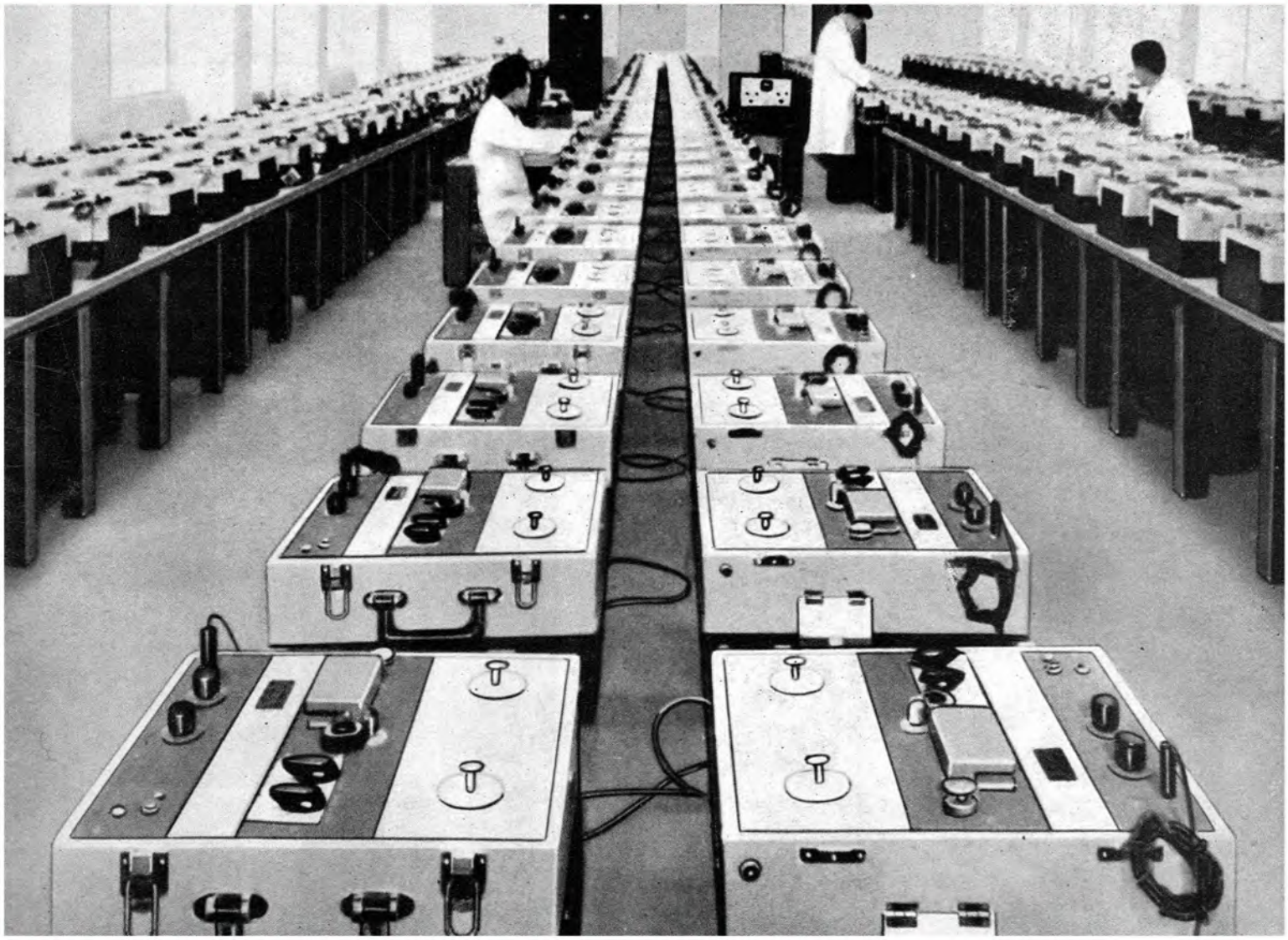
TAPE

RECORDING MAGAZINE

AUGUST 1962

1/6



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POPULAR RECORDS ON TAPE

(Special review page 16)

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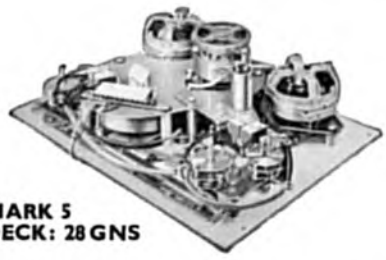
Mere illustrations can only show the functional appearance of these machines but a practical demonstration will reveal the realism and beauty of recorded sound obtainable from a Brenell. Ask your specialist dealer for a demonstration and you will hear what we mean.

All Brenell tape decks are fitted with an hysteresis synchronous capstan motor with an outer rotor and a large statically and dynamically balanced flywheel. This drive system is widely regarded as the most efficient for use in tape recorders. "Wow and Flutter" are reduced to below 0.1% at 7½ ips.

A NEW DEVELOPMENT FROM BRENELL

THE MK 510 DECK

This new introduction is basically the same deck as the Mark 5 but modified to take 10½" N.A.B. as well as standard spools. All other features remain as before. It is available in hammered gold or hammered grey finish and is supplied for use on 200/250V 50 c/s mains only. The additional cost is 7 gns.



MARK 5 DECK: 28 GNS

MARK 5: 64 GNS

MARK 5 TYPE M: 88 GNS

Brief Specification—Mk 5 Deck

Four recording speeds 1⅞, 3¾, 7½ and 15 i.p.s. • 3 independent motors • Interlocked controls • Pause control • Digital rev. counter • Fast rewind (1,200ft. in either direction in 45 secs.) • Provision for additional heads • 8¼in. reels accommodated.

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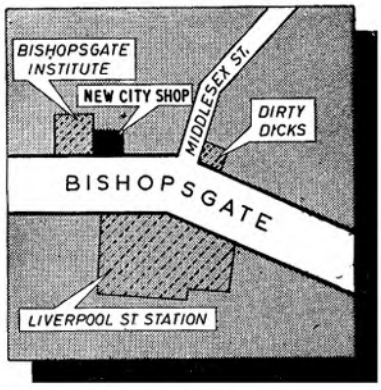

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Wide Frequency Range: Equipped with a record/play head which consists of specially treated core-materials being imported from West Germany.
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Index (Revolution) Counter.
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Monitoring and better reproduction: Monitoring of your recording may be accomplished by plugging a crystal earphone into the recorder's Output Jack. Superb reproduction can be obtained by operating a large Hi-Fi speaker direct from the Output Jack. Also your existing power-amplifier that does not have a pre-amplifier of its own may be driven from the same Jack.
Head Output and three position Power Switch: If desired, the tape transport mechanism (tape deck) of the recorder can be operated independently of the built-in amplifier and speaker. The Head Output Jack and the three-position Power Switch are provided to make this special function possible.

Retails at 79 GNS.

MODEL M6

Records and plays back either 4-track stereophonically or 4-track monophonically and also plays back 2-track prerecorded stereo tapes. Hysteresis Synchronous Motor always ensures constant tape speed. Designed for vertical or horizontal operation. Two inline and accurate V.U.-Meters reads recording and playback levels.
A precision Index Counter. Recording/play head consists of specially treated core-materials which are being imported from West Germany. Maximum output power of the built-in amplifier is 6 watt on each channel (total 12 watt) which can drive up to 12 in. extension speaker system.
Dual Head and Preamp Outlets are provided for connection direct to any other pre-amplifiers or stereophonic amplifier.
Instant Stop Lever. All operating controls are interlocked.
Automatic stop device.
The pinch wheel is always automatically released from capstan which protects it against a "spot" on the soft rubber surface causing uneven running.

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HI-FI WIDE RANGE STEREO SPEAKER SYSTEM MODEL SS-50

Matched with the Model M-6 in styling and size, complete with connecting cables.
Speakers: Two 8-inch mechanical 2-way (with built-in coaxial tweeter) speakers in a dividable carrying case.

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Akai's new modern factory in Japan, where the finest equipment is produced under the most up-do-date conditions.

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**Due to trade agreements Akai are sold under the name of Roberts in the U.S.A.*

For descriptive literature and full information of the Akai Terecorders contact your usual dealer or
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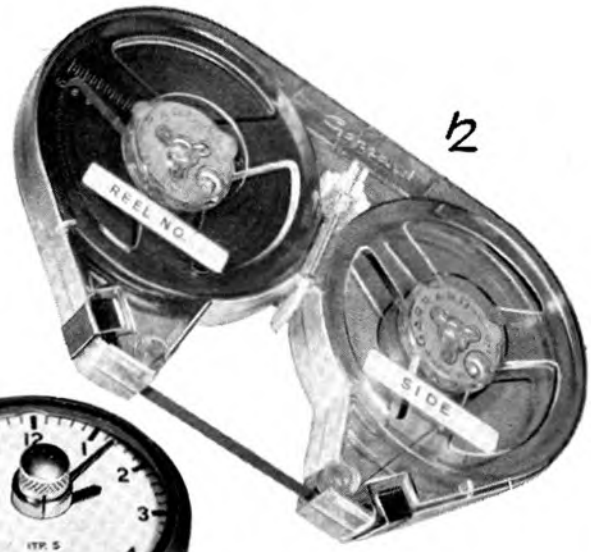

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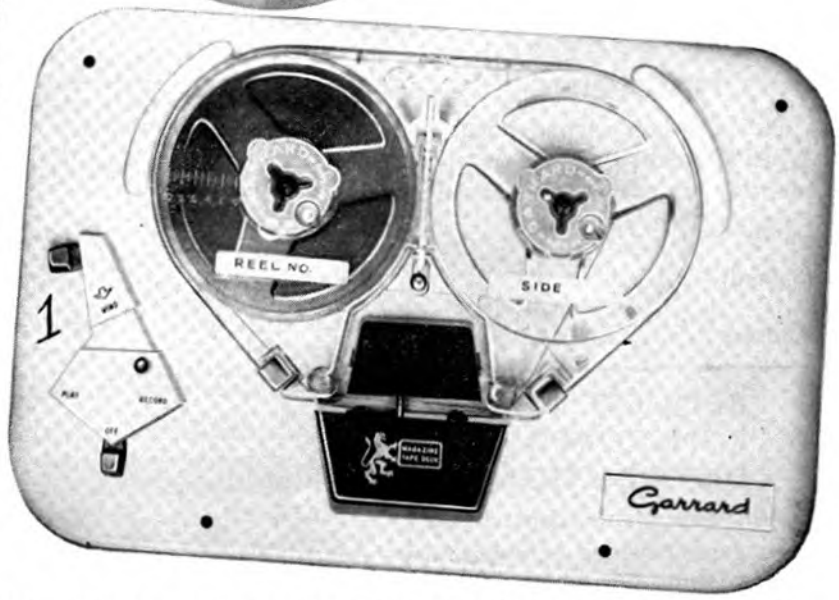

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Anyone can operate the Garrard system. Controls have been simplified. There are three positions only—PLAY · RECORD · WIND.

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Tape Position Indicator	1	19	6

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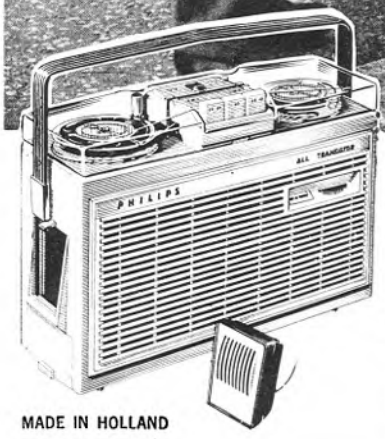

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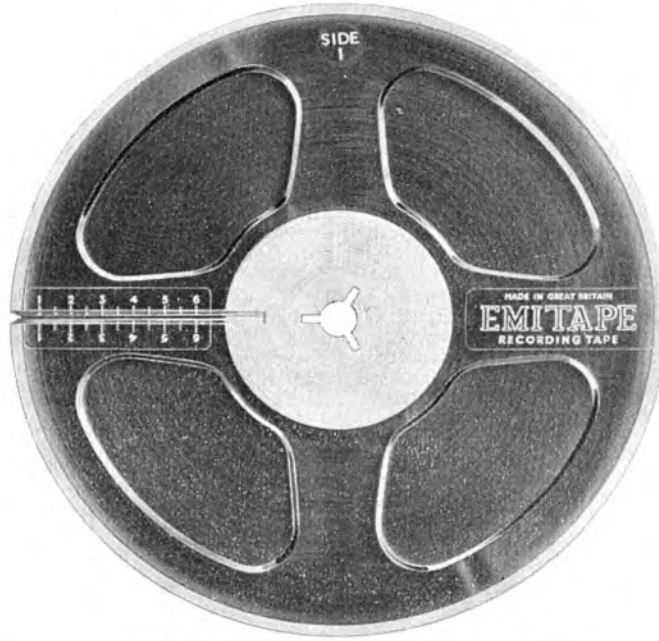

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Emitape 100 *was* hard to get. So many people wanted it. And this is the reason for the big demand. Emitape 100 gives twice the normal playing time, superb frequency response, minimum head wear—in fact, the best results for low-speed operation. The same research that produced Emitape for Video Recording (the most difficult tape of all to manufacture) also produced Emitape 100. Which means that Emitape 100 doesn't just make big claims. It keeps them.

Today, new production techniques are turning it out in even larger quantities. So although it's still wanted (more and more), the search can be called off. Emitape 100's everywhere—*now*.

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TAPE RECORDING MAGAZINE

Vol. 6 **No. 8** **August 1962**

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COVER PHOTOGRAPH: An impressive view of the workshops of the Akai Trading Company Limited in Japan. This Tokyo firm has recently introduced two recorders, the Terecorder M-6 four-track three-speed stereo model, and the De-luxe 69, two-track, two-speed model. Further specifications are given in the advert on page six.

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EDITORIAL

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R. DOUGLAS BROWN

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THE EDITORIAL VIEW

BY the time these words appear in print the judging of the entries in the 1962 British Amateur Tape Recording Contest will be well advanced. We shall hope to announce the full list of prize-winners in our next issue and the presentation of prizes and the customary celebrations will take place in London on Saturday, August 25.

I am in no position yet to offer any comments on the quality of this year's entries, but I can say that their number has not shown the expected increase. Recordings of music or speech are most numerous; the documentary/reportage, compositions and actuality classes run neck-and-neck in popularity; and "technical experiment" seems to have intimidated most people.

There has been a welcome, but small, increase in the number of club entries, but a disappointing response from the schools.

The new category for "performing talent," in which the recording is incidental and the judging will be of the performer, has attracted a fair entry—about a quarter of the total tapes received.

* * *

NOT for the first time, it is borne in on me that the development of the clubs, of tape recording activity in the schools and of creative recording in general has not gone forward in the last two years as rapidly or as widely as might have been wished.

Our readers will know that the main emphasis in this magazine has always been on the possibilities of creative composition on tape—on tape recording as an art form. It is to serve this end that the British Amateur Tape Recording Contest was established. We know that it has played a valuable part.

We know, too, that a number of manufacturers have taken the closest interest in developing creative tape recording. Others, we regret, have appeared to give little thought or encouragement to their customers once the money for their products have crossed the counter.

We repeat the view which we often expressed here before; that there is a need today for a quite ambitious co-operative campaign by all concerned with the promotion of tape recording. Not enough is being done yet.

* * *

IT can hardly be said that the publishers are not doing their bit. Another two volumes in the now unending stream of works on tape recorders and recording have just dropped on my desk. I have read with special interest Norman Paul's slim but useful volume, *You and your Tape Recorder*, a Foyle's Handbook selling at 4s.

Since Norman won the 1960 British and International Recording Contests with his magnificent tape, *The Rest is Silence,* he has become an acknowledged and expert guide to others who seek to emulate his example.

His book covers the whole field: it is another simple guide for laymen; but it is almost certainly the most modestly-priced on the market and it can be recommended as extremely good money's-worth.

Owners of Philips machines will want a copy of Frederick Purves' new *The Philips Tape Recorder Book* (Focal Press, 13s. 6d.). This is a thoroughly comprehensive guide, on the same lines as the earlier books covering Grundig and Walter machines. Comprehensive data sheets for the five models in current production are included. Much of the other material in the book is, of course, of general application.

* * *

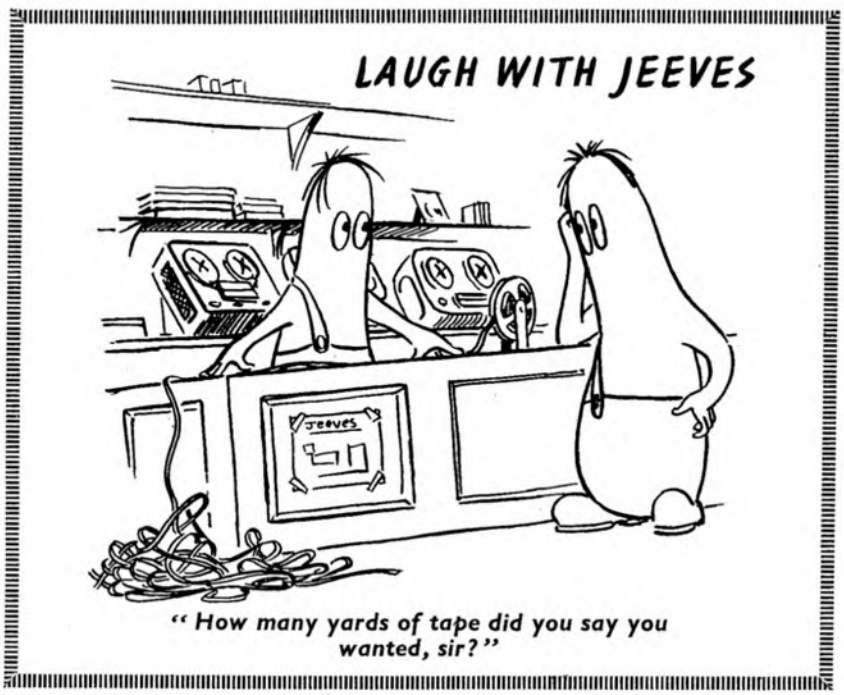
ACCORDING to an article in the *Financial Times* recently, "the days of the shorthand secretary are clearly numbered" and all because of tape. One firm which makes office dictating machines has pointed the way by limiting the use of personal secretaries to its top three executives only.

"Few executives require a personal secretary . . . it's just a status symbol," says this firm.

Instead you have either a dictating machine on your desk or, better still, a link with a centralised dictating unit. In such a unit "slave" recorders are controlled by the internal telephone system. These elaborate systems may cost anything up to £10,000 and E.M.I. have decided to make their models available on a rental basis.

What an old-fashioned reactionary I feel after reading all this: I have a dictating machine *and* a secretary!

THE EDITOR



"How many yards of tape did you say you wanted, sir?"

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The case for more power

The Audio Division of Aveley Electric Ltd., has produced a bold statement of amplifier design policy which raises issues of widespread general interest to stereo enthusiasts. We are therefore, reproducing it in full as a basis of discussion.

ONLY a few years ago it was considered that amplifier power of the order 10-20 watts maximum undistorted output was adequate for all domestic purposes, and even for small halls with quiet audiences.

The amount of power required to reproduce at realistic volume a given combination of musical instruments will obviously depend upon the efficiency of the loudspeakers used. With high efficiency loudspeakers, for example, less power will produce the same sound.

The power required will depend also upon the frequency range which is reproduced and it is well known that the double bass and organ on single notes may call for more power than a combination of several other instruments. A single heavy drum beat may demand an instantaneous peak of power hundreds of times greater than the average.

With the advent of stereo, and the need to live with two loudspeakers instead of one, it was generally recognised that loudspeaker cabinet sizes must be drastically reduced. After years of telling the public that large boxes were necessary for nice noises, manufacturers have had to produce arguments, as well as designs, for small boxes.

NEW TECHNIQUE

A widely adopted technique has been the use of heavily damped and even hermetically sealed cabinets with loudspeaker designs having natural cone resonance well below audibility.

The result is uniformly *low* efficiency through the audio band and an immediate requirement for greater amplifier power to produce the same volume of sound. Such speakers are already widely used in America where the average amplifier power is 30 watts and 50 to 60 watts per channel is not considered excessive. The same trend in this country is already evident.

A few years ago the dynamic range recorded on the discs of that day was little more than 45 dB. Today, the latest discs boast 60 to 65 dB. This means that the quiet passages are quieter, calling for lower noise levels in both disc and equipment, and the loud passages are louder, calling for greater reserve of power handling capacity both in the amplifier and the loudspeaker if momentary but unpleasant distortion is to be avoided on peaks.

A mere 6 dB increase in dynamic range is equivalent to a 100 per cent increase in peak power, if we assume that the average is the same and that the increase in dynamic range is divided into a *reduction* of the low levels by 3 dB and an *increase* of the peak levels by 3 dB.

If we now allow only a factor of two for "modern" loudspeaker efficiency and another factor of two for increase in dynamic range, then the 10 watt amplifier, which *was* adequate, must *now* have 40 watts. The factors are by no means generous, and the latest prerecorded tapes and "doctored" discs can certainly justify the American trend towards 60 watts per channel in a stereo system. Which is only a further factor of three beyond our allowance above, which is for a monaural system.

FINAL PROOF

The final proof, of course, is in the listening, and the most frequent comment made by those who have listened to our "Stereo 70" (35 watts per *channel* —70 watts total) or our "Mark IV" 30/40 watts monaural amplifiers, has been upon the smoothness and complete freedom from those things which make people wince during the audition of inadequately powered equipment on the latest recordings.

For these reasons then, we are not producing Avel amplifiers aspiring to the highest standards, with powers of less than 30 watts since they would be immediately obsolescent.

Many customers have asked us for toroidal transformers for EL84s and similar 10/15 watt output valves. We could produce them, but they would cost little less than our 30 watt transformers, so that we see no reason for their production. We can and will supply output transformers using normal high-grade laminations for EL84 etc., and while these do not have the special advantages of the toroid, we know from comparative measurements we've made, that they are still better than any similar transformers available on the market. The successful "filter design" formula, developed for our toroids, has been applied with advantage.

STRONG LINK

When the rest of the equipment, including the pre-amplifier and main amplifier up to the output stage, costs so much, the increase in price for a higher power output stage is a small part of the total. In our policy of high power, the final amplifier will remain one of the strong links in the chain for years to come.

Finally, we believe that the transistor is likely to displace the valve for powers up to 10 watts or so, and the tendency here will be to dispense with the output transformer altogether, or to use a compact auto-transformer. This technique we are investigating, but nothing is likely to be available until it has been thoroughly developed. We believe the high power valve type amplifier will enjoy many years yet before it succumbs to the semiconductor.

A NEW BOOK FOR THE DO-IT-YOURSELF ENTHUSIAST

Cabinet Handbook. Published by Wharfedale Wireless Works Ltd., Idle, Bradford. Price 7s. 6d. 112 pp., 94 illustrations.

IT is very easy for the designer of a loudspeaker enclosure to write laconically, "Use ¾ inch chipboard or similar material, all joints to be airtight". Unfortunately, it is not so easy for the home constructor to translate the drawing into an acceptable piece of furniture. In his latest book, G. A. Briggs offers invaluable advice to those who wish to combine utility with a certain amount of elegance.

Two-thirds of the book is devoted to materials, methods of construction and the use of sound absorbing materials, including a valuable section on veneering and polishing. Commercial methods of cabinet making are described and tips given to enable the reader to adapt them for his own use.

The remaining third deals with recent developments in loudspeakers, and gives working drawings for domestic and public-address enclosures ranging in volume from one to five cubic feet. The majority of the designs use a distributed port in the form of a series of narrow slits cut in the back of the cabinet. The advantages are that the size of the cabinet is very much less than that required for a reflex enclosure, the tuning is not so critical and the "closed box" resonance is virtually eliminated.

Inevitably, when producing a book of this size, the problem is what to leave out. It seems a pity that the title was not interpreted in its broadest sense and a chapter included on the layout and ventilation of equipment cabinets.

This is a well-presented paperback printed on excellent paper and should appeal to the audiophile who needs well tried designs and the encouragement to attempt them. Many wives will also find it useful as a practical kind of broad hint to give to their husbands.

PETER MILTON.

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* **5" REELS**
  Up to 8 hours playing on one tape.

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50 — 11,000 cps at $1\frac{7}{8}$ ips
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50 — 22,000 cps at $7\frac{1}{2}$ ips

* Concealed power unit combines unique mains system and re-charging device with built-in safety switch.
* The Only Tape Recorder On The Market with an accummulator which can be re-charged by a car battery.
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DOWN ON THE FARM

SPECIAL ASSIGNMENT

By Denys G. Killick

WHEN a request arrived from **Mr. John Dearing** of **Highgate** for me to describe a day's recording activities down on a farm I was delighted at the prospect. What could be better in late Spring than a day spent in the heart of the country with countless new sounds freely available and just asking to be recorded?

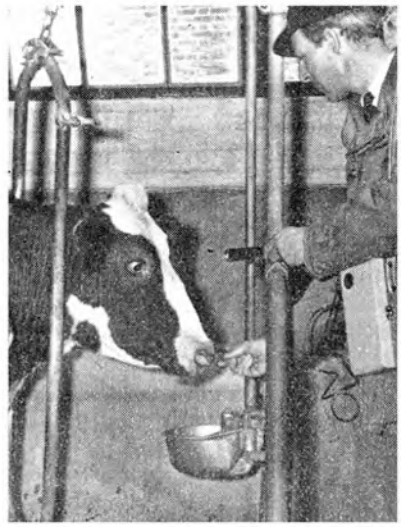
With keen anticipation I made my arrangements, checked over all the equipment and began to watch the weather forecasts rather anxiously.

The morning of my trip dawned grey and cold. A Force 7 gale was lashing the rain against the windows of my London flat. The idyllic picture condensed into the horrifying reality of acres of sticky mud; a few sodden dejected animals cowering in a windswept corner of a vast and very open field.

Such a situation calls for an immediate decision. Knowing it might prove difficult to make alternative arrangements for another day I reluctantly made up my mind to go ahead and began to wonder where I had last put my gum boots.

The Hall of Holyfield Farm is an historic residence only thirty minutes' drive from Central London. The estate existed in the days of Richard I and the present house is at least four hundred years old. When I arrived with my assistant the rain was spitting viciously back at us from the well-kept farm road, and the ancient trees were swaying in the gale. A quick dash from the car brought us to a massive oak door to be welcomed by Mrs. Craven, the farm manager's wife.

Mr. Craven himself proved to be a delightful personality anxious to do all he could to be of assistance to us. It was obvious that recording out-of-doors would be impossible. One has to be very careful to avoid getting portable equipment wet and there was no sign of a break in the rain. Even had it stopped the force of the wind would have seriously interfered with the microphone. Any recording would have to be done under cover and so I started right away on my interview with the farmer himself.



Readers suggest the recording assignment and if they wish, the equipment to be used. Killick does the job and reports on the problems encountered and the way they were solved. Let him have your suggestion for his next assignment

When conducting an interview I very much prefer to have some basic knowledge of the subject. At this point, however, I knew nothing whatsoever about Holyfield Farm. My questions and their answers followed rapidly as I learned what stock was carried on the farm and what animals could be located under cover.

I discovered that the farm comprised a mixed dairy farm and arable holding with about one hundred and eighty head of cattle. The weather would prevent any recordings being made out in the fields, and most of the cattle were out, apart from some calves and a few "special cases." The milking would take place about three o'clock in the afternoon, but apart from that it seemed there would be very little indeed to record. Nevertheless, I had made a start with my interview and nothing daunted prepared to make a trip around the outbuildings.

It was here that our luck changed. We were in what for want of better words I can only call the maternity ward. In one pen was a docile, soft-eyed cow. Lowing gently she licked at a new-born bundle of fur at her feet on the litter. She paused as I opened the door of the pen and looked at me with trusting patience as I walked right in beside her. The calf whimpered and she at once returned to the task of attending to him, giving me an excellent recording.

This is typical of a sound needing explanation. With the picture in my mind of that new-born calf the recorded sounds bring back the scene vividly—but only because I'm aware of what was taking place. From the recording itself there is nothing to indicate the event, and the sounds might well be those of a cow, or, indeed, any other large animal licking a lump of salt. At the same time I was very pleased with my recording because the sounds were a genuine presentation of an occurrence I had not before experienced.

Being so engrossed with the mother and her infant I hadn't stopped to look in the other pens. The calf we had been recording must have been delivered only a few minutes before we arrived, and now it was only too obvious that we were about to witness and record an actual birth itself.

There was very little sound. The birth was all over remarkably quickly and quite soon the cow was up on her feet tending to her offspring's toilet in just the same way as the earlier one. It was very touching to see the young calf's first faltering footsteps as he hauled himself up on his feet only to fall back on the litter a couple of seconds later. It was all so engrossing that I forgot about the weather until the head herdsman came hurrying in to get out of the rain.

This gave me an opportunity for my second interview, and in spite of the appalling conditions I began to feel that the whole trip had been well worthwhile. The herdsman told me a lot about the management of the animals from his point of view, and when I expressed surprise that a cow should be allowed to calve completely unattended he gave me a knowing smile and assured me that he knew exactly what was going on. Later Mr. Craven told me that this man could identify every individual animal on the farm, even at a distance of several hundred yards across the fields.

Typical of the reserved countryman I felt quite sure that his whole life was wrapped up in caring for his herd, and this was the feeling I tried to bring out in my interview. I probably failed to do so adequately on account of his natural reticence; he wasn't shy of the microphone but he was far too modest. He told me something about the mechanical milking system.

There is a very real danger of accepting too literally the explanations of events, even from the men who do the job. There is no doubt the herdsman knew all there was to know about his milking machines, but I could easily have gone away with a completely false impression of what was to take place later in the milking parlours. His reference to "electric" milking machines coincided with my own ideas and so I didn't press the point any further.

Later in the afternoon, the cows came stolidly down from the grassy slopes at the rear of the farm, pausing only to return with baleful eyes my own, inquisitive stare. Inside the milking parlour all was efficient activity. The four cowmen dressed in spotless white aprons

(Continued on page 24)

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"POP" TAPE ISSUES BY E.M.I.

FOR the first time, tapes of outstanding pop artists are now on the market at roughly the same price as the equivalent disc LP. E.M.I. has issued sixteen 3¾ ips mono tapes of some of its best-selling pop albums. Monthly releases start in September.

All these records are outstanding sellers as discs. They have been issued on tapes for that reason. Here Don Wedge points out some of the reasons for their success.

He found the recording standard good throughout. Packaging was superb—with two minor objections: tapes might be further protected by plastic bags; and two of the leaders parted from the main tapes. The boxes have colourful tops based on the record sleeve design and there are comprehensive title listings on the bottoms, making an object lesson in presentation.

THE YOUNG ONES film sound track. Cliff Richard, the Shadows. TA-33SX 1384 (*35s. 0d.*).

"The Young Ones" is the most successful musical film to come from British studios. The banality of its story was forgotten in a blaze of colour, fast-paced action, electric dance routines and an excellent score. Only the latter counts on the record, but the worth of most of it is highlighted.

The title song has already brought Richard a Gold Disc, the accepted trophy for a million sales. The single differed slightly in having orchestral accompaniment, which is missing in the film and consequently from this record.

In addition, there was a hit for the Shadows in *The Savage* and Richard had another one with *Girl in Your Arms. Lessons in Love* was a near miss. These numbers were from the mainstream of today's pop song writing and their worth has been proved.

Some of the production numbers, mainly by Peter Myers and Ronnie Cass, stand comparison with anything done for Hollywood's similar efforts.

All for one is a brilliant rallying song; *Nothing Impossible*, though written from contemporary headlines, will not date; *What d'you Know, we've got a Show* ingeniously links the vaudeville songs of yesteryear to *Living Doll* of the late 'fifties.

"The Young Ones" was designed to make film stars out of some of Britain's leading teenage attractions. Despite good reviews and its box-office success, non-lovers of rock stars and their music may be put off. They should not be; this record has much to appeal to all classes.

* * *

GIGI film sound track. Leslie Caron, Maurice Chevalier, others. TA-MGM-C-770 (*35s. 0d.*)

The Gallic charm of Chevalier and Miss Caron, though separated by half a century in age, combines with the score of a memorable film to make this record a must for most collectors.

To start with there is the enormous souvenir value for those who saw the picture. The score was by Alan J. Lerner and Fritz Lœwe, written as their first project following the success of "My Fair Lady" on Broadway.

"Gigi" turned out to be one of the great film musicals. But to listen to as a record without reference to the source, I find it uneven. *It's a Bore*, for instance, is.

But the incomparable artistry of the players—and here must be added praise for Britain's Hermione Gingold—and the writing genius of Lerner and Lœwe is undeniable.

* * *

THE KING AND I film sound track. TA-W 740 (*38s. 0d.*)

Richard Rodgers and Oscar Hammerstein II changed the course of musical show writing when, with "Oklahoma!" they merged pop song and dance with conventional drama. "The King and I" went even further; a musical was fashioned, with appropriate liberties, out of a real-life incidents.

Some wonderful songs were added—*Hello, Young Lovers, Getting to Know you, We Kiss in a Shadow* and *Shall we Dance?* among them. The stage show was a great success on Broadway and in London. But with the film version the visual scope was widened and it took on new dimensions.

The disc LP became one of the biggest sellers, aided by the star-name lustre of Deborah Kerr and Yul Brynner. The tape version needs no further recommendation.

There is a doubtful ending to *I Whistle a Happy Tune*, but clearly this meant nothing to the millions throughout the world who have already bought the LP. Only a pedant will be put off from buying the tape.

* * *

SOUND OF MUSIC original London cast. TA-CLIP 1453 (*35s. 0d.*).

Rodgers and Hammerstein took another page from life when they wrote this show about the escape from tyranny of the Trapp family. For the composers it seems to have been the final escape from the confines of pop music.

The result is square in the extreme, though still beautiful. It needs an acquired taste to listen to the songs alone.

The performance is excellent. Most stage cast albums are recorded in a day, usually on the Sunday after opening with all the strain that puts on the performers. I can never understand how they are as good as they are. This is an example of how good they can be.

* * *

BLACK AND WHITE MINSTREL SHOW. The George Mitchell Minstrels, featuring Tony Mercer, Dai Francis and John Boulter. TA-CLP 1399 (*35s. 0d.*).

Here is another kind of show. The "Black and White Minstrels" began as a BBC-TV production of nostalgia, pretty girls and zippy production. It transferred to the stage and now there are two companies, one in the West End and the other summering at Morecambe. In the autumn, there will be an Australian version. It is a great show business success story.

The record's history is no less impressive. Issued in the autumn of 1960, it became the HMV label's biggest seller of the year. It is the perfect supplement for the millions who would like the television show more often.

I counted 57 songs in the eight medleys on this record. They don't have the variety of Heinz, but they add to a great full-throated collection of the songs everyone hums or whistles.

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" TOPS " WITH ME. Helen Shapiro. TA-33SX 1397 (*35s. 0d.*).

At 15, Helen Shapiro has another kind of success story. This album, aimed directly at teenagers, was recorded while the singer was still a schoolgirl.

Most of the titles were hits for other singers in recent years—*Little Devil, Teenager in Love, Sweet Nothin's, Will you Love me Tomorrow* for example—with *La Mer* going back further.

The singer's technique belies her age. Aided by Martin Slavin as musical director, she comes out with an album that confirms her immense talent as a pop singer and gives indications of greater potential.

* * *

THE FABULOUS SHIRLEY BASSEY. With Geoff Love and his Orchestra. TA-33SX 1178 (*35s. 0d.*).

Fabulous is a strong word to use. But here is the pre-eminent British singer who has all her technique well under control, aided by absolutely magnificent Geoff Love arrangements.

The titles, unfortunately, are well-worn ones—*Foggy Day, Got you Under my Skin, S'Wonderful* for instance.

I've Never Been in Love Before is for me the greatest of them all. Shirley achieves a mood of innocence, pleading for understanding, with a subtlety that is a work of art.

I want to rave and rave and rave about this record. If ever there has been a better singer recorded in Britain I want to hear it. " Fabulous " is almost allowable.

Her style is mannered and brings its objectors. Of course, she is not the girl-next-door type. But she is a magnificent artist and the hackneyed choice of material is forgiveable.

* * *

ADAM. Adam Faith, with John Barry and his Orchestra. TA-PMC 1128 (*35s. 0d.*).

This record marked the turning point in the career of one of the most unusual artists ever to find success in Britain. It coincided with his appearance on BBC-TV's " Face to Face," when he proved he was no lamb being led to the slaughter by John Freeman.

Just as the latter programme showed he was a real and often articulate person, so the LP demonstrated that he could do more than sing cute teenage novelties like " What do you Want? ".

Here, Faith's range is extended to *Summertime*, which he does with style. He is best, nevertheless, with the cuties. His version of *Singing in the Rain* puts it in that class, but I like best *Green Finger*, the story of a boy who bought a cheap ring with disastrous results.

* * *

THE TEMPERANCE SEVEN (1961). The Temperance Seven, with Paul McDowell. TA-PMC 1152 (*35s. 0d.*).

This band seems now to be outliving its gimmick. But what a gimmick! To seriously (but not without humour in presentation) set out to play as the hipsters of 35 years ago did is not an obvious way to court fame.

But fame came. And stuck. You might find this record nostalgic or even quaint. It strikes me as outrageously funny. Bomb permitting, I'll listen to this tape again 35 years hence—and laugh even more.

ACKER. Mr. Acker Bilk and his Paramount Jazz Band. TA-33SX 1248 (*35s. 0d.*).

The gimmick here has only been in the presentation, none of which shows on record. If not quite Britain's best trad band, it is very near the top.

There is a whiff of cider (but not even a nod of the bowler) in Acker's vocals, but the band provides a good enough type of local trad on *Snake Rag, Original Dixieland One Step* and the other instrumentals.

* * *

ELLA IN BERLIN (" Mack the Knife "). Ella Fitzgerald. TA-CLP 1391 (*35s. 0d.*).

This is not the Ella Fitzgerald of the great " Songbook " records. On most of those she sang sweetly with the ultimate of taste, accompanied by large orchestras. They were the best possible performances of the works of the great pop composers and may never be bettered.

This record is an example of Ella singing as she is normally heard—with the backing of her regular group, the Paul Smith Quartet.

It was recorded in West Berlin's Deutschlandhallen and with some sense of occasion, Ella included *Mack the Knife* which had been written there by Kurt Weill nearly 40 years before and a few weeks earlier had been made into a hit all over again by Bobby Darin.

Ella's version, complete with applause, was a hit also when issued as a single and now the record bears two titles!

Perhaps there would have been more atmosphere — audience response — had the album been made at one of the singer's American (or even British, concerts. Much of the German audience could not have had a complete understanding of what she was about. But it demonstrates the majesty of her near-universal appeal.

Though it would be ridiculous for her to sing anything less than good songs, she has brought in some rarely heard ones like *Gone With the Wind, Too Darn Hot* and *Lorelei*. Her *Summertime* is a beauty and she ends excitingly with a humorous party-scat *How High the Moon*.

* * *

LATIN A LA LEE. Peggy Lee. TA-T 1290 (*35s. 0d.*).

Peggy Lee is another of the world's great female singers. This is another brilliant record. The mood is cool. She sings for much of the time with latin-American percussion instruments seemingly her sole musical support.

The record is a rare example of vocal mood music. Normally a singer's LP sets out to be a cross-section of the various talents and styles that can be safely exposed to provide a varying programme.

Though there are changes of pace and emphasis enough to avoid any suggestion of boredom even after twenty consecutive hearings, this record applies the latin mood to well-known songs and brings them up like new.

* * *

SONGS FOR SWINGIN' LOVERS. Frank Sinatra, with Nelson Riddle and his Orchestra. TA-W 653 (*35s. 0d.*).

This is it. Sinatra's biggest selling album, one that made the Top Twenty alongside the hit singles. One that established his partnership with Nelson Riddle as the greatest ever to be built up between singer and arranger.

Fifteen of the greatest songs, swung orchestrally and vocally, with a beauty that vigour cannot erase.

You Make me Feel so Young starts it and *How About You* ends. I'm ready for more—and there have been more, but not quite up to this standard. This is the ultimate. Though listed here last, it is the most essential of them all.

So many homes have the disc it must be known everywhere. My LP has become worn out with so much playing. I needed the tape. Probably you do too.

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WE have published various designs for the do-it-yourself enthusiast who wishes to build his own tape recorder. "TAPE" once again leads the field by publishing for the first time for amateurs a suggested circuit for a transistorised tape recorder.

This is the conclusion of a two-part feature which details the components and description of the record amplifier, bias and erase oscillator and provides a design for the erase head and oscillator.

RECORD AMPLIFIER

IF it were not for the losses incurred at higher frequencies, a constant current applied to the record head would impress a constant value of permanent flux on the tape at all frequencies. In practice there are several factors that affect this condition so that an increase in recording current is required at higher frequencies. There are the normal losses in the core material of the record head (i.e., eddy current and hysteresis losses) and, as the flux density in the record head is higher than that in the playback head, these losses become more important. These losses are frequency dependent.

Further losses occur during the recording process due to the effective wavelength of the magnetised particles on the tape. The main losses that occur under this heading during recording are demagnetisation, the effect of tape coating thickness and the field pattern of the recording head. It is assumed that the recording and playback heads are in perfect alignment.

Most of these losses can be reduced in a well designed recording head. The thickness of the tape coating, however, remains a problem. The optimum bias for a given head and tape is related to the tape thickness. A high value of bias induces the maximum signal intensity below the surface of the tape thus increasing the effective spacing between the magnetic flux and the playback head. Since this effect is wavelength dependent, the high frequency response suffers. Alternatively, if the bias is too low, there is a loss in sensitivity and a rise in distortion. The value of bias for maximum sensitivity does not correspond to the value required for minimum distortion.

In practice the amount of bias required is found experimentally, the exact procedure depending on the quality of the tape recorder. In lower priced models it is quite common for the bias to be increased for maximum sensitivity and improved high frequency response, and for the increase in distortion to be tolerated. In quality tape recorders the bias is increased beyond the optimum for sensitivity so that the response falls by 2 dB.

The high frequency response deteriorates slightly but distortion is reduced. Equalisation on record, therefore, is applied mostly at high audio frequencies to compensate for losses.

The constant current condition is approached by using a source resistance that is high compared with the reactance of the record head at medium frequencies. Since the voltage swing available at the collector of the transistor output stage is limited compared with that of a corresponding valve stage, a lower source resistance, and hence a low impedance head, must be used.

The record head used in the experimental model is a Bradmatic 5R412T/1 which is a special head having an impedance of 2 kΩ at 10,000 cps. The bias voltage for this head is approximately 18 volts, which corresponds to an increase above optimum bias to give a 2 dB fall in output at 1,000 cps.

The output impedance of the last stage of the record amplifier **(Fig. 4)** is approximately 3 kΩ and it was found that the maximum series resistance that could be added was 1 kΩ. The available voltage swing at the collector limits the value of series resistance that can be used. Some further improvement could probably be obtained by using a head of lower impedance but this would require a larger standing current in the final transistor stage.

An STC tantalum capacitor (C14) is used to couple the record head to the output transistor (see **Fig. 4**) because it has a very low leakage current and there is less danger of the record head being magnetised. It is possible to connect the head to the first transistor through a transformer but this introduces extra losses, and a high primary inductance is required for good low frequency performance.

The bias applied to the head is isolated from the output stage by means of a rejector circuit (L1 and C15) tuned to the bias frequency. Emitter bias is omitted on the final stage to allow the maximum possible voltage swing at the collector. High frequency compensation is obtained from two high pass filters; one is connected between the third and fourth stages and another between the fourth and fifth stages of the record amplifier.

It is possible to achieve overall equalisation by over-equalisation in the record or playback amplifier. Whilst this may be satisfactory for a tape recorder designed to replay only its own recorded material, the machine would not satisfactorily

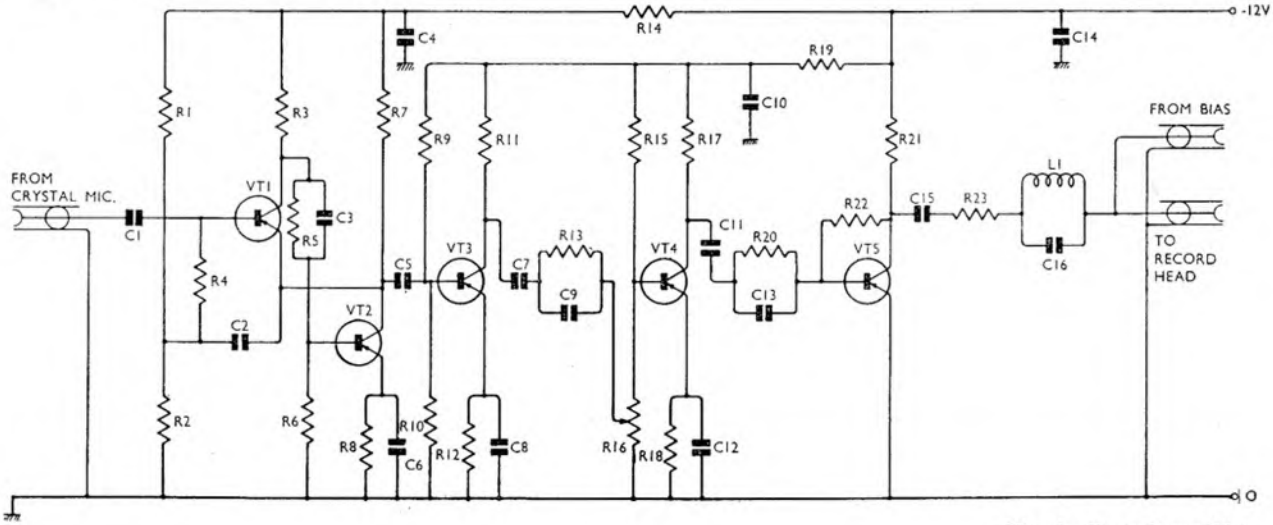

Fig. 4. Record amplifier

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BUILD YOUR OWN TRANSISTORISED TAPE RECORDER

By

R. H. CHILTON, *B.Sc.(Eng.), Graduate I.E.E.*

of

Standard Telephones and Cables Limited

replay pre-recorded tapes. In the design, both record and replay amplifiers follow as near as possible the C.C.I.R. characteristic which is now the accepted standard.

The input stage of the amplifier has a high impedance, permitting the use of a crystal microphone without loss in low frequency response. The Acos MIC 39-1 is a suitable crystal microphone. The high input impedance is achieved by feedback between the first and second stages. Both these stages are operated with a collector current of 250 μA and a collector-to-emitter voltage of 1.5 volts to reduce noise.

The sensitivity of the amplifier is such that saturation of the tape is reached for an input signal of 400 μV at 1,000 cps.

COMPONENTS

Resistors (Erie type 9. Tolerance ± 10 per cent)

R1	47 kΩ	R13	100 kΩ
R2	22 kΩ	R14	1 kΩ
R3	27 kΩ	R15	22 kΩ
R4	22 kΩ	R16	10 kΩ pot.
R5	27 kΩ	R17	4.7 kΩ
R6	22 kΩ	R18	3.3 kΩ
R7	33 kΩ	R19	470 kΩ
R8	3.9 kΩ	R20	33 kΩ
R9	56 kΩ	R21	3.3 kΩ
R10	22 kΩ	R22	120 kΩ
R11	12 kΩ	R23	1 kΩ
R12	6.8 kΩ		

Bias Rejector Coil (L1) (See Fig. 5)

Former: Neosid type 3510 with dust core.

Windings: 450 + 450 turns 40 SWG double rayon-covered plain copper wire, ½ wave wound.

Avo coil winder details:

A = 50; B = 35; C = 36; D = 50;

Nominal inductance 10.1 mH; Q at 50,000 cps = 55.

Capacitors

C1	1 μF	6 V electrolytic
C2	8 μF	6 V electrolytic
C3	1 μF	12 V electrolytic
C4	50 μF	25 V electrolytic
C5	8 μF	12 V electrolytic
C6	100 μF	6 V electrolytic
C7	8 μF	12 V electrolytic
C8	100 μF	6 V electrolytic
C9	680 pF	
C10	50 μF	25 V electrolytic
C11	8 μF	
C12	100 μF	6 V electrolytic
C13	680 pF	
C14	50 μF	25 V electrolytic
C15	20 μF	tantalum STC type
C16	1200 pF	472/LWA/5CA

Transistors

VT1	STC type	TK45C
VT2	,, ,,	TK45C
VT3	,, ,,	TK42C
VT4	,, ,,	TK40C
VT5	,, ,,	TK40C

BIAS AND ERASE OSCILLATOR

One oscillator is used for both bias and erase and operates at a frequency of approximately 50,000 cps.

For satisfactory tape erasure, the magnetic field in the erase head gap should be at least three times the coercivity of the magnetic tape. By experiment it was found that a field of 1,600 oersteds was required in the gap to erase signals on Emitape having a coercivity of 270 oersteds. The tape in this case was modulated at 1,000 cps to an extent which caused approximately 5 per cent harmonic distortion when using optimum bias.

The energy which is applied to the erase head is dissipated mainly in the form of heat caused by hysteresis and eddy current

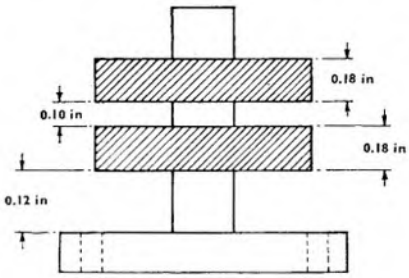

Fig. 5. Bias rejector coil

losses in the core material. Eddy current losses can be reduced by using thinner laminations in the construction of the head, but this has mechanical limitations and the use of Rho-metal, for example, will reduce hysteresis losses. At the relatively high flux densities and high frequencies involved the losses with a nickel-iron alloy core amount to two or three watts. Since the erase oscillator is normally operational during recording, a dissipation of this order imposes a severe drain on the batteries of a portable tape recorder.

The use of a ferrite material will reduce the power requirements considerably and for a flux density of 1,600 gauss at a frequency of 50,000 cps, the estimated core loss for a typical ferrite material is approximately 250 mW. This power is readily obtainable from a small transistor, such as the STC TK40C, operating as a class B oscillator.

Although ferrites have the advantage of low loss, they have the following disadvantages:—

Lower permeability; Lower saturation; Curie points are somewhat lower than nickel iron alloys; and are more difficult to machine.

For most practical purposes the lower permeability and saturation are not important when the material is used at a frequency of 50,000 cps and the saturation is still high enough for satisfactory erasure of magnetic tapes. Also the Curie point for most modern ferrites is sufficiently high to enable them to be used in the construction of erase heads.

Ferrite materials are rather brittle and the edges of ferrite cores tend to chip during machining. This is relatively unimportant in erase heads with a comparatively long gap length (0.008 – 0.010 inches). Subsequent wear on the head results in further chipping of the edges of the gap but wear can be reduced considerably by passing the tape over a pillar of P.T.F.E. (polytetrafluorethylene) before passing it through the erase head. A minute quantity of P.T.F.E. adheres to the tape and provides lubrication between the tape and head, thus reducing wear.

Erase Head Design

A suitable ferrite core is Ferroxcube FX1525. This size core can be used for half-track operation.

It is assumed that the flux in the core is 2,000 gauss and that the oscillator frequency is 50,000 cps. The volume of one pair of cores of FX1525 on the average was found to be 0.23 c.c. Referring to the graph showing core loss against flux for A4 ferrite material, the estimated core loss for the conditions quoted above would be 210 mW. For ease of calculation, the reluctance of the core is assumed negligible compared with the air gap.

The peak field in the gap is then approximately given by:—

$$H \simeq \frac{4\pi NI}{10\ l}$$

where H is the field in the gap
N is the number of turns on the core
I is the peak current
l is the gap length.

For a gap length of 0.008 in. (0,2 mm.) and a field of 2,000 gauss, the number of ampere turns required is 32. If the peak current of 100 mA is assumed, then the number of turns required on the core is 320.

The inductance of the head is given by:—

$$L = \frac{4\pi N^2 A}{l} \times 10^{-9}$$

again assuming that the air gap provides the greater part of the reluctance.

It can be seen that the inductance depends on the length and cross sectional area of the gap. The inductance of the

(Continued on page 21)

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(Continued from page 19)

head can differ from its calculated value considerably owing to machining tolerances. Using the above figures, the theoretical inductance amounts to 1.97 mH. The measured value (at $\omega = 10^4$) was 4.56 mH. The discrepancies could be attributed to errors in measurement of gap dimensions and the fact that no allowance has been made for stray flux around the gap. The working Q at 50,000 cps was 15.

OSCILLATOR DESIGN

Requirements

1. The power required to drive the head, from previous measurements, was found to be 270 mW.
2. Oscillator frequency: 50,000 cps.
3. Total harmonic distortion: less than one per cent. (The presence of harmonic distortion in certain cases gives rise to an asymmetrical waveform which impresses a signal on the tape equivalent to the original frequencies plus a d.c. component. The d.c. component increases noise level.)
4. High efficiency to reduce battery consumption.

A class B or class C oscillator will operate at high efficiencies and consequently the required power is easily obtainable from a low power transistor such as the TK40C (which has a maximum dissipation of 200 mW at 25 degrees C). This type of oscillator however, by the nature of its operation, generates harmonics of relatively large amplitude, but, by making the Q of the tuned circuit high enough, it is possible to reduce the harmonic content of the output current waveform. This has been achieved in the design with the result that the measured distortion is less than one per cent.

Design Considerations

A large C/L ratio is required in the collector circuit of the oscillator to give a high Q. Since a step-up transformer is required to match the oscillator to the erase head, it is convenient to place the tuning capacitor across the output winding where a smaller value can be used.

The transformer core material selected is Ferroxcube A4 and the core size FX1238.

The turns per volt figure was chosen to keep the maximum flux density low. For a value of 4 t.p.v. the calculated value of B_{max} is 300 gauss and core losses at 50,000 cps are approximately 20 mW.

The circuit **(Fig. 6)** is a conventional transistor oscillator with feedback to the base. A fixed amount of negative feedback is provided by the 4.7 Ω resistor (R3) in the emitter. This allows for production spreads in transistor current gain. The resistor also improves the d.c. stability.

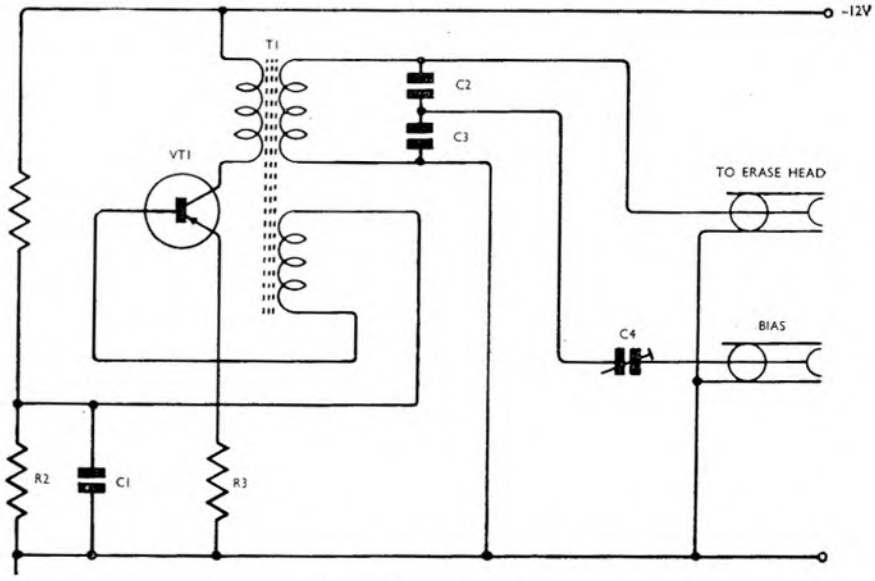

Fig. 6. Erase oscillator

The oscillator is designed to operate in class B with a low gain transistor whilst higher gain transistors will tend to work in Class C.

A total load of 300 mW is assumed. The supply voltage is 12 volts and a 1 volt drop is allowed for loss in the 4.7 Ω emitter resistor and the bottoming voltage of the transistor.

∴Effective load in collector is given by:—

$$R_L = \frac{11^2}{2 \times 300} \times 1{,}000 = 200\ \Omega$$

The peak collector current is given by:—

$$I_{max} = \frac{2\,(12-1)}{200} \times 1{,}000 = 110\ \text{mA}$$

Assuming class B operation, the mean collector current will be given by:—

$$I_{dc} = \frac{110}{\pi} = 35\ \text{mA}$$

The collector dissipation is the difference between the input power supplied by the battery and the a.c. output power, and is given in **Fig. 7** below.

This dissipation is within the maximum of 200 mW at 25 degrees C for a TK40C transistor without a heat sink.

$$P_C = \left(\frac{I_{max}}{\pi} \times V_{mean}\right) - \tfrac{1}{4}(V_{mean} - V_{min})\, I_{max}$$

$$= \frac{110}{\pi}(12-1) - \tfrac{1}{4}(12-1)\ 110$$

$$= 110\ \text{mW}$$

Fig. 7. Equation for the collector dissipation

For 110 mW dissipation the maximum rating would be reached at an ambient of 45 degrees C in free air. However, the use of a heat sink is advocated in this instance on the grounds that it increases the thermal stability.

Transformer Design (T1, Fig. 6)

The number of turns on the primary is determined by the restriction of maximum flux density in the core as described earlier.

For a voltage swing of 11 volts, the number of turns required (for 4 t.p.v.) is:—

$$\frac{11}{\sqrt{2}} \times 4 = 31\ \text{turns}$$

For a collector current of 100 mA the maximum base to emitter voltage that can be expected for the TK40C is 0.7 volt.

The number of turns required on the feedback winding is then given by:—

$$\frac{31 \times 0.7}{11} = 1.97 \simeq 2\ \text{turns}$$

By experiment the voltage required at the erase head, to give a peak current of 100 mA, was found to be 93 volts r.m.s.

The number of turns required on the output winding is then given by:—

$$\text{secondary turns} = \frac{31 \times 93\sqrt{2}}{11} = 370$$

COMPONENTS

Transformer

Core material: Ferroxcube FX1238.

Bobbin: Plessey CP48462 or E. K. Cole Plastics DP10857.

Winding details: Primary, 31 turns of 34 SWG enamelled copper wire. Feedback winding, 2 turns of 34 SWG enamelled copper wire. Secondary, 370 turns of 36 SWG enamelled copper wire.

The core is assembled without any air gap.

(Continued on page 26)

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CARE AND STORAGE OF TAPE

CARE and storage of tape recordings is a wide and complex subject, and has even led to large sums of money being devoted to research on it. For the amateur recordist with, in most cases, a modest collection of recordings the problem has often been found to be insoluble.

Sales of tape throughout the world, however, are ever on the increase, and today this "modest collection" is leading in many cases to a vast store of taped material. The latest announcement from E.M.I. of their entry into the "pop" tape market, plus extensions of catalogues by other tape record manufacturers, together with the increasing interest being shown by amateur recordists who regularly produce their own features and "sound album" tapes means that the problem is being faced in just that many more homes.

The purchaser of a tape record or producer of a feature tape in the first stages will most likely be content to place his tapes on a shelf or in a bookcase. Joined by later additions these tapes are liable to spend long periods without attention. Eventual replay may provide the staggering experience of a marred recording, perhaps of a once in a lifetime occasion, or of a favourite musical selection.

To help alleviate some of the likely difficulties to be encountered, the following extract from a special report on the problem published in America is provided.

The Preservation and storage of sound recordings by A. G. Pickett and M. M. Lemcoe is a 74-page booklet published by the Library of the U.S. Congress in Washington. It is the result of a study by American scientists which was made possible by a grant equivalent to about £23,500 made by the Rockefeller Foundation in 1959. Copies are still available from the Superintendent of Documents, Government Printing Office, Washington 25, D.C. price 45 cents.

Primarily intended for the guidance of librarians and others responsible for collections of sound recordings, the information contained therein is also of interest to the amateur. Because of the progress in the manufacture of magnetic tape since this report was first published, reservations must be made regarding the types of tape dealt with. Only acetate and polyester-based types were examined and tested. It is also necessary to bear in mind that the report dealt only with American products, using new samples of all the different brands by the four major manufacturers, together with some samples of older tapes.

The report contained a mass of detailed technical information, but most readers will be interested only in the extracts of their conclusions and recommendations printed below.

"PRINT-THROUGH does not need to be a problem.

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TWELVE RULES FOR THE PROTECTION OF YOUR TAPE RECORDINGS

A further advantage can be obtained by the future development of magnetic powder coatings far less susceptible to print-through than even the best currently produced coatings.

The recommended procedure for storing magnetic tape is to:

1 Use only metal reels with an unslotted hub of N.A.R.T.B. dimensions (10-inch reel size). The flanges of these reels must be replaced if they are deformed out of plane.

2 Package reels in sealed metal cans or sealed boxes of a material such as polyethylene / cardboard / foil / polyethylene laminate. The boxes should be stacked on edge in the shelves. Tape should not be packaged until it is in equilibrium with 70° F and 50 per cent R.H.

3 Stack temperature should be maintained at a temperature of 70° plus or minus 5° F for often-used recordings, and storage in special vaults at 50° plus or minus 5° F is recommended for seldom-used and valuable recordings. Stack humidity should be kept at 50 per cent plus or minus 10 per cent R.H., if this is feasible.

4 Playback and packaging rooms should be maintained dust-free and at 70° plus or minus 5° F and 50 per cent plus or minus 10 per cent R.H. Tapes exposed to other environments should be conditioned in the playback environment before playback.

5 Stray external magnetic fields should not be permitted in the stack, playback and packaging environments. The maximum flux density permitted should be 10 gauss. It should be remembered that all current-bearing wires have associated magnetic fields. Ordinary electric curcuits, if properly installed and balanced, will cause no trouble because the fields will "cancel out."

6 Playback equipment should be maintained as recommended by the manufacturer. This includes cleaning, tape transport adjustment, and component demagnetisation.

7 A rewind and inspection deck, separate from playback facilities, should be used for packaging and inspection. Winding tension for 1½ mil tape should be constant torque of 3-5 ounces at the hub of a 10-inch N.A.R.T.B. reel.

8 The best tape presently available for storage purposes appears to be 1½ mil Mylar base, with some doubt existing as to the coating to base adhesion of this type of tape. Any of the tape manufacturers are presently capable of producing longer lived tapes if there is a sufficient demand for them and it is hoped that one or more of them will do so.

Each of the major manufacturers produce good tape and each product seems to have a slight advantage over the others in one parameter, while being at a slight disadvantage in others. The competition in this market is enforcing rapid advances in tape construction and formulation, which should result in tapes of superior potential longevity in the foreseeable future.

9 Tape should be recorded at a maximum level below 2 per cent harmonic distortion (4 dB below normal recording level is usually satisfactory).

The first and last 15 feet of the tape should not be used for programme recording, but should have a burst of 10 mil wavelength (approximately 750 cps at 7½ ips) signal at maximum recording level, preceded and followed by several layers of blank tape for inspection purposes.

Tape should be aged in the packaging room for six months prior to recording. Recorded tape which has been exposed to other than the prescribed environment should be conditioned in the packaging room for six weeks prior to packaging.

10 Tape should be inspected once every two years, measured from time of last playback and rewound so that the curvature of the base is opposite to the direction of the previous curvature. This inspection should consist of measurement of print-through caused by the toneburst at the end of the tape and a spot check at the tape end next to the hub for coating adhesion or delamination. It need not include playback.

The benefits of rewind are in reduction of creep induced curvature and print-through. The disadvantage is in exposing the surface to oxidative attack. The tape should be inspected and wound after each playback.

11 Storage shelves should be of wood or a non-magnetisable metal free from vibration or shock.

12 Care in procurement and shipment should be taken. ”

Apart from these detailed considerations, there are a number of other points worth considering. One of the most important is protecting the tapes within their boxes. Dust and other extraneous particles settling on the tape can play havoc with the magnetic heads on a recorder. For this reason most manufacturers supply their tapes, or Tape Records, contained within a polythene bag.

One company specialises in the manufacture of these bags, supplying them in a variety of sizes. Available from Swain's Papercraft are tape protectors for any size spool from three inches up to and including 8¼ inches. The prices, per dozen, vary from 1s. 6d. to 2s. 8d.

Other handy accessories include the tape rack produced by M.S.S. Recording Co., manufacturers of Mastertape. Made from strong welded steel finished in abrasive-proof plastic with rubber feet to protect the furniture, it weighs only a few ounces. Accommodation for twelve tapes of any size between 3¼ and 8½ inches, is provided, each box resting securely in its own compartment with the title panel clearly visible. The price is 18s. 6d.

Although identification of stored recordings is a matter for individual taste, there are a number of firms supplying various forms of identification tabs. Metro-Sound Manufacturing Co., produce supplies of tabs for adhesion to the spools plus a folder for cataloguing the tapes. A set costs 3s. 11d. Multicore Solders Ltd., also supply labels suitable for marking tape reels and boxes at 2s. 6d. per set.

NO PRIORITY FOR STEREO BROADCASTING

—Pilkington Report

"A POSSIBLE long-term development"—the Pilkington Committee's report puts no higher priority on the development of stereo broadcasting, but tacit approval is given to the BBC's programme of experimenting. The main Pilkington recommendation that the BBC's Charter should next time be renewed for twelve years to allow greater elbow-room will also mean that the programme can be planned for a longer period ahead.

In fact the Committee, which spent a long time considering the development of colour television, regarded the sound counterpart, stereo radio, as "too detailed" a subject for close consideration (Sir Harry Pilkington's own words to me at the Press Conference). The report simply notes the BBC's continued experiments, and their view that "a regular service would have to wait upon the development of internationally agreed standards and of a 'compatible' system—that is to say one in which the stereophonic broadcast could be satisfactorily received by ordinary monophonic receivers."

This leaves things very much where they were, and everything will depend on the judgment of the BBC's experts and comparable technicians abroad on whether any particular system has reached the desired state of development. Even when a system has been decided on internationally and standards agreed, there will be the additional problem that over the next few years if the Pilkington recommendations are accepted the BBC's allocation of capital will be very fully used in developing an extra television channel and in the possible development of an elaborate network of local radio stations each with a range of about five miles.

Stereo may therefore find itself rather a long way down the queue, but at least the Pilkington report gives no positive discouragement, and technical developments may quickly alter the whole present position.

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SPECIAL ASSIGNMENT

(Continued from page 15)

and caps moved busily from animal to animal. All the time a faint pulsation from the milking machines provided an atmospheric background.

It was now that I discovered that although it is in fact electricity that provides the primary source of power, the milking machines are not themselves electrically operated. In an engine-room at the side of the parlour a two horse power electric motor was driving a vacuum pump and it's actually an air pressure of about fourteen pounds fed through a complicated network of pipes that performs the milking.

A stainless steel container carrying the small, pulsating unit on its lid is linked to the vacuum line on one side and the cow on the other. At a rate of about sixty pulsations a minute the milk cascades into the container while the animal placidly chews at specially prepared concentrates fed to it in its stall.

I recorded all these sounds, but once again they are meaningful only if a visual explanation of the scene is given to the listener. The sound of the milk pouring over the cooler in the dairy could easily be taken for the sound of water running over stones so it's essential to accompany excerpts such as this by a spoken descriptive interpretation.

This would not have been necessary in the old days. The sounds of milk being squirted by hand into an open bucket are so distinctive as to require no explaining. The lowing of the cattle in the background with the metallic clatter of churns outside would have brought to the listener a graphic representation of what was taking place without the need for the spoken word. But, let's face it, life today on a modern, efficiently run agricultural establishment is not like that at all. The milk-maids and the buckets belong to a past era and in their place we have the mechanical throb of the automatic machine. A pity? To one like myself the passing away of these nostalgic sounds is something of a tragedy, just as is the replacement of the steam engine by the contemporary diesel.

One of these days I shall find myself a little, old-world farm where the milk still squirts into the buckets and the milk-maids are as bonny as they were when Holyfield Hall was built in the reign of the first Elizabeth. But milking machines, like diesel engines, are part of the reality of life and living in our generation and therefore must be recorded. Who knows if in another four hundred years our descendants might not be thinking nostalgically of vacuum milkers as they dissolve their synthetically produced protein tablets in a tumbler of water?

Back at the Hall Mrs Craven entertained us to tea with delicious home baked scones and commiserated with our ill-fortune in happening to choose such a bad day for recording. Fascinated by all we had seen and heard we hadn't even noticed that the weather had again deteriorated, yet instead of being glad to leave it was with genuine regret that I headed the car away from that windswept corner of Essex.

TAPE RECORDS REVIEWED

THE CLASSICS

by Edward Greenfield

(Recorded music critic of the *Guardian*)

I REMEMBER going the other year to Walthamstow Town Hall—still one of the very finest recording halls in the world—for a recording session with the Sinfonia of London. Muir Mathieson conducted them in Bizet, orchestral suites from "Carmen" and the "L'Arlésienne" music, and I remember specially—stereo very new in those days—my astonishment at the fidelity of Allen Stagg's tape on the playback.

I cannot pretend that the 7½ ips stereo tape now issued by **World Record Club** can really compare with the 30 ips original, but it is still impressive

As ever the treble range is rather more limited even compared with the disc version, but Stereo 21 for all its comparatively modest price seems already to be establishing the same very high standards of reliability that we have got used to in EMI pre-recorded tape.

As to the performances I have to admit that at this distance they sound very English rather than French. I remember at the time how the crispness and straightforwardness with no sentimentalisation whatever were extraordinarily refreshing, but in "canned" form the electricity of the occasion is a little lower in voltage. Not seriously so, and I can recommend both *Carmen* and *L'Arlésienne* as most enjoyable.

It is the authenticity of the performance that makes Tauno Hannikainen's account of Sibelius's Second Symphony so very interesting. Hannikainen was a personal friend of Sibelius, and understandably World Records has made great play of the fact that the old composer expressly approved Hannikainen's approach to this and others of his works. I cannot pretend that this seems to me the last word in interpreting this particular symphony, although I certainly recognise it as one of the very finest to have appeared in recorded form.

Hannikainen's approach is crisp and clear rather than passionate. The opening with its repeated chords has none of the element of tentative foreboding that some conductors have brought. Rather it is straightforward and extrovert, and in the great climaxes of the finale where with the emergence of the work's big, memorable melody some conductors give it what must be described as Tchaikovskian treatment, Hannikainen is careful not to "go overboard."

This is above all a balanced account, not as exciting as some in its initial impact but increasingly so as one appreciates its great merits. The playing of the Sinfonia of London is excellent. On one significant detail at least Hannikainen revises the published score. I wish we had Sibelius's express authority for the change, but Hannikainen is the sort of conductor one feels one can trust instinctively. It involves the long rolls on the timpani just before the end of the finale. Hannikainen begins each consistently with an accent on the second beat of the bar where the score gives the third beat each time. The logic of the music, I think, supports Hannikainen, but I wish he would one day elucidate.

The recording on the tape version is marginally better than on the stereo disc, which was one of World Record's comparatively early stereo efforts. But good as it is it cannot really compare with the quality of reproduction on my third Stereo 21 tape this month, the *Tchaikovsky Violin Concerto* played by Tossy Spivakovsky with the London Symphony Orchestra under Josef Krips.

This is quite remarkably good with a clear, reverberant atmosphere that brings next to no congestion on the string tone. This, I imagine, is one of the World Record issues made originally by the American Everest company (recording in this country) and the balance between soloist and orchestra favours the soloist in the American manner.

As to the performance it is sweet and warm in a most attractive way. Spivakovsky has a magical touch with some of the delicate flourishes in the first movement. Thoroughly recommended.

"How many years have you been an illusionist?"

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NEW POPULAR MUSIC ON TAPE

By DON WEDGE
of "New Musical Express"

This tape really comes alive in its stereo version

MUSIC-ON-TAPE has its best record yet with **Riverside Singers and Orchestra.** There is unbelievable high quality of performance and musical arrangement. It comes in a straightforward manner in the mono version (TR 1243), but really comes alive in stereo 4TRS 1287).

Not often have I been able to compare so directly mono and stereo tapes of the same recording. The multi-channel version of the opening, *Shanty in old Shanty Town,* alone seemed worth all the extra investment in stereo.

The record blends orchestra and singers in superb arrangements throughout. This first track put male and female singers on opposite channels and has the orchestra surround them in compelling fashion. That makes a very exciting start.

It's not fireworks all the way. *Skye Boat Song,* though with modern phrasings, has a slow restful treatment. *Let me be Loved* has a fuller treatment by the female voices, but is quite straight, though not square.

The " Shanty " track is included on an unusual novelty, *Stereo Confidential* (4/DEM/S 123) also issued by Music-on-Tape. This uses extracts from several of the firm's tapes, linked by a commentary describing different kinds of stereo effects and touching on recording techniques in general.

It is concerned entirely with musical recordings but has lessons for all beginning to study stereo. Lack of technical data means it will be of restricted use for more advanced students, but it seems an invaluable aid for shop demonstrations and for teaching.

Leo Chauliac from Maxim's of Paris (MOT, 98-9963) is cocktail-style piano with rhythm support. Many of the tunes are French and not well known here. They are laced with standards such as *Night and Day, These Foolish Things* and *I Believe.* A good record for non-listening.

WORLD Record Club offers music from two stage musicals on *Jerome Kern* (TT121). *Roberta* was tune-filled with such items as *I Won't Dance, Lovely to Look At, Touch of Your Hand* and *Smoke Gets in Your Eyes.*

Music in the Air is a lesser-known show Kern wrote with Oscar Hammerstein. Produced on Broadway in 1932 (a year before *Roberta*), it was something of an experimental piece, Kern searching for more credible plots in musicals.

He and Hammerstein wrote imitation German beer-hall songs for it. Like many experiments it was not successful in itself. But there are some songs to hear with pleasure 30 years later—*I've Told Every Little Star, The Song is You.* Not familiar to me, but good to make acquaintance was *And Love was Born.*

Cyril Ornandel produced this for WRC using Maggie Fitzgibbon, Andy Cole, Marion Grimaldi, a chorus and orchestra conducted by Alan Braden.

It is treated in the theatrical manner—getting the sound the shows might if they were produced now. It is a quality product.

World Record Club's " Stereo 21 " series is a major effort involving 7½ ips two-track tapes. A little more separation would have been welcome on *Gershwin: Rhapsody in Blue/American in Paris* (STT 75). This is psuedo-classical music and " playing-about " with it is permissible. It is well suited to electronic heightening for effect.

Much more satisfactory are the show albums; WRC assembled some well-known performers for its concertised version of *Oliver!,* Lionel Bart's hit musical. (STT 151.)

The peculiar nature of the boys' chorus (with the charm of missed and broken notes) benefits from the added reality of presence in stereo. This is immediately noticeable in *Food, Glorious Food* at the beginning.

The dramatisation of the title song, when Oliver is discussed by the cast, also gained from the availability of sound placing.

Presenting Cole Porter (STLM 8) is somewhere between a concert version of a show and a straight vocal album. Some great songs are presented by Lorie Mann, Jean Campbell, Scott Peters and a choir, with an orchestra directed by Johnny Douglas. The performance is conventional and the recording matches it. It won't shock anyone, but I wished for something more adventurous and ear-arresting.

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188 VAUXHALL BRIDGE ROAD, LONDON, S.W.1
TATe Gallery 9615

www.americanradiohistory.com

Transistorised recorder

(Continued from page 21)

The total capacitance across the erase head should be approximately 2,200 pF, but the exact value is determined mainly by the inductance of the erase head, the latter being subject to normal manufacturing spreads. In the circuit, the 2,200 pF capacitor is replaced by two 4,700 pF capacitors in series (C2 and C3), the centre tap being used as a source of bias voltage. A voltage of approximately 45 volts r.m.s. is available at the junction of C2 and C3 for recording bias.

Resistors (Erie type 9. Tolerance: ± 10%)

R1	5.6 kΩ
R2	120 Ω
R3	4.7 Ω

Capacitors

C1	0.1μF
C2, C3	4,700pF
C4	250pF trimmer

Transistor

VT1 STC type TK40C

PERFORMANCE FIGURES

For maximum output with a high gain TK40C transistor, the supply current is 33 mA, developing 107 volts across the erase head; a low gain transistor requires a supply current of 28.5 mA and develops 92 volts across the erase head.

BATTERY CONSUMPTION

On record, the current drawn from the 12V battery is approximately 35 mA. This figure includes the current taken by the bias and erase oscillator.

During playback, the current with no signal is 12 mA rising to 50 mA for an average signal.

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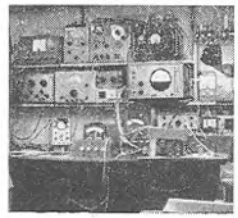

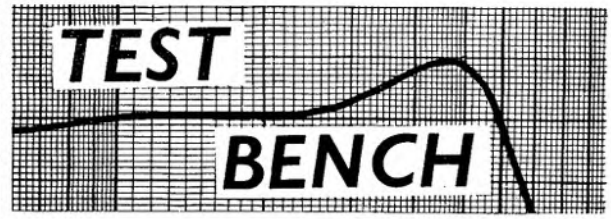

PHILIPS EL3536

THE Philips EL3536 tape recorder is a four-track machine capable of recording monaural or stereophonic ¼-track tapes or replaying ¼, ½ or full-track monaural tapes and ¼ or ½-track stereophonic tapes.

Three speeds provided are 7½, 3¾ or 1⅞ ips, and the recorder is supplied complete with a stereophonic microphone on a table stand, a seven-inch reel of LP tape, a spare seven-inch reel, and all necessary connecting leads. It measures 20½ x 15¾ x 11⅜ inches and weighs 43 lb. The price complete is £96 12s.

This is a machine intended for those who want the best, and is capable of making recordings of a high standard with a minimum of trouble.

General Description

The recorder is mounted in a wooden cabinet which is covered with a washable plastic. It has a strong handle mounted on one side and has a detachable lid which contains one of the loudspeakers as well as a compartment for housing connecting leads.

Deck layout is both neat and convenient, with the various controls arranged in groups. Directly in front of the tape deck are eight controls selecting *Microphone recording level; Gramophone* or *radio recording level; selector switch,* for stereo/mono or amplifier, *Superimpose switch. Mono* switch for combining both amplifiers on monaural replay, *Playback* volume control, *Balance* control for stereo reproduction, and a double *Tone control* for independently adjusting the tone of each channel.

Mounted behind these are the deck controls, these are of the push button type and in three groups of three. *Playback Recording* (with safety interlock), *Pause, Rewind, Stop, Wind,* and the three speed selectors. Pressing any one of the speed selector buttons switches the recorder amplfiers on and starts the motor. A smaller button just to the left of the speed selector buttons switches the recorder off and returns the buttons to neutral. At the rear of the deck is a four digit tape counter and just in front of the stop button is the " magic eye " recording level indicator.

All input connections are situated on the left hand side of the cabinet and all output connections on the right hand side. A storage space for the mains lead is underneath and has a removable cover.

The recorder is suitable for use in the tropics and can be used on mains supplies from 100 to 135 and 200 to 250 volts AC 50 cps, (or 60 cps to order).

Mechanical

Pressing one of the speed selector buttons, switches the recorder on and starts the motor. To replay: a recorded tape is placed on the deck in the normal manner and pressing the replay button will start the tape transport system in motion. Depending on the type of recording being replayed the track selector will have to be set to either tracks 1, 2, 3, or 4, or stereo. The playback volume control is set to the required sound level and the tone control adjusted to taste. Pressing the " stop " button returns all buttons to neutral.

To record: the microphone is plugged into the appropriate socket and by means of the two gain controls may be mixed with a radio or gramophone signal. With the stop button pressed all keys are in neutral and in this position the recording level can be set up on the magic eye indicator. The microphone balancing, etc., can be monitored on headphones (or internal loudspeaker). When the recording level, and/or microphone balance, etc., is satisfactory, pressing the " record " button will start the machine recording. The " selector " switch will, of course, be switched to either tracks 1, 2, 3, or 4, or stereo. When switched to stereo the signals from both channels are fed to the magic eye. It is possible, as a result, to make a stereo recording

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By

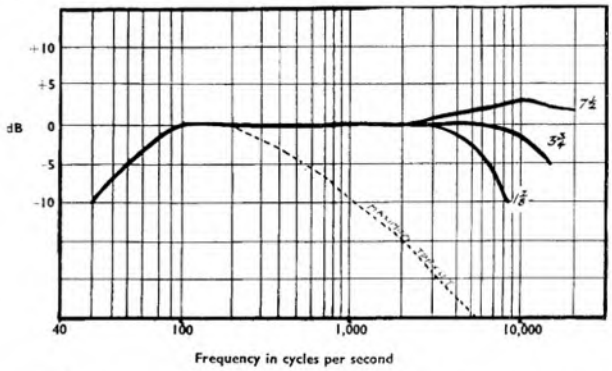
E. A. RULE

with one channel not working. The magic eye will not indicate which channel has the signal, it will only indicate the maximum signal from either channel. I suggest that when making stereo recordings a pair of stereo headphones are used to monitor the signal to be sure that "all is well." Apart from this slight disadvantage on stereo, recordings are very easy to make and it is possible to monitor the signal at all times.

Electrical

The microphone input is fed into an EF86 low noise pentode and the radio/gramophone input is fed to one half of an ECC83 (double triode). The output from these stages are mixed via the record gain controls and fed into a two stage amplifier using an ECC83. This amplifier has frequency selective negative feedback from the output of stage two to the cathode of stage one to provide the correct frequency response for each tape speed. The erase oscillator for both channels is an EL84 pentode which also doubles as channel one output stage on replay. Both channels are the same except that the EL84 on the second channel doubles as a monitor amplifier on record and as channel two output stage on replay.

On replay the signal from the tape head is fed into an EF86 which in turn feeds into a two stage amplifier using an ECC83. Frequency selective negative feedback is again used to provide the correct frequency response at each speed. The output from this is fed into an EL84 output stage which can provide up to four watts output.



Record/replay frequency response curves of the EL3536 measured with tape recorded 20 dB below peak level and one watt output (Ref.: 1,000 cps)

Tests

The recorder was put through the usual tests and in general met the claims made by the manufacturers, the record/replay frequency response is excellent and combined with a signal to noise ratio of −47 dB will enable recordings of a very high standard to be made. The measured power output into a dummy load was slightly over four watts but did show some distortion. However, this is to be expected at full power. Performance of each channel matched very closely and a slight movement of the balance control set the two channels to within 1 dB of each other.

A recording was made at maximum level on each track and after being made visible showed the tracks to be correctly positioned on the tape. The rewind time for 1,800 ft. of tape was just over three minutes.

The braking system is one of the best that has been reviewed. Winding the tape backwards and forwards several times on fast wind and then pressing the "stop" button, always left the tape evenly wound on the spool and without any loops. This tape deck has been used and steadily improved by Philips over a number of years and has resulted in the trouble free, high quality tape deck used in the EL3536 recorder.

Summing up

The Philips EL3536 recorder has been in use daily over a period of several weeks and many excellent recordings have been made.

The microphone supplied with the recorder is very good indeed. Used as a mono microphone it is very directional and capable of making high quality recordings. When used for stereo recording the stereophonic effect is very good and at least equal to anything reviewed before. The amplifiers have plenty of gain in hand and at no time during the testing were the gain controls "flat out."

Volume on replay is more than normally required for domestic use and would be quite suitable for a small hall. Enough speaker lead is supplied to place the second speaker up to 10/15 feet away if required.

With the speakers placed about eight feet apart and using professional stereo tapes the stereo effect and quality were very good. Using two hi-fi multispeaker systems improved the quality considerably and showed that the limiting factor as far as quality is concerned is the loudspeaker system used. The internal speakers fitted to the recorder cannot do justice to the amplifiers.

My main criticism is that the instruction book is vague. For example: a five-core lead complete with a plug is provided, but there is nothing to say what it's for. Not all connections are given for the various sockets and quite a number of users will have quite a time trying to sort them out. Apart from this, it is an excellent machine and can be fully recommended.

MANUFACTURER'S SPECIFICATION

Speeds: 7½, 3¾, 1⅞ ips.

Frequency response: 50-20,000 cps at 7½ ips. 50-15,000 cps at 3¾ ips. 50-7,000 cps at 1⅞ ips.

Signal-to-noise ratio: −40dB.

Wow and flutter: Less than 0.2 per cent at 7½ ips.

Recording system: Four-track stereo, left to right.

Maximum spool size: Seven inches.

Playing times: Sixty-four minutes per track using standard tape (1,200 feet) at 3¾ ips.

Rewind Time: Less than two minutes for 1,200 feet of tape.

Power Output: Four watts each channel.

Power consumption: approx. 80 watts.

Inputs: Microphone (3mV/0.1 M ohms); Gramophone/radio (150mV/1 M ohm) and diode (5mV/0.1 M ohms).

Outputs: Line (adjustable level, 1.5 V/50 K ohms); extension loudspeakers (4W/3-7 ohms); headphones (100mV/1 K ohm); and diode (2 v/56 K ohms).

Mains voltage: 110, 127, 220, 245v, 50 cycles; and 110, 117, 220, 245v, 60 cycles.

Valve line-up: Two EF86, two ECC83, two EL84, one EM84, two OA85, plus a metal rectifier.

Dimensions: 18½ x 15½ x 11 inches.

Weight: 46 lbs.

Manufacturers: Philips Electrical Limited, Century House, Shaftesbury Avenue, London, W.C.2.

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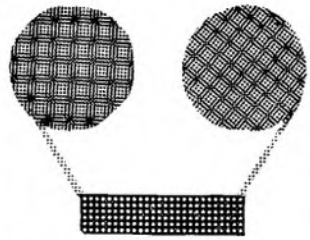
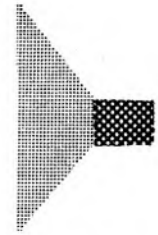


NEW PRODUCTS



NEW LUSTRAPHONE UNITS

ONE of two new instruments announced by Lustraphone recently is the Lustradyne Model VRP/69 shown in the left of the photograph right.

The frequency response is claimed to be substantially flat between 50-13,000 cps. Choice of impedance is provided, being low, line, or high as required. Low impedance output level is 90dB below lv/dyne/cm^2; and high impedance is 56 dB below lv/dyne/cm^2. Front to back ratio is given as average 15dB in cardioid positions.

The principle of operation for this new microphone is a combination of a pressure-operated moving coil unit and a pressure gradient ribbon unit. The two outputs of the microphone elements are brought out independently of each other in a four-core cable, but an external control unit which can be located near the equipment input socket has been designed to permit additional features. These include continuously variable directional characteristics from cardioid in one direction through bi-directional (figure-of-eight) to cardioid in the other direction; use as an omni-directional microphone; phase reversing of any or all combinations; and a filter circuit enabling the cardioid or bi-directional combinations to be used for speech, including close-talking.

Finished in satin chrome, 5½-inch long the Lustradyne weighs 19 ounces, and has a diameter of two inches. The control box measures 4¾ x 3¾ x 2⅛ inches. Four controls are provided, for cardioid/omni directional; Speech filter in/out; Phase reversing, and for cardioid/figure-of-eight/cardioid.

Their second instrument is the Microdyne, Model VR/70. This is a miniature ribbon velocity microphone incorporating a new conception of magnetic circuit design resulting in hitherto unobtainable miniature dimensions of the basically rectangular microphone head. The total volume is 0.6 of a cubic inch, and the output level is said to be comparable with that of a standard ribbon unit.

Quoted frequency response is substantially flat between 50-14,000 cps. Choice of impedance are again available, the low impedance being 90dB below lv/dyne/^{2}cm; and high impedance 56dB below lv/dyne/cm^2. A figure-of-eight directional characteristic is employed.

The microdyne microphone head measures $^{15}/_{16} \times 2^{1}/_{16} \times {}^{5}/_{16}$ and the over-all height including the base is 7¾ inches. The microphone weighs four ounces, the base 2½ ounces.

The head is connected to the base by a slim, tapering stem which incorporates an anti-vibration mounting. Terminating in a miniature three-pin socket with provision for a cable connection or stand-mounting plug, the plug can be securely locked in position by an external screw collar.

It is supplied in its standard version with a base ring and three detachable feet. The effective base diameter is 5½ inches and additional shock absorption is obtained by rubber cushions at the ends of the feet. Use as a hand microphone is possible by unscrewing and removing the base collar.

The prices of both units are available on request from the manufacturers.

Lustraphone Ltd., St. George's Works, Regent's Park Road, London, N.W.1.

IN BRIEF

A CHANGE of price is announced for the Symphony Automatic tape recorder. This model is now available for 59 guineas, from Symphony Amplifiers Limited, 16, King's College Road, London, N.W.3.

* * *

THE head office of the Tape Recorder Centre Ltd. has been moved to the central London showroom, 82, High Holborn, W.C.1, the Harringay showroom and offices having been closed.

Demonstration facilities at High Holborn will now include their entire range of tape recorders and all hi-fi equipment, one floor being devoted to each group. The new extended offices now also become the headquarters for mail-order in this country.

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TWO NEWCOMERS TO TAPE MARKET

(1) Magnetic Tape

ANOTHER newcomer to the tape field is announced this month with the announcement that Topco Enterprises are to market American magnetic tape in this country.

The new tape, manufactured by Burgess, the U.S. battery manufacturers, will be available in 3, 4, 5, 5¾ and 7-inch reels, in standard and long-play acetate and Mylar based, and double-play tensilised Mylar.

Claimed features of the new tapes are micro-finished surfaces, built-in surface lubricant, non-warp spools, and improved pre-coating techniques to produce a positive bond between the oxide and the base to minimise flake-off and keep recording heads clean, and a new dispersion process for high sensitivity and a low print-through figure.

The prices of the various tapes plus the lengths of tape accommodated on each spool is given as follows:—

Standard acetate (No. 111, 1.5mil): 3in-150ft. (7s. 6d.), 4in.-300ft. (9s. 6d.), 5in.-600ft. (17s. 6d.), 5¾in.-850ft. (23s.), and 7in.-1,200ft. (27s. 6d.).

Long-play acetate (No. 190, 1.0mil): 5in.-900ft. (21s.), 5¾in.-1,200ft. (25s.), and 7in.-1,800ft. (35s.).

Standard acetate, stereo quality (No. 141, 1.5mil): 5in.-600ft. (18s. 6d.), and 7in.-1,200ft. (30s.).

Long-play acetate, stereo quality (No. 140, 1.0mil): 5in.-900ft. (24s.), and 7in.-1,800ft. (40s.).

Standard Mylar (No. 102, 1.5mil): 5in.-600ft. (21s.), and 7in.-1,200ft. (35s.).

Long-play Mylar (No. 150, 1.0mil): 3in.-225ft. (9s.), 5in.-900ft. (25s.), 5¾in.-1,200ft. 32s.), and 7in.-1,800ft. (47s.).

Double-play tensilised Mylar (No. 200, 0.5mil): 3in.-300ft. (12s.), 5in.-1,200ft. (42s.), 5¾in.-1,700ft. (55s.), and 7in.-2,400ft. (68s.).

The tapes are available, by mail order only, from The Recording Tape Co., 44, Old Bond Street, London, W.1, and from Topco Enterprises, 101, Sydenham Avenue, Belfast 4, Northern Ireland.

BASF TRIPLE-PLAY

AN extension of their range of magnetic tape is announced by B.A.S.F. Chemicals Ltd., who have introduced triple-play tape.

The new product, to be available on 3, 4, and 4¼-inch spools, trebles the playing time available of standard tape. The new issues will accommodate respectively 450, 900, and 1200 ft. of tape, priced at 23s. 4d., 42s., and 52s. The respective playing times per track, at 3¾ ips, will be 24 minutes, 48 minutes, and 96 minutes.

Briefly, the new tape will allow an hour and a half of recording time on a three-inch spool to give a twin-track portable a big-machine capacity.

It is claimed to have the same B.A.S.F. qualities including full frequency response, negligible print-through, dimensional and magnetic stability.

B.A.S.F. Chemicals Limited, 5a Gillespie Road, London, N.5.

(2) B.S.R. and Collaro deck tape recorders

TWO tape recorders from a newcomer to the field are announced with the introduction of the Pakasound "Enthusiast" and "Connoisseur" tape recorders.

The first of the new models is a single, 3¾ ips, speed, two-track machine employing the B.S.R. Monardeck. This accomodates 5¾-inch spools providing a maximum playing time of 91 minutes per track, using double-play tape.

Among the features are an electronic ribbon recording level indicator, inputs for radio, pick-up and microphone, and an output for an extension loudspeaker unit, also available. This employs a 9 x 5 inch elliptical unit, the complete enclosure measuring 20 x 10 x 7 inches.

The "Enthusiast" is supplied complete with microphone, recording tape,

The Pakasound "Enthusiast"

empty spool, recording lead and jack plug. It weighs 19 lbs and measures 14 x 12 x 8 inches.

Their second model employs the Collaro Studio deck which employs three tape speeds, 7½, 3¾ and 1⅞ ips and accommodates 7-inch spools. The maximum playing time available for this two track model is 4¼ hours using double-play tape at the slowest speed.

The Pakasound "Connoisseur"

Among the features are push button controls, magic eye recording level indicator digital rev. counter inputs for radio, pick-up and microphone, and an output for an extension loudspeaker. Facilities for superimposition are also provided.

Housed in an attractive two-tone case measuring 17 x 15 x 8 inches, the "Connoisseur" weighs 32 lbs and will cost 47 guineas.

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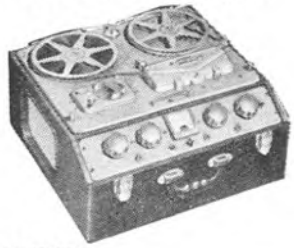

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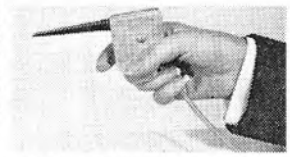

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News from the Clubs

BOURNEMOUTH

When members of the Bournemouth club visited the Audio Festival they hit upon a nifty idea of identifying themselves by wearing lapel badges bearing the name of the club. By this method they met a number of other club's members and partly solved an age-old problem.

One of the enthusiasts they met was Mike Brown, secretary of the Rugby club. He is one of their established tape contacts but until the Audio Fair they had never met.

The club has been able to provide some social and technical assistance to a local elderly couple who recently took possession of their first tape recorder. The wife is blind and her husband cannot walk too far, so, with the help of Tape Recorders Ltd. of Boscombe, the members set-up equipment in their home. Secretary Mrs. Lawson later visited the couple several times to teach them how to operate the machine and supplied them with recorded tapes.

Secretary: Mrs. J. L. Lawson, 8, Dolphin Avenue, Northbourne, Bournemouth, Hampshire.

BRIXTON

The Brixton members have had a hectic recent month. Among their many exercises have been the production of a tape on the Audio Festival; recording interviews with the candidates during the council elections; and issuing the first edition of their club magazine. They have also received and replied to a tape from the club in South Africa, and answered a taped letter received from an enthusiast in Aden.

Latest of their projects has been the celebration of the opening of new club studios. For this they presented their production of a skit on the popular BBC serial *The Archers*.

Secretary: R. G. Garrett, 56, Rattray Road, Brixton, London, S.W.2.

CARDIFF

The members of the Cardiff Society have managed to obtain the use of two meeting places. Their regular abode in Caroline Street is in future to be the venue for listening to their outside recordings, manufacturer's lectures, etc.; while a small room at 51 Charles Street will be devoted to specialised activities.

These will include tape exchanges, tape/slide show productions, equipment construction, and general discussions. The latter groups will meet by mutual agreement, a form of movable feast, with home-made tea and biscuits.

Secretary: Mrs. Rene E. Hill, "Gedrys," Gwaelod-y-Garth, Cardiff.

CARLISLE

Carlisle's tape club, formed last November, is to help the city's school teachers by giving lectures on the techniques of tape recording. The city's Musical Director had requested this favour because the teachers are a little "frightened" of their machines. Most of the schools in that area are supplied with recorders, but until today no instructions have been given on their use.

This twenty-strong club meets every Friday, and has a membership ranging in ages from 18 to a "sprightly 64."

Secretary: J. E. Francis, 29, Dalton Avenue, Raffles, Carlisle, Cumberland.

COTSWOLD

A demonstration of advanced testing techniques, with a view to helping members to a fuller understanding of test bench reviews in tape magazines, was given by members Colin Woods and Eric Jones at a meeting of the Cotswold society. Long-term speed stability measuring was demonstrated using a measured length of tape timed by a stop-watch, and a strobe tape for visual testing. A Gaumont-Kalee wow and flutter meter and a test tape also measured short-term stability on a Ferrograph. A final analysis showed the machine to have a figure of less than 0.2 per cent, well within the manufacturer's specifications.

A final test showed the degree of accuracy of the magic eye, or meter, recording level indicator. One of the test recordings heard during the evening was made by the speakers on the way to, and at, the Audio Fair.

Member Peter Duddridge has continued to feature in BBC broadcasts on the Midland and West Home Services. One of his latest programmes included an interview with the world champion crisp eater—a student at Cheltenham college. Details of how the gentleman's seconds stood around crushing packets of crisps ready to eat, plus a noisy account of the actual record-breaking attempt were included in the programme, which unfortunately went on the air at breakfast time. One wonders at the reception.

Hardly down to earth either was another of his tape's which, describing the experiences of parachute jumpers, including recordings made with a Fi-Cord during an actual jump. The secretary's newsletter does not say who made the jump. Enthusiasts are advised to contact Mr. Duddridge before attempting to emulate him.

Peter is becoming an acknowledged expert in nature sound recording. Several of his tapes have been accepted by the BBC library. His equipment includes three Fi-Cords, two Ferrographs, a Stuzzi Magnette, Stella battery portable, a Philips four-track, and an E.M.I. L2 battery portable. He also has the new Fi-Cord. He wishes it known that, contrary to reports, these machines are not all used at once. Ah well, back to my Scophony Baird.

For their June 25 meeting members journeyed to Oakridge Lynch for another location recording session using battery machines. Parties visited local hostelries where serious work—of one kind and another—was done in their search for comment on Dr. Beeching's policy of cutting down rail services.

Playback revealed that pubs are not the ideal place for interviews due to the intense amount of background noise. One party, however, Mrs. Jane Turner and Mr. and Mrs. Mostyn Price, operating a Philips EL3585, scooped the session with their recording of a visit to Chalford station. They had interviewed the station staff, recorded the arrival of the rail-car, and even managed to talk someone into letting them board an engine and sounding the whistle. The same whistle also appeared on another party's tape.

Comparative tests were later made with the Philips battery portables. A variety of microphones were used, including the AKG D19B, Beyer 119, Grampian DP4, and the small dynamic instrument supplied with the machine. Other recorders in use for the evening included the Fi-Cord 202, a Stuzzi Magnette, and "a whole posse" of Philips/Stella portables.

Secretary: Peter D. Turner, Cave Cottage, Oakridge Lynch, Stroud, Gloucestershire.

HOVE

A 45-minute taped report of the Audio Festival was heard by members of the Hove club at a recent meeting. This had been sent to them by Bob Coote, publicity chairman of The Voice-spondence Club.

Assisted by Mrs. Coote, Bob had provided an excellent discourse on the highlights of the Fair and also provided a made-up booklet of illustrations of the recorders and accessories described in this commentary.

The whole project was of special interest to the club members, none of whom had been able to make the journey to London.

Secretary: B. H. Guernsey, 44, Hogarth Road, Hove 3, Sussex.

LEICESTER

A change of venue and a decision to omit the term "Hi-fi" from their title was made at the recent AGM of the Leicester club. Their new meeting place is in the Leicester Museum, Princess Road entrance, where they now meet on alternate Thursdays.

The previous officers were re-elected, and details of the club can be obtained from the secretary Peter Starie.

At one of their first meetings in the new rooms, a discussion on the relative merits of mixing and superimposition was held together with a demonstration of adding sound to 8 mm cine film.

Secretary: Peter Starie, 56, Minehead Street, Leicester, Leicestershire.

NORTH LONDON

Taking just three meetings over the job, the members of the North London club have built a three-channel mixer unit. A series of meetings devoted to equipment construction began with a talk and demonstration on soldering. After an outline of how to read a circuit diagram had been given, various sections of the mixer were distributed for construction among members—some of whom were attempting such a chore for the first time.

At one stage it was discovered that only a small number were able to continue, and so chairman Sinclair Scott and Ron Skeggs took over to complete it.

Other of their recent activities have included the organising of a stand at the Forty Hill Rose Fayre, one of Enfield's largest fetes. Among the highlights of their exhibition was a taped programme of interviews and sound effects recorded during and shortly after the opening ceremony. On display at the stall was a wide variety of equipment including their mixer unit, tape recorders, a tuner, loudspeaker, de-fluxer, plus press cuttings on the club's activities.

A set of headphones offered a continuously-playing six-minute tape of familiar Enfield sounds recorded at the market-place, the local park and a restaurant. The popular *Record-your-voice* exhibit showed a new twist, by allowing friends of the speaker to hear the play back through headphones a second after the record was made on the Brenell Mk5M. Experimental echo was also added to some of the voices.

Throughout the day, up-to-the-minute reports were being recorded, edited, and made available for continuous playback. The finished tape included interviews with the Rose Queen and her predecessor, and the music from a 46-key fairground organ driven by a 1912 steam engine.

Visits and demonstrations in the past few weeks have included the presence of Mr. Allen of Simon Equipment Ltd., who put his firm's SP5 recorder through its paces for a joint demonstration with the Friern Barnet members; and a tour of London's continental telephone exchange which they visited in May.

Mr. D. Dumville of Northern Radio Services has also been along to see the members to demonstrate his Symphony Automatic tape recorder. His visit was followed by Messrs. C. I. Jarman and Brian Sandford of E.M.I. Electronics Ltd. who gave a talk and demonstrated some of their company's professional equipment.

Secretary: Richard Collinson, 30, Ridler Road, Forty Hill, Enfield, Middlesex.

RUGBY

A second tape recording course is proposed by members of the Rugby club. Final arrangements are still to be made, but it is expected to run along much the same lines as their experimental course held in February 1960.

Expected subjects are to include history and development of tape recording, choosing a tape recorder, equipment maintenance, microphone techniques, the use of tape, and interviewing. Primarily aimed at those already owning tape recorders, the course will also have a great deal of material included to encourage enthusiasm for the hobby.

One of the oldest clubs in formation today, the Rugby society spends a great deal of time encouraging greater interest in tape recording. They have only just recently successfully completed another annual convention to which a general invitation to all clubs was issued. Representatives from seven clubs attended the meeting, together with members of the local and tape press.

Each club was invited to provide a short account of its activities, while club member Mr. J. Campden recorded the whole of the proceedings on the club's own tape recorder. During the evening Terry Davis presented a film he had made during the previous meeting.

Among other activities of the club has been the acceptance of an invite from the Coventry club, who asked Rugby members to judge their internal competition. They have also formed a committee to arrange the club's participation in the A.E.I. Apprentice's rag to be held in Rugby on September 1. Initial ideas for their proposed float entry for the rag's theme, *In Days of Old*, suggests the club may design something of an Emmett or Heath Robinson creation, or maybe the "first gas-operated tape recorder."

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The secretary, president John Bannister, Dennis Middleton, Ernie Crane, and Jean Bester visited the Birmingham club during June in reply to their attendance at the convention. The B.Trac programme included a demonstration of equipment by Lustraphone Ltd., and afterwards the members met Mr. Pontzen of that company. Another exchange visit was scheduled for July 17 when the Rugby members were to travel to Northampton.

Other demonstrations have included a visit by Wyndsor Recording Co., who exhibited the new International tape recorder.

For their July 5 meeting, the members were to hear and make a start to a reply to a tape received from the Bournemouth members.

Secretary: Michael Brown, 219, Clifton Road, Rugby, Warwickshire (Rugby 3973).

SOUTH DEVON

At their April 25 A.G.M., the members of the South Devon club heard Chairman, Gordon Furneaux, call for greater active participation. First decision following his account of the previous year's work was a revision of club policy. More meetings are to be devoted to practical work, and fewer speakers will be invited to lecture.

They also decided to embark on a new project sponsored by Mr. Furneaux. This is *Audio-View*, a magazine programme on tape. This is to be produced every two months, and each edition will be edited by a different member. The first issue appeared in April.

Another new feature of the club is a trophy, to be competed for annually, for the best tape in their competition. It is a metal replica of a four-inch tape spool mounted on a mahogany base with a small plaque to bear the winner's name.

The first holder of this trophy is the chairman who received his award from the club's president Mr. Donald Aldous, Technical Editor of *Audio Record Review*, at a recent meeting. He was also presented with a certificate and a five-inch spool of tape. Mr. J. Brooke-Stewart, the runner-up, received a four-inch spool of tape.

A club dinner and dance has been proposed, and arrangements for this to be held in the New Year have been discussed.

Secretary: Mrs. J. Pletts, "Bridam," Kents Wood, Wells Wood, Torquay, Devon.

TAPEWORMS

A letter from Reg Preston of the "Tapeworms" International Recording Club claims a terrific response following the announcement of this club's existence in our last issue. Some misunderstanding has arisen regarding subscriptions, and we are asked to repeat that this organisation is entirely free, being composed only of enthusiasts wishing to exchange tapes.

All that is required to join the club are the details of name, address, recorder used (with speeds), occupation and hobbies. A foolscap s.a.e. is also requested.

Secretary: Reg Preston, 4, Queen's Road, Maidstone, Kent.

WAKEFIELD

Peter Wainright, Stephen Gaunt and Michael Storey of the Wakefield club, nicknamed "The Soundhunters" visited the Clevethorpe Old Folk's Home recently to provide an evening's tape entertainment.

A pre-recorded programme was played of selected old-time records, followed by voices of the past, Wakefield sounds, and an impromptu interview of some members of the audience. A return visit was made a few weeks later, and the club has now settled down to regular visits.

They make an appeal for the loan of old records for inclusion in the programmes, and would like to hear from anyone owning recordings of speeches or talks by famous personalities of the 20's and 30's.

Secretary: S. C. Gaunt, 13, Willow Drive, Sandal, Wakefield, Yorkshire.

WINDSOR

Members of the Windsor club are planning a local hospital service on the lines of the *Family Favourites* programme, but with the optional addition of sound effects from home. It will begin as soon as arrangements with the hospital are complete.

An official invite was received by the club recently asking them to record the proceedings at a "Safety in the Home" conference held at the Guildhall. These "vocal minutes" are to be made available to order at cost price.

Secretary: William A. C. C. Smith, 73, King's Road, Windsor, Berkshire.

CLUB MEETING DIARY

ABERDARE: Alternate Wednesdays at Cwmaman Institute, Cwmaman. (July 25.)
ABERDEEN: 1st Tuesday in every month at 8, Deer Road, Woodside.
AYLESBURY: Monthly at Hazell's Club, Britannia Street.
BARNSLEY: Every Tuesday at YMCA, Eldon Street.
BATH: Every Wednesday at 24, Green Park.
BATH (2): Alternate Wednesdays at 41, Herbert Road, Oldfield Park.
BEDFORD: Final Tuesday in month at 131, London Road.
BELFAST: Every Thursday at 44, Dublin Road, Belfast 2.
BIRMINGHAM: Every Monday at the Chapel Tavern, Ludgate Hill.
BIRMINGHAM (SOUTH): Alternate Mondays at The People's Hall, Oak Tree Lane, Selly Oak, Birmingham 29. (July 30.)
BLACKBURN: 1st and 3rd Tuesdays at Blackburn YMCA.
BLACKPOOL: Alternate Wednesdays at the Albert Hotel, Lytham Road. (July 18.)
BOSTON: 2nd and 4th Tuesdays at Pilgrim College, South Square.
BOURNEMOUTH: Alternate Tuesdays at the Pembroke Hotel, Poole Hill. (July 24.)
BRIDGWATER: Every Tuesday at Evis' Radio Shop, West Street.
BRIGHTON: Every Wednesday at The Brunswick Arms, 38, Ditchling Road.
BRISTOL: Alternate Wednesdays at 6, Royal York Crescent, Clifton, Bristol 8. (July 25.)
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.
CHESTERFIELD: Every 3rd Monday at the Yellow Lion Inn, Saltergate. Aug. 6.)
CLACTON: Every Monday at Ebor Lodge Hotel.
COTSWOLD: Fortnightly, alternating Monday and Thursday at Bayshill Hall, Royal Well Lane, Cheltenham. (July 23.)
COVENTRY: Alternate Wednesdays at Holy-Park Hotel. (July 18.)
COVENTRY (audio and cine): Alternate Tuesdays at the Liberal Club, Union Street. (July 31.)
CRAWLEY: 1st and 3rd Mondays at Southgate Community Hut.
DARTFORD: Every Thursday at 41, Winsor Drive.
DERBY: Alternate Wednesdays at Osmaston Park Hotel. (July 18.)
DONCASTER: Alternate Thursdays at Lancaster House, Westlaithe Gate. (July 19.)
DOVER: Alternate Mondays at the Priory Hotel, Dover. (July 23.)
DUBLIN: 1st Monday at "Hardy House," 6, Capel Street.
DUNDEE: Alternate Mondays at The Salvation Army Hostel, 31, Ward Road. (July 30.)
EASTBOURNE: Alternate Saturdays at Hartington Hall, Bolton Road. (July 21.)
EAST HERTS: Alternate Mondays at 3, Chadwell, Ware. (July 23.)
EDINBURGH: 1st and 3rd Wednesdays at 82, Newbattle Terrace, Edinburgh 10.
GLASGOW: Fortnightly, alternating Tuesday and Thursday at the Highlands Institute, Berkeley Street, Glasgow. (July 19.)
GRIMSBY: First Monday at 21, Langton Drive, Nunthorpe, Grimsby.
HARROGATE: Every Wednesday at 4, Belford Road.
HASTINGS: Every Thursday at The Rising Sun, East Parade.
HINCKLEY: Alternate Wednesdays at The Wharf Inn, Coventry Road. (July 25.)
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. (July 3.)
ILFORD: Alternate Tuesdays at the Gants Hill Library. (July 24.)
IPSWICH: Alternate Thursdays at the Art Gallery, High Street. (July 19.)
JARROW: Alternate Mondays at Jarrow Central School. (July 30.)
JERSEY: 1st and 3rd Mondays at "Santa Barbaba" Maufant, St. Saviour.
KEIGHLEY: Alternate Wednesdays at the Spencer Street School Rooms. (July 25.)
KETTERING: 2nd and 4th Wednesdays at the Rising Sun, Silver Street.
KIDDERMINSTER: Alternate Wednesdays at the NFU Meeting Room. (July 18.)
LEEDS: Alternate Fridays at 21, Wade Lane, Leeds 1. (July 20.)
LEICESTER: Alternate Thursdays at the Leicester Museum. (July 26.)
LUTON: 2nd and 4th Tuesdays at Flowers Recreation Club, Park West, Luton.
MAIDSTONE: Every Wednesday at the Ex-Services Club, Ashford Road.
MANCHESTER: Every Saturday, 6 p.m., at 20, Naylor Street, Hulme, Manchester 15.
MEDWAY: Every Monday at 23, Edward's Close, Wigmore, Gillingham.
MIDDLESBROUGH: Every Friday at 130, Newport Road.
MIDDLETON: Every Thursday at Tonge School, Oldham Road.
MILLOM: Every Wednesday at Millom Centre.
NORTHAMPTON: Every Tuesday at Studio One, Cross Keys Hotel, Sheep Street.
NOTTINGHAM: Alternate Thursdays at the Co-operative Educational Centre, Heathcote Street. (July 26.)
NORWICH: 4th Tuesday at "Lady Chamberlin Hall," 38a, St. Giles' Street.
PETERBOROUGH: Alternate Thursdays at The Youth Centre.
PONTYPOOL: Every Monday at the Hospitality Inn, Crumlin Road.
PLYMOUTH: Alternate Wednesdays at Virginia House, Plymouth. (July 25.)
READING: Every Monday at Abbey Gateway.
REDDITCH: 4th Thursday at The White Hart Hotel, Headless Cross.
RHYL: Alternate Tuesdays at Studio A, Bedford Street. (July 31.)
ROTHERHAM: Alternate Thursdays at St. John's Church Hall, Masbro'. (July 26.)
RUGBY: Alternate Thursdays at the Red Lion, Sheep Street. (July 19.)
SHEERNESS: Alternate Fridays at Arthur Gisby's, 136, High Street. (July 20.)
SOUTHALL: Every Monday at Southall Community Centre.
SOUTHAMPTON: Alternate Mondays at Prospect House, 8, Manchester Street. (July 30.)
SOUTH DEVON: Alternate Wednesdays at the YMCA, Castle Circus, Torquay. (July 18.)
STAFFORD: Alternate Tuesdays at The Grapes, Bridge Street. (July 24.)
STEVENAGE: 1st and 3rd Tuesdays at the Tenants' Meeting Room, Marymead.
STOCKPORT: 1st and 3rd Fridays at Stockport Boys' Club, Hempshaw Lane.
SWANSEA: Every Thursday at the YMCA Buildings, St. Helen's Road.
TRURO: Last Wednesday at the London Inn, Pydar Street.
URMSTON: Contact Keith Alker, 26, Hayeswater Road.
WALSALL: Every Wednesday at the New Inn, John Street.
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. (July 25.) Heath Park Hotel, Hemel Hempstead. (Sept. 5.)
WEST MIDDLESEX: 2nd and 4th Thursdays 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. (July 25.)
WHITSTABLE: Alternate Mondays at The Granary, 1, Borstal Hill. (July 30.)
WINDSOR: Every Thursday at The Guildhall.
YEOVIL: Alternate Thursdays at the Mermaid Hotel, Princess Street. (July 26.)
YORK: Every Thursday at 62, Micklegate.

LONDON

ACTON: Alternate Fridays at the King's Head, Acton High Street. (July 20.)
BETHNAL GREEN: Every Friday at Shoreditch Tabernacle, Hackney Road, E.2.
BRIXTON: Every Tuesday at The White Horse, 94, Brixton Hill, S.W.2.
CATFORD: Every Thursday at the Black Horse, Rushey Green, Catford, S.E.6.
FRIERN BARNET: 2nd Friday at 7, Harmsworth Way, N.20, and 4th Thursday at 146, Friern Barnet Lane, N.20.
LEYTONSTONE: Alternate Wednesdays at Harrow Green Library, London, E.11. (July 25.)
LONDON: 2nd Thursday at the Marquis of Granby, Chandos Place, Charing Cross, W.C.2.
NORTH LONDON: Every Wednesday at Bush Hill Park School, Main Avenue, Enfield.
SOUTH-WEST LONDON: Every Wednesday at Mayfield School, West Hill, S.W.15.
STOKE NEWINGTON: Every Wednesday at 53, Londesborough Road, N.16.
TUFNELL PARK: Details of meetings from G. Wilgrove, 38, Highgate Road, N.W.5.
WALTHAMSTOW: Alternate Fridays at 22, Orford Road, E.17.
WOOLWICH: Alternate Mondays at the North Kent Tavern, Spray Street, Woolwich. (July 30.)

Unless otherwise stated, meetings start between 7 and 8 p.m.

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