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TAPE RECORDING

AND REPRODUCTION MAGAZINE

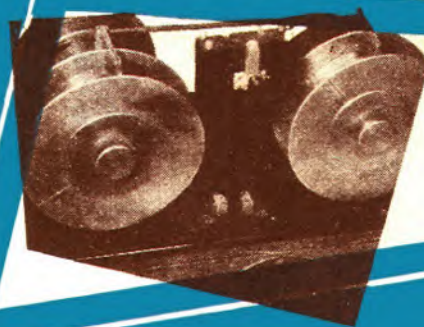


TAPE AS A NEW CLASSROOM AID

Pages 12-14

THE SIXTY YEARS STORY OF TAPE

Pages 6-7



LUDWIG KOCH ON BIRD RECORDING

Pages 9-11

THE ONLY PUBLICATION
IN THIS FIELD





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an expert writes

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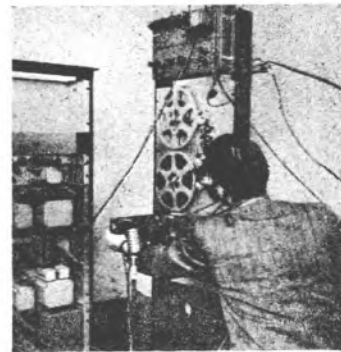
Looking back over the last seven years of Tape Recorder development, I think I can honestly say that the biggest single advance I have made since starting, was changing over to M.S.S. PM/15 Recording Tape.

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What exactly is a Tape Recorder?



Let's start by saying what it is not. A tape recorder is not a machine which ticks out Stock Market prices. It does not provide the ticker tape which is such a feature of the New York welcome to famous people. A tape recorder is a machine which records sounds; happy sounds, musical sounds, living sounds. And plays them back absolutely true to life.

IN fact, a tape recorder is something that can be either very useful, absolutely essential, or just downright good entertainment for practically every person you can think of.

For the music lover it provides his favourite music perfectly and economically. The tape on which the music is recorded can be stored easily and is 'unbreakable.' All tape is 'long-playing'—and it doesn't wear out.

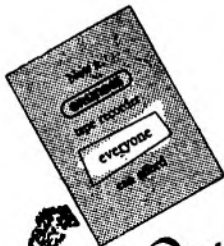
For the family man a tape recorder provides a family album in sound, from Baby's first word to young John's party piece. And speaking of parties—a tape recorder can join in anything from 'Consequences' to 'Musical Chairs.' It can give you music for dancing or even provide the accompaniment for 'Knees Up Mother Brown' (if you feel that way inclined).

For the youngster at school—many schools have tape recorders, education is made more interesting; something in which he plays a part—a real part that helps him learn and remember more vividly.

For the business man a tape recorder brings more efficiency. It helps him save time, helps him by recording important meetings verbatim, takes dictation, reduces routine trivialities.

The truth is, that whatever your walk of life, a tape recorder is an asset; either socially, or in business, or at home. Possibly all three combined.

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IAN ARNISON
R. BROWN

Technical Advisory Editor:

E. SWAIN
A.M.I.E.E., A.M.Brit. I.R.E.



*reporting on the home, office, factory, school, ciné,
amateur dramatic and musical uses of sound tape*

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Adventure in Sound

THE DEVELOPMENT of sound tape is one of the most significant technical advances of the twentieth century. Its potentialities are only now beginning to appear. As they are increasingly realised, we shall report and encourage the advances made; we shall stimulate public interest and so play a part in the industry's expansion; we shall inform and advise users of tape recorders and reproducers on how to make the best use of their equipment.

The use of tape equipment in the home has expanded rapidly. But the supply of regular information and advice has not kept pace. Recorders have too often been play-things, thrust aside after the first novelty has faded. But with a free flow of suggestions and ideas, with technical advice, with guidance on script-preparation and sound effects, the home tape equipment can take on a new everyday importance.

Stereophonic tapes are bringing new standards of music reproduction into the home. It is a safe prediction that they will progressively supersede other types of high-fidelity equipment.

Industry and commerce are already widely using sound tape in a variety of ways, and new applications are being worked out. The Post Office, airports, research establishments find it of vital importance. In countless offices it is replacing the old-fashioned dictaphone. New pocket-type recorders are available to export representatives, sales managers and travellers.

In the educational field, in journalism, in amateur dramatics there is obvious scope for the frequent use of tape equipment. Ciné enthusiasts have now found a new, simple and cheap method of adding sound-track to their film, using the synchronisers recently put on the market.

In this new, exciting world of sound, *Tape Recording Magazine* now makes its bow. It hopes for—and it promises on its own part—the fullest co-operation with those who have pioneered and who sustain this expanding and important industry.

THE STORY OF THE

TRIUMPH OF TAPE

A young man saw it all
nearly sixty years ago
—but history stumbled

GENIUS does not always get a just reward. Take the case of Valdemar Poulsen, an able young technical assistant employed by the Copenhagen telephone company

The year is 1898. Poulsen is 29 and, for anyone researching in the field of sound reproduction, living in an exciting and stimulating period. Twenty-one years earlier, Thomas A. Edison had produced the first audible reproduction of the human voice, using indentations made on tinfoil stretched over a revolving cylinder.

At one stage, Edison experimented with indentations on a paraffin paper tape; but ultimately he chose the cylindrical method.

Poulsen returned to tape or wire. But he broke away from the fundamental conception of recording by physical indentations, and worked on the idea of making sound induce varying magnetic effects in a moving steel tape.

What startling perception this young man must have had; he saw with the eye of a prophet the latest achievements of sound-tape recording. He suggested, for example, the use of his invention to record telephone messages automatically if there was no one to take a call; it could, he added, give a pre-arranged message, asking the caller to ring again later.

He saw his magnetised tape as an alternative to discs and cylinders for recording and reproducing music.

Most remarkable of all, in view of recent events, he suggested the use of a tape or strip of some suitable material covered with a magnetisable metallic dust; and went on to point out that it would then be possible to wipe off the recording so that the same tape could be used over and over again.

Poulsen, describing the principle of his telegraphone, said:—

"The invention is based on the fact that, when a body made of a magnetisable material is touched at different points and at different times by an electro-magnet included in an electric circuit, which carries electric currents varying in accordance with the vibrations of sound, its parts are subjected to such varied magnetic influences that, conversely by the action of the magnetisable body upon the electro-magnet, the same sounds are subsequently given out in the telephone (or loudspeaker) as those which originally caused the magnetic action upon the magnetisable body."

The young Dane, this amazing invention so clearly worked out in his mind, might have expected fame and fortune. He patented the idea and floated a company to market the equipment. It was not a success. History sometimes stumbles; it was not then ready to take this giant step forward.

Experiment continued, in the United States and in Germany in particular. In the mid-twenties a German called Kurt Stille worked with steel wire and linked up with a film promoter called Blattner to produce the Blattner-Stille recorder. In 1929 another German, Pfeumer, worked on development of a magnetic tape in which a soft-iron powder was mixed with an organic binding medium.

Before the war the British Broadcasting Corporation made some use of steel tape, wound in steel drums two feet in

diameter, weighing 11 to 12 lbs. and able to run for thirty minutes.

Then came the war, and research in Germany and the United States brought new progress, though inevitably most of it remained secret until after the fighting. In America small, light-weight machines were evolved for use in aircraft to record speech; in one case, wire of only 0.004 inch was successfully used.

But the Germans were meanwhile using plastic tape coated with a ferrous oxide. Entire programmes were broadcast from German transmitters during the war from these tapes, and the quality was so good that even the experts often believed they were listening to "live" broadcasts.

In 1944, when the Allies captured Radio Luxembourg, one of these machines was seized—and the secret of the modern tape recorder and reproducer was shared by all. This was the turning point in the history of magnetic recording. Intense research in Britain and America brought rapid improvement in the film base material and in the oxide coatings. Improved performance at lower operating speeds resulted.

The studio recording of music by broadcasting and gramophone companies was immensely simplified. Master copies had had to be cut on bulky wax discs, which it was necessary to maintain at carefully-regulated temperatures. All those complications could be forgotten. And the quality of reproduction was superior. On discs, because of reduced groove velocity towards the centre, distortion increases and frequency response tends to fall. With magnetic recording, this disadvantage disappears as the tape moves at a constant speed past the reproducing head.

Once tapes were in studio use, the next obvious step was to make them available to the public as an alternative to discs.

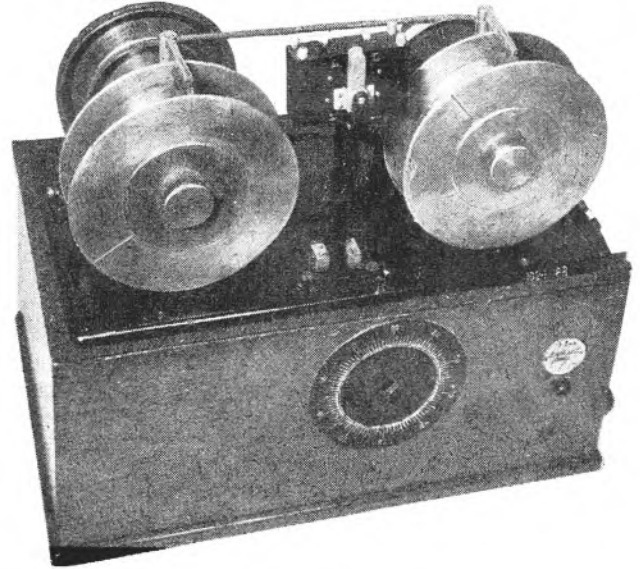
There were difficult new technical problems to surmount; in particular, how to reproduce copies from the master tapes. To E.M.I. went the credit of first finding a commercial method. In August, 1954, they were able to announce: "Listeners will be able to buy for the first time actual copies of the original master tapes as made in the recording

The history of the development of recording sound on magnetic tape, outlined in this article, is full of drama—and of plodding effort; full of triumphs—and of disappointments. Complete success was only achieved after nearly sixty years.

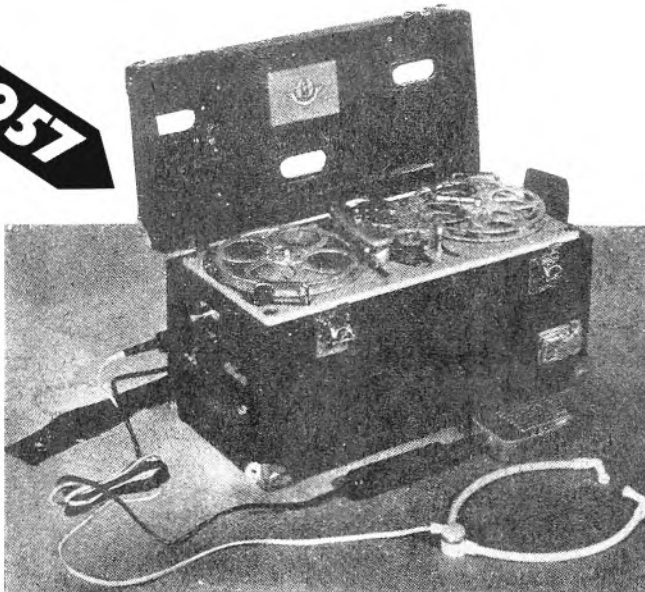
A 1907 model of Valdemar Poulsen's "telegraphone," using a magnetised steel wire.

Photo by courtesy of the Science Museum, London

1907



1957



studio, on which the full range of frequencies known to the human ear have been faithfully captured."

Still research continued, for there was a more exciting goal now in view—stereophonic, or two-channel, sound reproduction.

E.M.I. held their lead—they are holding it still. In April, 1955, came the announcement of the first "stereosonic" two-channel tapes. In effect, two separate but simultaneous recordings are put on to two parallel tracks on the tape. These two sound tracks are then reproduced through two identical sets of amplifiers feeding two loudspeakers.

Those who have heard this system have found the quality superb. With closed eyes, the conviction that one is actually sitting in a concert hall is overwhelming. By making full use of the natural function of the two ears to give a sense of direction, a full field of sound is obtained, stretching across the space between the two loudspeakers. When the sound comes from a solo instrument intended to be in a central position, then the listener hears it, not from the direction of either loudspeaker, but apparently from a point mid-way between them.

With this development under way, more and more manufacturers have produced tape recorders for the British public. Quality has steadily improved; price has steadily been adjusted to open up an ever-widening market.

Today the full potentialities of this new medium are only just beginning to be appreciated. Within a few years tape is likely to touch the lives of the vast majority of the people. We are in on the ground-floor of a technical triumph.



Two examples of the latest tape recording equipment. The E.M.I. L2 battery-operated light-weight portable recorder, as used by the B.B.C. commentators, is seen in the top picture. Below: a good example of a modern, popularly-priced recorder for domestic use—the Philips "Recordergram."



PHILIPS
- for everything
in tape
recording



Made in Holland

The Recordergram (Model AG8107), is the ideal portable recorder and costs only 39 gns.



The Recordergram Major (Model AG8106), 2-speed, with extra long recording time; inclusive cost is 62 gns. — wonderful value!

Philips tape recorders for the home (as illustrated) have gained a tremendous reputation for remarkable performance at a most reasonable price. The high quality and technical excellence of these instruments has been made possible by the wide experience gained in producing an immense range of more specialised Philips sound recording equipment. Included in this range are: PROFESSIONAL TAPE DECKS and associated amplifiers for single channel or stereo recording; STUDIO MIXING CONSOLETTES and other recording-studio equipment; PROFESSIONAL TRANSPORTABLE TAPE RECORDERS; MULTI-CHANNEL MAGNETIC RECORDING INSTALLATIONS—6 OR 15 CHANNEL; PLAYBACK EQUIPMENT; PORTABLE BATTERY TAPE RECORDERS; and a DICTATION MACHINE. In fact, *whatever* you want in the way of tape recording and sound reproduction, Philips are the people to get in touch with!

A large number of Philips accessories are also available, including tape, tape spools, leader tapes, telephone coils, foot switches, adhesive tape for splicing, jointing fluid, programme indicators, headphones, bulk erasers, and a wide range of microphones.



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(TR625)



Ludwig Koch in a characteristic pose. He welcomes the birds on his Icelandic tour



Birds, Bach and Broadcasting

THE UNIQUE RECORDING LIFE OF DR. LUDWIG KOCH as reported to 'T.R. Magazine'

LUDWIG KOCH, doyen of ornithologists and pioneer of sound recording, used tape for the first time as recently as 1953. Yet his recording experiences stretch back more than sixty-seven years.

As an eight-year old boy he recorded on an Edison cylinder the bird song of an Indian Shama. The song still exists on the cylinder, "a miracle," says Dr. Koch.

Later in the gay, colourful Paris of the eighteen nineties, he rubbed shoulders with many of the great artists of the time, Van Gogh, Toulouse Lautrec and the Impressionists. They all lived close to his home.

It is a city he loves. Several times he has recorded its most familiar sounds. Early morning, noon and night, the sounds change. For the life of a big city can be told in sound. And the life and atmosphere of each big city is different.

Given time and patience they can be accurately recorded. Possibly sound snapshots can recall a city in a more realistic fashion than photographs.

Making Records

Dr. Koch's recording career proper began after he had worked in important positions for the German Government, and later organised the City of Frankfurt's world famous "Exhibition of the Life of Nations." In 1928 he accepted an engagement as manager of the cultural department of the Berlin factory of EMI. There bird recordings and the invention of "the sound book" made his name famous.

He once succeeded in recording the unique Hildebrand organ, in a village near Leipzig, which Johann Sebastian Bach inaugurated in 1723 with a specially written cantata. This record still exists.

Electric disc recording was popular already and Dr. Koch established a great collection of bird-recordings and other invaluable discs of music and famous people. With few exceptions they were all destroyed by the Nazis without Dr. Koch's knowledge.

Until 1953, Dr. Koch had used all manner of recording apparatus, most of it highly technical equipment for the specialist.

It was on a trip to Iceland that he took an American model of a well known tape recording apparatus complete with battery, converter and considerable lengths of cable.

(Continued on page 11)

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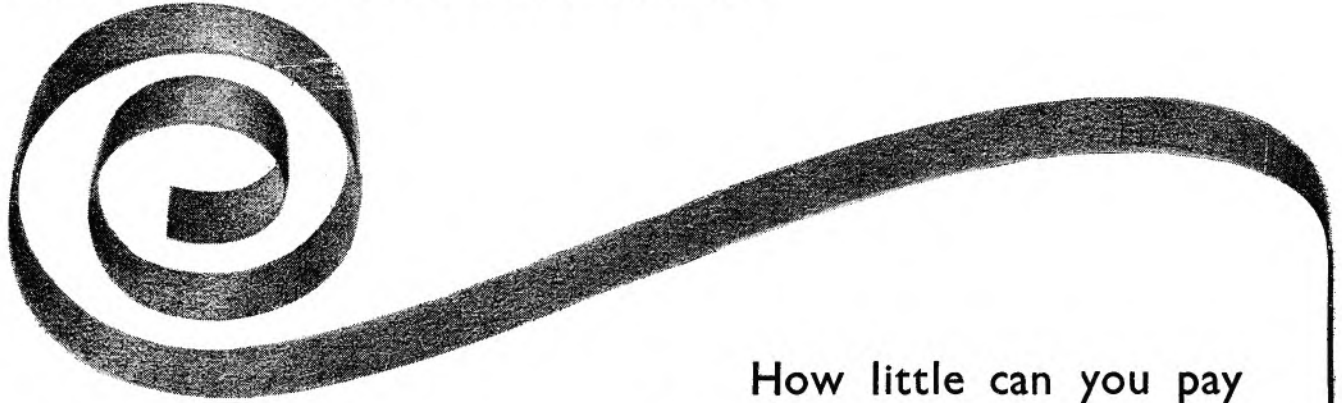
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Birds, Bach and Broadcasting

(concluded from page nine)

His mission? To record the calls and sounds of the Great Northern Diver.

On a still sea in a remote corner of Iceland he sailed towards eight small islands. There he found the nest and eggs of the rare and interesting bird he was after. The female was guarding the nest; the male was not in sight.

Dr. Koch set up his recording apparatus and waited. He heard no sounds other than those of the wind and the whispering grass. Alone he waited on through the long Northern night, never quite in darkness, never quite in full light.

He tested his apparatus. Always a faint humming obscured the other sounds as he replayed his tapes. This background hiss could have ruined the very rare calls he wanted to record. So he scraped and dug a pit through the loose earth and snow down to a depth of six feet. The noise disappeared; his tapes were clear.

After nearly a day's wait at about half past three in the afternoon the male bird appeared, inspected the nest where the female was sitting and proceeded to swim away.

It swam a little way out to sea, turned, faced Dr. Koch's little "hide" and uttered its eerie noise cooooo . . ee . . cooooo . . ee. Then it returned to be beside the female bird.

This little manoeuvre took place precisely to the minute of three-thirty. It was repeated, exactly to the minute, at half-hour intervals, until six o'clock in the evening when it stopped.

Asked to account for this Dr. Koch replied "I know of no explanation, ornithological or otherwise, to account for it. It was unique in my experience."

In this way the Great Northern Diver was recorded and its sounds made available to the thousands who regularly listen to Dr. Koch's broadcast talks.

Equipment Used

Since that time he has used more elaborate and highly technical tape recording apparatus.

He feels sure, however, that good—though not as yet perfect—results can be obtained by amateurs new to this field using modest equipment, providing a few simple facts are observed. He would not lay down any categorical "rules." "It is largely a matter of trial and error."

For instance, if you are recording bird or animal sounds in the open-air build a "hide" and make yourself scarce. Wait, exercise patience and you will be rewarded with sounds worth recording.

Use a moving-coil microphone and adjust its distance from the equipment and battery again by trial and error.



Adjusting and replaying tapes. Dr. Koch listens with an expert ear to the quality of the sounds he is recording

(In getting his tapes of the Great Northern Diver, Dr. Koch had his microphone one hundred and fifty yards from his main equipment. At that distance the results were perfect. Nearer the set he got much more interference.)

Try to get your microphone on the same level as the birds or animals. This may mean attaching it to the branch of a tree or burrowing down in a wood. Yet again experimentation is the answer.

These principles apply as much to the recording of birds as to his own experiences of recording wild life in the African jungle.

"The Golden Rule"

They apply just as much indoors as outdoors. Perhaps we might coin a phrase? "The golden rule is there is no golden rule."

All the same these hints should prove valuable whether you are recording the jackdaw in the garden or the pomeranian in the parlour.

For Dr. Koch would like to see thousands more enjoying the privilege of recording their own pets and enjoying his own life-long enthusiasm for ornithology and sound through the medium of the modern phonograph—the tape machine. He believes the day is not far distant when a really portable and cheap priced machine will make this experience even more widely known than at present.

It may seem a far cry from the Paris of the eighteenthies to a quiet suburb of West London today. Yet it is a journey Dr. Koch can remember in sound as well as mental image. It is an experiment in depth—depth of feeling as well as meaning.

Correspondence is welcomed
on all aspects of tape recording
and sound reproduction

A NEW AID TO EDUCATION



Boys of the Bloomfield Secondary School, Woolwich, listening to a tape recording of their school band

"Daily Mirror" photograph



A T.R. Magazine Special Correspondent introduces a series of articles on the way in which tape is changing our daily lives

AN average adult, called upon to perform in a broadcasting studio for the first time, feels a cold sweat forming on the brow. A normal child, offered a microphone, regards it as an exciting new toy; the young hand grasps it eagerly and confidently. This is fundamental to an understanding of the value of tape recorders in the class-room.

These machines are not, strictly, a *new* aid to education. Some teachers have made good use of them for the last seven or eight years; but in the last couple of years they have gained rapidly in popularity.

The government's credit squeeze has slowed the pace at which tape recorders are being added to the equipment of schools. Because their potentialities are not yet widely and fully comprehended, they frequently do not get as high a priority as other mechanical teaching aids—pianos, film strip and ciné projectors, epidiascopes, radios and gramophones.

In fact, the recorder is capable of wider use than most of these things. It is also cheaper to keep in use. The projector is of no value without films, nor the gramophone without records, and both are relatively expensive. But the recorder can use and reuse one spool of tape indefinitely. It is therefore among the most economical of all equipment to keep in daily use.



Less than half the nation's schools have so far been equipped with recorders. Some education authorities have a few machines kept centrally, for loan to schools as required; but this is never a satisfactory compromise. It is estimated in one county area near London that it will be eighteen months before purchase of equipment now enjoying higher priority is completed. But then, it is forecast, recorders will quickly become standard in all schools.

If this is a fair example, teachers have this period in which to familiarise themselves thoroughly with tape technique.

There is, it must be admitted, still a great deal to be learnt about the full and effective use of tape as a teaching aid. Some teachers who have experimented, have too easily discarded it after a trial period. This has been because its full potentialities and flexibility as a teaching medium have not been understood.

We found, for example, a case of a teacher who used a recorder for elocution lessons; but abandoned it because it could only be used effectively on an individual basis. With a class of forty, as she rightly argued, individual tuition was out of the question. But in fact, even with such large classes, there are many group activities for which the recorder is ideally suited.



The most obvious use of this equipment is for instruction in elocution. It is impossible for the most able teacher to convey to a child the exact nature of errors being made; and, equally, it is difficult for the child to believe he or she is making the errors attributed by the teacher.

With the aid of a recorder, the child, for the first time, hears himself or herself *with the teacher's ears*. There can be no subconscious resistance, on the "No, I didn't say that" pattern. The recorder reveals vowels off pitch, tricks of inflection, excessive speed, or slurring. The child becomes more self-critical.

Teachers with a special responsibility for backward children and with time for individual attention are able, for the first time, to *record* progress made. If individual recordings for each child can be taken and preserved, those with speech impediments are able to hear themselves as they were six months earlier; hearing clearly

Tape brings new life to the class-room

AND SOLVES OLD PROBLEMS FOR THE TEACHER

how they have improved, they gain in confidence and resolve.

Special techniques can easily be devised. A series of questions may be recorded, with intervals of silence in which children can be asked to supply answers. Over a series of lessons, by simple re-recording, the length of these gaps can be steadily reduced, as children's performance improves.

Such work is only done satisfactorily with smaller classes. What does the tape recorder offer to the teacher with a class of forty or fifty?



One idea which has proved popular is a school "radio-magazine"-type programme on tape. This can be built up from a rough script prepared by a class. It can include a series of brief items—a "girls' corner" lasting two or three minutes, a couple of minutes of a choir or a school band, an interview or two, some poetry reading, a commentary on a recent school sports event, a quiz session between two teams.

It has been found that even backward or problem children can be persuaded to join in; often they are keen to provide background noises and sound effects. Even with such a contribution, they get a feeling of taking part in a creative process.



Poetry readings can be extended into a complete lesson. A history newsreel may be recorded by dramatising some selected historical event. To assist self-expression, children may try dictating short essays on to tape, using only a few brief notes. Objections to this method readily spring to mind, but it usually leads directly to greater confidence, better marshalling of facts, and consequently to improved written work.

Similar results have been obtained by recording impromptu interviews between pupils, each taking it in turn to do the interviewing.

Plays, as well as poetry, can be recorded, and the standard of work shows distinct improvement with this

stimulus. One act can be recorded at a time, played back immediately as many times as desired, its faults discovered and discussed, and the poorer passages redone on the spot—either a whole scene or a single phrase. In this way, the highest possible overall standard is achieved and the finished result proves a real encouragement to those taking part.

Exactly the same method applies to music. Again, defects on particular passages are readily identified and analysed; the passages are recorded again, until the faults are eliminated.

Musical overtures and interludes or sound effects for plays can be taped in advance and worked in at the appropriate points.

If music is required for dancing lessons, the teacher can record a series of tunes in advance, leaving appropriate intervals of silence for verbal comment during the actual lesson. The machine can then be switched on to provide the necessary music, leaving the teacher free to concentrate on participation in the class activity.

(Continued overleaf)

Introduction to Electronic Circuits

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Here is presented in logical and concise development of thought, the fundamental principles of design and operation of the whole basic range of technically important electronic devices of the vacuum and the gas-filled type, and their application in practical electronic circuits. It has been written primarily for the student who wants an introduction to the subject, and will be of value to the research worker who requires to refresh his memory. It has been designed to meet an urgent need, for the field of electronic circuits and their practical application in research, tele-communication, navigation and industry has been growing rapidly in recent years, and existing textbooks are of too advanced a nature to be suitable for this purpose.

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TAPE IN SCHOOLS

(Continued from previous page)

Teaching of a very different type can be aided in the same way. The instructor who dictates passages for students practising shorthand can record them in advance, at the appropriate speeds, and can play the tapes during the lesson, remaining free to move about the room.

B.B.C. Schools broadcasts have greatly enhanced value in the school using tape. The broadcast can afterwards be analysed and discussed in an informed manner—the children speak as “professionals,” with microphone experience of their own. Then they go over the material again, recording their own version, experimenting with improvements they think they can make. The basic material is thoroughly assimilated—and many other valuable lessons learned incidentally.

All this is genuinely creative work. It forces the children into an active, rather than a passive, role.

It scarcely needs to be pointed out that foreign languages recorded on tape can play a most important part in linguistic instruction. A series of language courses is now available in this form.

Other ideas will occur to the teacher as the use of the recorder becomes familiar. Bird song and animal sounds may be recorded—an article in this issue offers Dr. Ludwig Koch's views on this exciting new approach to natural history. Typical sounds of farm and factory, of river and railway, can be taped for “atmosphere” in geography lessons. A remarkable experiment started in the United States and now spreading to other countries involves the exchange of tape programmes between schools; we hope to describe this scheme in detail in a later issue.

There are many incidental uses for the tape recorder in a school, apart from its value as a teaching aid. It can provide sound-track for films and film-strips, incorporating sound effects, music and commentary. “A typical day at school” programme can give parents a better idea of school work than any other form of exhibit on Open Days. Speech days and sports day, every important event in the school year, can be recorded for the school archives.

The ability to make sound recordings at any time with such ease, and to replay them immediately, is a revolutionary extension of educational technique. The day will not be long delayed when the tape recorder is as universal as the blackboard.

TAPE NEWS DIGEST

Tape cuts the phone bills

LONG-DISTANCE telephone calls will cost less for business concerns who take up an idea just devised by Grundig. Those who need to take lengthy reports over the 'phone will be able to reduce the length of calls by three-quarters.

The method has been used for trans-Atlantic calls with entire success. Full details of a month's American sales tour urgently required by an executive in London were transmitted in fifteen minutes—instead of one hour.

The message is recorded on tape at 1½ inches per second and played by magnetic induction through an adaption to the telephone at 7½ inches per second.

At the receiving end, the recording is made at 7½ inches per second and played back at the slow speed.

Thus, as well as squeezing four minutes of normal conversation into one minute, the message is effectively "scrambled" during transmission, and so given security protection.

Mrs. Cowdrey has Colin taped

IF you are a famous Test cricketer, away on a Commonwealth tour, newly married, and faced with decisions concerning the furnishing of your new home, how do you manage it all? The answer: communicate by tape.

That is the way England opening batsman Colin Cowdrey is keeping in touch with his wife while he is away in South Africa. And his messages recorded in intervals of cricket, are being replayed by his wife, and decisions being put in action. Shortly they will be reunited when Mrs. Cowdrey sails out to meet her husband.

Woman editor uses robot reporter

THE Matlock Mercury. Mrs. Ella Smith, owner, editor, reporter, advertising manager and sub-editor, has persuaded the local Matlock Council to let her cover their meetings by a trainee reporter and a tape recorder.

TAPE TITTER



Reprinted by courtesy of The Bulletin, Glasgow

The Council in turn has stipulated that all such recordings must be destroyed within twenty-eight days. Mrs. Smith plans to buy a second recorder to cover magistrates courts, political and public meetings.

She explains "I'm so busy I can't possibly get to all these meetings, so the meeting will be brought to my office." Mrs. Smith is confident that she knows the voices of local councillors so well that a wrong attribution is impossible.

Sermons on tape for the lonely island

TAPE recordings are likely to solve the church problems of North Ronaldsay (pop. 224), in the Orkneys. It has been without a resident minister since 1947.

Rev. D. Sutherland, in charge of the East church in neighbouring Sanday, has only been able to get across once since September, because of gales.

Orkney Presbytery at first considered the possibility of chartering an aircraft to fly in a minister. Later they decided to try and use tape. A rota of ministers to help Mr. Sutherland in the task of pre-recording services is being drawn up.

A problem remains. That of getting the recordings to Northern Ronaldsay—northernmost island of the Orkney group.

Terrier went to hospital—on tape

BUS driver Tom Slater is bringing favourite sounds and news to the bedsides of long-term patients in Preston hospital through the tape machine he saved for and bought himself. For instance, 16-year-old Bernadette Baines wanted most of all to hear her Irish terrier Peggy. Along went Tom; back came Peggy's bark.

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ARCHBISHOP BANS TAPE IN CHURCH

Watch next month for
CONFERENCES OR CORRESPONDENCE

How the big political parties, professional and trade associations, and Big Business use tape recording equipment.



MAKING FRIENDS WITH TAPE

The fascinating story of the growth of organisations to encourage the exchange of recorded messages between individuals and schools.



AND ALL THE USUAL FEATURES
Place a regular order with your newsagent

A CONTROVERSY about the use of tape recorders in church—now becoming increasingly popular—has been started by a ban announced by the Archbishop of Canterbury, Dr. Geoffrey Fisher.

Bracketing sound recording with photography, he declares that they are "likely to cause distraction and to interfere with the solemnity of the service."

The Chairman of the Association of Professional Recording Studios immediately protested that it was misleading to link the two things. He pointed out that recordings of marriages in church have been made all over the country, with the consent of the clergyman and the bridal couple, without anyone else present being aware of the fact.

The Archbishop's "directive" is officially said to be for the guidance of clergy in his own diocese. Policy in other dioceses is the responsibility of the bishops concerned.

But the Archbishop's lead in a matter of this kind may have wide influence.

His directive was issued in the following terms:—

"Permission is sometimes asked for photographs to be taken in the church during a wedding service, and also for parts of the service to be mechanically recorded. Cases have been known in which a photographer has taken such photographs without seeking permission.

"No photographs may legally be taken or recording made inside a church without permission from the incumbent.

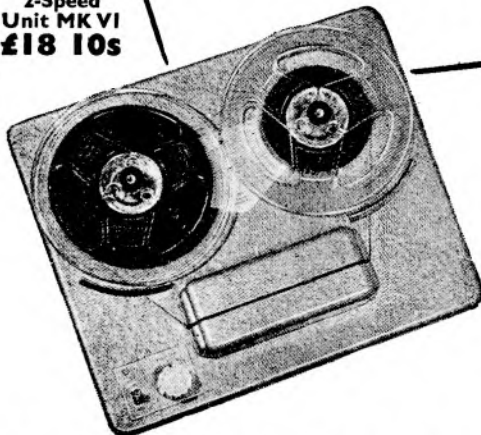
"The Archbishop considers that the taking of photographs or recordings during a service is likely to cause distraction and to interfere with the solemnity of the service.

"His Grace accordingly directs that no incumbent is to give permission either for photographs to be taken or for recordings to be made within a church during any service, except with the written authority of the Archdeacon, which will be given only in exceptional circumstances. He also directs that proper steps are to be taken and instructions given to the officials of the church to ensure that no such photographs be taken or recordings made by unauthorised persons."

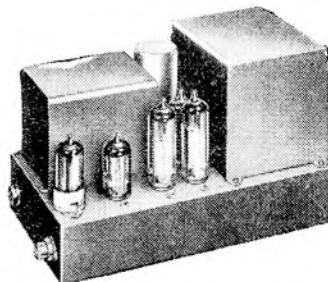
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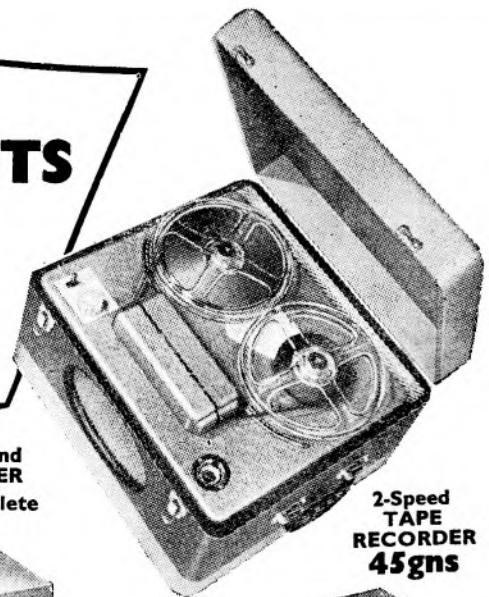
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A SPLENDID TEXTBOOK ON TAPE

The Gramophone Handbook, by Percy Wilson, M.A. (Methuen, 15s.).

THIS splendid new volume is an encyclopædia for all who are interested in high-quality sound reproduction. Mr. Wilson covers the whole field; but after we have passed logically through his fascinating preliminaries, over pick-ups and styli, turntables and amplifiers and loudspeakers, after we have benefited from his advice about planning a hi-fi system and installing and maintaining it, after all this we come to tape recorders and stereophonic reproduction as the climax of the book.

There is an encouraging photograph of Mr. Wilson before we start to read, showing him testing a tape deck.

Does he then, conclude, that the future lies with tape? If there can be any complaint against him, it is that he dodges a firm conclusion on this issue. He whets our appetite by reporting that a system of recording and reproducing by light rays is being developed and that other considerable advances are on the way, especially in the cheapening of production costs.

But he does not commit himself clearly about the future prospects.

About all that has happened in the past and about all current developments, however, he is expertly informed and a wise and discriminating guide.

Invaluable Advice

If you are thinking of buying a tape recorder, his advice about the minimum requirements you should demand is invaluable. If you have just bought one, he is a first-class mentor in its proper use.

While the bulk of the material in the book is factual, there are entertaining comments to enliven the narrative. Here is his description of what will happen when you get your new tape recorder home and use it for the first time:—

"You will pick up the microphone, set the machine to record and say a few halting words. You will soon come to a dead stop for lack of something to say and then, to relieve your embarrassment with the assembled company, you will proceed to rewind the tape and go on to replay. After the first few words you will be certain that something is wrong with the microphone or the recorder or both, because your voice

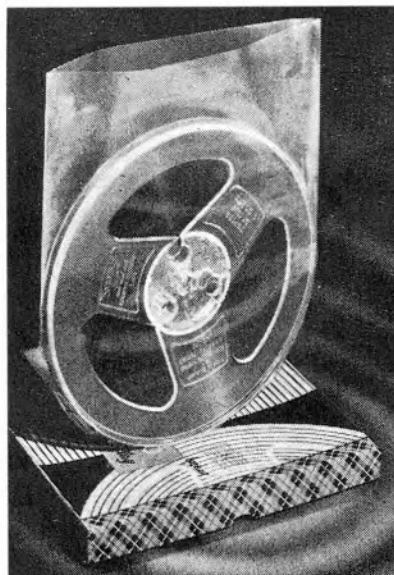


could not possibly sound so awful as that! Ask your wife. . . ."

The book contains an excellent glossary of technical terms and it fully justified the publisher's claim that it is "the most up-to-date and comprehensive handbook on modern developments in high fidelity sound reproduction that is available in any part of the world."

● GRIM NEWS TAPED

An enterprising garage proprietor at Epsom used his Grundig to provide customers with the latest, unhappy news about petrol rationing and prospects.



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Trade enquiries invited.



For the technically-minded, there is a mass of literature. But to the average man or woman buying a tape recorder, the contents of its smart, streamlined casing remain something of a mystery. This article makes it all easy to understand.

THE INTELLIGENT LAYMAN'S GUIDE HOW A TAPE RECORDER WORKS

THE simplest way to understand a tape recorder is to consider its operation in four distinct ways—the recording process, the play-back process, the tape transport mechanism, and the erase process.

RECORDING The user speaks into a *microphone*, which is simply a device which converts sound waves into corresponding electrical variations. The electrical output from the microphone being much too small to be used directly for recording purposes, it must be increased or amplified. The quality of the *amplifier*, which accomplishes this, is measured by its ability to reproduce

in amplified form at its output an exact replica of the small electrical variations applied to its input terminals.

The output from the amplifier is fed into the *recording head*. This consists of a ring of magnetic material around which is wound many turns of fine wire. Through this wire flow the electric currents which constitute the output from the amplifier. As the accompanying diagram shows, the metal ring has a small gap or slit in it.

Across and in front of this gap there exists a magnetic field, the intensity of which is proportional to the current flowing in the recording head winding and, therefore, proportional to the output of the amplifier. The tape moves in front of this gap and so through the magnetic field.

The *tape* is usually of a plastic material and is coated, on the side running nearest to the recording head, with a magnetic material. As each portion of the tape comes in turn under the influence of the magnetic field, it becomes magnetised; the intensity of the magnetisation is proportional to the strength of the magnetic field at the instant of passing the gap. Thus we have along the length of the tape varying degrees of magnetisation, corresponding to the current variations in the recording head winding.



PLAY-BACK To reproduce the recorded signal, the tape is passed in front of the slit in the *play-back head*. This is very similar to the recording head already described; in some tape recorders, in fact, a single head performs the dual functions of record and play-back.

As each portion of the tape passes the slit in the play-back head, it induces in the play-back head winding a very small voltage, the magnitude of which corresponds to the varying intensity of magnetisation of the tape. Thus, the voltage output from the play-back head is a replica of the voltage originally applied to the recording head.

This output is very small—smaller, usually, than that obtained from the microphone in the recording process. But it needs to be large enough to feed a loudspeaker, and so a greater degree of amplification is necessary during play-back than during recording.

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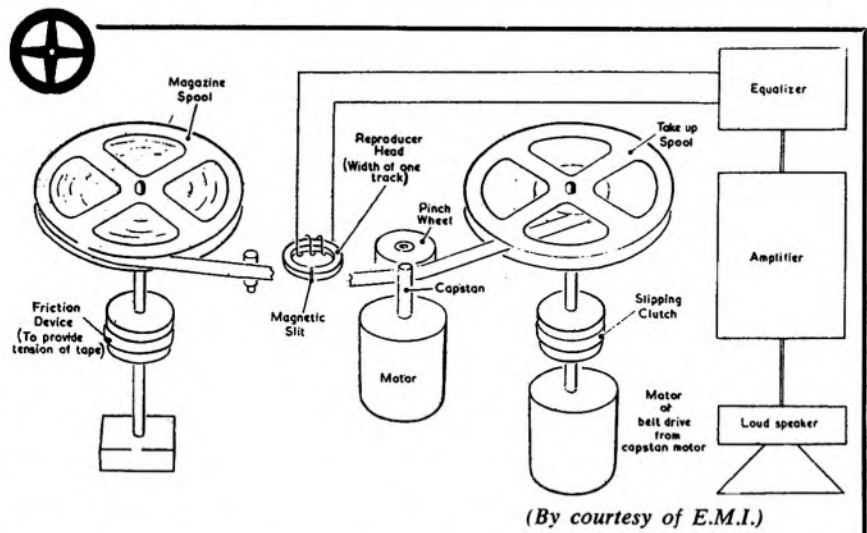
By
E. SWAIN
 A.M.I.E.E., A.M. Brit. I.R.E
 T.R. Magazine Technical
 Advisory Editor

The diagram shows that the signal passes through an *equaliser* on its way to the amplifier. The equaliser compensates for the non-linear frequency characteristic of the recording process; in other words, it ensures that the input to the amplifier on play-back is a true replica of the output obtained from the amplifier during the recording process. The equaliser, in fact, is usually integral with the main amplifier.

The output from the amplifier is now fed to a *loud-speaker*, the function of which is the reverse of that of the microphone—it converts the amplified electrical variations submitted to it into sound waves.



TAPE TRANSPORT The essential parts of the tape transport mechanism are two spools (the supply or magazine spool and the



(By courtesy of E.M.I.)




take-up spool), an electric motor or motors, and a braking system. The diagram indicates that the supply spool is on the left and the take-up on the right, so direction of tape travel is from left to right.




Most recorders have a four-position *switching arrangement*: record/playback; fast reverse; fast wind-on; and brake.


When the record/playback position is engaged, drive is applied to the take-up spool, either from a separate motor or possibly from a belt drive from the capstan motor. Often, a slipping clutch is incorporated in the drive to enable


the speed of the take-up spool to vary with the diameter of the wound tape.

At the same time, a friction device is applied to the supply spool, so that the tape is kept under tension and fed smoothly to the capstan. One of the most important requirements of a good tape recorder is constancy of tape speed, for variation mars the quality of reproduction. Technical terms used to express these speed variations (and familiar to all who have studied manufacturers' literature) are "*wow*" and "*flutter*"—the term used depending on
 (Continued on page 22)

I was conceived in the minds of two enthusiasts 
 and I grew up on a kitchen table  at the time when my world
 was young. They built and rebuilt me, as I evolved from the germ of
 an idea  into reality. Came men who saw and listened and said

"This we must build". They drew me  on paper
 and made me in metals;  they put power in my
 circuits and as they developed me so I grew over 6 long
 years, improved constantly, until I was no longer a fractions
 child but mature  and fit to face the outside world.

The enthusiasts who dreamed me and those who finalised and built me
 now say with pride "This is well done".  The voices of children,

the eloquence of oratory, sweetest of music, thunder of orchestra  — all this, and more — I give you.



Send for full details of the Truvox Tape Recorder R1 to :—

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 Technical and Service Dept., 328 Station Road, Harrow, Middlesex.

 NEWS FROM MANUFACTURERS

Notable year of progress in medium-price range



The Phillips and Bonson "Sinfonia" de luxe model, with Truvox Mark IV tape deck

THE year just ended has seen notable progress in tape recorder design in the medium price range. Those who want the quality that comes with machines in the £50 to £70 range now have a wide choice.

Truvox have produced a new tape deck (Mark IV) which is being used in their own R1 recorder and in de luxe versions of Phillips and Bonson's two machines. Collaro have marketed a new transcriptor deck which appears in several recorders, including the Elizabethan de Luxe from E.A.P. (Tape Recorders) Ltd.

Typical models from the season's lists are the following:—

The WYNDSOR REGENT (Magnetic Recording Co.) features a 10-in. elliptical speaker in the lid of the case, which is detachable. The speaker can thus be placed away from the recorder—a great advantage in, for example, ciné work.

Mixer inputs permit blending of speech and music and there is a monitoring device enabling one to hear signals applied to the record head. Speeds, 7½ ins. and 3½ ins. per second. Price, 54 guineas (with microphone).

* * *
The SINFONIA (Phillips and Bonson) is one of the smallest British recorders in its class (two-speed, 1,200-ft. reels, etc.) and many people will find this a great advantage. It measures 15 ins. × 13½ ins. × 8 ins. and weighs 35 lbs. There are separate input sockets for high-level and low-level inputs and separate switch positions to enable the machine to be used as an amplifier for microphone, gramophone or radio. The price is 66 guineas (with microphone).

* * *
The SONOMAG uses the Collaro deck, with three speeds (3½, 7½ and 15 ins. per

sec.). At the highest speed, frequency response is 40 to 16,000 cycles. As a portable machine, measuring 16½ ins. × 14½ ins. × 7 ins., it costs 48 guineas. But a Console model is also available in a contemporary cabinet of oak, mahogany or striped walnut finish and with a larger speaker. This costs 58 guineas.

* * *
The ELIZABETHAN DE LUXE also uses the Collaro deck and is the latest addition to the E.A.P. range. Connection between deck and amplifier is by "a patented control system." There are facilities for internal mixing of micro-

(Continued opposite)



THE SONOMAG PORTABLE

This portable tape-recorder has been specially designed around the wonderful Collaro three-speed transcriptor unit, the very latest in production technique. Its outstanding high-quality performance is able to attain professional standards, and is particularly suitable for reproduction of the excellent pre-recorded tapes now commercially available.

Complete with Collaro 3-speed Tape Transcriptor, Collaro Microphone, spare spool and 1,200 ft. of superlative "Mastertape."

Price 48 gns.

Also available in polished wooden fireside cabinet, finished walnut, oak or mahogany, with large 10in. speaker.

Price 58 gns.

ADAPTATAPE

is the name of the new SONOMAG Pre-Amplifier recommended to those already owning Hi-Fi equipment and wishing to add tape reproduction of the same quality. This is the **ONLY** pre-amp. at present available designed specially for the new Collaro Transcriptor, and rigidly fixed as a unit to it.

Demonstrations to all Hi-Fi enthusiasts of our pre-amp. used in conjunction with the Collaro Transcriptor Tape Unit, Collaro Transcription Motor, Leak Dynamic Pick-up and Diamond stylus, Leak Trough-line F.M. Tuner, Wharfedale Baffle 3-speaker system and Leak main amplifiers, will convince you of the fine standard of recording possible. Day, or evening (by appointment). Price 32 gns.

(Power pack, if required, 4 gns. extra)
Fitted into Fireside Console cabinet, oak, walnut or mahogany finish, 49 gns. Leaflet on request

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- Jackson Radio, 163, Edgware Road, W.2.
- London Radio Supply Co., Ltd., Balcombe, Sussex.
- Quality Mart, 8, Dartmouth Park Avenue, N.W.5.
- Readings Music Stores, 11, Station Approach, Clapham Junction, S.W.11.
- Sound-Tape-Vision, 71, Praed Street, Paddington, W.2.
- Woods Radio, 198, Lavender Hill, Clapham Junction, S.W.11.

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2 St. Michael's Road, Stockwell, S.W.9
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THE UNDER-40-GUINEAS BATTLE IS ON

“Joysticks” simplify control

A NEW NAME ENTERS THE FIELD



The Walter 303

THE battle is on—the battle for the mass market for tape recorders. The aim is a simple, efficient machine at modest cost and, for the present, the ambition of competing manufacturers is to get their recorders to the customer at something less than forty guineas apiece.

Now a new name to the general public—comes into the picture. Walter Instru-

ments Limited, of Morden, Surrey, announce their “Walter 303” at 39 guineas, complete with microphone and tape.

This firm, in fact, has ten years’ experience in the field, having made machines for export and for sale under other names.

With the appearance of the “303” the simple “joystick” control takes another jump forward in popularity. No one could go wrong in operating this neat recorder, for it has only two controls.

One is the “joystick,” which can be moved to positions giving recording, play-back, fast forward and fast reverse.

FOR THE TECHNICALLY- MINDED

Output, 3 watts.
Speaker, 9 ins. x 5 ins. elliptical high-flux.

Signal/noise ratio, better than—35db.
Frequency response, 40 to 10,000 cycles.

Tape speed, 3½ ins. per second, twin-track.

Microphone, crystal desk type.

Magic Eye

The other is a ten-position volume control and “magic eye” recording level indicator, which makes it easy to secure the right sound level.

The “303” is a single-speed machine, at 3½ inches per second, with twin-track, giving up to one hour’s recording per tape.

Provision is made to connect the “303” easily to a radio or amplifier to secure greater volume on playback; but its own high-flux speaker is claimed to give volume “great enough to fill a medium-sized hall.”

The machine is housed in a two-colour case measuring 13 ins. x 10 ins. x 8 ins. It weighs 19 lbs. and may be regarded as a lightweight portable.

POLYTHENE PROTECTION FOR YOUR TAPES

POLYTHENE bags are now available for tape. They are specially shaped at one end to fit the spool. They are the neatest, cheapest way of protecting magnetic tape from atmospheric changes, dust and dampness.

For seven-inch spools, they cost 2s. 4d. per dozen. Other sizes are available on request from Swains Papercraft of Buckhurst Hill, Essex.

Prince Products Move Office

Messrs. A. Prince Industrial Products Ltd., have moved into new and larger premises at 34, Marylebone High Street, London, W.1. (Telephone HUNter 0437/8) and are continuing from there distribution of UHER tape recorders.

Progress in medium-price range

(Continued from page 20)

phone and gram inputs, and there are outputs for external speakers, headphone monitoring and a feed for an external hi-fi amplifier. With moving-coil microphone, 1,800 feet l.p. tape and a radio-gram interconnecting lead, the price is 65 guineas.

The VERDIK tape recorder costs 45 guineas and has speeds of 7½ ins. and 3½ ins. per second. There is provision on inputs for mixing speech and music and a monitor socket for use with headphones or for feeding into an external amplifier. The price includes a crystal microphone. Verdik also make a 10-watt push-pull ultra-linear amplifier and pre-amplifier.

“Tape a necessity for the blind”

BLIND people are among other groups making increasing use of tape in their activities. Reporting this to *T.R. Magazine*, Tom Parker, London and Home Counties area organiser of the National League of the Blind emphasised his own personal experiences.

“It all started about five years ago,” he said. “I bought a tape recorder as a toy and gradually I found that it had become a necessity. Like so many other ideas in the modern world they start as toys and become necessities.”

He corresponds on tape with blind people in many different parts of this country, in Berlin, and particularly America.

Through the National Federation of the Blind of America he is able to dispatch tapes to blind persons there. He reports on aspects of British social life, local government, political happenings, and plays music sometimes.

The Americans in turn send him equally interesting replies. Recently some friends stationed at Uxbridge dropped in to see him. He played them a tape he had received from Wisconsin. One of the friends happened to come a few miles from there. So Tom made a tape and dispatched it to the boy’s parents who promptly replied by tape:

A small world? Even smaller on tape.

THREE MORE FOR MODEST PURSES

JOYSTICK control is also featured in two under-forty-guineas recorders marketed by Tape Recorders (Electronics) Ltd.

The “Playtime Plus,” at 35 guineas, is advertised as “the smallest lightweight in the world”—its dimensions are 12½ ins. x 10 ins. x 5½ ins., and it weighs only 16 lbs.

It records for one hour on a single spool, and a microphone is included in the price.

It’s “cousin”—the “Sound Cadet” at 39 guineas—is the same size and weight, but gives ninety minutes recording time with L.P. tape.

A third manufacturer competing in the low-price range is, of course, Philips, whose “Recordergram” at 39 guineas is now familiar to tape enthusiasts.

THE BRITISH AMATEUR TAPE RECORDING SOCIETY

is a non-profit making body of tape enthusiasts in all parts of the British Isles

Personal membership 10s. per annum. Affiliated membership for public bodies £1 1s. per annum

Details from

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Warwickshire.

WTP representative in Great
Britain.

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Address

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T.R. MAGAZINE SERVICE

- ★ **ADVICE BUREAU** The full resources of T.R. MAGAZINE are at readers' disposal. Queries on any aspect of tape recording and reproduction should be addressed to The Advice Bureau.
- ★ **AMATEUR TAPE ORGANISATIONS** We hope to become the recognised source for news of the activities of all the organisations in this country catering for tape enthusiasts. News should be sent to The Editor by the 15th of the month preceding publication.
- ★ **LETTERS AND IDEAS** Letters for publication and ideas for future issues will be welcomed. Manuscripts or articles and illustrations should not be sent without a preliminary letter.
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All matters dealing with advertisements, postal subscriptions, and distribution, must be dealt with by letter. Readers communicating with us on other matters may use tape, if preferred. The address for all editorial and advertising communications is: 426, CAMDEN ROAD, LONDON, N.7.

HOW A RECORDER WORKS

(Continued from page 19)

the number of times per second momentary speed variations occur.

The constancy of tape speed is determined by the capstan, against which the tape is pressed by a pinch wheel. To achieve uniform speed, the capstan must be machined to a high degree of accuracy.

Most modern tape recorders have at least two tape speeds, 7½ inches per second and 3½ inches per second being the most popular. Other things being equal, the higher the tape speed the better the quality of the recording.

To return the tape to the starting point for play-back after a recording has been completed, the tape must be rewound on to the supply spool. To facilitate this, the "fast reverse" position is provided. Drive is applied to the supply spool so that it rotates at high speed in the reverse direction to that in which it moved during recording and play-back. At the same time, the take-up spool is allowed to run free and the tape is released from the capstan drive.

The "fast forward" position enables any particular point on a recorded tape to be reached quickly. The take-up spool is driven at high speed, while the supply spool runs free and the tape is again released from the capstan drive.

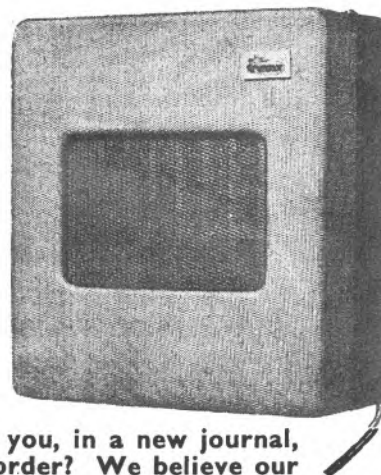
In the brake position, the tape is released from the capstan drive and both spools have braking forces applied to them. It is essential that both spools are stopped simultaneously; there is otherwise a risk of slack tape being thrown off.

* * *

ERASE To erase a recording from a tape, it is subjected to a magnetic field powerful enough to obliterate completely the recorded signal. The preferred system is that in which the tape is subjected to a changing magnetic field of diminishing intensity, so that it emerges from the field in a completely unmagnetised state.

In most cases, a separate erase head is used for this purpose.

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54 gns.

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