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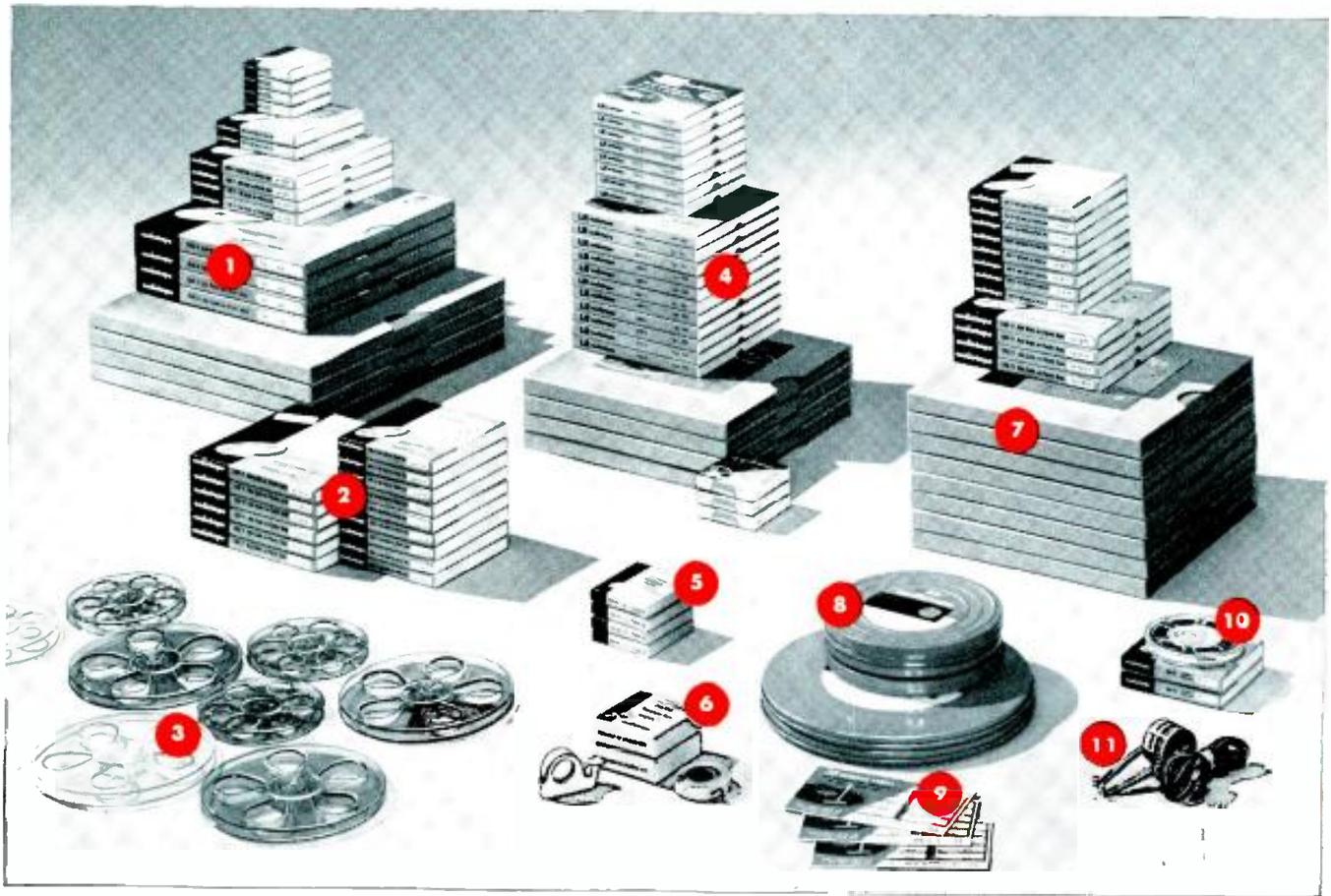
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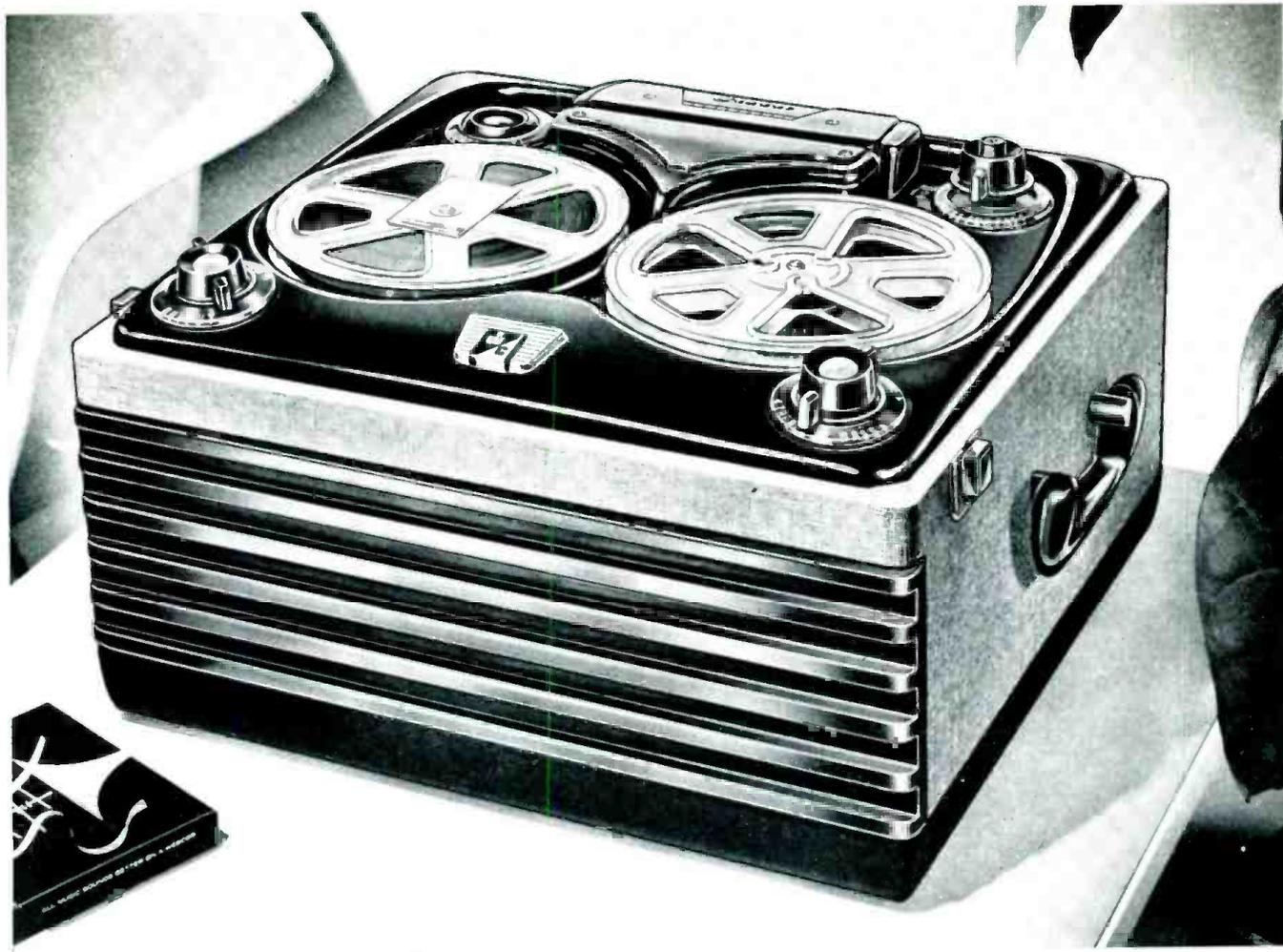
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VOL. 2 No. 5

MAY-JUNE, 1955

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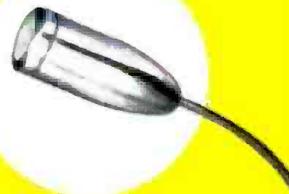
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NEW TAPES

By Charles D. Sigsbee

ALL of the tapes reviewed in this issue have two things in common. They are all tops for quality and some could be considered as standards against which others could be judged and all are dual track 7½ inches per second.

Many people have argued that you could not get maximum fidelity at that speed and width. Well, here it is. The RCA tapes, for the most part, sound better than their disc record counterparts on my equipment and my tape player is supposedly inferior

to my arm and pickup assembly. The veracity of this statement can easily be checked so I invite you to go to it.

The Omegatapes also sound full fidelity and closely match the RCA's in engineering quality. As we have also mentioned in previous issues, the tapes put out by Hack Swain, A-V Tape Libraries and Livingston are also pace-setters in quality.

Inasmuch as tape is a quality product it probably will continue to command a premium price as compared to records but

several firms have brought the smaller reels within record price ranges. Anyhow, when playing times are considered, tapes are an excellent buy. With the advent of low-priced playback only units, which will be announced shortly, we'll venture to predict a very bright future for tape records.

The reviews are set up a little differently in this issue and, I hope, should prove easier to follow.

CLASSICAL MUSIC

Gershwin — Rhapsody in Blue — Grofe — Grand Canyon Suite (Excerpts)
Byron Janis, Pianist
Hugo Winterhalter and his Orchestra
RCA VICTOR TB-3

Perhaps I am plebian but I prefer this over all other versions save one; the old Boston-Sanroma recording.

There is something about this recording that is vibrant and alive, not too highly concertized, sort of medium-rare and just right; perhaps the way that Gershwin intended it to be.

I never heard of Byron Janis before and just recently heard of Hugo Winterhalter but this evidence points strongly to the fact that I would like to hear of them again, and together.

Grofe fares as well in the three excerpts from *Grand Canyon* (Painted Desert, On The Trail, Cloudburst).

As for the fidelity; RCA included an excerpt from *Rhapsody in Blue* on their demonstration record, *Hearing is Believing*. The sound on this tape is better than that on the record, and at 7.5 inches per second, dual track!

Greig—Concerto in A Minor—Mendelssohn Concerto #1
Ania Dorfmann, Pianist
Robin Hood Dell Orchestra
Erich Leinsdorf, Conductor
RCA VICTOR TB-2

A deft and sure interpretation of two familiar, and well paired, piano works. The second movement of the Grieg is sensitively delivered by both the pianist and orchestra, a great contrast to the circus-music finale of the Mendelssohn piece on the reverse side.

Although the Robin Hood Dell orchestra is considered to be made up largely of members of the Philadelphia Orchestra, none of the famous and familiar sonorities of that organization are apparent on the tape. Perhaps the straightforward approach is to be desired in these two selections.

The balance between orchestra and solo instrument is good, although the piano is not quite as crystal clear as on the preceding recording.

On tape the recording stands alone which gives it considerable advantage over its record counterpart with thirteen competitors, including the formidable Gieseking-Von Karajan version.

Rodgers—Victory At Sea (Arr. by Robert Russell Bennett)
Members of the NBC Symphony Orchestra
Robert Russell Bennett, Conductor
RCA VICTOR TC-5

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It was difficult to decide under which category this brilliant arrangement belonged. Is it classical? Popular? Semi-classical? Semi-popular?

After repeated listening my mind began to conjure up imaginary choreography to this moving score, so the classification became self-evident. I'm not kidding about the choreography; I envision nothing more than a great baller to this music and wouldn't be at all surprised to see, one day, that someone had done it.

This recording is, in effect, a suite arranged from the thirteen hour original score for the Television series. It is divided into nine movements, each given a title which reflects an aspect of the sea portion of World War II.

The recording itself is flawless and may be properly called high fidelity. All of the elements are there; presence, dynamic range, balance, and frequency response. Better than its disc counterpart.

Tchaikowsky—The Tempest
Vienna State Opera Orchestra
Zoltan Fekete, Conductor
OMEGATAPE 6008

This is the orchestra of Thomas Scherchen and apparently it is their nature to turn out good recordings. Dramatic music, such as this, requires a dramatic orchestra and the Vienna group is every bit of that.

As for the music, I can't say for sure. The first couple of hearings are impressive but whether or not the impression would

last is a moot point. Perhaps it would pall soon like the *Romeo and Juliet* or *1812 Overture*. For a beginner's library or a high fidelity collection it should be well-suited.

This tape required a considerable treble cut and slight bass boost to make it conform to the standards of the others.

Side one had a fairly noticeable residual noise level, while side two did not. Whether this is peculiar to the tape we had for review or was on the master used for this particular tape we do not know.

Tchaikowsky—Serenade For Strings
Concert Artist Symphony of London
Mervyn Vicars, Conductor
OMEGATAPE 5002

There are now two (at least) *Serenades* on tape, the other is by the Sorkin Symphonette on the Webcor label, and I would say that you pay your money and take your choice. Both are good interpretations and well recorded although if I had to choose, I would be inclined to give this version the nod. But rather than take my word for it, I suggest you listen to both before buying.

The fidelity here is good. Like RCA, practically no equalization was needed which would suggest that the NARTB curve was used. This adherence to standards, which most of the pre-recorded tape people are doing is a wise move on their part. It assures the buyer of the tapes that he will receive music which can be played on his machine and sound right.



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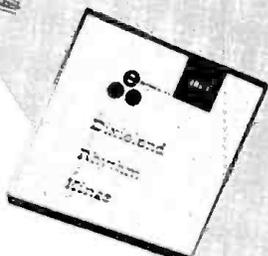
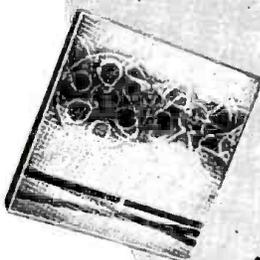
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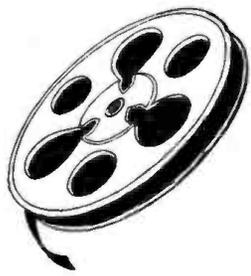
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Mozart—Piano Concerto #21, K. 467

London Mozart Ensemble
Mervyn Vicars, Conductor
Sergio Fiorentino, Pianist
OMEGATAPE 5007

Written by the mature Mozart (1785), this concerto illustrates the style that was to later have its profound influence on Beethoven. Many of its passages might well have been written by him.

The pianist and ensemble in this British recording turn out a searching and delicate performance of this beautiful concerto. Indeed, the interplay between orchestra and solo instrument is of a texture that can only be found in the later Mozart concerti.

Omega has reproduced this tape with re-

markable fidelity that succeeds in recreating perfectly the balance between the instruments.

Mozart—3 Salzburg Symphonies (K. 136, 137, 138)

London Mozart Ensemble
Mervyn Vicars, Conductor
OMEGATAPE 6001

Mozart's two chronologists, Koechel and Einstein, disagreed on the nomenclature of these works. Koechel, of the ubiquitous K., called them String Quartets, while Einstein labeled them Overtures. Whichever, they are here scored for chamber orchestra, sound quite pleasant and rather typical of the youthful Mozart.

The tape is well engineered and quite

clean, preserving the small orchestra feel of these three works.

POPULAR MUSIC

Dixieland Special—Pete Daily and Chicagoans Johnny Lucas and Blueblowers

JAZZTAPE 4003

Released by Omega, this tape has a greater fidelity than their previously reviewed classical offerings. This is an excellent presentation that should not be overlooked by Dixieland fans anywhere. The whole tape gets right to the roots of American jazz development.

The tape is good and clear with the soloists standing out in front aurally. I would say that the fidelity is as good as the best.

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AT5-5
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Rampart Street Ramblers—Wilber de Paris
New Orleans Jazz... Sensation, Hindustan, When the Saints Come Marching In, The Pearls, Prelude in C= Minor, The Martinique.



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Schubert — Unfinished Symphony, Sibelius — Finlandia

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D-100-1
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24.00 Set

Verdi — A Masked Ball (Complete Version) Paris Philharmonic Chorus Orchestra Radio-Symphonique de Paris. Rene Leibowitz, Conductor.

T-5-1083
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The above is just a fraction of the Titles available in this Hi-Fi tape library. Complete listings of Single, Dual, and Binaural track recordings available on request. For **QUALITY** reproduction all tapes are made at 7 1/2" per second.

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Inside Sauter-Finegan
The Sauter-Finegan Orchestra
RCA VICTOR TP-4

Another hard-to-define musical tape. Is it jazz? I have heard modern classical music that sounded worse. Poor way of putting it, perhaps, because I think this sounds wonderful, unusual, provocative. But what is it, jazz or classic—or neither?

The RCA accompanying brochure describes it this way:

"Well, as for the arrangements, one of our first considerations was shape. To define shape is a difficult thing. It is a composite of thickness and thinness of texture and sound. Rhythmic punctuation, tension and relaxation, the placement of climaxes, and generally, the organization of all the obvious and abstract elements that add up to a piece of music. It seems involved, but is in reality quite simple. Actually we should leave this to the musicologists to define, but since it is so important to us we thought we should mention it.

"Now, we didn't set out to create new sounds as such. We did want more elbow room, the freedom to move up or down in pitch as far as we wanted to go (within the range of human audibility of course) and in order to make clear the inner texture of the music—to provide a never-ending source of changing moods we had to have a variety of instrumental colors.

"To attain this there had to be a woodwind section of multiple doubles ranging from the standard saxophones to piccolos, flutes, oboe, English horn, clarinets, fifes and recorders. We added a full percussion section as a means of pointing up accents. A brass section of three trumpets, three trombones and a tuba. The rhythm is the usual guitar, bass and drums, with the pianist doubling on glockenspiel and celeste. Last, but not least, is a harp. This sounds like a vast conglomeration of instruments, as indeed it is."

And there you have it! As I say, it sounds like nothing I have ever heard, which is not meant to depreciate it in any way. The engineering job is magnificent and hi fi owners should give the tape quite a workout.

Jazz Lab—Frank Comstock
JAZZTAPE 4004

More of the above on a much smaller scale, but good. This is a recording studio job and, like the above, would never sound the same live.

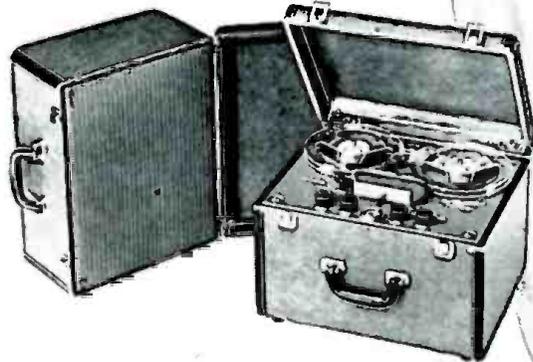
This tape is a little more orthodox in instrumentation, the sounds being derived from arrangement and musicianship only. Fidelity wise it is every bit as good as the Sauter-Finegan tape which is a superlative.

Melody Cruise to Italy
Irving Fields and his trio
OCEANIC OC 5-2

Here is a representation of the deal recently made between Livingston Electronic Corporation and independent record companies to distribute tape records.

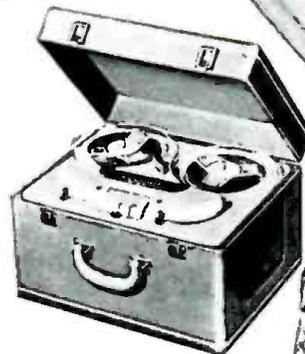
Irving Fields is a piano slylist of no small reputation as can be gathered from his arrangements of the Italian, and pseudo-Italian, folk songs recorded here. The collection is all familiar and should have you singing before it progresses very far.

Crestwood brings you new features...new models for 1955



CRESTWOOD new model 404 offers high fidelity response. (30 to 15,000 cycles at 7½" per second tape speed.) Gives you crystal clear performance — free from wow, hum and distortion . . . combined with model 402 power amplifier and speaker makes a two-case portable package . . . fits nicely into your hi-fi system and your budget, too!

Exceptional fidelity (50 to 10,000 cycles at 7½" per second tape speed) is featured in the new CRESTWOOD 304. New tape transport mechanism and professional type recording heads make the 304 one of the best values ever offered in a tape recorder . . . includes internal speaker, microphone, radio and TV connection cable.



The new CRESTWOOD consoles move tape recording enjoyment into a permanent and prominent position in your living room, den or recreation room . . . instantly ready to record or reproduce. Extended range dynamic speakers — fully baffled for complete range reproduction — give you truly outstanding sound quality . . . Choice of 300 or 400 Model Series in hand rubbed cabinets.



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BY DAYSTROM

Daystrom Electric Corp.
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753 Main Street, Poughkeepsie, N. Y.

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Town _____ State _____

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YOUR
OWN**

**HIGH
FIDELITY
RECORDS**

with the **REK-O-KUT**

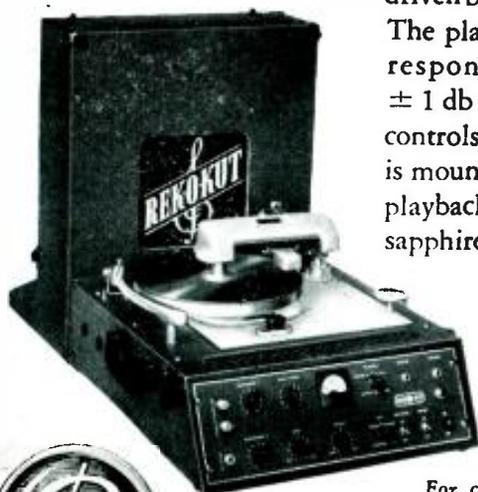
Challenger

**PORTABLE DISK RECORDER AND
PLAYBACK PHONOGRAPH**

The outstanding advantages of a disc recording is that it is permanent and it can be played back on any phonograph. Because of this, most tape recordings ultimately end up on discs.

If you would like to add your favorite tape recordings to your regular record library, it is a simple procedure to cut your own high quality record discs with a Rek-O-Kut Challenger. And you can also make direct recordings on disc—'live' or 'off-the-air'—at 33½, 45 or 78 rpm. And when the discs are finished, you can play them back immediately on the Challenger or on your own high fidelity music system.

The Challenger is the only portable recorder that employs a professional overhead cutting lathe with interchangeable lead-screws, and a turntable driven by a hysteresis synchronous motor. The playback amplifier has a frequency response from 20 to 20,000 cycles ± 1 db with independent bass and treble controls. A wide-range 10-inch speaker is mounted in the detachable cover. The playback arm is equipped with a dual sapphire magnetic pickup.



REK-O-KUT Challenger

for 33½ and 78 rpm—with Standard Groove Leadscrew \$459.95

45 rpm Accessory Idler 8.00

For complete description, write Dept. CE-24

REK-O-KUT COMPANY
MAKERS OF THE FAMOUS *Rondine* TURNTABLES
38-01 Queens Boulevard, Long Island City 1, N. Y.



Dancing Party

Sonora Matancera and his Orchestra
A-V TAPE LIBRARIES—AV-508

Eight numbers are featured on this tape, all of them Latin American rhythms including two mambos, two son mambos, two Bolero mambos and a Guaracha mambo. The tape which we had for review was a 7½ ips double track. The reproduction was excellent, clean cut and with full frequency range, quite up to A-V's usual high standard. This tape should be a natural for the groups who are learning the latest dance steps or for that party you are planning.

Let's Dance—Mambo

Charlie Palmieri Sextette and the Joe Roland Trio
A-V TAPE LIBRARIES—A-V 506B

This reel contains nine numbers played in mambo style. The first track has five tunes played by the Charlie Palmieri Sextette and the second track has four numbers by the Joe Roland Trio. There is some excellent piano work evident in the first set of tunes, which for the most part are familiar numbers done in mambo rhythm. Among them are Lullaby of Broadway, Night and Day, Sometimes I'm Happy and the Continental. The Joe Roland Trio plays Poor Butterfly, Lovers Mambo, I'm Getting Sentimental Over You and the Jingles Bells Mambo. The combo does a slick job on the mambo tempo with the mariba predominating in the numbers. Like the tape reviewed above, this should be a natural for those interested in the Latin American music or dances. Also like the previous tape, the recording is clear and clean, technically excellent.

The Investigator

Recorded Tape-of-the-Month-Club, Inc.
No. 102

This is not a musical tape. It is an imaginative and powerful political satire concerning a congressional investigator who finds himself in Heaven or "Up Here." This comic-tragic fiction documentary is the original production starring John Drainie and written by Canadian script writer Reuben Ship. It is a real collector's item. The full-track reel runs one full hour at 3¾ or can be had dual-track at 7½ ips. and is one that can be played over and over again with new facets appearing each time you hear it. Prior to writing this review, we have played it at least five times and still look forward to hearing it again. The cast is superb from start to finish and the story when thought about can leave you deeply moved. Yet there are many times in the satire when you will hold your side with laughter. To say it is unusual is to make an understatement. We understand that the Recorded Tape-of-the-Month Club is making a sample of this tape available to anyone, on a four-inch reel, for only \$.50. We'd suggest you look into it.

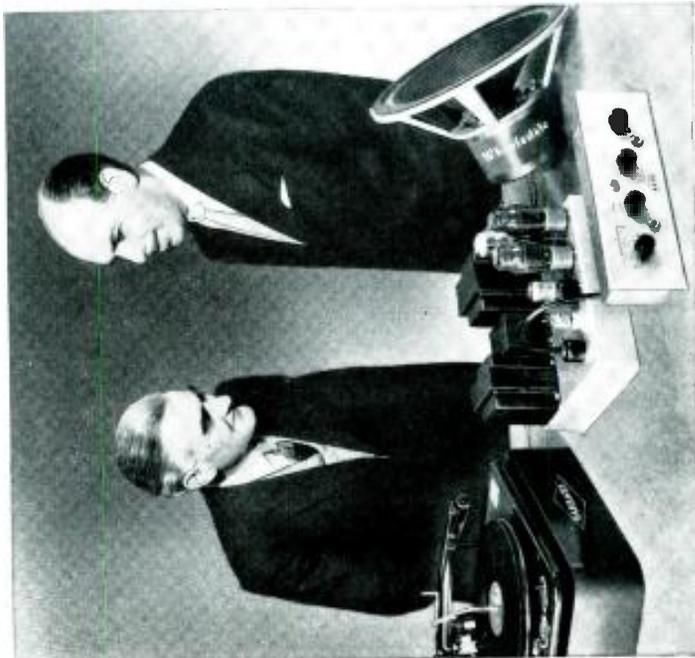
Tunetapes, box 2110, Hollywood 28, California, plan to publish in volumes ten hit tunes on 5 inch reels to sell at \$4.95. These will consist of top numbers on the Hit Parade plus standards by such composers as Johnny Mercer, Cole Porter, Richard Rodgers, Irving Berlin, etc. They plan to keep the series current with a new issue of ten top tunes each month.

NOTE: The only amplifier especially equipped with input and output tape recorder jacks on the front panel!

**Harold J. Leak, Esq. explains...*

How the LEAK "Point One" high-fidelity amplifier actually duplicates the original music

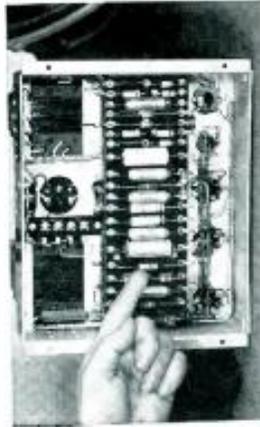
... and how it simplifies radio-record playing and tape recording



LC: Mr. Leak, please tell our readers what the "Point One" amplifier combination does in a high fidelity music system.

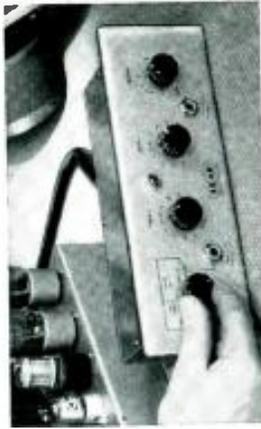
HJL: As you know, Mr. Carduner, the amplifier is actually the "heart" of the system. Your record player, radio tuner, or tape recorder feeds electrical impulses into the pre-amplifier and amplifier. These, in turn, strengthen the signals and feed them into a speaker.

It is difficult to strengthen a signal without distortion. "Point One" means that the Leak reproduces voice and instruments with insignificant harmonic distortion of 0.1% at 8 watts! This gives the illusion of the actual "presence" of the performer.



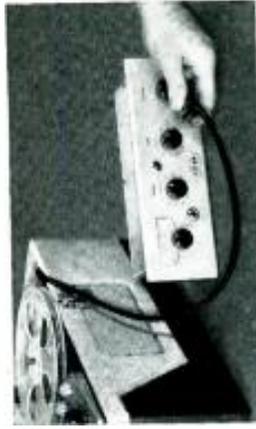
LC: In demonstrating the "Point One" amplifier at Audio Fairs, the most impressive thing we do is to turn the amplifier on its side, show people the terminal board "custom" construction used in American scientific instruments, almost never in radios.

HJL: We had a practical reason for this... because every terminal connection is easily accessible. It keeps servicing costs down...



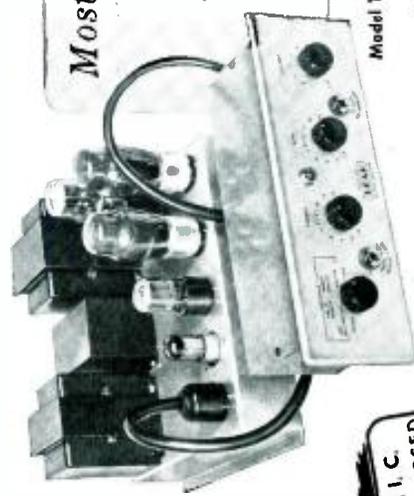
LC: Yes, and many have praised the control panel of the "Point One" pre-amplifier, because it offers every sensible adjustment to match the new hi-fi records... And full 25 db bass and treble range.

HJL: In fact, the "Point One" has more adjustments than the Leak amplifiers supplied to the BBC, but no superfluous settings to add unnecessary cost.



LC: Well, you have one very important exclusive feature. Plug-in jacks on the Leak front panel make it easy to give any tape recorder the full benefit of the Leak circuit, in recording and playback! People with portable tape recorders, who put them away when not in use, can connect them instantly. Practical features like this make the "Point One" most enjoyable to use.

*Most economical combination ever built by **LEAK** manufacturer of Britain's finest audio equipment*



Model TL/10 \$109.50 (Pre-Amplifier, Control Panel, and Amplifier, complete in every respect, including tubes)

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A quality-endorsed product of the British Industries Group, which includes Garrard Record Players, Leak Amplifiers, Wharfedale Loudspeakers, and R-J Enclosures.

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An interview between Harold J. Leak, Director of H. J. Leak & Co., Ltd., London, and Leonard Carduner, President of British Industries Corporation, New York. B.I.C. is an American company which offers you Britain's finest audio equipment... all fully guaranteed, with service and spare parts available throughout the U.S.

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NEW PRODUCTS

AMPRO CLASSIC RECORDER



The Classic Two-Speed, heavy-duty tape recorder, designed for rugged handling by students and teachers in schools and institutions, is marketed by Ampro Corporation, 2835 N. Western Ave., Chicago, Ill. It has speeds of 3 3/4 ips with a frequency response of 40 to 6,000 cps, and 7 1/2 ips with a frequency response of 40 to 12,500 cps. Other features include formica-like plywood 3/4" side panels with shock-absorbing Gen-u-wood rubber runners; Kalistron vinyl flame resistant, scratch, chip, crack and water-proof covering on top, bottom and rear; perforated, gold-finished steel grille full front; all electronic piano key controls; and pistol-grip cabinet handle. It is also available in recorder-radio combination model. The price is \$257.50, plus \$34.50 with radio.

L-P TAPE



ORRadio Industries, Inc., Opelika, Alabama, announces its new Irish brand, LP #600, long-playing magnetic recording tape, featuring the new Ferro-Sheen process.

EXPERT TAPE DUPLICATION

7" Tape Duplicated, any speed \$5.95
5" Tape Duplicated, any speed 4.95
Price Includes Tape
LP RECORDS MADE FROM YOUR TAPE—ANY SPEED
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This tape is available in standard reel sizes, in bulk and on either 1-mil acetate or Mylar polyester film base. The manufacturer claims that this tape reduces head wear, has a wider frequency range, less noise and reduced drop-outs. A 50% increase in playing time is obtainable with this tape. For additional information write Nat Welch, above address.

E-V SLIM MIKE



Electro-Voice, Inc., Buchanan, Mich., is marketing its Model 623 slim-type, dynamic microphone with the E-V Acoustalloy diaphragm, for public address, paging, home recording and radio amateur communications, either indoors or out. It can be used on a stand or in the hand and in vertical or angle positions; polar pattern is omnidirectional; it has a frequency response of 60 to 11,000 cps and output level —55 db.; it is finished in Satin Chromium, supplied with 18 ft. cable, and you have choice of Hi-Z or Low-Z by changing one wire in the cable connector. Its size is 1-5/16" x 7-1/2", it weighs 15 oz., and it is priced at \$49.50. For full details, write to Electro-Voice, above address.

FIDELIVOX TAPES

Electrosonic Specialties are marketing Fidelivox brand recorded background music tapes which feature concert organist, Robert Elmore. A real cathedral pipe organ is used and the manufacturer claims that the best of recording equipment, together with experienced recording engineers captures its full timbre. These tapes are available in 2, 4, 6 and 8 hour sections, dual track,

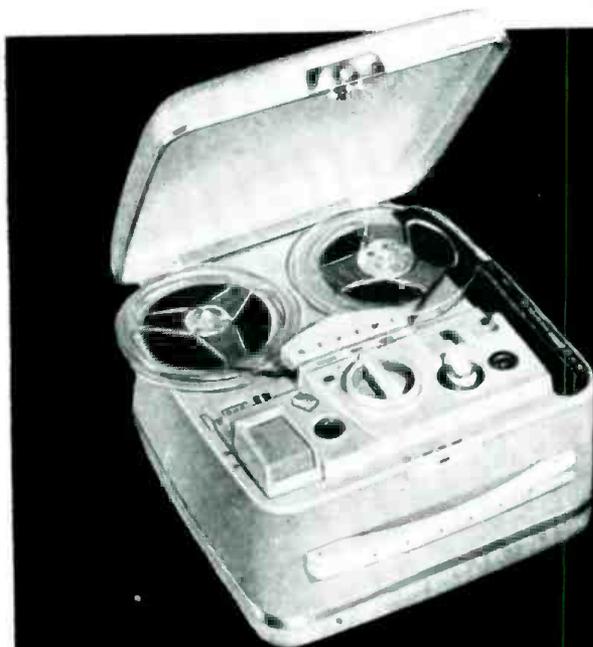
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Revere's exclusive *Balanced Tone* makes the difference
 in the brilliant high fidelity of
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The incomparable high fidelity and rich tonal quality of Revere Tape Recorders is the direct result of a Revere exclusive, patented feature. "Balanced-Tone" is the control that coordinates amplifier and acoustic system response to emphasize both high and low tones, giving strikingly realistic HIGH FIDELITY sound reproduction, even on low volume. Compare and you'll choose REVERE!



T-1100 DUAL-SPEED CONTEMPORARY. Single knob control, 3-hour play, two matched speakers, 360° sound distribution. FREQUENCY RESPONSE: 3.75 i.p.s. 85-7,000 ± 3DB; 7.5 i.p.s. 75-12,000 ± 3DB. WOW 0.3% Max. With microphone, radio attach. cord, tape, reels, \$159.50



T-700-D DUAL-SPEED DELUXE. Records up to 3 hours with long-play tape. Automatic keyboard controls; index counter. FREQ. RESPONSE: 3.75 i.p.s.—40-7,500 ± 3DB; 7.5 i.p.s. 40-14,500 ± 3DB. WOW 0.3% Max. With microphone, radio attach. cord, tape, reels, \$212.50



Announcing
REVERE T-11 CUSTOM RECORDER
 For professional use and custom home installation. Accurate 7.5 i.p.s. tape speed. Solenoid operated keyboard push-button control. Revere patented automatic head demagnetization. Two-level recording indicator. Index counter. Accepts 3, 5, 7 and 10 1/2-inch reels. Monitor amplifier with 2 1/2 watt output; cathode follower output, 2200 ohms at 1 volt. With adapters and plugs\$264.50
 FREQ. RESP. 40-16,000 ± 3DB
 WOW AND FLUTTER less than 0.2%

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noted pianist



MARIAN ANDERSON
famed soprano



ANDRES SEGOVIA
foremost guitarist



ZINO FRANCESCATTI
brilliant violinist

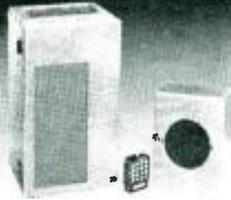


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A.C. Operated Magnetic Tape Recorder Message Repeater

Ideal for: Point-of-Sale Advertising ★ Super Markets & Stores ★ Industrial Exhibits Window Displays ★ Hotel Lobbies

Model A records and plays back messages, music or sound effects totalling 10 minutes in duration at 3 3/4 ips. Model B operates at 7 1/2 ips and records material for a period of 5 minutes. Employs a continuous loop cartridge of standard 1/4" wide magnetic tape which runs intermittently or continuously for any length of time without loss of quality or wear. Designed for dependable, permanent trouble-free performance. Easily placed anywhere.

Measures 15 3/4" H. x 7 3/4" D. x 9" W. Weighs only 13 lbs. Furnished complete with microphone tape cartridge, enclosed 5" loudspeaker and instructions.

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- This first book for nonprofessionals, devoted exclusively to the tape recorder, gives the complete story of what it consists and how to use it. Based on more than 2500 experiments.

- Contains a simplified course in hi-fi principles and terminology which enables you to understand and evaluate manufacturers' specifications: db, cps, ips, dynamic range, sound patterns, frequencies, etc.

- Photographs and specifications of 55 magnetic recorders guide you in deciding which type and make of recorder you would like to own.

- Hundreds of uses are given for enjoying your tape recorder at home, in schools, churches, camps, meetings, business, outdoors, etc.

- Explains each component from A to Z (its function and care) and suggests new accessories. Illustrated with photographs, charts, drawings and diagrams.

YOUR TAPE RECORDER

by Robert and Mary Marshall

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with 30 second breaks once each hour being the only interruption of the fine music. Details and prices are available from Electrosonic Specialties, 7230 Clinton Road, Upper Darby 2, Pa.

NEW RCA RECORDER



RCA, Camden 2, N.J., has introduced a new recorder-reproducer unit, Model SRT-1, which is designed for simple plug-in connection to home-assembled high-fidelity music systems. It has a frequency response of 50 to above 10,000 cycles, speeds of 7 1/2 and 3 3/4 ips, and a maximum reel size of 7". This unit also features half-track recording, can be installed in either vertical or horizontal position, has rapid rewind speed, an interlocking device which minimizes accidental erasure, and a monitor jack for plug-in earphones. The chassis can be installed in bookcase, storage cabinet, or furniture units, and it is priced at \$325. For additional details, write to RCA.

ELECTRO-VOICE SKYLARK



Electro-Voice has announced its new Skylark three-way loudspeaker system which is housed in an attractive, compact cabinet. The entire sound spectrum is divided into three segments. The Skylark incorporates two tapered horn ports which load properly the low-frequency and mid-range reproducer from 70 to 3500 cps, and a super very-high-frequency tweeter takes over at this point to beyond audibility. A large cone reproduces the lower frequencies and mechanical crossover is made to a smaller cone which has the lowest distortion of any reproducer in the industry—less than 1/4%. The complete threeway system is priced at \$89.70 net in mahogany and \$92.70 net in Korina blond. For complete information, write to Electro-Voice, Inc., Buchanan, Michigan, and ask for Bulletin No. 219.

A-V TAPE PLAYER



A-V Tape Libraries, 730 Fifth Ave., New York 19, N.Y., is marketing the Allegro Model T-10 tape player. This inexpensive unit plays back recorded tapes at either 7 1/2 or 3 3/4 ips, but it cannot record. The machine has a built-in preamplifier and features dual track heads. It lists for \$89.95. For additional information, write to A-V Tape Libraries, above address.

MASCO MODEL 500



A new Masco Model 500 tape recorder, manufactured by the Mark Simpson Manufacturing Company, has been announced. This model has a frequency response of 50 to 12,000 cps plus or minus 3 db, maximum reel size of 7", and it weighs 23 pounds. It also features dual speed-dual track, single shift knob, two neon recording level indicators, positive braking action, instantaneous changeover from fast forward to fast reverse, ivory and gold decor with luggage type leatherette covering of DuPont Fabrikoid, and it comes complete with a 7" reel with 600 feet of tape, a take-up reel, a ceramic microphone, 10 feet of cable, and a patch cord. It is priced at \$168.50. Further details may be had by writing the Mark Simpson Manufacturing Co., 32-28 49th Street, Long Island City, N.Y.

listen!



The Ampex 600 monitor selector switch lets you make an instantaneous listening comparison between what is fed to the tape and what the tape plays back to you. (Ask your local Ampex distributor for this demonstration*)

... and you will hear how perfect a tape recorder can be

On the Ampex 600 it takes the most perceptive listening to hear even the slightest difference between what goes into the recorder and what the tape plays back.

Listen again . . . after an Ampex has run for thousands of hours. The comparison will still be equally favorable. This sustained performance is something that specifications do not show. But this is the reason why Ampex has become a magic name.

For recording from F-M radio, copying of valuable records, playing of pre-recorded tapes or the making of personal or professional recordings, the Ampex 600 is a permanent investment in satisfaction.

ARTHUR FIEDLER *listens...*

"A studio Ampex is a cherished part of my home high fidelity system. But hearing this new Ampex 600 was a real surprise. It's such a convenient size, yet like my big Ampex it is a superb recording and reproducing instrument."

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AMPEX 600 PORTABLE MAGNETIC RECORDER

- 40 to 15,000 cycles response at 7½ in./sec. (± 2 db from 40 to 10,000 cycles; down no more than 4 db at 15,000 cycles).
- Over 55 db signal-to-noise ratio.
- Flutter and wow under 0.25% rms.
- Prices — \$498 unmounted, \$545 in portable case.

AMPEX 620 PORTABLE AMPLIFIER-SPEAKER UNIT

- Matches the Ampex 600 in appearance and quality.
- Price — \$149.50 in portable case.

For full specifications, write today to Dept. F-1887



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protect your tape library
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Reel Cabinets



Provide efficient, economical storage for valuable tapes. Available in three sectional models for 5", 7" and 10½" reels. Additional units may be added to the initial cabinets as the library increases. Also available in double door units with lock.

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FANFARES AND MANY MORE...
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Record your own dramatic productions at home... Bring up the theme... fade in the mood music for the opening scene. Turn on the rain... bring up the thunder and lightning.

Crowd noises, animal sounds, train whistles... all at your fingertips with "Major" Production aids. Your friends will enjoy your broadcasting party when they hear how they sound
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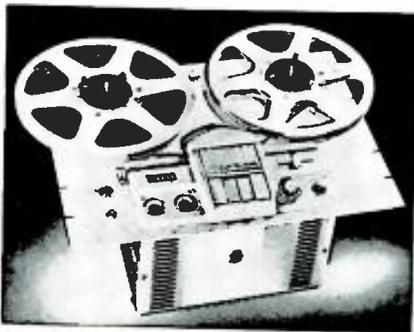
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REVERE RECORDER



Revere Camera Company, 320 East 21st Street, Chicago 16, Illinois, is marketing its Model T-11 tape recorder supplied without a case for custom hi-fidelity installations. This machine has a frequency response of 40 to 16,000 cps plus or minus 3 db, a speed of 7½ ips, less than .2% flutter and wow and a maximum reel size of 10½". It also features airplane type self-adjusting disc brakes, adjustable recording head azimuth, electrical remote control with automatic drive roller release, keyboard control, automatic head demagnetizing, two hum balancing controls, modulation distortion less than 1%, and a monitor amplifier with 2½ watt output. The recorder is designed for 19" vertical rack mounting as well as horizontal operation, and it is priced at \$264.50. For additional information, write to Revere, above address.

VM CONSOLE SPEAKER



V-M Corporation, Benton Harbor, Michigan, is marketing a new line of accessories for the Model 700 Tape-o-matic recorder. The leader among these is the Deluxe Console Speaker, a 12" Alnico 5 permanent magnet speaker matched to portable base reflex chamber. Its case has gold metal grille, rose and gray covering to match the Model 700 and a convenient carrying handle on the top. Also, a 25' sound cord with plug is supplied, with a convenient compartment for storage of cord, tape and microphone.

SECRET RECORDER



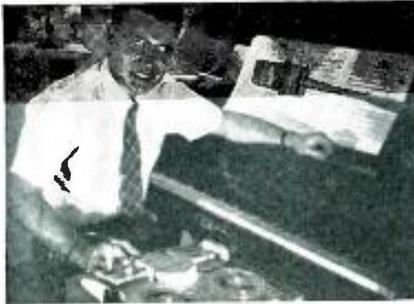
The Amplifier Corp. of America, 398 Broadway, New York 13, N.Y., has introduced its new Secret Recorder which comes camouflaged in an average size leather briefcase and is useful in investigative work. It weighs 11¾ lbs. and is 16" long, 12½" tall and 4½" wide. This machine has a sensitive built-in microphone and a constant level recording amplifier which automatically equalizes the intensity of nearby and distant sounds; it requires no warm-up delay and has instant starting and stopping; it provides continuous recording for 1½ hrs. at a tape speed of 1½ ips using long-play ¼" tape; it has a built-in preamplifier for earphone playback and may also be fed into any external amplifier with loudspeaker for greater playback volume; it has a low drain motor powered by five easily replaceable mercury batteries. For additional details and price, write to above address.

FILMAGIC CLOTH



A new material known as Filmagic cloth has been introduced by The Distributor's Group, Inc., 756 West Peachtree Street, N.W., Atlanta, Georgia. Colorless Silicones have been impregnated into a soft, scratchless flannelette to provide a waterproof and dirt-resistant coating when applied to film, slides, records, recording tape, etc. It cleans, polishes and protects such surfaces. This cloth can be washed again and again without losing its effectiveness. A Standard size cloth sells for \$2.00 and the De Luxe size for \$3.50. For a sample swatch and instructions, write The Distributor's Group, Inc., above address.

TAPE CLUB NEWS



... organ builder

A member of The Voicespondence Club, Harry Place of Nutley, N.J., has designed and built an electronic organ attachment for his piano. Harry records music played by himself on organ, piano, or both, and he would like to contact other recorder owners interested in organ building. He may be reached by sending replies in care of The Voicespondence Club. See address in box below.

Voicespondent Roy Howard of California suggested and carried through an idea to help all members locate one another's home in the United States. He arranged for The Texas Company to supply maps free of charge to all members. The Club sent a postal card along with its recent bulletin for its members to simply fill in and mail to receive their maps. A nice idea and a fine gesture on the part of The Texas Company.

A newly organized tape recording society known as The International Recordist Club is seeking new members interested in tape recording, especially recordings of music and drama. The club invites members from the United States, France, England and Italy to correspond and exchange tapes. This organization will issue a regular club bulletin. Send all replies to Robert McHaffey, 71-19-67th Place, Glendale 27, N.Y.

NEW BOOKS

Electronic Musical Instruments by Richard H. Dorf. 6 x 9 1/4", cloth bound, 326 pp., 255 illustrations. Published by Radio Magazines, Inc., Mineola, New York. \$7.50.

This is Radio Magazines' first venture into the "regular" book publishing field and they have made an auspicious start. The author is an engineering consultant and music lover, as well as a player of both the piano and the organ. This happy combination of circumstances is reflected in the book. He has also designed two organs, the latest of which will be made available in kit form for those who would like to construct their own.

Beginning with the nature of music and musical instruments, the book is divided into 22 chapters which progressively cover such

A friendship club, known as the World Exchange Club Cosmos of Sweden, has a section devoted to recording. This organization issues a magazine called "Pen Friends", and it has members from various countries throughout the world. Erik Lindgren, Masvagen 14 a, Lund, Sweden, is the manager of this club.

Leroy J. Brown, Jr., 540 No. Ninth St., Reading, Pa., would like to organize a tape recording correspondence club for teenagers in the vicinity of Reading and Berks County and the outlying counties. For complete details, contact Leroy at the above address.

The Sunland-Tujunga, California, Rotary Club is contacting Rotary Chapters in countries outside the United States by means of World Tape Pals. It is preparing a series of tape exchanges with the other clubs. The tape from Tujunga will include a typical club meeting, a round table discussion and some music. The first clubs with whom they are establishing contact are located in towns in Chile, Brazil, Rome, Sweden and Alaska.

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TAPE RESPONDENTS INTERNATIONAL

Fred Goetz, Secretary
P. O. Box 1404T, San Francisco, Cal.
THE VOICESPONDENCE CLUB
Charles Owen, Secretary

Noel, Virginia
WORLD TAPE PALS

Harry Matthews, Secretary
P. O. Box 9211, Dallas, Texas
INTERNATIONAL TAPE WORMS
Art Rubin, National Chairman
P. O. Box 215, Cedarhurst, L. I., N. Y.

GLOBAL RECORDING FRIENDS
Alfred L. Sferra, D.D.S., Secretary
125 Hamilton Street, Bound Brook, N. J.

The secretaries of the tape correspondence clubs will deeply appreciate receiving a self-addressed stamped envelope from those making inquiries about membership.

subjects as: Musical Facts, Requirements of an Instrument, Tone Color, Installing and Servicing Instruments, Constructing Instruments, Building the Thyratone, The Electronorgan (the one available in kit form) and a chapter on each of the major organs on the market today including the Hammond, Baldwin, Minshall, Wurlitzer, Allen, Lowery Organo, Hammond Chord, etc.

All are illustrated with pictures of the instruments, their component parts and the wiring diagrams and data for each. A section on electronic music patents is included in the appendix.

To the person with some knowledge of things electronic and an interest in electronic musical instruments, this book will be of great interest. So far as we know it is the only up to date book on the subject.

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TRG-5

QUESTIONS & ANSWERS

Questions for this department may be sent on tape or by means of a postcard or letter. Please address your queries to, "Questions and Answers," Film and TAPE RECORDING, Severna Park, Maryland. The most interesting and widely applicable questions will be used in this department and all inquiries will receive a tape or letter reply.

Q—We have an Ekotape recorder in our church for various uses. I am interested in the proper method of recording choir music. Can you help me with this problem?—D.R.L., New Cumberland, Pa.

A—The best plan for such recording is to set up your equipment and have the organist and choir combine their efforts on the loudest passage of music and set the level for recording so that the loudest passage is fully recorded. Don't change this unless it is necessary to bring up a very soft passage. Also, the microphone should be placed so that the organ and choir are in balance. This will depend upon the shape of the church and the position of the organ and the choir. There are few set rules for this type of recording.

Q—My recorder has two speeds, 3¾ and 7½. What are the different speeds used for? The instructions that came with the recorder do not cover. I have recorded several 7" reels of tape at 7½ speed, however. I found that by using the 3¾ speed I could get twice as many recordings on the same tape, with what appears to be no difference in tempo of music, etc.—A.A.Y., Chicago, Ill.

A—The lower speed will give the greatest economy and is adequate for voice recording and recording from AM radio which is limited by law to 5000 cycles. For the recording of live music and FM broadcasts, especially live FM programs, the 7½ speed is superior. The speed of the tape has no bearing on the speed of the music. Recordings made at either speed and played back at the speed at which they were made will reproduce the original material exactly.

Q—Can one make a duplicate recording by using two recorders by having the recorded tape on one recorder and the output of the first recorder plugged into the input of the second recorder? Can you record at the same speed or different speeds and get a good recording?—A.M., Afton, Mo.

A—Duplicate recordings are made in exactly the way you suggest. While there is some loss in quality, with care this is negligible. The output should be connected to the proper input so that a good impedance match is obtained with minimum noise and distortion. We refer you to the article on hum that begins on page 43 of this issue. Recordings may be duplicated at any speed. Some of the professional duplicating recorders run 30 or more inches per second to make tapes for playback at standard speeds.

Q—A very perceptible noise is heard as a background to my FM programs when certain makes of automobiles are passing in front of the house. It increases and decreases with the passing of the car. My recorder

faithfully records the noise along with the music, spoiling the best recordings. Is there any filter for this type of interference?—R.P., Iberville, Que.

A—There is no filter that will screen out this type of interference. We would suggest that you use a shielded lead-in which will help cut down the pick-up from the ignition of the passing cars, if not eliminate it altogether. If you are located in a fringe area it is possible that the signal strength is not sufficient to load the discriminator or ratio detector of your set and block out the noise. A better antenna would help to improve this.

Q—I just discovered your magazine and I feel it will fill a long standing need of tape recording enthusiasts. I am especially interested in the "Questions and Answers" department since I am a Bing Crosby collector and I have decided to dub my collection of approximately 440 discs on to tape and possibly sell the disc collection. However, I have heard that tape recording fades after a period of about five years due to the magnetic attraction of the earth and must be stored in lead-lined boxes to prevent fading. Is there any truth in this and where can these boxes be obtained?—D.C., Reisters-town, Md.

A—The magnetic field of the earth is too weak to have any effect on tape, however, the strong electrical fields of power lines or nearby motors could affect a recording. With proper storage conditions, tape should last far beyond the period you mention. As tape recording is relatively new, no definite figures have been established on its life. It would seem that the life of a tape would be the same as the life of the base material. The cellulose acetate material currently used as a base has been kept over ten years with no change and the new Mylar and Polyester bases are guaranteed for a lifetime. Regarding fading, we would like to call your attention to the experience of Tony Schwartz whose magnificent collection of tapes have been kept in their regular boxes, in an apartment with no special precautions. After eight years, there is no noticeable change from the original recording (see page 28 of this issue). Tape is best stored under ordinary conditions, a temperature from 60 to 70° F and a relative humidity of from 40 to 60%. Lead lined boxes are definitely not necessary—in fact they would be useless. If storage in a metal container is desired, use an iron or steel container which will serve to protect the tape from any accidental contact with electrical devices or fields. The metal container will absorb the magnetic field and protect the tape from it. Using Mylar or Polyester base tape, no special temperature or humidity factors need be taken into account to preserve the life of the material.

TAPES TO THE EDITOR

When sending tapes to the editor please use the 3" reel and indicate the speed at which it was recorded and whether it is dual or single track. We will listen to your tape, make notes from it for use in this column and then reply on your tape. Please keep tapes reasonably brief.

If you do not own a recorder a letter will be acceptable. Address tapes or letters to: The Editor, Film and TAPE RECORDING, Severna Park, Md.

To the Editor:

As a charter subscriber to TAPE RECORDING, I was deeply grieved to lose my file of this splendid magazine in a fire last week which wiped us out 100%, including my recorder equipment, the tapes, etc. If you know of anybody who has a set of back issues they no longer need, I'd appreciate hearing from them.—Edward D. Hurley, 594 Lake Shore Road, Manchester, N. H.

We were very sorry to learn of Mr. Hurley's plight and have sent him the Dec. 53, Oct. 54, Dec. 54, and Feb. 55 issues. Our supply of the other issues is now exhausted and we hope he will be able to obtain the remainder of back issues from some other source. Anyone who has spare copies of the missing issues please contact Mr. Hurley.

To the Editor:

I am Italian and I have a copy of your magazine. I like it very much and enclose the money for a subscription.

I do not have a tape recorder because here in Italy they are too expensive. It would be a dream if I could have one, and I would like to record the first words of my daughter. Do you know of some old one that might be of interest to me?—Repetti, Vincenzo, Via S. Bernardo 11, Piacenza, Italy.

To the Editor:

Like Jerry L. Heisler of Hopkins, Minn., I also recently purchased a tape recorder and wish to give praise to the wonderful magazine you are publishing. I too second his suggestion that you publish more articles for home users. Please don't just keep the suggestion in your mind, get them in the

magazine where we can read and learn how to exploit our recorders to the fullest.—Raymond King, Phila., Pa.

To the Editor:

I hope it is not too late to reply to Dr. Roger C. Terkuile's letter which appeared in your December issue.

He stated that tape recording was expensive. That it takes the finest in recording and playback equipment even to approximate the results obtained from a fine LP record and that tape recording is a nuisance. If by that statement he would include broadcast recordings, which the sweeping nature thereof would imply, then in my opinion he is completely in error. My tape recording experience also goes back to 1951. With the benefit of only a medium priced recorder and a floor model FM console I have built up a library of good-music station tape recorded broadcasts in the Washington area which, at only the fraction of the cost of LP's, are the envy of several of my LP friends. And this at the 7½ speed! Especially have I found the live broadcasts to be superior to the excessively amplified LP recordings one so often hears.

As for expense, I have yet to hear an LP recording which matches in quality a tape I made this winter of Ralph Kirkpatrick playing a harpsichord recital at the Library of Congress. Cost of the entire concert, including the Bach Goldberg variations and ten Scarlatti sonatas: about \$2.75. Cost of a comparable LP: \$10.00 more or less. Long ago the saving in tape cost more than matched the extra (\$75) cost of the recorder, as compared to a record changer.

One priceless advantage of tape recording is that one is thereby able to obtain direct FM broadcasts which, if well engineered, are, in my opinion, superior to any LP recording. The latter may have excellent, and frequently excessive, clarity of reproduction but invariably there is a thinness, a lack of "full body" which the direct FM recording has in abundance. I find proof of this by comparing tape recordings I have made of the Budapest Quartet, some of which are made from LP's and the rest from direct broadcast. If one can ignore the coughing and program rustling, the latter are superior.

Granted, these ideal conditions for recording are not for everyone. By the same token, where these conditions do exist, statements to the effect that tapes are inferior in quality to, or more expensive than, LP's simply are not true. As for the alleged nuisance of tape recording, what can be easier than sitting at home with the shoes off and obtaining a fine recording at the same time one hears it. Far less effort than shopping for it.—Lucius Kingman, McLean, Va.



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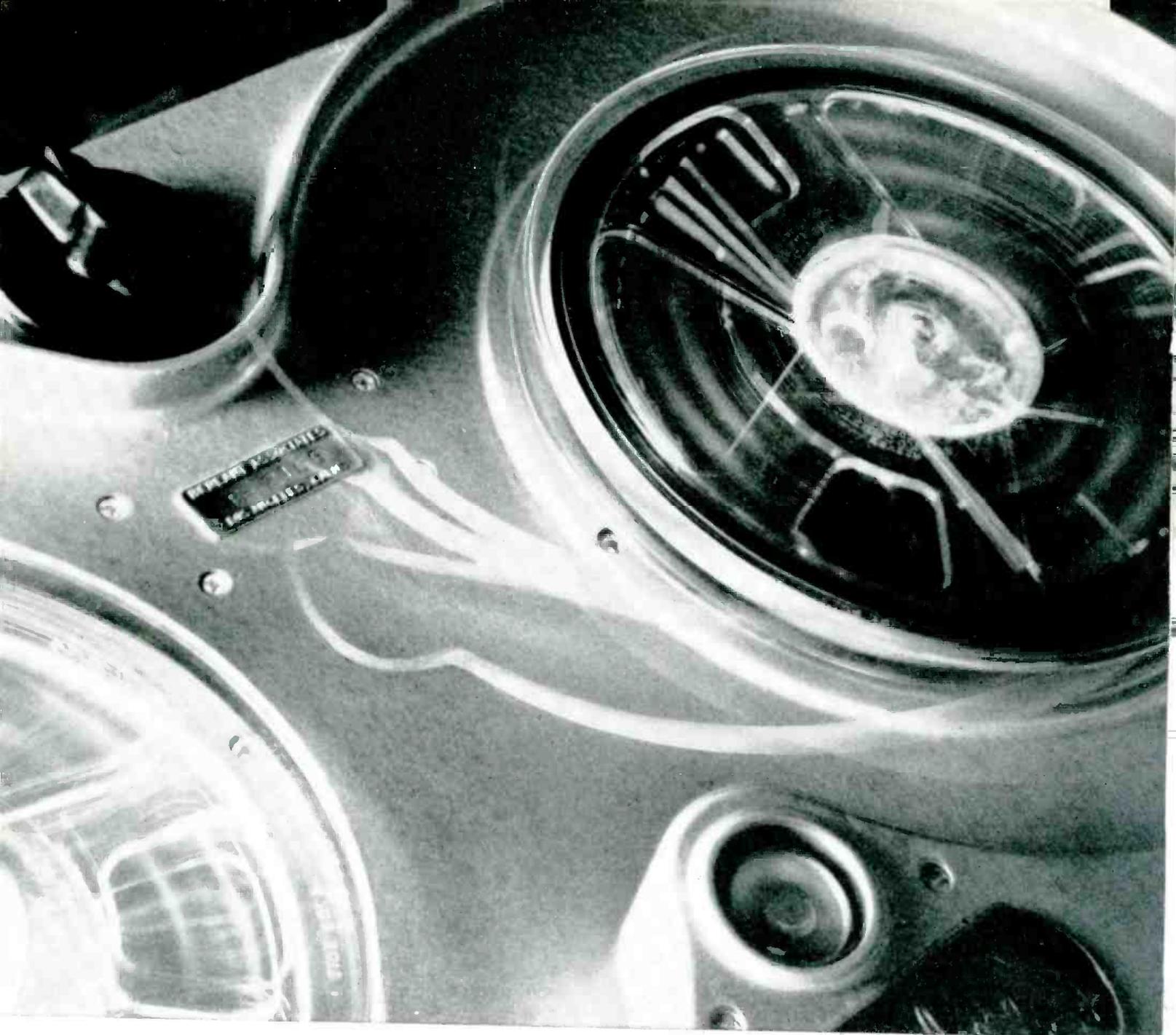
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Photos by Joseph Foldes

TONY SCHWARTZ: **Master Tape Recordist**

... his portable recorders have captured the mood and melodies of the big city. His exchanges cover the world.

by Jeanne Lowe

THE new horizons which magnetic tape recording has opened up in its still young, but spectacularly successful career, are a continuing source of amazement, even to those most familiar with the talents of this versatile new medium.

Take an individual with particular interests, plus some imagination and ingenuity, give him a tape recorder, and chances are you'll have a new use—or maybe a dozen new uses for it. The more you have to offer tape, the more it will give to you.

A particularly active and outstanding case in point is a 31-year old New Yorker named Tony Schwartz. Tony is a commercial artist by training and profession, but a tape recordist in every available moment. A true amateur in his pursuit of recording for personal enjoyment and expression, he has developed the creative potentialities of tape recording as a hobby to an unusual and newsworthy degree. At the same time, he is making a basic contribu-

tion, through his use of the medium, towards a better understanding of people.

Without ever travelling to a foreign country, this soft-spoken six-footer has gathered folk music recorded in its native setting in 40 different countries all over the world. In a few year's time he collected over 10,000 foreign songs—a collection so voluminous that it forced him out of his one room apartment into larger quarters, and so professional and unique that it caused Ben Botkin, former curator of folk music for the Library of Congress to state that it "could easily be transformed into a public archive."

The Voice of America and United Nations Radio thought this tape exchange interesting enough to broadcast excerpts on 5,000 stations throughout the world. You may already have heard Tony on the Dave Garroway show, or one of the other radio programs on which he has told about his recording hobby. Next month, anyone will be able to listen to some of the outstanding samples



No sound is too unusual—or ordinary—for Tony Schwartz to add to his collection. Here he is shown recording the sound of construction machinery near his home. The ever-ready Magnemite recorder he uses constantly, just as a camera fan uses his camera.

from his international tape collection on a record called "Exchange," which Folkways is issuing on both disc and tape.

Already, eight other discs have been produced from the thousands of fascinating sounds and songs which he has taped in his home town, New York, and two hit songs—"Wimoweh" and "Tzena" got their start in this country through Tony's exchange hobby.

Although Tony has had no training in electronics or recording, professionals frequently want to learn the special recording techniques he has developed, and famous folk singers whose records he once used to buy now make tapes at his West 57th Street apartment.

Recently a university invited Tony to join their Sociology department on the basis of his documentary recording work, and he has had a number of offers from recording companies to join their staff at handsome salaries. But he has turned these offers down. Tony doesn't object to collecting sounds for network programs like "The Search," on a free-lance basis. But he refuses to turn his tape recording hobby into his regular livelihood. "If I did, I'd try to record things that would sell, rather than things that interest me. My enjoyment of tape recording is as a means of getting closer to life."

Despite the impressive heights to which Tony's tape recording hobby has carried him, he started off quite casually. While in the Navy he had heard about a new thing called magnetic recording, and when he started work, after the war, he frequently noticed a wire machine in the store front of the office building where he worked. He thought the recorder might come in handy for making off-the-air recordings of folk music broadcasts to supplement his disc collection. If he didn't like it, he figured, he could always trade it in.

That was in 1946. Tony did trade in the machine, first for another, more expensive wire recorder and then, in 1947, when tape was introduced, he switched to the more faithful and flexible medium. Since that time, he has owned seven tape recorders, putting the three he now owns to fairly constant use. From an intriguing whim, tape recording has become practically a way of life.

But Tony is not a gadgeteer or an audio bug. Part of his absorption with tape, says Tony, is that it allows him to produce a creative product in terms he can support by

himself. But even more important, it provides him with a means of getting closer to people.

It was this predominating interest in people that led Tony to folk music and recorded folklore. To him, folk music is a spontaneous expression of people in all moods—joy, sorrow, work, and play. When combined with tape recording, it allows people at opposite ends of the world to communicate with each other, despite barriers of land and language.

Recorded folk music can also help you to meet people in your own city, Tony discovered. After he had been taking songs off the air for a while, he met one of the performers whom he had recorded. Tony mentioned the recording to him, and within a few days the singer arrived at Tony's door, guitar in hand, to hear the recordings and make some more in person.

"That's the way it always seems to go," Tony says. "One thing leads to another. I found that most folk singers didn't have a chance to hear recordings of themselves and were happy to come up to record a few numbers for me just so they could check on their performance."

Gradually he built up an impressive collection of folk music recorded in his home, and a host of friends in the folk music world. Pete Seeger, Burl Ives, Harry Belafonte, and Gordon Jenkins frequented his West 57th Street apartment, and when Yma Sumac came to New York, she made her first recordings on his tape machine.

He also developed a new approach to recording folk singers, causing many of them to comment, "I've never heard myself recorded like this before."

The secret, Tony says, is not an engineering trick, but a point of view. "I am interested in content, rather than total sound." By placement of the microphone, you can indicate your attitude towards the song and develop a perspective in sound. "If you want to stress the words, put the mike closer to the mouth of the performer; if it's the music you're more interested in, place the mike closer to the instrument." By bearing in mind the position of the person who will listen to the playback, Tony gives you the feeling that the performer is singing directly to you when he makes the recording.

As one thing leads to another in Tony's life, a folk singer mentioned that a friend of his in California knew a lot of good songs. Perhaps he would be willing to record

them for Tony on an exchange basis.

Tony thought it was worth looking into and carefully prepared a tape of choice selections from his growing collection. But when two months passed without a reply, he began to worry. "I was afraid he might not like what I sent him."

His fears were ungrounded. Not only was the Californian tremendously enthusiastic, but his response contained a wonderful assortment of new songs from his community, inspiring Tony to look around for some more exchange sources.

One way or another he found the names and addresses of people in this country and all over the world who owned recorders and were interested in exchanging folk music. Sometimes he found them through reading the classified columns of farm and ranch journals, music magazines, fraternal publications. Often he learned about them via the grapevine, through friends who knew of his interest and from strangers who began to hear of him.

As the tape exchange became heavy and he heard about many new sources, Tony prepared a tape "letter" to introduce himself and illustrate, by example, from his collection, what kind of music he was interested in. Over 600 of these were sent out in five years, bringing back to his mail box the most extensive amateur collection of folk music in the world, as well as some good friends and unusual experiences.

Sometimes Tony waited as long as six months but he never failed to get a reply, in fact, usually two or three arrived for every one he sent. Once an unknown European correspondent to whom he had sent a tape turned up on his front doorstep, guitar in hand, ready to make the exchange recordings in person, while on his vacation.

When others asked how to build a tape exchange library, Tony says that first of all you have to know what you want. Then you should guide your new sources to the type of material you wish to receive, such as Tony did in his tape letter. "Give something first, and ask last; if you do you will be much more rewarded."

Exchange is truly the basis of his collection, and he fills some unusual requests for the people who send him tapes. Once he recorded a sample of American radio commercials for an English girl who was writing her thesis on the subject, but had never heard one over the BBC. Sometimes foreign tape correspondents don't want tape recordings, but prefer material barter such as a pair of nylons or a hard-to-get tool. Tony tries to send it if possible.

Often you may have to do research and use considerable ingenuity to get what you're looking for. When Tony wanted to collect railroad songs, he first went to the public library and found a dictionary of all the railroad junctions in the country. From the many thousand listed, he compiled a list of several hundred from different regions.

Then he cross-referenced the railroad junctions with a directory of radio stations.

He made up a tape of railroad songs he had already collected into a program suitable for broadcast, and concluded the recording with an appeal for exchange tapes. This was to be sent out to those radio stations which were near railroad junctions. Before sending the tape, though, he always queried the program director to determine his possible interest in the recording.



The sound of children at play makes interesting listening. Here he tapes the "Wheeeee" of a child sliding down the sliding board. The mike is attached to his wrist with a stout strap. Lower: children's games make interesting recordings. Tony Schwartz has recorded a complete collection of children's street games and jumping rope ditties.

Many asked for it, and the results were beyond Tony's dreams. By way of example, Station KWRO in Coquille, Oregon, played the tape over the air three times, twice on the request of the schools. The program director made and sent copies of it to two of his friends and to several other radio stations. He also made recordings, free, for those people who came into the studio with songs in response to Tony's program, and sent the tape to him.

Although Tony doesn't speak any foreign languages, he has sent out his exchange recording, in nineteen languages, preparing it in this ingenious way: First, he asks a foreign friend of his to translate the tape letters idiomatically into the appropriate tongue. Then he has a native American who learned the language here read the actual recording from the translation. This way he retains the American accent in a foreign language, and gives the recipient the feeling that he is hearing from an American, not a native of his own country.

"You don't have to go far for authentic folk music though," Tony says, "There's material all around us, but we're not apt to notice it. In fact, we may not even think it's folk music."

One day when his mother was visiting him, Tony played for her a recording he had recently received from a mountaineer of a folk song called, "Dig My Grave."

"That's not a folk song," she sniffed. "I used to sing that when I was a child." She then sang her own version of the tune, which she had always known as "In Jersey City."

Tony began to develop a new perspective about folk music. Through friendships that developed with people in his apartment house, he learned about sources close at hand, and even under his own roof. The lady in the next apartment knew Yugoslav songs, the rabbi downstairs had lived in France and Belgium and remembered much of the native music. The Australian on the third floor knew tunes from Down Under. The Jamaican bank clerk knew Calypso tunes. He began to hear folk music as he walked along the streets in his neighborhood.

The wealth of live material all around him, which he had overlooked while recording material off the air or sending tapes to the far corners of the earth both surprised and fascinated Tony. He became intrigued with the potentiality of tape for documenting folk-lore-in-the-making in his own community. With the recent availability of light-weight, battery-operated tape recorders which "make the world your recording studio and the little hand-held box your control room," he had the equipment to do the job.

Recorder in hand, he began roaming the streets of New York 19, the postal zone where he lived, to tape the folk music and folk expressions of the heterogeneous area, which extends from the Plaza Hotel on Central Park South to Hell's Kitchen and the Hudson River waterfront on the other extreme.

Although New York 19 encompasses Times Square, Tin Pan Alley, Radio City, Carnegie Hall, the large television recording studios, music publishing firms and Broadway theaters, Tony did not record the formalized music that came from those places.

Instead, he got the songs of kids playing games and

singing on the sidewalks, an Italian street festival, the spiel of pitchmen, sounds of street drilling, flower vendors and night club barkers, a Puerto Rican storefront church service, an orthodox Jewish Friday night service at home, an auctioneer, sidewalk musicians. He even taped the voices of customers at the grocers—the everyday expression of people.

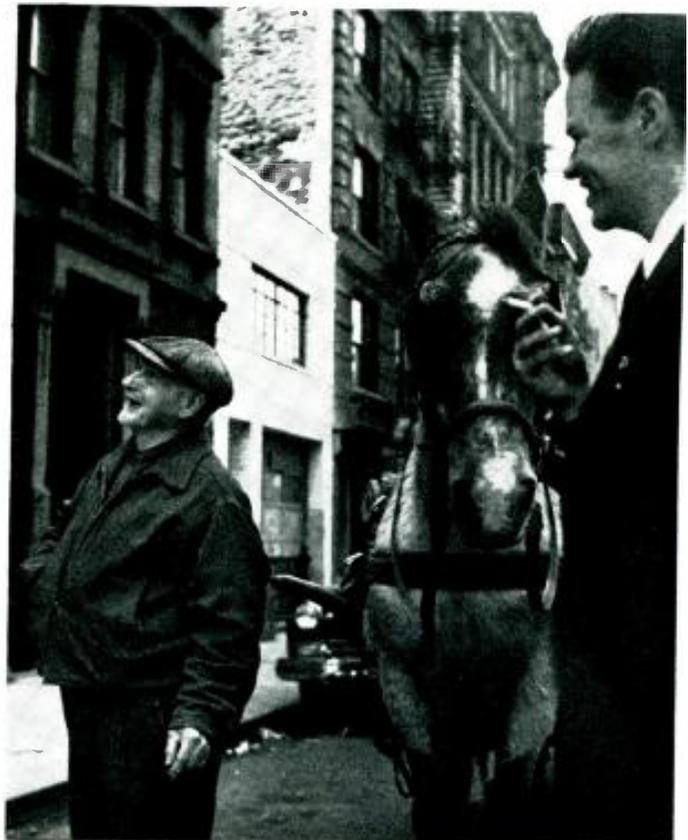
The first album to come out of this new project, "1, 2, 3, and a Zing, Zing, Zing," was a slight sensation. Disc reviewers called it "fascinating," "superlative," "outstanding." The youngsters who listened to it were delighted that the sounds which fascinated them had at last been recorded.

The disc also began to crop up in all sorts of unexpected places. Hospitals discovered that it was valuable in treating emotionally disturbed children. Sociologists studied it as a significant new source and the Museum of Natural History buried the record in its time capsule, so that people a century hence could hear children's folk songs of circa 1950. Across the seas, in France, a tape recordist got a grant, on the strength of Tony's results, to carry out a similar project in his own country.

Then there was a Moondog, a blind musician who wanders through the streets of mid-Manhattan in flowing brown robe and beard, and squats in store doorways to pound out exotic tunes and rhythms on his wierd instruments. Tony was so fascinated by his "music" that he taped it extensively. Mars released the results on disc.

Last March, Folkways brought out the "New York 19" album, which again brought to Tony's creative tape recording praise from all over. A critic for *Downbeat* said, "I cannot praise too expansively the work of Tony Schwartz." The artist Ben Shahn said that he has listened to it carefully some sixty times, and called Tony an artist. One reviewer said that Tony had, "opened a treasure house

Here and there in all big cities there is an ever decreasing number of fruit and vegetable peddlers who roam the streets with their wagons. Many of these itinerant merchants have unusual cries which are characteristic. A collection of these, combined with color slides of each vendor, would make a fascinating collection for any tape recordist. Note that in this picture, as well as in the others, the right hand is held in "recording position". Sometimes he holds a cigarette in that hand to make it appear more natural.





Left: the small Brush microphone is attached to the right wrist with a strap. The wire from the mike runs up the sleeve, across his back and down the left sleeve, terminating in a plug which fits the mike input on the recorder. Part of his huge tape collection can be seen in the background where racks extend from floor to ceiling. The next photo shows Tony setting up the self-powered Magnemite for outdoor work. He has made a few adaptations in the unit to suit his particular needs.

to the public." Another described it as "magnificently alive and diversified." Ben Botkin said that, "he succeeds in catching the idiom, accent and character of the man on the street" as no commercial recordings do. A professor at Bucknell University reported the record brought his students "alive to the realities in the city world" in which they live.

How does Tony go about it? How does he get such penetrating and fascinating recordings? Part of it is due to his point of view—the identification with people and the insight which this brings. Part of it is due to his methods.

"I never go out looking for material but always take the recorder along," says Tony. "I tape the things that interest me. The sequence arises out of the material I collect.

"Because the things that interest me most are what happen in every day life, I have tried to develop equipment and techniques which take the microphone to life and let it record what it finds. I want my equipment and me to be the minimum participants in a situation.

"The philosophy behind recording is what determines the design of equipment," he believes. Most of the time he uses a battery-operated, 12-pound Magnemite, which he has modified in certain ways. In order to make the controls immediately accessible, he has extended the start-stop and volume control knobs through the cover, into which he cut holes to accommodate them. This has two advantages. It allows him to be recording within a few seconds after he hears a sound or song he wishes to tape. Also, by keeping the lid on, he disguises the fact that he is carrying a tape recorder.

For candid street recording Tony wears a concealed Brush rubber-covered microphone on his right wrist, attached to a stiff watch band. From the mike, a wire runs up inside his right coat sleeve, around his neck and down the inside of his left coat sleeve, within ready reach of the Magnemite's input.

Recording on this candid basis is "educated guesswork," Tony says, and you have to remember from previous experience, as in camera settings. Practice will improve the percentage of good takes.

With this kind of mobile recording outfit, anything can be easily taped. "My job takes me to a printer's shop. The

sounds, situations and languages of a trade can be recorded in just a few minutes of the required job time. My ride to work may produce a recording of a cab or bus driver talking about work or other aspects of his life. The walk from dinner at a restaurant can yield a street preacher or musician. A Saturday morning walk to the supermarket can yield three or four children's games or jump rope rhymes." The recorder also accompanies him on Saturday night dates.

When the recording need not be candid, but there is no electric outlet handy, he uses a more sensitive microphone with the Magnemite lying open, recording at 7.5 i.p.s. and getting excellent results. For really high-fi recordings, when there is a power source nearby or he can take a generator in the car, Tony takes one of his Magnecords and records at 15 i.p.s. To go with it, he has designed a remote control box which enables him to do mobile recording up to 50 feet away from the machine.

The design of this particular piece of equipment evolved from Tony's belief that placement of the microphone is crucial in documentary work. You need to be flexible with the mike yet have the controls at the same place.

The remote control box allows just that. It is a metal box, somewhat smaller than shoe box size, which he hangs from around his neck to his waist on a leather strap. Level meter, volume control and output for monitoring sound are all extended from the recorder to this box by two lines which he keeps together with electrical tape. The meters are plainly visible to him on the flat upright side of the box.

For those who wish to do remote recording with a plug-in machine, Tony offers several cautionary bits of advice: Test the power source you are planning to use before plugging in. To do this, buy an ordinary neon bulb with a plug-in socket, and test the outlet with it. If both sides light up, the source is AC and usable. If only one side lights up, the source is DC and will save you from putting your recorder out of commission.

To keep all the highs with an extended microphone line, you should use a low impedance microphone, but most home recorders come with a high impedance mike. Tony offers this solution: Buy a line microphone transformer which will allow you to run the mike line a long distance, and a multiple impedance mike which will record at high

or low impedance equally well. "Your ingenuity will make the average machine right."

"Acoustics should not be a problem in documentary recording," Tony maintains. Tape brings the listener to the spot and puts the emphasis on the contents and context in which he will be hearing it, rather than the quality of the recorded sound. "You should accept where you are and make the recording as clearly as you can."

Two rules for making good documentary recordings which he stresses over and over are: Work close, and under-record.

An easy method he uses for learning how a room will sound and where to place the microphone is to listen with a finger over one ear. If something sounds good at 20 feet, go in to ten feet. Generally, the nearer you are to a person, the better.

Working close will decrease the hollow sound in large rooms. By increasing the proportion of the original sound to reflected sound, you will decrease the awareness of the room's acoustics.

If you are trying to record several different sound sources near each other, the remote control box is very helpful in getting the balance. You can move with the microphone and monitor simultaneously until you are satisfied.

To get around background noise in the street, get closer to your subject and lower the volume, Tony advises. You can always bring it up on playback. Should the voice of a person drop off as you are taping it, increasing the treble control will increase the legibility.

Of particular interest to many people is how Tony is able to get such natural recordings of children.

He admits that children are the hardest people to record candidly because it is so difficult for a strange adult to lose himself among them. If you stand nearby trying to record, they'll stop what they're doing.

"I have found that the best approach with children, as with adults, is to be honest with them. Tell them you are interested in their games and you would like to record them. I often play for the kids of one block the games of kids of another block or neighborhood."

After a while, they will start playing the games again and look upon you as a friend. They will be unconscious while you are recording, even though you may work with the microphone only seven or eight inches from their mouths.

"When I'm out recording, I always keep in mind some of the things I'm looking for, but at the same time keep myself ready for anything that sounds interesting or might be worth saving. Often one album develops while I'm working on another.

"For instance, when I was collecting the sounds of *New York, 19* I was frequently struck by the musicality of people's voices and expressions as they went about their daily lives—what you might call the innate musical ability in people. This showed up in some of the recordings I had already collected, like my 14-month old niece's prattling or the rhythmic cadences of a baseball radio announcer. I made a conscious effort to gather more, and the result was my most recent album, *"Millions of Musicians."*

"The real thrill in tape recording is getting the material back home and seeing it in relation to other things." Over weekends, he plays the week's collection, making detailed

notes of the material he has gathered, and storing it for future use. He does not edit the tapes until sometime after the original recording is made.

When it comes to editing for a record, Tony measures out on a wall near his editing work table an area 24 inches long. As he cuts different sections out of a tape he puts them up on the wall with masking tape, identifying each selection by writing on the masking tape. Selections that run over a minute he stores on small reels, marking them also with masking tape so that he knows what he has. Editing is more accurate at 15 i.p.s., he says, but it's easier at 7.5 i.p.s.

Shelves of tape line the walls in his hall and narrow workroom up to the ceiling, and with a growing collection which already verges on 800 boxes of tape, storage space becomes a problem. For this reason, as well as for easy access to material, Tony always edits down all the tapes he is planning to keep. In some cases he will dub a few selections worth saving from one tape onto another shorter tape, or in other cases, splice several different sections together. Like contents is the criterion, and as little as one minute's recording is kept on a separate reel.

After the tape has been edited for storage, he plays it back, writing down the contents in detail on an index card which he files in the tape box. Sometimes he cross-indexes from one reel to another, though he admits his cataloguing system leaves much to be desired.

Special shelves which he built in three sizes to house his 3-inch, 5-inch and 7-inch reels save on storage space. The new thin tapes which give fifty percent more tape on a standard reel are another way of cutting down space with a large collection. Tony is very enthusiastic about them for use with his portable recorder as well because it gives him fifty percent extra playing time on the five-inch reels to which this machine is limited.

Even though he lives in a steam-heated New York apartment, Tony follows no special precautions for storage of tapes. He thinks that much of the concern about this is unnecessary, pointing out that in the eight years he has had tape, he has never had a recording become useless because of age. He says they sound just as good now as when the recordings were first made.



One of the outcomes of his tape collection is this record issued by Folkways entitled "Exchange." The same material is available on tape. This is his most recent recording. For studio recording he uses his Magnecorder-Voyager and also uses it in his station wagon hooked to a motor-generator converter.



Recording the North Tonawanda player-piano with flute pipes. The mike, suspended from a camera tripod is picking up the old tunes.

CAPTURING YESTERDAY'S MUSIC

... fast disappearing from the American scene are the mechanical musical marvels of yesteryear. Finding and taping them is a treasure hunt you'll enjoy.

by George W. Walter

Photos by the author

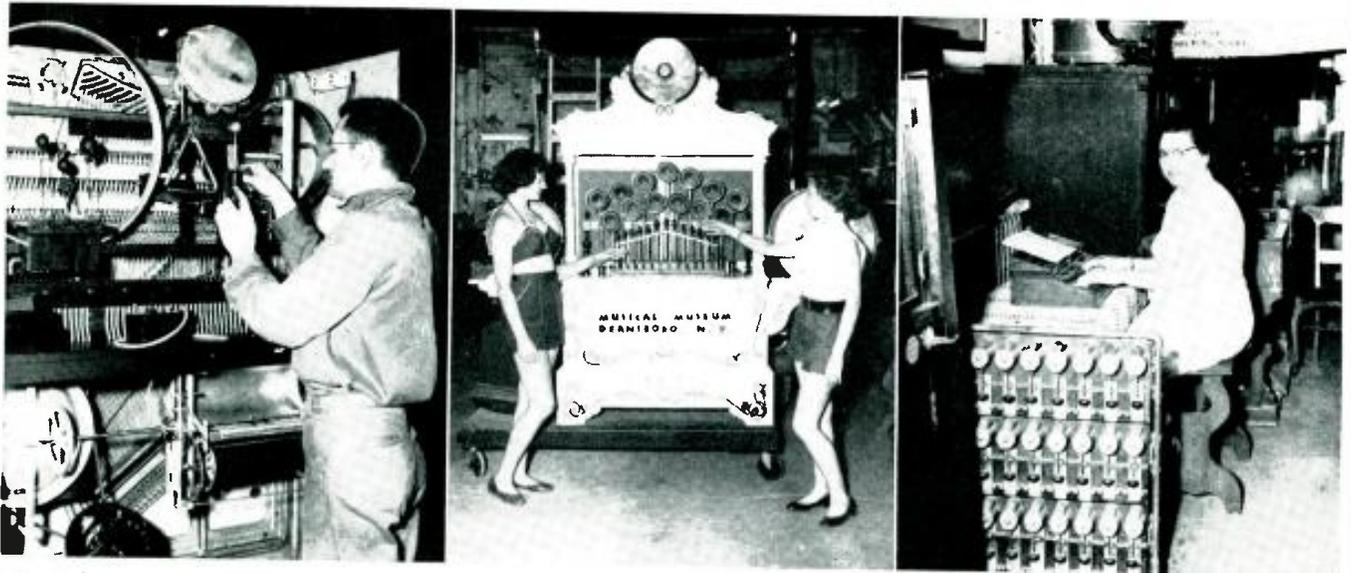
If you are looking for something new in music for your tape library, why not try to capture the nostalgic music of a bygone era on tape from so-called "barroom" pianos, music boxes, band organs and calliopes? Before juke boxes and their many record selections became common in restaurants and taverns, the automatic piano and its many counterparts, the Orchestron, Violano, Virtuoso, and others occupied their place. Nearly every ice cream parlor and saloon from the period 1910 to 1925 had one. They were popularly known as "barroom" pianos. Unlike the modern juke box where you can make a selection to play, the music on the old mechanical pianos was on a roll like the home player piano, usually ten tunes to a roll. There was no choice. You dropped your nickel in the slot at the side and the next selection played.

The band organs, operated on the same principle as

the mechanical pianos, but these were used mainly to provide the music for merry-go-rounds. The old steam calliope was a standby of circus street parades and attracted more attention and caused more comment than the elephants and caged wild animals.

The majority of the manufacturers of these mechanical players went out of business or converted to more lucrative products as did Seeburg and Link. In time replacement parts for these instruments were no longer available and it became practically impossible to get them repaired.

Today, like the cigar store Indian, these mechanical musical marvels are a collector's item. They have been taken from the saloons to museums. From coast to coast there are many excellent collections of these rare machines, but they are on display and not all are in working condition. Even auto museums have installed one or two



Left: Arthur Sanders, curator of the Deansboro Musical Museum, makes repairs on the mechanism of an Orchestron, an advanced type of an old fashioned barroom piano before shipping the antique to Alaska. An Alaskan businessman purchased the Orchestron in an ice cream parlor on Long Island. It is being restored by the Sanders. Note the intricate mechanism, including piano, drum heads and other instruments. Center: this Wurlitzer Band Organ uses a roll to simulate the sound of a band playing. Note pipes, drums and cymbal, all which play. The instrument was once used to provide music for a merry-go-round at Tupper Lake, N.Y. It has been completely restored by the Sanders at the Deansboro Musical Museum. Right: the Deagan Una-Fon, powered by a storage battery, was once used to attract crowds for medicine shows and advertising spiels before World War I. Played through the use of a small keyboard, it has a pleasant marimba-like sound. Mrs. Esther Skeritt Sanders of the Deansboro Musical Museum is at the keyboard.

instruments in more recent years to lend atmosphere.

It is impossible to speak for the management of all these museums, but the few curators I know have obligingly allowed me to set up my tape recorder and capture on tape the musical sounds of yesterday. The Deansboro Musical Museum, owned and operated by Mr. and Mrs. Hardie Sanders and their son, Arthur Sanders, at Deansboro, N. Y., welcome the amateur and his tape recorder. It is a policy of the museum to have each tape enthusiast sign a printed form stating that the recording will not be used commercially or for broadcasting.

The Sanders family travel through the country searching for all types of mechanical instruments, which they also restore. Their museum, which opened little more than two years ago has rapidly expanded and now includes seventy-five automatic pianos and other musical antiques.

Luckily, Arthur Sanders, who is the curator of the museum, was as much enthused as I in trying to capture the exact sound of each instrument on tape and he gave me his wholehearted cooperation. Each mechanical piano posed a challenge, not only as to placement of the microphone, but to eliminate as much as possible the noise of the motors that operated them. In many instances the loudness of the music being played drowned out the steady pumping of the bellows and rumble of the electric motor.

We also discovered early that it was possible to record some instruments with comparative ease with one type of tape recorder, while a completely different technique had to be used with another make.

The first recordings Arthur and I made were on an Ampro, at a speed of $3\frac{3}{4}$, and using the crystal microphone that came with the unit. Lacking a microphone stand, and not wanting to hand-hold the mike, I opened up my camera tripod and extended the arm on the head.

We tried various positions from the instruments that were to be played. By the simple record and playback method, it was soon determined that the most faithful

reproduction of the sound occurred when we were from ten to fifteen feet away. As the music was so extremely loud, it was necessary to turn the volume way down. This worked well for such instruments as the North Tonawanda piano with mandolin bar, vintage 1925, and the Violano Virtuoso.

We ran into our first trouble when we tried to reproduce the sound of the Welte Mignon Reproducing Piano, which holds the place of honor in the Sanders home. We hung the mike from a nail over the archway of the room, set it up in adjoining rooms, but the sound always came out with a tinny effect. The best we could do was to go into the adjacent living room to record.

A few months later I bought a dual speed Webcor and began experimenting all over again. Arthur and I found that we could not use microphone setups like we did with the Ampro, the results were far from satisfactory. We first tackled the Welte Mignon Reproducing Piano, using the higher speed of $7\frac{1}{2}$ with the tape. While this piano is in no way connected with barrooms, it obtains its name from its ability to reproduce exactly the touch, as well as the temperament of the artist who made a particular roll of music for it. This piano which is about the size of a concert grand was constructed in Germany. It was originally purchased in 1912 by Nicholas Orlando, famous concert pianist, at a cost of \$4,500. The piano finally turned up in Cleveland, N. Y., and the Sanders purchased it from a family there.

Orlando made many rolls for the Welte Mignon, but unfortunately the Sanders do not have any of them in their large collection. They do have autographed rolls by Ignace Paderewski, Claude DeBussey, Josef Hoffman and Greig.

Arthur and I finally solved the problem of trying to obtain a faithful reproduction of the Welte Mignon. When we placed the mike high or low, the sound of the pumping bellows was easily heard. Finally Arthur took two short pieces of wood, padded them and laid them across

and above the bass strings inside the case. The microphone was suspended by laying it face down across this platform. The resultant tape was of excellent quality.

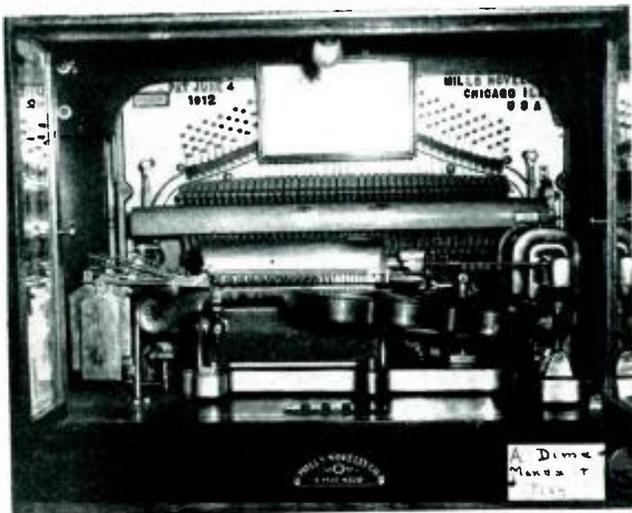
Our toughest problem was trying to record the Violano Virtuoso, designated by the U.S. Government in 1912 as the "Eighth Wonder of the World". It was the first mechanical musical instrument that was powered by electricity. The Mills Company discontinued production of these virtuosos in 1926. The instrument consists of a piano and a violin. The Museum has five of them, two of which contain two violins. The inventor is said to have lost his mind after laboring for years to make the initial model work. Watching one operate even today after a coin is dropped in seems unbelievable.

Starting with the simple "home player piano," inventors' imaginations ran wild in trying to see how many gadgets they could add to a larger model. Through the use of wooden and metal pipes, through which air was blown, imitations of the sounds of flutes, trumpets and other instruments were made. Some inventors eliminated the keyboard of the piano to make room for other gadgets. The probable height of noise was attained in an instrument known as "The Grand Orchestron". This imitated a 25-piece band, complete with drums, cymbals, blocks and castanets.

Most barrooms couldn't afford to be without an automatic player piano. The larger and more expensive models were a boon to the saloons that boasted space for dancing. Many orchestras were hired for the weekends. A "Grand Orchestron", proprietors learned, was a good substitute for the live musicians. It saved expenses as well as free drinks and lunches.

The Sanders obtained their Grand Orchestron from a Veteran of Foreign Wars hall in a coal mining town in Pennsylvania. Some of the parts had been broken up for kindling wood, and about all that remained was a shell,

Right: the Mills Violano Virtuoso, once called the "Eighth Wonder of the World", uses electric magnets to play a violin and piano. In this photograph, the entire mechanism is exposed, motor at bottom, piano roll that is the music, and the instruments. George W. Walter, Jr., Oneida, N.Y., a former Apollo Choir Boy looks it over at the Deansboro Musical Museum. The machine was one of the hardest to record. Below: in this close-up of the Violano Virtuoso, the violin, piano strings and hammers can be plainly seen. There is no piano keyboard. The instrument duplicates with amazing clarity and fidelity a pianist and violinist playing a duet. It is operated by electric magnets.



resembling an old-fashioned upright clothes wardrobe. There were about two pounds of coal dust in the bottom. The Sanders loaded the case and all the loose pieces they could find into their trailer and brought it to their museum. It took several months to restore. Arthur and I recorded two hours of its music before he sold it to an auto museum in Scranton, Pennsylvania. It is doubtful if another instrument like it will ever turn up.

We made one of our best recordings from a Seeburg Band Piano with flute pipes. It was manufactured by the J. P. Seeburg Co. of Chicago, who made several other types of mechanical pianos including a small 44-note Seeburg. We lifted up the lid on many of these instruments which resemble an upright piano, and placed the mike on a stand above it.

The Seeburg Band Piano sounds like a combination of piano, street organ, castanets and cymbals all intermingled. Many of the numbers on the piano rolls that we played are still popular.

A xylophone craze in the early 1920's had its effect on the piano makers. Among these in the museum is the Link piano of 1918, made by the Link Company, long famous for the Link Trainer. Due to patent restrictions of 1915, when the piano was designed, the manufacturer used his ingenuity to have fifteen tunes on an endless roll in the bottom of the case instead of using the up and down ten tune roll. The long opened roll gives the impression that when the operator started to insert the roll, it became unwound and the work was given up in disgust. Nevertheless, it plays and will repeat without having to be rewound as the regulation rolls are. If you have ever listened to a good jazz pianist and xylophonist playing—that is how it sounds, with possibly just a little added zip symbolic of the roaring twenties. We recorded this instrument "head on", with the mike raised to the level of the playing mechanism.





Left: the gay music of Paris can be heard and recorded from this old French Street Piano, restored to perfect working condition. To operate, a spring must be wound, a French centime deposited and the starter button pushed. Right: it takes an exceptionally large room to show off the Welte-Mignon Reproducing Piano that resembles a large Concert Grand. Mrs. Esther Skerrit Sanders, the owner, shows hidden panel that conceals the roll of music. The problem of recording the fine music of old masters on the instrument was solved by building a small bridge in the case over the bass notes and laying the microphone face down on the platform.

There are many mechanical instruments in the museum that are as fascinating to record as the "barroom" pianos. Among these are the various "band" organs that once furnished the music for merry-go-rounds. Today most of the music played for merry-go-rounds is on records and is played over a loud speaker system. One of the few exceptions is the Cottman Merry-Go-Round located at Sylvan Beach, N. Y., on the southern shore of Oneida Lake. This carousel is about seventy-five years old; the horses are stationary, and the music is authentic, furnished by a real band organ.

The Museum curator and I made our tape recordings of this old band organ, officially known as a Wurlitzer Band Organ, when William Cottman, the owner, sent it to the Sanders for repairs. From all appearances it suggests an old-time circus bandwagon without wheels. The drum heads were missing, several rats had found it an ideal nesting place, and shafts were bent and the bellows that blew the air into the various pipes leaked badly. The Sanders had to have several parts specially made to replace those that were worn out, as no replacement parts were available.

As soon as the Band Organ had been restored, we set up our tape recorder. Due to the immense volume of sound, it was rather difficult to find a good location to record the sound as it is heard. In our tests we sometimes had too much drum or too much bass. We struck a happy medium when we placed our mike about four feet from the ground, ten feet away and to the right. If you have ever listened to a small street band on the corner, that is the way the instrument sounds. It uses paper rolls.

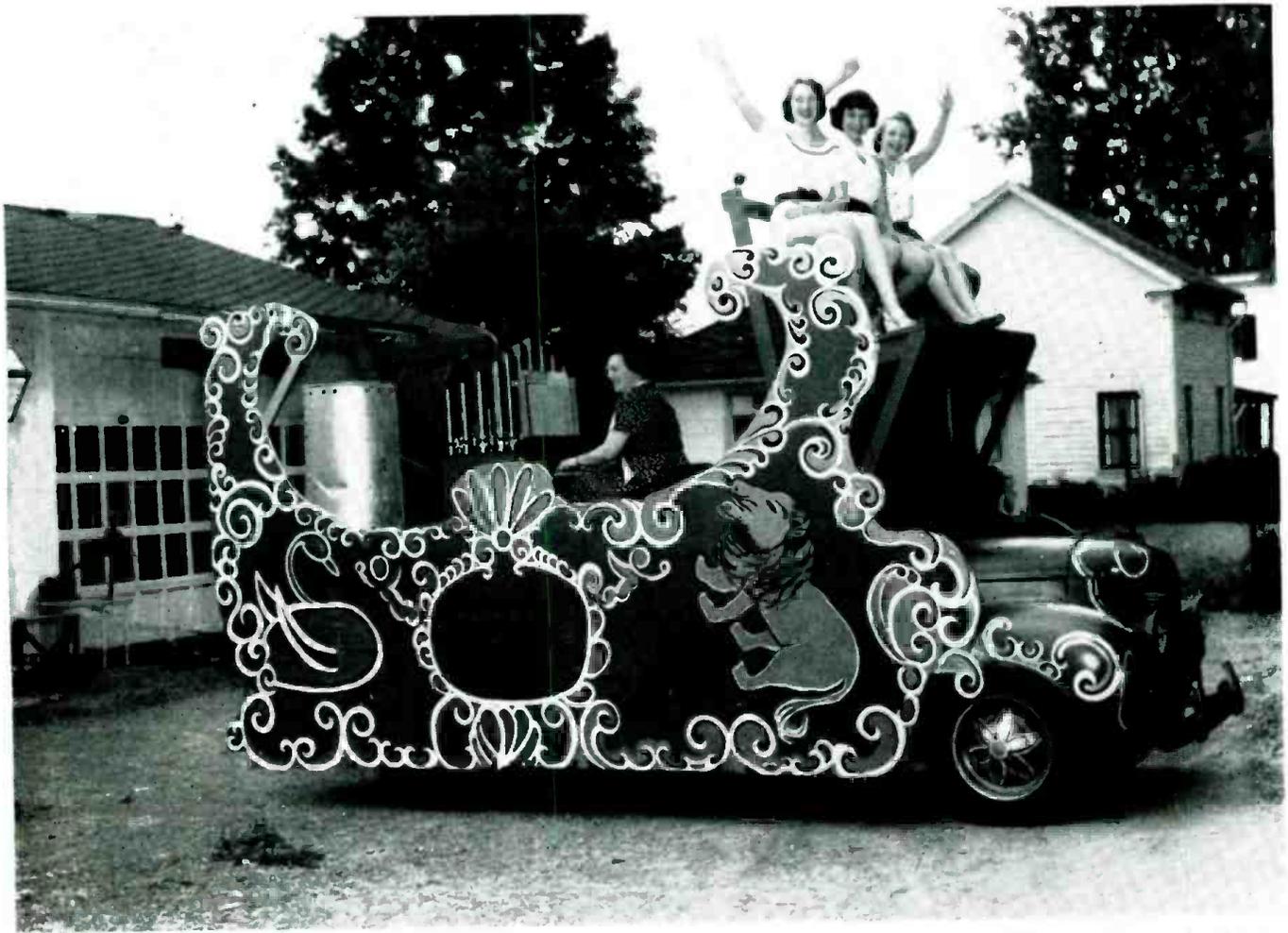
Several years ago Ozzie La Londe of Tupper Lake, N. Y., operated a merry-go-round, but by 1924 he couldn't make enough money with it as it was too small. It was in the Spring of 1953 that Hardie Sanders and Arthur went to Tupper Lake to look it over. They discovered La Londe possessed two band organs, a De Kleist, Military Band Organ which was used on a merry-go-round in 1898, and the later model, a Wurlitzer Band Organ. Neither was in operating condition. They were housed in

a small building some four hundred feet from the road. The Sanders dismantled the instruments which weighed about four hundred pounds each. With the aid of two other men, they plowed their way through ankle-deep mud, carrying the band organs through a garden and loaded them into the Sanders' trucks. The De Kleist Band Organ is now in the process of being restored. A large drum or "barrel", covered with small pins, creates the music when the barrel is revolved.

The Wurlitzer has been completely restored and resembles an old-fashioned high sideboard, except that it contains drums and several brass pipes. This machine uses a player roll. The Sanders operate it with an electric motor in the museum, but when used in parades, it is powered with a gasoline motor. Hardie Sanders recalls that one day while they were in Utica, N. Y., using the instrument to help advertise a breakfast cereal, an elderly man came up to him, looked the band organ over carefully and then asked pointedly, "Is it real?" Hardie said it took considerable time to prove to the man that it wasn't a false front housing a record player.

Another barrel organ in the Museum is affectionately known as the "Steamboat Organ". The Sanders purchased it through an antique dealer in Cairo, Illinois, who thought it was some kind of a chest of drawers. The Sanders thought they were buying a small hand organ until they received an express card for \$26 to cover shipping charges. The organ required a truck to move it as it weighed 400 pounds. The organ is manually operated. It took the father and son eight weeks to completely restore it. Research into the background of the instrument showed that it was made in Kratzau, a small town near Pilsen in the German Sudetenland, once called Bohemia, but now Czechoslovakia. It was made in 1875.

Brought to this country it furnished music for passengers on a Mississippi River steamboat. An old blind Negro turned the crank causing the various tunes to play, and then passed his high hat for coins. There are eight tunes, all of German origin on the barrel, including "Sarah Bernhardt Galop", "My Son, John Polka", and



Mrs. Esther Skerrit Sanders, organist, and one of the owners of the Deansboro Musical Museum, plays her Calliopo on the new bandwagon recently constructed for parades. The Calliopo, which can be heard for two miles on a clear day, originally came from Sylvan Beach, where, operated by steam, it played music for a merry-go-round. It is now powered by a five-horse gasoline motor.

many others. The sound is that of a small German Band with the umpah-umpah very much in evidence. It is so loud, it is easy to record from almost every part of the museum.

Working on the same principle are three other unique street pianos, seldom seen in this country. One is from Naples, Italy, circa 1890, and is one of the last almost full-size street pianos still in operation in this country. Similar in size, but much more ornate is the French street piano with a full roster of distinct French music. This is operated by dropping a centime, hand-winding a spring, and then pushing the starter button. Undoubtedly the most unique in appearance and sound is the street piano from Constantinople, Turkey, circa 1895. About the size and shape of a small coin-operated cigarette machine, it was made to be carried on one's back. The music that can be cranked out of it is exotic and has Oriental rhythm with the ringing of bells. To the Occidental ear it sounds like several children playing on toy instruments. They were all recorded by placing the mike at a level with the center of the instruments and about four feet away.

The Deagan Una-Fon was used in medicine shows and to attract crowds for advertising purposes about the time of the first World War. An early photograph in the Museum shows it being transported by an old Model T Ford. The instrument, powered by a storage battery, has the appearance of small bells on a square framework. It is

played manually on a small 32 note keyboard. It sounds somewhat similar to a marimba. There is seldom a person visiting the museum who can resist running his fingers across the keyboard. During the Christmas holiday season the Sanders sometimes load the Una-Fon onto a truck along with Mrs. Sanders, who is an excellent organist and pianist. They take along a few students who can sing Christmas carols. Travelling to the various small villages in the Deansboro area, the inhabitants are treated to caroling.

The Sanders also own a compressed air Calliophone, more popularly known as a "Calliopo". Loaded onto the back of the Sanders truck along with a five horse-power motor and compressed air tank, it is used often in street parades with Mrs. Sanders playing. This is one instrument we have not yet recorded. The sound carries for two miles and one must be a considerable distance away to pick up the tones without the motor noise.

There are practically all types of melodians, organs, and rare antique pianos, as well as music boxes that are waiting to be recorded providing someone is around who can play them. I am still waiting for the Sanders to have their 16th century Italian harpsichord tuned so it can be taped. There is also an exceptionally fine dulcimer in the museum waiting for someone to play, as well as several other antique and odd instruments. When someone eventually turns up who can caress the music from them—I want to be there with my tape recorder.



CZECH ACTORS. refugees from communism, listen to playback of weekly satirical program "Cafe de l'Europe" on tape recording machine in one of Radio Free Europe's Munich studios. Supported by contributions from American citizens, RFE now beams as many as 20 hours of home news and entertainment every day to the five key satellite countries of Czechoslovakia, Hungary, Poland, Romania and Bulgaria. Programs compete hour by hour with communist stations in such cities as Prague, Warsaw and Budapest.



BITING WIT and patriotic music featured in popular tape recorded programs like "Kohout's Cabaret" incite bitter attacks on RFE by Red officials in satellite countries. With tape, exile entertainers, clergymen, statesmen from behind Iron Curtain can address listeners in their native languages at all hours of the day.



ARMORED CAR ESCAPEES from Czechoslovakia tape record the story of their flight to freedom for Radio Free Europe listeners. Besides world news, RFE tells captive peoples the *real* news in their own countries. Coded messages to families and friends are daily part of network's schedule.

THE RADIO NETWORK THAT BRINGS HOPE TO 50 MILLION EUROPEANS

Leaders of Iron Curtain countries are anxious to drown out Radio Free Europe because RFE is stimulating opposition to communism in key satellite countries. By exposing communist collaborators . . . answering Red propaganda . . . revealing news suppressed by Moscow, RFE gives the will to resist oppression to the captive populations of Romania, Hungary, Poland, Czechoslovakia and Bulgaria.

But the job of broadcasting the truth grows harder. The Communists are stepping up their efforts to block Radio Free Europe. So far, superior engineering know-how has kept RFE ahead of Red "jammers". But now, more and *stronger* transmitters are urgently needed. Keep the truth turned on—by contributing to Radio Free Europe. Send your "Truth Dollars" to **CRUSADE FOR FREEDOM**, c/o your Postmaster.

Radio Free Europe uses "Scotch" Brand Magnetic Recording Tapes exclusively to assure uniform, highest quality broadcast results.



29 TRANSMITTERS like this one near Mannheim, Germany help Radio Free Europe break through the Iron Curtain. By beaming all transmitters on one target for certain periods of the day, RFE makes Soviet jamming ineffective.



OKLAHOMA CITY radio producer David Sureck fights daily battle with communism. Directing inspirational and service programs, adult and children's broadcasts, he exposes Red propaganda. Most RFE programs are tape recorded for round-the-clock broadcasting from transmitters in West Germany and Portugal.



"SCOTCH" BRAND Magnetic Recording Tapes are used exclusively by Radio Free Europe in the U.S. and abroad. "Scotch" Brand's easy erasability and superior fidelity make it a favorite with RFE engineers.



Probably the most exciting audio adventure was taping live jam sessions. Author would set up shop in dancehall booths or in front of bandstands (above) and tape improvised jazz on the spot. Despite unscientific microphone placement, recordings were remarkably balanced. "Jamming" above are members of the Don Richards band of Newark, N.J.

The Thesis Can be Seen and Heard

*. . . Here's the story of one of the first theses to be submitted
on tape for a master's degree*

by

F. H. GARNER

SOME graduate students just have to be different. Not content with a pedestrian thesis like, "An Evaluation of Methods of Teaching Chaucer to Eighth-Graders in South Orange Junior High School," or "An Inquiry Into the Causes of Suicide Among Hill Marias in India," they go bizarre and pick a subject like the relationship of American jazz to West African tribal music.

This subject (jazz and African music) is no figment of a primitive imagination. It's a fact. I, a candidate for a master's degree in cultural anthropology, wrote a thesis about it. And why not? I had developed a keen interest in the field of comparative musicology (a branch of anthropology) and I had been playing bass fiddle in jazz combos and dance bands since grammar school. Besides, the idea of a connection between jazz and African music was, still is, a hot controversy in and out of academic circles. Why not a live subject?

But it was more than a matter of timeliness and great interest. Each graduate student has a faculty committee who must approve the thesis subject before he can write a word. As a rule, the committee chairman simply says,

"Here, Jones, we think you should write your thesis on 'Causes of Suicide Among the Hill Marias.' Submit an outline in thirty days." Luckily, my committee was more democratic. They left it up to me. But they wanted to know exactly how I planned to handle it.

When you are dealing with the music of another culture area, you have to work with sound, not symbols. Notes can be transcribed on manuscript paper, that's true. But our five-line music staff and 18 standard key signatures are geared to a scale of tones divided into eight-note octaves. West African music, like the music of peoples in many other parts of the world, is no respecter of scale, even though it has been classified "pentatonic," a system of five whole-tones. What's more, the tones tend to waver, the singers and players glide from note to note and "bend" their voices. (Just like jazz.) Even trained musicologists get lost in quarter-tones and glissando signs, trying to notate this.

West African music emphasizes rhythm unlike European-American music which stresses melody and harmony. African rhythm often is so fantastically complex (a song



Photo © Barbara W. Merriam

Court musicians of the Batwa tribe, Nyanza, Ruanda, perform for the Mwami (king). The drum choir (center foreground) supplies percussion while horn-players (left) blow one or at most two notes on the vegetable gourds at specified intervals. To keep the melody going, each horn must be blown at precisely the right moment; individual notes are "hocketed" into the melodic line. This takes tremendous skill and practice, especially at fast tempos. Mike is an Electro-Voice 635.

may be built on three or four or more time signatures (operating simultaneously) that it defies classification under a single meter system like ours. One rhythm seems to predominate, then another. Nobody agrees where, which or when.

Music is timbre or tone-color—rich, dry, reedy, harsh, shrill, brassy—and it is dynamics—relative loudness and softness. These give West African music much of its color and vitality. They are just as important in jazz. Tonal and dynamic subtleties, instruments played to imitate human voices, flexible intervals are aural phenomena; they have to be heard.

So this was above all a study in sound. My committee knew it when we met to discuss the project.

Prof. Grant (musicologist): "You're aware, of course, of the difficulties involved in transcribing African music?"

Prof. Long (jazz authority): "And of faithfully transcribing jazz?"

Prof. Grant: "You'll have to use recordings. I don't think you can get authentic renditions of traditional tribal music. Some of the best is on cylinders in private collections. Many of the recordings from earlier expeditions are in libraries."

Prof. Long: "Same with the earlier recorded traditional jazz. Collectors' items scattered here and there."

A number of other questions. Then the 64-dollar one: "You must have thought of these problems. How do you propose to solve them?"

I thought fast. "With a tape recorder."

A thesis was born. Tape was the father. And I happened to own a portable machine, the Revere T-100.

We made many trips, the Revere and I—to the homes of jazz collectors, who would never let me out of the door

alive with their precious platters, but who in the interests of research were willing to let me tape their treasures in

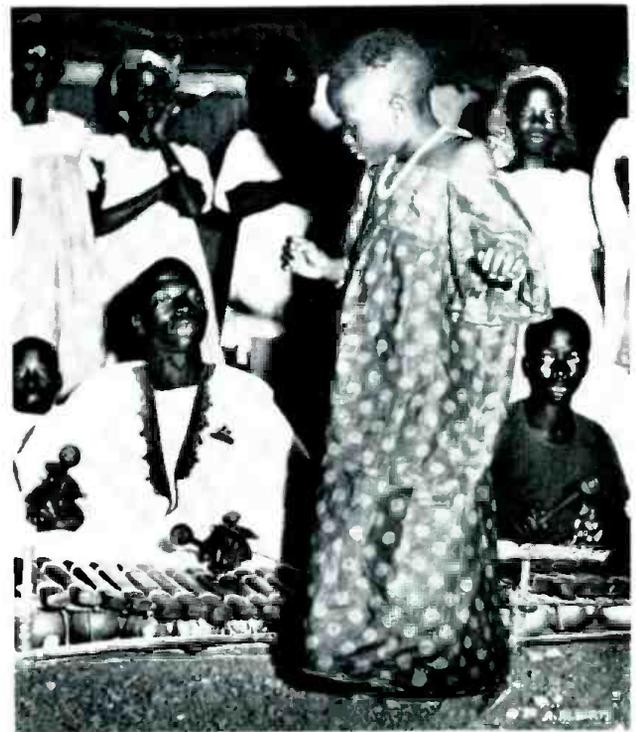


Photo by A. Alberts

Young Malinké girl dances to the music of a balafon group in the village of Sidi Djelli, central French Guinea. Rows of gourds under the hardwood keys act as resonators. Bells and rattles on the player's wrists are typical. The balafon, in various forms, is found throughout the Niger Valley and elsewhere in Africa.



Photo by Jean Silverman

Field trips were made—to New York City, not Africa—to tape collector's items, cylinders, non-commercial recordings in private homes and libraries. Music Branch of The New York Public Library (above) banned all tape recorders. "If we let them in," a librarian explained, "they'd multiply like rabbits." This was a set-back, since the Music Branch has in its archives some rare recordings.

their living rooms; to university libraries, where under surveillance of music librarians I taped passages from early cylinder recordings and out-of-date record albums; to the Music Division of the New York Public Library, where they would let *me* into the listening room, but *not* the Revere ("Sorry, it's not our policy to allow tape recorders in here"); to live jam sessions, where I set up shop in dark booths or right in front of the bandstand, and taped some of the "swingiest" informal jazz I have ever heard (only one manager ordered me to pull out the plug or pull out).

But others had. As recently as 1950, Arthur Alberts, a writer, and his wife made a six-month jeep-safari of the arc of land rising from the Gold Coast on the Guinea Gulf, north and west to the French Sudan and the Niger valley, down through Liberia to the South Atlantic shore. The jeep was equipped with a Magnecorder PT6-P, powered by a silent, efficient convertor system. Most of the recordings were made under the trees (in Upper Volta the mercury hit 130 degrees F., with almost no humidity), usually at night when, Albert says, "the musical pulse rises with a drop in temperature and the coming of moonlight."

Cutting down incidental background noise—from in-

fants, dogs, chickens, jungle birds and insects, to the enthusiastic prattle of audiences at the tremendous magic of the black music box—was a constant problem. These sounds provide local color in three albums, "Tribal, Folk and Cafe Music of West Africa," produced by the Alberts shortly after their return to the United States. Arthur Alberts returned in July from another expedition, this time through the Congo. His booty: thousands more feet of tape. Results on LP or pre-recorded tape should be available to the public soon.

Two years ago Northwestern University anthropologist Alan Merriam and his wife, Barbara, safaried the Congo in an overloaded panel truck ("We'd hate to say how many sets of tires we went through"). The couple went from tribe to tribe, traveling the haphazard trails and roads of the Congo and Ruanda, taping folk music and taking extensive field notes.

They worked with a generator-powered Magnecorder PT63AH with a three-input PT63P amplifier. Separate mixing controls regulated each mike input. (They packed three Electro-Voice 635's and one 650.) Despite a dual-dose of malaria, a touch of dysentery and other temporary incapacitations ("that's standard when you go snooping around the Congo"), they returned with a footlocker full of tape, from which they culled an LP, "Voice of the Congo" (Riverside Records LP 4002). Another disc is scheduled for release shortly.

Maybe we'll follow suit someday. But for the thesis, there was material. It was mostly a matter of cosmopolitan leg-work.

While the music was being taped, the writing moved ahead. Actually, the entire study might have been tape-recorded,* background and all, but the committee was not ready to accept that. They wanted something in black-and-white, too. My outline called for a lot of background material on the diffusion of African culture and music to the New World, requiring footnotes and references. This was put in writing.

The tape was edited to illustrate the music analysis in the manuscript. There was some commentary on tape as well, before and during the music. This called for a second recorder, and a friend happened to have one like mine. I dubbed from tape to tape, including in the final edited version passages from African recordings to illustrate certain points, and choruses from live and recorded jazz to show parallels.

A footnote in the manuscript might read, "T-18, 162'." This meant that what was being described in the text could be heard as the 18th musical example beginning on the 162nd foot of tape (the Revere T-100 has a time-footage indicator scale under take-up and feed reels so any selection on the tape can be indexed and located quickly). Each taped illustration was prefaced with a voice announcement: "Example 18. The following passages of Gold Coast Drums, record 1, band 3 from Alberts; and Lionel Hampton's vibraharp solo in "I Got Rhythm," side 3, band 4, from Benny Goodman's 1938 Carnegie Hall Concert, illustrate multiple-meter or poly-rhythm. In Hampton's solo, it is heard as melodic cycles of three beats superimposed on a basic beat in four. This is described on page 62 in the text."

*Two students at Princeton University submitted these entirely on tape.



Photo by A. Alberts



Photo by F. H. Garner

Left: Chief minister of the Moro Naba (Ouagadougou, Upper Volta) listens through unfamiliar earphones to a recording of court musicians in the Emperor's palace. Here, as elsewhere in West Africa, playback of recordings evoked amazement and delight among musicians and lookers-on. Recording machine used on this expedition was a Magnecorder PT6-P, with WE saltshaker and Electro-Voice 650 microphones. Right: professors compare author's transcriptions of West African tribal music with the sounds themselves. Prof. Long (left) checks a point in the thesis text. Graduate committee could listen to the tape, play it back, discuss it in the privacy of their own offices—an advantage for them if not for the author.

Then while Hampton was playing, the voice might cut in to call attention to the phenomenon. It didn't improve the music, but it sharpened the analysis.

Even if the 50-or-so records and cylinders used to illustrate the study had been available, finding the right grooves on each, announcing and commenting on them as they were played would have been a staggering task. Only one person could attempt it—the author. On tape, anyone who could thread a Revere and turn a knob could hear it, at leisure.

The recorder and a 12-inch auxiliary speaker were turned over to the committee (temporarily) along with the tape and manuscript. They could listen to it, play it back, and argue about it all they wanted, in the privacy of their offices—out of presence of the author which, from his standpoint, had its disadvantages. There was no room for bluff.

The novelty of presentation scored a hit, not only with the committee, but with faculty from other departments who heard about it and came to hear it. Someone suggested the university library exhibit the manuscript, books, pictures, and tape with a machine so anyone could look and listen. Quite different from the run-of-the-mill thesis written, dutifully read, and laid to rest in the library archives!

Whether or not this turns out to be the grand-daddy of taped music theses is beside the point. The point is what a new dimension for theses, dissertations, college and high school term "papers" and studies of every nature has been opened by the tape recorder. Not only in music, but in all the oral arts: poetry and speech, for example. Or any field where you can go out—to the concert, lecture, town meeting, tavern, classroom, street corner, anywhere people are making sounds, and bring 'em back on tape.

TAPE CLUB'S "OPERATION FRED" A SUCCESS

Tape Respondents International recently carried out a fine undertaking dubbed "Operation Fred".

Fred Goetz, founder of TRI, underwent a serious and costly operation and was home recuperating when he was visited by a member of the club, Dick Carter. Dick drove 90 miles from his home to make a presentation on behalf of the members of the club. In appreciation for the enjoyment received through Tape Respondents International, as a result of Fred's efforts, a tidy sum had been collected to help him meet the high costs of his hospital visit.

Some months previously, upon hearing of their leader's plight, two of TRI's members, Jim Greene of Little Rock, Ark. and Arthur Masters of Brooklyn, N.Y., decided to do something to help and give the rest of the members an opportunity to do the same. Jim wrote a script, and Arthur, together with Betty Anne Gatewood recorded lines. The pre-recorded tapes were then turned over to Jim who, assisted by Gor-



don Turner, made a master tape. The tape presented the facts concerning Fred's situation and stated that the members might like to show their appreciation to the founder of the club.

Jim Greene, left, wrote the script for "Operation Fred" in which Betty Anne Gatewood took part. Gordon Turner, right, helped in making the master tape. Arthur Masters, not shown, also helped in the project.

From the master tape 40 duplicates were made and these were routed geographically and sent from one TRI member to another. Although no one was asked to donate, checks poured in to the headquarters of "Operation Fred" in Brooklyn and Little Rock. The tapes were dubbed at various speeds and care was taken to see that they were sent to members who had to have them at a certain speed. A route list was sent with each tape and each member was asked to pay the postage to the next name on the list. Some tapes were lost and tracers had to be sent. Victor Beals of North Little Rock donated his time and a professionally made phonograph disc which speeded up the job of making the duplicate reels.

The project consumed a quantity of time and effort, but as Dick Carter stated, "It's friendship at its finest" and "I am sure that their target was most deserving".

Fred was greatly moved by this expression of appreciation and could hardly believe it was true.



Build this TAPE RECORDING CENTER

... always ready for recording or playback, this convenient set-up extends the use of your tape recorder

by

O. L. Schafer

Photos by the author

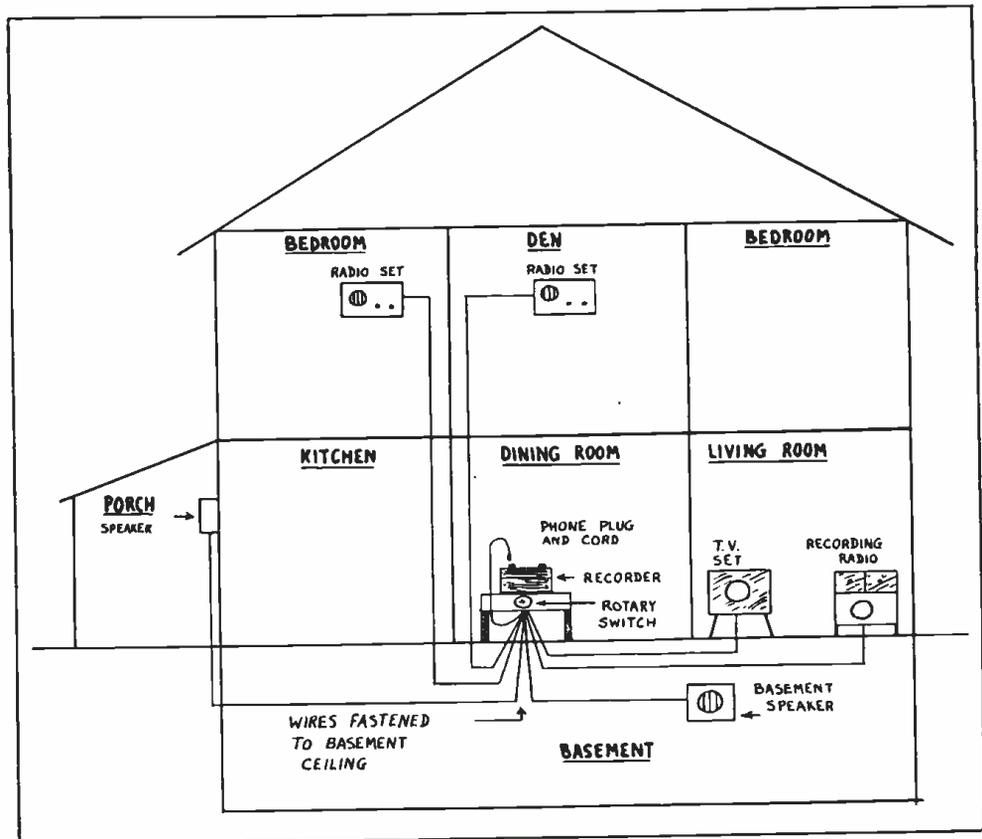
"GOLLY!" exclaims Dad, "Only two minutes to set up for the *Rodgers and Hammerstein Program*." He makes a mad rush for the recorder and quickly sets it down near the radio. "Now where is that hook-up cord? Must be down in the basement." He descends the steps two at a time and frantically looks through a pile of tangled cords. After searching for five minutes he remembers it is in a desk drawer. Now to get the recorder connected. He pulls the radio away from the wall, drapes the cord around two chairs and endeavors to place connecting clips on the radio speaker. After three attempts, the wiggly things finally hold. Not bad, only fifteen minutes wasted (plus all the *Oklahoma* music). Later in the program, while Mary Martin is "washing that man right out of her hair," Junior comes along, trips over the dangling cord and off come the clips. That ends the recording for the evening.

Has this ever happened to you? Well, cheer up. All your troubles will be over if you install the simple and inexpensive "Tape Recorder Switching System" shown in the circuit diagram (page 41). Your machine will be ready instantly to record from a radio or television set without any annoying hook-up preparations. Also, in a moment the playback output can be connected to external P.M. (permanent magnet) speakers in any part of the home, including those in your present radio sets. The sets need not be turned on. You will be able to listen to your favorite recordings in the bedroom, the den, on the porch, in the basement, or any other place, without moving the recorder. Only two controls are used—a two conductor flexible cord with a phone plug attached to one end and a rotary switch. No internal connections are made in the machine.

To start recording, you merely tune in the radio, insert the phone plug in the radio input jack of the recorder and turn the rotary switch to position 1. In switch position 2, you can also record from the radio but in this case the radio speaker is purposely silenced to avoid keeping the family and neighbors awake while you are recording late at night. While the switch is in position 2 for silent recording, the monitoring feature on your machine must be used to hear the program being recorded. Some machines are arranged so you can hear this from the recorder speaker. On others, you must listen to it from headphones that are plugged in the recorder monitoring jack. To record from the television set, you simply switch to position 3 with the phone plug in the input jack. The "silent-record" feature is not provided for television recording.

To hear your tape recordings on the external speakers, you insert the phone plug in the recorder output jack and turn the rotary switch to the desired setting. In position 1, the playback output will be heard in the speaker of the radio that is used for recording. Hereafter, we will call that set the recording radio. Position 2 cannot be used for playback. In position 3, the recorder output is switched to the television speaker. In positions 4 to 11 it will be switched to external speakers that are connected to these points. For example, page 42 shows the bedroom radio connected to terminals 5 of the rotary switch. If the switch is turned to position 5, the tape recordings will be heard in the speaker of the bedroom radio. All external speakers must be of the P.M. (permanent magnet) type and most modern radio and television sets have such speakers. Gang (C) on the rotary switch provides a circuit to permit normal use of the recording radio while the machine is being used for playback in positions 3 to 11.

Facing page: the tape recording center designed and built by the author. A Pentron recorder is used and storage space for tapes can be seen on either side of the machine. The 3-gang switch underneath the front of the recorder permits a wide variety of recording and playback possibilities. Right: a drawing shows how the lines are run from the switch to the various rooms. Recording can be done from the "recording radio" or TV set and playback to any one of the other rooms, basement or porch.



The materials needed may be purchased at any radio parts supply house and are listed below.

- 1—3-gang, 11 position rotary switch
- 1—11-position dial plate for the above switch
- 1—2-watt carbon resistor (see text for ohm size) Do not use wire wound resistor
- 1—phone plug
- 6 feet of rubber covered 2-conductor flexible cord

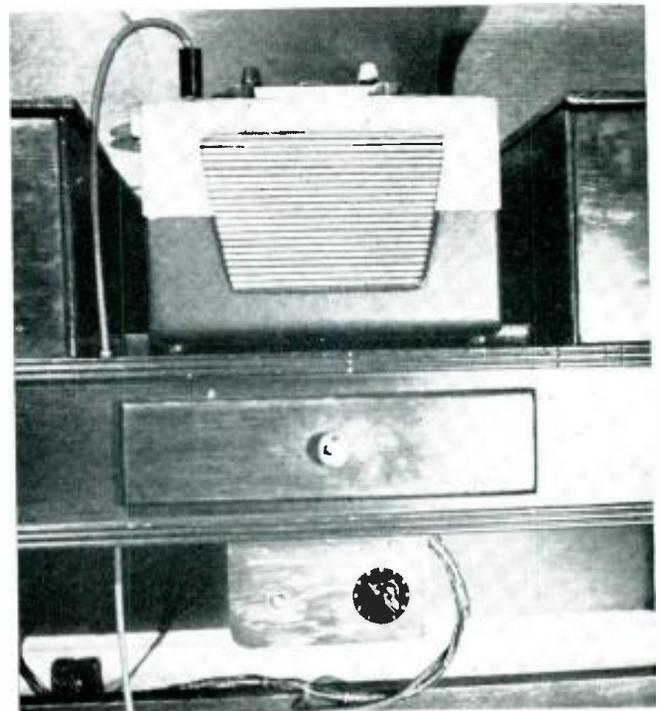
An adequate supply of 2-conductor twisted insulated copper wire, either 18, 19, or 20 gauge. This wire is used for connecting the rotary switch to the external speakers.

The information which follows may be helpful to those who wish to install this switching system.

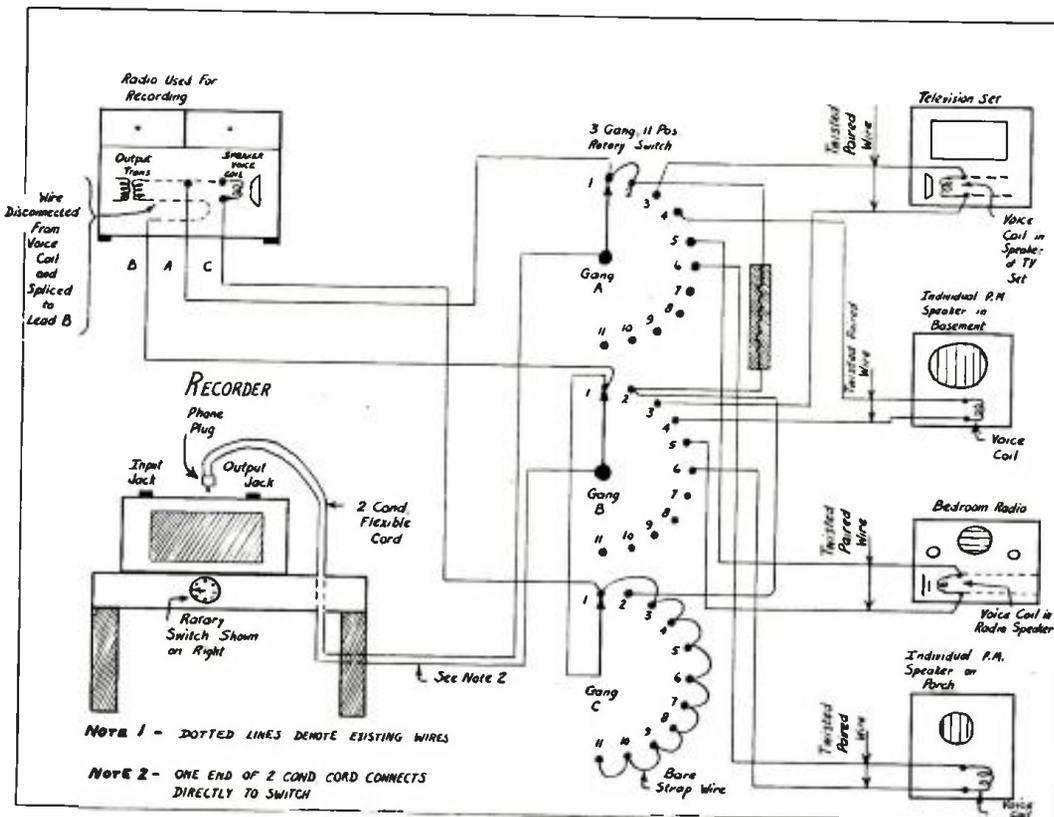
First decide where the rotary switch and cord will be located and which radio will be used for recording purposes. The author has installed them on a table specially constructed to hold the recorder and uses an AM-FM radio. The switch and cord may be mounted on any convenient table or it may be placed in the cabinet of the recording radio if there is room. Next, decide what remote speakers are to be connected to the system. These can be P.M. speakers in your present radio sets or separate speakers. Above is shown a typical installation with four external speakers. Allowing two positions for the recording radio, this plan requires the use of only six of the eleven positions on the switch. Five of the positions are thus available for other speakers and future users. Bear in mind that the layout shown is only a typical plan. The switching circuit is very flexible and permits you to connect speakers in any manner desired.

After planning the installation and securing the necessary parts, start wiring the rotary switch as indicated in

figure 1. Connect and solder all wires on the switch before mounting it. This includes connecting one end of the 2-conductor flexible phone plug cord and one end of the twisted pair wires that will later be run to the recording radio and external speakers. When this is completed, mount the switch and cord in their permanent location



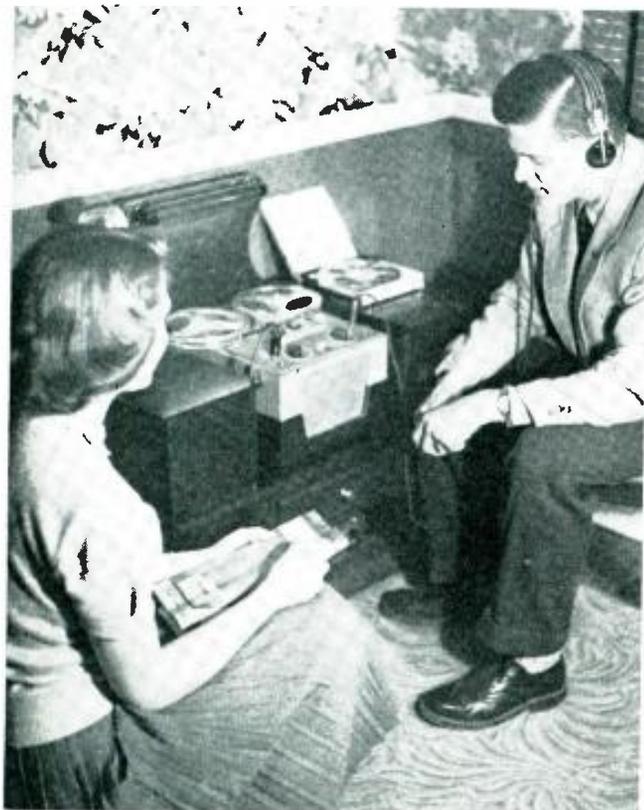
Close-up showing how the 3-gang switch is mounted below the recorder. The switches are available at radio parts supply houses and are not difficult to connect up.



The drawing shows the hookup for the multiple-gang switch. Note the connections for recording that have been made in the voice coil leads in the radio and TV set. The connections may be made to the volume controls of these units as is suggested and shown in the article that begins on the following page. All speakers used for playback should be of the permanent magnet type.

and install the external speaker wires. Connect and solder the wires directly to the voice coil terminals of these speakers. Wiring between floors may be run in the cold air ducts of the heating system, if available. Now connect the phone plug to the other end of the flexible cord.

To obtain the "silent record" feature in position 2, it will be necessary to make a slight modification in the recording radio. It consists of disconnecting a wire from one side of the speaker voice coil and connecting leads A, B, and C as shown.



Resistor (D) is provided to replace the recording radio speaker voice coil when that circuit is opened in the "silent record" position. The ohmage of this resistor should be approximately the same as the impedance of the voice coil. Now don't let this term scare you. It will be easy to determine the resistor value you should use. The impedance of speaker voice coils in most radio sets is either 3 to 4 or 6 to 8 ohms. All you need to know is which of these apply to your radio speaker and then use a resistor of the same value. The audio hobbyist or technician will know that the impedance in ohms is often found stamped on the back of the radio speaker. If not there, it can be obtained from the radio circuit schematic.

No internal connections are made on the recorder. Monitoring can be done on some machines with headphones, as can late-at-night listening.

We have made quite a "federal case" out of this resistor but really it is not too critical. The author records from a radio with a 6 to 8 ohm voice coil speaker and from a television speaker with a 3 to 4 ohm coil. As a compromise, a 5.6 ohm resistor is used and it works very satisfactorily with either set. You will probably find that a resistance about this value will be suitable for your switching system. In the event you are not satisfied with the tone quality of the recordings made while the switch was in position 2, try other resistors with values between 3 and 6 ohms. The one that produces the best results is the right type to use.

Now that we have settled this point, solder the resistor in place and you are all set. You will find that with this switching system a library of tape recordings can be easily and economically acquired and you will obtain maximum use from your recorder.

HUM - M - M - M - M - M

... here are the solutions to some of the most annoying hum problems that plague tape recordists.

by

JAMES H. MILLS, SR.

OF all the questions received by our "Questions and Answers" editor, fully fifty per cent of them have to do with the elimination of hum. Most of the hum troubles appear when the recorder is connected to a radio or TV set or another recorder.

The most prevalent and annoying source of trouble, noise and hum is caused in part by the "AC loops" which may be in the equipment itself. The inequality of line resistances and grounding systems in the home or business power wiring and ineffective line drainage methods used by manufacturers of radios, TV sets and other audio devices also add to the causes.

One of the most essential requirements for click, noise and hum-free recording is a common source of commercial power. This may be obtained by connecting all devices into the same double outlet or through the use of a three-way adapter which is available at your hardware store or electrical dealer's.

Almost everyone's electrical supply is heavily affected by commercial users, long exposed lines pick up noise, local appliances contribute clicks and current ups and downs, and even radio and TV stations can cause trouble as their current demands are heavy and fluctuate rapidly.

In almost every case a material improvement in the quality of recordings will result if you use a "brute force" line filter in combination with your multiple outlet plug as shown on page 45. These are the "Tobe" or "Cornell-Dubilier-IF series" units connected as shown in the sketch below. Be sure a good ground is provided for the filter as directed

in the instructions that accompany the unit.

After the three-way plug is inserted, connect the recorder, radio, etc. by plugging them all in the same plug. Transpose the plugs until minimum hum is achieved in all units.

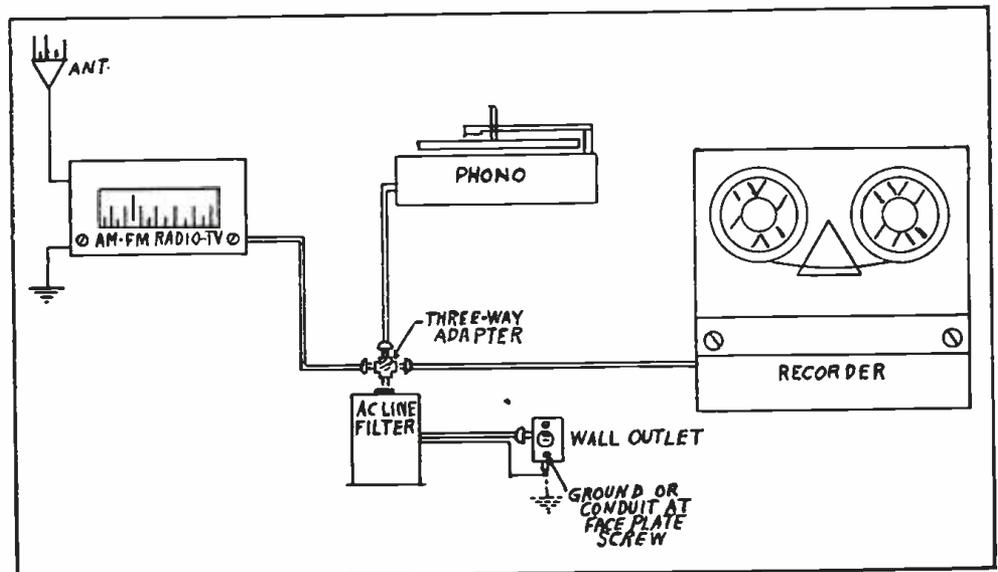
Once the hum is cleared from the incoming power you can turn your attention to the audio connections.

The following arrangements and circuits are not specific in every case but rather general. In some particular types of equipment they must be varied or experimentally applied; however, the principles involved may be fitted to almost any case by one fairly adept at hooking things up or by a radio or TV mechanic.

The popular type tape recorders have a conventional input arrangement which is fairly broad in tolerance. It usually runs anywhere from 15,000 to 500,000 ohm impedance with only minor losses in quality over this range. These input jacks are usually designated "Microphone," "Radio," or "Phono" and require a driving level, or voltage input, of from .01 (in the case of a microphone) to 1 volt (in the case of a radio or TV pickup).

Because of this wide variation, and because there is no standard ratio between these inputs from brand to brand of recorder, you may have to experiment to find the jack that gives you the least hum. It may be necessary to plug your phono connector into the microphone jack on the recorder, even though you have a jack on the recorder marked "phono." This would be true where the phono input was low. By plugging it into the mike jack you do not have to turn the volume up so high.

For the elimination of hum, clicks and noise from the power lines the use of an AC line filter is advised. A three-way adapter should be plugged into the unit and all the audio devices hooked into it as shown. The plugs should be transposed until minimum hum is secured from all units. The line filter should also be connected to a good ground.



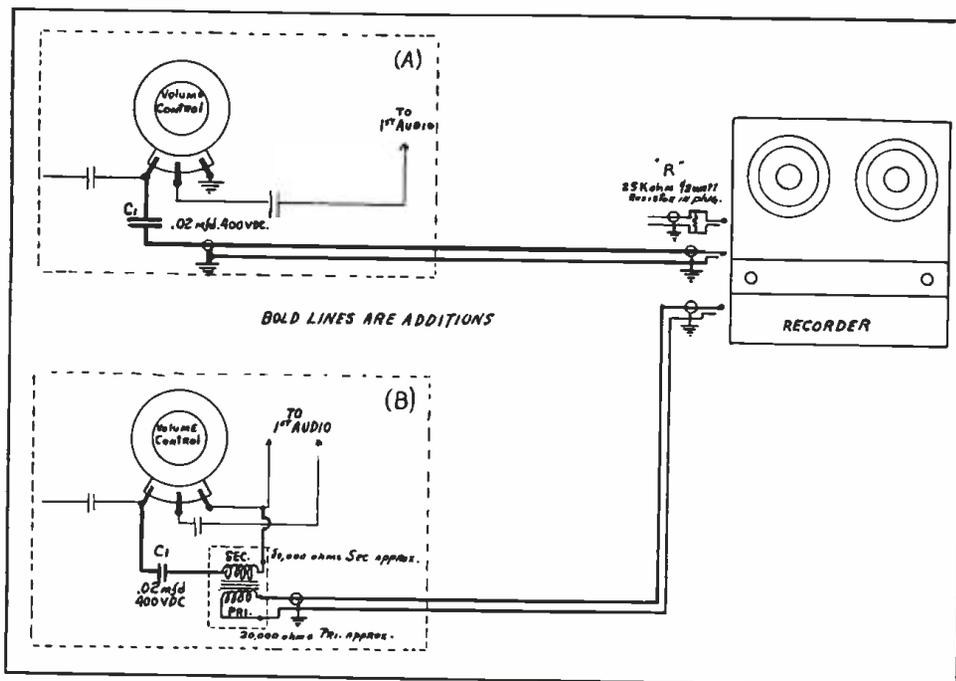


Figure 2. A—A simple connection that will work on most radio sets. The volume control is the best take-off point for recording. Note 25,000 ohm resistor which may be incorporated in the plug. B—For AC/DC sets and TV sets which may have a voltage on the chassis, it is necessary to hook up a transformer to prevent this voltage from reaching the recorder and causing hum. In stubborn cases, where ordinarily the hookup shown in A should be sufficient, B must be used instead.

Figure 3. While simply making a connection to the voice coil of the speaker will often produce good recordings, the best way to do it is shown in the drawing. This eliminates any possibility of hum and takes care of those speakers which may be grounded on one side. A 1 watt, 2000 ohm carbon resistor is connected to each line and across these is connected a 5 ohm, 2 watt carbon resistor. The transformer is hooked in as shown to give isolation.

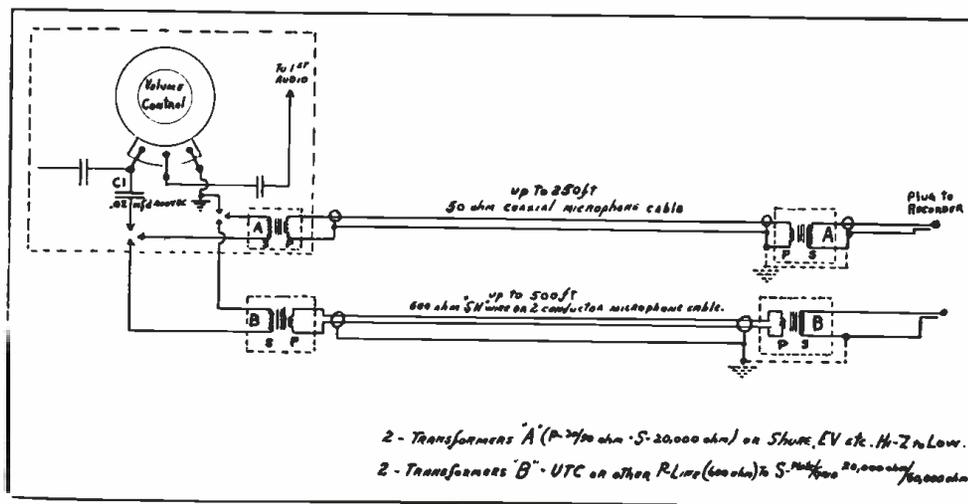
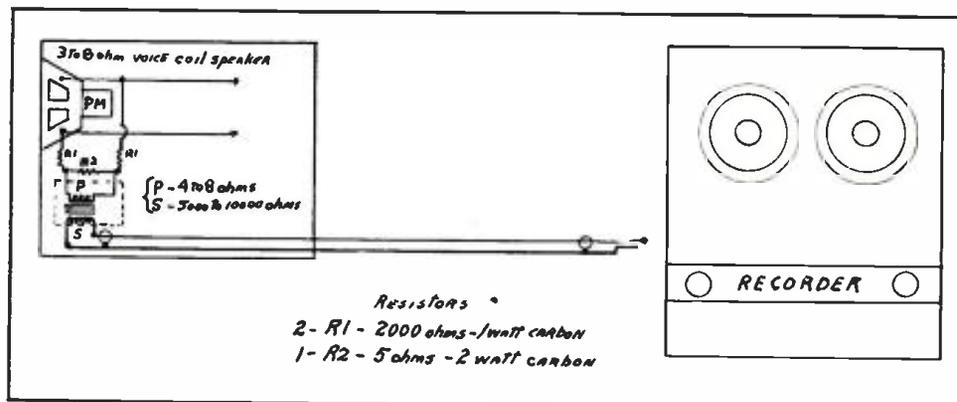
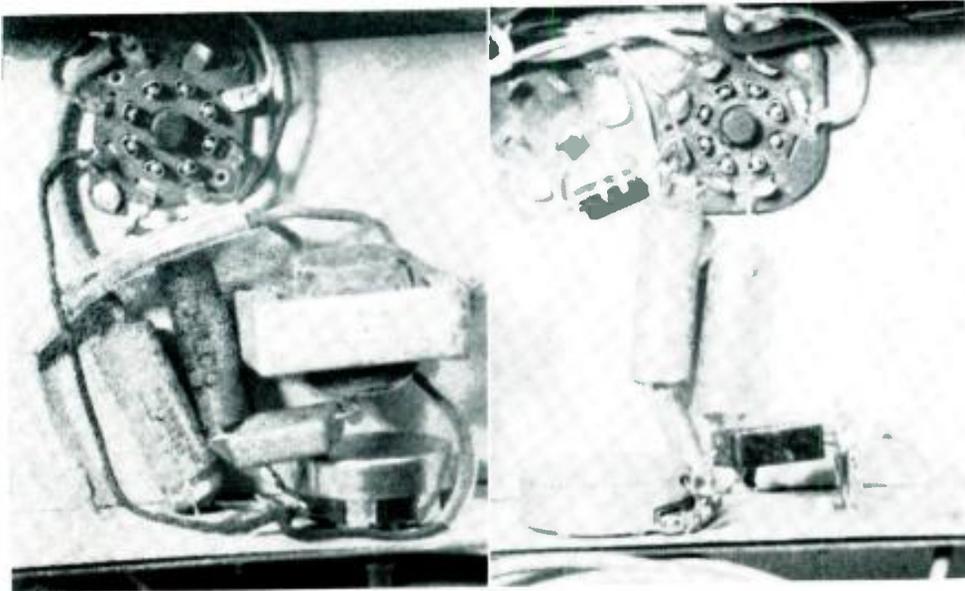


Figure 4. A—For long runs (up to 250 feet) transformers must be used at the source and at the recorder also. These are placed "back to back" with the low impedance sides connected to the line and the high impedance sides to the recorder and source. At B, the requirements for still longer lines (up to 500 feet) are shown.

This is no reflection on the recorder manufacturer. He may have designed his "radio" input, for instance, to take the current as supplied by a connection to the voice coil of the radio speaker. If you, instead, take your connection from the volume control, which is the better spot, then the "radio" jack is not the place to plug it in. You'll do better using the "microphone" input on the recorder. And so it goes.

The best point for your audio connection must next be selected on your radio, TV or other audio equipment and the items of prime importance are: 1—approximate impedance matching, 2—adequate driving signal level, 3—quality, 4—minimum noise and 5—ease and simplicity of connection. Impedance matching is not as difficult as it may sound. A single example should suffice to give you the idea. The voice coil of the usual loudspeaker, for instance, has an



Left: The transformer hookup that is shown in Figure 2B on the facing page. The transformer and condensers can be mounted neatly next to the volume control in the radio or TV set as shown. The volume control is at the bottom of the picture. Right: The simpler hookup shown in Figure 2A. This will work in most cases but hookup 2B may be required in stubborn cases of hum. The parts may be obtained from any radio supply house.

impedance (AC resistance) of 4 to 8 ohms. The mike input on your recorder will have an impedance of from 10,000 ohms up. If you connect the 8 ohms to the 10,000, your recording will sound distorted or tinny. You have a great mismatch. In a case such as this you buy a transformer, one coil of which has an impedance of 8 ohms and the other coil 10,000 ohms. You connect the 8 ohm side to your speaker and the other side to the mike jack. You have now "matched" the output to the input and whatever goes in one end should come out the other unchanged.

The best point to make a take-off for recording is generally at the volume control of an AM/FM tuner, radio, TV set or another recorder. At this point, if properly connected, each of the prerequisites are met with no noticeable effect on the volume or quality of the equipment being tapped. (See Fig. 2A).

Use only high impedance coaxial (single conductor shielded) microphone cable not exceeding 25 feet in length connected as shown. Make sure that the shield provides the ground by connecting it to both chassis. The condenser value may be increased to a maximum of .1 mfd. if addi-

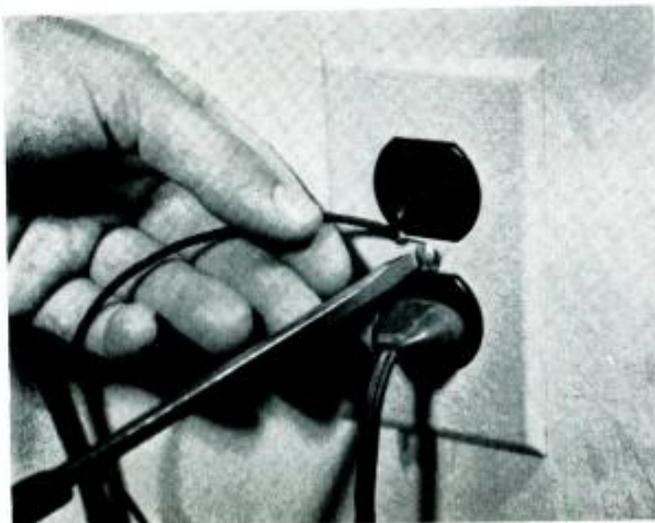
tional bass response is required by some tape recorders and the addition of the "R" resistor of 25,000 ohms at the recorder input may be required to reduce mismatch in some types of recorders which have one input for both mike and phono or radio.

When connecting to a crystal phono pickup connect directly to the crystal output leads being sure to connect the shield to the frame of the turntable, if possible. If a reluctance/magnetic type of pickup is used connect to the pre-amplifier unit with the shield conductor connected to the pre-amplifier chassis ground.

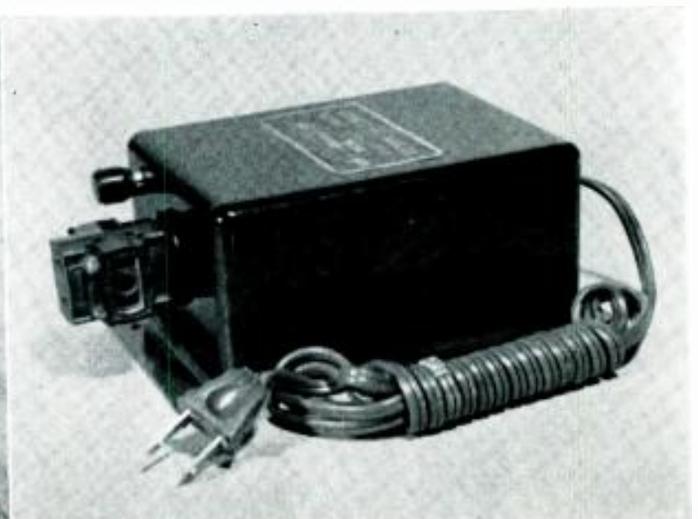
Figure 2B shows the connection required for audio units such as an AC/DC radio or TV set. These have the "chassis connected above ground" for bias purposes and cannot be connected as shown in Fig. 2A. The "chassis above ground" means that there is an actual voltage on the chassis itself instead of being neutral or "grounded."

In some stubborn cases, where a hookup such as is shown in 2A would normally be adequate, the hookup shown in 2B must be used instead. The connecting cable should be high

(Continued on page 49)

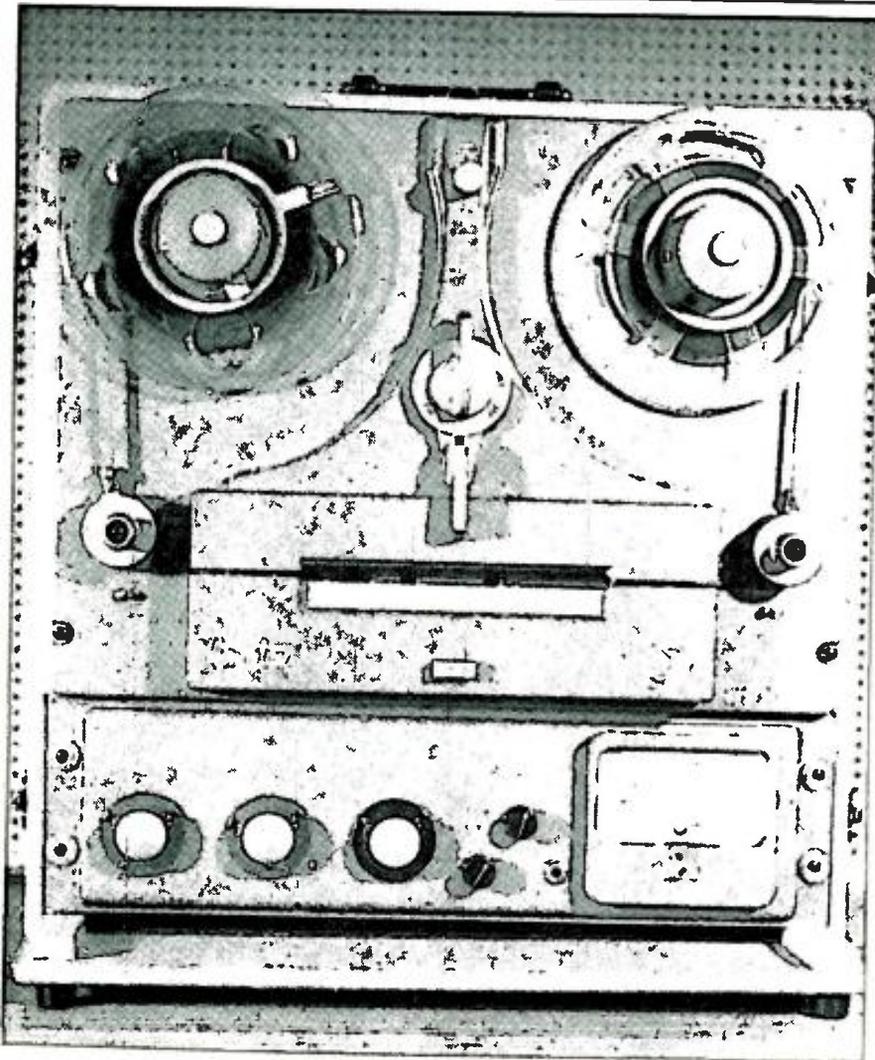


The Cornell-Dubilier AC line filter is shown at right. Into this is plugged a three-way adapter and all units, radio, TV and recorder plugged into it for best results. The terminal at the top of the case



is for the ground wire which may be connected to the center screw on the outlet face plate or other good ground. The line filter will eliminate clicks and noise coming in over the commercial power wires.

NEW PRODUCT REPORT



BERLANT CONCERTONE 20/20

. . . up to five heads, large VU meter, AB test control, 2 channel mixing, automatic shutoff, dual speed

IN this machine (the type tested was a dual track 7½ and 15 inch per second model) we found an equipment with a remarkable response for its price range. With the various head arrangements and other factors included in the design, the manufacturer seems to have a machine that will fulfill all amateur and most professional requirements in the recording and playback field.

The 20/20 is available in several different forms, the dual track, which is standard, single track, or binaural-monaural. Speeds are either 3¾ and 7½ ips, or 7½ and 15 ips. Up to five

heads may be mounted on the head rack making the recorder instantly switchable from single to dual track or to binaural.

The unit is equipped with three heavy duty motors. The tape drive is a two-speed capacitor-induction motor and two shaded pole motors are used on the take-up and rewind. The latter function at 2400 feet per minute and the speed can be varied by the lever. The tape transport contains no belts and produced less than 0.1% wow and flutter at the 7½ ips speed. It was still less at the 15 ips speed.

The pay-out and take-up spindles

STAOKSTED

Product: Berlant Concertone 20/20 Recorder

Manufacturer: Berlant Associates, 4917 W. Jefferson Blvd., Los Angeles, Calif.

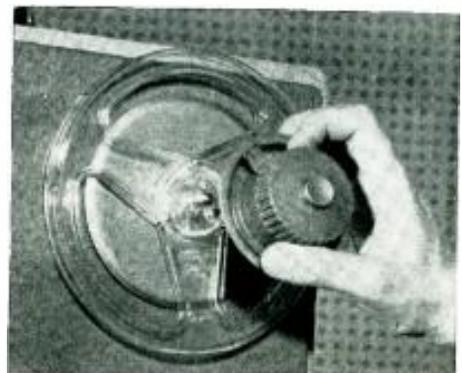
Price: Dual track \$445, single track \$470, binaural-monaural \$695. Case \$47.50 extra.

will take reel sizes from 4 inch to 10½ inch without the use of adapters.

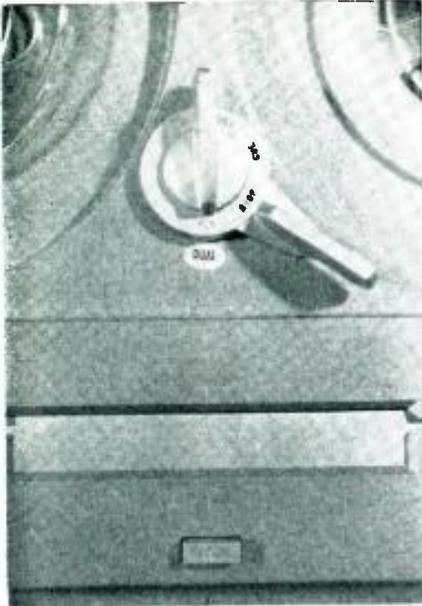
The tape transport control is a single lever and the machine has an automatic cutoff at the end of the reel or in the event of a tape break. The recorder was used over a period of three months and in that time developed no trouble or malfunctioning.

Constant and unvarying tape tension is supplied by means of the tape tension arms over which the tape travels both before and after contacting the heads. Threading is straight line and very simple and rapid.

The pre-amplifier section contains a two channel microphone and line mixer and a standard broadcast size VU meter. The AB test fader is a unique feature which permits the user to monitor either the incoming sound from microphone or line, or a mixture of the two, or to pick up the sound after it has been recorded on the tape. No noise or clicks accompany this switching from one to the other. The VU meter will also function for either record or playback. A monitoring jack for headphones



Reels are held in place with the "Reelok" which clamps on the shaft when the center button is pressed. Tab near edge releases it.



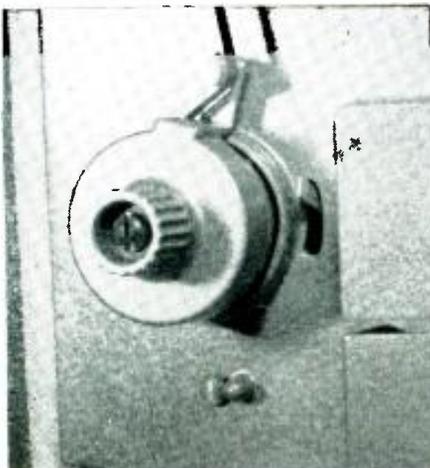
All mechanical controls are centered in this one unit. The smaller lever controls the fast forward and rewind; the larger the functions such as run, cue, edit and stop. The record safety button can be seen below tape gate.

is provided as is an on-off switch and a function switch which also shows the bias level at the heads.

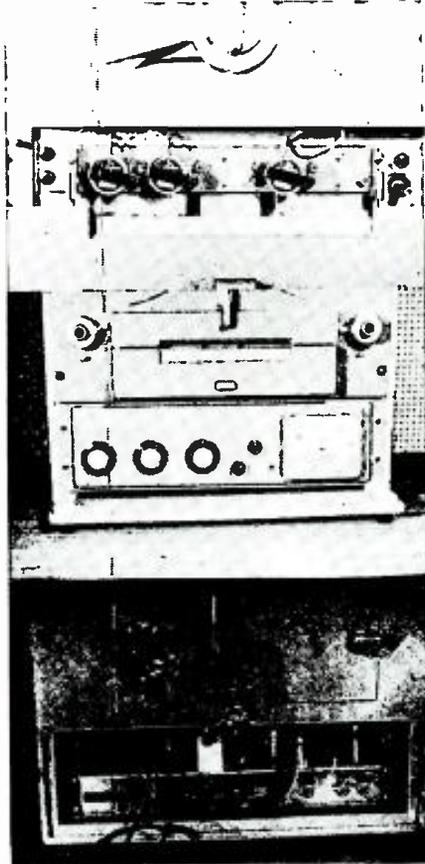
Results of the audio tests on the unit indicated that it exceeded AA program requirements at the 7½ ips speed (70 to 8000 cycles per second) and AAA program requirements at the 15 ips speed. (50 to 15,000 cps.). There was an ascending rise in response up to 17,000 cycles and tests showed a 35 db signal to noise ratio at the 15 ips speed. These are exceptional results for field testing.

The recorder is made either for rack or custom installation or may be mounted in the case. It weighs 45 pounds and an accessory dolly is available for shifting it from place to place.

The recorder will operate in any



Constant tape tension is maintained by the arms. Automatic shutoff occurs at the end of a reel or if the tape should break.



Top: the cover removed reveals the heads, erase, record and playback. Up to five heads can be mounted in the frame. Center, the control panel and tape gate with the large VU meter on the right. Lower: rear view showing preamplifier and ventilating port.

position, including face down, the reels being held in place by the "Reeloks" which clamp on the spindles when the center button is pressed. A tab along the edge is pressed to release them from the shaft.

The maker advises cleaning the heads once every ten hours of use and the face plates are instantly removable to give access to them and the pressure pads.

Inputs are on the back of the amplifier panel and include a high impedance microphone input and a 200,000 ohm unbalanced bridging input. Connections between amplifier and the drive panel are by means of cables and plugs. Speed change is effected by turning a single knob on the tape drive mechanism which changes the equalization at the same time.

The unit has a fine appearance being finished in a hammertone brown with copper fittings. The carrying case is light tan.

After having tested the unit and having subjected it to ordinary use over a period of three months we feel that we can unhesitatingly recommend the recorder as a fine machine.

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NOTICE

... due to the fact that author Harold E. Weiler made last minute changes to include material that is up to the minute, the appearance of his new book "Tape Recorders and Tape Recording" has been delayed. The latest available information is that the book will appear May 10th.

All those who have placed pre-publication orders will receive the book just as soon as it is off the press. We regret the delay.

**IF YOU HAVE NOT DONE SO
PLACE YOUR ORDER NOW
FOR THIS NEW BOOK**

It gives you the "know-how" for best recording results, covers recording instruments, piano, organ, banjo, etc. How to create depth, facts about sound, sound effects, recording indoors and outdoors, editing and splicing, putting sound on film. Library size, over 100 illustrations, 13 chapters.

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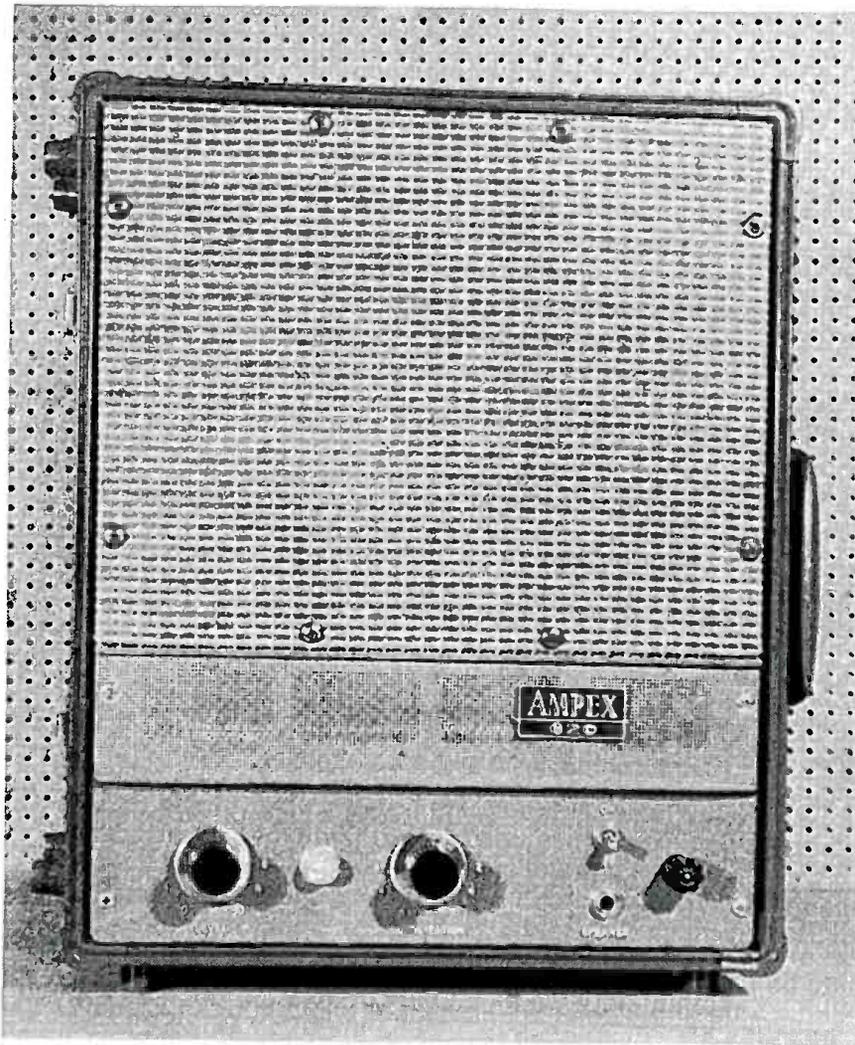
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AMPEX AMPLIFIER-SPEAKER

... 10 watt amplifier, excellent response, characteristic of this portable unit.

THERE is an old saying that "good goods often come in small packages." That old saw is fully borne out by this amplifier-speaker combination manufactured by the Ampex Corporation.

The Ampex 620 amplifier-speaker is a companion piece to the well known Ampex 600 portable recorder. It is housed in a Samsonite luggage case of about the same dimensions as the recorder and is much the same in outward appearance.

The lid is detachable and contains loops to hold the power and audio connecting cords. The speaker is covered by an attractive grille and below the

speaker grille can be found the controls. The volume control is on the left, next is an "on" indicator light and beside this the bass-treble control. An on-off switch is provided as well as a fuse receptacle and speaker outlet jack on the face of the panel.

The power and audio inputs are in a recessed well in the side of the case.

As an amplifier-speaker combination, excellent results were obtained on test. The frequency response measure with the unit at 2 watts output into its nominal impedance was 30 to 15,000 cycles per second at less than 1 dbm linear attenuation from a reference point of 1000 cycles per second. It had less than

Product: Ampex 620 Power Amplifier and Speaker

Manufacturer: Ampex Corporation, 934 Chartor Street, Redwood City, Calif.

Price: \$149.50

1% audio distortion, which is quite remarkable considering the circuit which is used. This is a three stage push-pull output having phase inverted drivers and a high-gain voltage amplifier. We noted several equalizing and reciprocal networks, some of which are directly associated with the speaker input.

The fine results we obtained are the more remarkable as the speaker unit is a single cone permanent magnet type. This is housed in an enclosure damped by a thick blanket of what appears to be Fiberglas. The packing prevents resonances and the success of this method is attested by the fact that our tests indicated an excellent response with but minor deviations up to more than 10,000 cycles and good flatness of response down to 50 cycles per second. This exceeds the claims made by the manufacturer.

Many novel arrangements have been incorporated into the speaker with the net result that reproduction is excellent to about 8 watts output—which is more than enough for the average room.

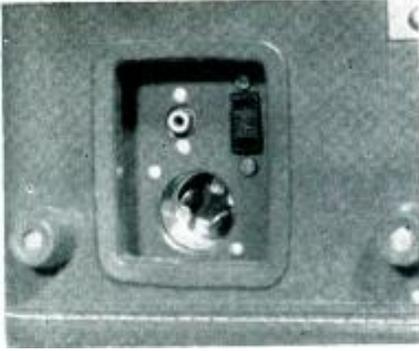
The tone compensation is a single control with the zero position at the center for a flat response.

A maximum of 8 dbm of bass gain is to be had with the control all the way in the bass position and on the high side a gain of 6 dbm is indicated at 10,000 cycles.

The input to the amplifier-speaker is high impedance and it will accommodate such things as a record player or



The 620 is housed in a mar resistant Samsonite luggage type case that matches the model 600 portable Ampex recorder.



In this well in the side of the case can be found the power and audio inputs as well as a 110 volt output receptacle.

turntable, a pre-amplified microphone, AM-FM tuner, etc. in addition to the tape recorder.

HUM—(Continued from page 45)

impedance microphone type not in excess of 25 feet in length. The transformer is an interstage audio type available at any amateur radio supply store. If possible, stick closely to the values shown or you may get distortion. UTC or other medium quality interstage transformers "plate to single grid" 10,000 to 50,000 ohm or "push-pull plate to grid" of low ratio (omit the center tap) will be satisfactory. Connect the high impedance side to the audio device.

The method shown in Figure 3 may provide an acceptable recording but its shortcomings lie in high hum level except in exceptional audio systems. Extraneous noise and room noise pickups, caused by the loudspeaker acting as a microphone and impedance variations due to speaker load changes at various frequencies may give trouble. This method is at best an expedient. R-1 should be a one watt carbon resistor, R-2 a 2 watt carbon and the cable should be (high impedance) shielded microphone type, not in excess of 25 feet. The transformer is a UTC or other medium quality "plate to voice coil" 10,000 to 4 ohm. It is inverted in connecting and bridged across the voice coil of the loudspeaker using the impedance matching "pad" as shown.

Pickups made by placing the microphone in front of the loudspeaker may provide experience in microphone use but in general will result in poor recordings. If a mike pickup is your only choice, wrap the mike loosely in gauze or a handkerchief, place it close to the speaker and hope for the best.

Where long runs between units (in excess of 25 feet) must be used, im-

Also provided is a power output receptacle in the well on the side of the case and an extension speaker jack on the face of the panel.

The speaker jack can be used to feed a major speaker enclosure or PA system and when in use the speaker in the case is cut off. This feature enables the amplifier alone to be used.

The 620 was a stock model in its original carton. The workmanship of the unit showed care. It was well assembled and had a fine, quality appearance.

We feel that this unit is worth the price asked and that we can recommend it without hesitation for its fine performance. As noted above, it exceeded the claims made for it by Ampex.

pedance conversion is required. See Figure 4. A choice of two low impedances is available and the quality of either method is excellent. One or the other may be used, depending upon your choice of material; however, once you settle on one method don't try to mix components.

Figure 4A indicates connections and materials for a 30/50 ohm connecting system and the two transformers are used "back to back" using conventional hi-lo units made by Shure, Electro-Voice, UTC and many others. The transformer ratio is nominally 15,000 to 30/50 ohm ratio. The cable is 30/50 ohm single conductor shielded microphone cable of the "Belden" type. Runs in excess of 250 feet require equalization to compensate for the attenuation of the high frequencies.

Figure 4B is for 500/600 ohm conversion and the transformers may be any good "plate to line" UTC, Chicago or other make, connected "back to back" at each end of the shielded two-conductor (600 ohm nominal) inside wire. This is commercially coded SH 22 or 19 gauge inside wire. Lengths up to 500 feet may be used without the need of equalization.

Competent and balanced equalization is much too complicated a subject to take up here but in general the bass and treble boost of your amplifier will more than compensate for moderately longer extensions of Figure 4B.

The hookups shown are for average recorders and will produce good to excellent results. If you desire perfection then you will have to buy professional radio-station type equipment which runs into hundreds and sometimes thousands of dollars.

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SHOP OR SWAP

Advertising in this section is open to both amateur and commercial ads. TAPE RECORDING does not guarantee any offer advertised in this column and all swaps, etc., are strictly between individuals.

RATES: Commercial ads, \$30 per word. Individual ads, non-commercial, \$.05 a word.

Remittances in full should accompany copy. Ads will be inserted in next available issue. Please print or type your copy to avoid error. Address ad to: Shop or Swap, Tape Recording Magazine, Severna Park, Md.

MAKE \$100 weekly spare time with your tape recorder. Guaranteed new condition. Used less than 24 hrs. Nothing wrong, need cash includes NAB adapters, 2 NAB reels, 1 hub tape. Shipped prepaid in original carton with original operating instructions. New \$385., now \$345. J. Shipton, 119 Evans, Iowa City, Iowa.

FOR SALE: Tapesonic 70-B 3-speed tape recorder. Guaranteed new condition. Used less than 24 hrs. Nothing wrong, need cash includes NAB adapters, 2 NAB reels, 1 hub tape. Shipped prepaid in original carton with original operating instructions. New \$385., now \$345. J. Shipton, 119 Evans, Iowa City, Iowa.

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MAGNEMITE PORTABLE tape recorder, records anywhere. Price \$100., or trade for other tape recording equipment, accessories, etc. Best offer accepted. M. S. Scherer, Ring Trailer Court, 1802 West O St., Lincoln, Nebraska.

WANTED: In good condition, late model used Magnecord or Concertone tape recorder. Harry C. Knode, 8400 Westchester Drive, Dallas, Texas.

FOR SALE: Eicor tape recorder, 7 1/2" speed, loudness control, excellent. \$75.00; Electro-voice Model 635 dynamic microphone, like new, \$37.50; Airline portable 3-speed record-changer, excellent, \$50.00; Prep 16 mm silent movie projector, \$15.00; Films, \$5.00 each. Shipping charges additional. Marilyn Phillips, 311 Penfield, Rockford, Illinois.

FOR SALE: RCA SRT 301 push button tape recorder, two speeds—3 3/4 and 7 1/2 ips, excellent condition, \$95.00; original cost, \$189.50. One year old. Contact Earl J. Hauser, 2265 University Avenue, The Bronx, New York.

PRECISION MAGNETIC HEADS, Erase—Record—Playback. Stencil-Hoffman Corporation, Hollywood 38, California.

RECORDINGS WANTED: French cafe music, 3 3/4 or 7 1/2 ips. W. R. Trevarthen, Trevarthen Electronics, 1651 Greenbrier Road, Long Beach 4, California.

FOR SALE: Webcor (Webster-Chicago) model 210 tape recorder; 2 speeds; dual track; magic eye recording level indicator; high quality crystal microphone; first offer over \$150. Write to Charles Kates, 310 Kaplan Ave., Hackensack, New Jersey.

WANTED: Personable salesman with tape recorder, evenings, to sell from our leads. Prefer Long Island or New York resident with car. Write TV-TIME, Woodmere, N. Y.

FOR SALE: Concertone F-1523 basic tape recorder, 7 1/2" and 15" per second, dual track, up to 10 1/2" NAB reel. Perfect condition. Used very little. With reels, original wholesale price, \$345. Sell for \$200. Also sell plastic base pre-recorded tape (1200 ft.) for \$1.25 a reel (Latin American selections). Don Rockwell, 685 Rutledge, Kankakee, Ill.

STEREO - BINAURAL MICROPHONES: One matched pair Concertone (Mfg. American Microphone Co.), dynamic, hi-impedance, new condition. Complete with 20 ft. cords and connectors, phasing disc and case—\$100.00. Will sell separately for \$50.00 each without case or disc. John Ballard Albert Lea, Minnesota.

FREE! Information on LeRol NEW design accessories. Build 10 1/2" reel adapter, instructions \$1.00. LeRol Engineering, Box 251, Elmhurst, Illinois.

FOR SALE: Crestwood tape recorder, \$100. Cascade 2-speed disc recorder-radio-phonograph, \$85. RCA-Victor 45EY2 45-rpm amplified record-changer, \$25. Teletone AM-FM 8-tube table radio, \$25. All guaranteed new condition, priced f.o.b. V. R. Hein, 418 Gregory, Rockford, Illinois.

DUAL SPEED, portable, Webster Electric Ekotape, Model 205, for sale. One year old, like new. Has just been cleaned and checked by an authorized dealer. Price \$135. Ronald L. Clark, 23 East Wright Ave., Waterloo, N. Y.

WANTED: March-April 1954 issue Tape Recording. A. C. Cooper, 193 W. Hazeltine Ave., Kenmore 17, N. Y.

FOR SALE: Fairly new, Model 228 Webcor wire recorder with all attachments. Richard H. Cowles, 162 College Street, Burlington, Vermont.

SYNCHRONIZER HOOKUP: Make sound movies with your tape recorder, \$10.00. Anderson, 2424 Phelps Street, Stockton, Cal.

FOR SALE: Webcor tape recorder, FM-AM hi-fi tuner, together \$180. Bartell, 1107 N. Western, Chicago, Ill.

FOR SALE: Revere tape recorder, Model TR-800 with a built in radio plus a bass reflex cabinet and a 12" speaker and a 10 watt, high fidelity auxiliary amplifier and pre-amplifier. Hardly used, excellent condition. New—\$397.50. Will sell for \$265.00. Write Elmer Fauss, 1218 E. Brady St., Milwaukee 2, Wis.

PRE-RECORDED TAPES: "Petite Revue" only 99c. Catalog, Stone, Lunenburg 1, Mass.

TAPE RECORDERS, tapes and accessories, nationally advertised brands. Free catalog upon request. Satisfaction guaranteed. Dressner, Box 66A, Peter Stuyvesant Station, New York, N. Y.

IT'S FUN to splice tape with Gibson Girl cutter-splitters. At your dealer or write: Robins Industries Corp., Dept. TR, 41-08 Bell Boulevard, Bayside 61, N. Y.

FOR SALE: Concertone 1502, synchronous motor, case, monitoring amp., selector switch for all inputs. Low impedance mike input added. Case carries 8 reels, 100 feet mike cable and mike. Other added features. Joseph Mazoff, 209 W. Cheyenne Rd., Colorado Springs, Colo.

FOR SALE: Revere tape recorder, Deluxe Model T-500. Few months old, perfect condition, with all accessories. Need the cash, \$100. Norman Cohen, 147-43 73 Avenue, Flushing 67, N. Y.

CRESTWOOD 401 tape recorder, Perfect. Used about 50 hours, 30-13,000 cycles, \$135.00. Craftsmen C800, Perfect, \$90.00. Foy Guin, Russellville, Alabama.

TAPE RECORDERS and accessories. Consult us about your recording problems. Liberal trade-in allowances on high fidelity recorders. Boynton Studio, 10 Pennsylvania, Dept. 305, Tuckahoe, N. Y.

WANTED: Minifon type battery recorder. Bernstein, 3200 N.W. 79th Street, Miami, Florida.

FOR SALE: Hi-fi equipment. Famous makes and latest models at a substantial savings. All like brand new and guaranteed perfect. Amplifiers, tuners, diamond pickups, changers, audio controls, speakers, tape recorders, microphones. I went nuts on hi-fi, and am now back to earth! Send stamped envelope for list. Philip Lance, Greenwich, N. J.

DISCS FROM your tape, \$1.00 up. Send for free list of services. Sales Recording Service, 3540 W. Jackson Blvd., Chicago 24, Ill.

FOR SALE: Magnecord outfit, PT63 mechanism, three heads and solenoid for remote control. PT6-J ten-watt amplifier with two mixing channels, PT6-M aux. spooling mechanism. Portable cases and rack mounting panels. Cost \$914.00. Will sell for \$700.00. K. E. Read, 622 1/2 N. Oxford Ave., Los Angeles 4, Cal.

"MINIFON" POCKET size recorder. New, complete with batteries, sensitive microphone, headsets, etc. Will sacrifice \$289.50 set for \$189.50 cash. New extra 1/2 hour and hour spools and batteries also at sacrifice prices. Address: E. I. Adams, 1901 Bella, Boise, Idaho.

BRAND NEW 1955 Model VM Dual Speed Tape Recorder, never used. Cost \$179.95. First \$145.00 takes. H. C. Taylor, Box 94, Englewood, Colorado.

SPANISH FOR BEGINNERS! Learn Spanish this new, easy way—with your tape recorder! Simplified, modern approach. You learn to understand, then speak. Record your own voice on blank spaces, compare with native voices. First tape approx. one hour at 3.75 inches per second. Booklet on LEARNING WHILE YOU SLEEP included. First tape, lessons, booklet and 15-day guarantee, just \$8.00. LANGUAGE TRAINING AIDS, 12101 Valleywood Drive, Silver Spring, Maryland.

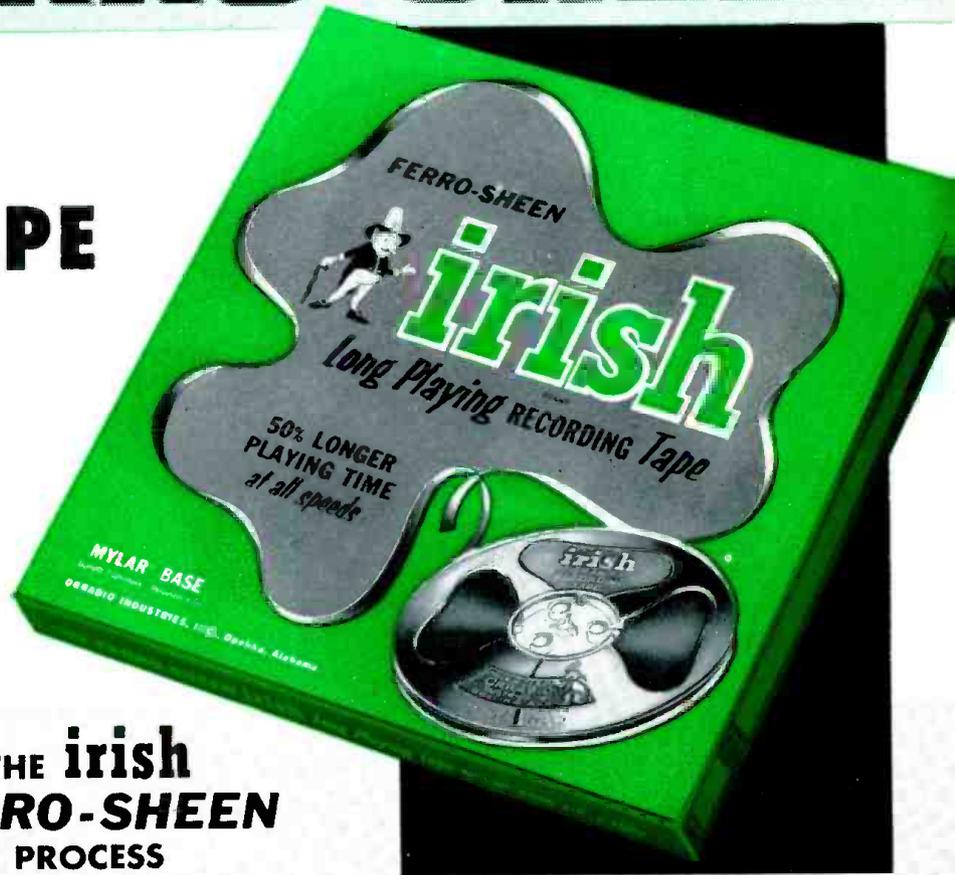
CONCERTONE HI-FI professional tape recorder, Model 1502, little used, new condition, \$300.00. Also, the new BR-I Berlant, reasonable. Don Rogers, 5013 Yecker, Kansas City, Kansas.

why FERRO-SHEEN

the sensational NEW irish TAPE

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- Extended Frequency Range . . . frequency response limited only by the recorder you use.
- Reduced "Drop-outs" . . . nodules and agglomerates virtually eliminated.
- Reduced Head Wear . . . from 40% to 100% reduction.
- Unexcelled Adhesion . . . no shedding of oxide.
- Permanently Plasticized . . . complete absence of imbrittlement with age.



THE irish FERRO-SHEEN PROCESS

Recently, after four years of research and development by our Tape Research Laboratories, irish revealed the most important magnetic tape development in six years, the exclusive, irish patented, FERRO-SHEEN process.

So, irish's big story is the FERRO-SHEEN process. A completely new concept in the art of tape manufacture. A new oxide and binder treatment, a new magnetic surface material and an improved plastic base, which results in the strongest bond — the highest uniformity of oxide particles — and the smoothest surface ever attained in recording tape manufacture.

FERRO-SHEEN gives you Extended Frequency Range — The FERRO-SHEEN process results in a smoother, glassier surface than any polishing process can give. This permits vastly improved contact with the magnetic head, utilizing all the response available in the magnetic medium . . . all the highs . . .

all the lows. Frequency response is now limited only by the recorder you use.

FERRO-SHEEN gives you Reduced "Drop-outs" — "Drop-outs" are caused by momentary loss of contact of the full surface of the tape with the recording head, due to nodules and agglomerates. New, high uniformity in distribution of the magnetic materials by the FERRO-SHEEN process virtually eliminates Nodules and Agglomerates.

FERRO-SHEEN gives you Drastic Reduction in Head Wear — The mirror sheen surface produced by the FERRO-SHEEN process is so frictionless and free from abrasives that head wear is reduced from 40% to 100%. FERRO-SHEEN Tape has "built-in-lubrication".

The FERRO-SHEEN process results in almost homogeneity between the magnetic oxide and the plastic film base. This treatment also results in a complete absence of imbrittlement with age. irish FERRO-SHEEN Tape is Permanently Plasticized.

**So, When You Buy Recording Tape, Remember . . .
only irish has the FERRO-SHEEN Process.**



Write direct to factory for name of nearest dealer.

ORRADIO Industries, Inc.

Opelika, Alabama

Export Division: Morhan Exporting Corp., New York, N. Y.
In Canada: Atlas Radio Corp., Ltd., Toronto, Ontario

Long Playing FERRO-SHEEN irish Tape

On Mylar Base: DuPont's new super strength film. Higher Tensile Strength. Greater Tear Resistance.

900' on plastic reel . . . \$3.05 user net
1800' on plastic reel . . . 5.50 user net

On Acetate Base: The standard plastic base of the recording industry.

900' on plastic reel . . . \$3.00 user net
1800' on plastic reel . . . 4.95 user net

In addition to SHAMROCK 300
and SOUND-PLATE 220 we are
featuring . . .

Long Playing FERRO-SHEEN irish Tape

on new thin base.

NOW you get 50% longer playing time on
the same size reel. Available on either
Mylar or Acetate Base at your dealers today!

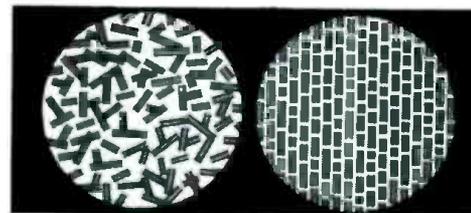




Now...record the whole performance...
without a break!

Got a favorite concert or opera program you'd like to preserve on tape? Symphony or dramatic production? Now, *record it all* using new "Scotch" Brand Extra Play Magnetic Tape. With 50% more tape wound on each reel, Extra Play Tape gives you as much recording time as 1½ reels of standard tape, plus strength to spare. This means annoying interruptions for reel change are sharply reduced to offer more perfect recording results.

You'll notice a crisper tone and higher fidelity, too—the result of "Scotch" Brand's exclusive oxide dispersion process. By packing minute, fine-grain oxide particles into a neater, thinner pattern, "Scotch" Brand has been able to produce a super-sensitive, high-potency magnetic recording surface. Hear the difference yourself. Try new "Scotch" Brand Extra Play Tape on your own machine.



Electron Photo Microscope Shows the Difference!

At left, artist's conception of magnified view of old-fashioned oxide coating still used by most ordinary long play tapes. At right, "Scotch" Brand's new dispersion method lays fine-grain particles in an orderly pattern to give a super-sensitive recording surface that contains as much oxide as conventional tapes, yet is 50% thinner.



Extra Play Magnetic Tape 190



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