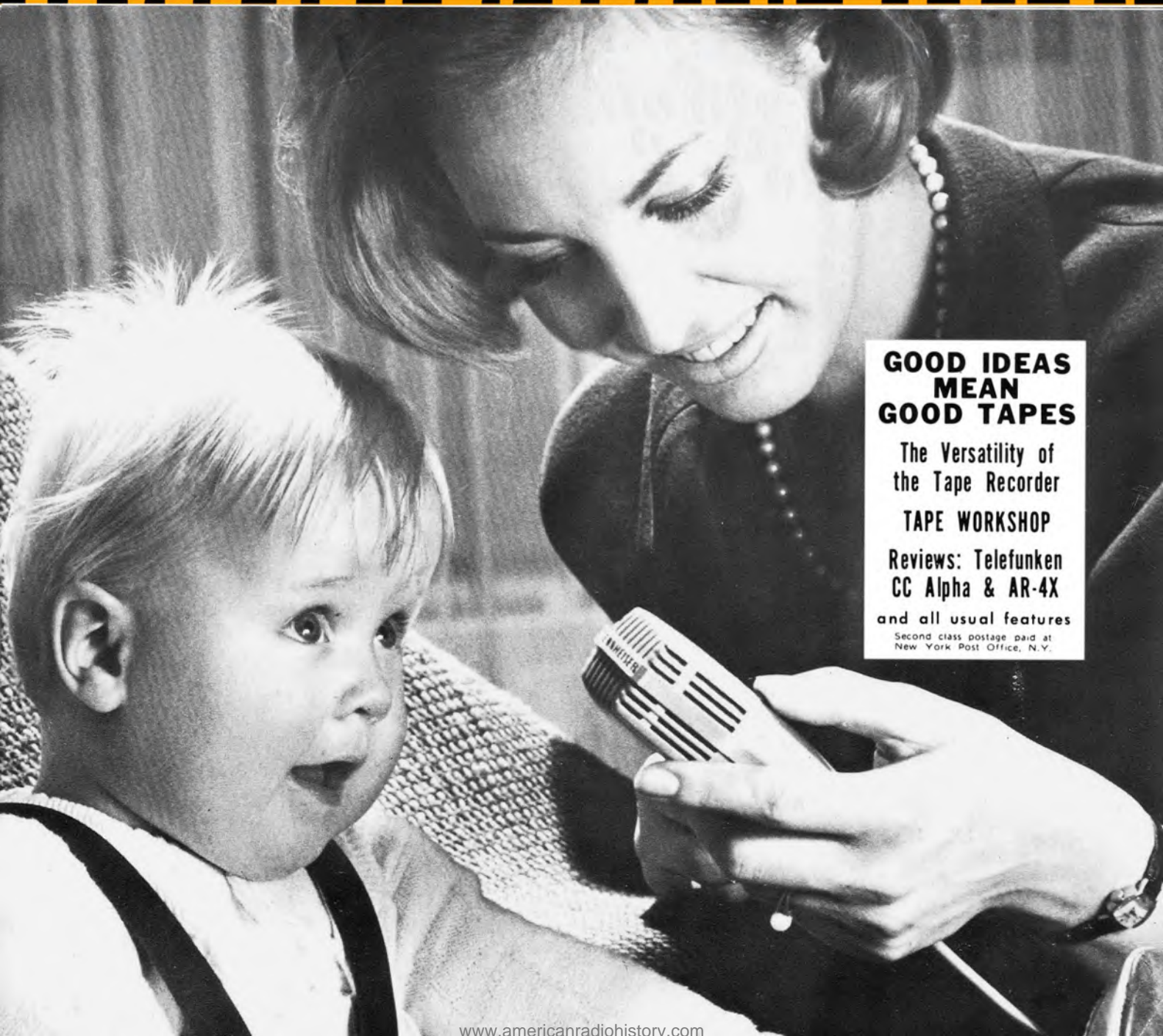


FEBRUARY 1971

TAPE

RECORDING MAGAZINE

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MEAN
GOOD TAPES**

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TAPE WORKSHOP

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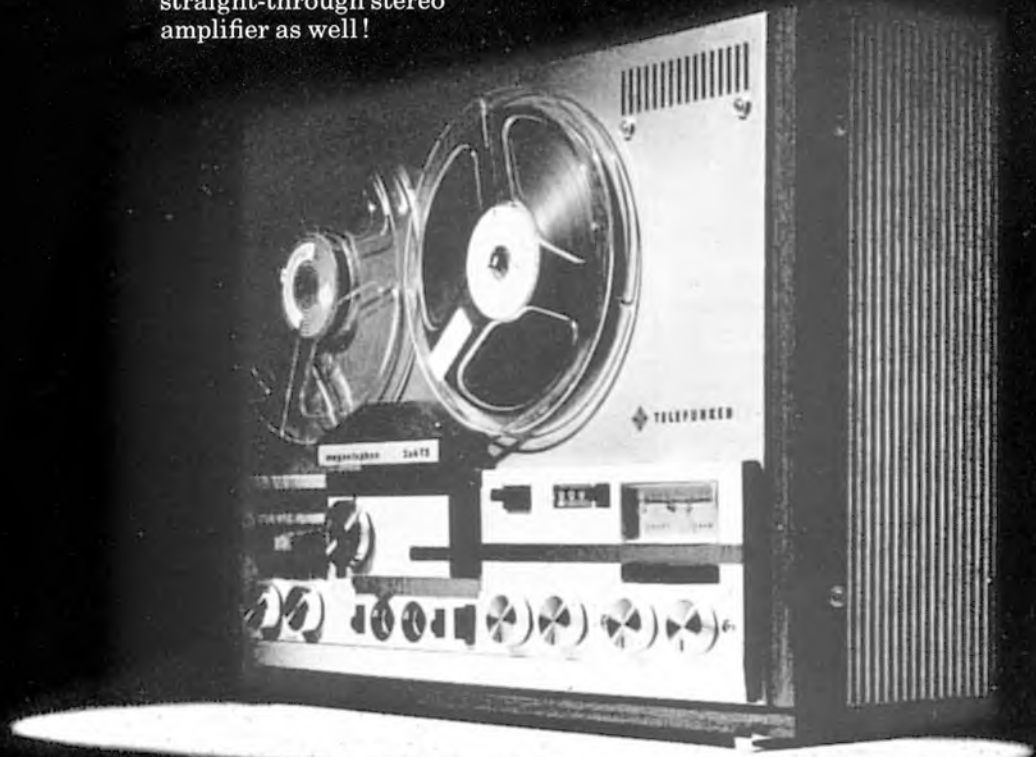
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TAPE RECORDING MAGAZINE

Incorporating TAPE RECORDING & HI-FI MAGAZINE
and STEREO SOUND MAGAZINE

Vol. 15 No. 2 February 1971

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Cover Photograph: Many people will have been given tape recorders of one kind or another for Christmas. For them, and for some who owned a tape recorder before, the burning question is — what to use it for? Here's one delightful application with baby's very first words being caught by the Sennheiser MD 411 microphone. For other suggestions read about The Versatility of the Tape Recorder on Page 54 of this issue.

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Tape trends and tape talk

By Douglas Brown

THE POSSIBILITY of video recording *anywhere*, calling for a battery-powered portable video recorder, seemed to me a distant one — until Rank Audio-Visual suddenly announced that they already have the Akai equipment available to do it. The pace of progress is breath-taking.

I look forward to seeing, and using, the new equipment; but, for the moment, I can only report with some sense of wonderment that the Akai VT 100 weighs less than 24 lbs complete with camera, clip-on monitor and batteries. Like a portable sound recorder, it can be operated while slung over the shoulder and it is claimed that the results are up to broadcast quality. Provision is made for operation from a mains supply or from a 12v DC car battery.

The U.K. price of the equipment complete is £568.

The machine is, apparently, already selling well in the United States. The Los Angeles police department, for example, has ordered 300 for use in its patrol cars. I look forward to printing more detailed information later.

News like this emphasises that foresight of the organisers of the International Amateur Recording Contest in including a video section in the 1971 event.

The rules for this section have now been agreed and will be published shortly, with full information about conditions of entry.



The Akai VT 100 portable video recorder

THE FACT that the biggest recording companies have agreed to seek united action in tape marketing techniques in Britain — through the recently-formed British Recorded Tape Development Committee — is a milestone. I have had a lot to do, in years gone by, with efforts to get the manufacturers working together to popularise tape, but the time was not ripe.

Now Philips, Ampex, C.B.S., Decca, R.C.A., Polydor, Precision and Liberty/U.A. have come together in one organisation. They have direct experience of the way tape records in cassettes and cartridges have been selling in America, compared

with Britain, and they are resolved to give the sales effort here a fillip.

Four out of ten records sold in America are on tape. Here only one in 14 are tapes. In Europe, the proportion of tapes sold is three or four times higher than here.

Why? Well, it's partly to do with purchase tax, of course. But more aggressive promotion may make a big difference. Until now the dealer hasn't even been encouraged or assisted to install a uniform type of shelving or racking for tape cassettes. In America, as I reported in this column after my last visit there, all the big stores (as well as the specialist dealers) have so-called "tape bars", where you can wander around among yards of racks full of tapes.

Then, again, the sums spent on specifically tape advertising and promotion in Britain have been modest to date. Even now, when millions of pounds are being committed by the giant firms to tape, the estimated advertising budget for 1970 was not much over £350,000, according to an estimate in *The Times*.

* * *

ONE OF THE MOST exciting results of the 1970 British Amateur Tape Recording Contest is reported from the West Country. Mrs Muriel Braddick, who won the class for tapes entered by handicapped persons, has since — and largely as a result of the publicity surrounding her success — established the Exeter Tapes for the Handicapped Association, which is registered as a charity, has a strong local committee, and hopes to be aided by trust funds.

Mrs Braddick had already done good work locally for the handicapped — her winning Contest tape was a description of a day out on the Devon moors recorded for the enjoyment of those unable to get out in person. Now the Contest has enabled her greatly to extend her work.

John Bradley tells me that the Federation of British Tape Recordists and Clubs is becoming something of a clearing house for tape activities to help the handicapped. Last October he broadcast an item on tapes for the blind in the B.B.C. "In Touch" programme, and he has had considerable correspondence from listeners.

John also broadcast recently over B.B.C. Radio London a half-hour programme about the British and International Contests, entitled "We've got you taped." The transmission included in full Terry Devereux's "The Vultures", John Parker's "Coachman", and John Shuttleworth's "The ash tip", and music and effects for introduction and conclusion were provided by Hanna Nielsen's "Handle with care" and Peter Bastin's "Not a word".

Radio London offers amateurs a splendid opportunity to show what they can do. Peter Redhouse, the station manager — with whom, as a professional broadcaster, I have worked for almost twenty years — is interested in amateur recording and is keen to find amateur work of a suitable quality to broadcast from his station. If Radio London programmes do not regularly include amateur recordings, it will be because the greatest city in the world is unable to throw up amateur talent and enthusiasm. And that, surely, cannot be possible . . .

GOOD TAPES ARE BASED ON GOOD IDEAS



IT IS THE NECESSITY that imagination shall be blended with technical competence that makes tape recording so challenging a hobby. It is because the quality of the original idea is so essential to success that tape recording may be considered an art.

One of the values of a national or an international contest is that it provides, not only a scale against which to measure individual achievement, but an arena in which ideas can be exchanged and developed.

What ideas provided the stimulus for entrants in the recent CIMES contest?

Some followed well-worn paths. The travel documentary remains as popular as ever, although there is a growing tendency to narrow the canvas and to portray one particular scene or individual rather than an overall atmosphere. Typically, a tape entered by a Frenchman, Maurice Lanfranchi, told the story of a Provençal musician who is keeping alive the traditional music of his countryside. The tape contained an interview with him, narrating the history of the instruments he uses, interspersed with examples of his music.

The music section of any contest is a difficult one to judge these days, when many amateurs achieve professional quality. A great deal of importance must be attached, therefore, to choice of subject.

Hanne Nielsen, the 14-year-old Danish girl who took the first prize in the CIMES music class, found — and recorded — the only orchestra in the world equipped

with instruments made entirely of glass!

Two glass-blowers at Kastrup (where Hanne lives) made, during the years 1934 and 1938, two tubas, two trombones, three horns, three trumpets and a drum — all of glass. They produce very good music, and Hanne Nielsen recorded some of it and added an explanatory commentary.

This was a unique subject, but there are plenty of opportunities for unusual recording. Without leaving Paris, for example, Gerard Kremer captured on tape the music of the Indian Harp, the most popular instrument of Latin America. He went to a concert at the South American Cultural Institute in Paris last April and got the story of the history of the instrument, as well as examples of its music.

The tapes I have mentioned thus far largely depend on the choice of individuals to be recorded. But a good idea supports itself and can be brought to realisation almost anywhere. Second prize in the reportage class was taken by Mr J. Haanstra, of Holland, with a tape which consisted almost entirely of people laughing. Different people, different laughs: the earliest efforts of a baby to laugh, the delighted roar of a toddler, the giggle of a schoolgirl, the infectious laughter of a woman.

A very simple idea, but a good one. Probably all the judges had a feeling that such a tape was taking an unfair advantage of them, but well over half of them were grinning broadly before the tape had ended.

A somewhat similar, but more ambitious, idea was tried by Arne Rognlien, of Oslo. He took his portable recorder to an underground railway station and invited one or two people to sing a little song “to promote pleasure in singing”. There was a touch of “Candid Camera” about it.

The sounds of nature offer plenty of opportunities for recording amateurs and each of the two prizewinners in this section of CIMES found a suitable subject. Benny Jensen, of Copenhagen, managed to get a couple of hover flies (*Lasiophthicus*) into a five-litre plastic container and to get a couple of microphones in there with them. He spent nine hours on the task and he ended up with one minute 43 seconds of recording of the two insects singing to one another.

Otto Schoni, of Switzerland, climbed up into the mountains each day for a fortnight in early summer to a place where frogs were spawning. We heard a composite one minute 57 seconds of the recordings he made: the female frogs “humming”, male frogs calling in competition with one another. When the noise reached its crescendo, Herr Schoni told us, it could be heard on the wind for up to two miles.

What about tape recording in schools? In the early days of British participation in CIMES, we established a reputation for the quality of tapes produced in British classrooms. There seems to be fewer of them nowadays; with tape recorders

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GOOD TAPES —GOOD IDEAS

Continued from Page 49

becoming almost universal as part of school equipment, the number of teachers anxious to make effective use of them seems to have declined. I wonder whether teachers' training includes sufficient guidance on the subject?

The best schools' tape heard at Geneva came from France and was the work of a group of eight-year-old children and three teachers. This, in the words of the teacher entering the tape, was what it was about:

"The children read a book at school, 'The Story of an Engine, liked it very much, and decided to perform the story on a stage. They were divided into several groups. Each started to write a different scene, then the whole class discussed and criticised each adaption, and the best were selected. Later, each pupil was encouraged to perform the part he most wanted to play and, again, the whole class judged and selected the best. There was a similar collective effort in deciding on scenery and other plans.

"Everybody was kept busy and felt very much concerned and responsible. Even those who, at first, showed little interest were infected by their friends' enthusiasm and finally joined in proudly.

"A whole series of lessons were involved in the exercise: elocution, written composition, craft-work, for instance. Altogether about six months was spent on the project.

"Then 'The Story of an Engine' was performed in front of parents and the rest of the school and was recorded. The purpose was to develop the children's desire for creative and artistic expression."

Runner-up in the schools section was also a French tape, featuring a class of six-year-olds. Titled "Morocco", it was a straightforward recording of a group of children cross-examining one of their number about his homeland.

It is difficult to go wrong when recording children; they speak with such spontaneity, utterly unconscious of the microphone, that the result is almost always attractive. Take this brief extract:

----- Have they got little houses on your camels? — because my mummy told me she'd been once where they have little houses on the camels.

----- Yes, like in India, where they put little houses on the elephants. And on the camels they sometimes put a . . . what they put on the beach.

----- An umbrella.

----- Yes, and little houses as well. For the king, when he wants to get on a camel, well, he has a little house.

----- What about the feet? Do you see his feet sticking out?

There was a special section in the international contest this year for entries on the subject "The youth of today — the world of tomorrow" and so we heard as well the teenagers having their say. But, of all the possible subjects for amateur recording, I think there is none offering such opportunity as the recording of young children.

TAPE WORKSHOP

By DENYS KILLICK

IN PREVIOUS instalments of Tape Workshop we have concentrated on problems concerned with audio quality. We have discussed getting rid of unwanted noise and we have talked about the ways of establishing a correct voice-to-microphone relationship in order to overcome the acoustic peculiarities of the recording room and the microphone in use. Now, for a change, we will turn our attention to another aspect of recording — to the actual performance of the person in front of the microphone.

There can be few who on first acquiring a tape recorder do not read some short extract from a book or newspaper and then sadly comment that there is a wide difference between the sound of their own voice on tape and that of, say, a B.B.C. spoken word production. All too often the blame is placed fairly and squarely on the equipment. But to blame the machinery ignores the fact that reading in front of the microphone is as much an art as any other kind of performance. A few, a very few, are born readers — most of us have to learn painfully and slowly *how* to read as a performance. This word *performance* is the key to the whole business; when reading in front of the microphone we are *performing*.

First of all it must be remembered that when we listen to a spoken word broadcast it is likely that the individual reading is highly skilled at his job. He is a professional who through study at a school of drama or in some other way has learned the tricks of his trade. And there are a good many tricks in the trade of reader. But first let's consider the faults in your own reading.

Most amateur voice recordings suffer from *montony*. By this is meant an inability on the part of the reader to make use of the full range of inflection, emphasis and dynamics that exist within the human speaking voice. We, in Great Britain, are at a disadvantage here. Compared to some continental nationals

we tend to restrain ourselves. One of the hallmarks of "good upbringing" is a refusal to shout or whisper. This is so inbred into us that as a result we tend habitually to speak in something approaching a monotone. If you don't believe it just listen to the sound of a "well-bred" Englishman's voice. It's just about the most boring thing on earth . . .

When holding a conversation with someone we tend to accept the monotony of the sound because it is directly associated with the live personality of the individual. As soon as we change the circumstances and find ourselves listening to the artificial reproduction of that same voice, divorced entirely from the dominance of the personality of its "parent body", we are immediately aware of a lack of interest. The listener's attention wanders and he quickly becomes bored. In other words what we have is a thoroughly bad recording.

The art of reading — or just speaking — in front of the microphone involves retaining the listener's attention and successfully conveying to him the sense of what one is saying. Now this must be done without any of the advantages associated with having the live flesh and blood of the speaker to assist in maintaining concentration. It therefore follows that what is required is a technique of *acting* that will tend to over emphasize rather than under emphasize, and this will be deliberately done with the sole object of making the recording interesting and lively instead of dull and boring.

Just about anyone can successfully read or speak in front of the microphone provided he is aware of his own limitations. All that is needed is an understanding of the full breadth of expression of one's own voice, plus the ability to use it together with an appreciation of the time it is likely to take the listener to absorb the various

TAPE WORKSHOP

By DENYS KILLICK (continued)

points within the reading.

Let's deal first with voice production. Every human voice is capable of a certain range of loudness and softness, another range of tonal values from down-in-the-boots to squeaky-on-the-top, and yet another range of speaking quickly and speaking slowly. The skilled reader will exploit these possible variations to the full, permitting his voice to vary in loudness (dynamic), to vary in musical notation (pitch), and to vary in the rapidity of delivery (speed). These are the weapons of the reader and they are the techniques that the amateur tends to overlook.

Those who have been used to acting on the stage will be well aware of these facts. They will understand the importance of a varied and interesting delivery. But most of us have little experience of dramatics and we believe that just because the sense of the word on the printed page is obvious to us we should be capable of delivering that self-same sense to the microphone. Sorry, but that is a fallacy. It just isn't true unless one has the necessary experience and practice.

In the days when I was teaching tape recording techniques one of the lectures that the students most enjoyed was that concerned with voice production for the microphone. It was really amazing how in the short space of a couple of hours the eyes — and the ears — of a full class of students could be opened to the possibilities that lay dormant within each and every one of them. My approach to the subject was quite simple, and it was one that you might care to follow yourselves. First of all I would select a suitable passage for reading from any book. This would then be copied so that every member of the class had a typewritten "script" in front of him. After allowing ten minutes or more for the study of the written word a volunteer would be called for. His job would be to read the piece in front of the microphone.

At this stage the reading would be

undertaken without any advice whatsoever. After carrying out this experiment on numberless occasions I found, without exception, that the readings were always dull and uninteresting with a quality that was calculated to bore the listener. The reader himself would invariably be only too ready to admit to his own weakness, but should there be any hesitation in this self-analysis the rest of the class were never backward in expressing their own feelings in no uncertain terms!

So from this point we would analyse the reading in some detail, and the entire class would mark their own copies of the scripts in pencil to indicate where variations in delivery would have assisted in maintaining *interest* and *meaning*. We would also discuss the meaning and purpose of punctuation, and it would soon become apparent that the system of commas, colons and full-stops that is commonly used on the printed page is quite inadequate for the spoken word. Punctuation is closely allied to timing and the deliberate insertion of pauses in the delivery, which, when properly handled, serve to either emphasize a phrase or to give the listener time to think and absorb the truth of a statement made.

Consider for a moment the difference between reading to oneself and listening to the recording of a reading of that same passage. When dealing with the printed page the eye travels at a rate to suit the intelligence or perception of the reader. If something is not understood the eye can go back and a sentence or paragraph may be re-read until its sense becomes quite clear. With a recording conditions are quite different. The voice goes on and on and on. There is no opportunity for recapitulation. If the sense is missed it is lost. And once the recording ceases to make sense the listener's interest will be lost too. So we can say that voice delivery is concerned not only with adding to the interest of the reading but also with making clear the sense of what is being read.

Reading in front of the microphone is probably one of the easiest techniques for the amateur to explore. He can experiment to his heart's content, and by so doing improve his voice control to the point where it will be of considerable benefit in everyday life, quite apart from the ready skill that he will be able to bring to the microphone. It is an attribute desired by many, and it can be acquired by the exercise of a little patience and commonsense.

I always used to suggest to my students that one of the ways to overcome inhibitions when placed in front of a live microphone is to read poetry. The reason for this suggestion was quite simple. Most "big strong men" tend to feel foolish when reading poetry anyway. If they can succeed in reading it in front of the microphone then they can read anything . . . ! Further, much poetry is written in such a way that it lends itself towards dramatic expression, thus enabling the reader to make the maximum use of the powers of his own voice. It's a good idea to choose something quite deliberately for its dramatic content. Don't hesitate to overplay the drama. Just for fun one can shamelessly *overact*. That is the way to lose inhibitions. That is the way to learn, or rather re-learn, the breadth of the power of one's own vocal equipment. Children tend not to be inhibited in the same way as adults. They are far more naturalistic and far less ashamed to make use of their full range of vocal accomplishments. That is why I use the phrase "re-learn". It is a case of getting back to the freedom of younger days — of really letting oneself go.

And, as I hope you now begin to realise, this can be quite fun. Learning to read before the microphone is not a dull task. To the contrary, it should be full of laughs and amusement. If it's not then there's something wrong with your practice. And it's something that can be undertaken by the entire family to the merriment of all.

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IT'S A STRANGE experience, an electric power cut. At the moment of writing things are returning to normal pending the holding of the Court of Enquiry, but only a couple of days ago I found myself having to sit in the dark and listen to sound reproduced on battery equipment. It was, as I say, a strange experience. Surrounded by costly audio gear, none of which could be used. Listening to the news on a tiny transistorised radio as the tuner stood silent and useless.

Many of us must have come to realise just how much we depend on the constant supply of electricity. So many of our modern appliances are useless without it. Not to mention the plight of those who depend on electric power for their warmth, their food or even their health. In many ways we have all become slaves to the electric god, but we don't realise it until the benefit of his miracle is suddenly denied to us.

Strange, too, how we British undergo subtle changes at such times of emergency. Instead of the insular keeping oneself to oneself attitude there's a spirit of helpfulness abroad. Something almost approaching a war-time sense of comradeship. People even remarked that, from this point of view, they would be sorry when the dark days would be over. Well, they are now over; we hope for good. Could we not try to keep just a little of that how-can-I-help-you feeling?

There was something very appropriate about the quotation on a magnificent 1971 calendar I have received from BASF in Germany. It reads: "If men would but concern themselves more with the progress of true science than with their own selfish interests . . ." Those words were written in the seventeenth century by Robert Boyle, a gentleman whom I chiefly remember for his "Boyles Law" defining the behaviour of gases.

I don't doubt that the phrase "true science" was more meaningful three hundred years ago than it is today. In the modern world scientific discovery too often works against the good of humanity, instead of for it. It is the fate of scientific work to suffer exploitation for military or commercial interests. And, in the name of progress, mankind is polluting his own atmosphere and robbing his environment of irreplaceable raw materials.

Take a fairly common substance, such as copper. There's a lot of it in audio equipment. We use a lot of copper. But the supply is not inexhaustible. It won't last for ever. Products in which quantities of such raw materials are used should be made in such a way that they endure. If bought, used and then just thrown away without any thought of salvage then those vital materials are lost to the world

CROSS TALK

By Audios

for ever. We are soon going to reach the stage where such a thing will not be allowed to happen. It will be an offence to allow the natural resources of the world to go to waste.

One has thoughts like this when sitting helplessly in the dark. Suppose there were to be no more electricity? What then? And how on earth did civilised life exist before that magic power was constantly available at the touch of a switch?

"Don't waste power" was the message from the government because they suddenly realised that power was in short supply. But memories are short and very soon the message will be: "We have plenty so waste as much as you like". A very few far-sighted people are now trying to spread another message. "Don't waste the world", they say. And they are right.

Conservation of resources implies making the best possible use of what we have. Manufacturers must stop making "junk" that will be discarded in a short time. We must return to the ideal that manufactured products should *last*. Artificial obsolescence, or the building into a product of a deliberate limitation on its useful life, is a crime against all the peoples of the world, not just against the pocket of the purchaser.

* * *

GOOD NEWS from Charles Cadwell of Tape Recording Service for the Blind. As a result of our article and appeal he has received a number of cash donations, quantities of Green Shield Stamps (which are still coming in) and offers of two second-hand Ferrographs at very reasonable prices. Not to mention the services of some very highly qualified readers. He would like to thank all those readers who responded so very generously. Their gifts are not only greatly appreciated but the help he has received will enable him to extend his activities still further.

If you remember we originally asked readers if they would donate Green Shield stamps with which a new Ferrograph could be "bought". About 250 books are needed. This target has not yet been reached so, at the risk of repeating myself once more, will those who have not yet posted off their stamps - or complete books of stamps - please note that the address is: Mrs Maureen Baylis, Hon. Secretary, Tape

Recording Service for the Blind, 48 Lye Copse Avenue, Hawley, Farnborough, Hants. This organisation is a registered charity and is acknowledged and supported by the Royal National Institute for the Blind. Your Green Shield Stamps could hardly be put to better use.

Some readers have pointed out to me the fact that there are other organisations doing valiant work in this field, and they felt it was wrong to ignore them. Of course there are, and this was made clear in our article about Charles Cadwell. So can I now once again pay tribute to all those who through the use of magnetic recording are easing the lives of those who have lost the gift of sight. They all deserve all the help they can get from we who are more fortunate.

* * *

THE BUGBEAR of purchase tax continues to bedevil us all. It's not just the extra money we have to pay when we want to buy anything, but, more serious, the manner in which the regulations affect the kinds of products that are offered to the public.

Take video, for instance. At present all activity in this field is limited to professional, industrial or educational use. Why? Because once the equipment is sold to the public in retail shops it is almost certain to attract purchase tax, and that tax would then be imposed on all the equipment whether used industrially or for home entertainment. In other countries the ordinary consumer is not so limited. If he has the cash he can buy: here the ability to purchase no longer confers the right to acquire.

This absurd state of affairs is going to affect all the future development and sale of video recording equipment in this country. As Douglas Brown reported in *Tape Trends* recently we already have the prospect of contests for amateur video recordings. But what chance does the British enthusiast have when he cannot buy the equipment? And what is going to happen when video cassette machines arrive, as they will within the next couple of years? Are they too going to be taxed out of the market? Are they either going to be for "reserved uses only" or will they be so expensive, thanks to the addition of tax, that few will be able to afford them?

As things stand at present it seems that it must be one or the other. Unless the government shows more sympathy than we have been accustomed to receive in the past.

I came across another example only the other day. A British firm making a British tape recorder of very high quality cannot sell it for amateur use. Why? Because if they did it would be subject to purchase tax. So, in spite of the serious lack of good British made recording equipment we are prevented from buying a home-produced machine because of purchase tax regulations. It is absurd, isn't it?

Chances are that the man who might have bought that British recorder will end up with an imported product. Up goes the import bill. To blazes with the balance of payments! And the fault lies with the government, not the public.

* * *

AT A RECENT meeting of exhibitors to discuss the forthcoming Sonex '71 exhibition that will be held at Skyway Hotel from Wednesday March 31 to Sunday April 4 (the first two days are for trade only - the public will be admitted from Friday to Sunday) there was some discussion about the problem of overcrowding in the corridors. The point was made that those firms who employ commissionaires to control their visitors tend to cause obstruction. A fat commissionaire occupies a great deal of floor space. So it seems that there should be work for a few thin sergeants!

THE VERSATILITY OF THE TAPE RECORDER

DISCUSSED BY OUR EXPERTS

NOW THAT CHRISTMAS is behind us a great many people will find they are using a tape recorder of one kind or another for the first time. Tape recorders will have been given as presents, and those fortunate enough to receive them will have been thrilled by the possibilities of recording sound.

But after that first thrill and excitement has worn off the new owner will begin to wonder how he can regularly employ his acquisition. And even those of us who have had one or more tape recorders around the house for quite a long time could benefit from a general reminder of the kind of things the equipment can be used for. So let us start right from the beginning and consider what a tape recorder is and what it does.

Above all else the tape recorder is a creative instrument. In spite of the much publicised "automation" that can now be found in many models the device is basically an appliance that will only perform the tasks that the operator determines. The first need is for the owner to exercise his intellect and intelligence. There is a profound difference between a passive activity, such as watching television or listening to gramophone records, and a creative activity such as tape recording.

Unfortunately there is a trend towards the more passive forms of entertainment. At one time listening to music meant literally making music oneself within one's own home. Now it means switching on the radio or listening to a gramophone record. Rarely does it mean going to a concert hall, and even more rarely does it mean getting out the music and actually playing. In this sense the tape recorder can be likened to the piano; it will remain silent and unused unless its owner makes the deliberate effort that is required for it to perform the functions for which it was designed.

Recording sound has been likened to taking photographs; in fact at least one manufacturer has used the term "sound snapshots" in his advertising. Whilst agreeing that there are certain analogies between the two occupations there are also important differences. And not least



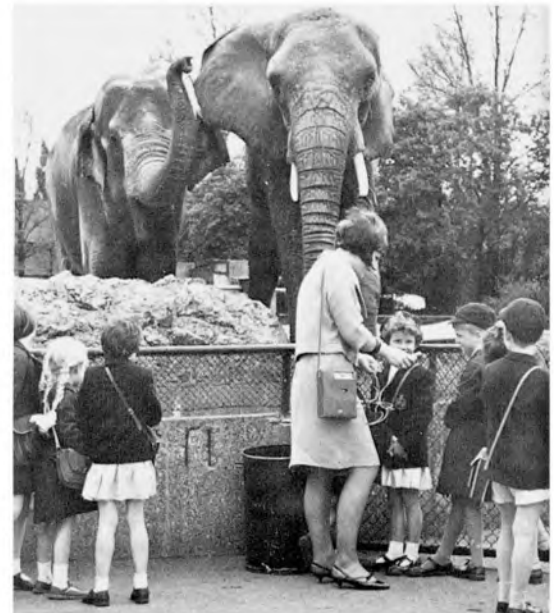
Reading at the microphone

of these lies in the fact that photography never pretends to *recreate* life — all it does is to offer a pictorial image which *reminds* those who see it just what the original subject was like. When elevated to an art photography can reveal aspects of subjects that were not previously apparent and would therefore have escaped the casual onlooker. Sound recording is quite different. When associated with so-called high fidelity techniques the aim is to *create an illusion of the recreation of life*. For example, in recording and reproducing the sound of the human voice the aim is to achieve such a close relationship to reality that the listener could *imagine* himself to be hearing the live voice of the speaker instead of the purely mechanical reproduction of that same sound. When looking at the photograph of a pretty girl there is no possibility of ever mistaking the pictorial representation of that person for the actual living flesh and blood. When listening to the recorded sound of the voice of that same girl the aim should be to produce an illusion of reality and life.

The person using tape recording equipment for the first time is likely to discover that his voice recordings are far, far, removed from the kind of quality described above. Voices will be recognizable as belonging to particular individuals, but they are likely to have a mechanical feeling about them that is

quite absent in real life. The people being recorded will almost certainly ask: "Does my voice really sound like that?" Can one honestly answer: "Yes, it must be because I have just recorded it"? Such an answer is both half true and half false.

The ordinary amateur recording of the voice, probably reproduced by playing back and listening to the sound from the built-in loudspeakers provided within the tape recorder, will certainly give a general idea of the characteristics and tonal inflections of the speakers; *what it will not do* is to faithfully reproduce every



Small battery powered portable cassette machines have many uses. When visiting the Zoological Gardens it is as interesting to record the comments of the visitors as it is to endeavour to record the sounds of the animals. A cassette such as is being recorded here will be full of happy memories of a very pleasant outing. Would you think to take your machine on such a trip?

IS YOUR MACHINE USED TO ITS BEST ADVANTAGE?

THE VERSATILITY OF THE TAPE RECORDER

continued from previous page

single sound in such a way that the listener would find difficulty in distinguishing between the live and the recorded sounds. To produce this result one must employ costly microphones and equally costly loudspeakers. To achieve such a result means progressing into the realm of high fidelity sound reproduction. This is only one part of tape recording which should be regarded as the art of getting as close to that desirable state of perfection as is possible *with the equipment at one's disposal*. So the correct answer to the person who queries

the recorded sound of his own voice should be: "Yes, this is the sound of your own voice. If I had been able to use better equipment there would have been a greater sense of reality, but that would not have improved the general intonation or pronunciation which is faithfully reproduced in my recording."

And the same comments would be equally true for live musical recordings as well.

But the fact that our own home recordings might lack that little "something" need not discourage. To the contrary, it would be advisable to point out that the kind of recorded quality heard on a new tape recorder is likely to be equal to, or in some cases even better than, the quality that could have been obtained using some of the best professional equipment available only a few years ago.

So in the field of voice recording just what can we record? First of all there are the sounds of the voices immediately around us — those of one's own family. What a wonderful thing to be able to record the voice of a young child, store



A very different kind of nature recording; this time with Richard Margoschis demonstrating the use of the reflector.

the tape away and let that child in adulthood enjoy listening to the sound of his own childhood voice. Similarly those "new adults" will one day be equally fascinated by the sounds of their parents' voices, and their grandchildren will be able to hear what their forefathers really sounded like. Just think of it — no other generation has ever been in this privileged position. We can do something for those who will follow us that our forebears were unable to do for us. So the first, the easiest and the most necessary use for the new tape recorder is to begin to collect a library of family voices. But that is only a beginning.

Correspondence by tape is another fascinating activity. Instead of writing a letter and slipping it in the post one records one's voice and then posts the recorded tape. Such a correspondence has many advantages over the written word. You will find there are many owners of recording equipment, both in this country and abroad, who will be only too eager to speak to you about their homes, their jobs, and their ways of life. You in return can introduce yourself and your



This Sennheiser headset permits personal listening.

family, bringing to your correspondent the vivid impressions of things which, although familiar to you, are quite new to him. The whole world is open to you. Suddenly you will find that distant countries are no longer strange, the ways of their inhabitants no longer incomprehensible. Persons of all ages, from the youngest to the most elderly, cannot fail to find that their lives are enriched and their interests widened through the medium of tape recorded letters. A number of organisations will help to put you in touch with other tape recorder owners at home and abroad, and several of them advertise in the classified section of this magazine. Why not make use of them?

Voice recording can be used in other applications too. You can improve your own diction, or that of your family, through the use of the microphone. When properly used the tape recorder is a powerful aid to memory and learning. If in your business or studies there are sections of text that you must "get into your head", try reading them on to tape and then listening to the playback whenever you have a few odd minutes to spare during the course of the day. It will be found that through the repeated listening to the sound of your own voice you will much more readily absorb the information than by merely reading and re-reading pages silently to yourself.

Even here we have only just begun to discuss the possibilities of voice recording. There is scope for exploring the realms of recorded drama. Dramatic situations can be imagined and enacted in front of the microphone. This will not only exercise one's acting ability but could even bring into play a whole range of other creative activities and open the door to new areas of self-expression. The drama could be at all levels and the technique is again applicable to all age groups. There is as much fascination in giving full rein to the imagination of very young children as there is in attempting

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5 1/2" 1200'	43/5	32/0	29/0	7" 2400'	89/0	72/0
7" 1800'	62/1	46/0	41/0			47/0
5" 1200'	43/3	32/0	29/0			65/0
5 1/2" 1800'	61/11	46/0	40/0			
7" 2400'	76/7	57/0	50/0			
5" 1800'	61/9	46/0	41/0			
5 1/2" 2400'	76/5	57/0	50/0			
7" 3600'	95/1	70/0	63/0			

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C120	30/6
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	13/0
	18/0
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	20/0

SCOTCH DYNARANGE - LOW NOISE

	10 or more
C60	15/2
C90	20/6
C120	30/6
	14/0
	18/0
	25/0
	20/0

SCOTCH DYNARANGE LOW NOISE

5" 600'	25/7	21/0	19/0
5 1/2" 900'	34/4	28/0	26/0
7" 1200'	43/6	36/0	33/0
5" 900'	33/10	28/0	25/0
5 1/2" 1200'	42/7	35/0	32/0
7" 1800'	60/0	50/0	45/0
8 1/2" 2400'	84/4	69/0	64/0
3" 400'	19/3	16/0	14/0
4" 600'	29/3	24/0	22/0
5" 1200'	47/10	40/0	35/0

GRUNDIG

High quality sound recording without fuss is the keynote of the Grundig Range. With concise easy to operate controls and at Cave's low prices a Grundig gives you real value for money. Compare our prices before you buy. Take these examples.

	List Price	Cash Price
Grundig TK149	£57 12 8	£45 10 0
Grundig TK146	£68 2 10	£56 10 0

TELETON FBX510 D

The quality of recording on this amazing stereo tape deck, has to be heard to be believed. Features include two vu-meters for record level and adjustable record level, three speeds, provision for seven inch spools, two microphone inputs, and a very attractive walnut finished case. List price £62/0/0. Cash price £49 10 0

AKAI TAPE DECKS AND RECORDERS

Prove for yourself the outstanding merits of the Akai 4000D. Having all the essential functional facilities, it also has many extras normally found on more expensive machines. The Akai 4000, the full tape recorder version of this excellent deck adds playback amplifiers and a pair of fine built-in speakers for stereo monitoring or just listening. And the Akai 1710 is surely one of the best complete tape recorder buys on the market to-day, combining all the best features of Akai engineering and construction. The above three models and the whole Akai range are available from Cave's at very low prices.



TAPE RECORDERS

	List Price	Cash Price
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REVOX SPECIAL LOW PRICES ON APPLICATION

Ferrograph 713	£188 10	£166 0
Ferrograph 702/704	£207 7	£180 10
Ferrograph 722/724	£242 10	£202 19
Ferrograph Cover	£6 5	£5 16

Akai 4000D	£89 19	£69 10
Akai 1710L	£89 0	£69 10
Akai 4000	£124 18	£102 19
Akai X5000L	£177 19	£156 13
Akai X5000W	£177 19	£156 13
Akai M10L	£245 1	£215 13

Philips 4302	£35 17	£29 19
Philips 4307	£49 10	£42 10
Philips 4308	£60 10	£51 19
Philips 4404	£83 0	£71 5
Philips 4407	£105 0	£90 2
Philips 4408	£139 0	£119 6
Philips 2502	£49 10	£42 11
Philips 2200	£14 18	£12 5
Philips FL3302	£28 7	£21 10
Philips 2400	£69 0	£60 13
Philips 2400 inc. Speakers	£86 0	£75 13
Philips 2401 inc. Speakers	£99 0	£87 0
Philips N2202	£29 18	£24 19
Philips N2602	£42 0	£29 19

Uher 4000L	£145 10	£130 18
Uher 4200	£187 5	£168 10
Uher 4400	£187 5	£168 10
Uher 714L	£55 10	£49 18

Sanyo Cassette	£20 19
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Telefunken M501	£43 11	£38 8
Telefunken M204TS	£124 19	£109 18

TANDBERG SPECIAL LOW PRICES ON APPLICATION

Grundig TK124	£44 18	£35 19
Grundig TK144	£49 19	£41 19
Grundig TK149	£57 12	£45 10
Grundig TK121	£54 15	£45 19
Grundig TK141	£59 4	£48 19
Grundig TK146	£68 2	£56 10

Truvox R44	£45 10
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Teleton T710	£34 15	£30 10
Teleton 5L40	£37 10	£32 19
Teleton FXB 510D	£62 0	£49 19

Crown CTR8750	£32 11	£24 19
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to create a more sophisticated production on a truly adult level.

So far we have thought only of voice recording within the home. As soon as we move outside a new vista of possibilities will immediately become apparent. Through the tape recorder we can now approach people who have interesting experiences to relate, and instead of writing down what they have to tell we can convert the sounds of their own voices into the form of a permanent magnetic recording. It is probable that in future years the entire approach to the study of history will have been dramatically changed through the advent of tape recording. We can, if so inclined, go out and "capture" our own little bits of history. Suggestions? What about the experiences of a Dunkirk veteran? We have all read about the evacuation of Dunkirk and most of us have some notion of what happened there. Compare the impact of those cold printed words with the reminiscences of someone who actually took part in the event. The differences between the two will be so great as to be truly staggering. Coming more up to date, how do people really feel when they have to live on the upper floors of a high-rise block of flats? We can read a lot about it, but what we read will not have either the interest or the impact of the comments of those who actually find themselves having to work out a satisfactory formula for living under those conditions.

Then there is the use of recording equipment in conjunction with photography, either still or moving. Nowadays most people take colour transparencies of things that interest them, such as holidays or outings. Some take moving pictures using 8mm cine equipment. Both of these activities are creative in their own rights, but in each case they need sound to accompany the visual image.

Of the two it is far easier to produce a sound-track to accompany colour transparencies than it is to synchronize sound with a moving film. For transparencies one can either add a commentary after taking the pictures or "actuality" recordings can be taken of the sounds produced by the subjects being photographed. In many cases the sound-track is made up of a combination of the two. When the slides are projected the tape is played so that the appropriate sounds correspond with the pictures being thrown on the screen. In sophisticated set-ups one can use an automatic projector together with an appliance on the tape recorder so that signals on the tape change the slides at exactly and precisely the right moment without the need for any intervention on the part of the operator. These "slide synchronisers" as they are called are

available from many tape recorder manufacturers and will usually "trigger" any automatic projector.

The problems are far more complex when dealing with cinematograph, since it is difficult to maintain synchronization between the moving tape and the moving film. However with modern equipment this is now possible, even up to and including the precision necessary for achieving so-called lip synchronization where the sound exactly corresponds with the movement of the photographed person's lips so that one has the illusion of the "photograph speaking" as we see on television and in the commercial cinema. The firm of Farnell-Tandberg Limited have engaged in an enormous amount of research and development within this field and their advice should be sought by those who wish to use the tape recorder in conjunction with the cine camera.

In the past it used to be said that the tape recorder was a "five minute wonder" which was used with enthusiasm when first acquired and then was destined to gather dust in cupboard or attic. Whenever that has happened the fault lies entirely with the owner, not with the equipment. The truth is that the uses to which the tape recorder can be put are limited solely by the owner's imagination. If you have a new tape recorder you should remember that phrase; if you already own a machine that is not being used to capacity then think well on those words.

We have as yet said nothing about using the tape recorder as a means of reproducing music. When not employed in live voice recording of the various kinds already described the equipment will find a ready and regular use as a medium of entertainment. Here one has the choice of three approaches to the subject. There is no reason why you, like many others, should not make the fullest use of all three methods.

The first is by live recording. Here, just as we record the voice, we record "live" musical performance. This could be confined to those members of the family who themselves play an instrument, or it could be extended to include amateur orchestras, choirs and other non-professional recitals. You only find yourself in trouble if you attempt to record professional musicians or works that are subject to copyright control. For advice on your legal obligations about copyright the reader is strongly advised to consult a booklet entitled "*The Law and your Tape Recorder*" by Andrew Phelan and available price 3s 6d post free from our own Tape Bookshop. It is a complicated subject with which we do not have space to cope in this article. The new owner of tape recording equipment should realise

that there is a law on the statute book which protects the owners of copyright and a great deal of the music that is performed in the home or broadcast on the radio comes within its provisions. We can only advise new owners to check on the legal limitations on the use of their equipment, and then to abide by the law.

After live recording we have the possibility of recording "off the air". Here one connects the tape recorder to the radio receiver or tuner and literally copies the broadcast. Instructions on this procedure should be found in the manual accompanying the machine, but we will give just one word of advice. It is quite wrong to do this by placing the microphone in front of the radio loudspeaker and then proceeding to treat the whole thing as if it were a live recording. It is always possible to make a direct electrical connection which will give very much better quality to the recording. If the method of doing this should not be apparent from your instruction booklet then please consult your dealer. It will almost certainly be found that for the cost of a few shillings in providing a suitable outlet at the radio or a lead to connect the receiving equipment to the tape recorder the versatility of the recorder will be enormously increased.

Then thirdly we have the possibility of reproducing pre-recorded tapes or cassettes. Here the quality will have been predetermined by the manufacturer and all we have to do is to sit back and enjoy listening to the sound being played. It is rather like using the tape recorder in the same way as one uses a gramophone.

These, then, have been just a few of the simplest uses to which tape recording equipment can be put. There are many, many, others. As the enthusiast progresses and becomes more ambitious he can start thinking about making up his own documentary programmes, about creating or synthesising new sounds by techniques of music concrete, he can through multi-track recording even turn the sound of his own single voice into a full choir, with or without musical accompaniment. . . .

Although primarily intended for new owners of new tape recorders it is hoped that this article will have reminded some of the existing owners of existing equipment of just a few of the things that they could be doing. At all times the tape recorder is a tool, and as such it will remain inactive until you, the owner, desire to make use of it. And since the diversity of uses to which it can be devoted are almost limitless it can truly be said that the amount of enjoyment, satisfaction, and pleasure that you get out of it is going to be limited, not by the equipment, *but by your own imagination.*

Try mixing it with the Sony TC-366... Sony's new 4-track, 2-channel tape deck for stereo/mono recording and playback.

Superb finish on the outside and SONY expertise on the inside – this model is for the enthusiast who knows what he's doing: allows simultaneous mixing from two separate microphone and auxiliary recording controls, and there's a professional three-head system for tape/source monitoring. When

the tape breaks or ends, a mechanical shut off device will automatically stop the tape and return the lever to neutral position.

Model TC-366 – for the man who is something more than an enthusiast.

Recommended retail price £110.0.0

SPECIFICATION

System 4-track stereo/mono recording and playback.

Power requirements AC 100, 110, 117, 125, 220 or 240 V, 50 or 60 Hz.

Power consumption AC 30 watts.

Tape speed $7\frac{1}{2}$ ips (19 cm/s), $3\frac{3}{4}$ ips (9.5 cm/s), $1\frac{7}{8}$ ips (4.8 cm/s).

Reel capacity 7 in. (18 cm) or smaller.

Frequency response 20 – 25,000 Hz at $7\frac{1}{2}$ ips; 30 – 20,000 Hz ± 3 dB at $7\frac{1}{2}$ ips; 30 – 17,000 Hz at $3\frac{3}{4}$ ips; 30 – 9,000 Hz at $1\frac{7}{8}$ ips.

Signal-to-noise ratio Better than 52 dB (normal), 55 dB (SLH).

Wow and flutter Less than 0.09% at $7\frac{1}{2}$ ips; less than 0.17% at $3\frac{3}{4}$ ips.

Harmonic distortion Less than 1.2% at normal recording level.

Level indication Two VU meters.

Fast forward and rewind time Within 1 min, 40 sec (1,200 ft. tape).

Inputs Microphone input, sensitivity -72 dB (0.19 mV), impedance 600 ohms, auxiliary input, sensitivity -22 dB (0.06 V), impedance approx. 100k ohms.

Outputs Line output, output level (0.775 V), impedance 100k ohms, headphone impedance 8 ohms.

Dimensions $16\frac{1}{2}$ in. (w) x $8\frac{3}{4}$ in. (h) x $14\frac{1}{2}$ in. (d).

Weight 22 lb. 8 oz.

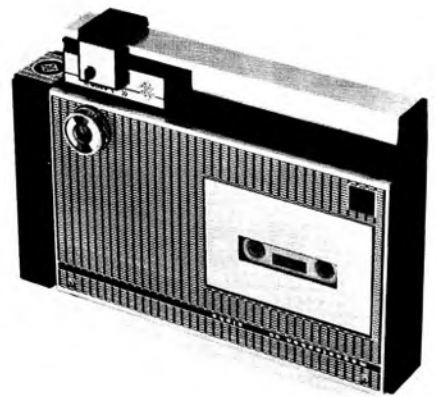
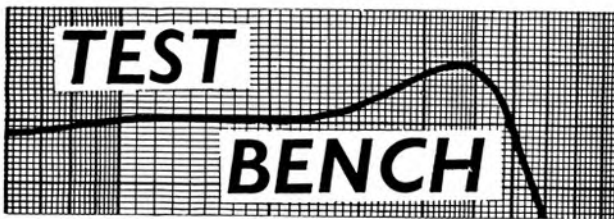
Accessories Empty reel R-7A, connecting cord RK-74 (2), head cleaning ribbon, reel caps, dust protector, non-skid pad (1 set), motor pulley, "SLH" sample tape.

Recommended optional accessories Telephone pick-up TP-4S, microphone ECM-21, F98 or equivalent (600 ohms), stereo headphone DR-4A, DR-5A, microphone mixer MX-6S, rec/PB connector cable RC-2, magnetic connecting cord RK-66.



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TELEFUNKEN MAGNETOPHON CC ALPHA

MANUFACTURER'S SPECIFICATION

Magnetophon CC Alpha

Power Supply: 5 dry cells, 1.5 Volts each, or mains unit 4000 and mains unit 4000-universal (optional extras).

Power Consumption: Approx 100 mA at 7.5V.

Battery Life: Approx 18 hours.

Tape System: Compact Cassette, 1 7/8 ips. Monophonic.

Frequency Range: 80 to 10,000 Hz \pm 3 dB.

Signal/Noise: Equal to or better than 45 dB (DIN 45 405).

Wow & Flutter: Equal to or better than 0.3% weighted.

Combination Sockets: Inputs; Microphone, radio, amplifier 0.2 mV into 2 kOhms, Record player tape recorder 150 mV into 2.2 MOhms. Outputs; radio amplifier, tape recorder, earphones approx 0.8 V at 18 kOhms.

Extension Speaker: 5 to 8 Ohms.

Output Power: 400 mW

Dimensions: 220 x 165 x 88 mm.

Weight with Batteries: Approx 4 lbs.

Recommended Retail Price: 37 1/2 guineas including purchase tax.

Distributor: AEG (Great Britain) Ltd., AEG House, Chichester Rents, Chancery Lane, London, W.C.2.

INVESTIGATED BY D. KILLICK
WITH HUGH FORD (of H. F. Engineering)

MAGNETOPHON CC ALPHA TEST CHART

Frequency Hz	Playback Only dB	Overall Response dB	Signal-to-Noise Ratio		Distortion %
			Unweighted	A Scale	
31.5	-15.5				
40	-10.0	-12.0			
63	-2.5	-5.0			
125	-0.5	-1.0			
250	0	0			
500	0	+0.5			
1000	0	+0.5	43.25	55.25	5%
2000	0	+1.0			
4000	-1.0	+2.0			
6300	-2.0	+2.0			
8000	-3.0	+1.5			
10000	-6.0	0			
12000		-3.0			
Wow & Flutter	0.21% RMS				

NOTES: The Overall Response figures relate to record and playback using a Telefunken C60 cassette. Playback Only relates to the reproduction of a standard Philips calibration cassette, reference TC-FR.

For Signal-to-Noise Ratio the tape was recorded to a level to give 5% distortion in the signal and this was related to the noise level produced from tape erased in the machine but see text for further information on the standardisation of this measurement which is quoted above as both "unweighted" and corrected to the "A" Scale.

The distortion figure above is deliberately imposed in order to relate noise levels to a fixed parameter. See text. Wow and Flutter is total RMS, the test frequency being 3,000 Hz. Test equipment used included: Bruel and Kjaer Signal Generator, B & K Frequency Analyser Type 2107, B & K Level Recorder Type 2305 and Gaumont-Kalee Wow and Flutter Meter.

WE HAVE SOMETIMES been called to task for concentrating on the higher priced equipment in our Test Bench series of machine reviews. In fact we do try to cover as wide a range as possible, both in terms of cost and kinds of recorders. This month, for instance, we are examining another Compact Cassette machine but of a very different type to that dealt with in our last issue.

This review is of particular interest because with all the news of developments within the cassette field the lower cost end of the market would appear to have been left out. For months

we have been talking of upgrading Compact Cassette tape recorders, but the more efficiently they perform the more money one is likely to have to pay for them. What of the less costly machines? Have they enjoyed the benefits of general quality improvement without necessarily increasing the price? Are there any noteworthy changes that are likely to make budget cassette recorders better value for money? How much ingenuity do the manufacturers bring to bear on design, styling, operation and efficiency at this price level? In examining the Telefunken Magnetophon CC Alpha we

shall be able to form an opinion on one firm's attitude to some of these problems.

To place the review sample into perspective it could be described as a battery portable mono cassette record/playback device incorporating some radically different design features and offered at a price of 37 1/2 guineas, or rather higher than the cost of the more conventional models of this type. Before discussing the machine's general appearance and convenience we will take a look at our Test Chart showing the results of our laboratory investigation.

To check the replay response we

played back the Philips TC-FR calibration cassette and related outputs to the reference level at 333 Hz. As will be seen from our figures there is an almost total lack of extreme bass, but the curve rises steeply from -10 dB at 40 Hz to -2.5 dB at 63 Hz. Thereafter we have a highly satisfactory succession of "noughts" to prove an absolutely flat response in the vital middle area. Fall-off is gradual from -1.0 dB at 4,000 Hz to -6.0 dB at 10,000 Hz.

It will be noted that the specification claims 80 to 10,000 Hz, plus or minus 3 dB, (and Telefunken are to be congratulated for quoting meaningful tolerances for the performance of equipment of this class) and our replay findings confirm that the equipment is operating within those limits. To relate the figures precisely to the specification it is necessary to add 3 dB all the way down the column when it will be found that no reading from 80 to 10,000 Hz is more than 3 dB above or 3 dB below an imaginary straight line.

For overall response tests we recorded a series of tones on the blank Telefunken cassette provided with the machine and then measured the output on playback. Once again a feature of these readings is a total lack of extreme bass, but the record-to-playback performance is well within the manufacturer's claim. It will be seen that even as high as 12,500 Hz, well above specification, the response is only 3 dB down.

Relating these figures to the kind of performance standard we now expect to find in the top-quality "high fidelity" cassette equipment (at much higher prices) it can be said that so far as overall response is concerned the CC Alpha ranks as equal to the best - apart from the lack of output in the lowest register. We have noted a similar lack of low frequency response before in small portable equipment of this kind and there is little doubt that the manufacturer's intention is to devote maximum care to the middle and upper regions of the audio spectrum. He is well aware of the fact that the lowest notes could only be heard when the machine is coupled to really good loudspeaker equipment, the price of which would be disproportionately great compared to that of the recorder. In other words, a lack of extreme bass will only concern the user with expensive auxiliary appliances, and such an individual should be thinking in terms of more sophisticated, and therefore more costly, cassette machines. For others one can only say that these machines lack what the user would not be able to hear anyway. We therefore regard our frequency response tests as giving results that far exceed expectations for this class of equipment.

As we explained last month, a number

of anomalies arise when one quotes measurements for distortion and signal-to-noise. As both are inter-related it is our intention to give noise readings relative to fixed distortion levels, and in cassette equipment we have decided to use 5% harmonic distortion as the norm. Recording on the CC Alpha it was found that the 5% distortion level was reached in a signal 0.75 dB above reference level at 333 Hz. It therefore follows that the machine is operating with a distortion content comfortably lower than the 5% maximum.

When a signal is recorded to the level mentioned above, 0.75 dB above reference to give 5% distortion, the signal-to-noise ratio was found to be 43.25 dB unweighted and 52.75 dB when weighted to the "A" scale. As the specification gives "better than 45 dB weighted" we are obviously well within the claim. This is still an area in which we tend to get better results from the more expensive equipment, and although in relation to cost the inherent noise within this sample is quite good we should expect to get rather quieter performance if we were prepared to pay more.

The accuracy of the running speed is important, and sometimes the lighter-weight portable machines do not show up too well when this is examined. When a 333 Hz signal was played back on the CC Alpha the electronic counter gave us a reading of 331.5, or accuracy within 0.5% of absolute. This is very good indeed, and again it surprised us for this class of equipment. Much better than expected.

Wow and flutter is equally important, since without the steadiest possible motion of the tape we shall get most unpleasant sound quality. Measuring to the DIN standard we arrived at a figure of 0.27%; working to our more usual RMS rating the figure was 0.21%. These are nicely within the claim of better than 0.3% weighted. We shall, however, have a little more to say about wow and flutter when dealing with the user section of our review.

It should already be clear to the reader that our technical investigation produced a series of results that varied from good to exceptionally good and in many cases gave us figures that we would only expect to obtain from the more conventional "fidelity" equipment. So we can now pass on to look at the design, operation and practical performance of the machine.

The first thing one notices about the CC Alpha is its very obvious differences to all other Compact Cassette portables. These machines have tended to follow a rather stereotyped form and shape. Now we have something that embodies radical departures from that norm.

Weighing only about 4 lbs and measuring some eight by six inches

overall, the machine has the appearance of a small transistor radio with a fixed carrying handle on the upper edge. There is a startling absence of the usual tape transport controls. One looks for press keys or joy-stick and they just aren't there. Instead a single slide, positioned at the end of the handle so that it can be moved by the thumb of the carrying hand, provides all the control functions other than record/playback level, both of which are governed by a single rotary knob immediately adjacent on the front panel. Even this knob is so cleverly designed that the record level meter and combined battery strength indicator is built into it!

The object of these features is to give the operator genuine single-handed operation. And it works. The recorder can be used to either record or playback whilst held in the right hand, the thumb controlling everything. Quite a *tour de force* on the part of the design department!

Cassette insertion and removal is via a trap-door covering the cassette housing in the front panel and opened by means of a simple press-button just above it. Input and outputs, including a facility for connecting the machine to an external 6 Volt or 12 Volt power source such as a car battery or mains supply, both possible only with the appropriate optional extra adapter unit, are by DIN sockets in the side, together with a DIN extension speaker socket and a slide switch for internal speaker muting.

The microphone provided is of some interest. Instead of the more usual "stick" type it is rectangular; a trap-door in the rear conceals a compartment for housing the connecting cable and, when open, forms a table support. The On/Off remote control switch is a red-coloured slide on the front, and the instrument can be fixed to the side of the machine. Power for the recorder is derived from five 1.5 Volt dry cells accommodated in the underside of the machine and these are reasonably easy to insert or remove in spite of the tendency of the spring contact to push the row of cells out before the cover is in position.

How does it all work? Well, first of all we must say that clever as the slide function control is it *does* take some getting used to. When pushed forward from the Stop setting the tape is in forward Fastwind. Pressure has to be maintained against a spring, and as soon as this is eased the slide returns to Stop of its own accord. This, of course, is to prevent drain on the batteries through unintentionally leaving it locked in Fastwind, which, with this arrangement, is impossible.

In the next movement back towards the hand Play is engaged. If the red Record button built into the slide is also

ACOUSTIC RESEARCH AR-4X ENCLOSURES

depressed then the function will be Record instead of Play. Such a movement, involving sliding backwards and pressing inwards at one and the same time, certainly calls for a degree of manual dexterity, but it can be done.

Once Record has been engaged the slide can only move out into Stop. Should the function have been Play it will travel further back into Rewind, a position that again has no permanent lock so that as soon as pressure is released the machine immediately reverts to Play. This arrangement does call for some care on the part of the user. We would have preferred the disengagement of either Fastwind function to have resulted in a reversion to Stop. As it is that will only happen from Fast Forward; after Rewind we go automatically into Play and the slide must be deliberately brought into the neutral Stop setting. This could result in the mechanism being unintentionally left running, so the user should remember to check that Stop is always engaged after a period of use.

Given a right-hand thumb of sufficient strength and dimension it is possible to control everything, including adjusting record levels, with that single digit. As we said before, it works. But one has to get used to it.

As soon as we came to seriously record and play back we were aware of what we consider to be the machine's weakest point. In fact this had revealed itself to us during our laboratory tests, in particular when we were checking the wow and flutter measurements. What happened was that the sound produced from the internal loudspeaker appeared to be very much worse than was indicated by the dials on our instruments. Pure tone sounded very "fluttery" with all kinds of strange, unwanted harmonics appearing. These aberrations were not being caused within either the record or the playback amplifiers, so they could only be introduced at one place — the built-in loudspeaker.

In our opinion this loudspeaker is hopelessly inadequate to deal with the performance potential of the machine. It buzzes and flutters (or rather, it did on our review sample) in a most alarming manner, quite spoiling what would otherwise have been cassette quality to a very high standard. What a pity! One thinks of phrases such as "spoiling the ship for a ha'p'orth of tar". Unfortunately the cost of a better loudspeaker would be likely to be rather more than the proverbial ha'penny, and we have reason to believe that the conscience of the manufacturer has been salved through the inclusion of an extension speaker socket giving a claimed 400 mW of audio power into 5 to 8 Ohms:

The reasoning appears to be that

money is better spent on producing a really good record/playback device, which this machine is, and economies should be in the loudspeaker because the user can always connect to another externally if he wants better quality. Right or wrong? We don't know. It really depends on the requirements of the individual purchaser. Some might resent having to pay more when they would connect another loudspeaker anyway, and for them the philosophy is correct. But for others the cost of an at least half-decent enclosure would have to be added to the purchase price. Alternatively the CC Alpha can be connected via its DIN sockets to auxiliary equipment of some kind, so it might be possible to make use of a better loudspeaker in say, a radio set.

However, less than half a Watt of power is scarcely adequate to drive many modern loudspeaker enclosures. We tried to drive a Celestion Model 120 directly from the CC Alpha and found there to be insufficient punch. The volume control on the machine had to be at maximum and so the noise and distortion were excessive. On the other hand, by connecting the recorder directly to a main amplifier (after muting the internal loudspeaker in the machine) we were able to enjoy playback to extremely good quality standards. This, too, showed just how good the accessory microphone included in the purchase price really is. It is one of the best we have come across in any of the lower cost machines.

The CC Alpha does not have an automatic record facility, so manual adjustment by reference to the indicator is necessary. We found this quite simple to operate, although the needle in the meter is small as one would expect.

It is not easy to summarise our conclusions about this machine. It has certain advantages, together with other disadvantages. Its usefulness to any one person will depend on how he expects to use it and what he expects to use it for. Its styling is such that it lends itself to hand carrying whilst playing, and we do hope it will not be used to disturb the peace and quiet of countryside or beach as has happened in the past through the misuse of transistor radios.

We are concerned about the inadequacy of the loudspeaker but delighted at the technical standard of the machine's performance. We could not recommend it to those who wish to acquire a "self-contained" sound source, but it could be seriously considered by any who are prepared to use an external loudspeaker or other associated equipment. Finally we must compliment Telefunken on breaking away from conventional layout and styling to produce a machine that is so very different to the run-of-the-mill models.

FOR THE SECOND of our 1971 loudspeaker reviews we have examined and tested a sample of model AR-4X from the American manufacturer, Acoustic Research. This firm has probably done more than any other in the field of loudspeaker evaluation and has gone to the trouble to publish all its findings in the form of technical papers. We cannot hope to compete with them, since they have at their disposal special laboratory facilities which they themselves have designed for the purpose, as well as a great deal of experience in this field. We have the utmost respect for their endeavours to bring loudspeaker evaluation out of the realm of guesswork into the more precise environment of scientific measurement. Unfortunately their techniques are sometimes so complex and lengthy that they cannot be duplicated in a magazine review. The mere fact that such a background exists does, however, tend to inspire confidence in the company's products.

And the AR-4X inspires confidence in other ways, too. Its obviously massive construction conforms with the best traditions of good quality loudspeaker manufacture, and this feature is particularly noted despite the fact that these are Acoustic Research's lowest cost systems at £39 19s each. Inside the cabinet measuring 10 x 19 x 9 inches are three drive units: one 8-inch acoustic suspension woofer and two 2½-inch cone drivers. On the rear of the cabinet is a single high frequency adjustment knob to allow the user to tailor the response to suit his own listening acoustic.

Speaking again of confidence, the AR-4Xs, in common with all other loudspeaker systems in the AR range, carry a guarantee of workmanship and performance under conditions of normal use for a period of *five years* from the date of purchase. This guarantee includes the cost of parts and labour, and within the U.K. freight costs to and from the distributor, Bell & Howell Ltd. If new packaging materials should be required these too are free of cost. The intention of the guarantee is simply expressed: to ensure that the product performs to specification during the guarantee period at no additional cost to the owner. Fair

ACOUSTIC RESEARCH AR-4X ENCLOSURES

continued from previous page

enough!

Our first technical tests were to check on the impedance of the enclosure throughout the breadth of the audio spectrum. As impedance varies in relation to frequency this is of some importance when the loudspeaker system is driven by amplifier equipment that could suffer damage should the load fall below a certain point. We found that at no time does the impedance of the AR-4X fall below 4 Ohms, although the amount of change in impedance at high frequencies depends on the setting of the treble adjustment control at the rear. When placed in its "Normal" marked position impedance is generally about 8 Ohms at all frequencies; with the knob in the position of "Maximum Top" we get the lowest impedance at high frequencies, but as mentioned previously never below 4 Ohms.

Next we tested with "white noise" produced from a special B & K generator. This is a hissing sound and it is made up of an equal mixture of all the frequencies in the spectrum to give a "white" sound, rather as all the colours of the rainbow blend together to give "white" light. By a carefully regulated method of filtering we can then examine every segment of the audio spectrum in turn. If the response of the enclosure is flat we should get a flat response within each frequency band examined.

It was found that with the treble control in its "maximum" setting (turned as far as possible clockwise) the curve was sensibly flat from 50 to 20,000 Hz. The test was then repeated with the treble control turned as far as possible in the opposite direction (anti-clockwise) to give a minimum top response. Under those conditions we found a dramatic fall-off at the rate of about 12 dB per octave above 1,500 Hz. Should the enclosure ever be used in this way the sound produced would be remarkable for its absolute poverty of high frequency content, so we could not help wondering why such a coarse adjustment should be provided?

On the basis that "knobs are for twiddling" there is an obvious danger that this enclosure could, in the home of some "itchy fingered" owners, find itself operating under conditions that would

simulate the "worst fidelity" possible — so users please beware!

When the treble control was positioned centrally, marked "Normal", there was a much more gradual fall-off from 1,500 Hz. giving a reduction in output of about 10 dB to 15,000 Hz.

So with this information behind us we continued our investigation by listening under a number of acoustic conditions and comparing the sound with that produced from other enclosures (including Quad Electrostatic and Bowers & Wilkins DMI) and our Koss ESP-9 Electrostatic headset. This latter appliance has a proven flat response from 20 to over 20,000 Hz and so is useful as a control.

Listening to the AR-4Xs in various living conditions we found that when a room has a thick, fitted carpet and heavy drapes our assessment of the correct setting of the treble control was about half-way between "Normal" and "Maximum". This is not precise and the setting selected varied with different individuals, although all were agreed on approximately "correct" adjustments. We believe that a room would need very heavy damping indeed before the maximum top would ever be required. When used with the control in its "Minimum" position the sound produced was, without exception, terrible.

We must, therefore, comment that the AR-4X offers the user a much too great degree of tonal correction and so tends to complicate installation through the need for critical adjustment. Had the control been less "coarse" it would be very much easier to strike that very fine balance between right and wrong.

An outstanding feature of this enclosure is the depth and cleanliness of the bass output. This compares very favourably with the sound produced by larger systems. As we have mentioned before, if the lowest cost enclosure in any manufacturer's range were to be "perfect" there would be no valid reason for producing more expensive models, so there *must* be weaknesses somewhere. In the AR-4Xs we detected a certain "hollowness" or "boxiness" that has the effect of detracting from the presence or reality of the sound. This is a fairly

critical judgement (of the kind that the manufacturers don't like because it is not substantiated by our measurements!) but it was apparent to us in the comparison process. To be fair one should probably solicit opinions on the quality of the loudspeaker under investigation from experienced persons who do *not* have ready means of comparison with other systems — in that way we should get unbiased initial impressions that are not coloured by the memory of other sounds produced from other enclosures.

However, the comparison technique is one that shows up *differences*, and that is what we are referring to here. We suspect that had we been able to compare the 4Xs with other models in the AR range we should have arrived at precisely the same conclusion.

So, to summarise, these are not, as they are not claimed to be, "perfect" enclosures. In relation to their cost they perform very well indeed giving a bass output that suggests larger, more costly boxes. Their biggest disadvantage lies in the provision of a too-coarse treble adjustment which must be critically set by the user for optimum results, but when properly positioned the enclosures will give a highly acceptable and thoroughly musical sound quality that will be appreciated by all other than the most hyper-critical. For them Acoustic Research make other systems up to £178 each, but that's another story.

CHROMIUM TAPE & BASF

It has been pointed out to us by BASF (United Kingdom) Ltd. that when we commented in our Chromium Tape article last month on a comparison between the new medium and BASF PES35LH there was a danger of our remarks being misunderstood.

We referred to the unweighted noise level from chromium dioxide tape as being approximately 3 dB worse than we would expect to find from a modern iron oxide high coercivity low noise tape. Our text then continued with the words: "We found the noise spectrum to be similar to that produced by BASF PES35LH". This statement is correct and BASF do not dispute its accuracy. They have asked us to make quite clear, however, that in this comparison we were speaking of the *noise spectrum* which bears no relationship to the *amount of noise*. The BASF tape referred to is, of course, one of the lowest noise conventional tapes at present available.



NATURE NOTES

FOR
FEBRUARY

BY RICHARD MARGOSCHIS

ON NOVEMBER 21st the members of Wildlife Sound Recording Society had the pleasure of hearing the winning entries in the recent E.B.U. wildlife recording contest. Arrayed before their Chairman, who was accompanied by the Chairman of Atherstone Rural District Council, were the four trophies won by British contestants: the gold, two silver and a bronze "Nightingale" awards. The three winners were also present. The occasion was the Annual General Meeting of the Society which was held in the Council Chamber at Atherstone and attended by some 35 members who had travelled from points as far apart as Middlesborough and the South coast.

After the business meeting they enjoyed a talk by Phil Drabble, well known naturalist, author and broadcaster who, on the following day, entertained them at "Goat Lodge", his Staffordshire home. Here they were able to see his wild deer and listen in to his two badgers asleep in their sett; this by means of a microphone placed in the sett and connected to an amplifier in the study. Phil Drabble has long been studying the habits of the badger and hopes that now, with recordings made from this microphone, he may be able to learn more about their language.

A couple of hours on Cannock Chase, with Forest Warden Gerald Springthorpe, concluded a most successful week-end.

I have no doubt that many of you visited the Audio Fair at Olympia. I wonder if you were one of the 1,438 who listened to the ten animal and bird sounds in the Animal Sounds Contest at the 3M Company stand. Entrants listened to the sounds, six of which were taken from last year's 3M/W.S.R.S. Competition, on headphones and were asked to identify each from a trio of 'possibles'. Only six were fully correct and the prize, a Bush TP60 cassette recorder, went to a 24-year-old art student, Judith Page, on the strength of her tie-breaking slogan — "Scotch low-noise cassettes give you better sound, less wear and better life, all because of the mirror-smooth surface."

It is always pleasing to hear from my readers; recently one asked for advice regarding a feature tape he is making about a certain agricultural process. What, he asks, is the right sort of background to use, and where, within easy reach of London, should he go to record it? Not being familiar with the immediate vicinity of London I was unable to answer the last part of the question satisfactorily but it is the first part within which lies all the interest.

I assume that some interviews have been recorded on location and that they will be linked by a narration. I suspect that a close microphone technique has been used for the location work and so I would expect a fairly clean background. This being the case, what is required is a suitable "habitat" recording to mix in with the interviews, and possibly the narration, to correctly "place" the piece in a certain part of the country. It must do better than

to merely place it geographically, however, for this process is carried out at a certain time of the year. It must, therefore, also be correctly placed chronologically.

The geographic location will determine the species which should be present or, as it would be difficult to include all the species which *could* be present, it might be safer to say it would determine those which should *not* be present. Also having a bearing on this point will be the time of the year — have our summer visitors arrived or have they already been and gone? Still on the subject of species, consideration must be given to the type of country in which the process is carried out — is it meadow or ploughland, are there any heaths or woods nearby?

The time of year is important because it will have a direct bearing on the song and calls which might be heard from whatsoever birds, or mammals, are present, whether they be natives or visitors. A mistake in any of these items may be passed over many times but, sooner or later, a keen naturalist is going to hear the programme and point out the error.

If my enquirer does not already have a suitable habitat recording then he is going to have to be very careful if he tries to make one before the correct time of year comes around again. The short answer is to make the recording in the same location and at the same time as the other location work.

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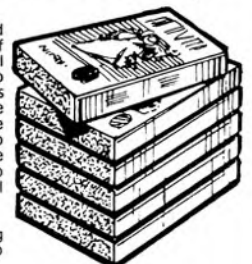
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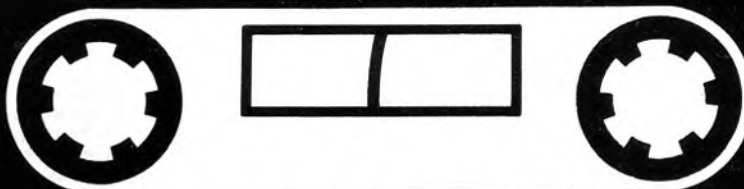
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Consultant Critic Katinka Seiner

DVOŘÁK. Symphony No. 9 "New World" and Overture "Othello". The London Symphony Orchestra conducted by Istvan Kertesz. Decca SXC 6291; 49s 9d including purchase tax.

This classical album from Decca is not Dolby-processed and so makes an interesting comparison with the repertoire reviewed last month. Recorded quality is quite good, generally up to the standard we have come to expect from "ordinary" cassettes, but with the inevitable background hiss that Dolby removes. There is no doubt that the latest high-speed copying equipment as used by Decca and other firms is doing a great deal to improve Musicassette playback standards. It is something of a mystery to me why copying at two to four times the previous speeds should result in cleaner tapes, but it does. Perhaps the reason is because the newer machinery is more efficient anyway.

Performance here is not quite so satisfactory. The opening of the first movement of the *New World* seems to me to be rhythmically uncertain, only working up gradually to a stronger, more expressive finish. Kertesz manages to convey the impression, rightly or wrongly, that he is groping in the dark, looking vainly for an underlying meaning which escapes him.

This uncertainty is particularly unfortunate as the Symphony expresses the composer's very positive reactions to the sights, sounds and impressions he received during the course of a visit to America. In listening to the *New World* we are looking at the United States through Dvořák's eyes and so should be as moved as he was by its striking contrasts: the anomalies of wealth and poverty, beauty and ugliness, black and white. Such a picture can only be drawn in bold, confident lines; the lack of direction at the opening tends to throw the whole out of focus.

And that feeling persists into the second movement when with insufficient cantabile the players seem to be inhibited. There is better cohesion and rhythm in the third and fourth movements, but by this time I was out of sympathy with the performance and the magic was refusing to work.

The sense of loss was all the more acute for me because the *New World Symphony* is rich in melody, many of which were inspired by Negro Spirituals whose plaintive evocations must have greatly moved this great master of melody and orchestration. All the power of his creative genius would have had to be devoted to the task of weaving together these separate entities to form a single great and cohesive whole. Such a work suffers when it does not have the treatment it deserves, and this, regretfully, was my conclusion about this performance.

Before leaving the *New World Symphony* I should like to mention a rather strange circumstance about its proper title. This cassette calls it, properly as I believe, Symphony No. 9. The words "in E minor" should have been added but were not. Now some authorities, and some records too, call the

New World Symphony No. 5. Even *The New Musical Companion*, a standard reference work edited by A. L. Bacharach and now in its twenty-second edition, does so.

This confusion has arisen because although this was the *last* of the nine symphonic works written by Dvořák four of these are "missing" but not lost. Two were unpublished and two were not given opus numbers. Correctly the *New World* should be numbered 9; when given number 5 this ignores the existence of the four very much earlier works. It is not usual to come across such a muddle so it is worth trying to put it right.

I found the Overture "Othello" to be much more satisfactory; for me this was the most enjoyable part of the tape, reminiscent of another work under the same title by Verdi. Dvořák himself is said to have regarded his overtures as "his best orchestral works" and such an opinion from an acknowledged master of orchestration is worthy of special note. Certainly "Othello" is both dramatic as it portrays the emotional extremes of the drama and melodic as it draws a clear picture of the action, I agree with Ray Minshull who, in his very interesting sleeve notes, asks why this piece is not heard more often? Had the interpretation of the symphony been more precise then it could have been strongly recommended; as it is my misgivings compel me to qualify my approval.

NICOLAI GEDDA SINGS FRANZ LEHAR.

Graunke Symphony Orchestra conducted by Willy Mattes. EMI TC-CSD 3676. 47s 6d including purchase tax.

Every now and then I come across an album of such outstanding quality that it has a profound effect on me. That quality might lie in the repertoire, the performance or the recording; sometimes, when all three are to an equally high standard, the experience of listening is a joy indeed. Such is this cassette by Nicolai Gedda.

For me Nicolai Gedda is the "No 1" tenor of the world. His perfect control, intonation and voice production together produce a soaring sound that convinces the listener (or me at least!) that here is a man who could do anything. Here is a voice in direct line with those of the great tenors of the past. With as much power as beauty he literally makes the music "come alive" when the recorded quality is as good as it is here.

His performance of songs from the well-known operettas of Franz Lehar proves the point that there are no barriers within the boundaries of art. Nicolai Gedda is equally at home producing a wonderful Benvenuto Cellini as he is on the concert platform singing the tenor part in Verdi's *Requiem*. Within the scope of his repertoire he strikes a powerful blow at the "cultural snobs" who scorn popular melody and concern themselves only with works that appear to be incomprehensible to the majority. This album gives us music of the people for the people with a standard of performance that

would be acclaimed in the finest opera houses of the world.

The delightful repertoire comprises: *Dein ist mein ganzes Herz, Hab' ein blaues Himmelbett, Schön ist die Welt, O Mädchen mein Mädchen, O Vaterland - Da geh' ich zu Maxim, Liebst glaub' an mich, Mein Ahnherr war der Luxemburg, Von Apfelbluten einen Kranz, Welga-Lied, Freunde das Leben ist lebenswert, Du bist meine Sonne, Gern hab' ich die Frau'n gekusst and Immer nur lacheln*. As you will see from the above all the titles are given in German without any English translation. There's a good case for using the German since that is the language in which the songs were written and in which they are sung here. But why not the courtesy of a little English as well for the benefit of the British public to whom the cassette is being sold? Many will know that *Dein ist mein ganzes Herz is You are my heart's delight*, but many more will not. *Maiden my maiden* is fairly obvious, as is *Apple-blossom time*, but *Girls were made to love and kiss* is not.

So that is my complaint, my only complaint, about this collection. For some unaccountable reason EMI have denied their British customers the English versions of the titles, despite the fact that amongst them are some of the most popular melodies from the pen of that most popular of composers, Franz Lehar.

But to return to the music, from which I find it difficult to tear myself away. It is compelling listening with more than a hint of nostalgia. I shall play it over and over again, and I cannot believe that anyone could find anything other than delight in it. So, as one of the best albums of its kind that I have ever heard, it is strongly recommended.

UNE SOIRÉE AVEC NANA MOUSKOURI & LES ATHÉNIENS. Double-play. Fontana 7561 001. 71s 6d including purchase tax.

Our music reviews this month are taking on a decidedly cosmopolitan flavour with the German of Lehar followed by Nana Mouskouri from Greece singing in Greek, French, English, and Hebrew with a continuative dialogue spoken by her in French. When singing Greek songs in Greek she gives us a translation - into French. The reason, of course, is because this album was recorded at a live performance in France and was intended for a French audience. That does not detract from its entertainment value for the British public, but once again I should have liked to find a little more English language information printed in the form of sleeve notes. Instead we have the bare minimum with *some* English titles and a great deal of space wasted on advertising material. Come, come, Philips, it's really not good enough, you know!

As for Nana, her voice is so familiar that one needs to say little about it. Except, perhaps, that within the extended programme time of this double l.p. one gets such a lot of it that its weaknesses begin to show. For instance, item 4 on side 2, *Tous les arbres sont en fleurs* (from "Honey") has been sung and recorded in very

much better versions. Her popularity cannot be denied, and she compares favourably with many other successful performers in the folk idiom. And yet there is a lack of expression, an inability to convey the mood of the song she is singing to the listener. What is missing is that vital fire of enthusiasm without which any performance can only be called "weak". Judging from the applause her French audience does not agree. They give her a reception bordering on the rapturous. I can only think that they can never have heard some of her songs performed by someone approaching, say, Nicolai Gedda's calibre.

The two albums make an interesting comparison between Mouskouri and Gedda. And the comparison is that there just isn't any comparison.

Nana's repertoire comprises: *Fidaki, Entre nous deux la riviere, Puisque tu m'aimes, Tous les arbres sont en fleurs, Ypomoni, Yalo yalo, Chèvrefeuille que tu es loin* (and that, as you must all know very well, is Scarborough Fair/Canticle sung in French. Help!) *Colours, Coucouroucouc paloma, The lily of the West, Je me souviens, Roule s'enroule, La fenêtre, Presentation de Athéniens, Hine ma tov, Ta pedia tou Pirea, Marie se marie, The first time I ever saw your face, C'est bon la vie, Manoula mou and Roses blanches de Corfoue.*

These double l.p.s. are fine when the interest is sustained; in this collection it tends to flag and I find it difficult to imagine that anyone would want to seriously listen from the beginning to the end. Actually I feel that Les Athéniens have a much stronger sympathy for the repertoire than their soloist, and their performance deserves praise. One thing that interests me is the phonetic affinity between the Greek and Hebrew languages. *Hine ma tov* described as "after a biblical text", is an example, but here too the success of the item owes more to the arrangement and the accompaniment than to the singer. Recording, however, is good, so those who want a really long evening of French, Greek, English and Hebrew might like it.

PERCY GRAINGER. The Light Music Society Orchestra conducted by Sir Vivian Dunn. EMI Columbia "Studio 2 Stereo" TC-TWO 295. 47s 6d including purchase tax.

It is hardly possible to be more English than Percy Grainger, a man whose music was literally steeped in the tradition of the English countryside that he loved so well. And on the front of the cassette we have a typically English rural scene, complete with roses around the door. Home again at last!

The recorded quality of this album is quite excellent with just the right balance between the various sections of the orchestra that is essential to the delicacy of Grainger's music. Many of the items will be very familiar indeed, and the programme includes: *Children's overture, Country gardens, Shepherd's hey, Londonderry air, Dusk, Handel in the Strand, Mock Morris, Shepherd fennel's dance, Molly on the shore and The haunted ballroom.*

Grainger is hardly likely to be remembered as one of the "greats" of the musical world, and yet there is a place for his compositions, works that are likely to endure for a very long time. Intensely interested in the folk lore and folk music of his native country he manages to convey an image of nationalism in the very best sense of the word. Utterly devoid of any aggressive feeling he says to us through his music, "Here is my country and this is what it means to me". His sense of fun in *Handel in the Strand* endears him to the heart and this collection does justice to his work.

A fine Grainger album that should be in every music library. Recommended.

RAY CHARLES GREATEST HIT. Volume II. EMI Stateside TC-SSL 10241. 47s 6d including purchase tax.

Sit back and enjoy the second volume from Ray Charles. "Greatest Hits", says the title. For once such a phrase is justified. One only has to hear the opening phrases of the first number, *I can't stop loving you*, to be aware of the fact that this is the beginning of a good cassette – a very good cassette indeed.

The recorded treatment of Ray's voice could not be better. I'm not quite so certain about some of the vocal backing which seems to be held rather too far in the background to reveal its true quality. There's an ethereal separateness about it, almost verging on the "angelic chorus" technique of some of our more stickily sentimental albums that is quite out of keeping with the down-to-earth, spade-is-a-spade attack of the singer. Yet the album is so good, so dominated by the strength of Ray Charles' personality, that even such an incongruity can be willingly forgiven.

And this personality is just what comes over as one listens. It's so forceful it literally hits out and strikes one between the eyes. One reason that the voice makes such an impact lies in the fairly close microphone position that picks up every tiny inflection – and most of the inflections are far from tiny! Ray has such a command of his material; he welds it and moulds it in what appears to be an effortless manner, bringing to every number a new brightness and new depth.

The choice of repertoire includes: *Let's go get stoned, Yesterday, Together again, You don't know me, The Cincinnati kid, In the heat of the night, Your cheatin' heart, Take these chains from my heart, Busted, Here we go again, That lucky old sun, Makin' whoopee, Don't set me free, Cryin' time and I chose to sing the blues.*

All good stuff. Unlike some soloists' albums, interest is not only maintained throughout, but if anything increases as the programme progresses. And that is an acid test! By the way, my criticism of the vocal accompaniment does not extend to the instrumentalists about whom we have no information but whose performance in many instances matches that of Ray Charles in ability and interpretation.

The only track I was not too keen on is *In the heat of the night*, but the rest is first-class. Recommended for those quiet moments that were made for Ray Charles to fill.

SAMMY DAVIS JR. Something for Everyone. Tamla Motown TC-STML 11160. 47s 6d including purchase tax.

"Something for Everyone" is an apt title for this collection with a mixed bag of numbers, all handled in the inimitable style of Sammy Davis Junior. And what a style that is!

Sammy is a very remarkable entertainer, carrying his audience along with him through his sheer exuberance. He would seem to have an excess of what Nana Mouskouri lacks, and he offers a fascinating comparison to Ray Charles. Both Ray and Sammy have a great deal in common, yet each is as distinctively individual as he could be. Both have that subtle quality that can transmute the apathy of a bill-paying, pain-nursing audience into a sounding-board that will reverberate under the absolute control of the performer. It's a wonderful ability that is envied by many.

Sammy's idea of numbers for everyone is made up of: *Spinning wheel, For once in my life, My way, Wichita lineman, Hi-heel sneakers, In the ghetto, You've made me so very happy, You'd better sit down kids and And when I die.*

Recording on this album is equally as good as some of the others reviewed this month. The voice is centrally placed, well in the foreground with every word audible. On some of the

numbers the accompaniment tends towards the over-obtrusive, but not to an unacceptable degree. If I had to choose between Sammy and Ray I think Ray would win, but that's a very personal view. You might think otherwise when comparing two albums with what can only be described as equal merit.

LOS ZAFIROS. Guantanamera. Pye ZCP 18255. 47s 6d including purchase tax.

Here's an album that I have really enjoyed more than most. Its treatment of a collection of Latin favourites is excellent, recorded quality is fine and it's pleasure all the way.

Too often we find that Latin melodies of the popularity of these numbers are treated to all manner of indignities until their identities are all but lost. This tape is quite different. The arrangements and the performance of Los Zafiros have an authentic reality that carries my memory back to those many happy days spent in Spain listening to the less skilled (!) but enthusiastic endeavours of the local bar musicians.

Rhythm and music seem to come so naturally to the Latin temperament. And the feelings aroused are infectious. One's feet start tapping; one finds oneself beginning to hum the melody; one is aware of an inner excitement.

Such were my reactions to this very delightful collection which is made up of: *Quando M'Innamoro* (A man without love), *Adios Mariquita Linda, Juegos Prohibidos* (Prohibited Games), *Besame Mucho* (Kiss me), *Hora Staccato, Ave Maria No Morro, Tristesse* (So deep is the night), *Les Gitans* (The gypsies), *La Bamba, Never on Sunday, Guantanamera and Cartagenera.*

Sparkling with happiness and fun, tempered with an astringent melancholia, this album can hardly fail to appeal to many. Especially those who, like myself, think enviously of the sunshine and colour of Spain in the midst of a dark, grey British winter. So bring a little brightness into your life. Try Los Zafiros.

JOHNNY HARRIS. Movements. Warner Bros. ZCW 3002. 47s 6d including purchase tax.

This album has a particularly long run-in (or at least the review sample did) and the opening phrases are particularly quiet, so that one waits, listens impatiently and then wonders if the programme has really begun or not. It has.

The collection is made up of: *Fragment of fear, Stepping stones, Footprints on the moon, Something, Give peace a chance, Wichita lineman, Light my fire, Fragment of fear and Paint it black.*

I would have liked to find rather more inventiveness in the handling of these numbers. As it is there is an unmistakably "dated" air about them, bringing to mind some of the more advanced music of twenty or thirty years ago. And that's not good.

In addition we have a monotonous repetition that does little more than "fill up space" so the whole left me feeling disappointed. Certainly not uplifted. Or interested.

If the album has anything then it is a sense of movement as the title indicates. Unfortunately that movement is by no means positive in its direction, seemingly wandering rather aimlessly from here to there and making quite a lot of noise on the way.

Recording is difficult to define, since so much of the quality on the tape obviously originates from the treatment, which in its technical cleverness is interesting but is musically dull. Not an album I would buy. It sounds to me too much like an experiment that did not succeed and so should never have seen the light of day.



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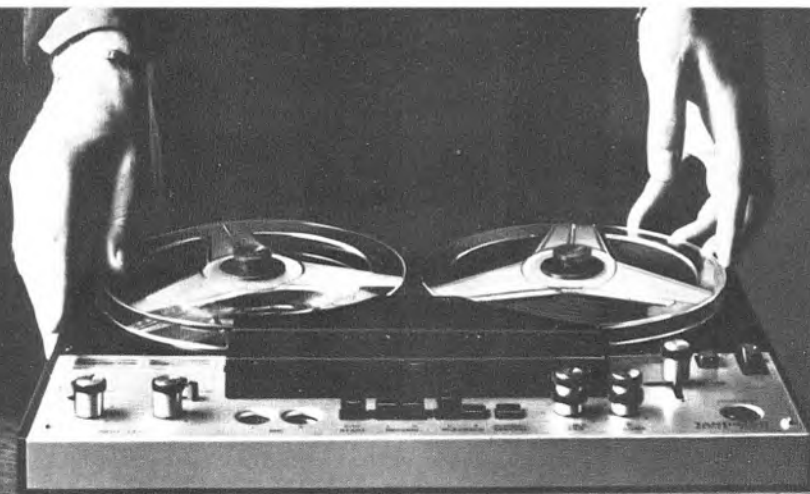
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Available from all leading audio dealers the Size 30 Cassette Case costs 24s 10d (£1.24) including purchase tax.

Also available from Multicore Solders is the Bib Cassette Tape Head Cleaning Tape suitable for all Compact Cassette models and believed by the manufacturer to be the first British-made product of its kind.

With the upgrading of cassette equipment the most scrupulous attention to head cleanliness is essential. Some of the modern cassette machines are capable of delivering very fine audio quality indeed, but this is only true so long as the head gap is free from dust or other foreign matter. Access is not easy, unlike many of the open spool machines where the head cover hinges back to reveal the exposed head assembly ready for the application of cotton-wool cleaning material.



Instead with cassette equipment the specially made Cassette Head Cleaner should be used. The device takes the form of an ordinary cassette, but it is loaded with a cleaning tape instead of magnetic recording tape. The "cassette" is merely inserted into the machine which is then switched to the Play function. As the cleaning tape passes the head it will remove

dust and other unwanted material to leave the head clean, and the entire operation will have taken only about a minute.

The effect of using any recording equipment with a dirty head is a fall-off in the high frequency response, and most machine manufacturers say that the commonest "fault" in equipment returned for repair is simply dirt that could have been removed by the owner. The Bib Cassette Head Cleaning Tape costs only 10s 7d and has been designed to do the job.

Bib Division, Multicore Solders Ltd., Hemel Hempstead, Hertfordshire.

B & O MAKE PRICE REDUCTIONS

IMPORTANT REDUCTIONS have been made in the prices of four of the range of Beovox loudspeaker enclosures from Bang & Olufsen. It is said that this has become possible by altering the production of Beovox models 1200, 1600, 2600 and 3000 to incorporate an extra 2-inch tweeter unit. As a result these models now incorporate three drive units and therefore under the purchase tax regulations are free of tax. It is added that the quality and value of the speakers has been increased but because of the tax exemption the actual cost to the customer has been decreased.

The new recommended retail selling prices are: Beovox 1200 in teak £26, in rosewood £27; Beovox 1600 in teak £26, in rosewood £27; Beovox 2600 in teak £35, in rosewood £36; Beovox 3000 in teak £43, in rosewood £45.

It is also announced that the Beovox 2200 is soon to be discontinued; its successor, the Beovox 1100, is now becoming available. The recommended retail price of the newer model is £25 in teak or £26 in rosewood, including purchase tax. Both the size and the specification of the 1100 are similar to that of the 2200 but the power handling capacity has been increased to a claimed 15 Watts RMS and a new roll surround bass unit has been incorporated.

Bang & Olufsen, Eastbrook Road, Gloucester.

NEW EDITION OF GRUNDIG BOOK

THE GRUNDIG BOOK, written by Frederick Purves and published by Focal Press, has now gone into its thirteenth edition.

First published in 1958 the Grundig Book gives full details of all Grundig tape recorders marketed in Great Britain since their introduction in 1952, together with information on the principal accessories available. It also takes the reader step-by-step through the principles of tape recording from the basic methods to the techniques of dubbing and mixing as well as giving a host of other information of interest to the amateur enthusiast.

The Grundig Book is available directly from Grundig (Great Britain) Ltd, The Book Centre, North Circular Road, Neasden and all the usual outlets.

Grundig (Great Britain) Ltd, London, S.E.26.

AIWA PORTABLE STEREO CASSETTE

THE FIRM of Selectro Electron (UK) Ltd., have reorganised their consumer sales arrangements for Aiwa equipment and amongst the new models announced is the TP 1004, a portable stereo cassette machine with detachable loudspeakers. It is said that when the loudspeaker enclosures are snapped on to the main unit the whole can be carried rather like a briefcase.



Operating from either dry cells or mains supply the machine has independent volume and tone controls with a VU type meter for each channel. Total weight is 10 lbs.

The specification refers to a maximum output of 1 Watt per channel and the two loudspeakers are each 5 x 3-inches. Cost of the TP 1004 is 62 guineas inclusive of purchase tax.

Selectro Electron (UK) Ltd., Selectro House, 15 Broomhills Estate, Braintree, Essex.

EAGLE PRODUCTS

WITH TUNER/AMPLIFIERS in the news at all prices we now have a new low-cost model from Eagle. Giving a claimed output of 3 Watts per channel the SMC 10 is fitted with a multiplex decoder and also includes AM reception. FM sensitivity is given as 2 microvolts for 20 dB quieting and the recommended retail price is £40 19s.



Digital clock radios are becoming more popular, and model DR71 uses a rotary system of clear, easy-to-read numerals showing hours, minutes, and seconds. The radio section carries both AM and FM bands and includes a built-in FM aerial which is claimed to be adequate for most areas. With a built-in delay timer getting up in the morning is made easy by turning the radio off at night and then leaving it to switch itself on at the pre-determined time with either alarm or music. It could also be used for recording radio programmes whilst away from home.



Eagle believe in the idea of offering loudspeakers in pairs in a single pack. One example is model DL50. The enclosures are finished in teak and contain a dual cone 170mm bass/mid-range unit together with an 80mm tweeter. Recommended retail price for the pair is £19 12s.

B. Adler & Sons (Radio) Ltd., Coptic Street, London, W.C. 1A, INR.

KELLAR DOLBY

WITH ITS CLAIM to be the first Compact Cassette Machine incorporating Dolby B circuitry, the Kellar DTA 50 should be available in the shops very shortly. Costing £150 it has a number of interesting features apart from switchable Dolby so that cassettes can be either recorded or played back "straight" or to the Dolby characteristic.

One of its most important provisions is of a high quality stereo amplifier which is said to give an output of 25 Watts per channel at very low distortion levels, together with provision for the connection of an external tuner and the signal from a magnetic cartridge with RIAA equalisation. The machine can therefore be used as a substitute for, or alternative to, the conventional main amplifier.

On the record/playback side the figures quote what is described as an "unprecedented frequency response" of from 20 to 15,000 Hz. from Compact Cassette at 1 7/8 ips. Wow and flutter is given as 0.15% weighted peak to peak and distortion off the tape as less than 2.5% at 0 VU.

The equipment has the usual cassette mono/stereo facility and full push-button operation including a Pause control for editing and a Record safety lock. The high frequency recording bias is specially set at 105,000 Hz to protect against beating effects with FM broadcasting and the magnetic head has a gap length of 1 micron.

The solid state synchronised DC motor is claimed to have low noise and long life and the printed circuit board terminals are described as "computer type gold plated".

An alternative model DCR1 built to an identical specification but without the final amplifier stage costs £94 10s.

Kellar Electronics Ltd., Maryland Works, 9 Brydges Road, London, E.15.

PHILCO RECORDER

PHILCO INTERNATIONAL LTD announce the release of a new four-track mains stereo tape recorder, the A5610WA.

The machine has fully automatic programme selection which permits up to 13 hours of uninterrupted stereo - or 26 hours of monophonic reproduction (!) - with automatic reverse, plus what is called "hours and hours of non-stop stereo" with automatic repeat. The automatic programme selection provides for (1)

stop at end of spool; (2) stop and reverse; (3) fully automatic cycling.

Other features include sound-on-sound and sound-with-sound, provision for either vertical or horizontal operation, instantaneous pause control, digital indicator, twin record level meters and tone controls. Housed in a walnut cabinet with tinted perspex dust cover the machine comes complete with a pair of matching loudspeaker enclosures, two dynamic microphones and the usual accessories at an inclusive recommended retail price of £159.

Operating speeds are 7 1/2, 3 3/4 and 1 7/8 ips and the specification claims a frequency response from 20 to 20,000 Hz at the fastest speed with a power output of 5 Watts RMS per channel. Wow and flutter figures are given as 0.2%, 0.3% and 0.4% at each of the three respective speeds and maximum spool size is 7-inches.

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Sony MR929	33	4	9	5	6	10	97	4	9
Sony TC252	33	5	0	5	10	10	99	15	0
Philips N4407	35	0	0	6	13	4	105	0	0
Akai 1710L	36	6	8	6	1	2	109	0	0
Sony MR939	38	13	6	6	2	3	112	0	2
Grundig TK247	37	10	0	6	5	0	112	10	0
Sony TC630	66	15	0	11	18	0	199	15	0
Philips N4408	40	11	9	6	15	0	121	11	9
Telefunken 204TS	41	19	0	6	13	4	124	19	0
Philips N4408	47	0	0	7	13	4	139	0	0
Tandberg 1241X	49	0	0	8	6	8	149	0	0
Sony TC540	50	15	0	8	5	0	149	15	0
Akai 1800	53	0	0	8	13	0	158	0	0
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Tandberg 1641-X	30	0	0	4	19	2	89	10	0
Akai 4000D	30	18	8	4	18	4	89	18	8
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Mns/Bat.	11	5	0	1	17	6	33	15	0
Philips RR290									
+ Radio	11	10	0	1	17	6	34	0	0
Sony TC100A									
Mns/Bat.	14	9	3	2	6	8	42	9	6
Sony MR411									
Mns/Bat+FM/AM	16	15	0	2	15	0	49	15	0
Philips 2400 Stereo	22	14	0	3	15	6	68	0	0
Philips 2400									
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Sony TC130 Stereo	37	10	0	6	5	0	112	10	0

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Philips RR290	11	10	0	1	17	6	34	0	0
Grundig C200	12	7	6	2	0	10	37	17	6
Philips RR482	18	4	0	3	0	8	54	12	0
Telefunken 302TS	22	15	0	3	15	10	68	5	0
Uher 4000L	48	10	8	8	1	8	145	10	0
Uher 4200/4400	62	10	10	7	11	187	5	0	

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Philips 4307	16	15	3	2	13	1	48	11	11
Telefunken 201	17	3	0	2	17	2	51	9	0
Ferguson 3238	20	12	0	3	5	0	59	12	0
Philips 4308	20	14	2	3	5	7	60	0	10
Ferguson 3249	22	9	0	3	3	8	62	9	0
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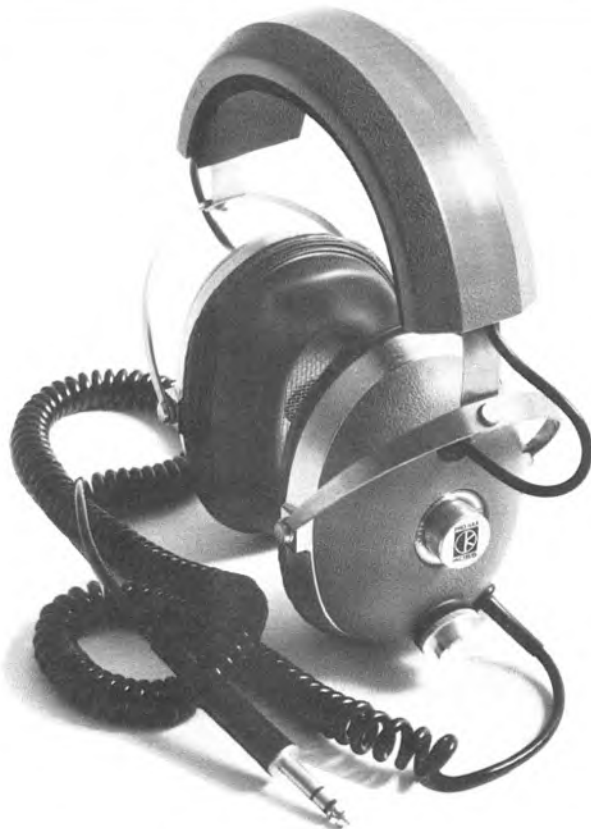
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Frequency Range	7½ in/sec: 20-27,000 Hz 3¾ in/sec: 20-17,000 Hz 1½ in/sec: 20-10,000 Hz
Output	2-line 100 kΩ-6 dB
Rewind/FF time	135 sec approx. for standard 7" tape
Power Supply	AC 110/115/125/200/230/250V, 50-60 Hz
Cabinet Finish	Walnut
Dimensions	18½" w x 8" h x 13½" d (472 x 202 x 339 mm) Weight: 24 lb 10 oz (11.2 kg)



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Full specifications and data will be sent gladly on request

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Cassette Chatter

Dear George,

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John Borwick wrote in the April 1970 issue of THE GRAMOPHONE: "These are excellent results and were verified on all four inputs."

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ARMSTRONG 521	56	0	0	46	0	0
DULCI 207	25	0	0	17	0	0
DULCI 207M	30	0	0	20	19	0
FERRROGRAPH F307	59	0	0	47	19	6
GOODMANS Maxamp	54	0	0	37	19	6
HL 505	23	2	0	16	19	6
LEAK Stereo 30 Plus	53	0	0	41	19	6
LEAK Stereo 30 Plus, in teak case	59	10	0	46	19	6
LEAK Stereo 70	65	0	0	52	0	0
LEAK Stereo 70 in teak case	71	10	0	56	19	6
LINEAR LT.66	21	0	0	16	19	6
LL Stereo Amplifier	23	10	0	16	19	6
METROSLIND ST70	36	0	0	28	19	6
PHILIPS RH 591	73	0	0	55	19	6
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PHILIPS RH 580	26	0	0	19	19	6
PIONEER SA 500	62	11	4	42	19	6
PIONEER SA 700	98	0	0	69	19	6
PIONEER SA 900	134	2	0	96	19	6
PIONEER Reverberation	45	9	11	32	19	6
QUAD 33 Pre-amplifier	43	0	0	38	19	6
QUAD 303 Main Amplifier	55	0	0	48	19	6
ROGERS Ravensbourne	59	10	0	46	19	6
ROGERS Ravensbourne (cased)	64	0	0	49	19	6
ROGERS Ravensbrook	44	0	0	34	19	6
ROGERS Ravensbrook (cased)	49	0	0	38	19	6
SINCLAIR 2000	30	9	0	22	19	0
SINCLAIR PROJECT 60/2 x 230/P25	23	18	0	16	19	0
SINCLAIR PROJECT 60/2 x 250/P28/trans.	32	17	6	23	8	6
SINCLAIR STEREO	61	19	0	45	19	6
TELETON 150	29	0	0	19	19	6
TELETON 203E	28	15	0	19	19	6
TELETON GA 101 30w RMS	33	15	0	22	19	6
VOLTEX 100 watt Stereo Discotheque, eight electronically mixed inputs	185	0	0	139	0	0

TUNERS

*ARMSTRONG 523 AM/FM	53	15	3	44	19	6
*ARMSTRONG 524 FM	41	17	8	34	19	6
ARMSTRONG M8 decoder	9	10	0	7	19	6
*DULCI FMT 7 FM	22	1	0	17	19	6
*DULCI FMT 7S Stereo	31	0	0	25	0	0
GOODMANS Stereomax	82	10	5	63	19	6
LEAK Stereofetic Chassis	59	18	0	51	19	6
LEAK Stereofetic in teak case	67	3	6	58	19	6
PHILIPS RH 690	39	0	0	31	19	6
PHILIPS RH 691	83	0	0	70	10	0
PIONEER TX500 AM/FM	77	18	9	63	19	6
PIONEER TX900 AM/FM	153	13	10	125	0	0
QUAD Stereo FM	51	0	0	39	19	6
ROGERS Ravensbourne	61	17	9	49	19	6
ROGERS Ravensbrook	45	0	2	39	19	6
ROGERS Ravensbrook (cased)	51	5	3	42	19	6
*SINCLAIR 2000	26	14	6	19	4	6
SINCLAIR PROJECT 60	25	0	0	20	19	6
TELETON 201X FM	36	0	0	29	19	6
TELETON GT 101	47	10	0	33	19	6
TRUVOX FM 200/IC	60	11	0	39	19	6

All above tuners are complete with MPX stereo decoder, except where starred.

TUNER/AMPLIFIERS

AKAI 6800	142	10	7	112	0	0
ARENA R500	82	0	0	69	19	6
ARENA 2400	111	6	0	71	19	6
ARENA 2600 Stereo AM/FM	82	0	0	94	0	0
ARENA 2700 Stereo	105	0	0	85	0	0
ARENA T1500F	72	9	0	59	19	6
ARENA T9000	303	9	0	258	0	0
ARMSTRONG M8 decoder	9	10	0	7	19	6
*ARMSTRONG 525	91	17	9	76	19	6
*ARMSTRONG 526	104	14	3	86	19	6
GOODMANS 3000	77	14	7	49	19	6
PHILIPS RH 781	74	19	6	54	19	6
PHILIPS RH 790	125	0	0	101	19	6
PIONEER KX 330 AM/FM/SW	78	12	4	62	19	6
PIONEER SX770 AM/FM	160	8	6	125	19	6
PIONEER SX990 AM/FM	194	14	8	149	19	6
TELETON F2000	51	10	0	31	19	6
TELETON 7AT 20	105	0	0	79	19	6
TELETON 10ATI 150w RMS	160	0	0	109	0	0
TELETON R4200	51	15	0	35	19	6
TELETON TF550	75	10	0	55	19	6
TELETON MX990 with Speakers	67	5	0	48	19	6
TELETON R8000 with Speakers	63	5	0	49	19	6
TELETON CR55	120	0	0	95	0	0
WHARFEDALE 100.1	131	5	0	105	0	0

All above Tuner-Amplifiers are complete with MPX stereo decoder, except where starred.

COMET for after-sales service THROUGHOUT THE UK

Service Depots at LEEDS, GOOLE, WAKEFIELD, DONCASTER, HULL and BRIDLINGTON

TURNTABLES

GARRARD SP25, fully wired with Goldring G800 Magnetic cartridge. Complete with base, plinth and cover. Special price £20 19 6.

	Recommended Retail Price			Comet Price			
	£	s	d	£	s	d	
ARENA SP25, with base and cover	22	1	0	17	19	6	
DUAL 1219 transcription	60	8	0	49	19	6	
DUAL 1209 transcription	42	12	4	34	19	6	
GARRARD AP25 Mk II	15	11	4	10	10	0	
GARRARD AP25	23	16	0	17	10	0	
GARRARD SL55	13	17	9	11	12	6	
GARRARD SL75 B	19	6	5	14	19	6	
GARRARD SL75 B	36	12	4	27	10	0	
GARRARD SL95 B	45	9	1	36	10	0	
GARRARD 401	31	14	2	25	19	6	
GARRARD SL72 B	30	2	0	24	19	6	
GARRARD 3500, with GKS cartridge	15	15	0	11	19	6	
Base and Cover to fit GARRARD SP25, SL55, SL65B, and 3500				Special Price	3	19	6
GOLDRING GL69 Mk II	26	12	6	21	10	0	
GOLDRING GL69 P Mk II	35	2	10	27	19	6	
GOLDRING GL75	36	8	2	29	19	6	
GOLDRING GL75 P	46	18	8	39	19	6	
GOLDRING Covers for 69P and 75P	4	4	3	3	8	0	
GOLDRING GL 75 complete with plinth, cover and G800 E Cartridge	67	19	0	53	19	6	
GOODMANS 3025	37	14	9	25	19	6	
MCDONALD MP 60	15	0	0	10	19	6	
MCDONALD 610	18	19	6	13	19	6	
Base to fit MCDONALD turntable	3	13	0	3	2	6	
Cover to fit MCDONALD turntable	2	12	0	2	2	6	
PHILIPS 228	19	19	6	16	19	6	
PHILIPS GA 146	24	19	6	24	19	6	
PHILIPS 217	32	0	9	27	4	0	
PHILIPS 202 Electronic	64	0	0	54	0	0	
PIONEER PL11	50	17	11	39	0	0	
THORENS TD125	75	17	8	61	19	0	
THORENS 152AB	120	3	11	99	19	6	
THORENS 150A Mk II	43	12	7	32	19	6	
THORENS 150AB Mk II	47	8	7	40	19	6	
THORENS TX11 Cover	4	2	3	3	13	6	

BASES, PLINTHS AND COVERS STOCKED

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SPEAKERS

ARENA HT 27	18	18	0	13	19	6
ARENA HT 28	17	10	0	12	19	6
ARENA HT 21	10	0	0	9	5	0
ARENA HT 7	19	19	0	17	0	0
ARENA HT 10	22	1	0	18	19	6
ARENA HT 20	32	11	0	26	19	6
ARENA HT 26	78	15	0	65	19	6
B & W DM3	63	0	0	52	19	6
B & W P2H	94	10	0	79	0	0
B & W DM1	32	0	0	25	10	0
CELESTION Ditton 120	24	0	0	18	0	0
CELESTION Ditton 15	32	0	0	24	0	0
CELESTION Ditton 25	65	0	0	49	0	0
DULCI AS 3	8	8	0	6	19	6
GOODMANS MINISTER	22	9	0	18	19	6
GOODMANS Majesta	57	0	0	44	19	6
GOODMANS Maxim	20	7	9	16	19	6
GOODMANS Mezzo II	30	18	0	22	19	6

	Recommended Retail Price			Comet Price		
	£	s	d	£	s	d
GOODMANS Magnum-K	40	2	0	28	19	6
GOODMANS Mirimba	24	0	1	18	19	6
GOODMANS Mirambo	22	5	6	17	19	6
GOODMANS 3005 (pair)	25	0	0	18	19	6
KEF Celeste	29	0	0	21	10	0
KEF Concord	43	10	0	32	19	6
KEF Concerto	53	10	0	41	19	6
KEF Cresta	22	3	4	17	19	6
LEAK Sandwich	45	10	0	32	19	6
LEAK Mini-Sandwich	29	15	0	21	19	6
LEAK 300	29	10	0	20	19	6
LEAK 200	23	0	0	17	19	6
LEAK 600	45	0	0	32	19	6
LOWTHER Acousta (with PM6)	45	10	0	38	7	6
LOWTHER Acousta (with PM7)	53	0	0	45	19	6
LOWTHER Ideal Baffle	35	10	0	29	17	6
PHILIPS RH481	11	0	0	9	2	6
PHILIPS RH482	18	0	0	14	19	6
QUAD Electrostatic	66	0	0	52	19	6
SINCLAIR Q16	8	19	6	7	19	6
WHARFEDALE Speakers						
Airedale	69	10	0	55	19	6
Denton	19	0	0	14	19	6
Super Linton	22	10	0	18	10	0
Melton	29	10	0	22	19	6
Dovedale 3	39	10	0	29	19	6
Rosedale	59	10	0	46	19	6
Triton (pair)	55	0	0	42	19	6
Unit 3 Speaker Kit	11	19	6	9	10	0
Unit 4 Speaker Kit	16	0	0	12	10	0
Unit 5 Speaker Kit	23	10	0	17	19	6

PICKUP ARMS

GOLDRING Lenco L75	12	6	6	10	10	0
GOLDRING Lenco L69	9	5	9	7	0	0
SME 3009 with S2 shell	31	6	3	25	19	6
SME 3012 with S2 shell	33	7	3	28	19	6

LARGE RANGE OF CHASSIS SPEAKERS AVAILABLE. PLEASE SEND FOR DETAILS

TAPE RECORDERS & TAPEDECKS

ALBA R22 Twin Track Battery/Mains	50	5	0	29	19	6
AKAI M10L	245	1	0	189	0	0
AKAI X2000	190	0	0	159	19	6
AKAI X5000 W/L	177	17	9	139	19	6
AKAI X330	342	11	4	269	0	0
AKAI X330D	312	11	3	245	0	0
AKAI X-360	380	1	6	284	0	0
AKAI X-360 D-deck	318	18	4	243	0	0
AKAI 1800SD	199	8	4	167	0	0
AKAI 4000 4-track Stereo	124	18	0	99	19	6
AKAI 4000 D 4-track Stereo deck	89	19	1	69	19	6
AKAI 1710L 4-track Stereo	89	17	0	69	19	6
BUSH TP 60 Cassette, Tape Recorder	29	8	0	24	19	6
BUSH TP 70 Cassette, Battery/Mains	29	19	0	23	19	6
FERGUSON 3244 Stereo 4-track	97	18	0	79	19	6
FERGUSON 3246	43	0	0	33	19	6
FERGUSON 3247 4-track	48	9	0	38	19	6
FERGUSON 3248 4-track	54	6	0	41	19	6</

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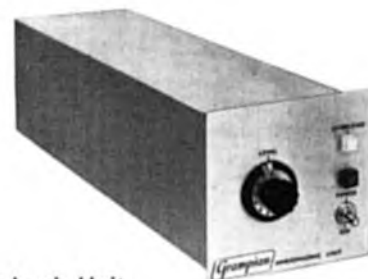
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The superb EMI L4A battery mains professional recorder has been sold by the Professional Products Department of the world famous E.M.I. organisation to professional, scientific & industrial users throughout the world. Ranking high in esteem with all professionals it has gained an unprecedented reputation for superb quality & utter reliability. Its specification developed over many years from the earlier world famous E.M.I. L2A, used almost exclusively by the BBC & other world wide broadcasting stations, provides facilities only to be found in other professional recorders such as Nagra, etc.

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Every machine brand new, fully guaranteed & supplied complete with superb carrying case (retail value £5.10.0), shoulder strap & comprehensive instruction manual. Recorders can be supplied to European or NAB standards (State which required when ordering). A full range of accessories are available including mains battery charger units, rechargeable battery packs, dynamic & ribbon microphones, monitoring headsets, etc.

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