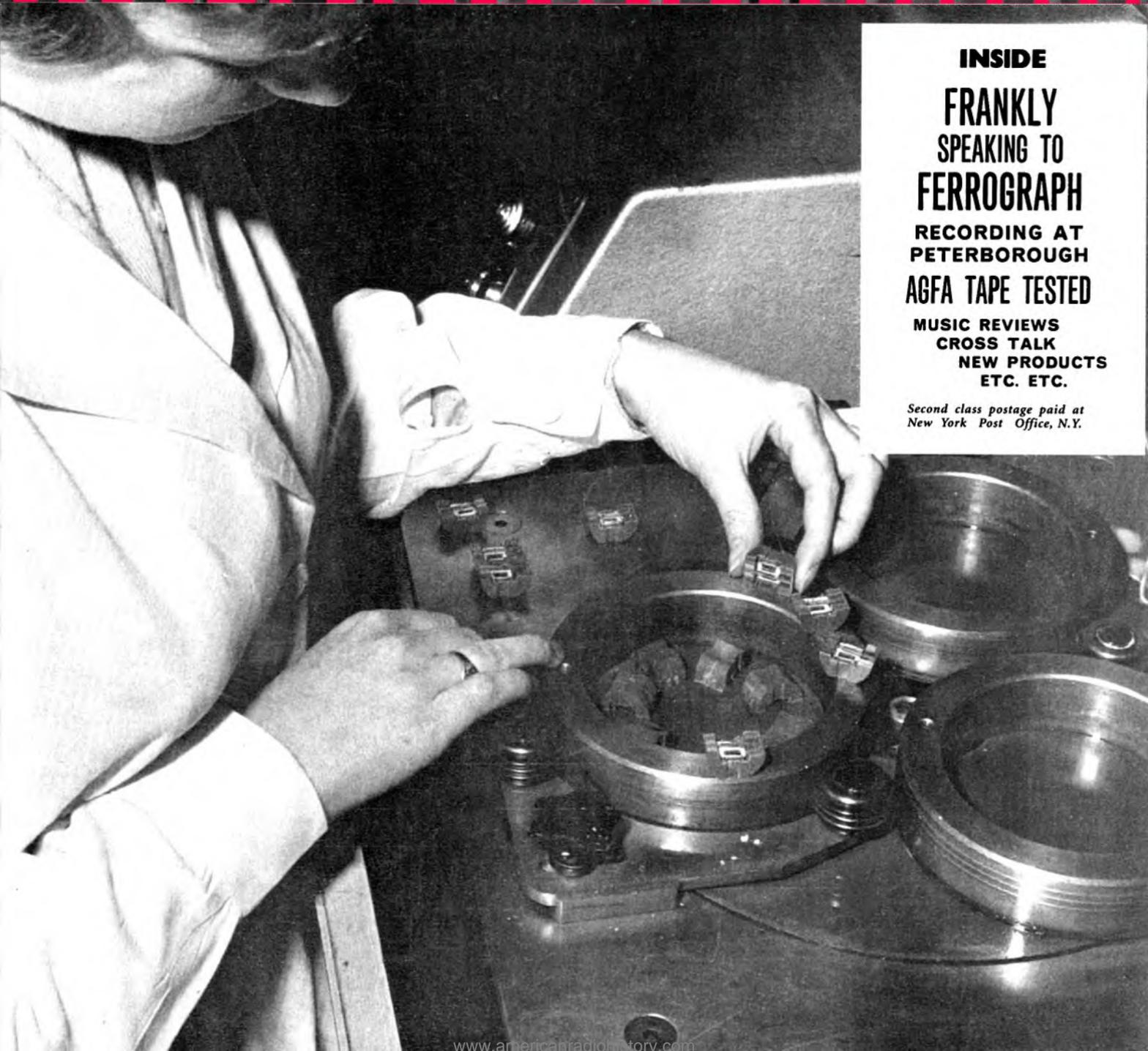


SEPTEMBER 1967

TAPE

RECORDING MAGAZINE

2¹/₂



INSIDE

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32 TV pianist Joseph Cooper plays this triumphant concerto with the Sinfonia under Dods. Also Saint-Saëns' poem Rouet d'Omphale.



443 Chart-topping folk group sing Morning Town Ride; Eriskay Love Lilt; Blowin' in the Wind; Kumbaya; Chilly Winds; plus 7.



31 John Hollingsworth conducts the Sinfonia of London in a thrilling performance of this famous ballet music.



202 One of Nat's greatest discs! You'll Never Grow Old; Because You're Mine; Walkin'; Because of Rain; plus 8 other tops.



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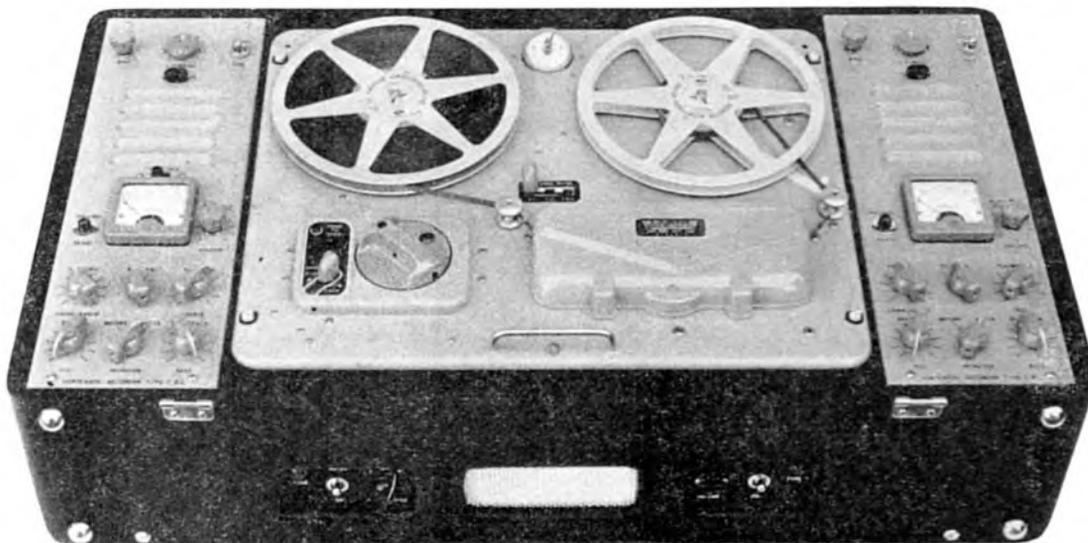
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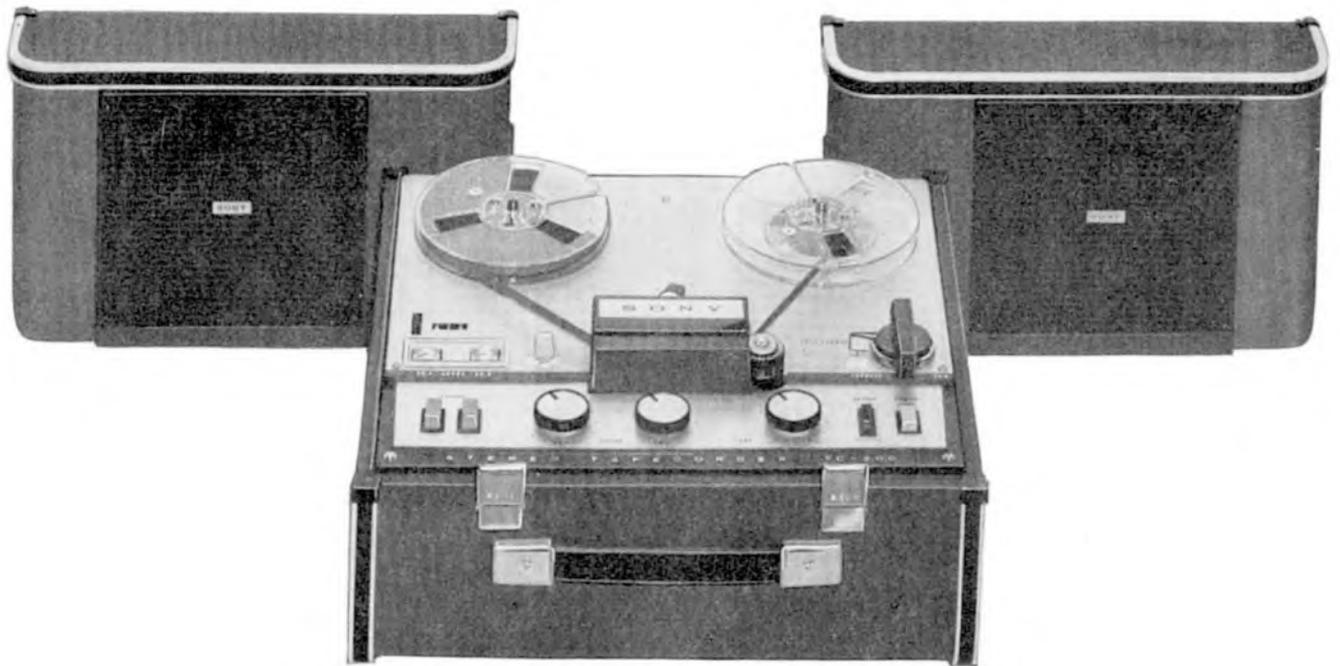
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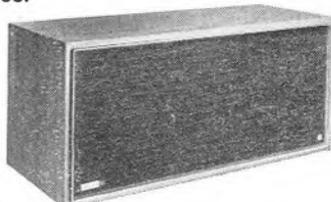
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TAPE

RECORDING
MAGAZINE

Vol. 11 No. 9 September 1967

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COVER PHOTOGRAPH: The most important component of any tape recorder is the magnetic head. Here, in the South Shields works of the Ferragraph Co. Ltd., we see one of the most critical stages of head manufacture. This is the machine which laps the internal surfaces of the two halves of the head so that they shall present optically flat faces. Tolerances are to half a wave-length of light! On page 334 of this edition will be found a transcript of the most outspoken discussion ever held with officials at this factory.

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Tape trends and tape talk

By Douglas Brown

THE British Amateur Tape Recording Contest, now being organised for the first time by a committee representative of all the leading publications in the field, presided over by the Director of the International Audio Festival, Cyril Rex Hassan, promises to be an outstanding success. Most of the leading firms who themselves formed the organising committee in recent years are continuing their active association by contributing cash towards the organising expenses or valuable prizes.

I think the keen amateur will have a greater stimulus than ever before when the full details of the prize-list and the judging arrangements are announced later this year. The judging will probably take place in March, so that the prize presentation gathering can be staged at the 1968 Audio Fair and the new contest cycle will thereafter be geared to the Fair.

As a result, British entries to the 1967 International Recording Contest (to be judged in West Berlin in October) will be selected by the Federation of British Tape Recordists and Clubs in a special way this year. They should be sent direct to the Federation by September 1. In future years, there will be no difficulty in taking the best tapes from the British Contest and entering them in the succeeding International event, as in the past.

Apart from the familiar classes in the British Contest—and we are reverting to the original pattern of categories for documentaries and plays and musical recordings and technical experiment, etc.—there will be a special prize for the most humorous entry. And the Cotswold Tape Recording Society have offered a silver trophy, in memory of their founder and first President, the late Eric Jones, for the best tape entered by a physically handicapped tape recording enthusiast.

Closing date for the Contest is December 31. It's time now to be getting on with your entry.

* * *

THE BBC 1967 National Tape Recording Contest closes on September 30. Tapes should be addressed to BBC Tape Recording Competition, Broadcasting House, Piccadilly, Manchester, 1. They must not exceed five minutes and the theme is "On the Move." If you want fuller information, write to the BBC immediately.

I shall be helping to judge the competition later on in the year. Last time there were some splendid entries and we all hope for evident advances in technique this time.

* * *

FIRST, however, I shall be trying my hand at an ambitious recording exercise myself. About the time you are reading these words I shall be on the

Super Continental express of the Canadian National Railways, running into Montreal after a journey of three days and three nights across the Rockies and the prairies from Vancouver on the Pacific coast.

I shall have a Uher 400 Report-L portable with me and I hope to have collected some good documentary material about the journey as seen through the eyes of various travellers. I will report fully on the subject once I am back in England and the tapes have been edited.

Meanwhile, it may be of interest to indicate how the idea has evolved in my mind to date. First came the idea of the train ride, then the general impression that it ought to provide good recording material. Then I contemplated the obvious *sound* material available: the specially organised children's hours on the train each morning and the bingo sessions each evening, and, of course, the usual train noises off. The main problem, it seemed to me, was that so much of the unique quality of this particular journey would be visual: how to get that on tape?

At the moment of writing, I am playing with the idea of getting a record of the journey as seen through the eyes of half a dozen different people on the train—the driver, the conductor, a Canadian, a child, an overseas visitor, and so on. A montage of their varying impressions of the same sights may come off well.

I have, therefore, taken care to see that the train crew is advised of my purpose and I hope to be introduced to them before we leave Vancouver, and again when the crews change over at Winnipeg. This sort of preparation is, I think, essential.

When it comes to the point, of course, my approach may turn out to be quite different. And if the tape turns out a success, it will almost certainly be as a result of good spontaneous material which I could not possibly have foreseen.

* * *

MY CONGRATULATIONS to a firm called Tape Recorder Spares Ltd. on their new catalogue—and I do not use this column for "puffs" without good reason. I have enjoyed 20 minutes browsing through it.

The firm markets plugs and sockets, screw and nut kits, test meter accessories, output, input, stereo, adaptor and connecting leads, attenuator links, fuses, drive belt sets and various other accessories, each prepacked in plastic bags and quite modestly priced.

What I like, however, is the way in which every item is clearly illustrated. It is almost an encyclopaedia of the myriad plugs, sockets and leads on the market, and should be of great value to relative beginners who are still feeling their way when it comes to linking one piece of equipment to another.

THINGS DO NOT ALWAYS GO RIGHT EVEN FOR THE SO-CALLED EXPERTS. DENYS KILLICK HOPES YOU WILL LEARN FROM HIS MISTAKES DESCRIBED IN THIS MONTHS TECHNIQUES FEATURE.

THE DAY EVERYTHING WENT WRONG

PITY the poor expert. Whenever he undertakes a job it is completed with accomplished ease. In whatever field he works the end product is there for all to see as a shining example of how things should be done. When the poor, deluded, non-expert amateur attempts to do the same thing he usually finds himself in dire trouble. Nothing goes right. Straight lines become curves, joints become gaps, balanced stability becomes as shaky as a cut-price insurance company.

From the heights of his very dull, consistent, perfection the expert looks smugly down on the bewildering chaos of frustrated amateur endeavour. The ordinary man-in-the-street is deterred from having a go by the hopelessness of competing against the you-should-have-done-it-like-me brigade. The expert, poor chap, stands in the very gravest danger of being thoroughly disliked.

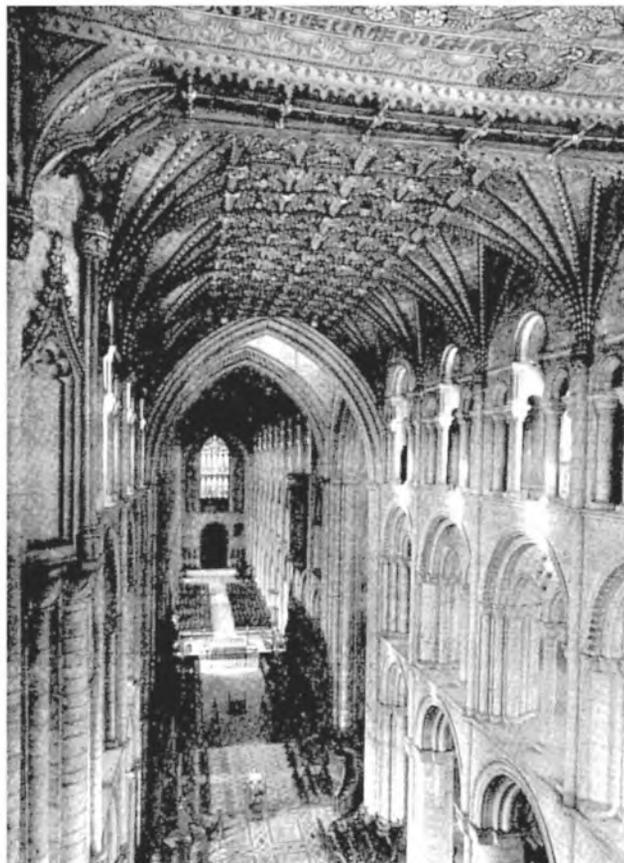
It has occurred to me that as my series on Tape Recording Techniques has now been running for some little time I may well be in peril of acquiring this obnoxious expert image. So this month I wish to devote my space to encouraging the happy band of ham-fisted bunglers, of which I am proud to admit to being a member. Far from regarding myself as an expert, I much prefer to answer to the status of apprentice. The only satisfactory way to really learning to do anything is to make mistakes and then resolve never to repeat them. Unfortunately I seem to have an ability to commit even bigger, and indeed more elementary, errors as the years go by. Of course I shall never fall into the same traps again, but there will always be even more stupid mistakes to be made another time.

The doleful tale now to be unfolded is that of a very recent recording session where everything went wrong—well, almost everything, anyway. I am telling it in the hope that it might encourage any reader who feels overawed by the sheer weight of the experts' propaganda, and at the same time to warn against committing the same stupid mistakes as I have made myself.

Have you ever noticed when things go wrong they usually start being perverse right at the very beginning? After that just nothing will go right. I had agreed to undertake a recording at Peterborough Cathedral. The occasion was a most unusual one. The Gregorian Association were to present a special Evensong service. This had not been held in Peterborough before, and it might well be many years before it would be again. Grateful for the invitation, I was determined to make a thoroughly good job and produce a memorable tape.

Always anxious to experiment, I decided to take this recording in stereo. To preserve directional quality in the stereo image cardioid microphones are indicated, so first thoughts were to use a pair of Sennheiser 405 condensers, one for each channel. These would give a beautifully crisp, clean, quality to the sound, and if positioned correctly the recording would have excellent stereophonic properties.

Two snags immediately presented themselves. Firstly such a recording would lack the characteristic reverberation of the cathedral (it would sound too studio-like) and secondly I was aware of the fact that during the service a part of the choir would process



The magnificent interior of Peterborough Cathedral. Recording in such a building is its own reward and even if things go wrong one is left with a deep sense of real satisfaction. The triforium, or gallery, referred to in the text can be seen running the entire length of the building from the bottom right-hand corner of the picture

around the church whilst singing. The stereo pair of cardioids would be quite incapable of dealing with this moving sound source. So I decided to be rather clever and position a couple of MD 211 omni-directional, moving coil, microphones on either side of the nave, and to mix each with the appropriate cardioid on each channel.

The reasoning behind this decision was that the two omnis could be mixed in at just the right level to bring in sufficient reverberation to give a realistic character to the sound from the main condenser microphones, and they would also satisfactorily pick up the moving sound source as it travelled up and down the aisles. So the equipment would comprise a pair of cardioid condensers with mike stands, a pair of omni-directional moving coils with some means of slinging at a height, two mixers, one for each channel, and a stereo machine. In this case the machine was to be a Vortexion CBL; and finally of course we had to have tape.

On assignments of this kind I always prefer to operate at 15 ips whenever possible. Such a high tape speed can be embarrassing if the programme duration is too long. In the present instance it was established that the service would be in two parts with a sermon, which would not be recorded, in the middle. The first part was of approximately 35 minutes duration and the second 25 minutes. These timings had been carefully checked at a previous performance in St. Paul's Cathedral.

A 7-inch spool of double-play tape only permits 30 minutes recording at 15 ips. To be safe triple-play would have to be used. Accordingly I earmarked two spools of Agfa PE65. This gives a 45 minute programme duration for each spool at 15 ips thus making plenty of allowance for possible overrun. Alternatively we could have used larger spools.

So far so good. It was at this point that the gremlins really got to work. The function was to take place on the Saturday. Foolishly, I had neglected to check over my recorder until the previous Thursday evening. One characteristic of Agfa PE65 tape is the rather different bias requirement as compared to some other brands of tape. Aware of this, I paid particular attention to establishing

correct bias levels. It was obvious something was wrong when the meter started giving absurd readings. A little investigation showed that one channel was not playing back, although it was definitely live.

As one cannot mix without monitoring, and as monitoring involves listening very critically to playback of the tape via the after-record monitor, I was in trouble. The only possible course was to use a different machine.

So late on Friday night I was playing around with a new and strange piece of equipment. Everything appeared to be in order; all the gear was packed up ready for an early start next morning.

The arrangement was for me to rendezvous with my chief assistant at 9 o'clock on the Saturday morning, and we would then drive down to Peterborough in convoy. When I knocked on his door he was a long time answering. He at last appeared in his dressing gown. A glance at his unshaven face confirmed the worst; he had obviously been struck down by some terrible, and I hoped not infectious, disease. My outburst of genuine sympathy tailed off into a rather angry muttering. The cause of the trouble was reaction to an injection the day before; he was about to go on a very long, and very expensive, cruise for his summer holiday. How the wealthy suffer! Making apologetic noises he pushed into my hand the cables and accessories it had been agreed he would provide, and disappeared up to his sickroom again.

On the road to Peterborough I secretly hoped that my friend would suffer just a little more discomfort before he recovered from the effects of his injection. When I realised he had omitted to put the skein of cord we always take for microphone slinging into the case he had given me I really began to feel quite pleased about his indisposition. But it was a beautifully sunny day and instead of taking the main A1 road out of London we travelled via the A10 and A14. This is a very beautiful route through some delightful little villages. We passed a profusion of inviting village inns; my wife noted their names so that we should be sure to call on the return journey. Our first sight of Peterborough Cathedral towering majestically above the city was truly awe inspiring. The sheer bulk of the building left one breathless with amazement.

I have worked in many cathedrals; few have impressed me as much as Peterborough. The flowing lines of the architecture impart a weightless grace to the structure. The great building appears to be delicately laid on the brilliant green grass of its surrounding lawns. Inside it encloses vast areas of vaulted space. It was here we were to take our recording.

The cathedral authorities were all extremely helpful. The vergers indicated power point positions, and selecting one behind a pillar I began to get the equipment strung out. Unfortunately the great girth of the pillar completely obscured the view from our recording station.

The conductor's rostrum was in a very obvious central position in front of the choir. I erected the microphone stands there, one on each side, intending to mount the pair of condenser cardioids. At this point my other two helpers arrived—one, by the way, a BBC engineer who, like most recording addicts, thoroughly enjoys a busman's holiday. We mounted the condensers and the BBC chappie neatly taped up the cables as I checked that the lines were operating correctly. It all looked very neat and professional.

Inquiry of the vergers revealed a means of access to the gallery, or triforium, running along the two sides of the nave. Up scrambled my other helper with a microphone lead from which we suspended a 211 omni—my part of the job always keeps me at ground level!

Being inherently a lazy individual I had arranged to have a special lead made up for the 211. This would split the output, feeding half to the mixer on one channel and half to the mixer on the other. This would save the trouble of stringing out a second omni. When the 211 was in position we inserted the split link lead and found it produced nothing but hum. Out came the soldering iron and solder, and the BBC chappie got down to some serious engineering on the connectors. He broke open the plugs and sockets, checked the wiring—still hum. He removed a common earth connection—still hum. He reversed the phasing of the conductors—still hum.

Whilst this was going on members of the cathedral staff began moving the rostrum. As they opened a delicately wrought iron gate at the entrance to the choir I was told that my microphones couldn't possibly remain where they were because the procession was to come straight out of the stalls towards the central aisle. All the neat braiding together of mike leads had to be undone and new positions found. It was heart-breaking.

If there should be too much separation between a pair of stereo microphones there is always a danger of producing a "hole-in-the-middle" effect in the stereo image. On playback sounds will come too obviously from the right-hand and left-hand speakers without any sound apparently emanating from the centre. To suit the requirements of the occasion my microphone stands now had to be pulled some 40 or 50 feet apart, one opposite each extreme wing of the choir and angled inwards to accept the sound

originating from the line of choir stalls opposite. Thoroughly dissatisfied with the new arrangement I returned to our recording station to see how my colleague was getting on with his split lead. He had had no luck at all; we were producing nothing but large quantities of top quality hum from the 211. So much time had been spent playing around with leads and microphone stands that we had lost the chance to suspend the other 211 from the triforium on the opposite side of the church. The only thing we could do was to feed the single omni into just one channel and hope for the best. It was now obvious that our hopes of producing really top quality sound were irrevocably gone. If only I had not tried to be too clever and had strung that second omni-directional microphone up, rather than fool around with split leads. But I hadn't and now we were in trouble.

But that was nothing to the trouble I was in as soon as the service started. When the choir began to sing I was amazed to find there was practically no signal on the record level indicators. A quick glance around the pillar told me the reason why. The entire choir were turned facing towards the altar—not towards the congregation. The conductor had positioned himself at what I would call the wrong end of the choir; the sound within my microphone areas was negligible. Helpless to do anything about it I had to put up with my microphones looking down the backs of the vocalists' necks instead of straight at their faces.

In such a situation one can do almost nothing. The obvious action is to increase the gain to reasonably modulate the tape, but if one gives way to this temptation the resultant increase in background noise will completely spoil the recording. The success of any musical recording lies almost entirely in the microphone positioning—if this is wrong one might as well pack up and go home.

Having come so far we continued recording, although I was thoroughly dissatisfied with the quality. Yet another disaster was very narrowly averted. I had broken down the service into two parts, with the sermon in the middle, when tape spools were to be changed. We were following the progress of the service carefully from printed scores, and I was watching closely as we approached the moment for the sermon to begin. For some reason, just what I shall never know, I changed my mind and decided to change the tapes during rather long prayers that preceded the sermon. This was done quite successfully in spite of the noise of winding on. But I was very thankful we did because, without any warning to us at all, the sermon had been deleted from the service. As a result, immediately after the prayers there followed the choral procession around the cathedral itself—probably the only item I would be able to record decently. In the event we were ready with a new spool of tape on the machine, but I might very easily have spoilt this too.

As the procession passed the omni-directional microphone I was getting, for the very first time, a well modulated signal. As it was getting a single microphone fed into one channel it could hardly be called stereo, but at least it was a recording. Remembering my own comments last month on preserving the "sound perspective" of a building by using a single microphone, I felt sure that at least we should have a realistic feeling of movement and space on playback.

At the end of the service the organist performed the usual improvisations as the congregation filed out. These proved to be brilliantly executed; the cathedral organ had a most glorious tone and I really began to cheer up at the thought of achieving at least one acceptable stereo recording. As the congregation left great founts of thrilling sound reverberated through the ancient nave. It was indeed an exciting experience.

Which sadly brings me to the last, terrible error of the day. It was only when we came to play back the tape later at home that I realised what had gone wrong with the organ recording. Just a few bars before the end, as the organist was working to a glorious, thundering climax, childish voices screamed out "Hello! . . . Can you hear me? . . . This is John speaking . . . Hello, Hello, Hello! . . ."

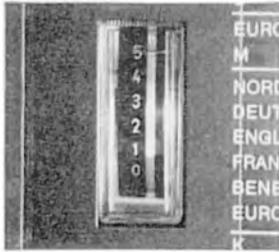
It was only too obvious what had happened. Whilst my attention had been entirely occupied in modulating the recording, and whilst my assistants' attentions had been equally fully occupied in watching me, some dear children—perhaps from the congregation, perhaps visitors or even perhaps from the choir—had approached the microphones and started shouting into them. At that precise moment I had not been monitoring, as I had previously handed the cans to one of the others. So there we were with the final recording of the day utterly ruined by our failure to properly protect our own microphones.

That is not really the end of the story. In spite of such an appalling series of disasters we all thoroughly enjoyed our day in Peterborough. So much so I am resolved to return at the earliest possible moment. And on the way back we made a point of calling at those inviting looking inns whose names we had noted on the journey out. The day ended with full agreement that it was so much better to have tried and failed, rather than not to have tried at all.

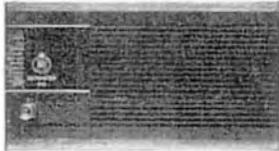


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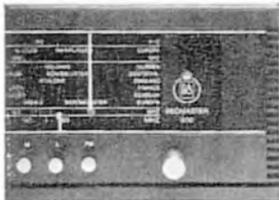
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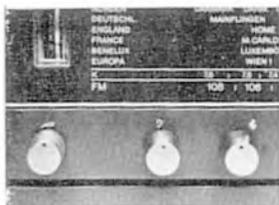
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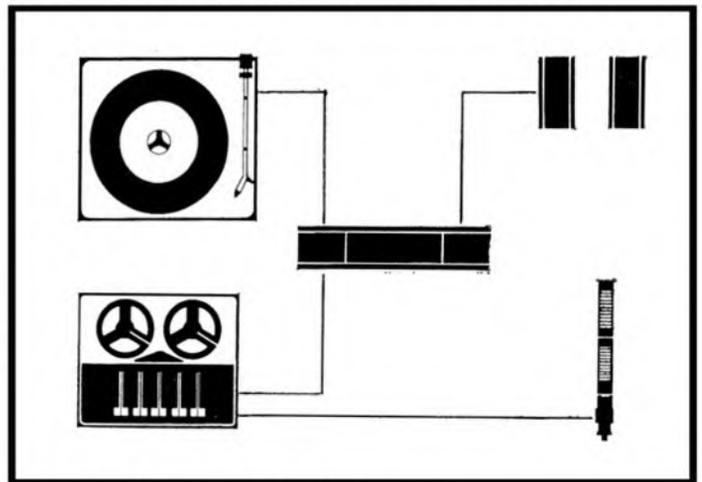


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FRANKLY SPEAKING—THE MOST OUTSPOKEN REPORT EVER PUBLISHED OF A DISCUSSION WITH A FAMOUS MANUFACTURER.

TALKING TO FERROGRAPH

DURING the past months a number of eminent audio journalists have been invited to tour the South Shields works of The Ferrograph Company Ltd, home of the "Incomparable Ferrograph." Your Editor was honoured to receive such an invitation, and was delighted to accept on behalf of his readers. All that he saw was impressive, particularly the meticulous care which goes into the manufacture of Ferrograph tape recorders as well as the pride in their product so freely expressed by employees at all levels throughout the works.

He was welcomed most cordially by Mr. E. H. Niblett, joint Managing Director, Mr. W. H. G. Metcalfe, Sales Manager, and Mr. N. Kincaid, Senior Executive. The tour of the works was of absorbing interest, but it was felt that the very frank conversations he had with these three gentlemen were so important, and so revealing, as to be worthy of reporting in detail. We are most grateful to The Ferrograph Company for so readily giving their permission for this private conversation to be published.

Editor: Firstly, gentlemen, I should like to compliment you upon the standard of excellence of Ferrograph equipment. This is well known to my readers, either from practical experience or by repute. What I have seen in the works today could be regarded as an object lesson to British manufacturers who are striving to achieve an equal reputation for their own products. This, however, does not mean that the Ferrograph, as a piece of equipment, lacks critics. I would therefore like to ask, on behalf of my readers, the very pertinent questions that I am sure they would like to put to you if they were to be here in person.

Ferrograph Officials: In showing you the works we have not hesitated to let you examine freely all our design, manufacturing and testing processes. It is our wish to answer any questions you may care to put with an equal frankness. In fact, far from resenting criticism we welcome it. Comments made by knowledgeable people outside our own organisation can often be most useful to us—Ferrograph might produce the best tape recorder, but they don't have a monopoly of good ideas!

You have already explained to me the origins of the business, founded by Mr. Wright and Mr. Weaire after the 1914/18 war. When did you start making tape recorders?

The tape recorder industry, as such, didn't exist until after the last war. We started investigating the possibilities in 1948 when



Ferrograph are proud of their rigorous testing routine through which every machine must pass before it is released. Here complete record/playback amplifiers are being put through their paces under the watchful eye of highly trained staff

little was known, either in this country or in the United States. We like to think that we were the pioneers in Britain because by 1949 the first Wearite tape deck had been both designed and completely tooled. Much of our success is due to the fact that the Admiralty were at once interested and began to call for instruments embodying it. We are very happy to say that the Admiralty is still one of our most valued customers.

The latest Series 6 deck, which I have just seen in its various stages of construction, bears a striking resemblance to all earlier models. Any changes appear to be superficial. Have you been making and selling the same product for the past 16-odd years?

To answer that question we must explain something of the Ferrograph philosophy. Right back in the days when we designed the very first machine we had to decide whether we would follow the dictates of fashion, or whether we would concentrate on producing a thoroughly sound and reliable piece of engineering. Our decision to leave cheaper, mass-produced, products to other manufacturers and to concentrate on a single, high standard was absolutely right—by the way this is a policy to which we shall strictly adhere in future.

All this is fully appreciated, but it does not answer the question, which is—"Are you still making what is basically the same deck today as you were manufacturing early in the 50s?"

No, we were coming to that. You see the answer to this question ties up specifically with the last point we made. Having decided to produce a sound piece of engineer-

ing, we then proceeded to regard it as a practical tool, designed to do a practical job. Now in the consumer market many manufacturers tend to either modify, or even redesign, their products simply to keep pace with so-called "popular" demand. Improvements in performance are the only criteria by which we assess the value of any particular modification. The Series 6 tape deck you have just seen on the production line is not the same deck that was made in 1950. It is, in fact, the product of some 16 years of continuous evolution. This evolution has been achieved by the untiring efforts of our Research Department. Can we ask you a question for a change?

Would you or your readers be pleased to pay more for a piece of equipment if the extra cost was not reflected in improved performance?

Certainly not. The relationship between performance and cost can always be expressed in terms of value for money and this should be the very first thing that every purchaser looks for.



Unlike most manufacturers Ferrograph actually make their own motors on the premises. Balancing armatures is a delicate but vital job. With the help of this machine it is done speedily and efficiently

Value for money is the key to the whole problem. You must remember that a large proportion of Ferrographs are sold, not to private individuals for domestic use, but to Government departments, the Services, industry generally, police forces and many other institutions. These people, too, demand value for money. Perhaps the individual soldier or employee does not treat his Ferrograph with the same care as the private owner—he can't be expected to. But his department will expect that machine to give long and reliable service. That machine is expected to be fully operational in ten years time, in spite of rough treatment it will inevitably receive.

As we have said before, the Ferrograph is a tool built to do a job, and built to last. The machine that is sold on Admiralty con-

Please turn to page 336



You wouldn't teach geography with a 1939 atlas

(So why use anything but Ilford Zonatape on your tape recorder?)

The tape recorder is fast becoming commonplace in many schools as a teaching aid. But a lot of schools, though they are very careful about what tape recorder they buy, don't seem to bother about the *tape*. They buy just any old stuff.

One tape — Ilford Zonatape — is, however, specially made for schools and anyone else who wants an utterly reliable tape. Not only specially made, but specially *tested*.

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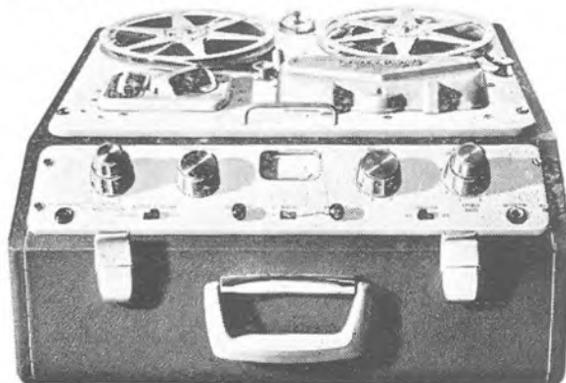
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TM 13

tract will be identical in all essential particulars to that sold over the counter of the local Hi-fi dealer. And whether it is sold to the Services, or a private customer, it will not only do the job it was built to do but it will go on doing it for many, many years.

That is a very laudable intention which I must admit has been realised. You could hardly have built up your reputation in any other way. But let me tackle you now on one particular issue. Some tape recorders at the upper end of the price range have abandoned the use of pressure pads. This is only possible by using a tape transport system so efficient as not to cause minor speed irregularities requiring pressure pads to smooth them out. Obviously this must reduce head wear considerably. Why does the Ferrograph still use pressure pads?

We're glad you chose this particular point because it illustrates in very practical terms what we have been saying throughout this conversation. There are indeed advantages in doing away with pressure pads. But what is the greatest advantage? A reduction in wear on the tape head. And what machine stands in greatest need of this benefit? Equally obviously, a machine whose heads are most liable to suffer, in terms of wear and therefore in terms of reduced performance, by the abrasive action of a tape.

I am not sure that is a very fair answer to my question!

No, of course it's not, but let us tell you a little bit about the Ferrograph heads which you saw being made in our works here. If we remove the pressure pads we certainly reduce head wear, but before we could consider taking such a step we should have to ask ourselves the question, "What is the effect of tape wear on the heads we now manufacture?" The answer is very interesting. The first effect of the abrasive action of the tape is actually to polish the head itself. This polishing is a continuous process which results in improved performance. But after many hours use, and we are thinking in terms of thousands of hours of running time, the tape wears a groove in the face of the head. With many types of head this would result in a lengthening of the effective head gap, giving a marked loss of response in the high frequency area. With a modern Ferrograph head, built up of two very precisely matched and aligned halves, when the same amount of wear occurs it will not alter the physical dimensions of the head gap. So you see wear on a modern Ferrograph tape head is of no practical consequence. In fact, if you talk to our Dr. Wilson he will be pleased to explain to you that, in theory at least, the Ferrograph head will operate at optimum efficiency when the thickness of the head has been reduced to a dimension equivalent to the length of the head gap. This is purely theoretical because the gap length, say .00015 inches, is so small that the head would physically collapse if it were to be reduced to that thickness.

Your arguments are very convincing. . . .

They are not only convincing, they are also truthful. Bearing in mind what we have told you, we must add the inescapable fact that a large proportion of Ferrograph equipment is used for industrial applications where frequencies considerably in excess of those used in audio work have to be recorded. The only way to record such very high frequencies is to use pressure pads. Since the same basic equipment is used both

industrially and domestically, can you then tell me why we should abandon pressure pads?

I think you have answered my questions perfectly. Can I now turn to styling? For domestic use, at least, styling is today regarded as of supreme importance. Within the home people will no longer tolerate any goods, whether they be tape recorders or furniture, that have not been styled to fit into a modern decor. Do you regard the styling of the Ferrograph to be as contemporary as it might be?

The question of design is largely one of personal opinion. You ask if the current models of the Ferrograph reflect modern design trends, and the answer can only be that they indeed do. It was for this reason that we introduced the teak versions recently so that they could fit harmoniously into a modern home. The place for the tape recorder is in the home where it will be used. We believe that our equipment fulfils this need perfectly.

And what of the future? Are you going to continue producing this same basic design, or can we anticipate seeing future models of the Ferrograph which are so different that we shall fail to recognise them?

As far as the future is concerned, please let me assure you that we are alive to modern needs and modern developments. Our Research Department continually produces new ideas and new approaches. We are governed solely by our overriding policy to produce reliable, efficient equipment that will give the user value for money. We shall make radical changes only if and when we feel that such changes would be in the users' interests. On no account are we prepared to change for the sake of change.

This does not really answer my question. Can we assume that we will see a radically new Ferrograph in the foreseeable future?

The possibilities of future development are never neglected. We can only repeat that change for the sake of change renders all existing equipment obsolete, and so is against the consumers' interest. Our wish, indeed our determination, is to maintain our position as manufacturers of some of the finest recording equipment in the world. The only direct answer I can give to your question is that it is our intention to maintain that position in the future.

Thank you for your very frank answers to my—perhaps embarrassing—questions. These I have put to you as expressing the unspoken thoughts of our very large readership. The answers you have given more than explain your own attitude to the points that have been raised. In fact I could wish that such an attitude were to be more generally adopted throughout the audio industry.

We are never afraid to face criticism because we believe that what we are doing is right, both from the customer's point of view and our own. There is nothing more pathetic than the degrading of standards to meet popular demand. It is a course that we would never adopt. Not only do we have pride in our own product, but we also have pride in all products of British manufacture and we try to play our part in maintaining an untarnished reputation for British goods abroad.

May I thank you for giving me so much of your time and for answering my questions so clearly. All my readers are not Ferrograph owners but I have no doubt that they will all be interested in what you have had to say. Once again thank you.

A TRM BOOK REVIEW

ABOUT YOUR HEARING by G. A. Briggs with James Moir as sub-editor. Published by Rank Wharfedale Limited, Idle, Bradford, Yorkshire. Price 15s. 6d. in semi-stiff cover or 22s. 6d. cloth bound library edition.

When the author very kindly sent me a copy of this book for review he expressed in his covering letter doubts as to its general interest to readers of *TAPE Recording Magazine*. In the introduction he declares that the book is intended for those who are interested, as amateurs, in the ear and how it works, and also for those who may be developing some degree of deafness and are looking for guidance.

The sense of hearing, like all other human faculties, is alas impermanent. It is a well-known fact that young persons generally have good hearing, but losses in aural perception occur quite naturally as one progresses into middle age and later. How many of us need to wear glasses due to a natural impairment of visual perception? It would be reasonable to suppose that at least as many suffer a similar deterioration to their hearing; the big difference is that poor vision is quickly apparent to the sufferer, whereas restricted hearing, as the result of a gradual deterioration, may pass quite unnoticed.

In my opinion we can roughly classify the impairment of hearing into three categories; those who hear all speech frequencies adequately but who hear only a limited proportion of the full audio range of a normal young person; secondly, there are those who are often described as "hard of hearing," meaning that they can only sense speech frequencies of fairly high amplitude and so require voices to be raised in conversation and, lastly, the deaf or partly deaf who require the use of artificial hearing aids. Since almost every single person will pass into at least one of these categories, happily most in the first only, an authoritative but simply-written book on the mechanics and deterioration of the sense of hearing should have a universal interest. "About Your Hearing," the volume now being reviewed, fulfils this requirement perfectly, combining a great deal of erudite information with the author's well-known sense of humour to sugar the instructive pill.

The eleven chapters include in their list of headings: Sound and Hearing, Hearing Tests, Forms of Deafness, Noise and Reproduced Sound, amongst others. Almost every page contains at least one photograph or drawing, many three or four. Wherever he could manage it, both in text and illustration, Gilbert Briggs appeals to the one human "sense" that should never deteriorate—the sense of humour.

The section on Reproduced Sound covers sixteen pages and deals with a variety of equipments, from the modern policeman's walkie-talkie to Hi-fi applications. Noise, that curse of modern society, gets fourteen pages including tables of relative noise levels and audiograms showing changes in industrial workers' sense of hearing after sixty hours' rest as compared to after eight hours' work.

Quite apart from its technical interest, I have found this book offers a great deal of really fascinating reading. The author is well known for his other works on acoustics, all of which have long been accepted as standard books of reference. The present volume is, in my opinion, the most interesting he has yet produced, and as such is strongly recommended.

ON THE FRINGE—

SPEAKERS FOR STEREO

DENIS GILBERT REPORTS

WHEN listening to any playback system the choice of loudspeaker will probably influence the result more than any other factor. This has always been regarded as true for mono playback, but in the case of stereo the choice and position of speakers plays an even more important part. In a single channel monophonic system we are concerned only with the siting of a single loudspeaker within listening room, whereas in stereo two loudspeakers have to be placed in a definite relationship both to each other and to the listeners.

In mono listening the sound comes to us from a single unit, sometimes described as a point source of sound. We hear the sound rather as if it were "entering the room through an open window." In an attempt to overcome this narrow beam of sound effect some loudspeakers have been designed to give omni-directional characteristics; the sound is deflected so it may appear to issue from the broad front of the listening room. An example of this type is the column speaker where a conical deflector irradiates the high frequency sound in all directions. The infinite baffle unit, known as a directional radiator, is an example of a directional loudspeaker.

It has been found that directional information is conveyed to the human ear far more easily by high frequency tones than those in the lower register. By "spreading" only the high frequency content in the column speaker the entire sound can be made to appear to fill the room. Conversely if a high frequency sound is issuing from an infinite baffle unit it will be necessary for the listener to turn his head through an arc in order to locate the sound at all. When doing this the ears are used rather like direction finders. With signals at the top end of the audio frequency range audibility is achieved only at a very limited listening angle; a slight turn of the head through a few degrees will cause the sound to disappear altogether.

For stereophonic listening the intention is to recreate as nearly as possible the original sound, giving it breadth and perspective in space, either corresponding to the original performance or corresponding to a version of that performance dictated by the sound engineers. Consequently the ability of the two loudspeakers to convey directional information is of paramount importance. There are arguments both for and against either the omni-directional or the directional types.

In fact the listening room itself is going to influence what we might call an ideal choice. Because an omni-directional loudspeaker irradiates high frequency sound in all directions it must be less specific, directionally, than the other type. If such a loudspeaker were to be positioned in the corner of a room, so that sound reflections could occur from adjacent walls, the stereophonic effect, although still present, would be reduced—perhaps to a marked extent. On the other hand a pair of highly directional speakers could, if placed too far apart, prove to be so directional as again to reduce or possibly completely lose the stereophonic effect from the listeners' point of view.

We have said that the high frequency content of sound indicates its directional character. It therefore follows that stereophony is possible using a single, full range loudspeaker to reproduce sound throughout the whole of the audio range, with a second loudspeaker designed to reproduce the high frequency content only. Such a system was quite widely used soon after the first stereophonic discs appeared. Many people already owned a single, full range loudspeaker of excellent quality and this was adapted for stereophonic use by the addition of a single, high frequency transducer as a separate unit. The Goodman "Stereophonic Bowl" was an example. The results from such a system are, however, likely to be less than perfect.

The pair of loudspeakers in a stereophonic set-up must be as precisely matched as is possible. The slightest difference in response, particularly in the upper range, is going to give a false shift to the

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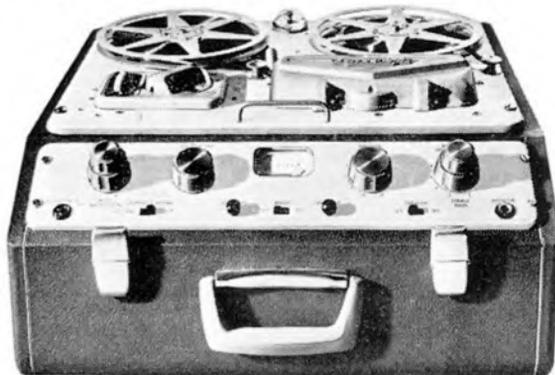
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TM 13

CROSS TALK

By Audios

A GREAT deal of interest has been aroused by the reference to "audio analgesia" that appeared in last month's New Products section. For the benefit of any who might have missed the original notice this was an announcement by the Plessey Company Limited of Ilford, Essex, of the marketing in this country of equipment developed by Auditorama Sales, South Australia, in conjunction with the Rola Division of Plessey Components (Australia) Limited. But what really interests the general reader is the possibility of using recorded sound as an anaesthetic in place of either a jab from a hypodermic or a whiff of nitrous oxide.

I have not yet seen this equipment in use, but your Editor is doing his best to convince me that I should investigate its practical effectiveness at the earliest possible date. If this experiment is going to require me to actually undergo a dental extraction I must regretfully decline with all possible haste. I may be an enthusiast, but that does not prevent me from also being a sceptic. . . !

One should not confuse audio analgesia with systems already used by many doctors and dental surgeons to relax their patients by means of music. The new process is utterly different. Its function is—to put it crudely—to knock the patient out cold. From my own knowledge of dentistry (all of which has been painfully gathered from the wrong end of the forceps) the anaesthetic effect of the sound would have to be both specific and complete. The agony of tooth extraction without any means of pain killing has to be experienced to be believed. I shall look forward with great interest to reporting on this in more detail in the future.

In the meantime, however, readers have been quick to point out that this method could have some singularly useful domestic applications. How convenient to finally dispose of the current marital argument by merely turning on a machine and feeding just the right blend of white noise and music to a speaker beneath the wife's pillow. And just imagine the result if the wrong material were to be replayed on all the many background music systems now being installed in hotels and other public buildings. What possibilities for industrial warfare!

If one firm were to smuggle the right tapes into a competitor's works and have them relayed throughout the factory and offices. The entire staff out like a light from managing director to teaboy—what an intriguing prospect! I don't think

somehow that this technique is going to move very far outside the dentist's surgery—but of course I might be wrong.

In the meantime neither I nor Tape Recording Magazine can accept any responsibility for the ill-effects that might be caused to any readers due to their experimenting with lethal blends of music and white noise.

RECENTLY in London the few remaining veterans from the Boer War attended their annual commemoration parade. Each year their number becomes smaller. Johannesburg's Africaner Museum has appealed for Boer War veterans to record their memories on tape for posterity. Here is a chance for the amateur to contribute something very worthwhile. Do you have an elderly relative with recollections of the Boer War? If so act now and get their stories on to tape. In a few years' time the opportunity may have gone forever.

It would be a good idea if a central library of historic recordings of this kind could be laid down. This is the kind of job at which the Federation excels, and I have no doubt that they would be only too happy to offer a place for such material in their sound archives.

ACTIVITY and development in the formation of Tape Recording Clubs is continuous. A new one formed in January of this year is the "Far and Wide Recording Club." This organisation already has representatives in Western Canada, New Zealand and South Africa. The aim of the club is to produce six editions of a really good sound magazine each year. So far they have achieved three, which is pretty good going.

Membership fee is a nominal 10s. annually and the sound magazines are dubbed on to members' tapes free of charge. The Secretary would be delighted to send fullest information to all who care to write to him, Barrie Harber, "The Far and Wide Recording Club," Eccles, Maidstone, Kent. He specially asks if inquiries could please be accompanied by a stamped and addressed envelope.

THE Americans have recently accomplished a gargantuan task by recording the whole of the Bible. This has been issued on 51 12" extra long play records, totalling 81 hours playing time. Produced by Bible Voice Corporation of North Hollywood, they distribute to record shops and bookstalls throughout the world. Also recently introduced is the Bible on open reel tapes at all speeds and also in eight track stereo cartridges.

Oddly enough I had suggested some weeks ago the possibility of such a project being mounted in this country. The sheer size of the task would make it at first appear to be utterly impossible. But when we think of the resources of the national tape recording interest it is soon obvious that the work of recording could be conveniently divided into small, easily manageable sections. The fact that the whole would be a combination of regional accents and voice inflections would probably add to the interest, rather than detract from it.

The only practical way of organising such an endeavour would be through the co-operation of a co-ordinating body. This is

where the long-suffering Federation of Tape Recordists and Clubs could once again come into its own. Secretary John Bradley is enthusiastic about it. Embarking on such a project would offer opportunities for all the separate bodies and individual members of the Federation to co-operate together in a single joint endeavour.

Would readers care to write to me letting me have their comments on this? If we obtain sufficient support it is just possible that we might be able to persuade one of the tape manufacturers to assist in the provision of recording tape. For a programme of 81 hours' duration the cost of tape could be quite a consideration. Would readers please write addressing their letters to me, Audios, at Tape Recording Magazine, Prestige House, 14/18 Holborn, E.C.1, letting me have comments for or against this proposal. If a sufficient number are in favour for us to get the recording under way you may be sure that a number of organisations would be interested in making use of it.

I HAVE just received a copy of the latest Agfa Magnetron Magazine. This publication will be sent free of charge on application to the publishers, Magnetic Tape Division, Agfa-Gevaert Limited, Great West Road, Brentford, Middlesex. This is a very excellent magazine, full of interesting illustrations and useful tips. The features include a Spanish travelogue, sound effects at home, a review of Photokina 1966 and a host of other items. Altogether well worth reading—particularly as it is free of charge.

WE in Southern England have just been subjected to a number of experimental sonic booms. The very substantial office block which houses TAPE Recording Magazine has twice had its windows shaken and its reinforced concrete structure trembling from the astoundingly powerful effects of what the authorities admit to be a "mild" experiment. Those in less privileged parts of the country who have not yet been so treated might be curious to learn what it is like. Any who remember the blast from wartime bombing will have a good idea of what to expect. The sonic boom is remarkably like the detonation of high explosive bombs—and not too far away at that.

My personal opinion is that it is absolutely monstrous that millions of people should be so inconvenienced—and their property stand in real risk of suffering damage—to enable a mere handful of passengers to reach their destination a little more quickly than they would have done by subsonic flight. We as tape recording enthusiasts should protest strongly. Having heard these bangs I can imagine no effective method of preventing them from interrupting a live recording session. If supersonic flight over this country is generally accepted then we should have to resign ourselves to recording under what would amount to battlefield conditions. If that thought horrifies you as it does me I urge you to protest, protest, protest in every constitutional way.

A CERTAIN lady friend of mine is about to depart with her battery portable machine for the latest African trouble spot. Her intention is to obtain actuality recordings of the situation in the breakaway state of Biafra. She tells me she has been cheered on her way by a plaintive demand from her bank manager. He is hopefully inquiring who will discharge the balance of her overdraft should she fail to return. . . .

stereophonic image. This shift of image will occur as a function of the differences between the loudspeakers and will appear at apparently random points in the programme, causing what should be a fixed image to move illogically across the width of the "sound stage."

This places the owner of a single, good loudspeaker in a difficult position. It is certainly worth while experimenting with a separate high frequency unit if only as a matter of interest. The directional effect can certainly be obtained in this way; the problem is whether or not it will be the correct directional effect. It's doubtful if it would be worth while spending very much money in an attempt to match up to an existing loudspeaker; far better to think in terms of a pair of new, matching units. The exception of course is if you are fortunate enough to have a single, good quality speaker of a type that is still manufactured, in which case the purchase of another, identical speaker will fulfil all the conditions as nearly as possible.

Assuming thought has to be given to the purchase of a pair of speakers then we must consider which are likely to be the best kind to buy. There is no easy answer to this question since it is going to depend to a certain extent on the conditions within your own listening room. Ideally the two loudspeakers would be placed in the room before it was furnished; the furniture could then be appropriately arranged and we should have "stereophony without tears."

In practice this is rarely possible (the arrangement, not the tears). This is one of the reasons why there is now available a considerable range of miniature speakers; complete enclosures of extremely small size. Because of their smallness they all, without exception, give a poor performance at the bottom end of the audio range. To reproduce sounds of about 40 Hz and below, the loudspeaker enclosure must have certain physical dimensions, and these are incompatible with miniature design. However, we come back to the fact that it is the high frequency sound which gives us the directional information. A loss of very low frequency (and sounds of 40 Hz and less are very low frequency indeed) will not affect the stereophonic image in any way. So we can say that these miniature loudspeakers are very suitable for stereo if we don't mind what are, quite honestly, fairly insignificant losses at the lower end of the scale.

In a great many furnished rooms it might be quite impossible to properly position a pair of large, full range loudspeakers. On the other hand a niche can usually be found for a couple of "book-shelf" size miniatures. As it is necessary to move the two loudspeakers in relation to each other and to the listeners to find the best possible position, smallness is an obvious advantage.

But another difficulty arises in the listeners' seating accommodation. The sound on each channel, fed independently to the two loudspeakers, must be properly "balanced," and this is done by ear. Whatever the playback equipment in use it is essential that the controls should be accessible to an operator who is seated in the proper listening position. It is not possible to balance up a stereophonic system when standing either on top of the loudspeakers, or when outside the area of stereophonic definition. All one can do under these circumstances is to make adjustments by reference to another listener's opinion as to what is right and what is wrong. The author can personally guarantee this process to be more productive of domestic strife than stereophony.

When not in use loudspeakers are merely obstructions. Corners of rooms are therefore often popular positions because here they can be tucked out of the way to occupy the minimum of floor space. A pair of loudspeakers may operate quite well from this position, one in each corner of the room, but this will depend upon both the width of the room and the distance away that listeners could reasonably be expected to sit. We run into trouble here if a pair of corner enclosures are purchased and then it is found by experiment that one of the pair must stand several feet out of its corner. Either side of a chimney breast might be an equally good position for rectangular-shaped enclosures, but again we have to bear in mind that our stereophonic image will be positioned *between* the two loudspeakers—a central sound would appear to come from the fireplace. This could be so incongruous as to destroy the effect.

It is dangerous to select a loudspeaker for mono listening by forming a judgment on its sound in a dealer's showroom. For stereophonic listening it is even more desirable to form judgments under actual conditions at home. Apart from sound quality and stereo effect, you might be surprised to find how big an apparently small loudspeaker appears to be when you get it home, and we are thinking of two, not one.

Cost has been deliberately ignored; a pair of monstrous cabinets that drive the family to live perpetually in the kitchen would be dear at any price. Sensible thought and investigation will lead to sensible purchase, making possible sensible stereophony within your own home—probably for a lifetime. And it's worth both the effort and the cost.

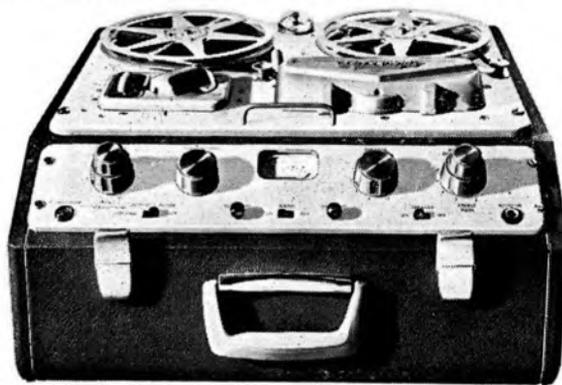
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TM 13

TEST BENCH



AGFA RECORDING TAPE

INVESTIGATED BY R. HIRST AND D. KILLICK

IN offering this review of Agfa recording tapes our aim is to both comment on the characteristics of the three grades of tape under investigation and also to assess the practical relationships between them. The tapes are: Agfa PE 31 (long play), PE 41 (double play) and PE 65 (triple play).

The sole use to which any recording tape is put is the production of recorded material. Everything we say in this review is therefore related to the sound quality that may be anticipated by the use of these tapes, and we have endeavoured to draw direct comparisons between the three grades. In this way it is hoped to give some general guidance on the fundamental differences between grades of tape of the same make, and the uses for which they are best suited.

Since we are dealing primarily with audio quality we must first define the attributes of a good recording. In our opinion these are:

- (1) Maximum undistorted output.
- (2) Good signal to noise ratio.
- (3) Wide frequency response.

In order to investigate any recording tape a recorder must be used to produce the necessary signals and evaluate play-back response. We cannot stress too strongly the fact that the relationship between the tape and the machine is specific. Results tabulated here refer to our findings when using one particular recorder of one particular make. They should not be regarded as directly applicable to any other machine when used with the same tape, since variations in bias current can produce wide variations in recorded quality. It was for this reason that the recorder selected for our tests was a Vortexion WVB 6-H which has a variable bias facility.

As we regard maximum undistorted output to be the most important attribute we show in Table 1 comparisons between output level and distortion when all three grades of tape are recorded with a 1 kHz constant input signal at the full recorded level specified by the machine manufacturers. In Table 2 the process is repeated after the bias value has been decreased by 20 per cent. These figures are worthy of detailed study as they show not only the effect of changing the grade of tape under constant recording conditions, but also the considerable differences resulting from fairly small changes in bias levels.

Table 3 lists the relationship between

TEST CHART — AGFA RECORDING TAPES

TABLE 1 Bias 1.25 mA

Type	Output	Distortion
PE 31	.8	1.3%
PE 41	.6	1.5%
PE 65	.36	1.8%

TABLE 2 Bias 1 mA

Type	Output	Distortion
PE 31	.86	2%
PE 41	.75	3%
PE 65	.46	4%

TABLE 3 Optimum Bias

Type	Output	Distortion	Bias level
PE 31	.8	1.3%	1.25 mA
PE 41	.72	2.0%	1.05 mA
PE 65	.46	4.0%	1.00 mA

TABLE 4
5% Distortion Level

Type	Increase to: Output
PE 31	1.1
PE 41	.88
PE 65	.56

NOTES: Tables 1 to 3 were compiled from a constant input signal of 1 kHz modulating the Vortexion WVB6 to full level.

In each table the Output figures quoted (actually in millivolts) refer to a constant level and are meaningful only in relation to each other. Similarly in Table 4 the readings are those of total output resulting from increasing the input gain to the point where distortion content in the recorded signal reaches 5%.

Test equipment used includes: Cossor Double Beam Oscilloscope, Bruel and Kjaer Signal Generator, Frequency Analyser Type 207 and Millivoltmeter, Marconi Distortion Factor Analyser and Vortexion Type WVB6H ½-track Tape Recorder.

“optimum bias setting” and output and distortion. Our definition of optimum bias is that generally accepted in this country, i.e., the bias level required to give 1 dB fall in signal level after maximum by reference to a 1 kHz tone.

Finally in table 4 we show the increase in signal required to produce a distortion content of 5 per cent, a figure regarded as the very maximum acceptable for quality work.

Correct interpretation of these tables should reveal a most interesting story. It will be noted that type PE 31 (long play) is consistently better than the other two tapes in respect of both output and distortion, even when subjected to a 20 per cent decrease in bias level. Furthermore it will be seen that this tape will hold the greatest increase in signal level before reaching the 5 per cent distortion mark. If we now consider the results obtained from the thinner grades, PE 41 (double play) and PE 65 (triple play) it is evident that output falls and distortion increases as

the tape becomes progressively thinner. We also find that thinner tape requires a lower bias level than the thicker grade.

This latter comment might appear to conflict with the manufacturer's claim that the same bias current is suitable for all three tapes. Whilst we cannot accept this as an absolute truth if optimum results are to be judged by British standards, it is evident that in the design of the tape much thought has been devoted to producing three grades with minimal differences in bias requirement.

The other two qualities investigated are signal to noise ratio and frequency response. These two factors are intimately related. Although the noise level in all three grades of tape was found to be exceptionally good, it was quite evident that with tapes of progressively thinner grade frequency response improved but signal to noise ratio deteriorated. According to the manufacturer's specification the deterioration in signal to noise ratio between PE 31

Please turn to page 342

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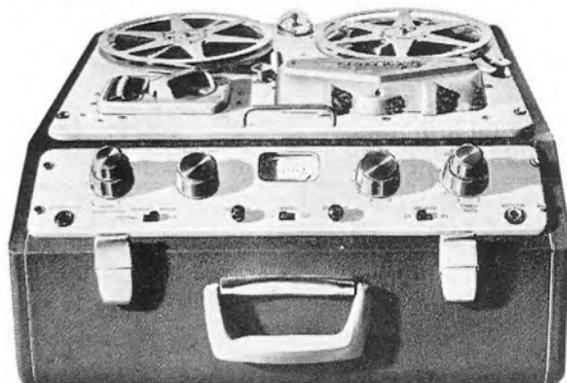
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TM 13

AGFA TAPE from Page 340

and PE 65 is 9 dB, and this we can confirm to be accurate. Against this we have established an improvement in output at 18 kHz of as much as 4 dB in the thin triple play tape.

It may seem strange that no tables have been prepared to show the relative frequency response characteristics. They have been deliberately omitted because the possible combinations are so great as to be confusing. It is sufficient to say that in an under-biased condition the upper frequency response will improve at the expense of low frequency response and an increase in distortion. On the other hand, too much bias will drastically reduce the upper frequencies but it could improve both the signal-to-noise ratio and distortion content. Values are meaningless since results are specific only to the machine being used for the tests. We can add, however, that when all three types of tapes mentioned in this review were correctly biased an output within the range of 40 Hz to 15 kHz was maintained, plus or minus 2 dB, with the thinner based tapes extending a little further into the upper region due to the better wrap-round achieved.

Other qualities were also investigated. Accidental stretching of tape can completely ruin an otherwise fine recording. All three grades were each subjected to 100 stop/start cycles at full rewind speed, and then checked for elongation. No measurable stretch could be detected in any of the test sections. We should like to add that even the thinner grades were extremely difficult to stretch when subjected to considerable abnormal pressure. Remarkably, the triple play PE 65 is exceptionally resistant in this respect—better than the same grade of any other make we have come across.

All recording tape loses a certain amount of oxide as it passes through the sound channel. In poor quality tape this accumulation of dust can clog the heads and also cause squealing. We found Agfa tapes of all three grades to be unusually free from oxide losses of this kind.

Print-through occurs when a "ghost" of a heavily modulated passage is literally "printed through" adjacent turns of tape on the spool. It would be reasonable to suppose that a reduction in tape thickness would result in an increased tendency to suffer from this fault. From our tests we could detect no audible or measurable print-through on any of the three grades. In this respect it should be remembered that the thinner tape is less heavily modulated, and this will, of course, materially assist in preventing this annoying defect. Erasure of recorded material presented no problems at all, each grade tested with heavily recorded passages was effectively cleaned at a single run past the erase head.

Summarising our findings we can say that all three grades of Agfa tape display very high qualities indeed. To assist the user in his choice of grades we would suggest that for optimum quality on good class recording equipment tape PE 31 is indicated as first choice, although the extreme upper limit of the frequency response will not be quite so good as might have been obtained on PE 65. One reason why the thinner tape gives a better response is because it is capable of maintaining a more regular and intimate contact with the record heads. If, therefore, a recorder employing a less efficient tape transport is used the thinner grade is recommended. Narrow track machines, running at slow speeds, could be expected to give a marked improvement in overall quality on

PE 65 as compared to PE 31, provided their bias setting is suitable.

From our results it will be seen that changes in grade of tape—even of the same make—will completely change the final recording characteristics which are a product of the electro-magnetic properties of the tape itself and the head and bias current across which it passes. Where figures in our tables do not appear to be complimentary to the manufacturer of the tape this really indicates nothing more than incompatibility between these two factors and should not be regarded as inferring criticism of either tape or machine. We can only repeat the advice constantly given in these pages, that users should check comparative results on their own equipment by recording on a composite tape made up of various grades or makes and then assessing their value either by ear or by measurement on instruments.

The tapes presented for review were in standard cardboard swivel containers of sturdy construction and pleasing design. Each spool was provided with a polythene bag and was equipped with coloured leaders and stop foils. Your reviewers are agreed that without doubt Agfa recording tapes are products of the highest quality suitable for both professional and domestic use, but we hope that we have made clear the basic differences between the grades offered and the necessity of considering them in strict relationship to the recorder on which they are to be used.

Prices of the tapes reviewed are: Agfa PE 31, 7-inch spool, 1,800 ft. 47s.; PE 41, 5½-inch spool 1,800 ft. 54s.; and PE 65, 5-inch spool, 1,800 ft. 60s. All prices are for the standard cardboard swivel box packing; many other spool sizes are available. Agfa-Gevaert Ltd., 27, Great West Road, Brentford, Middlesex.

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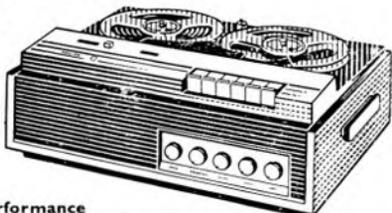
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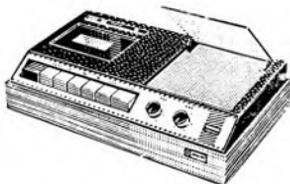


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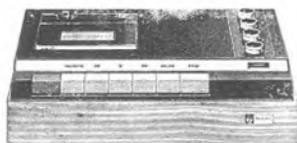


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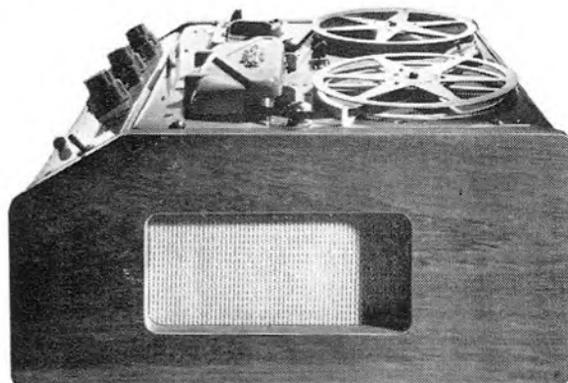
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Write for a complete list of the musicassette repertoire to Musicassette Department, Philips Records Limited, Stanhope House, Stanhope Place, London, W.2



MUSICASSETTE

REVIEWS

LES GRANDS SUCCES D'EDITH PIAF. Columbia MCC6015, 50s.

This album is an import from the Continent and is handled by the Imported Division of EMI Records Limited at Hayes. Two features common to imported Musicassettes are, firstly, the price which at 50s. each is 10s. dearer than our own productions, and the Continental recording is mono not stereo. One of the reasons for the delay in the introduction of Musicassettes into this country was the policy to defer manufacture here until the compatible mono/stereo system had been perfected. Abroad Musicassettes had been available for some time, but they were, and still are, monophonic. Of course when reproducing a mono Musicassette on a stereo playback machine the resultant sound will be "double mono."

So much for the technicalities. One really need not say a great deal about this collection. The name Edith Piaf speaks for itself. Many of the numbers are obviously copies of early recordings where sound quality was not up to the standard we have come to expect today. But it doesn't matter. There will never be another Edith Piaf—her untimely death was a sad loss to France and to her countless admirers throughout the entire world. We can at least be grateful that such recordings of hers as do exist will be cherished and preserved for posterity.

Her programme comprises; on side one: *La goulante du Pauvre Jean*, *L'accordéoniste*, *Je sais comment*, "ça ira," *Les trois cloches* and *Hymne à l'amour*, with on side two, *Milord*, *Mon manège à moi*, *La vie en rose*, *L'homme à la moto*, *Les amants d'un jour* and *La foule*.

They are all time honoured favourites handled as only Piaf knew how. Strongly recommended, particularly for those with a nostalgic affection for the immediately post-war years.

LES GRANDE SUCCES DE CHARLES TRENET. Columbia MCC6020, 50s.

As with all other imported Musicassettes this album has been recorded in mono and costs 50s. Most of the remarks previously applied to Edith Piaf could as easily be quoted of Charles Trenet. Recordings are again of necessity somewhat elderly and lacking in hi-fi quality. But hi-fi is an empty thing compared to the personality of the artistes. For my money I would prefer the vibrant life of an old recording of a real artiste to the highest fidelity reproduction of the dead sounds of a contemporary commercial noise maker.

The selection of items included in this album are on side one: *La mer*, *Au clair de la lune*, *Chacun son rêve*, *Seul depuis toujours*, *On Danse à Paris*, *Le retour des saisons*, and on side two *Revoir Paris*, *N'y pensez pas trop*, *Marie, Marie*, *De la fenêtre d'en haut*, *En écoutant mon coeur chanter*, *Douce France*.

All evocative of a decade now past, which, alas, will never return again. Faced with a choice between Piaf or Trenet it is difficult to say which I would prefer to own. If I said Piaf then my wife would quite surely say Trenet, which is fair enough.

NOEL COWARD FAVOURITES. The Les Reed Orchestra. Fontana CFP4001, 40s.

Noel Coward has probably done as least as much as any other single individual to exploit the lighter side of life and to make living more pleasant for enormous numbers of people. I looked forward to hearing this collection of Noel Coward Favourites, but was keenly disappointed when I realised that this is, of course, a purely instrumental series of arrangements without vocals. The wit and grace of Coward surely lies in the words, just as does the sentiment of *London Pride* and *Mad About the Boy*.

Apart from the two titles mentioned, the collection also includes: *Zigeuner*, *I'll See You Again*, *Dearest Love*, *Mad Dogs and Englishmen*, *Room with a View*, *Dance Little Lady*, *Poor Little Rich Girl*, *If Love were All*, *I'll follow my Secret Heart* and *Someday I'll Find You*. All good, nostalgic stuff, which would have meant far more to me personally with lyrics. As it is, I am left with a feeling of half enjoying what I half heard.

TO THE MEMORY OF KREISLER. The Gregory Strings. Fontana CFP4002, 40s.

If ever a man was worthy of an album with the title, "To the Memory of . . ." then that man is surely Fritz Kreisler. In his sleeve notes John Gregory wonders if there will be another like him. There may well be as virtuosos soloists, but certainly not as composer as well.

All the works recorded here are original Kreisler compositions, and they have been arranged for string orchestra by John Gregory. The programme includes: *Liebessfreud*, *Rondino on a theme of Beethoven*, *Schön Rosmarin*, *Alte refrain*, *Tambourin Chinois*, *Liebeslied*, *Caprice Viennois*, *Danse Espagnole* (arr. Kreisler), *Polichinelle*, *Shepherd's madrical*, *Marche miniature Viennoise*, and *Stars in my eyes* (from "The King Steps Out").

Having given the idea of the album my wholehearted approbation I have to admit regretfully that neither the arrangements nor the recorded quality really come up to the high standards required. The violin is a beautiful instrument, rich in harmonics and subtle nuances of tonal coloration. When one is used to hearing this luscious sound adequately reproduced then anything less can be disturbing. When listening to this otherwise very pleasant collection I was disturbed in precisely that way.

SHADOWS IN LATIN. Norrie Paramor. Columbia TC-SCX6012, 40s.

Norrie Paramor is undoubtedly a musical director of unusual talent, as the sleeve notes point out. In combination with The Shadows he has produced a thoroughly popular collection of considerable value.

A glance at the titles will indicate the kind of Latin treat they produce for us, including *Guitar Tango*, *Wonderful Land*, *Shindig*, *Little Princess*, *Stars Fell on Stockton*, *Apache*, *The Frightened City*, *Dance On*, *Atlantis*, *Foot Tapper*, *Nivram*, *FBI*, *The Rise and Fall of Flingel Bunt* and *Peace Pipe*.

Several of these items are extremely well known, in fact *Apache* was a number one hit in 1960.

As so often happens with Latin arrangements of this kind, success or failure hangs on the success of the arranger. No one is better qualified than Norrie Paramor to produce both the arrangement and the blend of sound that will set the cash registers jingling. All one can say is that he has done it again.

MUSIC ON TAPE

ORCHESTRAL & ORGAN

THE KING OF INSTRUMENTS, Catharine Crozier at the Aeolian-Skinner organ of the World Headquarters, Reorganised Church of Jesus Christ of Latter-day Saints, Independence, Missouri. Ampex ASC502 four-track stereo, 7½ ips. 75s.

Catharine Crozier is one of the leading American organists. Her distinguished career as both teacher and concert virtuoso is well-known in Europe, as well as America. She has given recitals at the Royal Festival Hall, where her performances have received critical acclaim. Now Professor of Organ at Rollins College, she has devoted her entire life to "the king of instruments."

The organ on which she performs in this album is the Aeolian-Skinner Opus No. 1309 completed in 1959. It contains 110 ranks of pipes in nine divisions. It is one of the most noteworthy of modern instruments.

The main work of the album is the Sonata on the 94th Psalm by Rebuke. This monumental work is regarded as one of the masterpieces of the German romantic school. Based on a single theme in two parts, the sonata is a free fantasy in three movements. The structure of the composition, with its interplay between the rhythmic and chromatic parts of the basic theme, mirrors the varying moods of the psalm. Its opening, with dark references to the Lord God of Vengeance, is filled with heavy pedal passages revealing the depth and beauty of the instrument. Ending on a note of hope and triumph, the whole offers a moving musical and spiritual experience.

The other items, nicely chosen to give a fine contrast, are *Arabesque Sur Les Flutes* and *Dialogue Sur Les Mixtures* by Jean Langlais, *Pastorale* by Jean Jules Roger-Ducasse, *Deuxième Fantaisie et Postlude pour l'office de complies* by Jehan Alain.

This album is undoubtedly one of the most interesting collections of organ works I have chanced upon for some time. Both the recorded quality and the performance impress upon the listener feelings of great power, perfect control and beautiful music. Apart from which this recording offers a dramatic sound source worthy of the very best in reproducing equipment. Recommended for organ lovers and hi-fi addicts, the collection is unusual enough and brilliant enough to suggest itself as an unconventional gift for most musical types who would undoubtedly treasure it as a most valued personal possession.

BEETHOVEN. Concerto for Piano, Violin, Cello and Orchestra in C Major, Opus 56 (Triple Concerto). Radio Symphony Orchestra, Berlin, conductor Ferenc Fricsay. Ampex C6236 4-track stereo 7½ ips. 75s.

This particular work occupies a rather strange place in the Beethoven repertoire. Composed in 1804/5 at a time when Beethoven was at the very height of his genius, the Triple Concerto is one of a small group of works which Paul Bekker referred to as being "lost to the present generation."

The idea of unusual combinations of instruments is by no means a bad thing in itself. Mozart's Sinfonia Concertante are

striking examples of successful composition in this field which have received the sustained popularity they so richly deserve. But with Beethoven it doesn't quite come off. Not that one should necessarily blame the composer; Paul Bekker mourned the loss of this work as being due to the inability of both modern instrumentalists and audiences to rise above mere technique which so easily stifles inspiration.

The sound quality offered in this recording is pleasing. The performance of the soloists, Géza Anda, Wolfgang Schneiderhan and Pierre Fournier, leaves little to be desired. Their conductor, Ferenc Fricsay, exercises admirable control throughout. In spite of this the work as a whole does not leave me with the great sense of satisfaction so often associated with Beethoven. The fault probably lies within myself, which is all the more reason for studying this work more carefully. It is interesting to note that my own feelings do coincide with popular opinion. I have no doubt that the work itself merits far greater attention than it receives.

Without blaming the recording in any way it must regretfully be recommended only to those serious music lovers who are really determined to get to grips with the Triple Concerto.

WAGNER. Siegfried-Idyll, Lohengrin Act I Prelude, Die Meistersinger Von Nürnberg Prelude, Tristan und Isolde Act I Prelude and Isolde's Liebestod. Berlin Philharmonic Orchestra conducted by Rafael Kubelik. Ampex C6228 4-track stereo 7½ ips. 75s.

My reaction to the opening of this tape was one of shocked surprise. The first sound is a rather nasty "click" which is repeated in the middle of the first bar of music. Background noise is unusually high and sound quality markedly gramophonic.

As the Siegfried-Idyll proceeds the sense of shock deepens. Sound is obviously of progressively poor quality, with unpleasant peaks and gross distortion in the heavy passages. The artificially mechanical colouration persists. I shall not listen to this version of the Siegfried-Idyll again.

The Prelude to Lohengrin shows only a slight improvement, but happily on Side 2 this is very marked. The Prelude to the first act of the Mastersingers almost approaches the brilliance we expect from Deutsche Grammophon and the Tristan und Isolde items are not less good.

Having great faith in the future of top quality 7½ ips four-track stereophonic tapes it is depressing to find such a highly reputable publisher accepting into his lists a recording of such poor quality as we find on Side 1. All gramophone companies, including the very best, suffer from the occasional recording that is far below their normal standard. We all know these rogue recordings exist, and we never fail to be depressed when we come across them. This, I am sorry to say, is one. It would be a wealthy man indeed who could afford to buy this album simply for the enjoyment to be derived (and there is plenty) on Side 2.

It has been pointed out that I rarely condemn a tape. Happily, this is for the very simple reason that nearly all the tapes received for review are of exceptionally high quality. I would be delighted if all music on tape maintained these standards without exception. That this does not quite happen is proven by the example under consideration—that it is a rare circumstance is also happily true. Not recommended.

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NEW PRODUCTS

NEW LOOK FOR MAGNAVOX

MAGNAVOX have given their model 363 tape deck a new look by incorporating a plastic tape deck cover made from Styron 475 polystyrene. Moulded by Insulators Limited of London the deck covers are available in contrasting colours with excellent print reproduction making operating instructions clearly visible.



Tape transport 363 is said to have been designed, engineered and manufactured to extremely close limits. It fits most conventional style cabinets and can record and replay to the high standards required by modern techniques.

Available to home constructors the price of the Magnavox 363 tape deck, quarter-track version, is £15 10s., and the half-track model £13 10s.

Magnavox Limited, Alfred's Way, Bark-
ing, Essex.

FIDELITY PRICE REDUCTIONS

MARK II models of the Fidelity Play-
master tape recorders have just been
announced. These machines are mains
driven valved models and the top deck has
been redesigned as shown top right above.

Circuit and features remain unaltered but rotary knob controls for volume and tone now replace the original edge controls. Thanks to high quantity production the recommended retail prices have been reduced to 19½ guineas for the twin-track version and 22½ guineas for the 4-track version. All prices include microphone, tape take-up spool and gram/radio recording lead.

Fidelity Radio Limited, Olaf Street, Lon-
don, W.11.



DIRTY HEADS? PRACTICAL NEW KIT FROM MULTICORE

WELL-KNOWN for their very practical series of accessories, the firm of Multi-
core Solders Limited have now produced a
completely new tape head cleaning kit to be
known as the Bib Tape Head Maintenance
Kit.



The kit is intended for the cleaning of
tape heads and all parts of the recorder
liable to soiling through the shearing off of
oxide. Within a blue plastic wallet are
packed two tape head applicator tools, two
tape head polisher tools, ten applicator and
polisher sticks, one double-ended brush, one
bottle of Bib Instrument Cleaner, one packet
of cleaning tissues and a comprehensive five-
page instruction folder. The various instru-
ments are designed to assist in the applica-
tion of the instrument cleaner which itself
has been thoroughly tested by The Ferro-
graph Company Limited, who confirm its
efficiency and safety. As a side benefit this
same Bib Instrument Cleaner is said to have
remarkable antistatic properties and can be
applied both to the whole of the deck panel
and any other surfaces liable to attract dust
—apart, perhaps, from gramophone records.

This highly practical accessory kit costs
12s. 6d.

Multicore Solders Limited, Maylands
Avenue, Hemel Hempstead, Hertfordshire.

FERGUSON UNIT AUDIO

TWO new additions to the Ferguson unit audio equipment by British Radio Corporation are the stereo tuner/amplifier (Unit 205 STA) and the stereo VHF amplifier (Unit 206 STA). Both receive BBC stereo broadcasts. The new stereo tuner/amplifier (Unit 205 STA) used in conjunction with other unit audio equipment has a claimed output of 7 watts per channel at speech and music rating with less than 1% harmonic distortion. The four wave-band radio tuner covers long, medium, short and mono and stereo VHF broadcasts.



Fully transistorised, the unit is stated to have a frequency range of from 30 to 20,000 Hz plus or minus 3 dB. Provided with a tuning level meter and red stereo warning pilot light the rotary controls are for on/off/volume, bass, treble and tuning with key switches for mono/stereo and automatic frequency control selection. An edge type balance control is sited at the rear. Sockets are provided for loudspeaker connections, pick-up input, tape input/output, AM aerial and earth and FM dipole. There is an internal ferrite rod for MW/LW reception. The 205 STA is supplied with two three-pin 2 amp. mains outlets providing a power supply for other equipment. Dimensions are 16½ inches wide, 8½ inches high and 9½ inches deep, and the cabinet is finished in a walnut veneer. Recommended retail price is 50 guineas plus 14s. 6d. purchase tax surcharge.



The stereo VHF tuner/amplifier (Unit 206 STA) follows modern low line styling and includes a multiplex decoder integrated with the amplifier. Channel selector buttons are adjustable for preset station tuning and optional automatic frequency control is provided. The claimed performance figures of the Unit 206 STA include 7 watts per channel at sine wave rating, a frequency range of from 30 to 20,000 Hz plus or minus 3 dB and an FM RF sensitivity over 88-109 M Hertz of better than 1 microvolt. Sockets are provided for loudspeaker connections, pick-up input/output, radio input and FM

dipole. Mains outlets are provided on the rear panel to power other equipment. The walnut veneered cabinet is 19½ inches wide, 5 inches high and 11½ inches deep, and the recommended retail price is 46 guineas plus 13s. 5d. purchase tax surcharge.

British Radio Corporation Limited, Thorn House, Upper St. Martin's Lane, London, W.C.2.

MAGNETIC DRUMS FOR REVERBERATION

IN many recording applications the facility to produce an artificial echo or reverberation is invaluable. The necessary time delay can be produced in a number of ingenious ways, one of which involves the use of a magnetic coated drum. This is the technique employed by Arbiter Electronics Limited, on whose behalf special drums have been developed by Mastertape (Magnetic) Limited. Manufacturing tolerances are critical—the record and playback heads actually work out of contact with the magnetic coating, so eliminating wear of either.



In use the drum is surrounded by a number of magnetic heads (including an erase head, a record head and one or more playback heads) whose working gaps are spaced from the coating surface by controlled amounts, perhaps in the order of one thousandth of an inch according to the function of the head and the type of unit. Delayed signals picked up by the playback heads can be used individually or mixed and controlled to produce a variety of reverberation, flutter and echo effects. The delay time of each echo is set by the peripheral speed of the drum and the spacing of each playback head from the record head.

There are many obvious applications for drums of this kind in other fields, such as delayed speech reinforcement systems and temporary stores for small amounts of analogue or low density coded data. Equipment designers are invited to discuss possible applications with Mr. G. C. Balmain (Audio) or to Mr. G. F. Doust (Data) of Mastertape (Magnetic) Limited who will be pleased to discuss these specialised products.

The complete echo units manufactured by Arbiter Electronics Limited include a twin stereo model, Soundimension, at 60 guineas and a smaller mono model, the Soundette, at 42 guineas.

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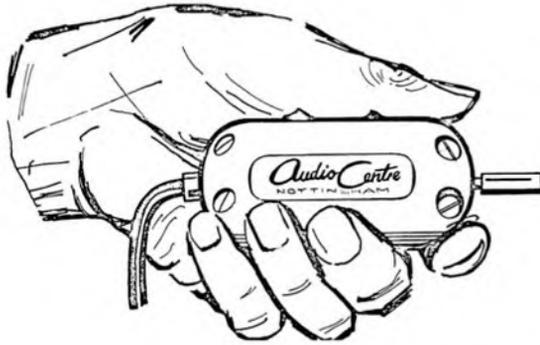
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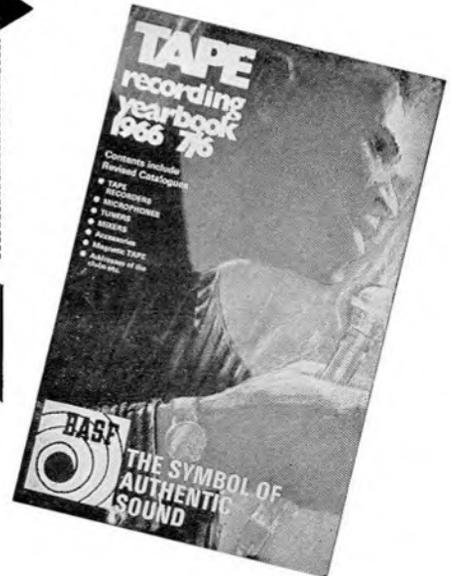
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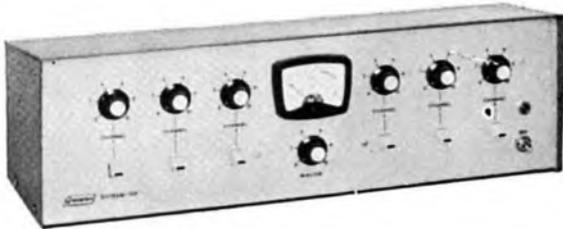
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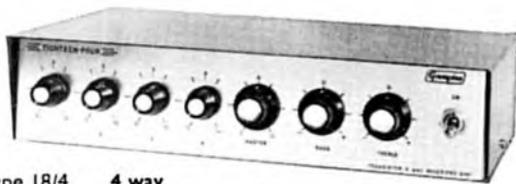
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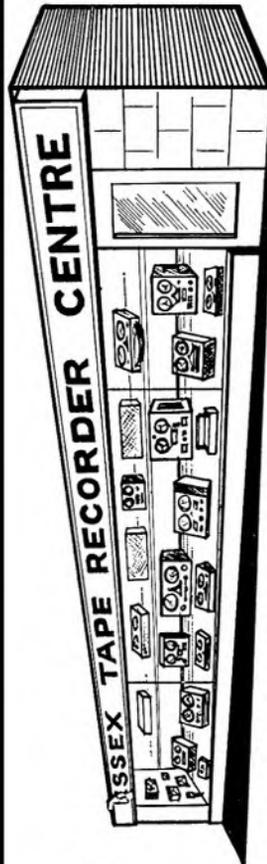
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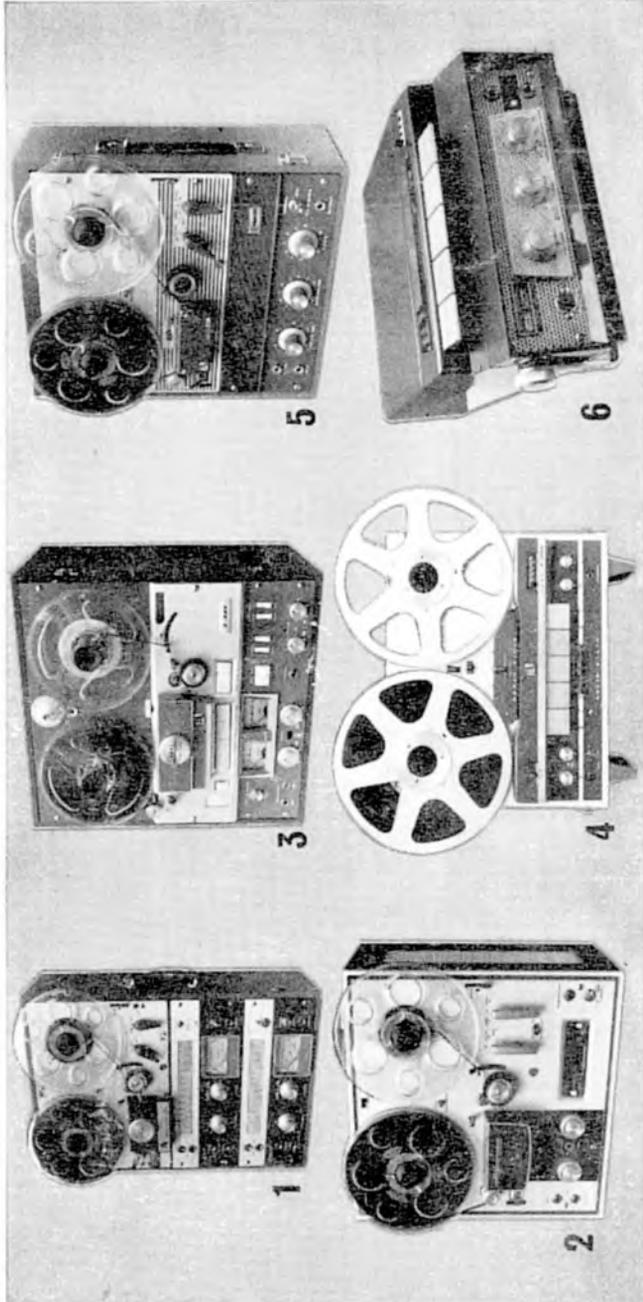
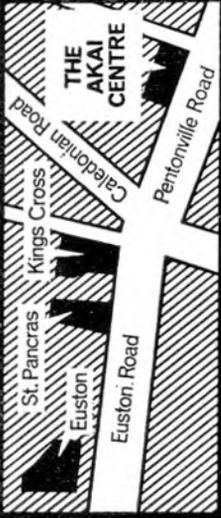
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