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microphone

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WOW AND FLUTTER	Not greater than .15% at 7½ ips
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AMPLIFIER OUTPUT	6 watts push-pull
SIG/NOISE RATIO	43dB unweighted
VALVES	1×8D8, 3×ECL82, 2 metal rectifiers
BIAS FREQUENCY	64 kc/s
REPLAY CHARACTERISTIC	CCIR
RECORD LEVEL	M/C Meter
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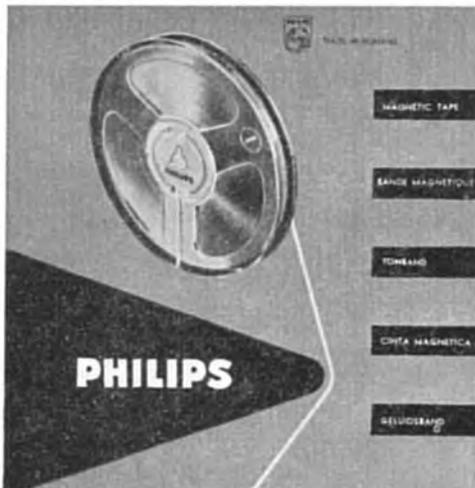
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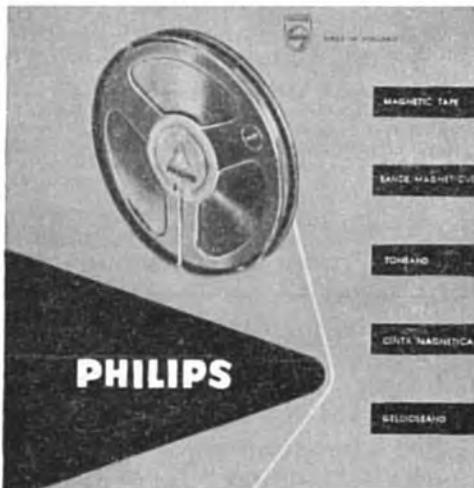
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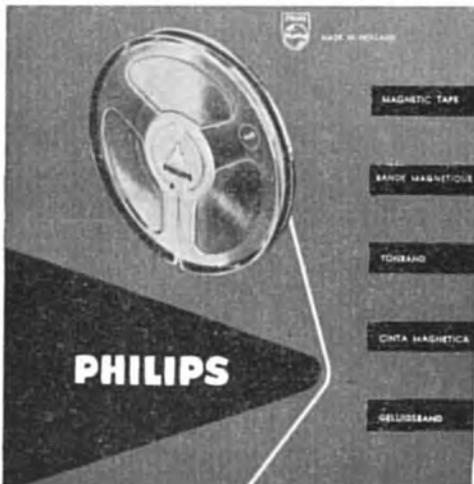
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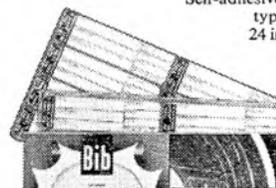
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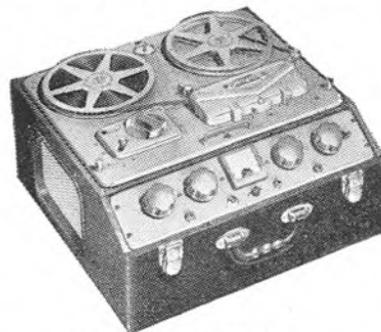
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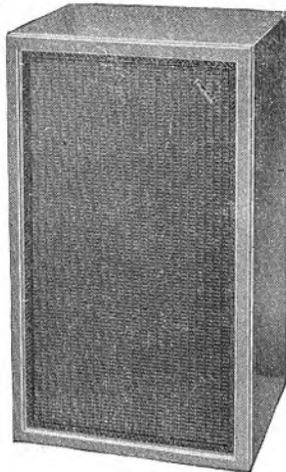
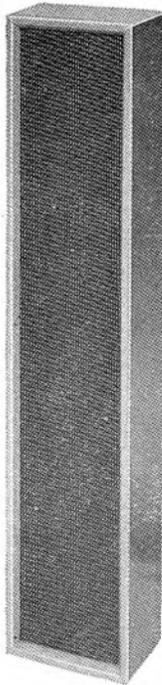
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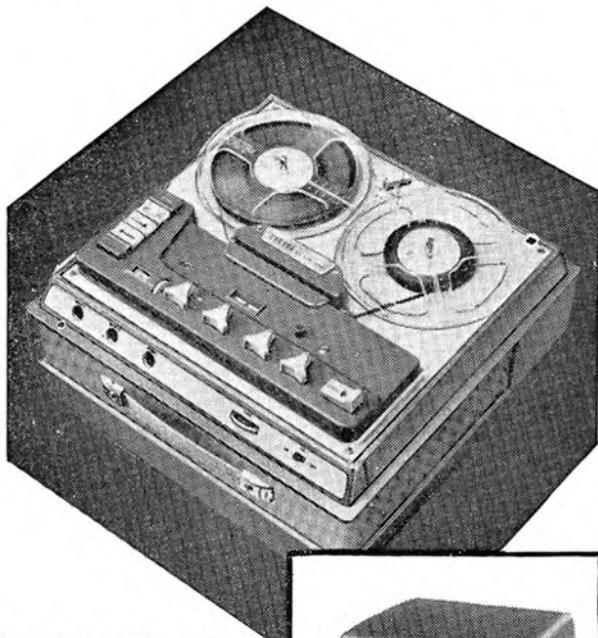
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 6 demonstration tapes that pave
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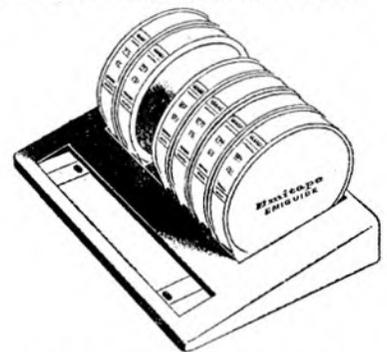
John Borwick, the well-known writer and broadcaster on all aspects of tape recording, has devised, written and recorded six EMIGUIDES. With these, you can *make your tape recordings as good as his.*

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TAPE

RECORDING
FORTNIGHTLY

Vol. 5 No. 22 1st November, 1961

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We take the view . . .

A DIGEST OF NEWS, COMMENT AND EDITORIAL OPINION

IT will be a long time before many of the British representatives forget their experiences at the fifth Congress of the International Federation of Sound Hunters and the tenth International Recording Contest adjudication. The events themselves went through in a smooth and business-like manner. The FICS session took some useful decisions. Perhaps the most interesting to amateurs in general was the recommendation to establish recognised standards in the use of coloured leader tapes.

The following code is suggested:—

Red—to indicate the beginning of a recording at 15 ips.

Blue—the beginning of a recording at 7½ ips.

Green—the beginning of a recording at 3½ ips.

White—to indicate the end of a tape or the beginning of the second track (all speeds), and

Yellow—to indicate a change-of-reel break in a single-track recording (all speeds).

This code, is in fact, based upon recommendations made by a European Broadcasting Commission conference in 1952 and so will bring amateurs into line with professional practice, so far as the two coincide. The industry and the Commission are to be informed of the FICS recommendations.

It was also decided to recommend that tapes exchanged internationally by amateurs should always be recorded on one track only, unless some other arrangements have been specifically made by sender and recipient. They should be recorded at 7½ or 3½ ips—the Congress resolved formally that “speeds under 3½ ips will not be recommended by FICS.”

INTERNATIONAL CONTEST RESULTS

BRITISH entries scored one first and one second in the tenth International Recording Contest (CIMES), judged in Berlin last month.

For the third successive year a British tape won the Schools Section of the Contest. This time it was “Life in 1801,” the feature tape produced by Class 4a of Pennington Junior Mixed School, Hampshire, which carried off the honours. They were awarded a prize of 500 French francs—about 35 guineas—given by the French electronic and recording industry.

Britain’s “Tape of the Year”—the London Tape Recording Club drama called “Just by Accident,” entered by Mr. Terry Devereux—was placed second in the Compositions Section of the International Contest. Mr. Devereux won a prize of 250 Swiss francs—just over £20—donated by Radio Lausanne.

The two British prizes in the International event went to Switzerland. The Wyndor Gold Medal was awarded to Mr. Willi Baumann (together with a sum of 1,000 Swiss francs) as the Grand Prix for the best monaural entry; the Tape Recording Fortnightly Shield went to Mr. J. Taverney (together with a sum of 1,000 German marks) as the Grand Prix for the best stereo entry.

The Federation is also preparing an international membership pass which will identify the holder as a serious recording amateur wherever he goes.

Next year’s Congress and Contest judging will take place in Strasbourg, in the new radio studios there.

Full delegations

IN Germany the Ring der Tonbandfreunde—the leading organisation of recording amateurs which has grown from half a dozen members in

1958 to over 2,500 at the present time—made an excellent job of the organisation. Herr Wilhelm Gluckert, of Mainz, who shouldered most of the responsibility, was in cheerful command throughout—and even managed to submit some entries in the Contest as well.

The hospitality was almost overwhelming. We were the guests of the Ring der Tonbandfreunde at a memorable dinner in the Kongresshalle, the almost fabulous building erected as an American gift to Berlin within yards of the Brandenburg Gate. Philips’ German company and Telefunken also entertained us lavishly and there was an interesting visit to the Telefunken factory.

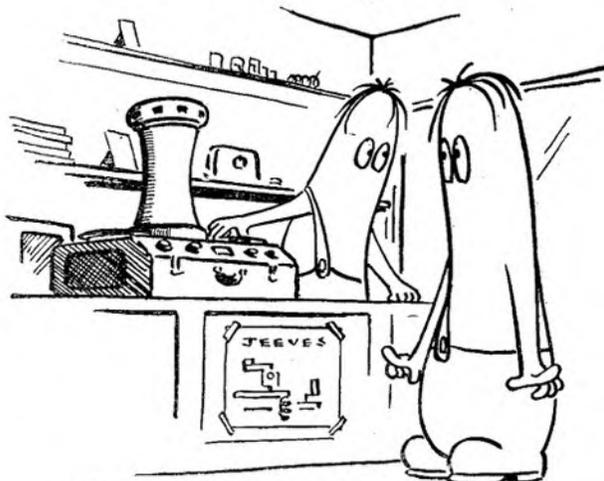
We missed the presence of representatives from Austria and Italy this time, but from all other affiliated countries full delegations attended.

It was a particular pleasure to have the producer of Britain’s “Tape of the Year,” Terry Devereux, and his wife, with the British party. This is a tradition which E.M.I. Sales and Service have made possible and which it would be pleasant to see spread to the other affiliated countries, so that these international gatherings brought together the most talented amateur recording enthusiasts, as well as the official representatives of their organisations.

Denmark this year organised a party of nearly a score of enthusiasts and while in Berlin they visited the radio station and the principal tape recorder factories in the city. On our last night we enjoyed meeting these Danish and their welcoming German friends at a pleasant social gathering at a restaurant on the Kurfurstendam, the gay and brilliant centre of Berlin night life.

In our next issue there will be a full illustrated report on the International Contest.

LAUGH WITH JEEVES



“I’m afraid we had to fit a new capstan.”



One of the three New York stations now on the air in FM Stereo broadcasting from the show.

FIVE AMERICAN STATIONS NOW TRANSMIT STEREO

Report from Peter Bardach

NEW YORK

AN overflow crowd of more than 30,000 high fidelity fans jammed the five floors of New York City's Trade Show Building in mid-September. The attraction was the 6th annual Hi-Fi Show.

As in previous years, over 100 exhibitors displayed their latest wares to the sound-conscious public, each of whom had paid \$1.50 for the privilege of looking, listening, and window shopping.

Most exciting news from the show this year was FM (VHF) stereo, the new system of true stereophonic broadcasting which was approved by the Federal Communications Commission in April of this year, and now being transmitted by a score of FM stations. Several New York area stations had studio facilities at the show and broadcast live stereo programmes.

Although the new stereo receivers and adaptors have only just been offered for public sale, three New York stations are already offering regular stereo transmissions daily, and two new "all stereo" outlets will be on the air by the time you read this report.

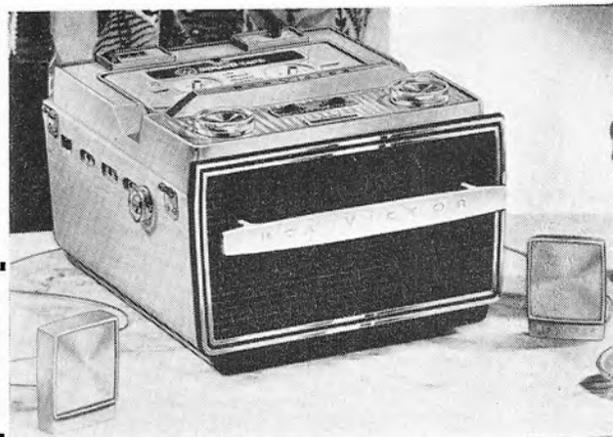
Among the \$6 million worth of high fidelity equipment were many new and redesigned tape recorders, ranging from miniature transistorized units to elaborate console models. The new stereo trend focused attention, naturally, on four-track models.

RCA Victor unveiled three "new" compact tape cartridge recorders, weighing slightly more than 13 lb., and employing a somewhat revised version of the RCA magazine-loading cartridge. An optional adaptor also permits any of

the units to play small reel-to-reel tapes. Using a book-sized plastic container, less than half-an-inch thick, in which two reels of tape are enclosed, this system eliminates the need for threading tape. The RCA system works at $1\frac{7}{8}$ (for voice) or $3\frac{1}{2}$ ips. RCA has simultaneously introduced a limited number of pre-recorded cartridge tapes. It should be noted, however, that virtually all other pre-recorded tapes are reel-to-reel $7\frac{1}{2}$ ips recordings, which cannot be played on the RCA models. In my opinion, moreover, the playback quality of the RCA cartridge tapes was much below the high standard of most $7\frac{1}{2}$ ips releases, although in fairness it should be pointed out that these RCA machines are not designed for the hi-fi "buff," rather they are aimed at the mass-packaged market which will probably find little fault with the quality of reproduction.

An impressive list of firms offered a view and preview of their 1962 models and related equipment. In the tape area alone were: American Concer-tone, Ampex, Bell Sound, Eico, Pentron, Sony-Super-scope, Tandberg, Bogen - Presto, Crown, Ferrograph, Gratz, Heath, Kane-

Right: The new RCA Victor which records as well as plays back stereo cartridge tapes



THE WORLD OF TAPE

A NEWS ROUND-UP

Mark, Norelco, Revere, Roberts, Saba, Stuzzi, Fujiya, Warman, Sonotone, Viking of Minneapolis, and Wollensak.

A trend toward compactness was noted as the principal feature in the tape field, particularly among the portables which are showing improved ability at extending frequency response. Among the standard units, we were particularly impressed with the new Viking Compact stereo model from Viking of Minneapolis. Simplicity of styling and the traditional absence of frills and gimmick or "trick" controls are the hallmark of this well-designed product.

A look into the future was provided by Richard Ekstract, chairman of the Show, who predicted that living-room walls may be wired for sound by the early 1970s, without any actual wires. He forecast wall paint that will contain special sound-conduction chemicals mixed right into it. He also ventured that tape recorders will measure about three inches square, powered by molecular electronic amplifiers. The "tapes" would actually be tiny wafer-like cards, containing an entire evening of music.

But that's only the beginning, according to Ekstract. The walls of the listening room will change colour according to the music being played. The sound frequencies will alter the chemical content of the wall paint so that certain sounds will produce blues, other sounds reds, yellows, etc. One wonders though about the rainbow-coloured hues that might be evoked by the rock 'n roll hits as we know them today!

These predictions for the future may not be so far out. Already, a Japanese company is said to be experimenting with a combination tape camera and TV set for home use. This would permit one to take pictures on vacation with the camera . . . come home . . . and immediately play the tape film on the TV set.

Perhaps the most unusual display at the music show was a completely sound-proof room. As any visitor to hi-fi shows know, this can be a welcome relief after several hours of sampling sounds. The "quiet room" was well attended!

ALAN EDWARD BEEBY'S TAPE TALK

IT'S arrived! The letter I've been waiting for ever since "Tape Talk" started, turned up on the breakfast table this morning. It came from one of our readers in London, Mr. D. Marchant.

"In a pub recently," he writes, "a group of recording enthusiasts were tossing the name 'Studholme Berkeley' around and drawing gales of laughter in the process. Who, or what, is 'Studholme Berkeley,' and what's the big joke? Do you know?"

Yes, Mr. Marchant, I do know. This is a gag dating back to the early 'fifties when we embryo recording types were still wondering what it (tape) was all about, and you could dine out free for a month simply by mentioning, quite casually, that you had *two* speeds on your machine!

"Studholme Berkeley" (known affectionately throughout the trade as Fred!) was an entirely fictional character invented purely as a sort of impersonal scapegoat for anything which went wrong with our recording experiments—like an air force "gremlin," for example. He was commonly pictured as a hearty, back-slapping, BBC-commentator type with "bags of tech-gen" and full of brilliant ideas which inevitably came unstuck.

So he's reached London now, eh? Well, you're welcome to him—he's certainly caused enough trouble up in this area!

SHIRLEY and I went to a party the other evening and, on the express wish of our dog-loving hostess, took Tess along with us. In the crowded lounge of the hotel, it wasn't long before Tess was up to her usual occupation of wandering around the room collecting pats.

"Where's that dog off to now?" asked Shirley, after Tess had been missing for about twenty minutes. "Probably scrounging cake and biscuits from somebody or other!" I replied, craning my neck and glancing about. "I'll go and see if I can find her."

I found her—sitting gazing fondly at a young man at the other end of the lounge. "I haven't got anything for you, old girl," he smiled, stroking her head. Tess prodded her nose insistently against the canvas hold-all at his feet. "There's nothing in there, my beauty!" said the young man again. There was, though. A Fi-Cord portable recorder and a Grampian Microphone!

Coincidence . . . ?

QUITE a number of eagle-eyed tele-viewers among our readers spotted it. "What was a Grampian DP/4 microphone doing alongside the BBC's usual type of high-priced mike in a recent filmed news-interview?" they wanted to know.

Mr. P. T. W. Vance, Head of BBC Engineering Information Department told me: "The two microphones? Well, the probability is that a separate sound recording was being made for use in one of our sound-services. It is not unusual for one reporter to cover the same event for both Sound and Television.

"So far as the choice of microphone is concerned, it is, of course, true that equipment capable of producing high-quality results is often expensive. It does not necessarily follow, however, that the most expensive equipment is always the most suitable for a particular assignment. Items for our news-broadcasts often have to be taken at very short notice, without rehearsal, and in very difficult places and conditions. Nor is it always possible for the news-reporter to be accompanied by an engineer.

"In these circumstances, a small, light and robust microphone requiring the minimum of additional equipment and technical experience may produce a more satisfactory result than one which is more delicate and therefore requires skilled technical handling and a quantity of ancillary equipment to realise, fully, its potential performance."

"SCOTS singer, Kenneth McKellar is a tape recording enthusiast," was a rumour that reached me recently. I asked him if this was true. "Yes, I have two tape recorders," he told me. "A Ferrograph and Fi-Cord portable." Kenneth is also a keen collector of gramophone-records, and has an impressive range of stereophonic equipment at his home.

He also enjoys making records himself. "So far as actual singing goes," he said, "I think it's the best medium of all, because it gives a singer more scope to perfect his performance." I asked him how he felt about television and radio work.

"Television is certainly the more rewarding medium of the two, if the more exacting, since the performance is usually given after working all day under blazing lights during rehearsals." And radio? "Radio is simpler—and cooler! The shows are usually taped in an air-conditioned studio which makes working a lot easier." How about "live" theatre work? "I value this greatly," he told me, "both for its immediate effect and the personal contact where audiences are concerned."

His latest LP disc, "Songs of the Hebrides," has the lot; music, songs, dialogue and sound-effects! This was his own idea, and it seems to be paying off, because the disc is selling like hot cakes. "The songs themselves are linked by introductions which were written and spoken by myself," he explained,

"together with 'sea-shore' sound-effects."

"And where were these 'sea' effects recorded?" I asked. "Up in the Hebrides?" Kenneth grinned suddenly. "Er, well, actually," he lowered his voice confidently, "on the sea-front at Hastings, I believe!"

Well, what's a few hundred miles between friends! It's a first-rate recording, anyway, and we could certainly do with a few more like it.

NOW and again, something happens to give a certain recording new significance—even poignancy. I have a recording of a theatre-organ recital which my colleague, Alan Ashton and I made at the Savoy (now the ABC) Cinema in Northampton. Nothing special about it; it was just another of our tape recordings—until a month ago.

Whenever I listen to that tape, I remember a very charming young lady named Laraine, the daughter of the Savoy's chief projectionist, Mr. F. Allen.

Four weeks ago "Bubbles" was admitted to Guy's Hospital in London for an operation; Two days later she died.

BACK in July, I reported that hi-fi enthusiasts engaged in building their own equipment-housing were experiencing difficulty in obtaining a certain type of silver-coloured speaker grille.

Mr. J. Parker of the Expanded Metal Co. Ltd., the makers, tells me: "As you will appreciate, it is very difficult and extremely uneconomical for us to deal with Do-It-Yourself enthusiasts individually, since their requirements are usually very small, and are always different. However, if any of your readers are unable to obtain the material locally, and would care to contact either ourselves or our nearest district office, we will always be pleased to advise them."

The address of the firm's head office is: Burwood House, Caxton Street, Westminster, London, S.W.1. The silver grille referred to, by the way, is known as Untreated Aluminium, and, for ordering purposes, No. 363A.

LETTERS IN: "Dear Mr. Beeby—Have you seen the enclosed details of our exciting, new game, 'Tape Recorder Bingo'? Don't you think it's the greatest? Wouldn't your readers just love to get in on it? Send us, without delay, all the available names and addresses of tape-clubs you have to hand. Sincerely, D.F.R."

LETTERS OUT: "Dear D.F.R.—(a) Yes. (b) No. (c) Shouldn't think so. (d) What do you think my name is? Sincerely, A.E.B.!"

Make way for the

LADIES

Personality of
the month.—9

Mrs. RHONA JAMES

A new regular
monthly feature

Edited by
Vivienne Gooding

WHAT is it that can turn a reticent young lady, microphone shy and uneasy at meeting strangers, into a highly efficient organising secretary, recording several tapes every week of the year and dealing with complete strangers as a matter of course? It was to find the answer to this question that I called on Rhona James joint UK representative with her husband John of World Tape Pals.

About a year ago the World Tape Pals' organisation in this country was in low water; membership had dropped to a frighteningly low figure and such records as existed were incomplete. It was at this critical time that Rhona and John took over.

"I was absolutely terrified!" admitted Rhona. "John had been an enthusiastic member of World Tape Pals for some time but I had never summoned up enough courage to say so much as a single word on tape. But when we realised that someone would have to take over the organisation and devote an enormous amount of time and energy to getting things moving again—well I could hardly leave it all to John could I?"

"I'm afraid now its a case of me leaving a lot of the donkey work to Rhona!" interrupted John.

Gradually I learned from them the whole story. At first they were both sitting up night after night until one or two o'clock in the morning writing letters and recording tapes. It took them several weeks to establish a complete list of current members, and then with the help of Leslie Wilson, a veteran WTP enthusiast, they set about the task of building up the membership until it reached its present figure of more than one hundred and fifty.

"I just didn't have time to be shy,"



laughed Rhona. "As a matter of fact I couldn't even type when we started, but within a few days of taking over this job I was knocking out letters by the dozen. Of course I couldn't keep on being silly over recording my own voice, and that's one thing I really am jolly glad about. Now I have my own personal correspondents all over the world and far from being shy about speaking on tape I not only do it without thinking but thoroughly enjoy myself into the bargain."

"I know you started this work to help John," I said, "but was that really your only reason, or did you have any other motives at the time?"

"I passionately believe," replied Rhona, "that ordinary people in all the countries of the world should try to get to understand each other and to appreciate each others point of view. If this could really come about, not with just a hundred and fifty people in this country, but with millions both here and abroad then we should surely have taken a decisive step towards the realisation of peace in our time."

A high ideal to work for? Perhaps, but there could hardly be a better one.

☆ My Diary ☆

HOW the weeks fly by! With more than three-quarters of the year gone I have been tempted to turn back and glance at some of the many pages now filled, turned over and forgotten. It's odd what funny little incidents are brought to mind.

There are several pages I can't even read now, but I don't suppose they contained anything of very great importance. That's just the trouble.

But I'm glad to say there are one or two really positive entries during the last few days. Much as I enjoy going out and taking a live recording of some massive choral work, it's perhaps even more pleasant to be able to play back the result to the choir at a later date, and that's just what I did one day last week.

From my point of view the recording was certainly nothing to be ashamed of, and there was no doubt that the choir not only enjoyed listening to the playback but also were able to take advantage of the opportunity to indulge in a little helpful self-criticism. The evening ended with an invitation for me to record some carols at Christmas and that I'm really looking forward to.

Have you ever wondered how many people know absolutely nothing about tape recording but would be only too glad to learn from an experienced amateur? Believe me there are quite a lot, perhaps more than you'd think. I have just arranged for a little group of eight or nine such people to spend one evening a week with me at home, when I shall do my best to tell them something of the mysteries of recording techniques. Our first such meeting takes place tomorrow and I must confess I'm just a little apprehensive. I'll let you know how we get on next month.

CHILDREN'S CORNER

ARE you going to have any fireworks on bonfire night? I hope so because it won't be very long now until November the Fifth. I used to look forward to letting off my fireworks for a long time before the night. When I was a little girl we used to eat roast chestnuts and drink hot black current juice to keep ourselves warm. What fun it was as the jumping crackers popped and banged and the catharine wheels whirled around in a beautiful shower of sparks!

But do you know the true story of Guy Fawkes and how he tried to blow up the Houses of Parliament? Wasn't it a good job that he was caught before he was able to explode his barrels of gun powder?

Although this happened a great many years ago we still remember it by letting off fireworks on Guy Fawkes night, and every year before Parliament is opened the cellars are searched again as they were then. That's in case anyone else should try to do what Guy Fawkes did.

Wouldn't it be a good idea to record a little play about Guy Fawkes and

the men who caught him? If you tramped along the hall in big heavy shoes it would sound just like the men searching the cellars, but you'll have to imagine what Guy Fawkes said when he knew his plot had been discovered.

Perhaps at the end of your play Mummy and Daddy would record the noises of the fireworks for you. I'm sure that your teachers at school will be telling you a great deal about the Gunpowder Plot and I think if you really tried you could make a jolly interesting tape that lots of people would like to listen to.

Beginning a new series of articles introducing children to tape recording by M. T. POLLARD

1: "Breaking in" the school recorder

IT was about three years ago that the primary school where I teach—a small one in a rural area—first acquired a tape recorder through the kindness of a parent "in the trade."

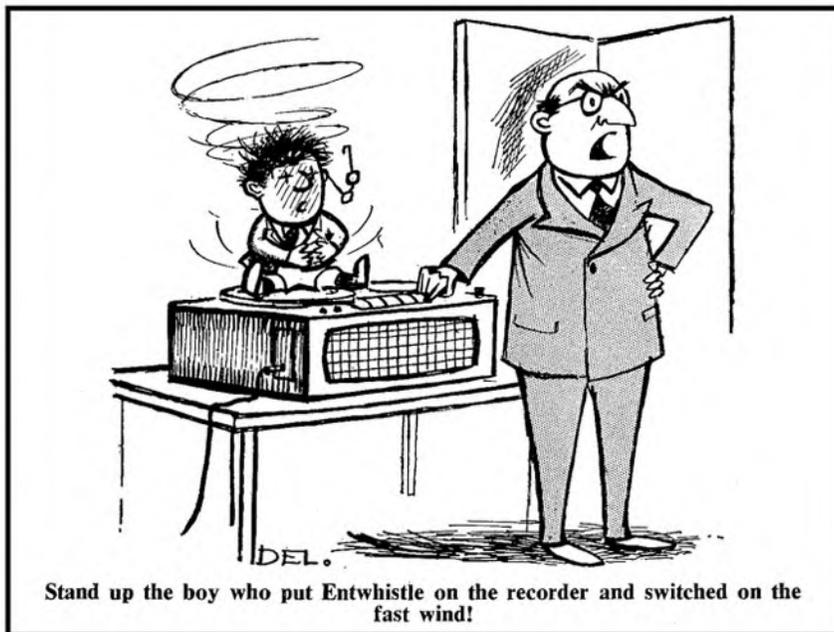
I remember very clearly the first week or so after the machine arrived. We recorded everything—morning assembly, the choir, a parents' meeting, play rehearsals, ordinary lessons—and played them back at first with enthusiasm, then with vague interest, and at last with boredom. I'm sure that no child's new toy received such slavish attention as that tape-recorder received from the staff during those first few days.

None of the staff had any experience of recording or any technical knowledge of the kinds involved, and we had to learn everything by trial and error. One of our first discoveries was the appalling acoustical quality of the classrooms and, in particular, of the larger room which we use as a hall. The morning prayers, on playback, sounded as if they were being intoned in some distant bathroom. The resonances of the hall gave to the play-rehearsal recordings an other-worldly air, as of a ghostly performance of *Where the Rainbow Ends* echoed eerily down the years.

Inevitably, side by side with the recording of various school activities, there was a programme of letting the children hear their own voices. This was, after all, only the repetition in a school setting of what happens in every house to which a recorder is introduced. Just as inevitably, this soon palled, especially for the children who had "had their turn."

It became increasingly obvious that unless something positive were attempted, the machine, so far from being the valuable aid that we had envisaged, would be degraded to a mere gimmick, a handy way of filling in the time when games were rained off.

Partly to gain experience with the recorder, and partly to find a more positive and creative way of using it, I embarked upon the recording of a serial play which was acted, more or



less impromptu, by the eight-year-old children in my class.

The tone of the play was something of a cross between "The Famous Five" and "The Archers," with a signature-tune chosen at random from our midget library of country-dance records and recorded, dead against the rules, from the record-player speaker via the microphone. This I took to be within the normal range of school

in the nature of a finished script. With children of this age, reading and talking are two very different activities, and sound it!

We worked from hand to mouth, considering only one week's instalment of the play at a time. Apart from anything else, this kept up the interest of those who were not in the cast or on my small technical staff. The nearest we got to a script was a list of the essential features of each week's action which I would jot down as we talked over the incidents to come.

Some kind of *aide-mémoire* was necessary, in spite of the informality of the whole thing, because I hadn't at that time heard of editing and we had to record each sequence in the correct order, with the opening announcement, sound effects and everything included as we went.

My primitive "shooting script" would look something like this:—

Episode 3. Family at breakfast. Children hurry food, then out to play. Playing in garden. Discovery of hole in ground. Children go down hole, explore. Fade out.

In house. Friend calls to play. Mother answers door. Mother goes into garden to call. Sends friend to

TAPE IN THE SCHOOLS

usage to be expected by the makers of these records, but now, having peered into the maze of copyright law, I find this is not so, and advise other teachers to keep within the law.

We started the project with nothing more than a title—"Footprints in the Snow"—chosen by me as being fairly ambiguous and imaginative.

Starting from here, the children contributed their ideas, and we welded as many of them as possible into some kind of plot, though without anything

find children. Friend goes down garden, calling. Fade out.

Inside hole. Children decide to turn back. Walk and talk. Suddenly realise they ought to see light of entrance. They are lost. Panic. Cries for help. Fade in signature tune.

Before recording each sequence, I would give the children a few ideas. The conversation over breakfast for instance, because otherwise children of this age tended to go straight to the point, asking if they could go out to play almost as soon as they had sat down to breakfast!

Then we would go ahead, aiming if possible to get a good "take" the first

time, because the impromptu conversation lost spontaneity if it was repeated. Sometimes, of course, one of the actors would "dry up" or one of the audience would cough or fall off his chair, and we would have to start that sequence again.

The week's instalment of the play would last for five or six minutes' running time, quite long enough considering that this, from the discussion of ideas to the final replay, would take about an hour to put on tape, usually in two sessions. The technical quality of the recording would have shocked any real recording enthusiast and would doubtless, if I still had it, shock me today.

However, nowadays, when "the serial" is an integral part of the life in my classroom, I have made few changes in those early basic techniques. Improvement in quality has come with better handling of the machine itself and with closer attention to detail.

So the children of a small country school received their initiation in the use of a tape recorder. There are, of course, more ambitious things to be done with the machine in school, but I have not yet found a better way of showing a new class of children the possibilities of the recorder and accustoming them to its appearance as part of the regular classroom equipment.

Is tape recording in schools a gimmick?

PAUL GROVES concludes his special series on broadcasting in school with this article on elocution.

"IS tape recording in schools a gimmick? Does the running of a broadcasting club warrant the expense involved?" These are questions which are asked from time to time by teachers, and questions which have occupied my mind.

In previous articles some connections have been shown between written work in schools and broadcasting. As the Lancastrian Club settled down its affinity with the English Department became apparent, and the thrill children obtained from hearing their own work broadcast was eagerly seized upon by its teachers. On this evidence alone the possession of a tape recorder and its accessories is essential in a school.

But perhaps the greatest contribution a tape recorder can make is in the field of speech teaching—a subject which as a speech specialist I find most difficult to teach, especially in an all-boys school.

It was my original intention to improve the speech of club members by recording them reciting "The rain in Spain falls mainly on the plain" and other vowel exercises of this kind—a practice which is followed at a leading dramatic school in this country.

However, it soon became apparent that if the club was to operate a successful weekly or fortnightly service, little or no time could be given to speech training lessons, dull or otherwise, and, with some regret, they were cancelled. Yet, after not many months it was noticeable that the boys' voices were improving.

And now, after six years, old tapes played back show that the voices of the majority of members have improved, particularly in authority, effectiveness, tone and diction; and even flat vowel sounds

have, in some instances, become more rounded. Since only bad individual errors (swallowing the ends of words) have been brought to the attention of members and no group teaching has been given this is most interesting educationally, and some conclusions I have reached about the reasons for this improvement may be of interest to other clubs.

The natural cycle of emotions experienced by people using a tape recorder for the first time appears to be as follows: 1. Shock—is that really me? 2. Pleasure—a natural conceit at hearing one's own voice, especially at full volume. 3. Displeasure—a growing awareness of defects and inadequacy. It seems important that the pleasure of recording should never be taken away from any child and that any speech training should be left until the third emotion has been reached.

The standards in any club will be set by its senior members. In the early days of the club I took parts in plays which I felt the boys could not authentically fill. Unintentionally, this set a standard at which they aimed; it made them more adventurous and ambitious in the use of their voices. This was an important stage in the development of the club. In recent years I have withdrawn from the acting side and let the senior boys set the standards.

Another standard which influences the members is that set by the BBC. It is noticeable that when interviewing or reading news, boys tend to adopt intonations and phrases used by BBC personalities. As the standard set is so high I find it a most welcome influence in a Secondary Modern school and would not decry it for being imitative. This does not mean to say that they are not critical of the programmes they hear; they are indeed most critical, jealously so. This criticism is something I foster to encourage intelligent listening.

The large number of tapes recorded in the provision of a regular service has given the members constant practice in using the recorder and also a constant reminder of the sound of their own

voices. This has been an undoubted factor in the vocal improvement. They have been allowed to spend spare moments recording their voices making noises, however silly.

At lunch-time curious "Goon" noises or imitations of popular singers might be heard coming from the studio booth. This has led to a general loss of self-consciousness and a lessening of fear when reading from scripts.

I was surprised one night, on arriving at the club late, to find four boys seated at a table round microphone 2, with a chairman at microphone 1. They announced that instead of the scheduled programme they were doing "Joke Box Jury." There followed a twenty minute unscripted performance during which the "panel," who imitated Bill Kerr, Charles Laughton, Sir Laurence Olivier and Nancy Spain, commented on some "pop" records. The result was not only funny but also a biting satire of the original and was well worth playing back to the school.

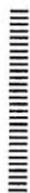
The value of light entertainment and humour in school broadcasting and their usefulness in helping the audience digest the more educationally biased programmes should not be overlooked. The magazine programme has been mentioned in a previous article in this context. In the field of sheer, undiluted humour other clubs might be interested to know that we have had success with Stephen Leacock. His *Defective Detective* and *Soaked in Seaweed* are ideal broadcasting, as is also Jerome K. Jerome's *Three Men in a Boat*. Clubs just beginning will find excerpts from the latter—we enjoyed the story of the "cheeses"—are very easy to adapt into ten minute plays. The former are more difficult but they are paradise to the technical side, who can go through the whole range of their sound effects, particularly those which simulate breaking glass or splashing water.

As these are my personal experiences with one club in one school, I would hesitate to draw any general conclusion. I know, however, what a valuable servant the tape recorder has been to me in the field of speech teaching; and I shall continue to encourage my members to buy one of their own so that they may continue the good work at home.

Tape recording in church—

“The Service”

By L.
REID



A GOOD tape recording depends as much upon the acoustics of the location as upon the equipment used, and churches provide their own special difficulties. If you want the best results you must be prepared, like the professional recording engineer, to spend considerable time and trouble in setting up your microphones; having once worked out a satisfactory plan subsequent recordings in the same church will be simplified.

Many churches record services for the benefit of old folk who can no longer attend, and it is in connection

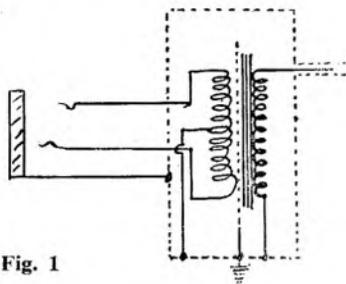


Fig. 1

with this type of recording that the following suggestions are offered. If your church does not yet make use of a tape recorder you might like to suggest such a scheme. Providing such a “home service” is both interesting and well worth while, and it offers opportunities for recording and editing which you would otherwise miss.

Recorded services are usually taken round on small portable recorders, so anything in the way of hi-fi is out of the question. The one essential is that every word must be clear, and the level high enough for comfortable listening; remember that some of the old folk may be hard of hearing.

When making recordings of actual services never lose sight of the fact that churches are not studios; the congregation must not be distracted by the sight of a mass of recording gear. Be so unobtrusive that few people

notice that a recording is being made. It is usually possible to operate from an inconspicuous pew, or even from the vestry if long leads can be used for the microphone.

Preliminary Survey

Make a preliminary survey of the building with these possibilities in mind, and find out the type and situation of the most convenient mains point. Then bring along your gear and make some tests.

If you can get permission to attend a choir practice you will be able to try out various alternatives on the spot. A time-saving dodge is to have headphones with an extension lead so that you can listen as you move around with the microphone; this is quicker than making test recordings. If you do record anything at a practice remember that rehearsals are private, so do not play back to outsiders.

The type of equipment needed depends chiefly upon the relative position of pulpit, choir and organ, and also on the type of service, i.e., whether the minister moves about or not. Whilst reasonable results can be obtained from most recorders their suitability depends on two factors, namely:—

(a) that the machine takes a reel giving at least one hour per track.

(Using one track is handier than having to turn over, even if there is time for this.)

(b) that the mike cable is long enough.

Many popular recorders have crystal microphones which give quite good results but which cannot be used at any distance from the recorder owing to a short cable; it is not advisable to extend the lead of high impedance microphones. The solution of this problem is to buy a low impedance microphone and a matching unit containing a transformer, which will make long cables possible. Incidentally, the Grundig condenser microphone is one high impedance unit which can be extended by special extension cables of five, ten and 15 yards. The microphone is very sensitive and good clear recordings can be made with it.

As mentioned above, low impedance microphones can be used on very long cables, and these are perhaps the most suitable for church use. If these are also connected on balanced line (Fig. 1) there will be no danger of hum, even when the recorder is not earthed, but it is always advisable to keep microphone cables away from power lines.

Low impedance microphones include the moving coil, which is very sensitive and omni-directional; and the

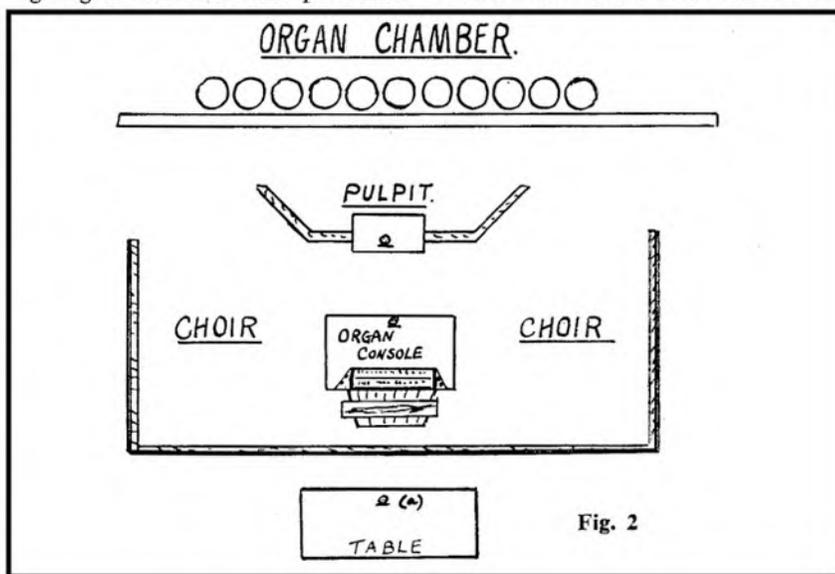


Fig. 2

THE AUTHOR ADVISES ON THE MOST SUITABLE EQUIPMENT AND EFFECTIVE LAY-OUT FOR CHURCH RECORDING

ribbon, which is bi-directional, not so sensitive, but has a wider frequency response making it specially suitable for recording music. Unless the moving coil type can be positioned carefully and used with the recording level at a fairly low setting it tends to pick up every cough and movement in the church.

The ribbon gives a quieter background, and as it is also the best for recording organ recitals, I prefer it for all church recording. Good microphones of this type can be bought for under £10. With several of these, supplemented by the full view type of moving coil microphone for pulpit use, it would be possible to tackle most recording jobs. To take full advantage of two or more microphones a mixer is essential, and a very efficient circuit was described in the January/February 1960 issues of this magazine. Construction is straightforward and results are excellent.

Extension Cables

Your equipment will be completed by the addition of several heavy duty microphone extension cables; useful lengths are thirty feet and sixty feet. I do not suggest that all these should be acquired at once; the pleasure of recording is that one can go on adding new pieces of apparatus as needed.

Having bought sufficient to make a start, your final results will depend greatly upon microphone position. To keep down background noise and get the clearness of speech needed, the microphone should be placed fairly near to the speaker. But do not forget that hymn singing has also to be recorded, and a compromise will be needed if only one microphone is available.

Fig. 2 is a plan of one typical church lay-out. The choir is grouped around the organ console (keyboards) with the pulpit behind and above, and the organ higher still. This is a very compact grouping, and the minister usually remains in the pulpit throughout the service.

From the recording angle the three levels, choir, minister and organ, make it hard to get a good balance with one microphone. Placing the microphone on the table (position a) suits the choir, but the minister, although possibly quite clear, sounds "afar off"; also a high gain is needed for the sermon, etc., and this means that every noise is exaggerated on the tape.

A high table stand placed on top of the organ console brings the pulpit more into focus, but is liable to pick out individual voices (and coughs) in the choir. Incidentally, old folk want to hear the tune of the hymns, so always try for a microphone position

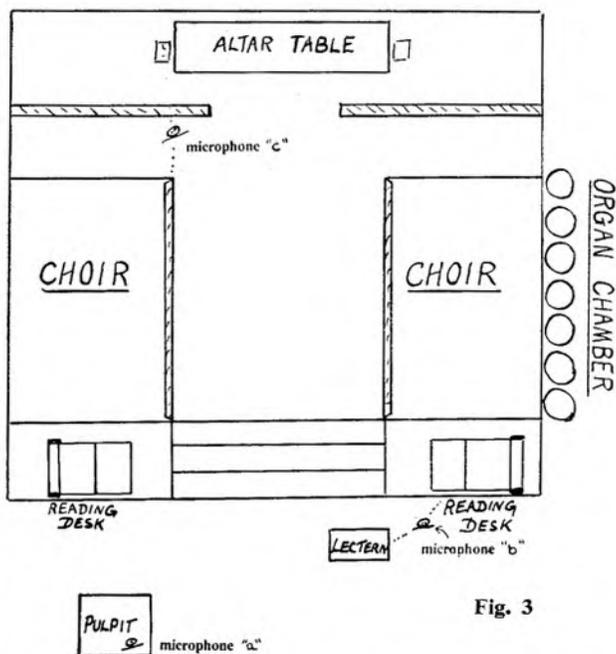


Fig. 3

Another and more awkward plan is that shown in Fig. 3. Apart from the wider spacing of choir and congregation, the minister moves about during the service, and it would need at least three microphones to keep his voice in the foreground. When this type of problem arises and a mixer is not available, there are several makeshift ways of getting round the difficulty; none is as good as a mixer, but might serve in an emergency.

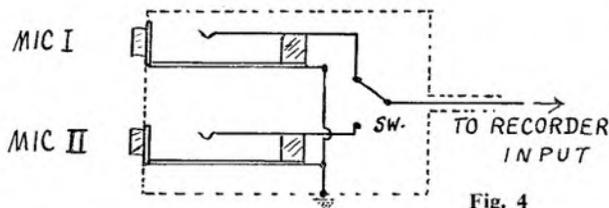


Fig. 4

which emphasises the sopranos rather than the basses!

I finally decided that the best compromise in the situation described was to place the single microphone in front of the pulpit book rest. Speech was clear and choir balance fairly good; in addition the same fairly low gain suited both, and reduced congregational noise.

This idea, unfortunately, is only possible when the choir are seated on each side and facing inwards towards the organist; in churches where the choir face the congregation such a microphone position would only pick up the basses. Ideally, of course, there would be one microphone "out front" for the choir, a second one in the pulpit, and somebody to work a mixer!

The first is to use a separate recorder and its microphone for each position, and the second is to mount several jacks in a screened box (Fig. 4) so that either microphone can be switched in. If the recorder gain is momentarily returned to zero when operating the switch, no clicks will be recorded.

Perhaps the best way of all, in such a case, would be to prepare and record a special short service for the old folk; those taking part could then be grouped to suit the equipment available. Alternatively, where an amplifier system is in use, plug the recorder into that.

Before recording any service get an Order of Service and go over this with the Minister and organist; then decide how much to record. It is seldom necessary to record a whole service, but better too much than too little even though the final tape will be

(Continued on page 24)

EACH day of my working life I seem to spend an average of an hour or two editing tape—either physically editing it myself on a machine of my own; or in a BBC editing “Channel,” working with an expert engineer editor. And although I enjoy editing, I don’t edit “for fun”: every joint that is made has some definite programme purpose, and this purpose will fall into one of several basic categories. These are:—

1. Getting the programme timing right. The duration must be adjusted to fit the scheduled space. In radio work this is often the overriding consideration. If a programme is badly planned and turns out to be seriously overlength the editing process may result in what is virtually a different programme. However, if only a small amount of fining down is necessary, most people seem to agree—afterwards—that the programme is improved by it.

2. Shaping the programme: giving it a beginning, a middle and an end, and ensuring that the pace and tension varies, and does not drop too low. Awkward parentheses, repetitions, phrases, whole sentences or paragraphs will have to go if they obstruct the flow of the programme.

3. Cutting fluffs, etc. Some minor faults lend character to speech; too many will make it difficult to follow. Mistakes in reading a script do not often sound like natural conversational slips.

4. For convenience of assembly: to combine actuality material with scripted links, to allow material of different types to be rehearsed and recorded

EDITING: 2 WHY AND HOW

PUT a microphone under someone’s nose and you immediately create an abnormal situation; listen to sound without seeing and you have another unnatural situation—one which concentrates the listener’s attention on characteristics of voice and delivery which may be more readily acceptable when the speaker is “in vision”. **ALEC NISBETT** believes that to find and express the truth in sound imposes considerable responsibility on both radio producer and amateur recordist.

separately, or to pre-record awkward sections.

Whether editing is used in a positive and constructive sort of way, or whether the major part of the creative effort is to be completed with the actual recording is a matter of temperament (and, some would say, organisational ability on the part of the producer). I, myself, belong to the former school, believing that a greater reliance on the impromptu (followed by selective editing) has a major place in sound production—but I know that some people regard editing as something of an admission of defeat, and use it only for dealing with overruns or particularly bad fluffs.

There is a lot to be said for this anti-editing point of view; but it does presuppose either that the broadcast has a well-rehearsed and perfectly timed script or that those taking part are capable, in an unscripted programme, of presenting their material logically, concisely and coherently (or that they are under the guidance of an expert interviewer or chairman who will ensure that they do).

In fact, such self-control under the stress of a recording session is rare; and even when the recording is made using a “midget” in familiar surroundings, the presence of the microphone produces an unreal situation

with (very often) stilted and uncharacteristic reactions on the part of speakers. One purpose of editing is to attempt to restore the illusion of reality, generally in a heightened form.

Naturally this process of editorial selection imposes a considerable responsibility on the producer, and it is one which is not met if the result distorts the character of the speaker. The aim should be that if the speaker heard a playback he would recognise it as the essence of what he said (within the limits of what was needed for the programme)—and feel pleased that he had expressed himself so clearly.

ROUGH EDITING

In the first instance you will be cutting your programme into rough shape, perhaps putting spacers in to indicate where you will be inserting a studio link; but in any case assembling material in its most logical order.

Remember that you can *transpose*. This is of considerable importance when several unrelated subjects have arisen in an unscripted discussion. The factors which governed the order of recording may not hold for the finished programme. You will want to start with a bang: start with something which may not be of vital importance, but which engages the listener’s attention and gives him a sense of “being there.” The middle should, while progressing logically, have light and shade; there should be variety of pace, of speech lengths and rhythm, and of mood. And the tension should build to an effective “curtain”: something which will in a few lines contain the essence of all that has preceded it, or which will suddenly offset and illuminate it.

As you select material, feed it on to your make-up tape in programme order, with transpositions and retakes in their proper place. At this stage try to cut at “paragraph pauses.” Rejoin the original tape after each cut, or feed off unwanted material on to a reject spool. Even at this stage exercise a fair amount of care where you cut even in a longish pause: do not cut in the middle of a breath, or cut too close to the first word when there is a heavy background. And except when only small cuts are being made it is always safest in a discussion programme or interview to cut from one voice to another. If you do come back in again on the same voice, check that voice quality, mood and balance are sufficiently similar: it’s easy enough for the listener to get the impression that a completely new voice has entered the conversation and to start asking, “Now, who is this?”

It will often be possible to rough edit

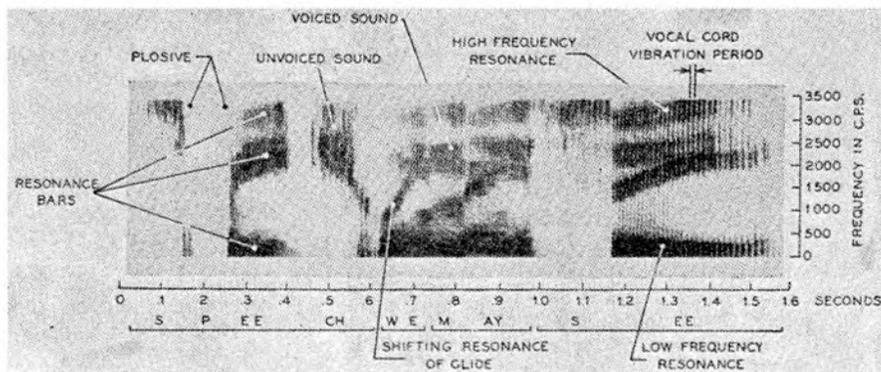
The professional at work in a BBC studio: A recording engineer marks the exact point of a cut. For this purpose headphones are satisfactory; he can get on with a little editing without disturbing the work of other people. But for quality checks that speaker in the corner will have to be used.

(BBC photograph)



EDITING: 2

WHY AND HOW



The human voice analysed using filters with a 45 cycle band-width. The fundamental and harmonics produced by the vocal cords can be clearly seen. Note also how the harmonics are emphasised in certain regions and reduced in others: these are the "formant" ranges which are due to nose, mouth and throat cavities. The way in which vocal resonances work is totally unrelated to the pitch of the fundamental—e.g. in the word "see" the movement of the tongue actually lifts the upper formants just as the voice is dropped for the end of the sentence. This form of analysis is very useful for studies of vibrato.

without bothering to mark the tape. Choose a particular point to the right of the heads, one at which it is convenient to take the tape between finger and thumb. Then lay this point of the tape in the block, appropriately offset, i.e., so that your thumb is at the same distance from the cutting groove as it was previously from the replay head. With very little practice it is possible to get quite expert at this, rough-cutting to an accuracy of less than a quarter of an inch.

FINE EDITING

After your rough editing you must consider how much more needs doing. Think of this in terms of:—

- (a) the shape of the programme as a whole,
- (b) the intelligibility and conciseness of individual contributions, and
- (c) the character and personality of the speakers.

The first of these considerations may mean that you have to take severe internal cuts in one section and not in another; you may have to cut out repetitions or verbal embroidery. Try to keep the theme of what remains tight and unified.

These are some of the other things you may wish to cut:—

1. Heavy coughs, etc. These hold up the action and may cause the listener to lose the thread. But if the speaker has a frog in his throat (and this section of the recording cannot be cut) it won't do any harm to leave in the cough which clears it—just for the psychological satisfaction of the listener!

2. Excessive "ums" and "ers" (or any other vocal mannerism which runs to seed). They should be cut if this actually improves intelligibility—which it generally will if they appear in the middle of a sentence. But about one in ten actually *improves* intelligibility by breaking the flow at a point where it needs to be broken. So be careful. Some speakers use these noises as an important integral part of their vocal sentence: it may not look good written down, but it sounds right on the tape. Other speakers seem to express quite a bit of character in these punctuating noises. In these cases, do not cut. An "er" which is moulded into the preceding or following word often cannot be cut anyway.

3. Excessive pauses. In real life these can stand to be a great deal longer than on a tape, because we watch the speaker's face as he thinks. On a tape a pause is just a pause, unless it lends real dramatic emphasis to its context. But pauses should not be cut down to nothing if the result sounds like a series of impossible vocal contortions. To

see what I mean, record the sentence, "You (pause) are (pause) a (pause) good (pause) editor," and then cut the pauses out completely. The result will sound like a case of hiccups. How much gap you need to leave depends on how much the mouth would have to change shape during the pause.

4. Superimpositions. Two people talking over each other are irritating. But this sort of thing needs great care in editing: it will generally be necessary to leave a partial overlap, or take out part sentences before and after.

5. Fluffs, where the speaker has gone back on himself. Again an edit will generally improve intelligibility. But take care here, as well; the first word of the repeat will often be over emphasised, so try to find some place to cut after (or in the middle of) this word.

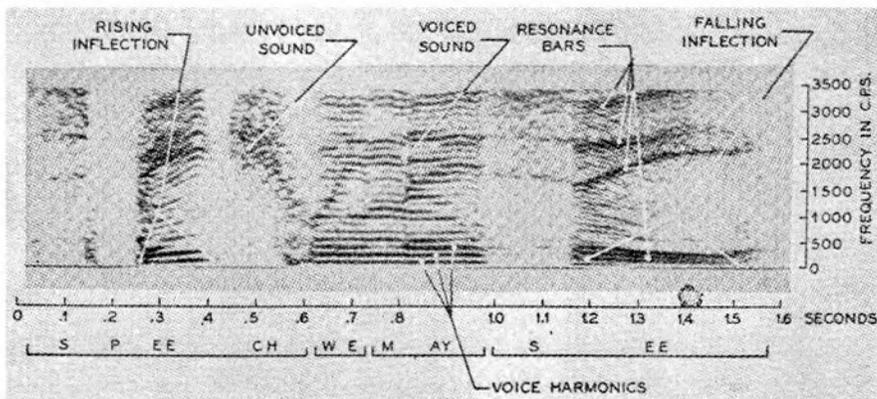
There will of course, be many other types of editing to do. Each different speaker presents a new set of problems and decisions as to whether to cut or not.

For example, when you start recording

someone "off the cuff" it is a common thing for the piece to start off slowly and gather speed and interest as it progresses. This is completely wrong for the start of a new voice in a programme tape, where the listener's attention and interest must be caught in the first few words. If you can't come in after this "warm up" period, it may be necessary to tighten up the opening sentence: this matters a great deal more than hesitations at a later stage, when the voice and personality are accepted by the listener.

In certain cases, particularly where the recording is of importance as a "document," no editing should be done at all (with the possible exception of cutting down really excessive pauses) and the greatest care should be exercised if any condensing is to be attempted, resorting if in doubt to a studio link.

In any case, don't go mad with your razor blade. It is very useful to have good ideas about where to cut; but just as important, perhaps, is to know where *not* to cut.



Analysis using broad-band filters (300 cps) shows the formants much more clearly. Besides telling us a great deal about the mechanism of speech these displays help us to understand why some edits work and others don't. Values which are the same when written down and perhaps even apparently the same when spoken, may turn out to be affected strongly by neighbouring sounds. Some illustrations of this will be given in the next article in this series.

(Illustrations from Potter, Kopp & Green, "Visible Speech." Copyright 1947, by Van Nostrand Co. Inc., Princeton, N.J., U.S.A.)

THE tape recorder market has widened considerably during the past four years. With it has grown the problem of service. There are now nearly two hundred different models in use, many of them by makers who are no longer producing. Radio dealers who are also tape recording enthusiasts are in a decided minority—a few have been named in these pages, and we should dearly like to add to the list.

In addition to this, the problem of service is accentuated by a lack of service information. Many machines have no printed operating instructions,

SEE HOW IT RUNS

A SERVICE BUREAU FOR READERS' PROBLEMS

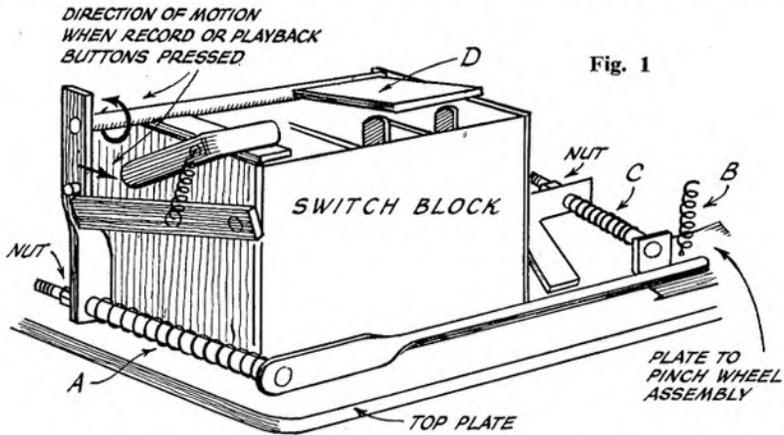
let alone servicing data. Of those that are well described by the makers, only a few are sold with technical information attached. There is a real reluctance

on the part of manufacturers to supply such data to the owner.

Consequently, a good deal of hit-or-miss service goes on. And in this office we receive a constant stream of queries about particular faults on specific models. The questions are too many and varied to be dealt with separately, so each article in this series will discuss a particular aspect of the tape recorder, quoting typical letters as an example of our readers' problems.

We are always glad to hear from readers, and willing to attempt an answer to servicing queries. Even more welcome is the report of a private solution to a teaser.

Faulty Pinch-Fit: Such a teaser was described to us by D.J.G. of Birmingham, who has a Regentone RT50 machine.



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ING/NOV I

HARRY MACK begins the first of a new regular series of articles offering technical advice on problems of general interest to recorder owners.

"The fault is that occasionally the speed seems to vary on playback. Music drops in tone and speech sinks to a growl—just for a short period. The trouble is not on 'Record,' because previous good recordings still play back properly."

A little thought will show that the fault is actually occurring on "Re-

sketch, Fig. 1, will show that the plate on which the pinch wheel assembly is mounted moves inward to engage the spindle and is assisted both by a compensating spring B and the compressed spring on the actuating rod A. The pressure pad assembly has a similar rod and spring action, shown at C. These items are readily seen if the

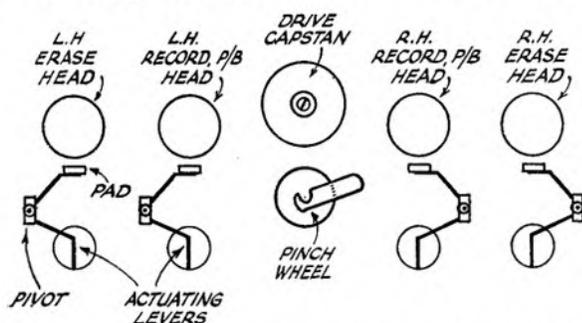


Fig. 2. Head layout of the Collaro Mk IV deck

cord" when the passage of tape along the face of the recording head is speeding up temporarily. Hence, when played back at normal speed, the tone appears to drop.

Passage of the tape is effected by drive between the capstan spindle and the pinch wheel. Pressure of the pinch wheel should be such as to hold the tape firmly but gently against the capstan spindle. To check this, depress the "Record" button while the machine is disconnected from the mains supply, slacken off a little tape from the take-up spool and pull gently in a straight line.

Too little pressure will allow the tape to move freely in the fingers. Too much pressure, either at the point of contact between pinch wheel, spindle and tape or at head faces via pressure pads, will require a strong tug to move the tape. The pressure pads can be temporarily eased away from the heads with the fingers of the other hand to exonerate them.

Adjustment of pinch wheel pressure on this deck, the Motek K10, is made by alteration of locknuts on actuating rods beneath the switch mechanism. *Not, as has sometimes been done, by bending the wide flap at the base of the switch that is depressed by both Record and Playback levers.*

A glance at the accompanying

deck is lifted from the cabinet (taking care not to lacerate the fingers on the exceptionally sharp edges of the ornamental cover-plate!).

Correct procedure for adjustment is as follows, to be carried out only if the setting has been disturbed:

First, adjust the locknut at the inner end of C until there is about a quarter-inch of the rod protruding beyond it.

Next, press the "Record" button and adjust the nut on rod A until there is approximately $\frac{1}{32}$ -inch play to the connecting levers.

Then, press the "Stop" button and check that the end of the rod below the "Record" button just touches the large flap, shown as D in the drawing. Slacken the locknut on C until it does so. Too much slackness at this point will prevent the pressure pad assembly from springing sufficiently clear when the "Stop" button is pressed. Always check this when adjusting, and run through the procedure a couple of times.

The Old Enemy: The fault mentioned by D.J.G. may not have been caused by faulty pressure alone. A common cause of erratic speed, especially on decks such as this, where the drive spindle rotates in a cut-away cylindrical casting, is the engineer's chief enemy, dust and grime!

A certain amount of dust is inevi-

tably picked up by the tape, transferred from pressure pads, etc., and can penetrate the space around the spindle, forming a variable "wall," which throws the tape away from the needed intimate contact with the pinch wheel. Causing a slight angle of the tape from the vertical, it can make the tape ride up and down, even making it ride up over the edge of the pinch wheel.

Dust and a metallic deposit from the tape can also impregnate the rubber of the pinch wheel, where it can be seen as a discolouration and felt as a hard sheen. This can be cleaned away with methylated spirits or a proprietary brand of cleaning fluid—but, on no account use such preparations as Carbon Tetrachloride (the popular switch-cleaner). Not, that is, unless you want to see the coating of your tape, and maybe your plastic head-casing disappear before your eyes! Methylated spirits, an orange-stick, a clean, lint-free cloth and patience is all that is required for cleaning operations.

An interesting sidelight on this pressure pad business is thrown by reader T. W., of Edgeware, who is using a Collaro Mk IV deck in a hi-fi rig. He is perplexed by "noisy recording on the lower track." He says he has checked by inverting the tape and playing back, and has changed the recording head (left-hand) to no avail. "I am forced to believe that the fault

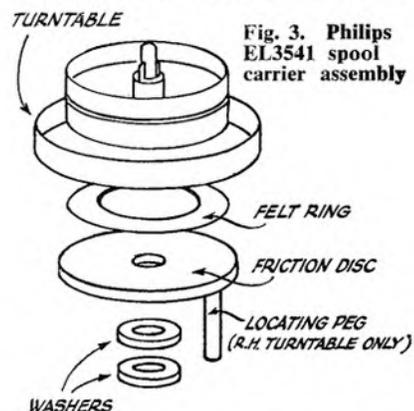
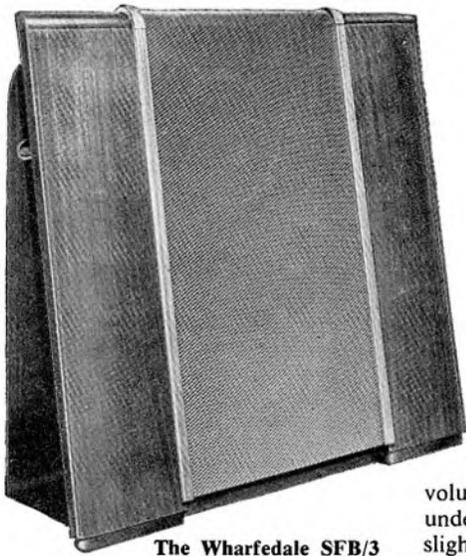


Fig. 3. Philips EL3541 spool carrier assembly

lies in the switching, but after taking one look at the two complicated switch-banks I am afraid to tamper with them!"

I hope T. W. has not succumbed to temptation, for the trouble sounds much more likely to be a simple matter of poor erasure. This is easily checked by recording on a known clean section of tape: if playback of this recording is satisfactory, yet the noise level rises with each new recording over the same section of tape all

(Continued on page 34)



The Wharfedale SFB/3

A PRACTICAL GUIDE TO Loudspeaker Enclosures

BY PETER MILTON

AFTER a suitable loudspeaker has been selected from the many apparently similar types that are available, the practical man comes into his own. There are a number of courses open to him. He can follow the recommended design of enclosure for that particular unit, he can cut a hole in the wall and cement it in place, or he can read all the theory and endeavour to obtain the same results as he would have had, had he not done so.

There is endless scope for experiment, and this and succeeding articles will deal with the more common types of loudspeaker mounting, discussing their principles of operation and performance, with practical examples where necessary.

The fashion in enclosure design seems to change from year to year, and after a period of progressive cabinet shrinking we have a number of "re-

volutionary" complete systems, made under controlled conditions, and a slight trend towards larger enclosures for the more conventional loudspeakers. (That means us.) The difficulty of fitting two large cabinets and a signal source into a small room has made a reduction in size imperative and enclosure design has often been a compromise between good performance and the space necessary to obtain it.

The need for some sort of enclosure is apparent when a loudspeaker is connected to an amplifier in order to test the system electrically before installation. The resulting sound is very thin and entirely lacking in bass. Let us make this our starting point, and try to deduce the performance of such a unit. Recapitulating on the August 9 issue, the electrical equivalent to the mechanical system takes the form of a series circuit if the current is regarded as equivalent to the cone velocity. The force at the neck of the cone is equivalent to voltage, and the power

dissipated in the circuit is directly proportional to the resistance and to the square of the current.

The current in turn is controlled by the impedance of the circuit. Fig. 1 is a graph of the behaviour of the reactive elements in the mechanical system plotted to a base of frequency. The compliance term, (capacitance in the electrical circuit) is drawn on the negative side of the axis and the mass term on the positive side, since they differ in phase by 180 degrees. At the point where they are exactly equal in magnitude they cancel and the current is limited only by the amount of resistance in the present. Away from resonance the current is controlled by the mass at high frequencies and by the stiffness at low frequencies.

At long wavelengths an unmounted loudspeaker can be regarded as two closely spaced radiators differing in phase by 180 degrees and it can be seen that the two outputs will tend to cancel. Under these circumstances the acoustic load on the surfaces of the cone is proportional to the fourth power of the frequency (Fig. 2).

Since $P = i^2 R$, R is proportional to f^4 , and i to $\frac{1}{f}$, the power is proportional to f^2 . In other words, the power radiated by a mass controlled doublet source decreases by 3 dB if the frequency is reduced by an octave.

Below resonance, the stiffness of the system limits the cone velocity, reducing the power by a further 6dB per octave. In terms of pressure response, the final slopes are 6dB per octave and 18dB per octave respectively.

If the loudspeaker were mounted on a baffle board, the radiation from the rear of the cone would be prevented from interacting with that from the front and as long as the dimensions of the baffle are greater than one half wavelength, the output would be independent of frequency down to the fundamental resonance of the loudspeaker. The change from independent

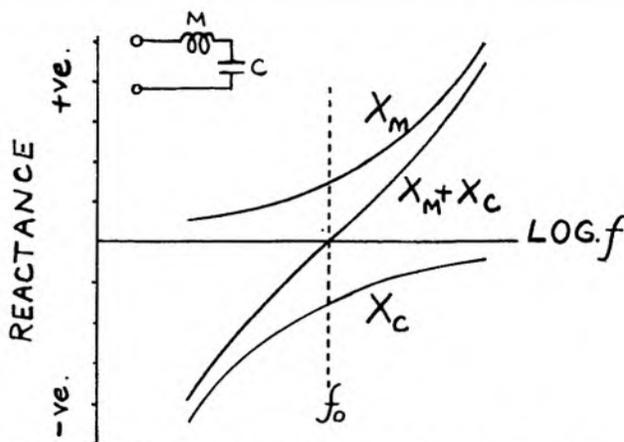


Fig. 1. The relationship between reactance and frequency in a series circuit. M =mass, C =compliance, f_0 =frequency of resonance

Loudspeaker Enclosures

Having dealt with the theoretical aspect of sound, the author now concentrates on the use of loudspeakers, dealing with each basic type of cabinet.

to doublet operation is well marked as can be seen from Fig. 3.

The frequency response curve was measured using an 8-inch diameter loudspeaker mounted on an 18-inch square baffle in an anechoic chamber. The three conditions of operation and the transition point are shown. A dip in the curve occurs at about 1,000 cps. This is caused by the radiation from the rear of the cone travelling round the baffle an extra distance of exactly one wavelength, arriving in antiphase with that from the front.

Normally, the frequency of cancellation would have a wavelength equal to the baffle side, but in this case the cone diameter is a third of the baffle side, reducing the effective path-length to about one foot. The cancellation effect can be avoided by using an irregularly shaped baffle or by placing the loudspeaker off centre. Under normal listening conditions the dip would probably pass unnoticed since the many different paths which the sound would travel to reach the ear would smooth out the general level.

If the baffle is required for a treble loudspeaker in a two way network, then the length of the side should correspond to one wavelength of the cross-over frequency, providing adequate loading over the octave below the cross-over point which is necessary for smooth reproduction.

The major difficulty with plane baff-

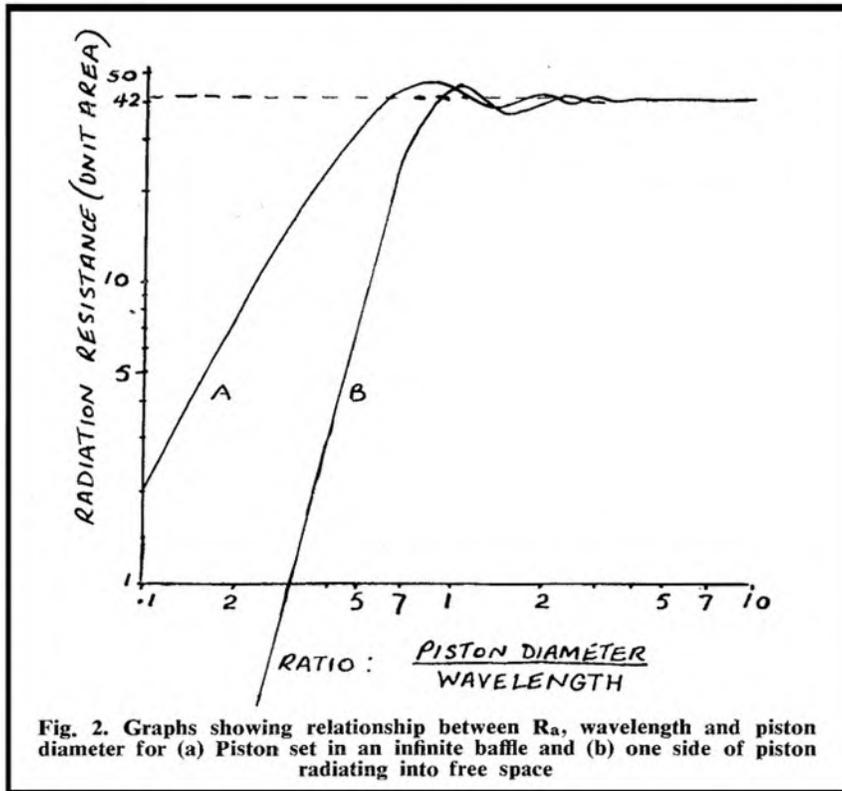


Fig. 2. Graphs showing relationship between R_a , wavelength and piston diameter for (a) Piston set in an infinite baffle and (b) one side of piston radiating into free space

fler lies in the amount of space which they require. In order to reproduce down to say 50 cps the length of one side would have to be at least five feet, even allowing for a 3dB power reduction at this frequency.

This limitation has led to the search for alternative methods of obtaining adequate performance from a loudspeaker in the bass register, but it does not mean that the baffle has been neglected commercially. The Wharfedale SFB3 is a very popular example of this type of system. It has a number of refinements, such as loudspeakers having dissimilar resonances and a sand filled panel which cannot vibrate. The overall sound is extremely pleasant, with a smooth bass and a "spacious" treble which has come to be associated with the name "Wharfedale."

This leads to one piece of advice—always listen to the result before deciding on what you might hear after examining the response curve.

TAPE COURSES

"THE Technique of Sound Recording" is the title of a new series of six lectures arranged by the British Institute of Recorded Sound in association with the University of London.

Beginning with *Sound Recording Today*, on November 10, the lectures will be held every Friday at 38, Russell Square, London, W.C.1. Other titles arranged include *The Age of Empiricism (1877-1924)* (Nov. 17); *Electrical disc recording, 1919-61* (Nov. 24); *The Evolution of Magnetic Recording* (Dec. 1); *Sound Recording and the cinema* (Dec. 8); and *Stereophonic Sound* (Dec. 15).

Fees for the full course is 10s. Tickets and further information are available from the B.I.R.S. at Russell Square (MUSEum 4507).

* * *

A ONE-DAY (9.45-5.30 p.m.) tape recording course entitled "The Tape Recorder in Christian Education" has been arranged for Saturday, November 4, at the Churches Television Training Centre, Central Hall, Tooting Broadway, London, S.W.17.

Among the lecturers will be John Weston and Arthur Lomas. The fee will be 10s., payable in advance, and tickets are available from the Rev. Cyril Thomas (Secretary) at the above address.

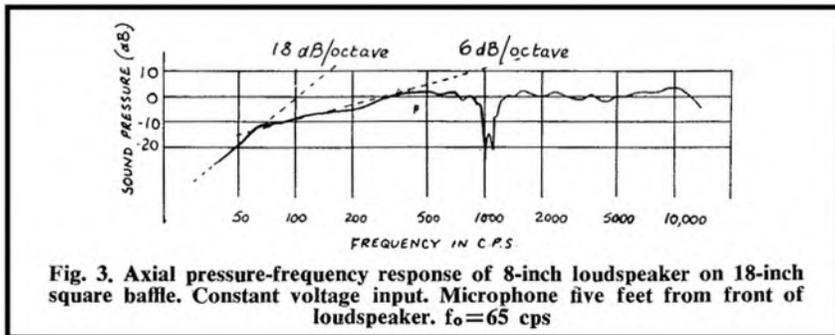


Fig. 3. Axial pressure-frequency response of 8-inch loudspeaker on 18-inch square baffle. Constant voltage input. Microphone five feet from front of loudspeaker. $f_0=65$ cps

Recording in Church

(Continued from page 17)

edited to provide a service in miniature. There will be some obvious cuts, some verses from long hymns, and usually the anthem.

The normal sermon will be too long and is best replaced by a specially recorded short message or prayer. Bible readings may also need to be shortened but retain the congregational Lord's Prayer, as sick people often like to join in this. To set the atmosphere fade in and out with a few seconds of organ music.

The old familiar hymns should be given preference, and care should be taken when omitting verses. It will help you to maintain a steady level if you can arrange with the organist to use contrasts of tone colour in place of contrasts in loudness; this is usually done for broadcast services. Failing this you must be on the alert for imitations of swelling seas, etc! If the microphone is close to the choir, warn them. Coughs in "close up" are very irritating.

Having collected sufficient material, you must now edit and cut this to provide a final tape which plays for about twenty minutes. I found that this length was about the limit to which one could go. It may be necessary to alter the order of your original recordings to give the shortened service some unity. Try and arrange everything around the reading and the minister's message or prayer, and adjust any difference in levels by recording everything at full depth on a second recorder when preparing the final tape.

I did not mention a second recorder when listing the equipment needed as it is usually possible to borrow one. Take care, when dubbing, not to introduce any distortion or loss of clarity; it often helps clearness of speech if the tone control of the first recorder is set rather on the bright side.

Finally check the tape by playing it through, and make out an Order of Service with tape-counter references opposite each item. This is a great help to whoever is going round with the recording as it may sometimes have to be shortened further by omitting a hymn.

When you have gained some experience in making recordings of services you will want to tackle something more ambitious such as an organ recital or cantata. This is a more difficult proposition, and there are quite a few pitfalls for the unwary. I hope to deal with some of these in a future article.

THE HUM AT HALLOWE'EN

"There is a hum from far away,
full, far from where 'tis heard,
a song from all the lonely hills
with never any word,
nor pause, nor rhythm whilst it lasts
to make the mind grow numb;
unhappy is the man indeed
who hears the fearful hum."

—traditional verse, Leicestershire,
written in the 18th century.

IT began to interest me, months ago. Thus it was, on the day before Hallowe'en that I took my tape recorder, and walked along the country road, to find the "fearful hum."

I met a man at the crossroads outside the town, a man enveloped in a plastic mac that rustled mysteriously as he moved. This man looked along the road, as though he were listening for some distant sound—the hum, perhaps.

"Do you hear the hum?" I asked him. He turned to face me, his plastic mac making a noise like fish-and-chips being wrapped in crisp, reluctant newspaper.

"Do the buses stop here?" he said. "I've been here for half-an-hour."

I brandished my tape recorder. "Half-an-hour," I exclaimed. "And you've heard *nothing*?"

"Only some music," he replied.



"You'll like my latest tape—it's a ghost story!"

The road was bare, the common-land bare save for gorse and grass.

"Music?" I enquired. "Was it like a hum?"

"Oh, no," he answered. "Brass band!" He pulled a small, transistor radio from his pocket, and switched it on. Wheezy melody danced away on the wind.

"I'm searching for the hum," I said, disappointed. "Everyone hears it these days."

"You want to try a pub," the man suggested. "That's the place for tall stories."

In the distance, a bright red bus trundled along the road. "That's my bus," the man smiled. "Thank you!"

The vehicle approached, and then passed me as I walked towards the town. Ladies, tired from shopping, snoozing by each window. Perhaps *that's* the cause of the hum—the total of all the snores in Christendom.

* * *

THE pub by the side of the road was a cheerful, welcoming building called "The Bandy Duck." I made my way into the Public Bar, and ordered a light ale. The man at the bar served me, and pointed to the tape recorder.

"We've got a tape recorder here, sir," he said. "Comes in very useful when we have a sing-song. If Gladys can't get here to play the piano, we play a tape recording of last Saturday's sing-song. Very useful."

"I'm trying to record the hum," I whispered. "Has anyone here heard it?"

He scratched his head.

"Well, sir, folks here say that they see all manner of things. And hear them, too, I dare say. Take the name of this house, for instance. Have you ever seen a bandy duck?"

"Aren't all ducks bandy?" I asked.

The man at the bar looked shocked at such a suggestion. "Oh, no, sir," he said. "They walk as straight as you or I."

A short story by DAVID LAZELL

THE HUM AT HALLOWE'EN

Mysterious things happen at Hallowe'en. If you set out to check on traditional country tales with modern electronic equipment, you must do it with the right attitude of mind.

Then, perhaps, you will not be disappointed.



Before, or after, an evening in the Public Bar, I wondered.

"One night, Ernest Trustshaw, the local councillor, was driving down the road, when, all of a sudden, he saw a bandy duck cross the road. He was so surprised that he stopped his car. And it was well he did, sir, for at that very moment, the bridge over the river collapsed! If he had been driving still, he would have been on the bridge at that fateful moment."

The man at the bar rolled his tongue around each syllable.

"And that strange creature was never seen again, as no one had ever seen it before. That's why we call this place 'The Bandy Duck'."

"Was Ernest Trustshaw a drinking man?" I asked.

"Never touched anything stronger than orangeade," the man at the bar replied. "My father was a temperance man."

"Temperance? And you manage this public house?"

"Every man to his own trade and fancy, sir," he explained. "In any case, my father said that seeing that bandy duck was a kind of omen that he should settle here."

He sighed, and then moved away to serve another customer.

As I finished my drink, he returned to me.

"I dare say someone here has heard this hum you're on about, sir," he said. "There's been a petition about the power station they're building in the big meadow. You ought to have a chat with Doctor Webber—he's in

the Lounge." He nodded towards the door in the corner.

I regretted not having recorded the tale of the bandy duck. I did not believe the story, but it would have been interesting for my friends in America; they believe anything.

* * *

DOCTOR WEBBER was alone in the Lounge, sitting at a table humming gently.

"Good morning, doctor," I said. "I wondered if I might have a word with you?"

"There's nothing for rheumatism but exercise and a good diet," he replied. "Pills only make it worse." He tapped the table. "Mind you, there's a great many folk who think that pills are the answer."

Doctor Webber was a small, neat man, wearing a tweed suit, as if he were a city-born man determined to be country-wise.

"Do any of your patients hear this hum?" I asked him.

"Ah," he breathed. "The hum!"

He was silent for a few moments.

"I read in an old medical book that people kept thinking that they heard cannons just after the Napoleonic Wars," he mused. "They were so frightened of further conflict that these fears became stimuli—imagined, but as real as if cannons were being fired in the distance."

"So you think that there's no hum," I suggested.

"I didn't say *that*," the doctor replied. "After all, it's hard to say

what we see and hear. Every man lives in his own private world."

"Have you heard the hum?" I said.

"Well, that's a difficult and personal question, young man, and I must be away to my visits." He stood up.

"I remember a lot of songs I used to know when I was young. Gilbert and Sullivan, Arthur Monckton—you know. . . . Sometimes I think I must have a private amateur operatic company in my mind." He touched his head quickly.

"Don't you ever sing to yourself, young man, creating music that no one else hears?"

He picked up the copy of *The Times* from the table and walked to the door. "There's your answer," he smiled.

Before I returned home I walked to the bridge over the river, just a hundred yards down the road. These waters would have claimed Ernest Trustshaw, I reflected, but for the shape of a bandy duck.

I made a recording of the waters as they rushed beneath the bridge. A young man passed, and winked at me, as I held the microphone above the river.

"The fish don't sing in autumn," he remarked. "Come back in the spring."

* * *

I STILL have the recording of the river, although the sound is almost obscured by the sound of a hum, like music from the mountains, or fish singing. More likely the machine needs fixing. . . .

FINDING the place of a particular passage of a recording on a tape has always been a time-wasting problem, and now with the increase in use of thinner, longer tapes and four-track machines using slower speeds, this problem has become more acute. Fortunately all modern domestic machines include a position indicator, more commonly in the form of a three or four digit turns counter. This, if used sensibly, can cut down the location time for any passage in any two or four tracks recorded on the tape to a period not exceeding that required for complete rewinding of the tape.

Before going into a method of logging position numbers it will be necessary first to explain the function of the turns counter, and to point out one or two simple rules which must be observed if maximum benefit is to be obtained from the device.

HOW TO KEEP TRACK OF THE TRACKS

Almost every recorder today incorporates a tape rev. counter. In this article methods of using this device to the maximum benefit are outlined, and the author also details a system of finding a given position on the second track.

The turns counter is almost invariably coupled to the take-up reel, taking its drive via a belt and a series of small cog wheels. The numbers registered on the indicator bear only a very complicated mathematical relationship to the length

of tape passing the recording head and cannot therefore be used for timing purposes.

Instead, use is made of the definite relationship between the numbers registered and the actual number of turns of tape on the take-up reel, and this is employed to give reasonable accuracy in cueing. The degree of accuracy achieved will depend on the design of the counter, which if it is such that there is undue play in the cog wheels and slip in the drive-belt will result in considerable error increasing progressively towards the end of the reel.

Another factor affecting accuracy is the smoothness of spooling that the machine is capable of, particularly when fast rewinding. It will be appreciated that to reach a desired position it will be necessary to put the machine into fast wind or rewind, and if the machine spools badly and loosely in these operations an error of several feet may result. Some machines have excellent indicators coupled with perfect spooling that can be relied upon to give accurate cueing almost to a syllable. The Telefunken 85 range of machines are particularly good in this respect, and can return time and time again to a desired position with uncanny accuracy.

When attempting to return to a marked position it is important that the hub size of the take-up reel chosen be exactly the same as that used when first logging the tape. One of slightly larger or smaller diameter will throw the entire system out. The length of leader strip must remain constant, and the indicator set to zero with the end of the recording tape always in the same position (preferably with the stop foil just clear of the tape slot).

Noting the start and finish of the various items contained on a tape is best done when making the original recordings. This, done for each of the two or four tracks, presents no difficulty, and providing the tape is wound to the start of a particular track, any place in it can readily be found. If the tape is wound with the green leader on the outside and a passage is required from one of the tracks recorded from the red leader end, and having only one set of numbers for each track, the place can be found only by laboriously rewinding on to another reel and starting from zero again. This wastes much time and is quite unnecessary.

It is possible to obtain a further set of

Stereo Notes

By D. W. GARDNER

IT is very easy to ask why something is not available and then to be told that it is. I propose to take the risk and ask why more is not done in a practical way to help people who are desperately keen to have their equipment functioning to full efficiency but who have a handyman rating of approximately zero.

I am thinking mostly of the man who builds up his equipment gradually, changing to stereo on the way. He frequently finds the need to reorganise connections, earthing systems and so on, in some cases with a spot of soldering as an essential ingredient. To the handyman this sort of thing is such a piece of cake that the subject is hardly worth mentioning, but to the other type it all becomes a real worry. He can pay for the jobs to be done by someone else, but how many technicians who really know what they are about will willingly do a succession of minor operations of this kind?

The non-handyman does not feel capable of tackling the work himself and finds it very difficult to ask others repeatedly to come along and make "a couple of little connections." For the requirements can change rapidly—not only as new equipment is incorporated but as domestic needs alter.

One may decide, for instance, that it is desirable to run an extra speaker or two in another part of the house—with facilities for switching them in or out independently. Or some temporary wiring may be needed for a borrowed tape recorder or other unit.

The ideal thing, I feel, would be a sort of wiring clinic, operating by post. Forms could be supplied to enable the customer

to indicate his needs and the nature of the equipment involved; and the answers could be in the form of a range of neat and highly-adaptable switch boxes and similar accessories, plus a standard method of attaching the flex where necessary.

With one standard approach to the problem and a familiar pattern of gadgets our non-handyman would gain sufficient confidence to cope with most of his changing needs. And, wherever possible, the situation would be met by lengths of wire or cable already fitted with the necessary soldered plugs and so forth.

This sort of service might be commercially unattractive, but I have a feeling that it could succeed in view of the desperate needs it could meet.

Equipment manufacturers could also do more, I believe, for the technical ignoramus, offering an appropriate selection of connection kits for the units they sell—including earthing facilities and instructions.

Naturally, requirements vary enormously, but our engineers are sufficiently ingenious, I know, to come up with a workable solution if only they could persuade themselves that the "easy, obvious" way of doing these jobs (in the way they have always done them) will never be easy or obvious to the non-technical three-quarters of the world.

It will also help if manufacturers will renew their efforts to achieve greater standardisation in the matter of plugs, connections and so forth—if only by continuously reducing the number of variations. These moves will pay dividends by eliminating one of the discouraging aspects of installing new equipment.

HOW TO KEEP TRACK OF THE TRACKS

By

L. G. BROWN

figures (reversed) from the first set of numbers (normal) for each track. These used together with the original numbers make it possible to return to any desired position in any one of the tracks without having to rewind completely.

When making the first set of figures, after the last item has been noted, run the tape on to the end of the reel until the stop foil is just about to enter the tape slot. Note the number on the indicator and subtract it for either 1,000 for three-digit indicators or 10,000 for four-digit indicators.

This number should be retained with the particulars of the tape, for it will be constant for both (or all four) tracks, and need only be determined once. (Should the reel in question be say one of 1,800 feet, it should not be assumed that the number obtained will be true for any other 1,800 foot reel, for tapes are not supplied to an exact length and, from different manufacturers, may vary slightly in thickness). The second set of figures, the reverse numbers, is obtained by adding the new number to each of the original numbers.

Finding the place then becomes simple.

(1) *Red leader showing. Selection required from track one. Place full reel on left-hand side of machine. Thread tape and wind on until the stop foil just clears recording slot. Set counter to zero. Fast wind forward to the desired number (Normal).*

(2) *Green leader showing. Selection required from track one (which starts at red leader end). Place full reel on take up side of the machine. Thread tape and wind back until stop foil just clear of recording slot. Set counter to zero. Fast rewind to desired number (Reverse).*

For four-track machines the same procedure applies, using (1) above for tracks 1 and 3, and (2) for tracks 4 and 2.

Using this system it is essential that both supply and feed reels are of the same diameter and as originally used.

Tables 1 and 2 show respectively for two- and four-track machine working, a system of filing these particulars which should be kept in the box accompanying the tape. Perhaps some enterprising manufacturer of tape accessories, recognising the logic of the system may undertake to produce printed cards in quantity for this purpose.

These instructions hold good for most recorders available today which include

Item	Leader Colour	Speed	NORMAL		REVERSE (add 206)	
			From	To	From	To
			Gershwin(1).....	Red ... 7 $\frac{1}{2}$...	000 ... 282 ...	206 ... 488
(2).....	Red ... 7 $\frac{1}{2}$...	284 ... 373 ...	490 ... 579			
(3).....	Red ... 7 $\frac{1}{2}$...	375 ... 429 ...	581 ... 635			
Borodin	Red ... 7 $\frac{1}{2}$...	432 ... 565 ...	638 ... 771			
Strauss	Red ... 3 $\frac{3}{4}$...	568 ... 621 ...	774 ... 827			
Ravel	Grn ... 7 $\frac{1}{2}$...	000 ... 228 ...	206 ... 434			
Rimsky-Korsakov ...	Grn ... 3 $\frac{3}{4}$...	231 ... 287 ...	437 ... 493			
Dukas.....	Grn ... 7 $\frac{1}{2}$...	290 ... 438 ...	496 ... 644			
Nicolai	Grn ... 7 $\frac{1}{2}$...	441 ... 569 ...	647 ... 775			
Weber.....	Grn ... 3 $\frac{3}{4}$...	572 ... 671 ...	778 ... 877			
(End of side 694)						
1000—694=206						

(Table 1. Telefunken 2-track, Scotch LP tape) (1800 ft.)

Item	Leader Colour and Track Number	Speed	NORMAL		REVERSE (add 8276)	
			From	To	From	To
			Beethoven (1).....	Red/1 ... 3 $\frac{3}{4}$...	0000 ... 0326 ...	8276 ... 8582
Rossini	Red/1 ... 3 $\frac{3}{4}$...	0329 ... 0518 ...	8595 ... 8794			
Liszt	Red/1 ... 7 $\frac{1}{2}$...	0603 ... 1202 ...	8799 ... 9478			
Beethoven (2).....	Red/1 ... 7 $\frac{1}{2}$...	1208 ... 1712 ...	9484 ... 9988			
Schubert.....	Red/3 ... 7 $\frac{1}{2}$...	0000 ... 0812 ...	8276 ... 9088			
Mozart	Red/3 ... 7 $\frac{1}{2}$...	0817 ... 1695 ...	9093 ... 9971			
Tchaikovsky	Grn/4 ... 7 $\frac{1}{2}$...	0000 ... 0746 ...	8276 ... 9022			
Berlioz	Grn/4 ... 7 $\frac{1}{2}$...	0750 ... 1425 ...	9026 ... 9701			
Ravel	Grn/4 ... 3 $\frac{3}{4}$...	1429 ... 1702 ...	9705 ... 9978			
Dvorak	Grn/2 ... 7 $\frac{1}{2}$...	0000 ... 0912 ...	8276 ... 9188			
Brahms	Grn/2 ... 7 $\frac{1}{2}$...	0916 ... 1382 ...	9192 ... 9658			
Bizet	Grn/2 ... 7 $\frac{1}{2}$...	1387 ... 1643 ...	9663 ... 9919			
Wagner	Grn/2 ... 7 $\frac{1}{2}$...	1650 ... 1708 ...	9926 ... 9984			
(End of side 1724)						
10000—1724=8276						

(Table 2. Philips 4-track, BASF DP tape) (2400 ft.)

the turns counter marking system, but not for those such as the Simon SP4 or recorders incorporating the Collaro Mk IV deck, which, because of their system of recording and playback in both directions will add further complications but doubtless the method could be adapted.

It is a pity that while manufacturers have agreed on standardising recording characteristics and tracking sense, no agreement has been contemplated to standardise revolution counters or tape reel hub sizes. One feels that they have missed the boat in this respect, for had there been a set standard, pre-recorded tapes might have arrived complete with a set of figures corresponding to, and as useful as the bands separating the tracks on a commercial gramophone disc.

When setting the indicator to zero for the start of recording or playback it has been suggested that the tape should be in position with the stop foil just clear of the recording slot. Apart from the

necessity for having a point to work to, this position has been chosen for quite another reason. Stop foils, while quite useful, can also be a considerable nuisance. It can be quite aggravating to have the machine switch off just after depressing the recording button.

With the Tandberg 6 for instance, the stop foil switches out the motor, and it takes several seconds to get the machine back into recording mode, and meanwhile the first few bars of a symphony may be irretrievably lost.

It is also impossible in some cases to start recording at the precise beginning of the recording tape. The stop foil separates the recording tape from the leader strip, and from a production point of view this is the most logical place for it to go. The tape recorder owner would be better served if it were to be spliced into the leader strip, and the first tape manufacturer to adopt this policy will add to his product another point in its favour.

Equipment Under Test

THE

PHILIPS EL3585

THE Philips EL3585 is a new-comer to the ranks of completely portable miniature battery-operated recorders. It is small in size and light in weight, though in this respect it is a little larger than some other machines available.

The dimensions are $11\frac{1}{2} \times 7\frac{1}{2} \times 3\frac{7}{8}$ inches, and the weight is 8 lb. including batteries. The fact that this is slightly larger than some other models does not detract in any way from its portability, indeed, it enables such functions as fast forward and backward wind to be included, and gives room for a four-inch diameter loudspeaker. Furthermore, space is provided in the case for storing a microphone and its lead, so that no extra "bits and pieces" are necessary when the machine is taken out of doors.

The machine is attractively styled in grey and cream plastic, with a transparent cover to protect the heads and tape reels. The machine may be operated for both recording and reproduction with this cover in place if three-inch tape reels are used. With the single speed of $1\frac{7}{8}$ ips, and using this reel size with double-play tape a total of 60 minutes playing time is available. With the cover removed it is possible to use 4-inch reels of tape, and under these circumstances the total playing time is doubled. The rewind time for three hundred feet of tape is 90 seconds, and fast forward wind 115 seconds.

Operating controls on this machine are kept to a minimum. The tape is set in motion by one of three push buttons, depending on the function required. The centre button with the single arrow pointing to the right is

By H. BURRELL HADDEN

used for setting the tape in motion for play or record. The left hand button with two arrows pointing to the left and the right hand button with two arrows pointing to the right are for fast rewind and forward wind respectively. All three buttons lock down mechanically, and can be released by pulling them slightly forwards. For recording, an additional push button towards the rear of the machine is pressed downwards and held while the "play" button is pressed, when both will lock down and the machine is set to record. Both buttons return to the "off" position automatically when the play button is released.

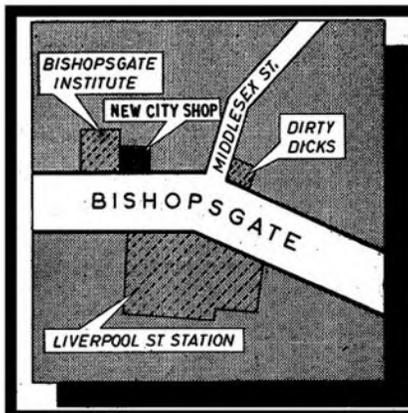
The only other control is the volume control, used on playback and record. This is of the "thumb wheel" type and is found on the front of the instrument beside the indicating meter. This meter serves a dual-purpose, supplying information on the state of the batteries and also acting as a level meter whilst recording. It is marked in three colours, black, red and green and these are used as follows: on playback the meter will read the state of the battery, and so long as the pointer is in the green segment the batteries are serviceable, they should be changed as soon as the pointer reaches the red segment. During recording

the meter indicates recording level and the volume control should be adjusted so that the pointer just does not move permanently into the red segment during the loudest passages; it should remain in the black segment with possibly occasional peaks into the red.

The power supply for the EL3585 is provided by six 1.5 volt U2 torch batteries. It is advisable to use batteries of the leak-proof type and in any case the batteries should be removed if the recorder is not to be used over a long period. The batteries are fitted after removing a sliding panel at one end of the case.

The battery life is approximately 20 hours if the recorder is used for four hours per day and considerably longer if it is used for shorter periods at longer intervals. Battery consumption can be economised on playback, by keeping the volume to low level since in this condition the current consumption is approximately proportional to the volume of sound.

The microphone provided with this tape recorder is a moving coil cardioid type, and this polar response is of great help in the rejection of unwanted sounds. It is stored in a compartment at the end of the case, above the battery compartment, and it is necessary to remove the microphone from this compartment in order to have access to the input socket. The microphone cable is stored in the compartment behind the microphone.



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NOW OPEN. We proudly announce the opening of our new City Tape Recorder Centre. This superbly equipped and stocked tape recorder paradise is easily reached by bus, train, tube and road. (See drawing.) Our Unique H.P. Terms, Free after-sales servicing, Free Technical Information, Pamphlets, etc., are readily available both here and at our other well-known branches.

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AND
205 HIGH ST. NORTH, EAST HAM
GRA 6543

All inputs and outputs are connected to one five-pole socket. The microphone, radio, and gramophone inputs are connected to pins one and four in parallel, with the earth on pin two. For microphone the input required is 0.3 mV across 2,000 ohms, and a special lead is provided for radio and gramophone which contains an attenuating resistor to reduce these higher inputs to the necessary low level. A line output is available from pins three and five in parallel, the earth again being on pin two. This output, which is variable from the volume control, gives approximately 1 volt across 1000 ohms.

The transistorised amplifier contains six transistors and one diode, and the machine is provided with two heads, one for high frequency erase and the other for record/play. In this respect it is superior to some other machines which have permanent magnet erase with consequent risk of increased tape hiss due to permanent magnetisation of the tape. In the machine reviewed tape hiss is at an acceptably low level and signal-to-noise generally was perfectly adequate. A number of recordings were made of extremely quiet sound



Wow and flutter were exceptionally good for a battery operated machine operating at this speed, and some perfectly satisfactory piano recordings were made. This test was completed with the machine stationary on a table. The maker's claim that the machine can be used during transport is undoubtedly true, but under these con-

One minor complaint. Some difficulty was experienced with the microphone cable and plug. On replacing these into the case, care has to be taken that the lead and plug are packed away into the corner of the pocket provided otherwise the microphone and the case can easily be damaged. It is a pity that this compartment could not be slightly bigger. This small space, furthermore, makes the fitting of the microphone plug into its socket a somewhat fiddly business, so much so that during field trials, I missed some valuable sounds. No doubt this would be easier with experience, but experience does not make one's fingers any smaller and there is just not enough room.

These minor details apart, I consider the Philips EL3585 to be excellent value for money at 24 gns.

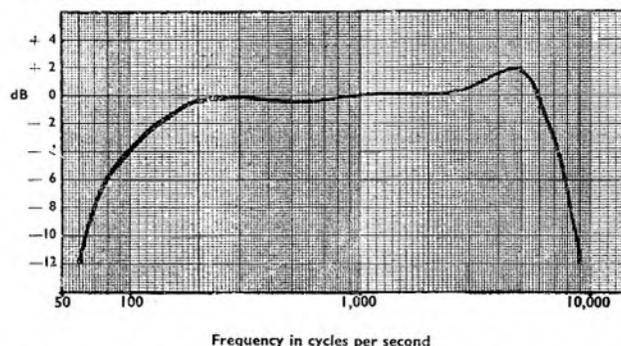


Fig. 1.
Philips EL3585
record/replay
characteristics

sources necessitating the use of high recording gain and these could be reproduced without any troubles from noise.

Frequency response tests were made on the machine and the overall record/replay response is shown in Fig. 1. This, as will be seen, is somewhat better than the maker's claim in their specification and the quality of sound recorded was very good indeed for this slow speed. No "playback only" curve is shown since at the time of writing there is no standard curve for recording at $1\frac{7}{8}$ inches per second. It is to be hoped that as more machines at this speed become available some standardisation of characteristic will be made.

ditions, great care must be taken that it is not swung violently or wow will result. As with most battery operated machines, it is recommended, when recording from microphone, that the microphone is kept some distance from the recorder, and preferably not on the same table, in order to avoid picking up the motor noise.

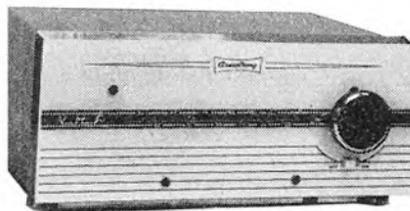
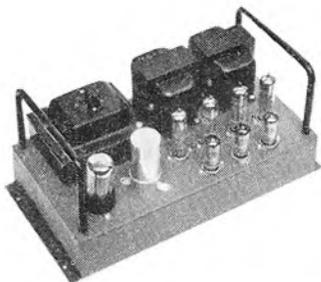
For the best performance of any tape recorder, it is desirable to keep the heads and the capstan clean, and in this machine the two plastic head covers are made removable for this purpose. Full instructions for cleaning the heads as well as instructions for all possible uses of the machine are to be found in the attractive two-colour instruction book.

MANUFACTURER'S SPECIFICATIONS

- Speeds: $1\frac{7}{8}$ ips.
- Frequency response: 120-5,500 cps \pm 3dB.
- Maximum spool size: 4 inches.
- Rewind speed: 300 ft. in 90 seconds.
- Current consumption: 120 mA.
- Batteries: Six 1.5 volt torch.
- Loudspeaker: Four-inch diameter.
- Inputs: Microphone (0.3 mV across 2,000 ohms); Radio (0.3 mV across 2,000 ohms); Pick-up (0.3 mV across 2,000 ohms); and line output (1 v. across 1,000 ohms, variable).
- Transistors and diode: Four OC75, two OC72 and one OA91.
- Dimensions: $11\frac{1}{2}$ x $7\frac{1}{4}$ x $3\frac{3}{8}$ inches.
- Weight: 8 lb.
- Makers: Philips Electrical Limited, Century House, Shaftesbury Avenue, London, W.C.2.

New Products

ARMSTRONG INCREASE RANGE



Top: The Armstrong A20 stereo power amplifier, centre, PCU25 stereo pre-amp, and bottom, their T4B FM Tuner

New tape by R.C.A.

R.C.A. GREAT BRITAIN LIMITED announce that they are marketing R.C.A. Red Seal professional quality magnetic tape manufactured at the R.C.A. plant in Indianapolis.

It is planned to extend the present range of acetate and mylar-based $\frac{1}{4}$ -inch tape by the introduction of instrumentation and television tapes in the near future.

R.C.A. Great Britain Limited, Lincoln Way, Windmill Road, Sunbury-on-Thames, Middlesex.

Ampex change address

AMPEX Great Britain Limited, which is responsible for the sales of Ampex equipment in Great Britain, announce a change of address to 72, Berkeley Avenue, Reading (Reading 55341), as from October 2.

Hitherto, the company has shared premises at Reading with its sister manufacturing company Ampex Electronics Limited.

GRAMPIAN INCREASE

GRAMPIAN Reproducers announce that the price of their DP/4L low impedance microphone has been increased to £8, and their medium and high impedance models have been increased to £9. The changes were effective as from July 17.

Gramplan Reproducers Limited, Hanworth Trading Estate, Feltham, Middlesex.

AN extension of their hi-fi range is announced by Armstrong Wireless with the introduction of a stereo power amplifier, a stereo pre-amplifier, and an FM Tuner.

The first two items, designated A20 and PCU25, will sell at a combined price of £52. The T4B FM Tuner will sell at £23.

Twelve watts push-pull output from each channel are available from the A20 power amplifier, with distortion rated as less than 0.1 per cent, and hum and noise as 85dB below full output. The quoted frequency response is 15-22,000 cps within 1dB, and power response as 20-20,000 cps \pm 1dB. Negative feedback is given as 29dB.

The valve line-up is three ECC83, four EL84, and a GZ34. Stability factor is said to be 20dB. High specification output transformers are incorporated, with grain orientated laminations and multi-sectional windings.

Six inputs providing for all possible signal sources, including the lowest output pick-ups and tape heads, are incorporated in the stereo pre-amplifier. Push-button function switching, with bass and treble tone controls, balance control, treble filter, and rumble filter are also included in the design. Distortion is

rated as less than 0.1 per cent, and hum and noise level (high sensitivity pick-up input) is given as 60dB at full output.

Two EF86, and three ECC83 valves are used.

Their tuner is a self-powered unit with automatic frequency control, and a full VHF band (87-108 Mcps). Valve line-up is two ECC85, and EF89, EF80 and EB91. It incorporates a cathode follower output, and variable output controls 0-500Mv.

Armstrong Wireless & Television Co. Ltd., Warters Road, Holloway, London, N.7.

Elstone to market Irish tape

ELSTONE ELECTRONICS LIMITED, importers of the Tandberg tape recorders, announce they have taken over the agency for Irish Brand magnetic tape, as from October 1.

Wilmex Limited, who have handled this product will continue as representatives for the Greater London area.

Elstone Electronics Limited, Edward Street, Templar Street, Leeds 2.

Parman introduce the "Symphonia"

ATRUVOX MK. 6 tape deck is the main unit of the Parman Symphonia console tape recorder. Also incorporated in this elegant piece of equipment are an 8-inch loudspeaker and 4-inch tweeter

by Wharfedale. These are housed in a separate acoustical chamber built into the main cabinet.

Two speeds are incorporated, $7\frac{1}{2}$ and $3\frac{3}{4}$ ips. The quoted frequency response at the top speed is 35-16,000 cps and at $3\frac{3}{4}$ ips, 40-12,000 cps, both \pm 3dB. Signal-to-noise ratio is given as -52dB, referred to 10 watts output from fully modulated tape. Wow and flutter figures are better than 0.1 per cent at $7\frac{1}{2}$ ips. and better than 0.2 per cent at $3\frac{3}{4}$ ips.

Maximum playing time available is $4\frac{1}{4}$ hours using double-play tape at the slower speed, provided by the provision for accommodating 7-inch reels. Rewind time for 7-inch reels of tape is approximately one minute.

Features include inputs for microphone (1 mV imp.—1 M ohm), radio (100 mV imp.—250 K ohms), or pick-up (80 mV imp.—250 K ohms). Ten watts push-pull output are provided.

The dimensions are $30 \times 28\frac{1}{2} \times 17$ inches, and the price of the Symphonia, in its hand-built cabinet satin-finished in medium walnut, is 142 guineas.

Also recently announced by this company is the Cygnet coffee table sound reproducer. This comprises a tuned acoustical chamber, housing a 13×8 inch elliptical bass loudspeaker and a 4-inch tweeter coupled via a carefully balanced crossover unit. The price is 21 guineas.

Parman Electronics Limited, Parman House, Balcombe Road, Horley, Surrey.



The Parman Symphonia

News from the Clubs

WHAT is believed to be the first ever "Tape Rally" in this country was held at Northampton in early October. Attended by club representatives and enthusiasts from many parts of the Midlands, the rally was organised by the **NORTHAMPTON** club, whose forty-odd members thought it was about time the club members met to talk shop and discuss techniques.

Describing the event afterwards, the secretary, Mr. J. Harrison, explained the rally was "a bit of an experiment," which had proved to be a great success. So pleased were the club members with the meeting, that they now propose a larger rally, which would be spread over three days, next year. They hope to get the co-operation of the manufacturers, so that those present will have the chance of seeing the latest machines in action. In addition to such demonstrations, they also plan general discussions and lectures.

Among those who attended the rally were members from the clubs in Bedford, Birmingham, Cambridge, Coventry, Kettering, Leicester, Nottingham, Rugby, and Warwick and Leamington. For many it was their first meeting socially, although previously all have exchanged tapes.

The Northampton club members are to be congratulated on their efforts.

During the same week, the **WAKEFIELD** club members were also deeply involved with a meeting of tape enthusiasts, although their activities were of a more technical nature, being in the form of a not-so-miniature Audio Fair.

Supported by manufacturers, dealers and the tape press, their one-day fair was a vast improvement on a similar venture by the same club in October last year. Quite a gloss had been effected to their second effort, including a twenty-page "Souvenir Programme" containing manufacturer's adverts and details of the exhibition stands.

It would appear the amateur clubs are now able to vie with the professional organisations, and it is encouraging to see the progress made in such a short time.

The variety of activities such as those outlined above, and mentioned often in this column lead us directly in to the latest ventures of the **WEST HERTS** members.

During the last few weeks they have covered quite a number of exercises including the production of a sound effect of a crowded dance hall using just two persons and a record player. The effect was achieved with George Richardson at the controls of a Telefunken 85KL.

Following his enlightening presentation, he proceeded to demonstrate the capabilities of his machine. This was followed by a practical demonstration of head alignment given by the secretary Peter Holloway.

"Out and about" during the month of August, the members complete with Cub, Fi-Cord and Minivox, were detailed to gather water recordings. Under the guidance of George Hill, they visited the local park and obtained recordings of water fountains, waterfall, and splashes. "Get the swans feeding on the river" was one request, and so armed with the necessary bread they proceeded to record the chirping of the cygnets and the angry hissing of the parent birds. To complete their effects recordings, they visited a fairground and captured the sirens of the roundabouts, the stallholders' cries, and the excited screams of girls on the "Octopus". All the recordings are to go to swell their library of sounds both authentic and imaginary.

Their regular competitions are still popular, and the latest was set to find out the sounds that would be taken on a desert island. The only conditions were that the sound must not exceed 45 feet of tape at 3½ips in the form of a continuous loop. Most of the entries consisted of sounds that would be left at home, but the winning tape, by Vera Jackson, was mostly compiled of cries of "Help" and "I'm over here", although there was a description of a cricket match too. Her prize was a book on tape editing.

Their September meetings included editing and filing the sounds recorded earlier, with Jack Hill once again taking charge for the dubbing sequences of water, fairground, train and station sounds; and a science fiction evening at Watford on September 27. A short script by John Grainger was distributed, and with the aid of Alan Morris' multi-vibrator they were off into space. As usual, the recordings improved as each attempt was made, and the meeting rooms, with adjoining hall, provided an excellent rocket count-down atmosphere with the aid of a Stuzzi Magnette.

B.B.C. "Sound" Programme

A magazine for radio and recording enthusiasts

2.40 p.m. November 12

QUESTIONS AND ANSWERS

I. W. Jarman and John Borwick
answer questions sent in by listeners

"Sound" is broadcast on alternate
Sundays on Network Three

**The next programme is on
November 26**

At their October 11 meeting the members heard the result of their previously inaugurated competition whereby each member in turn has four weeks to prepare a ten-minute actuality recording. The first victim was Dennis Millward who had recorded interviews with people associated with the Haggis families(!). He made recordings of them at work and play and after playing his tape explained the methods used and the general recording arrangements.

One of their most successful exercises was achieved when they were able to attend an open-air performance of *As You Like It* performed by the Pendley Manor at Tring. Using parabolic reflectors they obtained some very fine recordings despite the fact that aircraft continuously passed by overhead. A Brenell Mk. V, plus Michael Coates' home-built model, and Grampian DP/4 and STC4021 microphones were used, and members took it in turn for the various duties during the two-hour performance.

Experiments also with parabolic reflectors by the **WEST MIDDLESEX** members, who recently compared two models. Secretary "Sandy" Saunders describes their efforts, with battery portable machines, as not very illuminating, although this was put down to the lack of thought regarding the comparison tests.

They have been concentrating on technical discussions, with Phil Pratt and David Lloyd providing all the gen on valves and equalisation and bias. Phil Pratt's talk on valves, with particular attention to tape recorders, is now planned to be the basis of another of their *Technical Discussion Tapes*. Other talks have been presented by the secretary, on mixers for mono use, and by Stan Mace on the same thing for stereo.

At their September 14 meeting they were visited by Mr. Yardley of the Teddington Theatre Club who outlined the many ways in which the two societies can work together. The tape enthusiasts agreed to produce sound effects for the plays, and also to man the replay and amplifier equipment at their performances.

In order to fully appreciate the problems of lay-out at the theatre, the members were invited to a performance of Emyln William's play *Trespass* on October 5. Afterwards they agreed to provide the sound effects for the next production—*The Rape of the Belt*. Anyone have a spare lute?

At long last the members seem to have found themselves a suitable club headquarters. The first meeting at the new venue, a Southall school, was scheduled for October 26, but a number of points had to be cleared up first. The new rooms have ideal financial terms, and the club is now considering the possibility of weekly meetings.

Further material for their tape library was collected by the members of the **KETTERING** club recently when they descended on the nearby village of Rush-ton. Armed with portable recorders some members cornered local personalities and visited places of historical interest while others went to railway sidings to collect train effects for a proposed "sound picture" of the village. Afterwards the evening's activities were crowned with the usual get-together at the local hostelry. There, the recorders

(Continued on page 33)

Classified advertisements

Rate—Sixpence per word (minimum 5s.); **Trade**, ninepence per word (minimum 10s.); **box numbers**, one shilling extra. **Payment with copy**. Copy should be sent to Advertisement Department, "Tape Recording Fortnightly," 1, Crane Court, Fleet Street, London, E.C.4.

TAPE-TO-DISC

J & B RECORDINGS. Prompt Tape to Disc and Sound Effects Service. 14, Willows Avenue, Morden, Surrey.

TAPE TO DISC RECORDING

Reduced prices. Finest professional quality. 10-in. L.P.—30s. (32 mins.), 12-in. L.P.—35s. (45 mins.). 7-in. EP 17s. 6d.

48-HOUR POSTAL SERVICE

S.a.e. for leaflet to Deroy Sound Service, 52, Hest Bank Lane, Hest Bank, Lancaster. Tel.: H.B. 2444.

JOHN HASSELL RECORDINGS. Tape/Discs. All speeds. CCIR Studio, 21, Nassau Road, London, S.W.13. Riverside 7150.

TAPE-TO-DISC RECORDING SERVICE. All speeds. Photographic sleeves with all records. Details from E.R.S., 162, Shirland Road, London, W.9.

SERVICES

GRUNDIG sales/service in your area: High Wycombe phone 457, Newbury phone Thatcham 3327, Wallingford phone 3083, Orpington, Kent, phone Orpington 23816, New Malden phone Malden 6448, Watford phone Garston 3367.

MISCELLANEOUS

Ask your dealer for American Ferro-dynamics "Brand Five" recording tapes: the best tape value!

Friendly Folk Association Torquay (Est. 1943). Social Introductions, Pen-friends, Book-lovers, Stamps, Photography, Tapesponding. Members 100 Countries.

NEW GOODS FOR OLD. The full price for your old equipment allowed in quarter part-exchange for new. Send 3d. stamp for Leaflet C/60/TR. Box No. 431. *Tape Recording Fortnightly*, 1, Crane Court, London, E.C.4.

Recording Tape. Save up to 30 per cent. Send for list. Also 50 secondhand Recorders in stock. E. C. Kingsley & Co., 132, Tottenham Court Road, London, W.1. EUS 6500.

WONDERFUL SELECTION OF BARGAIN SECONDHAND RECORDERS completely overhauled and fully guaranteed from £12 always on display at all showrooms of Britain's Leading Tape Recorder Specialists, City & Essex Tape Recorder Centres. See page 28.

TAPE SPLICING is easy and accurate with EASYSPLICE tape splicer 5s. Patented, guaranteed. Over 6,000 sold. Easysplice, 30, Lawrence Road, Ealing, London, W.5.

RECORDING TAPE. See my advertisement on page 5. Nobody has yet asked for his money back. Villiers.

PRE-RECORDED TAPES

Unique complete catalogue listing all makes. Mono, Stereo, 7½ and 3¼ ips, including World Record Club tapes. Call for FREE copy or send 1s. mailing fee. Dept. T.R.I. Teletape Ltd., 33, Edgware Road, W.2. PAD 1942.

WAL PRODUCTS. The new D-Mag Head Demagnetiser, nylon bushed probes, £2 10s. The new Hi-Gain Pre-amp, with tape equalisation, ideal for Ferrograph, Philips, etc. For monitoring, dubbing, playback, etc., £7 16s.

WAL BULK ERASER (for tape and film), £7 18s. 6d. MONO WAL GAIN £5, STEREO £7 10s. Professionally designed, professionally built, for professionals. WELLINGTON ACOUSTIC LABORATORIES LTD., Farnham, Surrey (6461).

"STICKING TAPES"? Not if you keep them in polythene TAPE PROTECTORS to guard against dampness and atmospheric change. Per dozen, 3 in. 1s. 6d.; 4 in. 1s. 8d.; 5 in. 1s. 9d.; 5½ in. 2s.; 7 in. 2s. 4d.; 8½ in. 2s. 8d. From your dealer, or from SWAINS Papercraft Ltd., Dept. 6, Buckhurst Hill, Essex.

FOR SALE

Philips EL3538 Twin track, three-speed £35 o.n.o. and Grundig TK20 £25 o.n.o. Phone Flaxman 2238 week-days or Chesham 8801 evenings and week-ends.

Sabafon TK75 Auto/Reverse £50 o.n.o. (or exchange for Tape Deck). Philips EL3527 £25 o.n.o. Both excellent condition. Demonstration 'phone KNIghtsbridge 0906 evenings-weekends.

Simon SP/1 little used. Overhauled makers. 10 watt output. Monitor. Reslo ribbon microphone with 40 ft. lead. Matching transformer. £35. Phone CLerkenwell 2253.

Subscription Order Form

TAPE RECORDING FORTNIGHTLY,
7, TUDOR STREET, LONDON, E.C.4

I enclose my subscription of 45 shillings for one year, post free (Subscription to USA and Canada \$7) beginning with the issue dated.....

(BLOCK CAPITALS)

Mr., Mrs., Miss.....

Address

"Tape Recording Fortnightly" is published on alternate Wednesdays, and is obtainable at newsagents, bookstalls, and music and radio dealers.

PLEASE POST FREE SPECIMEN COPIES TO THE FOLLOWING TWO FRIENDS, WHO I THINK MAY BE INTERESTED:

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TAPE TIME CALCULATOR



The *Tape Recording Fortnightly* accessory, gives playing times for any size reel or length of tape.

A simple, read-at-a-glance device for any speed from 18ths to 15 ips. Orders can now be accepted at the address given below.



Price 2/6d

(3/- including postage)

Order from:

Tape Recording Fortnightly
7, Tudor St., London, E.C.4

News from the Clubs

(Continued from page 31)

were put to work once more when the innkeeper offered to record a ghost story of the Inn.

When members of the **CROYDON** cine club received a tape from a cine enthusiast in Illinois some weeks back, they quickly passed it over to the tape recording section for a reply. This group then decided to answer the tape by compiling five-minute extracts from each member. At a recent meeting, however, the required programmes were most noticeable by their absence, only Roy Sutton having achieved the aim. The members then decided to conduct a series of interviews with those present, with Mr. Garner acting as interviewer. This done the tape was played back for final checking, and is now on its way to America.

A false start also for members of the **WALSALL** club who were each recently set the task of compiling a tape to include five different modes of transport. The required tapes were in short supply,

and the treasurer had a "bonus" evening collecting fines galore.

Other of their recent meetings have been spent acting and recording a ghost play, and recording various operatic arias sung by their talented member Michael Kehoe.

When the group reformed after their "holiday" they heard an amusing tape received from disc-jockey Jack Jackson. This was to be the first association with this well-known figure who has agreed to accept the role of President.

A club has recently been formed at **HASTINGS**. Following a preliminary meeting, and a letter published in the local paper, twelve enthusiasts met at the house of John Aitchison last month and elected a committee. Posts were filled by Mr. H. Thompson (chairman), Mr. John G. Ashman (treasurer) and Mr. Aitchison volunteered for the secretaryship. His address is 62, Vicarage Road, Hastings.

A number of those attending the meeting were already in possession of tape programmes, and these were played over to the newcomers. Tapes played included organ music, recorded on location by Messrs. Thompson and Jackson, and an

experiment in *Musique concrete* by Ian Hills. Another tape heard during the evening contained good wishes on the club's formation. This was received from the members' first honorary member, Cecil Costlow of Preston, a founders' tape contact.

A change of secretary is announced for the **ULSTER** club. The newly-elected member is Mrs. Hazel Jordan of 36, Sandymount Street, Belfast 9.

Our regular readers will remember Eric Channon, President and co-founder of the **English Speaking Tape Respondents Association**. With Robert Ellis he began this international tape corresponding organisation in August last year, and the club played a large part in the recruiting drive which obtained almost 300 members within twelve months.

It is with regret then that we announce his death in a London hospital after a short illness. His enthusiasm for tape recording was second to none, and he had friends in many parts of the world. It was with the object of making some contribution to international friendship that he co-operated with his Scottish friend in the formation of **ESTRA**.

CLUB MEETING DIARY

Is your club included in this list? If not, send details, on a postcard please, including date of the next meeting.

ABERDEEN: 1st Tuesday in every month at 8 Deer Road, Woodside.
ACTON: Alternate Fridays at the King's Head Acton High Street. (Nov. 10.)
BARNSELEY: Every Tuesday at YMCA, Eldon Street.
BATH: Alternate Wednesdays at St. Mary's Church Hall, Grove Street. (Nov. 1.)
BATH (2): Alternate Wednesdays at 41, Herbert Road, Oldfield Park. (Nov. 1.)
BEDFORD: Final Tuesday in month at 131, London Road.
BELFAST: Every Thursday at 44, Dublin Road, Belfast 2.
BETHNAL GREEN: Every Friday at Shoreditch Tabernacle, Hackney Road, E.2.
BIRMINGHAM: Every Monday at the White Horse Cellars, Constitution Hill.
BIRMINGHAM (SOUTH): Alternate Mondays at Stinchley Institute, Hazlewell Street, Stinchley. (Nov. 6.)
BLACKBURN: 1st and 3rd Tuesdays at Blackburn YMCA.
BLACKPOOL: Every Wednesday at "Habonim," Lonsdale Road, off Lytham Road.
BOURNEMOUTH: Alternate Tuesdays at the Queen's Hotel, Queen's Road, Bournemouth West. (Nov. 14.)
BRIDGWATER: Every Tuesday at Evis' Radio Shop, West Street.
BRIGHTON: Every Wednesday at The Brunswick Arms, 38, Ditchling Road.
BRISTOL: Alternate Wednesdays at Redcliffe Church Hall, Guinea Street, Redcliffe. (Nov. 1.)
BRIXTON: Every Tuesday at The White Horse, 94, Brixton Hill, S.W.2.
BROMLEY: 2nd and 4th Thursdays at St. Mary's Church Hall, College Road.
CAMBRIDGE: Every Wednesday at the Mitre Hotel, Bridge Street.
CARDIFF: 1st and 3rd Tuesdays at 46, Caroline Street.
CATFORD: Every Thursday at the Black Horse, Rushey Green, Catford, S.E.6.
CHESTERFIELD: Every 3rd Monday at the Yellow Lion Inn, Saltergate. (Nov. 6.)
COTSWOLD: Fortnightly, alternating Monday and Thursday at Bayshill Hall, Royal Well Lane, Cheltenham. (Nov. 2.)
COVENTRY: Alternate Wednesdays at Holyhead Hotel, Coventry. (Nov. 8.)
CRAWLEY: 1st and 3rd Mondays at Southgate Community Hut.
DARTFORD: Every Thursday at 41, Winsor Drive.
DERBY: Alternate Wednesdays at Osmaston Park Hotel. (Nov. 8.)
DONCASTER: Alternate Thursdays at Lancaster House, Westlaine Gate. (Nov. 9.)
DUBLIN: 1st Monday at "Hardy House," 6, Capel Street.

DUNDEE: Alternate Mondays at The Salvation Army Hostel, 31, Ward Road. (Nov. 6.)
EASTBOURNE: Alternate Saturdays at Hartington Hall, Bolton Road. (Nov. 11.)
EDINBURGH: 1st and 3rd Fridays at 22, Forth Street, Edinburgh 1.
FRIERN BARNET: 2nd Friday at 7, Harmsworth Way, N.20, and 4th Thursday at 146, Friern Barnet Lane, N.20.
GLASGOW: Fortnightly, alternating Tuesday and Thursday at the Christian Institute. (Nov. 9.)
GRANTHAM: Weekly, 1st week in month Wednesday; 2nd, Monday; 3rd, Thursday; 4th, Friday at Grantham Technical College, Avenue Road.
GRIMSBY: 1st Monday at 21, Langton Drive, Nunthorpe, Grimsby.
HARROGATE: Every Wednesday at 4, Belford Road.
HARROW: 1st and 3rd Thursdays at St. George's Hall, Pinner View, North Harrow.
HASTINGS: Every Tuesday at 62, Vicarage Road.
HINCKLEY: Alternate Wednesdays at The Wharf Inn, Coventry Road. (Nov. 8.)
HOVE: Every Thursday at 44, Hogarth Road, Hove.
HUDDERSFIELD: 1st and 3rd Wednesday and last Monday at the Public Library, Ramsden Street.
HULL: Alternate Tuesdays at 281, Hessle Road. (Nov. 7.)
ILFORD: Every Tuesday at the RAFA Rooms, Cranbrook Road.
IPSWICH: Alternate Thursdays at the Art Gallery, High Street. (Nov. 9.)
JARROW: Alternate Mondays at Jarrow Central School. (Nov. 13.)
JERSEY: 1st and 3rd Mondays at "Santa Barbaba," Maufant, St. Saviour.
KEIGHLEY: Alternate Wednesdays at the Spencer Street School Rooms. (Nov. 1.)
KETTERING: 2nd and 4th Wednesdays at the Rising Sun, Silver Street.
KIDDERMINSTER: Alternate Wednesdays at the Town Hall. (Nov. 8.)
LEEDS: Alternate Fridays at 21, Wade Lane, Leeds 1. (Nov. 10.)
LEICESTER: Alternate Fridays at the Newark Girls' School, Imperial Avenue. (Nov. 3.)
LONDON: 2nd and 4th Thursdays at the Abbey Community Centre, Marsham Street, S.W.1.
LUTON: 2nd and 4th Tuesdays at Flowers Recreation Club, Park Street West, Luton.
MAIDSTONE: Every Thursday at the Ex-Services Club, King Street.
MANCHESTER: Every Saturday, 6 p.m., at 20, Naylor Street, Hulme, Manchester 15.
MIDDLESBROUGH: Every Wednesday and Friday at 130, Newport Road.

NORTH LONDON: Alternate Wednesdays at Bush Hill Park School, Main Avenue, Enfield. (Nov. 8.)
NORTHAMPTON: Tuesdays and Thursdays at 36, Spring Gardens.
NOTTINGHAM: Alternate Thursdays at the Co-operative Educational Centre, Heathcote Street. (Nov. 2.)
NORWICH: 4th Tuesday at "Lady Chamberlain Hall," 38a, St. Giles' Street.
PONTYPPOOL: Every Monday at the Hospitality Inn, Crumlin Road.
PLYMOUTH: Alternate Wednesdays at Virginia House, Plymouth. (Nov. 1.)
READING: Every Monday at Abbey Gateway.
REDDITCH: 4th Thursday at The White Hart Hotel, Headless Cross.
RUGBY: Alternate Thursdays at the Red Lion, Sheep Street. (Nov. 2.)
SHERNESS: Alternate Fridays at 136, High Street. (Nov. 10.)
SOUTHALL: Every Monday at Southall Community Centre.
SOUTHAMPTON: Alternate Thursdays at Southampton University. (Nov. 2.)
SOUTH DEVON: Alternate Wednesdays at the YMCA, Castle Circus, Torquay. (Oct. 25.)
SOUTH-WEST LONDON: Every Wednesday at Mayfield School, West Hill, S.W.15.
STAFFORD: Alternate Tuesdays at The Grapes, Bridge Street. (Nov. 14.)
STEVENAGE: 1st and 3rd Tuesdays at the Tenants' Meeting Room, Mrymead.
STOCKPORT: 1st Friday at the Unity Hall, Greek Street.
STOKE NEWINGTON: Every Wednesday at 53, Londesborough Road, N.16.
SWANSEA: Every Thursday at the YMCA Buildings, St. Helen's Road.
URMISTON: Alternate Thursdays at Davyhulme Scout Hut, Barton Road. (Nov. 9.)
WAKFIELD: Alternate Mondays at York Street Hotel. (Nov. 6.)
WALSALL: Every Wednesday at Bluecoats School, Springhill Road.
WALTHAMSTOW: Alternate Fridays at 22, Orford Road, E.17. (Nov. 10.)
WARWICK & LEAMINGTON: 1st and 3rd Wednesdays in Room 18 of the Royal Leamington Spa, Town Hall.
WEST HERTS: Fortnightly alternating at the Cookery Nook, High Street, Watford (Nov. 22) and Heath Park Hotel, Hemel Hempstead. (Nov. 8.)
WEST MIDDLESEX: 2nd Thursday at the Railway Hotel, Station Road, Hampton, and 4th Thursday at Dormers Wells Primary School, Dormers Wells Lane, Southall.
WEST WALES: 1st and 3rd Fridays at The Meeting House, New Street, Aberystwyth.
WEXMOUTH: Alternate Wednesdays at The Waverley Hotel, Abbotbury Road. (Nov. 1.)
WINCHESTER: Every Friday at 45a, St. Swithen's Street.
WINDSOR: Every Thursday at The Royal Adelaide Hotel.
WOOLWICH: Alternate Mondays at the North Kent Tavern, Spray Street, Woolwich. (Nov. 6.)
YORK: Every Thursday at 62, Micklegate.
Unless otherwise stated, meetings start between 7 and 8 p.m.

YOUR LOCAL DEALER

In this feature you can check your nearest dealer who is a hi-fi specialist giving expert attention to tape equipment.

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When writing to manufacturers for information about new products, please mention that you saw it in "Tape Recording Fortnightly."

Service Bureau

(Continued from page 21)

the indications are that erasure is incomplete.

This can be caused by several discrepancies, but it is always wise to check the obvious first, and that is cleanliness of face and correct pad pressure.

On this deck there are four separate pressure pads, each on its own pivot (see Fig. 2). The deck is a three-motor job, single track in both directions, with two pairs of heads ("Record playback" and "Erase," Upper and Lower track).

The offending pressure pad is the left-hand one, viewed in plan. Check by applying a little pressure with the finger while recording, then, if necessary, bend the lower section of the wishbone arm to compensate. In addition, see that the bracket is free to move on its pivot.

Checking the obvious first, as mentioned above, can solve many faults, apparently obscure, on these electro-mechanical devices. It is important to check that the tape is running true and level through the various stages of the transport mechanism before looking any deeper for "quality of reproduction" troubles. This means the level of the spools, guides, heads and pinch wheel must all be correct. The tape must come from between the flanges of the reservoir spool without rubbing, must run true between the steps of the guide pillars, without "riding," traverse the head gaps at the exact height (but more about this when we come to checking azimuth) and should receive the pinch wheel pressure vertically and evenly.

This leads to one final remark . . . B. T. O'B of Bristol 6 informs us that he had to "raise the right-hand guide pillar" of his Philips EL3541, because the tape was riding up against the step.

It is much more likely that the right hand spool was slightly high, causing the tape to ride upwards. This has been caused in the past by incorrect re-assembly after repair, and the addition of extra small washers beneath the friction disc. These PVC rings can be used to build up the turntable level to the required height.

Do not be tempted to make up the difference, or reduce the height, by adjustments beneath the spindle bearing, nor packing between the upper section of the turntable and the lower. Reasons for this will be more obvious when we consider clutch action, in a later article.

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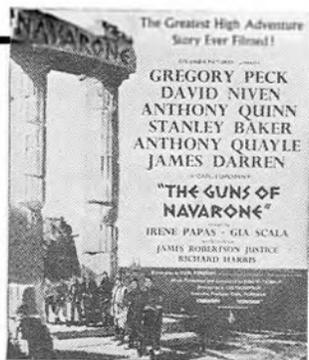
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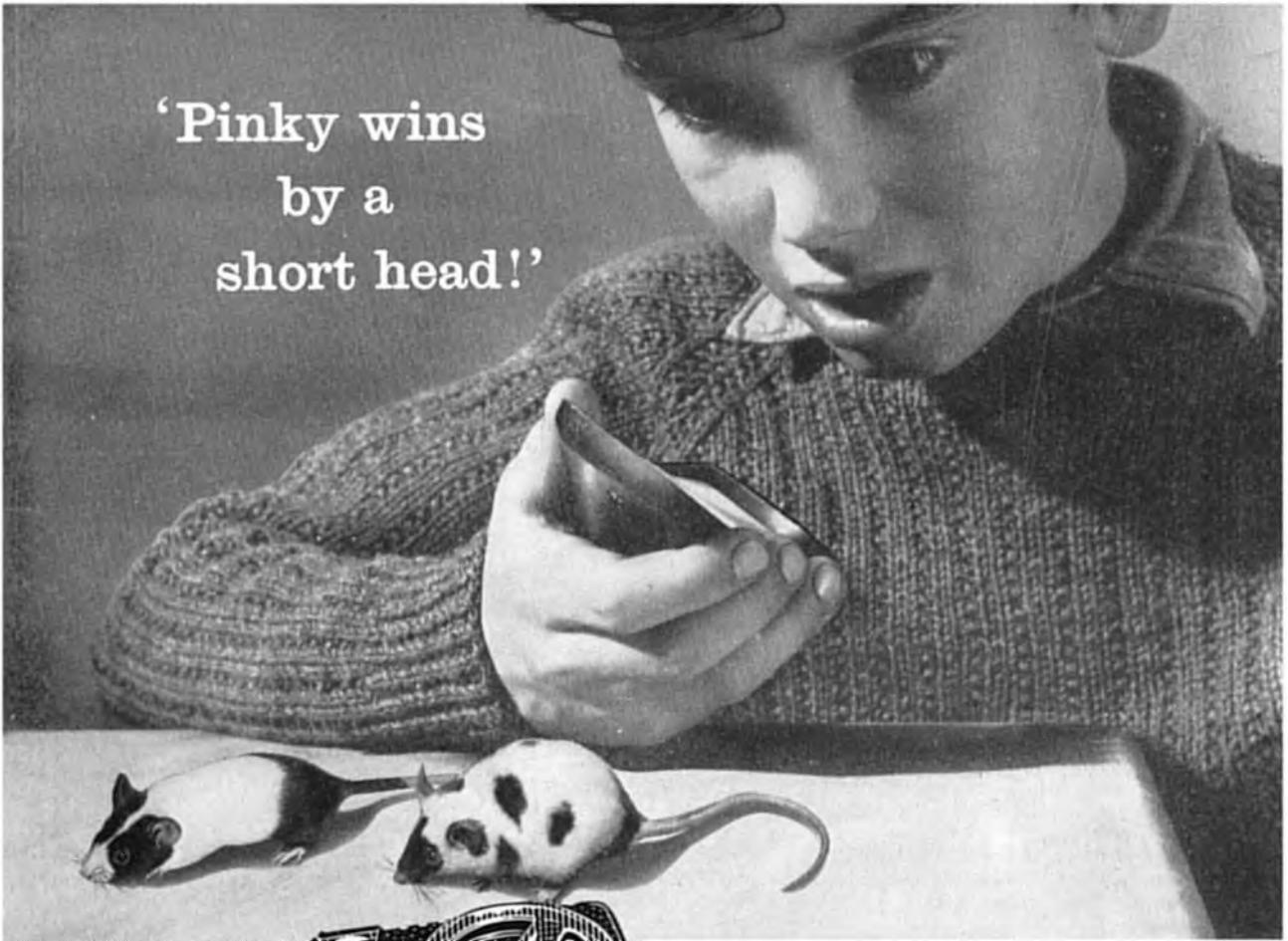
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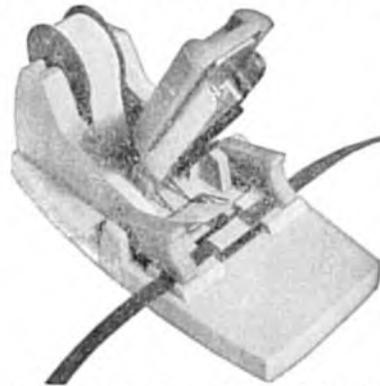
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TAPE
 RECORDING
 FORTNIGHTLY

Vol. 5 No. 23 15th November, 1961

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We take the view . . .

A DIGEST OF NEWS, COMMENT AND EDITORIAL OPINION

AMATEURS who are finding that it takes them a long time to acquire a full working knowledge of stereo techniques may be encouraged to hear of the experience of the BBC experts. They have just reported on their progress in an official publication (*Operational research on microphone and studio techniques in stereo-phony*, by D. E. L. Shorter, BBC Engineering Monograph No. 38, price 5s.).

And after three years work, they admit that there are still investigations to be made. Stage productions in the presence of an audience still present them with difficulties because of the restrictions on microphone placing. Transmission of outdoor events has been made difficult by wind noise on the microphones.

The report states that many possible alternative microphone combinations remain to be explored. In particular, a satisfactory method of using subsidiary microphones to place a small group of instruments in any desired part of the stage has still to be devised.

The BBC appears also to have had some studio problems. Many of the existing studios, it is stated, leave something to be desired for stereo musical programmes, but "acceptable" results

are possible given sufficient time to experiment beforehand.

On the whole, however, listeners who are looking forward to regular stereo broadcasting in this country will find a hopeful note about the prospects in this new publication.

Experience to date is sufficient to serve as "a basis for the detailed planning of future stereophonic studios, control equipment and programmes".

The European Broadcasting Union has not yet, of course, agreed upon a standard system for stereo transmissions, so that we cannot expect regular broadcasts here in the immediate future. But a recent conference in Stockholm of the different radio concerns allocated a large number of additional frequencies in Band II specifically for stereo broadcasts. This agreement will operate from September of next year.

Apparently the BBC is still not happy about any of the forms of "compatible" stereo systems using a single channel that have so far developed, for this report raises the possibility of an alternative approach. This would involve a fourth transmitter, at the present VHF stations, enabling transmission of the second stereo channel. This could be used in turn for Home, Light or Third programmes, according to which was transmitting material most suitable for stereo technique.

One advantage pointed out for this system is that the service area of the transmitters would remain as at present, whereas the compatible systems using a single transmitter for both stereo channels involve a severe contraction of the area served.

This latest BBC report is encouraging and appears to mark real progress towards the time when we have regular stereo broadcasts. It seems certain that that will be the day when stereo makes its real breakthrough in this country.

World Tape Pals

I HEAR news of negotiations to smooth the problems of international tapespondents. Rhona and John James, who are the UK representatives of World Tape Pals, report a meeting with the Director of the Spanish-speaking section of WTP, Senor Juan M. Handal, to tackle the problem of customs clearance on tapes.

Approaches are now being made to postal authorities in various countries to try to assure free passage for tape throughout the world. As Mr. and Mrs. James comment, some countries still look on a reel of tape as something sinister.

A postal conference in June, 1962, may provide the opportunity to have current practice re-examined and if nothing is settled then it is likely to be 1967 before the subject can be re-opened.

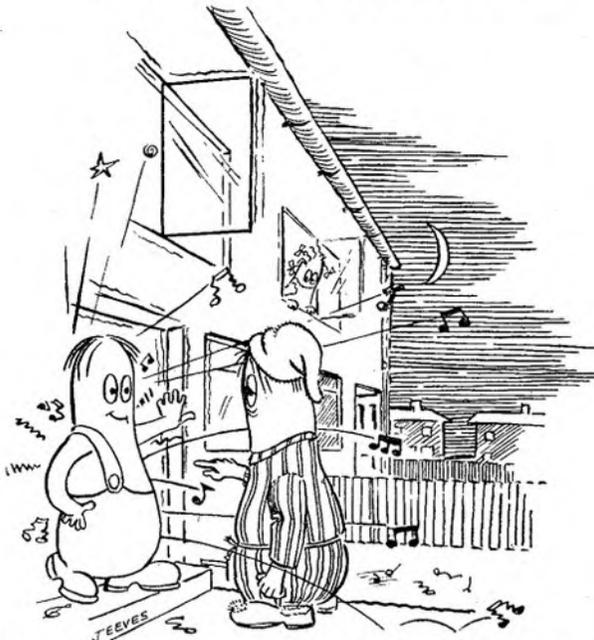
Enthusiasts who are concerned with this matter, therefore, are urged to write to Mr. and Mrs. James at 45, Boundary Road, Colliers Wood, London, S.W.19, if they have evidence to offer and representatives of other clubs may also like to establish contact.

Talking of tapespondence, I hear from Mrs. Phyllis Copinger that the club for French-speaking enthusiasts, Les Unions Mondiale des Voix Francais, is developing rapidly and now embraces tape recordists in such far-flung spots as Canada and Honolulu, as well, of course, as in Britain and France.

Gilbert Briggs

PRELIMINARY news of next year's Audio Festival in London indicates further expansion and interesting new developments. One important innovation will be demonstrations by Gilbert Briggs, who has a unique reputation in this respect. The concert demonstrations he had given in the past at the Royal Festival Hall and in New York at the Carnegie Hall are still talked about by all who were fortunate enough to hear them.

LAUGH WITH JEEVES



"No, we're not having a party. It's just a tape recording of the one you had last night."

BERLIN 1961



The British party seen near the Brandenburg Gate in Berlin—Mrs. Devereux, Mrs. Brown, Terry Devereux, Douglas Brown and Alan Stableford

THE TENTH INTERNATIONAL AMATEUR RECORDING CONTEST

IT was the Swiss tapes that made the big impact at the tenth International Amateur Recording Contest (CIMES) in Berlin last month. And it was the Technical Experiment section of the Contest that provided the most interesting evidence of advance in amateur recording technique.

The monaural Grand Prix winner was Herr Willi Baumann, of Steinach, Switzerland, a 43-year-old plumber who has been recording for nearly five years and whose photograph appears in this issue. I hope that readers will have heard his tape in the recent BBC "Sound" programme report on Berlin.

By the Editor

Sixty hours of work went into it, though the finished product plays for less than four minutes.

The significance of Herr Baumann's tape, it seems to me, is that it proves beyond argument that a skilled recording enthusiast can do with his tape recorder literally anything in the way of sound construction that he sets his mind to. In the early days of elec-

tronic music and musique concrete there were the inevitable suspicions that much of what we heard was little more than "doodling" with sound; that people were experimenting and producing interesting or dramatic effects, but that they were not using the medium in a disciplined way to produce pre-conceived effects.

Herr Baumann imposed upon himself a stern discipline. He recorded the note A on his oboe and then, using all the well-known tricks and techniques, he built up his sound patterns. He set out, however, to produce

(Continued on page 12)



The FICS Congress and the CIMES jury sessions were held in the West Berlin radio station and Telefunken arranged a simultaneous translation service in English, German and French, using a short-wave transmitter and headphones that enabled the delegates to move about the room without missing a word. Terry Devereux here suggests the ordeal of (left) one of the translators and (right) "the man who worked the switches."



SKETCHES By Devereux



Those who attended CICES had good opportunities to see something of Berlin and its current problems. The British delegation made a brief visit to the eastern sector of the city, beyond the Brandenburg Gate, which Terry Devereux has sketched on the left.

orthodox patterns of sound, so that it would be possible for the listener to judge the quality of his artificially-created montage against actual sounds heard directly.

His single note A on the oboe became, under his skilled hands, the sound of a motor-boat and a motor-cycle, of the three-tone horn of a Swiss post coach, of an air-raid siren, of heartbeats and of a fireworks display.

The whole thing was done using three recorders.

I felt as I did after hearing Norman Paul's documentary, *The Rest is Silence*, which was the Grand Prix winner a year ago, that here was a tape which, in its class, set a standard which it is going to be very difficult indeed for any amateur to improve upon.

The Grand Prix for a stereo tape was also won by a Swiss competitor, M. Jean Taverney, of Geneva, with a recording of the tune *Ramona*. Here again there was an element of technical experiment; this was not a straight recording, but the result of re-recording and mixing techniques. The stereo, needless to say, was first-class.

There were only seven stereo entries in the Contest, but this matches the British experience that stereo recording is slow to get going, but is growing steadily.

Switzerland triumphed in two other of the Contest's seven classes: Documentaries and Actuality.

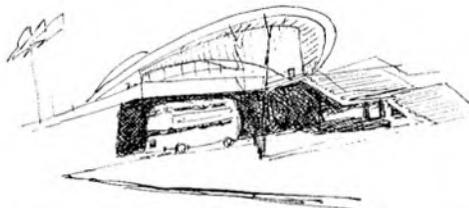
In the first of these, M. Francis Jeannin, of La Chaux-de-Fonds, entered a recording of green parrots talking. He had secured 40 hours of recordings of sixteen different parrots and made a clever selection, linking their efforts together with a witty narrative. It made a most unusual tape feature.

The Actuality winner was Herr Gerber Heinrich of Zurich, with a straightforward (but highly compe-

tent) recording of a Sardinian performing with an ancient musical instrument from his island. This is the launeddas, claimed to date back more than 3,000 years, and the man we heard playing it was stated to be one of only two who are still capable of doing so.

Not surprisingly, in view of these successes, Switzerland easily walked off with the prize for the best national selection of tapes. It was an impressive come-back for the Swiss enthusiasts, for I recall that 1960 was an "off" year for them.

Those tapes judged Grand Prix winners were extracted from the



Terry Devereux's impression of the Congress Hall, a modern building of unique architectural style, at which the Ring der Tonbandfreunde entertained the visitors at dinner

classes in which they were entered, so that the runners-up became class prize-winners.

The Compositions class was won by Mr. J. M. van den Busken, of Amstelveen, with a dramatic piece narrating the story of an exile Pole deciding to leave Amsterdam to return to his family in Poland. The story took him as far as Berlin on this journey, and to a great emotional and intellectual climax.

This was delicate material to handle in a tape to be judged by an international jury sitting in Berlin, but Mr. van den Busken did it skilfully as well as with technical ability.

It was in this Compositions class that Britain's "Tape of the year," Mr. Terry Devereux's *Just by Accident* was placed second.

In the Music or Speech class, a French competitor, M. Jacques Talandier, of Paris, came first with a four-minute recording of Polynesian

Songs and Rhythms, a high-quality tape that owed much to the opportunity to visit Tahiti—with high-quality equipment.

In the Technical Experiment category, Herr Baumann's tape having been removed, first prize was awarded to Herr Siegfried Meyer zu Hoberge, of Herdecke, for a piece entitled *Boogie in Playback*, built up from recordings of a guitar, a xylophon and his own voice.

In the Schools Class, as reported in our last issue, the British tape, *Life in 1801*, took the premier award. There were only two other entries—a disappointing total and it seems that schools

recording is not developing as widely or as rapidly on the Continent as in Britain.

Finally, in the stereo section, M. Taverney's tape having been taken out, first prize went to M. Michel Hubin, of Dinant, France, for a recording of an "evening chant" by a blind choir at Woluwe.

What of the British tapes that did not win prizes?

Mr. Richard A. Margoschis' documentary tape, *The Battle of the Brook*, was placed fifth of the eight entries in the class.

The amusing *PUM 31* produced by The Mutleyphonic Workshop group, was fourth in the Compositions class, out of six entries.

Mr. Albert Pengelly's *Final Curtain* was eighth out of nine entries in the Music/Speech category.

Miss A. M. Goodwin's *Blackbird with chaffinch, in a storm* was placed fourth of the four Actuality tapes.



CIMES in Pictures

Top Left: Fredy Weber, president of FICS and a professional radio reporter in Switzerland, is seen tape-recording an interview with a West Berliner during a visit to the wall dividing the city

Above: Willi Baumann, of Switzerland, seen with the equipment with which he made the tape that won the Grand Prix for monaural entries

Left: The international jury in session. In this photograph members of the Swiss, French, Belgian and Danish delegation can be seen

Clearly, Britain has slipped a little this year, compared with our successes in the last two Contests. This should be a stimulus to increased effort in the expanded 1962 Contest, details of which will appear in our first issue in the New Year.

The judging took place this year at the studios of the West Berlin radio station, Sender Freies Berlin, and its Director presided over the jury sessions. In collaboration with the German affiliate to the International Federation, the Ring der Tonbandfreunde, excellent arrangements were made. Herr Wilhelm Gluckert, who carried the main weight of responsibility, did a magnificent job.

An interesting and enjoyable programme between the FICS Congress and the CIMES sessions included a tour of the city, a reception by a representative of West Berlin at the Town Hall (where the prizes were presented), a dinner given by Philips of Germany at the Hotel Berlin, a tour of the West Berlin factories of Teledec and Telefunken, including lunch, a luncheon as guests of the radio station, a luncheon in the Berlin Industrial

Exhibition restaurant and a dinner at the Congress Hall given by the Ring der Tonbandfreunde, and a last-night informal get-together at a restaurant on the Kurfurstendam — Berlin's Piccadilly Circus.

Next year we shall gather at Strasbourg, at the new French radio station there. There are expectations that by then new affiliates will have joined the International Federation and the movement will have advanced.

CONTEST REPORT ON TAPE

"TAPE RECORDING FORTNIGHTLY" IS PRODUCING A SPECIAL FEATURE TAPE CONTAINING ALL THE WINNING ENTRIES IN THE BRITISH AND INTERNATIONAL CONTESTS OF 1961, TOGETHER WITH JUDGES' COMMENTS AND AN INFORMATIVE LINKING NARRATIVE

Full information will be printed shortly

This Christmas...

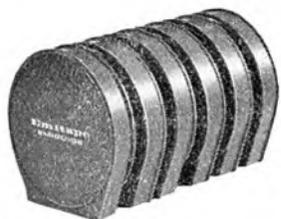


give
the Browns
Emitape



Then the Browns can capture all the fun of Christmas on Emitape. They'll want to invite their friends round to listen to this, so you must give them another reel of Emitape to record their friends' reactions to the Brown Christmas (know anyone called White?).

Cheerfully wrapped for Christmas, Emitape comes in four reel sizes. Fits any stocking, looks good on the best trees.



And, for the Greens, the new Emiguides

When it comes to getting the quality right, Mr. Green is well named. His Achilles' heel is well covered by one of the Emiguides—John Borwick's six instructional tapes. The other five Emiguides give you the right of way through the rest of the tape-recording maze. They're available as a set or separately to all sound-wise Santas for 8/6 each.



Emitape



EMITAPE DIVISION
E.M.I. SALES AND SERVICE LTD
HAYES, MIDDLESEX



And a present under £2 for Mr. Black

If Mr. Black asks you for three reels of leader tape, a reel of jointing tape, a reel of metallic stop foil, an Emitape jointing block and a pair of cutters, that's just his delicate and oblique way of asking for the Emitape Accessory Kit. 37/6.

TAPE IN THE SCHOOLS

GEOFFREY HODSON

Documentary tape by London schoolchildren

edits the latest news
— and comments

A BISHOP, a star television announcer, and the local newspaper's chief reporter were some of the celebrities I heard recently in a recorded documentary on a London suburb. It wasn't a BBC recording either, but a production by a Junior Mixed School.

The whole programme had been put together by the children under the guidance of their class teacher. They had looked up their local history, and a couple of children had also taken a tape recorder along to the home of the local historian to add to their facts.

Commentators had described the local high street and a local beauty spot. The class had investigated the local dairy, a local industry, the swimming baths, and a police sergeant.

The chief reporter had been a tremendous help, and the television an-

nouncer taught them a lot about microphone behaviour with his own twenty-minute performance in the school hall.

By the time the bishop walked in the children had met so many people they knew exactly how to behave, and they took him in their stride asking most intelligent questions.

The resultant tape was far too long for continuous listening; at least many of the individual items were too long for a properly balanced documentary programme, but the links between items were excellent.

What were they to do?

Well, in the first place they had already satisfied me educationally. In thinking about the project, preparing it, and doing it, they had accomplished something of great value. Simply learning how to meet adults and talk to them—taking an intel-

ligent interest in the world around them—organising facts: these are no mean feats.

The fact that they were tape recording was quite incidental. The machine helped to focus the project and give it impetus. True, it was pleasant to hear the recordings afterwards to reinforce their experience and knowledge, but the main work had been accomplished before this.

* * *

Next time they do a project like this, they might think in terms of shaping their programme a bit more. In this case they could have produced a weekly item right through the term called "This is Your Town". But a finished documentary, as such, could only be produced by editing. The mechanics of this would have to be done by the teacher outside the classroom, but the process of selection, timing and balance could have been done as a class activity.

But I hope they continue as they have begun—with the tape recorder as their servant, not master.

QUOTE OF THE MONTH

Poll-parrot Memory unwinds her spool

Walter de la Mare

SCHOOL TAPE CLUB

Further news of *The Microphone Society, Moseley Hall Grammar School, Cheadle, Cheshire, mentioned in June 28 issue.*

Officers for 1961-62 will be: Secretary, Struan Rodger (who broadcasts in BBC Children's Hour); Junior Treasurer, David Sands; Technical Organiser, Michael Ellis; Play Secretary, Robin Houston; Senior Technical Adviser, Andrew White.

Membership is restricted to 30. Andrew White is in the Sixth Form. He built the Society's mixing unit, and he is keenly interested in all aspects of radio, and at present he wishes to make his career in electronics research.

The Society meets twice weekly: one evening is mainly technical, one mainly for dramatic production.

Projected activities are: (1) a record request programme to be transmitted by line to the Old People's Home immediately adjacent to the school; (2) an Outside Recording Unit; (3) "Face to Face"—interviews with members of staff; (4) a "Readings for the Blind"



Left: Recording 'plane arrival announcements at Manchester Airport for a Schools Tape Club production.

section, under the direction of another sixth-former, Andrew Ginger, whose interest is medicine.

The Society's first full-length drama production, a science-thriller called "Transit" (see photograph) is in the editing stage. Perhaps significantly, Studio Manager Michael Ellis comments: "If you, too, want to follow in our footsteps, let me give you this advice: do not be too ambitious. Don't cram your first play with complicated music and effects, or you may find yourself in a jam."

But he adds: "Nevertheless, our members are very excited about hearing the finished tape, and I hope you will give drama productions a trial, as it is very rewarding to have done a play and to be able to listen to it."

The tape work has moved into the classroom in two ways. Form 2A were asked to write free criticisms of the dramatised poetry recordings referred to in the June 28 issue; and 4 Alpha Arts are working on the theme "Twilight"—a tape of natural sounds, voices and music.

* * *

STAFF ROOM NEWS

Peter Groves has been appointed Head of English at the new Earlesfield C.E. Secondary School in Grantham. He was in charge of the Lancastrian Broadcasting Club, at the Lancastrian School in Chichester, but there is not even a tape recorder in his new school—yet.

WHAT is "field" recording? Who does it, and why? Can I do it?

In the answers to these questions lie tales of adventure and excitement to stir the most lethargic spirit and to thrill the most unimaginative heart. Your "field" may be the local High Street on a Saturday afternoon or the drowsy quiet of a village Sunday with its church bells across the meadow. It might be the windswept desolation of a Norfolk marsh or the mechanical, clanging jollity of a bustling fair-ground. Whatever the field the problem is the same—to record living sounds that will recreate for us the mood, the atmosphere and the feeling of the place or event.

And what an understatement of the problem that is! Every recording situation calls for variations in technique to suit the particular circumstances involved. There is no such thing as perfection in the result; one does the best one can and learns what mistakes not to make next time. Always one can strive for something better. The last word has never been said and there is always more left to achieve than has ever been accomplished.

Field recording is the supreme challenge to the individual where both amateur and professional stand equal chances of success. Perhaps the amateur has the cards stacked in his favour because results will reflect not the cost or complexity of the equipment but the enthusiasm and imagination of the recording engineer.

To the question, "Can I do it?" only you yourself can provide the answer.

In this series of articles I have undertaken to carry out specific recordings as requested by readers and then to describe just how the job was tackled and what results were achieved. This I try to do very honestly, in fact I am inclined to talk far more about the failures and the errors than the successes because the object is not only to interest but also to help by indicating at least some of the many difficulties involved.

One recent request from a reader was to take a recording in a coal mine! Could you do it? More important from my point of view was, could I do it! The more I thought about the idea the more feasible it appeared to be until I met Bruce.

"Too easy!" said Bruce. "A coal mine is a commercial excavation where men work under fairly reasonable conditions. Why don't you record in a cave—a real cave that's still being

ANOTHER SPECIAL ASSIGNMENT, BY

DENYS G. KILLICK

INTO THE DEPTHS

explored and where you'll probably be the first to ever take a tape recorder?"

With apologies to the National Coal Board and the reader who originally requested the recording my coal mine became a cave from that moment on.

I had never been down a cave before, apart from the kind of thing where one pays at the gate and is conducted sedately by a guide through a series of brightly lit chambers. That, I was told, is definitely not caving. I now know that spelaeologists, as the caving enthusiasts are called, are the toughest race on earth risking life and limb as they fight their way through unknown subterranean passages.

I was warned that conditions would be the worst I had ever met, and I should have to cope with mud, water and cold. The equipment would have to be capable of being dragged through streams, lowered down rocky canyons and pushed through impossible crevices.

The party was to comprise Bruce, his friend Clive, who turned out to be a magnificent fellow and upon whom ultimately the success of the entire expedition was to depend, and myself. The other two were the caving experts and to them was left the problem of equipping me with overalls, climbing boots, miners' helmet and carbide lamp. My concern was to devise some method of packing the recorder in such a way that it would both survive the perils of the journey and also be available for use underground.

After much thought I finally got hold of an ex-government shell carrier, a metal box some two feet long with a hinged lid and a handle at each end. This I lined with really thick foam rubber, not only along the bottom but up the sides and across the top. Into this padded nest I packed a Fi-Cord recorder, wrapped firstly in clean, white cloth and then in a separate sheet of thinner foam rubber.

Also into the box, similarly wrapped, went a Grampian DP4 microphone, a fairly short microphone lead and a supply of spare batteries and tapes.

The remaining space was taken up with a camera, miniature flash gun and bulbs. This assortment of odds and ends was packed in such a way that they were jammed tightly into place; more foam rubber and clean cloths were pressed on the top before the lid was clipped tightly shut.

The whole outfit must have weighed over twenty pounds, but the greatest weight was the box itself and that had to be robust enough to withstand the roughest treatment. Finally tying lengths of stout rope to each handle muttering "Fools rush in . . ." to myself, I announced that my preparations were complete and the sooner we were off the better.

The cave of Agen Allwedd lies beneath the mountain ranges of Breconshire in South Wales. It rejoices at present in the distinction of being one of the longest cave systems in the world, certainly the longest in Great Britain. When fully explored it might even turn out to be *the* longest in the world.

Having left London early one Saturday morning we arrived at the cavers' hut on the mountain-side about two o'clock in the afternoon. A quick snack and we slipped into our sleeping bags. Fortunately I can sleep under any circumstances and at any time, for our programme called on us to spend all night in the cave. After another short rest on Sunday morning I should have to drive back to London, so I was asleep in no time.

From the moment I awoke it was as if I were in another world. I dressed in a pair of ancient trousers and an open-necked shirt. One woollen pull-over went under the shirt and two more over the top. My boots, heavy with climbing nails, felt clumsy and uncomfortable.

INTO THE DEPTHS

Our food for the trip consisted of sandwiches and bars of fruit and nut chocolate. This had to be prepared and then carefully wrapped in polythene bags secured with elastic bands. In the same way we packed matches, cigarettes and a watch. All other valuables were to be left behind. I tried on my helmet. It felt as strange and uncomfortable as the boots.

The entrance to the cave was 15 minutes' walk from the hut along a mountain track. By the time we reached it both my head and my feet ached and Clive was already carrying the all-important ammunition box containing the recorder.

We stopped in front of a metal door in the hillside. It was not a door one could walk through for it measured no more than thirty inches square. As Clive produced a key and unlocked it I thought of the Pied Piper of Hamlyn and the children imprisoned in the mountain. . . .

The lamps on our helmets were lit, and for the first time in my life I heard the hiss of the acetylene and the bell-like tinkle as the safety chain swung against the metal reflector. Later my stomach was to heave from the smell of the spent carbide, but that was to come much later.

Bruce went in first to show me how easy it was. He simply lay on the ground with his head in the opening, wriggled noisily until the soles of his boots disappeared in the gloom. He shouted for the rope which we pushed in to him, and then as he wriggled forward he dragged our precious ammunition box behind him. I followed, my nose six inches from the box and my heart in my boots.

I was pleasantly surprised to find that this narrow tunnel through which we were crawling was quite short; it opened up into a chamber where one could stand up and walk normally. But that, too, was quite short, for it led into a high, vaulted passageway where the walls were in places no more than six or seven inches apart and where the floor was so narrow that progress was only possible by climbing from ledge to ledge half-way up the walls.



I began to sweat profusely. The box, dangling on its rope, was passed from hand to hand as it bashed and crashed against the dripping rock faces. I had ceased to care.

Suddenly we stopped, faced by a tiny hole at the floor of the passage. Through it bubbled an underground stream.

"That's where we go next," I was told, and Bruce threw himself down full-length on to the bed of the stream and began to work his way through the hole. Once again I threw him the rope and he dragged the box behind him. As I followed I could see in the light of my lamp the water swirling around it as it struck rock after rock in the stream bed. But the tunnel was so small that it was all I could do to keep my head out of the water for long enough to breathe. It was impossible to crawl—there wasn't room enough to bend the knees; one wriggled from the elbows and somehow inched forward painfully a fraction at a time.

We had decided that on arrival at the other side of this "wet flattener" as it's expressively called I would start recording. One of the most important items of my personal equipment was a pair of stout industrial gloves. These I had been wearing all the time in the cave, and now when I took them off at least my hands were reasonably clean.

Unfastening our box I found to my great relief that the Fi-Cord was completely unharmed. The first tape was already laced up on the deck, so it was only a matter of connecting the microphone and starting to record. This I did, first of all explaining where we were and introducing Bruce who was at my side. We then called out to Clive and recorded the sounds of his progress along the stream bed as he made his way towards us.

By any standards these were good recordings, certainly they were original. I recorded some conversation between the three of us and a discussion of the hazards to come. On playing back the tape I note that we remarked on the fact that it had taken us 25 minutes to get less than two hundred feet inside the cave!

The main chamber, a gigantic cavern of cathedral-like proportions, was 1,500 gruelling feet away. Let me say only that we arrived.

The massive boulder supported by no more than a sixteenth of an inch of crumbling sandstone did NOT fall at the instant my prostrate body squirmed its way beneath it; the frail wire supporting countless tons of loose rocks did NOT snap as I climbed hand over hand up a dangling iron chain through a vertical opening the cavers are pleased to call a "chimney."

(Continued on page 34)

A precision job? Yes—a cut may have to
be accurate to a tenth of an inch or less.
But that's not too difficult if you know
what you're looking for.

EDITING AT THE EXACT POINT

Final article in a series by ALEC NISBETT

IN a "sentence" pause there are two places to cut at. One is after the word and any reverberation has finished and before the breath; the other is after the breath and before the next word. For most purposes it's best, and safer, to choose the latter. You retain the full natural pause which the speaker allowed, and you can cut as close as you like to the new word (which helps to mask any slight change in "atmosphere").

Cutting between the words of a sentence can be a great deal more difficult, however, as words sound very different when they are wound through slowly by hand.

But certain characteristics of speech can soon be recognised: for example, the "s" and "f" sounds. And the explosive consonants "p" and "b," as well as the stopped "k," "t," "g" and "d" are easy to pick out (though not always as easy to distinguish from each other) because of the slight break in sound on the tape which precedes them. Often enough in a spoken sentence the words may be run together to such an extent that the only break may be before such a letter—perhaps in the middle of a word.

Don't assume that because a letter *should* be there it *will* be. Complete vowel sounds may on investigation prove to be absent. The personal pronoun "I" is typical of many such sounds. In the sentence "Well I'm going now" it may be missing completely. If you try to cut off the "well" you may even find the "m" was a vocal illusion, no more than a slight distortion of the end of the "I" sound.

Similarly in "it's a hot day," spoken quickly, there is probably no complete word "hot." Nor will it be possible to isolate the word "hot tin roof," as the first "t" will be missing and the one that is there will be joined on to the following vowel sound in such a way as to have no separate existence.

Before going in for a lot of fine editing it's worth doing a little research into what the beginnings and ends of words sound like at slow speed, and where words blend into each other and where they don't.

In cutting between words, cut as late in any pause as possible. When searching for the right pause on a tape don't be misled by the vocal stop which often precedes the letter "t" and similar consonants. You can often cut *in* to a continuous edited sound, provided that the cut is not at an angle, but you can never cut *out* of one, unless you join straight on to a sound of equal value

(one for which the mouth would have to be formed to the same shape).

It is very difficult to insert missing "a's" and "the's"; these are nearly always closely tied with the following word, so that unless the speaker is enunciating each word clearly and separately it is necessary to take this in combination with the sound which follows.

The letter "s," however, is relatively easy to insert or (sometimes) remove. I quote these few cases as examples of the verbal surgery which the tape editor sometimes finds himself involved in, when trying to make a difficult transition work.

WHY CUT AT AN ANGLE?

It is always recommended that tape should be cut at an angle. The figure of 45 degrees is often mentioned as being suitable, and most editing blocks make provision for such a cut (though a 90-degree cut is sometimes offered as an additional facility, without actively being recommended for use).

What is so magical about 45 degrees? Is the 45-degree cut superior to those at other angles?

The simple answer to this is that provided the tape is actually cut at a reasonably sharp angle and not straight across, the exact angle is not vital. In any case a 45-degree cut means something different for each different speed or width of track—for instance, half-track (which is in fact about 40 per cent of the full width of the tape) will fade up two and a half times as fast as full-track, and quarter-track (using 15 per cent of the full track width) nearly seven times as fast; although nominally the sharpness of fade-in is about the same for 15 ips full-track as it is for 7½ ips half-track or 3¾ ips quarter-track.

But a 90-degree cut has the disadvantage that any sound on the tape, even atmosphere, at the point of cut starts absolutely "square"; and any sound which suddenly starts at full volume, *sounds* as if it starts with a click. An excellent example of this is the Greenwich time signal—the "pips." And indeed the very word "pip" suggests the effect I mean. To demonstrate this for yourself record a pure tone (which contains one frequency, and one alone) and cut in a short length of spacer at 90 degrees. Then try the same thing with angled cuts.

And here I'd like to take issue with the American studio writer, Mr. E. T. Canby. My experience is that if such angled cuts are used it is often possible to cut into liquid sounds *without* producing an explosive start (for example, an unwanted "p" or "b" sound).

Nevertheless, the angled cut, with its quick fade-in effect, might in many cases be improved still further by lengthening the fade-in—by taking the cut further along the tape. But it may not be possible to mark a longer cut so accurately; and in any case

it simply would not fit into a very small gap between two words without cutting into wanted or unwanted sounds on either side. We would soon find ourselves having to choose between various angles of cut, some of which would be difficult to handle.

Fades may be long and complex; they should certainly not be carried out mechanically, as with the standardised cut of an editing block. And so it is convenient to have a standard angle at which cuts are always made, and to leave fades to be worked out according to the peculiarities of the material of the programme. In any case, fades and mixes may vary in length from a fraction of an inch to several feet of tape. And just as a diagonal cut is nearly always preferable to a 90-degree cut when there is any atmosphere present on the tape; so, when there is any major transition from one type of background to another, or to studio quality, is a fade or mix preferable.

There are exceptions to both of these rules. There are cases when a 90-degree cut can be used for a certain type of special effect. For instance, I had a recording of a circular saw, but there was no effective "bite," as it ripped into a tree trunk. A 90-degree cut to a point just after the start of the effect gave exactly the sound I wanted: it was crisp but not overdramatic. Nevertheless, this is a device of limited usefulness. For nipping out clicks, etc., the square cut does, however, come into its own, for this is the only way to get rid of a fault which lasts only a tiny fraction of a second without taking any appreciable part of the wanted material.

Some people use 90-degree cuts for attaching leader and trailer tapes: but there is no real virtue in this tidiness. Nor is there any significant difference in physical strength between straight and angled cuts.

As regards the most suitable recorded tape speed for editing, I would plump for 7½ ips full-track. This I would certainly consider to be the optimum when using cine spools (those normally used on amateur and "portable" equipment) as lower speeds give lower quality and less precision in marking, whereas higher speeds make it more difficult to pull the tape over the heads by manually rotating the spools against the clutch or brakes. (But when using professional equipment with the larger NAB spools—these are the ones which are 10½ inches in diameter and have a much larger hub radius—15 ips is a convenient recording speed for editing.)

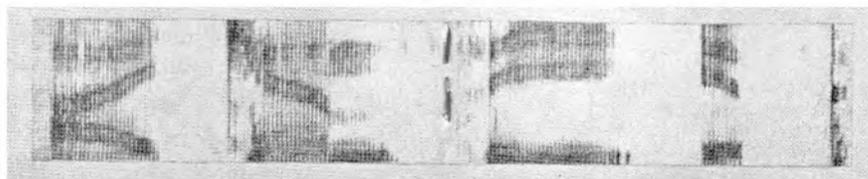
DOCUMENTATION

The editing session is one place where the importance of clear documentation shows itself: not merely the type of tape used and speed and track, but also detailed information (in footage or times) as to where each section can be located.

Since you can't edit if you have material

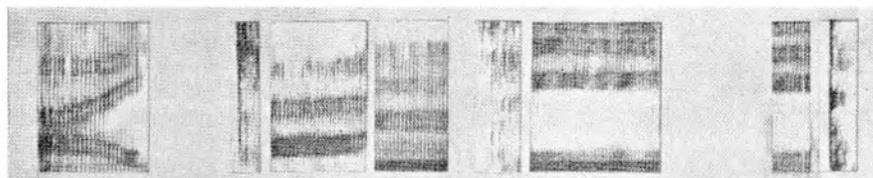
EDITING AT THE EXACT POINT

Final article in a series by ALEC NISBETT

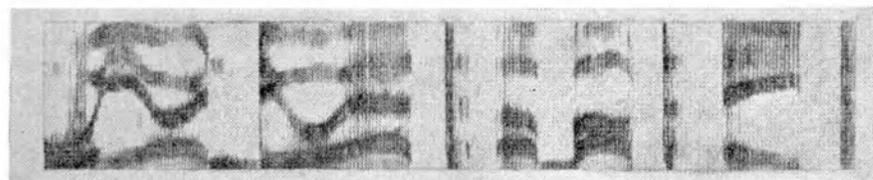


I can see it
ai kæn si it

The human voice analysed (0-3,500 cps) to show the formants (resonance, due to nose, mouth and throat cavities) which characterise speech. In the upper display pure sounds are "edited" together—and it's pretty clear that the results are not the same as in the (still carefully spoken) version below. This should also make it obvious why certain edits can't be made to work. An instantaneous change of shape of the vocal cavities not only is impossible, it sounds it, too



I c a n s ee i t
ai k æ n s i I t



We are due at about eight

This carefully enunciated sentence is full of vocal stops—but note that they mostly come in the middle of words: Wea/dua/t/a/bou/t/ei/t. This can aid editing—or confuse it



They say his voice is good

Note how the changing shape of vocal cavities shifts the formants about in this flowing sentence. It's possible to cut in to after the start, but not to cut off before the last word. And very difficult to match for internal cuts

Illustrations from Potter, Kopp & Green, "Visible Speech." Copyright 1947, D. Van Nostrand Co. Inc., Princetown, NJ, USA

of importance on the other track or tracks it is best to do all original work single-track, and to use other tracks only for copying purposes, or rehearsal, or for other relatively unimportant material. And, of course, if the tape is entered for a competition all other tracks should be wiped. For professional work in mono only full-track recordings are used.

Each recordist will decide for himself how many notes he will make on each recording and editing session—but here are a few suggestions.

Name and address of owner and recordist.

Reference number of recording.

Reel number (where more than one used) e.g., "reel 2 or 5."

Programme Title.

Subtitle (name of interviewee or title of music, etc.).

Overall duration, with cues in and out.

Date of recording.

Place of recording.

Technical notes:—

(a) Type of tape and reel size.

(b) Tape speed.

(c) Which track used (if more than one) and position at which material is to be found (if not at start).

(d) Details of any technical imperfection or fault in balance, etc.

Full details of contents with durations; e.g.—

(a) Addresses, etc., of interviewees.

(b) Music information: composer, writer, performer, copyright owner, record numbers, etc.

(c) Details of effects.

(d) Cross-references to material copied from other recordings.

Timed script or cue-sheet, with editing notes; and details of the current state of the editing process (amend other details in documentation when editing affects these).

Any extra information related to the programme, e.g., source of material used, contacts, etc.; and material which may be needed for publicity etc.

These are some of the details which in BBC practice are incorporated into recording reports (one for each recording, editing or copying session), "programme as recorded" details, or other records.

A very useful BBC procedure which might well be adopted by amateurs is the practice of writing a summary of the programme details both on the leader of the tape itself, and on the spine of the box in which it is kept. The contents of the tape can then be identified immediately whether the tape is lying loose, or stacked away on a shelf.

Most original speaker produced in last ten years

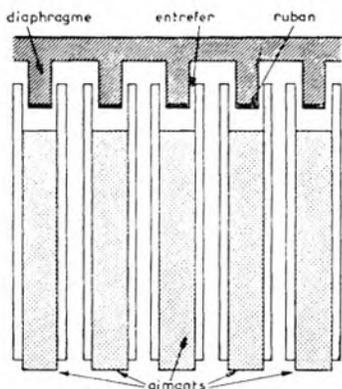


FIG. 1. Diagrammatic section through a portion of an Orthophase cell, perpendicular to the direction of the grooves made in the thickness of the expanded polystyrene diaphragm

WITHOUT a doubt, the most interesting exhibit at the Fourth International Salon of Electronic Components held in Paris earlier this year (the French Audio Fair), was the presentation on the Etablissements Ge-Go stand of prototypes of a new dynamic loudspeaker, christened the "Orthophase."

This speaker is probably the most original production in this field within the last ten years, and not least impressive among its many interesting features, is its amazing frequency response of 40-25,000 cps, with remarkably true wave form.

This speaker was designed by two French acoustics engineers, M. Poutot and M. Georges Gogny, originally as a professional reference apparatus for

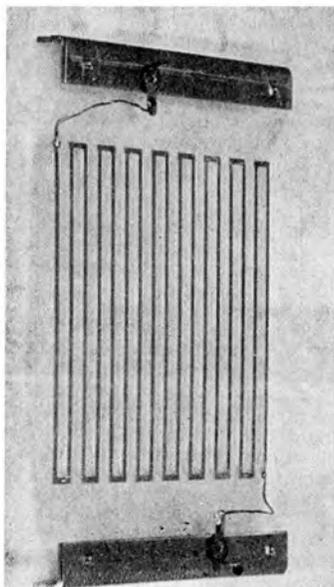
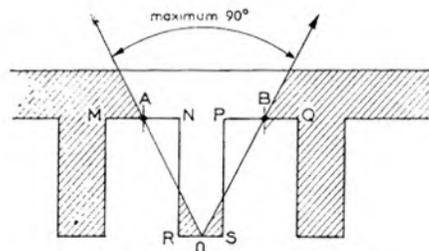


FIG. 2 (left): View of a complete Orthophase cell diaphragm, after the attachment of the aluminium ribbon and the bands of polyurethane constituting the flexible suspension. The diaphragm, measuring 10 x 10 cms., and the joints between consecutive ribbons are attached to the polyurethane so as to keep the greatest length for the motive portion

FIG. 4 (right): Assembly of the magnetic circuit of an Orthophase cell, seen from the front, fixed into the duralumin frame for the mounting of the diaphragm and side by side assembly of several cells. The parallel gaps between magnetic circuits may clearly be seen

FIG. 3. Partial section through the Orthophase diaphragm showing the resemblance to an assembly of parallel T-girders (A and B are respectively the mid-points of the segments MN and PQ, O being the centre of RS)



very high quality reproduction and intended for broadcasting studio or recording studio sound engineers, and therefore cost was no object. However, Hi-Fi amateurs will also find it useful, if their pocket is sufficiently deep.

A perfect speaker must in no way colour the reproduction of the sound which it delivers. Now, a conventional conical speaker diaphragm cannot operate like the theoretically necessary piston, except for a number of fairly low frequencies, the upper limit of which depends on its dimensions and the physical properties of the material constituting it.

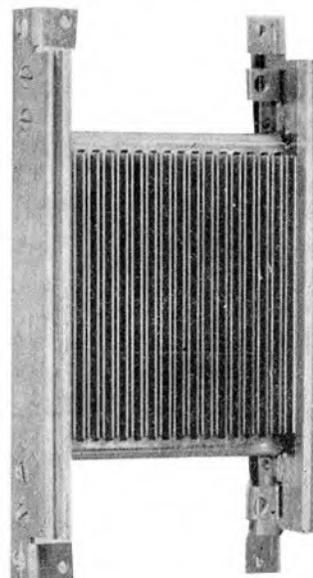
Beyond this limit, the conical diaphragm stops vibrating as a whole and produces complex ranges of partial and multiple resonance oscillations: the amplitudes to be transmitted are no longer respected and parasitic frequencies make their appearance.

Several skilled acoustics engineers have worked on this problem, including McLachlan, Rice, Kellogg, Gamzon and Stanley Kelly, but, despite their achieve-

ments, they have always been conscious of, and have striven for, further improvement.

The "Orthophase" is made up of elementary cells with a diaphragm of expanded polystyrene measuring 10 x 10 cms, and is actuated by seventeen parallel moving ribbons, thus representing an extension of conventional ribbon speakers, and it may reasonably be said to be a development of McLachlan's "Blatthaller".

The original "Blatthaller" and its recent Gamzon or Kelly versions, use a flexible diaphragm (a thin sheet of



Two French engineers designed the Orthophase, which is fully described in this article. It claims a frequency response of 40 to 25,000 cps. This condensed translation of a description by R. Lafaurie which first appeared in "Revue du Son" has been prepared by H. E. Saunders, Secretary of the West Middlesex Tape Club.

aluminium, a foil of Melinex or similar material or Mylar), while the "Orthophase" makes use of a practically rigid (more or less below 25,000 cps) radiating surface which vibrates as perfectly as a whole as it is possible to hope.

To make this radiating diaphragm, one starts with a 10 cm square cut from a plain sheet of expanded polystyrene 8 mm thick. Sixteen parallel grooves 4 mm wide and 6 mm deep are crimped into it (Fig. 1) leaving parallel, 2mm wide ridges, on the tops of which is stuck an aluminium strip (Fig. 2) which constitutes the moving conductor.

This forms a structure which may be likened to a parallel assembly of T-girders, the rigidity of which has been experimentally determined as being satisfactory provided that the angle AOB (Fig. 3) is less than 90 degrees (hence the configuration adopted).

The moving conductors are constituted by a greek key pattern of aluminium (resistance 0.25 ohm), the active portions of which comprise 17 strips 100 mm long and 2 mm wide. The diaphragm and the aluminium strip together weigh 1.51 gms.

At the two ends of the diaphragm, and perpendicular to the direction of the moving conductors, are stuck two 3 cms wide bands of polyurethane which constitute the device which suspends and attaches the "Orthophase" cell to the metal chassis (at low frequencies, a portion of these bands of polyurethane vibrate; this explains the figures given by the constructor for the active surface of each element: 10 x 13 cms).

In the magnet system, use is made of the most recent oriented-structure magnetic ferrites (Philips of Eindhoven). Seventeen rods of these ferrites (3 mm thick, 19 mm wide and 100 mm long), magnetised across their thickness, are held between pure Armco iron armatures 0.75 mm thick and 30 mm wide, forming (Fig. 1) at one of their ends, an air gap 3 mm wide and 6 mm deep, in which there is practically uniform strength in the neighbourhood of 2,000 Oersteds.

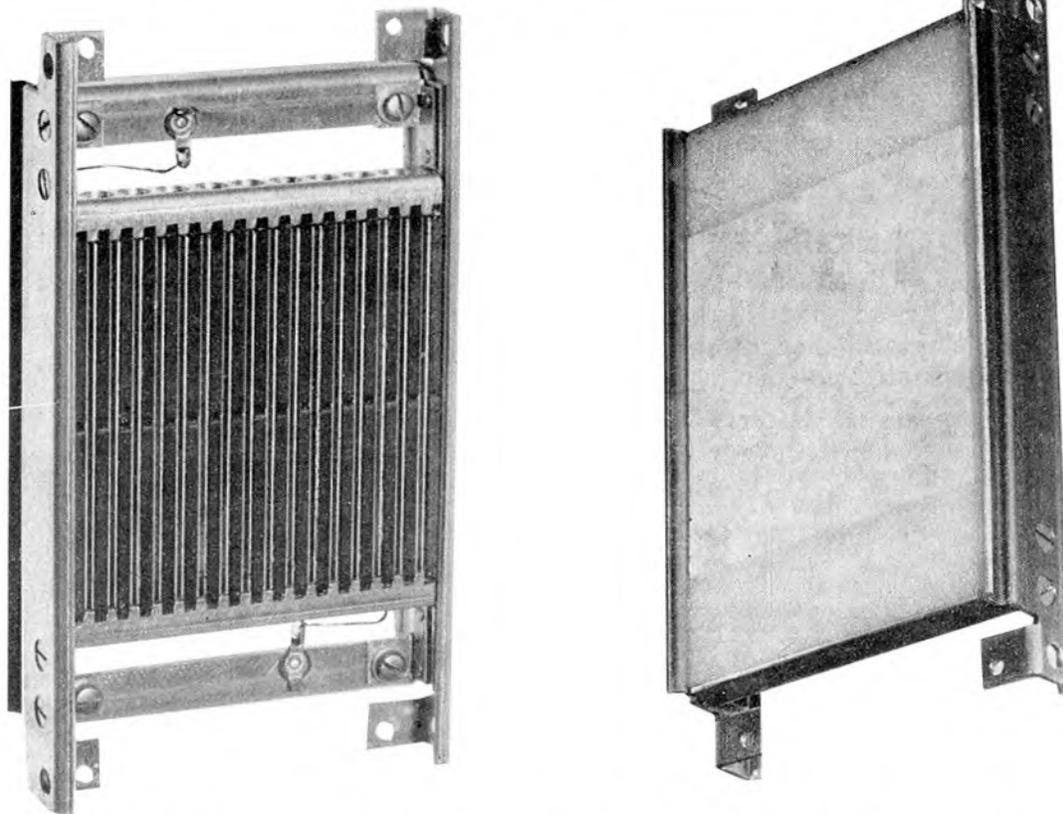
The magnets with their armatures (Fig. 4) constitute a perforated structure with parallel gaps (1.5 mm wide) through which the rear of the diaphragm communicates with the outside: this is a new

development, as a result of which each cell may be given a very low resonance frequency (of the order of 40 cps) which is well damped by the nature of the suspension and the air present in the gaps.

The remainder of the construction of an "Orthophase" cell merely consists of mounting members (Fig. 5)—a sheet duralumin frame supporting the magnetic structure and the diaphragm with the conductors suitably centred in the air gaps into which they normally penetrate to a depth of 3 mm. The cell, thus obtained, a front view of which can be seen in Fig. 6, is provided with mounting brackets so that it may be secured either in an acoustic surround which absorbs the rear wave, or to the sides of identical members distributed over a portion of a cylinder, enlarging the directive diaphragm to form an acoustic doublet with a wide emitting surface.

At present, the designers plan use of these "Orthophase" cells as follows:—P24 assembly: Professional type with 24 Orthophase cells distributed over part of a cylinder: admissible power, 100 watts; impedance 8 ohms; dimen-

(Continued on page 23)



Left: Fig. 5.—Rear view of an Orthophase cell, clearly showing the mounting members and the structure of the magnetic circuits, each of which actually uses two laminations of ferrites end to end. Right: Fig. 6.—Front view of an Orthophase cell

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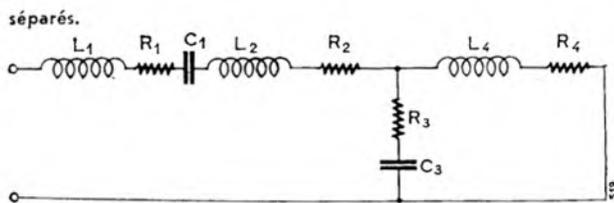
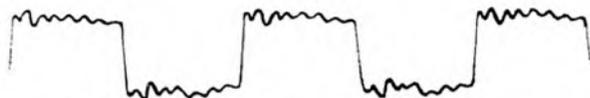


Fig. 7 (above): Equivalent electrical diagram of an Orthophase cell, the radiations of the two surfaces of which are assumed to be separate

Fig. 8 (below): Acoustic restoration of a square wave signal having a frequency of 1,000 cps. The reproduction of square wave signals by the Orthophase remains practically comparable to the trace shown up to 5,000 cps



(Continued from page 21)

sions, 84 x 72 cms; weight, 30 kg. P12 assembly: as above, but with only 12 cells.

SP4B4 assembly: an assembly of four Orthophase cells and four conical diaphragm speakers for reproducing low frequencies.

A1B4 assembly: one Orthophase cell supplemented by four loudspeakers for the low frequencies.

It is difficult to translate the mechanical system of an Orthophase cell by an electrical equivalent, but Fig. 7 is a reasonable approximation.

Measurements of acoustic pressures taken on 0.1 mm of the diaphragm with a miniature prove a perfectly correct piston action.

PERFORMANCE

Axial response: ± 2 dB between 1 and 25,000 cps. Above 1,000 cps, and more particularly between 40 and 200 cps, the response curve depends on the type of acoustic load used.

Fundamental resonance frequency: 40 cps.

Impedance at 1,000 cps: 0.35 ohm (practically independent of the frequency; an increase of 10 per cent at 15,000 cps).

Admissible power: Three to ten watts according to the nature of the acoustic load used. Output: about 2 per cent.

Intermodulation distortion: less than 2 per cent (frequencies used for measurement; 40 and 12,000 cps; amplitude ratio 12 dB).

Directive diagram at 15,000 cps; drop in level of 6 dB in one direction forming an angle of 30 degrees with the axis.

Transient response: Fig. 8 reproduces the oscillographic trace of the voltage at the terminals of a Neumann MM3 electrostatic microphone located at a few tenths of a millimetre from the diaphragm of an Orthophase cell receiving a square wave signal at 1,000 cps. This result needs no comment, acoustic transducers which are capable of such a performance are very rare indeed.

First published in *Revue du SON*, No. 97, May, 1961. Editions Chiron, 40 rue de Seine, Paris VI.

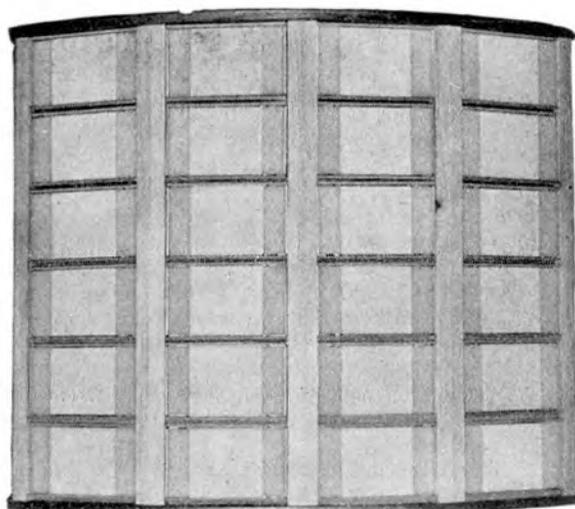


Fig. 9 (right): View of the 24-cell Orthophase loudspeaker with the coils distributed over a surface of part-cylindrical shape. The power is provided by a 50-watt amplifier of conventional form

TAPE RECORDS REVIEWED

In our next issue we shall publish a special section dealing with tape records. DON WEDGE gives a preliminary assessment of two recent issues.

HOW do you like your pops? Fizzy or still? Trade marked or mysterious? All these factors are presented in a batch of pre-recorded tapes just put on the British market by Esoteric Productions at quite attractive prices.

They began life as American recordings by various small firms and are being made available in this country for the first time. Esoteric (22 Coastal Chambers, Buckingham Palace Road, London, S.W.1) is doing a comprehensive job with each tape on sale in 3½ or 7½ ips, mono or two-track stereo versions.

But what of the product? I heard a set of Esoteric tapes in 7½ ips stereo. Now, hours later, I am still wondering why anyone should want to bother making tapes of a steam organ in stereo.

I suppose all sound must be better, more complete and "rounder" with natural separation. But it can go too far.

Only the merest margin of improvement can be given to the sounds of a steam organ! Musically such an instrument is limited to say the least. Its tonal qualities just cannot be taken too seriously at all.

To be completely fair, *The Sound of the Steam Organ* (S 100) is offered by Esoteric as the first in a proposed "Sounds of a Dying Age" series.

In any case, "pop" must be interpreted very widely in this case. The selection varies from Bizet's *Prelude to Carmen*, through *MacNamara's Band*, *Tavern in the Town*, and Schubert's *March Militaire* to such hot items as *I Wanna Girl Just Like the Girl That Married Dear Old Dad*.

The tape's appeal is to nostalgia; the historian and novelty seeker will welcome it.

A complete contrast is *The Ever Lovin' Miss Lee*—a most remarkable girl, and so is the record. We are told who produced it, what machines and microphones he used, who accompanied her—all interesting background information—but not a word about who Miss Lee is.

One can only suspect that her real name isn't Miss Lee at all. This makes for one of the most intriguing parts of the tape; guess who recorded it!

She gives a most remarkable performance. It is breathy and brassy at the same time. The box note sets the mood. "She has become a woman of experience, and one only needs to hear her sing to realise how vast and varied her experience has been!"

She begins with *Ja-da* in a breathy style reminiscent of an Atlantic roller, but this is not, fortunately, maintained to the last number of the tape, *Stout Hearted Men*.

Throughout the record, the tempo is super slow, giving Miss Lee time to inject meanings into the lyrics of *Blow, Gabriel Blow*, *Pretty Baby* and others that either weren't there before or which have been totally obscured by the up-tempo performance usually adopted.

Miss Lee's performance is off-beat; whatever welcome the tape gets is for that reason but there must be an unreserved good word for the accompanying quartet, particularly Barney Kessel, one of the world's finest guitarists, and harpist Anne Mason Stockton, who I had never heard of before.

Full marks for originality then, but hearing in a dimly-lit room is recommended.

GETTING THE ANGLE RIGHT

THE best performance of a tape recorder can only be obtained if the tape runs true to the head. That may seem self-evident, but there are many machines in use today that would give a greatly improved response if certain small adjustments were carried out.

Of these adjustments, perhaps the most important is the "azimuth setting" of the Record and Playback (or combination) heads. Quite a tiny variation in the alignment of the head-gap from the vertical can result in drastic losses—losses, moreover, that are not regular as regards frequency response; not merely a matter of decreased volume.

The reason for this is readily seen if we consider the relative sizes of head gaps and tape tracks. Fig. 1 shows the dimensions of the energised tracks on a half-track standard (quarter-inch) tape.

First point to note is the "safety lane" between the two tracks, kept at a minimum of three-hundredths of an inch to avoid cross-modulation and

the tape, where slight curling or variations in tape width could cause a change in modulation and false output. At frequencies through the reasonably level section of the response curve, and at constant speed, the output from the playback head is proportional to the width of the track it covers.

The erase head, it can be seen, overlaps the edge of the tape considerably. However, its inner level must be maintained as shown in Fig. 1. If it is set too low it will affect the recording of the other track; too high, and erasure will be incomplete. Therefore, when making azimuth setting checks, complete the job by testing for correct erasure.

movement has the effect of artificially enlarging the gap, causing a loss in output. Once again, the principal effect is at the higher frequencies.

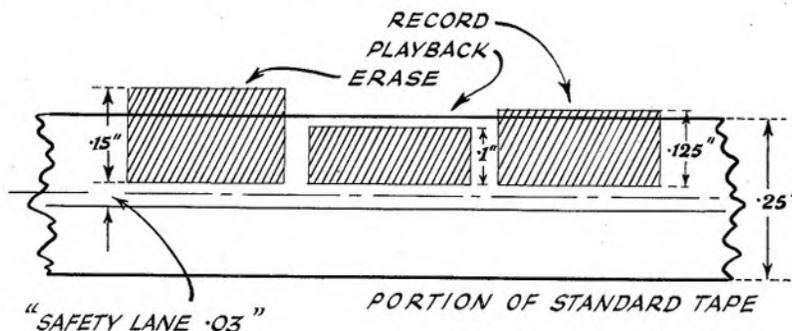
LEVEL-HEADED

The gap dimensions are so fine that quite a small angle of lean—less than the eye will detect—is enough to cause a serious loss. At $7\frac{1}{2}$ ips, replaying a tape on which a tone of 10,000 cps has been recorded, a misalignment of less than a degree can cause a 6 dB loss.

This point about gap dimensions brings us to our first query. Reader J. K. G. of Birkenhead asks why it is not considered possible to use an auxiliary Record head for Replay as well.

If he studies the specifications of each he will note that a Record head has a gap that may be twice as wide as a similar Replay head. One of the important factors in Recording head design is a rapid decay in the magnetic field when any particular portion of the tape has passed the gap. This can be visualised as an elimination of a kind of "blurring." By using a shim spacer of metal such as beryllium copper between the polefaces, eddy currents are formed which tend to make "peaks" in the magnetic field.

Playback demands a different set of circumstances. Here, the field is emanating from the tape, and if we consider each portion of the tape to be a small magnet it will be easier to understand. A pure sine wave signal impressed on the tape will magnetise the small portions in opposite polarity



partial erasure. Obviously, any discrepancy in the height of the head, relative to the track, will have a detrimental effect. This, even if the gap is vertical.

It will also be noted that the playback track is less than the width of the recorded track. This is to avoid reproducing the magnetised edge of

Vertical alignment of the heads is extremely important. If the line of the gap slopes away from front to back, intimate contact of the tape with the head face is not possible. There will be a falling off in high frequency response.

Misalignment so that the gap is not at right angles to the direction of

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HARRY MACK continues his series of articles offering technical advice on problems of general interest to recorder owners.

2: HEAD ALIGNMENT

for each half-wave. Thus we may say we have a small bar magnet for each half-cycle.

Now, consider a signal of 7,500 cps recorded at a speed of $7\frac{1}{2}$ ips. Each wavelength would be a thousandth of an inch long; each of these hypothetical bar magnets a half thou'. If our playback head has a gap greater than this, more than one of the small magnets will affect the field in the gap at any given instant. Thus, we can deduce from this that the replay gap has to be smaller than the shortest wavelength we need to reproduce.

In practice, it is not quite so straightforward. A "fringing" effect reduces the tolerance even further. The "effective" gap size is unfortunately greater than the physical size. Thus, manufacturers are concentrating on reducing gap sizes to improve high frequency response. A half thou' gap was considered normal not so long ago. Nowadays, gaps of as little as a fifth of a thou' are not unusual.

BRIDGING THE GAP

Where a head is designed for both Record and Playback, the gap may be in the nature of 0.00025 inch, and the design includes a modification of the rear gap for optimum conditions. It is not merely a compromise.

The net result of all this, J.K.G., is that using your Record head for dual-purpose will inevitably result in a high-frequency loss on playback. Even more serious would be an uneven playback response curve.

Returning to our main subject, azimuth setting, brings us to a query by H. M. of Carmarthen. He asks: "What is the recommended procedure for adjusting a Record/Playback head which has four screws securing it?"

As he does not state which model machine he is using, we can only assume he has one of the rare "balanced" head assemblies. Provided the four screws are genuine adjustments (not used as a pair for adjustment and the other pair for securing) then the best method is to set the level first by eye, with the head slightly higher than its correct setting.

Judge this by the run of the tape across the head face. Then bring the head down by adjusting the front pair a similar number of turns each.

Next, get the front face upright by

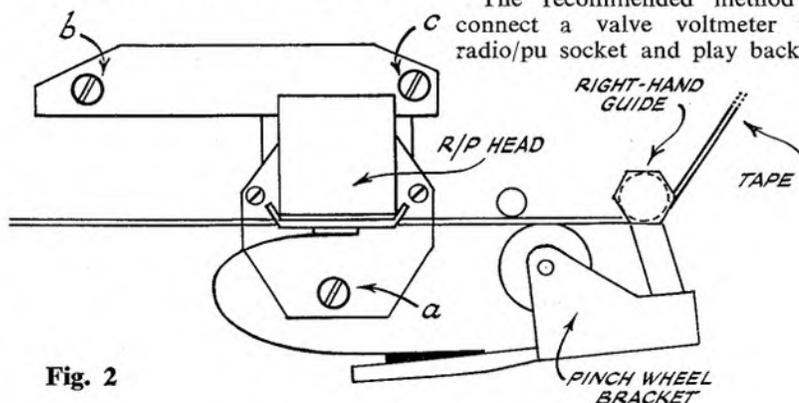


Fig. 2

doing the same with the rear pair. Finally, run the test tape through and check for maximum response by adjusting in pairs. That is, take a turn clockwise on one and a similar amount on its twin at the rear, then bring the opposite side down, also levelling by similar adjustment at the rear. Always check back for correct gap level as well as angle, after adjusting this type of head.

The problem of gap level—or correct head height—has been worrying T. W. of Plymouth, who says that he finds it difficult to adjust azimuth setting on his Philips EL3541, without the tape riding up the guide bracket.

This machine uses the three-screw system, illustrated in Fig 2. Also shown are the guides and bracket and an edge-on view of the guide-plate. The important thing is first to check the heights of the roller brackets A and B, using these thereafter as a guide for tape level. The manufac-

turers state that the height of the left-hand bracket above the mounting plate should be 16.3 mm, and the right-hand 16.5 mm.

Having checked this, T. W. can go on to level his heads. When the machine is switched to Record or Play, the guide bracket holds the tape against the front face of the head. The shape of this bracket is such that any discrepancy in head level can now be seen. All three screws can be adjusted to give the required height, so that the tape runs truly through the bracket. Finally, screw "b" is used to set the gap vertical.

TEST TAPE

The recommended method is to connect a valve voltmeter to the radio/pu socket and play back a test

tape (carrying a 5,000 cps tone recorded at constant 100mV input), adjusting for maximum output.

This brings us to the question asked by several readers, including B. O. L. of Taunton, and J. H. of Aberdeen, who want to know if it is strictly necessary to use a meter for azimuth setting adjustment. After all, says J. H., it is our ears that make the final judgment.

True, the maximum aural output can be gauged by adjusting the head when a constant tone is being played back. But more accuracy is obtained if we (a) watch a meter needle, and (b) feed in a measured constant note at a frequency near the upper end of the response curve.

Unfortunately, the human ear is not such an accurate instrument as even we high-fidelity fans like to pretend. The smallest difference in intensity of sound that the average person can detect is about 1 dB. And this varies with frequency, and is affected by the nature of the sound: i.e., the psychological effect of a pure tone is such as to impose a kind of delay as the loudness increases, but to accentuate "steps" in loudness. Readers are referred to the classic Fletcher-

(Continued on page 29)

CORRECTION

In the article "See how it runs," by Harry Mack, in our last issue, there was an inaccuracy in the reference to the Mark IV Collaro deck. This has two motors (not three, as stated) and records half-track in both directions.

Equipment Under Test

WHEN the novelty of owning a tape recorder diminishes, the enthusiast begins to realise that to produce the best results and gain the maximum satisfaction from his hobby certain accessories become necessary.

Tapes must be kept noise-free, heads must not become magnetised, and editing and other modifications to recordings must be attempted. To these ends, the items under review here provide a satisfactory answer.

The "D-mag" fulfils all the requirements of a good demagnetiser. It is portable, lightweight (9½ ounces), powerful but economical, its consumption being only about 25 watts; it can reach into awkward corners, and it provides a gradually reduceable field, which is most important for good demagnetisation, as it can be kept switched on and removed slowly from the object under treatment before switching off.

It consists of an electromagnet which operates directly from the A.C. mains (200 to 250 volts, 50 to 100 cps), the coil and core being bolted between

W A L D-MAG and HI-GAIN

By

ALAN BEAUTEMENT

two iron plates to form a "handle" about two inches square and one inch wide and a push button on/off switch, operated like a trigger, is mounted on the front. Above the switch, the side plates of the magnet are extended to form two tapered arms, about three inches long, the magnetic field produced being concentrated between the tips of the arms, which are covered with nylon to prevent damage resulting from contact

with the object being demagnetised.

It is well insulated, perfectly safe to use and suitable for a variety of purposes. As well as demagnetising tape recorder heads, it can be used for erasing large or small sections of tape, the latter sometimes being difficult to achieve precisely on a recorder, using the built-in erase circuits.

Film sound recordists, using "stripping" techniques will find it ideal for editing sound tracks, as the cushioned

Mind those Chestnuts

IT is a pity that so many people who are in a position to influence a wide section of the public neglect their responsibility when it comes to stereo and, instead of helping to cut a path through the jungle of fallacies and misconceptions, sprinkle water on the weeds—or plant a few new ones of their own.

Some of the weeds are in fact chestnuts (to keep our metaphors vaguely related). Take, for instance, the simpleton reaction to stereo of "I don't want to be able to tell where the various instruments are, I just want to hear the music"—which is just about as intelligent as saying "I don't want to hear the music, I just want to enjoy it."

That old chestnut does not deserve to survive much longer, but it will continue to whizz about our ears far too long if it is picked up and thrown on by people with a large potential audience. In a new book on tape recording it is honoured with a quote together with a comment: "There is a lot of truth in this."

Elsewhere the author discusses stereo recording and gives the impression that it is frighteningly difficult, deducing this, it seems, from consideration of the complicated technical arrangements employed at the big professional studios. The

Stereo Notes

By D. W. GARDNER

truth is, however, that for amateurs there are aspects which make stereo recording easier, even, than mono recording—especially by virtue of the fact that stereo tends to accept cheerfully acoustical environments that would give great trouble to the amateur who is using one channel only.

On the whole, I believe that too few people who are in a position to give a lead have taken the trouble to study stereophony thoroughly and to grasp its full implications. As a result they tend to absorb the fears and fallacies with which the audio atmosphere is bombarded on the subject and to pass them on as a substitute for true enlightenment.

A PROMISING contribution in the realm of ideas comes from our old, young Liverpool friend, Nigel Rees. Although, to his regret, he has not yet had the opportunity of experimenting with stereo drama (more's the pity), he has been thinking a good deal

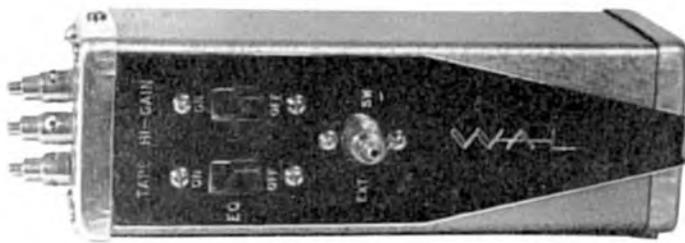
about it and suggests that "it has tremendous scope, almost more so than music."

Recalling a request I put out some time ago for stereo drama suggestions, he has come up with the discovery of "the first piece which I think would be a natural for stereo"—the first scene from Ionesco's "Rhinoceros."

In this scene, as Mr. Rees puts it, "Rhinoceroses rumble up and down the back of the stage in a way reminiscent of stereo trains. And, perhaps best of all, two conversations take place at the downstage opposite corners, which overlap. The give-and-take with this in stereo would be superb."

I fully agree with Nigel Rees' view of the possibilities in this, and hope that Harold Rottesman or another of our gifted tape-drama enthusiasts will see what they can do with it. Perhaps a Liverpool stereo tape recorder owner will link up with Mr. Rees and give him the opportunity of putting his ideas into practice. He did not suggest this himself, but it seems like a good notion to me. Any offers?

In any case, I should appreciate the loan of a recording of this piece if anyone decides to make it. I wonder, by the way, what results we would get if we tried out a recording of rushing rhinoceroses on the cat?



Left: The Wellington Acoustics Hi-Gain pre-amplifier and (right) the D-Mag head de-magnetiser

probes prevent scratching of the optical area of the film.

One point must be observed by the user when erasing tape or film—firm, smooth contact must be maintained against either of the probe tips. If the strip is allowed to float between the tips, the result will be poor erasure and modulation of the strip at mains frequency—otherwise it is very simple to use. There is a slight mechanical vibration when the unit is switched on, but this is normal and can be ignored.

The “D-mag” is supplied with a 5 ft. 6 in., three-core mains lead and instruction leaflet. The price is 50s.

THE “HIGH GAIN” PRE-AMPLIFIER

This is a more sophisticated accessory, with many uses, but, before continuing, a word of caution.

Transistors are essentially low-impedance input devices and are therefore unsuitable for use with any form of crystal microphone or pick-up, or any transducer having an output impedance in excess of about 50 K ohms. Special circuitry will increase this figure, but with much loss of gain, so the use of transistor amplifiers is restricted to moving-coil or ribbon devices and record-playback heads, all of which have low impedances.

Transistor power consumption is very small and therefore economical, the total current taken by the “Hi-gain” being about 1.6 mA, giving approximately 1,000 hours use from the internal battery, which, with the three-stage amplifier, is contained in a silver-wrinkle finished metal case, with chromium fittings. The overall size being only $6\frac{7}{8} \times 2\frac{1}{2} \times 2\frac{1}{8}$ inches, and the total weight 18 ounces—highly portable!

Controls consist of two switches only—an on/off switch and a “response” switch. In one position of the latter, the amplifier response is flat and in the other position, equalisation to CCIR standards (for $7\frac{1}{2}$ ips) is introduced, with a corresponding reduction in gain.

A co-axial socket is provided to which a remote on/off switch can be connected. Three other co-axial sockets on the end of the case, provide connections for the output, marked “O”, and two inputs, marked “H” (high imp.), and “L” (low imp.) respectively. The amplifier characteristics, via the two channels are as shown in the accompanying table.

The output impedance has a nominal value of 50 K ohms, but connection can be made to amplifiers of higher input impedances without any detrimental effect. Amplifiers of lower impedance should not be used, although for monitoring purposes,

standard 4,000 ohms headphones may be connected. A low frequency loss will result, but as most headphones have poor low frequency performance in any case, this should not cause much trouble.

As there are no AC heaters to bother about, the operation is free from internally generated hum, and, as no mains supply is required, it can be used in any spot which happens to be convenient, allowing main amplifiers to be located some distance away, when used as a pre-amp for tape decks, pick-ups, sound cine, projectors, etc.

By changing a mono tape head to stereo, it can be used as the early stages of a second channel, and it is ideal for monitoring one track of a pair, on four-track recorders, for synchronised recordings; or, by adding a monitor head to recorders with a combined record/playback head, it can be used to check programmes as they are taped, allowing the recordist to stop at once if anything goes wrong, instead of discovering errors on later playback. In fact its uses are many and varied, and this reviewer has only one criticism—the use of international phono-plugs for the co-ax connectors. Dictated by commercial expediency, no doubt, but I find them exasperating to remove and mechanically unsatisfactory—a pet hate, no less.

The “Hi-gain” is supplied with full specification, leaflets giving detailed connections and a number of suggested uses, so that even the absolute novice should find no difficulty in attempting several useful experiments to improve his recorder facilities. The price is £7 16s. 0d., complete with battery, 3 ft. of screened lead and co-axial plugs.

Both the items reviewed are manufactured by the Wellington Acoustics Laboratories Ltd., Farnham, Surrey.

SPECIFICATIONS OF HI-GAIN

Characteristic	Input H.	Input L.
Impedance	25,000 ohms (max.) ...	2,500 ohms (max.)
Input signal level	10 m.V. (max.) ...	1.0 m.V. (max.)
Gain—		
without equalisation	44 dB (160 times) ...	66 dB (2,000 times)
with equalisation	24 dB (16 times) ...	46 dB (200 times)
Frequency response	—1 dB at 30 cps to +2 dB at 25,000 cps ...	30—25,000 cps ± 1 dB
Noise level—		
without equalisation	52 dB down ...	54 dB down
with equalisation	50 dB down ...	52 dB down

THE IDEAL GIFTS
FOR ALL
TAPE ENTHUSIASTS
THE



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KLENZATAPE—for cleaning Tape Recorder Heads—Complete kit, 12/6; Fluid Refills, 3/11.

METRO-SPLICER—for both Recording Tape and 8 mm. Cine-Film—Complete with Film Emulsion Scraper and spare Cutting Unit, 15/-; Spare Scrapers, 1/-; Spare Cutting Units, 2/6.

The Original **METRO-TABS**—for making positive identification of Recordings **AT A GLANCE**—3/11 complete with Index.

Tape Deck Cleaning Brush—made from specially shaped feather-soft non-scratch Nylon, 2/6 each

The above items complete with many spares making a total value of £2 4s. 9d.

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Fine quality reproduction of speech and music awaits the user of this superbly designed general purpose microphone by LUSTRAPHONE. Its sensitivity, wide frequency range and sound-pattern enable excellent recordings to be made with absolute assured results. Its rugged design and modern style housing ensure safe working under rigorous conditions. Available in high or low impedances. Plastic housing. Complete with cable.

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Please send the Robuk Fun Book and full details of the RK3

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FIDELITY
GRUNDIG
PHILIPS
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SONY
TELEFUNKEN
etc., etc.

FRANCIS OF STREATHAM have long been known to readers of tape recording journals as one of the foremost and liveliest suppliers of tape-recorder and high-fidelity equipment in the country. This is the reflection of a policy of customer confidence gained from service and attention to detail no matter how large or how small your requirements. There are two well-stocked centres at your service—169-171 for recorders and everything for recording; 181 for hi-fi where you can choose from the best of everything from a stylus to stereo gramophone recorder, radio set-up.

QUAD, LEAK, ROGERS, WHARFEDALE, DECCA, ORTOFON, SHURE, GARRARD, Lenco, ARMSTRONG, MORDAUNT, THORENS, etc.

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Recorders at 169-171, **STREATHAM HIGH RD., LONDON, S.W.16**
Hi-Fi Dept. at 181, **STREATHAM HIGH RD., LONDON, S.W.16**
Between **STREATHAM STN.** and St. Leonard's Church ● **STReatham 0466/0192**



THE FI-CORD ABROAD

Bob Danvers-Walker, the well-known Radio and Television announcer, famous for his love of "going places" has just returned to England from his latest BBC assignment—a trip to Nice on a Lambretta scooter, recording a "Holiday Hour" programme for broadcast next February.

Bob used his old friend the Fi-Cord IA—which has accompanied him on many daring and unusual assignments in the past—to record his impressions of the trip, the object of which was to show how economically a continental touring holiday can be enjoyed.

GETTING THE ANGLE RIGHT

(Continued from page 25)

Munson loudness contours, published in most reputable books on hi-fi or sound reproduction.

Using a meter, even a quite simple AC voltmeter across the speech coil of the loudspeaker (or at the extension loudspeaker socket), enables the eye to distinguish the "creep" of the needle as the alignment of the head is carried out, to limits much finer than the 1 dB quoted.

Incidentally, the equivalent voltage change would be 2 dB. Doubling the voltage is a gain of 6 dB. Actual voltage reading at the output of the recorder may be in the nature of 1 volt. Obviously, the better the meter, and the nearer it matches the speech coil impedance, the more sensitive will the reading be. But as we are not concerned to measure output, merely to obtain an indication of difference, the actual reading is not significant.

If a test tape is not available for making this adjustment, a useful method of obtaining a test tone is to record the constant tone of the television test signal. This is put out at intervals during the morning, and sometimes during the afternoon. Frequencies used may be 400, 600 and 1,000 cps.

If the recording is made on a known good machine at the slowest speed, then played back at the highest speed, a 4,000 cps tone would be obtained by the normal three-speed machine.

However, it is advisable to use as high a frequency as possible for these tests, and a test tape made by recording the output of an audio generator is better. Always record the tape at high level, with the sound source output kept down, to maintain a good signal-to-noise ratio.

Adjusting the Erase head setting is rather a different procedure, which will have to be dealt with separately in a future issue.

THE WORLD OF TAPE • A NEWS ROUND-UP

A TAPE recording of the service is rapidly becoming almost as much a part of regular wedding preparations as ordering a photographer.

And proof of this turn of events is provided in a recently-published book *Modern Wedding Etiquette* by Alison Barnes. The authoress includes advice on organising a wedding recording, and in addition to providing a rough guide of the cost for professional coverage, informs the intending couple of the willingness of tape recording club members to provide such a service.

AN opportunity for a critical examination of a professional recording studio is offered to London tape enthusiasts, with the announcement of the third "At Home" of the Universal Programmes Corporation Ltd., a division of the International Broadcasting Co. Ltd.

Their open days have been extremely popular in the past, and this time, from November 24-26, they are to break new ground. This includes recording a live group on three-track equipment and then allowing selected members of the audience to follow the processes through to editing, dubbing, reduction to two-track and mono, and finally cutting mono and stereo discs.

Admission is free, but tickets may be obtained from the Manager, Allen E. Stagg, at 35, Portland Place, London, W.1., by sending a stamped addressed envelope.

STUDENTS of electronic music, musique concrete, radiophonics and abstract sound reproduction will be interested to learn of a new book on this fascinating technique published this month by Neville Spearman Ltd.

The author is F. C. Judd, A.Inst.E., one of the small handful of acknowledged pioneers in the making of "new music", who describes his book as being written specially for those who wish to experiment with new forms of sound and music. Chapters are devoted to magnetic tape techniques, electronic sound sources, filters, determination of frequencies, beat notes, artificial reverberation, and examples are given of simple electronic music and musique concrete compositions.

Bound with a hard cover, and containing twenty constructional diagrams,

11 photo plates and 14 graphs, *Electronic Music and Musique Concrete* is sold at 16 shillings.

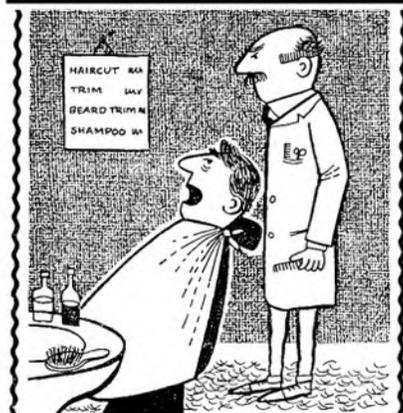
FOCAL PRESS LIMITED, have produced another book on Grundig tape recorders, this time devoted exclusively to the portable, battery operated models.

Written by Frederick Purves *The Grundig TK1 and Cub Guide* tells the TK1 and Cub owner all he could wish to know about his machine. It is scheduled for publication on November 27, and will be obtainable from the publishers, all Grundig Approved Dealers, and usual retail sources. The price is 7s. 6d.

AN automatic telephone service which provides up-to-the minute information on the wool market has been so successful in Brisbane since its introduction last month that similar services may be provided in other parts of Australia.

By dialling a phone number the caller starts a tape recording which repeats quotes from the Sydney Greasy Wool Futurs Exchange.

Hi-Fi HARRY by rich



"Alright agreed—no sport or politics from you, and no tape talk from me"

SABA IMPORTERS ANNOUNCE A NEW MICROPHONE RANGE

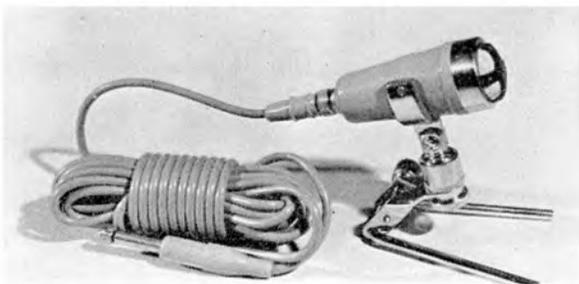
A NEW range of microphones have been introduced by Selmer's the importers of the Saba tape recorders. Four models are included in the range, which will be sold under Kent label, complete with a 20-foot lead.

The first is the DM-10, an omnidirectional high impedance instrument which can be used as a hand, table-top or floor stand microphone. It is supplied with a table-top base with adjustable adaptor which will fit any standard floor stand. It incorporates an on/off switch, and its sensitivity is quoted as 70 dB (at 600 ohms, 1,000 cps $0dB=1 V/\mu\text{bar}$).

The second model, DM-21, illustrated right, is also high impedance, with a non-directional characteristic. For hand and table-top use, it is enclosed in a die-cast body with a chrome grille and will sell at 5 guineas. Sensitivity is given as 75dB ($0dB=1 V/\mu\text{bar}$, 1,000 cps).

The DM-17, five guineas, is a high impedance model with a non-directional characteristic. A floor-stand instrument,

Right: The new Kent microphone DM-21



it incorporates an adjustable knob on either side for the stand, which is not included in the price. Sensitivity rating is 71dB ($0dB=1 V/\mu\text{bar}$, 1,000 cps).

Their fourth model is the DM-20, also high impedance non-directional, with a quoted frequency response of 70-10,000 cps $\pm 5dB$. Sensitivity is the same as for the DM-21. This is described as an adjustable microphone for use with recording or public address equipment. It has a brushed die-cast body, incorporates a new plastic diaphragm to eliminate distortion, and sells at eight guineas.

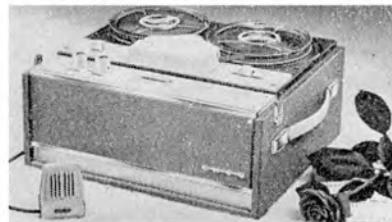
Also announced by this company is a lightweight dural column stand with an extension from 3 feet 4 inches to 5 feet 8 inches. It weighs 10 lb and costs £4 17s. 6d.

Henri Selmer Limited, 114-116, Charing Cross Road, London, W.C.2.

28-guineas model by Ekco

AMONG recorders shown for the first time at the Radio Show and now generally available, is this single-speed model illustrated below by Ekco. Incorporating the B.S.R. Monardeck with $3\frac{1}{2}$ ips, and accommodating $5\frac{1}{2}$ -inch spools, their RT366 provides a total playing time of three hours using double-play tape.

It has a quoted frequency response of 90-8,000 cps, and among its features are magic-eye recording level indicator, combined recording level and playback control and a 7×4 -inch elliptical loud-



The Ekco RT366

speaker. A spring-loaded record/playback control avoids accidental erasure. Input sockets are provided for microphone or radio, and fully-screened valves and special circuitry eliminate hum. Valve line-up includes an EF86, ECC83, EL84 and an EM84.

The RT366 is housed in a two-tone case finished in easily-cleaned plastic material in a choice of turquoise, and pebble grey or white grain and dove grey.

Dimensions are $13\frac{1}{2} \times 11\frac{1}{2} \times 7\frac{1}{2}$ inches, and the weight is 22 lb.

The price, 28 guineas, includes an Acos crystal microphone, spool of tape and spare spool, and a recording lead.

E. K. Cole Limited, Southend-on-Sea.

TIME SWITCH BY SANGAMO WESTON

A NEW domestic model time switch suitable for use with tape recorders has been announced by Sangamo Weston. Housed in a polystyrene case mounted on a metal bracket which can be used as a stand or for hanging on the wall. The time switch is supplied with lead and a 15A or 13A three-pin plug adaptor which is placed in the power point and the tape recorder or other appliance to be controlled is then plugged into the adaptor. A warning light appears on the rim of the time switch when the recorder is operating.

The control dial is marked with a 24-hour cycle. Two concentric circles of holes permit red pins to be placed for switching on and off at appropriate intervals. Six pins are supplied, and spares are available if required.

The minimum time between consecutive on and off operations is thirty minutes, and there must be a minimum



The Sangamo-Weston time switch

period of $1\frac{1}{2}$ hours between such operations. A manual operation button is provided to give immediate on or off when required.

The switch, Model S302, is suitable for 200-250v, AC mains, and costs £5 19s. 6d.

Sangamo Weston Limited, St. George's Court, 22-26 New Oxford Street, London, W.C.1.

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News from the Clubs

ONCE again it is the **COVENTRY** members who are providing the right spirit for the organised tape clubs. Their recent activities outlined in their newsletters could fill a page or two in this magazine, and in doing so would provide items of maximum interest to other clubs searching for ways to boost their own club, and activities.

One of the latest examples, providing a rather hectic week and untold publicity and good feeling for the club, was achieved during the latter days of September. Their endeavours concerned the Lord Mayor's Peace Conference held in the Belgrade Theatre, to which mayors from throughout the world were invited.

The Coventry members, represented by those stalwarts Henry Hopfinger, Roy Penfold and Les Skingley had been received by the Lord Mayor in his parlour to record a conversation on the ideas behind the conference. Permission was sought and granted for the club members to meet and record the delegates, and after the Dinner given by the Lord Mayor, the trio were invited into the Hotel Leofric to meet the Mayors of Graz, Austria; Lidice, Czechoslovakia; and Parkes of N.S.W., Australia, from whom they obtained recordings made on Les Skingley's Fi-Cord.

During the actual sessions of the conference, Henry Hopfinger visited the Belgrade Theatre and obtained dubbings of the tapes made by the chief electrician, Barry Griffiths.

Further recordings were made during the week with other of the overseas delegates and their wives, and the completed tapes were then edited and sorted into programmes for eventual distribution to those who took part.

All in all a hectic week, and a rewarding one for those concerned.

The regular club meetings of the members, of course, continued, and during the same week members were regaled with an impressive demonstration organised by R-E-S (Coventry) Limited. This was the local dealers' third annual visit to the club, and representative Malcolm Reid provided the thirty-odd members present with an entertaining evening.

On show and in use were a variety of machines including the new E.M.I. Voicemaster, Chitnis 9/S4K, Tandberg Series Six, Körting stereo model, and the first Japanese model to be examined by the club, the Sony 461. Also demonstrated were two miniature dictating machines, the Stuzzi Memocord and the Fi-Cord 101. American pre-recorded tapes were used for the practical performance demonstrations, and members also saw a Garrard 4HF turn-table used in conjunction with an HMV amplifier and pre-amp, complete with oscilloscope, and two Rogers speakers.

Inter-club contacts are being maintained, the latest excursions being between the clubs in Hinckley, South Devon, Leicester, Northampton and Warwick and Leamington.

The members of the **COTSWOLD** society have also had a varied series of meetings and recording sessions. Earliest of the experiences was the honour of being featured in *Wednesday Magazine*, the BBC West Regional programme. Following an interview with a member of the **Warwick and Leamington** club, Holmes Tolley of the BBC visited Chel-

tenham, to see Peter Duddridge. Following an emphatic "no" in answer to a question does the average owner use his recorder for the best, the Cotswold secretary went on to describe the advantages of joining a club, and outlined some of the activities of his fellow club members. The programme was played out by a recording of the Cheltenham Young Peoples' Orchestra playing *Die Fledermaus* which has been made by the society's chairman Clifford Benn.

Still with the BBC, members then reversed the process on October 7 when they visited their Bristol studios. Here the boot was on the other foot, and the professional engineers were bombarded with questions from their amateur counterparts. The tape enthusiasts saw the central control room for the West Region, and the telecine equipment where they showed particular interest in the recording of magnetic sound and its synchronisation with the film. In the television studios they were shown the complicated manoeuvring of the cameras, and members were also allowed to control the cameras which were trained on to other members. Peter Turner described the experience of seeing oneself other than in a mirror image as hardly less shaking than hearing one's voice for the first time.

To conclude their tour, members inspected a mobile video-unit where they watched the tape being edited, and finally visited the object of their tour, the sound recording block. Here the array of professional equipment including recorders, microphones and loudspeakers produced envious sounds galore. A listening test was arranged in which a signal generator produced tones from 30 cps upwards. One member claimed to hear 16,000 cps, but most had "lost the squeak" before that. It was interesting to note that some of the older members could still hear up to 15,000 cps, which seems to argue that ears can be kept in trim by hi-fi.

At the beginning of October the society organised a stand at the annual Hobbies' Exhibition run by the corporation. The stand was made and decorated by members with tape cartons and copies of the audio press, and a local dealer, Messrs. Ray Electrical, loaned high-quality recorders, tuners, amplifiers and micro-

(Continued on page 33)



Left: Secretary Peter Holloway, of the West Herts club, takes his turn at the parabolic reflectors while one of the actors awaits his entry during a recording session of the Pendley Manor's open-air production of "As You Like It." Right: Alan Stableford and members of the London Club prepare to leave their club rooms on a treasure hunt during a recent meeting

Classified advertisements

Rate—Sixpence per word (minimum 5s.); **Trade**, ninepence per word (minimum 10s.); **box numbers, one shilling extra. Payment with copy. Copy should be sent to Advertisement Department, "Tape Recording Fortnightly," 1, Crane Court, Fleet Street, London, E.C.4.**

TAPE-TO-DISC

J & B RECORDINGS. Prompt Tape to Disc and Sound Effects Service. 14, Willows Avenue, Morden, Surrey.

TAPE TO DISC RECORDING

Reduced prices. Finest professional quality. 10-in. L.P.—30s. (32 mins.), 12-in. LP—35s. (45 mins.). 7-in. EP 17s. 6d.

48-HOUR POSTAL SERVICE

S.a.e. for leaflet to Deroy Sound Service, 52, Hest Bank Lane, Hest Bank, Lancaster. Tel.: H.B. 2444.

TAPE-TO-DISC RECORDING SERVICE. All speeds. Photographic sleeves with all records. Details from E.R.S., 162, Shirland Road, London, W.9.

SERVICES

GRUNDIG sales/service in your area: High Wycombe phone 457, Newbury phone Thatcham 3327, Wallingford phone 3083, Orpington, Kent, phone Orpington 23816, New Malden phone Malden 6448, Watford phone Garston 3367.

L. BISHOP LTD., Tape Recorder Services, 1708, Bristol Road South, Rednal, Birmingham. Telephone: Rubery 709. Grundig Specialists.

MISCELLANEOUS

ASK YOUR DEALER for American Ferrodynamics "Brand Five" recording tapes—the best tape value!

FRIENDLY FOLK ASSOCIATION, Torquay (Est. 1943). Social Introductions, Pen-friends, Book-lovers, Stamps, Photography, Tapesponding. Members 100 Countries.

WONDERFUL SELECTION OF BARGAIN SECONDHAND RECORDERS completely overhauled and fully guaranteed from £12 always on display at all showrooms of Britain's Leading Tape Recorder Specialists. City & Essex Tape Recorder Centres. See page 30.

TAPE SPLICING is easy and accurate with **EASYSPLICE** tape splicer 5s. Patented, guaranteed. Over 6,000 sold. Easysplice, 30, Lawrence Road, Ealing, London, W.5.

"BRAND FIVE" American Tape. Standard Play, 5 inch (600 feet) 16s.; 7 inch (1,200 feet) 25s.; Long Play 5 in. (900 feet) 18s. 6d.; 5½ in. (1,200 feet), 23s. 6d.; 7 in. (1,800 feet), 35s. Sent by return. Post Free! Watts Radio, 54, Church Street, Weybridge, Surrey.

A BINDER is the ideal way of keeping your copies of *Tape Recording Fortnightly* clean and ready for easy reference. Available, price 14s. 6d. (post free), from 7, Tudor Street, London, E.C.4.

PRE-RECORDED TAPES

Unique complete catalogue listing all makes, Mono, Stereo, 7½ and 3½ ips, including World Record Club tapes. Call for FREE copy or send 1s. mailing fee. Dept. T.R.1, Teletape Ltd., 33, Edgware Road, W.2. PAD 1942.

RECORDING TAPE. See my advertisement on page 24. Nobody has yet asked for his money back. Villiers.

EXCITING NEWS from N.R.S.! Revolutionary new "Symphony" Automatic Tape Recorder makes its debut this month! Unique in the whole world, opens up new vistas of enjoyment from tape recording. Stuzzi Radio Tuner adds radio to above for only £5 9s. 6d. Details from: Northern Radio Services (Dept. TRF), 16, King's College Road, London, N.W.3. Tel.: PRImrose 3314.

FOR SALE

NEW PVC RECORDING TAPE. 1,200 ft. PVC, 15s. 600 ft., 8s. Hundreds already sold. No middleman. Refund guarantee. Post, packing, 1s. per spool. N. Walker, 28, Linkscroft Avenue, Ashford, Middlesex.

TELEFUNKEN M24KL Studio portable recorder with two interchangeable head assemblies. Full and half-track. Only two months old. Cost (new) £245 12s., asking £155. **AMPEX MODEL 2506 STEREO SYSTEM.** Consists of model 960 Recorder and a pair of 2010 Amplifier/Speakers, also together with its two Dynamic Microphones and Monitoring Head Set. Seven months old. Cost (new) £401 4s. 6d., asking only £275. All the above are as new. Write: A. S. Mackenzie-Low, Millfield, Old Town, Bexhill-on-Sea, Sussex. Phone: BEXhill 3922.

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Mr., Mrs., Miss.....

Address

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PLEASE POST FREE SPECIMEN COPIES TO THE FOLLOWING TWO FRIENDS, WHO I THINK MAY BE INTERESTED:

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.....
.....

TAPE TIME CALCULATOR



The *Tape Recording Fortnightly* accessory, gives playing times for any size reel or length of tape.

A simple, read-at-a-glance device for any speed from $\frac{15}{16}$ ths to 15 ips. Orders can now be accepted at the address given below.



Price 2/6d

(3/- including postage)

Order from:

**Tape Recording Fortnightly
7, Tudor St., London, E.C.4**

News from the Clubs

(Continued from page 31)

phones. A *Record-your Voice* service was laid on, and at various times an oscilloscope was connected to the recorder.

One special event during the three-day show was a public lecture and demonstration, prepared by Peter Duddridge and Clifford Benn, illustrating all aspects of recording, and depending solely on live recordings made by members.

The members were inundated with inquiries, mostly concerned with the purchase of equipment. The less expensive range received most attention, and the small battery recorders were most commented upon. On show and being demonstrated were the Clarion, E.M.I. Minifon wire recorder, and the new Philips EL3585.

From the practical point of view, their September 7 meeting is perhaps of most importance. For that evening a live recording session had been laid on. The subject was microphone positioning, and the society was fortunate in having the services of member Ray Tingley's dance band. Four instrumentalists were present, and they provided a wide range of tone colour and dynamics with their instruments which included piano, drums, tenor sax, banjo, piano accordion and electronic organ. Pianist Andy Clyne played his own composition *Passing Cloud* which was recorded as a waltz, and as a cha-cha-cha.

Upwards of a dozen recorders were in use, the members gaining much experience using identical microphones with different machines, and then reversing the process. One member recorded the sound reflected from various surfaces, provided by screens and walls, and produced some remarkable results. Eric Jones, in action with his home-constructed multi-channel mixer, also provided food for thought when his ambitious efforts were compared with those using simple equipment.

More inter-club activities, this time provided by the **BETHNAL GREEN** members who acted as hosts to their **Walthamstow** counterparts on September 1.

The visitors arrived in force and were entertained with recordings made by their hosts, who also displayed a number of recorders, including stereo models and battery portable models. A coloured slide show with tape commentary was also arranged. This was presented by two members who had visited the Channel Islands on holiday.

Further visits and another tape-club contact was announced at their September 23 meeting, when their annual dinner was held. The visitors were Mr. and Mrs. G. Smith who had brought down a greetings tape from the **Blackpool** members. During the evening the guests were entertained with an amusing stereo demonstration during which Len Burchell provided an effective argument with his loudspeakers.

Some forty members and their guests were present at a dinner on September 23, the first held by the club. During his speech, the secretary, H. H. Schaller, remarked on the progress of the club in its short existence, and announced the gift of a cheque from the directors of Howard Wall & Co Ltd, from which the club had its origin.

CLUB MEETING DIARY

Is your club included in this list? If not, send details, on a postcard please, including date of the next meeting.

ABERDARE: Alternate Wednesdays at 81, Brynmair Road, Godreaman. (Nov. 22.)
ABERDEEN: 1st Tuesday in every month at 8 Deer Road, Woodside.
ACTON: Alternate Fridays at the King's Head, Acton High Street. (Nov. 24.)
BARNSELEY: Every Tuesday at YMCA, Eldon Street.
BATH: Alternate Wednesdays at St. Mary's Church Hall, Grove Street. (Nov. 15.)
BATH (2): Alternate Wednesdays at 41, Herbert Road, Oldfield Park. (Nov. 15.)
BEDFORD: Final Tuesday in month at 131, London Road.
BELFAST: Every Thursday at 44, Dublin Road, Belfast 2.
BETHNAL GREEN: Every Friday at Shoreditch Tabernacle, Hackney Road, E.2.
BIRMINGHAM: Every Monday at the White Horse Cellars, Constitution Hill.
BIRMINGHAM (SOUTH): Alternate Mondays at Stinchley Institute, Hazlewell Street, Stinchley. (Nov. 20.)
BLACKBURN: 1st and 3rd Tuesdays at Blackburn YMCA.
BLACKPOOL: Every Wednesday at "Habonim," Lonsdale Road, off Lytham Road.
BOURNEMOUTH: Alternate Tuesdays at the Queen's Hotel, Queen's Road, Bournemouth West. (Nov. 28.)
BRIDGWATER: Every Tuesday at Evis' Radio Shop, West Street.
BRIGHTON: Every Wednesday at The Brunswick Arms, 38, Ditchling Road.
BRISTOL: Alternate Wednesdays at Redcliffe Church Hall, Guinea Street, Redcliffe. (Nov. 15.)
BRIXTON: Every Tuesday at The White Horse, 94, Brixton Hill, S.W.2.
BROMLEY: 2nd and 4th Thursdays at St. Mary's Church Hall, College Road.
CAMBRIDGE: Every Wednesday at the Mitre Hotel, Bridge Street.
CARDIFF: 1st and 3rd Tuesdays at 46, Caroline Street.
CATFORD: Every Thursday at the Black Horse, Rushey Green, Catford, S.E.6.
CHESTERFIELD: Every 3rd Monday at the Yellow Lion Inn, Saltergate. (Nov. 27.)
COISWOLD: Fortnightly, alternating Monday and Thursday at Bayshill Hall, Royal Well Lane, Cheltenham. (Nov. 30.)
COVENTRY: Alternate Wednesdays at Holyhead Hotel, Coventry. (Nov. 22.)
CRAWLEY: 1st and 3rd Mondays at Southgate Community Hut.
DARTFORD: Every Thursday at 41, Winsor Drive.
DERBY: Alternate Wednesdays at Osmaston Park Hotel. (Nov. 22.)
DONCASTER: Alternate Thursdays at Lancaster House, Westlaine Gate. (Nov. 23.)
DOVER: Alternate Mondays at the Priory Hotel, Dover. (Nov. 27.)
DUBLIN: 1st Monday at "Hardy House," 6, Capel Street.
DUNDEE: Alternate Mondays at The Salvation Army Hostel, 31, Ward Road. (Nov. 20.)
EASTBOURNE: Alternate Saturdays at Hartington Hall, Bolton Road. (Nov. 25.)
EAST HERTS: Alternate Mondays at 3, Chadwell, Ware. (Nov. 20.)
EDINBURGH: 1st and 3rd Fridays at 22, Forth Street, Edinburgh 1.
FRIERN BARNET: 2nd Friday at 7, Harmsworth Way, N.20, and 4th Thursday at 146, Friern Barnet Lane, N.20.
GLASGOW: Fortnightly, alternating Tuesday and Thursday at the Christian Institute. (Nov. 21.)
GRANTHAM: Weekly, 1st week in month Wednesday; 2nd, Monday; 3rd, Thursday; 4th, Friday at Grantham Technical College, Avenue Road.
GRIMSBY: 1st Monday at 21, Langton Drive, Nunthorpe, Grimsby.
HARROGATE: Every Wednesday at 4, Belford Road.
HARROW: 1st and 3rd Thursdays at St. George's Hall, Pinner View, North Harrow.
HASTINGS: Every Tuesday at 62, Vicarage Road.
HINCKLEY: Alternate Wednesdays at The Wharf Inn, Coventry Road. (Nov. 22.)
HOVE: Every Thursday at 44, Hogarth Road, Hove.
HUDDERSFIELD: 1st and 3rd Wednesday and last Monday at the Public Library, Ramsden Street.
HULL: Alternate Tuesdays at 281, Hesse Road, (Nov. 21.)
ILFORD: Every Tuesday at the RAFA Rooms, Cranbrook Road.
IPSWICH: Alternate Thursdays at the Art Gallery, High Street. (Nov. 23.)

JARROW: Alternate Mondays at Jarrow Central School. (Nov. 27.)
JERSEY: 1st and 3rd Mondays at "Santa Barbaba" Maufant, St. Saviour.
KEIGHLEY: Alternate Wednesdays at the Spencer Street School Rooms. (Nov. 15.)
KETTERING: 2nd and 4th Wednesdays at the Rising Sun, Silver Street.
KIDDERMINSTER: Alternate Wednesdays at the Town Hall. (Nov. 22.)
LEEDS: Alternate Fridays at 21, Wade Lane, Leeds 1. (Nov. 24.)
LEICESTER: Alternate Fridays at the Newark Girls' School, Imperial Avenue. (Nov. 17.)
LONDON: 2nd and 4th Thursdays at the Abbey Community Centre, Marsham Street, S.W.1.
LUTON: 2nd and 4th Tuesdays at Flowers Recreation Club, Park Street West, Luton.
MAIDSTONE: Every Thursday at the Ex-Services Club, King Street.
MANCHESTER: Every Saturday, 6 p.m., at 20, Naylor Street, Hulme, Manchester 15.
MEDWAY: Every Monday at 23, Edward's Close, Rainham, Kent.
MIDDLESBROUGH: Every Wednesday and Friday at 130, Newport Road.
MILLOM: Every Wednesday at Millom Centre.
NORTH LONDON: Alternate Wednesdays at Bush Hill Park School, Main Avenue, Enfield. (Nov. 22.)
NORTHAMPTON: Tuesdays and Thursdays at 36, Spring Gardens.
NOTTINGHAM: Alternate Thursdays at the Co-operative Educational Centre, Heathcote Street. (Nov. 16.)
NORWICH: 4th Tuesday at "Lady Chamberlin Hall," 38a, St. Giles' Street.
PONTYPOOL: Every Monday at the Hospitality Inn, Crumlin Road.
PLYMOUTH: Alternate Wednesdays at Virginia House, Plymouth. (Nov. 15.)
READING: Every Monday at Abbey Gateway.
REDDITCH: 4th Thursday at The White Hart Hotel, Headless Cross.
RHYL: Alternate Tuesdays at Studio A, Bedford Street. (Nov. 21.)
RUGBY: Alternate Thursdays at the Red Lion, Sheep Street. (Nov. 16.)
SHEERNESS: Alternate Fridays at Arthur Gibby's 136, High Street. (Nov. 24.)
SOUTHALL: Every Monday at Southall Community Centre.
SOUTHAMPTON: Alternate Thursdays at Southampton University. (Nov. 16.)
SOUTH DEVON: Alternate Wednesdays at the YMCA, Castle Circus, Torquay. (Nov. 22.)
SOUTH-WEST LONDON: Every Wednesday at Mayfield School, West Hill, S.W.15.
STAFFORD: Alternate Tuesdays at The Grapes, Bridge Street. (Nov. 28.)
STEVENAGE: 1st and 3rd Tuesdays at the Tenants' Meeting Room, Marymead.
STOCKPORT: 1st Friday at the Unity Hall, Greek Street.
STOKE NEWINGTON: Every Wednesday at 53, Londesborough Road, N.16.
SWANSEA: Every Thursday at the YMCA Buildings, St. Helen's Road.
URMSTON: Alternate Thursdays at Davyhulme Scout Hut, Barton Road. (Nov. 23.)
WAKEFIELD: Alternate Mondays at York Street Hotel. (Nov. 20.)
WALSALL: Every Wednesday at Blutecoats School, Springhill Road.
WALTHAMSTOW: Alternate Fridays at 22, Orford Road, E.17. (Nov. 24.)
WARWICK & LEAMINGTON: 1st and 3rd Wednesdays in Room 18 of the Royal Leamington Spa, Town Hall.
WEST HERTS: Fortnightly alternating at the Cookery Nook, High Street, Watford (Nov. 22) and Heath Park Hotel, Hemel Hempstead. (Dec. 6.)
WEST MIDDLESEX: 2nd Thursday at the Railway Hotel, Station Road, Hampton, and 4th Thursday at Dormers Wells Primary School, Dormers Wells Lane, Southall.
WEST WALES: 1st and 3rd Fridays at The Meeting House, New Street, Aberystwyth.
WEYMOUTH: Alternate Wednesdays at The Waverley Hotel, Abbotsbury Road. (Nov. 15.)
WINCHESTER: Every Friday at 45a, St. Swithen's Street.
WINDSOR: Every Thursday at The Royal Adelaide Hotel.
WOOLWICH: Alternate Mondays at the North Kent Tavern, Spray Street, Woolwich. (Nov. 20.)
YORK: Every Thursday at 62, Micklegate.
Unless otherwise stated, meetings start between 7 and 8 p.m.



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INTO THE DEPTHS

(Continued from page 17)

To record as we moved was for me impossible. It was not only the imminent danger to the machine had it been removed from its box, but more important every ounce of strength and energy I could summon was needed to continue our forward progress.

When we finally reached the main chamber I was in a state of complete physical exhaustion, tired beyond belief, more thirsty than I had thought possible, sweating in the bitter underground cold so that not only did the breath condense into heavy vapour, but clouds of steam rose from our bodies as if we were horses at the end of a race.

My second recording was taken in the main chamber after we had rested. I wasn't interested in recording anything until I had found a stream, thrown myself down on the primeval

mud beside it and gulped up great mouthfuls of the icy, crystal water.

This recording was not nearly so good as the first. My voice was tired, very tired. I spoke softly and the tape was badly undermodulated. The silence of the cave was overpowering. The motors in the tape recorder sounded disproportionately loud and one tended to whisper as one whispers in church. I knew the recording wouldn't be good—and I didn't care.

The next recording I took even further into the cave was much worse. The voices on the tape were scarcely audible. But the night was passing and desperately though I ached in every muscle and bone I knew that I must produce something worth-while even if only to justify all the trouble that the others had been put to.

I was so far gone that it took every scrap of will-power I could scrape together to make me take the machine out of its box for the last time. The object now was not to record conversation, for I knew I was long past that, but to record some of the distinctive sounds of our underground progress.

With the machine dangling round my neck I trudged through pools of water, recording the crash of my boots on the rocks and the tinkle of the stream.

Thankfully I packed the machine away for the last time. My one thought now was to get out—out into God's fresh air and away from the smell of the carbide, the slime of the rocks and the ever-present danger of the cave.

Looking back I will readily admit that I could have done better; in fact I should have done better. The truth is that when the test came I lacked both the physical and moral strength to do more than I did. If Clive hadn't shouldered the burden of the box for the majority of the trip the Fi-Cord would have been dumped somewhere in the depths of that cave for anyone to retrieve who was able.

I don't regret going, for I have a unique experience to recall and some recordings—of a kind—to listen to. I also have the determination to make a better job of my next assignment.

And by the way, don't forget it's up to YOU to write to the magazine and suggest where I should go next. But you'll have to be ingenious to think up anything worse than, "Into the Depths."

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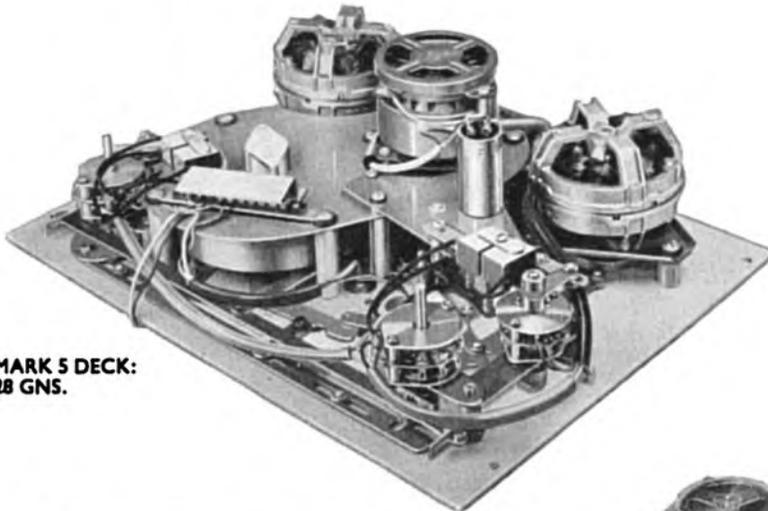
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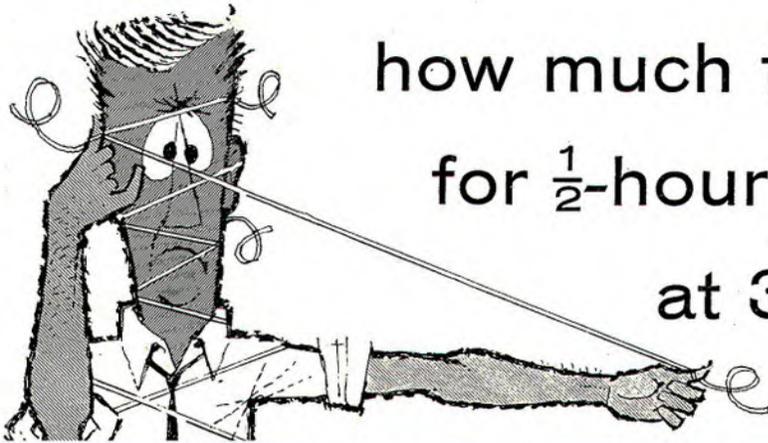


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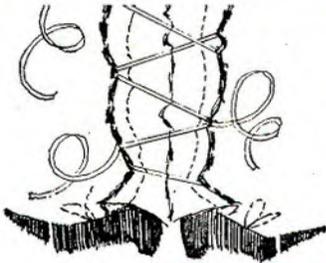
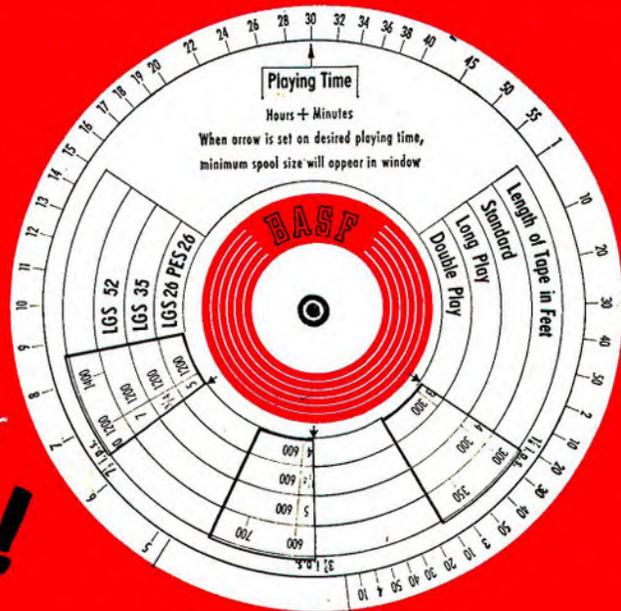
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