

the TAPE RECORDER

PRICE 1/6

SEPTEMBER 1961

Vol. 3 No. 8

INCORPORATING "SOUND AND CINE"



IN THIS NUMBER

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- Tape Recorder Workbench
- Home Recording — Filing and Indexing Tapes
- A 4 Megacycle Recorder
- Reviews of Tape Records
- Details of New Products
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- Sound and Ciné

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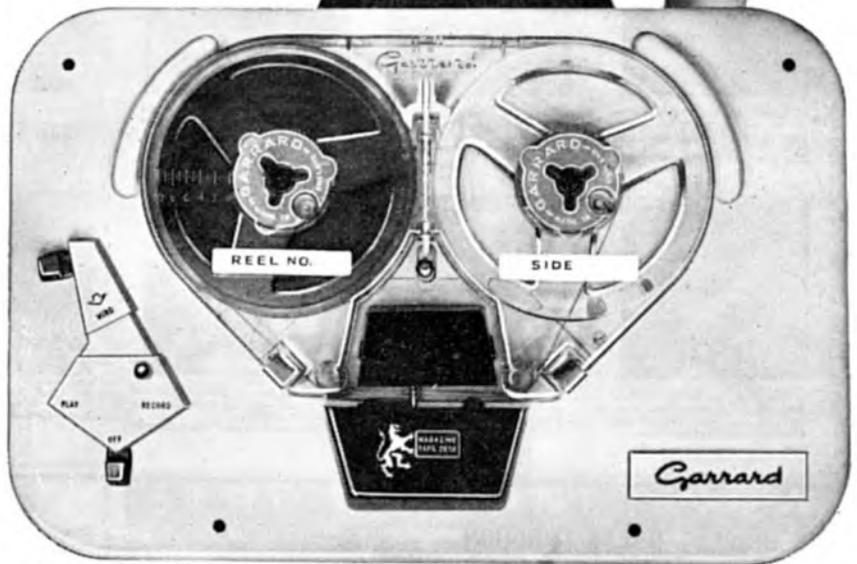
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38. Hervey Alan, Ian Wallace, Marion Grimaldi and chorus sing the immortal Cobbler's Song, Robbers' Chorus, Chu Chin Chow, etc. Disc: mono/stereo. Tape: mono only



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20. Answer Me, Nature Boy, Ruby and the Pearl, 8 more sung in the unique Nat King Cole manner. Disc/Tape: mono only



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22. 12th St. Rag, Isle of Capri, Smile, Blue Moon. 12 characteristic numbers from the Duke. Disc/Tape: mono only



46. Elizabeth Larner, Andy Cole, Peter Knight singers. Exciting 'double' featuring highlights from two famous shows. Disc: mono/stereo. Tape: mono only



47. Brahms Violin Concerto. Superb playing by Endre Wolf and Sinfonia di London, under the baton of Anthony Collins. Disc: mono/stereo. Tape: mono only

THE BIGGEST BREAK-THROUGH SINCE TAPE RECORDING!

Not only is this the greatest World Record Club introductory offer yet made... it is a unique offer never before matched by any record club or company anywhere in the world!

Any 3 for 30/-... Tape or Disc!

Choose now any 3 titles from the varied selections shown above. Next, decide whether you prefer them as high-fidelity 3 1/2 ips pre-recorded tapes, or as high-fidelity 12" LPs. Either way the price is the same. Just 3 for 30/- tape or disc. That's only 10/- each!

Unconditional Guarantee

When you receive your 3 titles you have 7 days in which to listen to your selections and decide whether or not you want to keep them. If you don't, just send them back and you owe us nothing. This guarantee is absolutely unconditional!

Joining World Record Club

We know however that you'll not only be surprised but amazed. A host of new technical developments have gone into the production of these tapes. They provide, at 3 1/2 ips, a range and response that was never previously attainable at

this slow speed. The LPs too, are the equal in quality of the world's best. We believe you will be anxious to keep them (if you do, you'll be saving up to £6 on shop prices for the tapes, or up to £4.10s. on the LPs). This decision will make you a full member of World Record Club, entitled to share all the many extra unique facilities that make the Club the only one of its kind in the world.

Your only undertaking is to agree to buy four more tape records (or 12" LPs) over the year from the exciting and adventurous selection of at least 60 titles that will be offered to you. Each of these future Club releases will cost you only 29/- plus postage. Tape or 12" LP—both cost the same. Again, far, far below any comparable shop prices for an original full length star recording. This is only possible because of the Club system of direct-by-mail distribution.

The more you buy the more you save!

If you buy more than your agreed 4 (and most members do) you can choose yet another title absolutely free for every 3 extra selections!

Your benefits as a club member

- * FREE monthly magazine, packed with illustrated feature articles!
- * FREE bonus tapes and 12" LPs!
- * EXCLUSIVE extra releases!
- * SPECIAL concert and theatre price concessions!
- * EXPERT GUIDANCE: WRC recordings are planned by an eminent advisory panel including the Countess of Harewood, Lord Montagu of Beaulieu, Sir Arthur Bliss, Richard Attenborough, Cyril Ornadel, Ray Ellington, Leon

Goossens, Malcolm Arnold, Steve Race, John Hollingsworth and Antony Hopkins. As special technical adviser on tape, WRC are privileged to have the services of Miles Henslow, editor of this magazine and distinguished authority on electronics.

Your Guarantee of Quality

WRC guarantees that every tape or record you choose (introductory offer, regular selection or bonus) will be of absolute top quality—the equal in every way of the very best recordings available anywhere in the world today.

You may return any tape or record with which you are not entirely satisfied.

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- Moussorgsky: Night on a Bare Mountain etc., Sargent/LSO
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Select the 3 titles you would like. Fill in and post the coupon today. Remember to indicate whether you require tape or disc. Send no money now. This is an opportunity you cannot afford to miss!

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34. Stardust, How High the Moon, Nearness of You, 'Round Midnight... 8 numbers by the vibraphone genius, Lionel Hampton. Disc: mono/stereo. Tape: mono only



35. 'O! Man River, Bill, Make Believe, many more memorably sung and played by full star cast. Disc: mono/stereo. Tape: mono only



36. Beale St. Blues, After You've Gone, 12 hits by one of the world's greatest trombonists. Disc/Tape: mono only



37. Thrilling playing: Revolutionary Studies, Polonaises A and A-flat, Fantasy-Improvis. 12 favourites in all. Disc/Tape: mono only

ANY 3 FOR
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42. George Browne, Isabelle Lucas and chorus sing Jericho, Swing Low, 12 well-loved songs. Disc: mono/stereo. Tape: mono only



43. Andy Cole, Barbara Leigh, Mike Sammes singers: High Society, Three Coins, Harry Lime, Gigs, 11 top film hits. Disc: mono/stereo. Tape: mono only



44. Leopold Ludwig and LSO in an exciting 'double' two of the world's greatest symphonies. Disc: mono/stereo. Tape: mono only



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45. Ian Wallace, Joyce Blair and chorus. Some Enchanted Evening and all the unforgettable songs from this great musical. Disc: mono/stereo. Tape: mono only



46. Marlon Grimaldi, Linden Singers and Orchestra. Deep in My Heart, Serenade—all the old favourites. Disc: mono/stereo. Tape: mono only



49. Beethoven's Fidelio, Brahms' St. Anthony Vars, Mendelssohn's Hebrides, Wagner's Siegfried Idyll. All under Britain's greatest young conductor. Disc: mono/stereo. Tape: mono only



50. David Hughes, Barbara Leigh, Andy Cole and chorus sing Indian Love Call, Rose Marie, many many more. Disc: mono/stereo. Tape: mono only



51. They Can't Take That Away From Me, Baby Doll, It Only Happens When I Dance With You, 12 favourite songs from the great Fred Astaire. Disc/Tape: mono only

FACTS ABOUT WRC TAPE RECORDS

By the use of new electronic techniques, World Record Club is able to offer, at 3½ ips, tapes of a standard previously unattainable at less than 7½ ips.

All are recorded on the same high-class Emitape as that used for professional recordings, with extended frequency response. The tapes are twin-track and can be played on either 2 or 4-track recorders. The spool size is 5".

At this stage all WRC 3½ tapes are *mono* only. However for stereo enthusiasts we have something special too:

STEREO TAPE RECORDS (7½ ips TWIN-TRACK)

An exciting catalogue of 7½ ips pre-recorded tapes *in stereo* only has just been prepared. These are *not* exclusive to club members and may be ordered direct by anyone individually and without membership commitments. Stereo tapes are on 7" spools and run at 7½ ips only. The reproduction quality of this series is fantastic and must be heard to be believed. Stereo tapes cost from 50/- to 60/- depending on playing time, plus 3/- postage, packing and insurance. A list of titles will be sent on receipt of a postcard to the Club, marked STEREO. Do not use the coupon for this stereo list unless you are also joining WRC.

SEND NO MONEY NOW

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THE LITTLE GREEN, RICHMOND, SURREY

I wish to join World Record Club as a

Tape member (3½ ips pre-recorded tapes)	Disc member (12" LPs)
--------------------------------------------	--------------------------

(Please tick which you *want* to be. Members must select *all* disc or *all* tape—unfortunately it is not possible to mix.)

Please send me the three titles of my choice as indicated. If I keep them beyond 7 days you may enrol me as a member of World Record Club and I will pay you 30/- plus 3/- postage/packing/insurance. As a member I agree to choose a minimum of 4 releases at 29/- each (plus postage) from your annual programme of at least 60 exclusive selections. After 1 year I may cancel my membership with no further obligations if I so choose.

All records/tapes supplied to me are covered by your 7 day unconditional guarantee.

Signed

This offer applies in Gt. Britain & N. Ireland only.

SPECIAL NOTE FOR TAPE MEMBERS ONLY

Because of the Club outlay involved in setting up its new tape division, we ask *tape members only* to agree to pay £1 deposit *AFTER* approving their first 3 choices.

(Send no money now) This deposit will be deducted from the price of your 4th selection

Place record/tape numbers only in boxes

1st Choice No.

2nd Choice No. 3rd Choice No.

Tick here if stereo 12" LPs required where available

Tick here if 7½ stereo tape leaflet also required

Mr/Mrs/Miss

(Block capitals please)

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★ Brilliant new microphone ★ Socket outlets for exciting range of accessories.

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GS. 14



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★
EDITORIAL

MEMBER OF THE
AUDIT BUREAU
OF CIRCULATIONS

THIS month we have good news for owners of tape recorders—and big news too. As all our readers know, we have thumped the "Tape Records" drum vigorously and periodically for more than two years, pressing and urging for some definite action. And now, suddenly and from the most unexpected quarter, they are here! Not one or two—not a selected highbrow catalogue for the few—not in a form, or at a price, that would rule them out of court for the majority—but in potential profusion—pops, classics, the lot—recorded at 3¼ i/s for the wide domestic market, and spooled on 5 inch reels to make them suitable for playing on almost every domestic recorder in the country!

For this most unexpected surprise we have to thank *The World Record Club*: and the news reached us so late that we nearly missed it for the September number. Thus it is that we are only able to give outline details. If last minute changes make it possible, we will try to include additional paragraphs in the news sections of the magazine; and as we write a re-shuffling is taking place elsewhere, to see whether it is possible to accommodate an advertiser's announcement in our advertising pages. Failing this, we recommend every interested reader to write to the *World Record Club* for full details—for this is a bold and enterprising move on their part, and one which deserves the full and immediate support of everyone who has waited so long for a tape records catalogue.

The important details that we have been able to verify so far are as follows; the catalogue will comprise *Everest* recordings (U.S.A.), which are reputed to be among the finest available; *Ariola* recordings (Germany) some *Capitol* and other American titles; also recordings made in Britain by the *World Record Club* itself. The tapes are being duplicated by the record and International Division of *E.M.I.* for the *World Record Club* from the Club's own master tapes. It is planned to release approximately 80 titles per annum, and to make them available to club members on a similar basis to that presently operating for the Club's disc programme. It is in this decision that we see the boldness and really enterprising thinking of the organisers, for it is their intention—as from August 27th 1961—to release discs and tapes, side by side, of all their new titles—and at the same price.

Thus it seems that, beginning almost co-incidentally with the publication of this number of the magazine, we are to see the first units of this new tape catalogue on offer—at a price of about 22s. 6d. per title, and of a playing time identical with corresponding l.p. discs. We calculate this price on the basis of the cost of discs to W.R.C. members, for membership brings the first three titles at 10s. each, with an undertaking from members to purchase four additional titles in the following 12 months at the usual Club price.

This is not the normal place in the magazine for commercial

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hand-outs or product reviews; but we are certain that our readers will agree with us that the occasion merits it. We thank the World Record Club for their enterprise in filling such a long felt need. We wish them every success in their exciting venture, and we hope that readers of *The Tape Recorder* will give them a good send-off by supporting it with the enthusiasm that it deserves.

* * *

Tape Recorder—A.B.C. Circulation Figures

★ In this column, just over a year ago, we announced that our membership application for the Audit Bureau of Circulation had been accepted, both for this magazine and its sister journal *Hi-Fi News*.

In that same issue (Vol. 2 No. 7, August 1960) we introduced the ABC monogram above, and noted that it was with a fair mixture of pleasure and anticipation that we did so, for we looked forward to the publication in due course of the official, audited circulation figures which would be studied by all interested sections of the industry as a barometric indication of progress—or otherwise. The first published figures covered the period from January to June 1960, and the second were for the period July to December 1960. However, as it takes at least three points to begin an interesting graph, we decided to await the auditors' results for the third six months, before making any further announcement in this magazine. These figures have just been confirmed, and we have pleasure in publishing them as follows:

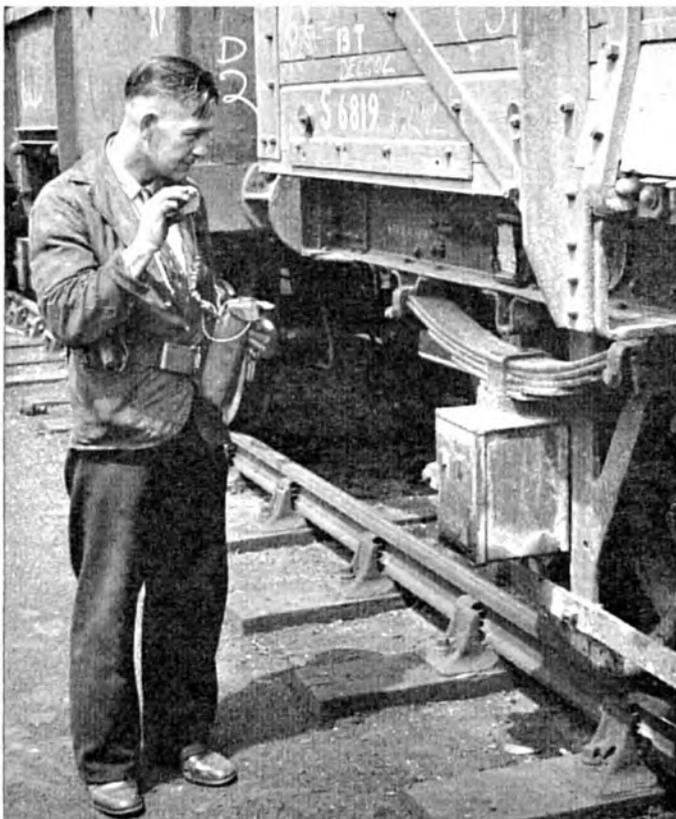
Average per month		
January to June	July to December	January to June
1960	1960	1961
17,173	17,736	20,794

We thank all our readers for their support which has made these figures possible

COVER PICTURE

THE picture shows Edward Ramonde, Chief Cameraman and Sound recordist of The De La Rue Film Unit, with Alan Kitson directing, on location at Chiswick for the purpose of filming "cut in" material at the annual outing of the Company's staff. The equipment includes E.M.I. tape recorders, Arriflex 16 mm camera, and Reslo and Grampian microphones. Photo by C. McMaster, Christie Studios.

HOW OTHERS USE TAPE



Eastern Region Uses Tape

TO obtain detailed information on the individual wagons which make up express freight trains, e.g. source, destination and contents, has been one of the most difficult problems in the handling of freight traffic.

This difficulty is now being overcome on the Great Eastern Line of the Eastern Region by the use of miniature tape recorders, about the size of a camera, complete with a microphone which can be conveniently worn round the neck or carried in the hand. The machines are American "Mohawks," manufactured in New York for Thomas A. Edison of London. Measurements are 8½ in. by 3¾ in. by 1¾ in. and the weight is less than 3 lbs. They are carried over the shoulder or in a pocket. Powered by an 11-volt mercury cell battery, they carry one cassette-type spool operating at 1½ i/s, giving a running time of one hour. The same battery also operates the motor, amplifier and transistors, which the machines employ.

The man in charge of making up the train in the marshalling yard records full details of each wagon in the course of his duties. He states in which direction he is proceeding, (i.e. to or from the locomotive), gives the numbers of the locomotive and brake van if attached, the number, identity and type of each wagon, as well as its contents (perishable, livestock, etc.) label date, source and destination. Walking slowly down an average length train, this can be done in under 10 minutes. The train preparer now returns to the office and surrenders his recorder. The cassette of tape is removed from the recorder and placed on a playback machine. The telegraph office at Liverpool Street is alerted that a message is about to come through and the tape is played into an Edison Voicewriter at the receiving end.

The message having been recorded on the Voicewriter in the Liverpool Street telegraph office, it is subsequently transcribed

by an operator who transmits its contents simultaneously on to a perforated tape feeding into teleprinter circuits to the Yard Master's office at Whitmoor marshalling yard—where the train will be broken up for dispatch throughout the country—and to the train control offices at Liverpool Street and Cambridge.

The information so obtained has been found to be extremely useful in the advance planning of marshalling yard work, in current traffic supervision, in the tracing of particular consignments, in the continual testing of transits and in the planning of future freight train services.

Six of these machines are at present in use on the Great Eastern Line at Temple Mills and Whitmoor marshalling yards, and, as a result of the success of their initial use, it is hoped to extend the system to cover the recording of all express freight trains on the line.

* * * "Hi-Fi" Radio In The Air

IN the autumn of this year B.O.A.C. will introduce an entirely revolutionary form of individual radio entertainment for passengers in flight. Known as "Hi-Fi", it is exclusive to B.O.A.C. and its development has taken many months of research and experiment.

The most important feature of this system is that it provides entertainment for those passengers who want it without disturbing those who do not. Transmission of tape-recorded programmes takes place within the aircraft on a frequency suitable only for in-flight cabin use. The compact receiving sets can be used anywhere in the aircraft, with earphones which fit under the chin rather like a doctor's stethoscope. Expendable plastic earpieces are provided for hygiene and the small receivers are contained in sealed plastic bags clipped on to the seat in front of the passengers.

The transmitting set, controlled by a switch on the steward's panel, is capable of providing forty hours of unrepeatable tape-recorded programmes or two channels of twenty hours each.

B.O.A.C. has had a wide variety of tape recordings made of selected programmes including light music, popular themes from operas, short plays, and general interest talks. The emphasis, however, will be on light music and there will be a modicum of high quality advertising. Passengers will be able to select the channel of their choice by pressing one of two buttons and they will be able to control the sound volume. At regular intervals the Corporation will issue completely new tape recordings for the benefit of frequent B.O.A.C. travellers.

B.O.A.C.'s fleet of Rolls-Royce 707 jetliners will be the first to be equipped with this individual radio system and the service will be available to first- and economy-class passengers by the autumn.



SEPTEMBER
NUMBER

★

Contents include:

Continuity Working in
Broadcasting
Colour Television
Readers' Letters

★

NOW ON SALE

NEWS FROM THE WORLD OF TAPE



A personally inscribed Unidyne III microphone and Performer's Kit is presented to Stage-T.V. star Lee Liberace (centre) by Shure Brothers, Inc., Evanston, Ill., in appreciation of his "outstanding showmanship and recognition of the microphone's critical importance to successful nightclub entertaining". The new unit and kit were presented by S. N. Shure (right), president, and F. V. Machin, (left) vice-president marketing, during the star's recent visit to the Shure high fidelity and microphone production facilities.

Cossor Radio Change of Address

COSSOR Radio & T.V. Ltd., have moved from 71 Endell Street, London, W.C.2, to 233 Tottenham Court Road, London, W.1. The telephone number remains the same, Gerrard 2931-5. This means that the administration offices and the showroom are now housed in the same building. Warehouse and Service facilities will continue to be operated from the existing addresses in Croydon.

Jason's New Address

JASON Electronic Designs Ltd., manufacturers of High Fidelity audio equipment and electronic test equipment announce that they have moved from Great Chapel Street, Oxford Street, London, W.1, to Kimberley Gardens, Harringay, London, N.4 (Telephone Stamford Hill 5477).

The company state that in addition to having greater factory space enabling them to increase production and provide quicker service facilities the problems brought about by parking in the centre of London will be overcome.

Audio Fidelity Stereo Tapes

THESE tapes are now available in this country and are exact duplicates of the original stereo mastertapes. A high standard of recording is employed offering a frequency response of 16-25,000 c/s. The first six tapes to be released in this country are "Louie and the Dukes of Dixieland", "Hamps Big Band", "Rome with Love", "Railroad Sound", "Port Said" and "Per-cus-sive Latino Cha Cha Cha". This last tape produced by Audio Fidelity Inc. of the United States, has been "doctored" for super stereo and the manufacturers go to great lengths to explain the recording techniques. They invite the

listener to examine the frequency range of 16-25,000 c/s on an oscilloscope. They state on the box "While the total frequency range on this recording may not be within the range of ordinary human hearing nevertheless, measurement with an oscilloscope and high-pass filters will show the upper dynamic frequencies. It is the opinion of the manufacturers that if these frequencies were omitted from this recording a certain warmth of tone that is felt and sensed, rather than heard would be lost. For this reason and to achieve the ultimate in our studies in High Fidelity Sound, we have gone to these extreme lengths".

The tapes are packed in study boxes incorporating a full colour cover design and can be obtained from **Tape-Music Distributors, 33 Edgware Road, London, W.2.**

Free Secretarial Service for Packaging Exhibition

FOR the first time at any exhibition a unique service for exhibitors and visitors alike is being offered by Grundig (Great Britain) Ltd. In Rooms 27 and 28 at the Packaging Exhibition, which is being held at Olympia from the 5th to the 15th September, Grundig are providing a complete comprehensive secretarial service. Grundig Stenorettes will be available for all correspondence, orders and reports and four expert audio typists will be in attendance. In addition, incoming telephone messages can be taken and recorded on request and either played back at a convenient time or transcribed and passed on as directed. Special exhibition stationery is available, but those who prefer to provide their own may do so. For those inexperienced in the use of dictating equipment, a member of the Grundig Office Equipment Division will be present to give advice and any other help that may be required. This service is provided free of any charge other than postage by Grundig (Great Britain) Ltd.





The photograph shows tourists visiting the Reichenbach Falls in Germany. The filming has already been done and the visitors are recording the sound effects for synchronising with the film.

Demonstration of Ampex Equipment

AMPEX (Great Britain), Ltd., will be showing the complete range of domestic and professional recorders manufactured by Ampex in America, at the premises of Nusound Recording Co., 23 Craven Street, London, W.C.2, from September 23rd to the 30th (excluding 24th) from 9 a.m. to 6 p.m. Saturdays 9 a.m. to 1 p.m. Demonstrations will be given of the 960 domestic portable recorder and the 2010 speaker amplifier, together with the 970 monitor recorder, the 601 professional and 351 professional stereo recorder. Mixers and speaker amplifiers suitable for the professional user will also be seen working.

Centre piece of the display will be the 'Signature Home Music System' which contains stereo tape and disc, AM and FM tuners, amplifiers and speaker networks. This unit is probably the most expensive in the world.

Engineers will be on hand to deal with any technical questions on tape recording that may be asked, regardless of the type of machine used. No tickets are required and the demonstrations will be continuous throughout the day.

* * *

Magnavox—New Address

MAGNAVOX Electronics Ltd., have moved their headquarters from 129 Mount Street, London, W.1, to Magnavox House, Alfred's Way, Barking, Essex. Telephone number Rippleway 5533.

* * *

No Autumn Audio Festival

THE committee of the International Audio Festival have decided not to proceed with the proposed Autumn Audio Festival this year. This news was given recently by the Festival Director C. Rex-Hassan, who also announced that the 1962 Audio Festival to be held at the Russell Hotel London from April 26th to 29th inclusive, is already nearly oversubscribed as far as space is concerned. Overseas firms are showing great interest and many new exhibitors are expected.

A SERIES of Stereophonic Music Concerts will be given nearly every Monday evening throughout the Theatre Season commencing on September 18th 1961. Symphonies will be played in something like historical sequence commencing with a few by Haydn and few by Mozart before those of Beethoven. All the symphonies of Beethoven will be played, and these will be followed by certain symphonies by Schubert, Mendelssohn, Berlioz, Dvorák, Tchaikovsky and other famous composers.

The Autumn Concert Programmes are now available. Readers wishing to obtain a copy should write direct to, The Clerk to the Governors, Cripplegate Theatre, Cripplegate Institute, Golden Lane, London, enclosing a stamped addressed foolscap envelope.



"Now, don't forget—four and three-fifths seconds—a sort of cross between Jack Jackson and Richard Dimbleby..."

NEWS AND PICTURES FROM THE CLUBS



MEMBERS of the **Stevenage Tape and Audio Club** took part with other local organisations at the Stevenage Festival last month. The club's stand comprised a static display of members' equipment and accessories together with a puppet show with the tape recorded voice of K. Crawford providing the puppets with material. An innovation that interested many people touring the show, was the chance to see and hear their own voices. This was done by a recorder being linked to an oscilloscope. The local Ciné Club also provided many demonstrations of 8 and 16 mm films, the sound tracks and effects having been recorded by the Recording club. A theatrical group in the Stevenage area has asked the club to provide the sound effect for a production of "The Sunken Bell" to be produced later in the year in the open air theatre. This calls for many difficult sound effects and plenty of help is required. Any reader living in this area, wishing to assist should contact the secretary, *L. V. McGregor, 42 Marymead Drive, Stevenage, Herts.*

THIRTY members attended the meeting of the **Coventry Tape Recording Club** at the Queens Hotel which proved how popular Club night can be, even during the summer months. H. Hopfinger provided an interesting talk dealing with the dubbing of sound on to striped film, this was illustrated with black paper and chalk showing the various systems of striping on 8, 9.5, 16 and 35 mm film. Question time afterwards proved that there was a definite interest in cine work and another meeting will be arranged in the near future. The library of tapes produced by the Coventry club seems to contain some very interesting items, various members have produced these programmes from time to time, which is the sign of a well-organised club. Details of meetings arranged in the future can be obtained from *L. S. Day, 41, Moseley Avenue, Coventry.*

THE first prize in a nationwide amateur ciné competition, sponsored by the Richmond Round Table for the Richmond Festival week in September, will be a complete 8 mm home movie outfit by Bell and Howell. Other prizes will be awarded for second and third positions. There is an entry fee of 12s. 6d. and the films must be submitted by September 1st. Further details and copies of the entry forms can be obtained from *B. Frith, 39 George Street, Richmond, Surrey.*

THE latest "Sound Hunt" to be organised by the **West Herts Tape Recording Society** was held at Watford recently, when members once again divided into two groups, each armed with battery portables, and instructions to record interviews with London Transport bus crews. Drivers and conductors were asked how they liked their work and why they chose that job. Passengers were also interviewed, finding out what the customer thought of the services provided, and to finish the exercise, car drivers were asked what they thought of the standard of driving by bus drivers. Generally speaking it was found that the con-

ductors and drivers enjoyed their jobs, the passengers had little to complain about and that the motorists found the drivers quite good on the road. Back at the club some quick editing was done and the tapes played over in the usual friendly competitive spirit. The tapes were judged by the organisers, J. Grainger and S. Attwood, and the winning team was announced to be P. Holloway, B. Scarborough, and J. and D. Hill. Other interesting meetings have been arranged for the coming months and prospective members are invited to contact *P. Holloway, 29 Fishery Road, Boxmoor, Hemel Hempstead, Herts.*

THE recording clubs of South Africa have now formed an association and already five clubs have joined. A national competition has been arranged with a floating trophy kindly donated by Philips (South Africa), Ltd., and it is hoped that the winning tape will be played over Radio South Africa. Anyone wishing to obtain further news of the association should write to the secretary, *B. J. Pienaar, P.O. Box 4354, Cape Town, South Africa.*

AT a meeting of the **Bromley Tape Recording Club**, member J. Perry, satirised his first impressions of the Club with wit, skill and imagination. D. Hart produced some interesting excerpts of sound effects recorded on location with a Fi-Cord, while R. Tourtell achieved outdoor recordings on a mains machine with vast lengths of lead. The Secretary, *D. A. Cornet, 110 Princes Plain, Bromley*, would like to hear from any reader interested in joining this club.

MR. Alan Clifton of E.M.I. Ltd., visited the **Liverpool Central Tape Recording Society** to give an interesting talk on magnetic tape production in this country. At a later meeting Mr. H. P. White of Wilmex (Distributors) Ltd., gave a film show illustrating the techniques employed in America. A visit to the B.B.C.'s studios in Manchester has been arranged for later this month and many other demonstrations and talks have been booked for the coming months. Details of Club activities can be obtained from *A. Evans, 13 Clapham Road, Liverpool 4.*

THE **Clacton Tape Recording Society** recently appointed a new secretary, Mr. J. Heavens, who with a couple of members recently interviewed Dick Emery who is appearing at Clacton for the Summer Season. It is hoped to record other interesting people when they visit this seaside resort and build up a library of recordings. Membership of the club has fallen slightly during the last two months, but it is hoped that many new members will join after the holiday period. Details of club nights and meeting places can be obtained from the Secretary, *J. Heavens, 27 Chapman Road, Clacton-on-Sea, Essex.*

MEMBERS of the **Brixton Tape Recording Club** used over 15 hours of tape when they covered the Lambeth Festival in June. A Baby Show, Dog Show, Firework Display, Beauty Queen Contest, Plays, Jazz Shows, Band and Talent Contests were among the many events recorded. This was the most ambitious programme the Club has undertaken so far. In the near future it is proposed that a tape of the Lambeth Festival will be presented by the Club to the Mayor of Lambeth for playing to local hospitals, schools and clubs.

Mr. Charles Standen, the Editor of "Tape Magazine For The Blind" has informed the Club that their tape on the 1961 Audio Fair has been heard in many parts of the World.

A full programme on various topics of general interest is planned by the Club for the coming winter. Prospective members will be most welcome at Meetings held each Tuesday evening 8—10.30 p.m. in a room over the Saloon Bar of The White

NEWS AND PICTURES FROM THE CLUBS

Horse public house at 94 Brixton Hill, London, S.W.2, or for further details write to the Club Secretary, R. G. Garrett, 56 Rattray Road, Brixton, London, S.W.2.

* * *
MR. R. YOUNG of the Hastings Ciné Club provided an entertaining evening when he visited the **Eastbourne Tape Recording Club** to show films produced by him during the past five years. A spoken commentary and background music was provided with the aid of a tape recorder coupled to the projector. Members were impressed with the quality of the recordings and the excellent camera work. Miss D. Harris will forward further details of the club to any person interested, if they contact her at 12 Victoria Mansions, Terminus Road, Eastbourne, Sussex.

* * *
MICROPHONES — and more microphones. Two recent meetings of the **North London Tape and Hi-Fi Club** (formerly the Enfield and District Tape Club) spotlighted these necessities to tape recording.

Meeting number one provided an opportunity for the chairman, Don Hughes, to demonstrate the correct methods of microphone handling and technique. At meeting number two a survey was made on more than a dozen mic's, from inexpensive crystal mic's to some old moving coil models. Some of them were brought to the meeting by members, and others were kindly loaned for the meeting by a local tape recorder dealer, Studio 248, Edmonton. Both music and voice were used in the tests on the microphones, which were conducted on a Grundig and a Brenell.

The club's fourth competition was won by Roy Smith. Tapes were to be submitted under the title of "A story in Sound". No voices were to be used—unless as a sound effect. Roy Smith's tape, the realistic story of a smash and grab, made full use of the opportunities for window-smashing, running footsteps, van noises, followed by police sirens, and dragnet-style music.

The club's name-change took place because of the requests of those members who are particularly interested in hi-fi, and because no other tape recording club exists in this area. Details of future meetings can be obtained from: R. Collinson, 30 Ridler Road, Forty Hill, Enfield, Middlesex.

* * *
MEMBER of the **Walthamstow & District Tape Recording Society**, 29-year-old Don Cooper has never seen the pretty 30-year-old typist whom he married on 22nd July, and his bride has never seen her husband either! For the couple who were wed at Wembley Church are totally blind. Don who has been blind since the age of two years is a piano tuner for a large London company, and Christine Waterhouse, of Wembley, who was born blind, is a shorthand typist. A keen tape recording enthusiast, Don has already engaged his wife's interest in the subject and both are expected to take parts in the Society's new play, written and produced by members. Christine's experience with a dramatic society will be a valuable addition to the keen team who have already produced one play on tape.

Further details can be obtained from: K. Perks, 9 Third Avenue, Walthamstow, London, E.17.

* * *
AS the result of a chance suggestion by a fellow tape-spondent, Don and Toni Fisher—a young couple from North Harrow are the proud winners of the golden microphone trophy—awarded to the winners of the first tape contest organised by the **Voicespondence Club of America**. Their tape pal thought the quality and 'presence' of some recordings made on a Fi-Cord during last year's holiday on the Norfolk Broads were so fine that he nagged them into entering the contest earlier in the year. Their eight-minute composite recording with narrative by Toni was judged by the well-known documentary and competition winning team of Kenneth Miller and Tony Schwartz (New York) and Kenneth



The above photograph shows members of the Eastbourne Tape Recording Club, having set up their equipment, checking the script in readiness for recording a play.

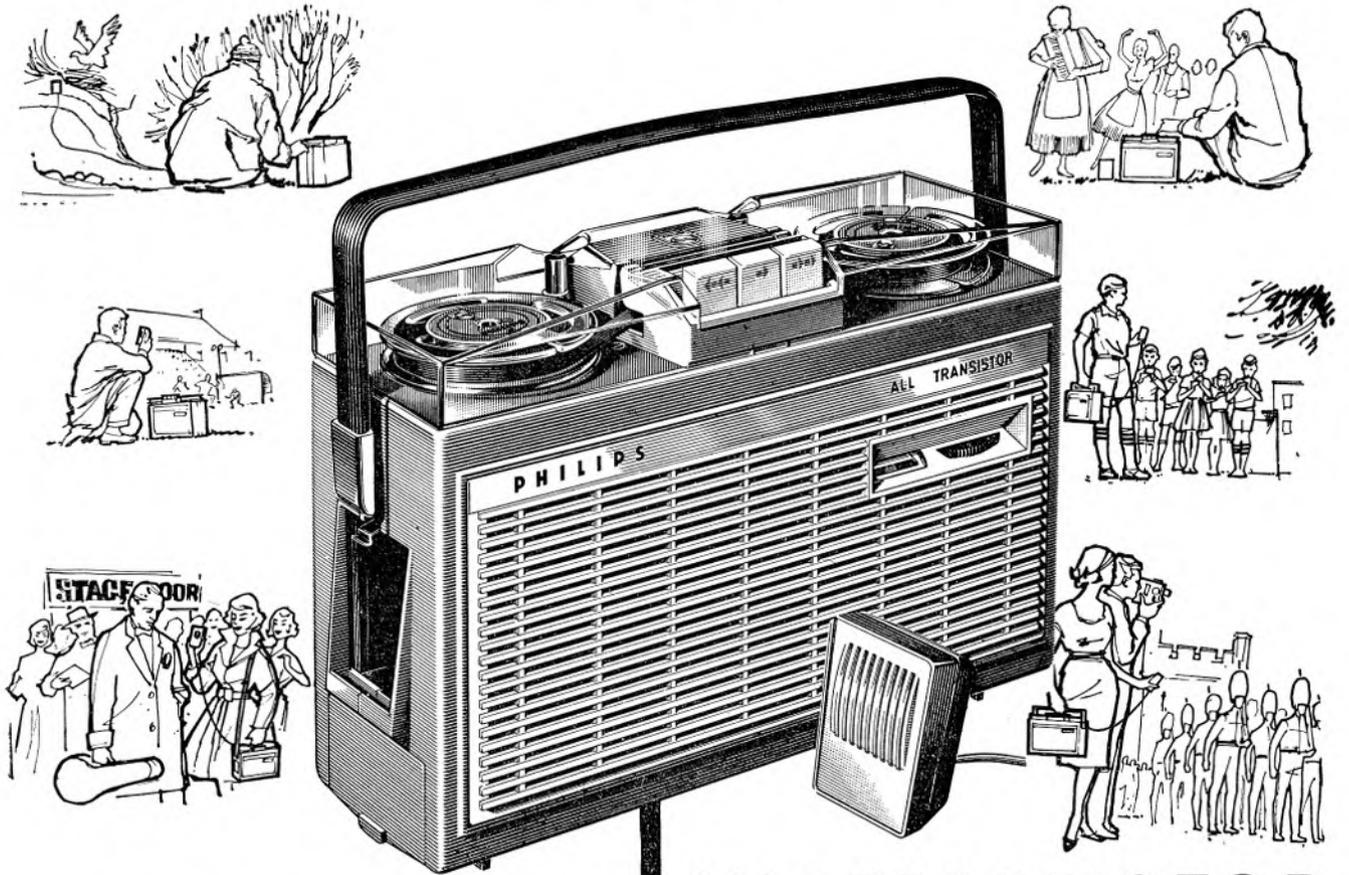
Worman (S. Africa) as best in the contest, which was open to 1,400 club members in over 30 countries in the world. Don Fisher was amazed recently when he received the golden microphone and presentation certificate from Voicespondence secretary, Charles Owen, of Noel, Virginia, for he had not expected to gain a place in the contest with his modest recording of a typical day's cruising on the Broads.

The Fishers have been keen recordists for the past six years and are kept busy with 20 tape pals within the Voicespondence club, this is their first attempt at a recording contest and now hope to have their tape entered in the forthcoming European competition. Further details of the Voicespondence Club can be obtained from: R. Coote, 57 Corelli Road, London, S.E.3.

* * *
PLANS are well in advance for the Autumn Exhibition to be held on September 29th and 30th. Many local dealers and manufacturers will be exhibiting equipment and the **Cambridge Amateur Tape Recording Society** will be publicising the advantages of joining a recording club. Home-made equipment will be on show and a competition has been arranged with valuable prizes for the winners. Further details of the activities of this society can be obtained from: M. E. Renshaw, 6 St. Vincent's Close, Girton, Cambridge.

* * *
AT a meeting of the **South African Tape Recording and High Fidelity Society**, Mr. Heywood gave an interesting talk on Multiple Speaker Systems. This was followed by a demonstration of such a system, built by the lecturer consisting of 22 bass speakers and 6 tweeters. Members were given the opportunity of asking questions after the demonstration and it was judged to be one of the most interesting evenings in the history of the club. Mrs. M. Worman spoke at the next meeting on the trials of being a Hi-Fi/Tape wife. She felt that she was well qualified to speak on this subject as her ears have been assailed for many years by hi-fi tests, and that she has walked many miles with her husband collecting weird and wonderful sounds on tape. When the time came for packing up equipment at the end of the evening, one member was heard to remark that as soon as the word 'subscriptions' was mentioned, there was a very large positive feedback in the treasurer's head causing violent oscillation, ultimately blocking all thought.

Tape recording goes mobile!



PHILIPS

ALL-TRANSISTOR BATTERY TAPE RECORDER

The portable recorder with the lifelike sound. At last you can capture any sound you want — from a military band to a bird in a tree, from touch-line commentaries to folk singing — play it over whenever you like. For this brilliant new Philips Battery Tape Recorder goes wherever you go; records or plays anywhere, any time — even while being carried; recreates each living moment with vivid reality. Light, easy to operate, completely independent of mains electricity, this is the tape recorder for you. See it at your dealer's, today!

Remember, for the best results, always use Philips tapes — now in colour-coded packs for easy identification.

- Fully transistorised for economical battery operation and true-to-life reproduction.
- Easy to carry — weighs only 8 lbs.
- Gives up to 20 hours' recording on six small, inexpensive batteries.
- Plays or records while being carried. Transparent plastic lid protects reels.
- Simple, error-proof controls. Accidental erasure is impossible.
- Dual indicator shows battery power and volume. Warns when batteries need replacing.
- Sensitive microphone fits in side recess for quick-action use.
- Maximum playing time: 2 x 60 minutes at tape speed of 1½" per second.

24 GNS.

Made in Holland

*Excluding batteries.
Optional extra:
carrying case and
strap 45/- complete.*

Another wonderful product from PHILIPS — the friend of the family

Philips Electrical Ltd., Century House, Shaftesbury Avenue, London, W.C.2
(BT109)

our readers write

. . . about pre-recorded tapes

From:—N. George, 205 Avon Road, Chelmsford.

Dear Sir:—Having been an ardent disc record fan for many years (since 1922), I welcomed the advent of recorded music on tape. It has all the advantages and none of the disadvantages of disc records, especially stereo. The time has gone when the average tape recorder owner wants to hear his own voice or family recordings.

Some people lose sight of the fact that tape is the ideal medium for reproducing, therefore let it be used to its best advantage—the reproduction of stereo at economical speeds. Practically all disc records are first made from tape—why not make tapes instead of discs? I understand that there is a wealth of pre-recorded tapes (3½ i/s stereo) available on the Continent and the U.S.A. Why not this country?

I think the most important thing is that the manufacturers should meet and decide once and for all the question of speed, tracks, frequency response, etc., and then issue tapes at economical prices. If they don't the tape recorder will most certainly die. If this should happen, I for one would not go back to the disc records. They are no more than miniature boring mills with the needle (sapphire or diamond) acting as the cutting tool.

Yours faithfully,

* * *

. . . about fastening tapes

From:—C. G. Ingham, 1 Golders Street, Upper Hutt, New Zealand.

Dear Sir:—I have been a very keen ciné-photographer for over thirty years and an exceptionally keen tape recordist for almost fourteen years. Long, long ago I came to the conclusion that the best method of fastening the end of a film or tape to a reel, was not to fasten it, but to simply place one turn round the core. It will then be found that the second turn locks it firmly. Nothing more need be done.

The great advantage of this method is that it is quick, taking only a fraction of the time of other methods, and it also prevents damage to the film or tape.

May I also make a comment on the term gear changing used by Mr. Borwick in one of his articles. To describe the process of dubbing tape to other speeds, I have used the terms "squeeze printing" or "stretch printing" or "squeeze dubbing" and "stretch dubbing". These terms are both descriptive and brief.

My basic equipment here consists of two standard Ferroglyph recorders and one three-speed Philips recorder, together with a valve mixer and several ribbon and moving coil microphones.

Yours faithfully,

* * *

. . . about four track recording

From:—R. G. Woods (Director) Miniflux Electronics, Ltd., 8 Hale Lane, Mill Hill, London, N.W.7.

Dear Sir:—As manufacturers and distributors of specialised components for magnetic tape recording, we heartily endorse Mr. Bartlett Still's remarks in the July issue of *The Tape Recorder* on the difficulties and pit-falls that amateur enthusiasts can encounter when fitting different heads to existing tape recorders.

From our experience it would seem that many are under the illusion that changing heads is no more difficult than changing a gramophone pick-up, whereas, in fact, the change over includes both mechanical and electrical problems that can only be satisfactorily overcome with the aid of highly expensive measuring instruments.

In all fairness it can, however, be said that if it is desired to adapt a machine to include a high-quality head for playback only—the difficulties are not so great and can be compared to that of fitting a pick-up.

However, when a head is to be used for recording purposes the problems are best left to the specialist having the necessary technical knowledge and laboratory facilities. The adaptation of machines to four-track operation provides even further problems since the requirements for tape guidance have to be stringent to prevent misalignment of tracks.

We think that Mr. Still's comments on this subject will help in avoiding disappointments from those amateurs contemplating a change of heads. It is regretted, however, that Mr. Still does not show the same wisdom when he condemns four-track working as "... representing a severely retrograde step in performance." We cannot share this view and feel that in this instance your contributor has not indicated the usual foresight shown in the past.

The degradation given by halving the track width need not be more than 3 dB reduction in signal-to-noise ratio and it is most interesting to note that this is substantiated in the same issue of your journal by Mr. Moir in the opening passage of his review on the Reflectograph recorder which uses our heads.

For a more detailed report on this subject we would cite the following reference which may be of interest to your readers: "Tape Head Relationship in Multitrack Recording" by F. Leslie of the Ampex Corp., U.S.A. Published in "Journal of the Audio Engineering Society," April 1961.

May we respectfully submit that a more open mind on this particular subject would be of greater value to your readers, than an unsupported brief dismissal of four-track operation.

Yours faithfully,

* * *

. . . about being creative

From:—F. G. Carlsen, Skrydstrup, Vojens, Denmark.

Dear Sir:—On page 340 (August issue) Mr. D. C. Comper puts the question: How one is to be creative with a single machine at ones disposal?

Creation is not dependent upon the technical facilities at your disposal, but upon the phantasy and imagination you show up in using your technical facilities. (Do you think that a poet with a type-writer is better than a poet with only a pen?) In fact it may be easier only to use one tape-recorder: dubbing and mixing is only complicating a recording. Although I have at my disposal more than one recorder I usually use only one for my competition tapes, and carry out what might be called "the creative work" by means of a pair of scissors. To conclude: What can a person owning ten tape-recorders do, when he has nothing to record on them?

Yours sincerely,

* * *

. . . about cheap tape again

From:—S. Bahrman, 42 Clouesley Mansions, Clouesley Place, London, N.1.

Dear Sir:—Your August issue contained two letters on the subject of cheap tapes. May I offer some comments based on experience? Mr. Jepson stated that "years ago" he bought some cheap tape and the coating flaked off. Mr. Holt found some cheap tape to be of poor quality. The only reasonable conclusion to be drawn from these statements is that some cheap tapes are not very good and I have no doubt that such tapes are of little value to the serious user. Nevertheless, considerable experiment has shown me that there is at least one very low priced tape available which compares favourably with any of the top price makes and is sold with a money-back guarantee. I do not own an array of tape-testing gadgetry, but I do have high quality recording and playback equipment, plus a critical ear. The cheap tape I use is of consistently high quality and I save a guinea on every 7 in. reel. I think it only fair to show the "other side of the coin" to fellow readers of your journal.

Yours faithfully,



THE
TAPE
THAT'S
GOT
WHAT
IT
TAKES

Session in Kensington . . . Party in Pimlico? Just the time to get it good on your tape recorder with GEVASONOR, the magnetic tape that's really got everything. For music, for voice, for sound whatever the source, you really must try GEVASONOR, the new tape manufactured by GEVAERT Ltd. Write for free descriptive leaflet.



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TELEPHONE: ISL 2131

By John Borwick

HOME RECORDING

PART 5 _____ *Filing and Indexing Tapes*

THE earlier articles in this series have encouraged you to record a wide variety of subjects in and out of doors. The emphasis has always been on experiment, so that you could push out your recording horizon and become skilled in all sorts of tape activity. Once you have done this you can decide to specialise, but still know how best to tackle each job that comes along without having to interrupt a creative recording session through lack of know-how.

Last month, in describing tape tricks, we began to manhandle the tape itself. We erased short passages to tidy up "fluffs" or mistakes on the tape, and we made endless loops by cutting off a short length of tape and joining its ends together. Far from being a kind of heresy to cut tape, it is the logical starting point of really professional standard programme building.

Why Edit?

Just as in amateur and professional film-making it is virtually impossible to start the camera running on each new shot so that the sequences join up into a logical or satisfying sequence, so your tapes will tend to become a series of unrelated disjointed sounds unless you do something about it. Viewing an unedited movie film is an experience no visitor will ever want to sit through twice. Re-takes, with or without actual mistakes, follow one another without pause. And there can be hardly any of the planned order of events—general view of beach followed by bathing adventures, etc.—which is the hallmark of a well thought out film.

The answer is to select, cut and arrange the individual parts until they appear in the best possible order for your purpose, with all mistakes or not-so-good pieces firmly excised. The medium of tape recording is much more flexible than film for this kind of creative exercise. Since there is no processing stage between recording and playback, as in film-making, you can re-take scenes as often as you like. By listening straight away you can make sure that everything sounds right before moving on to the next item. The poor movie enthusiast has to shoot and hope.

On top of this, the terrific advantage of tape is that by making repeated recordings in search of perfection, you are not using up the tape itself. You can erase as you go, or

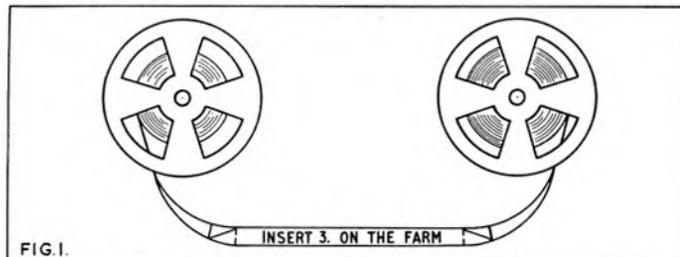
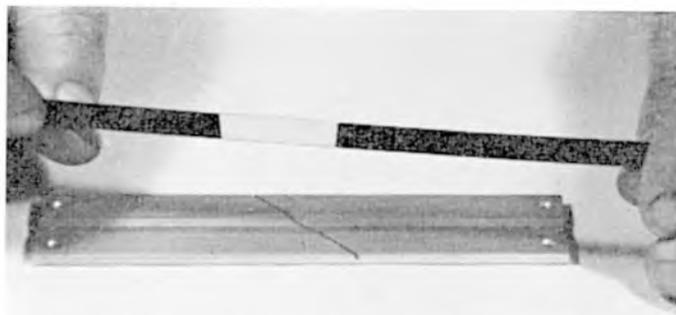


FIG. 1. It is a good idea to splice a piece of coloured leader tape into an album or lecture tape. This identifies each item and makes it easier to start each replay cleanly.

subsequently, and the tape will be as good as new. Cinematograph film is comparatively expensive, even in the small 8 mm gauge, and is a "once-for-all" medium which you cannot wind back and use again. But just because tape is so accommodating,



A well-made splice will last almost indefinitely and produces no audible break on future recordings.

you must meet it half way if you are to produce really interesting tapes. And more often than not this means you must get out your scissors or razor blade and physically cut it. It's true that you can use tape over and over again, but in the interests of improved programmes it has to be regarded as expendable sometimes.

More Editing Ideas

So far we have outlined the main reason for editing, to produce interesting programme tapes. Editing crops up everywhere, however. To give a lecture, for instance, it is a good idea to have all your recorded illustrations joined together in the right order with, perhaps, a piece of coloured leader tape in between each one. The family album type of tape will consist of recordings made at widely different times, and these are best linked together by editing. Or perhaps you are making recordings at school or in a youth club. You can bring everybody into the act by giving them separate recordings to do. Then watch the smoke fly when the selection and final editing sessions are taking place.

Besides the popular tape quizzes and prearranged "Musical

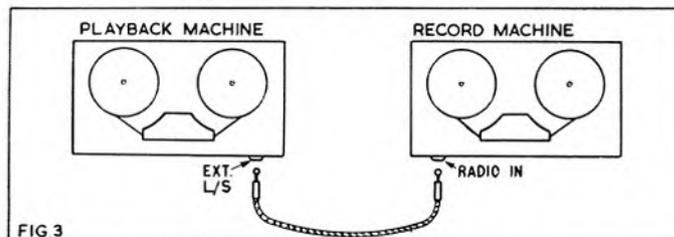


FIG. 3. Editing by copying from one machine to another will usually mean some loss of quality. However, it avoids cutting the tape and allows you to adjust volume and tone settings from one insert to the next.

"Chairs" recordings, you can edit together fake interviews in which eminent people appear to give reasoned replies to comic questions which you have cut into their recordings, and so on.

How to Edit

There are three ways to edit tapes, and it is a good idea to become adept at all of them since each has advantages for certain situations. First, and most important, there is the cut and join method in which you make no attempt to keep the tape in its beautiful unbroken condition. This is the best method for general purposes. It can be very quick, once you have mastered the technique; it is extremely accurate and preserves the quality of the original recording. Also, contrary to a widely held belief, a well made joint will stand up to all kinds of wear and can be recorded over without the least sign of trouble or audible gaps or clicks. In any case, this method is the only way to repair broken or frayed tapes and to add leader tapes, automatic stop foils, etc. So it is a fairly logical extension to apply a tape repair job to cope with the putting together of tape programmes.

The second method of tape editing needs two machines,



A commentator records her impressions after an underwater exploration. Even when submerged she could describe the scene into a special microphone let into her face-mask.

BBC PHOTOGRAPH

Emitape goes down with BBC diver

Interviews in unusual or noisy situations often contain superfluous material. The BBC find Emitape perfect for editing and cutting. 'Dead' material can be eliminated, interviews kept lively and to the point.

Emitape, consistent and dependable: the obvious choice for a broadcasting organisation famed for its technical excellence. Year in, year out, the BBC send thousands of 'packaged programmes' to radio stations everywhere, spanning the world—on Emitape.



When Emitape returns from the studios to the BBC Central Maintenance Unit, it is re-serviced, passing through this 'washing machine'. A giant electromagnet finally wipes off any signals remaining on the tape.

Emitape used by the BBC 9 times out of 10



EMITAPE DIVISION, E.M.I. SALES AND SERVICE LTD, HAYES, MIDDLESEX

or at the very least a special add-on deck of the sort described by John Hone in the February, 1961 issue of *The Tape Recorder*. For most of us, two machines means getting together with someone else who owns a recorder. Well this is not such a bad idea really, because the business of editing by copying from one recorder to another is one where an extra pair of hands is very useful. The idea is that you put a fresh reel of tape on one machine and use this for the final recording. You plug from the Output or External Loudspeaker socket of the second machine into the Radio or Pickup input of the first. Then, by carefully setting up at the beginning of each excerpt on your recorded tape or tapes you start both machines more or less simultaneously and record or "dub" from one to the other.

This way of editing may seem terribly complicated, and it does have the pretty serious disadvantage that you always lose some of the quality of sound when you dub. However, at least you avoid cutting the tape—which, as we have said, many people consider very important—and you can do quite a bit of sound manipulation at the same time. For example, you may be bringing together in sequence recordings which were made at very different loudness levels. Now the cut and join method would show up this difference in level unmercifully. But during the rehearsal run in the dubbing method you can check the level, and adjust either the playback or recording volume before copying so that the various inserted passages match exactly. Again, it may be that the bass or treble is excessive on the earlier recording. You simply adjust the tone controls on the playback machine until you are satisfied, and then dub.

Even more useful is the fact that you can actually arrange to fade in or out of scenes or musical passages, by simply rolling the volume control up or down. Or, if you are very slick at operating the controls, you can rapidly fade down and up again to wipe out clicks or other flaws in the first tape to leave the new recording clean.

This spot erasing or controlled fading was part of the subject of the article printed last month, and forms the third method of tape editing. As was shown, you can tidy up your recordings quite considerably by means of spot erasing or fade erasing.

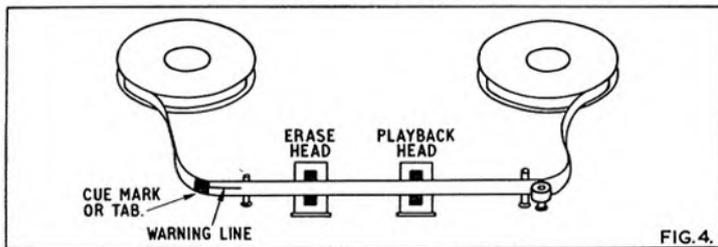


FIG. 4.

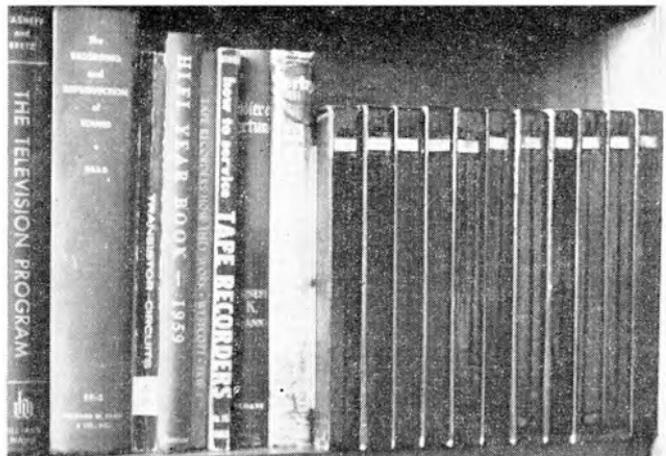
You should know just how far in front of the playback head to put the cue mark for a smooth start on replay. The horizontal pencil line is useful when looking for a cue during fast winding.

You use the erase head of your recorder for this, carefully see-sawing the offending passage past the head, or you can employ a separate magnet. The magnet method needs very careful handling, of course, to avoid demagnetising more of the tape than you mean to; and it is vital that the magnet is never brought anywhere near the tape heads themselves.

How to be Accurate

It is not proposed to give a great deal of space here to the detailed steps in editing by any of the three methods. The cut and join method is adequately described on the leaflet which you get with any editing block or roll of jointing tape. The two machine system is mainly a question of co-operation and the standard of smooth operation which comes only with practice. And we indicated last month how you should carry out the erase/edit procedures.

Instead, we had better look closely at the question of cueing in the tapes accurately and finding the place on the tape.



These points are common to all editing, and indeed to every kind of tape operation. The way to start is to choose an instantly recognisable portion of one of your tapes such as a certain word or musical phrase. Then wind back the tape repeatedly and press the playback button until you can guarantee to replay accurately on cue. If there is some recorded material on the tape just prior to the required passage, you will have to drill yourself to hold the volume control in the minimum position when pressing the start button, and then fade or whip up the volume to give a clean start or a gradual fade in as required.

You will get to know the period of time normally taken for your machine to get up to speed, and you should practise making a mark on the tape near the part at which you want to start and watch how far in front of the head you need to set this mark to give a slick beginning on replay. You use a Chinagraph pencil for this marking, but for more permanent cues on tapes there are a number of self-adhesive coloured marker labels on the market. These include Arrowtabs and Metrotabs, the latter being in a series of two-colour codings to correspond with a special Index Card also supplied. The object of these various marking systems is to overcome the main disadvantages of magnetic recording—that we cannot see the actual track. Of course the digit counter and clock-face types of position indicator should also be referred to as often as possible.

Tape Indexing

After even quite a short period of recording you will have enough items on tape to justify the setting up of a system of indexing. There is nothing so frustrating as having to play through a lot of unwanted material before you come to the bit you want. And it's worse in front of an audience. For long items, it will be enough to write the Title, Name of Composer, Artist, etc., and any further details you want such as date of recording, speed (if you have changed this anywhere during the reel), Volume and Tone setting, etc. For very short items, the emphasis will have to be on accurate location, and the identifying tabs system or pencil marks will have to be referred to directly in the index.

If you have only a few spools to index, all the above information can be included on a gummed label on the box itself. But as your collection grows, it will be better, to use a loose-leaf or other type of index book, referring to the tapes by number only. This number should then be printed on the spine as well as the back of the tape box. Tapes are best stored upright like gramophone records, and you should push a book-end type of weight against the end box to keep them from flopping over to the side. Ordinary living-room temperatures are best, and there should be no power wiring, etc., within about two feet of the tapes. Finally, do print the serial number and/or short title of the tape on the leader tape at the beginning and end of each reel.

You have now got to grips with the tape itself, and found that it is an expressive medium like cinematography or oil painting. We can therefore move on to building programmes on tape, and this forms the subject for next month.



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... tape recorder workbench

Practical suggestions for the tape handyman

by A. Bartlett Still

No. 20—ROUTINE MAINTENANCE

WITH the publication of the September issue of *The Tape Recorder* one has to acknowledge that the summer will soon make way to the darker evenings, and an increase of activity in the tape recording sphere. Those who are lucky enough to have a portable, and have been "out and about" will be turning their attention back to the "big" machine to get on with the job of editing and re-recording. What I am leading up to, of course, is that this is the time of year to carry out a little simple maintenance to get your machine on to the top line.

I have devoted some space to this subject in the past, *Workbench No. 3* was the first occasion, but there have been many new readers with the growth of our magazine, and I believe the importance merits a reprise of the main points.

The first thing I want you to look at is what is generally referred to as the sound channel, the slot into which you drop the tape when loading. This may have a small clip-on cover, as with most *Grundig* models, or it may be necessary to take out some screws and lift off the complete plastic deck cover as on those machines that use the *Collaro* deck.

Remove Oxide Particles

What we are looking for is any accumulation of brown dust, oxide that has rubbed off the tape. This should be removed with (say) the corner of a duster or small brush before it has a chance to get into any of the bearing surfaces. Next, look for any tape oxide on the faces of the heads, and on the pressure roller. The faces of the heads should be bright and metallic, anything that looks like rust should be removed. Use the wrong end of a match for this, as the wood will not damage the head faces. If a solvent proves to be required, try methylated spirits, *but nothing else without reference to the makers, as some heads incorporate a plastic moulding which might dissolve before your eyes!*

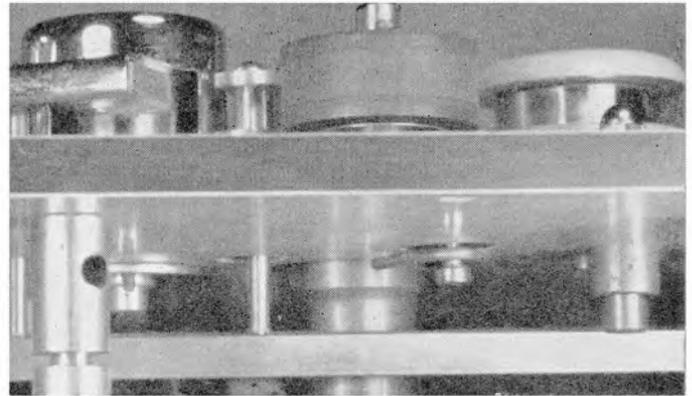
The pressure roller normally has a rubber surface and presses the tape up against a metal capstan to impart the main tape drive (on some machines the two materials are reversed). Build-up of tape oxide on these two is a not infrequent cause of an increase in wow and flutter. To clean the metal capstan, the matchstick should be called into service again, the capstan should have a clean and well-polished surface and should be dry. *Do not, under any circumstances, use any form of abrasive.*

Check Pressure Wheels

The rubber surface of the pressure roller may be shiny, instead of suede-like, with signs of brown oxide. The best way that I know of restoring the surface is to wash it in one of the usual detergents at normal strength. If possible, avoid complete immersion, as the bearing surface is probably an oilite bush and you should try not to wash out the oil. It is advisable, on replacing the roller, to put *one* drop of thin oil, such as *Three-in-one*, in the bearing. Before running tape through the machine, run it for a few minutes, on playback (without tape), to see if any of that drop of oil comes out of the bearing. If it does, wipe it off carefully as it should not be allowed to get either on the rubber roller or on the tape.

All of these points are concerned with the mechanised operation of the tape deck itself and are fairly obvious. One or two other things are equally important, the braking system should be checked and adjusted if need be, and attention must be given to the mechanical linkages of the deck to ensure that nothing is working loose or binding.

On the electronic side there is really little to be done. While all is working it is best to leave well alone, with the possible exception of the various switch contacts. These are often made of brass or



The above photograph shows (left) the playback head (centre) pressure wheel and tape guides. These should be checked for oxide dust and snippets of splicing tape.

phosphur bronze, silver-plated, mounted on either paxolin or plastic. Heavy oxidisation of the plating is one possible cause of trouble that can be largely prevented by the introduction of a smear of vaseline. Switch-cleaning fluids are available, usually consisting of a cleansing solvent which, after evaporation, leaves a lubricating film. Such fluids should always be used sparingly, particularly on continental machines where the switch banks, like the heads, often use a plastic that is soluble in Carbon Tetrachloride.

So much for the machine, what about the tapes? Warped spools should be rejected out of hand—they are one of the most frequent causes of wow on a recording. Any tapes that have been spliced should be inspected at the joins. A splice that has "oozed" may pick up on the capstan, and it is surprising how much tape can be wound up in a very short space of time as a result of this.

The aim of maintenance, such as I am suggesting, is twofold. In the first instance, if it is possible to return a condition that has deteriorated to good as new, this should be done. Preventive maintenance, to avoid trouble later, is less positive; one never really knows how successful it has been. Successful or not, however, I am firmly convinced that every minute spent on maintenance is worthwhile.

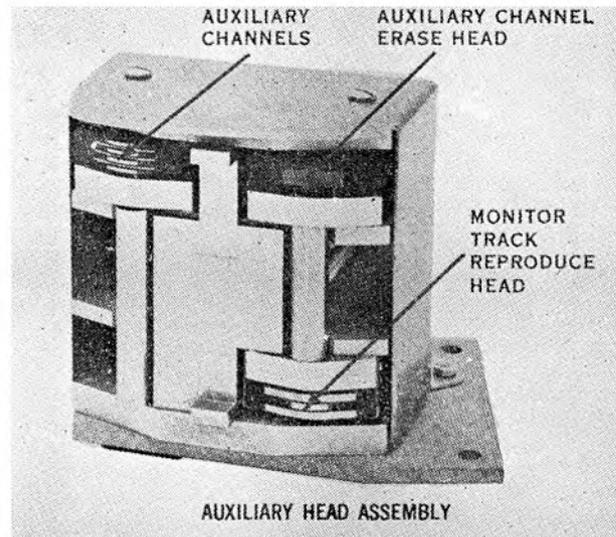
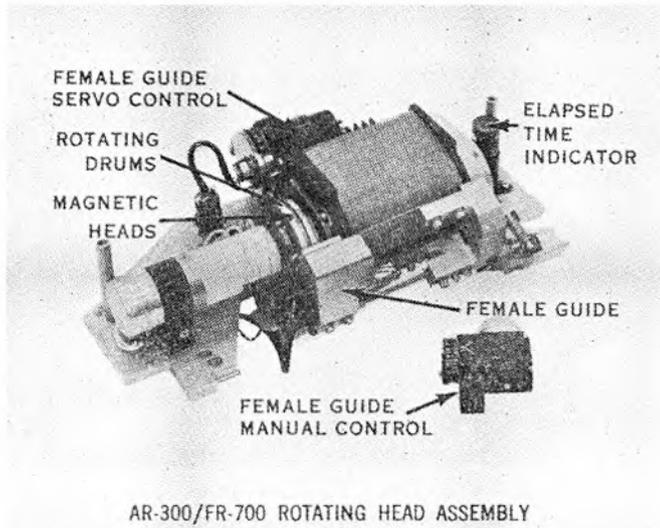
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while we are thinking in terms of 15 kc/s from tape . . .
 . . . AMPEX OFFER 4 MC/S!



FROM 60 to 15,000 c/s within 2dB is a good average for a good domestic tape recorder, running at $7\frac{1}{2}$ i/s, and readers who have followed our occasional news items about video recording must have been as intrigued as we were by the initial response of over 2 Megacycles per second necessary—and obtained—from tape for this purpose. But now even that apparently fantastic figure has been doubled up by Ampex in their latest ground and airborne tape equipment, for which they definitely state a frequency response up to 4 Megacycles per second! Needless to say the recorder and recording electronics are far more advanced, and far more complex than even the most elaborate professional equipment used for everyday sound recording, but the achievement deserves full notice, and we think our readers will be interested in these details of it.

Ampex, First to Record Television

Ampex were the first to develop a commercial system for recording and re-broadcasting television programmes from tape, and its equipment is widely used by television studios, our own B.B.C. studios included. The equipment which is described briefly on these pages, was developed for such jobs as radar tracking and missile counter-measures. The two models featured are the AR-300 and the FR-700. Ampex describes them as *wideband magnetic tape systems*, and give some of their applications as follows:

For Radar Reconnaissance: To record the output of special radar receivers for later playback and analysis of unknown emissions. *For Radar Tracking:* To analyse and evaluate the performance of search and fire control radar under actual conditions. *For Training:* For recreating actual conditions in the training of crews. *For Wideband Communication Monitoring:* Records a whole 4-megacycle frequency spectrum for later playback and analysis.

Record in excess of one million bits per sec.

These instruments, with their enormously wide frequency coverage will record in excess of one million bits per second. The transverse recording method solves tolerance problems inherent in parallel recording and provides for higher transfer rates in the future. They are guaranteed "compatible," which in this case

means that any tape recorded on an AR-300 or an FR-700 can be reproduced on another. This compatibility is possible because identical or very similar units are used for recording and reproduction.

Four heads for each of the two data channels

Four heads for each of the two data channels are mounted 90° apart on two rotating drums. Information is recorded transversely on the tape at approximate right angles to tape travel. An auxiliary head assembly records data longitudinally for two auxiliary channels. An erase head in this assembly demagnetizes the auxiliary track prior to the time it passes the auxiliary heads.

A monitor head in a fixed guide records a D.C. signal on the tape. This signal is partially erased by the rotating heads. The partially erased track is reproduced by a head in the auxiliary stack, to light an indicator to show that recording is in process.

A control-track head fixed on the wideband head-assembly, records longitudinally on the edge of the tape after it has passed the rotating heads. The signal is then reproduced on the FR-700 by a similar head mounted on the reproduce wideband head assembly to control the capstan servo for accurate tape speed on playback.

Technical Features

The AR-300 records, and the FR-700 records and reproduces, frequencies from 10 c/s to 4 megacycles with amplitude response ± 3 dB over the bandwidth! The AR-300 is an airborne recorder: the FR-700 is a bigger job altogether, for use on the ground. Solid-state components and printed circuit boards are used throughout the system for minimum size and weight. The AR-300 occupies a space of only 3.5 cubic feet and weighs 175 pounds with tape. It requires 325 watts of 115 volt 100 cycle A.C. or 28 volt D.C. power.

Wideband recording at low tape speeds is made feasible through the use of rotating magnetic heads which give effective head-to-tape speeds of 1,300 i/s. This allows reel-to-reel tape speeds to be kept to $12\frac{1}{2}$ or 25 i/s. You can record one channel for one hour at $12\frac{1}{2}$ i/s or two channels for a half hour at 25 i/s.

Data is recorded, transversely, on tracks 10 mils wide and 15 mils on centre, as compared to former tracks of 50 mils and 70 mils on centre, thereby allowing 4 times as much packing density as earlier recorders. The illustration (Fig. 3) shows how

while we are thinking in terms of 15 kc/s from tape AMPEX OFFER 4 MC/S! cont.

the various parts of the tape are used, and how two auxiliary channels record information longitudinally from 300 c/s to 15 Kc/s. These can be used to record audio information or timing signals.

Great Accuracy

A high degree of accuracy was essential for the design of this apparatus. For instance, the drum on which the heads are mounted is driven at a constant speed by its own servo-controlled motor drive amplifier. This servo is locked to a precise frequency standard which acts as reference. Capstan speed is kept constant by an inverter-driven synchronous motor. Inverter frequency is controlled by a precise frequency standard. Photosensing cells in the supply and take-up reel guides control the current through hysteresis clutch controls, thereby controlling the torque on the supply and take-up reels, so as to maintain constant tape tension at all times.

The tape is heated by a special guide to prevent temperature shock at critical stages in the tape handling, and to maintain an accurate time base relationship. A female tape guide controls the pressure on the tape as it passes the heads. It is manually on the AR-300 and servo controlled in the FR-700. During playback, the guide changes the pressure on the tape to counteract any possible change in the timebase relationship. A control track insures that the heads will always lock accurately on the proper transverse line during playback.

Wideband Data is FM-Recorded

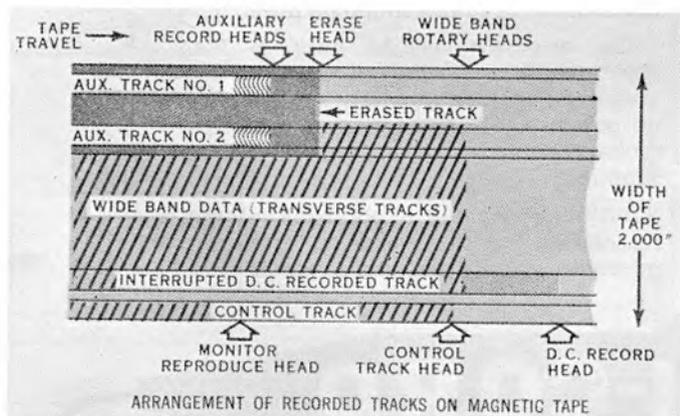
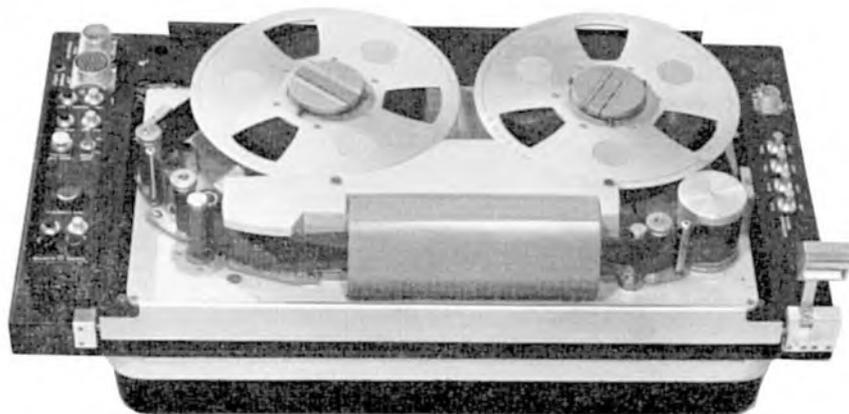
Data is recorded on the tape by Frequency Modulation. FM recording is used for several reasons. First, the wide frequency spectrum to be recorded covers too many octaves to be directly recorded by magnetic heads. FM effectively reduces the number

of octaves that must be recorded on a single track. The signal-limiting action in the FM system provides a means of eliminating variation in the head outputs caused by using multiple heads of varying sensitivity. In addition, FM recording reduces the amplitude instabilities inherent in the tape and enables a frequency response as low as 10 c/s.

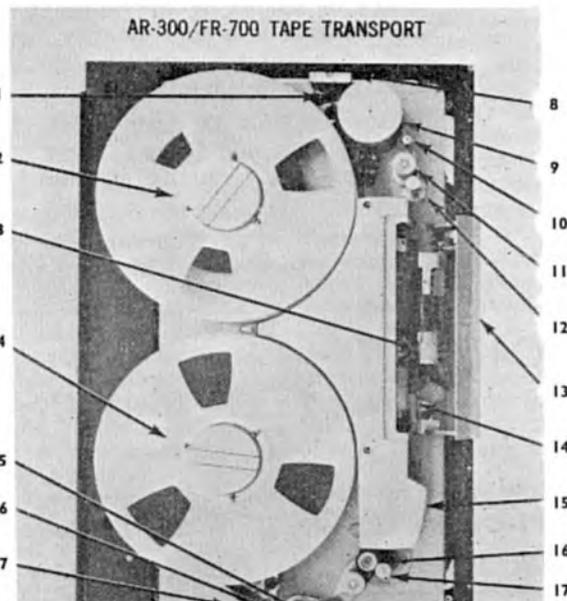
Tape Transport

Both the AR-300 and FR-700 use the same basic deck which is 30½ in. long, 10¼ in. high and 16¼ in deep. It may be operated horizontally (as in the AR-300) or upright. Both use the same record electronics consisting of plug-in printed circuit boards.

Hysteresis clutch controls, photo-sensing of the amount of tape on the reels, and a constant-speed capstan motor, assure gentle tape handling, preventing tape stretch or loops and insuring machine-to-machine compatibility. (In short, quite a tape recorder! **Editor**)



1. Tape.
2. Tape supply reel assembly.
3. Female tape guide.
4. Tape take up reel assembly.
5. Slack take up idler.
6. Rotary guide.
7. Take up reel photocell assembly.
8. Supply reel photocell assembly.
9. Heated tape guide.
10. Slack take up idler.
11. Rotary guide.
12. Monitor track record head fixed guide.
13. Wideband head assembly.
14. Tape.
15. Auxillary head assembly.
16. Pinch roller.
17. Capstan.





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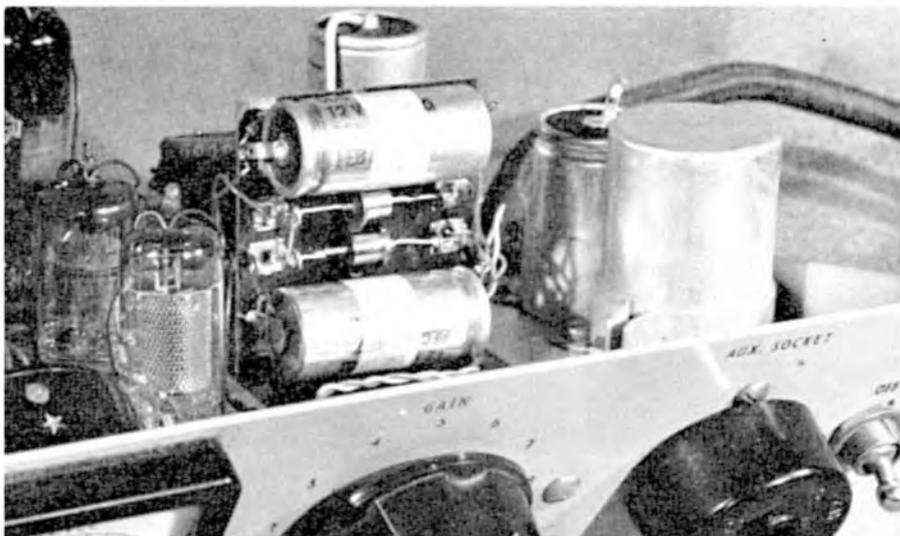
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A FERROGRAPH MODIFICATION



It is now over thirteen years since the introduction of the *Ferrograph* tape recorder, and it is not without justification that it has been adopted by professional users and discriminating amateurs, both in this country and abroad. It is even more of a tribute to the original model that there have been relatively few changes in the basic circuitry and mechanical details right up to the current "Series 4". Nevertheless, there is one feature about this excellent machine that many users do regard as a minor drawback.

Transient Current Surge

The mechanical design of the tape deck is such that when the tape transit mechanism is switched "on" it is locked in position by an electromagnet, which in turn is released by a short-circuit across it. This is provided by either the manual "Stop" button, or by a safety trip device should there be no tape in the head assembly. Unfortunately, the electromagnet is in the main HT + line and the action of energising and short-circuiting it sends a transient current surge throughout the whole amplifier section. The result is a loud "click" which, in the recording process, goes on to the tape. This

can be an irritation also if the machine is on playback—especially if connected to a high quality playback system.

Now the writer must make it quite clear that many users obviously do not find that this is much of a snag. It can be pointed out, quite rightly, that with a fair degree of skill and experience, plus expert operation of the mechanical "pause" button, it is possible to avoid this trouble. But it is something of a handicap when one is in a hurry and a third hand would be a considerable asset! So a simple and inexpensive modification to remove the cause of the trouble altogether would have much to commend it.

The obvious remedy is the removal of the electromagnet from the HT + line altogether, and one is simply left with the problem of providing a separate D.C. supply. Experimental tests showed that between 12 and 15 v. at 34-43 m/a would hold the magnet quite comfortably. This can be provided by a novel method—a compact voltage doubler supply deriving its A.C. source from the 6.3 v. valve heater line. A typical tag assembly with all the components necessary is shown, mounted on the amplifier of a *Ferrograph Series 2*.

The Circuit

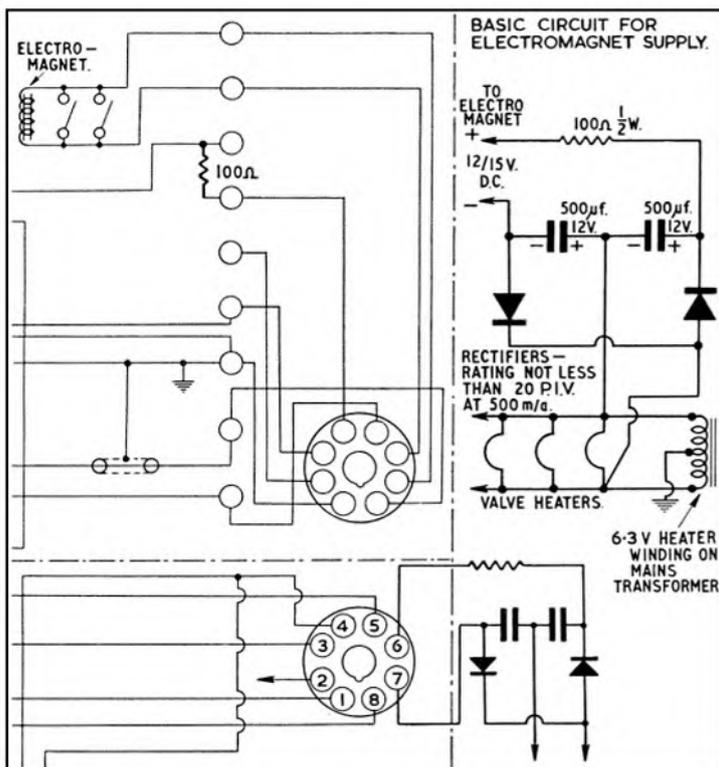
Connection to the electromagnet is via the two wires already provided to the lettered tag strip on the tape deck (labelled E and F, terminated on 6 and 7 of the amplifier socket). The resistor (R41, value $100\ \Omega$ $\frac{1}{2}$ watt) is provided to prevent a full S/C on the supply when either SW4 or SW5 is operated. A strap will be found connected between F and G; this is to provide + HT to the bias oscillator and, since the electromagnet is now no longer in the +HT line, an alternative connection has to be made. There is usually at least one spare wire in the cable to the deck—in this case, D (pin 4 at the amplifier socket). The two +HT wires, now removed from 6 and 7 on the amplifier socket, are both connected together on to tag 4. Similarly, the strap from G (the bias oscillator supply) should be connected to "D" on the deck tag strip.

One final step. The electromagnet in its original connection also ingeniously formed part of the smoothing circuit and, as might be expected, its removal results in some increase in hum. This can be corrected by increasing the value of the main smoothing capacitors and a $50\ \mu\text{f} + 50\ \mu\text{f}$ is recommended in place of the original $8\ \mu\text{f} + 16\ \mu\text{f}$ (C24 and C26).

It should be pointed out that throughout this article the terminal designations are those applicable to the early *Series 2 Ferrograph*. There may be some variation with other models, but this should present no difficulty if the relevant service manual is available.

Silicon Diodes Recommended

The cost of the modification (a most important point!) should be quite small, and certainly no more than 30s. The capacitors can be obtained either new or from reliable surplus sources



the latest

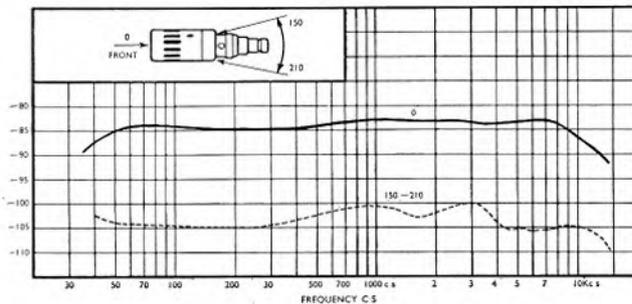
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FERROGRAPH MODIFICATION—(continued)

without difficulty. Because of restrictions in space, silicon diodes for the rectifiers are strongly recommended. These are now fairly easy to obtain at modest cost and should be rated at not less than 20 P.I.V. at 500 m/a. By way of an example, Type ZS72, marketed by Ferranti, is currently advertised at 4s. and is rated at 200 P.I.V., 750 m/a.

The writer would like to thank Messrs. Wright and Weaire for permission to reproduce part of their circuit diagram in the modified form, but must point out that such permission in no way implies endorsement or approval of the modification. Obviously too, they are unable to deal with any queries concerning it.

R. Williamson

A GRAMDECK PAUSE CONTROL

By D. A. CLOUD

OWNERS of the Gramdeck tape recorder have probably realised how difficult it is to stop the machine for a few seconds, due to the fact that it is not fitted with a pause control. This is a handicap when recording message tapes, interviews, etc., and also when using the deck for dubbing into another recorder. A silent remote control can assist in tape editing and thereby reduce tape wastage.

The writer has a Gramdeck, and soon found out the above limitations and the need for a stop-pause control. After experimenting with a number of ideas, the following device has proved the easiest and cheapest to make (cost about 11s. in July 1960). It has the advantage of being silent in operation, and can be used anywhere up to a radius of 12 feet from the recorder. It can be operated by either hand or foot, and it is adjustable for different sizes of spools. With a little ingenuity it can be made to fit other recorders of the Gramdeck type. The device consists of a rubber teat, 12 feet of rubber tubing, and a rubber No. 2 Round ball, all of which are obtainable from:—

The Altrincham Rubber Co. Ltd., 26 The Downs, Altrincham, Cheshire. (Costing the writer 9s. 6d. last July 1960.)

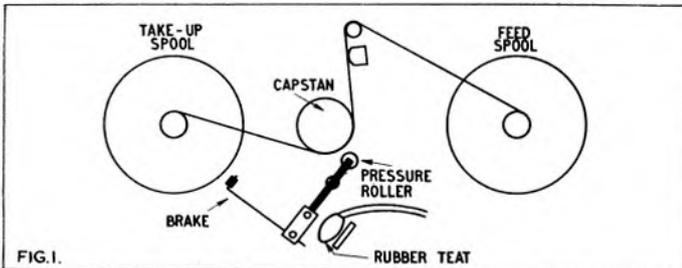


FIG. 1.

The other pieces of equipment bought were a bicycle spoke (2d.) and an "Ezeglise" Joining Bridge (6d.) from Woolworths.

The principle of the device is simple (see fig. 1). The lever of the spring-loaded pressure roller, which holds the tape against the capstan, is made to move away from the tape by inflating

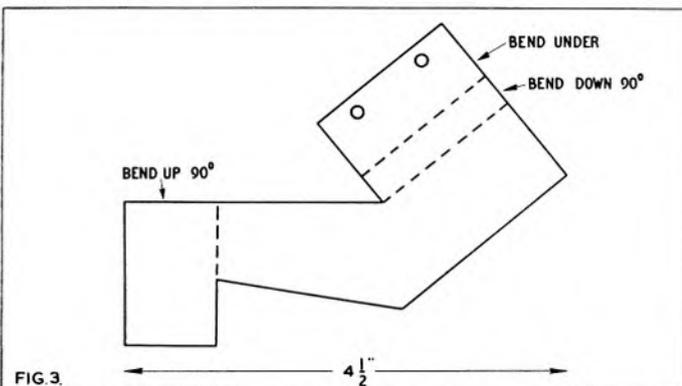
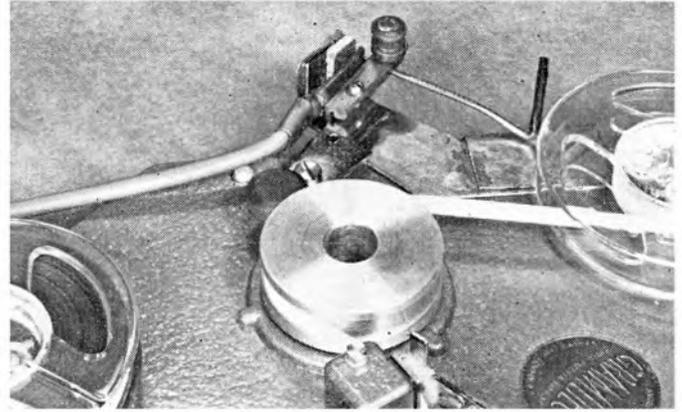


FIG. 3.



The photograph shows the Gramdeck fitted with the pneumatic pause control designed by the author.

the rubber teat, at the same time applying a simple brake to the take-up spool.

In the case of the Gramdeck, it was necessary to lengthen the lever of the pressure roller assembly, this was achieved by fitting on to the end of the lever an "Ezeglise" Joining Bridge by one of its screws, the other screw was used to clamp the brake wire in any position required. The brake was made from a stiff piece of wire (bicycle spoke). A small hole was drilled in the "Ezeglise" Joining Bridge so that the brake wire could be passed under one of the screws and also be clamped in position by it. A piece of rubber tubing obtained from a piece of electrical flex wire was fitted on to the end of the brake that came into contact with the take-up spool.

A clamp-on bracket was made to hold the rubber teat. The bracket could be made much more simply if one is prepared to drill two holes into the Gramdeck casting (at the time of making the device the writer was not prepared to do this). Fig. 3 is the actual shape of the template used for the making of the clamp-on bracket. Thick tin-plate or thin brass are suitable materials.

Fitting Instructions

The following is the method of fitting the device to the Gramdeck, other home-made designs may have to be modified.

- (1) Remove both spools.
- (2) Move pressure roller assembly into locked position (i.e. pressure roller is away from the capstan).
- (3) Fit the bracket holding rubber teat.
- (4) Fit the extension ("Ezeglise" Joining Bridge) to end of pressure roller lever.
- (5) Release pressure roller so that it is hard against the capstan.
- (6) Replace take-up and feed spools.
- (7) Place the Gramdeck on Gramophone turntable.
- (8) Thread up the recorder.
- (9) Adjust brake so that it is an $\frac{1}{8}$ to $\frac{1}{4}$ inch away from the edge of the take-up spool, when the pressure roller is against the tape and capstan.
- (10) Test. On inflating the rubber teat the pressure roller should be moved away from the capstan, and also the brake applied to the edge of the spool.

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SOUND and CINE

The International Scene

by Richard Golding

ONE of the satisfying features of cine is the spirit existing between different countries and the interchange of ideas that comes with this friendship. There are many dedicated and intelligent persons responsible for this interest and co-operation, but none more than Per Ormer of the Oslo Cine Club. For many years now, besides guiding the fortunes of his 700-strong club membership, he has travelled all over Europe, organising festivals, adjudicating and generally furthering the cause of good film-making. Of course, he is helped by the fact that he is "in imports" and that his overseas business friends are in many cases film friends too, but, as most club officials appreciate, sooner or later, and not only with cine, the original *raison d'être* can easily be lost or forgotten under a welter of administration work, and so it was with Per Ormer. He had not made a film himself for over four years, and what was more, he didn't realise it until some few months ago when something happened to bring him back into what he describes as the correct orbit.

Intermezzo in the Night

The occasion was three weeks before the Norwegian National Cine Competition, and some younger members of his club were showing their proposed entries. Ormer's criticism was perhaps a little too harsh and drew some rather pointed replies that left him somewhat shaken as to his own ability as a practical film-maker. "Theorising," they remarked, "is all very well, but what we want to see is what you can do with a camera and a script. Don't tell us, *show us!*"

Prestige was at stake, and after a restless night Ormer accepted the challenge; so, ringing the secretary of the National Competition whom he knew quite well, he found that he had one day in which to enter a film. "Give me the details," said the secretary, "and I'll fill in the form for you. What's the film called?" Ormer did some quick thinking. "*Intermezzo in the Night*," he said. "Classification?" "Scenario," said Ormer, and doing some rapid mental arithmetic added, "16 mm., 200 ft. B. & W. with separate-tape sound track."

The story that he had worked out was very simple but relied on some original gags, and concerned a young wife who gets her own back on her errant husband when he returns home late one night after a poker-playing session with the boys. To allow enough time for processing and editing and adding the sound track, it meant that he had to shoot the whole film during the coming weekend, and that a set and actors had to be organised immediately without the knowledge of the rest of the club. He was able to find some acting friends, and a friend with a large flat nearby (with a huge bedroom, that would allow him enough space to get back for his long shots) agreed reluctantly to its use.

Intermezzo in the Night is a comedy in which the visual gags have terrific punch. One of the most hilarious scenes is where the husband puts his head down on the pillow and then sits bolt upright in shock to find the back of his pyjama coat soaking wet. The audience, of course, is aware that the wife has placed the hot water bottle under the pillow with the stopper replaced with a handkerchief, but Ormer points the suspense by some intelligent cutting. The shooting had more than its share of complications, of which one was the flat-owner pounding on the door at one in the morning demanding his bed. The two main leads were not available together all through the weekend, and Ormer had to do some script tailoring to replace two-shots by one-shots and cover this up in his later editing.



Richard Golding, the author of this article, on camera for a London session which featured a street market. The bubble car was used as a dolly for tracking shots.

With three days to go before the actual screenings Ormer got his rushes back from the labs and began a frantic weekend of editing and matching up a separate-tape sound track. Luckily, all his camerawork and exposure was just right and he found that he could just get by with no retakes.

The competition results startled even Ormer, for he won first prize for scenario, the "Golden Scissors" for cutting, and a special prize for the funniest film among the awards, plus election as one of the official Norwegian entries for next week's UNICA Congress at Mulhouse, France.

"Fisheagle in the Pinetop"

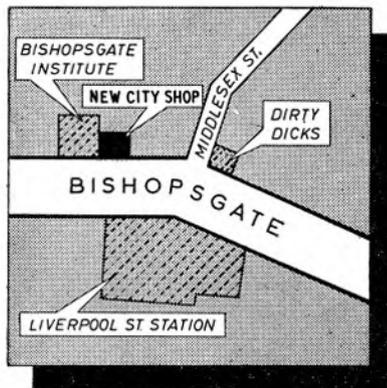
It would be true to say, I suppose, that good comedies from Scandinavia are rare, while natural history forms the major part of all competition entry. One of the best-known Nordic documentary men is Nils Ringen, also a member of the Oslo club, and his last film—*Fisheagle in the Pinetop*—is a real joy to watch. Telling me about his filming problems he said: "The fisheagle is a rare and shy bird so one must be prepared to be patient. After having studied the bird's habits, I built a well-camouflaged platform in a tree, and sat in this shelter for 21 days for seven hours each day. My Bolex was ready at all times, and I took an exposure reading whenever there seemed to be a slight change in the clouds above, for light and sharpness of picture is all-important in a film such as this. The eagle aerie was on a small island in the middle of a forest lake, and we had to use a rowing boat to get me to the shelter. Once I was settled down in the shelter, my young assistant would row back to the shore, and the eagle, after a while, would feel secure again and return to the aerie. In the nest were three fledgelings, which I watched from when they were one week old until that wonderful day when they all flew off for good. The male eagle used to supply all the fish that the family needed up to four feeding sessions a day. I also happened to see this magnificent male eagle plunge from a height of over 500 ft. after a fish, and the water spout went high into the air. Unfortunately the distance was such that I could not get a usable shot of this, but I was successful with others nearer the shore. The 21 long days spent in the shelter was so very worth while and the experience gained, so invaluable."

Pilot-Number Sound Tracks

Apart from the natural physical differences between film-making in Norway and in this country, I found that the basic problems are very much the same when it comes to preparing sound tracks with limited equipment. The pilot or number track is quite popular in Norway, as indeed it is here now, for making up separate-tape tracks or transferring the same to stripe. For the benefit of those readers who have not tried this method for themselves the procedure is as follows:

1. After having drafted the final agreed commentary from your shot list, you then break down the phrases, giving them numbers in

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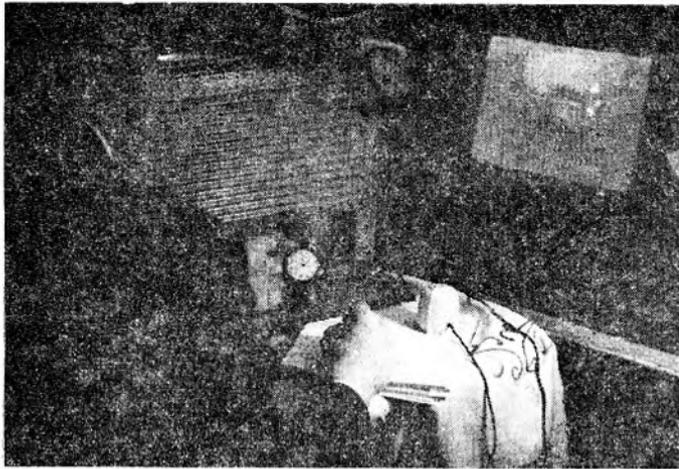
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Preparing a number track

the order to correspond with the relevant shot. Timing or measuring the shots is important before starting the actual recording.

2. Run the film on the projector at your proposed sound speed and start up the recorder.

3. Speak the shot numbers only as the appropriate shot comes up on the screen.

4. Run the tape against the picture to check that you have hit the picture in exactly the right place with your spoken numbers. You may well find that the tape will need adjusting or that you must entirely re-record. It is never easy to get first-time perfection.

5. If you are satisfied with the number/picture relationship, you can now number the tape-base with a grease pencil, or with stick-on cue spots, at the exact physical point on the tape where the spoken numbers occur. Cue marks are, of course, essential for tape and picture start.

6. The tape is then run through on its own. This time the commentary is spoken in full, each phrase being spoken into the microphone the instant the cue number passes over the recording head. The existing spoken numbers will, naturally, be erased automatically and the second recording should be fairly smooth and noiseless (apart from tape recorder noise, which you can experiment with by means of cutting down by using some sort of microphone shield).

The obvious advantages are that projector noise is completely eliminated, and that one person alone working with one single tape recorder, can effect this quite easily without too many headaches. Variations can be tried out, such as superimposing commentary over a music track, or twin-track recording using the same cue numbers. You may not get lip sync with this method, but with practice you shouldn't be too far out, and, if you haven't tried it yet, you may find it an interesting and satisfactory procedure.

Rumanian Documentaries on Loan

Rumania is another country where opportunities for the natural history film-maker abound, examples of which can be seen from the following films offered on loan to any school or other interested organisation. These depict the various aspects of life in Rumania and accent the well-known Rumanian dance and music forms. The sturgeon and the trout films are extremely well done and show how the streams are restocked, these include some quite lovely shots of a sturgeon catch. Write to: The Secretary, The British Rumanian Friendship Association, 101 Broadhurst Gardens, London, N.W.6. A loan of a projector can be arranged for the London and Outer London areas.

A Wedding at Oasului Village ...	...	20 mins.	Colour
Bucharest in Bloom ...	...	90 mins.	"
The Sturgeon ...	...	15 mins.	"
The Trout ...	...	10 mins.	"
Baia Mare ...	...	25 mins.	"
Eastern Carpathians ...	...	30 mins.	"
Full Steam Ahead ...	...	30 mins.	B. & W.
A Transylvanian Wedding	10 mins.	Colour
The Rumanian People's Republic	90 mins.	"
The Retezat Mountains	30 mins.	"

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Many of our readers will already be familiar with the Tandberg range of tape recorders, which have been available in this country for a considerable time. Up to now only four track machines have been marketed, but there must be quite a few people who have a preference for two track machines. A model has now been produced, to be known as the Series 3B, which is monaural, two track and fitted with three speeds of $7\frac{1}{2}$, $3\frac{3}{4}$ and $1\frac{3}{8}$ i/s. No photograph is available at present, but this will be published in New Products at a later date. Quality of reproduction is claimed to compare favourably with the four track Series 6, although the price is only £79 16s. Seven inch spools are fitted, and the frequency response is $7\frac{1}{2}$ i/s 40—16,000 c/s, $3\frac{3}{4}$ i/s 50—9,000 c/s, $1\frac{3}{8}$ i/s 70—4,000 c/s, all \pm 2dB. Other features are; two recording inputs capable of being recorded at the same time, pause or stop button, clock type counter and monitoring by headphones or external amplifier. Tapes fitted with metal stop foils automatically stop the machine at the end of the tape.

For readers wishing to know the more technical details of the machine we are printing below a precis of the specification. Further details can be obtained from Elstone Electronics Ltd., Edward Street, Templar Street, Leeds, 2.

Heads: Tandberg Half-track erase head and half-track record-playback head. Gap width .00025 inch. Tape moves left to right—International standard.

Fast Forward and Rewind: Takes about 2 min. in either direction without wearing the heads.

Controls: Joint playback and record level control. Speed change switch. Output selector switch. Bass switch. Selector for recording, playback, and public address. Lever control for start, stop, forward, and rewind. Instant start-stop and pause button.

Wow and Flutter: At $7\frac{1}{2}$ in/sec. better than 0.15%. This corresponds to 0.4% peak to peak frequency deviation. At $3\frac{3}{4}$ in/sec. 0.2% (0.6% peak to peak). At $1\frac{3}{8}$ in/sec. 0.3% (0.8% peak to peak).

Distortion: The tape recorded to the maximum level by a 400 c/s signal will give less than 4% distortion when played back. A recording level 10dB below the saturation level results in less than 1% distortion of the 400 c/s signal when played back.

Signal to Noise Ratio: 55dB below highest recording level (4% distortion) measured with a straight output meter.

Record Amplifier: Distortion at maximum recording level—below 1%.

Recording Level Indicator: The electronic magic eye EM 71 maintains its sensitivity corresponding to recording current to 10,000 cycles (with selenium rectifier and damped backward movement) EM 71 valve range is 26dB, plus overload.

Input: Microphone input Jack: 5 megohms and 50mV max. Because of the high impedance input, the loss due to the input impedance is below 3dB, at 20 cycles when using the Tandberg TM-2 microphone. Sensitivity of microphone input—1.5 millivolt, for maximum recording level at 1,000 cycles. Input sockets marked Input: 0.5 megohm and 5 volts max. Input voltage of 100 to 200 mV gives maximum recording level at 1,000 c/s, with the volume control set to maximum.

Output: At 1,000 cycles: 2 watts (2.8 volts) distortion below 1%
 3.3 watts (3.6 volts) " " 5%
 At 50 cycles 1 watt (2 volts) " " 1%
 1.5 watts (2.5 volts) " " 5%

Effective source impedance of playback amplifier is less than 1 ohm; negative feedback about 15dB (matched load impedance 4 ohms). Because of the low output impedance and high degree of negative feedback with corresponding low distortion, the playback can be fed into any Hi-Fi amplifier, regardless of input impedance, with no loss of frequency response or quality. Frequency response when used as amplifier only: \pm 2dB, 40 to 20,000 cycles.

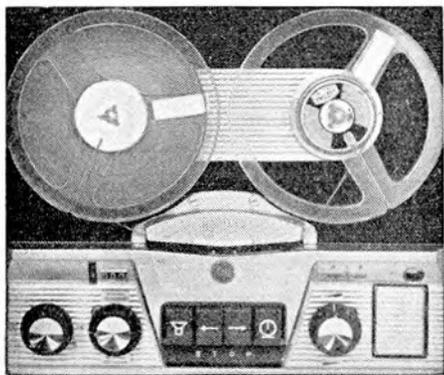
Erase and Bias Frequency: $66\frac{2}{3}$ Kc/s.

Dimensions: **Weight:** Price: Fine grain mahogany cabinet 15 x $11\frac{1}{2}$ x $6\frac{1}{2}$ in. 22 lbs. with carrying case 27 lbs. Including carrying case, with empty reel, and connecting cable £79 16s. (TM-2 Microphone £3 7s. 6d. extra).

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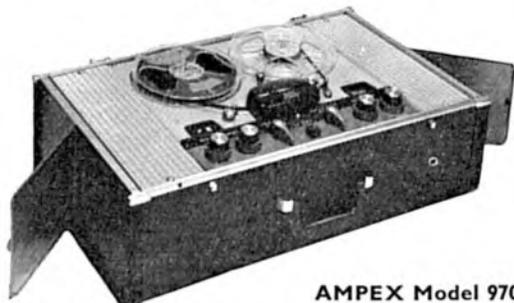
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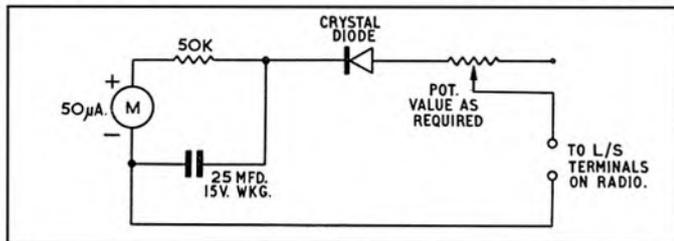
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Readers' Problems

Volume Indicators

Dear Sir:—I wish to make a volume indicator that can be plugged into the external speaker sockets of a radio (either in series or in parallel with the external speaker). I have a microammeter (maximum deflection=50mA). This apparatus is required for use with a Gramdeck tape recorder.—Yours faithfully,
G.A.C., Ward End.

I give below a circuit which will satisfy your requirements. You do not quote detailed characteristics of your microammeter, so I cannot give you a precise value for the sensitivity potentiometer. I would start with 50 ohms. and go up or down as may



be required. Any standard crystal diode may be used. If you need to increase the sensitivity of the circuit, any loudspeaker output transformer can be used, connecting the low (3 to 5 ohm) side to the set, so that it functions as a step-up transformer.

Echo and Reverberation

Dear Sir:—I have endeavoured to obtain technical information on producing an "echo" or "reverberation" effect in conjunction with a Hi-Fi amplifier, but apart from the fact that the principle is known and that certain mechanical devices can be used, I have been unsuccessful in ascertaining any details.

I assume, naturally, that an extra speaker is required and in the hope that you may be aware of how this effect is produced electronically, I have taken the liberty of writing to you for any assistance you may be able to give.

Yours faithfully, **D. F. F., Johannesburg.**

The principle adopted almost universally at the present time for producing echo effects makes use of magnetic recording techniques. A short loop of tape, or alternatively, a magnetic drum, is scanned by an erase head, a record head, and a number of replay heads. The position of the replay heads with respect to the recording head is variable, thus allowing adjustment of the transit or echo time. The original signal is recorded and simultaneously fed directly into a mixer together with the output from the replay channels. By adjusting the level of these outputs, and the transit time, so the required reverberation effect can be achieved. This system replaces the earlier acoustic echo chambers which required careful design and took up a lot of space.

Fitting a Fade Erase Circuit

Dear Sir:—I should be grateful if you could assist me with the following problem. I wish to fit a volume control to the erase head circuit of my Grundig TK8 recorder to enable me to superimpose speech on to pre-recorded musical and sound effect backgrounds. Unfortunately I have been unable to find anyone here who can advise me of the correct way to do it and I should therefore be very grateful if you could supply me with the necessary information and also if possible with a wiring diagram.

Yours faithfully, **D.M., Durban.**

The fitting of a fade erase circuit to common types of tape recorder was covered fairly fully in my "Workbench" column which appeared in the June 1960 issue of The Tape Recorder. Briefly the simplest method is to transfer the power by means of a potentiometer from the erase head to a suitable dummy load resistor. The resistor will need to be of about 2 watts rating and, in the case of a Grundig, the value will be 1K ohm.

Tape Sensitivity

Dear Sir:—I have a domestic tape recorder. When it was bought it was supplied with a well-known brand of tape. Since having the tape recorder I have used another well-known brand of tape on it. In using this new tape, I have found that to get the same quality of recording without over recording I have had to reduce the recording level to such an extent that the magic eye does not move on high modulation. Is this due to the tape I am using now being more sensitive than the tape supplied with the machine, or is it that this tape needs more or even less bias. By the way I have tried more than one reel of this tape.

Yours faithfully, **C. E. F., Norfolk.**

It is quite possible that the tape you are now using is more sensitive than the previous brand, but I think it more likely that this is an apparent effect due to the bias conditions. If a tape is under-biased its sensitivity is increased, particularly at the higher frequencies, and less input signal is required for the same playback volume. However, the playback volume for a given degree of distortion would be lower. While this may not be too noticeable under normal usage it does mean a decrease in the signal/noise ratio. There is, of course, no harm in using a different brand of tape provided the results obtained warrant a change.

Troubled by Static

Dear Sir:—On three of my T/R's—Grundigs TK5 and TK8 and Telefunken KL85, I am troubled with static being built up on fast wind. This static is presumably generated by the belt drive mechanism and passes through to the spools and tape. If I do not pass this static to earth by touching the spools as they revolve, quite large sparks flash from the spools to the deck cover. If I hold my finger within $\frac{1}{4}$ in. of the spool I get sparks arcing across at the rate of about one a second. If I actually touch the spool, I get a continuous phosphorescent glow at the point of contact. The belt drive mechanism is frequently cleaned with meths; the machine is usually earthed (though the drive mechanism does not go to earth); the heads and tape guides are regularly defluxed; and the troubles are similar, whether I am using metal or plastic spools, and irrespective of the type of tape. Could you please tell me (a) with frequent re-winding, can static build up on tape and harm permanent recordings. (b) Is there any easy remedy.

Yours sincerely, **H. J. W., Northampton.**

The build-up of static on your particular models of tape recorder is largely due to the use, by Continental manufacturers, of various forms of plastic in their construction. With present-day tapes it can generally be said that static will not build up on the tape itself due to the use of a conducting ingredient in the oxide coating. This is not to suggest that static, such as you describe, should not be prevented and this can best be done by the application of a furniture cream containing silicones. It should be used on all plastic parts of the deck, and also on the tape spools. This will leave a conductive coating which will last for two or three weeks.

Voltage Supply

Dear Sir:—The voltage settings are 220 and 245 volts on my tape recorder and the supply voltage is 240 volts or sometimes slightly less. I have kept my machine on the 245 volt tapping and occasionally have difficulty in starting the machine on record and playback. I wondered if damage would be caused if I used the 220 volt tapping.

Yours faithfully, **R. M., Workshop.**

Strictly speaking, if your supply voltage is 240 volts then you should use the 245 volt tap on your machine. However, the question really is how much below the nominal does the voltage fall? If it is normally likely to be anything below 235 volts then you could certainly use the 220 volt tap regularly. If you are having difficulty in starting the machine, set to 245 volts, when the mains is 240, then I suggest you get in touch with the manufacturers.

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(Appointed Dealer)

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TAPE, RECORDERS & ACCESSORIES

FIRST DETAILS OF NEW PRODUCTS

● We remind our readers that notices of equipment listed and illustrated in this monthly feature are in no sense reviews. When figures, specifications and diagrams are published, these data are extractions from manufacturers' lists. When samples of this equipment are submitted for test, they are passed to our technical contributors, whose reports are published in a separate section.

★

**FIDELITY
SINGLE-SPEED
"MAJOR"**

★



A NEWCOMER to the range of tape recorders manufactured by Fidelity Radio Ltd, is the "Argyll Major," a two track model, in a one-piece moulded case. The recording speed is $3\frac{1}{2}$ i/s, and the maximum spool size is $5\frac{1}{2}$ in. A 7×4 in. high flux elliptical speaker is fitted together with a magic eye level indicator and playback tone control. An external loudspeaker socket is provided enabling recordings to be played back through a larger speaker. Input sockets are fitted for microphone, radio and record player, and the machine is supplied complete with microphone, tape and extension lead. Price £29 8s.

A four track version of the above-mentioned machine is available and is named the "Argyll Major 4". This has the same features, but using an additional amplifier, it is capable of replaying stereo recordings. The price of this model is £30 19s. 6d. The manufacturers are Fidelity Radio Ltd., 11/13, Blechynnden Street, London, W.11.

★

**THE
SIMON
SP5
RECORDER**

★



SIMON have announced their long awaited SP5. This uses the E.M.I. 2-speed tape deck first seen at this year's London Audio Festival and has many novel features. Most outstanding of these is the outward appearance which is not only pleasing to the eye but a number of practical advantages are claimed including quality of reproduced sound, ease of operation and good ventilation. The basic recorder is 2-track monaural but a number of plug-in units can be bought to convert it to full stereo operation. Claimed frequency response at $7\frac{1}{2}$ i/s is 30-20,000 c/s ± 3 dB and 30-10,000 c/s at $3\frac{1}{2}$ i/s, wow and flutter at $7\frac{1}{2}$ i/s is said to be better than 0.15% and 0.2% at $3\frac{1}{2}$ i/s. No signal to noise ratio or distortion figures are given in the provisional specification. Other special features are the fitting of 4 heads, record, replay and two erase; $2\frac{1}{2}$ in. rectangular level indicator which is also calibrated to read bias; three motors, rewind time of 75 seconds for 1,200 feet of tape. The internal loudspeakers are a 10 in x $6\frac{1}{2}$ in. bass unit and a 4 in.

tweeter. For the overseas market only there is also a conversion available to enable records to be played at 45 and $33\frac{1}{3}$ r.p.m. The price has not been finally agreed but the basic recorder will not exceed £94 10s. The recorder will be demonstrated at the Radio Show. Further details of this interesting machine can be received from Simon Equipment Ltd., 48 George Street, London, W.1.

★

**FERROGRAPH
SERIES
420
RECORDER**

★



THE introduction of a new Ferrograph is always an occasion in the tape recording world and they have just introduced the series 420 which comprises Models 422 and 424—the essential difference being that the latter has the additional facility of providing for playback of 4 track pre-recorded material. Briefly the facilities offered are: 1. Recording and playback monophonically on either track independently and with continuous monitoring. 2. Recording and playback stereophonically with continuous monitoring on both channels. 3. Playback on one track whilst recording on the other. 4. A signal recorded on one track can be re-recorded on to the other. 5. During the transfer of a signal from one track to another additional signals can be superimposed through the simple mixing facilities provided. 6. A switch on the panel enables instantaneous comparison between input and recorded signal. 7. By making use of a delay between recording and playback heads, echo effects can be introduced. 8. N.A.B. recording characteristic is employed but on playback N.A.B. or C.C.I.R. can be selected at will. 9. Model 424 only—playback of pre-recorded 4-track material. All the basic Ferrograph features are retained, most of which have been little changed over the last twelve years of production. The price of the Series 420 is £115 10s. Models will be available in September. Further information can be obtained from The Ferrograph Co. Ltd., 84 Blackfriars Road, London, S.E.1.

Price Increase For Clarion Mark 1 Converter

G.B.C. Electronic Industries Ltd., announce that they have been compelled to increase the price of the mains converter unit for their Clarion Mark 1 tape recorder from 4 gns. to 5 gns.



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157**

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Manufacturer's Specification: Line voltage 110-250 volts 50 cycles A.C. Power consumption 62 watts. Tape speeds $3\frac{1}{2}$ i/s and $7\frac{1}{2}$ i/s $\pm 2\%$. Track positioning: four track in accordance with international standards. Rewind time approx. 250 seconds for 2,400 ft. of tape, $7\frac{1}{2}$ i/s. Max. reel size 7 in. Frequency response 40 to 15,000 c/s at $3\frac{1}{2}$ i/s, and 30 to 20,000 c/s at $7\frac{1}{2}$ i/s, both within ± 3 dB. Wow and flutter less than 0.2% at $7\frac{1}{2}$ i/s. Sensitivity: radio 200 millivolts, phono 100 millivolts, microphone 0.07 millivolts at 200 ohms. Output voltage: 1.4 volts max at radio or stereo connector. Signal to noise ratio better than 40dB. Output at speaker: mono 3.5 watts, stereo 1.8 watts per channel. Weight: 29 lbs. Price: £89 5s. Distributed by: **Technical Suppliers Ltd., Hudson House, 63 Goldhawk Road, London, W.12.**

THIS is a four-track stereo recorder with separate two-channel erase, record and replay heads. Low noise high frequency transistors are used as preamplifiers and two 2 watt power amplifiers are contained in the cabinet. The internal monitor speaker can be switched to one or both channels as required; it can also be switched off completely when external speakers or amplifiers are in use.

Comprehensive Instruction Manual

There are necessarily a large number of controls, switches and input and output sockets, and I found that the marking of some of the controls was slightly ambiguous and not at all self-evident. Close study of the very comprehensive instruction book is absolutely essential if best use is to be made of the very considerable potentialities of this machine. For instance, little plugs under the head dress cover allow heads and amplifiers to be interchanged, so that one channel can be used to monitor the other to give instant off-the-tape quality check. Cross recording from one track to the other is possible, and a novel control allows the superimposition of echo on a recording by using the slight delay between the record and replay times of adjacent heads. One can record on one channel and simultaneously listen to a completely separate programme on the other. With all these permutations and combinations available we must not lose sight of the prime use of this recorder: the recording of stereo, live from microphone, or direct from stereo gramophone pickups or stereo broadcasts.

Playback Responses: The playback only responses were checked by playing test tapes with surface induction characteristics of 100 and 200 microseconds time constant at tape speeds of $7\frac{1}{2}$ i/s and $3\frac{1}{2}$ i/s respectively. Fig. 1 shows these responses at the stereo or radio outlet sockets. 0dB corresponds to an r.m.s. output of 0.5 volts with the gain control fully advanced. It will be seen that the replay characteristics correspond closely to C.C.I.R. recommendations for these speeds.

Record Replay Responses: These responses were measured very simply by using the tape monitoring system mentioned above. Oscillator tones were fed to the phono socket of the "Green" channel and the head plugs inserted so that the top track was

monitored by the replay head and the "Red" channel using the stereo output socket. Fig. 2 shows the overall response at the two speeds. Heads and amplifiers were interchanged to record on track 3 with almost identical results. Playback level was set at 0.5 volts with the gain control full on. This was done because examination of the circuit diagram showed that small condensers were connected, between the top and slider terminals of the gain controls, which may have affected the response at intermediate settings of the controls. A quick check showed that this was in fact the case; with the controls half way the extreme top response was raised by about 3dB.

Recording Level and Volume Indicator: The monitoring facility also proved very useful whilst checking the correlation between record level indicator and recorded signal distortion. It was found that distortion occurred when the magic eye beams were just closed. Further checks against the standard test tapes showed that this distortion commenced only 6dB above test tape level instead of the usual 12 to 14dB above test tape level. This indicates that the bias is set below opti-

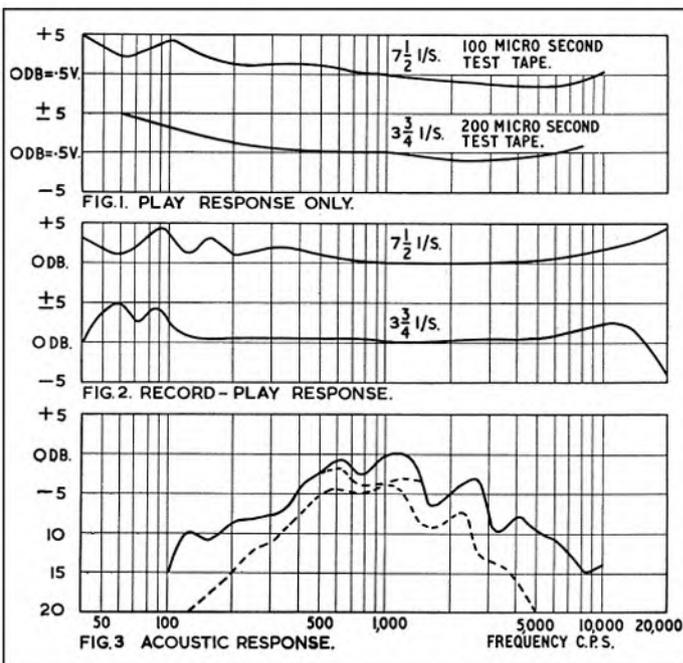


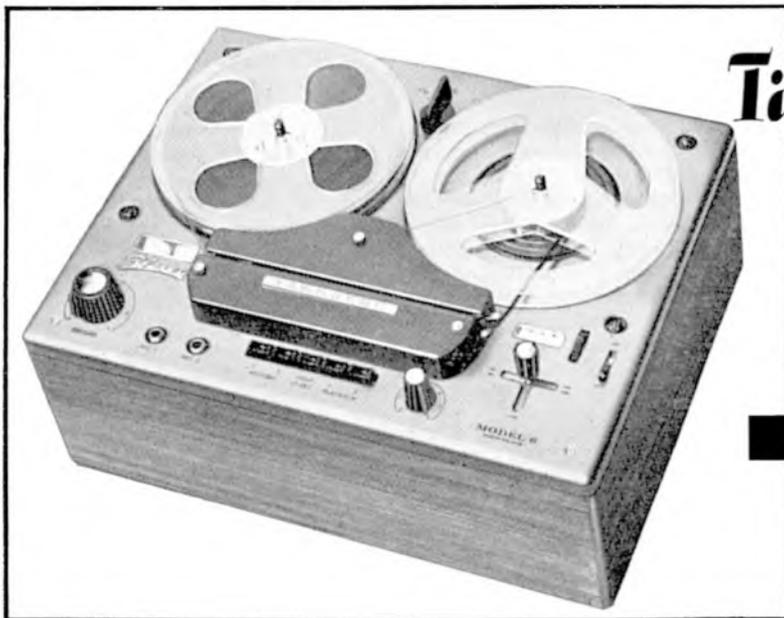
Fig. 1 Play response only. Fig. 2 Record play response. Fig. 3 Acoustic response.

mum, as is usual in most Continental machines, in order to obtain the very wide frequency response shown in Fig. 2. As regular readers will know, I personally deplore this practice as it can so easily aggravate intermodulation distortion and "drop outs" due to minor imperfections in the tape oxide, etc. It also limits the possible maximum signal/noise ratio obtainable.

Signal to Noise Ratio

Signal/Noise Ratio: Signal/noise ratios were found to be identical at the two tape speeds: 34dB below test tape level with no tape running, 33dB below the same reference using bulk erased tape, and 32dB below test tape level for tape erased and biased on the machine with the gain control at zero during record. This means that the signal/noise ratio of pre-recorded tapes (which we must assume reach true +12dB peak recording level and contain little recorded noise) may achieve a signal to noise ratio of 45dB, while tape recorded on the machine,

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with its limited peak recording level and slight bias and erase noise, will be in the order of 38dB.

The noise as seen on a C.R.T. was composed of almost equal proportions of 50 c/s hum and transistor hiss. Due to the falling response of the ear at low frequencies, only the transistor noise was audible with no tape passing the heads. With the tape running at $7\frac{1}{2}$ i/s tape noise was slightly more than the transistor noise, and at $3\frac{3}{4}$ i/s the tape noise was predominant. Thus for quarter track playback the transistor pre-amps are comparable to low noise valve stages for hiss, and definitely better than most valves for hum, unless the valve heaters are D.C. fed.

Microphone Recording

Unfortunately this advantage has not been held for microphone recording. With the gain fully advanced, which is essential for low level microphone recording, recorded hum is more than 10dB above erased tape noise, and is unpleasantly audible. It increases when the microphone socket is short circuited, and falls when it is open circuited, which indicates that it is caused by an electromagnetic "earth loop" effect and may be cured by earthing the mic. earth return to a different point on the chassis. I had no time to chase this down to its logical conclusion, but it is an unfortunate fault in this particular unit and should be checked in others before acceptance.

Output Stage and Speaker Response: The output stage and monitor speaker are dealt with together, as the output stages are "raw" pentodes with no negative feedback, so that a constant current, rather than a constant voltage, will be fed to the speaker and the voltage across the speaker terminals will reflect the change of speaker impedance with frequency.

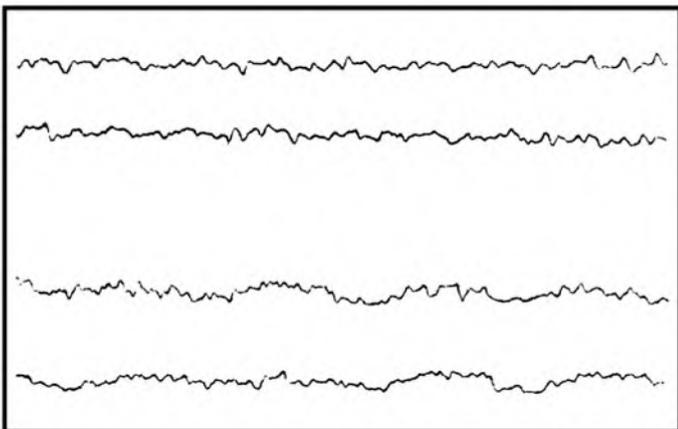


Fig. 4A Top two fluttergrams readings at $7\frac{1}{2}$ i/s, 0.1% R.M.S.
Fig. 4B (lower pair) $3\frac{3}{4}$ i/s, 0.15% R.M.S.

Also the switch-type tone controls labelled *Music-voice* and *Bass treble*, which cut the bass and top note response respectively, are inserted in the grid circuits of these stages. **Fig. 3** shows the overall acoustic response at one foot from the speaker fret, when a $7\frac{1}{2}$ i/s White Noise test tape is played and when the tone switches are operated. The response is rather "Hump backed" but is adequate for monitoring purposes. The relatively poor output stages make it desirable to operate quality stereo speakers through Hi-Fi power amplifiers fed from the stereo socket of the recorder.

Wow and Flutter: The wow and flutter performance of this machine is excellent. **Fig. 4a** shows the fluttergram or pen recording which indicates the instantaneous deviations from an absolutely constant speed of $7\frac{1}{2}$ i/s, and **Fig. 4b** that for the lower speed of $3\frac{3}{4}$ i/s. A very slight wow at capstan rotation frequency is visible and audible on a sustained pure tone at $3\frac{3}{4}$ i/s, but music is impeccable at both speeds.

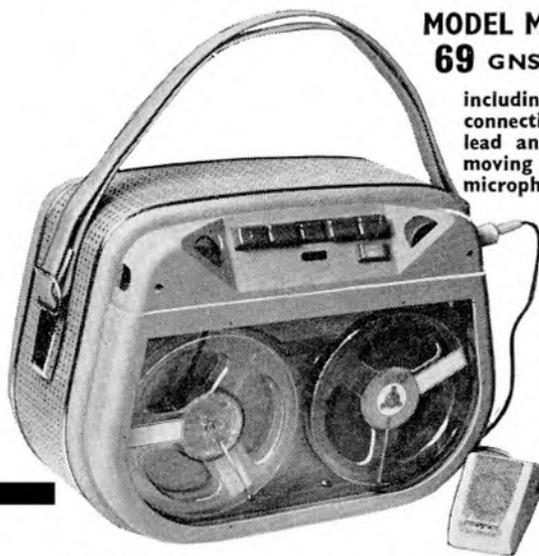
Comment: This is a machine for the really advanced amateur or semi-professional, and is certainly not suited to the aged, teenage, or female touch. It took me nearly two days to learn how to "play" it; but, once mastered, it is a very versatile instrument capable of superlative results. **A. Tutchings**

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TAPES REVIEWED

HAVING recommended our readers (Editorial column) to support a new venture, we decided that the least we could do was to give them some idea about what they might be letting themselves in for. Accordingly, and with apologies, we have dropped the "Readers Stereo Statistics" analysis and replaced it with these two columns—a new Tandberg, and some new tapes—both "hot news": and, as we write, Frank Sinatra is singing "Don't worry about me", at 3½ i/s, on World Record Club tape TTP 81, via Tandberg series 6, Quad amplifier equipment, and Tannoy speakers—our standard tape review apparatus.

We succeeded in prising eight tapes from W.R.C. for this eleventh hour report. They are: TTP 81, Frank Sinatra, "Over my Shoulder": TTP 82, Nat King Cole sings his favourites: TLMP 1, South Pacific: TTP 76, Tchaikovsky, Symphony No. 5, played by the London Symphony Orchestra, conducted by Sir Malcolm Sargent: TTP 86, Duke Ellington: TTP 154, Judy Garland: TTP 63, Grieg, Piano Concerto, played by Alexander Jenner and the Bavarian State Radio Orchestra, conducted by Odd Gruner-Hegge: and a new recording of "No No Nanette" on tape No. TTP 88.

Reviewing this batch was both simple and a pleasure, for without exception their quality is very good indeed, and the musical content is also of a very high standard. Time samplings were also taken of four, and these were: Nat King Cole, 36 mins: South Pacific, 44 mins: Frank Sinatra 33 mins: The Tchaikovsky symphony, 45 mins. As we jumped about from number to number when playing the others, accurate timings were not possible in the time available, but the quantity of tape on the spools suggests that they will be well up to the above averages. The recordings are on Emitape and on E.M.I. spools, as might be expected, since E.M.I. are producing them for W.R.C! The samples have printed white leaders and red trailers, in E.M.I. tradition, making it immediately easy to see what is what when (as often happens) a tape finds its way on to a strange spool. The boxes in our case were plain white, but we understand that they will be sold in handsome boxes with coloured cover designs. So much for the general details of the products.

South Pacific was particularly enjoyable, and it will undoubtedly appeal even more upon repeated playings when (having recently seen the film) one is able to anticipate the styles of the artists on the tape—Joyce Blair and Ian Wallace with the New World Show Orchestra. The numbers are, Overture: I'm gonna wash that man right out of my hair: Bali Ha'i: Some enchanted evening: There is nothing like a dame: Younger than Springtime: Dites moi: Bloody Mary: I'm in love with a wonderful guy: Cock-eyed optimist: Happy talk: Carefully Taught: This nearly was mine: Finale, twin soliloquies.

Nat King Cole and Orchestra, sings Ruby and the Pearl: Answer me: Nature Boy: Faith can move mountains: Pretend: A fool was I: Dinner for one please James: Mother Nature, Father Time: Forgive my heart: Someone you love: You weren't there: If love is good to me.

Sinatra sings, with orchestra, My dear baby: Look over your shoulder: White Christmas: Not as a stranger: Merry Christmas: Melody of love: I love you: How could you do a thing like that: Love till I die: Don't change your mind about me: Why should I cry over you: Don't worry about me.

Tchaikovsky. A very satisfying performance of this most popular symphony. And it so happened that this tape was straight from the experimental run, and therefore without a leader, or any information to tell us who was conducting an anonymous orchestra. This can sometimes be a good thing. Anyway, the tape proved that really good symphonic sound can come from a 3½ i/s tape—and the added knowledge that Sir Malcolm is to be the name on the label was part of the answer.

Space does not permit much more comment upon these tapes, but all of them are confidently recommended to readers for samples, according to their musical tastes. The recordings are all of high quality, clear and bright. Further details from World Record Club, Ltd., Lion House, Red Lion Street, Richmond, Surrey.

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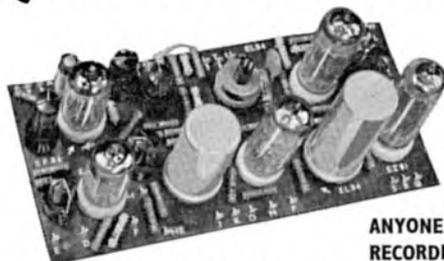
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