

OCTOBER 1970

TAPE

RECORDING MAGAZINE

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We laughingly refer to it as an amateurs' tape deck.

Laughingly? Well the 3000X is about as amateurish as a moon shot.

Recording is based on the Tandberg Cross-Field technique.

Which means it gives quite sensationally good specifications for frequency range and signal-to-noise ratio. But people have come to expect that from any Tandberg tape deck, so we'll move on and talk about the other features.

It's fully transistorised, has off the tape monitoring facilities and Din and phono sockets.

Two moving coil meters indicate recording levels.

You can cue-in at fast wind and rewind, as well as monitor recording and playback.

And you can mix, copy and try echo and other special effect recording.

Fill in the coupon, we'll send you the complete low-down on this quite exceptional tape deck, which, believe it or not only costs £99. 18s. 0d (recommended price).

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Name

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TM4

STAND 16 The International Audio and Music Fair Olympia

The 6000X.

Are you sure you can handle it?

The 6000X is no ordinary tape deck. If you buy it you get the kind of gadgets and devices you'd expect from a professional machine.

So you'd better read what it can do very carefully. Because you might be getting hold of something you can't handle.

Limiter permits up to 25 DB overload without distortion.

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'Sound-on-Sound' copying from one track to the other.

Facilities for echo and

other special effect recording.

Cueing possibility on fast forward or rewind.

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Automatic motor shut-off if tape breaks or ends.

And all that is really only the half of it. If you're still not sure send us the coupon.

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National's SA-73 integrated Stereo Amplifier gives you 52 watts of undistorted power and brilliance that challenges comparison. With the appropriate tuner and record player it provides a flexible music centre. Features include all-silicon transistor circuits with overload protection, slide type major controls, and facilities for speaker switching and connection to tuners, tape deck, record player and microphone. Price £73.10.0

Abridged Specification - Model SA73

Output 52W at 4Ω, 40W at 8Ω
 Continuous Power 16/16W at 4Ω, 13/13W at 8Ω
 Frequency Response 10 Hz-60,000 Hz ± 0 dB
 Harmonic Distortion 0.5%
 Dimensions 16" w x 5" h x 11 $\frac{3}{8}$ " d
 (406 x 127 x 300 mm)
 Weight: 18 lb (8.2 kg)



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Abridged Specification - Model SA-54..

Frequency Range FM: 88-108 MHz
 AM: 525-1605 Hz (571-187 M)
 Music Power (IHF) 90W at 4Ω, 80W at 8Ω
 Continuous Power (RMS) 32/32W at 8Ω
 Frequency Response 30 Hz-60,000 Hz ± 3 dB
 Harmonic Distortion 0.8%
 Sensitivity FM: 1.8μV, AM: 20μV
 Dimensions 19 $\frac{3}{8}$ " w x 5 $\frac{1}{8}$ " x 14" d (502 x 130 x 350 mm)
 Weight: 28 lb 8 oz (8.4 kg)



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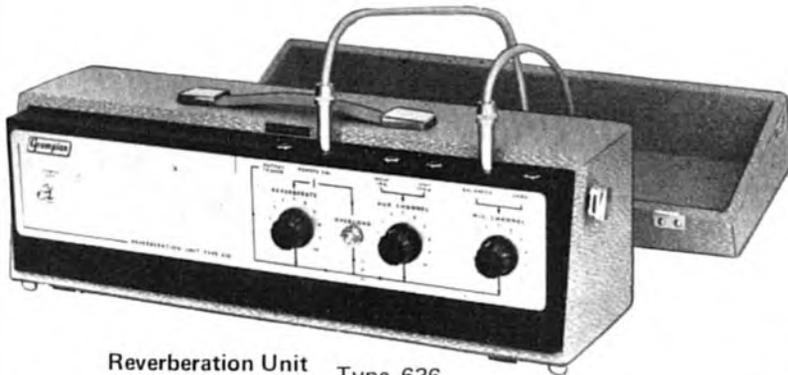
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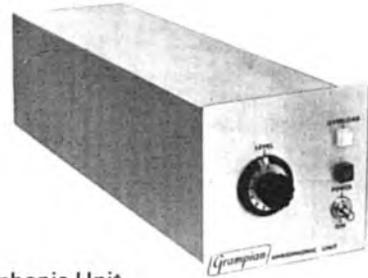
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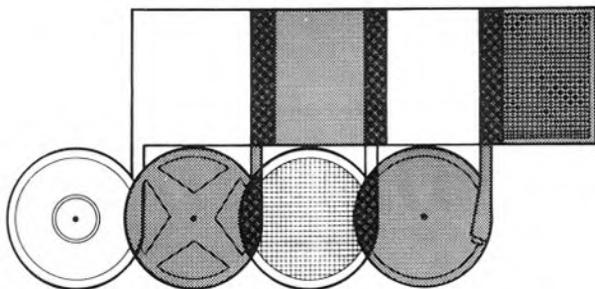
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Vol. 14 No. 9 September 1970

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Cover Photograph: Everyone is talking about it; the national press have reported it; only we have used it. Here we have the first commercial domestic Dolby cassette machine, the Kellar DTA 150. Through the use of the Dolby noise reduction system it is bringing a new high standard to the reproduction of cassette programme material. For the first time the gramophone record is subject to a serious challenge. Read "Dolby B Arrives" on page 326 of this issue.

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Tape trends in the Tape Contest

By Douglas Brown

THE EMITAPE Challenge Cup for 'The Tape of the Year' has been won by Ken McKenzie, of East Herrington, Sunderland, with a documentary tape featuring the amateur broadcast service to Sunderland hospitals.

The jury at the final judging session at the Mullard Theatre in London on August 27 found in it a whole catalogue of virtues: "told a story, it had music, lots of actuality, good scripting – it seemed to cover the whole board," said one judge.

As a programme, the jury found it well-shaped, the only one of the tapes they heard that moved to a natural and definite conclusion. But they had one criticism: Ken McKenzie, they thought, had tried to pack too much into his seven minutes and 54 seconds. The tape might have been better if one or two items had been dropped altogether, and some of the music had been cut too close at the links.

Ken McKenzie is a seasoned competitor in the BATRC and has carried off prizes before. He is a 27-year-old chartered accountant who has been recording for about five years and he is well equipped with Uher and Vortexion recorders and an array of high-quality microphones.

He is an example of an amateur enthusiast who has realised the full potential of creative tape recording and has grabbed every opportunity. Today he contributes regularly to his local BBC radio station and he has quickly developed an almost professional style. The Sunderland Hospital Broadcasts' service, which was the subject of his winning tape, also owes a great deal to his enthusiasm.

It has been operating since September 1968 and serves 2,000 patients in ten local hospitals. It started with commentaries on local soccer matches, moved on to include a record request programme, then a local newsreel. Today it operates on a seven-nights-a-week basis.

This was a very worthy winner of the coveted 'Tape of the Year' award.

* * *

I THINK it is very important when the premier award is carried off by a well-known and experienced amateur that newcomers to the hobby should be encouraged to believe that they can quickly make a mark.

This year's contest offered proof of this. The first prize in the Technical Experiment class was awarded to 17-year-old Michael Bastin, of Worcester, who has been recording for only 18 months.

It is true that he is the son of a distinguished recording amateur, Peter L. Bastin, a frequent prizewinner in earlier contests and the author of one of our Tape Handbooks. Bastin senior entered tapes that were shortlisted in the Drama and Reportage sections this year, but neither came out on top in its class.

Bastin junior took a 12-string guitar, an electric bass guitar and a Tandberg recorder, composed a 2 minutes 20 seconds tune called "Silly Girl", played it and sang it on six tracks and then merged them to produce his winning tape.

The jury considered it technically "very good" and an ingenious composition. Officially, there is no 'runner-up' for the 'Tape of the Year' award, but two of the judges made clear that they regarded "Silly Girl" as the second best tape.

* * *

A TAPE that caused lively discussion was a seven-minute feature-report on "John Parker, Coachman" entered by Dennis Rookard, of Brentwood, Essex. Essentially this was a straight-forward interview with a Suffolk practitioner of "the ancient art of coach driving", the narrative enlivened with sound effects of the coach and four on the move.

It had been originally recorded on one of the cheaper battery portables at 1 7/8 ips and then dubbed to an Akai 910.

When the judges offered their comments, Eric Robinson kicked off with the view that "John Parker, Coachman" was "the best of the lot for professionalism". But most of the other judges disagreed.

Everyone felt that it was "let down" by a very abrupt ending. One judge thought it was confusing because it did not contain enough information. Another felt that the sound effects had not been edited in with sufficient skill.

If, at this point, I can offer a personal word of encouragement to Mr Rookard, I felt the judges were oddly "tough" in their judgment of his tape. In my view it only failed to come out on top because of its very weak ending.

* * *

NOW FOR THE other results. Terry Devereux – another familiar name! – won the Drama section with a tape entitled "The Vultures" – a horrifying glimpse of a computerised, rocket-roaring future when human vultures commandeered the bodies of second-class citizens for organ transplant surgery.

This tape was given "full marks for experiment" and praised for its ingenuity. But the judges felt it "went out of focus", that it did not move to a satisfactory conclusion and, technically, that the levels were not properly controlled.

* * *

THE MUSIC section was won by John Shuttleworth with a 3 1/2-minute tape which was also selected as the outstanding stereo recording in the Contest. The music was specially composed by Mike Axtel (stereo winner in last year's contest) and played by his Wind Quintet. John Shuttleworth used very expensive equipment and there was an almost professional touch about this tape – "very good playing," observed musician Eric Robinson.

But, as some consolation to those competitors who have less sophisticated equipment than Mr Shuttleworth, I report the comment of one technically-qualified judge from the BBC: "Expensive equipment does not guarantee quality – I didn't like the way the reverberation had been cut and I thought there was peak distortion once or twice."

* * *

THE SCHOOLS section was won by the Hazlehead Primary School in Aberdeen with a feature about the river Dee. The club trophy was awarded to Brighton Tape Recording Club for a six-minute humorous tape called "A driving lesson". And the special prize for a tape entered by a handicapped competitor went to Mrs Muriel Braddick for a beautifully narrated message addressed "to a shut-in".

The judges were: music and showbiz personality Eric Robinson, BBC producers John Turtle and Michael Grimshaw, and critics Anne Duchene and Matthew Norgate.

ERIC CUSHION DESCRIBES HOW
HE DESIGNED HIS CONVERSION

FROM MONO TO STEREO



Eric Cushion's new stereo set-up designed to give high quality stereo reproduction of Compact Cassettes and Stereo-8 Cartridges.

THE COVER PICTURE of the October 1968 issue of *TAPE Recording Magazine* illustrated a domestic set-up developed over the previous 15 years comprising a combination of a Collaro turntable, Mullard pre-amplifier and Osram 912 main amplifier coupled to a Collaro Studio tape deck using a Mullard Type C tape amplifier, the outputs from which were fed to a GEC metal cone speaker. Owing to my need to be able to review eight-track stereo cartridges and Musicassettes in stereo in the home, where listening conditions are more controlled than in a moving car, part of the equipment previously described has just been up-dated.

For this purpose a Sinclair Project 60 amplifier was chosen because its compact dimensions allowed it to be fitted behind the front of the top pull-out drawer and beneath the Collaro turntable. There was even space to squeeze in a pair of Z30 output units and a Sinclair mains unit.

In the lower part of the cabinet, formerly occupied by a mono cassette player recorder and an AM/FM car radio, (both powered from another Sinclair mains power pack) there is now an eight-track stereo cartridge player modified to serve as a pre-amplifier only, an inexpensive Japanese FM tuner with multiplex adaptor and a mains powered Philips N2500 stereo cassette player. The Sinclair mains unit has been retained to drive the cartridge player and the radio, a two-way switching arrangement preventing them from both being in circuit together and thus overloading the mains pack.

The outputs from both stereo tape units and the mono recorder in the adjacent part of the cabinet are fed to the auxiliary input of the Sinclair Project 60

via a supplementary three bank wafer switch which can be turned to accept the output from any one of these sources. Other refinements on the main amplifier panel included a socket for recording from any of the input sources, including effects records, a supplementary unattenuated "aux" socket for use with a microphone, a mono/stereo switch and a key-operated rotary switch to transfer one of the output channels to an extension speaker in another room. Obviously, the extension speaker can be used satisfactorily only when the amplifier is switched to mono.

The main speakers now used for the reproduction of cartridges and cassettes are a pair of Rola Celestion Ditton 15s., each mounted on a set of four matching legs so that when used in an upright position they are approximately level with the listener's ears when he is seated in an easy chair. The reproduction from these speakers, or in fact from the equipment as a whole, is such that any blemishes on the tapes can be detected easily and their good points equally appreciated.

Construction of this revised set-up was not without teething troubles. We had problems with the Sinclair units but these were quickly sorted out by the

manufacturer; the eight-track unit initially made some odd track changes but this was soon overcome by Radiomobile who supplied the unit, while the FM tuner would not reproduce in stereo until we learned that the de-emphasis section of the tuner needed to be neutralised before the multiplex adaptor could do its stuff. The sketchy instructions queerly translated from the Japanese make no mention of this but a quick word with the manager of Henry's Radio in the Edgware Road provided the necessary advice.

Other problems that had to be solved during assembly related to the degree of attenuation to be applied to the various input signals. Using the Sinclair instruction manual as a basis the correct values of the individual resistor networks were soon arrived at, but to cope with the difference in outputs between the mono and stereo pick-up heads a variable resistor system was installed. This can be reached from underneath when the turntable drawer is extended.

As a precaution to prevent any of the individual mains units being left switched on, they are all wired through the mains push-button switch on the Sinclair unit and a warning lamp is installed to give a visual reminder.

Ferrograph Series 7 tape recorder

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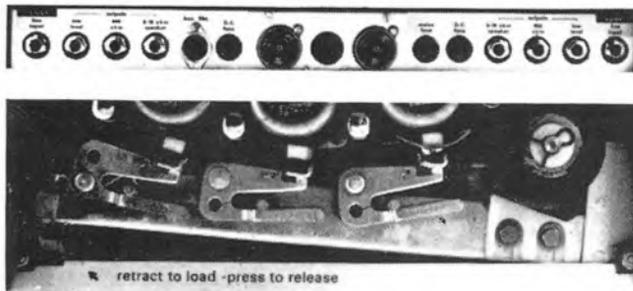
Ferrograph Series 7 tape recorders are British made, available in mono and stereo, with and without end amplifiers. All

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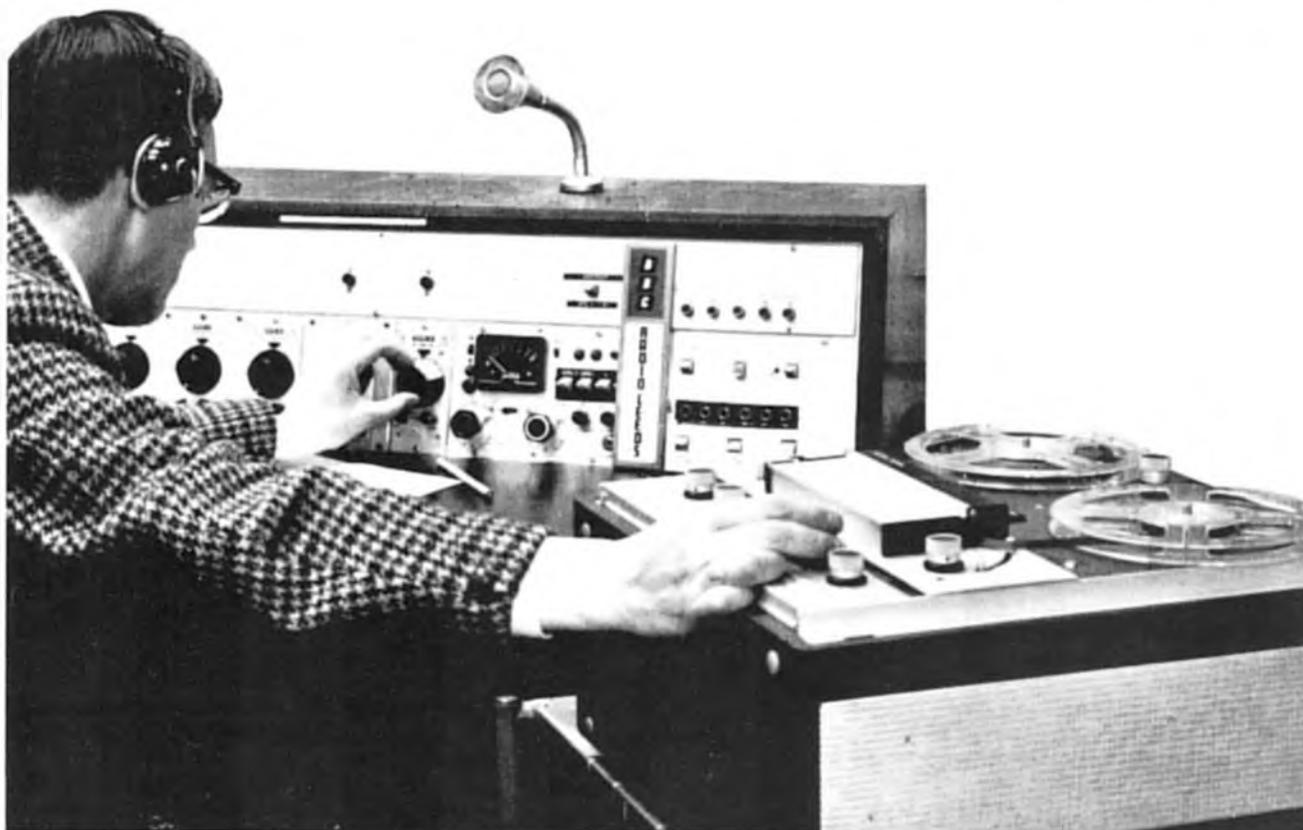
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Ferrograph



AFTER TALKING to a great many people intimately connected with audio I have come to the conclusion that tape recording is undergoing a radical change. This has been brought about by the impact of the cassette, the significance of which has even yet not been fully appreciated. We seem to find ourselves talking about cassettes here, there and everywhere. When a friend recently returned from a visit to Japan he told us that the audio factories he visited were concentrating almost exclusively on the development of the cassette system. That does not surprise me.

Looking back over the last few years I have come to believe that everyone – including Philips, the inventors – underestimated the potential of 1 7/8 ips plus the neat, plastic package of tape that brings convenience and fool-proof operation. I suspect that Philips themselves are astounded at the success of the lusty infant they spawned. Its dominance is such that “experts” who should know better are referring disparagingly to the “difficulties” of handling open spool reels. At a press reception the other day a highly respected consultant was speaking of the need for technical expertise in order to thread the tape on a reel-to-reel machine. And he had been brain-washed into really believing what he said.

This attitude is symptomatic of our changing times and our changing attitudes. Because cassettes are easier to use we shall use them; not because ordinary tape is too difficult but because it is slightly more difficult. All things must be made easy for all people. Personal effort is to be despised; any appliance requiring a moment's thought for its effective use is commercially doomed. Anything can be too difficult – nothing can be too easy.

How long shall we have to wait until we have a gadget that will save us the trouble of actually inserting the cassette in the machine? One can imagine a storage unit for an unlimited number of pre-recorded cassettes. By merely pressing a button any one could be selected, dropped into the mechanism, played and then returned to its allotted place without any human intervention at all. Such thoughts are not fantastic. The possibility of such a contraption already exists; it only needs some enterprising individual to invest sufficient capital for it to be made and marketed. It will come.

An extreme case? Perhaps, but it reflects the direction we are taking. Progress in the form of quality improvement is one thing, but deluding oneself into believing that only the most simple equipment is acceptable is quite another. There is an enormous demand for automation. We have seen it in photography where some of the most “sophisticated” cameras require the user to do

CROSS TALK

By Audios

no more than point and shoot. If all cameras were to be automated then all photographs would look roughly alike. There would no longer be any possibilities for creative endeavour. In tape recording we have the automatic gain control that “guarantees” perfect results every time. When it works it also carries an unspoken guarantee that all recordings will be the same too.

This piece is not intended to be a condemnation of the cassette system; to the contrary, I have been one of its most ardent supporters. It is an attack, however, on the growing antipathy towards what I fear will soon come to be regarded as old-fashioned open spool equipment. Let us use cassettes by all means. Let us marvel at the quality they will give and the delightful simplicity with which they can be used. But let us keep them in perspective and let them not overwhelm and finally exterminate that other breed of recorder to which audio as an industry and as a specialised interest owes so much.

There might appear to be two contradictory items in this issue of *TAPE Recording Magazine*. Our machine review deals with one of the lower cost open spool equipments running at 3 3/4 ips and states quite clearly that its quality potential is better than that of cassette equipment. So it is – of cassette equipment in a similar price range. Elsewhere we refer to a cassette machine costing £150 and giving a quality standard comparable to 7 1/2 ips open spool equipment. Confusing, isn't it? Performance must always be related to price. In good equipment we get what we pay for. There would be no point in offering a cassette machine at £150 if it only gave us the same benefits as open spool machines at £50.

Sometimes I think back to the days of Ludwig Koch and the disc recorders he used for nearly all his remarkable nature recordings. In the Science Museum at South Kensington there are photographs of him with all his gear. It required a furniture van to move it around. I wonder what he would think of those who continually harp about the difficulty of using open spool machines? His scorn

would surely wither those feeble hearts with a single, fiery glance.

Are we happier for having motor cars that do not require to be serviced, lights that switch themselves on when it gets dark, ovens that cook the Sunday joint in three minutes, tape recorders that do not need to be threaded? There is an awful danger that the final end product of all this super-abundance of convenience will be – boredom.

* * *

ALMOST ALL audio equipment nowadays is made to so-called free standing designs. Separate units are stood on open shelves and the whole thing looks more contemporary than today. At least, it does in the coloured brochures. I have just been discovering that there are quite a few problems involved in housing all those expensive teak-encased bits and pieces with their arrays of knobs and pilot lights.

Where the devil does one put them if one doesn't have shelves? I know, use one of the new modular fittings that come in a bewildering choice of shapes and sizes to make up what any sensitive person would regard as the ugliest piece of furniture at the highest cost. A lot of these weird assemblies really are frightful.

The alternative is to array the audio equipment on the sideboard. This I have done and my wife is beginning to object because she has not seen the top surface of her cherished sideboard for more than three years. Which is true. All five feet of its length is entirely occupied by equipment, all of which gathers dust and looks unsightly.

The solution to the problem would seem to be some kind of a rack with shelves so that the various items can be housed one on top of the other. That way they would take up a minimum of floor space (which was supposed to be the reason for giving up big hi-fi cabinets) and they would still be handy for immediate use. I suppose all swinging youngsters live in houses without walls inside. Then they can litter room dividers around the place and so acquire the vitally necessary shelf space. And presumably not a single speck of dust would ever dare to enter their domain. Funny, but life is different for me, and I still can't find anyone who makes a storage unit that will suit my room or my equipment at any price.

* * *

HAVE YOU NOTICED what very fine quality you have been getting from some of the BBC stereo broadcasts lately? I am thinking of one or two of the Prom transmissions in particular. The Albert Hall was always one of the most difficult recording locations, but since the acoustic was adjusted things have improved considerably. Now the engineers are thinking in terms of stereo they seem to be able to control the ambience even further, presumably due to the use of directional microphones.

The increase in stereophonic broadcasts with a broadening of the repertoire into the more popular classical field makes the radio a very worth-while source of recording material. A good tuner is essential as background noise is higher on stereo than on mono broadcasts. Given that, plus a good aerial, the enthusiast can add to his collection of recordings without difficulty. When recording like this “for keeps” it's not a bad plan to cut out the relevant programme notes from *Radio Times* and file them in the tape box. Jot down the date on the reverse side of the cutting as a matter of interest. I still have some tapes in my collection dated as far back as the early nineteen-fifties. Listening to them today is as much a nostalgic experience as an audio pleasure!

"DOLBY B" ARRIVES

LATEST NEWS OF THIS DRAMATIC RECORDING DEVELOPMENT

IN OUR AUGUST edition we broke the news of a remarkable development in domestic tape recording, the Dolby B noise reduction system. This we described as something of a miracle which would bring to the amateur many of the advantages of professional recording studios. Much of the high cost of the finest recording equipment is taken up by the need to reduce tape and system noise to the lowest possible level. The domestic Dolby B circuitry claims to effect a very significant reduction in recorded noise at a cost that makes it possible to manufacture and sell in the consumer market.

Dolby B will be of greatest benefit when the noise is greatest; in other words it is most useful in conjunction with slow tape speeds and narrow tracks. And when one speaks of slow speed and narrow tracks one thinks at once of Compact Cassette. It is in cassette equipment that the advantage will be most apparent, and we suggested in August that we should soon see the arrival of both cassette equipment incorporating Dolby B circuitry and Musicassettes recorded to the Dolby B characteristic. Announcements have now been made confirming the imminent release of both equipment and repertoire.

First of the new-style cassette machines, the DTA 50, is to be distributed by Kellar Electronics Ltd. of London, a firm that has the advantage of the services of Stanley Kelly, the distinguished consultant and audio journalist, as one of its Joint Managing Directors. In appearance it is not dissimilar to any other cassette record/ playback mechanism, but one only has to glance at the specification figures to realise that it is quite out of the ordinary. Frequency response, for instance, is quoted as 20 to 15,000 Hz. with a tolerance of plus or minus 3 dB on the range 40 to 12,000 Hz. To our knowledge this is the first time a cassette machine with such a specification has ever been marketed in this country. Wow and flutter is quoted as 0.15% weighted peak to peak according the CCIR and distortion off tape less than 2.5% at 0 VU. As we said in our last editorial on this subject, the cassette is about to be elevated to the status of "hi-fi".

None of the performance claims detailed above have anything to do with the Dolby B noise reduction system — apart from the fact that if we are going to improve noise levels then all the other



parameters must be equally good. So basically the DTA 50 is a machine that has been designed and built to come up to the most stringent audio standards. Just how far it will meet this specification can only be proven when a sample is submitted for review (this has been promised to us for early October), but knowing Stanley Kelly we suspect that the published figures are likely to be conservative rather than optimistic.

The machine will function in just the same way as any other cassette equipment, apart from the fact that it will produce its own recordings to the Dolby B characteristic and will be able to replay any other "Dolby-ised" cassettes with all the benefits of noise reduction. We would refer readers to our earlier editorial for detailed information on the subject, but perhaps should repeat at this point that the DTA 50 will play back *any* Compact Cassette, whether Dolby-ised or not, and Dolby-ised recordings made on the machine can be reproduced on any other Compact Cassette equipment.

All the advantages of noise reduction will be obtained on every recording made on this machine; similarly when pre-recorded cassettes manufactured to the Dolby B characteristics are available these should reproduce with a quality standard at least equal to that of the best l.p. gramophone records. It is significant that the first firm to make l.p. records in this country, Decca, will also be the first to issue Dolby B Musicassettes.

About 100 titles forming the basis of their new catalogue will be released by Decca in September, but these will all be "ordinary" (non Dolby-ised) cassettes. The

second release, in October, will include a number of Dolby items. These special cassettes *can* be played back on ordinary cassette machines — when that happens there will be no noise improvement and to bring the response back to flat it will be necessary to cut top response at the amplifier. But when played back on equipment incorporating the Dolby B circuitry, such as the Kellar DTA 50, the audio quality should approximate that of a 7½ ips open spool tape.

First obvious question will be: does it really work? We have reported on a demonstration heard at Dolby Laboratories' own premises in London, and described it as most impressive. But will the commercial production models come up to the standard of the admittedly "special" equipment used in the laboratory? After having played around with the DTA 50 for a short time we can only confirm that the results were startling. Reproduction of an ordinary Musicassette gave a hiss level that was highly objectionable. It must be remembered that because this machine has an extended upper frequency response it is bound to reveal a level of hiss that would probably not be audible in other equipment simply because of inferior

EVERYONE IS TALKING ABOUT IT – OUR NATIONAL PRESS HAVE

REPORTED IT – ONLY WE HAVE USED IT! . . . *cassettes at least as good as the best l.p. discs . . .*

First of the new Dolby machines, the Kellar DTA 150, is fitted with high quality audio output stages so that it can fulfil the functions of a main amplifier as well as that of a cassette reproducer. Other versions will also be available, in particular a "deck and pre-amp" having full record and playback facilities but without the final audio amplifiers. Such a machine could be suitable for use with an existing amplifier and loudspeaker installation, provided the overall quality is good enough to do justice to the high standard of Dolby cassettes. It is anticipated that other manufacturers will also be marketing machines to the new Dolby specification in the near future.

Decca promise the release of the first Musicassettes recorded to the Dolby B characteristic in October. We have had the opportunity to listen to a selection of this material when reproduced on both Dolby-ised and standard equipment. Audio quality is excellent in both cases, but when heard on a Dolby machine we have a lack of hiss and background noise that can only be described as dramatic. This could foreshadow the end of the gramophone record as we know it today.

performance at the top end. When speaking (hopefully!) of the possibility of extending the response limits of cassette equipment in the future through improvements to tape and heads we have tended to forget the noise problem, assuming it would look after itself and turn out to be no worse than that now experienced from good open spool recorders. In fact this might well not be so. It might be found that a really superlative cassette machine will always suffer from unacceptably high levels of hiss and background noise – *unless it is also fitted with its own noise reduction system*. If this should be true, then Dolby B will not be a luxury, it will be a necessity if we are to take advantage of these top-specification models.

At the time of writing it is not known at what price Decca will be offering their Dolby repertoire, but if it should cost more than the ordinary cassettes the extra will be very little. Since the new cassettes can be played back successfully on ordinary machines it would seem that the user will be getting finest value for money when he purchases the Dolby-ised versions, in spite of the fact that he will probably not yet have the equipment to reproduce to best advantage. In this way he will be accumulating a library of excellent recordings that can be enjoyed at present and yet will form the basis of a collection ready for immediate use on any Dolby equipment that might be acquired in the future.

When considering the cost of the first of the new machines, the Kellar DTA 50, we have to remember that we are getting a cassette machine of the finest quality *plus* the Dolby B noise reduction system *plus* (in the case of this model only) a top grade main amplifier delivering a claimed 25 Watts RMS per channel with a distortion content of less than 0.1%. Inputs are provided for disc (equalised to R.I.A.A. for magnetic cartridges) microphone and radio, so this machine could operate as the focal point of a hi-fi installation needing only a pair of (good) loudspeakers, tuner and transcription unit to give all the facilities required by the

enthusiast. Except, of course, A/B monitoring from tape. At this stage that is rather too much to ask!

Recommended retail price of the DTA 50 will be £150 and this will include an "unlimited" guarantee for a period of five years. During this time the only exclusions will be misuse and accident; any faults arising due to component or equipment failure will be serviced by Kellar Electronics Ltd. free of all cost to the consumer. This remarkably generous arrangement forms one of the main points of their approach to marketing. They believe that the manufacturer should accept and honour his responsibilities to his customers whilst at the same time making a gesture that will confirm his own faith in his products. Kellar state that they believe their guarantee terms to be the best offered by any audio equipment manufacturer, and they hope that other firms in the industry will follow their lead. So do we.

Consideration is being given to alternative versions of the new machine. Cost would be considerably reduced if it were to be offered as a deck with pre-amp giving all the record/playback facilities but omitting the audio output stages. The price of such a model would be well under £100 inclusive of purchase tax. Another possibility is for a playback-only deck, omitting both the audio output and the record facility. This could be used only for the reproduction of pre-recorded material but the price would be less than half that of the DTA 50. Deliveries of the first machines to the trade are promised for September so they should be available for purchase from October onwards. We have been assured by Decca that we will have a supply of Musicassettes from their lists for review as soon as they are ready so we shall be able to keep readers in close touch with these important developments.

The story of audio has always been a story of progress. The advent of Dolby B might well prove itself to be the greatest single leap forward since the introduction of the micro-groove gramophone record.

SONY

Try mixing it with the SONY TC-366 . . . here's a four track, two 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 $3\frac{3}{4}$ 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 $16\frac{7}{8}$ in. (w) \times $8\frac{5}{8}$ in. (h) \times $14\frac{1}{8}$ in. (d).

Weight 22 lb. 8oz.

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.



SONY

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INTERNATIONAL AUDIO AND MUSIC FAIR

THIS YEAR sees another change in what we have come to call the "Audio Fair". It will again be held at Olympia, as last October, but this time instead of being associated with photography it will be an event shared by the music industry. For the first time exhibits will include musical instruments, recorded tapes and cassettes, electronic organs and sound and recording studios. Again the period of the show will be a full week, from Monday the 19th October to Saturday the 24th October. The first day, Monday the 19th, is being reserved for trade and press only, and the times on that day will be 2 to 9 p.m. On the other days the show will be open to the public from 10 a.m. to 9 p.m. and tickets will cost five shillings each.

The omission of the photographic section does not mean that part of the exhibition was a failure; for many years the Photo-cine Fair has been a bi-annual event and so it is not due to take place again until 1971. By shifting the emphasis from photography to music the organisers are maintaining the closest possible contact with the real business of audio — the sound heard. To complement the displays and demonstrations there will be a continuous series of lectures, presentations, audio concerts and film shows for enthusiasts and music lovers.

Visitors to the 1969 Fair were said to have numbered 60,000; next month 100,000 are expected to pass the turnstiles. Remembering how congested the Hall became on the Saturday, readers are recommended to time their visits to take place other than at the weekend if at all possible. The same problems have been experienced at other audio events; interest is so great that the public tend to flood and finally submerge the exhibits on the most popular visiting days. Evenings will be better than the Saturday, and — if time can be found — the week-days will be best of all. We noted last year that from opening time to mid-afternoon during the week the visitor could enjoy the show in comfort, getting in to all the audio studios he was

interested in without too much queueing or waiting.

With three audio events in the year — Sonex, Audio 70 and the Audio Fair — it should not be necessary for us to repeat the arguments in favour of such shows, nor the philosophy underlying them. Sufficient to say that these "festivals of sound" offer unique opportunities for the enthusiast to see, to hear and to learn. No less important he will meet others with kindred interests and from the gossip and exchange of ideas he will find out more about his subject in a few hours than he could hope to pick up in months of patient reading.

There has been a good deal of discussion on the merits of hotel rooms as opposed to the large exhibition hall such as Olympia. One fact is beyond dispute: the bigger the area the larger the number of visitors that can be accommodated. Because of the nature of the building special "audio studios" have to be erected inside the Hall at Olympia and the design of these is said to have been improved after the benefit of last year's experience. Whatever the arguments, pro or con, the Audio Fair has always been a magnetic attraction for all who profess an enthusiasm for audio. It probably always will be.

THE EXHIBITORS

Name of Exhibitor	Stand Number	
Acoustical Manufacturing Co. Ltd.	30	KEF Electronics Ltd. 36
AEG (GB) Ltd.	23	H. J. Leak & Co. Ltd. 49
Alba (Radio & Television) Ltd.	47	Lee Products (GB) Ltd. 94
Armstrong Audio Ltd.	35	Link House Group 105
Arrow Tabs Ltd.	72	I. Markovits Ltd. 106
Audix B. B. Ltd.	24	Metrosound Sales Ltd. 37
Bang & Olufsen (U.K. Division) Ltd.	56	Minnesota Mining & Mfg. Co. Ltd. 3
BASF (U.K.) Ltd.	22	Mordaunt-Short Ltd. 33
Bell & Howell Ltd.	48	B. H. Morris & Co. Ltd. 20
Billboard Publications Inc.	102	Mullard Ltd. 57
Bosch Ltd.	1	Multicore Solders Ltd. 51
B. & W. Electronics Ltd.	21	National Radio 14
British Radio Corporation Ltd.	58	National Westminster Bank Ltd. 50
Brush Cleveite Co. Ltd.	10	Philips Electrical Ltd. 40
BSR Ltd.	17	Philips Records Ltd. 41
Daystrom Ltd.	15	Power Judd & Co. Ltd. 107
Decca Record Co. Ltd.	59	Precision Tapes Ltd. 63
Denham & Morley (Overseas) Ltd.	42	Protecta Systems Ltd. 66
Diamond Stylus Ltd.	27	Pye Records Ltd. 64
Dynatron Radio Ltd.	60	Rank Aldis (Akai) 49
EMI Electronics Ltd.	8	Rank Wharfedale Ltd. 49
Farnell-Tandberg Ltd.	16	Reslosound Ltd. 52
The Ferrograph Co. Ltd.	25	Rogers Developments Ltd. 32
Fraser-Peacock Associates Ltd.	70	Rola Celestion Ltd. 2
Gerrard Engineering Ltd.	7	Sanyo-Marubeni (UK) Ltd. 45
General Gramophone Publications Ltd.	104	Sharp Electronics (UK) Ltd. 43
Goldring Manufacturing Co. (GB) Ltd.	34	Shriro (UK) Ltd. 26
Goodmans Loudspeakers Ltd.	12	Shure Electronics Ltd. 31
Grundig (GB) Ltd.	18	J. J. Silber & Co. Ltd. 71
Hacker Radio Ltd.	5	Sinclair Radionics Ltd. 44
Hansom Books Ltd.	101	S.M.E. Ltd. 9
C. E. Hammond & Co. Ltd.	77	Soho Record Co. Ltd. 62
Haymarket Press Ltd.	99B	Sonab Ltd. 61
Highgate Acoustics	19	Sony UK Division Ltd. 4
Howland West Ltd.	53	A. R. Sugden & Co. Ltd. 13
IPC Business Press Ltd.	95 & 103	Tannoy Products Ltd. 29
IPC Magazines Ltd.	68	Tape Music Distributors Ltd. 11
ITT Consumer Products Ltd.	55	Transcriptors Ltd. 54
		United Dominions Trust Ltd. 81

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NATURE NOTES FOR OCTOBER

BY RICHARD MARGOSCHIS

THE BRITISH LIBRARY of Wildlife Sound has now been in existence for something over a year. I was very pleased to learn that the many recordings added during that period have included the complete library of the late A. G. Field. As an amateur, Tony Field produced many first class recordings of bird song, a number of which have been published on disc by the Royal Society for the Protection of Birds; it is good to know that this collection is now in safe keeping.

The British Library is particularly fortunate in having the services of Mrs Joan Hall-Craggs; at the end of June we spent a most enjoyable evening in London hearing her talk about the work of B.L.O.W.S. and play some of the recent additions to the collection. Joan Hall-Craggs is a musician and so her interest in bird song understandably takes a musical angle. She pointed out that at the beginning of the breeding season song is much more functional for the purposes of staking out a territory and gaining a mate. Then, as the hen settles down to the job of incubation the song, in her estimation and meaning of music, tends to become more musical. She believes that we should learn much more about the meaning of bird song if more musicians were to study it.

Songs that are used by birds for identification purposes must be sufficiently distinctive for the bird to express itself, not only as one of a species but as an individual of that species. Differences in the song of individuals of a species can often be heard quite easily but Joan Hall-Craggs went on to show how the more subtle differences could be demonstrated. One of the methods used was the "sonogram" in which the song is transferred from tape to paper and is shown as a pen line against time and frequency. This, of course, involves the use of a sound spectrograph which is an expensive piece of equipment, and so I was particularly interested in her other method which employed what I would call a form of shorthand. Suppose, for instance, you have a song phrase of seven notes in which the first three start with a slight drop in pitch; the next two are short notes having a rising pitch and the last two descend in pitch with a slight increase at the end. The phrase would be shown thus:-



There is no doubt that this is an excellent method of annotation and is capable of showing very slight differences in similar songs, although it does, of course, depend upon the worker's ear for placing each note in the correct spot of the frequency spectrum. It seems to me that here is a good opportunity for amateur recordists and musicians to get together and carry out some worthwhile research.

Are you *completely* satisfied with your field recorder? Does it have unnecessary appendages and does it lack facilities which you consider are important? I pose these questions specifically in connection with recording the sounds of nature because, as each month goes by, I become more and more convinced that what we who are really interested in this work really need is a

field tape recorder designed from *scratch* to carry out this very exacting job. When you are working in the field do you *really* require fast forward and rewind facilities? Do you really need the use of a speaker or is a headphone monitor point sufficient? do you need a tape indicator or variable tape speeds? does the meter need illuminating? is it vital to have erase facilities and what do you think about A/B monitoring? What self-respecting wild animal will stay near you when you produce the "clank" so often necessary to set a machine in motion? Is it really necessary to have to carry a machine weighing from 12 to 18 lbs. on your shoulder? There are many other points, too, which should receive consideration.

With these thoughts in mind sit back for a few minutes and consider just what your ideal machine would be like, not to record bands, people talking, railway trains and other similar sounds, but to record *truly* the delicate and relatively high frequency songs of our birds. Then jot some notes on a piece of paper and let me know what your ideal is. I shall be interested to hear about it and I know at least one manufacturer who will also be interested.

There is still time to book for the week-end course at Woodchester Park Field Centre if you contact me immediately and, remember, the closing date for the 'SCOTCH' Competition is coming up soon, Nov 30th.

Read
Natural History Sound Recording
 by RICHARD MARGOSCHIS

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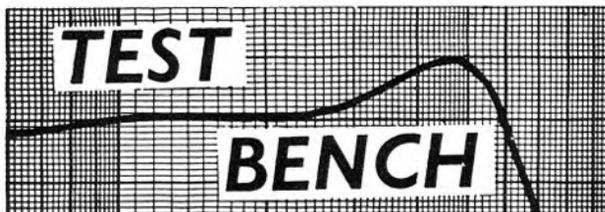
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GRUNDIG TK 121

MANUFACTURER'S SPECIFICATION

Grundig TK 121

Mains Voltage: 115V and 230V A.C. 50 Hz only.

Power Consumption: 43 Watts approximately.

Tape Speed: 3¾ ips.

Wow and Flutter: Equal to or better than 0.2%.

Recording Sense: Two track.

Frequency Range: 40 to 12,500 Hz.

Signal to Noise Ratio: Equal to or better than 52 dB measured with Grundig Low Noise tape.

Recording Level Indication: Moving coil meter.

Maximum Spool Size: 5¾ inches.

Fastwind Time: 220 seconds approximately for tape supplied.

Inputs: Microphone 100 mV, 100 kOhms Diode; 100 mV, 50 kOhm.

Outputs: High impedance 500 mV, 22 kOhm; External loudspeaker 4 Watts, 4 Ohm.

Loudspeaker: 7¼ inches by 3⅞ inches.

Dimensions: 15¼ inches by 11¼ inches by 6 inches.

Weight: 17¼ lbs. approximately.

Recommended retail price: £54.15.7d including purchase tax.

Distributors: Grundig (Great Britain) Ltd., Newlands Park, London, S.E.26.

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

GRUNDIG TK 121 TEST CHART

	Overall Response dB	Playback only dB	Signal-to-Noise Ratio dB	Distortion %
Frequency Hz	3¾ips	3¾ips		
31.5	-2	-3.5		
40	-0.5	-2.5		
63	-0.5	-2.3		
125	-1.0	-2.5		
250	0	+0.8		
500	0	+1.8		
1000	-0.5	+2.5	46.5	4.5
2000	-1.5	+2.8		
4000	-3.0	+1.3		
6300	-4.0	+1.0		
8000	-4.0	-1.0		
10000	-4.0	+0.5		
12500	-8.0	-2.0		
14000	-12.0	-4.5		
16000		-8.0		
Wow & Flutter	0.15%			

Notes: Overall Response figures relate to record and playback.

Playback Only relates to the reproduction of a 90 - 3180 calibration tape to DIN 45513 (this also conforms to NAB) referred to reference level at 333 Hz.

Signal-to-Noise and Wow and Flutter measurements are quoted as RMS figures in the table and therefore do not co-relate directly with the manufacturer's specification; see text for alternative readings for comparison purposes.

Test equipment used includes: Bruel and Kjaer Signal Generator, B. & K. Frequency Analyser Type 2107, B. & K. Lever Recorder Type 2305 etc., etc.

IN OUR New Products' section last month we reported on a completely new range of Grundig tape recorders; for this review we are examining the TK 121, the lowest cost of the open spool models. This machine uses a tape transport system and basic design concept that is repeated in some of the other more sophisticated - and therefore more costly - recorders, but the overall specification of these machines is similar. Our performance comments could be taken to relate to these other models as well as the TK 121.

At a retail price of a little over £50 including purchase tax the TK 121 is a

mains powered, half-track mono machine, complete with its own main amplifier and internal loudspeaker. It differs from earlier Grundigs in the provision of vernier-type slide controls for Volume, Tone and Record Level setting, in the single rotary lever transport selection, in overall styling and in specification.

The general appearance is impressive; it looks worth more than the asking price. Our job was to investigate its performance, and in particular we felt we should bear in mind the potential of the Compact Cassette system when examining open spool equipment in this price

range. The simple question that has to be answered: can we still get better audio quality from open spool equipment at a cost comparable to the price one would pay for a cassette machine? An affirmative would imply that there are good reasons for acquiring an open spool machine at this end of the price list; a negative could only mean that cassettes have surpassed and finally defeated the lower end of the market. Before going any further let us say that as a result of our investigation we do not believe this latter premise to be true. There are still definite advantages in opting for open

spool machines, but with the one qualification that they must now operate to a much higher standard than before. It was this high-grade performance that we were looking for in the TK 121.

Turning first to our frequency response tables we must comment very favourably on the overall figures which are well within specification and hold the promise of better quality than we can yet expect from cassette running at 1 7/8 ips. However this curve would not have been obtained had we not first checked – and corrected – the azimuth alignment of the single record/playback head. On the sample delivered the head was misaligned; this would not affect record-to-playback on the same machine but it would have meant a quality loss in the reproduction of pre-recorded tapes or in the playing back of tapes recorded on other machines with properly aligned heads.

In terms of the effort required to correct the fault it was very minor indeed – the work of a few moments with a screwdriver – but from the new owner's point of view it could be serious if he was not aware that the trouble existed. To be scrupulously fair it must be remembered that we are looking at one of the first of a completely new series of machines, a situation where one might expect to uncover weaknesses of this kind due to working with relatively unfamiliar inspection and testing techniques. Sure enough we did find a number of such deficiencies.

The overall response is probably an example of incorrect adjustment. It will be noted that the response falls off to a steady minus 4 dB between 6,300 and 10,000 Hertz, followed by minus 8 dB at 12,500 Hertz. In fact the machine should be within 3 dB over the whole of this range.

Discussing this phenomenon with Grundig's chief engineer it was agreed that the bias setting in the review sample was inaccurate and so a special check will be carried out to ensure that both azimuth and bias are correctly aligned on all the models delivered to retail shops. Similarly we found our review machine had a squeak in the clutch mechanism, and this too will be subject to special attention at the Grundig works. One of the purposes of a review is to ensure that the manufacturer's notice is brought to matters of this kind – they are not fundamental faults in either manufacture or design but are caused through incorrect or inadequate pre-release check procedures.

We should mention here that the tape used for all our testing was the spool supplied with the machine; a decrease in bias would undoubtedly pull back the upper end of the response curve as measured on this tape, but there would

also be a fractional deterioration in signal to noise measurements.

Our normal method of evaluating and publishing noise levels is to quote an R.M.S. figure, so for the sake of consistency we have adopted the same formula in our table. This gives us a reading of 46.5 dB, and is useful for comparison purposes when looking at other reviews of other equipment. The manufacturer's claim, however, is to the DIN standard and weighted to the "A" scale we obtained a noise figure of 54.0 dB, slightly better than specification.

We have a similar situation when we look at wow and flutter, the worst R.M.S. figure being 0.15%, the DIN equivalent being 0.19% as compared to the claim of 0.2%. Short term speed stability is appreciably better at the beginning and end of the tape, so we took our readings at the worst point i.e. near the centre of the spool.

Long term stability in the TK 121 is unusually good. Using an electronic counter the reproduction of a 333 Hz. signal gave us 333.4 at the beginning of the tape and 334.4 nearer the centre. Such tiny variations mean that there could be said to be no audible long term speed differences in the sample measured which in this respect was coming up to some of the best machines we have examined.

When looking at distortion it has to be remembered that "under 5%" is regarded as normal in Continental equipment at this price level. We found that when recording a 333 Hz. tone to the maximum permitted level as shown on the internal meter the signal was 5 dB above reference level and it contained 4.5% harmonic distortion. As such it was within the normal German specification.

In the UK, however, we like to think of "under 3%" as representing one of the criteria for "high fidelity", so we experimented by dropping the signal 2 dB. At this level we are still above the reference tone on the calibration tape, but the internal meter reading dropped from 70 to an approximate 60 and distortion was reduced to exactly 3%. In practical terms this means that the discriminating owner should slightly under record – certainly never allow the needle to pass into the red segment above 70 on the dial. Such a technique will ensure distortion levels comparable with the best domestic machines, although there will naturally be some slight deterioration in the signal to noise ratio.

The above comments relate specifically to record/playback distortion. On playback only the measurement was 1.0%, which is excellent.

Checking outputs and inputs we found that the reproduction of the reference level 333 Hz. tone gave 620 mV at the

line out socket and sensitivity of the microphone and diode inputs was 830 micro-volts, slightly less than the claimed 1 mV. Both these input circuits are equally sensitive, and it would be possible to overload the diode from some accessory equipment. Where this occurs it is only necessary to use an attenuator lead to bring the signal down to a manageable level.

Power output at the external speaker socket was found to be exactly 4 Watts into 4 Ohms at 3% distortion which agrees with specification. Neither the Tone nor Volume controls affect the line out signal, but both become operative as soon as one listens via the internal speaker or by a speaker connected to the external socket. The single slider controlling Tone has a central click stop indicating "flat"; it moves against a numeric scale with "maximum treble" at one extreme and "maximum bass" at the other.

This could be regarded as somewhat misleading, because we found that when moved to the maximum bass setting there is a very slight bass lift associated with a cut in treble response in the order of 6 dB per octave with a turnover frequency of 2 kHz. Similarly maximum treble has little effect on the upper frequencies but it does give a slight bass cut. From these comments it will be seen that the Tone control functions unconventionally to give what amounts to a "loudness compensation" such as is provided in a number of main amplifiers. We regard this arrangement as more complex and better from the point of view of practical use than a simple top cut such as is normally found in equipment at this price.

Finally we looked at electrical safety; this appeared to conform to the necessary high standards apart from the fact that slots in the grille on the underside are immediately below live mains terminals on the motor. It would be possible for the blade of a screwdriver or a hair-pin to be inserted and so cause an accident. When making this internal examination we noted a number of slivers of metal adhering to the loudspeaker magnet. These should have been removed at the factory since they could cause electrical damage.

So much for the technical investigation. We had certainly found a number of points to criticise, but making allowances for the fact that this was a new model plus the manufacturer's assurance of attention to these matters we were left with a machine capable of what can only be described as an excellent performance potential at its price. There is no doubt that this is in advance of that of the cassette, and so we had already answered the question posed at the beginning of this review. One of

the reasons for acquiring open spool equipment at the lower end of the price range is still the very worth-while one of better audio quality.

Coming next to the user part of this investigation we must again refer to appearance. Both design and styling are first rate. With black and silver trim the machine has a solidity and functional efficiency that inspires confidence. The three vernier slides operate smoothly; the rotary tape transport control lever is massively built and positive of action. The only caution here is a warning to turn deliberately but firmly into the desired function position using care not to over-run. We found that the effect of the careless use of too much force was to rotate past the required function into another. As a matter of interest we "crashed" the lever backwards and forwards several times from Rewind to Stop to Pause to Start and then on to Fast Forward and instantly back through the same sequence. In spite of the strain on the mechanism neither the machine nor the tape suffered the slightest damage; we would, however, not recommend the user to maltreat his equipment in this way.

Mains On/Off is by push button and when power is applied the large, clearly marked meter scale at the front of the machine is illuminated, as well as the various function positions around the main control lever. Another similar push button provides Record. Also on the top deck plate is a four-digit counter protected by transparent perspex and a sprung slide covering the DIN connection for microphone input. We wondered why it was necessary to conceal the microphone input in this way but soon discovered that the slide serves another purpose; when open — which it must be for the plug to be inserted — it actuates a speaker muting switch! All very ingenious and typical of the thought that has gone into the design of this model. Similarly we were sorry to find the meter built into a console in front of the sound channel — this arrangement invariably makes it difficult to get to the heads for cleaning. But not with the TK 121. The front of the head cover easily slides off leaving the meter where it is. Congratulations to Grundig for a very clever idea.

Inputs and outputs all use DIN-type connections placed in the rear of the machine. The instruction book warns that one of these (which at first glance appears to be standard DIN but isn't) is for the direct connection of a telephone adaptor which cannot be used in the U.K. Our Post Office regulations prohibit the use of such appliances which is a pity. The mains cable, permanently fixed, is neatly housed in a compartment within the underside and spare fuses are clipped to

the cover of the fuse housing. That in itself is evidence of practical thinking at the design stage, but Grundig have gone one better. The clips holding the spare fuses are made in such a way that the user can see at a glance whether or not the spares are in place *before* undoing the retaining screw that fixes the cover. That is surely thoughtfulness plus!

Generally the instruction booklet is clear and well illustrated. It does not, however, go out of its way to make it clear to the user that the 5-pin DIN socket referred to as "Diode" is in fact a Record/Playback facility offering a Line Out connection for use with an existing amplifier or for the connection of another tape recorder for copying purposes. This fact is dismissed in a single sentence at the bottom of a paragraph and could be overlooked very easily. Neither does it emphasise sufficiently the need to bring the rotary control lever into the Stop position to avoid putting a flat on the composition pinch wheel if left in the Run position for long periods without mains being applied. Follow the simple rule: always turn to Stop at the completion of any other function and you can't go wrong.

Checking playback first by reproducing some half-track prerecorded tapes we were pleased to note that there is more than enough "quantity" to satisfy any ordinary user. The Volume slide runs against a scale marked from 0 to 9. At setting 5 there was plenty of sound in a fair-sized domestic room. At maximum it was unbearably loud although distortion was still under control. These comments of course refer to the internal loudspeaker. When connected (via the DIN socket at the rear) to a main amplifier and full-range loudspeaker the quality of the sound left little to be desired. Such noise as there was came in the form of high frequency hiss (one of the least objectionable forms of noise interference) and there was no audible hum at all.

Recording is a positive joy. The meter clearly indicates peaks and is fully under control all the time, thanks to the ability to set levels precisely through the use of the appropriate slider. Only criticism here is of sensitivity; with many tuners or amplifier tape outputs the slider would be down at its lowest setting. Our signal was taken from a Quad 22 control unit and the slider was fractionally below 1 on the 0 to 9 scale. It would have been better had we used an attenuator lead to bring the signal down to a level that could be adequately handled at around mid-scale.

The more we use this machine the more we come to like it. One normally speaks disparagingly about audio quality from internal speakers, but this is one of the 121's strongest points against the

cassette competition. The sound it produces is so much better than that from the small cassette equipments as to make the latter seem very feeble indeed. One can really enjoy the playback of a tape without the use of any extra equipment at all. And there are a number of other pluses too. The microphone supplied comes neatly packed in its own padded container complete with desk stand. Very impressive indeed.

Our conclusions, then, are that the Grundig TK 121 offers a high quality potential at low price. It incorporates some very good and thoroughly practical ideas and will give the quality-conscious man who is working to a limited budget a complete record/playback system of which he will be proud. Of robust construction the equipment could be handled by other members of the family without fear of costly damage, whilst at the same time it is smart enough to grace the most elegant decor. In a sentence: a sophisticated product that can only bring credit to the famous name of its maker and a great deal of pleasure to its owner.

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Music

Musicassette Reviews

Consultant Critic Katinka Seiner

AFTER MIDNIGHT, with Billy Eckstine, Shirley Horn, Robert Farnon, Sarah Vaughan, Brook Benton, Benny Couroyer and Dinah Washington. Double l.p. Mercury 7560 001 71s. 6d. including purchase tax.

Philips Records Ltd. have courageously produced a new series of "double l.p." Musicassettes, each comprising two full-length albums in a single cassette, and we are pleased to be able to include these in our regular review. It will be appreciated that one of the features of programmes of this extended timing must be the use of thinner tape and we have noted a quality improvement which might well be accounted for by the fact that a reduction in tape thickness will assist in maintaining better head-to-tape contact. Certainly the audio quality of this collection, entitled "After Midnight", leaves little to be desired.

With no fewer than twelve items per side the total repertoire becomes quite formidable. This album gives us a choice selection of melodies and singers, all appropriate for the wee small hours, and includes: *Stella by starlight*, Billy Eckstine; *That old black magic*, Shirley Horn; *Only the lonely*, Robert Farnon and his orchestra; *Imagination*, Sarah Vaughan; *Moonlight in Vermont*, Brook Benton; *Blue and sentimental*, Benny Couroyer; *Wee small hours*, Dinah Washington; *I apologise*, Billy Eckstine; *Nancy*, Robert Farnon and his orchestra; *Let me love you*, Shirley Horn; *I'll be around*, Brook Benton and *I'll close my eyes*, Benny Couroyer. And that's only side one!

The marathon continues on side two with: *Love me*, Sarah Vaughan; *Everything I have is yours*, Billy Eckstine; *The very thought of you*, Benny Couroyer; *I'm a fool to want you*, Dinah Washington; *But beautiful*, Brook Benton; *All the way*, Robert Farnon and his orchestra; *Go away little boy*, Shirley Horn; *Tonight*, Billy Eckstine; *I hear a rhapsody*, Benny Couroyer; *Live for love*, Sarah Vaughan; *After midnight*, Brook Benton and *All or nothing at all*, Robert Farnon and his orchestra.

The effect of telescoping two complete albums together is to give extended playing time without the need to break into the programme so often for turning over and, of course, double the choice of repertoire. Here the selection is tasteful. The music happily lulls the listener into a sense of euphoria when enjoyed as a background accompaniment to other occupations or alternatively it can be appreciated as quality sound in its own right.

One of the reasons for producing cassettes of this length is to make it easier for the motorist to forget the cassette and to concentrate on his driving with a minimum of interruption. Having played a number of these double l.p.s. whilst on the move I can confirm that they do succeed in this aim. Also the programme offered here is admirably suited to driving, giving sufficient change to keep the driver alert without sending him into panics through the use of sudden blasts of sound or strange noises.

So far as performance is concerned it will not be possible to discuss albums of this length in any detail. Personally I found Sarah Vaughan and Dinah Washington to be my favourites in this collection, although Shirley Horn with *That old black magic* performs some very potent witchcraft of her own. All the numbers flow gently one into the other and the whole offers exceptionally good value for money. If bought as two separate albums the price would be twice 47s. 6d., 95s.; as a double l.p. at 71s. 6d. it effectively reduces total cost by more than £1. Well worth the investment.

13 CLASSICAL MASTERPIECES. Double l.p. Philips 7505 002. 74s. 6d. including purchase tax.

The price structure of the new double l.p. Musicassettes includes slightly higher rates for the classical repertoire, and as a matter of interest the Sinatra albums also come in the more expensive bracket. However, the single cassettes also sell on a similar two-tier arrangement with classics costing 49s. 11d. each so the saving is still considerably more than £1. And the other benefit is in quality improvement; this particular album is one of the very best Philips releases I have heard.

As might be expected the list of items covers the broad field of lighter and more popular classical pieces, not that any of them are any the worse for that. The Dresden Philharmonic Orchestra under Herbert Kegel gives us: *Warsaw Concerto* with Siegfried Stöckigt at the piano, *Intermezzo* from "Notre Dame" by Franz Schmidt, Khatchaturian's *Waltz and Gallop* from "Masquerade," *Intermezzo* from "Cavalleria Rusticana" by Mascagni, *Polovtsian Dances* from Borodin's "Prince Igor" with Radio Chorus Leipzig and four popular violin pieces by Kreisler with Egon Morbitzer violin (and Kurt Masur conducting) *Liebesleid*, *Liebesfreud*, *Schön Rosmarin* and *Caprice viennois*, a single item from Das Grosse Orchestra Des Deutschlandsenders with the Berlin Radio Soloists is Offenbach's *Barcarole* from "The Tales of Hoffman". The Leipzig Radio Symphony Orchestra bring us Rachmaninoff's *Prelude in C sharp minor*, Opus 3 No. 2., again with Siegfried Stöckigt at the piano and *Clair de lune* by Debussy. The Orchestre des Concerts Lamoureux performs Chopin's *Grande valse brillante*, Opus 18, from "Les Sylphides" under Jesus Etcheverry and *Ritual Fire Dance* by de Falla under Roberto Benzi. In this truly cosmopolitan collection we have another piece by Khatchaturian, his *Sabre Dance* performed by the Hague Philharmonic Orchestra conducted by Witold Rowicki and finally in conclusion Waldteufel's *Les patineurs (the Skaters)*, Opus 183, by the Vienna Symphony Orchestra conducted by Wilhelm Loibner.

What a collection! Just think back to the days of 78 rpm gramophone records. Goodness knows what the cost of such a library (for that is what it is) would then have been. Quite

enormous, I'm sure. Yet now we get it all on single, neat, easy-to-use cassette at a price that would leave old-time record buyers gasping with astonishment. And they would be no less surprised by the audio quality, at which even a contemporary critic is entitled to express an equal astonishment. In particular the solo piano comes over extremely well. Many of the masters from which this album was made up had originally been recorded by VEB Deutsche Schallplatten of Berlin and they are to be congratulated on the value of their achievement, just as the Philips engineers should receive acknowledgement for retaining that fine standard in their cassette version.

Of all the double l.p.s. I enjoyed this one the best. Every single item has been heard before – over and over again. Yet this is classical music that can be appreciated by young and old, by the sophisticated and the novice. It's all pleasure all the way and as such it is an album I shall treasure. And for motor car use I found it ideal in spite of the fact that the dynamic range is wide. Perhaps the reason is that the works are so well known it is impossible to be taken by surprise at the loudest passages. An album that can only be strongly recommended.

CYRIL STAPLETON – Women in Love and Other Great Waltzes. Pye ZCP 18330 47s. 6d. including purchase tax.

This cassette is one of the first from the new firm Precision Tapes. With part ownership vested in General Recorded Tapes of America the London company has been able to call on the vast experience of the American concern in the manufacture of pre-recorded material. One might have hoped, therefore, to have a really outstanding quality standard. As it is, first releases are by no means remarkable; one or two have an unnatural "boxiness" or artificial resonance spoiling what would otherwise be a good quality cassette. Typical is this Cyril Stapleton collection. It has a thoroughly gramophonic sound that is far removed from the reality of strings.

Comprising a number of theme tunes all with the common factor of "women in love" it could have made an interesting and enjoyable album. As it is the falseness of the sound – almost an old-fashioned, cinema-like quality – spoils it for me. The repertoire includes: *Women in love*, *Hushabye mountain*, *Romeo & Juliet*, *A taste of honey*, *The last waltz*, *Lara's theme*, *Edelweiss*, *Jean*, *Moon river*, *Peyton Place* and *Ballerina*.

The underlying thought and programme balance is good. Perhaps the dated quality is due to the use of elderly masters – it certainly sounds like it. A pity because the level of back-ground noise is remarkably low and with modern "presence" recording techniques the whole could have been dramatically good.

Instead we have a cassette that will not be played too frequently.

SINATRA AT THE SANDS WITH COUNT BASIE. Double l.p. Reprise 7420 002 74s. 6d. including purchase tax.

This double l.p. is a double bonanza for Sinatra and Basie fans. With a total of twenty-one items shared between them it's nothing short of a Sinatra/Basie Festival. With live audience reaction at The Sands.

Recently we had to offer adverse criticism of the Sinatra performance – a brave thing to do! In this collection there is none of the lethargic feeling of advancing years which had to be mentioned previously. To the contrary, Sinatra here is vibrant and stimulating. Perhaps it's the effect of the audience. Or Basie. Whatever the cause we are back to Sinatra the entertainer *par excellence* in perfect control of his own voice and of his "guests". They demonstrate their enjoyment noisily, and one can't blame them.

Menu for the night includes: *Come fly with me, I've got a crush on you, I've got you under my skin, The shadow of your smile, Street of dreams, One for my baby, Fly me to the moon, One o'clock jump, Frank Sinatra monologue, You make me feel so young, All of me, The September of my years, Get me to the church on time, It was a very good year, Don't worry 'bout me, Makin' whoopee!, Where or when, Angel eyes, My kind of town, Sinatra closing monologue* and again *My kind of town*.

The sleeve notes take us through the repertoire with appropriately Americanised atmospheric information. Almost a book about the cassette, and about the thoughts and the comments of the customers. Actually it suits the Sinatra free-and-easy chat between numbers where he shows himself to be in complete command of the situation all the time. Sinatra is boss, and the diners know it.

These double l.p. cassettes are, of course, precisely the same physical size as any other Compact Cassette – they must be to fit the mechanism. But the plastic case for a double is larger than that of a single. Reason: to accommodate the voluminous programme card and, in some cases, sleeve notes. It is amazing how much text can be squeezed on to a quadruple folded card and this particular one takes maximum advantage of it.

Difficult to say which of the numbers warrant special mention. Perhaps it is sufficient to say that they are all up to the best standard of the performers, and as such they represent the cream of the Sinatra/Basie repertoire.

Recorded quality is good. Very good. The voice is always well in the foreground and every word can be heard as clearly as if he were to be in the listening room whilst it is being played. Many a younger singer could take a few lessons from his technique. Greatest impact is from the sense of fun and enjoyment that comes right over from this cassette, an album that is really a recorded show. When Sinatra laughs and jokes, as he frequently does, the audience laughter is so genuine. This is not the rehearsed applause of the television show but the spontaneous response of real people. As such the sincerity of the event is transparently clear and in its recorded form it gives the listener a deep and lasting satisfaction.

This is an album to listen to in bits and pieces, at odd times, at moments when one wants to be cheered up. And in the car. It suits mobile use very well indeed. If you have to take the children the funny lines will make them laugh too and so brighten up what might otherwise be a dull trip. No snags here, so recommended.

MARY POPPINS. Original soundtrack with Julie Andrews and Dick Van Dyke. Reprise ZCBV 4026 47s. 6d.

Unlike some show and film music this album has a slightly "tinny" quality about it that detracts from listening enjoyment at the beginning. Pity, because thousands have seen

and loved the film and many might be put off acquiring the cassette as a permanent memento of a happy occasion.

The generous selection of numbers includes: *Overture, The perfect nanny, Sister suffragette, The life I lead, A spoonful of sugar, Pavement artist (Chim chim cheree), Jolly 'oliday, Supercalifragilisticexpialidocious, Stay awake, I love to laugh, A British bank (The life I lead), Feed the birds (Tuppence a bag), Fidelity Fiduciary Bank, Chim chim cheree, Step in time, A man has dreams (The life I lead, Spoonful of sugar) and Let's go fly a kite.*

I can't help feeling that some of the troubles with this tape must lie with the original recordings. Some of the numbers are really excellent – most of the objectionable sound occurs in the orchestra sections, particularly the *Overture* at the beginning. Rendering of the voices does tend to make up for the other deficiencies, so those of my readers who feel themselves hell-bent for an evening of utter depravity are recommended to Mary Poppins.

NANCY & LEE. Nancy Sinatra and Lee Hazlewood. Reprise ZCR 6273 47s. 6d. including purchase tax.

Another offering from Precision, and this time with very much better quality. Again we have the benefit of an extremely quiet background, but now it is plus better overall recording standards so the whole is most acceptable. Nancy and Lee have voices that complement each other; both are lazy and sensuous – both convey a great deal more than they sing.

The album is made up of: *You've lost that lovin' feelin', My elusive dreams, Jackson, Greenwich village folk song salesman, Summer wine, Storybook, Children, I've been down so long it looks like up to me, Jackson, Some velvet morning, Sundown Sundown and Ladybird.*

These are two artistes who know exactly what they are doing. Together they work to create an atmosphere, and they succeed in the first few bars. The feeling is then sustained throughout the length of the record and when it's all over one has a sense of loss. There's a fascination about them. I'm not sure that it's a healthy fascination, but it fixes the listener with the inescapable persistence of a snake mesmerising its victim. Not a very flattering comparison, yet it sums them up perfectly. Cold-blooded, without a hint of real warmth, and yet indisputably beautiful.

So this collection is regarded with somewhat mixed feelings. I like it in spite of myself and I suspect that you, too, will find yourself experiencing similar emotions of reluctant admiration. And, as I said before, at the end of the programme there's that queer sense of loss. Odd, isn't it?

With the advent of the new "Dolbyised" Musicassettes we shall clearly state in the review notes if any individual cassette has been recorded to the Dolby B characteristic and shall comment on its performance when heard on ordinary equipment as well as the sound quality that can be heard when a machine fitted with Dolby circuitry is used. In the lack of any such reference it can be assumed that the cassette under discussion is "standard" or "non-Dolbyised".

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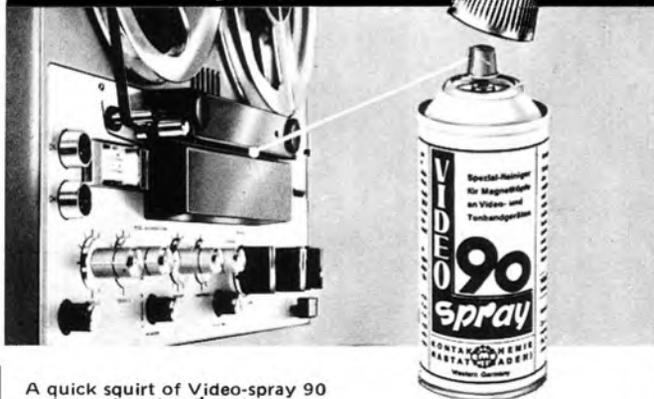
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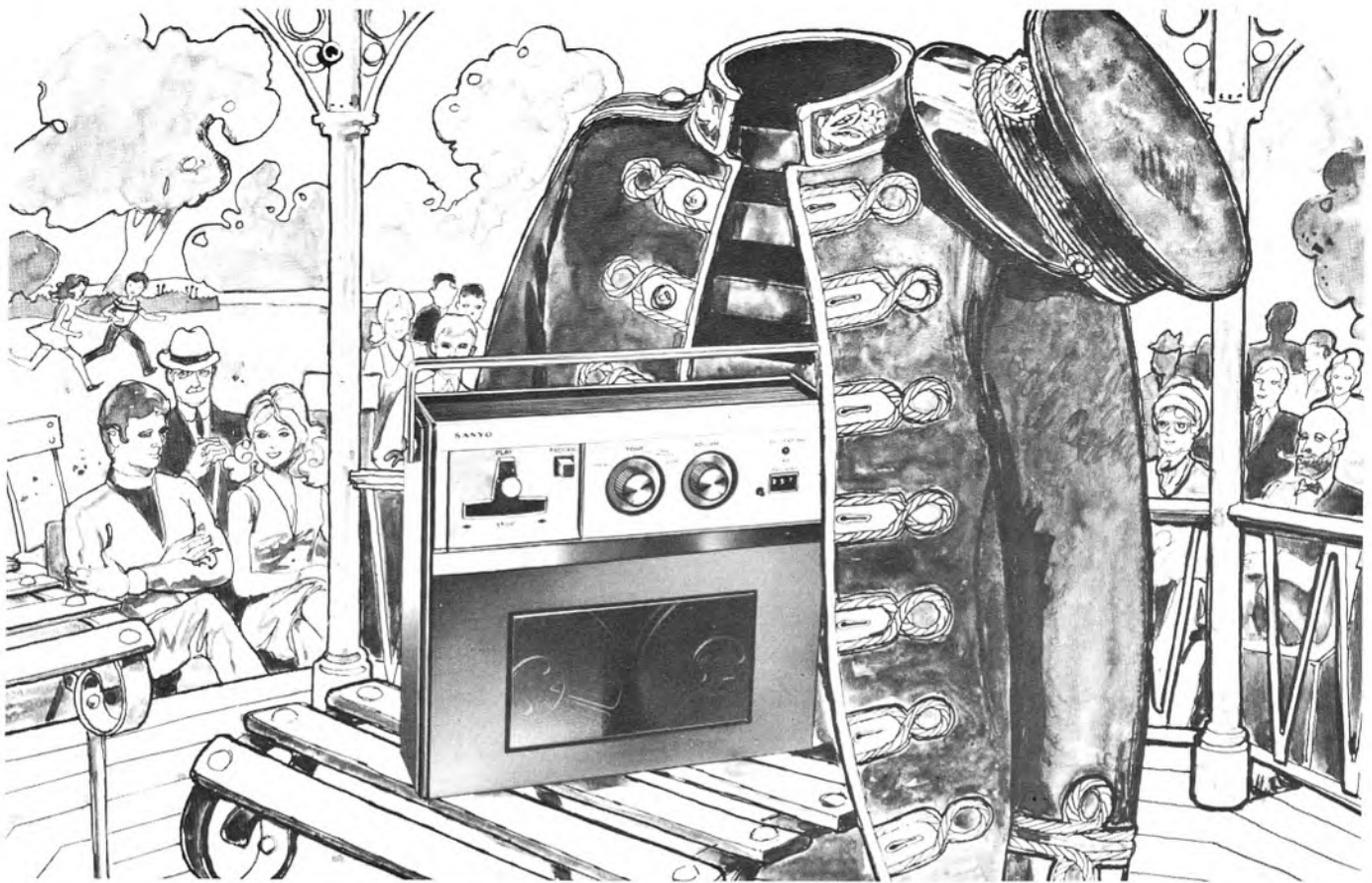
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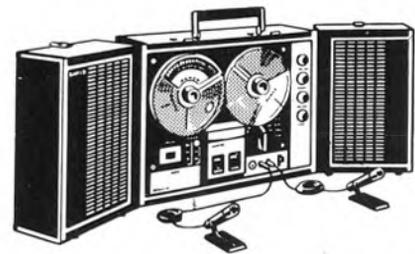
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