200 foot reels. A new Reeves Soundcraft tape, TP-3, takes a slightly different tack with a 0.5 mil high output tape ("5 db more than any other extended play tape") on a 2⅜ inch reel.

■ **Tourists at the White House are greeted and guided nowadays by a tape recorded voice.** The two minute recording, delivered over a Viking of Minneapolis tape unit, welcomes visitors and gives visitors a brief background on what they will be seeing.

■ **Who says vacuum tubes are dead?** A tube and transistor manufacturer insists that they aren't, observing that 1965 factory sales of entertainment receiving tubes will total about the same as the 1964 rate—120 million units. Naturally, much of this number goes for television receivers which have been slow to turn to semiconductors. Tubes are quickly fading away in the hi-fi industry, of course, with every major manufacturer now represented with a transistor unit (Marantz and Dynaco do so have transistor equipment; a preamp and power amp, respectively.)

■ **Technical seminars on field effect transistors (FET)** are being given around the country by H. H. Scott, who pioneered use of these devices in hi-fi tuners, in cooperation with Texas Instruments. The Scott-Texas Instruments seminars are being held for qualified scientists and engineers in New York, New Jersey, Massachusetts, Illinois, Ohio and California, among other states.

■ **Does FM radio influence the sale of records?** Sure does, says a music trade publication, which made a recent market-by-market study of the subject. The medium has long been a strong influence on sales of classical records and jazz, it was reported, but now that FM radio use is increasing, the FM's influence on record and pre-recorded tape purchasing has spread to popular music.

Compare these Sherwood features and specs! *ALL-SILICON* reliability. Noise-threshold-gated automatic FM Stereo/mono switching, FM stereo light, zero-center tuning meter, FM interchannel hush adjustment, front-panel stereo headphone jack, rocker-action switches for tape monitor, mono/stereo, noise filter, speaker disconnect and loudness contour. 100 watts music power (8 ohms) @ 0.3% harm distortion. IM distortion 0.1% @ 10 watts or less. Power bandwidth 12-35,000 cps. Phono sens. 1.8 mv. Hum and noise (phono) —70 db. FM sens. (IHF) 1.6 μv for 30 db quieting. FM signal-to-noise: 70 db. Capture ratio: 2.4 db. Drift ±.01%. 40 silicon transistors plus 14 silicon diodes and rectifiers. Size: 16⅝ x 4⅜ x 14 in. dp.

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 (4Ω)	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 (4Ω)	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 (4Ω)	0.5%	1.9	479.95	4.00

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

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SPEAK FOR THEMSELVES

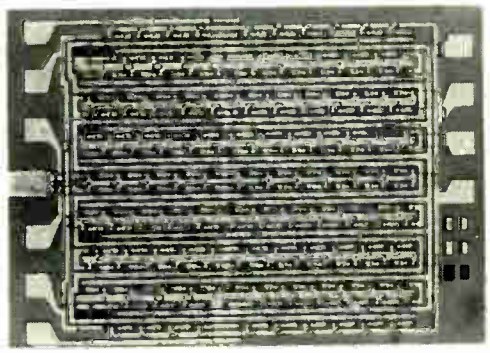
S-8800 100-watt FM *ALL-SILICON* Receiver
$359.50 for custom mounting
$368.50 in walnut leatherette case
$387.50 in hand-rubbed walnut cabinet

SHERWOOD 1st IN ALL-SILICON HIGH FIDELITY SYSTEMS

Sherwood

Sherwood Electronic Laboratories, Inc., 4300 North California Avenue, Chicago, Illinois 60618 Write Dept. F1

Hi-Fi WAVE OF THE FUTURE



The past decade was an exciting one for audiofans. We saw hi-fi revolutions, not merely refinements. Look at the record of audio developments that bloomed over the last 10 years:

1. Stereophonic playback equipment and records.
2. Four-track stereo tape recorders and pre-recorded tapes.
3. FM multiplex stereo tuners and broadcasts.
4. Small speaker enclosures with low bass frequency outputs.
5. Solid-state equipment.

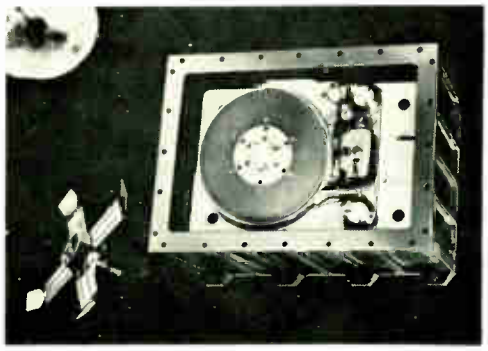
Looking ahead, what upheavals might we expect 10 years from now? Five years hence? Next year?

Much depends upon what new discoveries are made and, if such breakthroughs occur, how long they take to reach the public. As an example, E.M.I.'s Alan Blumlein initiated research on the 45° 45° stereo record system we use today in 1929. Thus, it took almost 30 years for the development to become a commercial reality. Similarly, though transistors were developed in 1948 by Bell Laboratories, they weren't in wide-spread use in high fidelity equipment, which stresses wide-range sound with low distortion, until some 15 years elapsed.

General David Sarnoff, RCA's Chairman of the Board, made some forecasts recently in which he envisions a single electronic medium as the future major channel of news, information and entertainment in homes. He bases this prediction on technical advances that have removed the distinction among voice, picture, telegraph and data transmissions, so that all of them pass simultaneously through the same relays in the form of identical electronic pulses. Sarnoff says that present equipment "may be displaced by an all-purpose television screen mounted on the wall . . . coupled to a sound system and a high speed electronic printer for recording any information the viewer wishes to retain."

The next miniaturization breakthrough in hi-fi amplifiers will likely depend on microcircuits such as the General Instrument Corp. devices shown here. This magnified photo, for example, shows 542 MOS transistors on a speck of silicon not much larger than the letter "o." Below, leads are bonded to the microcircuit.

One day, a system of electronic pulses is expected to be at the heart of sound and viewing entertainment equipment. The instrumentation recorder here, for example, used pulses to capture photos of Mars on a small strip of Scotch magnetic tape. The Mariner IV program photo was recorded 7,800 miles from the planet.



what's on the audio horizon for 1966 and future years?

Right now we have audio amplifiers that operate on the principle of pulses instead of rising and falling waves (see *The New Audio Frontier —Digital Recording*, AUDIOFAN April 1965). This method has been shown to be highly efficient, suggesting lots and lots of power in a tiny package. Unfortunately it also produces an enormous percentage of distortion at this time.

There are all sorts of hi-fi developments we would *like* to see, let alone innovations. In this light, perhaps additional separate sound channels will one day be practical, making stereo sound three dimensional instead of two dimensional. Then, too, maybe a breakthrough in speakers will topple the moving coil design from its perch (none thus far have even come close). The same fate could befall magnetic phonograph cartridges. But these are what-might-be speculations if such-and-such was discovered.

Let's explore, instead, some possible changes that could take place based upon present technology. A good bet in the future, though not in the near future, is the displacement of solid-state circuits by micro-circuits the size of a few fingernail-sized chips. Imagine a 200 watter boiled down to the size of a silver dollar!

How about the prospects for magnetic tape which is shaped like a record? (There's no law that says tape must be in strip form, is there?) In fact, a magnetic recording mat of this type with equipment was introduced to radio-TV broadcasters recently for commercials.

In discussing future roads which high fidelity equipment might take we cannot ignore the promised impact of cartridge tape players in automobiles on home playback equipment. Also liked by industry odds-makers are home video tape recorders, which made their debut at shows the latter part of '65. Both areas are discussed in accompanying articles, as is a long-shot—stereo sound for television. This concept has been booted around for some time (and still is), but in any speculations about audio in the future it remains a distinct possibility.

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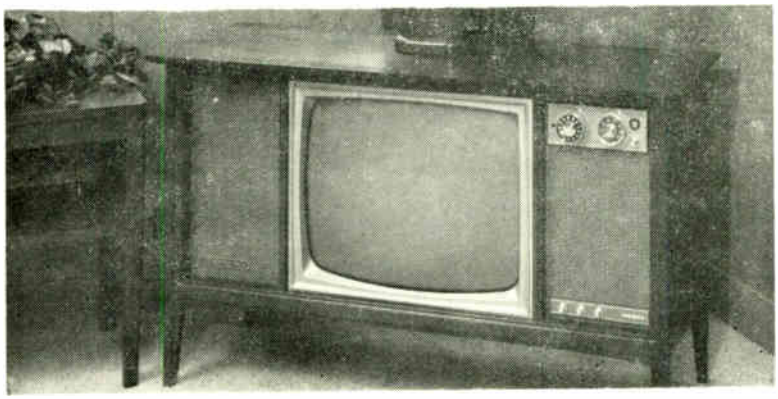
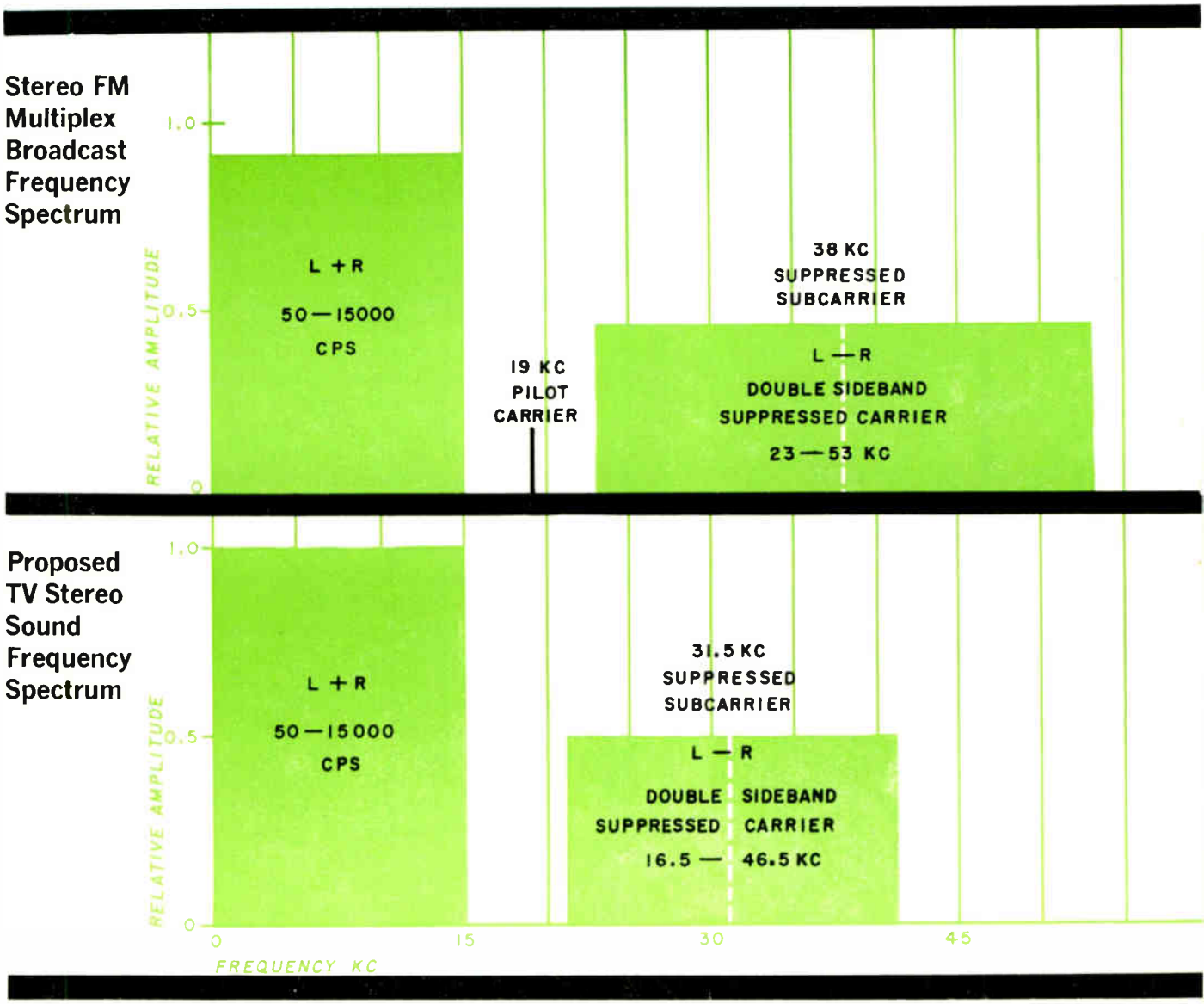
A TV STEREO SOUND SYSTEM



The standard TV set at left was modified to receive and produce stereo sound signals. The experimental stereo system is very similar to the one used for FM stereo multiplex.

How would you like to have your TV pictures spiced with stereophonic sound. It's not a far-fetched idea, you know. The Federal Communications (FCC) is already looking into the feasibility of it all.

What are the prospects for video telecasts with stereo sound? Not especially good for the *immediate* future. It would take about 1½ years of study to explore the possibility of stereo sound for TV with all segments of the industry, estimates the Electronic Industries Association (EIA), who had been asked by the FCC to develop recommendations for the stereo system. The association put a damper on telecasts with stereo sound by a recent request to drop or defer for an indefinite period the FCC's inquiry into the feasibility of



adopting such a system. Not enough industry interest at this time, says the EIA.

Nonetheless, it *is* known that General Electric, Philco, Westinghouse and Zenith have developed stereo sound systems for television. Such a system was introduced only a few months ago by Westinghouse at the 21st National Electronics Conference.

The TV stereo sound system by Westinghouse is very similar to the FM radio multiplex stereo system we hi-fiers have enjoyed since 1961. It provides for two separate channels, each with a frequency response capability of 50 to 15,000 Hz, for instance. (And like radio's FM stereo, signal-to-noise ratio is better on mono than on stereo, so an outdoor TV antenna would be in order to get good fidelity with this system too.)

Two channels of audio information are transmitted with one telecast signal. The same basic left + right and left − right signals are used as with FM radio. The left + right signals, formed by adding the output of the left microphone to the output of the right microphone, corresponds to a conventional monophonic signal. So TV sets *without* stereo receiving circuitry would play in a normal manner, irregardless of the type of broadcast signal transmitted by the TV station.

Of course, TV sets equipped to receive stereo would combine the L − R signal with the L + R signal in such a way that two separate audio signals are presented. (TV sound, incidentally, is frequency modulated, whereas the picture is amplitude modulated. Consequently, TV sound shares the same quality potential that our FM hi-fi tuners enjoy.)

There are differences between the approved FM radio stereo and the prototype TV stereo sound system discussed here, to be sure. For example, the L − R subcarrier signal, 38 kc, could not be used with TV because strong harmonics would interfere with a 15.75 kc picture signal. To correct this condition, a 31.5 kc subcarrier was chosen. The 15.75 kc signal is used to keep the set's signal in step with the transmitter's signal. In FM radio's stereo system, a 19 k pilot signal is used for this purpose.

how did it sound?

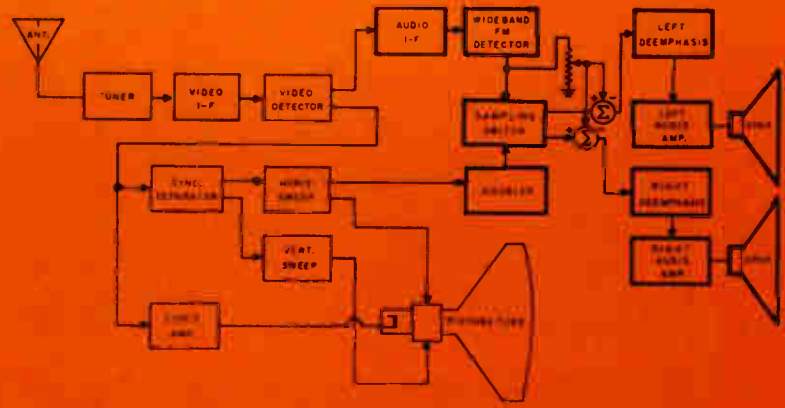
Proof of the pudding is in the system, a 19 kc pilot signal is

(*Please turn the page*)

The standard FM stereo broadcast band frequency uses a 19,000 hz pilot frequency to keep the signal received by an FM tuner in step with the signal being transmitted by the station. In addition to the spectrum shown, there's a storecasting band (not shown) at a subcarrier frequency of 67,000 hz.

The experimental TV stereo sound system has a 50 to 15,000 hz frequency capability, as does the FM radio system. A 31,500 hz subcarrier is used instead of a 38,000 hz subcarrier to avoid beat notes which would appear in the video picture. A 19,000 hz pilot signal is unnecessary because a practical pilot signal is already part of the convention TV signal.

A block diagram of the TV stereo sound system presented at a recent MEC conference illustrates how the signals travel through the set. Observe that the TV set's horizontal signal, 15,750 hz, is used as a pilot signal. Doubling the signal makes it 31,500 hz.



(*Continued from previous page*)
is stereo sound on TV?

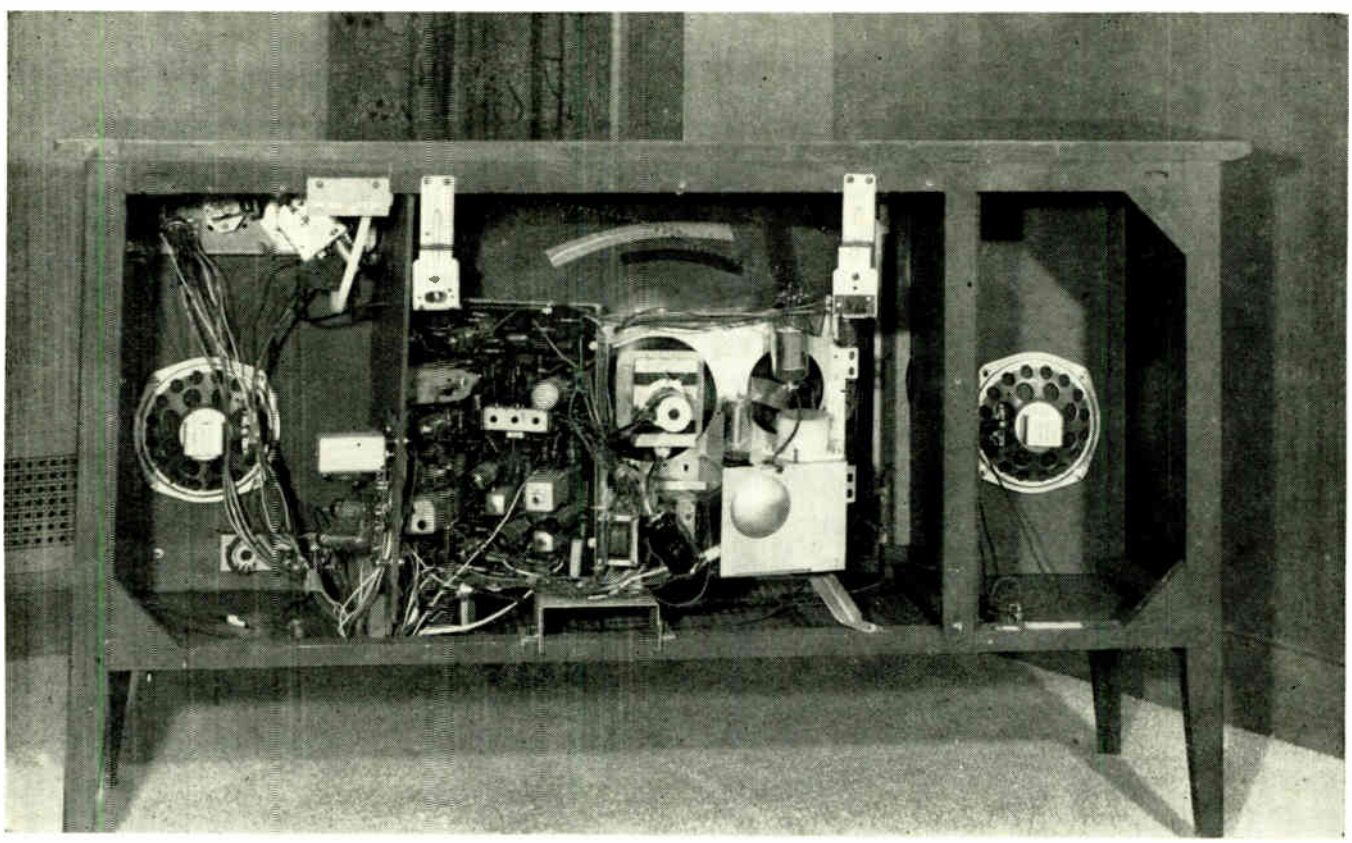
A dramatic demonstration of TV stereo sound was made by Westinghouse, using a standard commercial television receiver with modifications to detect and separate audio signals. A twenty minute video tape recording with stereo sound was transmitted over-the-air and with closed-circuit methods.

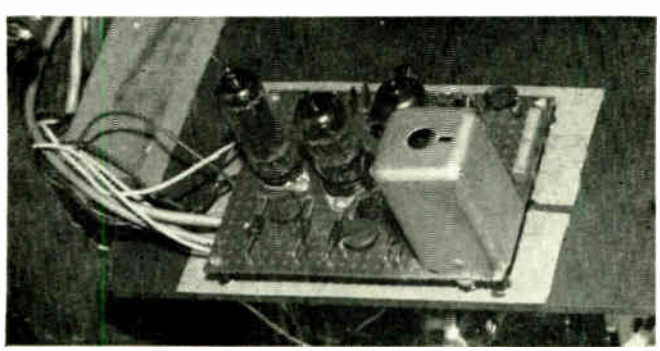
Persons viewing and listening to the taped program material—which included jazz band music, a vocal duet, and a discussion sequence—were "unexpectedly surprised and impressed with the added depth and realism provided by the stereophonic audio," says a Westinghouse spokesman, who further notes that "this realism was enhanced by the interaction of visual position information and stereophonic sound."

Audio channel separation greater than 20 db was obtained over the range of 50 to 10,000 Hz when stereo information was transmitted. This could be improved about 10 db, according to engineers, if more refined equipment were used.

An audio challenge not faced by FM radio is a measure of performance with TV's FM sound: video buzz in the sound. Buzz performance of the experimental TV set was judged satisfactory. This presents a problem, it seems, only if the buzz performance in a monophonic audio system is marginal.

The proposed system is said to be fully compatible with standard color and black & white TV systems, provides two channels of audio with hi-fi capabilities, and is simple and economical. The stereo sound roadblock, however, appears to rest with the TV broadcasters, who would be faced with new program production problems.





The rear view of an experimental TV set with stereo sound reveals additional circuitry to demultiplex stereo signals and to add a second audio channel. The stereo circuitry, which is mounted vertically on the left speaker compartment wall, is shown closeup at left.

Record TV programs, take motion pictures with sound and play 'em back instantly. Save recordings or erase them, as you wish. All this is now within reach of hi-fiers with the new home video tape recorders.

VIDEO TAPING IN THE HOME

Probably half of what you see on television today is played on a video tape recorder (VTR). You, too, can enjoy moving pictures and sound captured in the same way with magnetic tape on less expensive in-the-home VTRs.

It took ten years from the time the Ampex Corporation introduced VTRs to the broadcast industry for "instant movies" (no film developing) to reach the public at a reasonable, though still rather high price—in the neighborhood of $1,000. Sony and Ampex both have VTR models in this category, while other companies, including Concord, Delmonico, and Panasonic are expected to show VTRs in this price class soon.

Before VTRs in the home really make it with the American public, however, the new entertainment medium's prices will have to be lowered to at most $500, say marketing experts. And 1966 is not expected to be the year for this to occur.

Home VTRs had a false start a few years ago when a British company, Telcan, announced a video tape recorder deck for some $160. But they never came through with the units, so it might as well have been announced as $1.60. Another British company, Wesgrove, does market a low-cost ($392 in kit form) VTR on the West Coast. But its

(*Please turn the page*)

The price breakthrough in video tape recorders—down from some $50,000 when they were introduced to below $1,000 today—have made them promising additions to hi-fiers' audio systems, while adding a brand new dimension—sight. At the top-left, a Sony video tape recorder ($995) in a hi-fi dealer's showroom attracts attention of patrons. Below it is a Norelco VTR ($3000). To its right, is an Ampex VTR deck ($1,095) And at bottom is Ampex' VTR-TV console ($1995 plus space for a 25' screen TV set).

inferior picture limits its attractiveness to experimenters.

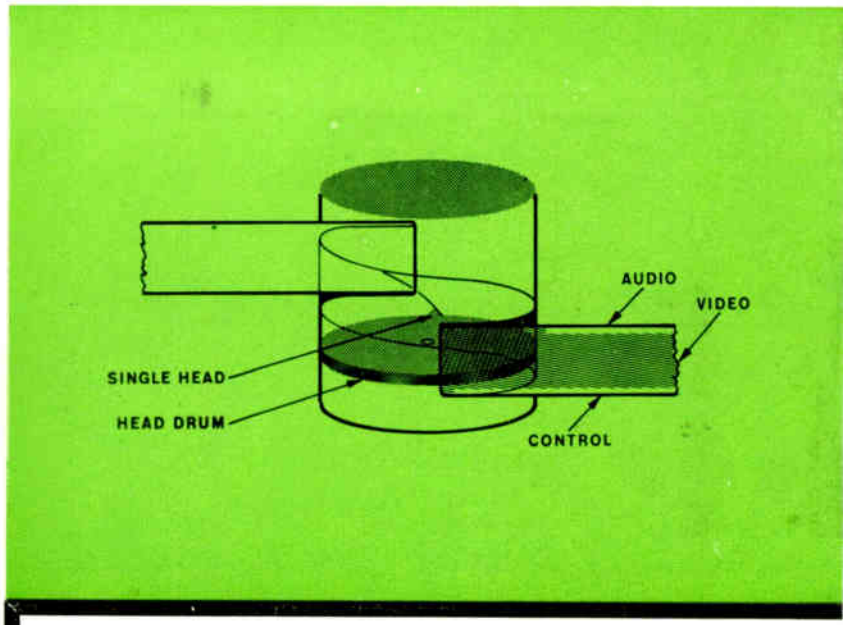
To reproduce pictures you need a very wide frequency response, up to and beyond 1 million Hz. To achieve this requires exceptionally fast tape speeds.

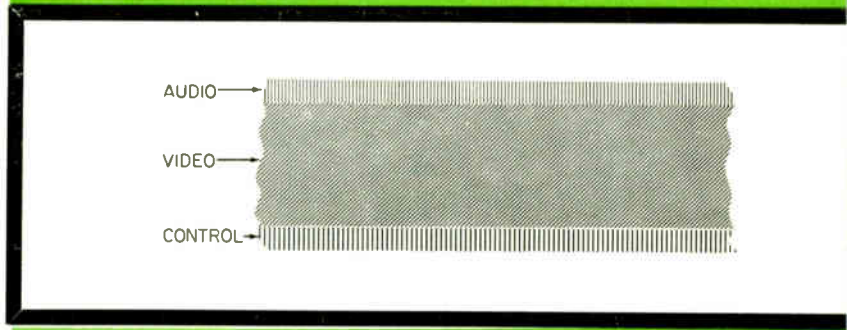
Wesgrove uses the "brute force" system of video recording, which means pulling the tape past the heads at very high speeds, say 90 inches per second. Other companies, including RCA, Par, and Fairchild Camera and Instrument are said to be working on home VTRs using this system of high tape speed. The big disadvantage here is that you eat up so much tape that costs might be prohibitive.

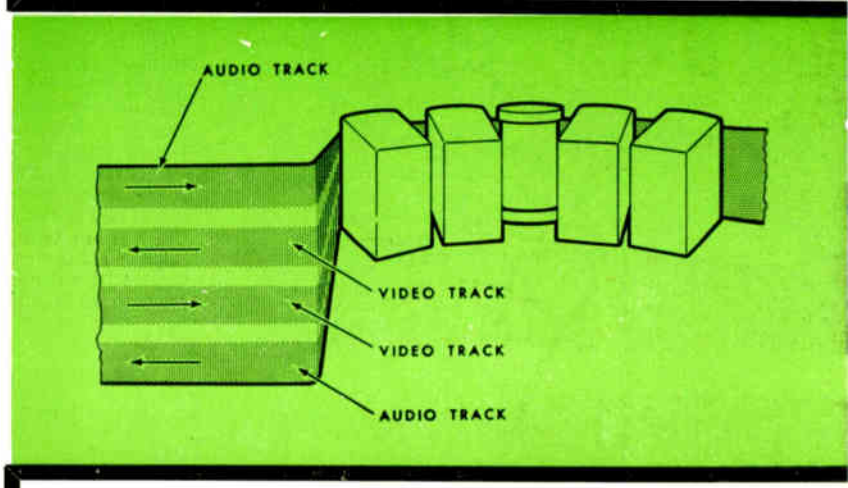
Recognizing this, other companies, including Ampex and Sony, use what is called the "helical scan" method of video recording. Here high *relative* tape speed is accomplished by wrapping slow moving tape (7½ ips to 12 ips with present home VTR models) around a housing in which a head rotates rapidly. Thus, video tape consumption is on the order of audio tape consumption. (Video tape cost, however, is $40 to $65 per 1-hour reel. This, too, will no doubt slow acceptance of home VTRs.)

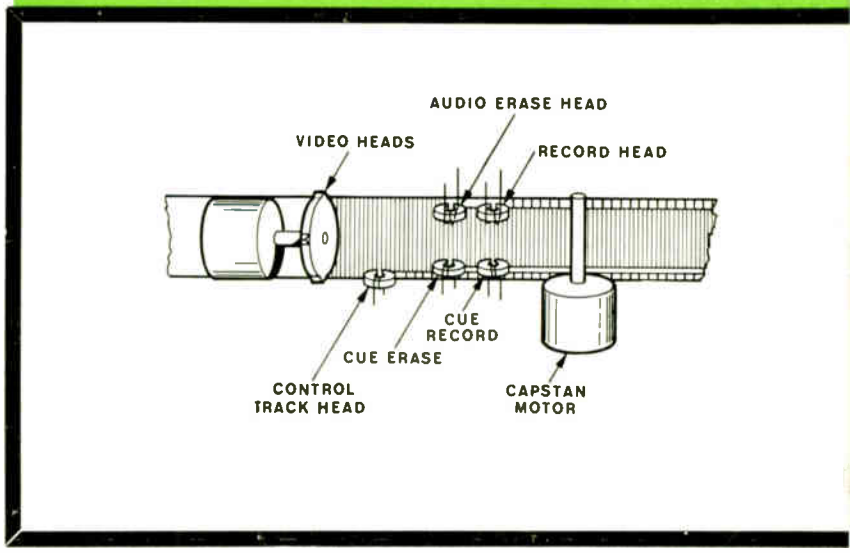
There are no standards for video tape recording. Therefore, a video tape made on one manufacturer's machine cannot be played back on another manufacturer's VTR. It would be comparable to trying to play a sound tape recorded at 7½ ips on a recorder that has only a 3¾ ips speed.

The attractions of home video tape recording are great, of course. A user can record his favorite or special TV programs and replay them whenever he wishes. He can take "movies" and play them back immediately. And given some time, prices are sure to decline. The way industry developments are taking place, it wouldn't surprise us if many less affluent audiofans are in the market for a VTR within a few years.

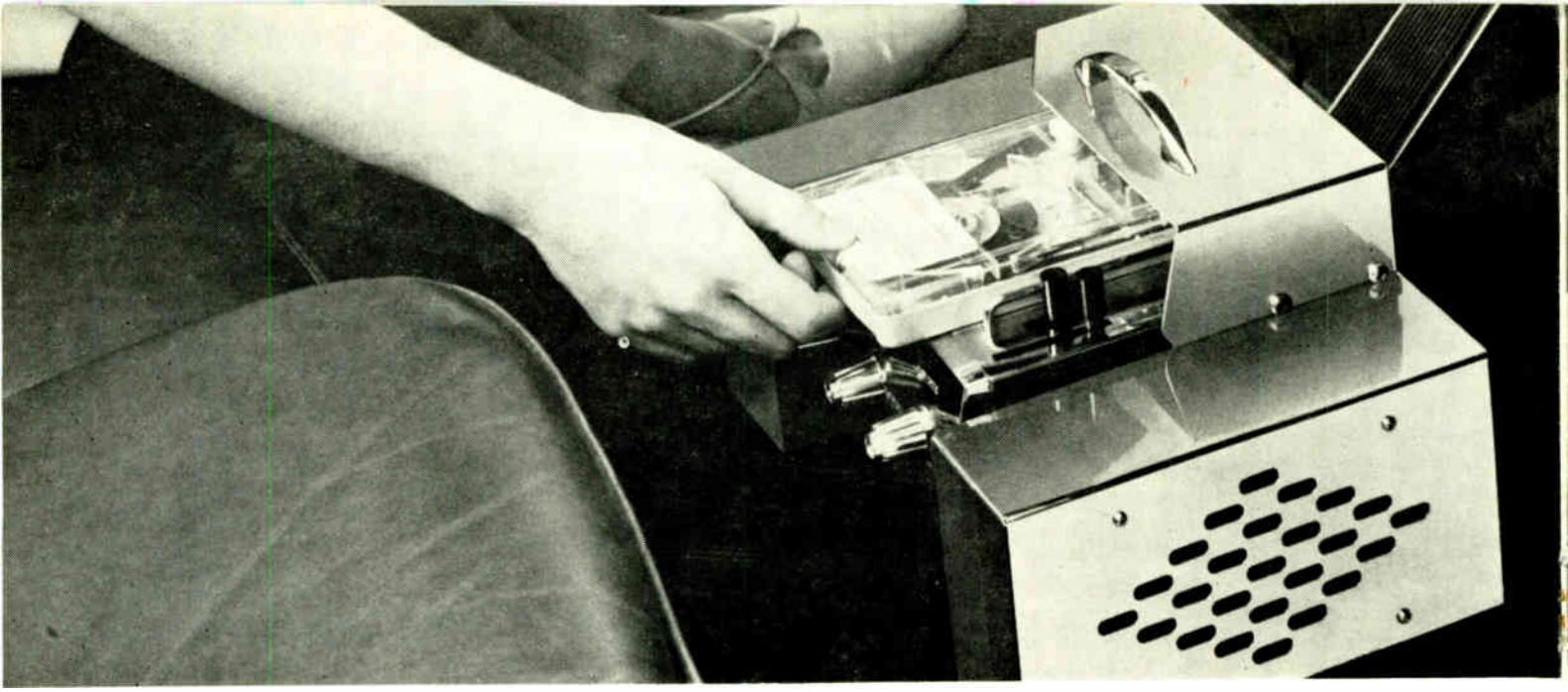




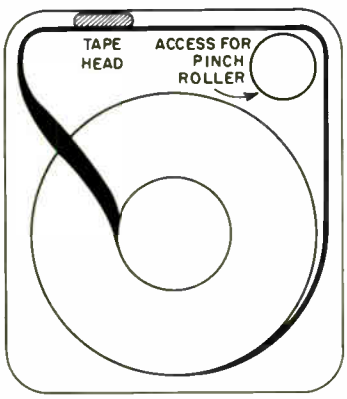


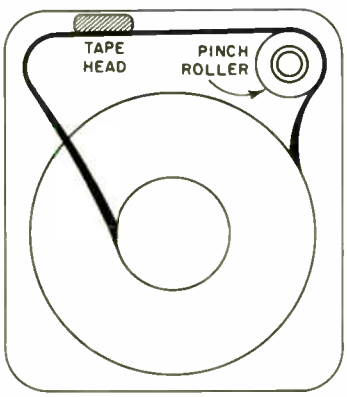


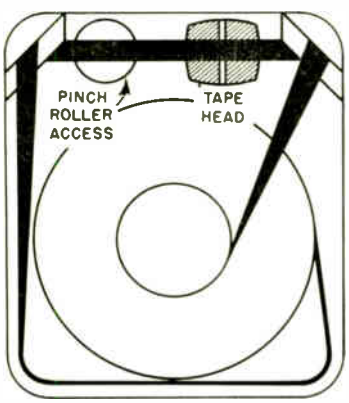
The helical-scan video tape recording system makes it possible to achieve high relative tape speeds, needed for good pictures, by using revolving recording heads while tape passes at a reasonable speed, 7½ ips to 12 ips. Because of the way the video tape winds around the heads the left reel side (feed reel) sits a bit higher than the right reel side (takeup reel). Using this system, video information is recorded in diagonal swipes, while audio and control signals are at top and bottom edges in perpendicular fashion. This makes it a bit tricky to edit, naturally. A longitudinal or "brute force" video recording system, the third drawing, does away with diagonal recordings, but substitutes the need for extremely high tape speeds (heads don't move). This imposes some new problems, such as eating up yards and yards of expensive video tape. (And sometimes razor blades eventually add up to more than the razor itself.) The last drawing shows the transverse recording system used in broadcast video tape recorders. They're great but too expensive by far for home use.



THE GREAT AUTO TAPE PLAYER RACE







The three types of auto player pre-recorded tape cartridges on the market, none of which are interchangeable, are shown at left. From top to bottom: Fidelipac, which is the oldest type; Lear-Jet, the only one with a pinch roller mounted on the cartridge itself; and Orrtronics, which routes the continuous loop of tape so that tape passes over the tape head in a horizontal position. The Fidelipac and Orrtronics cartridges are favored from a fidelity viewpoint. Lear-Jet, however, has endeared itself to auto manufacturers.

auto cartridge tape players

(name)	(manufacturer)
Use Fidelipac Cartridge	
Audio Spectrum	Audio Spectrum
Auto Matic	Automatic Radio
Auto Phonic	Quality Audionics
Auto Sonic	SJB (Martel)
Auto Stereo	Autostereo
Auto-tape	Viking
Craig	Craig-Panorama
Metra	Metra
Muntz Stereo-Pak	Muntz
Porta-Tape	Telepro
Transworld	Transworld
Use Lear Cartridge	
Lear Jet*	Lear Jet
Motorola**	Motorola
Orrtronics	Orrtronics
Use Orrtronics Cartridge	

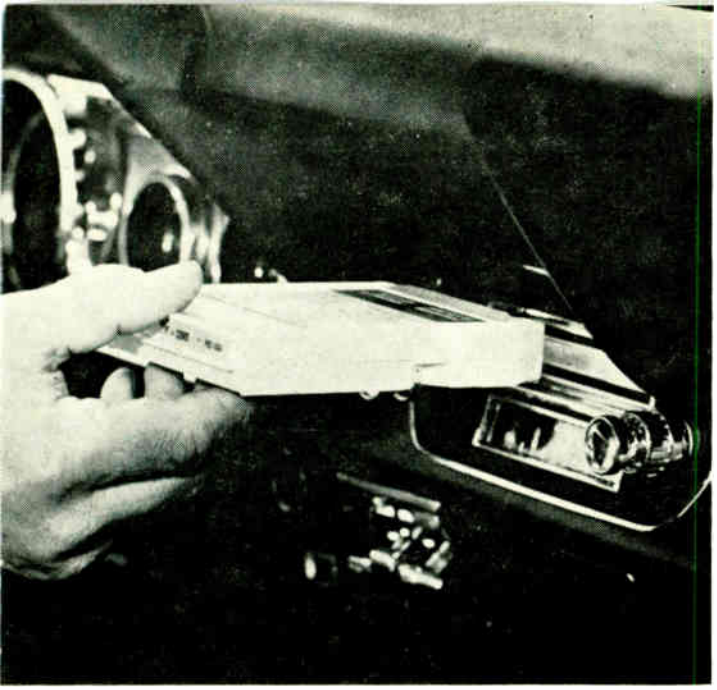
* Used in Chrysler automobiles

** Used in Ford automobiles

Even people who aren't sonic-minded are succumbing to the lures of automobile tape players with pre-recorded tapes. And why not when, here at last, is a practical entertainment medium in automobiles that (1) does away with the plethora of teen-age music on AM radio airwaves, (2) silences disc jockey gibberish (". . . for Tony and Mary, who celebrate their fourth week of going steady, and for all the gang at Central High in the Animals Fan Club . . .") and unrelenting commercials, (3) eliminates reception fading problems that often plague FM auto radios cruising hither and yon.

Add the attribute of a continuous loop of tape which completely eliminates tape handling by users, and the attractiveness of the entertainment system in automobiles is fully understandable. Just slide a cartridge into a slot and you've got up to a few hours of steady playing time.

Viking of Minneapolis introduced an auto cartridge tape player in 1960, so the whole concept isn't really new. But it wasn't until this past year when the idea took hold and showed promise of acceptance by a mass market. Lear-Jet and Motorola are producing auto tape cartridges and equipment for the Ford Motor Company, which offers tape players as optional equipment, Chrysler appears all set to offer the



A variety of 4-track auto tape players which use Fidelipac pre-recorded cartridges are available. Viking of Minneapolis, who introduced auto tape players first a number of years ago, and Martel (extreme left) are two names familiar to most hi-fiers. Automobile original equipment tape players are being produced by Motorola (left) for Ford. It accommodates Lear-Jet's 8-track tape cartridge.

same type of equipment, and there is a considerable choice of music already on pre-recorded cartridge tape. All this will no doubt help to create a good environment for auto after-market sales.

There are 100,000 to 300,000 auto tape players in cars today, depending upon whose reports you believe. This isn't even scratching the surface, when you consider the many millions of automobiles on the road. But it's a start.

Will 1966 be the big take-off year for auto cartridge tape players? It might well be, but there are many obstacles.

For example, there are three major types of tape cartridges—Fidelipac, Lear-Jet, Orrtronics—none of which are compatible. Consequently, tape playback equipment differs. So the problem facing buyers is, which one should they hang their dollars on?

Though all three employ the principle of a continuous loop of tape at 3¾ ips which acts as both a feed reel and supply reel, construction differs. The Fidelipac type cartridge uses a pressure roller located on the player (it fits into an opening on the cartridge) to advance the tape. It has the four-tracks so familiar to hi-fiers.

The Lear-Jet system, in contrast, has a pressure or "pinch" roller built right into its cartridge. Further, it has eight tracks on its playback head.

The Orrtronics cartridge, which started life as a four-track type, now features eight tracks. However, the tape passes over the tape head in a horizontal position, whereas in the others tape passes over the head in a vertical position. Like Fidelipac's cartridge, it too uses a pressure roller located on the player.

Right now Fidelipac cartridges have more pre-recorded music albums than others. While pre-recorded albums on Fidelipac type cartridges number in the thousands, Lear-Jet cartridge albums are still counted in the hundreds. But the Lear-Jet cartridges promise to catch up, what with RCA endorsing the system and tape cartridge duplicators rapidly expanding eight track album production. (Capitol and Columbia have thus far not committed themselves to any auto tape cartridge.) The Orrtronics music library is relatively small, too, but promises to grow.

What does all this hold for the audiofan who already has tape? Can he transfer his reel-to-reel tape recordings to cartridges? In some instances he can. It's conceivable that recordings can be duplicated and wound on empty four-track cartridges with some pain-staking effort. Too, Muntz-StereoPak does sell duplicating equipment for this purpose and at least one tape player manufacturer has available duplicating equipment for dealers who will charge a nominal fee to duplicate a person's own tape recordings for non-commercial purposes. Nothing that approaches this admittedly awkward process exists for eight track Lear-Jet cartridge thus far.

Looking at it from another view, wouldn't it be nice, to say the least, for the cartridges to be playable in the home? Hi-fiers would have to double purchases of their favorite music: one cartridge for the auto tape player, one reel for the home tape player. An answer to this might be adding another component to a hi-fi system: a home auto cartridge tape player. This way you could duplicate cartridge albums. (Ampex, it is heard, is manufacturing some home cartridge tape players to complement Orrtronics cartridges.)

Whichever cartridge system wins out, if any one does, it seems certain that auto tape cartridge players in growing numbers will complement other audio equipment. It might not be hi-fi, but it can provide continuous hours of commercial-free music of the listener's choice, with the convenience of operation that auto drivers seek.

The near future prospects for tape cartridge players other than auto player types in the home, however, appear bleak. Reel-to-reel types are still far and away the leaders.

PROFILE OF AN AUDIOFAN

hi-fier doubles listening pleasure with two stereo component systems

Old hi-fi equipment doesn't fade away. When an audiofan upgrades his system with improved components he might trade in his gear, sell it privately, give it away to a relative or, as Herbert Cohen, Brooklyn accountant-turned-manufacturer of aluminum air conditioner grilles, elected to do—use it as a second system in another area of his home.

Walk into Herb's living room and you'll see a Fisher receiver, a Garrard changer with a Shure cartridge, and two KLH 6 speaker systems, all with a few good years of heavy use, but still in fine fidelity form. This "family" hi-fi system is often operated by Mrs. Cohen.

But where is the latest hi-fi stereo equipment? Just meander down to the Cohens' 20′ x 10½′ x 7½′ listening and TV room in the basement and you'll see it in a handsome environment — wood-paneled walls, acoustic-tiled ceilings, carpeting, and a brick artificial fireplace. Herb Cohen's woodworking hobby came in handy here, for he did the paneling and ceiling installation himself, as well as building cabinets, bookshelves, and the equipment panel board shown in a photo here. (A bricklayer took care of the fireplace, where a 21″ color television receiver is inset.)

Among his other hobbies is photography, a common interest of many hi-fiers. (Herb Cohen acquited himself well in this area by submitting photos of his hi-fi system to AUDIOFAN, as all readers are invited to do.)

Herb chose his latest hi-fi equipment with the care of an audio connoisseur. His audio tastes were nurtured over a period of 12 years, starting out with Pilot hi-fi components shortly after some military duty in Korea. His present new system is ensconced in a corner "music wall" of bookshelves and a wood panel.

On the top shelf of a four-shelf section sits two Marantz model 8 power amplifiers (35 watts per channel). Below the amplifiers are two Marantz electronic crossover control networks. Stationed on the next shelf is a McIntosh MR 67 stereo FM tuner and a CDR rotator control, which enables our audiofan to turn his roof-mounted Finco FM antenna to the best position for receiving whatever FM broadcast he tunes in. (He uses 72 ohm coaxial antenna lead-in wire.) The bottom shelf supports a Thorens TD-124 turntable with an SME tone arm and an Ortofon elliptical cartridge.

The remaining equipment in this area is wall mounted. The pride and joy of Herb Cohen's hi-fi setup is his Crown SS-700 stereo tape deck. "I've used just about every tape recorder, I think, so I can really say this one is a beauty after using it about a year," says Herb Cohen.

On an opposite wall, to both sides of the fireplace, are floor-standing Tannoy 15-inch speaker systems and bookshelf-resting Janszen electrostatic speakers. "No, I didn't connect my TV's audio section to my amplifier or speakers; just didn't have the foresight to run wires when the fireplace was built."

Nothing is perfect, of course. For example, Herb wishes he had an automatic reverse feature, even though he uses 10½″ reels. He also notes that he's really restricted to

Hi-fier's newest stereo hi-fi system is located in basement. Large floor speaker systems and bookshelf-resting electrostatic tweeters are at each side of the fireplace. Other gear is on equipment corner below.

Our audiofan's twin sons sit near his older stereo hi-fi system, which is handsomely mounted in a living room wall. Part of one speaker's grille may be seen directly above the boy's head. Below is a full view of the basement component system, which also reveals the record cabinet built by January's audiofan.

one speed, 7½ ips, on his model because it's inconvenient to change speeds. "I would have to change a rubber-type band on the back of the machine." However, this isn't truly important to him since he's seeking top fidelity in most of his recordings.

The tape recorder serves Herb Cohen well and often. For example, he's recorded 7 reels on 10½" spools and 50 reels on 7" spools. "I've been using high output, one mil tape up to now," he said, "but plan to try a low noise tape which I've heard so much about."

Herb's taping consists of recording the most interesting selections on LPs ("I only buy stereo records") as soon as he brings the new discs home. He also does much taping off-the-air.

His tape recording efforts don't end here. "I use a litle Concertone battery powered tape recorder-AM radio set to record my baby daughter." (He also has twin sons.) "The fidelity can't match my Crown's, of course, but it's more convenient to use for this purpose," says Herb.

"My record collection, about 500 to 600 stereo records, is stored in the cabient just below my turntable," says Herb. "I use a Dust-Bug when I play one." Herb's collection runs the gamut from progressive jazz.

"I find the sonics on stereo records pretty good, especially RCA and Columbia," notes Herb. "Capitol stereo, however, has disappointed me recently, though previously they were superior."

There's no doubt about Herb Cohen's hi-fi enthusiasm. "I haven't missed a hi-fi show in seven years!" He plans to add a Jensen headphone amplifier soon to give him convenient private listening, observing that his electronic crossovers make it inconvenient to use headphones at present.

In summing up his new stereo installation, Herb observes that the "atmosphere created in this room provides me and my family with many hours of pleasure." And isn't that what hi-fi is for?

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1966
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THE LANGUAGE OF NOISE

What is your hi-fi system saying when it makes a sound like a sizzling steak? Like a motorboat? The meaning of these and other hi-fi noises is explained here.

scratch & hiss

interference noise

low frequency noise

microphonics

If your loudspeakers suddenly start to howl, your outfit is in trouble and is calling for help. In this particular case, in fact, you had better hop quickly to the volume control and turn it all the way down because you have a very dangerous condition—sustained acoustic feedback (more on this in a moment).

This is just one of the sounds in the language of hi-fi noise, a language you would do well to learn. The commonest of all noises, hum, has so many origins that we gave hum an article all its own in a previous issue. After hum, comes hiss or "scratch." The two shade into each other on discs; the analogous noise from tape is purely hiss. It's a high frequency distress signal.

A noticeable record "scratch" was a mark of high fidelity in the pre-war, shellac, 78 rpm days because it was impossible to have good, strong highs without having some surface noise. With today's vinylite surfaces, a bothersome amount of surface noise from a disc is *low* fidelity—something is wrong! Here are some main possibilities:

1. You may simply have a noisy record. A swish, a loud noise that comes in once each revolution, comes from a poor fill in the plating process. Or the whole surface may be noisy. Try a couple of records you know to be quiet before you blame your machine.

2. The stylus is chipped or broken. This is a record destroyer: change it at once!

3. Pickup mechanism is damaged.

4. The pickup may be working into the wrong input; a magnetic plugged into an unequalized preamp will have a strong overemphasis on highs.

5. You may have set the treble tone control very high without knowing it. Always check this.

6. You are trying a different pickup or loudspeaker which has a strong peak in the mid-highs. Note that extended high response, if smooth, without serious peaks, produces *less* hissy noise than less extended highs that are peaky.

7. The tweeter control on your speaker may be turned up too high.

8. Here is a fairly unlikely one, but it has happened. The woofer in your speaker system becomes inoperative. Perhaps the leads to the woofer are broken, or during experimentation with speakers you overlook reconnecting the woofer. At first you will turn up the volume to try to get enough sound, with only the tweeter or tweeter and midrange operating. The highs, and surface noise, will be monstrously emphasized. Of course, it won't take you long to realize that you have no bass.

9. Strong hiss from a tape recording may, again, simply mean you have a noisy recording. But before you try another tape on the machine, demagnetize the heads with a head degausser. A magnetized head not only makes the tapes sound hissy, but it records the hiss into the tapes.

Beyond that, any misadjustment of amplifier or speaker system that strongly overemphasizes the highs, like those listed above as causes of disc scratch, will make a tape sound hissy.

10. If you are just starting with an FM stereo tuner, and get a lot of hissy noise on local or regional stations that ought to come in strongly and quietly, the problem is almost certainly with your an-

tenna, as has been pointed out in earlier articles. Try a roof antenna with good gain.

11. If you get a lot of hiss on stations that once came in loud and clear, investigate the following:

A tube or other component in the r-f or i-f amplifier may be defective, cutting the gain of the tuner way down. Or a component may have changed value radically so that the tuner is seriously out of alignment. Or it could be out of alignment because one of the settings has been inadvertently shifted. You need good professional help on all of this, unless you have high skill with a signal generator and oscilloscope.

12. Something may have happened to your lead-in; if it is twin-lead, and has swayed into contact with a metal rain spout or other large metal object, and if you are pretty far from the station so that the signal is fairly weak anyway, the change the metal makes in the characteristics of your lead-in can reduce signal strength below the full-limiting level, letting in the noise. Note that antenna lead wire does not have to be directly shorted by metal-to-metal contact. Just the proximity of metal can degrade its performance. Or perhaps one or more of the lead-in connections is broken at the antenna. Or maybe you have forgotten to reconnect your antenna, after some experimenting or rearranging of your system.

13. An outside chance: the station itself is at fault with a signal that is way below normal power. If this does happen it is likely to be corrected fairly promptly.

Interference noise

Among the noises you may get from the "outside" on your tuner, and even in severe cases on your system in a tape or pickup playback mode, are a grinding, rough buzzing, or fast popping that come from electrical machinery in your home or in the neighborhood, or from various kinds of leaks in the power supply. The most typical case concerns an air conditioner, oil burner (very frequently), refrigerator, or similar device with a motor.

If you are lucky and the trouble *is* right in your own home, you will be able to identify it by turning the suspected devices on and off, and noticing what happens to the noise in your loudspeaker. The cure takes two possible forms, which depend on the fact that the interference can get from the machine to your equipment in two different ways. The interference exists in the first place because any device that interrupts the power very rapidly over and over, as in the commutator of a motor, creates sharp transients of current on the line that have a considerable amount of energy with frequencies over a wide band, both audio frequency and radio frequency.

The radio frequency, in particular, can travel to your equipment either over the power line, and come in by the back door, so to speak; or it can travel through the air and be picked up directly. A very well shielded FM tuner, in good alignment, is highly resistant to noise through the air. However, the noise may be strong enough to break through, even so. Depending on the design of the tuner power supply, noise coming over the power line may get in fairly easily, or with difficulty.

In most cases some experimentation is needed to find out which route the noise is taking, so the most likely cure can be applied. For noise on the line, the standard cure is to add a filter circuit, which may be bought at your hi-fi dealer's. It is usually better to put the filter right at the offending device, but you may get relief with the filter on the power cord to your tuner or amplifier.

For airborne interference, a metal shield enclosing the offending device, and grounded, is the recommended cure. Use a very fine mesh wire screen, and enclose the source of the noise completely. In the case of oil burners, which often put out airborne interference, you may need advice from an expert to make sure you don't cut off essential air intake, or confine explosive gases.

Low frequency noise

Now let's go to the other end of the noise spectrum: noises of very low frequency. They come mostly under the heading of "rumble." This low-breathing, heavy-footed noise comes most often from vibration in a turntable. Every turntable has *some* vibration: the rumble is always there. In good equipment it is below audibility, but an overemphasis on the bass frequencies can bring it in. (Just as an overemphasis on the highs brings in the ever-waiting tape hiss or record surface noise.)

So if you hear rumble that you didn't hear before, look into these possibilities. Again, it may be the record or tape. A certain number have rumble recorded into them. So double check.

A new pickup or loudspeaker with stronger bass might make rumble audible. This is a fairly common experience. There are two cures: a rumble filter (if your amplifier has one, try using it); or a more refined turntable, which will allow you to leave the bass "wide open" (some filters eliminate some of the low bass in music).

You may have moved your speaker to a spot in the room that emphasizes rumble frequencies or, perhaps, you may have the bass control or the volume control, or both, turned up far beyond your usual settings.

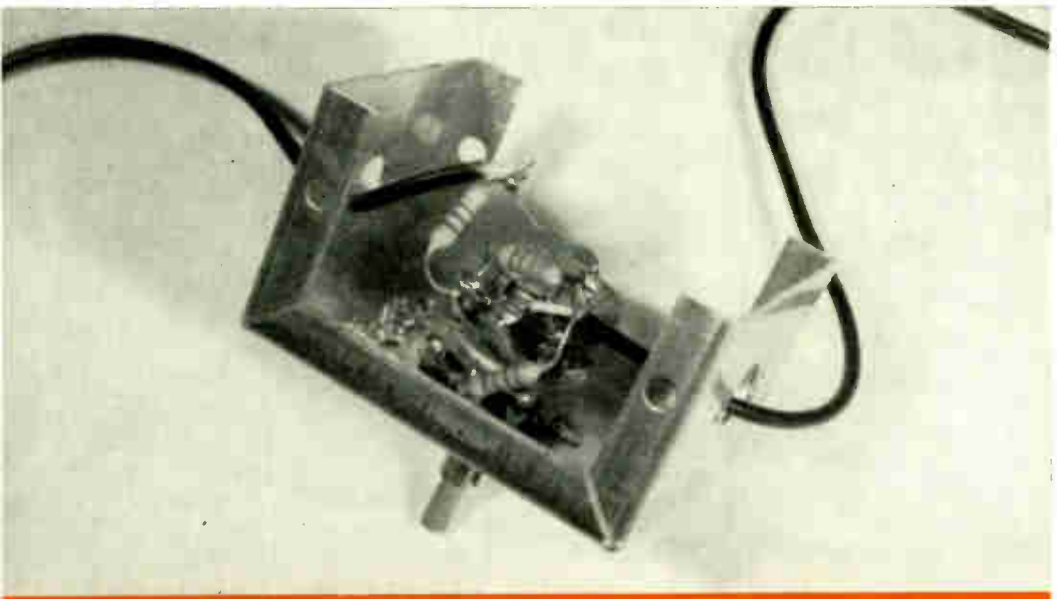
And it is possible, of course, that some breakdown has occurred in the turntable or changer: a rotating part off its pivots or out of line, a "flat" on a rubber driving puck, a motor defective. Wear on bearings may raise the rumble level gradually, though this is unlikely in modern turntable design. Or the turntable may need lubrication badly.

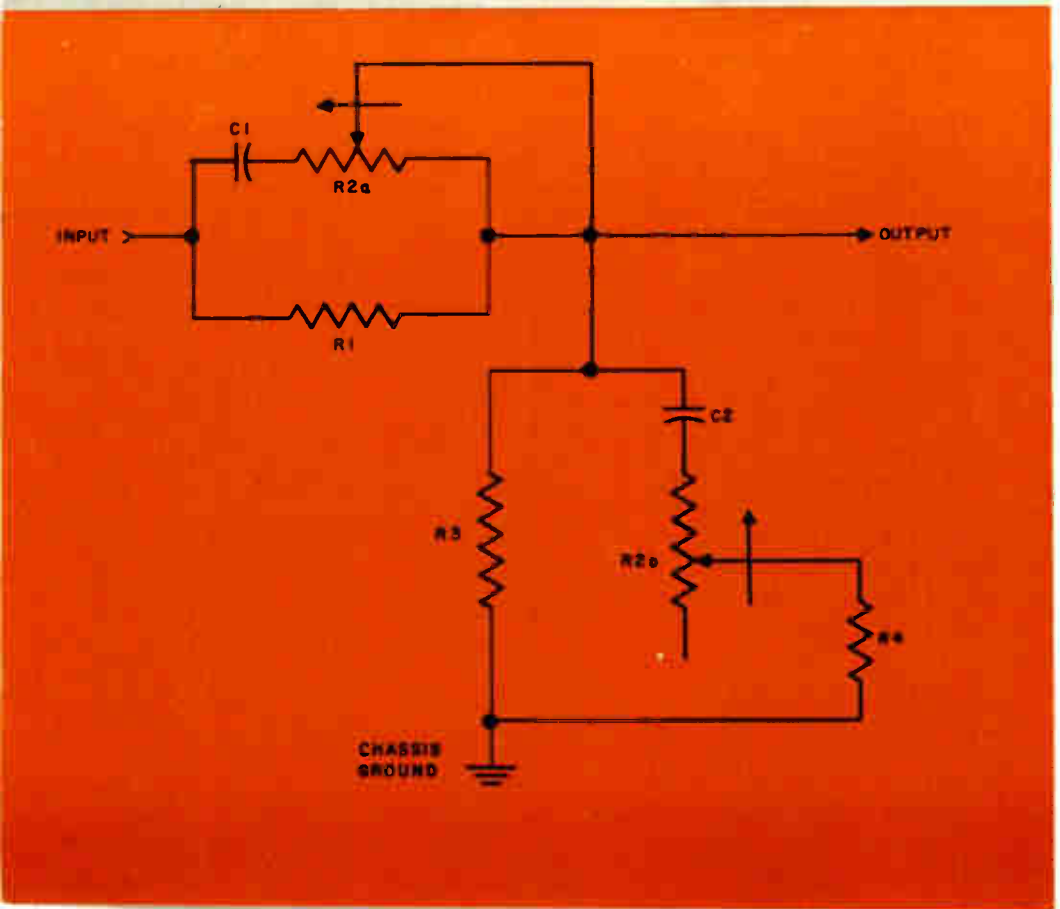
An intermittent rumble noise may come, too, from acoustic feedback, the shaking of the turntable by loud bass notes from the speakers. But the really bad case of acoustic feedback produces that sustained howl we mentioned at the beginning. This is a prime danger signal, because the amplifier or speaker might go up in smoke, so to speak, with the tremendous overload. Lifting the

(*Continued on page 25*)

build your own presence control

Adding a presence control to your hi-fi system will allow you to emphasize middle frequencies whenever you want to, such as making a singer's voice more prominent. An internal view of AUDIOFAN's construction project control is shown in Fig. 1. (You need two dual controls for stereo.) Its electrical schematic is illustrated below the photo, in Fig. 2.





If you like recorded vocal music and own many records featuring vocal selections, this project is for you! Ever wonder why, in some of your recordings, the vocalist seems masked or buried by the accompanying orchestra, while in still others, the vocalist is "right up there" at stage front-and-center? The answer lies in the recording studio control room where, in all probability, the recording engineer has electronically created the "stage presence" you find so lifelike. The device he uses to create this effect goes by various technical names which we prefer to call a "presence control."

Although the human voice contains low, middle, and high frequencies much like a musical intrument, it has been found that the greatest vocal energy lies in the range between about 400 cycles per second and 1500 cycles per second. By emphasizing these frequencies somewhat during playback, it is possible to bring the vocal portion of any program into pleasing prominence. Obviously, a conventional tone control on your amplifier won't do. If you were to boost your treble control, all frequencies above 1000 cycles would be emphasized, resulting in screetchy highs. Boosting your bass control will add boom. Boosting *both* tone controls has an effect just opposite to the desired one. Highs and lows are both accentuated while the vocalist retreats backstage. To accomplish improved presence, we need to boost only the mid-fre-

quencies while we leave all the others alone.

It doesn't take much electrical emphasis of these mid-frequencies to accomplish a startling improvement in "presence." In practical terms, if we can boost the "voice frequencies" by only 6 decibels, the vocalist will sound half as far away from you as the orchestral accompaniment.

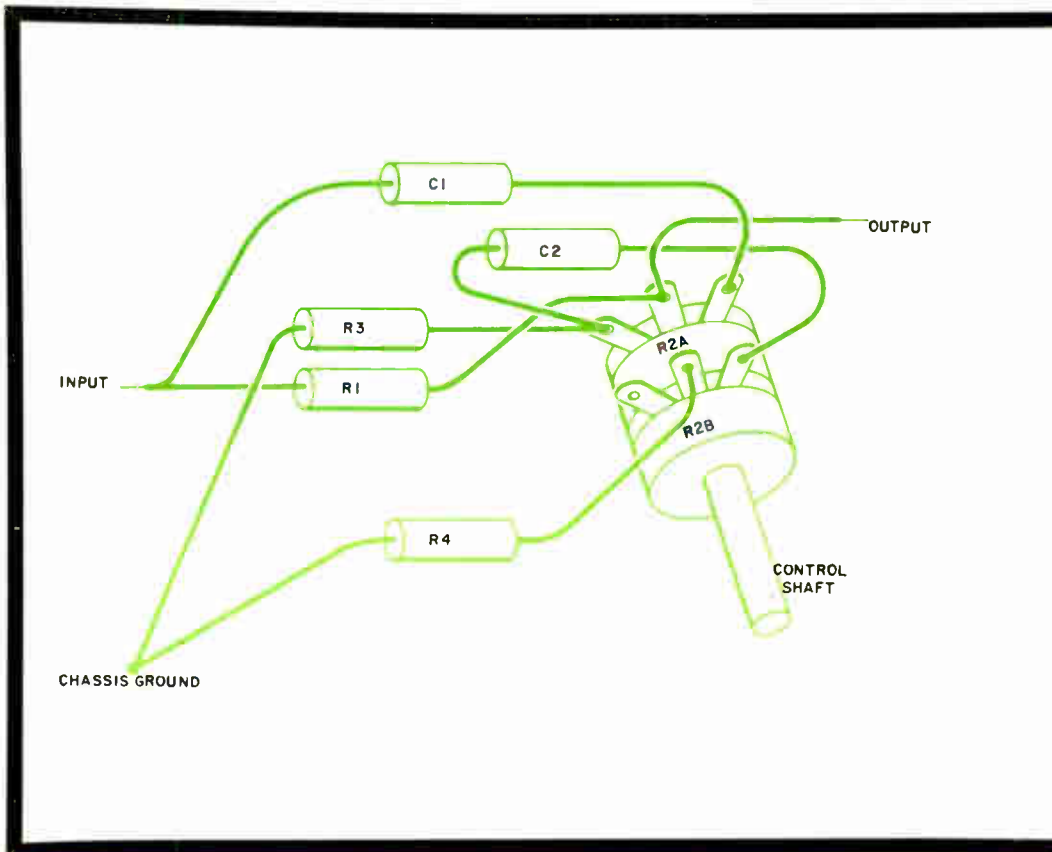
Professional filters used for presence controls generally use expensive coils in tuned circuits as part of the system. Because these coils are expensive and are not readily obtainable, the presence control to be described uses only resistive and capacitive elements. A schematic diagram of the control is shown in Fig. 2 and a wiring diagram is illustrated in Fig. 3. A dual potentiometer, a few resistors and two capacitors are all you will need if you want to wire the control into an existing amplifier or receiver. If you want the control to be an "outboard" device, you'll need a small (about 2" x 2" x 2") metal chassis such as that shown in the photograph of the completed project.

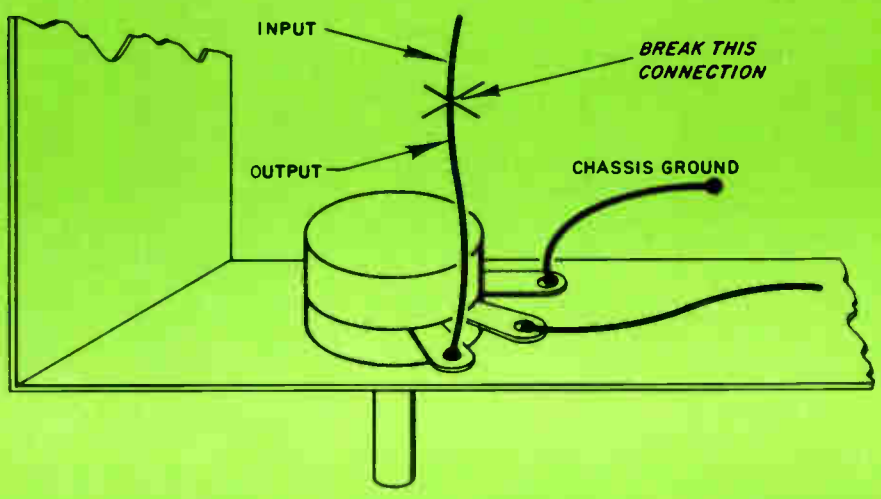
wiring the presence control

In following the wiring diagram of Fig. 3, be especially careful of the wiring to the terminals of the dual potentiometer. The wiring shown results in an increase in "presence effect" as the control is rotated clockwise. It won't be serious if the entire potentiometer is wired opposite to the diagram

(*Please turn the page*)

The wiring diagram in Fig. 3 shows you how a dual control will look after hooking up components needed to make it a presence control. The control (two controls for stereo) must be connected into your hi-fi system, of course. This is accomplished by breaking into a lead wire on your volume control, as shown in Fig. 4. Simply follow input and output connections in Figs. 3 and 4.





(Continued from previous page)

(both front and rear sets of terminals) because you would then merely have to rotate the control counterclockwise for increased presence and clockwise for less effect. However, if you should accidentally wire one part of the control as shown and the other in reverse, the vocalist might well recede into the distance and never be heard from again!

If you own a preamp-amplifier combination or a complete receiver, the best place to "break into" the circuit is at the high side (input) to your volume control. It should be pointed out that if you own a stereo system, two controls such as the one described here will be needed since "quadruple" potentiometers, all controlled by one shaft and knob are not readily available. The only inconvenience involved in this is that you'll have to remember to set both knobs for the same degree of presence effect from each channel. Most volume controls are connected as shown in Fig. 4. The wire, or wires going to the "un-grounded" end of the control should be disconnected and reconnected to the point in your presence circuit identified as "input" (Fig. 3). The "output" point of Fig 3 is then connected to the "ungrounded" terminal of the volume control. In the case of stereo systems, the second "presence" circuit is connected to the other section of the volume control (for the second channel) in much the same way.

To try out the presence control, play one of your favorite vocal recordings and start with the control at its minimum (counterclockwise) position. Listen carefully to what happens as you rotate the control clockwise!

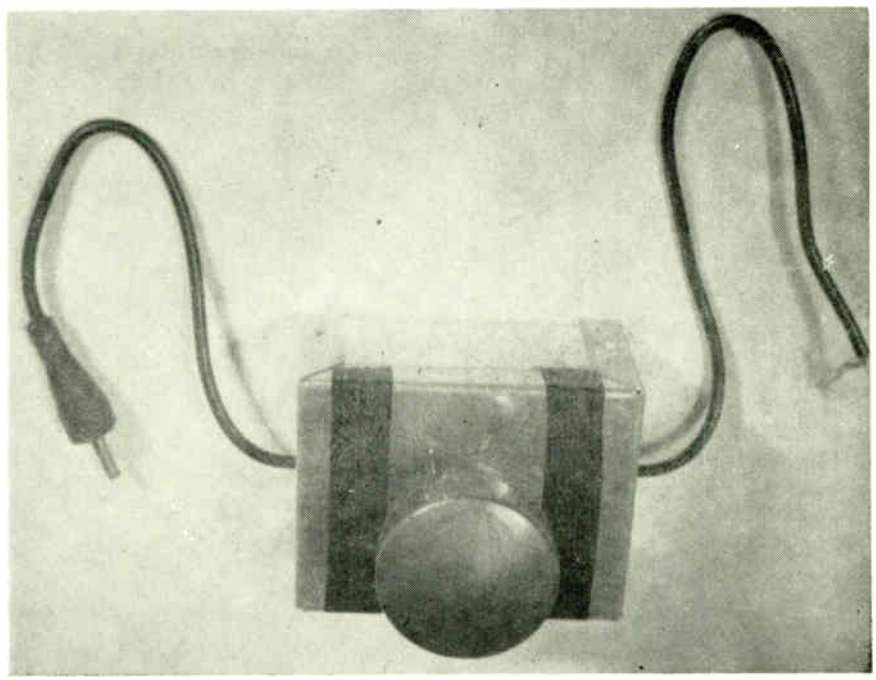
The particular values of capacitance shown in the parts list will cause a maximum "peak" in response at about 1000 cycles. If you wish to experiment with presence peaks at other possible frequencies, to see which pleases you most, consult the table below.

PRESENCE CONTROL CAPACITORS

Max. Peak Frequeney	C1	C2
500 cps	1200 uuf	300 uuf
800 cps	820 uuf	200 uuf
1000 cps	680 uuf	150 uuf
1200 cps	470 uuf	100 uuf

PARTS LIST

Part	(Double for Stereo)
C1	Capacitor, Ceramic Disc, 680 ±10%, 500μ
C2	Capacitor, Ceramic Disc, 150 ±10%, 500μ
R1, R3, R4	Resistor, 470K, ½ Watt, ±10%
R2	Potentiometer, dual, 1 Meg (Ohmite CCU-1052, or eq.)
Chassis	2"x2"x2" or larger.
Miscellaneous	Control knob, control mounting hardware, solder, hook-up wire, etc.



A front view of the completed presence control is shown here. You can build the control or controls into a section of your chassis if you have the room or mount it to a side of it. Another choice is to make it a permanent connection or a temporary one (as it is here).

NOISE

(*Continued from page 21*)

pickup off the record, turning the volume down, or throwing the off switch will stop it.

Then look for the following possible causes:

A volume control or bass control turned up far beyond normal.

A change in speaker or speaker position that feeds stronger vibrations into the floor, and thus across the room to the equipment cabinet. Sometimes this one can be cured with a thick piece of sponge rubber under the speaker cabinet. This also helps if your neighbors downstairs or in an adjoining room have been complaining about loud sound from your equipment.

You may have a new equipment cabinet in which a panel vibrates strongly on certain notes, and feeds the vibration into the turntable. Backing the panel with a second thickness of wood will often stop this.

Your turntable suspension may have lost its filtering action for vibration due to aging rubber or a defect in a spring; or there may simply be a solid object between the floating motor board and cabinet, which keeps the turntable from floating "free" and transmits vibration to it.

If you can't get rid of fairly frequent acoustic feedback by any of the methods suggested, you must try a more compliant turntable suspension. Putting more weight in the section of turntable that floats will also help in most cases because it lowers the resonant frequency of the floating system; if the resonance is well below the audible range, say at 5 to 10 cps. it is in a region where the gain of the amplifier is very low, which makes feedback unlikely. Vibration frequencies higher than the resonance can't get through to the turntable.

Noises that get their start in the amplifier come usually under one or another of four headings: sizzling, popping, motorboating, microphonics.

If a frying or sizzling noise makes you think of cooking, it's with good reason, because it usually means that a resistor *is* cooking to death—it is being "boiled" by a tremendous overload of current. Here's another time when you jump to the power switch and turn everything off. Then look for a resistor that is browned or charred, or has noticeable blisters, or is extremely hot to the touch (but some large resistors, usually in the power supply filter, run quite hot normally. It is the smaller ½-watt to 3-watt resistor that should not be too hot to touch). Of course, if a resistor burns up it usually means that there is a short or breakdown somewhere that threw an abnormal load on the resistor. You may need professional help to find this. A capacitor or transformer with a short can also burn up and sizzle while doing it. Look for a component which seems to be "melting".

A light popping sound usually means that you have an intermittent short, often in a paper capacitor. But motorboating, a strong putt-putt, which is almost exactly like a one-lung gasoline motor running slow, means that the amplifier is oscillating very slowly, often because of insufficient filtering across the power supply. This increases the feedback from high-level to low-level stages through the common load in the power supply. If a filter capacitor in the power supply fails, or one in a decoupling filter, a high-gain amplifier is fairly likely to take off this way. Severe motorboating can damage an amplifier, so turn it off if you hear this.

Microphonics is a fault of vacuum tubes, and is becoming rarer with the take-over by transistors. This ringing or boinging sound means that one of the early tubes in the amplifier, when vibrated mechanically, sends out a signal. Find the one at fault by tapping each tube lightly with a pencil or your fingernail. If you tap hard, the vibration will spread to several tubes and you can't tell which one is ringing. The cure is often simply to substitute another tube of the same type; they tend to vary greatly in microphonics. Or you can use a special low-microphonic tube that will substitute for the bad one. Or you can mount

(*Continued on page 32*)

WHAT'S GOING ON

AMPLIFIERS/RECEIVERS

Hi-fiers look up! One of the Three Little Indians remaining without a solid-state power amplifier has been picked off—Dynaco will introduce a solid-stater. This leaves only the two big M's among major hi-fi manufacturers who have not gone the solid-state route with power amplifiers, though they do produce solid-state preamplifiers. Dynaco, on the other hand, does not yet have a solid-state preamp. Here are details on some of the latest solid-state units.

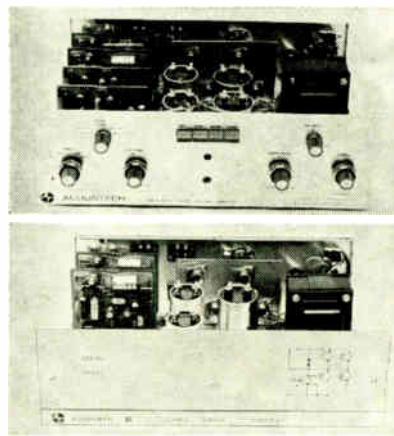
AMPLIFIERS/ PREAMPLIFIERS

DYNACO. Dynaco starts the new year by saying it will have a solid-state component—a 60 watts rms per channel power amplifier. The full rated power is said to be

delivered from 20 Hz to 20,000 Hz at less than 1% distortion, with distortion reducing sharply at lower power levels. The new 60/60 amplifier employs a biasing circuit which, by its inherent current limiting operation, protects transistors in the event speaker leads accidently short. Consequently, says Dynaco, fuses, thermal cutouts, or circuit breakers are not required. A self-adjusting bias arrangement eliminates any d-c changes through the thermal cycle. D-c feedback controls transistor characteristics.

KENWOOD. A 60-watt AM/FM multiplex stereo receiver, Model TK-60, has been announced by Kenwood (50 watts total at 8 ohms). The solid-state receiver has a frequency response of 20 to 70Kc ±1 db. Other features include a 4-gang tuning condenser, 5 i-f stages with 3 noise limiters and a wideband ration detector. The TK-60 also has automatic switching to the proper broadcast mode, mono or stereo, front panel stereo headset jack, a tape monitor switch, tuning meter, on-off multiplex noise filter, FM afc, loudness tape monitor and speaker switches The unit is priced at $239.95.

ACOUSTECH. Acoustech, a division of Koss/Rek-O-Kut, introduces a stereo power amplifier kit and a stereo preamplifier kit, model XI and model P/M, respectively. Both kits include pre-assembled, plug-in printed circuit boards that require no adjustments. The 35-watts per channel (for under 0.25% IM) power amplier comes punched to accomodate the pre-amplifier section. A gold anodized front panel is supplied to conceal holes if the P/M preamp is not used. A second front panel is packed with the preamp module which is substituted for the original panel when both units are used as an amplifying system, as shown here. The power amplifier



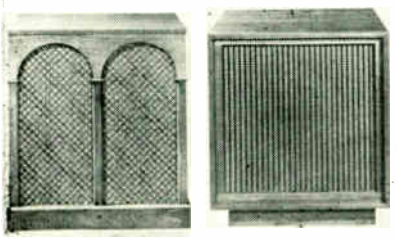
can be used with virtually all tube or solid-state preamplifiers, says the manufacturer. It requires 1¼ volts input for 28 watts rms output per channel and has a high input impedance of 100K ohms. All shielded cables are cut to length and stripped. The power amplifier kit is priced at $129.50; the preamplifier kit at $89.50.

TAPE PLAYERS

VIKING. Viking of Minneapolis' new Model 807 is strictly a tape player; that is, it is used to play pre-recorded tape through a music system, but doesn't record. The 807, therefore, does not contain any electronics. It's plugged

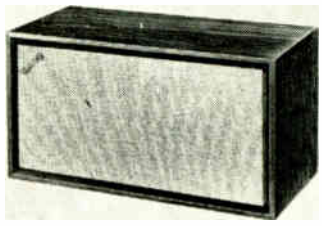
directly into a music system amplifiers' tape head inputs. The unusual head mechanism allows the unit to play full, half or quarter track pre-recorded tapes in mono or stereo, at 7½ ips or 3¾ ips. No pressure pads are required because it has a hyperbolic playback head (tape lifters raise tape during fast modes). Two 4-pole motors are used. Specs are impressive: frequency response is 30 to 18,000 Hz at 7½ ips; flutter and wow less than 0.2% rms at the same high speed. The 807 accepts up to 7" reels. It comes complete with a walnut base at $124.95.

BOZAK. R. T. Bozak expands its furniture line of speaker enclosures and equipment cabinets with two broad stylings: the Century and the Moorish. The Century has a contemporary style with a low-boy look. The speaker enclosures (B-300, B-302A and B-305 speaker systems) achieve a three-dimensional illusion with vertical stripes on the grille cloth.



Wood surfaces are either walnut with a matte finish or cherry with a dark polished fruitwood finish. In contrast, the Moorish units (B-300, B-302A and B-4000 speaker systems) use rounded arches. The dark grille cloth is overlayed with a metal grillwork of antiqued bronze to heighten the Iberian image. Other furniture stylings available are Urban, Italian Provincial and French Provincial. Mahogany surfaces are finished in hand-rubbed light or dark fruitwood.

WHARFEDALE. Wharfedale's new W30 compact bookshelf speaker system may be operated to its full output with amplifiers rated as low as 10 to 15 watts per channel. The 19" x 10" x 9¼" deep system incorporates a network design which gives users a switch



choice between a full-bodied sound or a more subdued, mellow sound while preserving the full range of response, says the manufacturer. The W30 is priced at $69.95.

1966 coming ■ events

FEBRUARY 18 to 20 (Friday to Sunday)

Philadelphia High Fidelity Show

BENJAMIN FRANKLIN HOTEL, PHILADELPHIA, PA.

MARCH 27 to APRIL 3 (Saturday to Sunday)

Los Angeles High Fidelity Show

HOTEL AMBASSADOR, LOS ANGELES, CALIF.

APRIL 18 to APRIL 25 (Monday to Monday)

San Francisco High Fidelity Show

PACIFIC AUDITORIUM, SAN FRANCISCO, CALIF.

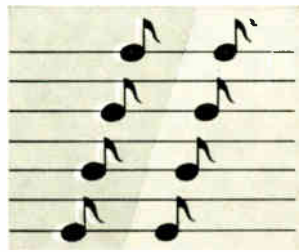
APRIL 25 to APRIL 28 (Monday to Thursday)

Audio Engineering Society Convention

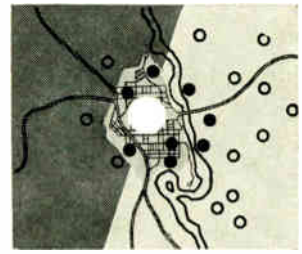
HOLLYWOOD ROOSEVELT HOTEL, LOS ANGELES, CALIF.

Only Scott can give you these performance extras

Widen your range of listening enjoyment with Scott Wide-Range AM. This exclusive Scott extra, incorporated in the new solid-state 388 AM/FM stereo receiver, adds an extra listening dimension for your listening pleasure... brings Scott quality sound to the exciting news, sports, and current events coverage you'll find only on AM broadcasts.



Scott's tremendous usable power gives you total clarity throughout the entire frequency range. The 388 gives you 100 watts of music power... enough to drive even the most inefficient speaker systems... enough to power distant extension speakers. Direct-coupled silicon output design guarantees power delivered to your speaker systems free of distortion.



Explore new listening areas with Scott's exclusive field effect transistor circuitry. Scott's revolutionary FET FM front end circuitry approaches the theoretical limit for sensitivity and freedom from spurious responses . . . lets you receive more stations more clearly. Scott is the first, and only, manufacturer to use this important advance in solid state design.

All these extras are found only in the Scott 388 AM/FM receiver

Scott's new 100-watt 388 solid-state AM/FM stereo receiver is specifically designed for the accomplished audiophile who demands the best . . . and then some. Every feature, every performance extra that you'd expect to find on the finest separate tuners and amplifiers is included in the 388 . . . and many features that you won't find anywhere else.

The new Scott field-effect transistor FM front end sets new industry standards for sensitivity and spurious response rejection. Scott's famous Wide-Range AM adds the whole spectrum of AM programming to your listening enjoyment.

Other engineering features of the 388 include: heavy military-type heat sinks, scientifically designed for maximum heat dissipation; silver-plated tuner front end for maximum sensitivity; and built-in protection from such common problems as accidental shorting of speaker terminals, operating the amplifier section without a load, subjecting the input to a high level transient signal, or operation with capacitative loads, such as electrostatic loudspeakers. Only $499.95

THE 388 AM/FM STEREO RECEIVER . . . Usable Sensitivity, 1.9 μv; Harmonic Distortion, 0.8%; Drift, 0.02%; Frequency Response, 15-30,000 cps ±1 db; Music Power Rating per channel, 50 watts; Cross Modulation Rejection, 90 db; Stereo Separation, 35 db; Capture Ratio, 4.0 db; Selectivity, 45 db "Wide" and "Distant" AM bandwidths.

Scott . . . where innovation is a tradition

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SIMPLE CHECK-UPS THAT KEEP YOUR SYSTEM TIP-TOP HOLD ON TO HIGH FIDELITY

A continuing series of maintenance and service tips on hi-fi system components

keep those grooves clean!

The thing that mostly wears records out is dirt. That is, in most cases on hi-fi equipment. A very bad worn stylus, or pickup with enormous stylus mass and low, low compliance can wear records like a flash. But even then, dirt makes it faster and worse. With moderately good to good pickups, a major part of the blame goes on the dirt. Briefly, the dirt in the groove acts as an abrasive. The passing stylus rubs it against the groove wall, and one of the first things that happens is a loss of the very top frequencies, which are represented by extremely small wiggles in the side of the groove. Another thing that happens is a rise in scratch because the groove wall gets rougher.

The dirt problem on disks has stirred up many, many people, and given rise to a lot of hair-brained schemes. The disc tends to hold on to the dirt because an electrostatic charge builds up from friction on the disk surface, either in handling it or in playing it.

One good way to get the dirt out and at the same time reduce the electrostatic problem for a while is simply to wash the records. Old, noisy records often get back their sparkle; wear is arrested. The way to do it is in a dishpan or sink, with lukewarm water to which a little mild detergent has been added—not soap! Hold a record upright in the sink, with about a half of it submerged, and slosh the water over the whole surface, on both sides. Then run plenty of lukewarm water over both sides to get the detergent off. Now pat the record *almost* dry with a lintless, clean cloth, and let it stand upright in the air for a few minutes—not long enough to collect more dust.

To keep them in fairly clean condition, you could use a record groove brush. But avoid putting thick, gummy stuff on the surface of the record, on the theory that this neutralizes the electrostatic attraction. It may do this, but it also collects dust in big gobs and holds on to it, or it may form gobs of its own that get on the stylus tip and lift it out of the groove. Dirt collecting on the tip, incidentally, is a very frequent source of severe distortion when you play old, dirty records. So the less "stuff" you put on the surface, the better.

Dirt acts as an abrasive as well as a road block to light-tracking cartridge styli. So to insure long fidelity and distortionless reproduction, be sure to keep records and styli free of it.

ASK THE AUDIOFAN ANSWER MAN

Readers are invited to write in for answers to their audio problems. Questions of widest interest will be published here, together with solutions.

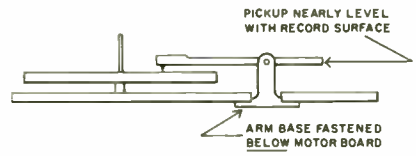
FROM A. G. L., CHARLOTTE, N.C.:

I recently had an unsettling experience. I have two or three early LP's that I treasure for the particular artists represented, and play from time to time even though each record is considerably warped at some point on its surface. When I play one of these records, I have always noticed a distinct "wow" effect, a rise and fall in pitch, when the pickup went up and down over the warped section of the record. I thought this was inevitable. Resigned my ear to it, so to speak. But several days ago I took two of these records to a friend's home for an evening of joint listening. He was most proud of his new audio system, and there was one way it did startle me. When his pickup rode over the warped places in my records, there was no wow! I didn't mention his superiority to him on this count. However, I certainly would like to know how it comes about and how I might get it for my own system.

ANSWER:

Very probably, you are suffering from "warp wow" because your pickup arm has a pivot high above the record surface, and the arm makes a considerable downward angle from pivot to stylus. With this configuration, when the end of the arm moves up and down over the warped record, it also has a considerable amount of forward and back motion, in the plane of the record surface. When it moves back (down), it in effect increases the record speed, raising the pitch; when it moves up and forward, the net speed under the pickup is reduced, lowering the pitch.

The cure is to get the pivot in the arm that provides vertical motion as close as possible to the same height as the record surface. If the pivot height is not adjustable on your arm, you may be able to set the arm base on a platform below the level of the motor board, or to lower that whole section of the board. Or perhaps the motor and turntable can be raised. Or you may find buying a new arm the best cure.



If the vertical pivot of a tone arm is too high, as shown in the top drawing, it'll produce "wow" on a badly warped record. To reduce wow, you might set the arm base low as shown in the bottom drawi-g. This may bring the pivot near the level of the record surface

Audio Club News

"down under" tape recordists

The Australian Tape Recordists' Association invites overseas tape enthusiasts to join their group. "The basic principle of A.T.R.A. is friendship via personal and recorded contacts," says the association's president, Harry Calf. On joining the non-profit association ($3.00 plus $1.00 initiation fee), members receive a welcome tape from the president, as well as tips designed to get you started in correspondence. International tape round-robins are now in operation, advises Calf.

New joiners also receive the association's bi-monthly journal, "ATRAVUE," which includes headquarters news, branch activities, and articles on tape equipment. If you'd like to contact the association, write to A.T.R.A., P.O. Box 67, Eastwood, N.S.W., Australia.

To give you an idea of the enthusiasm displayed by members in Australia, Secretary Graham Lowe tells AUDIOFAN that four officers (see photo) traveled a total of 300 miles to attend a meeting.

A inquiring reporter

(IF YOU HAVE A QUESTION YOU WOULD LIKE OUR INQUIRING PHOTOGRAPHER TO ASK, WRITE US YOUR SUGGESTIONS.)

PLACE: NEW YORK HI-FI SHOW

QUESTION: HOW DID YOU LIKE THE SHOW?

ZENON ONUFRYK

ELECTRONIC ENGINEER, 9 YEARS HI-FI INTEREST: THERE IS A SERIOUS LACK OF TECHNICAL INFORMATION. THEY WILL, FOR EXAMPLE, HAVE SOME AMBITIOUS CLAIMS FOR SPEAKER RANGE, BUT YOU

CAN'T GET THE DECIBEL INFORMATION. NEXT YEAR I WOULD LIKE TO SEE MORE ENGINEERS. PEOPLE COME HERE FOR INFORMATION THEY COULDN'T GET ANYWHERE ELSE. I KNOW THIS IS THE MOST IMPORTANT THING FOR ME.

RICHARD DAVIS

CLERK, 10 YEARS HI-FI INTEREST: VERY GOOD SHOW. I LIKE TO COME AND GET A BROAD IDEA OF WHAT IS AVAILABLE. IT'S VERY INTERESTING TO SEE COMPONENTS AND DEVELOPMENTS WHICH I CAN'T

FOLLOW CLOSELY DURING THE YEAR. THE LISTENING IS NOT ALWAYS GOOD. I THINK SPEAKER MANUFACTURERS SHOULD BE SEPARATED MORE SO THAT THEY DON'T INTERFERE WITH ONE ANOTHER.

BERNARD ESCOBAR

TV TECHNICIAN, 15 YEARS HI-FI INTEREST: I JUST LOVE THE SHOW. I THINK IT'S WONDERFUL. DIDN'T HAVE ANY DIFFICULTY HEARING JUST WHAT I WANTED TO HEAR, AND GOT GOOD HELP FROM THE EXHIBITORS. IT'S A VERY ENJOYABLE

SHOW, ALTHOUGH I THINK THE ROOMS SHOULD BE LARGER. IT'S MUCH TOO DIFFICULT TO LISTEN IF STANDING RIGHT IN FRONT OF THE SPEAKERS. I LIKE TO GET TO THE BACK OF THE ROOM.

WILHELM LIEDHOLM

BANKER, 10 YEARS HI-FI INTEREST: IT'S A BETTER SHOW THAN LAST YEAR BECAUSE EXHIBITORS WHO HAVE NOTHING TO DO WITH HIGH FIDELITY HAVE GONE. THEY'VE DONE THE PUBLIC A SERVICE. A SHOW LIKE THIS IS STILL A DRAIN ON YOUR FEET

AND YOUR TIME. NEXT YEAR, PERHAPS, THE MANAGEMENT WILL MAKE AN EFFORT TO KEEP THE SOUNDS FROM THE VARIOUS SPEAKER EXHIBITS SEPARATED MORE FROM EACH OTHER. THERE'S ALTOGETHER TOO MUCH INTERFERENCE.

SHARE YOUR HI-FI INSTALLATION . . .

AUDIOFAN Magazine will pay $10 for photos of hi-fi component arrangements it uses. Simple snapshots will do, together with a few words on how you found the best spot in the room.

This isn't a contest. It doesn't matter whether your hi-fi stereo system is big or small, elaborate, or simple. So let's hear from you.

Send material to AUDIOFAN MAGAZINE 25 West 45th Street New York N.Y. 10036

NOISE

(*Continued from page 25*)

the tube socket on vibration-resisting mounts.

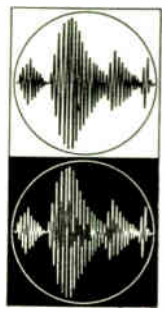
There are a couple of noises that come from the loudspeakers themselves. A raspy sound on certain notes may mean that the voice coil is rubbing against the magnet because it's off-center. Damage to one side of the suspension or to the cone may produce this. Or there may be a tiny piece of wood or metal lodged in the gap between voice coil and magnet. Bits of metal are apt to be pulled into the gap by the magnet when a speaker is out of its enclosure. Such foreign bits in the gap can usually be fished out by careful work with a thin strip of stiff paper or plastic.

But you may hear a practically identical rasp if you have severe multipath distortion in your FM reception. If you get the rasp only when listening to FM, you probably have multipath distortion and should consider using a more strongly directional antenna.

Very severe transient distortion anywhere in the system, including the speaker itself, can also produce a rasp, but this degree of distortion is most unlikely in any equipment that an audiofan would be willing to live with. A serious breakdown might produce it.

Finally, suppose your speaker rattles a bit every once in a while. Obviously the rattle comes only on certain notes. You can run it down yourself if you can borrow an audio signal generator. Feed the generator into your amplifier, set the volume high, and run slowly through the spectrum until you come to the rattle. Leave the generator set on the note that produces the rattle and explore the speaker enclosure. You will probably have to open it. Putting your hand firmly on various sections of the speaker and enclosure will usually lead you to the rattling bit.

There's your basic glossary of the language of noise. Knowing it well may save you a lot of lost time and lost fidelity.



the technical quality of records and tapes

Reviews are concerned with audio reproduction qualities, not musical performances by Edwin S. Bergamini

Made Without Microphones. (Ted Nash, etc. Repeat 100-5, tape).

The Repeat people aren't telling how they've dispensed with microphones. (Actually, they've used instrument pick-up transducers instead of microphones.) But their results are impressive. The quality is smooth (we added treble) and perhaps a bit bass-heavy (dig that low drum!). There's medium channel separation, ditto instrumental mix; the pickup presumably is directly from each instrument (an advantage when the engineer finds himself documenting a piccolo moving back and forth across the stage in "Don't Rain on My Parade"), no special stress (none needed) on depth, medium recorded level, and excellent channel balance. Hiss and crosstalk were low. Our most brilliant setup did the best by this tape. The smooth, sensitive Ted Nash sax is among the very finest we've ever heard.

Dusty Springfield (Philips PHS 600-174).

Disc jacket indicates material "partially recorded in electronically created stereo." Nearly impossible to tell the true from the counterfeit by ear, and the record jacket does't tell which numbers are recorded which way. Whether real or reprocessed from mono, the "stereo effect" is there for this singer and combo.

The Four Seasons Entertain You. (Philips, PHS 600-164, stereo (PHM 200-164, mono).

This was probably miked in a pretty dead studio, with minimum channel mix and maximum miking for each instrument, as well as reverb added to take the pall off the sound. Result: a walloper, especially when the boys are in full cry. In the last bands of Side 2, words shattered a bit; none of our test cartridges could convincingly avoid the chipped-china effect (who wants their china that way?). This included our pet elliptical stylus, as well. For the rest of it, instrumental placement and balance are excellent, and the recorded level medium.

Friendly Persuasion. Ray Conniff, his Orch. & Chorus. Columbia CS 9010, stereo (CL 2210 mono).

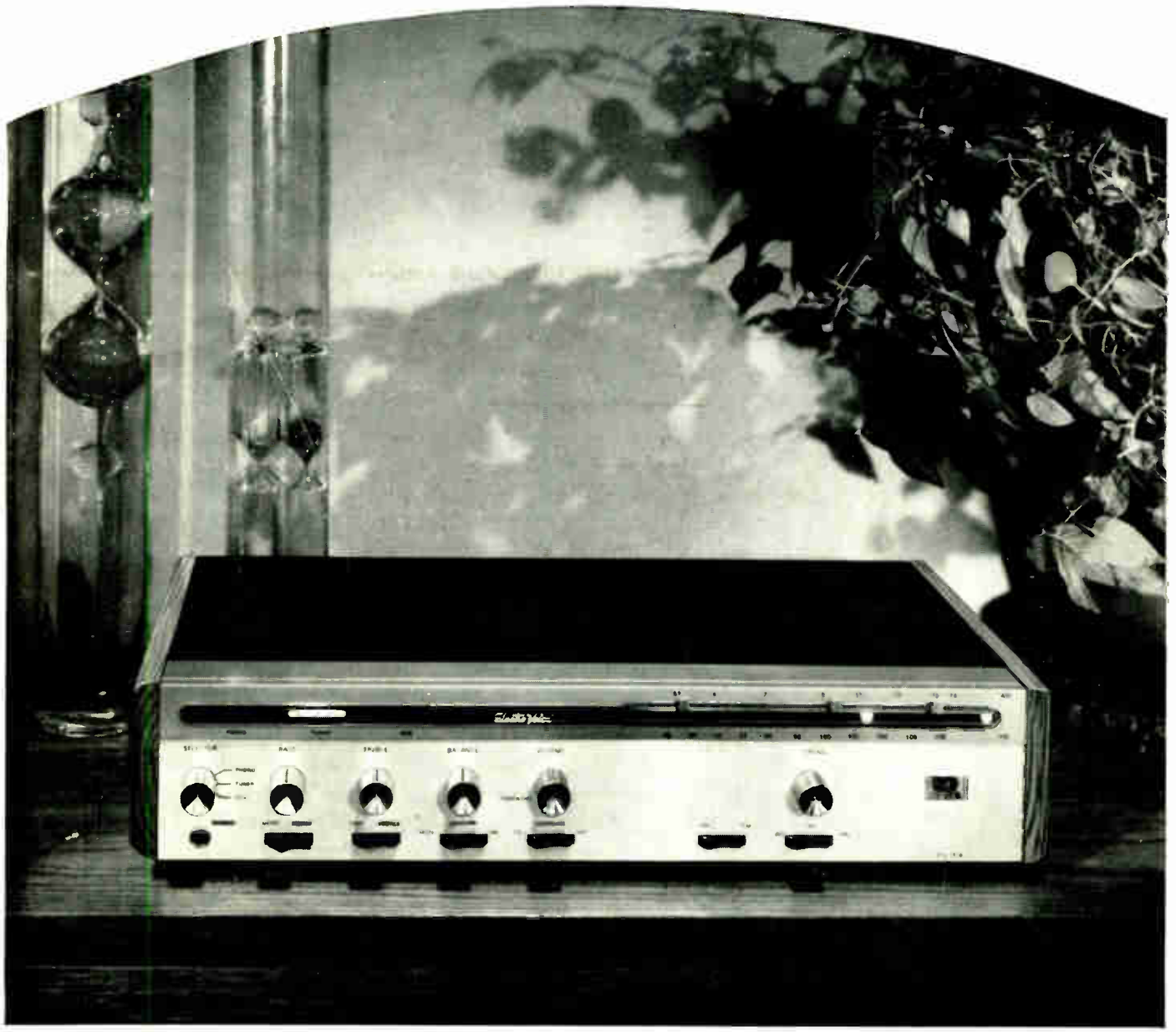
This is "no real problems" engineering; it suits the easeful Conniff stuff well. Biggish band, small chorus, large studio, many mikes. Depth is minor here, separation generally wide. The degree of channel-mix seems to vary from number to number (long's you don't get twitchy about the old locus, or feeling of environment, you won't be too disconcerted). With all those mikes (see disc jacket), placement had better be sure (it is). Level is medium high, balance good. Even our most brilliant rig was helped by a notch of added treble.

"Evenings in Erevan" (Monitor MFS 429).

This product has a curious and fancy processing. Even after careful channel balancing the solo voice (Jacques Duvalian), heard from the left side, goes farther left when channels are reversed. Very persuasive stereo effect in normal setting.

Cheers. Tessie O'Shea (with accompaniment). Command RS 872 SD, stereo.

Sibilants! The lady moves about a bit, as can be heard. Level is high, balance first-rate, placement of instruments and voices firm. O'Shea is given a good stereo stage, and is neatly surrounded by a chorus for some of the numbers. That stage is wide, but there's no ping-pong problem here; mixing has been carefully attended.



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