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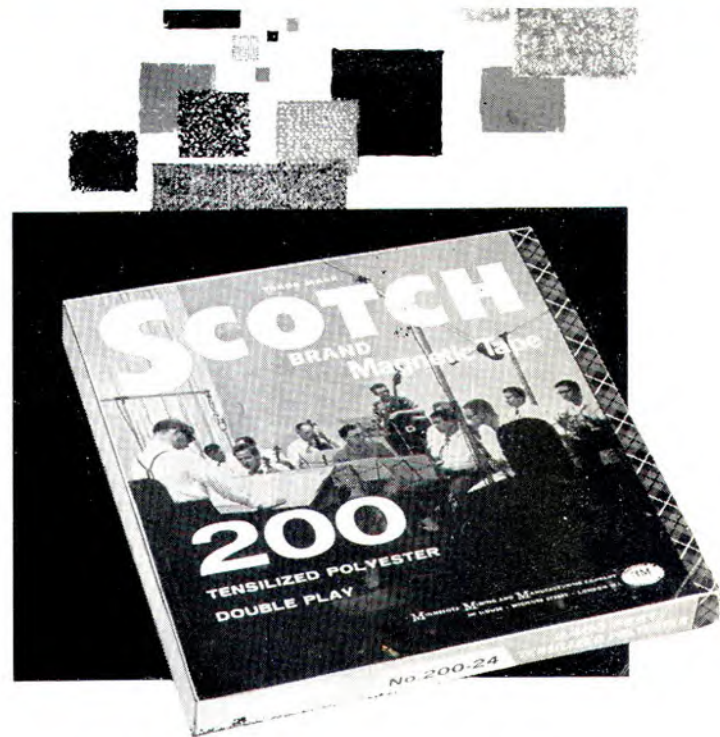
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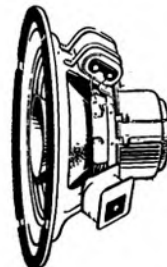
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SP. 4

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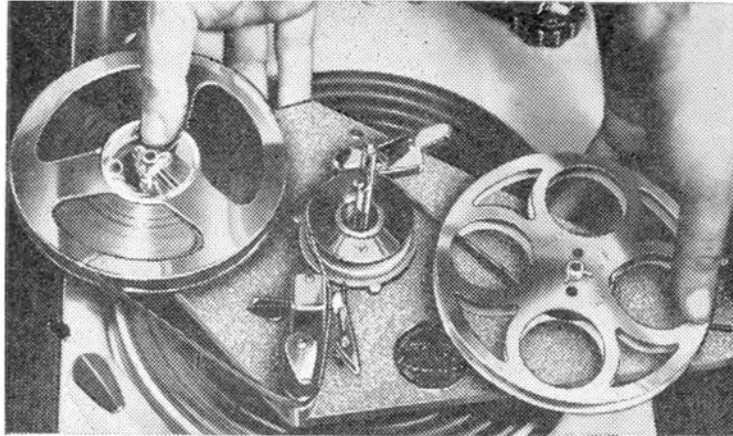
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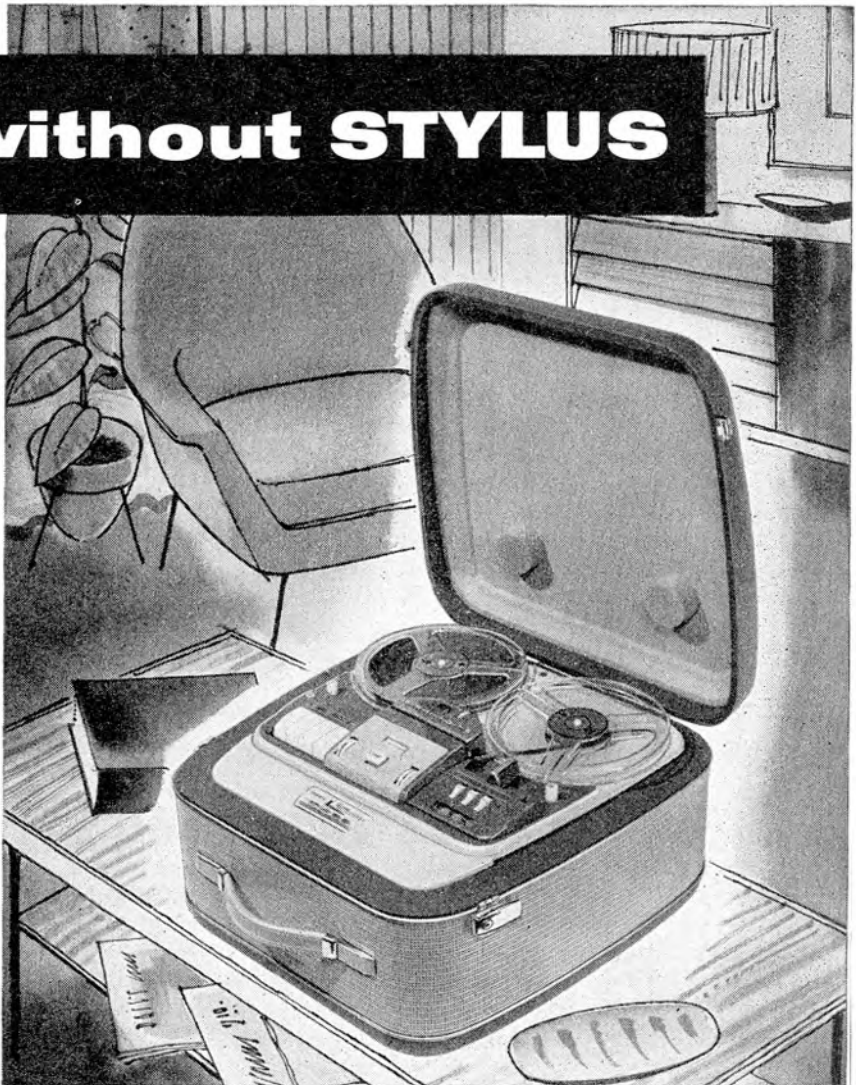
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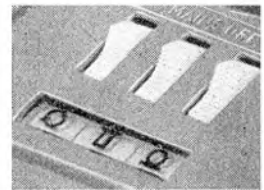
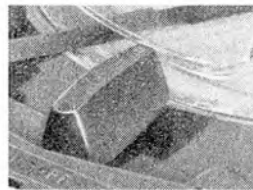
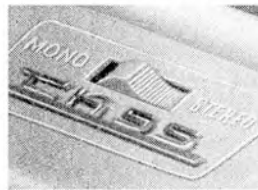
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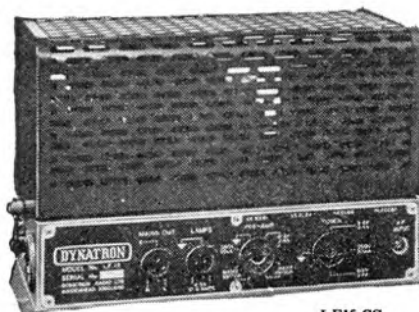
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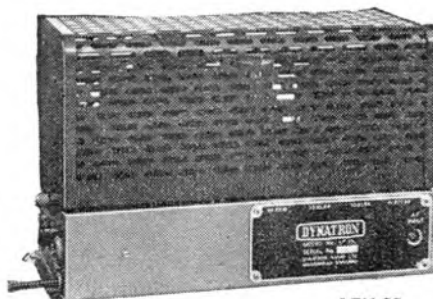
STEREO

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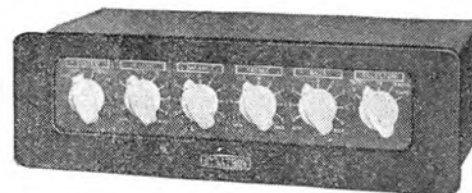


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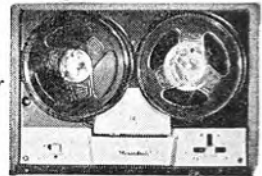
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S U P P L E M E N T

THE CLASSICS



by **Edward Greenfield**

(recorded music critic of *The Guardian*)

ONE of the more incomprehensible habits of the recording companies in this country is that British artists are often shamefully neglected. I can think of few violinists worthier of recording than Alan Loveday, yet it has been left to Saga, a comparative newcomer in the recording field to give us recordings of him and to allow us in the cold test of playing records side by side to estimate in the most calculating way of all just how he measures up to some of the world's great virtuosi.

Last year among the first Saga tapes I praised highly Alan Loveday's interpretation of the Beethoven Violin Concerto, which I felt had a breadth and spontaneity rare in any recorded performance. Now in his second Saga issue comes an interpretation of the last of Bach's six sonatas for solo violin which I am sure will prove riveting even for those who do not normally like chamber music or even like Bach. These solo sonatas are perhaps the most demanding violin music ever written. Without the support of another instrument the tone of a violin can easily pall, and though Bach's musical arguments are as weighty as any he ever conceived it takes a master violinist to hold each work together with the full concentration needed. The technical difficulties with double, triple and even quadruple stopping are formidable and a lesser player can easily get bogged down in them so that the whole work seems a collection of isolated parts.

There is an absurd confusion of nomenclature in these works. Bach wrote six of them, but for some incomprehensible reason the old tradition was to call the first, third and fifth "sonatas" and the second, fourth and sixth "partitas." I prefer to number them all together and call this last sonata in E major No. 6, but equally often you will find it called Partita No. 3.

There is virtually no distinction musically here between a sonata and a partita, but the point does underline the fact that to Bach a sonata was on the face of it a freer form than it became several decades later with Mozart and Haydn. This last one in E major has six movements beginning with a Prelude and continuing with a series of dance movements just as Bach's suites do (in fact when Bach wrote a set of precisely similar works for solo cello he did call them suites and not sonatas or partitas—such is the confusion of musical terminology). After the prelude there is first a Loure, a slow stately dance, then a Gavotte—the most popular movement in the work—a Minuet, a

(Continued on page 13)

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The recording head of any Tape Recorder tends to become magnetised in use. Small at first but gradually building up, this residual magnetism can seriously affect the quality of your recordings by progressively increasing the hiss level. It can also impart a noisy background—which can never be removed—to any pre-recorded Tape at the first time of playing.

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(Continued from page 11)

Bourrée and finally—as in most Bach suites—a Gigue (after the English Jig) in 6/8 time.

Loveday plays with a command both technical and interpretative that few violinists today convey on records. Two who have on records displayed a similar sense of command in this work are Heifetz and the Hungarian violinist, Johanna Martzy. After being thrilled by Loveday's playing at the first hearing I made a point of comparing the three interpretations side by side. This, as I have said, is the most searching test that any performance can undergo. An interpretation can often pass the test of cohesion as an individual expression, but be seen to be markedly inferior to another when the parts are put side by side. After my initial hearing it did not surprise me, however, when Loveday's performance matched and even surpassed the other two.

Heifetz, of course, is by far the most dazzling technician of the three. His speeds, except for the final Gigue, are consistently faster than those chosen by the other two, yet his double stopping is crisper, firmer as though it were put together after two "takes." Technically the whole performance is breathtaking and there is an overall strength which grips one. Yet I have to admit there is a lack of warmth which these sonatas, intellectual as they are, certainly demand. Martzy provides such warmth. She has a fairly wide vibrato, yet the effect is warm rather than simply soupy and over-romantic. In this country at least she was comparatively little known when she made the recording, and she spent considerably more trouble over the recording sessions than many a more eminent violinist might have done. In many ways then an even more satisfying performance than Heifetz's.

★

But it is Loveday's that I would choose in the last resort in preference to either. He has just as rich a tone as Martzy, yet one does not even notice the vibrato at all—a sure sign of complete control. In other words there is purity as well as richness—the rarest combination. In the Loure Loveday chooses a fastish speed like Heifetz, remembering that though slow and stately this is also a dance. In the other movements he is not afraid to choose a basic speed slower than either of his rivals and in the Gavotte and the Gigue for example, this allows more natural spring in the music and greater delicacy of shading too. This never deteriorates into mere pulling about in the way that I for one find distracting in the performances of, say, Menuhin.

I could go on further but space forbids. The recording is outstanding with the catch of the bow on the strings clearly caught. The recording of the Bach E major concerto on the reverse is also outstanding.

The orchestra as in the Beethoven concerto is the Royal Danish under George Hurst and the recording engineer was again Allen Stagg of I.B.C. Unfortunately the orchestra was not on its finest form. So in the slow movement while Loveday plays the lovely cantilena with exquisite feeling the cellos—so important here—are very variable in their intonation. Even so this is not enough to make any difference at all to a firm recommendation for

(Continued on page 15)

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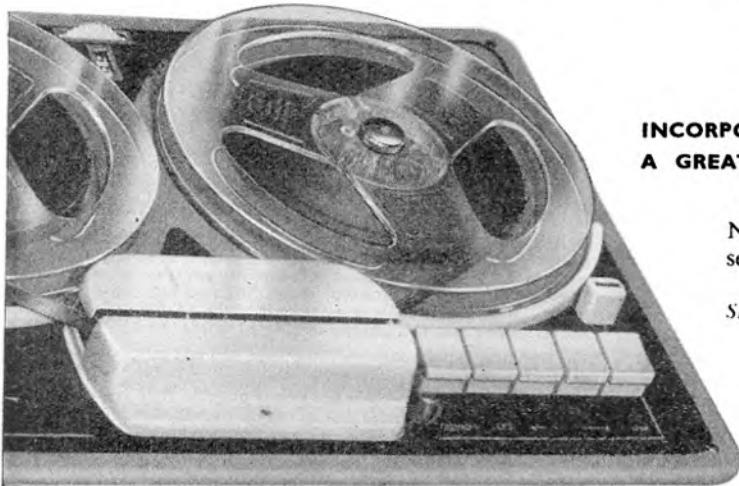
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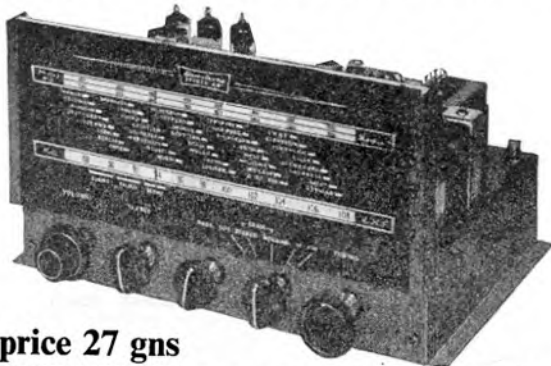
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(Continued from page 13)

this tape. I have spent the whole of this month's article on it because it is an outstanding issue, and one which I think many tape enthusiasts not normally interested in recorded tape will find attractive. Saga has managed to squeeze both works on to one of its 600 foot tapes at 35s. (STA 7014.)

BEAT AND OFF-BEAT



by Don Wedge

(of "New Musical Express")

JACK PAYNE is a name known to everyone, young or old. A pioneer of radio, he has adapted himself to the modern needs of television. He has also produced one of the finest albums yet to come from British studios—Jack Payne Presents "Say It With Music" (HMV HTD 821).

The title is significantly worded. Payne, always a forthright man, has not been happy with the way so many recording, radio and television studio leaders are billed "So-and-so and his Orchestra."

Too frequently the personnel of one orchestra is virtually the same as the others. A small, very affluent coterie of highly-skilled musicians, known as "session men," have cornered the market and just move from one studio to another to play under different conductors.

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When Jack Payne was asked to return to the recording studios to conduct again after an absence of more than a decade, one of the conditions Payne made was that it would not appear as though the orchestra belonged to him.

The session men chosen for the record included several known as soloists or leaders themselves—Alec Firman, Anthony Pini, Jock Bain, Bert Weedon, Charles Katz, Bernard Monshin and Louis Voss among them.

Payne's arrangers were Dick Barrell, Brian Fahey and one of the outstanding recording leaders of today, Tony Osborne.

The tunes were picked with outstanding care, most of them with associations for Payne. "Say It With Music" is his signature tune; "Love Is the Sweetest Thing" was written by Ray Noble for him to sing in a film; he was part composer of "Blue Pacific Moonlight."

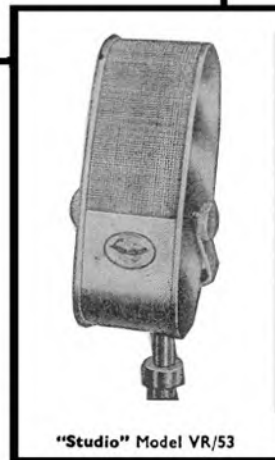
The other numbers were also played by Payne's pre-war and war-time bands—"Just One More Chance," "I'm In

(Continued on page 17)

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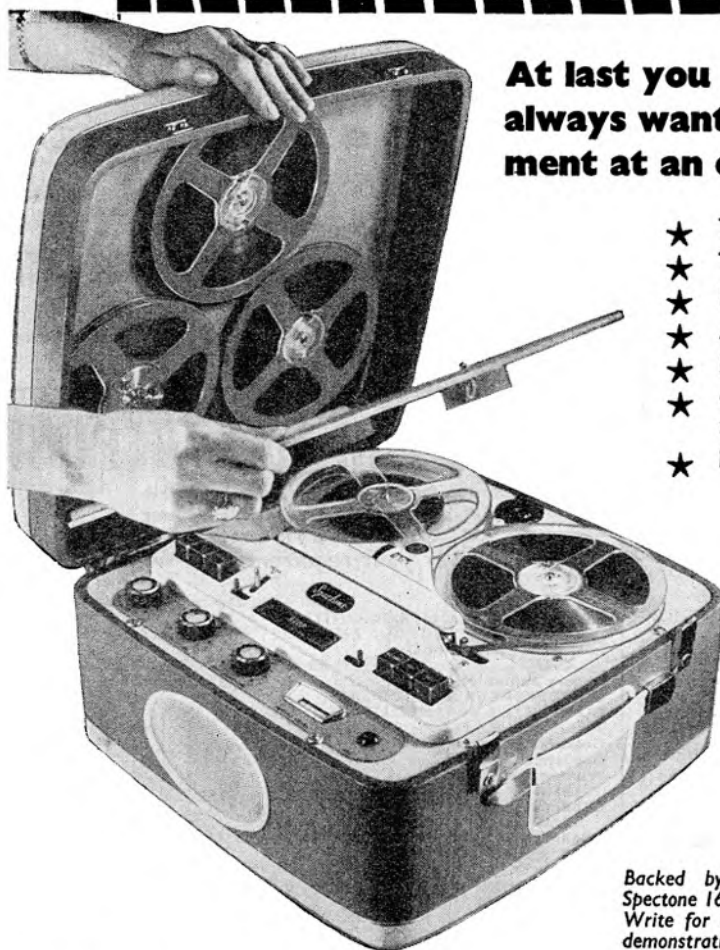
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(Continued from page 15)

the Mood For Love," "Love In Bloom" and "I Surrender, Dear" among them.

For this record, Payne was looking for outstanding songs that had not been over-recorded, yet were still well known. He succeeded.

Inevitably with such an intention the numbers have a nostalgic air. But the treatment is completely modern and far from dated.

* * *

Another master of album music is George Melachrino. He has won such a following in the United States that he now records for an American company, RCA-Victor, although his sessions still take place in London.

Previously he was under contract to HMV and some of his work for them is available on tape. **Soft Lights and Sweet Music** (HTD 803) being one of them.

George records with two combinations, the Melachrino Strings and an orchestra featuring woodwind and brass, too. It is the strings that are featured on this tape, and there are two featured piano solos by Semprini.

The album has an apt title. It comprises sweet music played as softly and, usually as slowly as is decent. Really dreamy stuff, ideal for relaxation.

Most of the numbers are standards—the title tune, "The Touch of Your Lips," "Love Walked In" are three—but Semprini's two features are from film scores. One of them, the theme from "The Story of Three Loves," has a long lineage. The piece is really one of Rachmaninoff's variations on a theme by Paganini!

However, both this and Semprini's other feature, the theme from "The Last Rhapsody," merge into the mood created by Melachrino.

* * *

Ray Martin is another musician who exported his records to America and now has a contract direct with a United States firm. Not only that, he saw such a bright future there that he emigrated.

Martin gave up his position as artist and repertoire manager of Columbia, a job he shared with Norrie Paramor, who continues alone. In addition to his managerial responsibilities, Martin also recorded for his label as an orchestra leader.

Both he and Norrie Paramor combined for one album, available on tape, **Latin Nights** (CDT 860). It is rather heavier stuff than Melachrino's. Though still restrained, the use of fairly unusual rhythms creates a more fluctuating mood.

A wider range of instrumentation emphasises this effect. Use of accordion and organ is particularly noticeable. There is a nice balance of new and old tunes which also adds to the listening pleasure.

"Jealousy" and the traditional "Two Guitars" seem to complement "Mambo In the Moonlight" and "I Speak to the Stars," hit parade items of not very long ago.

The two conductors alternate on the various tracks. I can't help wondering if they were using the same orchestra. Certainly the general sound is the same. It raises the question whether any record album should set out to sustain a mood or be one of variety.

Both types seem to enjoy success as far as discs are concerned, but those who issue pop music on tape have to take into account that a lot of it is bought for commercial use. This particularly applies to orchestral records, which generally tend to sustain a chosen mood.

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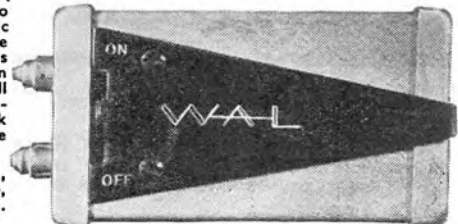
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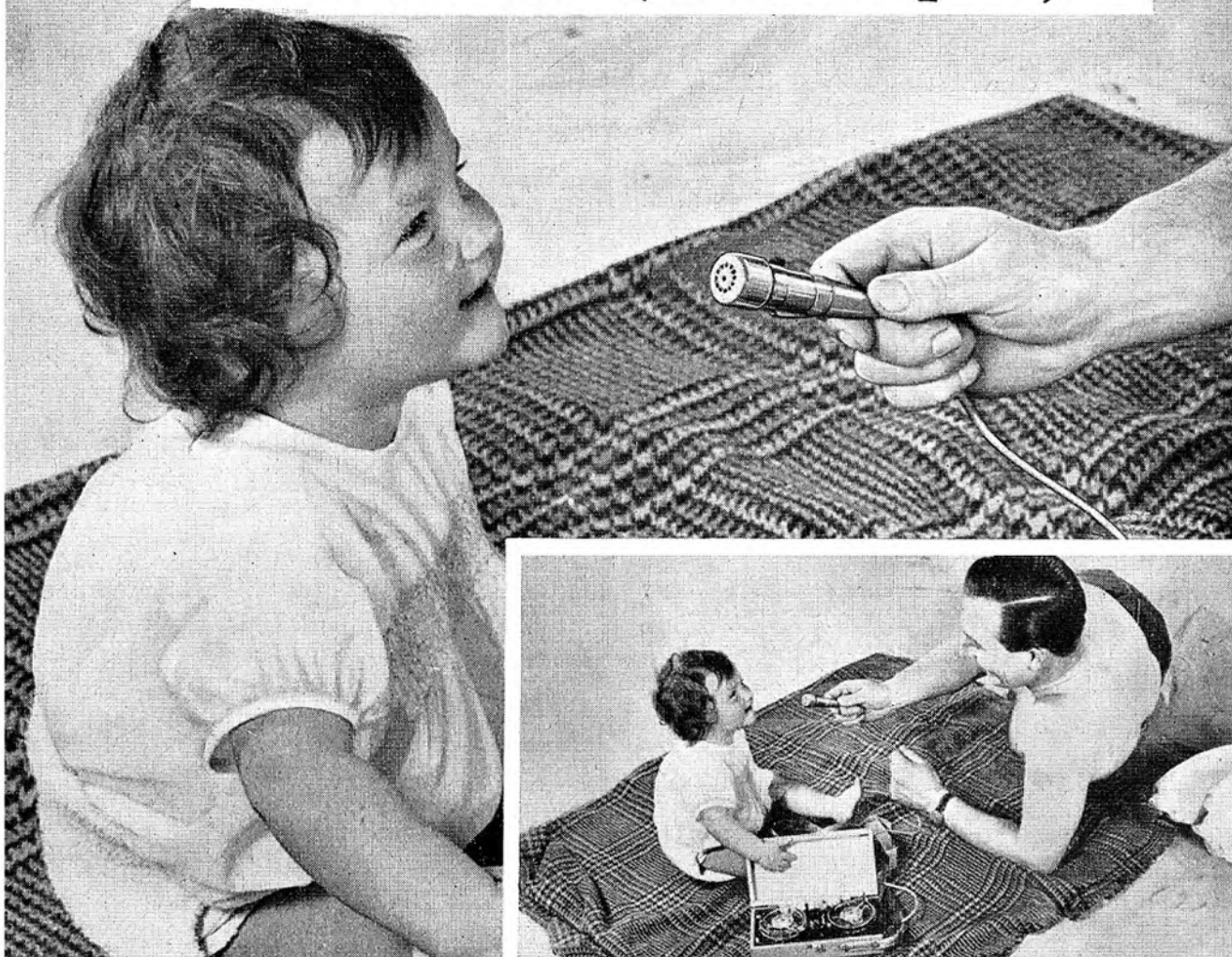
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EDITOR: **R. D. BROWN**

TECHNICAL ADVISORY EDITOR: **CHARLES LANGTON**,
A.M.Brit.I.R.E., A.M.Inst.E.

TECHNICAL ADVISORS: **ANGUS MCKENZIE**
F. C. JUDD, A.M.Inst.E.

STEREO: **DOUGLAS GARDNER**
Editor of Stereo Sound and Music Magazine

MUSIC: **EDWARD GREENFIELD**
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DON WEDGE
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THE story of Phoenix Productions—an amateur tape group which has been operating in Australia for several years—really starts in England. In 1947 Mr. C. L. Appleby, its Director and a founder member of the British Sound Recording Association, formed a small organisation calling itself the "Microphone Players" in Brighton, Sussex, with the object of writing, performing and recording radio drama by keen amateurs.

At this time, before the popularity of tape recorders, all work had to be done direct on to disc, with its obvious limitations of high expense and short playing time. Finance limited the work done and, having no positive outlet for productions, enthusiasm waned and the idea was temporarily shelved.

In 1952, Mr. Appleby emigrated to Australia and it wasn't long before the idea of an Australian version of the "Microphone Players" began to take shape.

Wider Scope

The Australian Broadcasting Commission's two stations, and four other independent commercial stations in Brisbane, seemed to offer wider scope for an outlet for their efforts than was ever possible in England.

A few other English migrants and a small band of enthusiastic Australians got together to form Phoenix Productions. Two small rooms were acquired for the studio—one room for the technical equipment and the other for the studio itself. A hole was knocked in the dividing wall and a plate glass panel inserted.

A second-hand tape recorder was bought and re-built. Two old "78" turntables and pick-ups were next obtained and a mixer for two mikes and two turntables designed. A modernistic desk was made from scraps of timber. Curtains and floor-covering were turned out of junk rooms and, finally, a fairly presentable replica of a broadcasting studio came into being.

The available talent in script-writers, artists and technicians encouraged the tackling of many phases of radio entertainment—drama, short stories, interviewing, burlesques, panel games, etc., but a disappointing setback was encountered.

Australian radio does not take kindly



to amateurs trespassing on their sacred soil unless used as a "gimmick" in commercial exploitation. But still the work went on.

Closed Circuit

Amateur writers could hear their work performed on a "closed circuit" and were enabled to pick out their faults in writing for the ear rather than the eye. Actors and actresses were able to develop their mike technique and characterisations. Producers learnt the art of using the musical bridge, and what "effects" to leave out.

Some of the writers now found that their work was beginning to be accepted with encouraging frequency by professional radio. Several actors and actresses passed auditions for A.B.C. drama roles on the strength of experience gained in the Phoenix Studio.

Unfortunately, one or two of the successful ones deserted to become full-time

radio personalities. Those who remain still seek an outlet for much hard work and thought. The possibility of an exchange of tapes with similar groups or individuals in the old country, and of entering the British and International tape recording contests, has given a new thrill to Phoenix activities and a very definite incentive to perfect, rather than just to experiment.

Links Wanted

An attempt was made to contact similar clubs throughout the Commonwealth of Australia by means of editorial Press mentions, but without success. The Press were not really interested and the lack of response made it obvious that Phoenix was the only club of its kind in Australia.

So if any British Club is interested in communicating with a Club from "down under" they should contact C. L. Appleby, 149 Sirius Street, Coorparoo, Brisbane, Queensland.

We take the view .

A DIGEST OF NEWS, COMMENT AND EDITORIAL OPINION

MMARGUERITE CUT-FORTH, producer of the B.B.C. "Sound" programme for recording and hi-fi enthusiasts, tells me that it is to be heard in future on Sunday afternoons. Obviously, this is going to be a better listening time than previously, and the programme should gain a lot of new admirers.

"Sound" returns to the air on Sunday, September 27; incidentally, I shall not be surprised if you hear in the first programme something about our third British Amateur Tape Recording Contest. At the time of writing, the winning tapes are being studied at Broadcasting House.

During its trial run earlier in the year, "Sound" was transmitted in the Network Three programme on Monday evenings. It will still be heard at that time, too. There will be a new programme every fortnight, first heard at 3 p.m. on a Sunday afternoon, then repeated at 6.40 p.m. on the Monday eight days later.

The improvement is made possible by a bold piece of B.B.C. re-thinking on Network Three and its admittedly minority audience. In future we are to get afternoon programmes at weekends, in addition to the evening transmissions.

Every Saturday afternoon from October 3 there will be two hours of uninterrupted "music of the masters"—a symphony concert, with a recital fitted into the interval.

Continental Visitors

SSOME of the men who have presided over the tape recording revolution on the Continent will be in London at the end of next month for the annual congress of the International Federation of "Chasseurs de Son." Already, I have heard from friends in France, Holland and Switzerland who will be here. Others are expected from Belgium, Germany, Italy and Scandinavia.

We are planning a reception in London at which the visitors will be able to meet their British opposite numbers, including representatives of the clubs, the B.B.C., and the industry.

The judges in the recent British Contest hope to be present and one of them, Douglas Cleverdon, will know by then how he has fared in the most exacting contest of them all—that for the International Italia Prize, which professional radio producers regard as a badge of outstanding skill.

Mr. Cleverdon's productions have ten times been selected as B.B.C. entries for the Prize; three of them have received awards.

This time his production of Bill Naughton's "June Evening"—heard

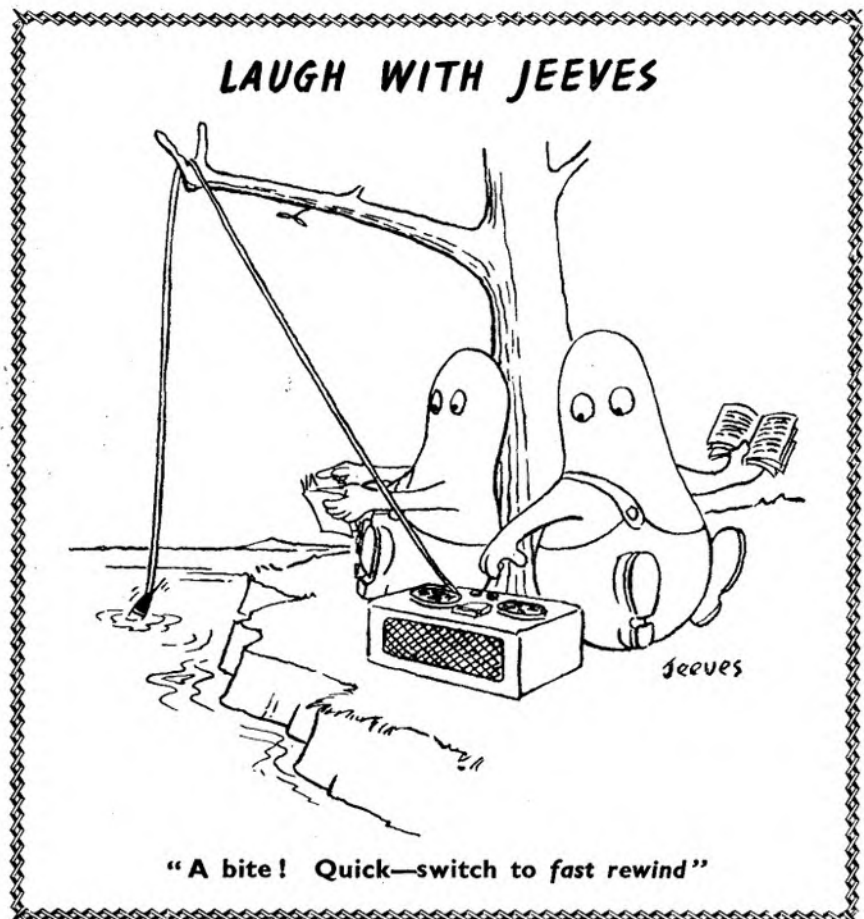
on the Third on July 29 last year—has been submitted.

No Joke

JJO DOUGLAS was seen going around the Radio Show appealing to her friends to supply her with a joke about tape recording for use in her speech at the recent Emitape lunch at the Savoy.

It was a delightful speech when she made it—but she failed to find a tape joke.

Perhaps our readers can oblige. A five-inch reel of tape will be sent to whoever sends the best joke about tape recording, in time for publication in our next issue.



British Amateur Tape Recording Contest 1959

Nightingale's midnight song makes Tape of the Year

MR. A. ACLAND, winner of the Emitape Challenge Cup, the Wyndsor Gold Medal and a ten-guinea cheque for his recording of Kentish nightingales, had every right to look pleased (see right) when he came to London to be hailed as the producer of The Tape of the Year.

Mr. Acland, who is 58, has been recording for only seven months. His four-minute tape, made on a Stuzzi Magnette battery portable, was recorded at midnight as he knelt deep in a wood beside the converted Nissen hut in which he lives.

It was only his second attempt at recording the nightingales. It came off brilliantly. A few feet of tape was shed from the end, but otherwise no editing was called for.

And the judges commented: "A first-rate recording. . . . Not a very ambitious subject, perhaps, but the programme carries out perfectly what it attempts to do."

* * *

It may not have been quite as simple as it seems at first. Mr. Acland's father had a life-time of experience with song-birds, and he has inherited the interest.

Two other winners came to London for the Emitape Luncheon at the Savoy



Hotel and to visit the Radio Show afterwards.

Mr. D. E. Harrison, 32-year-old librarian from Leeds, entered a humorous composition that tickled the judges' fancy—a satire on travelogues.

Mr. Richard Margoschis, of Ather-

stone, a 38-year-old Health Inspector, recorded an old country traditional ceremony.

Another winner was unable to be present—Mr. Harry L. Ayers, a 44-year-old Dundee industrial chemist, who, unfortunately, was indisposed.

The Dundee Club, however, won the Club Section of the Contest and Mr. Leonard Douglas, who flew down to represent it, was able to represent Mr. Ayers as well.

* * *

Apart from the actual winners, there were many exceptionally good tapes submitted. Though the total number was not much up on the previous year, the judges unanimously agreed that their quality showed a marked improvement. Many were of near-professional standard.

In the Documentary Section, Mr. Kenneth Blake, of London, submitted a feature on radio-taxis, which was considered so good that the judges split the ten-guineas prize in this class, awarded six guineas to Mr. Margoschis and four guineas to Mr. Blake. In this same section, Mr. B. W. Harley, of Birmingham, winner of the Tape of the Year title in the two previous contests, produced a highly-commended effort called "Chainmakers of the Black Country."

Another of last year's prize-winners who scored a "near miss" this time was Nigel Rees, whose ingenious and imagina-



WINNERS AT THE SAVOY: Left to right, Mr. Leonard Douglas, representing the Dundee Tape Recording Club and Mr. Harry Ayers; Mr. D. E. Harrison, of Leeds; Mrs. H. A. Lewis; Mr. A. Acland, of Walderslade, Kent; Mr. Douglas W. Gardner and Miss Jo Douglas, two of the Judges; Mr. H. A. Lewis, Managing Director of E.M.I. Sales and Services Ltd.; and Mr. R. A. Margoschis, of Atherstone



EMITAPE LUNCHEON: Some of the winners, judges, E.M.I. representatives and guests seen at the Emitape luncheon at the Savoy

tive entry called "All about tripe on tape" was highly commended. So was Mr. R. K. Trotter's "Found in the morning."

In the Music Section, Mr. Richard Williams was highly commended for "Bach—Gloria," an ambitious attempt to record chorus and orchestra.

Other commendations went to Mr. Norman Paul, for "Dover Beach," a recording of Tennyson's poem against a background of waves on a shore, and to Mr. R. L. Armstrong, for "L'eau concrete," an attempt at music concrete based on water sounds.

* * *

Those who may have hesitated to enter for fear that they lacked sufficient experience will be interested to know that two of the four sectional winners had had only six or seven months' experience—Mr. Acland and Mr. Harrison.

* * *

Some competitors used ambitious equipment. Mr. Margoschis, for example, used Bradmatic and Brenell decks, C.J.R. and home-built amplifiers, a home-built mixer, a Bib splicer and a Reslo microphone.

Mr. Acland, on the other hand, went out with his Stuzzi, with the microphone and the tape that came with it, and made The Tape of the Year.

There was contrast, too, in the amount of work put in after the actual recording.

JO JOKES: Miss Jo Douglas, speaking for the guests, was in lively and witty form. Beside her, Mr. J. Wooller, of the E.M.I. Recording Materials Division, laughs at one of her jokes

THE WINNERS

The Tape of the Year

"Just a Song at Midnight," a recording of nightingales in a Kentish wood, by A. Acland, Esq., of "Berkeley," Boxley Road, Walderslade, near Chatham, Kent.

Section 1—Compositions

"In Search of Bunjistan," a satire on travelogues, by D. E. Harrison, Esq., of 3, Garth Road, Leeds, 17.

Section 2—Documentary

"Lane Setting," reporting a country tradition, by Richard A. Margoschis, Esq., of 14, Victoria Road, Mancetter, Atherstone, Warwicks.

Section 3—Music or Speech

"Second Fiddle," a recording of organ and violin, by Harry L. Ayers, Esq., of 88, Clement Park Road, Dundee, Scotland.

Section 4—Actuality

"Just a Song at Midnight," by A. Acland, Esq. (see above).

THE CLUB SECTION was won by a documentary tape on the jute industry entered by the Dundee Tape Recording Club.



Mr. Nigel Rees reported that he had made 145 splices in editing his tape.

Obviously, there are no set rules. Any one with the interest to make a real effort stands a genuine chance of being among the winners.

For those who came to London for the presentation of prizes there were plenty of excitements. First the Emitape Luncheon at the Savoy, which Messrs. E.M.I. Sales and Service Ltd. have now established as a red letter day in the tape recording year.

* * *

This year, for the first time, the event was honoured by the attendance of Mr. H. A. Lewis, the managing director of the firm, and his wife charmingly presented the Challenge Cup to Mr. Acland.

Afterwards, the party moved on to the Radio Show at Earls Court. On the

(Continued on page 27)

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- * Because of its specially developed, extremely flexible LUVITHERM base, BASF tape ensures intimate contact with the recording head, enabling it to register and reproduce the full recording range of frequencies with unmatched fidelity.
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THE PRESENTATIONS: On the left, Jo Douglas with Mr. H. M. Creek, Managing Director of Wyndor Recording Co., is seen presenting the Wyndor Gold Medal to Mr. Acland on "Tape Recording Magazine" stand at the Radio Show

(Continued from page 25)

Tape Recording and Hi-Fi Magazine stand in the Audio Hall Jo Douglas presented the remaining prizes. Mr. H. M. Creek, Managing Director of Wyndor Recording Co., was there for the presentation of the Wyndor Gold Medal, which his firm has presented.

Mr. Acland went off to the TV studios. First, the independent Tyne-Tees concern interviewed him on closed-circuit television, while the thousands of visitors watching sets on the various manufacturers' stands looked in.

Later, Jo Douglas interviewed Mr. Acland for the B.B.C., and this was transmitted "live" the following day.

The tapes submitted by Messrs. Acland, Harrison, Margoschis, Ayers and Kenneth Blake will now automatically be entered as the British entries in the International Tape Recording Contest this autumn.



Left: Mr. Acland is seen receiving the Emitape Cup from Mrs. H. A. Lewis

SCHOOLS WINNERS VISIT ZOO

A SCORE of pupils from the Meeching Junior School, Newhaven, Sussex, were entertained by Messrs. Grundig (Great Britain) Ltd. this month to celebrate their triumph in the Schools Section of the British Amateur Tape Recording Contest.

Meeching were winners of this section for the second consecutive year.

This time their entry, under the general title "As we see other countries," was an imaginative account of a trip to a mythical country. In fact, it was recorded in the Ouse Valley in Sussex and in Somerset.

Mr. John Weston, the same schoolmaster who was in charge of last year's successful production, was in charge of the Meeching effort.

The children who participated were collected by Grundig from Newhaven and taken by coach to Maidstone Zoo

Magician D'Arcy presents the Challenge Shield and a box of tapes to Mr. John Weston, of Meeching Junior School, Newhaven

AS GRUNDIG GUESTS

for the afternoon. They had tea there and enjoyed a conjuring entertainment by D'Arcy.

The Grundig Challenge Shield and half-a-dozen tapes for future use were

presented to Mr. Weston by D'Arcy. The official presentation of the Grundig Challenge Cup to the Meeching School will take place later in the year.



THE PERFORMANCE YOU ARE ENTITLED TO EXPECT . . .

and how to check whether you are getting it

MY first article dealt with the general requirements associated with tape transport mechanism, azimuth alignment and tape heads. The following paragraphs deal with some of these items in greater detail, and introduce the performance standards required of the type of amplifier(s) normally used with high fidelity recorders (not to be confused with professional equipment used by recording studios and broadcasting concerns).

TAPE GUIDES

In order that the tape lies correctly on the heads and winds on to the spool symmetrically between the spool flanges, the guides must be accurately placed. An incorrectly positioned guide can also cause vibration and oscillation of the tape, and when the tape is passing over the heads and guides there must be no tendency for the tape to ride up or down.

Vibration due to poorly designed guides and pressure pads will cause fluctuation in response from the tape, especially at the higher frequencies; when a test tape or recorded tone is played through, the effect is obvious by a rapid change in intensity of the tone. Such an effect may not be noticeable from recorded speech or music. If the potential buyer of a recorder is in doubt, ask the demonstrator to play through a frequency test tape.

Flutter effect, if any, is particularly noticeable between 2,000 and 6,000 cps, as the pen recording of Fig. 1 shows only too clearly.

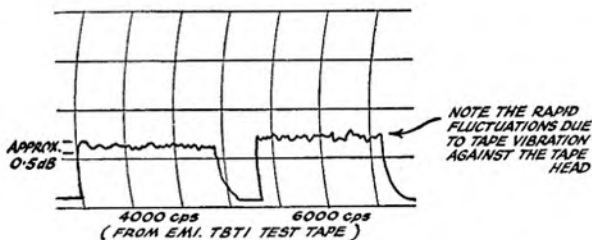


Fig. 1. Fluctuation from tape head output due to poor pressure pad adjustment

A bad example of tape vibration due to poorly designed tape guides and pressure pad mechanism is shown by another pen recording (Fig. 2) which was taken over the frequency range 40 cps to 14,000 cps from a domestic class

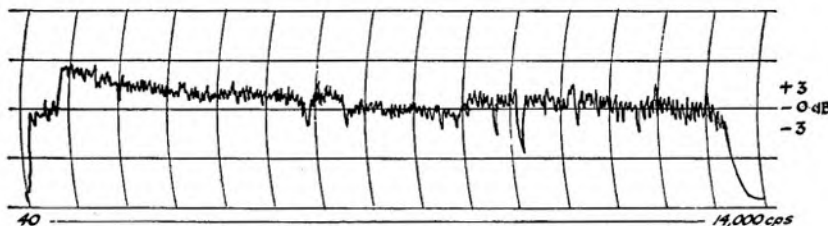


Fig. 2. Pen recording showing fluctuation in tape head output due to poorly designed tape guides and pressure pads

recorder. The overall response from a frequency point of view, is excellent, but note the continuous variation throughout the entire frequency range by more than plus or minus 1 dB at some frequencies, particularly above 2,000 cps. From recorded music these variations were just noticeable, but an untrained ear might not have been aware of them.

WOW AND FLUTTER

Out of a dozen technical specifications for well-known makes of tape recorders, only five or six quoted any specification for wow and flutter. Those given below are an average representation of the figures to be looked for or inquired about when buying a recorder, although such percentages are not always maintained in mass produced equipment—a point which is sometimes painfully obvious with recorders submitted for review.

- Maker A: Less than 0.2 per cent (rms) at $7\frac{1}{2}$ ips tape speed.
- Maker B: Less than 0.2 per cent (rms) at $7\frac{1}{2}$ ips.
Less than 0.25 per cent (rms) at $3\frac{1}{2}$ ips.
- Maker C: Less than 0.2 per cent (rms) at $7\frac{1}{2}$ ips.
- Maker D: Less than 0.25 per cent (rms) at $3\frac{1}{2}$ ips.
Less than 0.4 per cent (rms) at $1\frac{1}{2}$ ips.

BEAT NOTES

Another phenomenon not normally detectable by ear is the formation of beat notes, whether from recorded tones on a test tape, or musical instruments. In a small domestic recorder, 50 cps hum due to poor smoothing may not be noticed by the average listener, owing to the comparatively poor bass response of the small cabinet and internal speaker usually associated with transportable recorders.

While a low level of 50 cps hum may have no annoying effect, "beat notes" produced by signals passing through the amplifier can produce unpleasant sounds which would be noticeable with intent listening, but might not be heard by the casual listener.

The pen recording of Fig. 3 shows the large fluctuation caused by beat note effects where a fundamental tone of 200 cps is nearly zero beat with the fourth harmonic from 50 cps ripple voltage present in the output stage. The beat notes are of very low frequency in this case, but beat notes produced at other frequencies within hearing range can also be generated in the same way, or by a badly designed amplifier.

Beat notes at random frequencies are difficult to detect when listening to recorded music and again a suitable test tape is a useful aid to detection. To test for beat notes due to the presence of 50 cps ripple voltage, listen carefully with one ear close to the loudspeaker and the gain control turned fairly well up (tape stationary); hum or ripple at 50 cps should be obvious if it is present to any extent. Run the test tape through at frequencies of 100 or 200 cps, at the same time turning the gain control slowly up and down. Beat notes will be quite noticeable when the amplitude of both the test tone and any 50 cps ripple are about the same.

F. C. JUDD

A.M.Inst.E.

offers further advice to those buying new equipment or wishing to check their existing set-up

Beat notes can occur at all frequencies and are determined by the relationship of fundamental tones and their harmonics. For example, a tone of 100 cps mixed with a tone of 105 cps will produce a beat frequency of 105 minus 100, which equals 5 cps. A tone of 105 cps mixed with 50 cps may produce a beat tone of 105 minus 50, which equals 55 cps, as well as a beat note of 5 cps due to the second harmonic of 50 cps, namely 100 cps. (105-(50×2) equals 5 cps.)

The pen recording of Fig. 3 may serve to show this more clearly. It will be seen that the beats can reach an amplitude several dB above the steady output from the test tones and will vary in frequency as the frequency of one of the tones is changed.

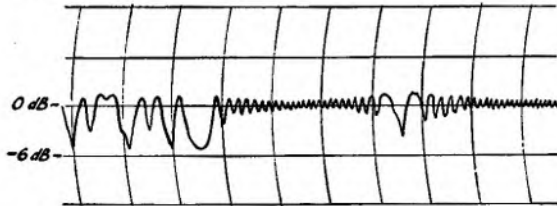


Fig. 3. Beat notes produced from steady recorded tone by presence of 50 cps ripple voltage at output stage

OTHER TAPE DECK FACILITIES

Most manufacturers provide additional controls such as a pause button, trick recording button, record safety button, tape length indicator, etc., all of which are useful but cannot be classified with performance specification.

Such items as a separate monitoring head, automatic tape stop devices, or a remote control system are often included in more expensive recorders, but are not essential to good electrical performance.

If any of these items are provided, however, they should function properly and the purchaser should ask for a demonstration. The tape length indicator, for example, should be accurate enough to return the tape to within a few inches of a desired position.

Mechanical noise from the drive motors or other continuously moving parts should be considered and, although ideally there should be no noise at all, it should at least be inaudible above quiet passages of music or speech.

AMPLIFIER AND FREQUENCY RESPONSE

The frequency characteristics for correct reproduction is that preferred by the Comité Consultatif des Radio-Communication (C.C.I.R.)* for programme interchange at a tape speed of 7½ ips. This requires a bass rise equivalent to that of a series combination of resistance and capacitance with a time constant of 100 micro-seconds, together with high frequency lift to compensate for replay head losses.

This means that certain frequency response correction must be applied, first in the recording process and secondly in the playback process, to compensate for frequency response losses due to both the tape head and the tape magnetising process. (Fig. 4).

The usual procedure is to emphasise the higher frequencies

REPLAY HEAD OUTPUT & C.C.I.R. CHAIN REPLAY RESPONSE

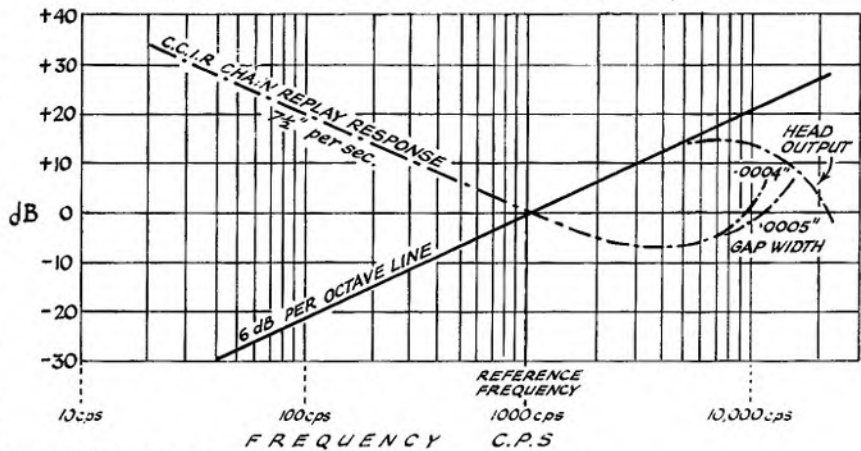


Fig. 4

during recording and the lower frequencies during playback and, therefore, amplifiers with special frequency characteristics are required.

The specifications for high fidelity amplifiers call for certain figures with regard to hum and noise, harmonic and inter-modulation distortion, etc., and a well-designed tape recorder amplifier should call for similar requirements. All too often harmonic and inter-modulation distortion is forgotten, and hum and noise are left to the imagination.

It is no good expecting high fidelity reproduction from a first-class external amplifier and speaker, if the tape recorder internal amplifier is incapable of reproducing to the same standard.

For example, if the tape recorder internal amplifier(s) have a hum and noise level of -30 dB no improvement will be made by using an external power amplifier with a hum and noise level of -60 dB. Most noise and hum generation occurs in the first stage of an amplifier which, in the case of the tape recorder, will be the valve immediately following the tape head. The signal for an external amplifier is generally taken from either the first valve, but more usually from the second, and any hum and/or noise generated in these stages will therefore be reproduced by any following amplifier. The same applies to harmonic, inter-modulation distortion and noise or distortion produced by over emphasis during the record or playback (early stages) process.

If you have a tape recorder with reproduction which seems quite satisfactory from its own amplifier and speaker, do not be disappointed if results with an external Hi-Fi amplifier and speaker are not what you expected.

The following figures are quoted from specifications supplied by different makers and are representative of good design standards:—

Manufacturer	Hum and Noise Level	Harmonic Distortion
A. (Domestic class)	-45 dB below signal at full output	None quoted
B. (Semi-professional)	-45 dB at full output	None quoted
C. (Professional recorder)	-55 dB at full output	2 per cent at peak recording level
D. (Domestic class)	-45 dB at full output	None quoted
E. (Domestic class)	-50 dB at full output	None quoted

It will be noticed that only one manufacturer quotes a distortion level, which for the average domestic class tape recorder should be no more than 3 or 4 per cent. The distortion content of tape is generally lower than the output of a gramophone pick-up and, of course, there is no deterioration in quality towards the end of a recording, such as that due to imperfect tracking of a pick-up. If a tape recording is occasionally allowed to overload, the subjective effect is not as bad as that produced by excessive level sometimes found on modern disc records.

If really full justice is to be done to a good tape recording, the amplifier chain should have an ideal signal to noise ratio of 60 dB because of the wide dynamic range that can be obtained with tape.

* British Standards Specification No. BS.1568. 1953—P.D. 1908 "Magnetic Tape Sound Recording for Programme Interchange."

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Emitape is chosen by world-famous recording companies—like H.M.V., Capitol, Columbia, Parlophone—for recording the greatest artistes of our time . . . It is also the choice of the B.B.C. and I.T.V. for recording every kind of programme every day and of the research workers for countless applications in industry and science. And, of course, Emitape is made by E.M.I.—leaders in sound recording for over 60 years . . .

Here then is good reason for *you* to choose Emitape for your own tape recordings. With Emitape you can always be sure of the finest possible recording quality—remember, the Emitape you buy is the same .0015" PVC base Emitape used by professionals the world over.



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This portable model with an output of 2½w. is provided with twin tracks, giving a total playing time of 3 hours by using 'double play tape'. Will make recordings from microphone, radio or gramophone records, and an electronic recording level indicator is included. There is automatic erasure when recording, and an extremely simple operation with interlock to prevent accidental erasure. The single tape speed is 3½ips. and reel diameter 5½". Included with this model is one reel of tape and take-up spool and a crystal microphone. The cabinet is attractively covered in plastic leathercloth over moulded wood fibre, and weighs only 15½ lb.

SPECIFICATIONS

- ★ Single speed: 3½ ips.
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COPYRIGHT — THE FEDERATION VIEW

THE Committee of the Federation of British Tape Recording Clubs has now completed the consideration of the Copyright problem which was decided upon at the recent Federation annual general meeting.

It has issued the following as an official statement of its policy:—

RECORDING OF LIVE PERFORMANCES OF COPYRIGHT MUSIC

Amateur recordists generally are familiar with the legal position regarding the recording of *public* performances of copyright music. The Committee has found no evidence to suggest that individuals or clubs have been guilty of any infringement of the law relating to such recording.

No question of a system of licences arises in this case, since the question of copyright is not the only one which has to be considered in recording of this nature. The organisations concerned with protecting the interests of the performer are also involved. The Federation recognises that tape recording clubs stand in the same relationship to the law on this subject, as any other organisation.

The recording of "live" performances of copyright works *in private*, and the subsequent play-back of such recordings *in private*, is what the proposals by Mechanical-Copyright Ltd. are designed to bring under control. The proposals also refer to this type of recording, when undertaken as a *club activity*.

The Committee of the Federation of British Tape Recording Clubs is firmly of the opinion that there can be no justification whatsoever for any agreement involving the purchase of a licence purporting to give the "right" to record in the privacy of the recordist's home.

Everyone has the right to himself *perform* copyright music *in private*. The recording of such performances for the immediate or subsequent enjoyment of the recordist, *in private*, is such a minor extension of the existing right, that the Committee sees no reason why this should involve payment of a fee.

Finally, it must be pointed out that the Federation has no control over the private recording activities of individuals belonging to Member Clubs. Nor would it wish to have such control. Unless Mechanical-Copyright Protection Society Ltd. enjoys powers considerably in excess of what might reasonably be supposed, any system of licensing would be difficult to administer and impossible to enforce.

The other "right" to which Mechanical-Copyright's proposal refers, is the right of a tape recording club to record *as a club activity*, for subsequent play-back *as a club activity*, works which are the subject of copyright.

Now, the common interest which leads individuals to form tape recording clubs, is the common interest in the *art and science of tape recording*. It may well

"No grounds for payment"

A number of readers' letters dealing with copyright have been held out to make room for this important statement. We shall devote more space to the subject in our next issue.

be, that on occasion, members of such a club will record a performance in a private meeting of the whole or of part of a copyright work. However, the object of making such a recording is *never* to play it for the enjoyment, by members of the club, of the work involved.

The interest lies, not in the work itself, nor yet in the manner of its performance; the interest lies in the recording as an example of recording technique, or as an indication of the quality of a particular piece of recording equipment. The content of the recording is of negligible importance. Club recordings such as these are *never* given public performance and, indeed, are rarely preserved after having served their purpose.

In view of these facts, the Committee considers that any agreement, involving payment for the "right" to use copyright works for these purely technical purposes, would be totally unjustified and contrary to the spirit, if not to the letter, of the Copyright Act, 1956.

RECORDING OF RADIO AND TELEVISION BROADCASTS

Recording of this sort forms no part of the activities of a tape recording club. Exceptionally, a manufacturer's representative might make such a recording at a club meeting, in order to demonstrate the facilities provided by a particular machine.

As a *private* activity of tape recorder owners, the recording of broadcast material, insofar as it is not covered by the dispensation published by the British Broadcasting Corporation, is beyond the control of the Federation. The Committee suspects that it is also beyond the control of Mechanical-Copyright Protection Society Ltd.

COPYING OF GRAMOPHONE RECORDS AND PRE-RECORDED TAPES

Tape recording clubs are not concerned with the copying of commercial recordings. As a *private* activity, this is doubtless illegal. The assumption by the Federation of the duties of a law-enforcement agency would prove to be unpopular, unrewarding and unconstitutional.

The Federation recognises that the advent of the domestic tape recorder, capable of producing, cheaply very high

quality copies of gramophone records, might well cause concern to those whose financial interests are involved. However, it is clearly no part of the duties of the Federation to provide a solution to the problem.

PUBLIC PERFORMANCE OF COPYRIGHT WORKS

The Federation is always willing to advise individual recordists and tape recording clubs of the correct procedure to be adopted in order to comply with the law relating to the *public performance* of copyright music. The existing arrangements seem to be perfectly adequate, the tape recorder, in this case, serving merely as an alternative to the gramophone.

SUMMARY

It will be seen that the anxiety felt by the copyright protection organisations concerning the activities of tape recording clubs is based on a misunderstanding of the objects of these clubs.

Members of tape recording clubs are involved in two basic types of activity. They listen to talks and take part in discussions on technical matters relating to the whole subject of sound recording and reproduction. Insofar as this involves the use of copyright material, this is invariably incidental to the main purpose of technical exposition.

It is the creative activities of tape recording clubs—the production of original recorded features and programmes—which are fundamental to their existence. The primary object of a tape recording club is to produce tapes, in much the same way as the production of photographs is the primary object of members of Photographic Clubs. We have not heard it suggested that these clubs should pay a licence-fee, on the grounds that the equipment which they use is capable of producing copies of copyright pictures.

It is the opinion of the Committee of the Federation of British Tape Recording Clubs that there are no grounds for entering into any agreement which involves payment by Member Clubs for "rights" which they do not desire or which they already possess.

Members are advised to familiarise themselves with the Copyright Act, 1956; and to ensure that, as a club, they strictly observe the provisions of the Act relating to public performance of copyright material.

On no account should tape recording clubs, whether members of the Federation or not, take unilateral action of a sort which might tend to prejudice the case as stated. It is unlikely that this statement will prove to be the last word on the problem of copyright. The support of *all* tape recording clubs for the Federation's stand, would do much to ensure that the Tape Recording Movement continues to flourish, unhindered by financial penalties imposed by the guardians of commercial recording interests.

Rose Bruford students in the field. Left, recording skiffle in Chislehurst Caves. Right, interviewing a whelk stall-holder are Miss J. Hutson, Romford teacher, and Mr. T. Sylvester, a Nottingham research worker



THEY TAPED JAZZ IN CAVES, CADETS ON PARADE – AND A WHELK STALL

OVER forty enthusiasts from all parts of England and Wales gathered at the Rose Bruford Training College for the second six-day tape recording course organised by Geoffrey Hodgson. Men and women from all walks of life, including a psychiatrist and a G.P.O. engineer, were present. The teaching profession was well represented.

A varied programme was arranged, with Jack Singleton, of the B.B.C., as senior programme producer, assisted by Desmond Briscoe and a team of experts in the recording field. Graham Jones, technical operations manager, had equipment worth £2,000 in his care. Full use was made of the mobile transmitters provided and operated by Fred Judd, one of the technical advisers of this magazine.

Practical experience in interviewing and editing, a popular feature of the course, was obtained when teams were sent out to collect material for a programme entitled "Saturday Roundabout." Chislehurst Caves provided the setting for a jazz recording session, while a whelk stall at New Cross Gate enabled the students to obtain not only an interview with the proprietor, but refreshments as well.

Visits were also made to the motor-car racing at Brands Hatch and to the parade ground at Woolwich Barracks, where Air Training Cadets were recorded in action.

One of the students at the course was the producer of the "Tape of the Year" — Mr. Arthur Acland.

The next course will be held during April next year; final details will be published shortly.

Tape report of Show for Clubs

THE Federation of British Tape Recording Clubs made an interesting innovation at this year's Radio Show. Secretary Alan Stableford secured official permission to tour the stands and to record interviews with representatives of the various firms, discussing new products of interest to tape enthusiasts.

These interviews, which capture much of the atmosphere of the Show, will be edited into a tape containing a general survey.

This tape will be circulated to all clubs affiliated to the Federation.

It will also be made available, without charge, to any other tape recording club which is interested.

Details can be obtained from Mr. Stableford, at 9, Normandy Terrace, London. E.16.

STAR RECORDIST

ANOTHER top-line star is identifying herself with tape recording. It is still a fact that the majority of tape recorder owners are lovers of serious music, and they will appreciate the enthusiasm of Joan Sutherland, the operatic singer, for the medium.

She has agreed to endorse Grundig products and will soon be featured in their publicity campaign.

Like many other musicians, she uses her recorder for rehearsals and broadcasts.

Lord's Prayer

MR. H. J. WALDING, of Northampton, is trying to get together a collection of the Lord's Prayer spoken in as many different languages as possible, preferably by a native of the country concerned.

He has many examples already, but if anyone would care to get in touch with him direct, at 48, Freehold Street Northampton, he will let them know whether their particular language has already been recorded.

MAGIC WITH A RECORDER

A NEW use for the tape recorder has been found—appropriately enough —by a magician. D'Arcy, who is a Gold Star member of the Inner Magic Circle, hit on the idea when seeking a new method of cabaret entertainment.

The act took nearly a year to perfect. It involves split-second timing, so much so that some who have seen it are convinced that D'Arcy is a master ventriloquist. The tape recorder, in fact, tells him what to do and supplies the answer to many of the tricks.

D'Arcy displayed his skill to the children from the Meeching Junior School, Newhaven, who were entertained by Messrs. Grundig (Great Britain) recently. He uses a Grundig machine in the act.



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FIRST OF A SERIES OF THREE ARTICLES FOR THOSE WHO WISH TO START A FASCINATING NEW HOBBY

CLUBS or societies now exist in most countries to help the owners of tape recorders to converse with one another all round the world by exchanging recorded messages. But there may still be many readers who have not used their recorders in this way and this series of articles is intended to help and encourage them to take the first steps in a most enjoyable hobby.

JOINING A CLUB

I have been a member of the Voicespondence Club for over two years, so my remarks will apply mainly to that club, but the same general principles apply to all similar clubs.

The Voicespondence Club issues a quarterly magazine, giving news about members and activities of the club, with a supplement listing new members. In addition, an annual Directory of Members is issued, which lists their interests, hobbies, professions, and type of tape recorder, giving speeds and other relevant details.

To join a club, first write to the secretary asking for particulars and a membership application form. If you intend to join a club overseas, enclose with your letter one International Postal Reply Coupon obtainable for 9d. from General Post Offices. This is polite and really necessary, as these clubs are non-profit-making and, in most cases, the staff are part-time honorary workers without remuneration.

On receipt of the application form, complete it in the usual manner, including your Christian name and those of your wife and family, if they intend to join in. All these clubs are very friendly and members are always known by their Christian names.

You will find on the application form a section where you should list your interests and hobbies. It is very important not to list too many interests. Write in those about which you are prepared to do the talking, and can talk knowledgeably.

You may have other hobbies and interests which you would like to know more about. Don't include these, as you will find some person listed with whom you can soon start talking. Also on the form you may find a section asking how you were introduced to the club; perhaps you would mention this magazine.

The annual subscription may vary from club to club, but in the case of the Voicespondence Club it is three dollars for U.S. and Canadian members, while members in other countries send eight 9d. International Postal Reply Coupons to cover cost of mailing.

Making friends by tape exchanges

When you receive your Directory of Members you will find it difficult to choose a contact. When I joined the Voicespondence Club, my wife and I spent days going through the list. You could start as I did, by looking for a member with the same job as yourself in the States. But when I tried this, there wasn't one!

I should think most jobs, professions and occupations — such as Craneman, Light Buoy Tender, Concession Stand Operator, Railway Shunter—are listed, but there was no Air Traffic Control Officer.

Eventually we sent off two air letters to members in the States, asking if they would "Voicespond" with us.

You might prefer to study the interests of various members to find those which coincide with yours. There may be quite a number. This makes it more difficult, so what about choosing different parts of the world, or places you may have visited? We selected people from U.S.A., living on the Eastern and Western Seaboard and in Central and Southern States, and we found it most intriguing to compare the different accents from these parts of the States.

In your first letter you should list your interests and hobbies; your contact won't have your listing in the Directory, as you will be a new member. It is essential, and one of the few rules agreed internationally, that you always write first before making a tape contact—unless the particular member has stated in the Directory that a letter is not necessary.

The Voicespondence Club has a special list of experienced members who are prepared to start you on your way with the first tape, if you don't feel confident enough to start on your own.

YOUR FIRST TAPE

As soon as you receive a letter in reply, asking you to go ahead, start work on your first tape. Your contact may start the ball rolling by replying to your letter with a tape. This, of course, makes it easier for you.

It will be up to you to decide the size of reel to start with, but a total of 30 minutes (15 each track) should suffice. If you feel that is too long for your first tape, try a 15-minute one. When you get established and know your friends well, you can easily introduce a longer tape if required.

Always begin by giving your name, your friend's name and the date, and with your first reel it is a good plan to enclose your name and address on a piece of paper. You might start your tape something like this:—

"Hallo, George Smith. This is Bill Brown, coming to you from London, England, on this sunny August morning of Saturday, September 29, 1959. The music you just heard was . . . etc., etc."

If possible, it helps to make a better and more interesting tape if you can start with some suitable music, preferably of the type which he likes; but keep it short, as he is waiting to hear you speak. Some people have a regular

By W.
**PATRICK
COPINGER**



signature tune with which they begin and end their tapes. You will always associate such a tune with your friend who uses it, giving an additional link.

WHAT TO SAY

Make a few brief notes on what you intend to talk about, in order to keep your thoughts together and compose a reasonably coherent programme. Never write out what you are going to say. This would defeat the whole object of the hobby.

You must try to maintain a completely unrehearsed conversational naturalness, which is not difficult if you mentally change the microphone into the person to whom you are talking.

On your first tape you should be able to keep going quite easily, particularly if you have selected someone from foreign parts, which I consider is far more interesting than a contact in this country.

Your brief notes might read:—

"Self — age — wife — children — names — ages. House — garden — town — village — street live in — job — how far to work — travel by bus, car, train, etc."

You then give details about these brief headings, talking naturally. Don't bother about phraseology or wording. Don't get pedantic in your speech. If you normally drop your aitches don't try to put them back in! Go on to talk about your interests and ask your correspondent questions about his.

NEXT MONTH—Receiving your first reply.



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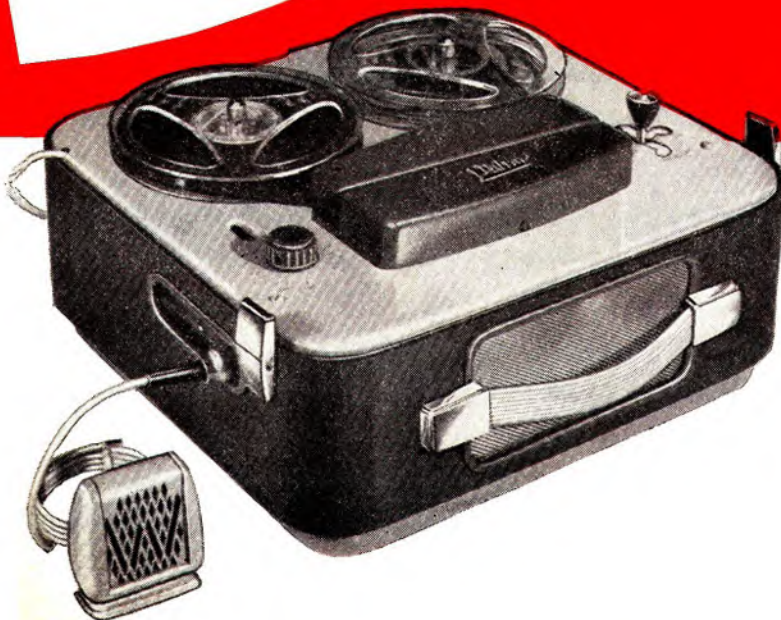
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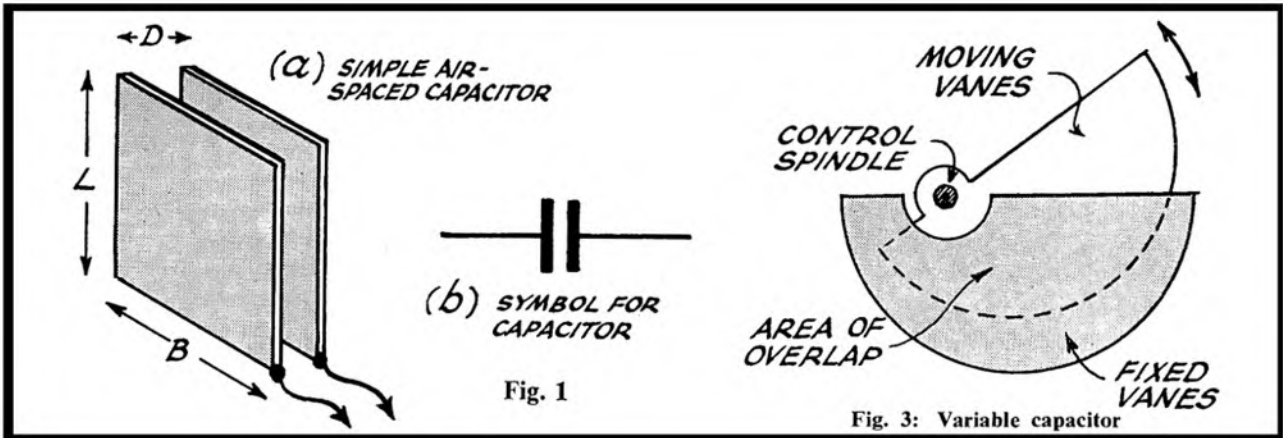
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CAPACITORS

MANY capacitors are used in tape recorders and, although the study of capacitors is a subject in itself, this article may help towards a clearer understanding of their purpose.

The old, but still widely used, name for a capacitor is *condenser*. Capacitors are classed according to their construction and, although various types differ widely in this respect, the principle of operation is the same for all.

Capacitors are used for storing electricity and can be charged up rather like a car battery, but with certain very important differences. Whereas a car battery can supply current for many hours after being fully charged, a capacitor is only capable of holding a minute quantity of electricity in practice, and can be discharged in a fraction of a second. In most cases they do not need to hold their charge for more than a few milliseconds (or even microseconds) so this is no disadvantage.

The amount of electricity which the capacitor will hold depends upon its *capacitance*, or value. The unit in which this is measured is called the *farad*, although this is too large for practical purposes when it becomes rather like a housewife weighing her cooking ingredients in tons. Therefore, for practical purposes a much smaller unit is used, the *microfarad* (mf or pf). This is one millionth of a farad, and the largest capacitors used in tape recorders have a capacitance of about 50 mf.

Even the microfarad is too large for many purposes, and the still smaller *pico-farad* (pf), or one millionth of a microfarad is used. Thus 0.001 mf may be expressed as one thousand picofarad. This is more convenient than dealing with decimals, and becomes even more so for capacitors

as low as, say, 5 pf, or 0.000005 mf. The simplest capacitor consists of two metal plates having their faces parallel, placed close together but not touching, Fig. 1. This is a two-plate, air-spaced capacitor, and its capacitance depends upon the area of the plates (assuming they completely overlap) and the distance D between the plates.

There is, of course, a limit to the extent to which the area of the plates may be increased and, if a larger capacitance is required, more plates may be used, as shown in Fig. 2. Fig. 2a shows a three-plate capacitor and a moment's thought will reveal that the capacitance is now twice as great as a two-plate capacitor having identical dimensions. Actually, the capacitance of a multi-plate capacitor is proportional to the number of *spaces*, so that the five-plate capacitor of Fig. 2b will have four spaces and is, therefore, four times as great as the equivalent two-plate component.

In practice, air-spaced capacitors are only available up to about 500 picofarads, and find their use mainly as tuning capacitors in radio receivers. These have to be variable, and so one set of plates is fixed to the main framework, while the other set may be moved into or out of mesh with the fixed plates. Thus the area of overlap may be adjusted to produce the desired capacitance, Fig. 3. In a typical case, the capacitance may be varied from 50 pf to 500 pf.

As the majority of capacitors in a tape recorder are larger than 500 pf, a second

method is adopted to increase the capacitance without actually increasing the physical dimensions of a capacitor. If we take any air spaced capacitor, and completely fill the spaces between plates with any liquid or solid insulating material, such as oil, or sheets of mica, paper, etc., then the capacitance immediately increases to double, treble, or many times the original value.

For example, immersing in oil may multiply the capacitance three or four times. Mica insulation may increase up to seven times. Other materials, such as ceramic, produce an increase of 500 or more times.

The physical size of a capacitor can thus be reduced considerably by the use of such insulation. The insulation between the plates is known as the *dielectric*, and the number of times the capacitance is increased by the use of such insulation is known as the *dielectric constant* of the material. Thus, if the dielectric constant of air (or vacuum) is taken to be unity, then that of oil is three or four, mica up to seven, and ceramic 500. These are only representative figures, and different grades of a particular material will usually display various values of dielectric constant.

A further advantage of using a solid dielectric is that it may be made very thin, so that in effect the plates can be spaced closer together without touching each other than could be the case in an air spaced capacitor. This, once again, results in an increase in capacitance.

All capacitors have one basic function: Although they will not allow the passage of DC, they do offer an easy path to AC. Fig. 4 illustrates this. The capacitors in a tape recorder make use of this principle, and Fig. 5 shows some of them at work in an amplifier. Generally, capacitors are used for *coupling* an AC signal from one point to another, or for *decoupling* an unwanted AC signal to earth.

(Continued on page 39)

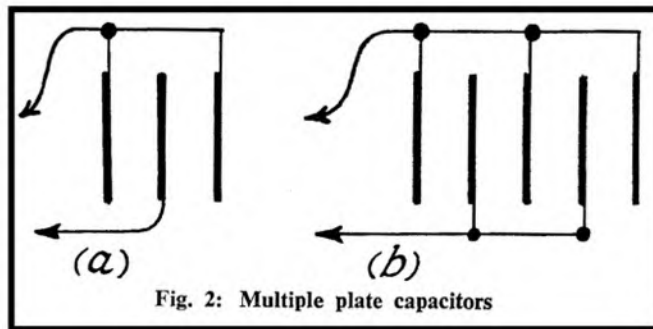


Fig. 2: Multiple plate capacitors

THE SCIENTIFIC BASIS OF TAPE RECORDING by CHARLES LANGTON, A.M.Brit.I.R.E., A.M.Inst.E.

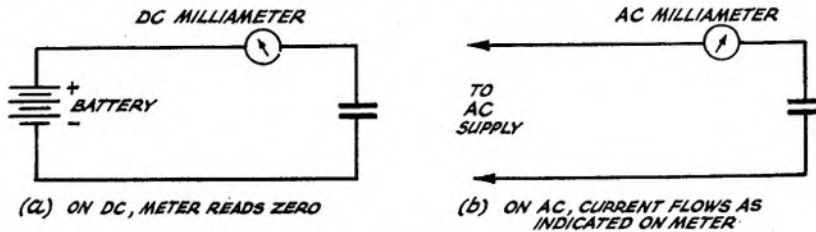


Fig. 4

For example, C³ is necessary in order to transfer the amplified audio signal from the anode of V¹ to the grid of V² for further amplification. A wire could not be connected directly between these points, because the HT voltage on the anode of V¹ would then be applied to the grid of V². This would damage V². Fortunately, however, the HT is DC and the audio signal is AC; therefore the coupling capacitor C³ may be joined between the two points, so as to block the HT from the grid while allowing a free passage for the audio signal. C⁵ acts in a similar manner in the following stage.

V¹ is a pentode valve, and the screen grid has to be connected to HT, usually at a lower voltage than the anode. Thus, a resistor R¹ is used to drop the voltage to a suitable value. An audio voltage would be present on the screen grid, however, if it were not for the decoupling capacitor C¹, and this would reduce the gain and possibly lead to instability. C¹,

therefore, allows an easy path to earth for the unwanted audio voltage. Decoupling capacitors are sometimes known as *bypass* or *filter* capacitors.

C² and C⁴ are the cathode decoupling

capacitors. Once again, they short out to earth any audio voltage appearing at the cathode of the appropriate valves, while their presence does not interfere with the direct bias voltage which is developed across the resistors.

A further example is C⁶, connected between HT positive and HT negative. As the HT will normally be obtained from the mains operated power pack, there would very likely be a certain amount of AC superimposed on the HT. This would cause hum, as it is essential that the HT should be pure DC. Therefore C⁶ is a decoupling capacitor of large value which shorts out the AC ripple to earth, leaving the HT line clear. C⁶ is called a *smoothing* capacitor.

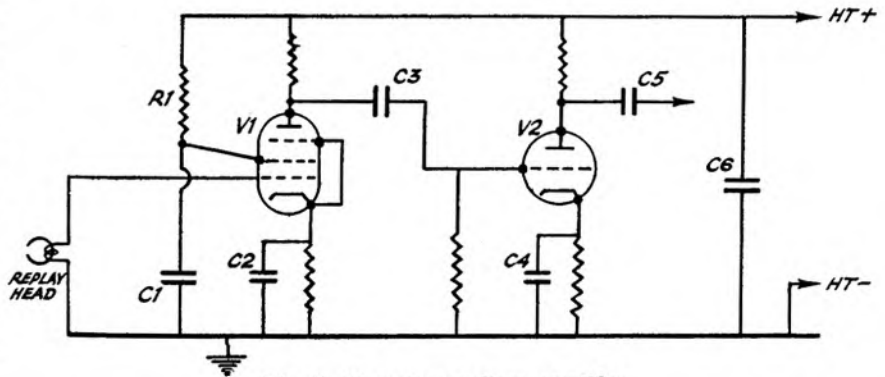


Fig. 5—Two-stage voltage amplifier

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Radio Show should have convinced remaining doubters

STEREO

PAGE



**Edited by
D. W. GARDNER**

SPARING use of spectacular sound effects and a larger number of well-organised programmes of stereo music played their part in assuring visitors to this year's Radio Show that stereophonic sound is not something to marvel at and leave alone, but something worth spending money on in anticipation of hours of musical enjoyment in the home.

Helping to settle the doubts of people who have been confused through hearing cheap "only just" stereo, were such demonstrations as those by E.M.I., using an array of expensive professional tape equipment at 15 ips. Listeners were thereby left in no doubt about the desirability of stereo in principle and, with the highest standards to guide them, they were in a good position to reach sound, critical assessments of the equipment in the lower-price groups.

Among features of special interest to stereo-tape enthusiasts were the new Cosmocord stereo microphone, the Simon stereo replay adaptor, the Collaro "Studio" deck (with space for a third head for stereo playing) and the stereo version of the Brenell 3-star recorder.

The latter, a prototype, was performing very nicely, and has a number of useful facilities for people making their own stereo and monophonic tapes. With 4 watts per channel, three playing speeds (7½, 3¼ and 1½ ips), and a price of 89 guineas, without microphone. This model seems to have a bright future before it.

In the stereo amplifier field there were interesting innovations by B.T.H., Pyc, Associated Electronic Engineers and the combined forces of E.M.I. and S.T.D. The Emisonic-Orthotone high-fidelity equipment emerging from the latter association captured a considerable amount of attention. The stereoscope, an amplifier designed with the American market in mind, is a fascinating piece of equipment with an array of controls and switches that should stagger even the U.S. hi-fi fan.

In addition to scratch and rumble filters and a loudness control switch, there is an oscilloscope-type indicator to provide visual balance. The amplifier costs nearly £70, but it has a great deal to show for it.



JUST before the opening of the Radio Show, G.E.C. staged a laudable and daring demonstration of stereo on tape in closely integrated comparison with live sound. It arose from Hugh Brittain's determination to achieve "natural standards of reference," and utilised a piece of music, specially composed for the purpose and played by members of the G.E.C. staff, entitled "Sonata for Jazz Group and Beer Tankards."

The piece was first recorded on tape, with carefully arranged gaps for the various instruments involved: for the demonstration the performance began "live" and first one and then another instrumentalist ceased playing—in favour of beer tankards—allowing the stereo tape to take over.

This enabled the listeners to compare the recorded performance of each instrument with its live counterpart. The new G.E.C. slender "periphonic" speakers were used, together with two G.E.C. 12-watt amplifiers, and very few people were able to detect any difference between the live and the recorded sounds.

Naturally, to achieve quality that will stand immediate comparison with reality demands the highest standards of recording technique, as well as of the equipment, but the principle is one that might well be tried out by clubs and individuals as a method of checking the capacity of various items of equipment.

After all, our objective should be, not so much to decide whether one piece of equipment seems to perform better than another, but to discover how close each comes to the ideal of reproducing the original sound perfectly.

STEREO QUIZ

- Q. Can you get stereo from a monophonic recording by using two channels ?
- A. *Never. Only the complete stereo chain can give you the true original location of the instruments or other sounds. The separation sometimes achieved by juggling with frequencies represents a serious distortion of the positional content of the performance, by allocating high notes to one side and low notes to the other.*
- Q. How do you find out about all these things ?
- A. *By studying Stereo Sound and Music Magazine regularly.*
- Q. How do you make sure of getting a copy every month ?
- A. *By placing a regular order with your newsagent.*



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Elizabethan Escort	45	6 5 0	3 8 4
Saja Standard	45	6 5 0	3 8 4
Verdik S1	45	6 5 0	3 8 4
Elektron	47½	6 17 6	3 12 2
Wyndor Viscount	49	6 19 0	3 14 2
Spectone 161 (Ex Tape)	49	6 19 0	3 14 2
Grundig TK20	52	7 0 0	3 19 4
Dulci-Harting Deck* (with pre-amp)	55	7 5 0	4 3 4
Elpico	55	7 5 0	4 3 4
Telefunken 75KB (with microphone)	56	7 6 0	4 5 10
Brenell 3 Star	58	7 10 0	4 9 0
Veritone Portable	58	7 10 0	4 9 0
Saja Export	59	7 19 0	4 10 0
Truvox R2	59	7 19 0	4 10 0
Grundig TK25	62	8 2 0	4 15 0
Telefunken Deck*	63	8 3 0	4 16 8
Philips 8108	63	8 3 0	4 16 8
Elizabethan Essex*	65	8 5 0	5 0 0
Veritone Venus*	66	8 9 0	5 2 6
Brenell Mk. V (with microphone)	69	8 11 0	5 5 6
Stuzzi Magnet	69	8 11 0	5 5 6
Grundig TK30*	72	9 12 0	5 10 0
Telefunken 85*	75	9 15 0	5 15 0
Harting HMS*	82	10 12 0	6 5 8
Grundig TK35*	82	10 12 0	6 5 8
Sabafon Automatic*	89	13 9 0	6 13 4
Simon*	95	14 15 0	7 1 8
Tandberg Stereo* (4-track)	124	20 4 0	9 3 4

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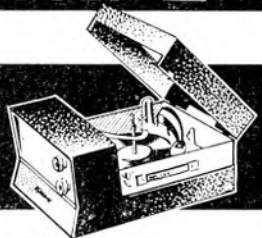
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1959 RADIO SHOW

The Radio Show of 1959 will be remembered as a milestone in the history of tape recording. It was there that the industry gave notice that it was ready to go out for the mass market. The big radio firms took the field; a whole batch of new tape decks were introduced; prices of recorders began to tumble; stereo became a commonplace on every stand.

The one big overwhelming feature was the appearance of a whole range of recorders costing less than thirty guineas—machines aimed at a market which is as yet scarcely touched.

One came away with the impression that the tape industry may easily double its capacity before we see another Radio Show.

The Garrard "Bichette" deck—the first with tape loading in magazines—naturally attracted much attention. Other manufacturers are busy experimenting on similar lines; the merits of magazines, as against the present-type spools, was a staple of Show conversation.

★

The news that H.M.V. will be in the market soon with a £50 domestic tape recorder caused a stir in the trade, but the public must wait for a few more weeks for news. Meanwhile, Ferguson are in the field with a recorder, as are several other big radio manufacturers.

Two firms have brought the price of complete stereo tape equipment below the £100 mark.

THE NEW DECKS

THE significant growth of activity revealed by the Radio Show was a direct result of the development of several new decks. In particular, the new B.S.R. "Monardeck," which is going to manufacturers at a price well below anything previously available, has made possible the sudden appearance of numerous recorders at under thirty guineas.

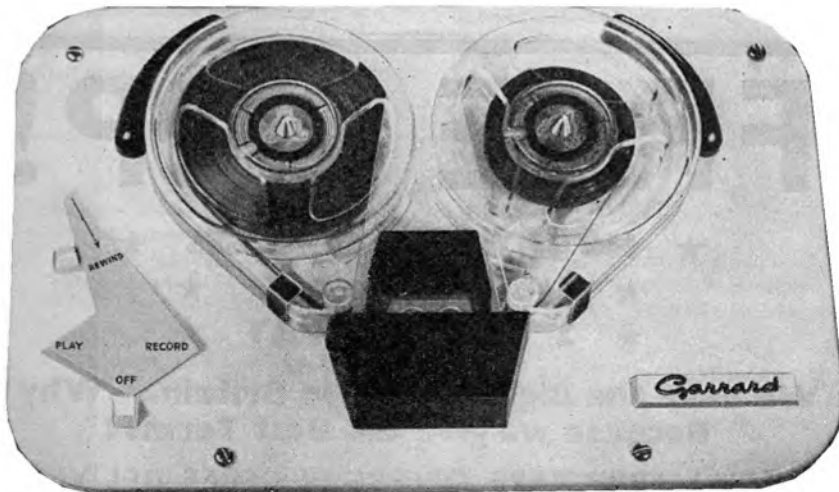
It is used, for example, on the Elizabethan "Avon" (illustrated in our last issue) and on the new Sound "Prince."

It has tempted a number of manufacturers who have hitherto not appeared to be fully committed to large-scale output of tape recording to take the plunge—Portogram, E.A.R., R.G.D., all have modestly-priced machines incorporating the Monardeck.

New firms have entered the field as manufacturers, using this deck—Alba, Saga, Amplion and Avatone to mention a few.

Naturally, the other big firms who have been in the gramophone field are looking to their guns in the face of this B.S.R. incursion. One of the most interesting things at the Show was the demonstration of the new Garrard "Bichette" deck, the first made in this country to operate with tape loaded in magazines.

It is a neat design, with controls so simple that a five-year-old could operate them without going wrong. Two 4-in. spools are entirely enclosed in a transparent plastic case, the whole of which drops into position on the tape deck as easily as a disc on a turntable. There is no tape threading, no anchoring of tape, no tape spilling.



The Garrard "Bichette" deck—the first British design incorporating magazine loading of the tape

The tape can be stopped at any point and the magazine removed from the machine. Later it can be replaced and the playback continued from the same point.

Double-play tape is used, so that a magazine gives a total of 70 minutes on the two tracks—the speed being 3½ ips.

The deck will play conventional spools of tape, too, but in that case there may be difficulty with braking. The only other limitation that needs to be mentioned is that the deck provides for "fast forward" but not "fast rewind." It is

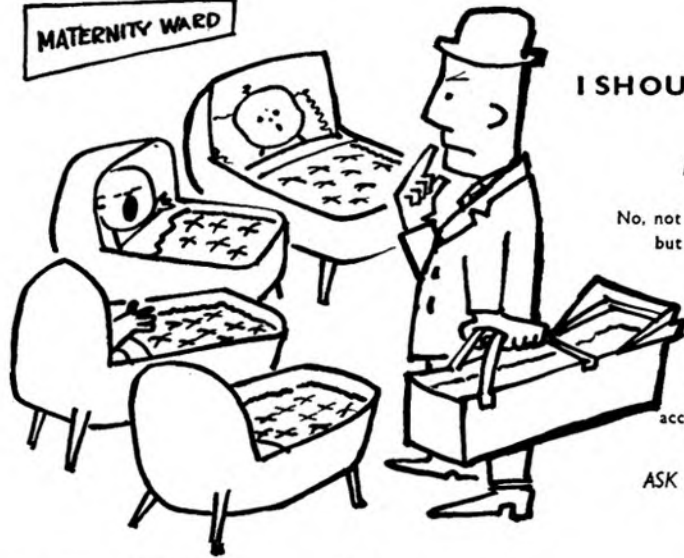
so simple, however, to turn the cassette over to achieve the desired result that this is not considered a drawback.

The spools in the magazine are held by a spring-loaded brake, which is only released when the deck is switched on. The tape is thus kept taut and there is no danger of spillage when the magazines are handled away from the recorder. When playing, the magazine is locked on the deck.

Frequency response is given as 30 to 7,000 cps, or up to 10,000 cps with a

(Continued on page 45)

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PORTABLE STEREO—Attractive Ann Peel, of Egham, Surrey, proves that the new Veritone Venus stereo model is really portable. Both cases—one houses the recorder and the other the two speakers—weigh 50 lbs. together. And the cost is less than £100

suitable amplifier design. There are only two controls—the rewind switch and a three-positional function switch for Play-Off-Record.

First firm to announce a machine incorporating this deck is E.A.R. A prototype was shown at the Radio Show and production is about to start, but full details are not yet available. It is obvious that other manufacturers will not be far behind.

Garrard think that the deck may be available for retail early in the New Year.

The third big firm to come forward with a new deck was Collaro, whose "Studio" deck (described and illustrated last month) was seen at Earls Court to be a most handsome and efficient design. With its 1½, 3½ and 7½ ips speeds and the provision for easy fitting of a third head, to provide monitoring or stereo facilities, this deck has a flexibility that ensures wide popularity.

One cannot help wondering whether Collaro themselves have done so much to popularise the idea of separate controls for the two tracks that users will be loath to go back to lifting off and reversing reels; but a big difference in cost of production is involved, and the "Studio" deck has so attractive a specification that it is likely to be as widely used in future recorders as previous



1959 RADIO SHOW REVIEW

(Continued from page 43)

Collaro decks have been in the past.

Here again, it is likely to be a few months before the decks are sold separately through retailers.

Apart from new machines introduced at the Show, there were a number on private view to dealers, which will be introduced shortly. None was more interesting than the £50 model with which H.M.V. are about to enter the domestic tape recorder market. This is a two-speed machine (3½ and 7½ ips) with a quoted frequency response of 40 to 12,000 cps ± 5dB at the top speed. It takes 7 in. spools and rewind time is only 50 seconds.

There are three heads and separate record and playback amplifiers. Fuller details are likely to be available for our next issue.

Walter Instruments also had interesting news for the future—a stereo reproducer that will go into production early next year. This firm is working on miniaturised and transistorised recorders.

E.A.P. was showing a prototype of a machine to be known as the "Major", using a Collaro Studio deck and a push-pull amplifier delivering six watts to the internal four-speaker system. Production begins this month and the provisional price is 59 guineas.

(Continued on page 47)

ECONOMY MACHINES—Three of the new recorders introduced at the Radio Show which set new price levels. Left is the Sound "Prince," using the B.S.R. deck, including such facilities as mixing of two inputs, superposition and monitoring. It costs only 32 guineas.

Below, new machines by two big radio manufacturers who have now entered the tape field. On the left is the Alba "Duchess" costing 26 guineas; on the right, the Ferguson 441 TR, priced at 28 guineas.





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TK55 with microphone pocket	45s.
TK820/3D (no pocket)	40s. 6d.
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Telefunken KL85 (no pocket)	45s.
Telefunken 75	38s.
Telefunken 85	45s.
Elizabethan Escort (no pocket)	37s. 6d.
Philips AG8108 (with pocket)	41s. 6d.
Philips AG8109 (no pocket)	38s.
Regentone	38s.
Sound 444	46s.
Stella ST450	42s.
Wyndor Viscount	41s. 6d.
Saba with microphone pocket	45s.
Electron with microphone pocket ...	39s.
Perth-Saga MK5 with mic. pocket ...	45s.
Saga M40 with microphone pocket ...	37s. 6d.
Grundig Cub with microphone pocket	30s.

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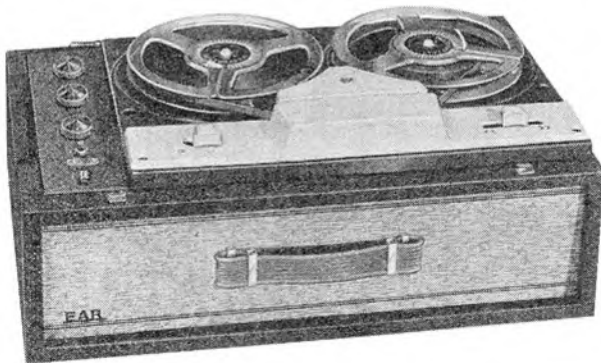
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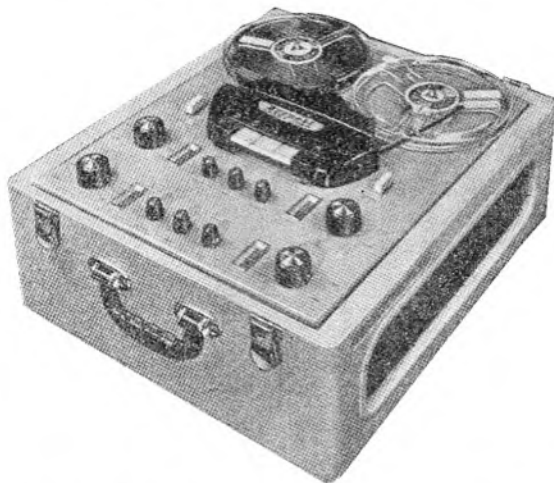
(Continued from page 45)



The new E.A.R. "Bantam"



Truvox showed this new R. 7 recorder



The new stereo version of the Brenell 3-star machine
(Continued on page 48)



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Garrard 4HF	18	9 9	55	6 20 1
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Axette	6	12 2	19	0 7 2
WB HF1012	4	15 0	14	3 5 2
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THE RADIO SHOW

(Continued from page 47)

On the stereo front, Veritone introduced at the Show the stereo version of their Venus machine. This is a very handsome and compact equipment, housed in two matching cases—machine in one, speakers in the other—which weigh 50 lb. between them. The price is 95 guineas.

Brenell also showed a new model—a version of their well-known 3-Star—which provides full stereo recording and reproducing facilities in a very convenient form. All controls and all input and output sockets are easily accessible at the front of the machine; there are two modulation indicators—one for each track—close together on the deck so that both can be watched together; and there are two built-in speakers so that recordings may be checked without external aids.

Frequency compensation is provided at the three speeds—7½, 3½ and 1½ ips. The two amplifiers can be used independently of the tape mechanism and so are suitable for reproducing stereo discs.

The price is 89 guineas, or 95 guineas with two microphones.

It is not possible here to do more than mention a few of the other exhibits at the Show. Fuller information about specific machines will appear in future issues of *Tape Recording and Hi-Fi Magazine*.

Saga—well-known for their tape records—have entered the field with three machines, including a 19-guinea "Tapelet" which is designed to couple with the amplifier in a radio.

Truvox showed their entirely new design R.7 recorder, which tracks in both directions, takes 7 in. reels and has an output exceeding 4 watts. Speeds of 7½ and 3½ ips are provided. The same firm showed its Mark IV deck in mono and stereo versions, at 25 guineas and 37 guineas respectively.

Reps have introduced a new R.10 recorder, using the Collaro "Studio" deck and incorporating some ingenious dual-purpose controls. For example, the "record commence" button becomes a super-imposing button during recording, and the main volume control adjusts the monitoring level when recording. The price is 56 guineas.

Lee Products showed their extremely neat TR400, with the B.S.R. deck, at 26 guineas.

At the more expensive end of the scale, the Simon and Reflectograph machines attracted great interest.

In our next issue we shall introduce a new feature called "THE NEW MODELS," which will illustrate and describe the latest machines in full detail.



The 3S.38—one of the recorders in the new Sagatone range

PRODUCTS REVIEW

A NEW GELOSO



A NEW MODEL ELPICO Geloso recorder, known as the G.256, is a beautifully compact example of modern Italian styling. "It looks like a jewel and works like a gem," say the manufacturers, who announce it as the smallest mains-operated recorder in the world.

It measures 10 x 5½ x 4 in. and weighs 6½ lbs.

It operates at 1½ ips, at which a frequency response of 80 to 6,000 cps is claimed. Using standard tape on 3½-inch reels, and using both tracks, this gives an hour's recording time.

Tracks are changed by reversing the spools. There are simple, straight-forward push-button controls. Power output is approximately two watts and signal to noise ratio is quoted at better than 40 db.

With a crystal mic. and a 430-ft. spool of tape and spare reel, the machine costs 26½ guineas.

Accessories available include headset and foot or desk finger-tip controls, for use as an office dictating machine; and a converter with which to operate the recorder from a 12v. D.C. battery.

Lee Products (Gt. Britain) Ltd., Elpico House, Longford St., London, N.W.1.

Philips Market Tape Cassette



A CASSETTE to provide continuous playback of messages of up to twenty minutes' duration has been introduced by Philips Electrical Ltd. Catalogued as type EL3963/00, it is designed for use with the Philips AG8108G recorder, but it can also be used with certain other models with a left-to-right tape sense and facilities for locking the tape turntable in a stationary position during recording and playback.

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THE MANNEQUIN

RECORDING DEVICES LTD. have introduced the "Mannequin"—a new machine made entirely in England, using the B.S.R. deck, and priced at 26 guineas, including microphone.

It is a small, compact machine, but has built-in mixing and superimposition facilities. It can be used as a straight-through amplifier.

Recording Devices Ltd., 95, Villiers Road, London, N.W.2.

FOUR-TRACK TELEFUNKEN

A NEW FOUR-TRACK Telefunken recorder is announced by Welmecc. Model 76TR, the Magnetophon, takes 5½-in. spools and operates at 3½ and 1½ ips. It is thus capable of 12 hours 40 minutes recording or playing time.

The machine is basically similar in appearance to earlier Telefunken models, but additional small push-buttons situated between the spools enable the desired track to be selected. Recordings on two tracks can be played back together.

There is a new transistor pre-amplifier stage and frequency response claimed is 30 to 9,000 cps at 1½ ips and 30 to 16,000 cps at 3½ ips.

The Magnetophon sells at 64 guineas, excluding mic.

Welmecc Corporation Ltd., 147 Strand, London, W.C.2.

IN BRIEF

WYNDSOR RECORDING CO. LTD. announce that Mr. R. Russell, General Manager, has been appointed a director, joining the present directors, Mr. H. M. Creek (chairman and managing director) and Mrs. E. A. Creek (secretary).

THE FIRM OF DULCI has been taken over by Lee Products (Great Britain) Ltd. Present Dulci models are being continued and the range is to be extended and improved.

ELECTRIC AUDIO REPRODUCERS LTD. announce that the issued shares of the company have been purchased from Gas Purification and Chemical Company Ltd., by Mr. Leonard Stone and the other former directors of the company, Mr. E. Kaye and Mr. J. R. Sharp. The company's range of products has been extended to include tape recorders.

OWING TO EXCEPTIONAL PRESSURE ON SPACE, DESCRIPTIONS OF A NUMBER OF NEW PRODUCTS HAVE HAD TO BE HELD OVER UNTIL OUR NEXT ISSUE.

F. C. JUDD offers a preliminary laboratory report on

THE TAPE RECORDING MAGAZINE TEST TAPE

THE first combined monaural and stereo frequency test/demonstration tape to become available in this country has been specially made by Olympic Sound Studios, of London, for exclusive issue by *Tape Recording* and *Stereo Sound* magazines. The standard of recording is high and complies with specifications generally adopted in Britain. It is a tape which should be in great demand by tape recorder owners, dealers and manufacturers.

Frequency Test Bands for the three tape speeds of 3½, 7½ and 15 ips are provided for stereo and monaural testing, and the tape contains selected demonstration recordings in stereo.

An announcement at the beginning of the tape warns users about the importance of demagnetising the playback heads before running the tape through on the frequency test bands. Partial magnetisation of the head can damage the tape and render it useless for accurate test purposes.

The first frequency band is at 7½ ips and commences at 10 Kc/s (10 dB below peak recording level) for azimuth alignment.

Then follow sections containing the following frequencies:—

7½ ips :	1 Kc at peak level			
	3 Kc/s Wow Test			
	1 Kc	20 dB below	peak level	
	15 Kc/s	"	"	" "
	12 Kc/s	"	"	" "
	10 Kc/s	"	"	" "
	8 Kc/s	"	"	" "
	6 Kc/s	"	"	" "
	2 Kc/s	"	"	" "
	1 Kc	"	"	" "
	500 cps	"	"	" "
	250 cps	"	"	" "
	126 cps	"	"	" "
	60 cps	"	"	" "
	40 cps	"	"	" "

3½ ips :	160 cps at peak level			
	160 cps	20 dB below	peak level	
	8 Kc/s	"	"	" "
	6 Kc/s	"	"	" "
	4 Kc/s	"	"	" "
	160 cps	"	"	" "
	60 cps	"	"	" "
	40 cps	"	"	" "

15 ips :	1 Kc peak level			
	1 Kc	20 dB below	peak level	
	15 Kc/s	"	"	" "
	12 Kc/s	"	"	" "
	10 Kc/s	"	"	" "
	6 Kc/s	"	"	" "
	120 cps	"	"	" "
	60 cps	"	"	" "
	40 cps	"	"	" "

The final section of the tape is intended for owners of stereophonic recorders and playback machines. The test section contains an 80 cps band, in phase, followed by a band at 80 cps, out of phase.

Special tests for determining the correct connection of the two channels are included, together with further recordings for checking the phasing of the loudspeakers and balance of the amplifiers. Speech and a metronome are used for these tests, which are extremely valuable for setting up and balancing new equipment.

The section ends with first-class stereophonic recordings of a jazz group, a woodwind ensemble, road drills and trains.

Angus McKenzie is to be congratulated on the excellent recording and the accuracy of the frequency test bands.

Further details of how the tape may be used to best advantage will be given later, with a technical report on the accuracy of the frequency band levels, and details of a simple output meter which, together with the test tape, will enable one fully to test the response of any machine.

READY NOW

We apologise for the delay that has occurred in production of the special Test Tape. Supplies are now available and those who have made inquiries may now send remittances with firm orders, and tapes will be despatched immediately.

This tape has been designed to test the efficiency of tape recorders and to check the balancing of stereo.

PRICE • TWO GUINEAS

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Order from:—

TAPE RECORDING & HI-FI MAGAZINE
7 Tudor Street, London, E.C.4



TESTED IN THE LAB

THE SPECTONE 161

THE Spectone 161 portable tape recorder is a moderately priced machine, operating at 15, $7\frac{1}{2}$ and $3\frac{1}{2}$ ips, using the well-known Collaro Tape Transcriber, and capable of very good results from microphone, radio, or other inputs. Its performance as a player for pre-recorded tapes is excellent.

The machine has various facilities which are becoming more and more necessary as the art of home recording progresses. For example, two simultaneous inputs of low and high level are provided, which can be mixed on their own controls; and provision is made for superimposing one recording on another, with means of fading down, or even out, the previous recording, as required. An output to feed a quality amplifier is provided, as is also an extension speaker socket, this last muting the internal speaker.

The finish of the recorder is excellent and there is ample carrying room for four reels of tape, three in a compartment in the lid and one on the machine.

One adverse criticism: the compartment at the back of the machine, designed to contain microphone, spare plugs and leads, and mains lead, is far too small. There is only really enough room for the mains lead with a 2-Amp plug. The flap which covers this compartment could well have been provided with a slot for the mains lead so that it could be closed when the machine was in use.

FUNCTIONAL TEST

The recorder received for review was tested for frequency response, wow and flutter, signal noise ratio, etc., and found, with some slight exceptions to be within the maker's specification.

Frequency response at $7\frac{1}{2}$ ips was tested with a CCIR test tape and, after suitable adjustment of the tone control, was found to be within ± 3 dB between 40 and 12,000 cps, and 7 dB down at 15,000 cps, measured on the extension speaker terminals with 15 ohm load, showing the machine to be an excellent reproducer of pre-recorded tapes.

The overall response, from record input to play output, on Emitape at $7\frac{1}{2}$ ips was found to be slightly worse at the high frequency end, and on investigation it appeared that there may be some loss of high frequencies in the recording amplifier, if the level indicator—an easily read magic eye—is to be believed at all frequencies. This loss was noticeable on the other speeds as well, but at all speeds use of the tone control—a top lift one, by the way—could put things right again. This, however, with some increase in hiss.

At $3\frac{1}{2}$ ips the response was ± 3 dB from 60 to 8,000 cps, being 10 dB down at 10,000 cps. At 15 ips the response was

somewhat up in the bass, being +5 dB at 50 cps, +3 dB at 200 cps. From then on it was ± 3 dB to 15,000 cps, -3.5 dB at 16,000, and -20 dB at 20,000 cps. Frequency response on both heads (this is a reversing machine) was very similar.

Noise level was better than -40 dB below full tape modulation, and mostly consisted of rumble from the motors, possibly due to a microphonic valve.

Slight wow and flutter were detectable by ear at $3\frac{1}{2}$ ips, but the machine was still within specification, and at $7\frac{1}{2}$ ips measured better than 0.2 per cent.

The Collaro deck is so well known that there is little need to comment on it here, and the one on this recorder performed well, as would be expected.

Sensitivities for peak tape modulation, as shown by the level indicator, were: microphone 0.6 mv, and radio/gram. 10 mv.

The maker's specification, which the recorder performs well, is given for those who are technically minded.

Supply: 210-250 A.C. 50 cps.

Maximum power consumption: 85 watts.

Tape deck: Latest Collaro Mark IV tape transcriber.

Speeds: 15 ips, $7\frac{1}{2}$ ips, $3\frac{1}{2}$ ips.

Rewind time: 3 minutes (approx.).

Frequency response: 15 ips ± 3 dB 50-16,000 cps; $7\frac{1}{2}$ ips ± 3 dB 50-12,000 cps; $3\frac{1}{2}$ ips ± 3 dB 50-8,000 cps.

Hum and noise: Better than 45 dB below peak output.

Wow and flutter: Better than 0.15 per cent.

Bias and erase frequency: Approx. 60,000 cps.

Erase socket: Used when superimposing one recording on top of another.

Inputs: Microphone (High Impedance); Radio/gram. (250,000 ohms); Extension amplifier (Minimum matching impedance 50,000 ohms); Extension speaker (15 ohms $2\frac{1}{2}$ watts).

Sensitivities: For 2 watts output: Radio/gram.—120 m/v; Microphone—3 m/v. For Peak Recording: Radio/gram.—30 m/v; Microphone—0.75 m/v.

Valves: E.C.C.83, E.C.L.82, E.L.84, E.M.84.

Speakers: 7 x 4 Elliptical 15 ohms P.M.

Controls (other than Tape Deck): Tone/mains on-off.

Microphone/playback volume and radio/gram. volume, with full mixing facilities on recording.

Weight: 36 lbs. (complete), approx.

Dimensions: $15\frac{1}{2}$ x $15\frac{1}{2}$ x $8\frac{1}{2}$ ins.

The microphone supplied with the recorder is the Acos 39/1 and is capable of some very good results. The record amplifier has ample gain for low level ribbon or moving coil microphones and the serious recordist would be well advised to buy one of these. The recorder's potentialities are greater than those of the microphone supplied with it.

One final point: the amplifier can be used as a "straight-through" reproducer for radio or gramophone or for microphone on its extension loudspeaker.

At 49 guineas the Spectone 161 is a good, reasonably priced recorder, capable of giving a great deal of pleasure to all those who invest in it.

B.H.

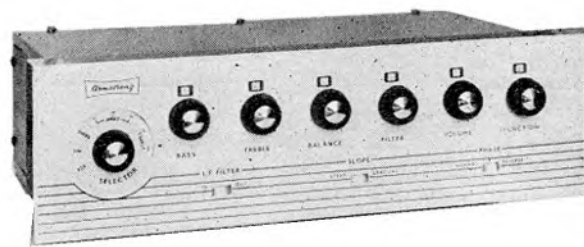
THE ARMSTRONG PCU.27 STEREO PRE-AMP

DESIGNED to provide every possible facility for all sources of sound reproduction both now and in the future, the PCU.27 stereo pre-amplifier is an engineered product of sound design and construction. It has an elegant appearance that will do justice to any hi-fi furniture with its neat white 14½ in. × 4½ in. control panel, artistic lettering and decoration. It is recommended as a high fidelity instrument and will operate with the Armstrong A.10 or any other power amplifier of comparable quality.

The controls are nicely spaced for convenient manipulation, each having its own direct indication of position which is visible through a small window in the control panel. The unit cover and chassis are constructed from high grade rust-proof steel and stove enamelled with a hammered bronze finish.

The chassis layout and component distribution is excellent, all components being of high quality and securely fitted in their respective positions.

The functions of the PCU.27 are mainly to receive and select a signal from any sound source and to match the source so that the quality of reproduction is not impaired. Accepted standards of correction can be applied to adjust the signal where necessary to suit individual programme



The controls are nicely spaced for convenient manipulation

material and finally pass the signal via a correctly matched output terminal to the power amplifiers.

The controls and switches of both channels are ganged to provide simultaneous operation; closely matched potentiometers and other components being used to ensure no disparity of adjustment between the two channels.

Input selector switch

The input selector switch is an eight-position control for switching the various inputs, all of which are available for stereo or monophonic sound sources.

I was invited to witness the Armstrong laboratory tests for frequency range, square wave response, as well as satisfactory operation of all controls to the maker's specification. In addition, a wide range of tests were applied in my own laboratory, where the PCU.27 was subjected to pen recording tests for frequency response, actual operation into power amplifiers, operation from stereo on tape, frequency tests from tape, listening from an AM/FM tuner, etc.

The results, which were published in detail in the July issue of *Stereo Sound Magazine*, were extremely good, following closely the Armstrong specification and in some respects surpassing it.

The unit may be used as a recording amplifier and provides a signal level of 350 mV at 270 K.ohms impedance for stereo or monaural recording.

The power required to drive the PCU.27 is as follows:—
HT+300 volts at 8 mA. LT. AC 6.3 volts at 2 amps.

The input circuits are designed so that the input voltage can be approximately 30 dB above the quoted sensitivity in each case before overloading occurs.

Listening tests were conducted with the aid of two A.10 amplifiers, each feeding loudspeakers suitably placed for stereo reproduction. Although each speaker was of different make and consequently had a different frequency response and sensitivity, the controls on the PCU.27 provided more than sufficient range to cater for differences such as these. The unit was also tested, using an A.10 amplifier on one channel and a Mullard 510 home constructed amplifier on the other channel. Again the PCU.27 controls proved capable of equalisation for two dissimilar amplifiers as well as the loudspeakers.

Reproduction from stereo on tape was excellent and monaural operation using a single channel input, from a radio tuner for example, but using both channels of the amplifier chain was most effective.

Armstrong are to be congratulated on producing this new unit which made its debut at the recent London Audio Fair and should cater for the most ardent hi-fi enthusiasts with its versatile range of control and selection of inputs.

Anyone contemplating setting up for stereo would do well to consider this unit as the nucleus of a complete system, for it is reasonably priced at £26 10s. **F. C. J.**

THE SONOCOLOR KIT



The Sonocolor splicing and editing kit, which is now available in this country at £3 12s. 6d., is a splendidly comprehensive kit, with a very efficient splicer, adhesive tape and splicing glue, three reels of differently coloured leader tape, and a box of useful clips for securing tape ends. I have had it in regular use for two months and, with it, I have the confident feeling that I can do anything a professional studio editor can do! Tape Recorders (Electronics) Ltd., 784, High Road, London, N.17, will provide on request a full catalogue of this and other tape accessories.—R.D.B.

NEWS FROM THE CLUBS

CONGRATULATIONS to **Dundee Tape Recording Club**, who collected two prizes in the B.A.T.R.C. The number of entries in the club section of the Contest was, frankly disappointing. Most of the clubs who specially requested us to add a club section did not, in the end, submit tapes. Perhaps this was due to the short time left between the announcement and the Contest closing date.

Edited by

FRED CHANDLER

I have received varied comments from club secretaries on the new presentation of this column—brickbats and bouquets are about evenly distributed. Suggestions are always carefully considered, but we must try to give an overall description of club activities, and with more clubs forming weekly it is difficult to promise anyone regular space in every issue. It is for new ideas, as well as tried and tested methods, that we look, ideas that can be passed on to the younger clubs.



One of the greatest deficiencies has been our inability to print the dates of future meetings. We believe we have found a way to overcome this problem. More details next month. Meanwhile, will club secretaries include in reports the date, time and venue of future meetings?

One of the embarrassments of actuality recording, particu-

larly interviews with "the man-in-the-street," one that I have suffered many times, is the need to explain to the "victim" exactly what you are up to. The **National Federation** have a plan to dispose of, at least, the introduction problem. Secretary Alan Stableford has designed an official card that gives the name, address and photograph of the holder. Further details will be available shortly.

Outside recordings have taken the place of many club meetings recently. The **London** club substituted a trip to the Sussex coast for their August meeting. Fourteen members and five recorders invaded the quiet of Eastbourne to collect recordings of a speedboat trip; a ride on a miniature railway; an open-air church service and interviews with holiday-makers.



Two members of the **Coventry** club have also been out and about. Roy Reynolds operated the Boosey-Hawkes portable recorder and Ted Bright interviewed, when they sought the opinions of "Mr. and Mrs. Coventry," on the re-development of the city. Terry Nurse and Mr. Minton of **Birmingham** club have had the same idea, using a Stuzzi. Their tape included interviews with a newsagent and the owner of an amusement arcade.

The recently formed club in **Ipswich** has had a busy time lately. Their outside recording dates included two fetes; a visit to the local Saturday morning children's film club; interviews at the Spa Pavilion, Felixstowe; a local girls' choir and

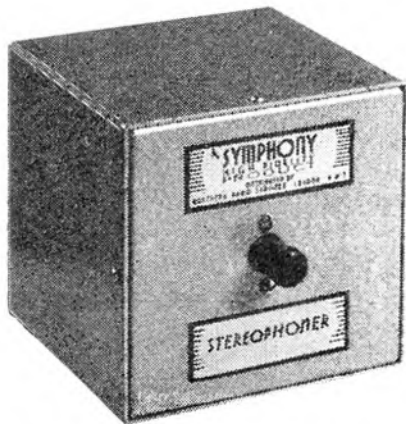
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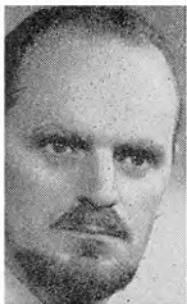
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Club Personalities No. 3

ALAN STABLEFORD

Federation of British Tape
Recording Clubs

ALAN STABLEFORD has been interested in tape recording for about four years. A member of the London Tape Recording Club since its inception, he recently became its chairman. In 1958 he attended the inaugural meeting of the Federation of British Tape Recording Clubs in Coventry, and was elected to the Committee. He became Secretary of the Federation at the A.G.M. last June. He also founded the West Essex Tape Recording Society in February 1959 and was its first secretary.

He has broadcast in the B.B.C. "Sound" programme and recently collaborated with Ken Sykora in a Children's Hour broadcast, during which a number of his own recordings were used.

He uses a Vortexion WVB recorder, a Grundig TK35 and a Fi-Cord, and is particularly interested in actuality recording and unscripted interviews. Normally a tolerant person, Alan tends to become enraged on hearing the word "Tapespond," and is unenthusiastic about the pleasure to be derived from an exchange of small-talk with a taxi-driver from Boise, Idaho, or even a druggist from Dallas, Texas.

Aged 35, married, with two children, he hopes one day to be able to devote more time to tape recording, and less to tape recording club "politics."

He is Managing Director of a firm of retail chemists.

a visiting Dutch girls' choir. Planned for the future are interviews of the show companies at the Spa Pavilion.

An introductory commentary, a description of the bride's arrival and comment on her dress were included in a recording of a local wedding made by Nevin Anderson, Chairman of the Sheffield society, using a Stuzzi portable.

Warwick and Leamington members supported a fete organised by local teen-agers to raise funds for a Youth Centre last month. Demonstrations of tape recorders and a "record your voice" stand were among the interests provided. Visitors could also hear tapes outlining the Society's hospital tape service, the various world tape organisations, and local recordings made last year. Seventy persons visited their tent and the entrance money collected was presented to the "Riverside Cavalcade" organiser.

The visits by Mr. Parrington, of Walter Instruments Ltd., demonstrating the Walter 101, 303 De luxe and the 505, are proving very popular among clubs. His most recent visits were to the clubs in Edinburgh and Kettering. The West Middlesex members have entertained Mr. Barrington-Coupe, of Saga Records Ltd. He presented a programme of Saga classical pre-recorded tapes and introduced Sergio Fiorentino and Joyce Hatto, two of the pianists who are featured on Saga tapes. One of the tapes heard was a master tape, being played virtually for the first time. The soloist, Sergio Fiorentino, had not even heard it.

Mr. Tucket, of Fi-Cord, paid members of the Walthamstow club a visit to demonstrate the battery portable. Recordings made on the instrument were played back on the Chairman's Baird recorder, with impressive results. Members of this club were recently treated to a demonstration of a home-made microphone built from a telephone ear-piece.

Clubs are not sitting back and waiting for demonstrations to come to them. A number are visiting factories and show-rooms individually and in groups. Two companies, Grundig and Walter Instruments, have already held tours of this kind. West Middlesex, luckier than most in this respect, are able to

make regular visits to Olympic Sound Studios for the various lectures and demonstrations held on the first Saturday in each month.

Members of another London club, in Catford, were invited to visit the M.S.S. Recording Studios in August. After inspecting the equipment used in the studios, they were able to see disc cutting in operation. The Wakefield club members travelled to Batley, where they were introduced to the range of cabinets and speakers produced by Richard Allen Ltd. Although strictly a disc demonstration, the information obtained, especially regarding stereo, was gratefully received.

Further north, in Aberdeen, an informative evening was enjoyed by the members who were conducted around the B.B.C. Studios by Mr. Lyons, Acting General Programme Producer. After explaining the different operations involved in broadcasting, Mr. Lyons played back material which had just arrived for editing.

The first edition of the British Tape Recording Society's inter-club news magazine has been circulating among clubs. Included in the tape is a 15-minute interview with Tony Schwartz—a professional sound recordist in America. The second issue of The Recordist, house journal of B.T.R.S. is also available. Both these new issues are distributed from the society's new headquarters at 52a, 64, Hough Green, Chester.

A change of venue has also taken place in Leeds. Meetings will in future be held at The Adelphi, adjacent to Leeds Bridge. Their A.G.M. will take place there on October 8.

While the established clubs are expanding, new clubs are springing up throughout the country. The latest has appeared in Aberystwyth, where the West Wales Tape Recording Club held its inaugural meeting in July. The Secretary is Gareth Jenkins, 5, Glyndwyr Road, Aberystwyth, Cardiganshire. Meetings are to be held monthly.

Two other clubs are proposed in Birkenhead and Manchester. John Booth, 11, Rose Gardens, Neston, Wirral, Cheshire, is keen to start a club in the Birkenhead and Wirral district. In Manchester, Joseph Kerrs is forming a club. His address is 20, Naylor Street, Hulme, Manchester 15.

Dennis Osborne, founder of the Birmingham club, has relinquished his position as secretary. His resignation has prompted the idea of starting a Family Tape Circle. He would like to hear from any family who is interested in exchanging tapes with his family. They have three children, George (13), Maria (12) and Veronica (5). Write to him at 75, Millmead Road, California, Birmingham 32.

The Secretaries of the clubs mentioned this month are: Charles Aitken, 59, Strathmartine Road, Dundee, Angus. Nat. Federation: Alan Stableford, 9, Normandy Terrace, London, E.16. London: Roger Aslin, "Fairlea," Boars Head, Crowborough, Sussex. Roy Reynolds, 1, Thurlstone Road, Radford, Coventry. Terry Nurse, 161, Stuart Road, Yardley, Birmingham 33. Malcolm Wilding, 31, Darwin Road, Ipswich, Suffolk. B. T. Jeeves, 58, Sharrard Grove, Sheffield 12. Warwick: Brian Race, 30, Ashford Road, Whitnash, Royal Leamington Spa, Warwick. John Penman, 22, Lauriston Place, Edinburgh 3. A. M. Webb, 93, Regent Street, Kettering, Northants. West Middlesex: H. E. Saunders, 20, Nightingale Road, Hampton, Middlesex. Walthamstow: J. A. Wells, 178, Selwyn Avenue, Highams Park, London, E.4. Derek Harker, 62, Barmeston Road, Catford, London, S.E.6. Michael Storey, 331, Horbury Road, Wakefield, Yorkshire. William Hobben, 22, Ruthrie Terrace, Aberdeen. B.T.R.S.: Ted Yates, 210, Stamford Road, Blacon, Chester. Terence Quigley, 32, Derby Road, Rawdon, Leeds, Yorkshire.

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J. & B. Recordings, tape/disc, all speeds. 14, Willows Avenue, Morden, Surrey. Mit 8155.

Our Stratford Branch stocks almost every make of tape recorder manufactured. All recorders available on our unique No-Interest Terms. Highest part-exchange allowances obtainable anywhere. Examples: Grundig TK9/12 £25-£35. TK5/20 £23-32. TK8/3D £33-£43. Telefunken KL75 £28-33. Philips AG8108 £32-£43. AG8109 £19-£23. Write for lists. Essex Tape Recorder & Hi-Fi Centres, 2, Maryland Station, Stratford, E.15. Maryland 5879.

FRIENDLY FOLK ASSOCIATION, 87, Terrace, Torquay. Leading International Correspondence Hobby Club since 1943. Now included, facilities for Tapesponding. Details free.

JOHN HASSELL RECORDINGS. Tape/Disc. All Speeds. C.C.I.R. Studio, 21, Nassau Road, London, S.W.13. Riverside 7150.

TAPE RECORDERS. players, radios, etc. (modern), wanted for cash or exchange. Callers or particulars: Cooks, 159 and 187, Praed Street, W.2 (opp. Paddington Station). PAD 6464.

TAPE RECORDERS. Large selection of used models, most as new. Three months guarantee. Part exchanges with other machines, cameras, binoculars, etc. Ferrograph Tape, 7 in. spool, 1,200 ft. 25s. Cooks Miscellaneous Store, 159 and 187, Praed Street, W.2 (opp. Paddington Station). PAD 6464 or 5931.

Pre-recorded tapes of new piano medleys. Played in modern style by Al Marsden. Full tape 5 in. dia, price 50s. Recording Dept., 51, Garden Street, Nelson, Lancs.

Sonomag Adaptatape. March '58. Extras, good condition. Offers. 29, Leechcroft Road, Wallington.

LINEAR LT45 tape amplifier for sale. Suit Collaro, Truvox, etc. In new condition, unused. Cost 12 gns. £6. Box 309.

TAPE/DISC/TAPE transfer, editing, copying. If quality and durability matter (especially with LPs from your precious tapes) consult in your own interest Britain's oldest (not cheapest!) transfer service. **SOUND NEWS**, 10, Clifford Street, London W.1. REG 2745. P.S.: few Gevaert 1,700 ft. tape, 31s. 6d., E.M.I. 1,200 ft. on Ferrosponds 25s., post free.

SPECTONE 151.B., 1957. Microphone, Tape. Straight from manufacturers check-up. Cost £77. £40. Allen, 27, Alexanders Terrace, Corsham, Wilts.

EXPERT tape recording amplifier. Also Expert "Master" amplifier and pre-amplifier. London. Offers. Box 310.

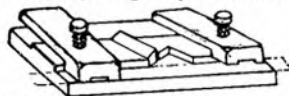
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OCTOBER, 1959

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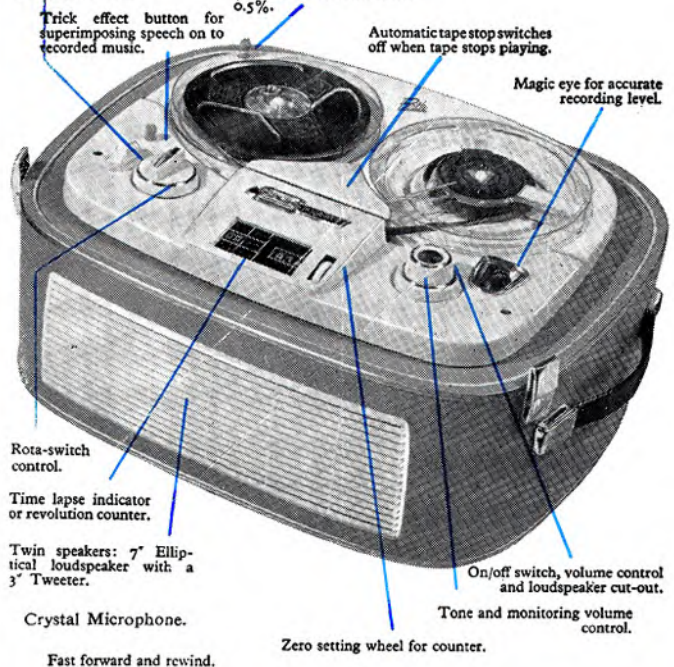
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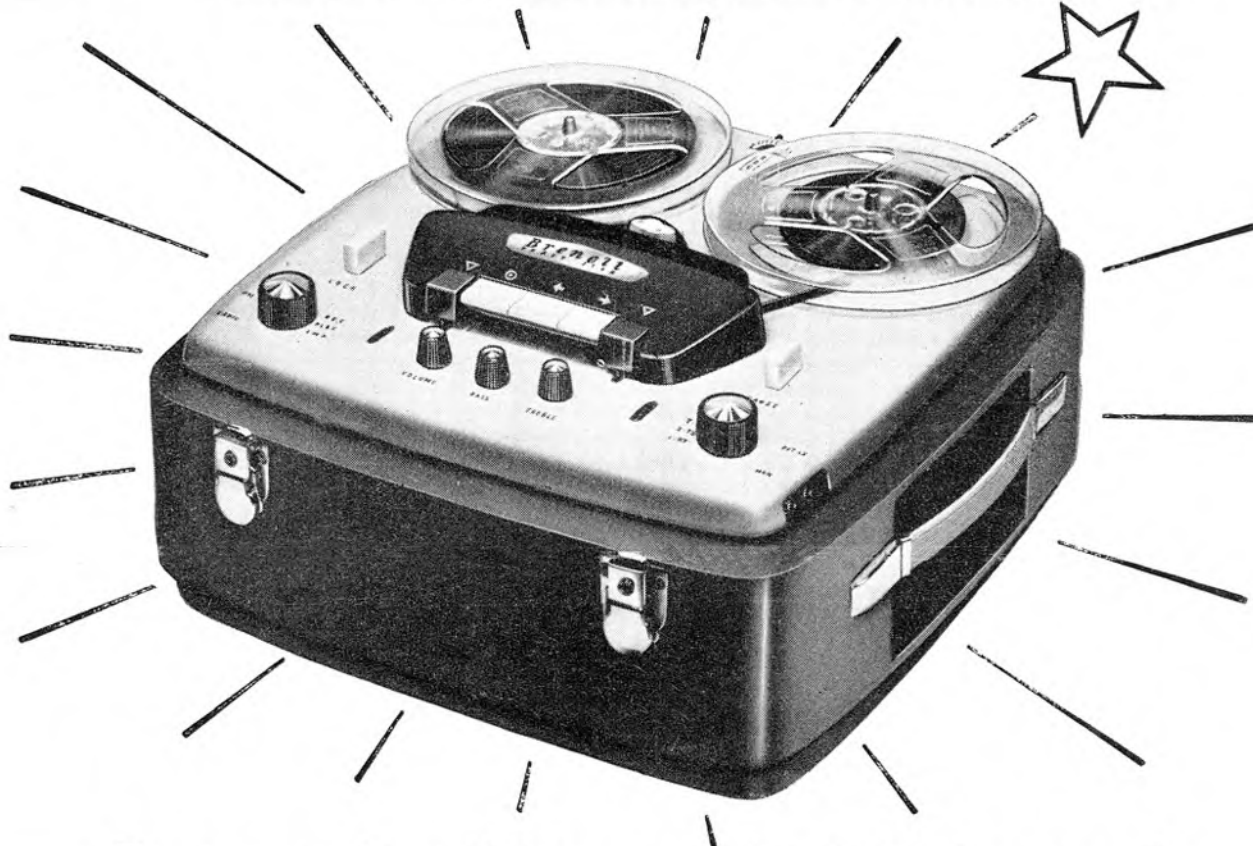
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