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# **TAPE RECORDING**

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**APRIL, 1956**

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**TAPE RECORDING**

VOL. 3 No. 3

MARCH-APRIL, 1956

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**IN THIS ISSUE**

CAPTURING THE MELODIES OF BIRDS . . . . .	Donald J. Borrer	22
TAPE SPLICING AND SPLICERS . . . . .	Sam Chambliss	28
HOW TO RECORD STRING INSTRUMENTS . . . . .	L. L. Farkas	32
MAKE YOUR OWN BINAURAL RECORDINGS . . . . .	Jack Bayha	37
STEREO SOUNDORAMA . . . . .	Adrian Siegel	42
BUILD THIS SOUND EQUIPMENT CASE . . . . .	Fred Furman and Hermann Hensel	44
NEW PRODUCT REPORT: RCA JUDICIAL RECORDER . . . . .		46
NEW PRODUCT REPORT: AMERICAN 203 MICROPHONES . . . . .		48
NEW TAPES . . . . .	Charles D. Sigsbee	8
TEEN TAPERS . . . . .	Jerry L. Heisler	14
TAPE IN EDUCATION . . . . .	John J. Grady, Jr.	16
NEW PRODUCTS . . . . .		13
BOOK REVIEW . . . . .		19
QUESTIONS AND ANSWERS . . . . .		20
TAPES TO THE EDITOR . . . . .		21
TAPE CLUB NEWS . . . . .		41



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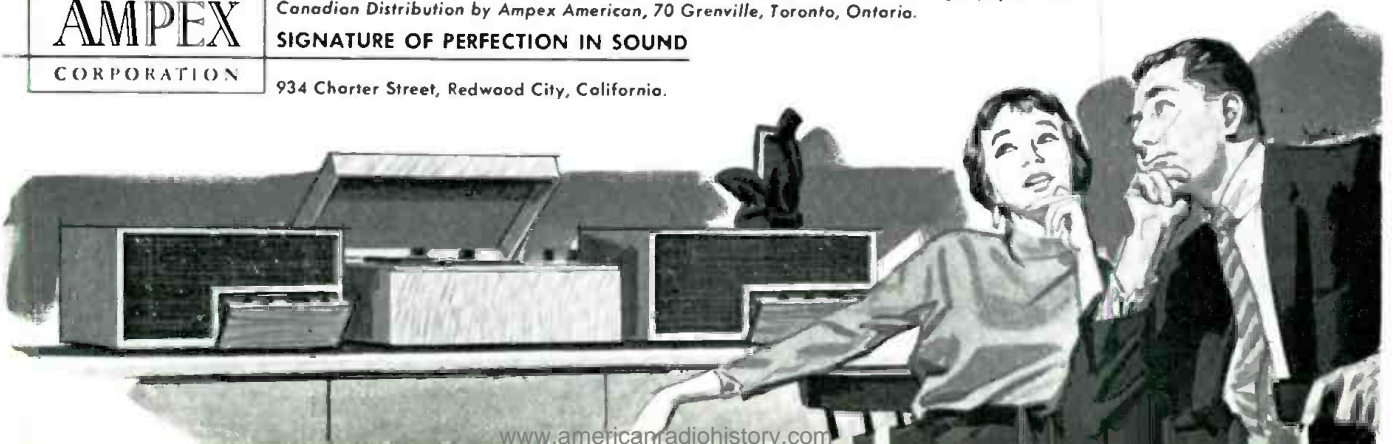
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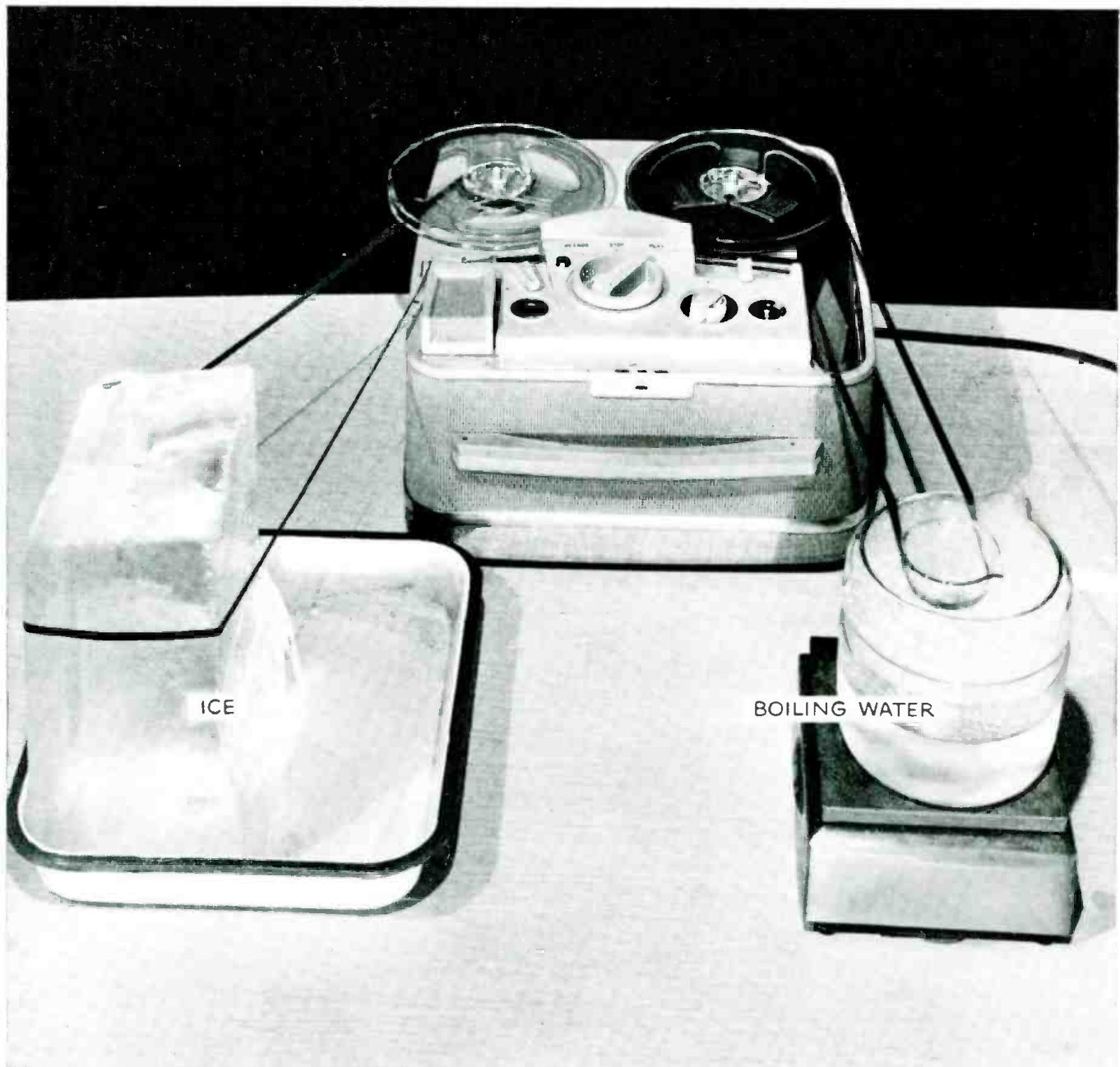
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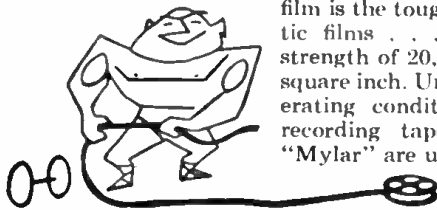
Magnetic recording tapes made with Du Pont "Mylar" last longer, need no special care in storing—the tape torture test pictured above shows why. In this laboratory demonstration, tape made with "Mylar" is run from the recorder into boiling water and around a cake of ice. Even extreme conditions

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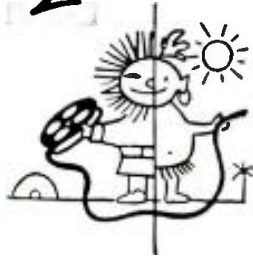
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## 5 ECONOMY, TOO



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*All leading tape manufacturers now have tapes made with "Mylar" in their line. Most leading dealers are featuring your favorite brand made with "Mylar". So—take advantage of all the important extras found in tapes made with "Mylar". Next time you see your dealer, ask him for a reel or two of your favorite brand of tape . . . made with "Mylar".*

\*Du Pont manufactures the base material "Mylar"—not finished magnetic recording tape.  
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## NEW TAPES

By Charles D. Sigsbee

Several of the tapes this issue are stereophonically reviewed, something we intend to continue on a regular basis.

My first intention, when preparing the column, was to write a long lead piece on the snowballing interest in stereophonics in the living room, but then came a last minute deluge of tapes to be reviewed. Now the thing is oversized, deadline time is here, so I will have to bely the whole idea until next time.

We reviewed all of the tapes on two pieces of equipment this month, the Ampex 612, and the new stereophonic Viking FF75SU. The former unit is already well known, but the latter is brand new and worth looking into for the man with the limited budget.

The unit I have is as close to universal as one can get in the tape field. It plays in-line binaural, staggered binaural, dual track monaural, and full track monaural, perfect for reviewing tape records.

But, as I said, we will have to save this, and other impressions of stereophony, for the next issue. Right now, the reviews.

### CLASSICAL

#### BEEHOVEN

Symphony #3 in E flat Major (Eroica)  
Utrecht Symphony Orchestra  
Ignace Neumark, Conductor

#### RECORDED TAPE-OF-THE-MONTH CLUB SELECTION #115

A recording that is much better than one would expect, considering the price (\$5.95 to members) and the relatively unknown quality of the orchestra.

Actually it is a lively and powerful performance, extremely well recorded. The conductor assumes command with the opening chords of the first movement and leads the highly responsive orchestra through a performance that is impressively fresh and alive.

The tape is recorded at a high level so that it is completely quiet except for the music. It may safely be labeled, the bargain-of-the-month.

Should you wish to contact Tape-Of-The-Month, their address is Box 195, Radio City Post Office, New York, N. Y.

#### CHOPIN

Les Sylphides

#### ARNOLD

English Dances

Orchestra of the Royal Opera House,  
Covent Garden  
The Philharmonica Orchestra  
Robert Irving, Conductor

#### RCA VICTOR CC-13

Chopin did not write a ballet, as one might gather from the heading, but his music was used by Glazounoff who orchestrated it into a ballet called, *Chopiniana*, choreography by Michel Fokine. The name was changed later, along with the music. Many people have added their touch to *Les Sylphides* through the years,

including Stravinsky, Tcherepnin, Liadoff, Rieri, Caillet and Britten. But none, fortunately, have succeeded in blotting out the genius of Chopin.

The ballet is a beautiful one to watch as well as to hear. As Irving conducts it, the temptation to dance is tantalizing, whether one can or not. Even I was tempted to sneak in a few entrechats, except that the available floor space was already occupied by the family's six year old prima.

The recording itself is uncommonly well done, with a balance and clarity that would be difficult to surpass.

The other track, by the young English composer, Malcolm Henry Arnold, consists of two sets of short lyrical dances. These are not, as one might expect, orchestrations of authentic English folk dances but, rather, original compositions based upon the various characteristic modes.

The pieces are promising enough to make one wish that they could hear more from the composer. It is rumored that his *Second Symphony*, not yet recorded, is an important one. I, for one, certainly want to hear it as a result of listening to these dances.

Again the recording is superb and recommended, without reservation, to the owners of the widest range equipment.

#### CHOPIN RECITAL

Impromptus, Op. 29, 36, 51  
Fantasie Impromptu Op. 66  
Berceuse Op. 57  
Tarentelle Op. 43  
Erno Balogh, Piano

#### LYRICHORD TAPE LIBRARY LY 5-2

Many fine pianists have devoted a great deal of their lives to the comparatively secure life of an accompanist. Erno Balogh is one of these, having been for many years the accompanist for Lotte Lehmann.

He here proves himself to be a capable solo artist in what is apparently a labor of love, the music of Chopin. Not likely to unseat the firmly established interpreters of the Polish dreamer he, nevertheless, turns in a lyrical and understanding performance.

Those looking for a tape recording of Chopin's music will find this to be a welcome addition to their libraries. The recording is excellent, although the level might have been somewhat higher to eliminate the possibility of mechanical noise on some instruments.

#### DVORAK

Concerto for Violin and Orchestra, Op. 53

#### GLAZOUNOV

Concerto for Violin and Orchestra, Op. 82

#### GLIERE

Romance for Violin and Orchestra

David Oistrakh

State Orchestra of the U. S. S. R.

Conducted by Kiril Kondrashin

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(All tapes recorded at 7.5 inches per second.)

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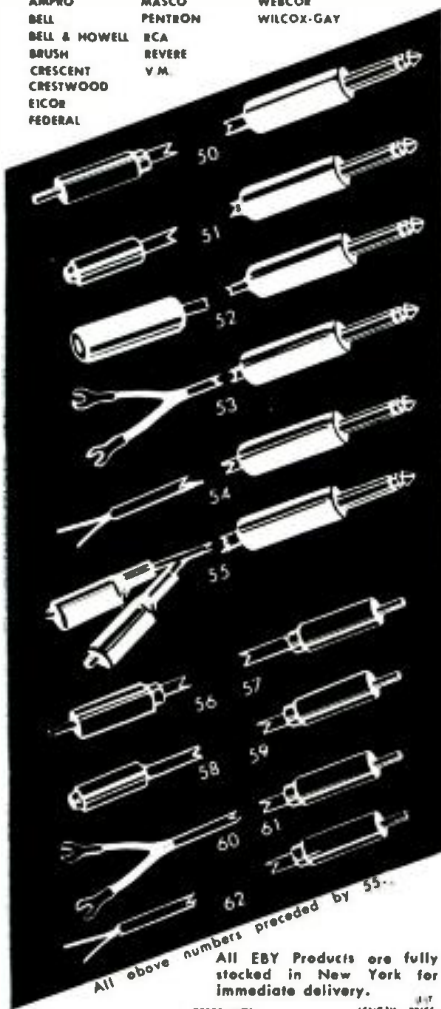
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If this recording didn't boast of the presence of Oistrakh, it would go unnoticed. The fidelity is several cuts below the, by now, accepted standard for tape and Kondrashin apparently was not too inspired by the virtuosity of the soloist, as the orchestral support proves. Or should we say, lack of support

Of course, Oistrakh is magnificent in his performance of both concerti, perhaps more so in the 'Glozounov' because it affords more opportunity for a display of virtuosity.

So much has been written, over and over again, about the extraordinary abilities of the Oistrakhs, father and son, that it would be silly for me to go into it here. Suffice it to say that, prior to recording, one would have indeed been fortunate to have heard performances like these but once in his lifetime.

### ORGAN RECITAL

Bach: Toccata and Fugue in D-minor  
Mendelssohn: Sonata #2 in C-minor  
Franck: Chorale in E-major  
Kurt Rapt playing Vienna's Piaristenkirche Organ

AUDIOSPHERE 711-BN (binaural)

The organ, in my opinion, doesn't seem to benefit much, one way or the other, from stereophonic reproduction. The two-channel sound is impressive all right, but it is even when the organ source is from a single track tape. This enters into the realm of psychoacoustics; it is difficult for the mind to separate the sources of sound when played on a pipe organ, possibly because of the great differences in pipe groupings observed from instrument to instrument.

There is a great deal of difference between two speaker and single speaker source, however. An organ recording is enhanced by spreading the sound over a wider area than that enjoyed from a single speaker. But, unless one is familiar with sounds made by the particular organ from the approximate location of the recording microphones, the stereophonic recording doesn't add much to the enjoyment of the sound: Try it.

Kurt Rapt is not a flashy, bombastic organist, for all of his youth. In fact, he tends to lean a little bit toward the straight-sided interpretation. So, if you prefer your organ recordings on the showy side, loaded with high fidelity pyrotechnics, this one is not for you. But, if you prefer a solid, literal performance by a capable craftsman on a wonderful old Viennese instrument, then this is your recording.

### ORGAN RECITAL

Purvis: March Grotesque  
Bach: Sheep May Safely Graze  
Franck: Piece Heroique  
Dupre: Cortège Et Litanie  
Purvis: Nocturne  
Purvis: Les Petites Cloches  
Dupre: Adagissimo  
Purvis: Toccata Festiva  
Richard Irven Purvis playing the Grace Cathedral (San Francisco) Organ  
HIFITAPE (no number) High Fidelity Recordings, Hollywood, Calif.

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The contrast in the sounds produced by this organ, in comparison to the Vienna instrument just reviewed, are startling in the extreme. This is a relatively new, and quite large, Aeolian-Skinner cathedral organ of 5,794 pipes. The lowest "C" vibrates at 16 cycles per second while the one foot pipes extend to 16,000 cps. The reverberation time in the Cathedral is fully five seconds.

All of this, plus Purvis' abilities as an organist, help to make this one of the most outstanding organ recordings of all time. The realism of the reproduction is just short of uncanny. I can almost believe, from the 30 cps oscillations of my speaker, that some 16 cycle notes are on the tape. Who is to know?

As if the fantastic organ sounds were not enough, the engineers have included the Cathedral carillon during *Cortege et Litanie*.

#### ROSSINI

Four Famous Overtures

Siege of Corinth

Journey to Rheims

Tancredi

The Turk in Italy

The Vienna State Opera Orchestra

Mario Rossi, Conductor

AV-Vanguard AV-1522B

The overtures to four of the more obscure of the 36 Rossini operas ably put through their lively paces by Rossi and the orchestra.

Actually these operas have grown into obscurity with the passage of time, because they were all popular during Rossini's lifetime, particularly *Tancredi* which was so popular in Venice that the courts had to order people to stop humming and whistling the arias on the streets.

This recording is a good one to begin an evening of group listening because it is light enough and, at the same time, heavy enough to settle everyone down for the more serious works to follow. It is also a welcome addition to collections of Rossiniana.

The recording is good and properly percussive, though not as outstanding in this regard as others of similar nature reviewed recently.

#### POPULAR

DAVE BRUBECK QUARTET

Jazz at Oberlin

FANTASY FT-3

Jazz at the College of the Pacific

FANTASY FT-4

These are interchangeable, the only difference being that Lloyd Davis plays drums at Oberlin, Joe Dodge at C.O.P. They are recordings made at concert appearances, complete with live, and demonstrative, audiences.

This is the jazz quarter at its best. Even the most diehard jazz-hater couldn't help but admit that Brubeck is a finished musician (student of Darius Milhaud), whose improvised structure approaches the classical in concept. If in doubt, listen carefully to the solo piano in *The Way You Look Tonight* on the Oberlin tape.

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#### Model "333"



A slender, uni-directional microphone of amazing ruggedness and striking design. It reduces random noise pickup by 73%, almost completely eliminating the distracting background noises so frequently encountered in making recordings outside a controlled studio. The "333" provides a readily accessible multi-impedance switch that permits its use with all types of amplifiers and varying lengths of cable. Other features include a Voice-Music Switch, anti-"Pff" filter screen, and a vibration-isolation unit mounted in live rubber. The "333" provides high-output and a smooth frequency response, with a production uniformity guaranteed to  $\pm 2\frac{1}{2}$  db, 30 to 15,000 cps.

#### Model "525"



An exceptionally fine probe microphone of broadcast quality. The "525" is an omni-directional microphone with a frequency response of 40 to 15,000 cps, production uniformity guaranteed to  $\pm 2\frac{1}{2}$  db. Other features include multi-impedance switch . . . high output . . . and "Duracoustic" diaphragm, specially designed to withstand moisture, heat, cold, and physical shock. The "525" is furnished with a swivel adaptor and a neck lavalier cord and belt clip assembly.

#### Model "300"



A bi-directional gradient microphone that reduces reverberation and the pickup of random noise energy by 66%! The "300" can be placed at a 73% greater distance from the performer than is possible with omni-directional microphones, providing greater freedom and allowing group recording. This high fidelity microphone also features a readily accessible Voice-Music Switch, multi-impedance switch, anti-"Pff" filter screen, vibration-isolation unit mounted in live rubber . . . frequency response with a production uniformity guaranteed to  $\pm 2\frac{1}{2}$  db, 40 to 15,000 cps.

NOTE: Models "333" and "525" multi-impedance switch is for 50-150-250 ohms impedance. Model "300" multi-impedance switch is for 50-250 ohms and high impedance.

SHURE

SHURE BROTHERS, INC.

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*Stardust* and *These Foolish Things*, again in the Oberlin recording, point out the best features of the entire group, but particularly Brubeck and Paul Desmond on alto sax.

It is easy to see, from these tapes, why the Dave Brubeck group has been such a force in jazz circles. The recordings are quite good, audience and all.

#### HI-LO'S IN HI-FI

Frank Comstock and his Orchestra  
OMEGATAPE ST 7006 (Stereophonic)

Popular music seems to lend itself more to initial stereophonic aural impact than classical music (large orchestra). This is probably because of the small initial sound source making the directivity aspects of the two channels more noticeable. It is easier to determine the location of the individual instruments of the orchestra, or the voices of a quartet such as this one.

Omega has always turned out a good high fidelity product in their pops, monaural recordings, so it is only natural that their stereo tapes should be, at least, twice

as good. This one is; at least.

These fellows, the Hi-Lo's, get a little too exuberant for my taste every once in a while, but they never fail to impress in this recording. Their arrangements are fresh approaches to old standard tunes and apparently written with two-channel recording in mind.

#### GERRY MULLIGAN QUARTET

Gerry Mulligan, baritone sax  
Chet Baker, trumpet  
Chico Hamilton, drums  
Carson Smith, bass

#### FANTASY FT-2

These fellows know how to avoid being compared to Dave Brubeck: They just eliminate piano entirely.

Good jazz quietly, almost unobtrusively, presented by a highly talented group. Gerry Mulligan solos in an intelligent, precise manner on an instrument that used to be used only for fill-in effects.

Mulligan, a former side man for Gene Krupa and Charlie Barnet, is currently arranging for Stan Kenton, in addition to

arranging for his quartet, composing, and doing what he does here.

The recording is high fidelity, with excellent balance between instruments.

#### PIANO PANORAMA

Barbara Carroll, Piano  
Joe Shulman, Bass  
Herb Wasserman, Drums

#### ATLANTIC TAPE LIBRARY AT 5-1

It would be unfair to try and make a comparison between Barbara Carroll's style and that of Hal Schaefer. Here is a more intimate, subtle approach reminiscent of the dimly-lit, softly decorated hideaway that appeals to just the two of you.

We have waxed rhapsodic about this gal in the past, and don't intend to change our minds now. She is good, even sensational, as her legion of fans have known for some time.

A good, clear recording.

#### GEORGE WRIGHT ENCORES

At The Mighty Wurlitzer Pipe Organ  
HIFITAPE (No Number)  
High Fidelity Recordings  
6087 Sunset Blvd., Hollywood 28, Calif.

Hifi fans will go crazy over this one. A large, five manual theater organ capable of almost any orchestral effect that you can imagine creates sounds that are unbelievable, except here they are. Do you own one of those giant, multi-horn corner speaker rigs? This recording will give it a workout (and you too) like it's never had before.

The range of the instrument is phenomenal, from an earthquaking bass that you feel, rather than hear, to a fundamental tone six octaves above middle "C." If this isn't enough, there are all kinds of effects introduced by George Wright, from a guitar to a bird (the real thing).

Musically it is interesting as Mr. Wright has been swaying audiences for years at New York's Paramount Theater. I'll bet that "Quiet Village," from this album, would be a big hit on juke boxes everywhere.

The box includes more technical information on the recording procedure, as well as the organ, because both combine to make this memorable aural experience.

#### FOLK MUSIC

##### AMERICAN FOLK SONGS—ALBUM #1

Sung by Travis and Margaret Johnson  
RECORDED TAPE-OF-THE-MONTH CLUB  
SELECTION #113

The more familiar folk songs authentically presented by the Johnsons, who may be remembered as one-half of the Song Spinners.

A short spoken commentary on the origin of the song precedes each selection, which adds to the enjoyment of the recording, particularly for people somewhat unfamiliar with the 12 selections.

The songs are sung straight, without embellishment, which serves to add to their charm. Collectors of folk music should certainly include this one.

# STEREO

**STEREOPHONIC TAPES (7" reels, 2 channel "inline," 7½ips.)**  
**ST-7006 THE HI-LO'S IN HI-FI — Frank Comstock Orchestra \$10.95**  
*Surrey with the Fringe on Top, Too*  
*Young for the Blues, Shadow Waltz, Island of Desire, Chinatown My Chinatown, Birth of the Blues, Long Ago and Far-Away, Summertime*

**NEW REGULAR RELEASES**

**8001 GRIEG: Peer Gynt Suites No. 1 and No. 2**  
**BIZET: L'Arlesienne Suites No. 1 and No. 2**  
 L'Orchestre Societe Francais, Hans Hagen  
 7" reel, dual track 7½ips. 60" \$10.95

**2001 MISTER ZITHER — Anton Karas, Zither & Vienna Amusement Orch.**  
 Hans Hagen, Cond. *Just a Gigolo, Cuckoo Waltz, Glow Worm, I Kiss Your Hand, Madame, Lili Marlene, Potpourri of International Evergreens*

**3001 RIMSKY KORSAKOV: Scheherazade, Op. 35 — Vienna Pro Arte Orchestra, Herbert Haffner, Cond.**

**3003 JOHANN STRAUSS: Waltzes and Polkas — Vienna Pro Arte Orchestra, Anton Paulik, Cond.**  
*Including: Blue Danube, Acceleration Waltz, Fizzicato Polka, etc.*

**3004 TCHAIKOVSKY: Serenade for Strings, Vienna Pro Arte Orchestra, Friedrich Schuster, Cond.**  
**IPPOLITOV-IVANOV: Caucasian Sketches — Vienna Pro Arte Orchestra, Herbert Haffner, Cond.**  
 7" reel, dual track, 7½ips. \$9.95

**demonstration tape \$2.00 postage paid**

**D-3 Excerpts from 2001, 3001; 4002, 4006, 4007, 4008, 8001, 5006, 6003, 3004, 3003 (5" reel, dual track, 7½ips.) JIM AMECHE explains "Fidelity Unlimited"**

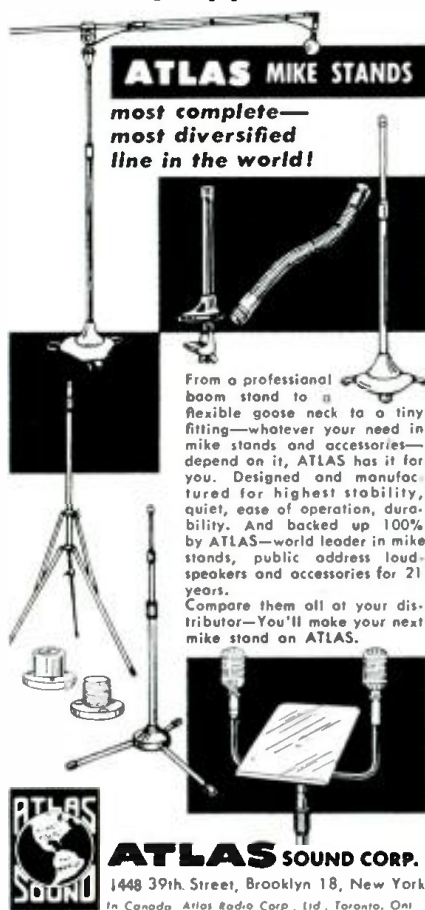
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## NEW PRODUCTS

### RCA JUDICIAL RECORDER



RCA recently introduced the "Judicial," Model 7TR3, 3-speaker, push-button portable tape recorder. This machine has speeds of  $3\frac{3}{4}$  and  $7\frac{1}{2}$  inches per second, and features a newly developed amplifier, which has an output of two watts, undistorted. Its three loudspeakers include a  $6\frac{1}{2}$ " woofer and two  $3\frac{1}{2}$ " tweeters. Included with the machine are a remote control cable permitting operation up to 10 feet away, a specially-designed ceramic mike, and a counter for indicating how much tape has been used. The controls of the "Judicial" include push buttons for play, record, fast forward and fast rewind, as well as a large stop bar. A storage compartment for extra reels of tape and the 7-foot accessory cord is provided in the case, which is finished in gray leatherette. It is priced at \$199.95. For further information, write to RCA, Camden 2, New Jersey.

### NEW IRISH REEL



ORRadio Industries, Inc., T-120 Marvyn Road, Opelika, Alabama, manufacturer of Irish tapes, has designed a new 7" reel, featuring 32 square inches of indexing area,

(Continued on page 17)

# NOW! BERKSHIRE TAPE HIGHLIGHTS

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Does a thrilling adventure in recorded music sound like a worthy objective? Here is an opportunity you won't want to miss. "Berkshire Highlights" is a full 5" reel (600 ft.—over  $\frac{1}{2}$  hour playing time) of pre-recorded tape ( $7\frac{1}{2}$  ips dual track)—containing excerpts from the Berkshire catalog—by the great masters—Mozart, Haydn, Bach, Beethoven, Schubert, Tchaikowsky, etc.

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You can take advantage of this gateway to musical pleasure by sending this coupon at once. Remember—good music, well reproduced on tape, is music that cannot grow old.

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Two models of this versatile dual-speed, dual track recorder are now available in LIMITED QUANTITIES, with tape speeds of 3¾" and 7½" or 7½" and 15" per second. Both models feature the employment of a synchronous hysteresis capstan motor providing unparalleled long-term speed stability, thus avoiding pitch errors on playback.



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# TEEN TAPERS

BY JERRY HEISLER, National President



HERE it is April already and my how the time does fly. I've heard from a number of teens since the last issue and it's good to hear from all of you and to know that you enjoy recording and look forward to the swift formation of Teen-Tapers. We're in the process now of contacting a lot of people who we think might be interested and it shouldn't be long before we have a large chain of Teen-Taper clubs and a directory ready so that the clubs may start getting in touch with one another. The "kits" are nearing preparation also. I saw proofs of the charters and cards and they promise to look quite impressive.

While we're in the process of getting many clubs started, we want to enlist your aid in helping to make this club a huge success with a wide variety of members from all over. You can do this by sending us your name if you haven't as yet done this, and in addition, send us the names of all of your teen-age friends who own recorders whether they live near you or not. We want to get as many people with us as we can. So get those letters, cards, or what have you into us at once. Write to Teen Tapers, c/o Tape Recording Magazine, Severna Park Maryland.

Along with general inquiries, we'd like to hear what you're doing with your recorders.

We had a letter from William Welzenbach out on the West coast in L. A. He told us of some of the fun he's had with his recorder at parties. William reports that he put his mike someplace in the fireplace and had his recorder in another room. He then went into the room with all the guests and started up a conversation with everyone. About 45 minutes later he went out, got the recorder, and played it back to the astonished and "embarrassed" crowd. It went over big he reports, and you may enjoy using your recorder in this way at a party. Use your ingenuity and see what fun you can have. William also suggests that we mention what fun can be had by tape response. We certainly agree.

This is perhaps one of the most interesting things we teens can do. Imagine your tape club talking with a group in England, Canada, Germany, or some other place within our country.

Mr. William C. Kidd, a teacher from San Antonio, Texas, wrote in to say that he wants to organize a club in his school. He believes that it will be quite an educational help. To quote Mr. Kidd, "The possibilities seem almost unlimited. (At least my students think so)." We truly agree with him that the fun we teens can have with a recorder is only limited by the imagination.

We're pleased to hear that William L.

West Jr. in Philadelphia, Pa., has started a group among some members of the sound crew at school. He is also doing some work at church which seems interesting. Let me mention, that Teen-Tapers clubs can be started anywhere there is the desire. We are aiming primarily at schools, but church youth groups, scout troops, clubs of any sort may all want to start clubs. Howie Schwartz in Brooklyn, N. Y. also expressed the desire to start a club. All teens in the Brooklyn area may want to look Howie up if you're interested. He lives at 208 Bay 22 Street, Brooklyn 14, N. Y.

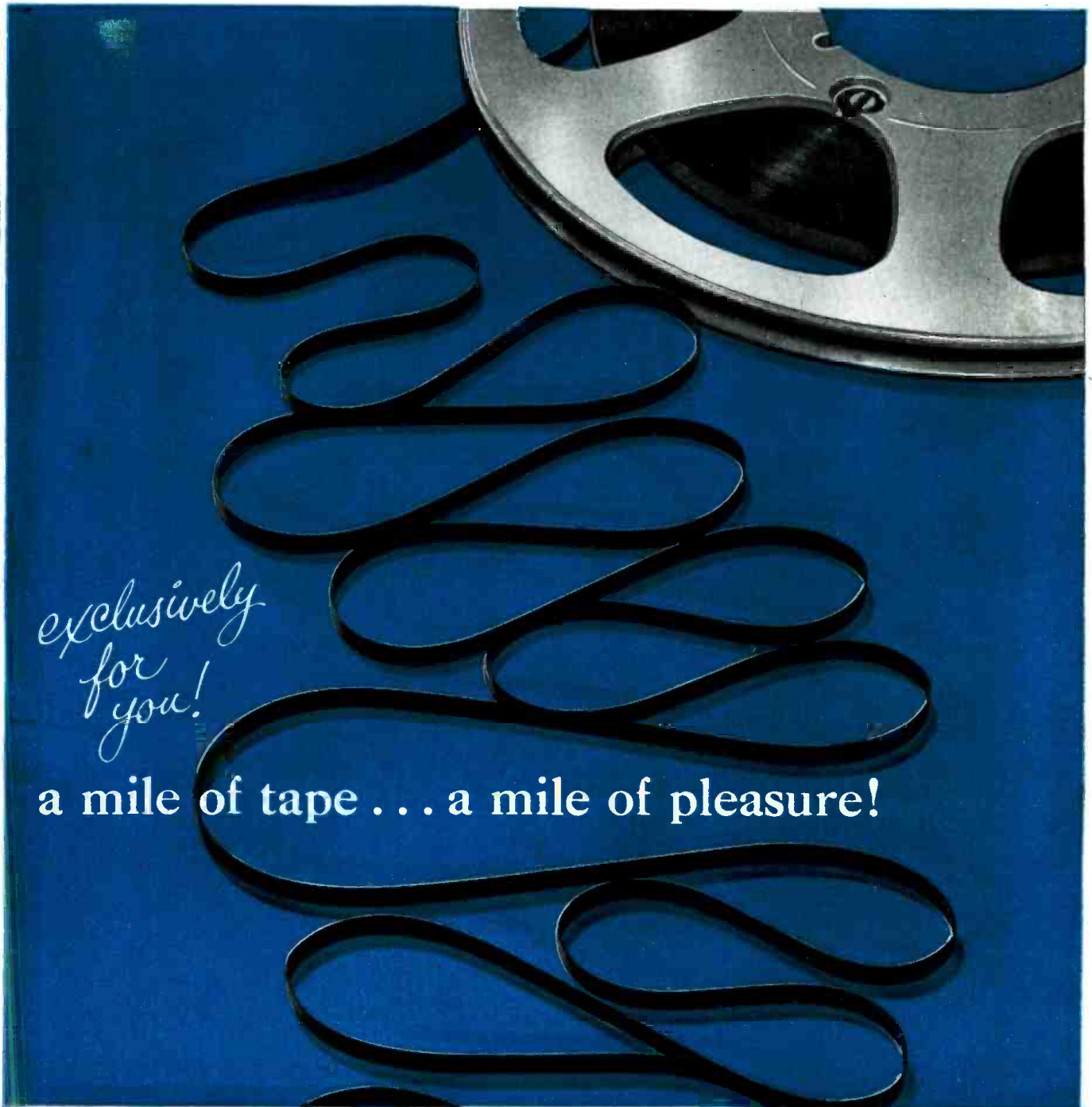
My good friend Roy Trumbull, who tapes me from Corte Madera, California has been telling me about a lot of the radio work he has been doing over an FM station out his way. Sounds real great.

Stan Gebben of Zeeland, Michigan, told me that he has been doing some radio announcing too. It seems that interest in tape goes right along with radio. If anyone else is doing anything like this please let us know about it.

I heard of another use of a recorder last week. Ronnie Johnson, used his machine to record the complete set of sound effects for a play given at the Highland Park High School, Highland Park, Illinois. Ron pre-recorded everything in the proper sequence and, on cue, dubbed them in at the required time. If any of you are active on your school stage you might want to try this.

Those of you teens who want to really be in on the ground floor in new developments in recording ought to listen to a binaural tape at your earliest convenience. I heard one several weeks ago and it really is sensational. VM Corporation has a popular priced model, and for the real hi-fi enthusiasts, Ampex has a special rig. This technique of recording gives you the same effect as a stereophonic movie sound track. It sounds like the orchestra is all around you. The particular tape I heard also had a sound effect of a train. I ducked to avoid being hit, it sounded so real.

That about does it for now Teen-Tapers. It certainly is good to know that interest is on the upgrade. We haven't forgotten about our promise of the kits, and cards, etc., and they'll be ready shortly. In the meantime get your clubs going. Above all, write in to us. Send us your names and the names of all of your teen friends who might be interested in our program. The larger our group, the more fun and enjoyment for all. There's absolutely no charge so let's get at it. Address all inquiries to Teen-Tapers, c/o Tape Recording Magazine, Severna Park, Maryland. Everything concerning teen-agers and tape recording is within our realm so let's hear from all of you soon. Keep em spinning.



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\*DuPont Polyester Film



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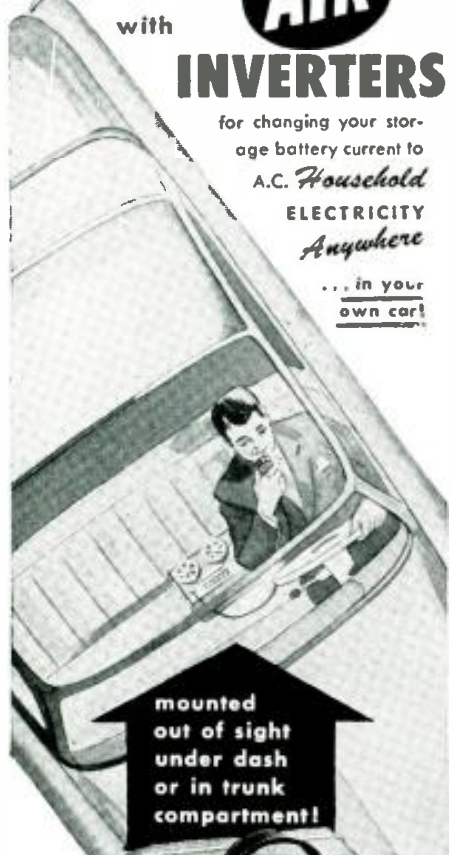
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# TAPE IN EDUCATION

BY JOHN J. GRADY, JR.



**A**N elementary school teacher of our acquaintance stopped by to chat a bit a few days ago. As part of her duties in the rather small school in which she teaches, she is responsible for the music appreciation lessons. She was recounting how her records had become worn and scratchy from over-use and there were no funds for more. She also wondered if we might have any suggestions as to how the school might obtain a tape recorder when the audio-visual budget was practically non-existent for the rest of the school year.

We told her that quite a few schools manage to get a recorder through the efforts of the PTA. It is relatively easy to convince such a group that a recorder is needed and once they are convinced, the money is usually forthcoming.

One of the most convincing ways to prove the need for a recorder is to hold a demonstration of what it can do before the PTA. We know of a few instances where this has been done and it proved successful every time.

How do you hold a demonstration without a recorder? Here is where your local audio visual dealer can do you and himself a favor at the same time. Either he can demonstrate the machine in person or lend it to you to show before the group.

With recorders, hearing is believing and we would suggest that you record some typical school material that can be played to the parents. Be sure it is something in which they will be interested and in which even the layman in educational matters can see the value.

What might this be? We'd suggest that you tape a child who has a reading difficulty, without identifying the child of course, and then demonstrate how the tape recorder can aid that child in making him read better. If you have a before and after sort of tape, the point can be made dramatically.

A music class singing, the school band at practice, even a classroom session should prove of interest to the parents. It will be up to the person making the demonstration to point out the value of all these things to the group.

In this day and age, the recorder might almost be considered as necessary to the educational process as pencils. The use of a recorder in school is only limited by the imagination.

Perhaps one of its greatest assets is its ability to *prove* the need for correction where such need exists. This goes for adults as well as children.

For some reason, most of us actively resist the thought that we might need correction in speech habits or reading skills. However, once we have had the opportunity to hear ourselves as others hear us the reluctance to change disappears with great

rapidity, and we're willing to take action.

We recall the experiences of a primary teacher who was working with a small group in remedial reading. One of the tots persisted in repeating phrases and could see nothing wrong when the error was called to his attention.

One session with the recorder, however, proved to the youngster that he sounded much worse than he thought and the necessary correction was made surely and swiftly.

Even our friend's problem of worn and scratchy records can be solved with a tape recorder. How? Simply by transcribing records to tape when they are new and then using the tape for playback. Transcribing records to tape is very simple, all you need do is connect the output of the record player to the radio-phonograph input of the tape recorder and the job is done.

District instructors find recorders a great help as do the classes they visit weekly. At Palos Verdes Estates, an ocean front suburb of Los Angeles, Dr. N. D. Myers, the superintendent of schools, utilizes modern magnetic recording as a functional procedure in the schools of his district.

And Walter Slike, district music instructor, ably prepares his instructional routines and records them. Thus students receive maximum personalized instruction.

Freed from duty at the piano, Mr. Slike easily maintains class discipline, secures increased class effort, and as a result parents of seventh and eighth grade students have sound reason for pride in the class glee clubs.

Home room teachers also derive benefit from the use of tape recorders. They can supervise class practice of music assignments between the weekly visits of Mr. Slike by merely using his prepared tapes to provide the necessary accompaniment. The large classes of Palos Verdes schools are indeed fortunate to have such efficient instruction provided through the installation of magnetic tape recording equipment.



Tape recorder helps teach students to sing at Palos Verdes, California. Piano Accompaniment provided by the recorder permits the instructor to give individual attention to seventh grade music students.





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Also splices type leader stock to any type magnetic tape without adhesives. Endless loop splicing no problem.

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- ... in seconds!



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**ELIMINATING DOWN TIME!**

for splicing all types of film including:  
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Signal in: 3MV - 100 CPS  
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5 watts.

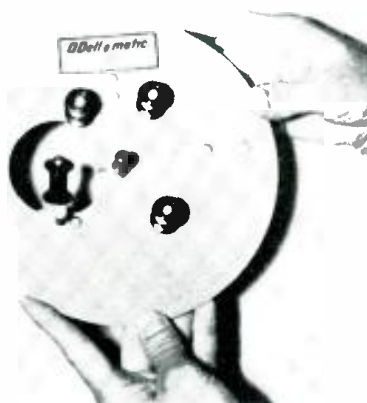
- Play the new pre-recorded tapes with sparkling new fidelity. 60 db. signal-to-noise ratio on NARTB playback characteristic.
  - Designed for connecting into home music systems. Use with variable reluctance phonograph cartridges.
  - Equalization control can be adjusted to match characteristics of high fidelity sound systems.
- Dist. in Canada by Musimart of Canada, 901 Bleury St., Montreal

Write: **DYNAMÜ**, Malco Bldg., Minneapolis, Minn.

(Continued from page 13)

two enlarged side openings for easier threading, and laboratory tests show the new reel to be 28% more rigid than the former standard reel. Designed to operate with equal efficiency on all tape recorders on the market, this reel offers four large flat areas for indexing with china crayon or adhesive labels. Scraping of tape against the reel is eliminated. The new reel is being offered on all Irish tapes at no increase in price.

**MOVIE FILM REWINDER**



A new invention, called the O'Dell-O-Matic, which automatically rewinds movie film, is now being marketed. It consists of a simple attachment that screws on to any 8-mm., 16mm. or Brownie projector, 3 special reels and 2 hubs. No tools, gadgets or devices are necessary—no drilling or damage to the projector. The O'Dell-O-Matic can be attached in less than 5 seconds and lasts for life of the machine. According to the manufacturer, it is impossible to break or scratch film. This invention sells for \$19.95 and is available from O'Dell-O-Matic, 3975 Lake Michigan Drive, Grand Rapids, Mich.

**McINTOSH AMPLIFIER**



McIntosh Laboratory, Inc., 320 Water Street, Binghamton, N. Y., is marketing a 30-watt amplifier, Model MC-30, which incorporates the McIntosh Circuit, employing unity coupling in the output. Frequency response is from 20 to 20,000 c.p.s., plus or minus 1 db at 30 watts. Harmonic distortion is less than 1/3% at full 30 watts, all frequencies. This amplifier is styled in black and chrome and is priced at \$143.50. Additional information is available by writing to the manufacturer, above address.

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*System*

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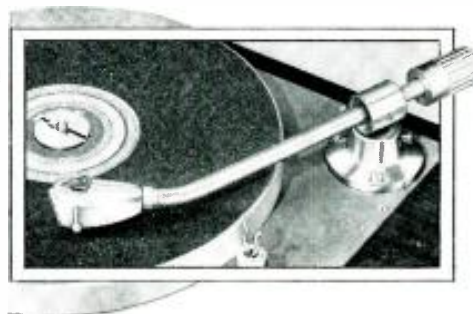
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## MAGNETIC RECORDING

By S. J. Begun

242 pages, 130 illustrations. Price \$5.00

- for Home Entertainment Movies Broadcasting Amateur Radio Secret Communications Speech Scrambling Professional Recording Transcriptions Telegraphy and Telephony Automatic Announcing Magnetic "Memories" Recording Transients Chronoscopes

... and many other uses that make this one of the fastest-growing phases of the electronic industry.

Here's your "Open Sesame" to a fast-growing branch of electronics in which far too few have specialized to date! Whether recording is your hobby or your business, this book will pave your way to better results, new techniques and effects.

From simple wire or tape recorders for home entertainment to complicated equipment and processes used in secret services, movies, industry and elsewhere, MAGNETIC RECORDING brings you complete, how-to-do-it data. From basic circuits to components; from commercial and home built equipment to its operating and service problems, you get the latest information and expert guidance. And, chances are, you'll be amazed at the opportunities for recording specialists in this steadily expanding field.

Starting with the fundamentals of magnets and acoustics, you progress rapidly to the advanced phases of the art. Biasing methods, distortion, re-producing heads, erasing, a full-fledged re-generation technique, amplification, instrumentation and measurements and helpful analyses of modern commercial recording equipment, are but a few of the subjects covered. Dozens of schematics, block diagrams, cross-sections and under-chassis photos make things easy to understand and are invaluable guides in selecting new equipment or building your own.

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Send MAGNETIC RECORDING for 10-day FREE EXAMINATION. If book is O.K., will then promptly remit \$5.00 (plus postage) in full payment. If not, I will return it postpaid and owe nothing. (SAVE! Send \$5.00 cash with order and we pay postage. Same 10-day money-back guarantee.)

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## NEW BELL RT-88



Bell Sound Systems, Inc., has unveiled its Model RT-88 tape recorder. This machine has speeds of 3 1/4 and 7 1/2 i.p.s., a frequency response of 50-10,000 cycles, and a three-motor tape transport mechanism. Inputs are provided for microphone and radio, and outputs permit use of exterior speaker or amplifier. It also features straight-line slot design threading, and complete push-button control with buttons for the two speeds, Record, Play, Rewind, Fast Forward and Stop. Complete information may be had by addressing Bell Sound Systems, Inc., Columbus 7, Ohio.

## BATTERY OPERATED RECORDER



A new, lightweight, battery-operated tape recorder, manufactured by Electric & Musical Industries, Ltd., of England, available through Ercona Corporation, Electronic Division, 551 Fifth Avenue, New York 17, N. Y., has been introduced. Weighing only 14 1/2 pounds, including batteries, the E.M.I. Series L-2 measures only 14" x 8" x 7", uses standard 5" reels of 1/4" tape, and requires no external power source. It is available in three models: 3 3/4 ips for 30 minutes, 7 1/2 ips for 15 minutes, or 15 ips for 7 1/2 minutes. Frequency response at 15 ips is within plus or minus 2 db of the response at 1000 cps, between 50 and 7000 cps, and within plus or minus 3 db from 7000-10,000 cps. Additional information is obtainable from Ercona Corporation, above address.

## FREE BROCHURE

The Amplifier Corporation of America, 398 Broadway, New York 13, N. Y., is offering free a brochure which describes the VU Magnemite series, portable, battery-operated, spring-motor magnetic tape recorders, with built-in VU meters. It completely details the features of fourteen models.

Write to the above address for your copy.

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REEL No. DM-561 (DINNER MUSIC): Cielbirbin, The Bosary, LaGolodrina, The Velvet Glove, Jealousy, Beautiful Ohio, An Apple Blossom Wedding, Red Sails in the Sunset, Indian Love Call, Dripping and Dreaming.  
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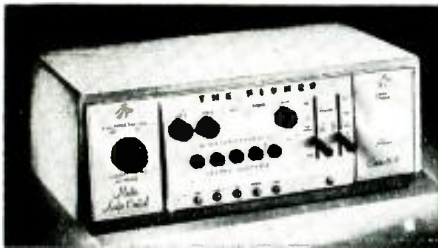
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Electronic mixing and fading of any 2 signal sources. No insertion loss. Extremely low hum and noise level. \$19.95

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NO SCISSORS!  
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Designed to save tape ends and form splice edges.  
At Your Dealers  
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**MAGI-CLIP**



Niblack Thorne Co. is marketing the Magi-Clip, designed to keep recording tape from unwinding in mailing, handling or in storage. This handy little non-magnetic brass clip holds tape securely and reduces tape wear. It fits any size reel, snaps on and off, and ends the need for masking tape or rubber bands. These clips are priced at 4 for \$1, 10 for \$2, or 30 for \$5. For further information, contact Niblack Thorne Co., Dept. P-21, Box 86, Scottsdale, Arizona.

**TAPE TOUR**

A tour, consisting of 56 days in England, France, Switzerland, Italy, Austria and Germany, has been arranged by the European Traveling Seminar, specifically for recording European sounds for radio and educational work. It is designed for audio-visual teachers, faculty members of radio and audio-visual departments of colleges, etc.

Among the recordings made will be interviews with famous peoples in various fields of endeavor, community discussions on American and European customs, European entertainers, on-the-road recordings of background sounds and people, material from such organizations as UNESCO and Radio Free Europe, etc.

Total cost of this tour is \$1290, and any interested parties may contact the Seminar at Alban Towers, 3700 Massachusetts Ave., N.W., Washington 16, D. C., for details.

**BOOK REVIEW**

*Tape Recorders—How They Work*, by Charles G. Westcott. 5 1/2" x 8 1/2", 177 pages, profusely illustrated. Published by Howard W. Sams, Indianapolis 5, Indiana. \$2.75.

It would be possible to review this book in one word—excellent. For the first time here is a volume which translates into layman's terms the things ordinarily found in engineering textbooks. The volume is clear, concise and complete and should be on the library shelf of every recorder owner.

The book does not go into recording bur, sticks to the subject of the title. The purpose of the book is to tell the reader "what's under the cover" of his recorder and how it works. Just as a photographer can get better results from his camera when he knows the "why," so the recordist can get better results from his recorder.

Chapters include: A Bird's Eye Perspective of the Magnetic Recording Industry, Theory of Magnetic Recording, The Motor-board—Tape Transport Mechanism, Drive Motors for Tape Recorders, Volume Indicators, The Bias Oscillator, Equalization Circuits, The Record and Playback Amplifier, Magnetic Recording Heads, Magnetic Recording Tape, Test Procedures and Index.

We recommend this book if you want to understand your tape recorder.

**A  
NEW**  
*Magnificent  
tape recorder*

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THE  
*Citation*

The Citation, finest portable tape recorder in the moderate-price field, is as modern and handsome in design as it is rich and clear in faithful reproduction.

More important, the Citation makes it possible for you to afford professional levels of full frequency and undistorted fidelity — with features usually found only in tape recorders for professional use.

Before you decide, see the Citation. To be convinced, hear the Citation.

Write for full information, or ask your MagneCORD dealer for a demonstration. He's listed in the classified telephone directory under "Recorders."

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**TURNER MODEL 57  
DYNAMIC MICROPHONE**

**RESPONSE:**  
50-13,000 c.p.s.

**LEVEL:**  
-55 db.

**IMPEDANCE:**  
Wired for quick selection of high or low impedance.

**CABLE:**  
20-ft. 3-conductor shielded cable with Cannon XL-4 quick-disconnect plug.

**CASE:**  
Modern, slim, inconspicuous; satin black with chrome fittings.

**MOUNTING:**  
Hinged 60-arc coupler. Standard 3/8" - 27 thread.

**DIMENSIONS:**  
8 3/4" long. Dia. 1 1/8".

**WEIGHT:**  
14 oz. less cable.

**USE:**  
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**PRICE:**  
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**\$57.00**

Desk Stand \$7.50 extra.

Rugged dependability, Modern styling,  
Sound performance at a value price—

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**THE COMPANY**

948 17th Street, N.E.  
Cedar Rapids, Iowa

## 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**—Last October I found I could record through a speaker as well as a mike. I placed a speaker outside to pick up traffic noises. I ran a wire from the speaker to the mike jack in the recorder. I put my earphones on and heard a radio show from a local radio station. I went outside to check on it but couldn't hear anything. I couldn't understand if my recorder was acting as a radio set or if the speaker was sensitive enough to pick up the show from a distant receiver. Can you tell me how it happened?  
—A. H., Elkhart, Indiana.

**Q**—I am picking up the local radio station when I record. Please tell me what to do about this.—A. E. E., Brewton, Alabama.

**A**—These two cases are similar. In the first, the wires used to connect the speaker to the recorder provided a long enough antenna to pick up the station signal. Apparently the length of the wire, plus the capacitance was some multiple of the frequency of the radio station signal. In addition, some part of the recorder was acting as a detector of a radio set to convert the signal so that it could be heard. It is also possible that the signal was coming through the power lines in both cases. A judicious by-passing of the preamp grids and an alteration of the length of the wire leading to the recorder may remove the offending signal.

In the second question, no antenna is involved. Here the recorder itself is behaving as a radio. The cure cannot be prescribed at a distance but will require a careful check of the components by a good service technician to discover what is acting as a radio detector. A brute-force filter on the power line might be a help also.

**Q**—Is there any kind of testing device for checking the speed of tape recorders similar to a stroboscopic disc that is used for turntables? If there isn't how about suggesting it to a likely manufacturer. There ought to be quite a market for it.—E. L., Meinrad, Indiana.

**A**—Test tapes, which are issued by a few companies, have on them marker signals which are spaced at definite time intervals on the tape. By means of a watch or clock with a sweep second hand, the timing of the recorder may be checked closely. It would be impractical to attempt to check capstan speed as the diameters vary, depending upon the basic speed of the motor and the degree of speed reduction employed.

**Q**—I am doing Hammond Organ recording using a 556S mike to feed the recorder. I am having no success at all recording from the Leslie speaker cabinet with the twirling horns revolving, as I get a whoosh-

whoosh effect that is unbearable. The wonderful tremulant effect provided by the twirling horns can only be picked up with a mike. No answer to my problem as yet. Hope to find one through your magazine.—J. S. B., Gardena, Calif.

**A**—From what we can determine, it seems to us that the twirling horns in your Leslie speaker are making more noise than they normally should. When working right you should not get much more noise than that heard on the Hammond's regular speaker, when it is not being played yet still turned on. I would recommend that you check with the Hammond representative in your area to make sure the horns are working correctly.

Beside the horns, however, you may also be trying to pick up the organ tones with your microphone too close to the speaker. With the mike too close any noise would be accentuated. Try moving the microphone back until the sound of the horn becomes not much more than background noise and then boost the sound level of the organ tones. By doing this you can record the tones at a lower level on your recorder and therefore decrease your microphone sensitivity to extraneous noise.

**Q**—I have a single track recorded tape that runs through my double track recorder with what seems excellent range of sound. My complete lack of technical knowledge would lead me to believe that either the bass or treble should be lost.—J. L., Bridge-water, Conn.

**A**—Even though your tape is full track the recorder picks up only the half track. This results in some loss of volume but no loss of frequency response.

## NOTICE

New price reductions on plastic tapes in regular and long play have been announced. Also new thinner 1 mil and 1/2 mil "super" mylar tapes are now available. For full information send for our 1956 price sheet.

★ USED TAPE, plastic and mylar bought and sold.



New empty plastic reels in boxes. 3" 10c; 4" 22c; 5" 24c; 7" 27c ea. 10 1/2" fiberglass Reel \$1.49. EMPTY BOXES: 3" 3c; 4", 5", 7" 5c ea.; 10 1/2", 25c ea.

"Tape Recording" magazine, 35c (back issues available). Audio Devices 1956 TAPE RECORDING DIRECTORY free.

Please Include Sufficient Postage.

**COMMISSIONED ELECTRONICS, INC.**

2503 Champlain St. N.W., Washington 9, D. C.

# 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:

For the past four years I have been buying and trading tape recorders and equipment in order to build what I felt would be the tops in equipment.

I have finally completed my dream, which is shown in the photo. I can play any tape on the market from 3 3/4 ips. to 30 ips., half-track, full track or binaural.

The unit consists of two Magnecord PT63's, one Magnecord binaural unit, two Harman Kardon Festival tuners and one Hallicrafters SX-62 receiver.

The main purpose in building such a large rig was to have continuous play on the top and bottom units. The top recorder, tuner and pre amp are one unit. The lower recorder, second Festival tuner and pre amp comprise the other unit.

Using switches it is possible to take the material from one unit and transfer it to any other. The M90 recorder is a separate unit with its individual Harman Kardon tuner and speaker. All the speakers are connected to the rack and are fused. They may be used on one tuner each, or all speakers may be connected to one unit at the same time. — Anthony Roman, Jr., Elmburst, N. Y.

We're drooling . . . with a layout like this you can do practically anything with tape. Our congratulations to Mr. Roman, I'd.

To the Editor:

A few words from me. For the past four years I have been in the recording field as a professional. To date I have run through my recorders some sixty thousand feet of tape, from which some fifty per cent was transcribed to discs. As a professional in this field I have gained some interesting points from some of the articles appearing in your magazine. All I can say is, that this

magazine offers good advice and it speaks the layman's language. For the amateur as well as the pro, it should be in their libraries.

I hope it will continue to live up to its present high standard and go to higher goals. Thanks to the editor, staff and all those concerned with its being published. —Gustav H. Fischer, Fidelity-Film-Sound Systems, Jamaica, N. Y.

Thank you very much Mr. Fischer for the kind words. We're glad to know that you find TAPE RECORDING interesting and helpful. We'll do our best to keep it that way. Ed.

To the Editor:

I am not planning to buy a recorder at the present time. I bought a copy of your magazine to see what was going on in the tape world.

I have just recently bought a \$250 Hi-Fi phono and though reproduction is very good on recent LP's, performance on re-issues is poor. Too much noise. For instance, a couple of jazz LP's I have just received apparently have never been reprocessed. Originally issued in 1938, all the old surface noise is still there and the records were advertised as Hi-Fidelity!

I am only interested in a tape machine as far as reproduction of jazz music goes and from what I can see in your magazine, jazz is really limited and expensive compared to discs.

However, even though I do not understand everything about tape recorders yet, eventually a recorder may be the solution to better reproduction.—Mitchell Chichuk, Pennsgrove, N. J.

*Tapes may seem to be higher in cost than discs but when you take into account the amount of minutes of music you get, the cost differential becomes much smaller and when you consider the superior reproduction and the unlimited life of tape, tape is the better buy.*

*And once you have heard stereo jazz on tape you'll be ready to switch over—but fast.*

*As you probably know, all present day records are taped before being made into discs. It was tape that made the LP's possible. No record can match the master tape but a good duplicate tape is practically indistinguishable from it. Tape does not wear out, as discs do, it is quieter, there's never any surface noise, such as you mention. It all boils down to the old adage—"You get what you pay for" and, if you want the best, your answer is definitely tape.*

*As you already have most of the components of a music system, the addition of a tape deck and preamp should put you in business. You'll even find that it will pay you to record your discs on tape and use the tapes for playback to save record wear.*

## NEW! PENTRON *Emperor* 3 Speaker Hi-Fi Tape Recorder

with  
SEPARATE "ROVING" SPEAKER



\$249.50  
LIST  
Most complete line . . .  
\$139.95  
UP

. . . exclusive UniMagic Control

Only the new Pentron Emperor recorder offers this newest concept in audio pleasure. The Emperor's "roving" tweeter in a separate baffle, perfectly balanced with 2 heavy duty woofers in the recorder, reweaves the whole complex beauty of the music even at low volume. Don't miss the experience. Hear and feel this difference in audio dimension — see the Emperor's bold incomparable styling at your Pentron dealer.

Push pull 10-watt amplifier. VU meter. Automatic index counter. Instantaneous braking. Frequency response 40-12,000 cps.

LARGEST EXCLUSIVE MAKER  
**PENTRON**  
OF TAPE RECORDERS

116-55

**PENTRON CORPORATION**  
787 South Tripp Ave., Chicago 24, Ill.



A common inhabitant of woods and ravines is the Carolina Wren, which has a loud clear song consisting of several similar phrases. A single bird may sing as many as twenty-two different songs.

# Capturing the of

The singing season is  
hand - - now is the  
prepare your recording

**B**IRDS are without doubt the world's most versatile singers, and if you are interested in unusual melodies you should try recording bird songs. You can record many birds right at home, either from a window of your house or in your yard, particularly if your yard contains a few trees and shrubbery. You'll find recording bird songs a fascinating hobby.

Recording bird songs is a wonderful way to get acquainted with both the birds and their songs, and you'll find that birds have interesting singing habits. Listening to song recordings is an easy way to learn bird songs, and although you can buy phonograph records of the songs of many birds it's a lot more fun to make your own tapes.

Most bird songs can be recorded satisfactorily with the average home recorder. The frequencies generally lie between about 1,000 and 8,000 cycles per second, with relatively few over 8,000. You can get good recordings of most songs with a tape speed of 7½ inches per second; with the higher-pitched songs a tape speed of 15 inches per second will give you a better recording. I use the faster tape speed because it gives greater fidelity with the higher frequencies, and it enables me to play the songs back at a reduced tape speed when I want to study the details of a song.

The biggest problem in recording bird songs is to get the microphone within range of the bird. If the bird is singing in your yard, you may be able to get a good recording merely by setting the microphone on the window sill. You'll do better if the pick-up can be limited to the direction of the bird, and still better if you use a parabolic reflector to increase the strength of the sound at the microphone. If your recorder operates only on AC current, a long power cable, or a low impedance microphone on a long cable, will enable you to get the microphone closer to the bird.

One reason for some sort of directional pick-up is the problem of extraneous noise. If you've never done any outdoor recording you may be surprised at the amount of noise you sometimes encounter. The sounds of traffic, airplanes, and

trains, even though they may seem to be a long distance away, will often spoil a recording. If you want to record just one bird, you may have trouble with other birds singing nearby. Man-made noises sometimes make it impossible to get good recordings no matter how directional your pick-up is, and the only thing you can do is wait until the noises have stopped or moved out of range, or do your recording somewhere else. The singing of other birds is usually not so bad, as they can furnish a natural background for the singer you're recording.

A simple way to screen out some of the extraneous noise is to use a cone or cylinder of cardboard around the microphone. A better way, which not only provides directionality but adds to your pick-up, is to use a parabolic reflector.

I have made many good recordings in my yard—or in other people's yards—using a recorder powered by AC current; I usually use a long power cable to get the microphone closer to the bird. However, I've made better recordings, and of more kinds of birds, using a battery-powered portable recorder. I now use a Magnemite Portable Model 610-E, with a Brush BK-106 microphone mounted in a parabolic reflector. If I'm recording under conditions where it is desirable to be able to move about easily and quickly, or if I'm working alone, I use a 24-inch reflector (see facing page); one person can easily carry all this equipment. If mobility is not so important, that is, if the bird I want to record is apt to remain in one place for a while—and I have some assistance in carrying the equipment—I use a 40-inch reflector mounted on a tripod (see photo, p. 25); this has more than twice the pick-up of the smaller reflector.

Most recording of bird songs must be done in the spring and early summer, during the birds' mating and nesting seasons. In the northern part of the country the first singing starts about the middle or latter part of February, and continues until about mid-summer. Call notes can be recorded almost any time of the year. During the heat of the summer most birds are quiet and sing little.

# Melodies

# Birds

almost at  
time to  
equipment.

by

**Donald J. Borrer**

Donald Borrer, of Ohio State University, records a bird song with a Magnemite portable, and microphone mounted in a 24 inch parabolic reflector. This equipment can be carried most anywhere.



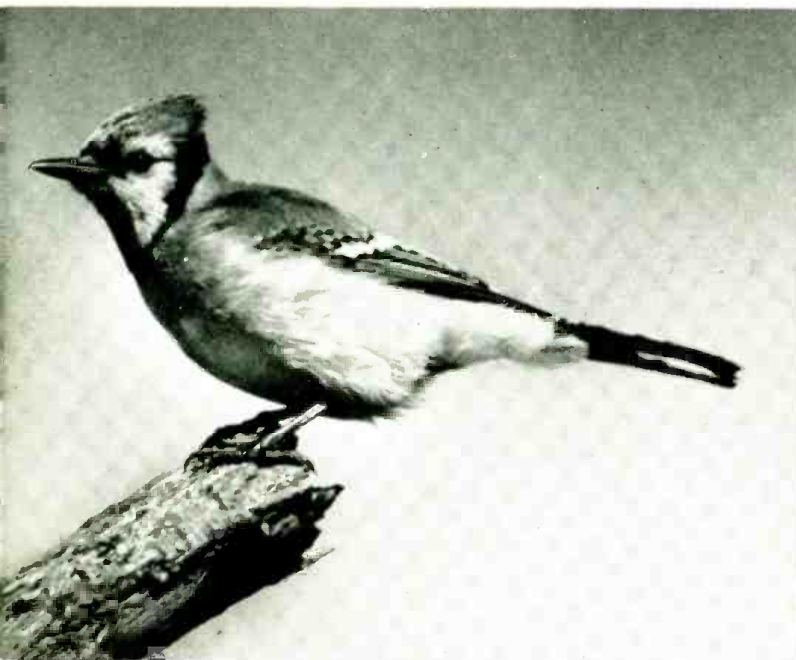
The best place to record bird songs is on the nesting grounds, where the birds do most of their singing. If there are birds nesting in your yard, you can record them right there. Nearly all the singing is done by the males. Song seems to be the male's means of advertising itself, proclaiming its nesting territory, and attracting a mate. Once the territory has been selected, the male sings from a few selected perches in its territory. A little observation will soon reveal the location of these singing perches, and knowing where a bird is apt to sing is a big help in getting a recording. The best time to record birds is early in the day; this is the time when there is the most bird song, and the least extraneous noise.

During March, April, and May many birds are migrating north, and pass through your area on their way to their nesting grounds farther north. Many of them sing during migration, and recording their songs is usually a matter of being ready for them when they pass through. Some will go through your yard; others are more apt to be found in woodlands, parks, thickets, and swamps—places providing different habitat conditions from those in your yard.

If you hear a bird song you don't recognize, my advice

is to record it first and look it up afterward. If you fail to find or identify the bird, at least you have the recording; you may later learn what the bird is, or you may find someone who can identify the recording. A pair of binoculars is very helpful in identifying birds, and if you're interested in a good bird guide, Roger Tory Peterson's "Field Guide to the Birds" (Houghton Mifflin Co., \$3.75) is one of the best. "A Guide to Bird Songs," by Arctas A. Saunders (Doubleday and Co., \$3.00) is the best guide to bird songs.

When I make a recording in the field I use the microphone to put my field notes on the tape. Later the recording is edited, that is, the parts I want to keep are cut out, assembled, and labeled. A recording is labeled (on the leader tape) with the name of the bird, the date, and a serial number, and additional data on the recording are put into written field notes under this serial number. The tapes are filed by species; I use 3-inch, 5-inch, and 7-inch reels, depending on how much tape I have on any particular species. This editing, incidentally, is often quite a job, and may take longer than it took to get the recording in the first place. I think I have done well if I have a minute of edited tape for



Left: The Blue Jay is looked upon by some people as a rather noisy bird, but it has the remarkable ability of uttering several notes at once. Right: Nearly everyone is familiar with the Cardinal, a common bird throughout eastern United States. Its song is a series of loud, clear, whistled notes.

every hour I have spent getting it.

My associates and I have been recording bird songs for several years, and now have recordings of 196 species—plus recordings of a good many other animals. Our tapes fill a couple of fair-sized book cases in the Department of Zoology and Entomology at Ohio State University. In the process of making these recordings, and in studying the recordings themselves, we have learned some interesting things about bird songs, and we have been surprised at the vocalizing some birds can do.



One of our most versatile and persistent singers is the Song Sparrow. No two individuals sing quite the same, and individual birds can be recognized by their songs.

There is a great deal of variation in the songs of different birds—in their length, the frequency with which they are sung, and in their complexity. Some songs are quite short, only a second or two in length, while others are long-continued and of an indefinite length. Most of our common birds sing at fairly regular intervals, the interval varying from about five to thirty seconds in different species. Once this interval is determined, you can often predict within a second or two when the next song will be sung. For example, wood thrush songs are usually four or five seconds apart, Carolina wren songs about six seconds apart, cardinal songs nine or ten seconds apart, song sparrow songs ten or twelve seconds apart, field sparrow songs about fifteen seconds apart, and ovenbird and yellowthroat songs about twenty seconds apart.

Some amazing complexities can be found in bird songs. Many birds are capable of some rather remarkable vocal gymnastics, and their songs are not as simple as the bird books lead us to believe.

Bird notes are often not pure musical tones, but contain many frequencies, and their pitch is difficult or impossible to determine accurately by ear. Many songs contain more notes than the ear detects; some birds can utter a hundred or more distinct notes a second. What sounds to the ear like a buzzy note is actually either a very rapid series of short notes, from forty or fifty to a hundred or more a second, or it is a note that fluctuates up and down in pitch equally rapidly. There are notes in some wood thrush songs that fluctuate in pitch two hundred times a second, and some of the buzzes of this bird consist of notes uttered at the rate of a hundred and twenty a second. What sounds like a trill in a bird song is usually a rapid series of notes or phrases, up to forty or fifty a second (if uttered more rapidly they would sound like a buzz); notes fluctuating in pitch from ten to forty or fifty times a second also sound like a trill.

Many birds can utter more than one note at a time. In one song sparrow song I recorded in Maine there is a moment



when eight notes are uttered simultaneously. In some wood thrush and blue jay songs there are moments when four notes, pitched like the notes of a major chord, are uttered simultaneously. Some wood thrush songs contain a series of relatively steady notes, and at the same time a rapid series of lower-pitched, abruptly down-slurred notes. Some bird notes may be slurred over an octave or more in less than a hundredth of a second.

These features of bird songs, as well as many others, have been determined by means of electronic sound-analyzing equipment, but many of these things can be detected simply by playing the recording at a reduced speed (one-half to one-eighth normal speed). Playing bird songs at a reduced tape speed often produces more very unusual effects.

Once you begin recording bird songs you'll soon find that they show a lot of variation; the same bird may sing different songs, or the songs of different individuals of the same species may be different. If you can make a number of recordings of a single individual, for example, a bird nesting in your yard, you'll be able to determine just how many different songs it sings. The cardinal, a bird that commonly nests around houses, has a fair-sized repertoire; I have recorded as many as four different songs from the same individual, but I suspect it sings more than that. I have recorded 13 different songs from a single song sparrow, a bird that often nests in yards containing shrubbery. I have recorded 18 different songs from a single wood thrush and 22 from a single Carolina wren—birds you may have in your yard if there is a woods or ravine nearby. Once you learn the songs of some of these birds, at least the song sparrow, Carolina wren, and wood thrush, you can recognize individual birds, and you can tell if the bird in your yard one season is the same bird that was there the season before.

After you get a collection of bird song recordings, you'll have a lot of fun listening to them, and you'll soon learn to recognize the different species. And you'll find that all the bird students in your vicinity will be interested in listening to your recordings.



The author (right), and Dr. Carl R. Reese, a colleague, capture a bird's melody with a Magnemite portable, and microphone mounted in a 40 inch parabolic reflector. The parabola is aimed by sighting through a small hole near the center.

## BUILT-IN RECORDERS FOR CARS



An artist's conception of the auto tape recorder-radio combination now being developed.

Development of a tape recorder-radio combination for automobiles is on the horizon and may be announced some time this year.

The unit can be used for recording or playback while driving or parked and will use part of the electronics of the car radio.

Using the Cousino mechanism, and automatic, continuous tape cartridge, eliminates many of the parts contained in a conventional machine. Field tests of prototypes have shown that the driver can handle the process of playing or recording a tape without taking his eyes off the road.

Cartridges are stored in a space beneath the dashboard and inserted in the recorder by merely pushing one end into the large playing slot. It automatically locks in position and with a push of the "ON" button will play.

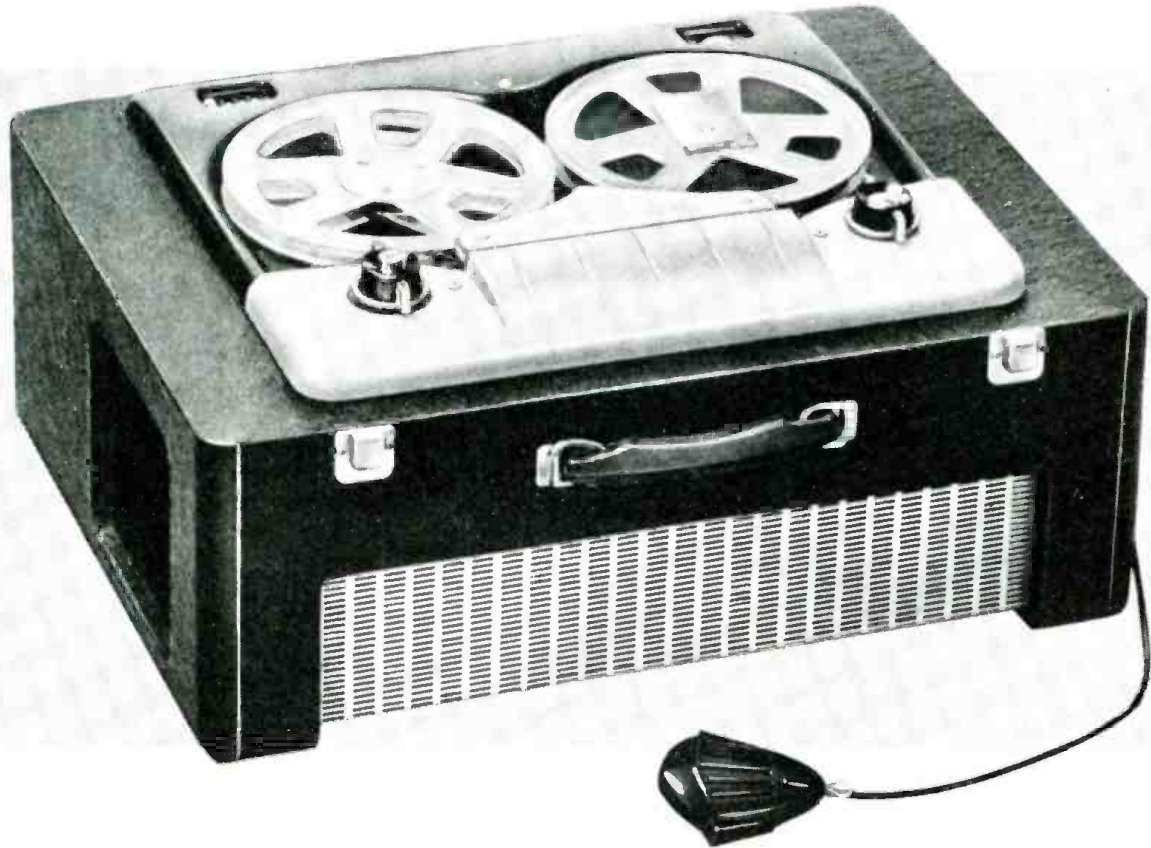
At the end of the recording, the tape automatically stops playing and the cartridge ejects itself.

Cousino, Inc., 2385 Madison Avenue, Toledo, Ohio, originally developed the device, and can supply full details.

# WEBCOR

VERIFIED HIGH FIDELITY!

**ROYAL CORONET** *Portable Tape Recorder*



**TWO MOTORS!  
TWO RECORDING  
HEADS!**

**NEW TAPE COUNTER!  
THREE SPEAKERS!  
NO REEL TURNOVER!**

For matchless, professional-type performance at moderate price, the Webcor ROYAL Coronet is the finest value on the market today! Actually, it offers you features no other tape recorder of comparable or even higher price has!

Balanced sound system with three speakers and omni-directional sound reproduce music with the thrilling effect of stereofonic dimensions.

Two motors maintain constant speeds at  $7\frac{1}{2}$  and  $3\frac{3}{4}$  ips. Two recording heads eliminate the nuisance of reel turnover . . . permit instant change from one track to the other.

Easiest operation with one-knob controls. Input, output jacks. New Veedor Root Tape Counter. Switch permits monitoring with or without recording. Tone control. Fast forward and rewind. Super-sensitive system. Multiple negative feedback circuits assume minimum distortion.

See your Webcor dealer soon for a demonstration of the Webcor ROYAL Coronet. Ask him too, about the Webcor Library of pre-recorded tapes, with their fine musical selections.

***All music sounds better on a* WEBCOR**

# tape recorders

## EASIEST OPERATION!

### **ROYAL**

#### *Portable Tape Recorder*

The ROYAL is the most popular tape recorder in the world today.

The ideal tape recorder for all-purpose recording. High fidelity reproduction. Two recording heads, two motors for constant speed. No reel turnover. Input, output jacks. Monitor switch. New Veedor Root Tape Counter. Dual speeds at  $7\frac{1}{2}$  and  $3\frac{3}{4}$  ips. Automatic stops at end of tape. Easy one-knob controls. Safety button to prevent accidental erasure. Multiple negative feedback circuits for minimum distortion. Top quality construction for years of trouble-free service.

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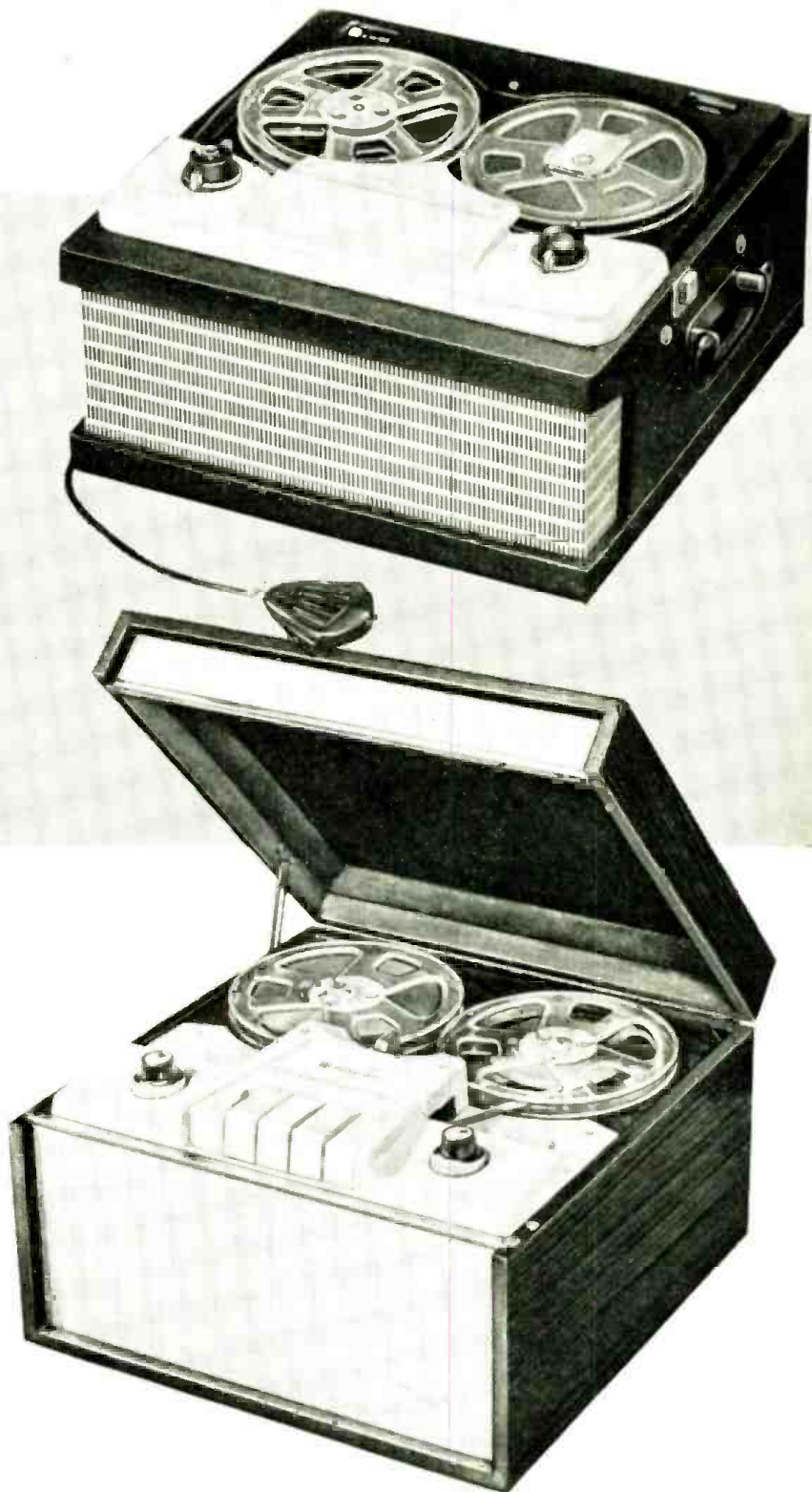
### **FANTASY**

#### *Push-Button Tape Recorder*

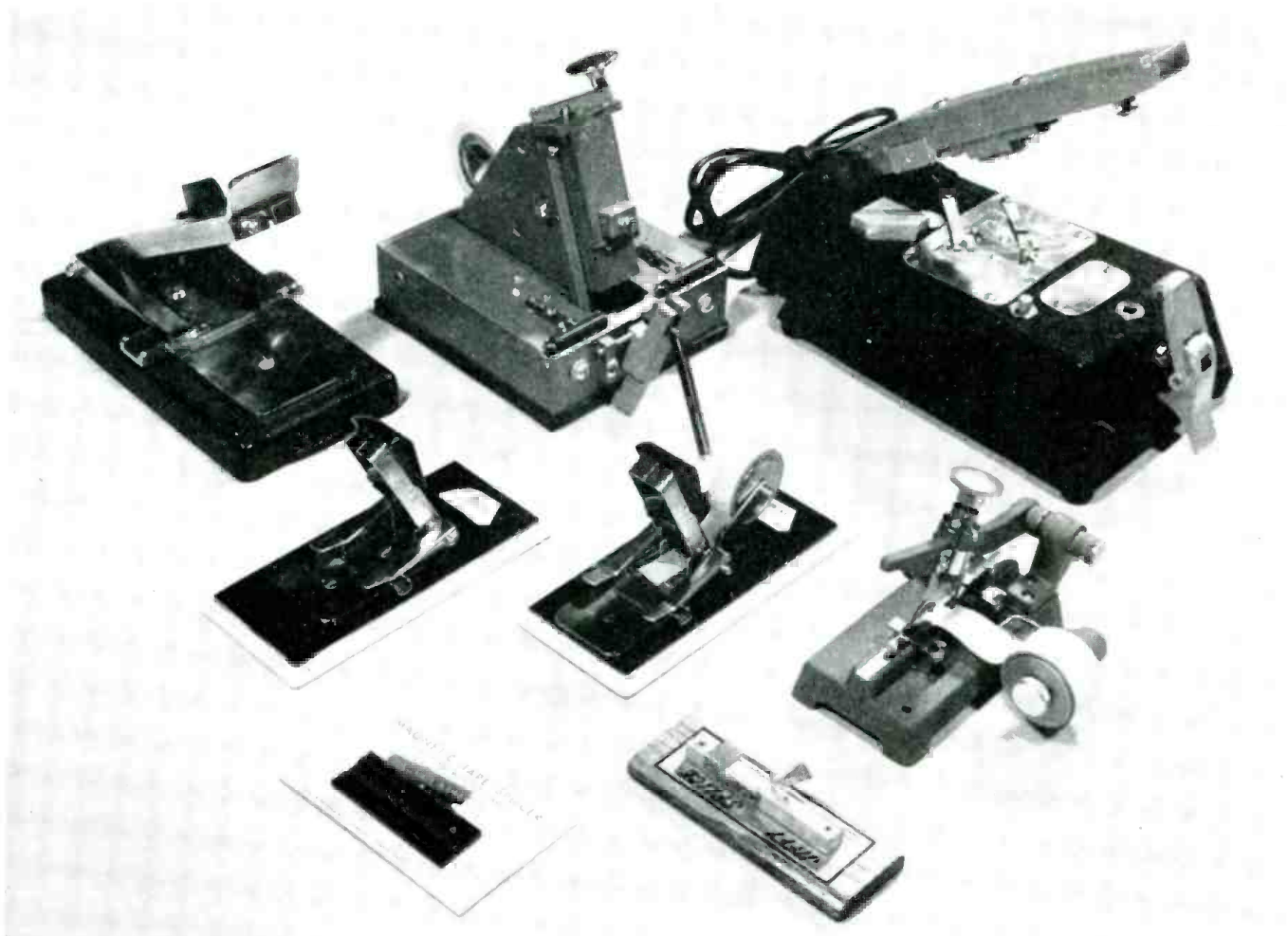
##### *Table Model*

(Also available in portable model)

Without doubt, the world's best value push-button tape recorder. Easiest operation. Editing switch. Fast forward and rewind. Two speeds:  $7\frac{1}{2}$  and  $3\frac{3}{4}$  ips. Monitor control. High fidelity sound system.



See the Tony Martin TV Show • Every Monday Night – NBC Network



Shown are all the splicers available today. These range from simple splicing blocks to automatic and heat sealing devices. In addition to splicing regular 1/4 inch tape, some splicers are also available in sizes to accommodate up to one inch tape used in computers, etc.

## TAPE SPLICING AND SPLICERS

by Sam Chambliss

*Photos by the author*

... here's how to make a good splice—by hand or automatically

**T**ODAY'S magnetic tapes aren't prone to break but there's still a goodly amount of splicing to be done in any well-run recording operation.

A poor splice can cause all kinds of troubles. Here are some of the woes that confront those who slip up on their splicing technique.

1—Loss of recording. A pair of heavily magnetized scissors will cause a partial, and noticeable loss if used to trim tape or if laid on a reel.

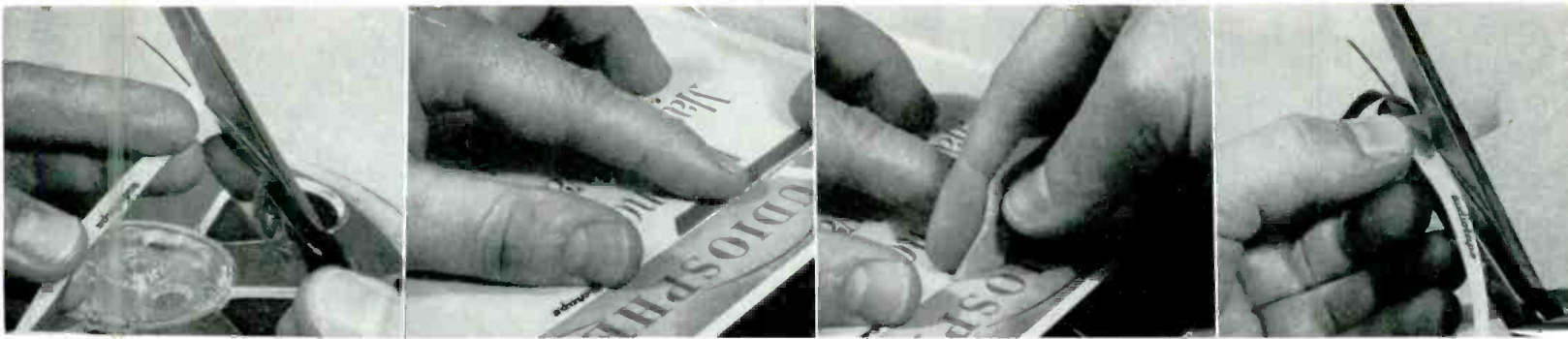
2—Loss of high frequencies. Splicing tape adhesive deposited on the playback head (especially from cellophane tape which should *not* be used) will cause the loss of highs by preventing good contact between head and tape. If you have any doubts on this point, try flopping a recorded tape and running it through shiny side against the head.

3—Break in continuity. A poorly aligned splice will cause the tape to momentarily travel at different angles as it passes the head. This may cause a noticeable and unwanted change in the sound character.

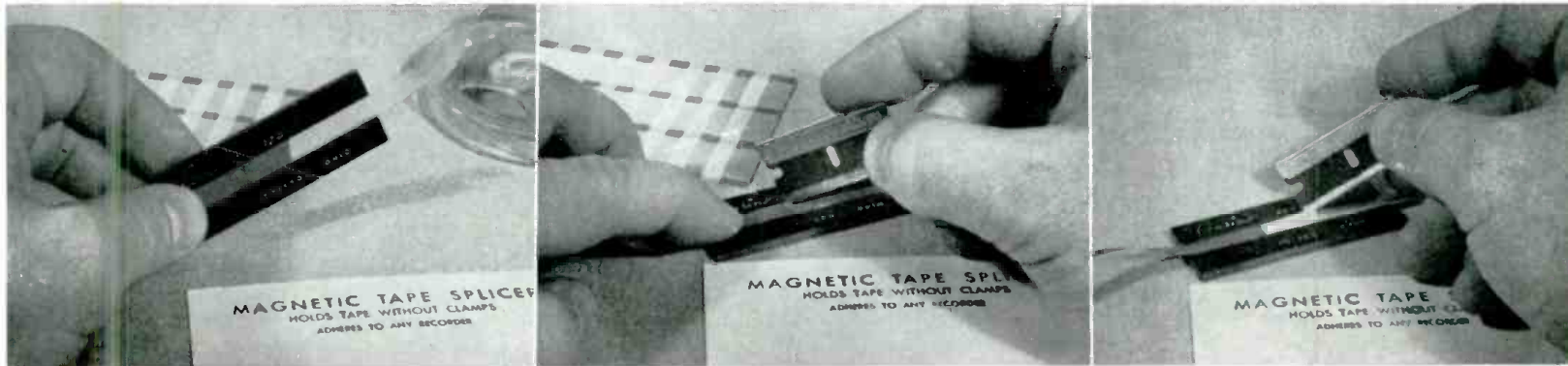
4—Wow. A bulky splice, or one that has pulled apart



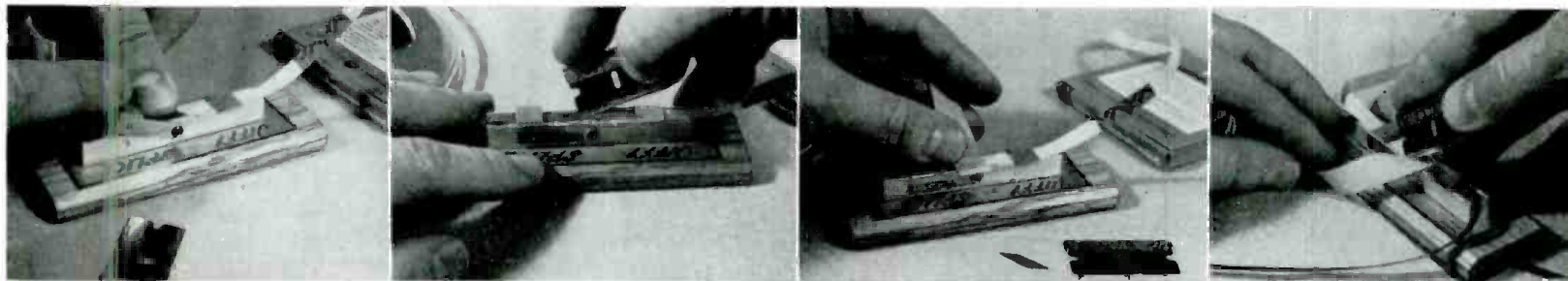
Leader and timing tape is available from all major manufacturers and can be obtained at most dealers. This is either tough paper or plastic material and will protect the magnetic tape on the reel.



Making splices with the scissors is the most primitive method. The tape is held in alignment and a straight angled cut made through both pieces. The tape is then placed glossy side up with the cut edges butted together. Make sure tape is in line. Here printed line on box is used as guide. Apply splicing tape and press firmly. Lift splice and trim with scissors, cutting slightly into tape.



The Cousino splicer. Press tape in groove which will hold it in place. Draw sharp razor blade across tape using guide to get proper angle of cut. Apply splicing tape—tweezers or the edge of the blade make it easy. The splicing tape is 7/32 inch in width and enough for 24 splices is provided with the splicer. The splicer has an adhesive pad on the back which holds the splicer to the recorder or other surface.



The Jiffy Splicer. The tape is placed in the grooved aluminum bar and the swinging arms are positioned to hold the tape. The razor blade is used to make the cut and the splicing tape is applied. With the tape still in the groove, the blade can be used to trim the splice before it is removed from the unit. The splicing block is mounted on wood with a felt padded base.

can cause the tape to bind or hang up on the tape guides, reels or pressure pads producing a jerky motion which causes wow in the reproduction.

Fortunately most of the evils just listed can be banished with a bit of care. Further, splicing becomes fun instead of a chore with one of the modern splicers.

A major point to consider before purchasing a splicer is how much splicing you expect to do, and how much patience you have.

The home-grown scissor method is not recommended for the nervous, the impatient or the father of a child that has just finished tying the cat to the bed.

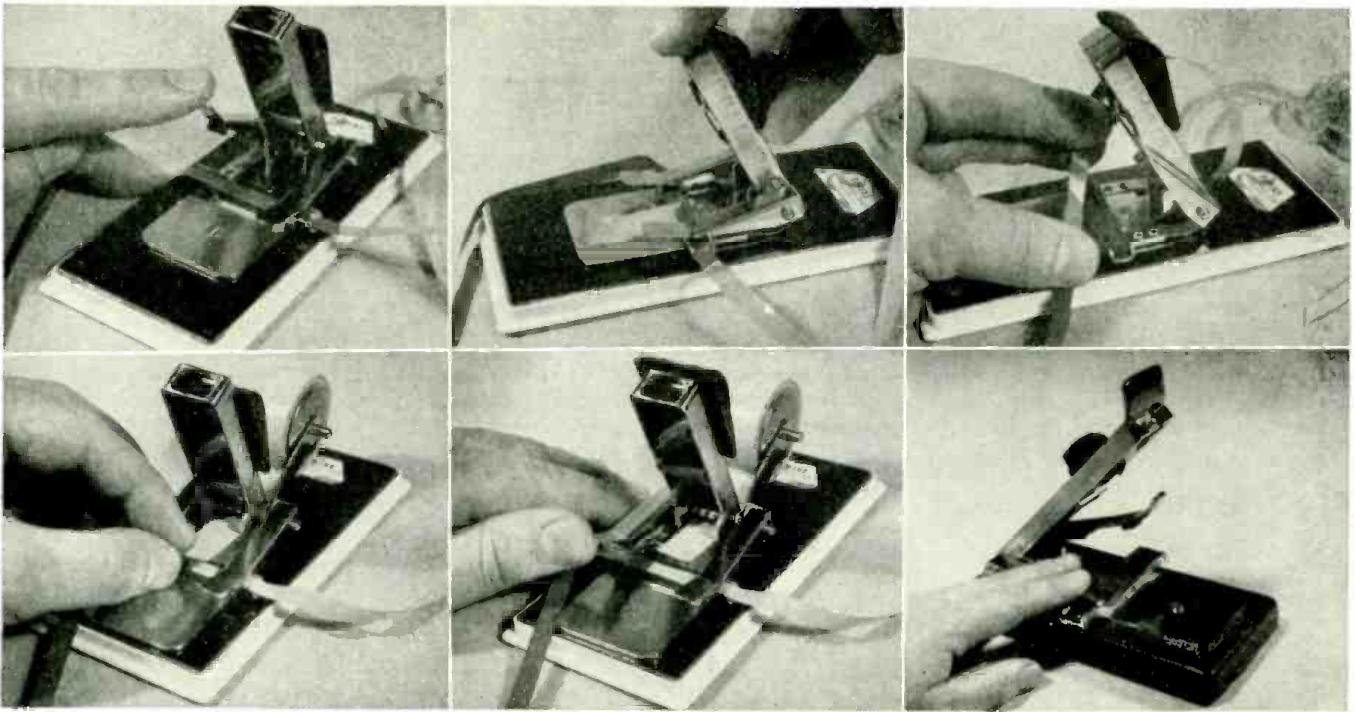
You may not encounter many tape breaks but there's wise forethought in splicing leader material on both ends of recorded tape. Any material will break after repeated bending and creasing, such as is applied in starting the tape on

the reel. This breaking can be confined to expendable leader tape—which is made to take it.

There's also the desire to eliminate the commercials after a recording session with the FM tuner. You might also want to put in strips of leader material between selections on a reel, or to create definite intervals of silence. Good splicing technique, with or without assisting devices is a primary requirement for any owner of magnetic tape equipment.

For those who do extensive editing, or who really ride the hobby, consideration should be given to the time savings provided by the more refined splicers.

What constitutes a good splice? 1—the spliced tape will lie unassisted in a straight line. 2—Any extra bulk (splicing tape tab) should be on the side *away* from the heads, i.e., on the glossy side of the tape. 3—Joints should be butt



The Robins "Gibson Girl" splicer is available in several sizes and models. The tape is placed in the channels and the arms positioned to hold it. The knob is pushed back to "miter" position and pushed down. This cuts tape at 45° angle. The chip is blown away and the splicing tape applied. The knob is moved forward to trimming position and pressed down completing splice which has "Gibson Girl" shape. The unit at lower right is heavy duty model which comes in various sizes and will handle from 1/4 to 1 inch tape depending on model.



The Reiter Skila splicer automatically applies splicing tape and trims splice. The tape is positioned in the guides and rubber rollers hold it in place. The cutter bar assembly is raised and the handle pushed away or pulled toward the operator to cut tape. A carboly wheel makes the cut. Chip is removed and the knob on top pressed. This ejects tape, applies it and trims splice all in one operation.

joints and be angled to provide best sound continuity as the splice passes over the head. 4—The splice should be no wider than the tape. 5—The splicing tape should be flush or very slightly within the recording tape edges. 6—Only splicing tape or heat splicing should be used.

The use of commonly available cellophane household tape is definitely out. These tapes have a gummy adhesive which, in time, will ooze from the edges of the splice, depositing on the guides and heads. It will also permit the splice to pull apart and the adhesive will adhere to adjacent layers causing sticking and wow.

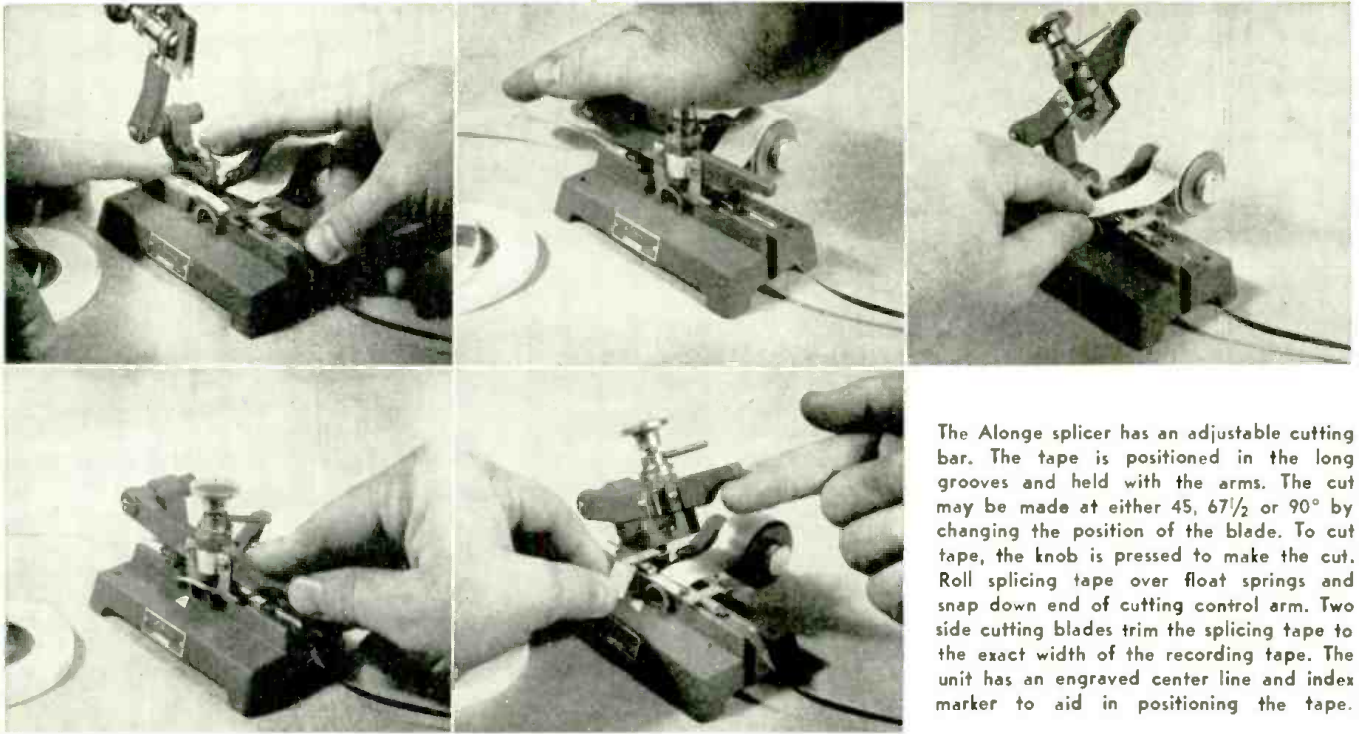
If the recording is single track you may cut and clip with impunity but if you have a dual track recording remember that anything you cut out of one track also removes material from the second track. The best practice is to remove

the minimum of material, especially if you are faced with a break in a recorded tape.

The smaller splicers may be mounted on the recorder in a convenient position which makes splicing both easy and quick.

Most of the major tape manufacturers make either leader tape, splicing tape, or both. The leader material, also called "timing tape" is printed with indicators at specific distances so that it is easy to measure off time intervals. Two firms use tough, tear resistant paper for their leader material and two provide plastic leaders. These, and the splicing tape, should be obtainable anywhere recorders are sold.

The splicers range from the simple to the complex but all are easy to use. Simplest is the Cousino which is a plas-



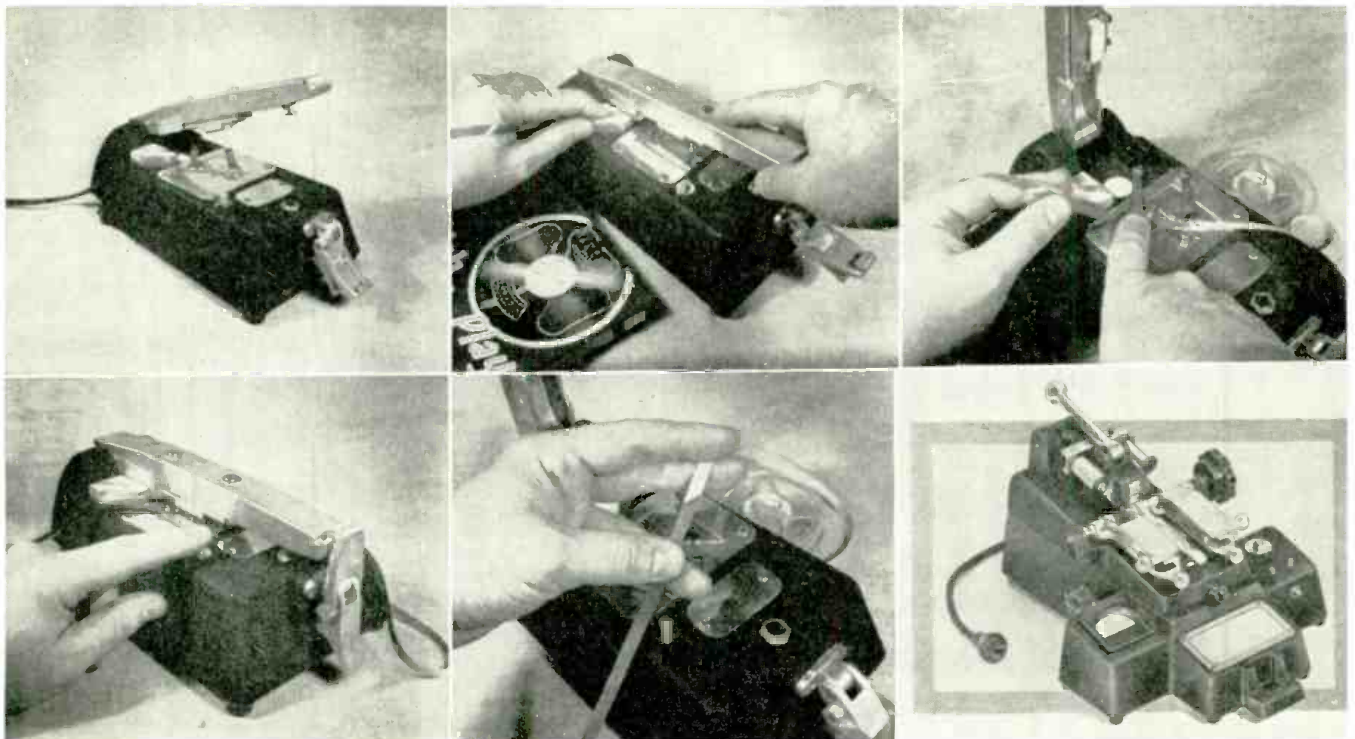
The Alonge splicer has an adjustable cutting bar. The tape is positioned in the long grooves and held with the arms. The cut may be made at either 45, 67½ or 90° by changing the position of the blade. To cut tape, the knob is pressed to make the cut. Roll splicing tape over float springs and snap down end of cutting control arm. Two side cutting blades trim the splicing tape to the exact width of the recording tape. The unit has an engraved center line and index marker to aid in positioning the tape.

tic block with a groove to hold the tape and a guide for the razor blade that is used to cut the tape.

The Jiffy splicer is a bar of aluminum with a cutting guide for the razor blade and two arms to hold the tape. The "Gibson Girl" splicers have arms to hold the tape, cutting, and trimming blades. The Alonge has hold down arms, an adjustable cutter and trims the completed splice.

The Skila splicer uses a carboloy wheel to cut the tape and it automatically feeds the correct amount of splicing tape and trims the splice. The Presto-Splicer does not use splicing tape but makes the splice by heat and pressure, even on dissimilar materials.

With the proper materials, good splices are easy to make and good splices mean trouble-free performance.



The Presto splicer is the only one using heat and pressure to effect the splice. The tape is trimmed as shown. It is then aligned on the bed, overlapping about 1/64 inch across the centerline. The bar is locked in place and the button pressed. The timing is automatic and when the bar is lifted the two pieces will be welded together. Butt joints can also be made. The unit at lower right is the professional model which will splice movie film, magnetic film, tape, roll film, etc. Splices on this unit take only ten seconds to make.

# How to Record String Instruments

by L. L. Farkas

Knowing how an instrument produces its tones will enable you to make a better mike setup.

**S**UPPOSE you want to record a violin solo, or say a hot session on a bass fiddle right in your own home. How do you go about it? How do you set up the microphone and the instrument to obtain as good a recording as possible?

For any kind of pick-up you must know exactly where the sound is coming from, so our first step is to examine the instrument to be recorded and determine how it creates its tones.

First let us take the violin. It consists of a soundbox with four strings stretched across a bridge connected to the box. Now when a bow is drawn across the strings, it sets them in motion and the vibrations thus created are

transmitted to the soundbox by way of the bridge and soundpost. The motion of the wood then is imparted to the air confined within the soundbox, building up a vibrating column of air which emerges from the F holes in the violin. This reinforces the original vibrations of the strings and produces mellow tones.

Now since the tones of the violin come both from the strings and the F holes of its soundbox, the set-up is simple. The microphone is placed so that its pick-up beam is centered on both the strings and the F holes of the violin. For an average full-toned performance, the microphone should be about three to four feet away. Do



Johnny Mercer gives downbeat to Paul Smith Trio, all set for a single string guitar solo and some hot thumping on the bass-viol. The bass-viol is on the dead side of the mike, but playing into the beam.





Left: Yehudi Menuhin playing across the microphone beam during normal range of violin. Right: A close direct pick-up position for high register violin solo. When tones are in this register, their volume tends to be lower than those notes in the normal spectrum of the instrument.

not decrease this distance, otherwise the noise of the bow drawn over the strings may become prominent. In this case it is better to be a little too far away than too close.

Of course there are exceptions. When the tones are either in the extremely high or low register, their volume has a tendency to be quite a bit lower than those notes in the normal spectrum of the instrument. Then you should move in closer, to a distance of one to two feet, to prevent the body of the tones from being lost.

If stepping in becomes awkward, you can assume a position from which both the high and low register tones can be recorded at normal level. Then for the other parts, you simply turn the violin slightly to the side of the microphone beam. Either method will work as well, except that the direct beam pick-up will produce slightly fuller tones. Incidentally, at these extreme portions of the scale, the sound of the bow seems much less evident and will not generally affect the recorded quality of the tones.

When the violin is muted, the volume produced is also cut down. Since the natural vibrations of the strings are dampened, less sound is transmitted to the soundbox and, without the deeper vibrations of the air column, it acquires a rather high-pitched characteristic. For a good recording you must then place the instrument very close to the microphone, as close as six inches to a foot away. The range of distance is given because different instruments and performers will produce different volumes of sound.

One word about perspective: if you want the tones in your recording to sound intimate and full, set up the violin in the closest playing position at which the tones are still not distorted—let us say, three feet away in the straight set-up. If you want the violin to sound distant,

then you either place it about eight to ten feet from the microphone or on the dead side of the microphone. However, unless the room has good sound characteristics, the violin in a distant set-up will have a tendency to sound thin, and for that reason violin solos using such pick-ups should be attempted with discretion.

Closely related to the violin is the viola. Built along the same lines, it is about one-seventh larger and has a lower and less penetrating tone. Nevertheless it seems to have more volume than the violin and must therefore be set farther back from the microphone, to a distance of approximately four to five feet.

The positioning is the same as that used with the violin, paying particular attention to the direction in which the F holes are facing. A good pick-up on a viola should produce tones that are both deep-throated and full. This will be almost totally lost if the instrument is placed too far away from the microphone since its low tones drop off much faster with distance than those of the violin. When the viola is too close, the tones of the instrument will have a tendency to distort; and if it is played in combination with violins, then its tones may drown out the lead and thus mar the desired chords.

The violin-cello is also built along the lines of the violin, but it is actually twice its size. It is also played with a bow but, because of its size, the instrument is set up with a tailpin resting on the floor. The cellist plays it from a sitting position, holding the instrument upright by the neck. With the cello in this location, the microphone must either be lowered or tilted downward so that it faces the F holes of the soundbox. A distance of four to five feet should prove adequate.



Set-up for violin trio on cardioid microphone. Note that center lead violin plays directly toward center of microphone beam.

The violin-cello can also be played by placing its tailpin on a chair. This has the advantage that the microphone does not have to be lowered or tilted; however it may prove a bit more awkward to play in that position and therefore the playing method will be left to individual preference. As for tone quality, probably the floor position will produce better tones because it eliminates the possibility of introducing any mechanical vibrations or noises from the chair used to hold up the instrument.

Here as with the violin there is the problem of pick-up on extremely high and low tones. It is true that the range of the violin-cello does not match that of the violin and therefore the extremes are not as great; nevertheless there is sufficient variation in volume from one end of the instrument's range to the other, to affect the pick-up.

Again there are two methods to cope with this situation. One is to set up the cello with its F holes facing directly into the microphone and to crank up the recorder gain each time a high or low passage is reached. In the average room, without excessive reverberation, this should work out fairly well.

The other method is to bring the cello in, say to about three feet, so that its tones will record with normal recorder gain at the high and low register. Then for all other tones, the cello is turned with its F holes slightly to the side, so that the sound is aimed across yet still into the microphone beam. This will decrease the volume of sound reaching the mike without greatly affecting the quality of the tones, and will thus permit the normal tonal range of the instrument to be recorded without distortion.

The fourth violin-type of instrument you may want to record is the bass-viol. It is about twice the size of the cello and about four to five times the size of the violin. Naturally with its heavier and longer strings, and its larger resonating cavity, the tones produced are lower in range

and deeper in intensity.

Two methods are used in playing the bass-viol, so consequently this will mean two different types of microphone set-ups. In one method the tones are produced by drawing a bow across the strings, in pretty much the way used with the cello. The resulting tone is sustained and very powerful. For that reason, when the bass-viol is being played with a bow, it should be set from eight to ten feet from the microphone. And, as with all violin-types of instruments, its F holes should be aimed at the microphone.

When it is not practicable to place the bass-viol that far away from the microphone, the instrument can be brought in close, to about three feet from and on the dead side of the microphone. By thus placing the bass-viol outside of the microphone beam, its volume will be radically cut down; yet enough of the tones will be picked up by the microphone so that they can be recorded. As with all dead side pick-ups, the tone quality may not be quite as full as desired, but generally it will be good enough to produce an acceptable recording.

In the second method, the strings of the bass-viol are plucked by hand. This results in a tone which is sharper but which does not seem to carry as far as when the bow is used. To obtain the full value of the notes on the recording, the bass-viol must then be brought in closer to the microphone. A distance of about five feet with the instrument facing directly toward the microphone should result in a fairly good pick-up.

Again, as with the previous method, when there is insufficient space for the straight pick-up, the bass-viol can be brought in to the side of the microphone and set approximately two feet away. Actually it can even be placed directly in front of the microphone, provided the microphone is not tilted downward toward the F holes as this is tantamount to placing the source of sound on the dead

side of the microphone. Then the tones of the instrument are projected below the microphone beam and are thus picked up only indirectly.

Sometimes, when the bass-viol either is played with a bow, or when the strings are picked by hand, the recording will show a decided boom or "woofing" on certain notes. This is caused by some object in the room, or even the room itself, resonating at the frequency of the particular note. The simplest way to eliminate this defect is to turn the bass-viol about a quarter turn from its original position and then readjust the microphone location to obtain the desired pick-up. If the woofing is still present, try placing a small rug under the tailpin of the bass-viol. As a last resort, hang drapes against one or two walls of the room, especially if there happens to be wide unbroken expanses of walls or windows.

Another popular string instrument is the guitar. It comes in two general types. The older type consists of six strings stretched across a flat soundbox and it is played by plucking the strings over the large circular hole in the soundbox. As with the violin, the vibrations of the strings are transmitted to the air within the soundbox and then emitted through the large circular hole to reinforce the sound of the strings.

The guitar tone is soft and mellow and in order to be picked up and recorded correctly, the instrument must be placed fairly close to the microphone. The best way is to sit on a high stool, with the sound hole of the guitar facing and not more than two feet away from the microphone. The guitar can also be raised up by placing your foot on a chair located close to the microphone and then holding the guitar up on your raised thigh. Either way should produce a fairly good pick-up and a good recording.

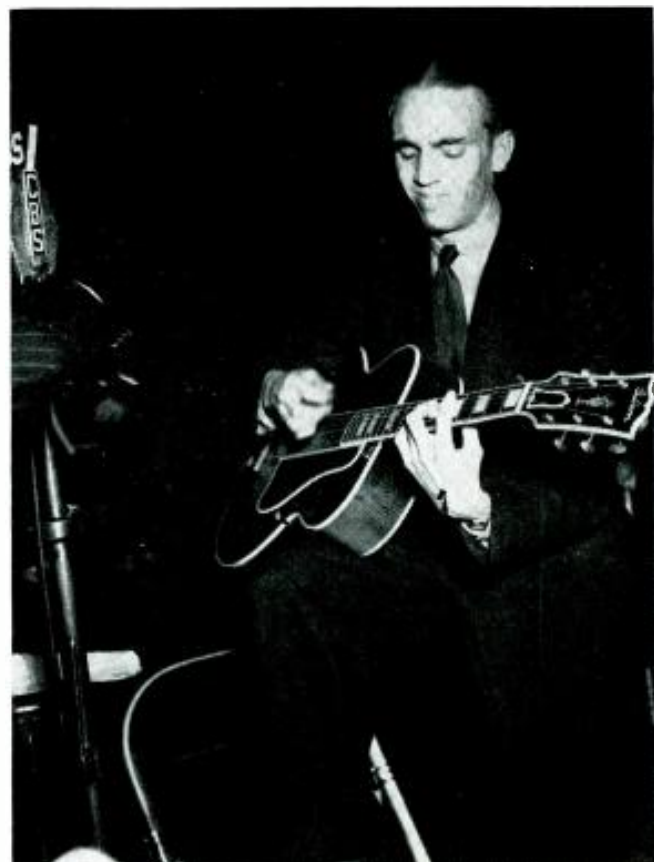
When the guitar became chiefly a rhythm instrument used for orchestral accompaniment, its natural softness of tone made it difficult to be heard amidst the other parts of the orchestration. Thus changes were made in its construction to give it a more piercing and louder tone. This was done by adding a bridge and a soundpost and eliminating the large sound hole in favor of F holes.

The set-up for solos with this type of guitar is essentially the same as with the older type, except that it must be placed a bit farther away from the microphone, at a distance of about three feet. Watch the tilt of the microphone. If the microphone is set completely vertical and the guitar sets under it, even though it is very close, its tones may shoot under the microphone beam, as in the case of the bass-viol. Here however the quality of the guitar tones will deteriorate rapidly with their distance from the microphone beam and they will have a tendency to sound thin. In such case either move the guitar back slightly or tilt the microphone toward its F holes.

Single string solos on a guitar can be played fairly close but generally no nearer than a foot from the microphone, otherwise the tones will lose their mellow quality. They will then sound metallic and may also distort.

Perhaps not quite as popular as the guitar, the harp is still played by a number of people who enjoy its vibrant quality. The harp is triangular in shape and consists of an upright pillar and a slanting soundboard, both rising from a common pedestal and united by a curved neck-piece. From forty-three to forty-six strings are strung from the neck to the sounding board.

As the strings are plucked, they start vibrating. This mo-



Top: Gene Autry watches Jerry Scoggins record solo. Here the guitar is too far below microphone beam to produce a good tone. Bottom: A good guitar solo position, with F holes aimed directly at microphone.

tion is transmitted to the sounding board and, in combination with the air column built up in that cavity, produces the characteristic sound of the harp. Control of the pitch is obtained by the use of seven pedals in the pedestal. Notes are dampened by placing the fingers on the strings, stopping their vibration.

The volume of the harp tones is not very high; therefore, in order to obtain a good recording, you must place the microphone fairly close to the instrument. By setting the harp so that its sounding board faces the pick-up beam at an angle from a distance of four to five feet, a fairly good pick-up should be obtained. Make sure that the head of the microphone is tilted toward the sounding board. This will insure fullness of tone with good definition.

Should the harp be set too close to the microphone, the noise of the strings being plucked will overshadow the musical tones and, at the same time, the quality will be poor. Conversely, should the harp be too far from the microphone, then tone definition will be lost. A compromise between these two extremes should be the right distance.

Now, no treatise on recording of solo string instruments would be complete without discussing the electric guitar. There are several models of this instrument. In early types, a contact microphone was fastened to the sounding board of an ordinary guitar. This unit, picking up the vibrations of the sounding board, would transmit these to an amplifier and associated loudspeaker. Thus the tone finally emitted was a replica of the original sound but naturally greatly increased in volume.

The modern electric guitar differs from the ordinary guitar. While retaining essentially the original form, the instrument is much smaller, its face is made of metal, and the sounding box of composition material.

The method of generating its sound is also different. At some point along the length of the strings, usually near or at the bridge, a strong electro-magnet is located. The strings, vibrating in this magnetic field, change the current flow through the windings of the magnet. This in turn is fed to the amplifier and then to the loudspeaker.

There is even a unit which is composed of a combination of two such guitars—two separate instruments each

tuned to a different range and with separate volume controls, but again both of these feeding into a common amplifier and loudspeaker. Many of the guitars also boast of a pedal sound attachment which permits softening or swelling the amplified tones, very much in the same way as an organ will soften or swell its tones.

But whatever type of electric guitar is used, and no matter how many controls it may have, it produces its sound by means of a loudspeaker. Generally a cable connects the guitar to the amplifier and, when the loudspeaker is not placed in a carrying case with the amplifier, it may in turn be connected to the amplifier by another cable. In either case the loudspeaker can be located at any convenient spot for the pickup. It can be placed on a bench or table and the microphone set four to five feet in front of it, facing the cone of the loudspeaker. If the sound level from the loudspeaker is too high, it can be cut down with the guitar volume control.

One word of caution: with some amplifiers, reducing the volume beyond a certain point will introduce distortion and a great deal of the low notes as well as some of the highs will be attenuated. In such a case, especially if the loudspeaker cannot be pushed farther back, then we have to resort again to our close side pick-up with the speaker aimed across the microphone beam. Here of course, you must be careful not to bring the loudspeaker too close to the microphone or any speaker hum or noise may appear in your recording. Keeping the loudspeaker about three feet away, and the volume control on the guitar amplifier held about midpoint should produce an acceptable pick-up.

Now I realize that I have not discussed all the string instruments—only some of the main ones. But I must repeat: the method of picking up any string instrument is simple. Determine how the sound is produced and then place the microphone so that it will be in the direct flow of that sound. Naturally different instruments will have various characteristics which will necessitate shifting the microphone or the instrument around. But with some experimentation and a little patience, you should have no trouble in making the best possible pick-up and recording right in your own home.



Plucking the strings of a bass-viol by hand results in a sharper tone than when a bow is used, but the tone does not carry as far. The position of the bass-viol is below the microphone beam in this setup.



The EMC Brass Sextette Band at an actual binaural record-playback session. Karlson speakers on both sides of the stage are used for playback. Note mike placement for binaural pickup.

# Make Your Own Binaural Recordings

by Jack Bayha,

*Development Engineer, VM Corporation*

**A**S A long time fan of recorded tapes, both monaural and binaural, we believe that the first time a person hears a binaural or stereophonic playback they have opened to them a new world in the enjoyment of tape recording.

When they hear their first binaural 'home recording' a whole new universe opens up. While the commercial "pre-recorded," or to use the name the duplicators prefer—"recorded," tape is quite good when played back on your binaural system, something amazing awaits you when you hear your own binaural recordings. The writer believes that the commercial binaural tapes are the finest thing in the world of high-fidelity, but when you can record your own tapes—you'll love them even more. There is a marked psychological advantage to the home version in stereo as opposed to the commercially duplicated tapes. While the commercial people have available the finest in music, played by the top musicians, and very excellent recording equipment, they lack the do-it-yourself feature.

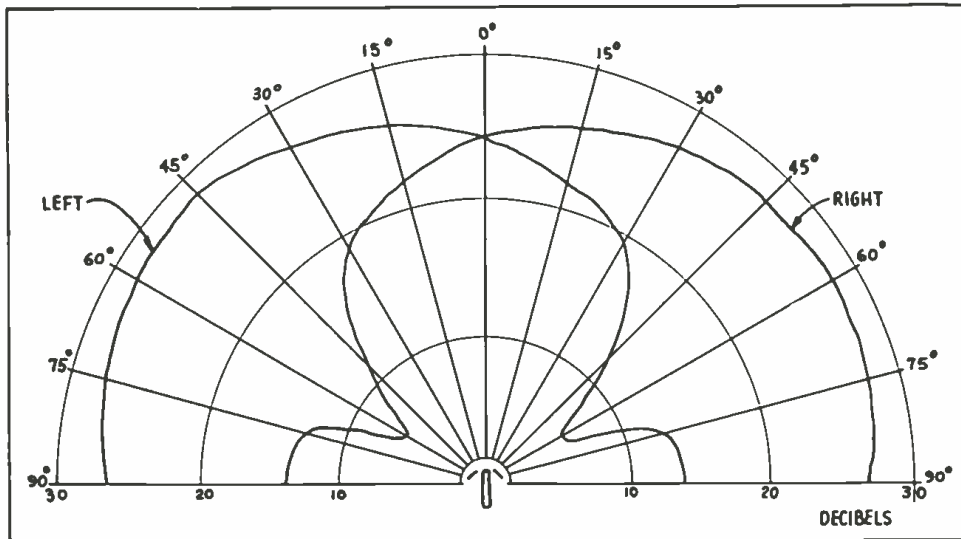
The writer has done a considerable amount of experimental recording in binaural, often in competition with the finest professional monaural machines. Naturally an amateur binaural recorder has up to now been just that, something home built, generally around a conventional

monaural unit. The writer has done his early work with a so-called "piggy-back" V-M tape recorder consisting of one V-M Tape-o-matic transport mounted above two Tape-o-matic amplifiers; the transport being equipped with two heads. We "cut our teeth" with this unit and recently have been fortunate to have the first V-M pre-production stereophonic, or binaural recorder model to work with.

The intent of this article is to protect the average amateur recordist from the troubles the writer initially went through. Knowing what does not work out too well is sometimes a very valuable asset, particularly if one at the same time is told what does work well.

Some writers have suggested the use of two separate tape recorders as a method of binaural recording, one which completely ignores the problem of bias oscillator frequencies and resultant beats, etc. We feel that successful binaural recording can only be done by using a good commercial product or by extensive re-design of existing tape recorders, beyond the ability of the average amateur. We will attempt to present the basic elements of recording as we have found them, not necessarily as the commercial experts may do the same recording date.

As an amateur we must feel lucky if we can get the



This Bangs and Olufsen Polar Plot shows actual coverage, as measured in a sound room, of the stereophonic microphone assembly. There are almost perfect characteristics for recording large groups.

average musical group to let us record, particularly a union group. This means we must usually be happy with the location of the various groups in the orchestra, we cannot put the brasses in this corner, the reeds here, etc. We are compelled to take what locations the various groups of the orchestra or chorale group are in and work with this. The commercial recordists generally locate the various groups for the best recording, which is usually not the best for an audience to hear sitting in the auditorium or

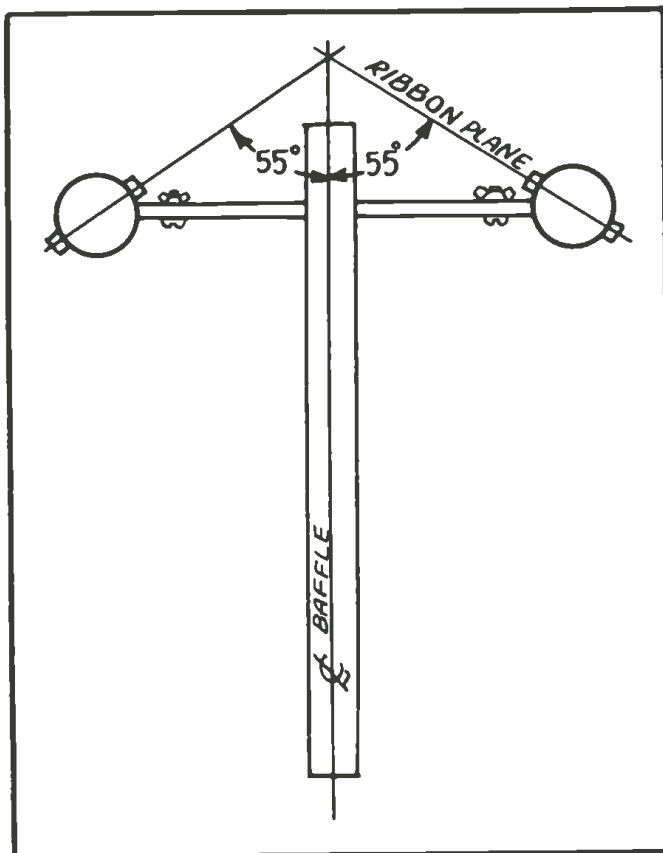
hall. This means we must do a little special microphone work to get out of the recording artists what we want on our tape. We will take the problems of recording one at a time:

#### Microphone selection:

Faced with relatively difficult conditions to work under, the amateur recordist is strongly advised to start off with very fine quality microphones, the finest he can afford. For most of us, we must, on a price basis, rule out the capacitor or condenser microphone; this leaves us with the second finest, and some will argue the finest, in microphones. It has been our finding that a velocity or ribbon microphone makes the ideal recording unit. With limited freedom in mike placement, the extreme sensitivity of the ribbon units makes a vast difference. We agree with the Radiotron Designers Handbook, the radian's "bible" which says of velocity mikes, "undoubtedly the best microphone for high-fidelity, particularly for transients." We have used the Fentone Blue-Ribbon mikes in all of our recent work. Made by Bangs and Olufsen in Denmark, these units are characterized by excellent performance and a most appetizing price. Naturally it is necessary to use a transformer at the recorder end of the cable with these mikes. Shure Brothers A86A Cable Transformers have been used with excellent results.

The dynamic microphone of high quality manufacture, if used in a low impedance version, does a good recording job, but seems to lack sensitivity and recording sparkle in the writer's opinion.

All we can add on the subject of microphone choice is that you can never make a recording that is any better than the microphone used. On recording dates we occasionally see some poor tape fan running his tape through a top-notch professional tape unit with a dictation response crystal or ceramic hand-held microphone. He is a terrible thorn in the side of the manufacturer of the tape unit he has. He says, "It's awful, won't do a good recording job." We bet it will; it will record just what comes down the mike cable to its input. For binaural or monaural get a good mike or mikes.



Angular relationship of ribbons, in the Bangs and Olufsen stereophonic microphone assembly, to achieve the pattern shown.

### Microphone Placement:

It is very difficult to tell just what microphone placement to use for binaural or stereophonic recording. We have operated on the basis of using mikes placed in the recording session at the same spot as our speakers at home. This works quite well for it gives very adequate separation and a good sense of sound between the speakers. This set-up performs on the rather logical theory that we have a microphone picking up a sound in one position, and in playback a speaker radiating the same thing the mike heard. We like the effect.

This system, when using sensitive mikes usually puts our mikes at the front of the stage and about 12 to 15 feet apart. We generally are lucky enough to have the cooperation of the conductor and bands involved, in that they will not knowingly blow the ribbons out of our mikes by blasting directly into them when the solos are played, musicians often walking forward at that time. This placement seems to work out quite successfully.

From Denmark, with the cooperation of the Bangs and Olufsen engineers, we have gotten precise details of the binaural microphone set-up as used in Europe. Some question existed in our minds, as well as in the minds of the B and O engineers, as to how recordings made this way would sound when played back using speakers instead of earphones, which is the form of playback for which the microphone assembly was designed. The device proved to be excellent for earphone playback and more than satisfactory for speakers. It is characterized by compactness, uniformity from session to session, it is always the same spacing, and is well worth following. Actual polar plots of velocity response have been supplied by B and O.

If you wish to duplicate this arrangement remember that only microphones with this precise directional pattern will work in this exact arrangement. With microphones of unknown or nonuniform directivity patterns, considerable experimentation may be necessary. An examination of the polar plot will show that an excellent coverage will result when the microphone assembly is placed front and center on the average stage. The vane also effectively limits crowd noises, a problem at some sessions in public places.

### Microphone Cables:

Something most people completely disregard as an im-

portant consideration in tape recording is mike cables. We feel they are important enough to bear a little attention. Always check them carefully for continuity, and noisy connections before going out on a recording date. Remember you will need a fair length of cable to get proper mike placement in most circumstances. Always have all you can available. Always use the standard three-pin Cannon connector, and if you make your own cables, use the standard code, they will then match almost anyone else's cables. This will allow you to borrow a cable from someone else occasionally—an absolute life saver!

The author does not believe a three-wire system is essential, since no high impedance lines are run if you follow our advice. We have found with our 50 ohm impedance that two conductor coaxial line does not afford any problem with respect to hum.

### Monitoring:

Once again binaural recording is a little different from monaural recording; with monaural, monitoring helps, with binaural, it's an absolute must. Don't get upset; you will hear what you are monitoring through binaural phones every bit as pleasing as the original performance and you won't miss a thing. If you are one of those who can't stand about five pounds of dead weight on your head, we have an answer for you. For monitoring the Telex Twin-set is terrific. It's feather-light, has good frequency response for monitoring, and does a most adequate job. What impedance to get will depend on your individual tape recorder's monitoring provisions. Under any circumstance plan to use head set monitoring. You can use a VU meter or a flashing neon to keep you within overload limits, but do your balancing of the two channels by ear, through the phones, using the normal recording level indicating devices as a sort of limit setter only.

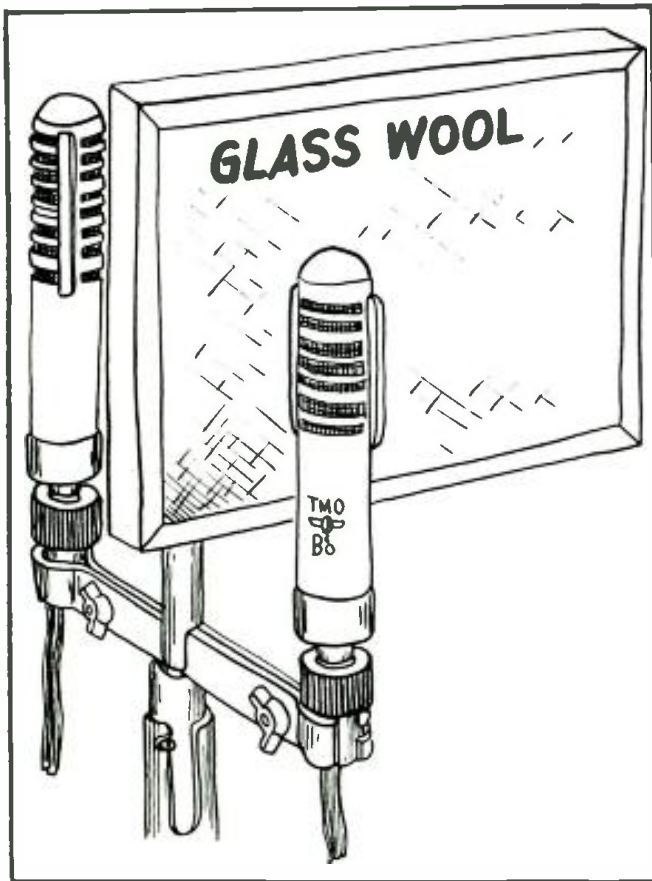
### The Recorder:

What tape recorder you use for binaural recording is a matter of personal preference and capacity of one's pocket-book. We cannot in fairness recommend any specific unit; all we can do is set forth a few things to consider in selecting a recorder for binaural. It should have . . .

1. Connections for headphones for monitoring.

A VM binaural tape recorder and accessories. Beside the recorder is a dual corded Telex monitor set, and microphone case. A case for your mikes is a good investment.





In the Bangs and Olufsen stereophonic microphone assembly, the mikes are 7 5/8" apart, center to center. Sound absorbing vane is 11 1/4" long, and of glass wool, or other "dead" material.

2. A VU or neon overload indication system.
3. Provision for playback, either built-in, or as a compact accessory. You will seldom get away from a date without having to play back for the band, particularly while binaural is so new. It's a sort of price of admission for recording privileges.
4. Either separate channel tone controls for recording, or the writer's preference, no tone controls for recording. Monitoring level in itself will generally be enough for the average tape fan to handle.
5. A fast forward as well as a fast rewind is another must.

#### Playback Provisions:

As we have said earlier, if you wish to use your binaural recorder for recording anything other than home activities, if you wish to do "field" recordings, you should have a portable playback system of some sort. A pair of eight inch speakers and two inexpensive "kit" amplifiers with 5 watt output is quite adequate. If your recorder has power output amplifiers, you of course do not need the extra amplifiers. You should have cable enough to allow you to set the two playback speakers at least 12 to 15 feet apart should you desire. Whenever possible, carry playback provisions with you. After all, the musicians who have cooperated with you would in most cases like to hear a playback. You will revel in the astonishment of the band or chorus if you are a typical tape fan.

#### The Recording Operation Itself:

If you are one of those who wishes to do "field" recording, and as a binaural fan you surely will be, certain things we have learned are of value to you.

It is essential to bear in mind when you are hopeful of recording a group of union musicians, that the contract they have with the place they are playing for, forbids any recording of any kind except for extra pay. After all, they make their living out of playing music, and recording pay is a part of it. You cannot expect to set your tape recorder down in front of a band and make recordings without pre-arrangement. You will, however, be surprised at the cooperation you can get if you talk to the leader of the band beforehand. Explain how the tapes you make will not be used for commercial purposes. Offer to let the band hear them after they are through playing. Generally the leader of the group will talk with the men and get their approval. Remember, they are giving you a privilege when they let you record. If they will not let you set up your recorder, be graceful about it. They may maintain they cannot give you permission, nor can anyone locally do so. This is not a stall; it's a fact. If they will let you record, be cooperative and considerate.

#### School Bands, etc.:

If you are going to record a school orchestra or band, start things off by contacting the Music Director of the school. Get his permission and be sure to offer to hold a playback session for the band. With stereophonic recording the band can hear itself as it actually sounds, something impossible with any other form of recording, and something of incalculable value to the band. The music director of one of the schools we have recorded said that our tapes sounded better than the actual band, and the band was quite good. Frankly he actually does hear a better sounding band in front of our playback speakers than he hears on the podium; his listening vantage is better. You should get just as much pleasure out of playback sessions for schools etc. as you do from recording work. After all the proof is in the listening, and no one is a better judge than the musicians themselves.

#### General Recording Courtesy:

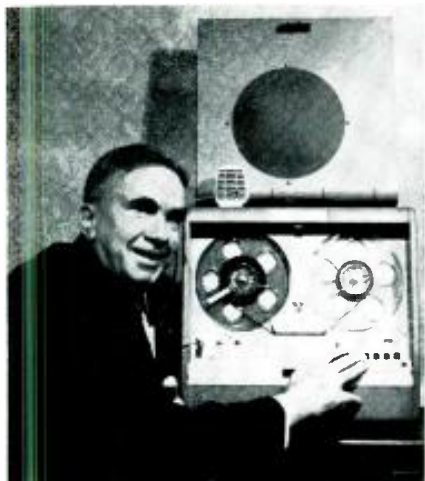
If you follow a few simple rules of courtesy, you will find yourself always welcome for a repeat performance.

1. Always ask permission *first*.
2. Always be willing to make a playback if requested.
3. Always get to the recording date before the band starts or the crowd collects. Get your equipment in place, make it as inconspicuous as possible.
4. Don't run back and forth during the performance moving mikes. Remember, *you* are recording binaural, *you* can move the mikes back and forth across the stage with your level controls to quite an extent.
5. Carry enough AC extension cords of good UL approved types for the equipment you will be operating, so you won't be bothering the stage electrician.
6. Get your mikes in the best position possible but not at the expense of the mikes already placed there by the auditorium's PA system.
7. Keep your cables out from underfoot, for your sake and that of the performers.

*The author is particularly indebted to Mr. Manna Woodworth, leader of the House of David Orchestra. Dr. Paul Hamel of the Emannuel Missionary College, Music Dept., and Mr. Roy Driscoll and Howard Lorenz of V-M Corporation for their help in the recording experiments and circuit design work on which this article is based. We are also indebted to Messrs. Ehrlich and Fenton of the Fenton Company who secured the data from Bangs and Olufsen of Denmark.*



# TAPE CLUB NEWS



Fred Goetz, founder of Tape Respondents, International died recently, after a lengthy illness.

Fred Goetz, founder of Tape-Respondents, International, which was organized in 1950, died on Tuesday, January 31.

Born in Germany, this tape club pioneer had been ill for quite some time. He recently transferred all T-R-I records and correspondence to Jim Greene, the club's new secretary.

During Fred's illness, all hospital and other arrangements were handled by Mrs. Doreen Young of San Francisco. She and her husband had been friends of Fred for some 30 years.

Mrs. Young wrote that he died peacefully, and interment was to be in Memorial Cemetery at San Francisco, where his grave will have perpetual care.

We are all sorry to hear of Fred's passing, and are sure that he will be remembered for his work in promoting international friendship through T-R-I.

Voicespondence Club members Len Hoskins, James Sletten, Louis Seidita, and Arthur Verken have combined forces and come up with an original type of local tape club in Wisconsin. Originally designed for blind Wisconsin Voicespondents only, this exclusively masculine club now admits any male recorder owner in the state. Formed primarily for fun, there are no dues, formalities or strict rules, in this club.

It is called Taenia, the scientific name for a tapeworm; the president is known as scolex, the biological terminology for the worm's head; and the members are referred to as proglottides, technical term for the sections of the worm.

Taenia meetings are conducted via round-robin tapes among its members.

Recently elected Associate in the Photographic Society of America, Voicespondent Fred Calvert of Pennsylvania, was asked to act as a judge for a photographic salon held in the Canal Zone. Fred suggested he tape record his comments and criticisms regarding the entries. The Canal Zone photo club thought this a fine idea and quickly located a recorder to listen to the tape.

World Tape Pals has announced a contest for its members. Prizes will be offered for the best article of not more than 250 words on the subject: "The Benefits of Tape Recording Exchange."

Entries should preferably be typewritten, although handwritten on one side only of plain paper will be acceptable. They must be submitted with the contestant's name and address on a separate card or slip attached to his entry, and must reach World Tape Pals, P. O. Box 9211, Dallas 15, Texas, before May 10, 1956. All must be the work of the person submitting it, and cannot have previously been published.

First prize awarded will be \$25; second prize, \$5, plus ten reels of ORRadio 225-foot LP tape; and third and fourth prizes, each, ten reels of ORRadio 225-foot LP tape.

All entries become the property of World Tape Pals and cannot be returned to sender.

A Danish tape recording magazine, called the Baand-Amatoren (The Tape-Amateur) is being published 10 times a year by Dansk Magnetone Klub (The Danish Magnetic-Sound Club). It is issued in a spoken edition, as well as written, for the blind.

In the January '56 edition is a list of winners in "The 4th International Contest for the Best Amateur Sound Recording of 1955," among which are two Danish contributors. This copy also contains an interview with the grand prize winner, a young Dutchman.

According to Art Rubin, National Chairman of International Tape Worms, the club once known as Global Recording Friends, has merged with I.T.W. International Tape Worms applications will be sent out to all Global members, with a special membership fee of \$1.00 for the first year, instead of the usual \$2.00. Thereafter, the dues will revert back to the regular cost.

A local tape club has been formed by three boys, ages 13-14, in New York. Anyone wishing to exchange tapes with any or all of them may do so by recording on a 5" reel of tape, or smaller, at 3 3/4 i.p.s., and sending it along to Dick Conklin, G Ricky Blvd., Albany 3, N. Y. All tapes will be answered immediately.

## JOIN A CLUB

### TAPE RESPONDENTS INTERNATIONAL

Jim Greene, Secretary  
P.O. Box 21, Dept. T, Little Rock, Ark.

### THE VOICESPONDENCE CLUB

Charles Owen, Secretary  
Noel, Virginia

### WORLD TAPE PALS

Harry Matthews, Secretary  
P. O. Box 9211, Dallas, Texas

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Art Rubin, National Chairman  
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The famous Philadelphia Orchestra, Eugene Ormandy conducting, recording stereophonically. As this was a real recording session, the audience saw the orchestra in shirt sleeves instead of the more formal attire always worn at public concerts.

## STEREO SOUNDORAMA

by Adrian Siegel

*Photos by the author*

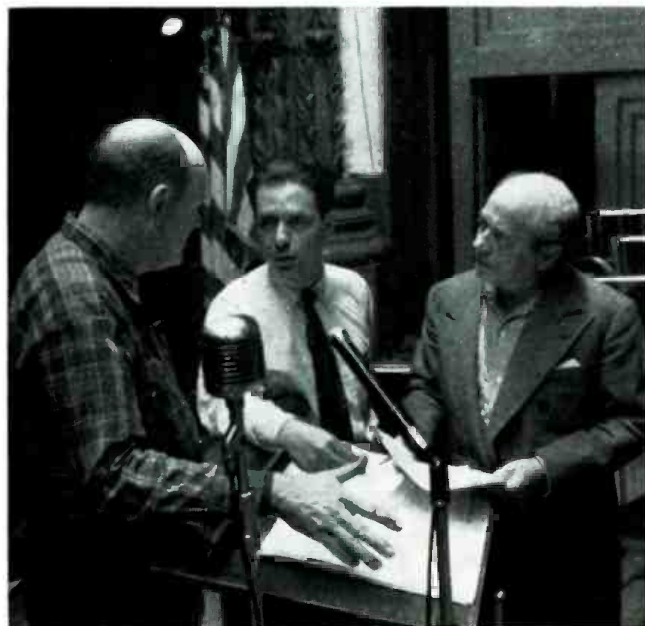
*. . . the famous Philadelphia Orchestra presents the first stereo sound concert to an enthusiastic audience*

*Editor's note: Mr. Siegel is the world's foremost photographer of musical personages and events. In addition, he is also a member of the Philadelphia Orchestra. We are glad to bring you this exclusive coverage.*

**T**HE Philadelphia Orchestra, under Eugene Ormandy added another first to its audio pioneering when it performed the first stereo recording and playback demonstration for a large Academy of Music audience.

Twenty-three years ago the orchestra cooperated with Bell Telephone Company engineers in transmitting stereo sound over long distance wires between Philadelphia and Washington, D. C. In that experiment, microphones were set up in each section of the orchestra and these were connected to amplifiers which transmitted the pickup to Washington. There the signals were further amplified and played back through speakers set up on the stage of Constitution Hall in the same position as the mikes in Philadelphia. The experiment, in those early days of audio, was a success.

The Soundorama held at the Academy of Music on February 13th made a deep impression on the audience. Two nights later, at another musical affair in Philadelphia, people were still talking about it.



Russel Tinkham, Ampex Corporation, left, confers with Robert Rogers, center, president of WGMS, who staged the stereo soundorama and Eugene Ormandy, conductor of the Philadelphia Orchestra.

Robert Rogers, of Washington's Good Music Station, did the commentary in his usual fine style, explaining to the audience what was happening, and the whys and wherefors of the various phases of the program and the equipment.

Critics from the Philadelphia papers, agreed that the performance was excellent. The *Philadelphia Bulletin* said: "A large audience was fascinated by demonstrations in which the progress and innovations in hi-fi sound were demonstrated. Mr. Rogers 'took apart,' in an informative and amusing script, Benjamin Britten's 'The Grown-Up's Guide to the Orchestra.'"

The post-intermission part of the program found the men of the orchestra in informal attire (they had been in full dress during the first half) for this was a 'Recording Session with the Philadelphia Orchestra.' . . . "a large audience at the Academy of Music (was) fascinated by the demonstrations."

The *Philadelphia Inquirer* said: "The evening's second half was given over to a recording session in which a number of works were heard 'live' and played back in a magnetic tape recording for comparison. This was said to be the first time a stereophonic sound recording had been immediately played back to an audience. This was a severe test but the engineers passed it with considerable distinction. The reproduction had remarkable fidelity."

The demonstration used Ampex model 350 recorders, Fisher 50AZ amplifiers and Jensen Imperial Speaker systems. Responsible for the technical details and the actual recording was Thomas Tait, symphonic broadcast engineer for WGMS, R. J. Tinkham, of Ampex, Karl Kramer, of Jensen and George Maerkele of Fisher.

Mr. Ormandy very aptly picked for the stereophonic recording, one of the same pieces that was used in 1933. This is the Philadelphia's world-famous performance of the Bach Toccata and Fugue in D Minor. Mr. Ormandy's own orchestral transcription was used.



Upper: Engineers rig the mikes in position. In addition to the stereo pickup the audience also heard an unbalanced pickup from a number of mikes placed in the orchestra and a perfectly balanced recording made with a single mike suspended in front of the stage some thirty feet overhead. Upper center, the Jensen speakers were placed as shown for the stereo playback, slightly less than one-third the distance from either side of the stage. Lower center: the audio control center in one of the boxes. Fisher audio controls and amplifiers were used. Lower: the almost capacity audience who heard the first public stereo recording and playback demonstration in Philadelphia's Academy of Music.



# The Case of the Movie Club's Sound Equipment

by  
Fred Furman

and  
Herman Hensel



Compactness of this layout permits efficient operation of both the projector and sound equipment.

**T**HE New York 8mm Motion Picture Club has a handsome new case to house their tape player and amplifier. To a movie club, magnetic tape equipment is as important as a projector these days, especially if the club specializes in 8 mm. The 16mm boys have their sound on film, both optical and magnetic, but sound on film has not proven entirely practical for 8mm.

You see, 8mm sound on film is practical for commentary and dialogue but not for musical accompaniment. This is because the slow speed of the film through the projector just will not give adequate response. Speed up the projector and you lose the advantages of 8mm film economy.

For a long time we eighters found an interplay of disc records on double turntables to be the satisfactory accompaniment for our film productions. Then came magnetic sound on tape with stroboscopic devices, such as the so called "tiger tape," permitting almost perfect synchrony between sight and sound. Many 8mm filmers have adopted tape recording as a second hobby and with a goodly number the two hobbies are happily wed into one.

We have received, for showing at our meetings, so many films with accompanying tapes that our club found it advisable to purchase suitable equipment for playing and amplifying them.

The club had no need for a recorder since most of the members have their own. Our need was for a player only, with no erase head, so there could be no possibility of our erasing someone's prized sound track. The amplifier had to have good quality for use in a small room for our regular meetings (our membership is limited to thirty) yet must be powerful enough to fill a ballroom for our annual show which plays to an audience of over three hundred.

One of our members is an engineer with Bell Telephone Laboratories and we rely on his technical advice in the many fields relating to our hobby. His selection of magnetic tape equipment that is particularly suited to our needs has proven wise indeed.

After careful deliberation he chose, and we purchased, an Audiosphere tape player; a Bogen amplifier, Model

DB110; and a Jensen Duette Hi-Fi Two Way Reproducer System, Model DU202.

Storage then became a problem as we keep our equipment in a check-room between monthly meetings. The speaker is self-cased and offered no difficulty. The player and amplifier both came without a case and their cartons soon became dilapidated. Now the two are neatly housed in a single wooden case which protects them well in storage and bears upon its back and front our club insignia so that it can be immediately identified.

This ingenious case was designed and constructed by our member, Hermann Hensel, who is an architect and hobbyist. It not only protects the equipment but permits its use without removal from the case. Back and front of the case slide up and off to give access to all controls and jacks. Space is left for all necessary ventilation. The lid is removed and metal legs fit into sockets in each corner to make of it a stand for our projector. Mr. Hensel had so carefully determined the length of these legs that the projector is held at just the proper distance from the tape player to properly view the stroboscopic lines upon the tape. To better fit it for the role of projector stand, there is no handle on the lid, the case being carried by means of a belt of webbing, looped through two handles on opposite sides of the case.

Mr. Hensel says that the case can readily be built and finished by any amateur handy with tools, and with new materials for approximately \$8.00 or less. Dimensions may vary to fit a particular player and amplifier.

"Plyscore" (good one side) fir plywood was used for the sides, top, shelf and slides, all other pieces being of solid pine or cypress, listed as follows:

A—2 pieces  $14 \times 18\frac{1}{2} \times 1\frac{1}{2}$  (These were later cut apart to form sides of both case and cover as explained in text.)

B—1 top  $13\frac{1}{2} \times 13\frac{3}{4} \times 1\frac{1}{2}$

C—1 bottom  $13 \times 12\frac{1}{2} \times \frac{3}{4}$

D—1 shelf  $12\frac{5}{8} \times 12\frac{3}{8} \times 1\frac{1}{2}$

E—2 cover sides  $12\frac{1}{2} \times 3\frac{1}{2} \times 13/16$



Mr. Hensel, left, inserts the legs into sockets in the lid of the case from which Fred Furman has removed the front and back.

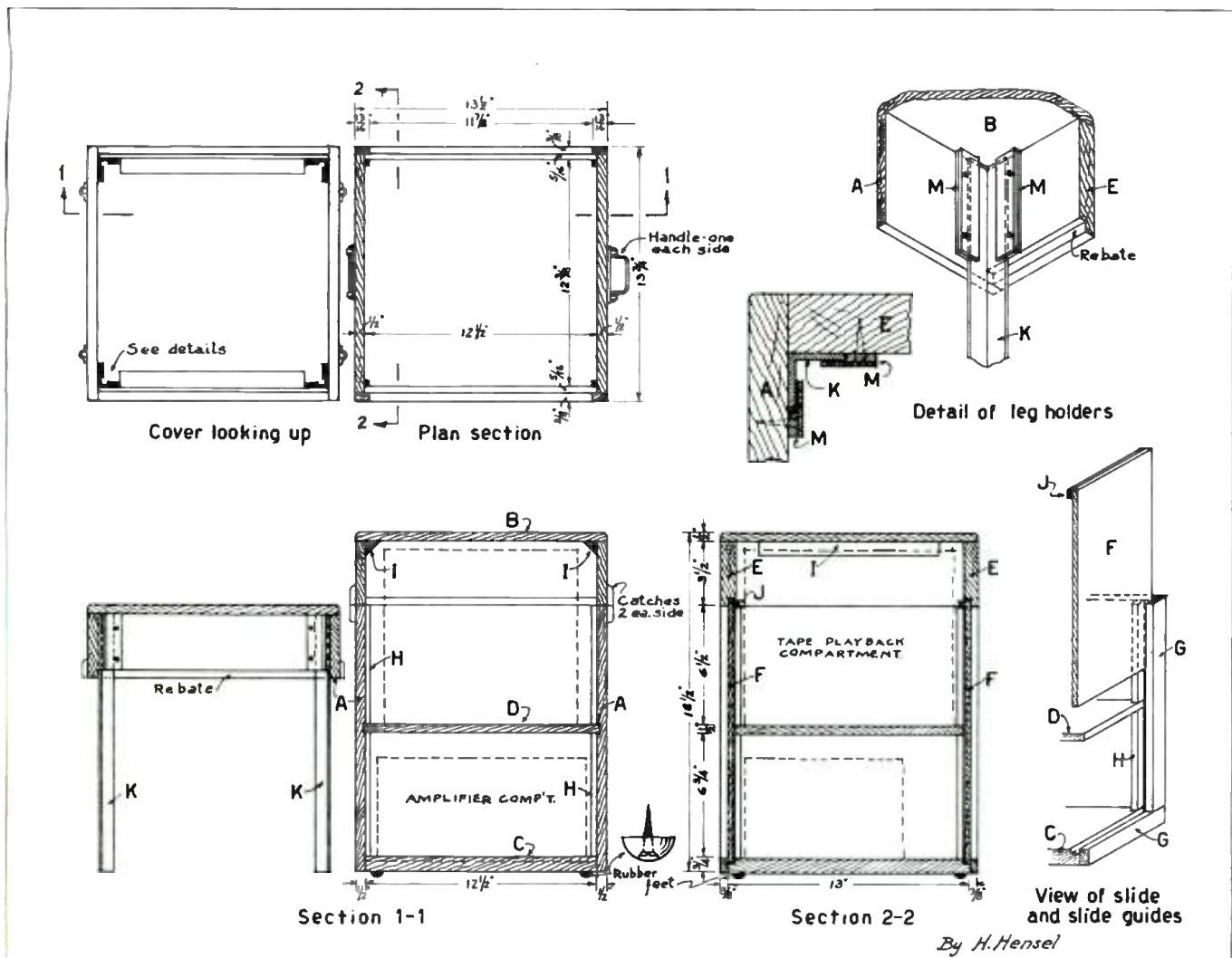


Archibald MacGregor, club projectionist takes over from Messrs. Hensel and Furman and the show gets underway.

- F—2 slides  $14 \times 12\frac{3}{8} \times \frac{1}{4}$
- G—Solid wood strips  $\frac{3}{8} \times \frac{13}{16}$  (about 7 ft. length cut to fit) to cover plywood edges and to form grooves.
- H—Solid wood strips  $\frac{5}{16} \times \frac{5}{16}$  for slide guides, (about 5 ft. length, cut to fit)
- I—2 beveled pieces  $\frac{7}{8} \times \frac{7}{8}$  for reinforcing sides to top.

- J—2 grip pieces  $\frac{5}{16} \times \frac{5}{16} \times 12$  for slide tops.
- K—4 legs  $\frac{3}{4} \times \frac{3}{4} \times \frac{1}{8}$  extruded aluminum angles, lengths to suit.
- M—8 leg holders made up of  $3 \times \frac{3}{4} \times \frac{1}{8}$  aluminum flats and  $3 \times \frac{3}{8} \times \frac{5}{32}$  pieces, drilled and counter sunk for screws.

(Continued on page 49)



Plans for the attractive and practical case. Measurements may be changed to allow for different equipment than used by the club.

# NEW PRODUCT REPORT



## RCA VICTOR ORTHOPHONIC RECORDER

**. . . . push button control, indexing counter, remote control switch, voice-music control, dual speed, dual track.**

**T**HE Model 7TR3 recorder is the first RCA Victor machine to be completely manufactured by RCA. Previously, the RCA recorders were made to RCA specifications by outside firms.

This recorder is very attractive in appearance and is well made. The color scheme is gray and black. The case is light gray leatherette.

The recorder is of moderate size, measuring  $9 \frac{5}{16} \times 18 \frac{1}{4} \times 14 \frac{9}{16}$  inches with a weight of 38 lbs.

The machine is dual track, dual speed with a single head containing both the erase, record and playback functions. As with most machines, the reel reversal is manual. The push-button controls are: fast forward, fast rewind, record (with safety interlock) and play. The bar in front of the keys is the stop control.

Recording indication is by means of neon indicators, of which there are two, one for normal and one for overload. For location of selections, the recorder has a program indicator.

An unusual feature of the recorder is the remote control. This is connected in the rear of the case and with it the motor may be turned on or off and the machine engaged in either play or record, depending upon which mode has been set by the button control on the recorder. This unit works very well and could be handy for dictation. Under the socket accepting the remote control cord plug is the remote-local switch which must be thrown to the proper position when the control is used.

Rubber caps are provided to hold the reels on the spindles so that it is possible to operate the recorder in an upright position or to carry it with the reels in place.

Mechanically the recorder is powered by a single heavy duty motor and the tape transport mechanism is mounted on a heavy base plate. The push buttons are spring loaded and the solenoid operated remote control works satisfactorily. When operating the recorder, the buttons should be pressed firmly.

S T A **OK** S T E D

Product: RCA Victor  
"Judicial" Orthophonic Hi-Fi Recorder, Model 7TR3

Price: \$199.95

Manufacturer: RCA Victor  
Camden 2, New Jersey.

The recording-playback amplifier is of typical RCA design and construction, custom designed to meet the popular Hi-Fi conception of reproduction.

On the model we tested the  $3 \frac{3}{4}$  ips speed produced a flatter playback response between 100 to 5000 cps than the  $7 \frac{1}{2}$  ips speed although both were well within allowable limits. An output of four watts may be had without distortion.

The recorder has three speakers, a  $6 \frac{1}{2}$  inch woofer and two  $3 \frac{1}{2}$  inch tweeters. Recorded tapes played on it sounded very good.

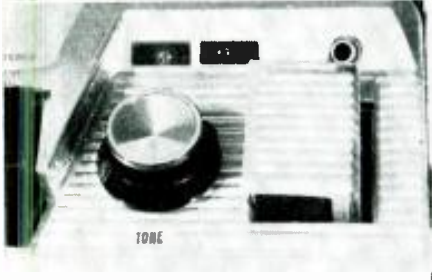
The recorder has a "voice-music" switch which, in the voice position preemphasizes the voice range when required. In the music position the equalization is for an essentially flat response.

The radio-phono jack serves a dual purpose in that it is used as an input when recording from radio, phonograph or PA system or as an output for connection to a home high fidelity system or PA system. A connecting cord with alligator clips is supplied with the recorder. This is a high impedance connection.

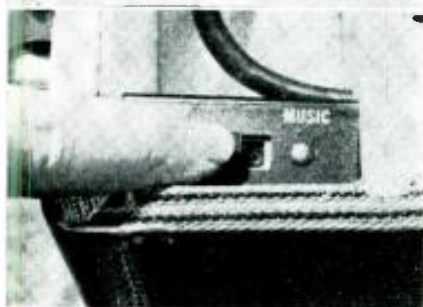
The tone control, which is used to increase or decrease treble emphasis,



The case closed. Reels may be left on the spindles and the top closed for carrying. Rubber reel retainers are provided to hold the reels in place.



Top: the microphone fits into a well in the control panel. Center: showing the microphone in place, the microphone jack, record and overload lights, and volume and tone controls. Lower: left side of panel has counter, radio-phono input and on-off speed control.



Push button controls for fast forward and rewind, play and record are centered on top panel. Stop is controlled by bar in front of buttons. Controls are positive but must be pressed firmly to insure locking into place. Lower: The "voice-music" switch provides preemphasis of the voice range or a flat response for music.

is effective and is operative only during playback.

When switching from one mode of operation to another, the "stop" bar should be depressed first.

In operating the remote control the indicator knob should be turned to the "motor on" position. The operator should pause briefly to allow the machine to attain full speed before further turning the knob to the play or record position. To stop the recorder the knob is turned to "off" and another brief pause should be made as the "motor on" position is passed.

The machine will accommodate a 7 inch reel with a rewind time (1200 ft. of tape) of 2 minutes. Power consumption is only 60 watts.

We found the frequency response to be good from 100 through 5000 cps at the 3¾ ips speed and from 70 through 8000 cps at the 7½ ips speed on the recorder we tested.

This is the first of three recorders to be put out by RCA, a lower and a higher priced unit are in the making.

In view of the splendid appearance of this unit, its attractive design and the remote control feature, we feel that it is worthy of consideration if you plan to purchase a recorder in the moderate price class.



Upper: remote control switch turns on or off and in second position turns on playback or record. Lower: Rear of case has auxiliary speaker jack, socket for remote control cord and local-remote control switch.

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# NEW PRODUCT REPORT



## AMERICAN RECORDER MICROPHONES

... ceramic and crystal models—light weight, small, 100-7000 cps range.

**T**HESE two new microphones are encased in plastic (red, black, gray or beige) with a simulated gold grille. They are designed for durability, are of light weight and our tests showed that they also had good quality. Their size is small, measuring only  $3\frac{1}{4}$ " x  $2\frac{1}{8}$ " x 1", and they have an unobtrusive and pleasing appearance.

Either mike weighs but two ounces and they may be hand held, placed on a flat surface or taped to the wall or fixtures.

The microphones are available in various colors. A five foot shielded cable is attached to each mike. Either RCA-type phono plugs or miniature phone plugs are supplied with the mikes at slight additional cost.

The output of both mikes is high impedance with a —55 db level for the X-203 crystal type and —62 db for the B-203 ceramic. These outputs make the mikes suitable for most non-professional recorders.

The pick-up pattern of both units is omni-directional and the frequency response covers the voice and average music range (AM radio or TV sound) with excellent results.

The X-203 (crystal element) has a reasonably flat response from 100 through 7000 cycles per second with an output of —55 db. This is slightly preferable to the B-203 for music pick-up where sensitivity and/or quality under indoor conditions are controlling factors.

The B-203 (ceramic type) also has a reasonably flat response in the range between 100 through 6000 cycles per second with an output level of —62 db. This mike is to be preferred to the crystal where outdoor exposure to high humidity, high temperatures, rough handling or where shock resistance without damage are the most important factors.

Any crystal microphone is a relatively sensitive instrument where

**S T A F O K S T E D**

Product: American Microphones  
Models B-203 and X-203

Manufacturer: American Microphone Co., 370 S. Fair Oaks, Pasadena, Calif.

Price: \$8.35 list with RCA phono plug, \$9.40 with miniature phone plug, \$7.25 and \$8.00 without plugs.

shock, heat and humidity damage are concerned. As the principal element is a crystal of Rochelle salt, extreme humidity can soften it, as can temperatures over 115° F. Crystal microphones should not be stored where they would be subjected to either of these conditions. It is inadvisable, for instance, to put them in such places as the glove compartment or trunk of the car where the temperature can climb to more than 100 degrees in the summertime.

The ceramic type mike would be preferable when children are to operate the recorder where the chances of the mike being dropped or bumped are increased.

The microphone element in both models is shielded and no difficulties were experienced from hum pickup using the length of shielded cord supplied with the mike.

The light weight and small size of these microphones, together with their unobtrusiveness would recommend them for use where microphone concealment is necessary. They should also do well in conjunction with self-contained portables where space is at a premium.

If the mike is used in a concealed position, which necessitates a longer cord than furnished, extension cords should be shielded and grounded to avoid hum and noise pickup. This is true of any high impedance mike.

We found that the specifications of the manufacturer were met or exceeded in all categories of our tests and we feel that either of the microphones is suitable for amateur recording where general area coverage is desired.





Hermann Hensel carrying the sturdy case he made to house the tape player and amplifier used by the New York 8 mm Motion Picture Club for accompanying films shown at their meetings.

Also 4 trunk catches and 2 brass plated steel chest handles which were secured with brass rivets, peened over washers on the inside of the case.

1 heavy woven pack strap (Army surplus) if desired.

Miscellaneous items: — glue, brads, screws, sandpaper, rubber feet, stained varnish or paint.

Where dimensions of some pieces are somewhat over size in comparison with the sketches, they were cut and planed down to size.

Sides A were ploughed out 1/2" wide by 1/16" deep for housing the tape playback shelf D. The lower inside edge of cover sides E were ploughed out to form the rebate for tops of slides F. The sides A, top B, shelf D, and bottom C were first fitted, then glued and nailed with long brads, care being taken to square up the work before nailing. A line was drawn across the sides A, 4" down, parallel with the top B, and cut through squarely (with a fine tooth saw) for the cover. NOTE—allowance for thickness of saw cut had been made in the height of sides. Then sides E were fitted in, glued and nailed. Pieces I were next glued inside to reinforce sides to top.

As plywood was used for the sides of this case, the strips G were glued and nailed with brads to the edges, thus avoiding the sight of the five laminations. These strips also formed the out-

er sides of slide grooves. Strips H were cut to length, glued and nailed to the inside of sides A to complete the slide grooves. The 1/4" thick plywood for slides F were dressed at edges and fitted to slide easily into the grooves and a strip J secured to back of each slide at top edge as a grip for pulling same up.

Nail heads were set 1/16" or so below finished surfaces and filled with wood putty or wood filler. All work was sanded smooth and corners rounded neatly.

Hardware was then fitted to the case, the centers of screw holes located and marked by tapping a sharp awl or ice pick into the wood. Hardware was then removed and finishes applied.

This particular case received two thin coats of shellac for the interior surfaces, sanded lightly when dry. The exterior was given a coating of mahogany oil-stain wood filler rubbed off smooth and allowed to dry overnight. Next day a thin coat of shellac was applied which, when dry, was sanded with FINE sandpaper (two sheets of #00 were rubbed, sanded sides together, to obtain fineness), dusted clean and given one coat of high gloss mahogany-stained varnish flowed on with a brush. The hardware was then firmly attached when the finish was completely set and dried. The rubber feet were also attached at this stage.

Leg holders or sockets M were screwed inside each corner of the cover as clearly shown in the detail of the sketches. The length of the legs K had to be determined by experiment so that projector would be the proper height to view the stroboscopic effect of tape or disc on the playback. The legs of our equipment were made about 16" long and when not in use they pack inside case.

When our amplifier was installed in the case we found plenty of room behind it to stow the attachment cords.

All packed, the case can easily be carried by the chest handles or, if we wish to carry it by one hand, we attach the webbing pack strap through both handles.

### TAPE CLUB FORMED IN BALTIMORE

Under the leadership of Gerson Eisenberg, who was named chairman pro-tem at the first meeting, a new tape club has been formed in Baltimore. The organization meeting was held in the Enoch Pratt Free Library, which will act as a depository for tapes of civic events, city sounds, etc. made by members.

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Volume 2, No. 2: Building an Electronic Mixer, Mike Stands, Orchestra Recording.

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Volume 2, No. 5: Tony Schwartz—Master Recordist, How to Avoid Hum, Capturing Yesterday's Music, Build This Recording Center, Thesis on Tape.

Volume 2, No. 5A: Sounds to Keep Your Trip Alive, Recording Bands Outdoors, Capturing Insect Songs.

Volume 2, No. 6: Recording Radio and TV Bloopers, Automatic Slide Shows, Beautify Your Recorder, Tape Filing System, Stereophonic Tape.

Volume 3, No. 1: How Tony Martin Uses Recorders, Joining a Tape Club, Tape For Folk Dancing, Recording Xmas Music.

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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.

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

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

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**PRECISION MAGNETIC HEADS,** Erase-Record-Playback. Stancil-Hoffman Corporation, Hollywood 38, California.

**NEW! INEXPENSIVE! GUARANTEED!** "End-of-Tape" automatic shutoff control, only \$4.95. Build 10½" reel adapter, instructions \$1.00. Le Roi Engineering, Box 251, Elmhurst, Illinois.

**WEBCOR "ROYAL CORONET"** Model 2612 portable tape recorder. Three speaker Hi-Fi with tape counter. Brand new 1956 model. Cost \$255.00, will sell for \$189.00. Also brand new Webcor "Royal" Model 2611 portable tape recorder. Cost \$225.00, will sell for \$169.00. Both in original cartons. Write James J. Michael, 2445 Lakeview Ave., Baltimore 17, Maryland.

**BRAND NEW 1956 Model Hi-Fi VM-700** tape recorder, never used. Cost \$179.95, yours for \$138.00. Jack Fives, 2916 Rockrose Avenue, Baltimore 15, Maryland.

**MAGNECORD PT6-BAH** Binaural or can be used Monaural, in beautiful enclosure with 10½" reel extension, used 20 hours. New \$637.50 and will take \$425.00, excellent condition, just like new. For more information, write F. A. Mason, Box 7, La Sierra Sta., Arlington, California.

**FOR SALE:** Concertone Model 1501 professional tape recorder. 7½ and 15 i.p.s., dual track, takes all reel sizes. Includes Model 501 carrying case with built-in amplifier and 8" speaker. Used only in home, top condition. Cost \$432. Selling for \$315 or best offer. Add \$35 if you desire high-gloss ebony finish custom cabinet adequate to hold above recorder and other units you may have—size 36" x 16" x 30" high. FOB Washington. D. C. Phone Clearbrook 6-1283 or write James N. Davis, 7628 Lakeview Drive, Falls Church, Virginia.

**LARGEST SELECTION.** Tape recorders, accessories, tapes. Free price list. Hi-Fi Hobbies, 975T East 178 St., New York 60, N. Y.

**FOR SALE:** Midgetape battery-operated, pocket-size, tape recorder complete with battery, microphone and tape. Brand new, never used. Original cost \$260.00, will sell for \$200.00. Dick Dowd, 137-28 Laurelton Pkwy, Rosedale 10, N. Y.

**FOR SALE:** Used Model 2010 Webcor tape recorder with mike, excellent condition, two speeds, dual track, 7" reel tape, input-output assembly, two channel input mixer, testing tape, \$100, plus shipping charges. Write John Morrissey, 43-13 Elbertson St., Elmhurst, N. Y.

**MAKE AN** easier living tape recording. Write Bilina Studios, Ridgefield Park, New Jersey.

**TERADO-CHIEF CONVERTER** for 6 volt battery, like new, list \$49.95. Best offer over \$30.00. Reason—got a new 12 volt car. Bill Coleman, Duncannon, Pa.

**WANTED:** Walkie-Recordall, Model CCB. State price, age and condition. Sidney Helperin, 20665 Centuryway, Maple Heights, Ohio.

**PICTAPE:** "A true picture fidelity" recording tape. Broadcast-Telemetering-Computer quality. Sample 1800 ft. reel \$5.75. Guaranteed. Pictape Products Corporation, 152 West 42nd St., New York 36.

**RECORDS FROM YOUR TAPES.** Also lectures, speeches, etc. Recorded on tape or discs. All speeds, lowest prices. Patmor Sound Systems, 92 Pinehurst Ave., 3K, New York 33, N. Y.

**MAGNECORDER** for sale: PT6-AH mechanism, hysteresis synchronous motor, 7½ and 15 i.p.s., equalized for 15; PT6-J amplifier; 10½" reel adapter set; 5—10½" reels; case for amplifier. Excellent condition, \$300 or best offer. R. W. Hoffmeyer, Walhalla, S. C.

**WANTED:** Berlant or Concertone 20/20 with 3¾" speed. Cash. Albert Clark, 46 Congress, Battle Creek, Michigan.

**TAPE RECORDERS,** tapes and accessories, nationally advertised brands. Free catalog upon request. Satisfaction guaranteed. Dressner, 69-02 A, 174 St., Flushing 65, New York.

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**TAPE RECORDERS, HI-FI COMPONENTS:** Famous makes, highest trade-in allowances. A few like-new demonstrators at really big saving. State wants, describe trade-in. Greenwich Specialty Company, Greenwich, N. J.

**FOR SALE:** Revere T-1100 tape recorder, latest model, asking \$75.00 F.O.B. Reply to Dept. A, Tape Recording, Severna Park, Maryland.

**SWAP:** Rolleicord Reflex F 3.8 1/300th camera. Spaulding registered golf clubs, jewelry and plastics engraving machine with boxes of lettering, leather work tools. For tape recording and hi-fi equipment. Ed Tierney, 1441 E. 252 St., Euclid 17, Ohio. Phone REdwood 1-2478.

**MAKE \$100 WEEKLY** spare time with your tape recorder. Send 25c, refundable. Records from your tapes. Finest professional equipment. Low prices. Free list of services. Valentine Sound, 4253 Farmdale, North Hollywood 2, Calif.

**FOR SALE:** Nearly 300 Lang-Worth 16 inch vinylite transcriptions, 33 1/3 r.p.m., in perfect condition, used very little, together with two metal filing partitioned cabinets to store them in. Over 3,000 various musical selections. Make reasonable offer on F.O.B. basis. Also, Concertone #1401 professional hi-fi tape recorder, excellent condition, good as new, dual track, two speeds—7½ and 15 i.p.s.—takes up to 10½" reels, with preamplifier in a carrying case, \$175.00 F.O.B. Radio Music Corp. transcription arm. will play vertical transcriptions up to 18 inches in diameter, together with a diamond stylus head, plug-in type, with an equalizer and filter for vertical and lateral transcriptions (high impedance), all in perfect condition. Original cost was \$125.00, will accept \$25.00 ppd. New GE VR phono-preamplifier, \$6.00. Two-speed GI phono motor and turntable, 33 1/3 and 78 r.p.m., good condition, \$5.00. Write to Associated, 67 Franklin Ave., Garfield, N. J.

**FOR SALE:** Timex Magnetic Disc Recorder, also plays 16 2/3 and 45 r.p.m. phonograph records, new condition, \$30.00, plus postage. Marilyn Phillips, 311 Penfield, Rockford, Illinois.

**DISCS from your tapes.** All speeds, \$1.00 up. Hammer Recording Service, Box 33, Seattle Heights, Wash.

**FOR SALE OR TRADE:** Silvertone, list \$102.95; an Eicor, list \$126.50; or a new Telectrotape, list \$79.95. Either tape recorder for \$65.00, first class condition, and will guarantee good working order. Also a new 10 watt amplifier in case for \$26.50. Has 2 speaker outputs, one phono and one mike input connection. George Bischof, 1503 E. Vickery, Fort Worth 4, Texas.

**AMPEX 400-A** tape recorder, \$695; Electro-Voice 635 dynamic microphone and stand, \$37.50; both in new condition, priced FOB, V. R. Hein, 418 Gregory, Rockford, Illinois.

**FOR SALE:** Ampro Hi-Fi tape recorder, Model 757, built-in radio, wired for external amplifier or speaker and remote control, list \$275. Yours for \$155. Also Wireway recorder, plays 78 r.p.m. records, for \$55, both in perfect condition. All back numbers Tape Recording magazine, 30c each. Schultz, 205 East 85 Street, New York, N. Y.

**FOR SALE:** Webcor Model 210 tape recorder, 3¾ and 7½ i.p.s., automatic reverse, good mechanically and electrically, used three years, factory overhauled—\$80.00. Ampro Hi-Fi, Model 756, like new—\$160.00. Sell either one. Ray F Knochel, Lincoln, Illinois.

**LEARN HYPNOTISM FROM TAPE.** Complete course, \$4.00. Free information. Drawer 697, Ruidoso, New Mexico.

**FOR SALE:** Presto TL-10 Tape Drive Unit. Used four months, \$50 or best offer. James Griffith, 307 North 12th, Atchison, Kansas.

**TAPES recorded on discs.** 45's only, \$1. For complete information write, Pete and Pat Productions, 2647 Middle Road, Davenport, Iowa.

**FOR SALE:** New Pentron Pacemaker T-90. Lists for \$199.95, will sell for \$120. Jerome Farber, 763 Fox Street, Bronx 55, N. Y.

**MAKE MONEY** with YOUR tape recorder, \$50 to \$75 a week, associated with an established recording studio. Send \$1.00 (refundable) for complete information. Chardon Recording Co., P. O. 141, Chardon, Ohio.

**WANTED:** Bing Crosby material: transcriptions, V discs, sound track, broadcasts, telecasts, guest shots, promotion discs, publicity discs, unissued songs, anything unusual by Bing Crosby on pressings, disc or tape. Also want old records. Harold Sunners, Box 13, Brooklyn 4, N. Y.

**POCKET TAPE RECORDER** (1½ IPS), used only 15 hours on European trip. Plenty of extras, 6 cartridges and carrying case, extra batteries. Cost \$350.00, sacrifice \$225.00. Will tape details at 7.5 IPS. E. C. Snyder, 3953 Piedmont Ave., Oakland, Calif.

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**WANTED:** Copies of "Tape Recording"—Volume 1, Numbers 2 and 3. State price. Joseph C. Nicholas, P. O. Box 147, Palmer, Michigan.

**DISC RECORDINGS** from your tape. Write for details and price. Sterling Records, 27 Beacon Bldg., Boston, Mass.

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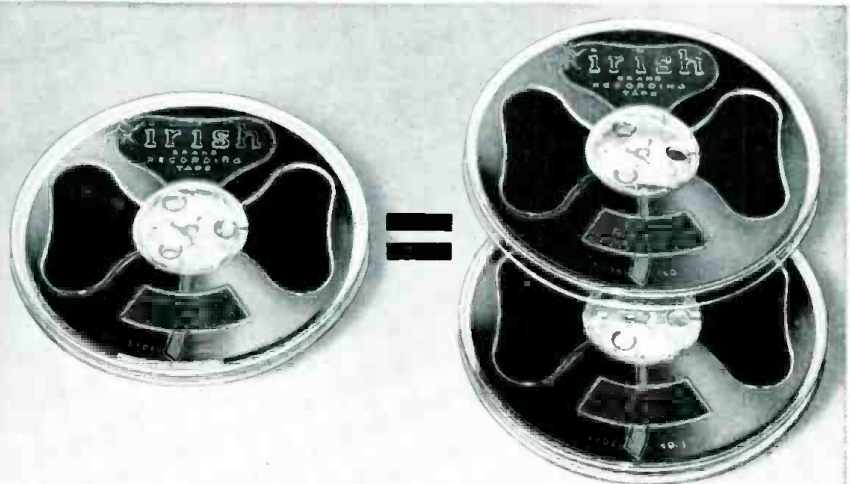
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