

JULY 1964

TAPE

RECORDING MAGAZINE

24

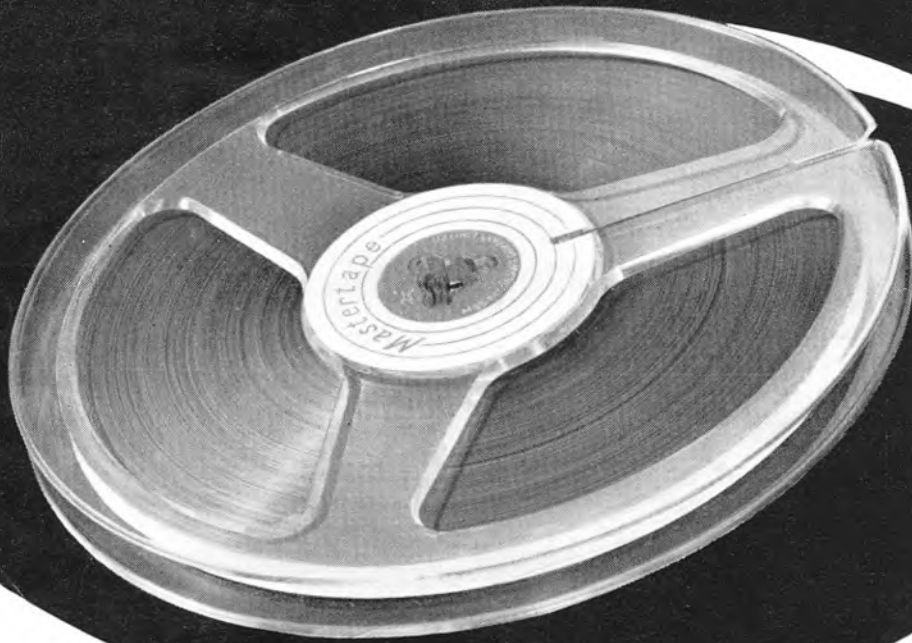


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Professional advice on producing sound effects ● **Recording outdoors with a battery portable** ● **Drama productions on tape** ● **How to record music** ● **Reviews of tape records** ● **Equipment tested** ● **Service Bureau** ● **News of new products** ● **News from the clubs**

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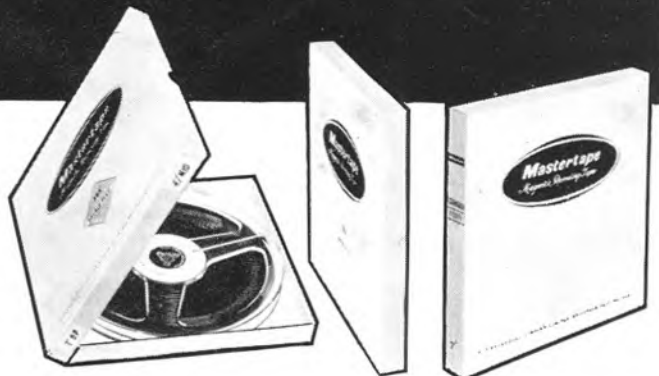
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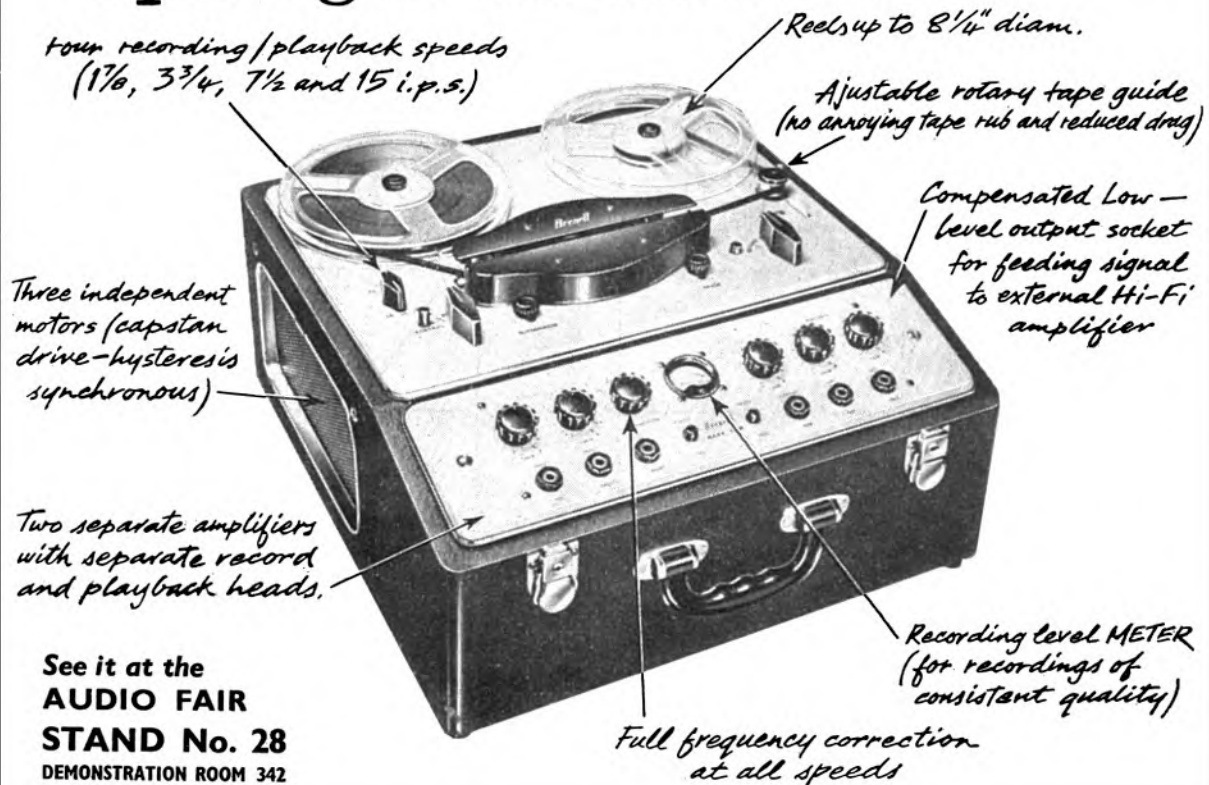


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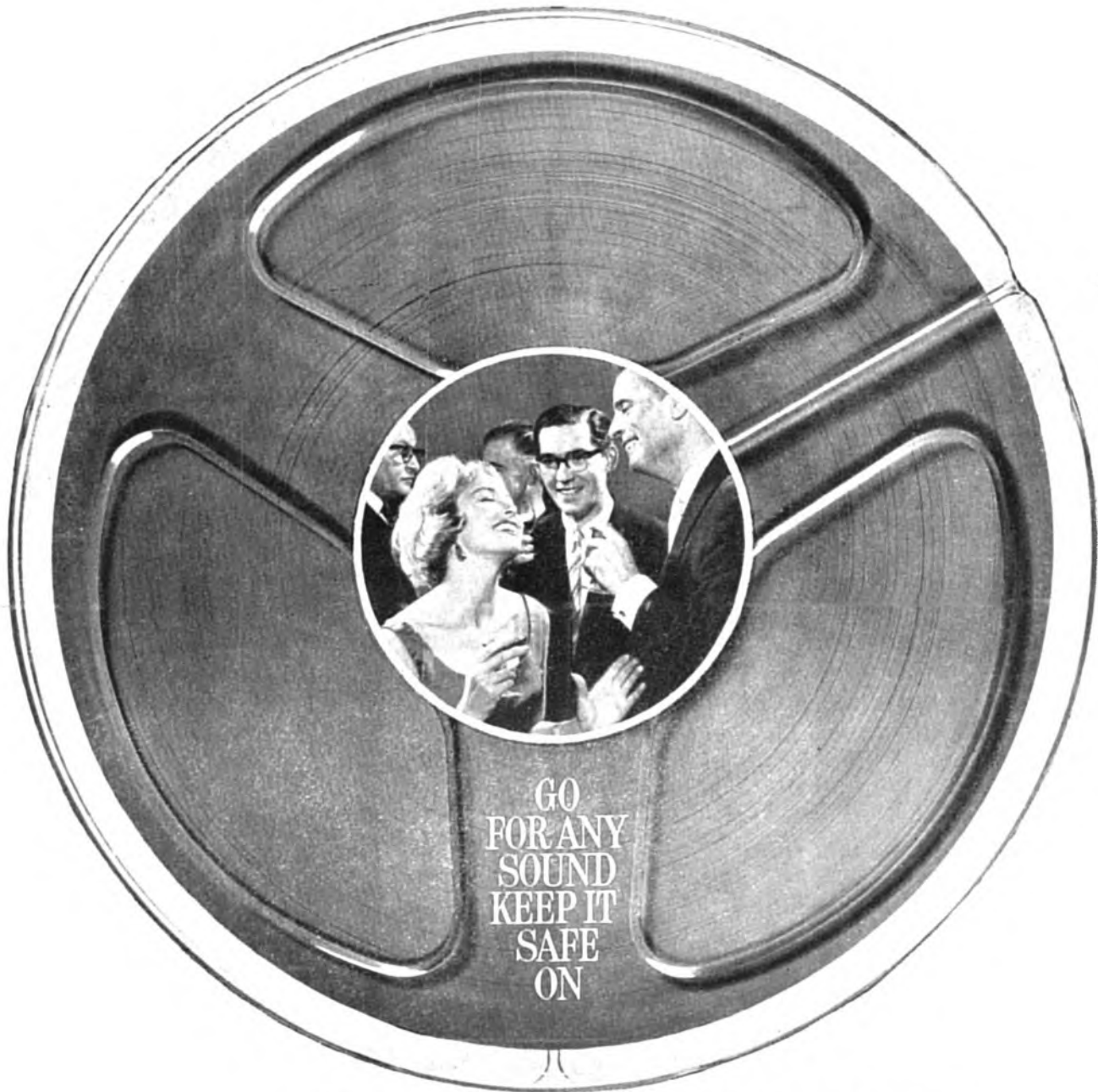
plus...

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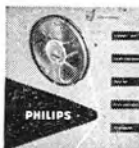
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FOR ANY
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KEEP IT
SAFE
ON



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for longplay
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for doubleplay
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for tripleplay



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Telefunken 85 ...	8 15 0	6 10 8	83
Grundig TK41 ...	8 0 0	5 17 11	75
Brenell 5/2 (Meter) ...	7 15 6	5 16 7	74
Brenell 5/2 ...	7 5 0	5 8 8	69
Truvox 92 ...	7 5 0	5 8 8	69
Reps R10 ...	6 4 0	4 12 11	59
Telefunken 95... ..	6 4 0	4 12 11	59
Grundig TK18 ...	4 2 0	3 1 5	39
Grundig TK14 ...	3 13 6	2 15 2	35
Wyndor Trident ...	3 10 0	2 11 11	33
Ferguson 3200 ...	2 16 6	2 0 10	26

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TAPE AMPLIFIER UNITS: Models TA-IM and TA-IS. The mono version, TA-IM, can be modified to the stereo version, TA-IS, by the modification kit TA-IC. Special features include bias level control, recording level indicators, printed circuit boards.
TA-IC £6.15.0. TA-IM £19.18.0. TA-IS £25.10.0.

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Total Price £15.18.0 kit



FM TUNER

HI-FI AM/FM TUNER. Model AFM-1
Also available in two units as above: Tuning unit (AFM-T1 £4.13.6 incl. P.T.) and I.F. amplifier (AFM-A1 £21.16.6).

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AM FM TUNER

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High quality stereo Tape
Decks.

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TRUVOX D83



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The "Cotswold" is an acoustically designed enclosure 26" x 23" x 14½" with 3 speakers covering the full frequency range 30-20,000 c/s. The "Cotswold" MFS. A minimum floor space model size 36" high x 16½" x 14" deep.
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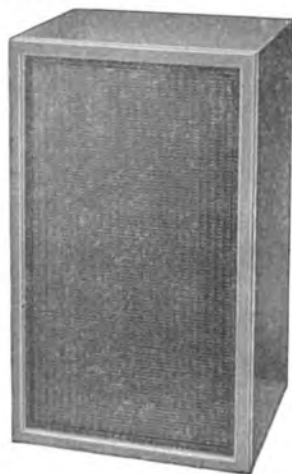
TWO FOR TAPE FROM WHARFEDALE

MODEL W2

A really compact loudspeaker system giving full range performance on mono and stereo.

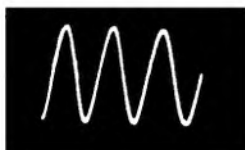
Size: 23½ x 14 x 12
Weight: 37 lb. complete
Frequency Range: 30-17,000 c/s.
Max. Power: 15 watts
Impedance: 15 ohms.

£27.10.0 in whitewood.
£29.10.0 fully finished with a choice of oak, walnut, or mahogany veneers.

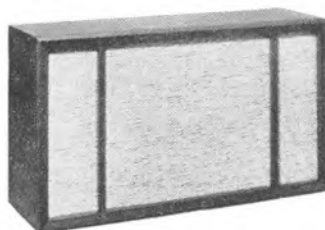


As the waveform shows the enclosure gives distortion free performance down to 30 c/s with 4 watts input.

**FREE LEAFLET
ON CABINET MODELS
ON REQUEST**



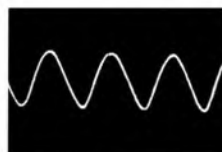
BOOKSHELF 2



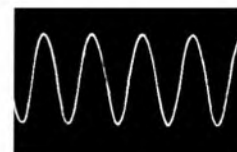
Where space is limited or where mobile external speakers are required for use with a mono or stereo Tape Recorder or Record Player, the "Bookshelf 2" gives remarkable performance judged on a size/price/mobility basis. **Units:** specially designed
Size: 19 x 11 x 6½ deep.
Impedance: 8-16 ohms.
Weight: 18 lb.

10 in. and 5 in. Speakers are fitted with Wharfedale Silver Magnets 12,500 lines flux density. Polished Walnut, Oak or Mahogany Veneers. **£16.10.0.**
Unpolished **£15.15.0.**

The clean low-frequency performance is clearly illustrated by the wave form oscillograms taken with an input power of three watts.



50 c/s.

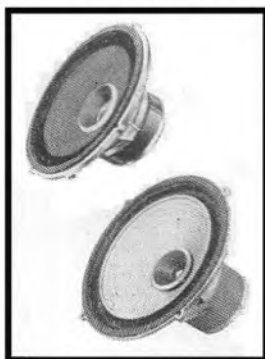


60 c/s.

Load Matching: When used with a set or tape recorder with small output at 2/3 ohms a WMT 1 transformer is worth fitting for optimum results.

FOR THE DO-IT-YOURSELF TAPE MAN

Two loudspeakers from the Wharfedale Super Range which will give excellent results on mono or stereo.



SUPER 8/RS/DD

Impedance 10/15 ohms.
Ceramic Magnet
Flux density 14,500 oersteds. Total flux 60,000 maxwells
Aluminium Voice Coil
Max. input 6 watts rms or 12 watts peak.
Frequency range 40-20,000 c/s Bass resonance 50/60 c/s.
Price: 134/2 inc. P.T.

SUPER 10/RS/DD

Impedance 10/15 ohms. Flux density 16,000 oersteds
Max. input 10 watts rms or 20 watts peak.
Frequency range 30-20,000 c/s.
Aluminium voice coil. Roll surround and double diaphragm.
Base resonance 38/43 c/s.
Price: 218/8 inc. P.T.

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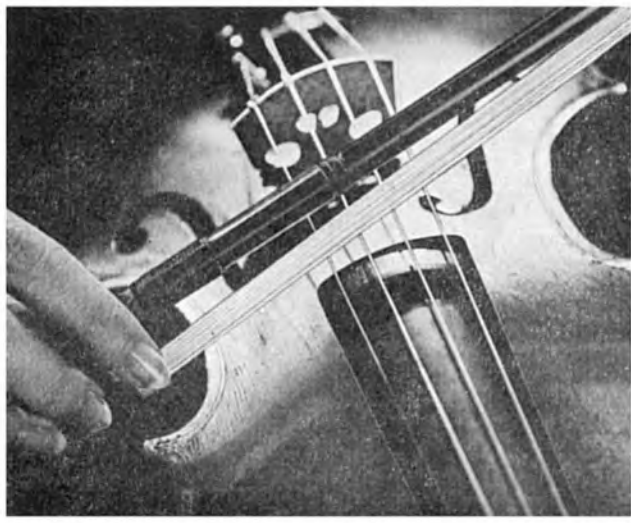
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ALL ON INTEREST FREE HP at

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218 HIGH ST. BROMLEY KENT. RAV. 4000

IN A WORLD OF SOUND



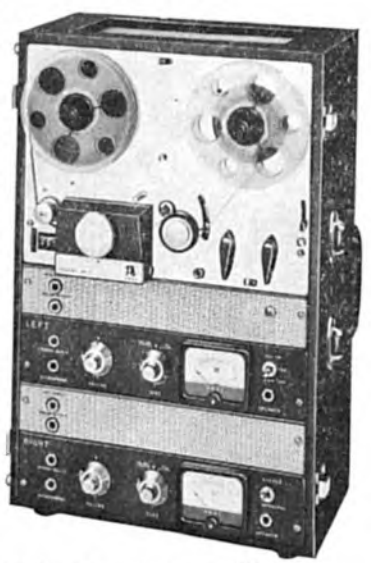
... the most important contribution to the development of recording equipment has been made

AKAI M7

4-TRACK TAPE RECORDER
 THE WORLD'S FIRST 'X'—FIELD TAPE RECORDER

Sound . . . sheer quality of vivid AKAI sound. From the lucid treble notes of the piano to the brave and brassy blare of the trumpet, AKAI tape recorders will faithfully reproduce your favourite sound time and time again—at your command.

AKAI Model M-7. 4 track, 3 speed, full stereo or monaural, twin amplifiers, cross-field recording head, total output 12 watts, V.U. meters. Complete with microphones and accessories £139.13.0.



AKAI Model 345. 4 track, 2 speed, full stereo or monaural, fully automatic operation, protected circuit, automatic re-play device, total output 20 watts, V.U. meters, remote control. Basic price £208.19.0. Remote control £6.10.0

AKAI Model 707. 2 track, 2 speed monaural, V.U. Meter, sinele touch speed control, automatic shut-off device. Total output 6 watts. Complete with microphone, recording tape, empty reel, reel caps, service cables, and full instructions. £88.4.0

AKAI Model 903. 2 track, 2 speed monaural with mixing facilities, V.U. meter, monitoring switch, Instant Stop device, supplied complete with microphone. Reel of tape, spare reel, reel caps, 50 cycle adaptor and splicing tape. £84.0.0

Twin speaker systems are available for all AKAI machines and range from the SS 50 at £31.10.0 through the SS 55 at £37.10.0 and the SS 70 at £38.17.0 to the SS 100 at £43.14.0 and a full range of accessories are available for all models.

If the Akai M-7 is not yet at your usual dealer, write for literature and detailed information to:—

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HITACHI

TOP NAME IN

TRANSISTORIZED TAPE RECORDERS

BELSONA TRQ 399. Price 35 gns.

Tape	3 inch recording tape (85 mm diameter)
Tape Speeds	3½ inch/sec (9.5 cm/sec) 1⅞ inch/sec (4.75 cm/sec)
Motor	6V, 0.6W, with electric governor
Recording Time	34 min. both ways at 3½ speed, 68 min. both ways at 1⅞ speed
Output	500 mW
Speake.	4 inch x 2½ inch (10 x 7 cm) P.M. speaker
Amplifier	6-transistor amplifier, 1-transistor high frequency generator
Recording System	AC bias system
Erasing System	DC electromagnetic system
Track	Double track
Rewinding Time	Less than 4 min.
Fast Forward	
Winding Time	Less than 4 min.
Frequency	150-7,000 cycles (3½ speed)
Characteristics	150-4,000 cycles (1⅞ speed)
Power Source	Four flashlight cells (used for both amplifier and motor)
Dimensions	Width 8 13/16" (224 mm), Height 3⅞" (85 mm), Depth 6¼" (155 mm)
Weight	4.4 lbs. (2 kg) including batteries

Compact Belsona portables offer many features previously found only in standard models. 'Hitachi Ring Base Transistors' for full tone and volume. Level Meter recording guide and battery life indicator. Transistors eliminate warm-up, permit immediate recording and playback. Hitachi also offer finest quality mains operated models, like the TRA 500.

Convenient Accessories 1 Highly sensitive dynamic microphone... 1 Earphone for play back or monitoring recording... 2 Extension cords for recording from radio or for replaying over radio speaker... 1 Hitachi recording tape permitting over 1 hour of recording... 1 Splicing tape for connecting tapes... 1 Reel... 1 Polishing cloth for wiping off head... 1 High quality leather case with shoulder strap for convenience in carrying.

Power sources for home use throughout the world can be used. Hitachi AC Adaptor can be connected easily.

For full details please consult your dealer, but in case of difficulty, contact: **Lee Products (G.B.) Ltd.**, 10/18 Clifton Street, E.C.2 Telephone: BIS 6711 (Distributors for U.K.)



Hitachi, Ltd.

Tokyo Japan

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Six hundred feet of the new Trade Mark **Scotch** TRIPLE PLAY TAPE

- The new 3" reel of Scotch Triple Play Tape is 600' long
The finest 3" Triple Play Tape on the market
And costs less per foot than other top brands.
- Scotch Triple Play Tape not only plays longer, it lasts longer too
- It's coated with "Superlife" a new oxide coating that eliminates rub-off and lengthens tape and recording-head life.

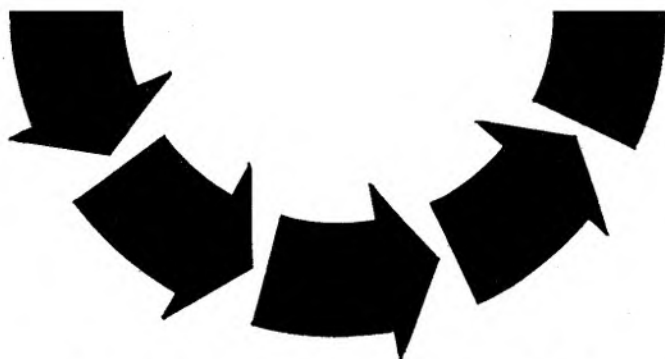
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MANUFACTURING CO. LTD.

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Available in 3" and 4" reel sizes



How fast is Speed ?

Among the many factors taken into consideration by Tandberg engineers when designing semi-professional tape recorders are Tape running speed and maximum reel size.

It is now more than ten years since Tandberg demonstrated their ability to produce a standard of performance at 7½ i.p.s. better than that previously achieved by many expensive 15 i.p.s. tape recorders. Since that time the completely dedicated Tandberg tape recorder research team have progressed from one outstanding development to another.

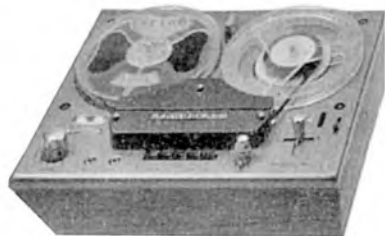
With a speed of 15 i.p.s., and before the advent of modern Long Play tapes, a 10½" reel was essential. The modern Tandberg Series 6 or 7 use 7" reels and with L.P. tape will play 45 minutes at 7½ i.p.s. or 1½ hours at 3½ i.p.s. uninterrupted. This has enabled Tandberg to produce semi-professional tape recorders weighing only 25 to 28 lbs. and measuring 15½" x 11½" overall.

Due to their modest dimensions and absence of overhanging reels, Tandberg Series 6 and Series 7 have therefore established themselves as first choice for inclusion in permanent HI-FI installations.

With final reference to Tape Speed as related to performance we quote:—

"At 7½ neither he nor the reviewer could distinguish the tape from the original. At 3½, the two could be barely distinguished. The reviewer made his differentiation largely on the basis of slightly higher background noise when the tape was played". (Tandberg 64 reviewed in AUDIO March 1963).

"Even at the lowest tape speed of 1½ i/s it needs a sharp ear and a really good performance source to be sure, every time, whether you are listening via tape or directly". (A. Tutchings reviewing Series 6 (2-track) in The Tape Recorder).



Write for details of
Tandberg Series 6 & 7
Tape Recorders and
28 page booklet of
Technical Reviews.

Tandberg

ELSTONE ELECTRONICS LIMITED
Edward St., Templar St., Leeds 2. Tel: Leeds 35111 (7 lines)

TAPE

RECORDING
MAGAZINE

Vol. 8

No. 7

July 1964

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COVER PHOTOGRAPH: "I'm Matt Dillon. And my brother, he's the one wearing the helmet, is John Wayne of the U.S. Marines. We're having a bottle, and that thing we're talking into is our only link with civilisation." Or, for the technician, the new Phillips EL 3300 cassette-loaded battery tape recorder is put through its paces by two young enthusiasts. The recorder is reviewed on page 280 of this issue.

"TAPE Recording Magazine" is published on the third Wednesday in the month, by Print and Press Services Ltd., from 7, Tudor Street, London, E.C.4.

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Back numbers, if still in print, are available at 2s. 6d. per copy.

Address all communications

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FLE 1445

EDITORIAL

ADVERTISING

Editor,
R. DOUGLAS BROWN

Advertisement Manager,
MISS PAMELA DURHAM

Assistant Editor, FRED CHANDLER

Tape trends and tape talk

By the Editor

IT IS SOMETIMES amazingly difficult for the idealist to do his good works. Sometimes his motives are misunderstood. Sometimes he gets into difficulties because he needs the co-operation of others who take a severely practical view of life.

A problem of the second type now confronts tape enthusiasts who are organising services for the blind.

From the original idea of reading on to tape books, articles from periodicals and the like, some enthusiasts have developed special tape magazines for the blind; these are full of interest of every kind, with musical links, commentaries and interviews, and documentary material.

The Post Office have a long-standing arrangement whereby they carry Braille books and "talking books" at special concessionary rates.

The concession was first introduced in 1936 because Braille books are more bulky and much heavier than ordinary printed books and the blind person would have been at a considerable disadvantage when it came to sending them by post.

When, later on, the "talking book" came along, the Post Office extended the concession to cover it, feeling that the same principle was involved as in the original concession.

Now, however, the "tape magazine for the blind" has come to the notice of the postal authorities and they have ruled that the postal concession cannot be extended to cover it.

This is a situation in which one sees clearly that the decision is legalistically correct, but its consequences are thoroughly undesirable. Most of the enthusiasts who prepare these tape magazines for the blind do it as a voluntary service, making their own equipment available free and giving up much of their time willingly to the task. In many cases the tapes have been donated specifically for this work. The only expense, then, is the postage.

If this basic expense is now suddenly increased, many amateur enthusiasts may find it difficult to sustain their

service on the present scale. The Post Office will gain nothing; the blind will lose.

And, as so often with legalistic decisions, an ingenious legalistic mind can readily devise means of defeating the Post Office intention in most respects.

As I understand it, the whole script for a "tape magazine for the blind" could be published in a duplicated news-sheet with as small a circulation as you like and then read on to tape, and that tape would qualify for the concession! Only the music would need to be sacrificed.

I think the Post Office official who has decided this matter has acted in accordance with the rules. But I should like to see the representatives of the blind taking the matter up and having questions asked in Parliament, so that a revised decision, based on common-sense and charity, may be announced.

* * *

WHO ARE THE BEST customers of British manufacturers of tape recording equipment. In Europe, most recorders are exported to Denmark, Belgium and Switzerland.

Last year about 36 per cent of British exports went to Europe, about 15 per cent to North America and about 10 per cent to Asia.

Over one and a quarter million pounds' worth of tape was exported last year.

* * *

AS READERS MAY HAVE guessed from the absence of news in recent months, the Telcan video machine will not be on the market as soon as was hoped.

In America, where Telcan have linked with Cinerama, the appearance of machines in the shops is now off until next year. I anticipate that the British launching will come after the American debut.

Meanwhile, another major American company, Fairchild, have announced a videotape recorder. Like Telcan, it records at 120 ips, but quarter-track on standard quarter-inch tape (Telcan is half-track).

The Fairchild recorder has a price-tag of less than 500 dollars (about £180), with a closed circuit TV camera at about 150 dollars (£55).

EVERY NOW and then *Punch* turns to tape recording for a laugh. And it is, indeed, a subject which gives the humorist plenty of scope. I am not surprised that Mr. E. S. Turner, the author of the latest *Punch* piece, enjoyed himself at the expense of a reader who wrote to one of our contemporaries discussing stereo.

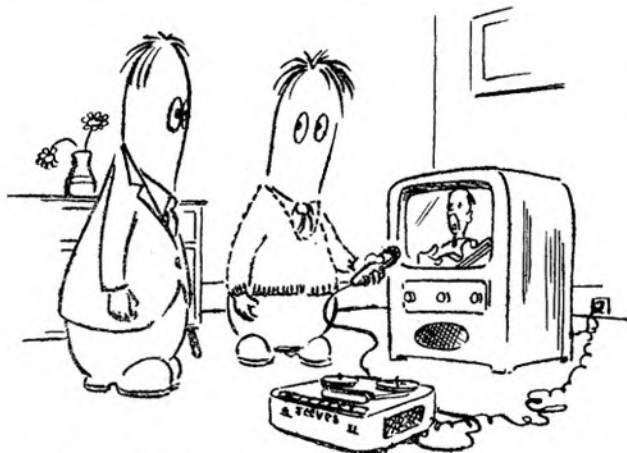
"Listening in bed with one's head upside down creates the effect of an orchestra playing upside down," this reader apparently wrote in all solemnity.

Mr. Turner also looks at the new offers of sleep-learning equipment and warns: "wait until the marriage guidance and happy wedlock people start sending out their under-the-pillow suggestions."

As for video prospects, he sees a happy prospect ahead: "The ultimate dimension in happiness will be attained—that of appearing on television without having one's head bitten off by Robin Day or his ilk."

Touché.

LAUGH WITH JEEVES



"I thought I'd try a spot of video tape-recording."

Script-writing, like other forms of creative work, cannot be taught. In this new series a writer for stage, radio and TV gives some practical guidance starting with "The Treatment".

Working on a tape script

By ROY RUSSELL

A SCRIPT is a script whether you write every word in full dialogue layout, or make fairly detailed notes and run it into conversational English as you tape it, or jot down headings and extemporise on them, or interview people off the cuff, or waffle on with no particular plan to guide you.

The result, for good or bad, is a script and may be cut, edited, reshaped or augmented from a verbatim type-back or directly on the tape. You will be very fortunate if your live material does not need working on. Professionals do it all the time. "Don't worry if your script runs over the 58½ minutes" a BBC producer told me, "We'll cut it back on the tape after production. A line here, a word there." And this from a radio play that I had considered a final highly-polished script.

There are three general types of tape-scripts. First, the dialogue script which is intended for actors practised in playing to microphones (not necessarily professionals, by any means) or by a commentator skilled enough to make a script come to life—giving the impression that he is thinking it up as he goes along. For examples, study BBC Repertory company actors and such top-class script jockeys as David Jacobs or Jimmy Hanley.

We are concerned here with creating the script rather than its execution, although the scriptwriter must always be imagining, all the time he is working on it, how he intends it to be interpreted. A fast or exciting scene is written in shorter phrases than a slow or quiet one and so on.

But some recordings may actually be on

hand when scripting begins. This is the second type of script where the material has been recorded as the opportunities occurred and is now available for dovetailing, as it stands, or edited, into an overall script.

The third type is where the script is prepared in advance with gaps left for actuality material, interviews, on-the-spot sounds, effects and perhaps a mixture of the real and the fabricated to be recorded subsequently.

Each type has its merits and uses. Your subject matter or basic idea may lend itself better to one of them. But quite often a good tape programme could be made by each method. These would be different treatments of the same subject, and choosing the treatment should be one of your first chores when setting out to write a script.

The obvious treatment for a sound programme of say, a football match, would be a fast, all-talking commentary with actuality backgrounds mixed in. Less obviously, and with possibly more artistic and less sports reportage, the subject could be treated from the emotional angle: the teams in the dressing rooms before and after, thoughts aloud, the irony of the "before" and "after" contrast, the cocksure team loses, those who secretly thought they had no chance won; or as a comedy, on the field remarks to each other and the referee, crowd comments, referee mind-wanderings to his domestic troubles; or as a fantasy, using musique concrete effects for the patterns of the players, the boot of the ball, the corner-kick, the penalty, the goal, etc., or the actuality of the victorious (or vanquished) team's return home. Or both.

The decision as to treatment is a very important one and, if possible, it should be taken before any recordings are made. This must affect the format of the script, its details and even the way the recordings are made. Background effects may be called for to be real or synthetic, symbolic or non-existent.

Whatever your treatment, however, it must have shape, as with a sonata or a symphony, a novel or a film, or a play. Of course the skeleton shouldn't show when you have clothed it in the flesh of dialogue. Its purpose is to hold the finished job together. And when we look later on at the purpose of the basic shape we will know how to create it.

Where material which shows potential as the bones of a programme has already been collected the treatment has to be considered in reverse. The recordings should be played through and studied carefully to elicit what type(s) of treatment they best lend themselves to. Which amounts eventually to the same thing.

If more than one person is working on the programme, it is as well to explain the treatment to everyone concerned. A good idea can always be enthused about: "This is a new angle on the subject, chaps. I don't think it's ever been done before . . . well, not quite like this. Nesta Pain once did a programme on insects but this is human beings and the story is quite different."

This not only informs and encourages the team, it is a good test of whether your idea and treatment are worth working on anyway. You may find yourself having to defend them against criticism. Now is the time to discover fundamental weaknesses. So never be ashamed to say "Well, it's an idea," and search for a better. Or even a variation which overcomes the criticism. When thousands of inches of tape have flowed past the record-head it is a bit late in the day.

It is wise, therefore, if you are a lone worker, to criticise your own ideas. Self-criticism at all stages is a good thing any way, and particularly early on. On the other hand never allow it to stifle your creative impetus. If in doubt about an idea, give it a whirl. If it doesn't come off at least the practice has been valuable, particularly if you can pin-point why it hasn't. And there is always the glorious chance that it might come out not only different but good.

So keep your thoughts on the general treatment of your subject flexible. If you have doubts be alive to them but don't let them hold you back. Any section of a script can be re-written or even scrapped.

If working on paper comes slow and laborious to you, slam your thoughts onto tape as fast as they bubble out, jumping illogically to a new idea as you exhaust the previous one.

It is when you play back, selecting and rejecting, trying to put the pieces together and reject the no-good stuff that the work begins. More time has to be spent in perspiration than inspiration. Too many scripts show brilliant ideas, inadequately worked upon. Which is a pity.

I intend to deal with the shape and structure of a script at length, so it will be the subject of my next two articles. But don't be hidebound by the thought of overall sequence, continuity and linkage. Get the clay in your hands first; moulding should begin only when you have more than enough to work on.

Once you have decided on the treatment let your imagination take flight. Shape it to your ends afterwards, only if, and where, the results do not measure up to your requirements. I shall be saying more about the practicabilities of flexible working in later articles too.

Meanwhile if you have particular script-writing problems let me know and I will try to elaborate on them in this new series.

Recording a quartet with solo horn only

By RUPERT L. TAMS

A MUSICIAN friend asked me if he could record the four parts of a horn quartet on tape. He would then be able to say to admiring colleagues—"This is me playing with me, myself and I."

Having heard records of certain great singers performing duets with themselves, there are certain artistic advantages which we had noticed.

In the first place, an artist always inflects notes the same way. Secondly, ideas on phrasing the superimposed parts are not likely to conflict between, say the tenor and bass if the same person is singing them both, and thirdly, a single interpreter will be equally "standard" as regards tempo and dynamics of the whole music.

For example, a cadence of two successive notes of the scale played by one musician and then another, may differ considerably. (From bitter musical experience I suspect that in fact most musicians have a different way of playing any one given note.)

There is also the little matter of the rests and those mysterious time intervals between finishing one note and playing the next, only indicated vaguely in the score as "legato" or "staccato" or by other foreign words.

I had been studying these by slowing down the piano recordings of the late Arthur Schnabel, and if I am to believe my ears the liberties he took with these unwritten time intervals are such when enlarged by slow tape speed, that Herr Professor would have been relegated to the beginners' class, provided of course that the examiner had an ear equal in acuity to the tape recorder.

So it seems that from the interpretive

point of view, much is to be gained by one musician playing many parts—on with the one-man band.

Apart from having one performer, sorry, executant, we should only be using one instrument.

With four horns there would be, unavoidably, slight differences in the colour harmonics or tuning, whereas one instrument superimposed on itself should blend perfectly, any tonal idiosyncrasies or timbral dissonances not beating discordantly with those of the three others.

Both these arguments substantiated our reasons for trying to record a quartet using one instrument and one player.

The work to be thus impermeably taped was a quartet for horns by Hindemith which had the advantage of being little known (outside of horn playing circles that is, where its intervals of ninths and elevenths are very highly regarded, perhaps because if a wrong note is played it is likely to fall into this scheme and the listener thinks—"Ah yes that must be another eleventh."). It also had commendably short movements.

In our first attempt at the recording the simplest possible means were used. The parts were superimposed using two tape recorders. The recorded part was played back from one through a hi-fi loudspeaker system, with the player adding the next part. These were then recorded by the second tape recorder via a suitably placed microphone.

The two parts are then played back and the third part added and so again for the fourth one.

As a visual metronome, we had equipped ourselves with a weight on a piece of string, but our artist, being used to playing in a major orchestra disdained it, the preliminary ejaculations of the tape recorder opera-

tors serving as an adequate starting indication as the conductor's baton would be.

We used an expensive machine for recording, the tapes being changed over to a good so-called "domestic" type machine for playback through one of the best hi-fi setups I have heard.

The first adjustments for sound level were made, our instrumentalist playing the entire first movement bass part. This was then recorded and the tape moved to the other recorder for playing back.

The operator of the recording machine had noted the amplitude of the maximum peaks and had set his control to half the value for the next operation of superimposition—fortunately the horn is not a very percussive instrument. The microphone was placed midway between the player and the loudspeakers for adding this next part.

He then recorded two-thirds of the third part and one-third of the second (a whim of his to avoid difficult counting) accompanying the bass part without difficulty as it poured from the loudspeakers.

On playback, we were horrified to hear a loud clacking noise with almost every note. It was of course the valves of his horn. There was also a small amount of high frequency noise present which we did not like either.

The former was easily cured by asking our artist not to bang his valves; by moving the microphone farther away from him; and arranging to point the horn directly at the microphone.

The microphone we used was an omnidirectional, very sensitive crystal one, of which we then had a high opinion.

The high frequency noise, we suspected was caused through playing back with a larger head gap than that of the tape head of the recorder, this integration introducing transient harmonics rather like rectification. So from then on we altered our operative system, always playing back from the same machine which had made the recording.

Instead of taking off a reel of tape and passing it to be placed on the playback machine, the simpler process of unplugging the microphone from one machine and the amplifier from the other and exchanging leads was adopted. As with our previous method, we had to consider that we were playing back three times, and the finished four parts would not be on the same reel of tape on which the first part was recorded. It would never have done to present our musician with a reel containing three-quarters of his work.

The horn player applied salve liberally to his lips and we started again with the bass part of the first movement.

When three parts were on tape we could but admit that the band of high frequency noise was not merely still with us but was growing and developing as much personality as the scratch of an old '78 disc.

Having completed the last part, we found that the result, though interesting musically, was far too low-fi for any connoisseur of sound reproduction to applaud.

We listened critically, argued, and concluded that it sounded very like microphone noise.

Any X-cut quartz crystal has piezoelectrical resonances which can be stimulated by a sound wave containing suitable harmonics. On each successive recording the microphone might act as a filter emphasising its own characteristic band of noise, selectively from the speaker source. (We were being too clever about this.)

The acoustic resonance of the room undoubtedly added to the noise and in the

(Continued on page 278)

Have you ever tried recording the 'silent' countryside?

By L. REID

Now that so many battery recorders are on the market at prices to suit every pocket many more people will be tempted to have a go at outdoor recording. If you are joining the ranks for the first time don't expect too much at the start; early attempts at outdoor work are liable to resemble the decapitated photographs produced by our first camera! There is more to outdoor recording than simply taking a battery recorder into the nearest wood and switching on, although a man who did just this came first in a tape recording contest! The element of luck involved makes this a most fascinating hobby.

I must warn you that if you have any ideas of a peaceful countryside "where the lowing herd winds slowly o'er the lea" you can discard them at once. Unless you are very lucky indeed the lowing herd will be inaudible above the noise of farm machinery, and one might as well be in a factory as in a harvest field when the modern reapers are at work. The recordings will sound very much the same!

Even the sounds of Nature herself appear rather overpowering at close quarters to some people. There is a story of a towns-

man who went to the country for a holiday and returned next day complaining of animals bawling their heads off and birds screeching outside his bedroom window at unearthly hours! Sometimes I wish I could find as much vocal activity when I take my recorder out; all too often conditions are exactly the opposite, and only unwanted noises greet the microphone.

Even in the most remote areas someone is sure to be shouting, or trying to sing; clattering round in some old jalopy or shrieking overhead in a jet plane. I've encountered hammering and banging and clanking in the most unexpected places, and noise carries long distances in the open air, which seems rather strange in view of the damping effect of the atmosphere.

The noisy people always seem to start their infernal din just as the bird I've waited ages to record begins to sing; the only sounds I get on tape then are unrepeatable! A fortune awaits the man who invents a microphone with the human ear's discrimination against background noises.

It is now several years since I made my first attempts at outdoor work. I sallied forth with a brand new Butoba and high hopes of getting results to equal those of Ludwig Koch! I soon learned better.

My first discovery was that as soon as I left the shelter of my four walls I was "troubled by wind" . . . not internally, but through the microphone. The lightest breeze sounded like a howling gale and effectively blasted all other sounds off the tape. Microphone wind shields are available but are rather clumsy things to carry, and often a crumpled handkerchief wrapped loosely round the microphone will help. One also learns to shield the microphone with your body and clothing.

Incidentally if you think it would be easy to record the sound of wind in trees . . . just try it, and you will learn a valuable lesson!

My first live subjects were blackbirds; they simply gave themselves up from every tree. Thrushes, rooks and robins proved equally agreeable. In fact one robin sat on a post while I walked up to him and thrust the microphone almost under his beak as he warbled happily. I thought I was making excellent progress until I decided to go after more elusive game such as cuckoos and corncrakes, both of which seem scarce in my area.

Then the fun began!

I drove all over the countryside asking people if they could tell me where I could find a cuckoo, but they only looked at me rather oddly. Nor was I any more successful in tracking down a corncrake, although I sometimes got other sounds on tape during my search.

Once when working my way quietly round a promising meadow I was startled by a loud roar close behind me. Fearing that I was about to be tossed by a bull I turned quickly and came face to face with . . . a cow! She was peering through a gap in the hedge to see what I was up to. Very soon her companions joined her and presented me with a lowing herd in ideal recording conditions. Intrusions are not always so welcome!

There was an evening when I waited beside a lake to record some ducks which were quacking and splashing towards me. Just as I switched on a group of children erupted, apparently from nowhere, and ran yelling towards the water. Seeing my equipment of course they wanted to know what I was doing and if I was from the BBC; so like the ducks, I departed hastily. Fishermen always refer to "the one that got away" but the recordists phrase is "if

only something had happened a minute earlier, or later."

Nowadays I seldom go out with any definite ideas of collecting a particular sound; I'm content to search for sound effects and take what offers. This is much more rewarding. Sometimes one gets rather bizarre results . . . like the waterfall which blew up!

I'd been recording the water tinkling in a small glen . . . miles from human habitation I thought . . . when a loud explosion made me jump. Apparently someone was shooting rabbits in a nearby field. I do not look in the least like a rabbit but I thought it wise to beat a hasty retreat with my recording of the waterfall which ended abruptly in an explosion.

Farm animals can prove every bit as temperamental as any prima donna. Sometimes it seemed as if every living creature had taken a vow of silence . . . maybe in protest against the noisy human race.

I often drove for miles along country roads past flocks of "dumb" sheep, herds of pigs without a single grunt amongst them, and flocks of hens which had indeed "cut the cackle"! Sometimes it seemed they did it on purpose. I could hear them during my approach and again as I left the scene, but while I was there . . . silence.

On one of these outings my wife suddenly exclaimed "sheep" referring to a flock glimpsed through the hedge. Grabbing my gear I made for a gap. There they were, but the only sound was of tearing grass and chewing. I regarded them and they stared at me; a few even stopped chewing for a moment in contemplation of the strange sight. I made encouraging sheep noises but they only continued to look at me stolidly, and I thought, rather pitily. Then as I turned away a single derisive "baa-aa" followed me, and from the car I heard a chorus of "baas" as though they were discussing me . . . but I did not go back. Once is enough to be fooled by sheep.

On another occasion it was my turn to fool some animals. I was able to do this with the help of a recording of a young bull, who, incidentally, also seemed to hold me in low esteem. He must have been of a wandering disposition for he had a metal plate fastened across his horns. This had slipped sideways giving him a rakish look as he glared at me out of one eye. He obliged with a magnificent display of bellowing . . . all duly recorded, and finally turned away with a sound very like a very contemptuous "yah."

Next time I encountered a herd of silent cows I played back the bull's deep voice. Their indifference vanished immediately and they looked as interested as a cow can and pressed forward with gentle "moos". I was afraid they would fall through the hedge in their eagerness to find the bull.

This playback idea can produce some amusing results. If a recording of a blackbird or robin is played in a garden the odds are that the "resident" bird will come tearing up in great excitement to find the invisible intruder! I wish I'd had some real sheep noises to play to those sheep.

These are only a few of the sort of experiences which the outdoor recordist may expect, and travelling around with a battery recorder makes every outing much more exciting. Besides, the tapes provide entertainment for the winter evenings, when through the miracle of sound recording we can re-live our happiest moments. Such recordings are to us the equivalent of the big-game hunter's moth-eaten animal heads on the wall, or the fisherman's rather dilapidated fish in a glass case.

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Elizabethan LZ.29 (illustrated)—7½, 3¾ and 1½ ips	£37.16.0
Elizabethan Popular 400—3¾ ips only	£26.5.0

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*Reflectograph Model A (3 head system)—7½ and 3¾ ips	£110.5.0
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*Telefunken 95—7½, 3¾ and 1½ ips	£61.19.0
Elizabethan LZ.30—7½, 3¾ and 1½ ips	£33.12.0
Optacord 403 (with monitoring)—3¾ and 1½ ips	£47.5.0
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The quality of speech recordings was very good, particularly when played back through hi-fi equipment. (The Extra input on my Leak Point One Stereo is rated at 50 mV and is therefore comfortably loaded by the EL 3300.) The record/replay response curve in the accompanying group confirms the flatness of the response up to around 6,000 cps, which is highly satisfactory for a tape speed of 1½ ips. Indeed the quality of the reproduction is quite surprising from such a small machine. I made a number of recordings from radio and was able to obtain astonishingly good reproduction of music.

Quite apart from the innovations which make this recorder extremely versatile and "quick on the draw," its quality of performance will recommend it to a wide range of amateur and business tape users. The price of 25 guineas seems remarkably low, including as it does a handsome carrying case. The cassettes, which retail at 19s. 6d. each, make an ideal, compact storage system.



The motor is governor controlled, and the makers claim that the correct running speed will be maintained so long as the supply voltage is 6½ volts or over. At all times during playback or fast winding the needle on the recording level/battery life indicator shows the state of the supply voltage, a separate red band on the scale showing when the batteries need changing.

As an alternative, an auxiliary socket on the Sanyo "Portable S" allows for operation from any convenient 9 volts D.C. source. Once again there is an optional extra accessory for this purpose. It consists of an A.C. Mains adaptor, which lets you run the machine direct from 110/220 volts A.C.

TEST RESULTS

The maximum spool size is only 3¼ inches, but this gives up to 15 or 30 minutes per track at 3½ and 1½ ips respectively with double play tape. The tape supplied ran for 15½ minutes per track. The rewind time was 1 minute 50 seconds.

Recordings made through the microphone and replayed on the machine's own 4 x 2½ inch built-in loudspeaker made a favourable impression. This was no doubt enhanced by the greater-than-usual output power rating of the Sanyo, which is one watt maximum, 0.8 undistorted. This means that you can produce enough actual volume to fill a very large room, and, incidentally, you can just about deafen yourself if you wind the volume up too high while listening on the monitoring earphone.

Replaying these recordings through a hi-fi loudspeaker naturally produced improved bass reproduction but did tend to reveal the limited frequency response one expects from microphones, etc., outside the professional class. However, recordings made via the Radio input were pleasantly reproduced. The 3½ ips speed was better, of course, as is confirmed by the response curves (see accompanying graph).

Wow and flutter were commendably low at both tape speeds. No doubt the elimination of changeover pulleys or idler wheels, by using a simple drive capstan collar, has produced a useful simplification of the drive mechanism all round.

While A.C. biasing is used, the erase head works on D.C., so that the noise level tends to be high as is often the case with transistorised portables. In general, however, this latest Japanese importation can be strongly recommended. I know of no other battery portable currently available to beat it at the price.

ACCESSORIES

The included accessories are the leather carrying case, dynamic microphone with remote switch, radio lead, monitoring earphone and a small roll of jointing tape. These are all contained in a zip-fastening leather case which slips on to two straps for shoulder or hand carrying.

Available as extras are the following: foot pedal on/off switch FS.61, A.C. mains adaptor D9-MC (Price: three guineas) and telephone adaptor.

Manufacturer's Specification

Input sockets: microphone (with remote control switch) and radio.

Output socket: external speaker or monitor earphone.

Dimensions: 8½ x 3 x 10 inches.

Weight: 5½ lb. (without batteries).

Price: £37 16s.

U.K. Agents: Russell Richards Limited, 1, Dyers Buildings, Holborn, London, E.C.1.

Manufacturer's Specifications

Outputs: External amplifier 0.5 volt, 20,000 ohms; headphones 200 mV, 1,500 ohms.

Cabinet dimensions: 7¼ x 4¼ x 2¼ inches. Carrying case dimensions: 8¼ x 6½ x 2½ inches.

Weight: 4 lb., including case and batteries. Manufacturers: Philips Electrical Limited, Century House, Shaftesbury Avenue, London, W.C.2.

SANYO PORTABLE 'S'

By John Borwick

THE Sanyo Portable "S" tape recorder will strike many people as being a nice compromise between the heavy mains-operated machines (some of them "portable" only in name) and the pocket-sized midgets which, with a few famous exceptions, are toy-like in their fragility and limited technical performance. It is manufactured in Japan by the Sanyo Electric Co. Ltd.

This two-speed, half-track recorder is certainly no toy, as a glance at the specification will show. It is true that the upper case is made of plastic, but it is quite robust and of course normally

has the added protection of the snap-over leather carrying case. Except when changing batteries, there is no real need for the machine ever to be taken out of its case. It is designed for operation while being carried on the detachable shoulder strap, and there are port-holes for the volume control, footage indicator scale and loudspeaker grille.

The spools are very firmly held on their spindles by spring clips, so that there is no danger of them coming adrift, even if the machine is tipped upside down. When you are not on the move, the recorder may be used vertically or horizontally. In the horizontal position the machine resembles a square piano, with the controls, input and output sockets and volume meter in a row along the front.

THE CONTROLS

Four identical piano keys give the usual facilities of play, fast wind, rewind and stop. Alongside the play key is the safety record lever, so that it is easy to depress them simultaneously for recording.

Remote controlled start/stop operation is very useful for mobile recording (and of course for dictation, etc.). It is provided for in two ways on the Sanyo machine. First, the microphone carries a slide switch and its cable terminates in a dual jack plug. This fits into dual sockets so that the microphone switch will stop and start the machine either for recording or playback.

Second, a socket on the side of the machine takes a foot-switch connector (Sanyo make a suitable switch as an optional extra).

The two tape speeds, 3½ and 1½ ips, are not switchable, as on most recorders. Instead, you fix a removable collar on the drive capstan for 3½ ips, and take it off (there is a parking place for the collar when not in use) for 1½ ips. Making this change-over takes only a few seconds.

The volume control and the recording level indicator (this carries a second scale to indicate the battery voltage; see next section) are easy to read and adjust. The meter pointer moves into a red section on the dial if the input signal is too high.

POWER SUPPLIES

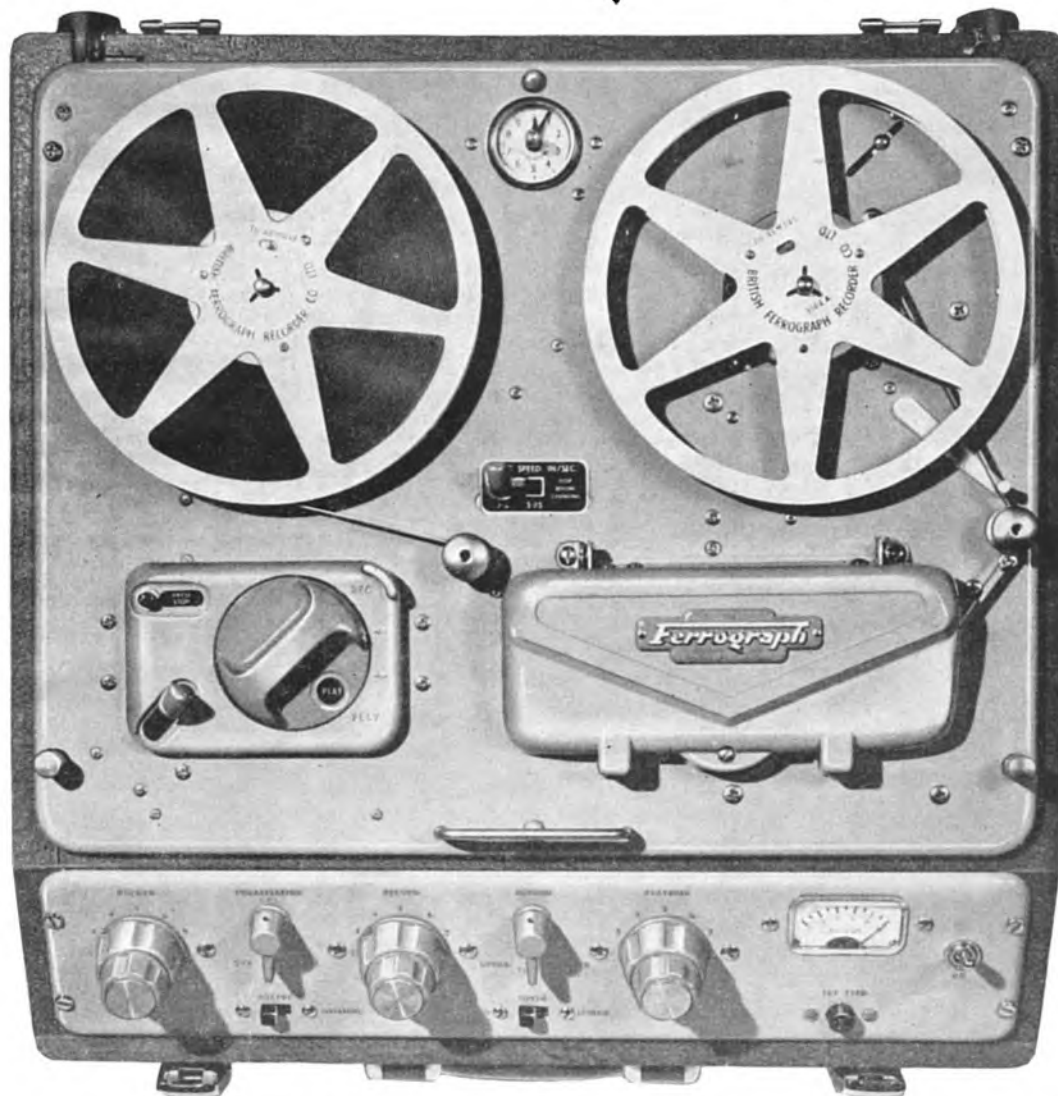
The normal power supply comes from six 1.5 volt size C batteries (for example, Ever Ready U.11). As with all battery recorders, it is recommended to use the leakproof type, and to make a habit of removing the batteries if the machine is to be out of use for a period of time.

RESPONSE GRAPHS

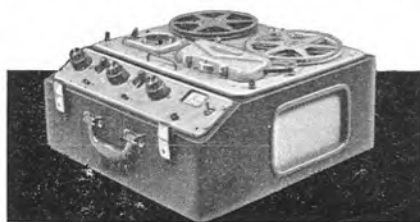
The response graph in Fig. 1 was obtained by recording fixed level tones via the input socket on the EL 3300 and measuring the level reproduced for each tone at the External Amplifier socket.

Some tape recorders have more than one output connection, and I find that I have not always made it clear which was used in the test. For example, in my recent review of the Ferguson 3204 I used the External Loudspeaker socket. The graph showed a falling off in low frequency response, which is in fact a deliberate feature of the design—to prevent overloading the built-in loudspeaker at low frequencies. A superior bass response is, however, available at the high impedance output socket of this machine. J.B.

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John Borwick asks:

HOW WIDE IS A RECORDING TAPE?

MOST people would say that the answer to this question is a quarter of an inch, unless they happen to come into contact with some of the industrial grades of half-inch, one-inch and two-inch wide tapes used in instrumentation and video recording. But Philips have made a real bid to change all our ideas on tape widths with their new cassette-loading recorder, the EL3300, which you will find reviewed in the Test Bench feature on page 280.

This revolutionary recorder uses $\frac{1}{2}$ -inch wide tape, that is half the standard width, and it employs standard quarter-track heads to give two-track mono operation.

Of course we shall soon hear all the old arguments from the "flat earth" brigade who want everything to stay as it is. To them, standardisation is of first importance; we should have one speed, one track convention, one thickness and one width.

But I for one have never found four tracks very easy to work with, and I have the feeling that many owners of four-track recorders just use Tracks 1 and 4 because of the difficulty of finding the particular recording they want on four tracks. So the return to two-track, albeit on half width tape, makes quite good sense to me.

I have just been putting the new Philips

machine to the test, and I applaud the ingenuity of the designers in producing the most interesting recorder for amateur or office use for several years. The fact that it uses cassettes of non-standard width tape will be no serious drawback provided Philips make spare cassettes readily available.

DO YOU EVER TAPE MUSIC?

Surely every owner of a tape recorder has to answer "yes" to this question. We know that it is expressly prohibited under the Copyright Act of 1956. Any unauthorised re-recording of gramophone records either directly or from a broadcast, even for private purposes, is an infringement of the copyright normally held by the issuing company.

Yet tape is so convenient for collecting together specific programmes of musical selections of our own choosing that we succumb to the temptation, even when we are already regular buyers of gramophone records. When it comes to producing feature tapes, to tell a story or sound documentary, we are bound to want music from somewhere. And the same thing happens in preparing sound tracks for slide and cine shows.

Cine enthusiasts have always had an easy way of legalising their dubbing of gramophone records. They simply have to join the Institute of Amateur Cinematographers (Secretary's address: 8, West Street, Epsom, Surrey) and they are covered for the express purpose of amateur film making.

Now, as you will have seen from the announcement in last month's issue of this magazine, tape recorder owners can obtain similar coverage and so dub music with a clear conscience. The Federation of British Tape Recording Clubs have been licensed by the Mechanical Copyright Protection Society Limited to permit members to record copyright musical works for use in members' homes, hospitals, national and local charities, club premises, old peoples' clubs and homes, and local, national and international competitions.

Note that this agreement covers the music only. You should normally get the permission of the recording company too, to cover the actual performance copyright.

Previously, it would only be clubs affiliated to the Federation who would benefit from

this arrangement. But I am delighted to see that individual Associate Members are now possible. So if you cannot join a club you can still become an individual member and get all the fringe benefits including a Bulletin, etc. Your subscription will be 10s. 6d. per annum, plus a 5s. fee which gives the copyright clearance. I think that this organised deal with the M.C.P.S. is just what we have wanted all along, and I hope many people will take advantage of it. The Secretary of the Federation is E. Roger Aslin, 1007a, Finchley Road, Golders Green, London, N.W.11.

WHAT ABOUT SOUND EFFECTS?

Just as important as music for feature tapes are sound effects, or "noises off," as they used to be called in the theatre.

In theory, it is now easier for you to acquire sound effects of trains, farmyard animals, thunderstorms, etc., than ever before. E.M.I. Records issue an extensive list of about twenty 7-inch 45 rpm discs costing 7s. 3d. each. I have most of these and they are very good value for money, no copyright payment being required for amateur re-recording or public performance.

I have also just been listening to some of the records issued by Recorded Tuition Limited on the Castle label. These are produced by my old friend Fred Judd, and he tells me that the best seller is undoubtedly EFX-2 "Electronic Schemes and Music Concrete." This is a compliment, of course, to his own great talent for compiling electronic compositions. But I wonder if it also means that most people, like me, prefer to record their own everyday sound effects?

Certainly, if time and your recording resources allow it, there is a lot to be said for privately recorded effects. You can make them fit the script exactly, and there is a unique satisfaction in recognising the dawn chorus recorded from your own bedroom window, or the "army marching," that was really a box of dried peas being shaken from side to side.

My advice is to use these excellent disc effects (some are also sold as tapes) where the sound is so unusual that you feel you could never record it well enough yourself, or when you just cannot spare the time to record it. But in all other cases hunt down the sound with your own microphone, or make it up from kitchen utensils, etc.

This procedure firmly rules out some of the easy effects I have seen advertised on disc. I have even seen this delicious item, "Man lighting pipe." Well, I ask you!

DO YOU QUALIFY FOR THE SECRET SERVICE?

The recent discoveries of Russian microphones in the American Embassy (and American microphones in certain American people's homes) must have interested all readers of this magazine. Possessing a tape recorder and microphone makes each one of us capable of eavesdropping, and so invading other people's privacy.

But, unless you join the Secret Service and are actually ordered to do this kind of thing, I would earnestly suggest you *never* record anyone without their knowledge and permission. I am not getting all up-stage about this, or suggesting that we should have a written Code of Conduct for tape-owners. It is just that these espionage stories have made people naturally jumpy, and if you record secretly you may add to the general suspicion directed at microphones, thereby making it difficult for normal non-spies to enjoy their hobby or do a job of work involving location recording.

An Impedance Matching Unit

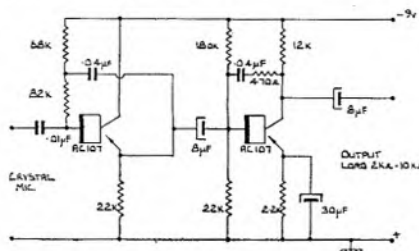
ERRORS occurred in the "Impedance Matching Unit" diagrams (*May issue*), for which the author wishes to apologise. In Fig. 1, condenser C3 from the 56K/22K junction should be joined to collector of TR2 and then to the output terminal. In Fig. 2, condenser C3 (omitted) should be shown joined from the base to the collector solder tags of TR2. The red spot on TR1 should be shown on the upper side, not as drawn.

As stated, the supply voltage should be 1.3 volts and the circuit works satisfactorily on 1.5 volts. The use of higher voltages resulted in an unacceptable noise level; but this could be reduced by careful selection of components. Higher voltage condenser for C3 affected noise considerably. The Clarion recorder referred to (now obsolete) had the virtue that the input was via a condenser; consequently the DC conditions in the matching unit are not disturbed and the unit cannot be supplied with DC by the machine. Readers are advised to check that similar input conditions are effective in any apparatus used with the matching unit.

Mr. A. C. Gorman, Deputy Chief Engineer of Cosmocord Ltd, has offered the circuit (shown right) as a variant of the original arrangement. He writes: "Employing this latest circuit, with a microphone of about 600 pF capacitance, the frequency response will be flat down to approximately 60 cps, the effective input impedance being some 4.5 megohms. Noise level referred to the input is of the order of -76 dB re one volt. Under practical conditions this will amount to a 20 dB (or greater) signal-to-noise ratio when using our Mic. 39. Using the considerably higher output microphone, Mic. 43, the signal-to-noise ratio will be at least 30 dB."

"We would make one point with regard to Mr. Pitcher's supply voltage. This is rather low and could

cause difficulty in that either or both of the transistors could be running close to cut-off conditions and, additionally, might suffer from poor temperature stability. We suggest that, especially with our latest circuit, a voltage of approx. nine volts be used. If a lower voltage is desired, the operating conditions of the two transistors should be carefully checked. At normal room temperatures, each transistor should ideally have approx. one volt DC between collector and emitter; setting this voltage, if necessary, by adjustment to the 82 K ohms and 182 K ohms bias resistors. Use of very low battery voltages, achieving one volt across the transistors may result in very low collector currents (of the order of 1°C) and temperature stability will then be poor. The collector current of each stage should not be less than 300 microamps if temperature stability is to be satisfactory."



Causes and cures for hum problems

By HARRY MACK

CAUSES of hum are legion; cures range from the unlikely to the plumb improbable. Wherever hi-fi fanatics foregather, tales of the hunting of hum would make a fisherman blush with envy. I recall the experience of a colleague, who accepted the challenge to get a quart of equipment into a pint-pot cabinet. He succeeded in squeezing transcription turntable and tape deck, pre-amp, main amplifier and power pack, and even one of a pair of loudspeakers into an enclosure that was originally designed to hold a console radio. But the amount of engineering, and the time he took in trying out modifications made the project as wildly uneconomical as it was technically unnecessary.

Whether one is interested in hooking things up oneself, modifying a basic design to gain some improvement, or merely repairing a standard machine, the problem of hum eradication will, sooner or later, present itself. It is as well to know the causes and perhaps accept a few hints on the cures.

Fundamentally, hum is the result of unwanted pick-up of the mains frequency, 50 cps. But simply to say this is to reduce matters to the bare bone. The pick-up may be electro-magnetic, electro-static, inductive, capacitive, or any combination of the foregoing. In practice, the amplifier noise can be divided between the "electrical" hum and the "noise-on-signal." The first can be caused in a number of ways, including faulty valves, electrolytic capacitors, induced magnetic fields, faulty coupling components, and so on—all apparently obvious faults. The second is much more insidious, is generally the bugbear of the input stage and can vary in cause between simple contact resistance to the combination of capacitance and inductance in a seemingly resistive circuit. Here, the noise factor of the valve, or transistor, and the quality of the components used in the input stage, as well as the layout of the stage, can be of vital importance.

Taking the first and most obvious cause, electrolytic failure. Several readers have queried points on this, including whether the value of capacitor used must be exactly as the original, whether a choke input is superior to capacitor input, and whether resistive series filtering is not a retrograde step. Other readers have asked whether a modification from valve to semi-conductor rectifier needs a change in filter components.

So, if the older hands will forgive me, let us begin with a brief note on what mains rectification is, how it is done, and why filtering is necessary for a "clean" HT voltage.

Fig. 1 shows a typical power unit as used in the modern tape recorder. The mains transformer supplies AC to a full-wave rectifier, in this case a valve, and the DC from the cathode of the valve is filtered before application to the main HT circuits of the apparatus. It will be noted that the secondary of the mains transformer is centre-tapped to chassis and the negative line of the HT circuit completes the current path. The rectifier valve is virtually a one-way-only device and conducts on the half-cycles when its anode becomes positive. The result is a direct current output varying at the frequency of the input pulses. At the common output of a full-wave rectifier, as shown, this variation, or superimposed AC, is at 100 cps, as the anodes each receive alternate positive-going signals with respect to the common chassis tapping of the secondary. This is rather important when we come to eradicate hum, and is one reason why a full-wave circuit is superior for tape recording.

One reader, who was faced with an expensive mains transformer replacement,

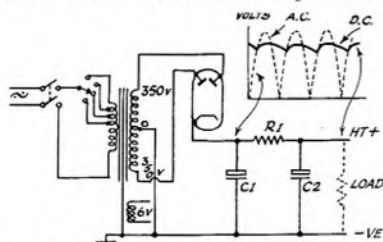


Fig. 1. A typical power unit in the modern tape recorder

wanted to know whether the power pack could be replaced by a half-wave input, using a silicon diode and a larger filter. The objection here is that the safety factor of the double-wound mains transformer is lost, and the AC ripple is a good deal harder to get rid of.

Filter action can lead to quite involved explanations, but all we need to consider is the effect of various types and value of component. First, the reservoir capacitor, shown as *C1* in **Fig. 1**. This charges to a value determined by its capacitance and the resistance through which it discharges. The lower the value of resistance, the faster the discharge, and the more the resulting pulsation. The larger the capacity of *C1*, the less this ripple will be, but there are limitations to the amount of capacitance we can

place across the circuit, principally because of the peak inverse voltage rating of the valve. For half-wave rectification, because the charging pulse appears only half as often, the time period during which *C1* can discharge is longer, and thus the ripple is greater.

The load through which *C1* discharges consists of *R1* and *C2* in series, with the amplifier load across *C2*. If we use a choke in place of *R1*, supposing the resistor value to be 500 ohms, and the choke to be 10 Henrys, which are fairly normal values, then the efficiency of the filter is much greater—in fact, the choke is more than ten times as efficient at trapping the AC, whereas its DC resistance may only be half as much, allowing better voltage regulation, and a higher voltage for a greater current drain. But—and it is a big BUT—a choke will radiate quite a strong magnetic field, so unless the power pack is sufficiently removed from the amplifier, and particularly the input circuits, resistor-capacitor filtering is the order of the day. In fact, the most popular circuit in the modern machine is a bridge-connected metal rectifier with RC smoothing (**Fig. 2**).

Increasing the value of *R1* will improve the smoothing, but the voltage drop across it becomes greater, and the regulation is worse. Consider the 500 ohm resistor, with a 16 microfarad capacitor at *C2*. At 100 cps, the frequency of the main component of our ripple, the reactance of *C2* will be 100 ohms, giving us a 6:1 reduction (five times as much AC being developed across the resistor). Now, if we make the resistor twice as big, 1,000 ohms, the reduction factor is 10:1, but the voltage dropped across the resistor—that is, the important DC voltage which we require as our HT—is twice as much. If the amplifier draws 100 mA at full load, a 500 ohm resistor will drop 50 volts, whereas the 1k resistor drops 100 volts. We need more than 300 volts of HT, and the usual unsmoothed HT is between 350 and 380 volts, so we cannot afford the larger resistor unless we have plenty of voltage in hand.

A further factor to be considered is the wattage of the filter resistor. *R1*, at 500 ohms, passing 100 mA, develops five watts. In practice, because of the AC component, this is greater, and ten-watt component is called for to keep heating to a minimum. If we double the value of the resistor, at the same current, we double the wattage developed, and a ten watt, 1k resistor would overheat.

Some practical matters to consider when hum is originating in the power pack, are outlined graphically in **Fig. 3**. First we have the mains transformer fixing bolts. They should be tight, preventing the laminations from setting up a buzz. If they are loose the buzz may be quite obvious, but sometimes it is possible for an apparent background hum to be traced either to this cause, or to the mounting bolts of the transformer, indicated (b), or even the mounting of the sub-chassis itself.

Some constructors advocate mounting the power supply sub-chassis on rubber blocks where it is within a cabinet enclosure, to prevent the vibrations setting up a sympathetic hum through the woodwork. The laminations of the transformer should be securely earthed to the main chassis. (See **Figs. 1** and **2**.) So should the body of the metal rectifier, and the electrolytic capacitor, if it is mounted on the sub-chassis. Not all electrolytic capacitors have the outer can connected to the negative pole of the capacitor, and a bad joint at this point can cause annoying hum problems, particularly where the alloy can is clamped in a mild steel or plated bracket. (c) in **Fig. 3** shows this point, and (d) the clamping of the rectifier.

A further point is the mounting of *R1*, sometimes across the tags of the electrolytic capacitor, but sometimes on a separate tag-strip, whose mounting tag is employed as earth return for convenient parts of the circuit. (e) points to this possible source of hum.

When replacing any of these parts, always ensure that the chassis return connection is clean and bright, and use brass screws and nuts in preference to steel. Where the electrolytic capacitor is mounted directly on the printed circuit panel, the fixing tags may be the earth return points, and these are pressed through the panel and bent over or twisted around, then soldered to the foil. Looseness at this point can cause hair-line cracks in the foil. Leakage between the two sections of the electrolytic is another fault that can give rise to hum. When replacing, it is far better

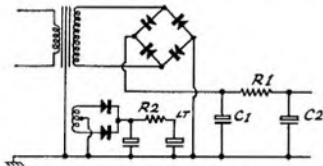


Fig. 2. A bridge-connected metal rectifier with RC smoothing

to substitute the whole unit rather than linking across the faulty section of a multiple electrolytic capacitor, although this often takes place in an emergency.

The power supply proper may have other refinements. For example, it will be noted that there is another rectifier in Fig. 2. The purpose of this one is to provide a DC heater supply to the first stage, again to reduce hum. The filter capacitors used here will be considerably larger, but much less likely to fail.

When replacing electrolytic capacitors, always check the peak and working voltages, and allow plenty of positive tolerance. The working voltage is that DC at which the component is expected to work, and the peak voltage is that at which it may be expected to break down. If the normal 300-volt HT is employed, a 350-volt DC WKG component is used, and to fit a 275-volt DC WKG component is asking for trouble. Anyone who has been within "ballistic range" when an electrolytic capacitor "blew its top" would not care to take such chances—quite apart from the mess and smell that has to be cleared from inside the cabinet after the explosion!

In some machines, where relays are used for the mechanical functioning, the coils of these components may be employed as part of the filtering. Some of the Continental circuits can be very difficult to trace for this reason, and unless one has a diagram handy, it is better practice to revert to the amplifier HT line and begin tracking hum at this point. A coil does not normally alter in value, and the relay mostly depends on its physical position for correct functioning, so its presence can be ignored if it operates properly.

Where a subsidiary HT has to be taken from the equipment, either to power other equipment or perhaps provide a polarising voltage, the point in the circuit at which it is tapped off can be important. There may be subsidiary filter circuits, especially in the feed to the first stage, with separate electrolytic capacitors decoupling this line. Tap off prior to this point, but after the main filtering, but watch the current drain. This must not be such as to cause *R1* or any alternative series components to overheat, or to drop the HT below normal working level. A further stricture, regrettable though this

may be, is the limit placed on current drain by the mains transformer design. All too often, this is working to its design limit, and as this component is not exactly the model of efficiency, heat losses can be considerable—and replacement expensive.

The actual positioning of a mains transformer, and indeed, any inductive component, is most important in the tape recorder. It is almost impossible to eradicate electro-magnetic fields, despite heavy shielding, etc., so we find that some machines allow slight adjustment. When checking, make sure you orientate the transformer, choke, relay, or what-have-you with the machine in normal operating condition. Reason for this is the habit some designers have of using the motor field as a hum-bucking device, to cancel out the field of the transformer, etc.

In the same way, the routing of cables, and the positioning of those natty little feedback loops known as hum-bucking coils can be of the utmost importance. Set the machine up in "play-back" position, with treble tone control, if fitted, at the fully attenuated position, and bass at full boost, and note that a good machine should not be audible at a couple of feet distance. If a microphone transformer is fitted, and the machine can be switched to "record," with the output monitored, a similar test should be made while orientating the microphone transformer for minimum hum pick-up. This position can be most critical. Final tests should always be made with the machine reassembled, as the stray fields depend greatly for their effect on proximity of metal parts. One particular machine hums like a science-fiction monster when one is working in its innards, but is quite docile when the heavy cast top-plate is re-fitted.

Ironically, the better the loudspeaker fitted to the tape recorder, the more prevalent is the hum problem—not because the

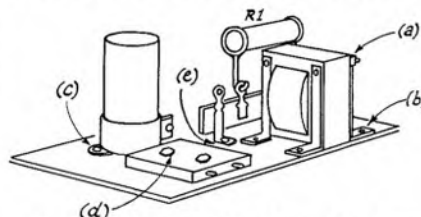


Fig. 3. Points to consider when hum originates in the power pack

loudspeaker itself causes hum, but because its enhanced frequency response enables it to reproduce what is already there. This should be remembered when fitting larger extension loudspeaker units. The problem on tape recording is somewhat worse than when dealing with "straight" amplifiers, as the equalisation circuits during recording give a considerable bass boost, and hum which may be masked by tape noise, can be brought out on subsequent replay. Reducing either track width or tape speed reduces hum picked up in this way, but as always, the real answer is to get to the root of the problem and eliminate the hum at source.

Readers who have stayed with me this long will probably have noted that no reference has been made to the many other kinds of noise, not to the input stage design, etc. which plays such a big part in the reduction of hum. It was felt that this subject merited a separate article, and the next service bureau will answer a few of the queries we have received on input stages and microphone repair. Earth wiring, from the practical viewpoint, will also be considered, as it ties in very closely with input stage design. Enough for now. Ho-hum.

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Maximum playing time, minimum in-
formation; generally fine performances,
indifferent recordings. That about sums up
the merits and shortcomings of these six
Recotape issues. The minimum advertised
playing time here is seventy minutes and
the maximum (for the ballet tap RML 7008)
is 85 minutes, some achievement on a five-
inch spool.

The market aimed at, I imagine, is the
listener wanting "wallpaper music"—an
agreeable, long-playing background. For
him the absence of full information will not
be too serious. Only on three of the tapes

is the name of the conductor given, and
though the Vienna State Opera Orchestra is
given as performing throughout, I am not
at all convinced that that is always so.

My doubts come not from quality of
performance which is very creditable, but
from various extraneous points. I have
never heard for example, a Viennese horn-
player with so wide a vibrato as the one
at the opening of the Delibes "Coppelia"
music. That style of horn-playing smacks
of French traditions, and I should not be
surprised that some of the absence of
information has been occasioned by the very
variety of sources. All the same, over each
tape the recording acoustic is reasonably
consistent. The principal weakness in the
recordings is a lightness in the bass, and
the range is not very wide. There is also
an occasional blemish in the transfers.
Sometimes in loud passages you get blast-
ing, and I do not think my own reproducer
has been to blame in all cases.

A mixed bag then, but for what I suspect
is the special purpose of these tapes, quite
reasonably commendable. Horenstein may
be rather too anxious to force the pace in
Casse-Noisette for example, but it is an
alert performance. Perlea may indulge him-
self in one or two personal tricks in the
Brahms Academic Festival Overture, but it
is weighty and light-hearted in exactly the
right balance, which is more than one often
finds.

HOLST. Choral Fantasia; Psalm 86.
FINZI. Dies Natalis. Janet Baker,
Wilfred Brown, Ralph Downes, English
Chamber Orchestra conducted by
Imogen Holst and Christopher Finzi.
WRC (TCM 50), 3½ ips, mono. 29s.

After a really extended session this
month with the pop classics on Recotape,
it has been a delight to turn to this taxing
music by two highly sensitive modern
British composers. Gustav Holst was the
contemporary and close friend of Vaughan
Williams, best remembered now for his
brilliant and colourful "Planets". Suite.
This Choral Fantasia represents the other
extreme of Holst's output. It was written
in 1930, only four years before he died, and
he devised a curious combination of
soprano solo, chorus, brass, percussion,
strings and organ. The organ has an
extended cadenza and generally the mood
of the work is sombre like another fine
work of Holst's written about this time
"Egdon Heath." Performance and record-
ing are exemplary; the composer's daughter,
herself a celebrated musician, draws strong
singing and playing from the performers.

By a happy parallel, it is the composer's
son who conducts the work on the reverse,
Gerald Finzi's song cycle "Dies Natalis."
This has words by the sixteenth century
poet, Traherne, and few modern composers
have set English words with such under-
standing and sensitivity. Wilfrid Brown,
the tenor soloist, sings them with fine
artistry, revealing the beauty of Finzi's
vocal line and its chiselled precision. Finzi
was a miniaturist of a high order, a com-
poser who wrestled with himself before he
committed his thoughts to paper, and this
work enshrines his art at its finest. Like
Imogen Holts, Christopher Finzi proves an
ideal interpreter.

The tapes reviewed this month are issued
by the following companies:
"Columbia," "Encore," "HMV,"
"Liberty," and "Verve"; E.M.I. Records
Ltd., 20, Manchester Square, London, W.1.
"Recotape": Esoteric Productions Ltd., 22,
Coastal Chambers, Buckingham Palace Road,
London, S.W.1.
"WRC": The World Record Club Ltd.,
Box 11, Parkbridge House, The Little Green,
Richmond, Surrey.

POPULAR



By Fred Chandler

A tape for the girl-friend

TENDER IS THE NIGHT. Johnny Mathis. H.M.V. (TA-CLP 1721), 3 1/2 ips, mono, 35s.

Johnny Mathis, the young lean-faced American singer brings out the maternal instinct in most women, and this latest album of his builds up the impression of a "little boy lost." The emphasis is naturally on the romantic mood starting with the title number Tender is the night. Twelve titles altogether, including Where is Love from Lionel Bart's "Oliver," Somewhere from "West Side Story," Laura, and No strings from the recent unsuccessful London show of the same name.

A dream is a wish your heart makes, and A ship without a sail, emphasises his charm and preoccupation with sweethearts. The girl-friend will really love this one.

MARIA ELENA. The fifty guitars of Tommy Garrett. Liberty (TA-LBY 1184), 3 1/2 ips, mono, 35s.

Fifty strumming guitars providing pleasant listening during the relaxed part of the evening. The title song, recently appearing in the hit parade, is a particular favourite of mine and it would seem, many of my colleagues. Its haunting melody seemingly plucked out from a gentle breeze has provoked much rhythmic head-nodding from my visitors.

Some old favourites are included in this album including Eddie Calvert's hit Cherry Pink and Apple Blossom White. Others are Anna, Brazil, The Breeze and I, and Taboo.

In addition this multi-track tape features six other numbers all well recorded, and all liable to encourage further visits "south of the border."

Musicians of the highest calibre

JAZZ



By Mike J. Gale

JAZZ AT THE PHILHARMONIC presented by Norman Granz (Vol 4) Kush, The Mooch, Wheatleigh Hall. Personnel: Dizzy Gillespie, Stan Getz, J. J. Johnson, Leo Wright, Art Davis, Chuck Lampkin, Lalo Schiffrin and Candido. Verve (TA-VLP 9048), 3 1/2 ips, mono, 35s.

Another volume in this series, and one full of outstanding performances which place this record above fault.

As with volume one (reviewed in this column in May) the musicians are not only

of the highest calibre, but they play so well together—perhaps helped by the appreciative audience. Both together and with solos they explore every subtle tone colour with wonderful sensitivity.

Candido features in Wheatleigh Hall with a magnificent drum solo which rates with the best I have ever heard.

The whole programme is jazz at its very best.

CHARLIE BARNET AND HIS ORCHESTRA. WRC (TT 303) 3 1/2 ips, mono, 29s.

Charlie Barnet is a name perhaps not so well known today, but at one stage in his career he had many large-selling popular records.

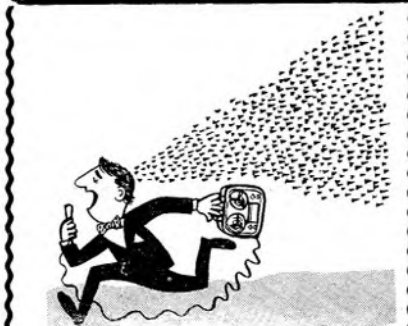
Born into a wealthy family, by the age of sixteen he had disregarded his family's wishes and was leading his own band on a transatlantic liner. In 1932, after visits to the South Seas and South America, he was playing at New York's Paramount Hotel, and within two years he made his first recording.

Many then unknown musicians and singers were associated with his band in the thirties, but Barnet was gradually moving towards outright commercialism and the resulting criticism. His most famous hit was Skyliner in 1944, but despite the financial success, he never reached out of the shadows of the great soloists like Goodman and Herman who also led large white bands. If a jazz musician turns towards commercialism then he will reflect the current idiom and years later—if he has followed and not created style—he will become sound-dated and shallow. To be commercial invariably means a band settles into the formula type of playing with every item sounding alike.

This record covers three sessions from 1952 to 1956 with Barnet's constantly re-arranged band getting more commercial and brassy each time. The first set consists of Who's your hoosier, Blue hound bus greys, Things ain't what they used to be, and Argo. Barnet uses twelve of the sixteen members on brass compared with sixteen out of nineteen for the 1956 session.

Both the 1952 and 1956 recordings are on track 2, and here one gets the opportunity to compare styles as well as the different types of compositions: the 1952 set covers Keep the home fires burning, Let's blow the blues, Rhubarb and Swingin' down the lane, while the most recent set consists of Lemon Twist, Blue Rose, Hear me talking to you and Lumby.

Loud, brassy and commercial, it fails to compare with the big negro bands of the time.



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NEW PRODUCTS

**GRUNDIG ANNOUNCE
NEW
CONSOLE MODEL**

LATEST of the Grundig range of tape recorders is the Table console TS19, a single-speed half-track machine selling at 54 guineas.

The quoted frequency response is 40-14,000 cps. Accommodation is available for 5½-inch spools, providing a playing time of 45 minutes per track using standard-play tape at the running speed of 3½ ips. Rewind for a long-play tape is achieved within 3½ minutes.

Among the features of the TS19 is a magic eye recording level indicator, facilities for mixing, automatic tape end stop by metal foil, and storage space for tape and accessories in the cabinet.

Inputs are provided for microphone (2mV/3 M ohms); radio (4mV/50 K ohms); and pick-up (400mV/1 M ohm). Outputs include high impedance (700 mV into 10 K ohms); switchable loudspeaker (5 ohms);



and monitor headphones (14 v into 220 K ohms). It incorporates a multi-octave superphon loudspeaker measuring 8½ x 4 inches, and providing a power output of 2½ watts.

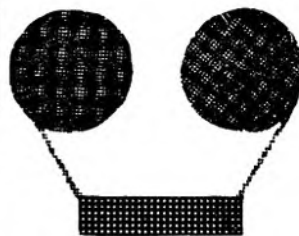
The power supply is 110-240 volts, 50 cycles, AC, power consumption rated at sixty watts. The valve line-up includes an EF86, ECC81, EL95, EM84 plus two selenium rectifiers.

Housed in a walnut cabinet, the TS19 measures 21½ x 13 x 8½ inches, and weighs 29 lb. Included in the price is a GDM microphone and special tape container, GK15.

Grundig (Great Britain) Limited, 40, Newlands Park, Sydenham, London, S.E.26.

**3M INCREASE TAPE
RANGE
WITH TRIPLE-PLAY**

THE 3M Company has added triple-play tape to its extensive range of "Scotch" magnetic recording tape. Their latest tape has a new coating called "Superlife" which is a direct development from coatings used on instrumentation and computer tapes.



The tape is to be marketed in three- and four-inch reels holding 600 ft. and 900 ft. for 24s. 9d. and 38s. 6d. respectively. "Superlife" is black, so it is easily distinguishable from the standard red/brown, and it incorporates an improved binder to ensure better adhesion of the oxide particles. Advantages claimed for the new tape are its extreme toughness; rub-off is virtually eliminated; life is greatly extended (up to fifteen times is claimed); and the mirror-smooth surface reduces recording head-wear considerably.

As with other "Scotch" tapes, the new product is colour-coded to indicate type. The box is gold-coloured and the style numbers are 290-6 (three-inch), and 290-9 (four-inch).

Minnesota, Mining and Manufacturing Co. Limited, 3 M, House, Wigmore Street, London, W.1.

**STEREO HEADSET
BY
S. G. BROWN**

ALIGHTWEIGHT headset of robust construction is announced by S. G. Brown Ltd. The new unit, the Diplomat Personal Auditorium, comprises a pair of headphones connected to a two-channel control unit with infinitely variable channel mixing facilities. The whole unit is contained in an attractive zip-topped carrying case.



Individual control of volume to each channel is provided, plus facilities for mixing a proportion of each channel with the other channel. The proportion of mixing can be varied, enabling two channel reproduction to be "tuned" through various degrees of stereophonic sound.

The quoted frequency response is 30-20,000 cps. Normal input signal is 3.5 volts RMB for 95 dB, SL for less than one

per cent distortion; maximum undistorted load 80 volts RMB, producing 120 dB, SL for less than three per cent distortion. The impedance is predominantly capacitive at 0.00 mfd per earpiece (regarded as 150 K ohms at 1,000 cps). The Auditorium headset weighs 3½ ounces.

The Diplomat Control Unit 12C.100 operates directly from low impedance output circuits, and provides facilities for switched selection of input impedance, giving matching to 15 ohms, or 600 ohms for each stereo channel, or 7.5, 30, 300, or 1,200 ohms mono depending upon method of connection. The two channels can be wired in series or parallel when connected to mono equipment.

The control unit measures approx. 11 x 9 x 3½ inches, and is available in white, black or pigskin colours.

Further details and prices available from the manufacturers.

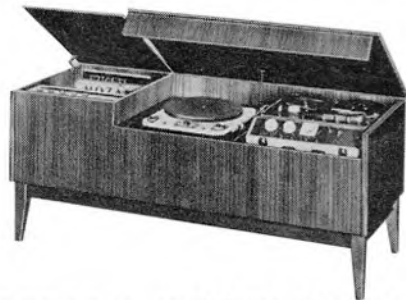
S. G. Brown Limited, King George's Avenue, Watford, Hertfordshire.

NEW CABINET BY RECORD HOUSING

RECORD HOUSING recently announced the latest of their hi-fi equipment cabinets, the Lowflex (illustrated below).

This has been designed to allow for greatest flexibility in order to house any of the latest hi-fi equipment available.

Three compartments are provided, each veneered and polished throughout, with



measurements as follows: Compartment "A" (on the left), 16(w) x 20(d) x 13(h) inches; suitable for amplifier/tuner/controls, tapes or discs—removable record partitions are provided. Compartment "B" (transcription turntable, three sets of controls, or amplifier/tuner controls), measures 17(w) x 20(d) x 9(h) inches; and Compartment "C" (right-hand side in our illustration) for tape deck, turntable, or complete tape recorder, measures 19(w) x 20(d) x 9(h) inches.

Overall size is 57(l) x 21(d) x 14(h) inches, plus nine-inch legs. In walnut or mahogany wood, the price is 27 guineas. A teak version is also available at 30 guineas.

Record Housing, Brook Road, London, N.22.

ELECTRONIC WORLD INTRODUCE LARGER REELS

LARGER reel sizes for their range of magnetic recording tapes is announced by *Electronic World*.

The new sizes are 8½ and 10 ½ inches providing fifty and 100 per cent more footage respectively than seven-inch reels of the same grade. Standard, long-, double- and triple-play varieties will be available and the

prices will remain in proportion to those of seven-inch reels.

Electronic World also announce two special offers during June, July and August. New customers are offered a free sample length of tape on a seven-inch spool, and customers ordering tape during these summer months will be given a free take-up spool of the appropriate size with every order.

de Villiers (Electronic World) Limited, 16-20, Strutton Ground, London, S.W.1.

MORE ACCESSORIES FROM T.R. MAINTENANCE

TAPE Recorder Maintenance have introduced the latest addition to their pre-packaged range of tape recorder spares.

With the increase in popularity of four-track recorders the cleanliness of the record/playback head is even more important. With this in mind they have devised head cleaning brushes designed to enable cleaning on most models without removing the top deck.

The blade of the brush is thin enough to slip into the majority of sound channels and the angle of the bristle will remove oxide deposits without scoring the heads.

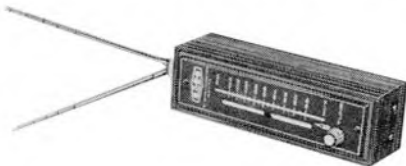
The price is 4s. 3d.

Tape Recorder Maintenance Limited, 323, Kennington Road, London, S.E.11.

BATTERY TUNER FOR TAPE RECORDERS

A COMPLETELY novel transistorised, battery-operated FM receiver with a built-in audio pre-amplifier has been introduced by Britimpex Ltd.

Their Danish-manufactured Signalmaster, illustrated below, has been specially designed for use with tape recorders. MESA silicon transistors and four IF amplifier stages contribute to the low noise content of the new unit which will sell at 18 guineas, or 19 guineas including the telescopic aerial.



The power is supplied by six 1½ volt pencil type batteries, and the battery life is rated at approx. 120 hours with four hours' daily use. The aerial impedance is 75 ohms, and the AF signal rated at 1½ volts rms maximum.

Britimpex Limited, 16-22, Great Russell Street, London, W.C.1.

CORRECTION

IN the review of the Grundig TK 6, last month, the battery life was quoted as approximately eight hours. The manufacturers do not quote a battery life in the specifications; although they estimate twenty hours intermittent use, or approximately twelve hours continuous use is available with some types of batteries.

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5½" / 1,800 ft.	35/-	<input type="checkbox"/>
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TRIPLE PLAY (Prestressed Polyester Base)

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" / "	150/- doz.	<input type="checkbox"/>
3½" / 650 ft.	17/-	<input type="checkbox"/>
4" / 900 ft.	23/6	<input type="checkbox"/>
5" / 1,700 ft.	40/-	<input type="checkbox"/>
5½" / 2,300 ft.	52/6	<input type="checkbox"/>
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BATH

During recent meetings of the Bath tape society members have been busy constructing equipment and a control room for their "studio."

A new three-channel mixer unit has been completed, and the control room reconstructed. This includes a simplification and wiring of the controls, and the installation of a talk-back system from control room to studio.

Secretary: Mr. R. J. Empson, 17, Luckland Road, Weston Park, Bath, Somerset.

BARNSELEY

An idea of the possibilities to be explored by tape societies is given in a recent newsletter from the Barnsley tape club. Dependent entirely on small-money raising efforts of their own, the members provide broadcast services to local hospitals for five hours every week, two on Wednesday and three on Saturday. This is to be increased to six hours per week. In addition, special broadcasts for local festivals are also arranged, one such occasion being the Borough's centenary celebration.

The club's programmes are published in the *Sheffield Telegraph*, and each week a programme parade goes on the air telling the patients of the following week's arrangements. A survey of their listening audience showed that 75 per cent prefer "Radio Barnsley" to the regular BBC broadcasts.

As well as broadcasting the club organises tape recording activities including demonstrations by manufacturers. Grundig and B.A.S.F. were among recent visitors. They also recently arranged an 11-hour recording session at a local jazz festival. Afterwards, the same four members spent a further 12 hours making up a programme from the recording and compiling it for a special broadcast.

The club recently celebrated the broadcasting of its 10,000th record request and the patient concerned was presented with a record by a well-known Barnsley group. With two tape recorders, many tapes, record player decks, and sound mixing facilities in a studio built by the members, all members are actively engaged producing their weekly programmes. Among donations received for their efforts has been £75 given by the Barnsley Hospital Management Committee. With a further grant from the Sheffield and District Convalescent and Hospital Services Council, and their own money-raising efforts, the latest addition to the club, a £100 recorder, was purchased.

Secretary: J. Fisher, Studio One, Y.M.C.A., Eldon Street, Barnsley, Yorkshire.

BRIGHTON

At the AGM of the Brighton tape club a new secretary was elected. Mr. K. Upton replaces the former secretary Mr. R. Vivian who was elected chairman.

During the usual resumé on past activities members recalled a visit to the Eastbourne club during January when Mr. E. Savage gave a film show with a tape commentary. Another visit involved members in a recording session with a local church organ. Business then turned to future events and the first to be discussed was a series of educational visits. Already the club have visited a Fire Station, G.P.O. Telephone Exchange, a cinema, and a power station.

Secretary: Keith W. Upton, 47, Kingsley Road, Brighton 5, Sussex.

BRITWELL

Six tapes, winners in the six competitions held throughout last year, were

judged in a final contest during a recent meeting of the Britwell tape club. An independent judge, blind music teacher Mr. Jim Taylor, listened to the tapes and awarded first place to ex-chairman Mr. Len Jenkins. Entries were given points for content and recording quality. The titles were, "A Martian's eye-view of an everyday event on earth," "A dramatised news item," "Lost," a story based on four sound effects, a thriller, and another story illustrated by music. Mr. Jenkins receives the club's Challenge Cup for his entry.

The club's second AGM was held on April 1, and the committee were re-elected. Future meetings were discussed and organised and these included a talk by a representative of E.M.I. Tape Ltd., a demonstration by Brenell Engineering Ltd., and the first of this year's competitions entitled "The First World War."

Secretary: B. J. Jackson, 6, Second Crescent, Gloucester Avenue, Slough, Buckinghamshire.

DARTFORD

Inter-club contact was made by members of the Dartford society who recently visited the nearby Bromley club to attend a lecture given by Grundig (Great Britain) Ltd. Two of the new Grundig models were shown and demonstrated, and afterwards the members of the various visiting clubs exchanged views and opinions on the recorders.

Another demonstration, this time back at their own headquarters, was given at one of their more recent meetings when members saw the MSS tape film called "Journey into Tape." This is an 8mm sound stripe film shown on a Eumig projector with a sound-stripe attachment.

At an earlier meeting one of the members gave a lecture on loudspeakers. During his talk he showed how the cone of a speaker moved relative to the sound produced. A steady signal was fed to the speaker and using the light from a strobe lamp so that the speed of the strobe beat with the signal by a small amount the action of the cone could be observed.

A look round a local cinema was recently arranged for members. They saw the projector room, amplifiers, lens, and the equipment for automatic control of the projectors, curtains, lighting, and sound equipment. Then a visit backstage was arranged so that the loudspeakers could be examined.

Secretary: E. H. Foreman, 117, Westgate Road, Dartford, Kent.

DERBY

During one of the April meetings the youngest member of the Derby tape club, Mr. N. Evans, presented an "all your own" programme of recordings of Latin and Flamenco music. In contrast to his presentation, members of the visiting Bemross tape club provided a cleverly produced amusing satire on the BBC Third Programme.

In the club's monthly competition, "An imaginary journey," Mr. S. Hassall was awarded first prize, second and third places going to Mr. M. Nicholls and Mr. F. Shaw. For light entertainment Messrs. D. and E. Flecknoe produced a "Lucky Dip" tape, and Mr. D. Hill took the chair for his presentation of a "Juke Box Jury" show.

Other recent activities have included a technical demonstration given by Mr. H. Burton who showed his wire recorder; and the final talk in his series "An appreciation of classical music" by Mr. A. Stanway.

Secretary: Miss E. Hassall, 52, Richmond Road, Derby, Derbyshire.

EDINBURGH

March and April proved very busy months for the members of the Edinburgh club. First there was a request for members to record the laying of a Foundation Stone of a new church. Two members complete with Ferrograph recorded the ceremony which was

carried out by the Moderator of the General Assembly of Scotland. A number of professional recording engineers were also present with their equipment; but afterwards they had to ask the Edinburgh club members for dubbings of their tape because their own were not good enough. Full marks Edinburgh!

The project was followed by two lectures on recording which were given to the Edinburgh Cine Society. The first was for beginners to the hobby, and the second lecture was for the more advanced enthusiasts.

The end of March saw members organising the recording of a wedding. This was eventually achieved by Neil McLewd using a Ferrograph recorder.

Further outside recording activities are in preparation. One of these will be the setting up of a clubstand at the Hobbies and Handicrafts Exhibition to be held in November. Meanwhile tapes are welcomed from other clubs.

Secretary: James Moodie, 4, Christiemiller Grove, Edinburgh 7, Scotland.

GLASGOW

Two tape and slide shows were given by the chairman John Wood and Ken Knowles at recent meetings of the Tape section of the Radio Club of Scotland in Glasgow. These consisted of tours through Scotland and England.

Other events have included lectures on soldering, editing and splicing with practical demonstrations, given by the secretary; and a lecture on cinema sound given by Mr. P. Douglas.

John Douglas then presented tapes he had made when interviewing teenagers waiting outside a theatre for a well-known beat-music group. J. Knowles joined the ranks of demonstrators with his presentation of a talk on feedback during which he showed how feedback could be eliminated. His talk was followed by another tape and slide show, this time of a local stock car race meeting.

One of the more recent meetings saw members travelling eighty miles to visit the Dundee club members where they had an enjoyable and interesting meeting followed by a tour of the city. Since then the Glasgow club has played host to the members of the Ayr society.

Other inter-club contacts have been strengthened with two of the Middleton club members attending the Glasgow club meetings for some months. When Mr. and Mrs. Hooper returned to their home town they took with them a tape for playback at a Middleton club meeting.

The club now issues a monthly magazine on tape, plus a twenty-four page magazine issued free to members. The members are now busily compiling their entries for the club's annual tape competition.

Their latest assignment was the compilation of a programme entitled "At Home," based on "This is your life" of club members. New members are welcomed any Monday evening at 336, N. Woodside Road, Glasgow.

Secretary: A. McCallum, 9, Glen Devon Square, Glasgow, E.3, Scotland.

JOHANNESBURG

A live recording session was held at the May 3 meeting of the Tape and Hi-Fi Society of South Africa in Johannesburg. For the occasion the members had invited the Stefan Klopper Trio to the meeting to play for them.

The meeting followed a lecture demonstration presented by Mr. K. McKenzie of S. A. Philips (Pty.) Ltd. entitled "The Philosophy of Sound." This included a demonstration on microphone placing to achieve various effects. During the same meeting, held in one of the city's theatres, recorded examples were played back through the ultra-modern sound system employed in the theatre. A film of tape recording was also shown.

At an even earlier meeting members organised an FM Symposium in co-operation with the South African Broadcasting Corporation. This was attended by over a hundred enthusiasts.

Secretary: Anita Stuart, P.O. Box 11326, Johannesburg, South Africa.

TAPE EXCHANGES

TAPE recorder owners who wish to contact others with similar interests, to exchange news and views by tape are invited to fill in and return the form on page 292, giving their name, age, address, special hobby or interest for this section.

Details given here also include speeds and spool size to be used, name of recorder, and special area to be contacted.

Birtley, Miss June (37). 233, Gowan Avenue, Toronto 6, Ontario, Canada. Music. 7½, 3½ ips. 7-inch spool. Korting MT136.

Blackburn, Stanley (25). 23, Trent Street, Longridge, Preston, Lancashire. Humour, pops and light classical music. 7½, 3½, 1½ ips. 7-inch spool. Elizabethan LZ29, four-track.

Brown, Derek (20). 7, Haygate Drive, Wellington, Salop. Pop records, canoeing, and catering. 3½ ips. 5½-inch spool. Philco Model 5200.

Butler, Walter Y. (67). 173, Catherine Street, Leicester. 35mm photography, travel. 3½ ips. 5-inch spool. Majestic.

Cook, Robert (25). 28, Allan Street, Essendon W.5, Victoria, Australia. 8mm and 35mm photography, travel, music. 7½, 3½, 1½ ips. 7-inch spool. National four-track, stereo. UK, Holland and Germany.

Currie, James (25). 13, Russell Street, Hamilton, Lanarkshire. Literature, travel, music. 3½ ips. 5½-inch spool. Grundig TK23. UK, USSR, Eire, Sweden.

Davies, Brian (21). 23, James Nelson Crescent, Trench, Wellington, Shropshire. All music, humour, people, politics and economics. 7½, 3½, 1½ ips. 7-inch spool. Grundig TK46, stereo. Overseas only.

Dedek, Jiri (39). 11, Shannon Close, Grove, Near Wantage, Berkshire. Photography, motor-cycle scrambles, music. 7½, 3½, 1½ ips. 7-inch spool. Truvox R94. Female contacts preferred.

Doyle, Brian (24). 43, North Road, Belvedere, Kent. 35mm photography, theatre, travel, music. 7½, 3½, 1½, 15/16 ips. 5-inch spool. Ever 4000. Reporter portable (battery/mains).

Everitt, Arthur (39). 45, Poynders Hill, Hemel Hempstead, Herts. Opera, general science and wine making. 7½, 3½ ips. 7-inch spool. Brenell recorder.

Forrest, John (20). 1, Glen Cottages, City Road, Tilehurst, Reading, Berkshire. Music, finance. 7½, 3½, 1½ ips. 7-inch spool. Truvox PD86, four-track.

Gallaro, R. M. (39). 100, Lincoln Avenue, Whitton, Middlesex. Amateur radio and piano playing. 3½ ips. 5-inch spool. P.A.A. special. France, Holland. Letters not required.

Gregory, Rick (24). "Danetree," Eastclose, Middleton-on-Sea, Sussex. Music. 3½ ips. 7-inch spool. Philips 3541D, four-track.

Gunstone, Fred (45). 29, Heolegylws, Ely, Cardiff, South Wales. Classical books and travel. 3½, 1½ ips. 7-inch spool. Reps R10.

Harner, Richard (28). 64, Middleton Hall Road, King's Norton, Birmingham 30, Warwickshire. Records and radio. 7½, 3½, 1½ ips. 7-inch spool. Truvox R94, four-track. Male contacts only. No letters please.

Hughes, Oswald (25). 17, Erw Fren, Tregarth, Bangor, Caerns. Pop music, humour and horse riding. 7½, 3½, 1½, 15/16 ips. 7-inch spool. Cossor, four-track.

Mills, Benjamin (56). 66, Havenfield Road, Booker, High Wycombe, Buckinghamshire. Photography, painting. 7½, 3½, 1½ ips. 5-inch spool. Civic.

Murray, John (34). 27, Gerrard Road, Portobello, Willenhall, Staffs. Talking, no sports. 7½, 3½, 1½ ips. 7-inch spool. Philips EL3549 four-track.

Page, Mrs. Maud (47). 45, Elgin Avenue, Belmont, Harrow, Middlesex. Gardening, swimming and music. 7½, 3½, 1½ ips. 7-inch spool. Philips EL3541H.

(Continued on page 292)

CLASSIFIED ADVERTISEMENTS

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TAPE EXCHANGES

(Continued from page 291)

Perry, Frank (36). 91, North Parkway, Leeds, 14, Yorkshire. Photography, tropical fish, all music. 7½, 3½, 1½, 15/16 ips. 7-inch spool. Philips EL3549, four-track.

Regan, Bob (31). 48 Command Workshop, REME, Cyprus. BFO 53. All music, hit chat. 3½, 1½ ips. 7-inch spool. Philips EL3585, battery-operated, Robuk RK4, Grundig TK25.

Richardson, Terence (23). 15, Pellydell Road, Northampton. Photography, motoring, music. 3½ ips. 5½-inch spool. Fidelity Minor (Argyll) 444 (four-track). Female contacts preferred.

Seton-Savage, R. (45). 71, Sutherland Avenue, London, W.9. Photography, music. 3½ ips. 7-inch spool. Verdik. Male contacts in UK only. Letters first please.

Stevens, Peter (29). 33, Doreen Avenue, Kingsbury, London, N.W.9. Arabic music. 3½ ips. 5½-inch spool. Majestic recorder. Egypt, Nubia.

Struthers, John (24). 14, Hughenden Road, Clifton, Bristol 18, Gloucestershire. Travel, politics, books, music. 3½, 1½ ips. 5-inch spool. Ferguson, four-track. UK, USA, Commonwealth. Female contacts preferred.

Swin, Andrew (23). 25, Cowbit Road, Spalding, Lincolnshire. Literature, languages, classical music. 7½, 3½, 1½, 15/16 ips. 7-inch spool. Philips EL3549, four-track. Europe.

Symons, George (29). c/o Box 14, Fordsburg, Transvaal, South Africa. Photography, acting, writing, drawing. 7½, 3½, 1½ ips. 7-inch spool. Akai M7. Male contacts preferred. Letters first please.

Simmons, R. (29). 54b, High Street, London, S.E.25. Music, theatre, swimming and tennis. 7½, 3½ ips. 7-inch spool. Sony TC500, stereo. Male contacts only.

Spurrell, Peter (37). 1, Dendy Street, Balham, London, S.W.12. Photography, music, and films. 7½, 3½ ips. 7-inch spool. Vortexion recorder. Male contacts only.

Watson, John (22). 43, Clavering Avenue, Barnes, London, S.W.13. Pop music, films and travel. 7½, 3½, 1½ ips. 7-inch spool. Elizabethan LZ29. Male contacts only.

Tape recorder owners wishing to make contact with others of similar interests are invited to complete and return this form. (BLOCK LETTERS PLEASE)

Name Age

Address

Special interests

Speeds to be used Maximum spool size

Recorder owned

Special areas to be contacted

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Bell, Stephen (19). Flat 3, 78, Camden Hill Road, London, W.2. Electronics, jazz, folk music, literature. 7½, 3½, 1½ ips. 7-inch spool. Repts R10.

Brookes, Derek (13). 17, Argoed Crescent, Frimarsan, Caernarvonshire. Films, pop music and sport. 7½, 3½, 1½ ips. 7-inch spool. Philips recorder. UK. Female contacts preferred same age.

Davies, Lyndon (19). 7, Gorsehill Road, Poole, Dorset. Cinema organs. 7½, 3½ ips. 7-inch spool. Collaro studio deck, Mullard Type "A". USA, Hilversum VHF area. Letters first please.

Deasey, Anne (13½). 18, Turnberry Road, Annan, Dumfriesshire, Scotland. Student in French. 3½ ips. 7-inch spool. Stella ST459/00. France.

Duxbury, Ronnie (15). 42, Walton Lane, Barrow-in-Furness, Lancashire. Music, especially pop, sports, comedy. 7½, 3½, 1½ ips. 7-inch spool. Simon SP5.

Ewart, Matt (19). 9, Sighthill Street, Edinburgh 11, Scotland. Cycling, hi-fi, music. 3½, 1½ ips. 7-inch spool. Cosor 1605, Philips 3586. UK.

Fellner, Peter (17). Halfway Pitch, Pitchcombe, Stroud, Gloucestershire. Photography, music, cinema. 7½, 3½, 1½, 15/16 ips. 5-inch spool. Uher 4000 Report S, battery. Female contacts in Gloucestershire.

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Lander, Clive (17). 2, Knightscroft House, Rustington, Sussex. Pop music, sport and hiking. 3½ ips. 5-inch spool. Philips EL3541, four-track. Female contacts only in UK.

Potter, Terry (16). 7, Somerset Road, Linford, Stanford-le-Hope, Essex. Pop music, cinema, motor cycles and fishing. 7½, 3½, 1½ ips. 7-inch spool. Grundig Cub, Fidelity Playmaster and Repts R10. Male contacts only. Letters first please.

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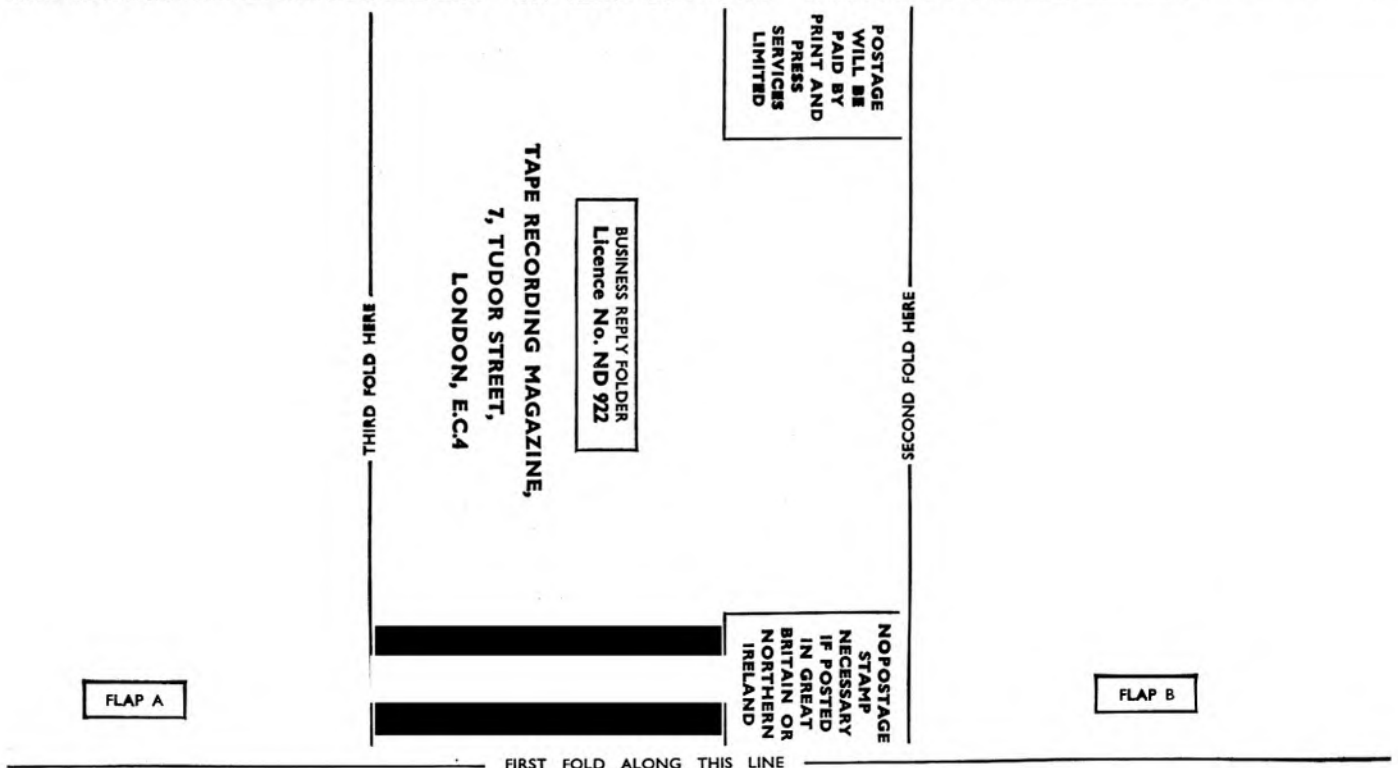
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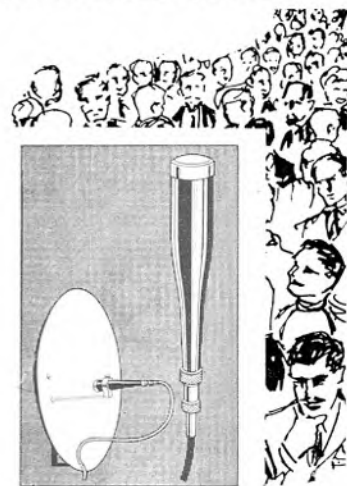
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