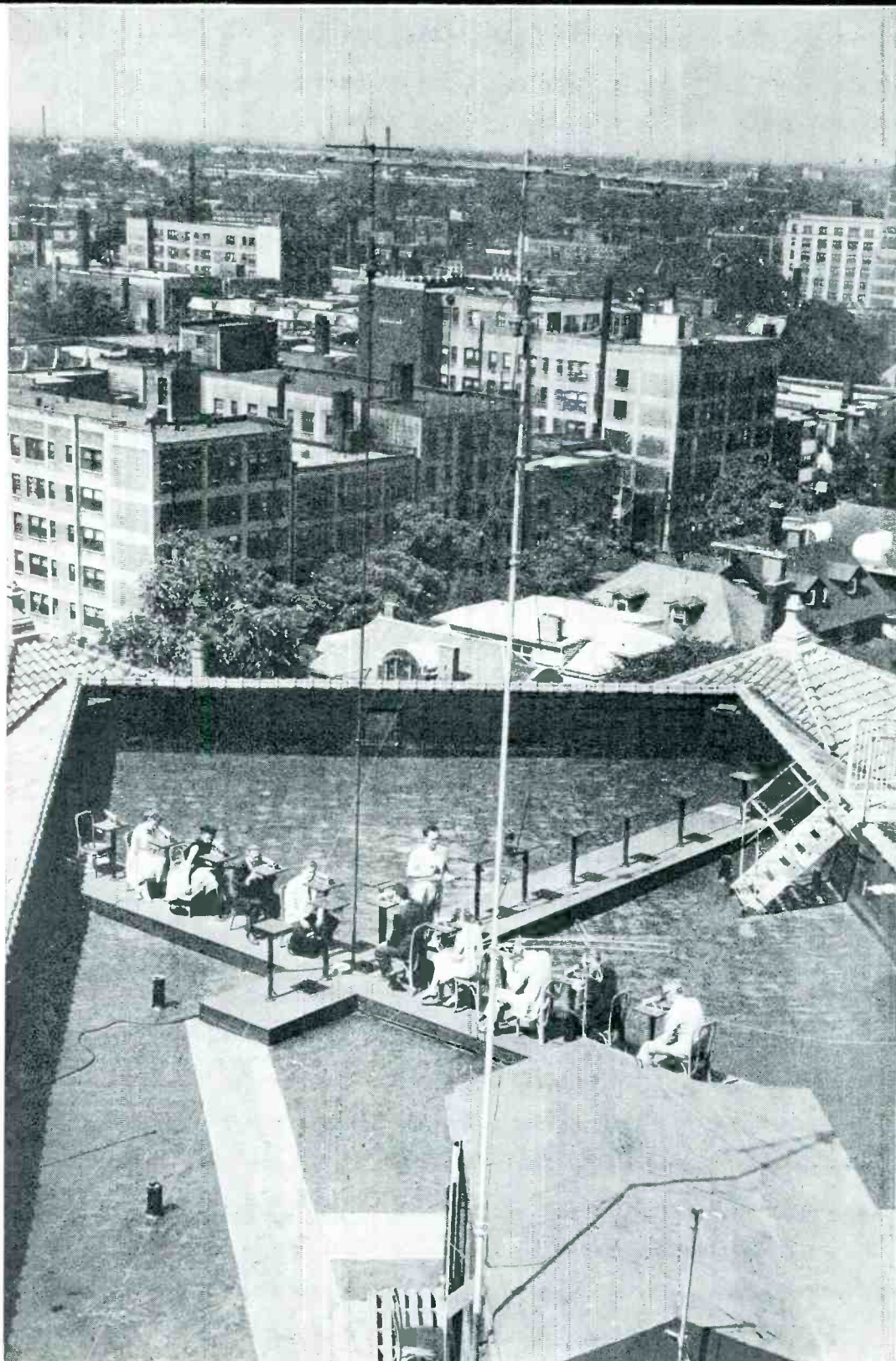


TAPE RECORDING



Moonwatch team tracks satellites. See story on page 14.



BLOOD and THUNDER CLASSICS

*Audiotape "speaks for itself" in a spectacular recording
—available in a money-saving offer you can't afford to miss!*

DETAILS OF THE PROGRAM

The stirring "Blood and Thunder Classics" program includes these colorful selections:

Tschaikowski . . .	Russian Dance
Sibelius . . .	from Finlandia
de Falla . . .	Dance of Terror. Ritual Fire Dance (El Amor Brujo)
Brahms . . .	from Symphony No. 4 in E Minor
Khatchaturian . . .	Saber Dance
Stravinski . . .	Infernal Dance of King Kastchei, Finale (Firebird Suite)
Beethoven . . .	Ode to Joy (Symphony No. 9 in D Minor)

DETAILS OF THE OFFER

This exciting recording is available in a special bonus package at all Audiotape dealers. The package contains one 7-inch reel of Audiotape (Type 1251, on 1½-mil acetate base) and the valuable "Blood and Thunder Classics" program (professionally recorded on standard Audiotape). For the entire package, you pay only the price of two boxes of Type 1251 Audiotape, plus \$1. And you have your choice of the half-hour stereo program or the full-hour monaural version. Don't wait. See your Audiotape dealer now.

HERE'S a reel of musical excitement that belongs on every tape recorder. "Blood and Thunder Classics" is a program of great passages of fine music, specially selected for their emotional impact.

The makers of Audiotape have not gone into the music business. They are simply using this method to allow Audiotape to "speak for itself." This unusual program shows you how vibrant and colorful music can be when it is recorded on Audiotape.

"Blood and Thunder Classics" is available RIGHT NOW from Audiotape dealers everywhere.

(And *only* from Audiotape dealers.) Ask to hear a portion of the program, if you like. Then, take your choice of a half-hour of rich stereo or a full hour of dual-track monaural sound — both at 7½ ips. Don't pass up this unusual opportunity.



audiotape TRADE MARK "it speaks for itself"

AUDIO DEVICES, INC., 444 Madison Ave., N. Y. 22, N. Y.
In Hollywood: 840 N. Fairfax Ave. • In Chicago: 5428 N. Milwaukee Ave.

CROSSTALK

from the Editors

THE TAPE INDUSTRY is gearing itself for one of the biggest upward surges it has ever taken. This was manifest at the annual meeting of the Magnetic Recording Industry Association held recently in Chicago where a dynamic and forward-looking program was presented to the membership by the newly elected officers. Membership in the association is at an all time high, with 44 companies and the membership has tripled in the last few months.

* * * * *

NEW OFFICERS elected at the meeting are: President, Herbert L. Brown, Vice President and Manager of Ampex Audio; Vice President, Ken Bishop, General Manager of Bell Sound Division, Thompson, Ramo, Wooldridge Co.; Treasurer, Charles Murphy, President, Michigan Magnetics; and Secretary, Herman Kornbrodt, Audio Devices. On the board of directors are: Hugh Daly, General Manager, Magnecord; Victor A. Miller, president of V-M Corporation; Russ Molloy, Vice President, Bel Canto Magnetic Tapes; J. Herbert Orr, President, ORRadio Industries; Irving Rossman, President, Pentron Corporation; and Harry Sussman, President, Telectro Corporation.

* * * * *

ALL OF THE manufacturers of magnetic tape are members, as are all of the manufacturers of magnetic heads and reels and cartridges. This new setup will mean faster standards work, among other things.

* * * * *

MOST EXCITING event of the Electronic Parts Distributors Show in Chicago was the unveiling of the first available 4 track, 7½ ips stereo tapes. These received a rousing reception from the distributors and dealers attending the show. High-Fi shops, photo stores and music dealers will have to hustle. It is understood that the tapes will also be in evidence at the music merchants show to be held in New York in June. The reaction to the tapes is expected to be as good as from the parts jobbers who have already placed orders for the new tapes. (See separate story, page 22.)

* * * * *

TO THE CONSUMER, it will mean that he will be able to buy tapes at about half the price of former purchases, if he has a four track machine. The industry association went on record as supporting the view that tape is tops in sound reproduction, however it did not, and logically could not, state any speed or trackage as being preferred.

* * * * *

AS HAS BEEN mentioned here before, the four track machines will play two track tapes so if you should switch, either by buying a new machine or installing a four track head in the one you now have, you will still be able to play all the tapes in your present library and the cost of installing a four track head, estimated at about \$30 or less, will quickly be paid for by the savings possible in the four track tape.

* * * * *

BEFORE ANYONE THINKS that two track tapes are done, let us state that the companies who are putting out the four track tapes are also making the same material available on two track. It is estimated that there are about 600,000 two track stereo machines in use today, which should represent a sizable market for the seller of stereo tapes.

* * * * *

PRODUCERS OF MUSIC on tape, and the industry association were equally emphatic on one point—since tape is admittedly superior to disc in stereo reproduction, there will be no compromise with quality and they plan to see that the tapes remain superior to discs. That is one reason for the choice of the 7½ ips speed.

* * * * *

THE OPINION WAS EXPRESSED that the stereo disc is the best thing that ever happened to tape. The market potential before the stereo disc, was about 5,000,000. Now there is hardly a person in the land who has not heard stereo or heard about it. The inherent quality in tape plus the fact that some stereo tapes will now be selling below the price of the same amount of music on stereo discs adds up to the fact that tape is on its way with a head start.

Operate your...

- tape recorder
- P. A. system
- portable TV set
- hand tools

FROM YOUR CAR, Boat or Plane!

with

ATR

INVERTERS



for changing your storage battery current to A.C. HOUSEHOLD ELECTRICITY Anywhere... in your own car!

OPERATES PORTABLE TV SET directly from your car!

OPERATES

- RADIOS
 - RECORD PLAYERS
 - MIXMASTERS, ETC.
- directly from your car!



MAKE YOUR CAR, BOAT OR PLANE "A ROLLING OFFICE!"



OPERATES

- TAPE RECORDERS
 - DICTATING MACHINES
 - PUBLIC ADDRESS SYSTEMS
 - ELECTRIC SHAVERS
- directly from your car!



mounted out of sight under dash or in trunk compartment

ATR

UNIVERSAL INVERTERS

Especially designed to change 6 or 12 volt D.C. to 110 volt A.C. 60 cycles.

for...

- EXECUTIVES
- SALESMEN
- OUTDOOR MEN
- POLICEMEN
- REPORTERS
- FIREMEN
- PUBLIC OFFICIALS

MODELS 6U-RHG (6 volts) 125 to 150 watts. Shipping weight 27 lbs. List price \$89.95

DEALER NET PRICE \$59.97

12U-RHG (12 volts) 150 to 175 watts. Shipping weight 27 lbs. List price \$89.95

DEALER NET PRICE \$59.97

Write for literature on other Sizes and Models of ATR INVERTERS, priced as low as \$9.95 list.

SEE YOUR JOBBER OR WRITE FACTORY

✓ NEW MODELS ✓ NEW DESIGNS ✓ NEW LITERATURE

- "A" Battery Eliminators
- DC-AC Inverters
- Auto Radio Vibrators

ATR

AMERICAN TELEVISION & RADIO CO.

Quality Products Since 1931

SAINT PAUL 1, MINNESOTA, U. S. A.

HI-FI

TAPE RECORDING

VOL. 6 NO. 8

JULY 1959

MARK MOONEY, JR.

Editor and Publisher

JOHN L. ALLEN

Circulation Manager

JEAN COVER

Assistant Editor

ROBERT W. LAPHAM

Art Director

JAMES H. MILLS, SR.

Technical Consultant

ANTHONY J. MORIN, JR.

National Advertising Manager

274 Madison Ave., New York 16, N. Y.

IN THIS ISSUE

TAPING THE SPACE AGE	Mike Francis	14
THEY TAPE THE INDIAN HIT PARADE	Henry F. Unger	19
4 TRACK TAPES ARE NOW AVAILABLE		22
MOVIE TAPING ON LOCATION	Don Dunn	24
ROVING REPORTER IN EUROPE	Laurence Mallory	26
SPEEDWINDER KIT	Joseph J. Kramp, Jr.	30
CROSSTALK		3
NEW TAPES		5
QUESTIONS AND ANSWERS		8
FEEDBACK		9
CLUB NEWS		10
NEW PRODUCTS		11
TEEN TAPERS	Jerry L. Heisler	12
TAPE IN EDUCATION	Joseph J. Kramp, Jr.	13
NEW PRODUCT REPORT: STEELMAN TRANSITAPE		32



HI-FI TAPE RECORDING is published monthly by Mooney-Rowan Publications, Inc., Severna Park, Md. (Severna Park 548). Entered as second class matter January 7, 1954 at the Postoffice, Severna Park, Md., under the Act of March 3, 1879. National Advertising Representative: J. V. Associates, 274 Madison Ave., New York 16, N. Y. (OREgon 9-0030). Subscriptions, U. S. and Possessions, Canada and Mexico, \$3.75 for one year, all others add \$1.00 a year. Two years \$7.00. Contents copyrighted by Mooney-Rowan Publications, Inc., 1959. Printed in U. S. A.

POSTMASTER—Send all address labels clipped from undeliverable copies with Form 3579 to Hi-Fi Tape Recording, Severna Park, Md.

NEW TAPES

Four-track tapes below are so new we cannot give all prices, nor label information, since most of the boxes we got copies in did not yet have their labels printed. These tapes were all obtained at the Electronics Parts Distributors Show in Chicago. Prices range from \$6.95 to \$8.95 for anywhere from 30 min. to approximately an hour's playing time. See article beginning on page 22.

CLASSICAL

BLOOD AND THUNDER CLASSICS

Russian Dance (Tchaikowsky)

Dance of Finlandia (Sibelius)

Dance of Terror, Ritual Fire Dance (de Falla)

Symphony No. 4 in E Minor (Brahms)

Saber Dance (Khatchaturian)

Infernal Dance, Finale (Stravinsky)

Symphony No. 9 in D Minor (Beethoven)

Orchestras not listed

AUDIOTAPE

30 mins.

2-track, 7 1/2 ips

Audiotape dealers are offering this exciting recording in a special bonus package. The package contains one 7-inch reel of Audiotape (Type 1251, on 1 1/2-mil acetate) and the "Blood and Thunder" program for the price of two boxes of 1251 tape, plus \$1. Any recorder fan who appreciates classics, and even those somewhat dubious, would do well to take advantage of this offer.

This tape is a stirring recital which demands attention. It is a panorama of orchestral colors, highs, lows, surging volume. It is powerful in its intensity. We do not have a listing of the performing orchestras, but they are superb. You don't have to be a classics advocate to perk up your ears and give a listen.

Tchaikowsky's Russian Dance is from the context of the popular Nutcracker Suite. The Saber Dance reached familiarity as a pop hit, but here it is presented as a complete and "legitimate" performance. The soloist and chorus which appear briefly in Beethoven's Symphony No. 9 in D Minor add to the desirability of having this tape in your collection.

The Audiotape manufacturer is simply using this release to allow their product to "speak for itself"—and so it does. Clear, radiant fidelity shines from this fascinating tape.

SEMI-CLASSICAL

MUSIC HALL BON BONS

Our Waltz

Holiday for Strings

Jazz Pizzicato

Fiddle Faddle

Blue Tango

Mountain High, Valley Low

Toy Trumpet

In An Eighteenth Century Drawing Room

Swedish Rhapsody

Pavan

Swinging Shepherd Blues

On the Trail

Raymond Paige conducts The Radio City

Music Hall Symphony Orchestra

EVEREST STBR-1024

40 mins.

4-track, 7 1/2 ips

Latch onto a comfy chair or sofa and just relax and listen, really listen. You will be hearing some of the finest classical and semi-classical music ever written. It is performed magnificently, the way it was meant to be. This music was composed to be completely digested, not just tasted, and to honestly appreciate it you should honestly listen attentively.

Everest releases are new on the tape scene and let's hope they stay on the scene for quite some time to come. They belong.

These recordings are a product of Belock Recording, a division of the Belock Instrument Corp., which is considered one of the world's finest precision electronic facilities. Harry Belock, founder of the company, is an international authority on sound, and the Belock recording studio is completely modern and just about acoustically perfect. With a combination like this how could any tape miss? Fidelity is perfect.

POPULAR

BLUE HAWAII

Blue Hawaii

Cocoanut Grove

Island of Golden Dreams

Little Brown Gal

Hawaiian Paradise

My Little Grass Shack

Trade Winds

The Hawaiian Wedding Song

Sweet Leilani

Hawaiian War Chant

Song of the Islands

Beyond the Reef

Hawaiian Sunset

Aloha Oe

Billy Vaughn and His Orchestra

BEL CANTO ST/60

32 mins.

4-track, 7 1/2 ips

This tape makes you want to hitch a ride on the next boat for our 50th state. It's just great. Billy Vaughn has a style all his own, one which is most certainly appreciated by the listening public as evidenced by the popularity of Blue Hawaii and Trade Winds. This tape contains both these plus many others in the Hawaiian idiom. The drums in Hawaiian War Chant give you that "I just gotta dance" feeling. Pleasant listening all the way through.

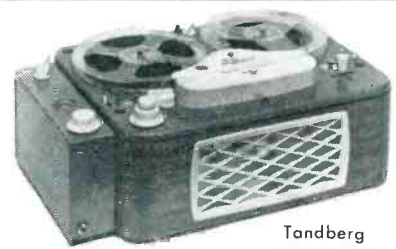
Bel Canto's engineers have done their usual fine recording job. There is a smoothness about this recording that smacks of the velvety taste of frozen custard. Soooooo easy to take and soooooo tasty. A treat all the way.

Fidelity is the greatest.

ELLA FITZGERALD SINGS THE RODGERS AND HART SONG BOOK. Vols. IV and III.

Side 1: I've Got Five Dollars, I Didn't

Out-Performs any STEREO TAPE RECORDER



Tandberg
MODEL 5-2

Exclusive Tandberg features assure the finest stereo quality and performance. You get more tape value, too—up to 8 hrs. and 32 min. on one reel! Tandberg Stereo plays back two and four track tape. Besides incomparable stereo performance, it is the first to offer recording and playback on four monaural tracks. And only Tandberg offers superb tape motion at 1 1/8 I.P.S.

Monaural tape recorders are available in 2 or 3 speeds, with or without foot pedal for remote control.

Stereo Features

- 3 operating speeds — 1 1/8, 3 3/4, and 7 1/2 I.P.S.
- 4-track Stereo, 4-track monaural recording and playback, plus playback of 2-track Stereo and 1/2-track monaural
- 2 built-in preamplifiers and power amplifiers
- 4-track record-playback head and 4-track erase head which can erase 1 or 2 tracks at a time
- Automatic tape stop at end of play
- One lever control for tape start-stop, fast forward and rewind, record-play
- Distinctive style, mahogany finish, leather case

NOW

another Tandberg FIRST!

Tandberg Model 4

The ONLY Four-Track
Monaural Tape
Recorder, PLUS
Stereo Playback.



- Records on all four tracks separately.
- 4-track erase head erases one track at a time without affecting other recordings on the same tape.
- 17 hrs. of recording on one reel of tape.
- Plays back all stereo or monaural tapes.

See your dealer or write to:

TANDBERG

8 Third Avenue, Pelham, N. Y.

Canadian Agents: Engineering Sound Systems Ltd.,
167 Kipling Avenue South,
Toronto 18, Ontario, Canada.
Clifco, 245 W. Osborne Rd.,
No. Vancouver B.C., Canada

Know What Time It Was, Where or When, I Wish I Were In Love Again, Blue Moon, To Keep My Love Alive, My Heart Stood Still, Give It Back To the Indians, Lover

Side 2: Johnny One Note, Small Hotel, Bewitched, With A Song In My Heart, Wait Till You See Him, Have You Met Sir Jones, You Took Advantage Of Me

Ella Fitzgerald

VERVE VST-10004

51 mins.

4-track, 7 1/2 ips

The timbre of Miss Fitzgerald's voice is such that you do not grow tired of it. You might want to join her in the lyrics at times or find a dancing partner, or just listen, but you do not tire. She does not have a fancy or unusual delivery, she simply sings a song the way the composer must have intended it be sung. Whether a dreamy ballad, or jumpy swinging tune Ella lays it in your lap. While her voice has a husky quality, her pronunciation is quite clear.

One criticism and that is of the lyrics in some of the selections, particularly those in "Bewitched." They are more for the nightclub crowd, not a family gathering.

We can find no flaws in the fidelity of Verve's reproduction. The orchestra (we do not know which since our box was so new it did not yet have the label complete) seems to hold its place in the background most adequately, and Ella certainly holds her own in the forefront.

LEIBERT TAKES RICHMOND

Side 1: Dixie, In the Still of the Night,

In A Little Clock Shop, St. Louis Blues, No Other Love, Old Man River
Side 2: Greensleeves, Autumn Leaves, Virginia Hoe Down, Tara Theme from "Gone With the Wind," Washington and Lee Swing

Dick Leibert playing the Mighty Wurlitzer pipe organ

WESTMINSTER 4T 102

30 mins.

4-track, 7 1/2 ips

When Mr. Leibert is at the controls of the magnificent Wurlitzer in the Byrd Theatre at Richmond, Virginia, nothing but the choicest of musical sounds are emitted. His organ "fan-tactics" are a joy to be heard. The variations this tremendous musical giant wrings forth are amazing. The tick tocks "In A Little Clock Shop" are tastefully realistic. Whether the tempo is swifty or soothing, the sound is enjoyable.

Mr. Leibert tripled with the Mighty Wurlitzer and the recording acoustics of the Byrd Theater are a happy combination indeed. Westminster's recording engineers add their talents and you come up with a delightful tape both in content and reproduction.

MR. MUSIC MAKER LAWRENCE WELK

The Glory of Love, Side By Side, Somebody Else is Taking My Place, The Trail of the Lonesome Pine, Dance With a Dolly, Way Down Yonder in New Orleans, Always, All Alone, The Song is Ended, La Sorella, Silver Polka, Jolly Polka, A Little Bit Independent, I'll

Never Say "Never Again" Again, You're Driving Me Crazy, Makin' Whoopee!, Scatterbrain, Blue Danube, Skater's Waltz, Estudiantina, I Can't Give You Anything But Love, Who's Sorry Now, The Sheik of Araby, and When You're Smiling

Lawrence Welk and His Orchestra

BEL CANTO ST/57

30 1/2 mins.

4-track, 7 1/2 ips

"Mr. Music Maker" most aptly describes Lawrence Welk. This versatile gentleman and his bubbling orchestra have become increasingly popular in the last few years with music lovers in all categories from the bouncy teenager to the older folks. One reason for this is that whether the music is a dreamy waltz, a tinkling polka, a jumpy rock and roll, a semi-classical or classical selection, Mr. Welk and his band do it justice.

This tape contains a varied collection, all of which gracefully seem to fit together quite well. While it spins you find yourself sometimes singing along and sometimes ready to dance around the room. Even with a sore toe you just can't keep the foot from tapping.

While our enjoyment of the performers may be a slight influencing factor, we can find no flaws on this delightful tape in the overall music patterns nor in the reproduction fidelity.

THE GLENN MILLER SOUND IN STEREO

Serenade in Blue
Song of the Volga Boatmen
Moonlight Cocktail
Anvil Chorus
Kalamazoo
Sunrise Serenade
Under the Double Eagle
Danny Boy
Chattanooga Choo Choo

Recorded by members of the Glenn Miller Orchestra—Arranged and conducted by Maxwell Davis

OMEGATAPE ST-7026

25 mins.

2-track, 7 1/2 ips

The day in 1944 the plane carrying Major Glenn Miller disappeared somewhere on a flight from England to Paris was a sorry one indeed. This great band leader had a style which spoke a language all its own through his music. No one has ever been able to replace him. Perhaps others will utilize the "Miller Sound"—the lead played by a clarinet and tenor sax in unison—but they just cannot speak Glenn's language.

This tape is a collection of some of his most remembered interpretations. While it just cannot and does not have the extra special something Glenn Miller gave to a rendition, it brings back fond memories.

I find that I cannot get the volume from this tape that I would like to. Fidelity is not quite up to par. All Glenn Miller fans will be glad to have a tape of his most familiar works in their collection, however.

SHOW TUNES

GIGI AND MY FAIR LADY

GiGi Selections: GiGi, Waltz At Maxim's, Thank Heaven For Little Girls, The Parisians, I Remember It Well, The Night

Check yourself with—

Tapebook #2

HOW'S YOUR HEARING?

by James M. Laing, M. Ed.

Are You Getting The Most Out of Your HI-FI or Stereo?
Can You Understand Speakers? Hear Lyrics Plainly?

Protected hearing is the key to your listening enjoyment.

Hearing is one of your most precious human possessions. It, however, like every other precious possession, requires protective care. Without proper protection your hearing can leave you completely, and without warning.

To properly protect your hearing there are two things you must do: (1.) test your hearing periodically, and (2.) seek early medical guidance as soon as a hearing test indicates a possible hearing loss.

Periodical hearing tests are important because, unlike most other ailments, a hearing loss gives you little positive warning. A hearing loss can creep into your life so gradually that you can be completely unaware of its presence.

Test your hearing . . . and be sure!

To help you check your hearing periodically is the purpose of this "hearing check recording."

TAPE CONTAINS

30 minutes of music by the famous Lenny Herman Orchestra — good for listening or dancing as well as screen testing of hearing. Specially monitored.

33 tone pairs to test musical discrimination

75 word pairs to test speech discrimination

Full 7" 7 1/2 IPS

dual track reel

full direction booklet

Only \$9.95

Postpaid

ASK YOUR DEALER OR ORDER FROM
TAPEBOOK DEPT.

Mooney-Rowan Publications
Severna Park, Md.

They Invented Champagne, Reprise: GiGi

My Fair Lady Selections: On The Street Where You Live, I've Grown Accustomed To Her Face, With A Little Bit Of Luck, I Could Have Danced All Night, The Rain In Spain, Wouldn't It Be Lovely, Show Me

The Radiant Velvet Orchestra

CONCERTAPES 4T-4001

34 mins.

4-track, 7 1/2 ips

Songs from both these popular musicals can now be heard on one 4-track stereo tape.

Both shows were smash hits and the motion picture version of GiGi walked away with quite a few Oscars. The music of Loewe is marvelous. You listen to it and come aglow.

Mr. Giovannini both as conductor and at the keyboard is great. This kind of music just never grows tiring. Its popularity and appeal is not to be denied.

Every tape collection should contain a section devoted to show tunes. Anyone who secs the musical either on the stage or screen will certainly want a tape of the music to keep the memory of it fresh and lasting.

Stereo is very effective on show tunes. Such music is designed to captivate an audience, and true stereo is captivating in itself.

Concertapes has combined two delightful tapes on one and the fidelity is tops all the way through.

MIKE TODD'S BROADWAY

Opening: My Object All Sublime
It Wouldn't Be Love

In My Memoirs

The Girl on the Police Gazette

I Love You

Gondola Song—Fireworks Polka

Lucky in the Rain

Close As Pages In A Book

Stay With the Happy People—Violins
From Nowhere

Could It Be You; Finale: Away Out West
Around the World

Jack Saunders Orchestra

EVEREST STBR-1015

34 mins.

4-track, 7 1/2 ips

So much has been said about the showmanship of Mike Todd that it is impossible to elate more about this tremendous personality. He lived in a world of music and when his talents turned toward a Broadway show it was likely to be a smash hit. For twenty years there was seldom a night the lights of Broadway did not shine on a Michael Todd hit.

This musical calvacade of hit show tunes is a befitting tribute to Todd's genius. It is a charming grouping, well presented, with evenly balanced stereo reproduction. Jack Saunders and his orchestra turn out a fine job, and the Belock Recording Studio seems to turn out splendid recordings.

DEMONSTRATION

A MIRACLE IN SOUND

Among the selections on this tape are:

The Lady Is A Tramp, Getting Sentimental Over You, Rain On the Roof, The Clock, Flight of the Bumble Bee, Toreador Song from Carmen, Grand Canyon Suite, and Sleight Ride

Excerpts from various Mercury releases

MERCURY DEMS-3

42:20 mins.

4-track, 7 1/2 ips

At present this tape is only available to machine manufacturers, but if and when it is obtainable to the consumer, by all means go get yourself a copy. It's relishable music, a treat to anyone's ear.

Since this tape is one of the very first copies, we do not have a label listing the selections nor the performers, although we do recognize some of the excerpts.

The mixture on this tape includes danceable music, Latin music, soothing music, airy music, classical and Christmas music—everything a demonstration tape ought to contain. Arranging and style are superb.

No holes in the middle of this stereo engineering feat, the sound flows along beautifully—a credit to any proud hi-fi enthusiast's equipment and audience. The compositions are very well blended. Fidelity is excellent.

WEDDING MISHAP

Being a recordist may seem, to some, like a serious business. But it, too, has its humor.

The experience below happened to the writer, Richard S. Levy, of Buffalo, N. Y., and it's guaranteed to be accurate.

Weddings create a demand for the services of recordists, both professional and amateur, and Mr. Levy was called upon to record one which happened to be conducted mostly in a foreign language. After the wedding, the bride's brother, a professional singer and regular patron of the Levy studio, asked if he might use the tape to play to the family. He agreed to return it for disc dubbings.

Months passed and Mr. Levy did not receive the tape or any orders from the family for discs. On a later recording date the recordist happened to run into the bride's brother and casually inquired about the wedding tape.

After some hesitation the singer told this story: He had taken his recorder and

the tape to the church and played it for the clergyman. At one point, the clergyman excitedly said: "Play that again!" On the repeat playback the clergyman gasped: "They're not married!"

It seems that the marriage contract had to be read to the participants according to the laws of the church and their subscription to it married them in the eyes of the church. The clergyman had erred in his recital of the contract and, as he interpreted it, the young couple were not married. Because of this he personally met them at the train on their return from the honeymoon and hastily conducted a valid marriage. (State law was apparently fulfilled on the first occasion.)

Needless to say, no dubs were ordered of the first wedding, nor was a tape made of the second.

We might point out, however, that in this particular case having a tape recording of the wedding certainly came in handy.



CLAUDIO ARRAU
tapes his own
recordings on



That alone is not
the reason why
you should use



Here's why
you should use

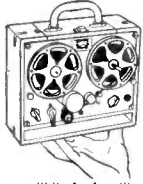


It's the best-engineered tape in the world... gives you better highs... better lows... better sound all around! Saves your tape recorder, too—because the **irish FERRO-SHEEN** process results in smoother tape... tape that can't sand down your magnetic heads or shed oxide powder into your machine. Price? Same as ordinary tape!



Available wherever quality tape is sold.
ORRadio Industries, Inc., Opelika, Alabama
Export: Morhan Exporting Corp., New York, N. Y.
Canada: Atlas Radio Corp., Ltd., Toronto, Ontario

Record Anything, Anywhere with "The Magnemite"



Battery-operated, spring-motor tape recorder designed for professional field use. Assures complete independence from AC power. Meets National Association of Radio and Television Broadcasters standards. 60 Models available.

Write for free literature and direct factory prices to Dept. HF:

AMPLIFIER CORP. of AMERICA
398 Broadway • New York 13, N. Y.

© M. Day, Fall 1960

A SOUND INVESTMENT

When we find one we don't hesitate. Hi-Fi TAPE RECORDING magazine will pay many future dividends in recording and listening pleasure.

Where else can you invest at no risk? TAPE RECORDING's time honored "money-back guarantee" makes this investment the bluest of blue chips.

This practical magazine will bring you each month:

- Consumer new product reports of recorders and equipment tested by our staff
- New products
- Newest developments in techniques which will improve your results
- The experience of recordists from all over the world
- Plus—questions & answers—tapes to the editor—tape club news—classified section, etc.

Fill out the coupon below and drop it in the mail today. If your check book isn't handy we'll be glad to bill you later.

2 Years\$7.00
1 Year\$3.75

HI-FI TAPE RECORDING Severna Park, Md.

Please enter or renew my subscription as indicated below:

2 years\$7.00

1 year\$3.75

Payment enclosed. Bill me later.

Name

Address

CityZoneState

QUESTIONS & ANSWERS

Questions for this department may be sent by means of a postcard or letter. Please address your queries to "Questions and Answers," HI-FI TAPE RECORDING, Severna Park, Maryland. The most interesting and widely applicable questions will be used in this department.

Pickup from Radio or TV

Q—As a subscriber to your magazine, I am writing to ask if you will please advise me regarding the following problem.

I have a Norelco Continental monaural tape recorder, TCA television console, Zenith portable clock AM radio. I am also contemplating the purchase of a portable Zenith AM-FM radio.

My problem is that I wish to tape music and other TV and radio programs on my Norelco recorder.

The dealer from whom I purchased the Norelco has advised me that all it is necessary to do is to have jacks installed on my TV set and radios. However, the dealer stated he was not equipped to do this but any radio dealer could do the installation of the jacks for approximately \$5.00 or \$6.00 each.

In addition to the dealer from whom I purchased the tape recorder, I have contacted three other radio dealers, whom I shall call dealers A, B and C, for sake of explanation.

Dealer "A" advised me that I would be wasting money by purchasing a portable AM-FM radio and having jacks installed on it, since the operation was very expensive and that I should have a large console radio with large expensive speaker to tape music from it.

Dealer "B" advised me that I need a combination AM-FM tuner, an amplifier and speaker, estimated cost at approximately \$275. This dealer stated satisfactory taping of music from radio or TV could not be done without these accessories.

Dealer "C" advised me that the only thing I needed was an AM-FM tuner to tape programs, both TV and radio, cost approximately \$80.00. That I merely plugged the tuner into the power outlet and connected it to my tape recorder and therefore I did not have to use either my radio or TV set to record programs since the speaker unit in my tape recorder would serve. This would eliminate installing jacks entirely, which he stated was risky because there was likelihood of me receiving a severe electrical shock from the FM radio or TV and, in addition cause severe damage to my tape recorder.

I explained to all these dealers that because of a hearing loss I could tell very little difference in music from my tape recorder and a hi-fi or stereo system, therefore I did not care to obtain hi-fi or stereophonic music on tape.

Can you advise me which of the dealers A, B or C, above, or the dealer from whom I purchased my recorder is correct?—C. U., San Francisco, Cal.

A—It was a sad day when you started shopping dealers A, B and C. All we can say about them is that they were sincerely misinformed, wanted badly to make

a sale or did not understand what you wanted.

You are not interested in hi-fi, all you want is to tape the music from radio or TV and you will be happy.

We would suggest you go to a reliable radio parts house and buy three normally closed jacks. These are fifty cents or less each. If you do not have it on hand, some hookup wire and a soldering iron or solder will be needed too but you should be able to borrow the tools from someone for a few hours.

Inside your radios and TV you will find the loudspeaker. On the back of the speaker you will find two wires which lead down to the amplifier.

Mount each jack in a convenient place on the radios and TV set. You will find the jack has three terminals, one connects to the body of the jack, the other connects to the center spring and the third to a contact arm that touches the center spring when the plug is not in the jack.

After mounting the jack, disconnect one wire from the speaker terminal. Solder this wire to the terminal connected to the contact spring of the jack. If it is not long enough, extend it with a bit of the hookup wire.

Next, take a piece of hookup wire and solder it to the speaker terminal from which you did not remove the wire. Solder the other end of this wire to the body terminal of your jack.

Finally, run a wire from the remaining terminal on the jack (the center contact arm) to the speaker terminal from which you first removed a wire.

If you do it correctly, you will now be able to play the radio or TV as usual until you put in the plug on the cord leading to your recorder. Then the speaker in the set will be cut off and the current will be fed to the recorder.

Simplest of all is to merely clip the clips on your accessory cord to the speaker terminals but the use of a jack is better.

Disconnect the sets from the wall socket before working on them. There is no danger of shock from a radio but there may be some from a TV. Even if it has been disconnected there may still be a charge in the capacitors in the high voltage system for the picture tube which can give you a jolt.

A much better pickup point is at the volume control where shielded cable may be connected and run to a jack on the side of the cabinet. This is a high impedance source and eliminates any hum or other noise that may be generated in the amplifier of the TV or radio.

But again we are getting off what you personally want—which is perfectly good, average lo-fi music. This you can get from the speaker hookup described above.

FEEDBACK

Excerpts from readers' letters will be used in this column.

Address all correspondence to: The Editor, Hi-Fi TAPE RECORDING, Severna Park, Maryland.

To the Editor:

On page thirteen of the June issue of your magazine I find the inquiry of J. S. Szanyos who has a model 402 Crestwood recorder and who wishes to know the maker of the motor on this recorder.

I have the same model and I find the following plate on the motor; Manufactured by The General Industries Company, Elyria, Ohio. Model D-10; Part No. 20340.

I trust that this will enable Mr. Szanyos to secure a new motor for his recorder.—*S. G. Folsom, Lima, Ohio.*

To the Editor:

With reference to Mr. J. S. Szanyos' letter in the last issue of TAPE RECORDING (June '59) I think he has very good cause for complaint in not receiving answers to his requests for information from the company he wrote to.

This happens too frequently and is very unfavorable to the tape recording industry and tape fans alike, I have heard several complaints of the same nature.

Is this because these companies think that the average tape recorder fan is a dufus who doesn't know what he wants and having spent from \$300 to \$400 ceases to buy anything else in the tape recorder or other electrical lines?

Perhaps if these complaints were brought before the companies involved by TAPE RECORDING magazine they would carry more weight.

In regard to Mr. Szanyos' tape recorder the Crestwood #402 I have one of these also and I consider it a very good machine in most respects.

I had trouble with the motor on this machine also occasioned by the lower space washers on the armature wearing out, and this is a trouble with most tape recorders which have a motor operating in a vertical position, these motors should have a thrust bearing to prevent this, for while the lower bearing may receive enough oil, it does not work up to the space washers, I was compelled to replace with some makeshift washers on mine.

Assuming that the winding is not burnt out and that the bearings are in fair condition on Mr. Szanyos' motor, I hope this may be of some help to him.—*Peter F. Gilles, Cleveland, Ohio.*

To the Editor:

I wonder if your other subscribers could help me in my search for tapes of any of the Jean Shepherd Sunday night shows?

3¾ ips preferred, but can use 7½ ips as well. Would be willing to pay for tapes and trouble involved.—*Bern Sharfman, 1010 North Second Street, Harrisburg, Pa.*

To the Editor:

The May '59 issue of TAPE RECORDING contains a letter from Mr. Curtis D. Janke which was published in this column. For sheer rancor I have not seen its equal in a long while. Letters of this type are usually

sent by persons with a single gripe or pet peeve but this one is a real dilly.

In less than one column of space Mr. Janke has managed to (a) accuse the Editor of collusion with advertisers (b) criticize everything about the magazine except the paint on the office walls and (c) kick the entire tape industry into a neat little category he has created especially for this purpose . . . proposing for our serious consideration that this gang is composed of inept characters who are apparently sworn to a mass conspiracy against him.

Ordinarily the best way to handle such letters is to shrug it off and console yourself with something on the order of "everyone to their own taste, as the old woman said, etc." but we find a slightly different situation here. The thing which sets this letter apart from the general run is the seventh paragraph.

Mr. Janke carefully explains he has been heavily interested in tape for over seven years, modestly admits he is neither careless or ignorant about the subject (wish I could say the same!) and has had considerable experience in buying, selling, repairing and adjusting tape recorders during that time. As proof of this background he asks us all to believe that a record changer which has been given years of use with no maintenance whatsoever is the winner by a knockout when compared to sound reproduction by means of magnetic tape.

Certain things in this world are accomplished facts. They are obvious, demonstrable and can be conclusively established. One of these "things" is the *inherent* superiority of tape to discs. Flying in the face of such a basic premise is analagous to claiming that the sun shines at night and the moon is what we see during the daytime.

Nobody can question Mr. Janke's right to prefer discs to tape if he wishes. This is strictly the realm of personal preference and is no grounds for dispute. However, when anyone sets himself up as a knowledgeable expert and renders a specific judgment which is completely opposed to accepted fact then he has left the area of personal preference and finds himself faced with the prospect of being called on to furnish valid proof of what he represents to be factual.

It would be helpful if Mr. Janke would enlighten my ignorance by advising his method of reconciling the inconsistencies and answering several questions raised by his remarks.

Inconsistencies:

1. You say you "happen to know" the Editor would never do anything to tread on the toes of his gods, the advertisers. Your letter wouldn't be printed because it wouldn't be in line with his particular pitches. Your letter *was* printed and in the Crosstalk section of the same issue is a swat at an advertiser who also has an ad in the same issue.

2. These two tape decks, plus the several preamps which accompany them, must be pretty professional stuff if one preamp alone costs nearly as much as an excellent complete recorder. If so, why aren't you using these "excellent" complete recorders instead of your present rig? On the other hand, you also say that in "every case" you have found disc playback superior to tape so how could there be such a thing as an excellent complete recorder?

3. You make much of a speed differential between two decks. You say nothing about having compared two changers for the same purpose.

4. Your more than seven years of heavy interest in many facets of tape do not quite jibe with your findings regarding disc superiority unless you meant to say it took you seven years to find this conclusion.

Questions:

1. What do you offer to establish your statement that disc playback is cleaner, has better frequency response, far less hum, hiss and so forth?

2. With the extortionate prices of tapes and the complete rejection of ¼-track tapes (with or without experience of using them?) why have you not been buying discs all along? Stereo discs of the double-band variety have been around for several years. Why didn't you adopt them in preference to tape?

Unless and until Mr. Janke produces something more than irresponsible statements, backed up with demonstrable proof, I must disagree with the Editor's suggestion on telling him why he *should* prefer tape. There is a saying to the effect that the only thing in this world which is worse than not getting what you want is getting it. I'll be very happy to assist him in disposing of his tape equipment and get him into discs up to his ears. This should enable him to get half a dozen record changers.

To clarify my own status, he may also know I am not acquainted with a single staff member of TAPE RECORDING and as for Mr. Mooney I have never laid eyes on him or had so much as a line of correspondence from him.

Neither am I one of his gods, the advertisers. In more than five years of publication I have one small ad to my credit.

From his remarks about the low frequency response, hum, hiss and so forth when playing tapes I am wondering if it might not be within the realm of possibility that for more than seven years Mr. Janke has been running the shiny side of the tape next to the heads instead of the dull side. In view of his stated high investment in equipment it's the only remaining possibility I can think of. If so, reversing this condition will remedy his difficulty.

My vote goes to TAPE AND TAPE RECORDING. Keep up the good work!—*Frank Zeman, Cincinnati, Ohio.*

Numerous letters were received disagreeing with Mr. Janke. Having just recently heard the high quality of the new four track stereo tapes, which, as mentioned elsewhere will, in some cases, sell for less than stereo discs, we venture to predict that the high quality music lover will swing to tape very rapidly. In fact, it is quite possible that it may capture a good share of the "mass market."—Ed.

TAPE CLUB NEWS

Tape Theme

American Tape Exchange member, Richard P. Flam, advises all members to find and use a theme on their tapespondence. This is a sort of identification. For instance, some Londoners use the chiming of Big Ben, several Australians use the call of a Cuckaburra, Texans could use strains from "Deep in the Heart of Texas," etc. The theme should be suited to you. Once you have decided, should you ever tire of your choice, it can be changed, although this is not advisable once your tape pals get to know your theme. Anyway, we like the idea—it's just another little touch that makes the hobby of corresponding by tape so much fun.

Certificates of Recognition

World Tape Pals, Inc., announces certificates of recognition for its members who are active in international friendship.

WTP members who correspond with as many as ten persons in countries other than their own will receive an official certificate listing the countries. When the number reaches 15, 20 or more he will receive additional certification.

Proof of his activity will be a postcard sent to him from each tape pal he has corresponded with. These cards may be turned over to the member's local WTP representative or sent to Dallas headquarters.

WTP members in good standing, in the United States and abroad, are especially invited to participate.

Delinquent Replies

Voicespondence Club District Deputy Carl Williams of New York advises club members to get in touch with their District Deputies if a tape is lost or unreturned. It is the deputy's job to get in touch with the person who has not returned your tape and call it to his attention, warning that failure to return tapes will result in his being dropped from membership.

Before doing this, however, you should wait a reasonable time before complaint. Members are supposed to write a card of explanation if they cannot answer a tape within a few weeks, but even if you haven't gotten such a card you should wait at least four weeks before assuming you will get no reply. Add two more weeks to this in the case of tapes sent to another country. Then it is advisable to drop the delinquent member a postal card inquiring about the tape and if he doesn't answer within two weeks, contact your District Deputy.

Club "Night-Out"

The British Tape Recorder Club is considering the possibility of a "night out" for its members which would be a general get-together climaxed by a visit to the theatre. Since the "West Side Story" has had excellent reviews, the club would like to get bookings for one of its performances. Since this must be arranged rather far in advance, the club urged interested members to let headquarters know some time ago. The club has been trying to obtain a block booking for the 1st of August.

Club Congratulated

At the opening ceremony of a Blind, Handicapped and Old Age Pensioners Centre in Birkenhead Park, England, Mr. F. K. Oliver, president of the British Tape Recording Society was congratulated by Mr. Percy Collick, Member of Parliament for Birkenhead town, on the excellent services rendered folks of the town by the B.T.R.S. club. Mr. Collick said he wished to express his most sincere thanks and admiration to all members throughout the country who were engaged in the fine work of the clubs and hospitals. He added that he most sincerely wished them every success.

Telephone Committee

At a meeting of Club du Ruban Sonore held on April 8, a Telephone Committee of three members was formed to convocate members (within a reasonable distance we assume) to meetings which will take place every month if possible, at the "Association Canadienne-Francaise des Aveugles, 904 East Beaubien St., Montreal, Que."

Round Robin

Round Robin tapes are very popular with Club du Ruban Sonore members. Recently, club president, Jacques Cimon, started a Round Robin with the question, "Why are there so many single men?" We would hazard a guess that some of the answers will be rather amusing and, in any case, most interesting.

Ghost Train

During a recent Model Railway Display held at the Birkenhead YMCA a tape recorded commentary with sound effects was used to illustrate the model train movements. For advertising the display, a public address van toured the streets playing a tape with the train sound effects and announcing the affair. It was rather novel when people in the streets suddenly heard a train roaring through their midst.

The idea for all this was originated by F. K. Oliver, president of the British Tape Recording Society. By dubbing from a loop the voice of the announcer was recorded for a full, uninterrupted 30 minutes. The railway sounds had previously been recorded at local stations. Both were combined for the final effect.

Interested in Stamp Collecting?

A Tape Recording Unit has been started within the American Topical Association and anyone who has a recorder or access to one is invited to join. The object, of course, is to talk Philately and its interesting side lines.

There are no dues, the only requisite being that you be a member of the A.T.A. and that is very nominal. The Charter for this closes when they have attained twenty-five members.

For the present the name for this will be Philatelic Tape Recording Unit. Any queries will be answered. Address all communications to Harvey E. Johnson, 111 Prospect Street, Elmhurst, Illinois.

This new facet of stamp collecting sounds like fun.

Club Member Seeks Understanding

United Recording Club member, Rev. W. Francis Forbes, S.S.B., is keenly interested in the Eccumenical Movement in religion, the unification of the entire Christian religion, and in religious understanding between peoples of all nationalities and walks of life, not conformity, but simple understanding. He is looking forward to developing a wider and wiser understanding of his fellows and the making of new and interesting friends in the club.

Having watched these clubs develop and grow through the years, we who edit this column are firmly convinced that people such as Rev. Forbes can find no better means of developing understanding, interest and new friends than by tapespondence and membership in one or more of the clubs.

JOIN A CLUB

AMERICAN TAPE EXCHANGE

Stuart Crouner, Secretary
181 E. Main St.
Gouverneur, N. Y.

AURORA SCIENCE TAPE SOCIETY

Walt Richard Sheasby, Jr.
215 North Baldwin Ave.
Sierra Madre, Calif.

BILINGUAL RECORDING CLUB OF CANADA

J. P. Paquette, Recruiter
1993 Morgan Boulevard
Montreal, Quebec, Canada

CATHOLIC TAPE RECORDERS OF AMERICA, INTERNATIONAL

Jerome W. Ciarrocchi, Secretary
26 South Mount Vernon Avenue
Uniontown, Pennsylvania

CLUB DU RUBAN SONORE

J. A. Freddy Masson, Secretary
Grosse Ile, Cte, Montmagny,
P. Que., Canada

ORGAN MUSIC ENTHUSIASTS

Carl Williams, Secretary
19 Van Derveer St.
Amsterdam, New York

TAPE RESPONDENTS INTERNATIONAL

Jim Greene, Secretary
P. O. Box 416, Dept. T, St. Louis 66, Mo.

THE VOICESPONDENCE CLUB

Charles Owen, Secretary
Noel, Virginia

UNITED RECORDING CLUB

Richard L. Marshall, President
2516 S. Austin Boulevard
Chicago 50, Ill.

WORLD TAPE PALS, Inc.

Marjorie Matthews, Secretary
P. O. Box 9211, Dallas 15, Texas

FOREIGN

AUSTRALIAN TAPE RECORDISTS ASSOC.

Jack A. Ferry, Federal President
Springbank Rd., Clapham, S. Australia

BRITISH TAPE RECORDING SOCIETY

Peter M. Bardach, U. S. Representative
210-16 Grand Central Parkway
Queens Village 27, N. Y.

TAPE RECORDER CLUB

A. Alexander, Secretary
123 Sutfon Common Rd.
Sutton, Surrey, England

Please enclose self addressed, stamped envelope when writing to the clubs.

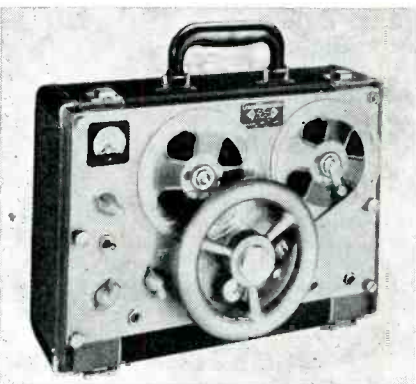
NEW PRODUCTS

MARK VII CONCERTONE



American Concertone Division of American Electronics, Inc. is now producing a tape recorder and playback system which will handle reel sizes up to 10½ inches at either 7½ and 15, or 3¾ and 7½ ips. It is designated the Mark VII Concertone, and it plays both two-track and four-track stereo tapes. Separate heads are used for record, erase and playback; three motors operate the tape transport system, which eliminates clutches, belts and pulleys; controls are push-button; and a calibrated meter indicates recording and playback level. Other features include four input channels with separate gain controls, and automatic reel-end or power failure cut-off switch to stop tape travel. The companion 17-watt Concertone speaker amplifiers are packaged similar to the recorder-playback and are optional accessories. For price and additional information, write to American Electronics Inc., 9449 W. Jefferson Blvd., Culver City, California.

TRANSMAGNEMITE



The Amplifier Corp. of America, 398 Broadway, New York 13, N. Y., is now producing the TransMagnemite portable, miniaturized, field recorder. Ultra-low noise transistors were incorporated in this machine to achieve a low-equivalent-input noise level of less than 0.25 microvolts. High efficiency circuits were designed so that minimum battery current is consumed with economical dry rechargeable batteries. Features of the machine include modular

plug-in construction, high speed rewind, adjustable alignment head mounting, high-inertia balanced orbital flywheel, ultra-precision balanced flyball governor, double barrelled Swiss-steel spring-motor, precision lapped Swiss made worm gear system, transistorized record VU indicator, and noise free and non-corrosive battery mounts. Complete technical specifications and prices may be obtained by writing to TransMagnemite Division of the Amplifier Corp. of America.

ROBINS HEAD CLEANER



Robins Industries Corp., 36-27 Prince Street, Flushing 54, N. Y., is marketing its HC-2 recording head cleaner. Each bottle includes a brush-top applicator to facilitate use. For additional information and price, write Robins.

AMPEX TUNER



Ampex Audio Inc., 1020 Kifer Road, Sunnyvale, Calif., has introduced its new AM-FM tuner model 502, which incorporates on a single chassis two completely independent, but perfectly matched, radio tuners. The tuner was designed as a precision unit to provide optimum balance between the two parallel channels at all levels of operation. Other features include accurate visual tuning indicators for achieving properly balanced tuning, and convenient, simple controls and flywheel tuning mechanisms. It also has provision for adapting to FM multiplex stereo broadcast reception. Frequency response is 20 to 20,000 cycles, FM, and 20 to 8,500 cycles, AM. Total distortion is less than ½ of 1%, and it is priced at \$249.50. Contact Ampex for more particulars.

THE CASE FOR BETTER SOUND

Why settle for ordinary tape when Sonoramic gives you so many exclusive extras—brilliant reproduction, permanent plastic container, 3-way indexing system with pressure sensitive labels and V-slot self threading Selection Finder reel.

FREE Tape time ruler. Gives you... footage and recording time on reel. Write Dept. **R7**

Aerodynamics CORPORATION.
LODI, NEW JERSEY

Tape Recorder Owners:

RECORD STEREO

- Records
- Tapes
- FM Broadcasts
- Live Performances

using the

HARTLEY STEREO DUPLICATOR

and any stereo playback recorder

\$19.95

Just plug it in

Your machine's recording amplifier is provided with an external output. One tie-in cord from this output to the lower channel of another recorder synchronizes the two for stereo recording. Your tape deck is left free to play material for recording.

HARTLEY MFG. CO.
10133 SE 8th
Bellevue, Washington

ELEMENTS OF MAGNETIC TAPE RECORDING



By
N. M. Haynes
Engr. Vice-President
Amplifier Corporation
of America

\$7.95

6 1/4" x 9 1/4" 392 pages

This book combines the basic information about magnetic sound recording with all the latest, newest developments in this field.

**BOOK DEPARTMENT
TAPE RECORDING MAGAZINE
SEVERNA PARK, MD.**

DO YOU HAVE TWO FRIENDS . . .

. . . who are interested in recording and who would enjoy receiving a FREE sample copy of

Hi-Fi TAPE RECORDING Magazine?

If you do, just send us the names on a postcard or use the coupon below.

Hi-Fi TAPE RECORDING
Severna Park, Md.

Please send a copy of Hi-Fi Tape Recording without charge to:

Name

Address

City Zone State

Name

Address

City Zone State

Your Name

Address

City Zone State

TEEN TAPERS

BY JERRY HEISLER

ALTHOUGH summer camps have long been dedicated to providing summer fun in a rustic woodsy atmosphere away from the noise of the city, there are a few city conveniences that can add greatly to the camping program, and your enjoyment of it. One of these is, of course, the recorder.

Not too many years ago I was a counselor at a southern camp and I took along some recording equipment to see what could be done with it.

There were some obvious applications, and these I tried immediately. I recorded song fests, campfire programs, and the voices of some of the campers in various activities. I did this with the thought of using these tapes at future camp reunions as well as providing the campers with rainy day amusement.

Our summer provided us with the opportunity to present two Broadway plays on our stage and recordings were used to help campers learn how the professionals had played the parts. The recorder was also helpful in memorizing lines. We also made tapes of our plays so that we would have a permanent record of them.

For those of you interested in nature, a recorder taken into the woods lets you capture the sounds of nature in her own surroundings.

A favorite Saturday night activity at our camp was a dress dance to the music of a name band. The music was provided by records that I had taped during the winter. On several occasions the camp was split into two groups. Since we had a limited number of records, I recorded all of them on tape. One group could then use the tapes, while the other group used the discs. For the other music that was originally on tape, I copied the tapes for the other group to use.

Most camps have a photography program and the tape recorder can add a new dimension to this activity. We made a sound movie from an original script. Of course

the sound was not synchronized with the film, but it was realistic enough for our purposes. The filming and recording were all done by teenage campers like yourselves.

A camp movie for use in showing the camp to prospective campers can also be made into a sound movie by making a recording to go with the film. I'm sure your camp director would be interested in this.

These are some common uses of a recorder. I also came up with a very specialized use. After being in camp a few days I discovered that reveille was blown every morning by a record that had to be played at 7:00. The counselor responsible for this operation had to get up at 6:30. Feeling sorry for him, I began to think of a way to get around this. I made a tape of the reveille record, provided a time slot and then followed it with mess call and the flag raising ceremony. By connecting the recorder to an inexpensive time switch we were able to have the entire procedure become automatic. Needless to say, the counselor welcomed the additional sleep.

Once during a heavy storm, the power failed and the clock stopped. But what better way to spend a rainy day than sleeping?

There are many other uses for a recorder in the camping program and an active imagination on the part of the camping staff can come up with some good ideas. If you're a counselor or a camper, bring your recorder along.

So much for camping. We've heard a lot of talk about the pros and cons of stereo records versus stereo tapes. If you're in doubt, the best solution, and the least expensive, is to have both. The phonograph you now have can be converted by adding the stereo cartridge. You can use the recorder for the other track. And likewise, if you add a stereo head to your recorder, you can use the amplifier and speaker of the phonograph for the other half. So if you have a phonograph and a recorder, you can have stereo on both for about \$30 depending upon your choice of head and cartridge.

THE MIGHTY THREE

BY DICK FIREMAN

The three-inch reel is good for more than correspondence. It is ideal for recording short musical favorites. It puts such items right at your fingertips where you can hear them instantly, without taking time to rewind.

The three-inch spool will carry more than five minutes of 1.5-mil tape per side—roughly equivalent in time to one of the old 10-inch 78's. This is just right for pop singles and some of the short classics like de Falla's "Ritual Fire Dance" (three minutes fifty seconds in one performance) or Debussy's "Clair de Lune" (four minutes ten seconds).

Wound with 1-mil tape, a three-inch reel will carry as much as 7 1/2 minutes per side. With .5-mil tape, it will take more than

ten minutes. This is room enough even for old warhorses like "Finlandia" or the Prelude to "Die Meistersinger" (nine minutes thirty seconds each).

The three-incher comes wrapped with 150 feet of 1.5-mil tape—four minutes at 7.5—or 225 feet of 1-mil tape—six minutes per track. But the reel will hold considerably more. Additional time can be spliced on, or the spool can be bought empty and wrapped with anything that fits your music.

For years we buried our favorite music on the insides of seven-inch reels where it could only be heard after laborious rewind. Now all we have to do is slap a three on the deck and throw the switch.

TAPE IN EDUCATION

BY MAJOR JOSEPH J. KRAMP, USAF, RET.

THE big news in education this month are the statements by President Eisenhower and his Science Advisory Committee. The President's statement announced the findings of the committee on 23 May and emphasizes the great need for strengthening of all education in general and science and engineering education in particular.

The Science Advisory Committee in a 16,000-word report "Education for the Age of Science" lists the national goals for strengthening science and engineering education. The Science Advisory Committee is composed of the most competent educators in the United States and their report should serve as a blueprint for the development of our educational program for many years. The report makes a plea for an increase in the funds invested in education. The committee said "Doubling our current annual investment in education is probably a minimal rather than an extravagant goal." At present the American people are spending about 18 billion dollars a year—approximately 4 per cent of our gross national product. Implementation of the recommendations of this report, which we hope will be in the near future, will mean greater emphasis on the productivity of our educational system.

The cited report concludes that four major areas need specific and urgent attention throughout our educational system: (1) the curriculum and the content of courses, (2) the quality and effectiveness of teachers, (3) the recognition and encouragement of students, and (4) the development of intellectual leadership. Some of these needs were recognized by the National Defense Education Act of 1958 and programs are underway. The major effort stimulated by the National Defense Education Act of 1958 seems to be centered around language training and the exploitation of television.

The utility of magnetic tape in achieving the goals set by the Science advisors cannot be questioned. The achievements of the relatively few educators who have been exploiting tape are well known. The results speak eloquently. Classes taught by tape have invariably scored much higher in achievement and retention than those taught by our "Conventional" archaic methods. The Science Advisors recognize this and recommend the exploitation of tape.

Although the potential uses of tape in teaching have not been fully explored, much very valuable work has been done. The techniques for separating the class into groups of equal learning rate and instructing each group at its optimum rate have been developed and tested by Sister Mary Theresa Brentano at Mt. St. Scholastica. Techniques have been developed which will permit each student to be instructed at his individual rate. At Goucher College the Political Science Department revises its course material constantly to avoid the possibility of its becoming stale. Such revision of textbooks would be highly impractical if not impossible. The tape libraries

throughout the nation have on file lectures and instructional material of the greatest value which can be duplicated and made available to any school regardless of its size or remoteness. Tape teaching has been shown to be more effective, the teaching more personal, attention and comprehension better.

At present, many of our talented students are not afforded the opportunity for full exploitation of their capabilities. It is only in the larger schools where the number of gifted students (the upper 15 per cent of the age group) reaches a size that warrants special instruction. The smaller schools, and there are many of them, do not have the resources to cope with any students who do not fit in the average category. Gifted children become as much a problem as retarded children and their talents frequently go unrecognized. It has been estimated that perhaps as many as half of our potentially gifted students are lost through this unfortunate circumstance. Many schemes have been proposed to alleviate this problem. Private tutoring, is of course, very effective but places a terrific burden on the teacher, whose main responsibility is the class as a whole. The expense of private tutoring must also be borne generally by the individual and is therefore denied to many for economic reasons. The use of tape, however, allows the teacher more freedom for individual attention and makes it possible to give advanced instructions to the exceptional student without disrupting the class. The cost is insignificant compared with the results obtained—an extra tape recorder and perhaps some additional library tapes.

The quality and effectiveness of teachers can be improved by proper application of tape. We grant that not much can be done for a poor teacher but thank heaven they are rare. Tape can be a sturdy staff for the teacher which will lighten her load and improve the quality of her teaching at the same time. Initially, teachers using tape will probably have to devote more time to the preparation of their lessons but as libraries are built up the teachers will be able to prepare their lessons with less effort and will find their work load lessened. Teachers will now have more time for keeping abreast of the latest developments in their particular field. The big bonus to the teacher comes in the opportunity for more individual instruction in the classroom. The teacher using tape can effectively teach more students than she could by the older methods of instruction.

The development of intellectual leadership presents a problem to the small school whose budget does not allow courses in all of the subjects considered for the broad intellectual development of the individual. Where budgetary restrictions do not permit the employment of instructors in some courses that are considered desirable, there are generally instructors with experience in allied fields who could "double in brass" if course material were made available to them on tape.

ROBINS
TAPE-KARE KIT
Take Care With TAPE-KARE

- ★ Cuts wow and flutter
- ★ Increases frequency response
- ★ Eliminates squeal
- ★ Cleans, lubricates, revitalizes and protects with SILICONE



\$2.00 List

AT DEALERS EVERYWHERE
Write for **FREE Catalog of ROBINS'**
Phone and Tape Accessories!



ROBINS
INDUSTRIES CORP.
FLUSHING 54 · NEW YORK

RECORDS, Masters, Stampers, Pressings, TAPES from your tapes or discs. Also High Speed Tape Duplicating. Quantity Discounts. Write:

MERLE ENTERPRISES
Box 145, Lombard, Illinois

RECORDS FROM YOUR TAPES

Meetings, concerts, training aids, etc economically re-recorded on permanent hi-fidelity discs. Professional quality—overnight service—all speeds—any quantity. Write for Free Folder and Prices

RECORDED PUBLICATIONS LABS.
1568-1580 Pierce Ave., Camden 5, N.J.

TAPE RECORDERS



HI-FI COMPONENTS SLEEP LEARN KITS

MERITAPE
Low cost, high quality recording tape. In boxes of 500.

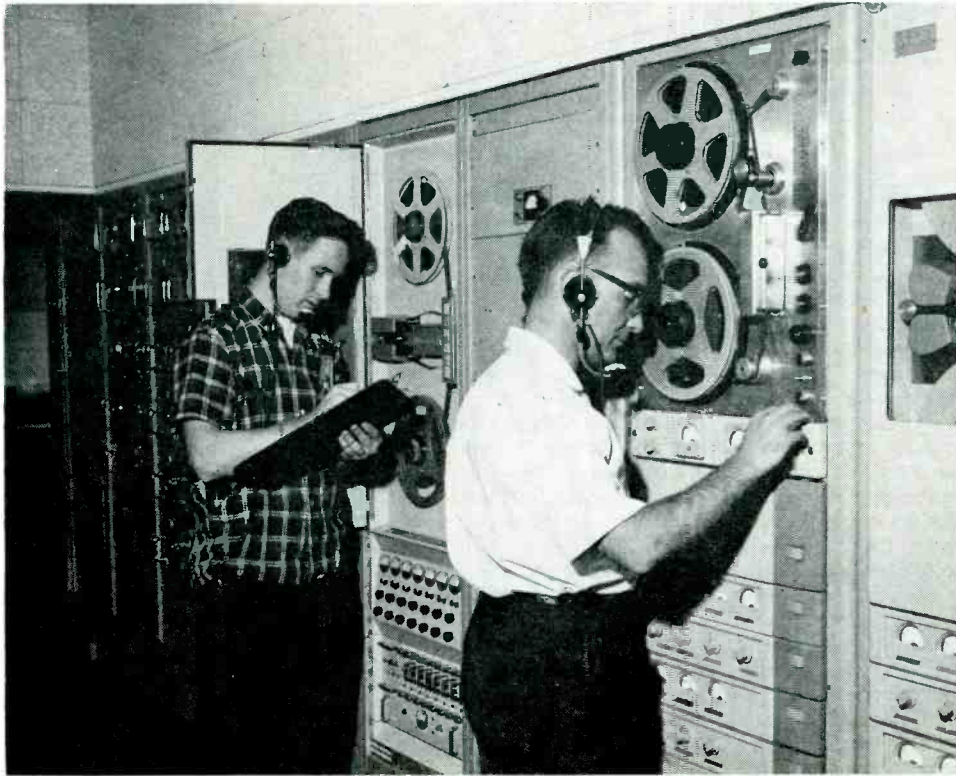
Unusual Values FREE 1959 CATALOG

DRESSNER, 69-02 AA, 174 St., Flushing 65, N. Y.

HAVE FUN AT YOUR NEXT PARTY

Tape record this old fashioned melodrama and play it back. Good for a hundred laughs. Complete set of scripts (Six copies) as presented on air—only \$2.95 postpaid.

HI-FI TAPE RECORDING
Severna Park, Md.



Courtesy, The Jet Propulsion Laboratories, California Institute of Technology

Tape recording the signals from the interplanetary Pioneer IV. William Harris (left), technician, and test engineer Walter Becker monitor the information-packed audio signals while a Mincom C 107 and an Ampex 307 put them on tape. The Mincom is the newest in instrumentation recorders and is completely transistorized.

Taping The Space Age

by Mike Francis

... tape recording is an important element in the study of space.

YEAR Two of the Space Age is well under way. Since that history-making day of October 4 in 1957, when Sputnik I first sent its beeping radio voice back to earth from outer space, men have sent eleven artificial satellites into orbit around our planet. Of these, two Russian and three American baby moons have fallen back to earth. The rest are still in orbit, with estimated survival periods of a month to over 200 years. These almost incredible achievements of human intelligence, ingenuity and technical skill constitute Step One in man's conquest of space.

The entire project of satellite launching and study was part of the 1957-58 International Geophysical Year (IGY). This was a broadscale scientific program encompassing scores of nations, thousands of scientists. It involved every branch of science relating to the earth, its atmosphere and interplanetary space.

Officially the IGY ended on December 31. However, so exciting were the results of this international knowledge-seeking onslaught against the mysteries of nature, that the IGY Governing Committee meeting in August last year decided to continue the program at least through the



U. S. Army Photo

A tense moment at the Atlantic Missile Range, Cape Canaveral. First reports of the flight of Juno II with its space probe Pioneer IV, come into the block house at the launching site. Left to right: Dr. Wernher von Braun, Dr. Jenke, Mr. Jack Froelich, Dr. Kurt Debus (pointing), K. Sandler and Brigadier General J. Barclay.

end of this year. This extended combined venture is named "The International Geophysical Cooperation—1959." It promises continued achievement in Man's quest for knowledge about his universe, and has indeed already paid off in large-scale accomplishments.

Astounding though the launching of artificial satellites may be, this feat has already been exceeded. On March 3 a four-stage, 60-ton Army Juno II rocket launched the Pioneer IV space probe from Cape Canaveral, Florida. This powerful boost imparted a speed of 24,791 miles per hour to the gold-coated projectile, lifting it above the earth's gravity forever. On March 4 it passed close to the moon and then went into an orbit around the sun. Two months earlier the Soviet Union announced that its first space probe, "Mechta," had passed the moon on January 4 and was taking its place as an artificial planet of the sun.

Both Pioneer IV and Mechta will probably circle the sun forever, unless they are destroyed by collision with stray interplanetary debris. It is quite conceivable that future man, perhaps a million years from now, will recover these two artificial planets; if they escape accidental collision, he will find them in an almost perfect state of preservation.

These projectiles, sent into the space between the planets, constitute Step Two in man's conquest of the Universe.

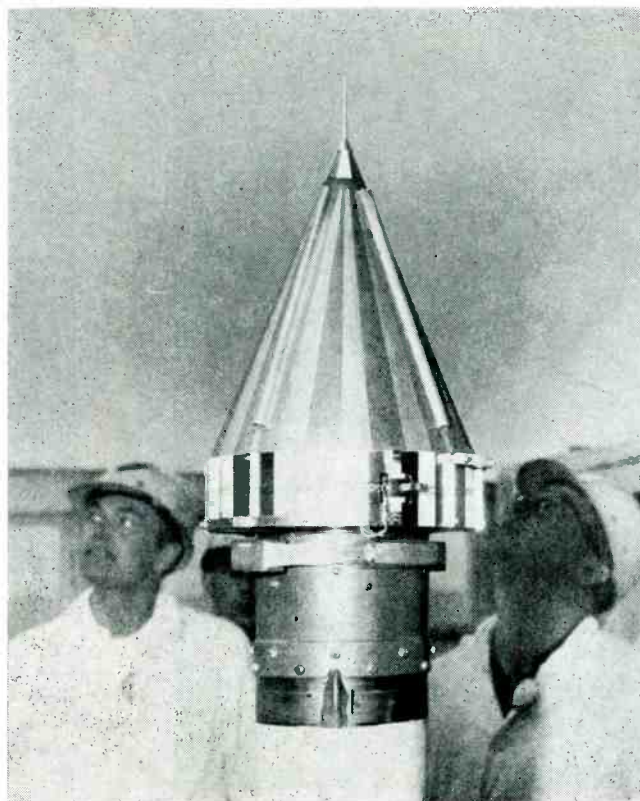
Tape recorders, most of them the home type shown in the photographs, are an indispensable part of the Space Age. Without magnetic tape recorders Step One and Step Two could not have been accomplished by today's technology. Tape recorders are the brain and the memory of the Space Age.

The ballistic problems of launching artificial satellites and space probes are in themselves a momentous task, challenging the utmost in engineering and technical skill. Yet, for scientific purposes, the launchings are not the end objective. They are but the means to an end—detailed research of the information gathered and produced by projectiles in space.

There are two types of information contributing to research in the Age of Space. First is the data gathered by sensing instruments aboard the projectiles and sent back to earth by radio. The second is the behavior of the projectiles themselves as observed from ground stations optically, by radar and photographically. In both types of research magnetic tape recorders are the nerve center of the equipment array.

The data carried by signals from satellites is extremely intricate, consisting of special modulation techniques on the satellites transmitting carrier wave. It requires deciphering and analysis by experts who know the coding and who can subject the signal to repeated examination at various speeds on a tape recorder playback. From such analysis are deduced quantitative as well as qualitative information about X-ray and other radiation intensities, cosmic ray counts, meteorite impacts, ionization conditions, magnetic field strength, temperatures both inside and on the surface of the projectile, and many other conditions prevailing in outer space.

With the development of the Man-in-Space program of the National Aeronautics and Space Administration, ground receiving stations will be bombarded by a most complicated and uninterrupted abundance of satellite telemetry.



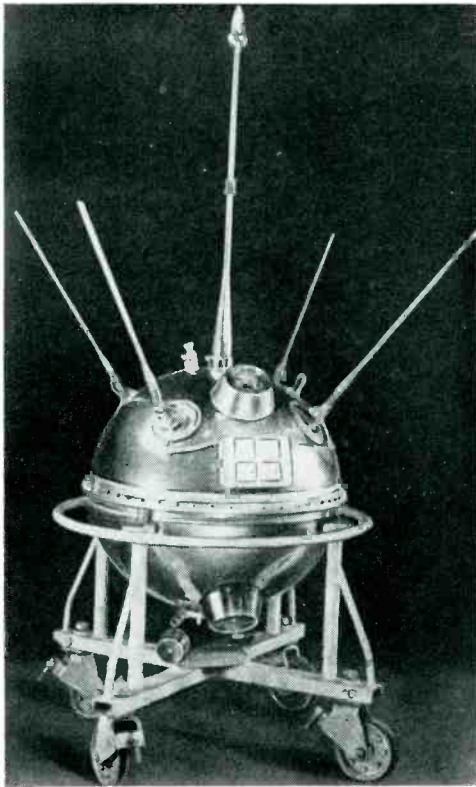
J. S. Army Photo

The generously instrumented payload of the Pioneer IV space probe that passed close to the moon on March 4 and is now in orbit around the sun. Tape recordings of its signals have produced huge quantities of information as it escaped from the earth's gravity forever.

Every measurable physical, and mental, condition of the man in the satellite capsule will be coded into the carrier and transmitted to receivers on earth. This information will reach the earth within a few hundred microseconds, far more quickly than it can be analyzed. Recorded on tape, however, analysis and decoding of these signals become a matter of fool-proof routine.

With rare exception satellites and space probes are instrumented with data-gathering equipment and a transmitter to radio the data back to earth. It has been estimated that over a million feet of tape were used in the moon projectile experiments alone, to record the telemetered signals. In order to keep a space probe "in sight" (and therefore in radio contact with ground stations) receiving centers are located around the globe. Such stations are located in Florida, California, Hawaii, British Malaya, England and other strategic points. In order to maintain a 24-hour per day watch and keep the projectile under continuous surveillance, these stations "pass" the target from one to the other as the earth spins on its axis. Telemetered signals from Pioneer IV were recorded on tape as they were received by whichever ground station commanded a line-of-sight to the missile at the time. The tape data is currently being analyzed, but full research of the recorded information will take months longer, perhaps even years.

The data reduction center for the Pioneer IV experiment is the NASA/Jet Propulsion Laboratory at the California Institute of Technology in Pasadena. Here the magnetic tapes are played back and subjected to the closest scrutiny, yielding meaningful and important facts from the intricately-woven telemetered patterns as received by ground stations.

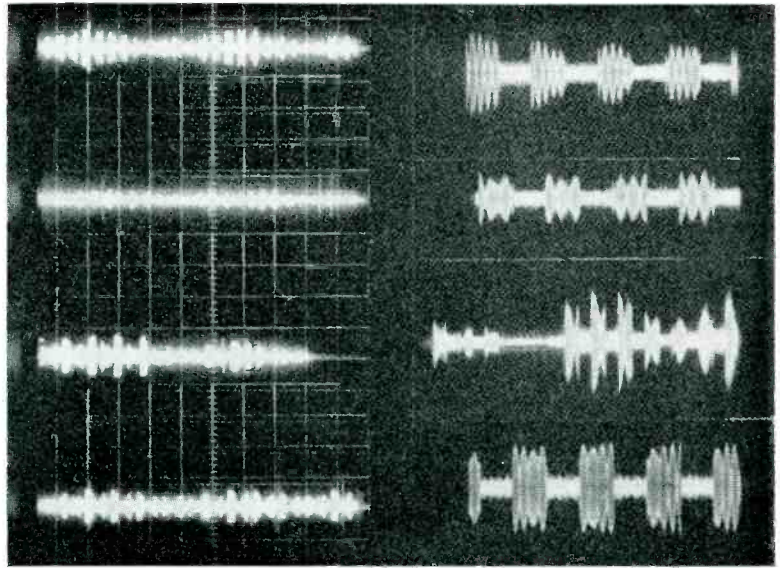


Courtesy, *Sky and Telescope Magazine*

The wealth of information on these tapes is beyond measure, for they contain another most important element: the ballistic behavior of the launching rockets themselves. Their general performance, the precision with which they follow pre-set programming, component stage firing times, control responses, their direction and orientation in space, their spin rate, their temperature at any instant—these are accurately recorded on tape and examined at once. This performance data is then used to refine and improve subsequent firings. So rapidly do firings follow each other in the National Aeronautics and Space Administration program, that data received from one rocket can be put to use in another within a matter of hours or days.

Paralleling the Man-in-Space program of the NASA is the forthcoming attempt to send two deep-space probes to the planet Venus. This plan is also under the auspices of the NASA, the first shot was scheduled for a time when the earth and Venus are suitably located in their orbits. This probe is designed for arrival at Venus after a 150-day journey, shooting past that planet, and going into a permanent orbit around the sun. A day or two later another shot was scheduled to take place, this one to be captured by the gravitation of Venus and revolve as a satellite around it as our artificial moonlets revolve around the earth. Following a curved path known as the *Hohmann ellipse*, these messengers from earth to Venus will traverse 240,000,000 miles of interplanetary space. It is expected that during most of their long trip telemetered signals from their transmitters will reach the earth in sufficient strength to be recorded on tape and analyzed. This will yield much information about Venus and the conditions on or near its surface.

Judging from the recently-announced success in picking up a radar echo from Venus, chances seem excellent for successful telemetry from a Venus-bound instrumented probe. On February 10 and 12 of last year radar contact



Courtesy, *Sky and Telescope Magazine*

Left: The instrument package of "Mechta," the Russian space probe, sits on an assembly carriage. Launched January 2, this instrumented payload reported the conditions it found between the earth and the moon. Now, like the U. S. Pioneer IV, it is following an orbit around the sun. Above: Oscillographs of telemetered signals from Sputnik I. Recorded on tape and subjected to close scrutiny, it is possible to measure and interpret the modulation on the carrier and to separate the signals from atmospheric received with the signal.

with our nearest planetary neighbor was established. Announced after more than a year's study, the success of the experiment has been proved beyond a doubt. To do this, a tape recording was made of the transmitted pulses from the antenna of the Lincoln Laboratory near Westford, Mass. These radar pulses were aimed at Venus. Five minutes later, allowing for the radar signals to strike Venus and return to earth, another recording was made, this time of the return echo. The next job was to compare and correlate the signals from the two tapes. Since one is the echo of the other, they should bear close resemblance to each other. Comparison is an intricate process, requiring a digital computer, because the echo signals were extremely weakened by attenuation in space, and were masked by interference from terrestrial as well as cosmic sources. The correlation was successful, however, and an indisputable match was found between the transmitted signals to Venus and the return echo signals. Here the tape recorder played a very intimate part in the procedure.

Powered with solar batteries that last indefinitely, the Venus projectiles' transmitters should be stronger than the radar echos, they can be directed along a low-attenuation path toward the earth, and should be readily discernible when received and recorded by receiving stations like the one at Westford.

Equally important in performing a significant job in the Space Age are the uses of tape recorders in visual observation projects of satellites and other missiles.

The job of tracking artificial satellites was assigned by the U. S. Government to the Smithsonian Astrophysical Observatory at Cambridge, Mass. Observatory director is Dr. Fred L. Whipple. Dr. J. Allen Hynek, associate director, is in charge of satellite tracking. Dr. Armand N. Spitz, of the Spitz Planetarium Laboratories at Yorklyn, Delaware, is coordinator of Visual Observations. Leon Campbell, Jr.

is Supervisor of Station Operations. These men organized amateurs into an international system of satellite observers, and called it "Operation Moonwatch." The name is maintained during the 1959 International Geophysical Co-operation.

The system consists of about 160 Moonwatch teams in the United States, with 100 more in foreign countries. Each team is made up of a dozen or more members and a station leader appointed by the Smithsonian office. Such a team is stationed at the Edgewater Beach Hotel on Chicago's north side. Mr. Rodney J. Faxon is the station director.

In May, 1957, six months before the first artificial satellite was launched, HI-FI TAPE RECORDING published a detailed procedure for timing satellite observations with a tape recorder. The method was adopted by the growing number of Moonwatch stations, and has many advantages, particularly because accurate timing of a satellite's passage can be accomplished in the dark without reference to a visual timepiece of any sort. This is important, since most observable passages occur in the darkness immediately before dawn or just after sunset. Another advantage is that the tape recorder system is automatic once it is set in action, and need not be synchronized with a standard time reference at any interval, as in the case of a stopwatch. Events occurring in rapid succession can be timed with a tape recorder as accurately as a single isolated event. As many as sixty different phenomena can be timed within a period of one minute without loss of accuracy, without confusion, and without writing anything down.

The method is extremely simple. Audio time signals, with the seconds of the day and night clearly indicated, are regularly broadcast by the U. S. Bureau of Standards Radio Station WWV, its sister station WWVH in Hawaii, and station CHU at the Dominion Observatory near Ottawa, Canada. Depending on the location of the Moonwatch station, one of these time signal transmitters is tuned in on a short-wave receiver, then fed through a mike mixer to the tape recorder. The time signal recording is continuous during a satellite-observing session and forms a time reference upon which the observers' comments are superimposed. Each observer looks through a telescope preset to cover a certain part of the sky along the expected path of the satellite, and is provided with a microphone. All mikes are tied into the tape recorder through the mixer, so that any observer, when he sees the satellite cross the center of his field of view, reports the instant of crossing by voice. This signal is recorded on the tape, superimposed on the continuous time signals, and can be exactly identified with *one particular* second of time when the recording is played back. The playback can be repeated as often as necessary and constitutes a permanent record of the satellite passage.

At the Edgewater Beach Moonwatch station, Faxon and his associates have altered the reporting technique somewhat. Instead of a voice report from the observer who sees the satellite in his telescope, he presses a button mounted at his position, at the instant the satellite crosses the center of his field. This activates the audio oscillator within the shack, producing a $1/5$ second pulse which is fed through the mixer to the tape recorder. Thus the audio pulse, rather than the observer's voice, is superimposed on the time signals. To clearly identify the observer who made the ob-

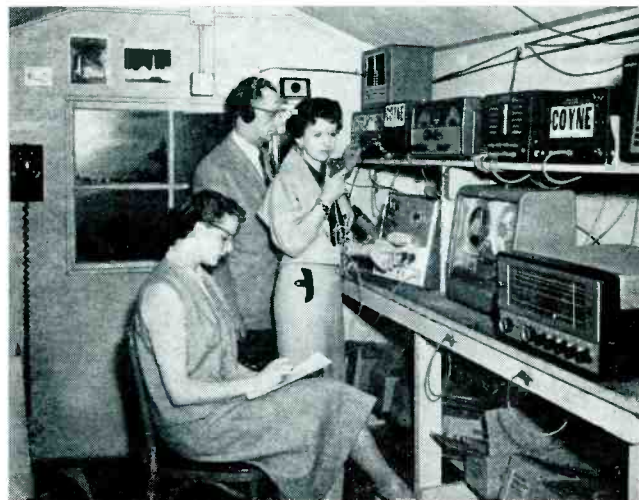
servaion, pressing the signal button also turns on a green jewel light at that observer's position. Since the observer's telescope is positioned in advance, the satellite's position in the sky is indicated, within one degree. A playback of the recording determines the time of passage through this position within 0.1 second. Thus the one-degree accuracy in position and the 0.1 second accuracy in time are both fulfilled.

This is precisely the information that the Moonwatch team is charged with determining. Cambridge headquarters insist on one-degree positional precision, and will tolerate a timing accuracy of one full second. However, they expect, and get, timing figures that are accurate to within plus or minus 0.1 second.

With a little practice, it is easy to break a one-second time pulse into tenths. Even if played back at the same speed at which the recording was made, just listening to the pulse will enable a practiced ear to break a second up into quarters. If recorded at $7\frac{1}{2}$ ips and played back at $3\frac{3}{4}$, the second can readily be divided into eighths. A one-second pulse recorded at $7\frac{1}{2}$ and played back at $1\frac{7}{8}$ ips will be four seconds long and can be broken into tenths with great accuracy.

Ruler measurements on a segment of tape can also help divide the second into decimal parts. Since we know the inches of tape transported during one second, the length of tape between the start of the second and the observer's report can be measured in inches, establishing the required decimal accuracy.

Once the position and time of a satellite observation are determined, the data is transmitted by telephone or wire to headquarters in Cambridge. Here the figures, together with similar data from other Moonwatch stations, are fed to a high-speed computer. This machine works out an orbit for the satellite and transmits tentative orbital elements to the huge Baker-Nunn photographic tracking stations located throughout the world. These \$70,000 units, designed especially to time and photograph the satellites with great accuracy, cannot go into operation without prior information from the Moonwatch system of observers.



Courtesy, Webcor, Inc.

Checking the radio and recording equipment before an expected satellite passage. Receivers are tuned, tape recorders are set in motion. With all equipment operating, Helen Gibbs (seated), Rodney Faxon and Connie Perkins will join their associates on the observing platform, confident that the automatic timing system will perform with a $1/10$ second precision.



Courtesy, Webcor, Inc.

The computing room in the tower of the Edgewater Beach Hotel. Standing is Connie Perkins. Seated (left to right): director Faxon, chief computer Walter Skoropad, assistant Harold G. Schoen, secretary Helen Gibbs and Molly Gaba in telephone contact with Cambridge Moonwatch headquarters. Team member Noreen Mulvaney was absent when this photo was taken.

It is imperative, therefore, that full advantage is taken during a satellite passage over a Moonwatch station, especially if the satellite has been newly-launched. The observation must be made and timed with precision, the data must be transmitted to headquarters without delay. The world is waiting, literally, for a "clean" observation and a precise time determination. The electronic memory of a tape recorder is perfectly suited for this task.

Considering that a satellite passage across an observer's telescopic field only takes 12 seconds or less, the Moonwatch team must be completely prepared for action well in advance of the expected passage time. During the observing session a tape recorder and short-wave receiver are in use. Yet other important events, which also need to be noted, may occur during the session. As an example, on Tuesday and Friday evenings the Civil Air Patrol radio broadcasts satellite prediction data at between nine and ten P.M. Eastern Standard time. Faxon's team tunes in the nearest CAP station, VPO3, located at Inkster, Michigan, for data necessary to determine local circumstances of a predicted satellite passage.

It has often happened that a satellite observing session was taking place at the same time as the CAP broadcast. Faxon found it necessary, therefore, to employ another short-wave radio and a second tape recorder to pick up and record the broadcast from VPO3. For this purpose the Edgewater Beach team uses the Webcor Royalite recorder. Weighing only 20 pounds, and equipped with a third speed ($1\frac{7}{8}$), this unit is ideal for use both in the shack and for transfer to the computing room after the session is over. Faxon also takes this recorder with him when he lectures or gives demonstrations to interested groups.

The computing room is at the top of the south tower of the hotel, overlooking Lake Michigan, Outer Drive and Lincoln Park. Here the tapes and the Royalite are brought and the data analyzed. A calculating machine expedites the computations. Mr. Walter Skoropad, whose other hobbies are mathematics and his amateur radio station W9OUC, is chief computer. His assistant, Harold G. Schoen, is an insurance underwriter. Together they analyze

the information recorded on tape during the observing session, assimilate that received from the CAP broadcasts, and organize their results for transmission to Cambridge. They also prepare tables and charts for future passages of the satellite.

The team spends a very busy evening when a satellite passage is expected. Members are notified about eight hours in advance. At the Edgewater Beach station Faxon and the nucleus of members arrive at least an hour early to ready the procedures and check the equipment. Even when no passage is expected team members spend Tuesday, Thursday and Saturday evenings at the station. Sometimes, when they are already there they are notified that a passage is expected early the next morning, just before dawn. In that case team members remain as guests of the Edgewater Beach Hotel.

Other uses of the tape recorder at a Moonwatch station occur frequently. Faxon often "recaps" an observation on tape after the evening's work. Important sidelights and special incidents and instructions, which may easily be forgotten later, are placed on tape. Thus a complete and accurate record is kept on tape for future reference.

Another function of the recorder in the Atlas was to store 7-channel code messages sent to it from the ground, to be relayed back to earth on command from an interrogating station when the Atlas had moved to the other side of the earth some 45 minutes later. This marked an avenue of advance in ultra-high frequency communications, using the orbiting satellite as the medium for long distance, around-the-earth transmissions without depending upon the ionospheric reflections required by longer radio wavelengths.

Extensive quantities of information can be handled by such a system. First, the information is put on tape at regular speed. Ground transmitters at station A then send the signals *at high speed* (compressed) to the satellite's recorder, which stores them in that form. When the satellite reaches station B on the other side of the earth, command signals release the stored messages from the satellite and record them *at high speed*. Finally, when played back at regular speed again, the signals are expended into their normal form and hence are readable.

It requires little imagination to picture the enthusiasm and excitement with which we will soon be recording the first human voices from the moon, from brilliant Venus, or from mysterious Mars. From out of the millions of miles of empty space between the earth and the other planets human sounds and video-tape pictures will be transmitted back to earth, telling and showing us the wonders these remote worlds present to the eyes of the first space pioneers.

Today the tape recorder is assisting in the birth of the Space Age. Tomorrow it will help guide the Space Age through its youth. The progress that follows is beyond limit, but depends upon the intellect of our civilization. A human intelligence that today is capable of hurling an artificial projectile into deep space, to remain there forever, will find the way to bring the Space Age to full maturity and fruition.

Whatever happens, or will happen, in the Age of Space will be recorded on tape. And, like the rockets themselves, the tape recorder will be a significant vehicle for man's journey to the stars.

They Tape the Indian Hit Parade

by Henry F. Unger

. . . . these folks tape authentic Indian chants and ceremonies.



Young Apache dancers warm up for a recording of the Apache Crown Dance or Dance of Mountain Spirits. In some instances the Boleys must adhere to certain agreements with the Indians before they can record certain chants or dances.

FOR two days the recording studios of Ray and Mary Boley's Arizona Recording Productions in Phoenix, Arizona, resembled a top brass meeting in the Pentagon. Apart from Mr. and Mrs. Boley, no white person crossed the threshold of the studio as long as a group of San Carlos Reservation Apache Indians was in songful session.

Reasons for the furtive, hush-hush two-days of no-trespassing for the white man was the fact that the Indians were recording sacred songs known only to the ears of this tribe. Only the technicians, the Boleys, because of long-time friendship with the Indians during other recording sessions, were granted earfuls of these holy of holy songs. Once the group of Indians left the studio, a pact between the Boleys and themselves, confined the recorded sacred songs only to the reservation.

Winning the confidence of various Indian tribes through kindness and through their professional recording skills, has enabled the Phoenix Boleys to accumulate over 100 titles of tribal chants in a sort of Indian Hit Parade. The Boley recordings of Indian sounds can today be heard

emerging from an isolated Navajo hogan, from a cluster of Apache Wickieups, from a juke box in Gallup, New Mexico restaurant, from a network of Indian radio stations in the Southwest or from a score of places where the unusual tribal chants teamed with the Boley recording magic are appreciated.

Although selling their Indian recordings through various outlets, the Boleys still consider this phase of their big recording and movie business, a happy hobby and a chance to preserve the Indian music as part of American folk lore. It is this fun with a hobby that has often prompted the Boleys to drive several hundred miles to record an unusual Indian song.

Equipped with their portable Ampex, sensitive microphone and a long table, the Boleys will visit the reservations of the Pueblos, Hopis, Navajos, Kiowas, Tewas, Zunis at various times. Always they have contacted previously the leaders of the tribal council, who in turn prepare the finest singers.

These recording visits into the windswept areas of the

Indian reservations are not always without incident or humor. A steady howling of Indian dogs almost upset the well-laid plans of the Boleys during a recent visit to the Window Rock Fair. The recording couple hoped to put on tape the voices of the finest Navajo singers competing during this Indian Fair.

An old, honored singer, Tseya Chee was procured by the tribal council for the Boleys and accompanied by two younger Indians, an attempt was made to find a suitable place for the recording session. Most homes were locked. All the Indians were at the Fair. Finally a squaw permitted the group to use her house. After considerable instruction to the Indians, the Boleys signaled for a rehearsal of the "Sun Dance Song." Hardly had the Indians begun to sing when dogs nearby began to howl. Despite several attempts, the dogs would not be silenced.

Determined to record this favorite song, after the long journey, the Boleys hurried the singers into their car and drove another mile to a cluster of homes where electricity was in use. The request at the first home was greeted with an encouraging remark, "Go ahead and use the place—we're on our way to the Fair. Just lock up when you are finished." The absence of dogs in this area permitted the completion of the song.

The Boleys remember the difficulty encountered while taping the Ute Sun Dance in Southern Colorado. Four singing Utes were slated to make the chant in a small store in the equally tiny town of Ignacio. The Boleys envisioned trouble when the leading singer deposited his huge drum in the center of the room surrounded by his three accompanists. In a hurry, Ray's technical recording knowledge convinced him that the drum beats were too loud for the small interior. He asked the leading singer to record the song outside. But he refused.

Determined to make the best of a poor situation, the Boleys completed three recordings of the song. Moments later when they asked the same singers to perform in a social bear dance, utilizing a small drum, the leader immediately requested that the dance be recorded outdoors.

Mystified by the sudden switch, the Boleys discovered the reason for the refusal of an outdoor recording with the giant drum. The drum thumper had a date to attend a rodeo and he was convinced that the singing of the Ute Sun Dance, a quasi sacred song would bring rain and



Edward Lee Natay, foremost Navajo Indian chant recording artist on the Ray Boley list of performers.

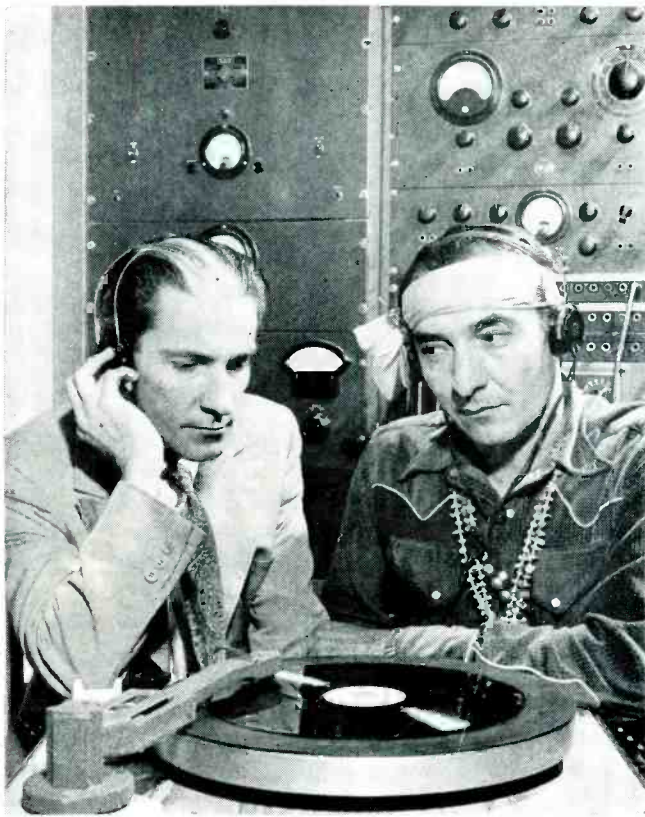
thereby cancel the rodeo!

In our age of electricity, numerous Indians still depend on the old-fashioned wind victrola on some vast reservation. Frequently, the Indians, young and old, stop at the Boley studios and buy the latest releases of Indian chants. At last year's huge Arizona State Fair, scores of Indians left the Arizona Recording Productions booth loaded down with albums of Indian tribal chants.

The hobby of capturing Indian sounds began innocently enough for the Boleys in 1951 when a Phoenix Theater group needed an Indian chant for a portion of a play. The Boleys contacted distinguished singer Edward Lee Natay. The song, a decided hit of the play, prompted the audience to request copies of the song. This was the spring-



Navajo Indians chant as they dance the Yeibeichai, centuries old healing ceremony, which the Boley's tape recorded.



Ray Boley (left) and Edward Lee Natay, Navajo singer, listen in on the results of previous tape recordings.

board for the Boley twosome to track down Natay for recording dates.

This proved more disconcerting than any later recording sessions. Natay was no longer in Scottsdale, his usual home. The Boleys were directed to Pueblo. From there they continued the chase to Santa Fe and then to Albuquerque. Finally, despairing of ever seeing the famed singer, they tried once again in Scottsdale. He had returned home and the Bolely Indian song enterprise was underway. Into an album called, "Natay—Navajo Singer" the Bing Crosby of Indianland poured a set of haunting melodies, exciting rhythms, recording such traditional songs as "Zuni Sunrise," "Tewa Turtle Dance" and "Sacred Mask Dance."

Before they had progressed very far, the Boleys became aware of characteristics not uncovered among white chanters. It was for instance, an old Navajo singer who recognized the demise of his former quality-packed voice. Along with a quartet of other accompanists he was asked to contribute a traditional cry from the top of a mountain. It was the cry of a wounded animal, piercing and beautiful. And yet when the Boleys indicated that there would be a playback, the old man asked them to refrain until he had left the vicinity. He was convinced that his voice had seen better days. Respecting the old man's judgment, the Boleys put the recording on the shelf.

Electronics no longer frighten the Indian. The Indian Dinah Shores step up to a microphone and sing with the ease of a white chanteuse or of the male Indian. When recording in a northern Arizona radio station studio, either Ray or Mary Boley baby sat with one or two of the Indian babies while momma recorded songs or they looked pleased as the Indian mother belted out her finest song while her baby slept peacefully in her arms. Indian children rarely were a burden when others were recording, the

Boleys recall. Often, even an entire village would turn out to watch a recording session and the silence surpassed that of a sound-proof studio.

Although the Boleys seek out singers with a knowledge of the traditional ancient Indian songs, they are not averse to recording pop tunes for the bobby sox crowd. This focuses on a current song, still possessing the Indian rhythm and using Navajo words but with an occasional sly insertion of English phrases. Foremost exponent of this type of song, recorded by the Boleys is the Navajo girl, Whitefeather, voted third place in the Miss Indian of 1957 contest. Beating a rhythmic drum, this girl handles parodies and songs of fun, such as "Sho Atee D, Listen, Girl" a ditty in which a parent warns a daughter about her boy friend. A 7-year-old Navajo girl Redwing is an expert accompanist doing the hoop dance with bells. Her father, Laughing Boy, another recording artist handles the singing in the household. Discs with such titles, "Sonnie, I'm Leaving You," "The White Chimney," "Lonesome For My Sweetheart" and "Oak Creek" are popular with the Indians throughout the reservation. Indian hospitals, with homesick Indians plead for the recordings. It's not uncommon for a group of silent Indians sitting pensively listening to a jukebox in some faraway trading post, soaking up the Boley recorded Indian tunes. Particularly popular during the Korean fracas was the Korea Memorial Song made by the Oglala Sioux singers and recorded in Flagstaff, Arizona. The sad overtones of the Sioux Indian in battle had a lugubrious appeal to the Indian.

Despite the wide cooperation between Indian and the Boleys, certain rules must be followed by the recording duo before the songs can be put on record. For instance, prior to recording several songs of the San Carlos Apache Indians, the Boleys had to promise that no reference in advertising be made to savage Apaches. With that promise made, the Boleys taped seven stirring songs.

One of Boley's best sellers in the Indian field and one of the most unusual is the Yeibeichai, the final chant of the ancient and very sacred "Bluebird." Before the Boleys could swing their Ampex tape recorder into action, they had to win over the permission of the high tribal authorities at Window Rock and the chant could not be recorded until after the first frost. A team of Navajo chanters produces a very eerie rendition of this most widely heard Indian chant.

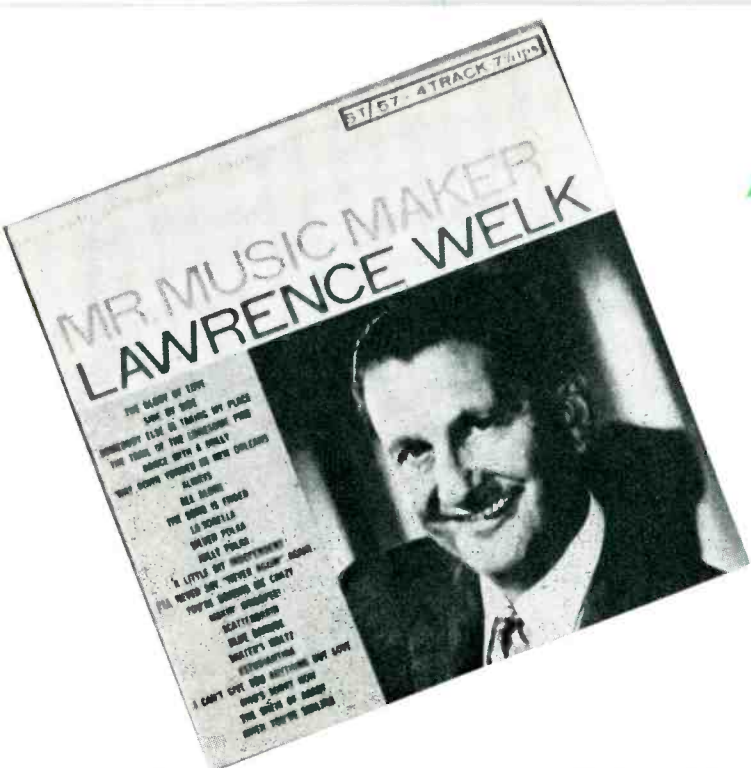
Today, 56,000 tape recorded feet after their initial attempt to record Indian chants, the Boleys occupy a warm place in the hearts of Indian tribes throughout the West. Their Indian records are used by colleges and even some small independent movie companies have utilized the chants on their sound tracks.

Capturing the full realism of the Indian's chants, be they war dance songs or love songs, the Boleys never fail to arrange the proper props—the singers around a crackling campfire, the bells, rattles, flutes and the ever-present drum—in a situation that produces the finest music.

Perhaps the greatest tribute to the recording skills of the Boleys came not so long ago when at the Window Rock Fair, attracting thousands of Indians, the scheduled Indian singers proceeded to rest at various intervals and substituted the Boley Indian chant recordings. No complaints were heard from the visiting Indians. The realistic recordings amply substituted for the personal appearances.

4 Track Tapes are

... Excellent quality, double the discs will face tough, perhaps u



It seems only a short while ago, actually about eight years, that all tape recorders were single track; the majority of them running at 15 inches per second, some at thirty.

Then a few enterprising firms switched to the now familiar, dual track heads, cutting in half the amount of tape necessary for a given length of recording and doing away with the necessity of rewinding.

Based on this same dual track heads, stereo on tape came into vogue and gained great popularity. At the present time it is estimated some 600,000 two-channel stereo playback recorders are in use in homes throughout the land.

Again progress has laid its hand on the recorder manufacturers for, in a development analogous to the switch from full track to dual track, some twelve machine manufacturers are turning from two tracks per tape to four. Thus history repeats itself.

Full track tapes had to be rewound, dual track tapes did not. Two track stereo tapes must be rewound, four channel tapes do not have to be.

For the person who uses his recorder as a home music instrument, and more than half the recorders are used in this fashion, the coming of the four track tapes will, as in the case of the switch to dual track, mean greater savings.

It is believed that most four track stereo tapes will be priced in the neighborhood of \$7.95 for up to 47 minutes of music. This makes them directly competitive with the better stereo discs.

All of the new tapes will be issued at the 7½ ips speed which gives top fidelity. At the same time that they are issued in four track, they will also be put out in the two track versions so owners of two track machines can look forward now to a resumption of new releases.

In any discussion of the new four track tapes there always arises the question—what about cartridges? The industry feels that someday there will be a cartridge type of tape but for the present 7½ ips reel-to-reel is a proven and tested product whereas the other is new and untried.

Should cartridges be issued, they will most probably be 4 track but play at the 3¾ ips speed. This will cause no one any difficulty since the tape can be removed from the cartridge and wound on a reel for playing on any four track recorder. And, since most of the recorders now on the market have the 3¾ ips speed as well as the 7½ speed, the owners will be able to play the tapes no matter in what form they are packaged.

As of this writing a count of noses reveals nine recorded



Now Available

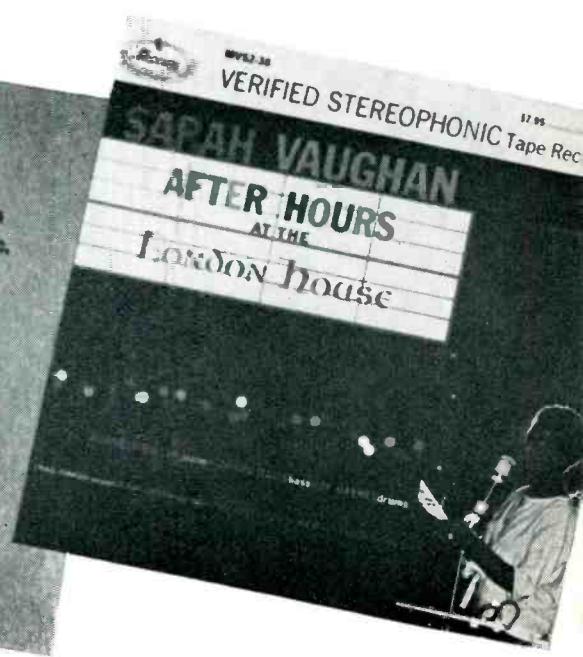
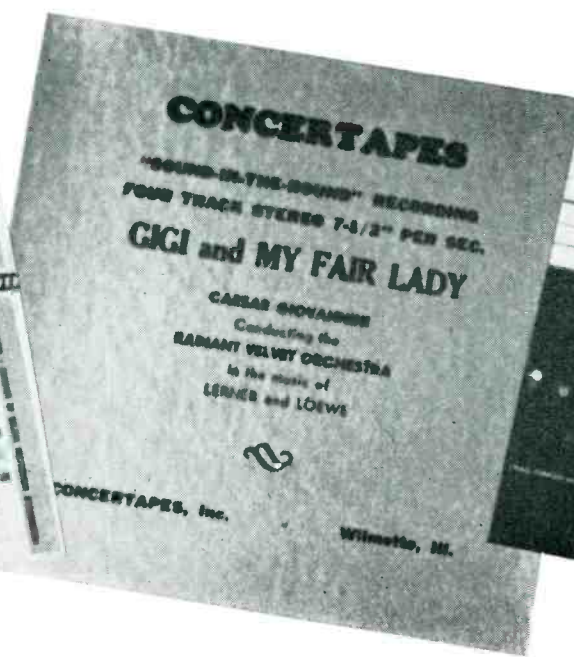
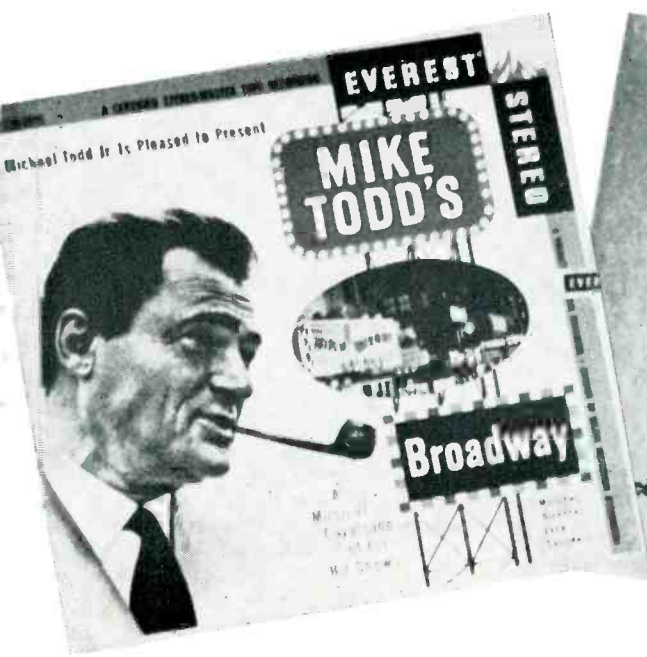
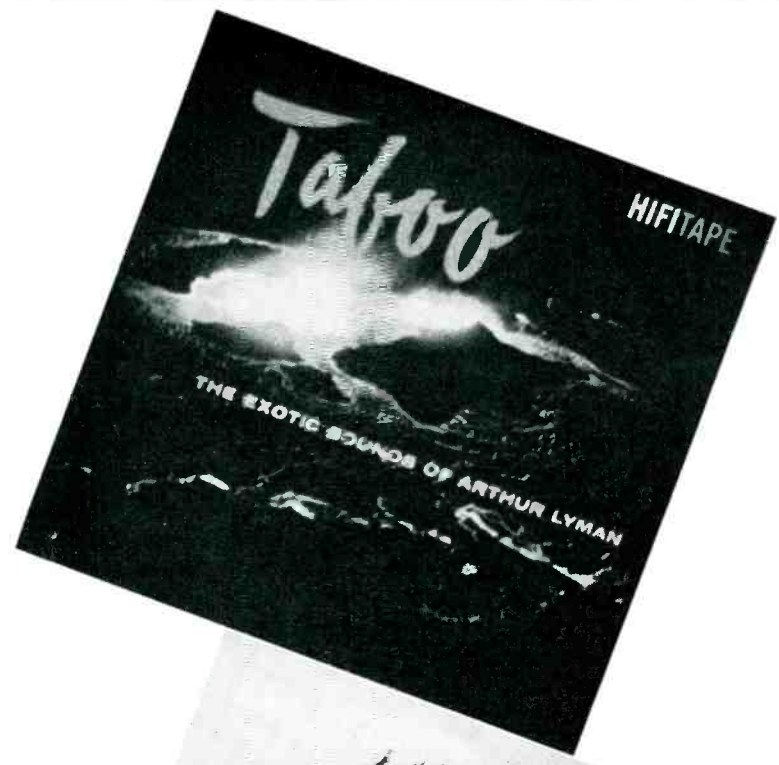
playing time, lower in price. Stereo unbeatable competition.

tape producers ready to go. Mercury has one demo tape now and will have thirteen ready by the end of June at the show for music dealers. Concertapes has five ready with prices from \$6.95 to \$8.95 for a full hour. By fall the entire library will be available, including new releases. Tandberg-SMS has nine tapes now and will have another ten by June 22 and forty by September. Bel Canto has twelve for immediate shipment and will have sixty-five by fall. Everest with five tapes now will issue about ten new titles a month with one hundred and fifty by Christmas. Westminster has four tapes at present with their entire library to follow. Omega has one now with thirty-five to follow. High Fidelity Tapes will have ten by June and Verve has two now and will follow with its entire library. This adds up to about one hundred and fifty tapes by mid-June and about one thousand-five hundred by Christmas.

Conversion kits will be available from most manufacturers for those who want to convert to four track.

It must be remembered that this four-track tape is of most interest to those who play stereo. Some machines record monaural only, using tracks 1 and 3 in one direction and 2 and 4 in the other. Only the Tandberg plays and records all four tracks separately. So if you do not use your machine for music, or stereo recording, a dual track recorder will serve you just as well.

That's what's in the wind today and we believe it will carry tape to the greatest heights ever.



Movie Taping on Location

by Don Dunn

... a drive-in is the ideal source for taping a movie soundtrack.

THE student of dramatics or the connoisseur of fine music often runs across a scene or a theme in a motion picture that he wishes could be captured on tape. Admittedly, much movie music today is available in recordings made from the sound tracks—but there is much that is *not* offered for commercial sale.

As a particular fan of Danny Kaye, I desired to obtain recordings of several songs he had sung in a picture. These numbers had never been released on discs, to my knowledge. I owned a VM 700 tape recorder complete with microphone and an alligator-clip cord to feed directly from a loudspeaker. With that as basic equipment and an additional two dollars investment, I managed to record a complete movie sound track.

Two ways of doing this immediately spring to mind. One would be to wait until the movie showed up on television and record it off the air. While this is a simple solution to the problem—and one used by many—the particular Danny Kaye picture I was interested in has not been released for TV, and might not be for many years.

The second answer would be to carry a tape recorder into a movie theatre, find a convenient plug, and hold the microphone in the air to pick up the sound. Obviously, the crowd noises and theatre echoes would be recorded as well, and the idea is somewhat impractical.

The perfect solution to the problem is the drive-in movie.

When the movie I was interested in played a neighborhood drive-in, I placed my recorder on the front seat of

the car and made an early start. Along with the recorder, I took a 25-foot extension cord, a double-light socket, a screw-in plug for one of the sockets, and a screwdriver.

Arriving at the theatre well before showtime, I paid the admission price and drove my car to a vantage point I had selected on a previous visit. I then sought out the theatre manager and explained what I wanted to do. After he was assured that I intended to break no laws and would leave his theatre exactly as I found it, he gave me permission to proceed.

As I seldom use my recorder in the car or away from a normal supply of power, I did not wish to purchase a relatively expensive inverter to draw current from the car battery. Therefore, the first problem was a power source.

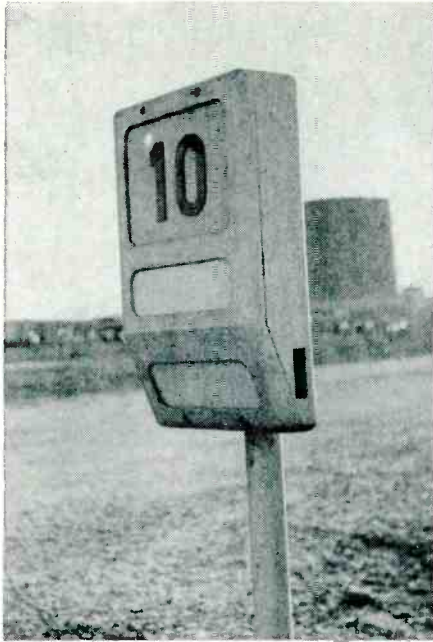
In the theatre parking area, I had parked my car near a walkway that led to the refreshment stand. This walkway was lighted at night by knee-high light standards on each side.

With the screwdriver, I removed the protective cover from the lightbulb on the standard nearest my car. I replaced the bulb with the double-socket I had brought along, and then inserted the bulb into the empty socket. Into the other socket, I plugged the male end of the extension cord. (It is necessary to be sure the bulb is replaced in a socket as law requires the walkways be well lighted during the shows.)

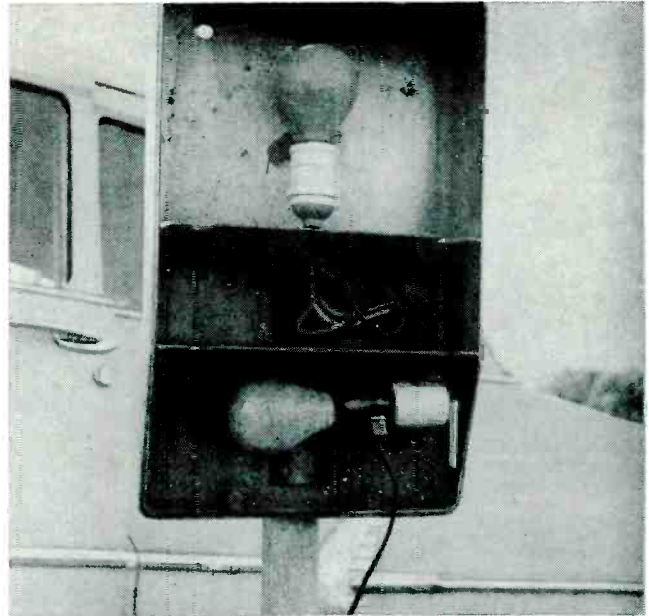
The extension cord ran a few feet along the side of the walkway and into my car window to the recorder.



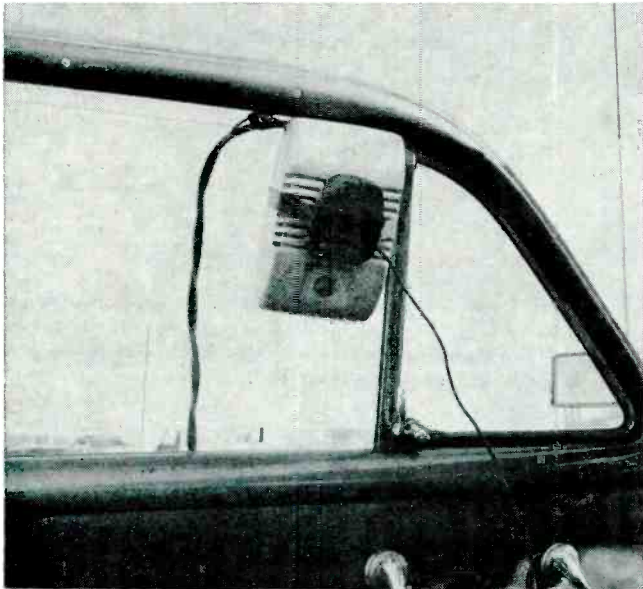
Equipment to take along to drive-in theatre, in addition to your recorder: extension, alligator-clip jack cord for the speaker, roll of electrical tape, regular and Phillips-head screwdriver, socket plug and spare light bulb (just in case you break one belonging to theatre).



The source of power to be tapped is located in the lighted indicator sign at the end of each row in the drive-in parking lanes.



Interior of indicator sign after front has been removed with screwdriver. Extension plug is inserted and light replaced. Numbered front of sign can then be replaced over wire during performance.



Theatre speaker with mike taped to it via a single band of electrical tape. Whenever possible, however, it is better to attach alligator clips to the speaker terminals and plug the jack into the recorder "radio" input.

(Fortunately, I had checked to make sure the current was AC and proper for my machine.) Turning the "On" switch, I found the recorder operating normally.

With a power supply assured, I next set about getting a sound source. Again, the screwdriver came in handy as I removed the back of the in-car speaker furnished by the theatre.

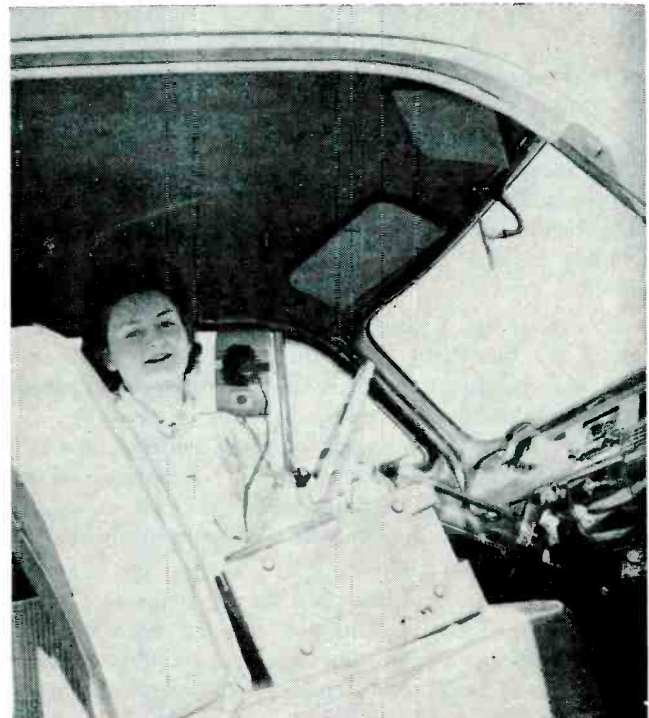
I adjusted the alligator clips on the speaker terminals in standard fashion, plugged the jack into the "radio" input of the recorder, and had ample time to test for volume and distortion during the musical and cartoon features before the picture began.

(At some theatres where I have used the above method of recording, either the manager does not wish his speaker to be dismantled or construction makes this difficult. In such cases, I have taped the microphone directly to the

speaker and held the volume low to avoid vibration. This method gives satisfactory results under the conditions.)

Of great importance is the matter of "straightening up" after the recording session. The speaker must be reassembled, the walkway light returned to its proper position and its cover replaced. Actually, this is but the work of a few moments. By doing it correctly, however, the theatre manager will be friendly when your next request is made.

As many articles have pointed out previously, recordings made in this manner—whether from actual performances, off the radio or off television—may not be duplicated and offered for sale. However, they may be kept for study and enjoyment by the person making the recording.



In the car setup with recorder on seat where the controls are easily reached and the speaker-and-mike on the window are in normal listening position.



Roving Reporter

... reporter-lecturer tapes material on European vacation for use later in preparing talks.

Notre Dame, Paris. The author hauled his recording equipment up flights of three hundred or more steps to the towers of Notre Dame to interview and record the woman who acts as guide and rings the tower bell.

EACH year I spend two to three weeks vacation in Europe in search of new material, recorded and photographic, which is eventually made into a new talk. These are given to Women's clubs and other societies back in Britain. The taped material helps me to give a more complete picture of foreign places and also goes out on the monthly bulletin issued by the British Tape Recording Society.

Four years ago I purchased a battery operated recorder, one of the first to be issued on the British market. Ever since this machine has been my inseparable companion whenever I make a trip, either at home or abroad.

At the same time I bought a special Outside Broadcast microphone with the recorder which, I hoped, would enable me to make recordings under difficult conditions which are often encountered in a plane or while making a voyage in smaller craft.

The first vacation, to the little known island of Corsica, was quite an adventure. Cine film, still and movie cameras, recorder, tapes and spare tubes made it necessary to sacrifice clothes to bring the baggage down to the weight restrictions of the Air Company.

Almost before the plane had left the airport, the recorder was out on the floor and I had started making the

first recording. As I flew over the flat countryside of Northern France, the plane bucked slightly. I kept my fingers crossed and hoped that the speed of the recorder wouldn't be affected. On playback that night in Paris I discovered that this hadn't been the case. After a few experiments it was clear that while the machine would maintain its speed when held at an angle of ninety degrees on end, it certainly didn't function correctly when tipped even slightly from front to back. As this had happened in the plane, the wow had spoiled all my recordings.

Making a mental note to remember this in the future, I carried all fourteen pounds of equipment up the three hundred or so steps to the top of the towers of Notre Dame in Paris.

The woman who acts as a guide and rings the great bell in the tower would be excellent material for those back home. On playback, trouble was still with me. The batteries had shifted making a poor connection and causing a condition which sounded like atmospherics over the radio.

"This is a good start to a vacation," I thought. The next day things went more successful. I managed to get a clear recording of the station announcer at the Gare de Lyons wishing us all a good trip, although the engineer refused to sound the whistle for me.

in Europe

by Laurence Mallory

The Bridge of Sighs, Venice, connects the Doges Palace with the prison. Although many sounds can be captured on tape in this romantic city, the high spot of Mr. Mallory's visit was recording the concert held out on the canal.

Corsica proved rather barren as far as recording material, though rich in color and scenery. By holding the microphone down by my side and turning my back on a group of children who were playing a typical street game, I managed to record them singing and hopping about.

It was a small "Bistro" or cafe that provided the best recordings of the entire trip. Singers, guitarists and a man playing a mandolin gave a wonderful performance of local songs, both in dialect and in French. Despite the fact that the microphone was at the other side of a large room and waiters were continually passing by, the music is some of the best that I have ever recorded on the portable machine.

Since then I have gained much experience, particularly in using the microphone as the recorder has no volume control on it. On a trip to Brittany, France, a merry evening spent with a French family was rounded off by recording them singing drinking songs. Bottles were clinked and one of the youngsters sang the verse, clear and sweet. The others joined in for the chorus, giving more volume than harmony as everyone was slightly merry by this time and the table was littered with empty bottles of "Vin Rouge."

Last year I set out for Venice, Italy. As this trip was to be made by car, my Grundig recorder also went along. The portable machine made excellent recordings in the car-



ferry plane as it flew across the Channel, and I was able to give a running commentary of Calais as the plane came in to land. Then, just across the frontier in Switzerland, another short recording by the roadside, describing the disused blockhouses by the side of the river Rhine.

In Switzerland a village Fete with the local orchestra playing typical Swiss music and an Aunt who brought out her Zither, this was recorded on the Grundig, all helped me collect a sound picture of the country. Two tape friends were visited and then I was off once again across the formidable St. Gothard pass with its 35 hairpin bends, towards Italy, Milan and finally Venice.

If you have never been to Venice you have yet to see one of the quaintest and most romantic cities of Europe.

The Gondoliers in their yellow straw hats with two red ribbons trailing down the back, utter sharp cries as they pole their slim black craft round sharp corners. The church bells ring out over the still air each night, their tones quite different to those in Britain.

While all this is worth recording, it is the concert held out on the canal that is the high spot of the visit. Six or seven gondolas collect and drift silently along one of the canals leading off the Grand Canal with its Rialto Bridge. In one of the craft, singers accompanied by a violinist and



The author is shown recording on the waterfront at Porto Ferrajo, on the Island of Elba. Activity on the waterfront usually produces an interesting recording.



Typical Corsican fishermen. When interviewing such folk it is well to talk to them first, before the recorder is turned on, to learn something about their work and interests. Then you will be ready to ask questions which should bring forth instant replies rather than a silence when the mike is placed in front of them.

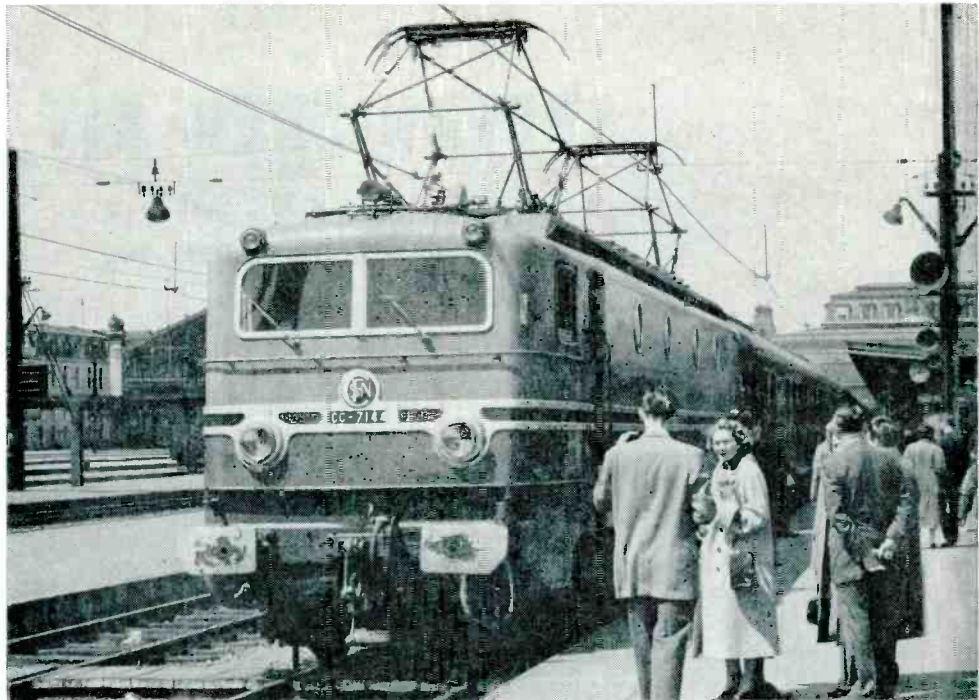
accordionist, sing operatic arias and Italian Folk Tunes. All around is the slap of water as it laps against the sides of the gondolas. So appreciative are the Italians of singing, that windows are flung open and people on the quays stop and listen to the music as it floats softly across the night air. As the concert comes to an end, the gondolas slowly slip their moorings and drift silently down a smaller canal, the songs dying in the distance.

Luck was with me and I was in the craft next to that which contained the singers and musicians. The recordings are excellent and are listed amongst my most treasured memories of this unforgettable city.

This year, Italy presented quite a different problem. I had decided to fly over to Pisa, with its leaning tower, and then go as far south as the island of Capri by coach.

Pisa provided another unusual recording for my library. Two street musicians, playing home-made instruments and music which was reminiscent of North Africa, came walking down the street. A hundred lira coin, about thirty cents, brought forth a repeat performance, every note of which was recorded on one of the main streets of Pisa

The "Mistral," is a crack French express from Paris to Marseilles. When the engineer was asked to blow the whistle so it could be recorded he replied in his typically French manner, "It is against regulations, Monsieur."



with a crowd of curious Italians looking on.

The gaily dressed Tarentella dancers, performing beneath colored lights in the palm decked gardens of the hotel at Sorrento, gave me some more typical folk music.

Since that trip to Corsica, I have gained a lot of experience in making location recordings and interviewing people.

An interview, particularly outside under existing conditions, is rather tricky. Most people talk quietly when confronted with a microphone and it becomes necessary to hold it much closer to them than to yourself. Your voice, being more accustomed to recording, will carry further and clearer.

It is always well to remember that the listener wants to hear the person interviewed and not the reporter. Your job is to ask questions which will bring forth interesting

answers from the other person, not quite as simple as it sounds. So many questions can be answered by either "Yes" or "No."

I generally talk to the person before making a recording and learn something about their job. This gives me an idea of the questions I am going to ask and also helps to make them less conscious of the microphone. After a few minutes they become engrossed in explaining their work to you, completely forgetting the microphone. I have found that this technique works wherever I am recording and whatever the nationality of the person.

While roving recordings bring back memories for oneself and interesting sounds for others, they also help you to see the life and people around you. You will find that you come back from a vacation with material and knowledge missed by the average tourist.

The harbor of Ajaccio, Corsica. Wherever the author went his recorder was with him, and it never failed to catch the myriad of sounds in a particular location. Such things as boat whistles, motors starting, water lapping, people shouting, all preserve a harbor scene in a mind's eye.



SPEEDWINDER KIT

by Joseph J. Kramp, USAF-Ret.

...this handy little accessory is simple to construct.

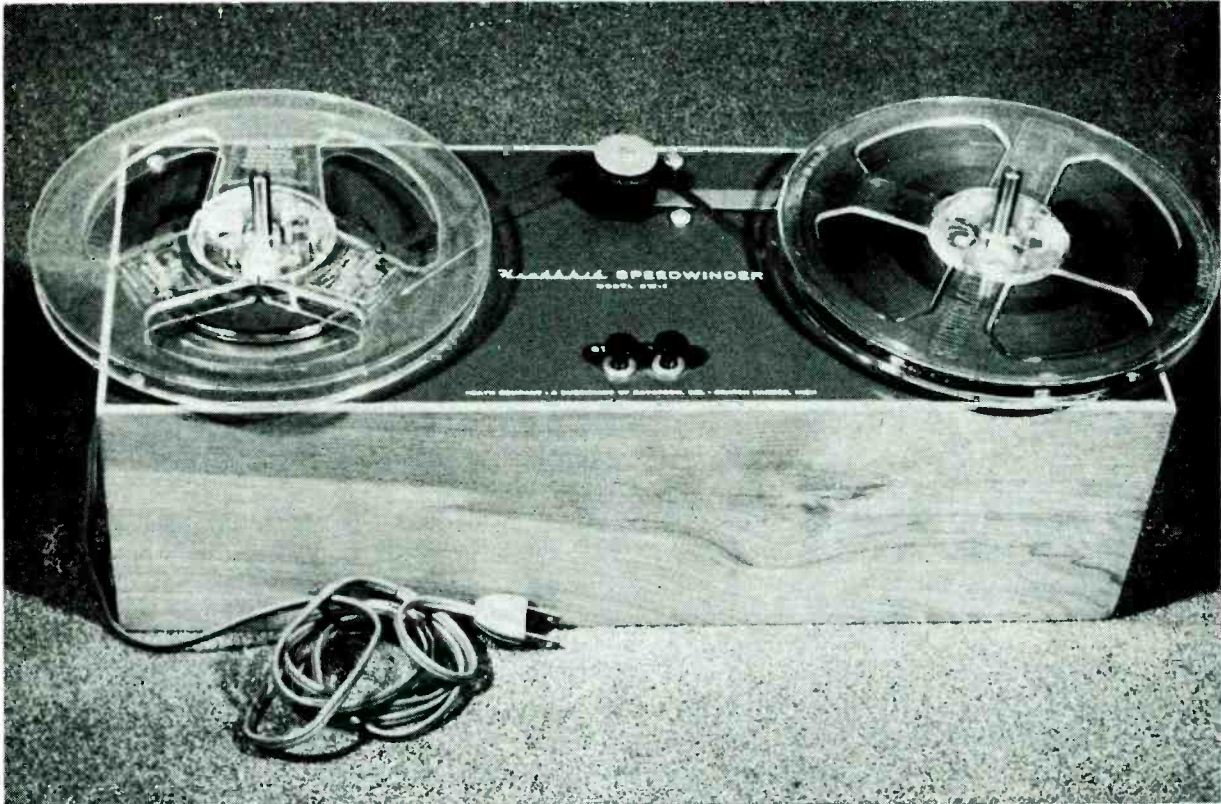


Fig. 1. The Heathkit speedwinder is a neat compact unit that will give years of trouble-free service. The use of this machine eliminates the wear on the tape and your recorder that is inevitable when you rewind in the normal manner on your tape deck.

THE Heathkit Speedwinder is a very useful accessory for both the professional and "Audiophile" tape user. This handy little device provides a fast automatic means of rewinding tape separate from the tape deck itself.

It is generally agreed that a tape stored in the played or non-rewound condition will maintain its quality for a much longer period of time than one that has been rewound in the usual manner. When rewound on a normal tape deck, the tape builds up unevenly on the storage reel, causing varying tensions which, when left for long periods of time, stretch and deform the tape. By storing it in the played condition, a smoothly stacked wind with uniform tension is assured as it has been spooled evenly at the slower playing speed. By utilizing the Heathkit Speedwinder to rewind the tape immediately before playing, the convenience of a ready-to-play reel is combined with the storage benefits of non-rewound tape.

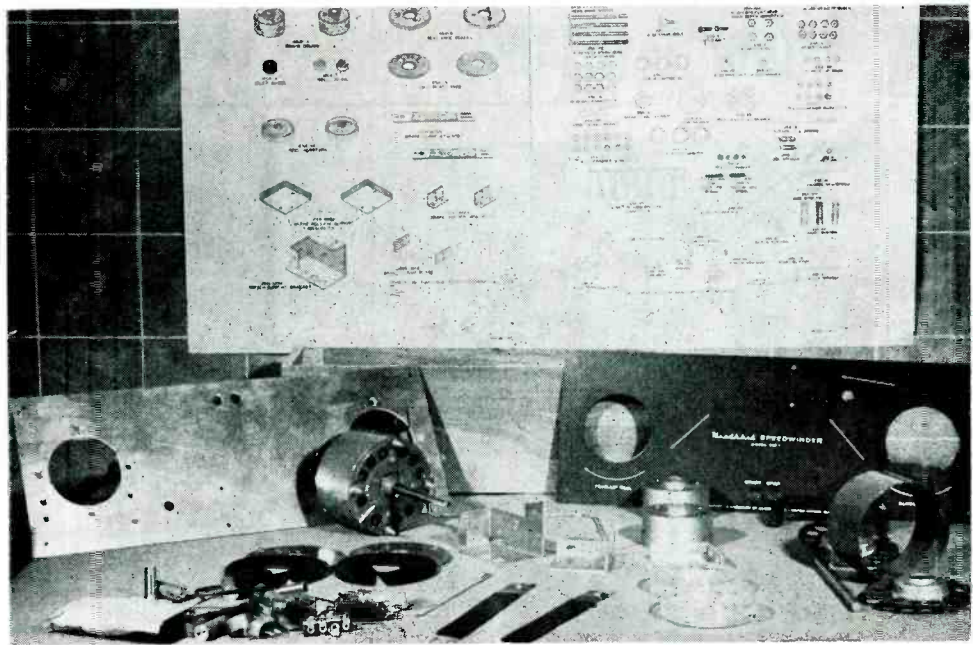
The Speedwinder is also very useful to the operators of

motion picture projection equipment by providing a more satisfactory and less awkward way to respool the film after projection.

The assembly of the Speedwinder is very simple and can be accomplished in just a few hours. The accompanying instructions are, as in all of the Heathkits which we have seen, very clear and fool-proof. Check the parts against the parts list and diagram of the parts to be sure you have all of the parts and can identify them and you are ready to begin.

The mechanical assembly of the parts as shown in figure 3 goes very rapidly. You may find yourself wishing that you had smaller fingers to get at some of the small pieces but with a bit of patience the parts can all be installed with standard size fingers. This machine has a minimum number of moving parts that can bind upon one another so you need not waste much time examining parts for burrs. The start button of black plastic needs some

Fig. 2. The speedwinder has relatively few parts and they are adequately pictured on the large chart shown in the background. You should have no trouble in identification of parts or location of mounting holes with the excellent pictorials.



smoothing and fitting, however. Work carefully and fit this piece in according to the directions and be careful to not overdo the filing.

The installation and adjustment of the brakes is the trickiest part of the whole assembly but is not difficult. The instructions and diagrams furnished are very easy to follow and if you follow them carefully you should have no trouble. After you have finished the machine and checked it with a roll of tape you may have to readjust the brakes a bit.

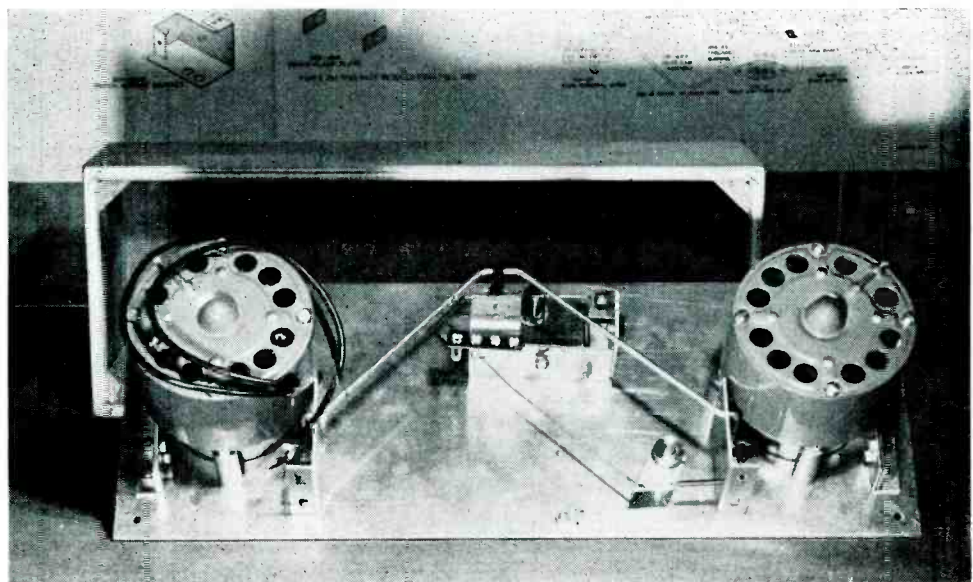
The electrical connections are very simple in this machine but you should take normal care with the soldering if you want trouble free operation. There are only seven solder connections in this machine.

After the Speedwinder is completed you should check the operation with a reel of tape. There is a possibility of tape breakage if the adjustments of the brakes are incorrect, so it is advisable to use an old tape for this first test. When properly adjusted, both reels will be braked evenly to a stop without throwing a tape loop or shifting the tape on the reel. A severe maladjustment could also break the

tape. If the operation of the machine indicates that something is not working properly, consult the section of the instruction booklet entitled "In Case of Difficulty." All of the possible failures are described along with the proper corrective action to be taken. Of course, if you have difficulty, you may send the unit to the factory service department or take it to one of the local Healthkit dealers.

The Speedwinder is a very well engineered machine that should give many years of trouble-free service. The regular use of this machine for rewinding will reward you by preventing unnecessary wear of your tapes and recorders. The convenience offered by providing a means of rewinding tapes or films while the recorder or projector is performing its primary function will be readily appreciated by those who play several reels in sequence, since there is no waiting between reels for rewind. The operation, once started, is automatic and quiet, the tape or film being rapidly re-spooled and the machine stopped at the instant the respooling is complete. The machine cannot continue to turn and shred the end of the tape or film as rewinding on a tape deck often does.

Fig. 3. This bottom view of the speedwinder shows the simplicity of the design. The parts go together easily with no tendency to bind or act stiff. You will find that this is one of the easiest kits you have ever assembled.



NEW PRODUCT REPORT

STAFF TESTED



STEELMAN TRANSITAPE

*... fully transistorized, battery-driven portable.
Two speeds, may be operated from car battery,
weighs only 7 lbs.*

LOOKING more like a large camera than a tape recorder, the Steelman Transitaape weighs only 6½ pounds without batteries and just over 7 pounds complete and ready to go.

The unit has a four inch speaker behind the attractive protective grille on the front and the microphone is a lapel-type crystal mike which fits in a receptacle on the top of the case.

The machine is dual track and employs an erase head and a record/playback head made by Sonotone. It is also dual speed having 1⅞ ips and 3¾ speeds available. Regular 3 inch reels and standard tape are used.

This has the advantage of permit-

ting the playing of tapes made on the Transitaape on any home recorder having the correct speeds.

An examination of the machine reveals careful workmanship and the drive mechanism and electronic parts are well engineered. The unit itself is attractive in appearance as well, having a genuine leather outside case, leather carrying handle and a shoulder strap.

Extensive use of modern plastics is evident in the construction, the exterior knobs and facings all being made of plastic.

The controls include a volume control on the left side of the unit, a fast

Product: Transitaape Portable Recorder.

Manufacturer: Steelman Phonograph & Radio Co., 2-30 Anderson Ave., Mt. Vernon, N. Y.

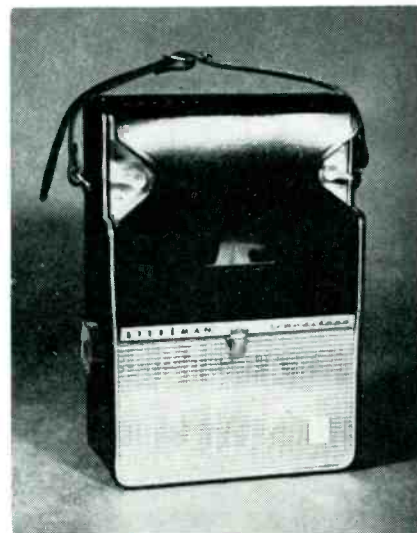
Price: \$199.00

forward and rewind, a speed shift and a record/play control. Neon indicators are used for recording level control and also as an indicator of battery condition. The former is mounted on top of the case so it may be seen conveniently when the unit is being carried. The latter is situated just above the speaker grille, as shown in the illustration.

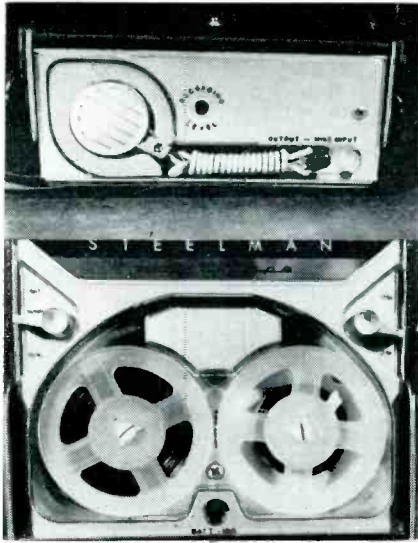
To use fast forward or rewind, the lever is moved to the desired position and the on-off, record/play switch put in play position. The fast forward-rewind lever should be returned to neutral after the winding is accomplished, otherwise the next time you start the unit, it will start in fast-forward or rewind.

The volume control serves both for recording and playback. Inasmuch as the control is for volume only, it may be set and left in position.

Batteries are not furnished with the unit and must be bought separately. This insures freshness. Thirteen of them are required, seven for the motor, which will have a life of about 50 hours and six for the amplifier, which



The Transitaape with the case closed. Because all controls are on the outside, the unit may be operated without opening the case at all.



Upper left: The top of the recorder showing the lapel mike in its cradle and the record level indicator. Lower left: The face of the machine which uses regular 3 inch reels. Record and playback speeds at $1\frac{7}{8}$ and $3\frac{3}{4}$ inches per second. Speed control is on right fast forward and rewind on left. Indicator, lower center, shows condition of batteries. Above: connection block on back of recorder provides for remote control cord and external battery cords.

will last about 300 hours. Total cost is about \$10. The batteries are Mallory mercury batteries, MR-12R or equivalent. AA penlite cells may be used in an emergency but these will not have the life of the mercury units.

If the batteries are in good condition, the battery indicator lamp will glow when the recorder is turned on. If it does not light up, it indicates that the batteries should be changed.

The motor in the recorder is very small and is a DC motor with an integral electro-mechanical governor which holds the speed from 7 to 9.4 volts. Thus the batteries can fall off quite a bit before the speed will change.

Bearings in the unit are either jewel or oilite and no lubrication is required.

On the rear of the case is the accessory connecting block and the switch that is used when the unit is fed from a 12 volt car battery or 220/110 AC instead of its own batteries.

A number of accessory cords are available including a remote control cord with a push to talk switch. A similar cord is available for floor use when

transcribing from the recorder.

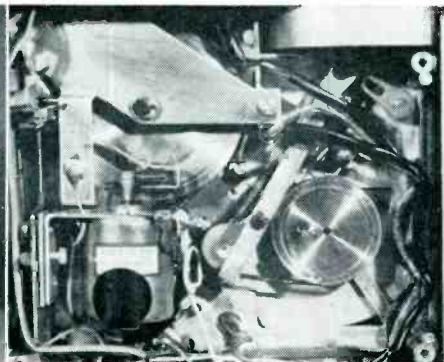
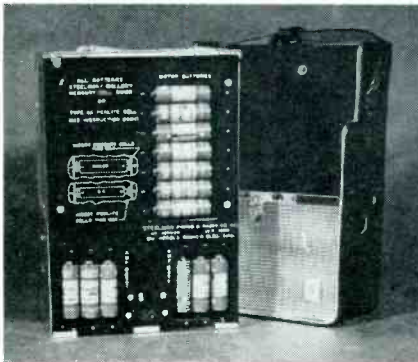
Also available is a 220/110 volt AC power source adapter and a 12 volt DC car battery adapter cable.

We found in using the unit that the recording level indicator indicates overload, as it states and it is better to record and not have it light at all. There is considerably less distortion.

The recorder is not "Hi-Fi" and is not sold as such. It does an excellent job on voice, a reasonable job on music at the $3\frac{3}{4}$ ips speed. Voice reproduction at the $1\frac{7}{8}$ speed is adequate.

Although the instruction book states that recordings may be made with the mike in its compartment, we had much better results taking the mike out as machine vibration, small as it is, also leaves its imprint on the tape.

If you are looking for a really portable machine to take on a trip, etc. we think it will pay you to look this one over. Its compact size and light weight are distinct assets and the fact that the tapes can either be played on a home machine or the Transitaape is a worthwhile feature.



Left: the battery compartment is revealed when the case is removed. The unit takes six Mallory MR-12R for the amplifier and seven for the motor. Penlite cells can be used in an emergency. Right: the drive mechanism of the recorder. The motor is at lower left with circular label on it.

NOW HEAR THIS . . .

. . . THE WORLD'S FIRST

TAPE BOOK®

**ALL ABOUT TAPE—
ON TAPE**

**Will give you the information
you need in sound, not in
the written word. A new
first in publishing history.**

. . . authored by Jack Bayha . . . a book to which you listen . . . the first book specifically designed and produced on tape instead of the printed page. . . Now you can actually HEAR what good recording, over-recording, wow, flutter, distortion, wrong mike placement, etc., sound like. A test section allows you to adjust the head of your recorder for best results. Chapters include: How a Tape Recorder Works, A Demonstrated Glossary, Recorder Operation, Home Recording, Field Recording, Low Impedance, Microphones, Recorder Maintenance and Testing. . . Playing time of the Tapebook is one hour. Accompanying each reel is a 28 page booklet containing 80 illustrations to supplement the spoken word. It is unique, enjoyable and instructive.

**7½ IPS, 7" Reel, Dual Track
\$6.95 postpaid**

**3¾ IPS, 5" Reel, Dual Track
\$5.95 postpaid**

**Including a 28 page manual of
illustrations**

**Ask your dealer
or order direct**

**TAPE BOOK DEPT.
MOONEY-ROWAN PUBLICATIONS
SEVERNA PARK, MD.**

We specialize in TRADE-INS — highest allowances — Ampex, Bell, Concertone, Crown, Ferrograph, Presto, Tandberg, Hi-Fi components, accessories. Catalog.

BOYNTON STUDIO
10 Pennsylvania Ave., Dept. TR
Tuckahoe, N. Y. Tel. SP. 9-5278

MAIL ORDER HI-FI
You can now purchase all your Hi-Fi from one reliable source and be assured of perfect delivery. Carston makes delivery from NY stock on most Hi-Fi Recorders and Tape within 24 hours. SEND US A LIST OF YOUR HI-FI REQUIREMENTS FOR OUR WHOLESALE QUOTATION and our FREE wholesale catalogue.

CARSTON STUDIOS
125-C East 88 St. New York 28, N. Y.

IF YOU ARE MOVING—
Please notify our Circulation Department a month in advance if possible. Thus you are assured of not missing a single issue. We have some useful, interesting articles coming which you will not want to overlook.

Hi-Fi Tape Recording
Severna Park, Md.

SHOP OR SWAP

Advertising in this section is open to both amateur and commercial ads. HI-FI 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, Hi-Fi Tape Recording Magazine, Severna Park, Md.

WANTED: FRIENDLY TAPESPENDENTS — Anyone, anywhere. Buzz a tape now to: C. Hooper Phillips, 8024 Chesterfield Drive, Knoxville 19, Tennessee.

WHEN PROMULGATING YOUR ESOTERIC cogitations or articulating your superficial sentimentalities and amicable philosophical and psychological observations, beware of platitudinous ponderosity . . . says Dave Goldin of 2 Wainright Ave., Yonkers 2, N. Y.—a robot with a recorder who would like to hear from you.

WANTED: TAPES OR DISCS of Balfe's operettas or songs. Bohemian Girl, etc. J. Lipman, 405 6th Ave., San Francisco, Calif.

SPLICE FREE TAPE. Professional quality 45/15,000 cps. Permanently lubricated. Money back guarantee. 7" boxed reels. Acetate 1200', 1 1/2 mil, 4/\$5.20; 1800', 1 mil, 4/\$6.75; Mylar 1800', 1 mil, 4/\$9.00; 2400', 1/2 mil, 4/\$13.00. Postage 15c per reel. Hi-Sonic, Box 86GG, New York 63, N. Y.

LEARN HYPNOTISM, SELF-HYPNOSIS from recorded tapes! Other helpful "Mind-Power" Tapes, Books, Recordings! Free Catalog. Write Philanthropic Library, Drawer TR697, Ruidoso, New Mexico.

FOR SALE: Berlant Model 33 stereo record and playback in cases. Excellent condition. Can't be told from new. \$700. Also, new Presto 1-D cutting head, \$135. Hickok Model 610A FM-TV signal generator, Hickok Model 195 scope. Fine shape. Will swap 610A and 195 for Telefunken U-47 mike. Cliff Juranis, 525 Buttonwood St., Reading, Pa.

DEMONSTRATION AND COMMERCIAL RECORDS from tapes. Music taken from tapes arranged and recorded. Write for prices. Five Star Music Masters, 93 Beacon Building, Boston.

FOR SALE—BELL STEREO tape transport, Model T213 including two RP 120's—\$195; Bell stereo amplifier, Model 3030—30 watts, \$124. Brand new in factory sealed carton with guarantee. Must sell—need cash. J. Wiese, 50-12 67th St., Woodside, L. I.

AMPEX STEREPHONIC SYSTEM, complete. New. Recorder, two matched amplifiers and speakers, \$575 complete or will sell components separately. Don McClain, 4110 Pennsylvania, Kansas City, Mo.

UNUSUAL VALUES: Hi-fi components, tapes and tape recorders. Send for package quotations. Stereo Center, 51 West 35th St., N. Y. C. 1.

SELL: Pentron T-90 "Pacemaker" tape recorder, new condition, \$75; Shure 737A microphone, \$15; Remington noiseless office typewriter, \$35; Approved A-800 preamplifier, \$15; Portable radio, \$10; Sperti sunlamp, \$10. V. R. Hein, 418 Gregory Street, Rockford, Illinois.

SEALED CARTONS: Madison-Fielding 320 stereo-amp, \$119; Bogen FM-50, \$61; RC-98/4L, \$47; Metzner 60, \$42; Ampex A121, \$366. Catalog free. HiFi, Roslyn, Pa.

SWAP—MAGNECORD monaural PT6J with PT-6A; Stereo PT6BAH with PT6BN; microphones; 8 inch speakers with baffles; McGowan amplifiers. Chardon Recording Co., Bell Road, Newbury, Ohio.

WANTED: Tape or disc of "Danse du Ventre" Polka. Write price and details. Paul Gillette, 17161 Riley St., Holland, Michigan.

RECORD CUTTING for every occasion from your tape to unbreakable disc—weddings, socials, lectures, schools. Free information. Albergo Recording Studio, 121-18 Rockaway Blvd., South Ozone Park 20, N. Y.

USED RECORDING TAPE (used exactly once) each reel: 1200' x 7" dia. bears famous Audio-tape name. 6 reels \$7.95; 12 reels \$15.50; priced FOB, Bradley, Box 62, Evanston, Illinois.

LEARN WHILE YOU SLEEP. Improve Memory, Personality, Learn Languages, Erase Tension, Stop Smoking, Lose Weight . . . without drugs. Free details. ASR Foundation, Dept. HT1, Box 21, Henry Clay Sta., Lexington, Ky.

WOULD YOU LIKE TO LEARN

WITH YOUR TAPE RECORDER?

The tape recorder opens the door to many subjects that can be done through home study. For the first time, it is possible for the teacher to talk directly to the student, to hear his lessons and to make corrections and criticisms. Instead of correspondence, tapespondence will be used.

In an endeavor to find the areas of greatest interest to tape recorder owners, we have printed the coupon below. The few suggestions are ours. You will doubtless have other and better ones. Will you take a minute of your time to think about this and then jot down your areas of interest. Thanks.

MAIL THIS COUPON

TAPE RECORDING SEVERNA PARK, MD.

Gentlemen:

I would like to see courses made available as checked at right

Name

Address

City Zone State

- Russian
- French
- Public Speaking
- Music Appreciation
- Other

FOR YOUR AUDIO BOOKSHELF



YOUR TAPE RECORDER

by Robert and Mary Marshall

This is the first book for nonprofessional users and includes the photographs and specifications of 55 recorders as a guide to selecting the proper machine for various uses. The book does not deal with technicalities. It was written after some 2500 experiments had been conducted, using recorders in the fields of education, camps, meetings, business and the home. Part of the book is devoted to an explanation of hi-fi principles and terminology.

5 3/8" x 8", cloth bound, 288 pp. Illustrated.

\$4.95

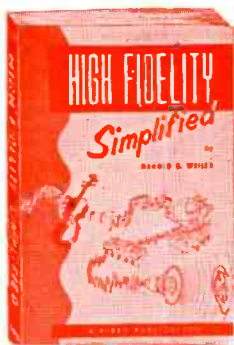
TAPE RECORDERS AND TAPE RECORDING

by Harold D. Weiler

The latest book by the well known author of "Hi-Fi Simplified" which has sold over 65,000 copies. Written so that anyone can understand it the book covers Room Acoustics; Microphone Techniques; Recording From Records; Radio and TV; Sound Effects; Tape Recorder Maintenance; and Adding Sound to Slides and Movies. Over 100 illustrations and diagrams in 13 chapters of practical down-to-earth suggestions make this book the beginners bible.

5 1/2" x 8 1/4" — 190 pages — illustrated — paper bound.....

\$2.95



HIGH FIDELITY SIMPLIFIED

by Harold D. Weiler

This book has sold more than 65,000 copies and is one of the most popular books on the subject. It covers the How, What, Why and Where of Hi-Fi, Sound, Acoustics, The Simple Loudspeaker, The High-Fidelity Loudspeaker, Loudspeaker Enclosures, The Basic Amplifier, The Amplifier, The Record Player, Tuners, Use of a Home Music System, and Tape Recorders. It is illustrated with numerous drawings, charts and pictures. While authoritative, it is written in an easy-to-read style.

5 1/2" x 8 1/2", paper bound, 208 pp. Illustrated.

\$2.50

HOW TO MAKE GOOD TAPE RECORDINGS

by C. J. Le Bel, Vice President Audio Devices, Inc.

A complete handbook of tape recording containing 150 pages of up-to-the-minute information of practical value to every tape recordist. Easy reading for the most inexperienced of home recordists.

Sections include: How A Tape Recorder Works, Characteristics of a Tape Recorder, Selecting A Tape Recorder, Selecting A Recording Tape, Using the Tape Recorder, Making A Microphone Recording, Acoustically Treating the Studio, Tape Editing, Binaural or Stereophonic Recording, Putting Together A Recording Show, and a Glossary of Tape Recording Terms.

5 1/4" x 8", 150 pp., paper bound, illustrated

\$1.50

TAPE RECORDERS—HOW THEY WORK

by Charles G. Westcott and Richard F. Dubbe

This book is based on the principle that to get the most from a recorder, one must first understand thoroughly how it operates. It contains diagrams and schematics and explains in not too technical language "what's under the cover" of a re-orderer.

5 1/2" x 8 1/2", 177 pp., paper bound, illustrated

\$2.75

TECHNIQUES OF MAGNETIC RECORDING

by Joel Tall

This book translates the complexities of a science into practical, easy-to-follow techniques. It is a book for the professional who wants new ideas, new standards of excellence, and a book for the amateur just introduced to magnetic recording. Beginning with a description of Poulsen's invention of magnetic recording, the author presents a condensed history of developments since 1900. Then he treats the many problems that arise in magnetic recording. Individual chapters are devoted to recording in such areas as medicine, education, and public entertainment and advertising. The inclusion of descriptions written by the originators of various techniques, extensive quotation from the laboratory notes of pioneers, an extensive glossary, and a comprehensive bibliography make this book invaluable to the amateur and to the professional.

8 1/2" x 5 1/2", 472 pp., cloth bound, illustrated

\$7.95

BASIC ELECTRICITY

by Van Valkenburgh, Nooger and Neville, Inc.

These five volumes, and the five listed below on Basic Electronics are the texts of those subjects as currently taught at Navy Specialty Schools. They are simplified, clearly illustrated and one basic concept is explained at a time without the use of complicated mathematics.

Vol. 1—Where Electricity Comes From, Electricity in Action, Current Flow, Voltage and Resistance, Magnetism, DC Meters. Vol. 2—DC Circuits, Ohm's and Kirchoff's Laws, Electric Power. Vol. 3—Alternating Current, AC Resistance, Capacitance and Inductance, Reactance, AC Meters. Vol. 4—Impedance, AC Circuits, Resonance, Transformers. Vol. 5—DC Generators and Motors, Alternators.

BASIC ELECTRONICS

Vol. 1—Introduction to Electronics, Diode Vacuum Tubes, Dry Metal Rectifiers, Power Supplies, Filters, Voltage Regulators. Vol. 2—Introduction to Amplifiers, Triode Tubes, Tetrodes and Pentodes, Audio Voltage and Power Amplifiers. Vol. 3—Video Amplifiers, RF Amplifiers, Oscillators. Vol. 4—Transmitters, Transmission Lines & Antennas, CW Transmission and Amplitude Modulation. Vol. 5—Receiver Antennas, Detectors and Mixers, TRF Receivers, Superhets.

6" x 9", 128 pp. Each Volume \$2.25.

\$10.00

Complete set, 5 volumes

BOOK DEPARTMENT

HI-FI TAPE RECORDING MAGAZINE

Severna Park, Md.

Please ship immediately the books checked.

I enclose

NAME

ADDRESS

CITY..... ZONE..... STATE.....

All books shipped postpaid from stock same day order is received. If not satisfied return books within 5 days and money will be refunded.

- Tape Recorders and Tape Recording
- Techniques of Magnetic Recording
- How To Make Good Tape Recordings
- Tape Recorders—How They Work
- High Fidelity Simplified
- Your Tape Recorder
- Basic Electricity Vols. Set
- Basic Electronics Vols. Set



James Kelly, author of best seller, "The Insider", recording a priceless moment with his daughter, Jill.

When there's one priceless moment

DEPEND ON ACETATE BASE TAPE

When you are the recording engineer, don't let the tape come between you and perfect results. Always use the tape with an *acetate* base.

Why is *acetate* better?

Acetate base tapes resist stretching—even under strong rewind tension. Tape that stretches can cause wows. Tape that is too thin causes "print throughs" that show up as annoying echoes and ghosts on the playback. *Acetate* has unusually long life expectancy . . . gives tapes lasting performance quality.

Leading producers of high fidelity monaural and stereophonic recordings use *acetate* base tapes. Give your own library of recordings the same high quality advantages.

And remember, *acetate* based tapes are more economical, too!

Acetate film for recording tape base is produced by Celanese for conversion by all leading tape manufacturers. Look for the name *acetate* on each box of tape you buy, or check with your dealer.

Celanese®

Acetate... a *Celanese* plastic film

CELANESE CORPORATION OF AMERICA, PLASTICS DIVISION, DEPT. 160-G, 744 BROAD STREET, NEWARK 2, N. J.

Canadian Affiliate: Canadian Chemical Company Limited, Montreal, Toronto, Vancouver

Export Sales: Ancel Co., Inc., and Pan Ancel Co., Inc., 180 Madison Avenue, N. Y. 16