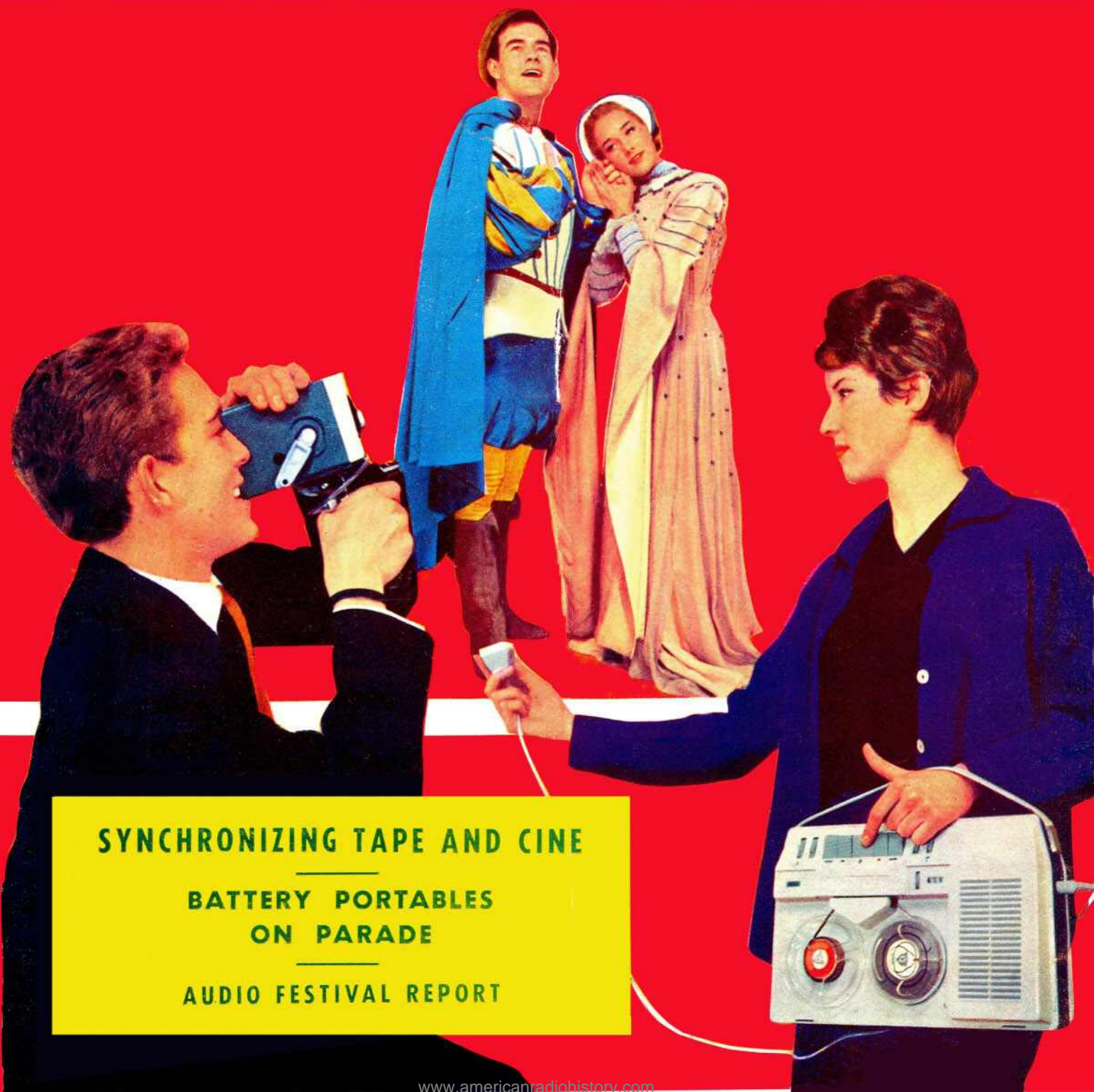


# amateur **TAPE RECORDING** and **HI-FI**

VOL. 3 NO. 11

**THE SOUND MONTHLY**

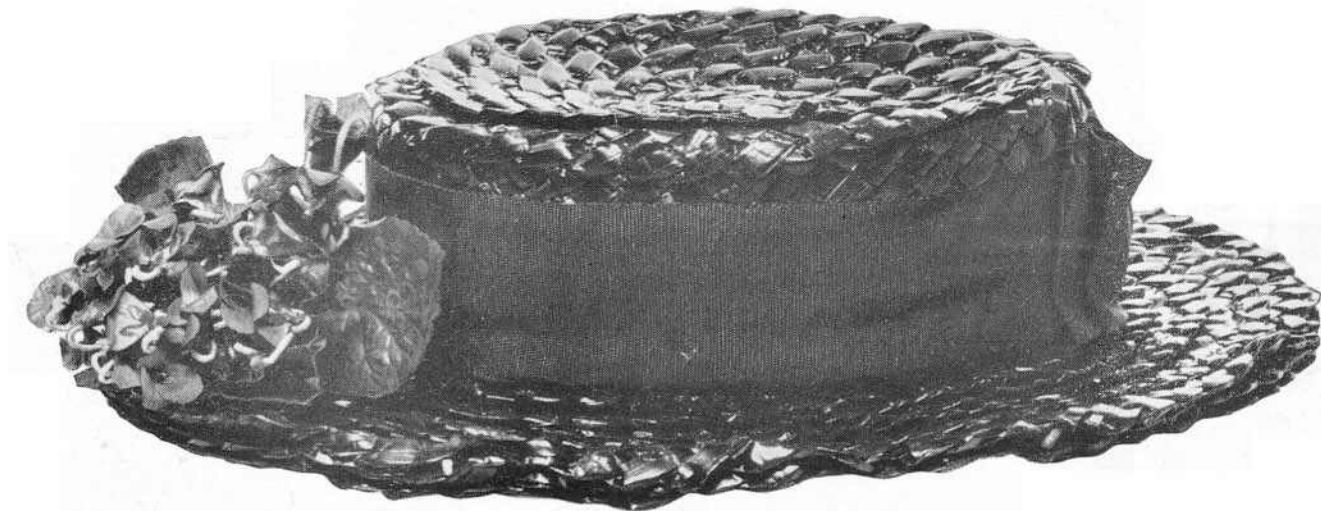
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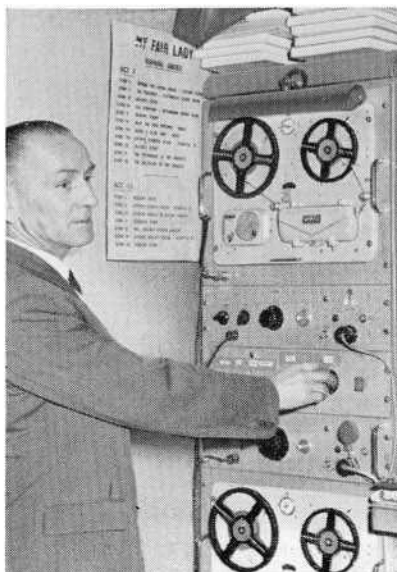
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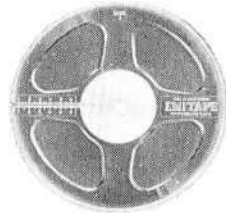
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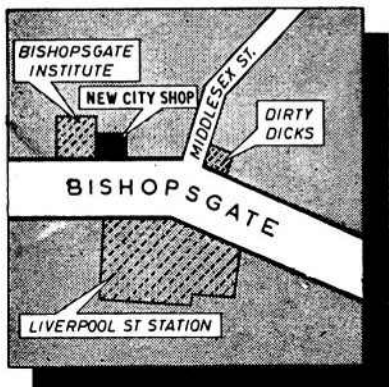


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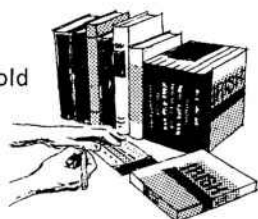
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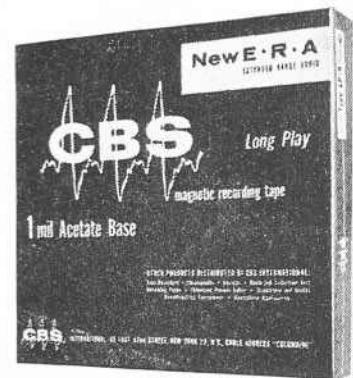
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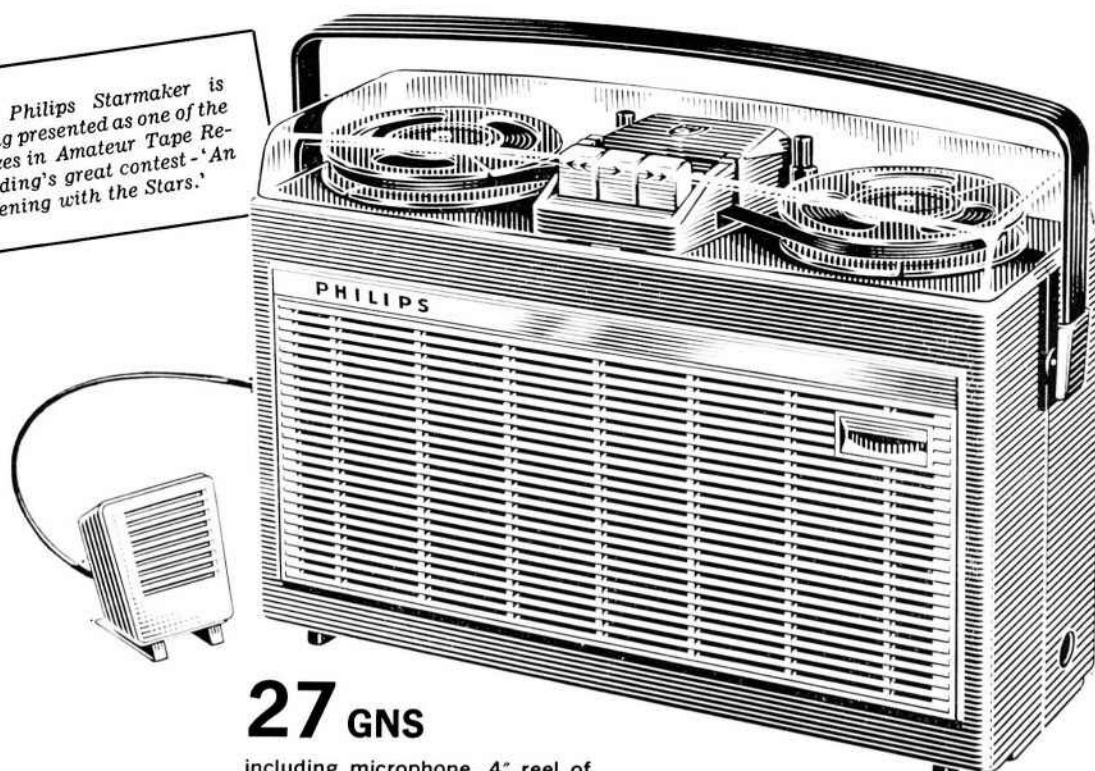
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## THE SOUND MONTHLY

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### Challenge

We have now seen and assessed the new features in tape recorder design that appeared at the Audio Festival. **ONE THING CLEARLY EMERGES: FREQUENCY RESPONSE AT THE HIGH FREQUENCY END OF THE AUDIO SPECTRUM HAS AGAIN BEEN EXTENDED BY A FEW KC/S.**

Why this fanatical endeavour to climb up and up—10,000, 12,000, 15,000 and now 20,000 cps.? What next: 25,000 to 35,000 cps. and at what expense? Already manufacturers are claiming a response of 22,000 cps. and over, for a tape speed of  $3\frac{1}{2}$  i.p.s.

The high-grade record/playback heads now available to all tape recorder and tape deck manufacturers *do* enable the designer to obtain the extended frequency response which is essential to high-fidelity reproduction but, unfortunately, 'frequency response' has become a 'sales slogan':

"... professional frequency response"  
"... fantastic frequency range" and so on.

Many of the claims made, especially for  $3\frac{1}{2}$  i.p.s. are not only false, they are virtually impossible. Even those tape recorders which

do respond up to 20,000 cps. at  $7\frac{1}{2}$  i.p.s. rarely do so without introducing noise at the higher frequencies. Why? Because to achieve this sort of response means using excessive boosting during recording and, therefore, the full gain of the recording amplifier must be employed. A frequency response up to 12,000 to 15,000 cps. is adequate for high-fidelity reproduction and can easily be achieved at  $7\frac{1}{2}$  i.p.s. *without* noise.

Our contributor, A. Lester Rands, comments on this in our feature "Tape Without Tears", and the special pen recording included in the article clearly shows the result of excessive frequency correction during recording. Tape recorder designers say they have to force the frequency response up because the Sales Departments consider that a wide one is a good selling point! Having reached the 'Everest Peak' of frequency response, is it not time manufacturers concentrated on producing tape recorders with sensible tape decks, freedom from hum and noise and, oh yes, *an overall distortion level of a lot less than 10% at the rated output of the tape recorder?*

JUNE, 1962  
VOL. 3 NO. 11

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## TAPE RECORDERS

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**W**ITH June almost upon us, our lighter thoughts concerning springtime are turning toward the more strenuous activity of summer holidays. Later, in the autumn and the foggy winter which usually follows, it is nice to relax in a comfortable armchair and re-live some of those few weeks of summer vacation. That gorgeous day on the beach and the Punch and Judy show, or the amusing incident with the French Customs, embarrassing when they insist on opening *all* your baggage. Perhaps you were touring in the

The EL3585 has a line output so that tapes could be copied on to a higher speed mains recorder for editing etc. Uses six U2 cells and all controls are at the top of the machine. This new model has a record-level meter.

This should prove an excellent recorder for all outdoor sound collecting, providing one accepts the limited frequency response. For further details and full technical specification, write to Philips Electrical Limited, Century House, Shaftesbury Avenue, London, W.C.2.

# PORTABLE TAPE RECORDERS

**The mobility of battery portables opens up a completely new range of recording possibilities to the mains recorder owner. Our survey covers all the currently available models, to enable the prospective 'field' recordist to make the wisest choice.**

Highlands or through the flat, yet colourful countryside of the Netherlands. Wherever you were there was *sound* to capture and bring back. Sounds that would have made those winter-time reminiscences almost real. Sounds which you may never have the chance to hear again, sounds that would have been invaluable for your colour slides or cine film, or just sounds to add to an interesting collection. With all this in mind we planned not only this survey of portable tape recorders, but also a *real tour with three of the machines selected from those included in the Survey.*

Our journey through sound will take us from London across the Black Country to the Lakes, then on to the Western Highlands, North by Ben Nevis and the Lochs and back to London via Edinburgh and the East Coast. Our tour will include visits to tape clubs as far north as Dundee, to tape recorder dealers and *all places where SOUND can be captured on tape.* But more of this next month.

## CHOOSING A PORTABLE

First consider carefully whether you want recordings merely to remind you of holiday events; are they to be used with colour slides or cine film? Do you want recordings of professional quality or will you be content with good quality, but with a limit on frequency response? Will you want to copy the recordings you make with the portable, replay them on a high-quality mains recorder, edit them for a sound track to a cine film etc., or a nicely turned out documentary of your holiday? There is, of course, the price to consider as well as spool sizes, tape speeds and various other facilities. This survey covers the currently available portables in order of price, starting with the less expensive machines and finishing with professional models.

### The Philips EL3585 (Fig. 1)

This is one of the lowest priced transistorized recorders and, incidentally, one of Philips latest products. Weight 8 lbs. Price 24 gns. Moving coil microphone, tape and spools supplied with recorder. Speed  $1\frac{1}{2}$  i.p.s. Two-track operation. Frequency response 120 to 5,500 cps.  $\pm 3$  dB. Will accommodate 4in. spools without plastic deck cover or 3in. spools with cover on.

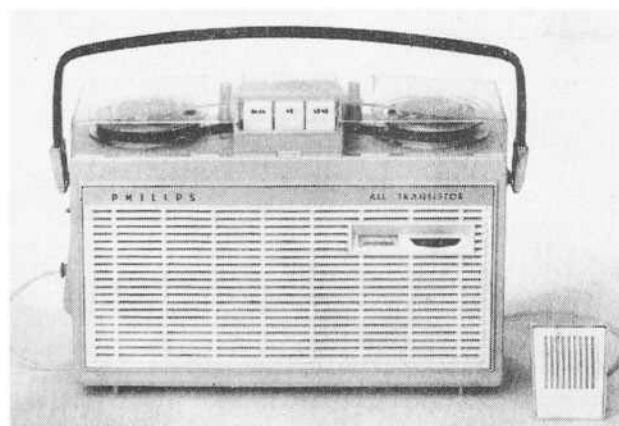


Fig 1. Philips new portable all-transistor battery-operated tape recorder (EL3585) sells for only 24 gns. The moving coil microphone stows away in the side of the machine when not being used. On the front of the machine is a dial for indicating volume when recording and the battery level during playback. A safety interlocking device prevents erasure of the tape.

### Grundig TK1 (Fig. 2)

The TK1 is a popular little portable costing 29 gns. and is ideal for holiday sound collecting. It can be connected to another recorder for copying but has a tape speed of  $3\frac{1}{2}$  i.p.s. which permits its tapes to be replayed and edited on a larger machine. Microphone, tape and spools etc. supplied. Frequency response 80 to 8,000 cps. is adequate for all but high-fidelity sound collecting. The TK1 employs 7 transistors and operates from six  $1\frac{1}{2}$ V cells which permit approximately 20 hours use at the rate of about 2 hours per day. Twin-track operation and 3in. spools provide reasonable recording duration if d.p. tape is used and the TK1 has a magic eye level indicator.

This is a nice compact little machine, very suitable for use on holiday or for sound collecting in conjunction with photos and colour slides.

For technical details etc., write to Grundig (G.B.) Limited, Newlands Park, Sydenham, London, S.E.26.



Fig. 2. The Grundig TK1 battery-operated portable tape recorder.

#### G.B.C. Electronics Industries Limited

The Clarion portables are almost too well known to need description. There are three models, the Clarion Mk. 1 at 19 gns., the Clarion Mk. 2 at 27 gns. and the latest model, the Clarion 88 which is 39 gns. All three have an adequate performance for sound collecting with a limited frequency range and quality of reproduction. The Clarion Mk. 1 operates at  $3\frac{1}{2}$  i.p.s. and tapes can be replayed on another machine. When used in conjunction with a special Clarion external amplifier known as the Twinset, the Mk. 1 becomes the Mk. 2. The Clarion 88, which has a tape speed of  $1\frac{7}{8}$  i.p.s., is rather more suitable for office use. For those who seek the least expensive portable, the Clarion Mk. 1 would fill the bill. For full details of all three models, write to G.B.C. Electronic Industries Limited, 121-123 Edgware Road, Marble Arch, London, W.2.

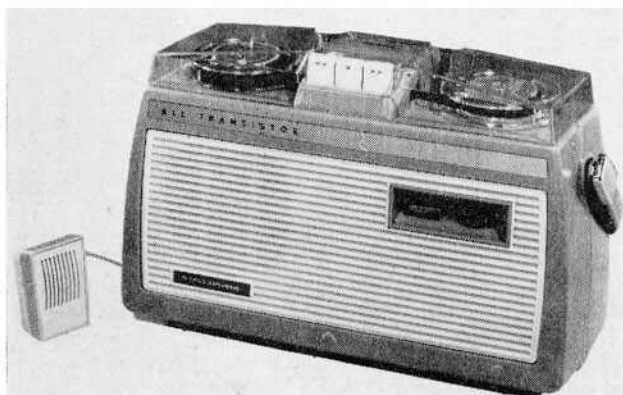


Fig. 3. The Stella ST470 transistorized portable tape recorder.

#### The Stella Model ST470 (Fig. 3)

This is another in the inexpensive range. It is a fully transistorized twin-track recorder with tape speed of  $1\frac{7}{8}$  i.p.s. and accommodates 5in. or 4in. spools. Frequency response is 120 to 5,500 cps.  $\pm 3$  dB. The ST470 operates from six  $1\frac{1}{2}$  V U2 cells and weighs 8 lbs. The makers do not state whether a line output socket is fitted, but tapes made on the ST470 could, of course, be replayed on a standard mains machine running at the same speed. Again this is a recorder with limited frequency response but is quite suitable for sound collecting and like most other transistorized portables can be used for music recordings also. The ST470 is supplied complete with microphone, tape and spools etc., and is fitted with a recording-level meter. Price 25 gns. Full details and specification from Stella Radio and Television Co. Ltd., Astra House, 121-123 Shaftesbury Avenue, London, W.C.2.

#### The Butoba MT5 (Fig. 4)

The Butoba MT5 is already well known and is one of the better class of portables. Price 66 gns. It has two speeds,  $1\frac{7}{8}$  and  $3\frac{1}{2}$  i.p.s., with a frequency response of 50 to 13,000 cps. at  $3\frac{1}{2}$  i.p.s. Because of the extended frequency range etc., it is very suitable for cinefilm work etc., and for collecting sounds which will later be edited and copied. Headphone monitoring, record-level eye, tone control etc., are some of its special features and the MT5 will take 5in. tape spools. No microphone or tape is supplied.

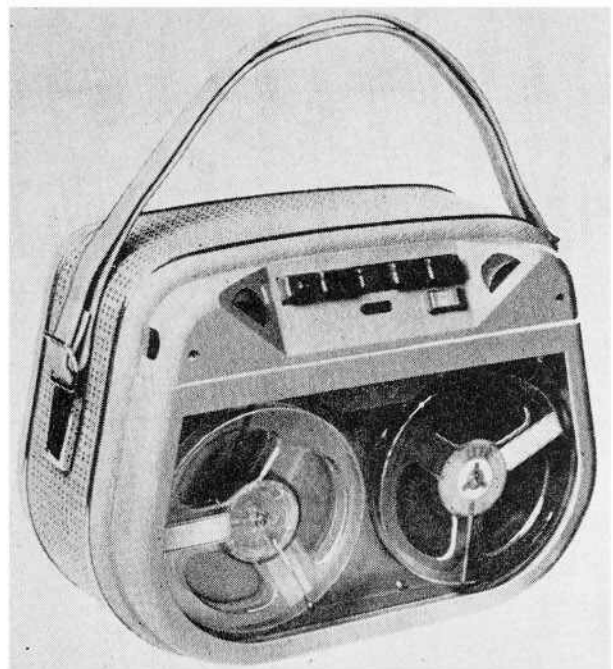


Fig. 4. The Butoba MT5 portable tape recorder.

#### The Butoba MT7 (Fig. 5)

This recorder made its first appearance at the Audio Festival and is a brand new model. It has been designed for the popular market and is ideal for cinefilm work etc. Price is in the lower bracket: 44 gns., including tape and microphone. Speeds  $1\frac{7}{8}$



and  $3\frac{1}{2}$  i.p.s. with a frequency response of 100 to 12,000 cps. at  $3\frac{1}{2}$  i.p.s. Battery operated and fully transistorized. The MT7 may prove to be a popular machine for general outdoor recording.

Both the MT5 and the MT7 are marketed by Denham and Morley Limited, 173-175 Cleveland Street, London, W.1, who will send full details on request.

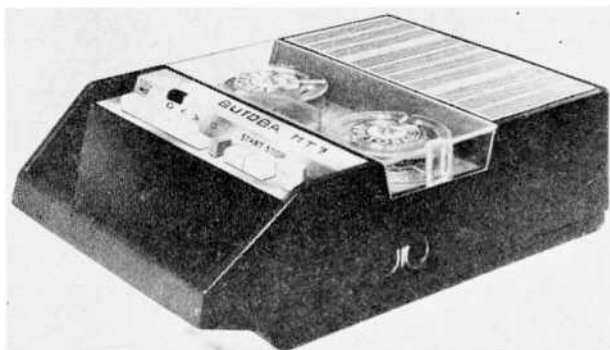


Fig. 5. The new Butoba model MT7 portable tape recorder.

#### Loewe-Opta Model 412 (Illustrated on front cover)

The model 412 is a two-track single-speed recorder ( $3\frac{1}{2}$  i.p.s.) with a frequency response of 50 to 12,000 cps. It has push-button control, recording-level indicator, internal speaker etc., and will take 4 $\frac{1}{2}$  in. spools. Transistors are used throughout and the machine operates entirely from five  $1\frac{1}{2}$  V cells or can be driven from a car battery. No microphone or tape supplied, but a high-quality dynamic microphone is available at 3 gns. This could be a useful recorder for cinefilm and colour slide work in view of the extra frequency range and the necessity to use a high-grade microphone. Price 43 gns. Full details of the model 412 and other Loewe-Opta tape recorders, obtainable from Highgate Acoustics Limited, 71-73 Great Portland Street, London, W.1.

### IN THE HIGHER PRICE RANGE

Now we come to the semi-professional and professional portables which are necessarily expensive. These machines are used by recording studios, professional interviewers, for radio and TV etc., and may interest the serious amateur recordist and cinefilm enthusiast. Most of these recorders operate at  $7\frac{1}{2}$  i.p.s. so that tapes can be directly edited ready for copying. We will deal first with the new Fi-Cord 202.

#### The Fi-Cord 202 (Fig. 6)

This is the successor to the original Fi-Cord model 1A and has some very exclusive new features. Speeds  $3\frac{1}{2}$  and  $7\frac{1}{2}$  i.p.s., with a frequency response of 50 to 12,000 cps. at  $7\frac{1}{2}$  i.p.s. The 202 will accommodate 4 in. spools and run (at  $7\frac{1}{2}$  i.p.s.) for approximately 20 hours on Mercury batteries (7 $\frac{1}{2}$  V). Special 'electronic' batteries permit an extended running time up to 60 hours. The 202 has forward and reverse re-wind, a built-in loudspeaker, microphone and tone inputs and an output socket which can be used to feed a copying recorder. The performance of the Fi-Cord 202 is such that it is used by the

B.B.C. and similar organizations and should prove a valuable asset to the serious outdoor recordist. Accessories include carrying case, choice of microphones and a power supply for car battery operation. Price 66 gns.

Further details of the Fi-Cord 202 and its special accessories can be obtained from Fi-Cord Limited, 40a Dover Street, London, W.1.



Fig. 6. The new Fi-Cord model 202.

#### The Uher 4000 (Fig. 7)

This is another new model employing transistors and is, of course, battery operated. It has four speeds,  $\frac{1}{8}$ ,  $1\frac{1}{8}$ ,  $3\frac{1}{2}$  and  $7\frac{1}{2}$  i.p.s., and frequency response of 50 to 12,000 cps. at  $7\frac{1}{2}$  i.p.s. It is a twin-track recorder for professional use and the price complete with a Uher type 606 microphone and a 5 in. spool of tape is 93 gns. Microphone input is low impedance and the model 4000 has a VU recording-level meter. There are inputs for radio, gram and microphone and outputs for external loudspeaker, remote control, external power unit etc. Weight is 7 lbs. This recorder can be operated from dry batteries, re-chargeable 'dryfit' cells, or car batteries. Interested readers should write for the four page technical leaflet about the Uher 4000, obtainable from Bosch Limited (Domestic Appliance Division), 205 Great Portland Street, London, W.1.



Fig. 7. The Uher type 4000 portable tape recorder.

#### The E.M.I. Model RE321 (Fig. 8)

The E.M.I. RE321 is a professional portable recorder and one much used by the B.B.C. for interviews and commentaries. It is an improved version of the original L2 and has a small loudspeaker for spot playback. It operates from eight 1½V Ray-O-Vac cells and has such features as a recording-level meter, line and headphones output sockets, 30 ohm microphone input and a bass cut control. Frequency response for the single speed of 7½ i.p.s. is 60 to 10,000 cps. Various accessories such as a battery carrier, headphones, canvas cover etc., are available. The price is £124 without microphone or other accessories.

Full details and technical specification from E.M.I. Electronics Limited (Recording Equipment Division), Hayes, Middlesex.



Fig. 8. The EMI model RE321 professional portable tape recorder.

#### The Sony Model I.E.M. (Fig. 9)

Last but not one on the list is the Sony model I.E.M. professional portable priced at 250 gns. This is an exceptionally expensive recorder but has some special features which bring it into the professional class. It employs transistors and operates from six 1½V cells. A recording-level meter is fitted and the tape speed of 7½ i.p.s. permits a frequency range of 100 to 5,000 cps. One special feature is the spring driven motor which permits an overall speed stability of less than 1%. The recorder is obtainable with C.C.I.R. or N.A.R.T.B. record/playback characteristics and it has a balanced line output (600 ohms). No microphone or other accessories are supplied with the recorder.

Full details of all Sony recorders from Tellux Limited, 44 Brunel Road, London, W.3.

Finally we give mention to two portables which are really intended for business use. We have included them in order to make the survey as complete as possible.

#### The Edison Midgetape 400

This is generally known as the Midgetape Chief 400 and is an all-transistor portable employing a tape cassette which runs for one hour. There are two versions of the Chief 400; one at £129 10s. has a built-in loudspeaker; the other at £115, has

no internal speaker. A microphone and batteries are included with both. Various special 'office use' accessories are available. Further details can be obtained from Thomas A. Edison Limited, Victoria House, Southampton Row, London, W.C.1. but as we said this recorder is really intended for business and office use.



Fig. 9. The Sony model I.E.M. portable professional tape recorder

#### The Stuzzi Memocord (Fig. 10)

We reviewed this ultra miniature tape recorder some months ago and again this is more suitable for office and business use. The well known Stuzzi 'Magnetite' portable has been discontinued. The Memocord employs transistors, has a built-in microphone which also operates as a replay loudspeaker. Speed is variable between about 3 and 4 i.p.s. and the Memocord has four-track operation. It includes tape on interchangeable spools and a number of special accessories are available which enable the Memocord to be used for dictating purposes. Price 25 gns. in special 'book' shaped carrying case. Details from Recording Devices Limited, 44 Southern Row, Kensington, London, W.10.

Space naturally prevents us from including full technical details and specifications of the portables covered by this survey. Any of the makers will be pleased to supply their brochures on request, but please mention A.T.R.

The three portables chosen for our tour of England and Scotland will be featured in the July issue of A.T.R. They

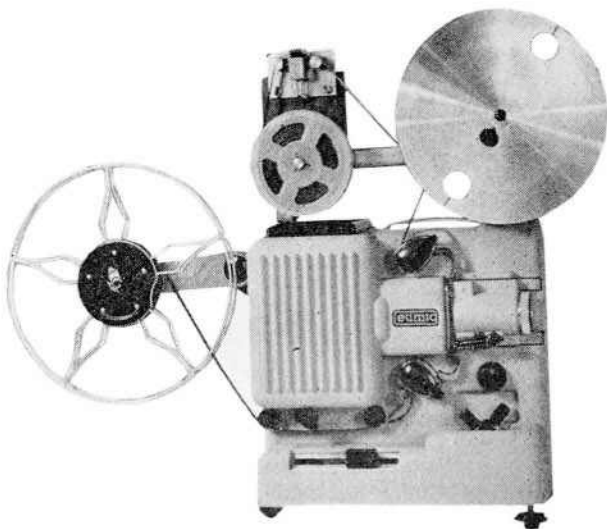
fall into three different groups and our report on their performance under field conditions will illustrate what you can expect for your money.

**ATR**



Fig. 10. The Stuzzi Memocord personal portable miniature tape recorder.

**Amateur Tape Recording & Hi-Fi**



**Looking for new fields to conquer? The blending of sound and vision offers a challenge, and success will bring a rare satisfaction. This, the first in a new series of articles, explains the vital matter of synchronization.**

# TAPE AND CINE

**by A. TUTCHINGS, M.B.K.S., M.B.S.R.A.**

**A** LOT of further development will have to be done before we can have picture and sound on tape as the B.B.C. and I.T.V. do, so we must consider ways of combining the filmed visuals and the taped sound.

At first sight this looks very simple. A tape recorder will store the sound and a cine camera the picture; it is only necessary to stop and start them in step and all will be well. But not only must they start and stop together; they must stay exactly in step throughout the film.

We are used to a tape recorder running at a constant speed of, say,  $3\frac{1}{2}$  i.p.s., and it is easy to assume that a cine camera or projector also runs at a fixed speed. But the camera is usually spring driven and the speed is likely to vary by about five per cent during a 30-second shot. The projector is often fitted with a speed control and the actual speed is critically dependent on the voltage, temperature and state of lubrication.

It is fortunate that the eye is extremely tolerant of changes of projected picture speed. The gross extreme from silent film speed of 16 frames per second to sound speed of 24 f.p.s. is obvious, but not distressingly so; this represents a speed difference of 33 per cent. Plus or minus 10 per cent would hardly be noticed on most subjects.

## Keeping in Step

Camera speed variations need not be considered if we are interested only in adding a simple commentary to an existing edited film. Any given recorder will repeat a recording to an accuracy of about 1 per cent, or about one second in two minutes. If your projector is fitted with a fixed speed induction motor, it too will repeat a two-minute film to about the

same accuracy. So, for short films, a fixed speed projector and a normal tape recorder will keep in step sufficiently well for simple commentary and music or broad background effects.

The same speed limits could result in a timing error of several seconds on a five minute film; and the same tape and film played on a different projector or recorder could result in an even greater mismatch due to small deviations in the absolute speed of either unit. Such a simple system would be satisfactory on your own projector and tape recorder, but useless for showing on any other equipment.

## Using a Stroboscope

If your projector is of the variable speed type, then some means must be provided to alter the speed of the projector to keep it in step with the taped commentary. (Note that it is the *projector* which is controlled, due to the above-mentioned eye tolerance to picture speed.)

Most of you will have seen, or used, a stroboscope to set the speed of a gramophone turntable to exactly 78 r.p.m. by making the pattern stand still when it is illuminated by 50 cycle mains supply giving 100 flashes per second (lamp flashes twice per cycle, once on the negative peak and once on the positive peak).

A cine projector beam is interrupted 48 times per second when projecting a film at 16 f.p.s. (a three-bladed shutter is used to reduce flicker), so that a 78 r.p.m. gramophone strobe will appear stationary when illuminated by the projector beam if it is rotating at about half its normal speed (actually 40.5

r.p.m.). Thus a normal 78 r.p.m. gramophone strobe disc mounted on a 1.78in. diameter disc driven by  $3\frac{1}{2}$  i.p.s. tape (Fig. 1) will appear stationary when illuminated by light from the projector beam when the projector is running at precisely 16 f.p.s.

Projector control for this system is manual and may sound rather complicated and difficult. But, in fact, if the projector is allowed to warm up and settle down to a steady speed for about five minutes before synchronizing the film, it is surprisingly simple and efficient. It is worth having an assistant maintain exact 'sync' during the recording of the commentary, but on projection an occasional glance at the strobe pattern and a slight adjustment of the projector speed control is all that is required.

## Tape Synchronizer

Most modern 8mm. projectors can be fitted with a 'tape synchronizer'. This is an automatic device for controlling the speed of the projector by the tape speed (Fig. 2). The tape is led from the tape recorder capstan around a swinging arm, which operates the speed control resistance in the projector, to a second capstan which is driven by the projector.

If the projector is running slower than the tape recorder the tape loop slackens and the control arm moves the resistance to a low value so that the voltage on the projector motor is increased and the speed increases to take up the slack. If the projector tries to run faster than the recorder, the arm moves in such a direction as to drop the projector speed.

Thus, after a few oscillations, the control arm settles down to a position where the two units are synchronized, and there-



FIG. 1.

78 R.P.M. GRAM STROBE (7 1/2" LINE)  
MOUNTED ON 1.78 INCH DIAMETER  
DISC DRIVEN BY TAPE AND ILLUMINATED  
BY PROJECTOR BEAM.

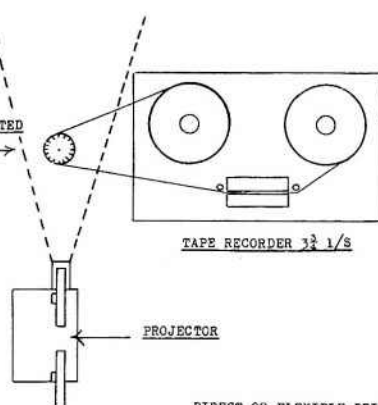


FIG. 2.

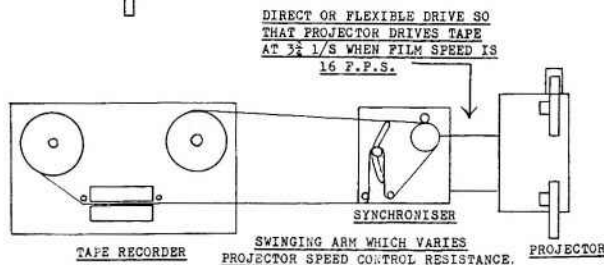
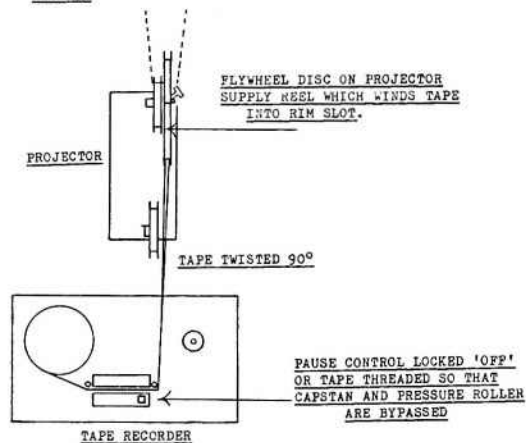


FIG. 3.



after the tape tension moves the arm very slightly to maintain exact 'sync' between tape and film. But even this system is subject to small cumulative errors due to tape stretch.

Perforated tape is now available, and with the capstan on the projector replaced by a toothed sprocket, frame-to-frame synchronization is possible over any length of film. Tape stretch still occurs, but the perforations ensure that the slight extra length is distributed evenly throughout the film and is not allowed to build up to an appreciable error near the end. With this system 'lip sync' and the exact matching of 'spot' sound effects is possible.

#### Special Systems

And now we have the T.T.T., the Tutchings Tape Transporter (Fig. 3), which short circuits all synchronization problems by making the projector transport the tape as well as the film. It consists of a heavy disc which clamps on to the supply reel spindle of the projector so that, as the film is pulled through the projector, the disc turns and winds the tape into a shallow groove in its periphery or outer edge. The mass of the disc smooths out sprocket flutter and small speed variations, and speech quality and the production of sound effects are excellent.

Music may, however, sound a bit seasick due to the long term speed instability of the average projector. It is necessary to bypass or incapacitate the capstan or pressure roller on the recorder so that the projector takes charge of the tape speed. Most modern tape recorders have a pause control which lifts the pressure roller away from the capstan, and on others it is possible to lead the tape behind or around the capstan so that it can be pulled through by the projector. The photograph shows the disc fitted to a projector, together with a tape head and tape supply reel and spindle.

Sound stripe, or a magnetic track on the edge of the film, is the complete answer to all synchronization problems. But, with suitable projectors costing £180 to £200, most of us still have to think in terms of separate tape and film despite the slight complexity of threading, and so on. Tape has many advantages, and owners of four-track or stereo recorders can record music or sound effects on one track and speech or

commentary on the other so that a 'fluff' in delivery of the commentary can be erased and re-recorded without spoiling any of the laboriously synchronized effects or music.

Another trick is to project the film and record a 'cue' track which marks the beginning and end of each scene. By listening to this track on headphones it is possible to record the commentary without running the projector at all. This eliminates the ever present trouble of projector noise and the slight inconvenience of working in semi-darkness. **ATR**

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### STUDIO DECK AUTO-STOP

(VOL. 3, No. 6)

### EMOTIONAL IMPACT OF HI-FI

(VOL. 2, No. 11)

### TAPE PARTY TIME

(VOL. 3, No. 5)

These are just some of the fascinating and informative articles to be found in back issues of 'A.T.R.'

Limited quantities are available of all issues (except Vol. 1, No. 12, and Vol. 3, No. 2) at 2/6 each, post free; from,

"Amateur Tape Recording & Hi-Fi" Magazine,  
Back Numbers Dept.,  
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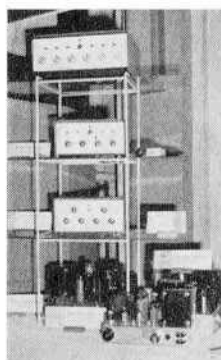
# TAPE FAMILY ROBINSON





The Ampex 'new look'. The kind of tape recorder we should all like. Price range from £602 up to £892 10s. 0d. for a stereo recorder. A.T.R. photo shows one of the new Ampex 352 models.

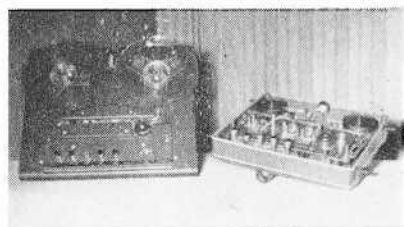
# AUDIO FESTIVAL REPORT



On the Lowther Stand. Lowther are perfectionists in Hi-Fi, and new models appeared at the Audio Festival, including a fine integrated stereo amplifier.



Tug (BASF) Wilson, setting up the train control system early on opening day. One of the BASF unique demonstrations of other uses for magnetic tape. The entire model railway was controlled by impulses recorded on tape, alongside authentic train sounds.

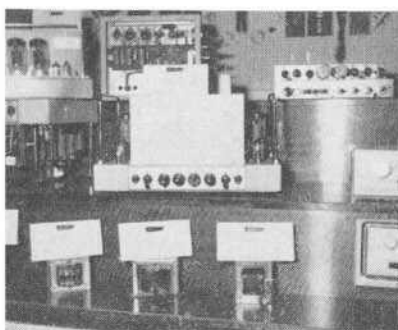


We hope to see and hear more of the new Planet tape deck, which aroused considerable interest among enthusiasts and recorder manufacturers alike.

## Our Technical Editor finds food for thought in this year's Hi-Fi Parade at the 'Russell'

My reactions to this year's Audio Festival were a little mixed. Some good Hi-Fi was to be heard and some good equipment was on show, but there was also some bad Hi-Fi and a lot of equipment which seemed to be unconnected with Hi-Fi except that their leaflets quoted this now very much over-used and abused abbreviation. The term seems to be applied to almost anything that reproduces (?) music. Teenagers call their record player 'the Hi-Fi', cosmetic manufacturers produce 'Hi-Fi' lipsticks. Does Hi-Fi have any real meaning any longer?

On 'Trade Day' I and a few thousand others went around the stands and the demonstration rooms, listening patiently to each manufacturer's latest and greatest. I am still half deaf as a result, but



We were intrigued by the 'Radford Electronics' stand which displayed the new Radford high-fidelity amplifiers now available as constructional kits. They are wonderfully engineered outfits and have an exceptionally high standard of performance.

I was not impressed. Poor stereo, especially from gramophone records, pointed to either insufficient channel separation in the pick-up or to recordings

in which panning techniques had been over used. Tape is still the superior recording and reproducing media, and anyone who heard the excellent stereo demonstration by Lustraphone will no doubt confirm this.

On the other hand many demonstrations were spoiled by the use of poor quality pre-recorded tapes.

By and large very little that could be classed as a completely new development was in evidence. The Planet Tape deck looks promising, and about half way through the Festival, Telefunken sur-



A.T.R. staff ready for the onslaught on opening day. A.T.R. Stand featured new books on tape recording, the Atrecord build-it-yourself tape recorder and, of course, the colourful A.T.R. magazine itself.

prised the trade by introducing an automated domestic tape recorder.

The Fi-Cord 202 was seen by many for the first time and a few new styles in loudspeakers were to be seen. Oh yes, Grundig came up with the TK23, a new domestic recorder which A.T.R. will no doubt feature in the 'Sound Scene' later.



Multi-coloured tape spools made an attractive exhibit on the Zonatape stand.

One question I did put to a lot of tape recorder manufacturers. Why produce recorders with exceptionally wide frequency response at the expense of spoiling reproduction with noise and distortion. Reply in most cases—"Because all our competitors are doing it."

**ATR**

**Amateur Tape Recording & Hi-Fi**



# WORKING WITH ACKER

**NORRIE PARAMOR, busy musician and composer, likes to work on his own most of the time. But he found being locked up in the same house with Acker Bilk certainly had its moments . . .**

**C**AN you imagine spending whole days trying to compose music locked in a house with Acker Bilk?

Well, I couldn't—but I did. Acker and I spent quite a few hours on the score of his film, 'Band of Thieves'. The action takes place in gaol and, believe me, that's just where I felt like going. That man Acker is the end when it comes to thoughtful composition.

"Man," he kept saying, "man, that's great—great. But—" And off he'd go again.

At one time I thought we'd be spending next Christmas locked in the same house. But everything gets done in the end.

I must say, though, this is a phase of my job I really enjoy. I like working on my own, of course. It's a lot easier sometimes. But there are the times when you tear up page after page of music, alter hundreds of notes—and it still lacks something.

Then you get one word of advice from someone who knows what he's talking about, and suddenly the whole thing makes sense!

Working with Acker is about the biggest laugh ever, from the moment you start in the morning until midnight. Mind you, there's the serious side of the business too. We didn't leave that house. Once we were in, that was the end.

We stacked up, chewing our pencils, playing chords on the piano and on Acker's clarinet, humming like lunatics. I had to lock the dog out—he likes to join in when there's any music going, and we were in enough trouble without any help from the canine composer!

After Acker, coming back to the office in Manchester Square was pretty tame. But what faced me when I got in? Nearly 100 tapes sent in by would-be stars! This was just about a week's collection, and I or my staff make a point of listening to every tape that comes in. And I mean EVERY—which isn't always such an easy thing, believe me!

After a while you get to know just what you're looking for—the star voice quality—and you know if you've found it after the first couple of bars.

There's a certain something that makes a star voice and it's made up of four separate things. Individuality is the most important. There are far too many Helens, Elvisses and Adam Faiths about.

Originality and an unusual sound are two other factors. Appeal is the fourth.



## Serious business

There are hundreds of people who think they're the greatest thing to hit music since Gigli. Many of them CAN sing, but that's not enough. In this day and age they've got to have something individual about their voices—something that makes you sit up and take notice straight away, otherwise it's not worth bothering about.

This is especially true today because pop music has grown up. I have seen a great improvement in songs and arrangements since I started out in this business many years ago. There is also a new approach by the singers themselves. Once it was a big laugh, but now it's serious business.

For instance, Cliff has improved out of all recognition. Originally he was simply a rock 'n' roll singer; now he's a talented singer and, more important than that, he's an artiste in the true sense of the word.

Obviously he's had help from producers and directors, but I think a lot has been achieved by pure hard work on his part. And that hard work has paid off.

He has reached star status now, which may get many of you thinking that we don't take so much trouble when recording his discs. But the records he makes have to be top quality all the time—indeed, it's more important now than it ever was.

This year certainly promises to be one of non-stop travel for me. In just a few months I've been to Luxembourg, Paris and Israel, and it looks as though I'll be packing up my music sheets again soon for another trip across the ocean. Anyway, I hope to see you again next month—on land.

**ATR**

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**Beethoven . . . Mozart . . . Sibelius . . . these are some of the favourite composers represented among the classics now available on tape, reviewed here by Peter Redfern and Stan White**

# tape parade

**Beethoven's Symphony No. 3 in E flat, Op. 55 (Eroica). World Record Club (STT 74). The London Symphony Orchestra, conducted by Josef Krips.**

Beethoven sketched the outline of the 'Eroica' in a wood close to his home. He had a favourite limetree against which he would rest and, gazing intently at the waving pattern of leaves and branches, create his music.

The 'Eroica' was not completed for another two years—in 1804, by which time Napoleon, the original inspiration of this work, had allowed himself to be proclaimed Emperor and had lost Beethoven's sympathy. So the work was thrown to one side but, fortunately for us, Beethoven allowed it to be published under a new title, the 'Sinfonica Eroica'.

It is wonderful music, full of colour and variety, and lovingly played here by the L.S.O. Another first-class tape from this club's library.

**Verdi's 'La Traviata'. World Record Club (TT 103). Chorus and Orchestra of the Hamburg State Opera, conducted by Napoleone Annovazzi.**

Some of the world's most famous operatic solos are embodied in this story of the courtesan who found true love. The soloists are Virginia Zeani (soprano), Giuseppe Savio (tenor), Paolo Gorin (baritone) and Gerda Becker (mezzo-soprano).

'La Traviata' means the misled, but I don't think I am misleading the opera lover when I say that he will find three-quarters of an hour of pleasurable listening on this tape.

**Mozart Serenades. World Record Club (TCM 25). Newell Jenkins leads the Everest Woodwind Octet in a performance of two Mozart Serenades—No. 11 in E flat major (K.375), and No. 12 in C minor (K.388).**

This is soothing music skilfully played and faithfully recorded.

**The Peaceful Side of Jazz. World Record Club (TT 128). Billy Strayhorn (piano) with Michael Goudray (bass) and the Paris Quartet.**

Recorded in Paris in May 1961, this might well be the jazz equivalent of the previous tape in that its aim is also to soothe rather than to stimulate.

Numbers such as 'Lush Life' and 'Passion Flower' have little jazz content and are further hampered by a gasping chorus, but 'Take the A Train' and 'Just A-Setting and A-Rocking' liven things up. Altogether, a very mixed bag.

**Peter Redfern**

Among several excellent classical tapes I have reviewed recently are two more in the **World Record Club** Stereo 21 series in two-track stereo at 7½ i.p.s.

**Sibelius (STT 42). Symphony No. 5 in E flat major, Op. 82/Karelia Suite, Op. 11. Sinfonia of London, conducted by Tauno Hannikainen.**

The performance recorded on this tape sounds excellent to me, though there may well be one or two fine points which a severe critic of classical music would single out for comment. Technically speaking, the sound reproduction is comparable to the majority of the stereo discs I have heard. There is no tape hiss, and the highs and lows can be adjusted to your personal taste without introducing any distortion.

**Serenade for Strings, Tchaikovsky (STT 37). Serenade for String Orchestra, Op. 48, Tchaikovsky/Air from Suite No. 3 in D (Air on the G String), Bach/Minuet from String Quintet in E, Op. 11, Boccherini. Sinfonia of London, conducted by Alexander Faris.**

This tape is a joy to me; in fact to the point where I feel I might even switch to classical music in preference to my usual repertoire. Again, the performance is first class. The sound of those strings is

enough to send a thrill of pleasure down anybody's spine; it certainly did for me. As for the standard of reproduction, this is one of the finest stereo recordings I have heard in any field—the orchestra is right in the room with you.

**"1812" Overture/Polovstian Dances. Two-track stereo, 7½ i.p.s., 3½ i.p.s. Esoteric (Tape Of The Month Club). Rhapsodies and Dances. Two-track stereo, 7½ i.p.s., 3½ i.p.s. Esoteric (Tape Of The Month Club).**

Much improved technically, these stereo releases reach a good standard of reproduction in stereo at both available tape speeds. The music is well known and again sounds extremely well. If it's your type of music, you will be well satisfied with the performances for such a modest outlay.

**Living Percussion. Two-track stereo, 7½ i.p.s., 3½ i.p.s. Esoteric (Tape Of The Month Club).**

Just about every percussion instrument you can think of is used in this recording, from drums and vibes down to the tinkle of triangles and bells. The music is all familiar stuff, arranged to give out some excellent sound to good effect without blasting you out of the chair. Such popular tunes as 'Beal Street Blues' and 'Easter Parade' are included, with some nice modern and often swingy playing.

**Presenting Cole Porter. Stereo 21 (STLM 8). Two-track stereo, 7½ i.p.s. The New World Show Orchestra, conducted by Johnny Douglas, starring Jean Campbell, Lorie Mann, Scott Peters and Choir.**

Here are just about the best artistes it's possible to assemble for such a collection of all time favourites from the pen of the world-famous Cole Porter. Everyone will have his own particular favourites, but my own choices are 'You Do Something To Me', 'Just One Of Those Things', 'Let's Do It' and 'Anything Goes'.

The whole tape is first class technically and musically, and I would urge the tape companies to give us many more recordings of this character. It gives a great deal of pleasure to sit and listen to top-flight artistes performing such well written popular songs as this.

\* \* \* \*

Quite a lot of correspondence has been sent to me by readers asking where they can obtain pre-recorded tapes, especially club releases which they would like, without joining a club to obtain them.

Let me assure them that these clubs do a good job of work in making tapes available to members on very favourable terms; there is no question of being made to buy material you do not want. However, the people controlling the clubs realise that not everyone wanting the tapes wishes to join the club; therefore it is possible for readers to purchase tapes without club membership.

World Record Club (Stereo 21), Park-bridge House, The Little Green, Richmond, Surrey.

Tape Of The Month Club (Esoteric), 22 Coastal Chambers, Buckingham Palace Road, London, S.W.1.

Please direct your enquiries to these people mentioning A.T.R. Stan White

## A VISITOR FROM TANGANYIKA



South Devon Tape Recording Club's Chairman, Gordon Furneaux, welcomes Mr. R. Judd, Chairman of the Tanganyika Tape Recording Club. Also in the picture, from left to right, are Mrs. S. Furneaux, Mr. Brian Mudge, Mr. David Pletts, and Mrs. T. Brooke-Stewart.

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edited by Terry Nurse

This month's Club News starts with a Continental flavour . . .

### Bath

THE technical section of Bath Sound Recording Society has been busy building a power pack and five-channel mixer for their new studio. The recording section has been helping a local Spanish Dancing Club by building taped programmes from their concerts.

The local Toc H group intends to start a full-scale Hospital Broadcasting Service and the club has been approached to assist with this. They have promised full cooperation.

Recently the Society visited the inmates in two wards of the St. Martins Hospital, Bath, who greatly enjoyed the society's film of the Bath Carnival which the club made last year.

### Cambridge

Peter Shiston, one of the members of Cambridge Amateur Tape Recording Society's technical sub-committee is soon to purchase a disc-cutter. This will save the society a considerable amount of time and money when requests are received (as they frequently are) for transferring tape recordings to disc.

Provisional plans are under way for the society to experiment in recording television pictures on normal domestic tape recorders.

Plans are now at a very advanced stage for the 1962 Cambridge Audio Exhibition to be held in the autumn.

### Dundee

At a recent meeting of the Dundee Tape Recording Club, the Chairman, Walter Coupar, demonstrated two new tape recorders, loaned to the club by Messrs. Watts Ltd. After demonstrating a two-speed twin-track model, Mr. Coupar put a single-speed, twin-track mains/battery portable through its paces, first on batteries, and then on mains.

At the following meeting, work commenced on the club entry for the national tape recording contest.

### Fareham

Mr. R. T. McLean, 20 Beaconsfield Road, Fareham, Hants, is contemplating forming a tape recording club in Fareham, and those interested are invited to write for particulars.

### Glasgow

Albert Barnes, 7 Southpark Terrace, Glasgow W.2, is forming a tape club in the West End of Glasgow.



Some of the equipment used by Leicester Museum for, amongst other purposes, replaying information to the public about items of historical interest. Gathered round the machines are members of the Leicester Club. Mr. Walden, Director of the museum, is seen on the extreme left, in the back row.

### Hull

The main activity of Hull & District Tape Recording Club is their Hospital Broadcast Service. There are now four fully trained teams, each consisting of a Controller, a Timer, a Disc and Tape Operator, and a Disc Jockey, operating the service on a rota basis. In addition there are six other trained members who are able to take over the various duties when necessary because of illness, holidays, other commitments, etc. These "spare bods" are also occasionally taken into other teams so that they keep their hands in.

The broadcasts (6 to 7 every Sunday) are radiated to seven hospitals within a 25 mile radius, and the club hopes to link-up more hospitals in due course. Broadcasts go out from the club's own studio and control room (built by members) and, to date, 28 editions of "Flat Spin" (as the programme is called) have been broadcast. They have had a grand total of 3,200 requests, used 681 discs, and mentioned by name 1,453 patients! Each programme takes up to about 50 man-hours in sorting, planning, preparing, scripting, pre-recording and broadcasting.

Recently 250 posters advertising the programme to the public have been distributed locally.

The club's record library now consists of more than 1,200 discs (mostly 78's) and sorting and tabulating them by title and artist is becoming a very big job.

The club has recently completed a tape/slide show on the subject of the Hospital Broadcast Service.

### Ilford

Ilford and District Tape Recording Society has formed a Programme Recording Group responsible for providing demonstrations at club meetings each

month and for the production of documentary tapes. On the P.R.G.'s first evening as hosts, members heard about the fine social service they are assisting, previously an out-of-club activity undertaken by members Fred Faulkner and Ken Hartman. This service covers the production of stories with sound effects to improve and make possible the speech of deaf children at an Essex school.

### Kettering

The Kettering and District Tape Club has completed a play, *A Matter of Smash and Grab*, and has visited the County Fire Brigade H.Q.

### Leicester

The last meeting of Leicester Tape Recording and Hi-Fi Club was devoted to demonstrations of microphones. Some fifteen were on view and eight of these were coupled to three low-level mixers which were connected to an electronic mixer, and thence to a Ferrograph tape recorder. Comparisons between the mics could therefore be made when the tape was replayed.

At a recent meeting Mr. Walden,



Director of Leicester Museum, gave a talk on how the museum uses a recorder for various applications.

## Leyton

**Leyton Tape and Audio Club** recently recorded in stereo a stage production of the play *The Whole Truth*. Leyton Arts Council invited the club to join them in presenting an open evening on May 14th.

The club is recording a sound picture of the borough and up to the moment they have recorded for inclusion in this tape a fashion show, Highland pipers, and a concert. The club has also been

## Northampton

The **Northampton Tape and Cine Club** recently spent five hours recording dance bands at the local Band Festival, organized by the Northampton Branch of the Musicians Union. Secretary R. C. Foster and club member Mr. Stobber, who made stereo recordings at 7½ i.p.s., tells me they used up to 12,000 ft. of tape. Other recordings were made on Elizabethan and Cossor mono recorders.

In contrast to this on May 1st, the club presented at the Grand Hotel, "Sound Through the Ages". Starting

items this time—a testimony by Mr. Bill Young, a Methodist lay preacher, who was blinded at seventeen as the result of an accident; a contribution by Mrs. Frances Poole, Secretary of the **Disabled Christians Fellowship**, herself a sufferer from multiple sclerosis; a discussion on whether the Christian should be concerned with politics, and a thought-provoking feature on the possibility of life on other worlds. Behind this interesting project is our old friend, David Lazell, from whom full details can be obtained at 25 Wheatland Drive, Leicester Road, Loughborough, Leics.

# HULL TEAM'S TRIUMPH

asked to provide sound effects for a "Leyton Through the Ages" show. This will include sounds of battle which the local fencing club will provide and the sounds of arrows flying through the air, to add to the effect. Luckily they can depend on one of their members—a keen toxophilist—for this latter effect.

## London

Membership of **Howard Wall and Bethnal Green Tape Recording Society** is growing, and so is the range of club activities. A visit from 'Mr. Audio' himself, F. C. Judd (the club's description), was recently enjoyed by members, who listened to his talk on sound mixing and musique concrete. The club has visited the Walthamstow Telephone Exchange where the Chairman's son, Mr. J. Burchell, showed members the mysteries

with the very first type of cylinder phonograph—horn types—they traced the history of recording right up to modern stereo recorders.

Preston and District Hospitals have requested that the club forward a 30-minute programme for a series they operate over their large Hospital Broadcasting Network, called "Round Britain". During the next few weeks the club will be working on this special programme. A call for volunteers to help with Northampton club's special services goes out to A.T.R. readers—especially those who would help in recording news readings for the blind.

## Rugby

Plans are advanced for the 1962 **Rugby and Midland Tape Clubs' Convention**,

## Thornton Heath

**Thornton Heath Tape Recording Club** held a contest recently for a 5-minute tape on any subject. They received such a good response that playback of all the tapes took two meetings! The contest was won by the youngest member—16-year-old Adrian Webster, whose story tape was ingeniously made up from dubbings of gramophone records.

## TOP TEN CLUBS FOR JUNE

- |                   |                 |
|-------------------|-----------------|
| 1. HULL           | 6. HOWARD WALL  |
| 2. THORNTON HEATH | 7. NORTH LONDON |
| 3. NORTHAMPTON    | 8. LEYTON       |
| 4. BATH           | 9. CAMBRIDGE    |
| 5. RUGBY          | 10. ILFORD      |

of an automatic exchange. Members recently entertained residents of Bethnal Green Rehabilitation Centre by demonstrating mono and stereo recordings. It was so well received that it developed into an impromptu dance session. Swinging!

A mixer-building exercise was recently completed by **North London Tape and Hi-Fi Club** members, some of whom had never before tried to build their own equipment.

## Middleton

Mr. G. E. West, 187 Oldham Road, Middleton, Lancs. has formed a tape club in **Middleton**, near Manchester.

## Tape Crusaders

The fifth edition of the **Tape Crusaders Fellowship** sound magazine is now available and includes several interesting

## LEAGUE POSITION

	Pts.
1. NORTHAMPTON	26
2. THORNTON HEATH	25
3. WHITSTABLE	15
4. MEDWAY	14
5. RUGBY	12
6. CAMBRIDGE	11
7. HULL	10
7. WALTHAMSTOW	10
9. BATH	9
9. CARLISLE	9
11. BIRMINGHAM	8
12. BROMLEY	7
12. SWANSEA	7
14. SOUTH DEVON	6
15. HOWARD WALL	5
15. LIVERPOOL	5
15. NORTH LONDON	5
15. STOKE NEWINGTON	5
19. BOURNEMOUTH	4
19. SOUTH BIRMINGHAM	4
19. WARWICK	4

A treat for the patients (especially the girl patients) at Mayday Hospital was a personal message from Cliff Richard and the Shadows, recorded by the club and played back during their regular record request programme. And as a special treat, patients were able to see a film of the Club Secretary, B. Marlow, interviewing Arthur Haynes. The film was made by member Arthur Stevens, who is a keen cine-with-sound enthusiast.

### Amplifier Certification Scheme

WITH the introduction of the "AMG Specification for Methods of Measuring and Expressing the Performance of Audio Frequency Amplifiers" the Audio Manufacturers' Group of B.R.E.M.A. has inaugurated a Certification Scheme for the purpose of registering equipment, the claimed performance of which has been tested and verified against the specification, and for the issuing of certification labels which may be affixed to the equipment for identification purposes.

The great advantage of this Certification Scheme is that it will set a seal of authenticity on the claims made by British amplifier manufacturers for their products.

This will be particularly valuable in the export field where claims are usually viewed most cautiously by potential importers.

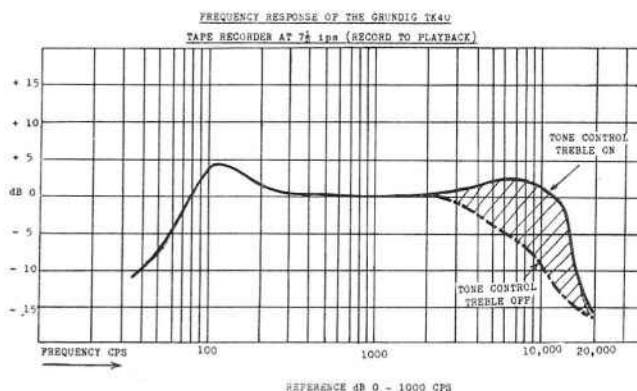


Fig. 1.

# THE SOUND SCENE

This month's 'Sound Scene' concerns a movement to raise the standards of British amplifiers and presents a comprehensive review of the Grundig TK40.



Edén Kane meets Ken Peters at A.T.R.'s Audio Festival stand.

The majority of amplifier manufacturers have already expressed their willingness to participate in the Scheme, and we hope that those firms who, perhaps, have not yet considered all the advantages will add their support to make this a united effort.

A.T.R. sees this as the vital first step, from which the British Audio Industry could build an unchallengeable reputation for accuracy, reliability and quality throughout the world.

## THE GRUNDIG TK40 TAPE RECORDER

reviewed by F. C. Judd, A.Inst.E.

It is some time now since I had the opportunity of reviewing a Grundig mains recorder and the arrival of the TK40 was awaited with some curiosity as to what new features and improvement in performance Grundig have introduced in this latest product. The TK40 is a three-speed, four-track recorder with, as I had expected, some very new features. I will not waste time and space describing in detail its appearance which as usual is impeccable. Nor will I say more about controls except that 'piano key' buttons make operation extremely simple. With the aid of the novel instruction book the absolute beginner cannot fail to make a good recording and play it back first time.

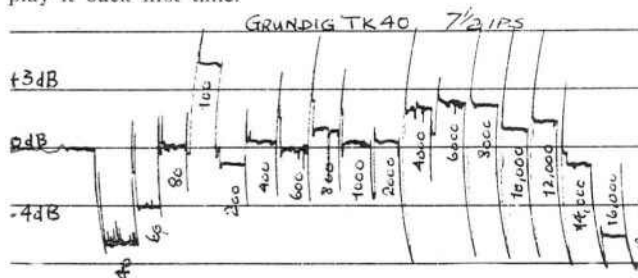


Fig. 2. Pen-recorded graph showing the frequency response of the Grundig TK40 at  $7\frac{1}{2}$  i.p.s. Compare this with the plotted response for  $7\frac{1}{2}$  i.p.s. shown in Fig. 1.

The three speeds are  $1\frac{7}{8}$ ,  $3\frac{3}{4}$  and  $7\frac{1}{2}$  i.p.s. and the track designation is of course to the standard now widely used, but first something about the new facilities. First, there is a tape cleaning device which is retractable and therefore out of the way when not in use. When in use, two soft pads engage the tape and wipe it free of dust before it traverses the tape heads.

There is an improved tape pressure system which holds the tape snugly against the heads and reduces the risk of high frequency losses so often due to poor pressure pad systems.

The hub clutches are new and employ a multi-disc arrangement which prevents tape snatching and provides a smoother and gradual start during recording and re-wind. The re-wind control permits gradual or fast winding and there are facilities for superimposing and, much more useful, synchronization of



Fig. 3. The Grundig TK40 Tape Recorder.

two recordings on opposite tracks. One can make a recording on say track 1 and synchronize it with another on track 3, or vice-versa. Then there is dual channel input and mixing, microphone and radio or gram etc., and—undoubtedly of great interest to cine enthusiasts—a socket permitting direct connection of cine projector tape heads to the Grundig TK40 for recording or playback. In other words the TK40 can be used as a record/playback system for film sound stripe.

The TK40 will accommodate up to 7in. spools with the lid off, or 5½in. spools with the lid on for transport (the lid must not be on when the recorder is actually being used). In addition to the facilities I have mentioned so far, there is a treble-cut tone control, provision for monitoring, direct play-through using the amplifier for a pick-up etc., automatic tape stop, which operates on record/playback or fast re-wind, a cathode ray level indicator, a novel tape position indicator (digital counter type) and various sockets for external amplifier, external speakers, telephone adaptor, diode (radio) input and remote control for office use etc.

#### Performance

Having dispensed with the features and facilities we turn to electrical and mechanical performance, which as usual with Grundig instruments is beyond criticism. Elsewhere in this magazine reference is made to the need for lower noise level and distortion so often produced by forcing the frequency response up to 20,000 cps. or more. Grundig have quite wisely used no more h.f. pre-emphasis than is necessary to maintain a perfectly adequate frequency response. The pen-recorded graph of Fig. 2 shows the overall response at 7½ i.p.s. (record to playback) which extends to well over 14,000 cps. before falling. The pen-recording also shows the almost complete absence of modulated noise over the whole frequency range. This indicates discrete pre-emphasis during recording and a clean bias oscillator waveform. The only detectable noise is in the low-frequency region below 100 cps. Now all this adds up to an overall high signal-to-noise ratio which is maintained even at 1½ i.p.s. because again no excessive pre-emphasis is used.

(The plotted frequency response for 7½ i.p.s. is shown in

Fig. 1 which also shows the working range of the treble cut control.)

Mechanical performance was also above reproach and it is doubtful whether the 0.1% wow and flutter content could be bettered. The deck operates smoothly and it is almost impossible to spill the tape or put undue tension on it when braking or re-winding.

#### MAKER'S TECHNICAL SPECIFICATION

Mains voltage: 50 cycles AC only, 110, 200, 220, 240V.  
Power consumption: 70 watts (approx.).

Maximum spool size: 7in. (lid removed), 5½in. (under lid).

Tape Speeds: 7½ i.p.s., 3½ i.p.s., 1½ i.p.s.

Running time per 1,800ft. Grundig double play tape type TDP8: Approx. 3 hours at 7½ i.p.s., 6 hours at 3½ i.p.s., 12 hours at 1½ i.p.s.

Fast wind (time per full tape). Fast forward: 3 min. 35 sec. Fast rewind: 2 min. 36 sec.

Wow and flutter: ±0.1% at 7½ i.p.s., ±0.12% at 3½ i.p.s., ±0.2% at 1½ i.p.s.

Frequency response: 60 to 18,000 cps. at 7½ i.p.s. ±3dB, 60 to 15,000 cps. at 3½ i.p.s. ±3dB, 60 to 9,000 cps. at 1½ i.p.s. ±3dB.

#### Full level recording

Output level via tape (from high impedance output): 115 mV at 7½ and 3½ i.p.s., 750 mV at 1½ i.p.s.

Distortion factor (max.): 5% at 7½ i.p.s., 6% at 3½ i.p.s., 6.5% at 1½ i.p.s.

#### Input sensitivities

Microphone input: 2 mV.

Radio/diode input: 6 mV.

Pick-up input: 475 mV.

Telephone adaptor: Depending on telephone impedance.

Output power: 2.5 watts.

#### Impedances

Microphone input: 1.5 M.ohm (approx.).

Radio/diode input: 40 K.ohm.

Pick-up input: 1 M.ohm (approx.).

Telephone adaptor: 1 K.ohm.

Ext. loudspeaker: 5 Ohms (approx.).

#### Cine Socket

Required head impedance: 280 K.ohms at 75 Kc/s.

Recording bias: up to 0.25 mA.

Recording current: 0.03 mA.

Playback level: 1.8 mV min.

Erase head impedance: 30 ohms at 75 Kc/s.

Erase current: 400 mA.

Loudspeaker: 4in. X 6in. with ceramic magnet.

#### Hum and noise level

From high impedance output: 8 mV.

From low impedance output: 27 mV.

Weight: 27 lbs. 8 ozs.

Dimensions: 16½in. X 15in. X 7½in.

Type of microphone supplied: GDM18 high performance moving coil microphone.

With the exception of the 'cine socket' all the various facilities were tested and the TK40 was also given an 8-hour non-stop run during which time it performed to specification and without overheating in any way whatsoever.

The TK40 is an excellent example of what a domestic class recorder should be. Its new features will please any keen recordist and should be of great interest to the cinefilm enthusiasts. Full details and brochure from Grundig G.B. Limited, Newlands Park, Sydenham, London, S.E.16. Price of the TK40 complete with microphone etc., 75 gns.

#### THE STUZZI 201 : A CORRECTION

Contrary to our announcement last month, neither the 'Stuzzi 201' nor the celebrated 'Papst' motor embodied therein suffer from 15% 'wow and flutter'.

The decimal point which sank should, of course, have made the report read '1.5%.



# THE THINGS YOU SAY . .

We are still receiving correspondence arising from the letter we published some months ago from a reader criticizing the service he had received from a British manufacturer.

Dealers also came under fire, and last month one replied in their defence. This month under 'Broken Promises' comes the counter-attack.

## IN TUNE

W. J. Tomlinson of Walthamstow, E.17, recently purchased a Stuzzi Tape-Tuner Unit:

"After some fiddling to align it with recorder and amplifier inputs I have nothing but praise for its performance. Admittedly I live in the London area and am in a strong signal field but I feel sure that, with even a small external aerial, people less fortunate in terms of signal strength will get good results. The unit as it stands is first-class and the only personal arrangement I would like is 3-way switched tuning on the Third, Home and Light. I realise that a unit such as this cannot cater for the individual but it is gratifying to find a commercial unit that does its job and at a low cost."

## BROKEN PROMISES

✱ John N. Davies of Sale, Cheshire, writes:

"Further to my letter concerning unkept delivery promises printed in the February 'Dear Sir' column. I was interested to read Mr. Higham's reply in the April issue and I quote from his letter: 'I am constantly amazed at the fact that none of these people seem to have used the facility of a specialist tape recorder retailer to assist them in their requirements, . . .'

"I recently had occasion to use this 'facility' when requiring to purchase a well-known mixer. The promised delivery was one week—the actual delivery one month.

"It is not suggested for one moment that this incident is typical, but it does serve to show that even specialists are not beyond reproach!

"Now I should like to take a more constructive line and again I quote Mr. Higham: 'The firm with which I am associated provides constant advisory facilities for any customer purchasing recorders from them . . .'. How about customers who move to another town and no longer live near the original supplier? Will they be turned away and told to return their equipment to the manufacturer for servicing?

"This happened to me when I requested the fitting of two additional heads to my machine and this job can't even be classed as servicing, it is new work entirely.

"If equipment must be returned to the manufacturer for every little thing it runs the risk of more serious damage in transit.

"Again I ask, is this the general attitude of the trade or are there reputable dealers offering full service facilities?

"I am sure that many Northern people would like to know the answer to this question as most of the manufacturers are in the London area."

## CLICKETY-CLICK

Rex Baldry of Clapham says:

"I have built a radiogram using one channel of a Mullard Stereo 7-7 amplifier, a Standard Jason F.M. tuner, a Collaro TRP 59A Turntable and a Stentorian speaker unit. All works very well, but the set-up is very sensitive to every single spark produced from light switches etc. The trouble appears to be in the amplifier, for disconnecting the F.M. Tuner makes no difference. I was very careful with the earthing, which is either through the tape recorder or the mains lead, again no difference, be there both, either, or no earth paths. Shielding the EF86 (used in place of ECC83) makes no difference. The control unit is in a separate shielded unit from the amplifier, and the mains are not controlled from there, but from an external switch."

*You have a problem which can be extremely difficult to solve and the cure may mean suppressing every electric light switch in the house. This may not be effective, for switches in nearby houses can also be a source of interference. A filter in the mains lead to the amplifier might prove effective. It is mostly a case of trying.*

*We suggest you write to Belling & Lee Limited for their booklet about interference and details of mains suppressors etc.*

## PROBLEM CORNER

Can any reader come to the aid of L. J. Carroll, of 1 Rosewood Avenue, Upton-by-Chester, Cheshire? He has a 'Saja Export' tape recorder, but is unable to obtain any technical information on it. The most important details he needs are the respective impedances of the radio and phono inputs.

## A.T.R. YOUTH CLUBS?

Derek J. Chatterton of Camberwell has an idea for A.T.R.:

"The idea is that 'Youth Clubs' should have their own section in A.T.R. as do schools and tape clubs. They could be told how to use a tape recorder in the club and how to tapespond with other clubs, thus bringing youth closer together throughout the country. I feel sure that this could be done and that it is well worth doing."

*We look forward to hearing readers' views on this suggestion.*

## BLIND AUDIO ENTHUSIASTS

One of our readers, who is an audio enthusiast, is considering organizing for blind audio enthusiasts a free service on tape of readings from technical articles in this and other British and U.S.A. journals and from books on audio.

Readings would be made on 5in. reels of two-track tape at 3½ i.p.s. and the only cost to the recipient would be the return postage.

So that a decision can be made as to whether there is a demand for this service, we should be pleased to hear from any blind subscriber who would like to take advantage of the service if it was established and perhaps he would confirm that he has facilities for playing tapes recorded as mentioned above.

We, on our part, will gladly give our copyright permission for our articles to be reproduced in this way. **ATR**





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**TAPE AMPLIFIER UNITS, Models TA-1M and TA-1S.** The mono version, TA-1M, can be modified to the stereo version, TA-1S, by the modification kit TA-1C. Special features include the provision of a bias level control; easy to read thermometer-type recording level indicators; large printed circuit boards. TA-1C £6.10.0. TA-1M £18.2.6. TA-1S (identical presentation) £23.6.0.



TA-1M



S-88



USC-1

**HI-FI STEREO 16W. AMPLIFIER, Model S-88.** Within its power rating, this handsome looking amplifier is the finest available, regardless of price. U/I push-pull output, 0.1% distortion at 6w/chl. £26.12.6.

**HI-FI STEREO 6W. AMPLIFIER, Model S-33.** Only 0.3% distortion at 2½w/chl. £12.8.6.

**HI-FI 12W. POWER AMPLIFIER, Model MA-12.** Generous auxiliary power supply (single channel). £10.19.6.

**STEREO CONTROL UNIT, Model USC-1.** With variable filter, switched rumble filter, and printed circuit boards. It operates direct from tape heads. Total power requirements 250v 10mA DC, 6.3v 1.5A AC. £18.18.6.



USC-1

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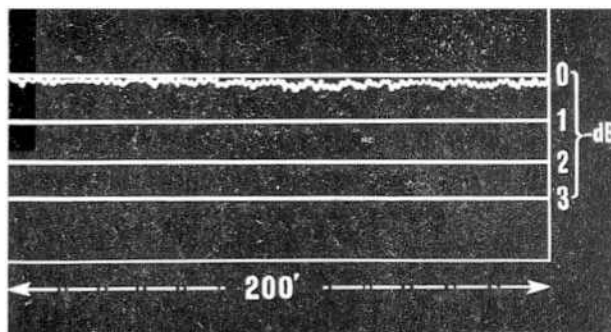
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**T**HE finished Atrecord deck and amplifier assembly can be housed in the special case made and supplied by Martin Electronics Limited or built into a larger cabinet. A larger cabinet would, of course, increase the baffle area for the loudspeaker and result in an improved bass response. Alternatively, reproduction can be greatly enhanced by using an external loudspeaker. The makers of the Atrecord kit can supply a high-quality speaker known as their type 7021, which costs 8 gns. (see Fig. 1). This has an impedance of 3 ohms and will directly match the extension speaker socket of the Atrecord which is also 3 ohms.

#### THE PERFORMANCE OF THE ATRECORD

The Atrecord has a good frequency response and a low hum and noise level. The response of the amplifier alone extends down 40 cps. and up to 15,000 cps. as shown in Fig. 2.

The overall record/playback response is not far removed

# THE ATRECORD

by F. C. JUDD, A.Inst.E.

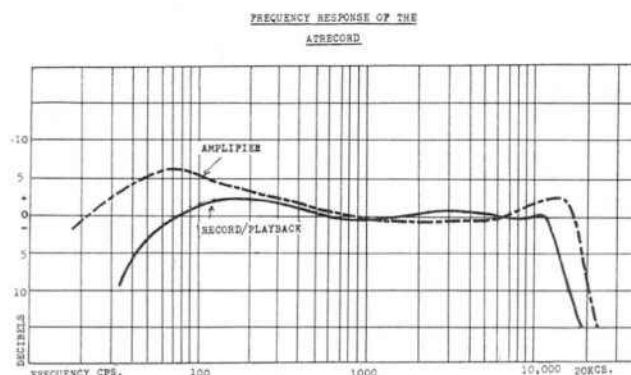


Fig. 2.

## FINAL TESTS

Readers who have followed the construction of the ATRECORD in Parts I to III of this series will now find the test and operating details for their home-built recorder, in this fourth and final part.

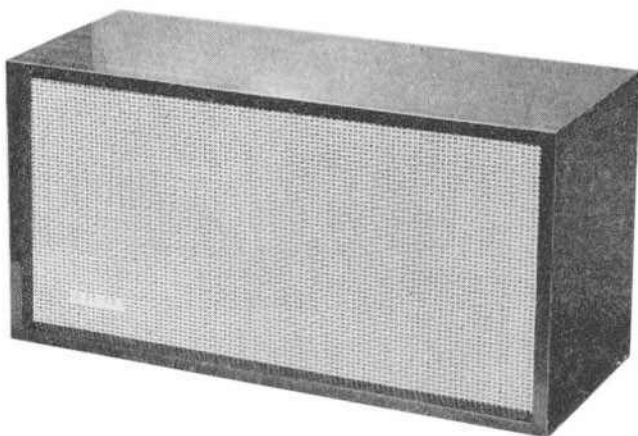


Fig. 1. The Martin Electronics Type 7021 High-Fidelity Loudspeaker and Enclosure.

from this, being  $-3$  dB at 50 cps. and  $-3$  dB at 14,000 cps. This is quite a good response for  $3\frac{1}{2}$  i.p.s. and since the recording pre-emphasis at the higher frequencies is not overdone, noise and distortion are kept to an absolute minimum.

The mechanical performance is excellent and the deck facilities are sufficient for all practical purposes. We gave the Atrecord a good deal of practical use, long running periods, intermittent stopping and starting, re-winding etc. and can assure constructors that despite the simplicity of the deck it does work well.

#### RECORDING AND MICROPHONES

The sensitivity of the magic eye record-level indicator is adjusted so that peak recording level is indicated when the two sections of green light just meet, although a brief overlap on some extra-loud sound will not necessarily spoil a recording.

The pick-up input socket is for high-level inputs such as those from a radio tuner or a crystal cartridge pick-up. The input impedance is high enough to dispense with any frequency correction between a crystal cartridge and the input socket.

The Atrecord has a high-impedance microphone input and will therefore operate with any high-impedance microphone. We recommend the Lustraphone LD66Z/high-impedance model which costs £4 12s. 6d. A high-impedance ribbon microphone could also be used and we found that the Lustraphone 'Ribbonette' works admirably with the Atrecord.

Finally we should be pleased to hear from readers who are building, or who have built the Atrecord, and also from readers who have any particular requests for more constructional features of this nature.

ATR

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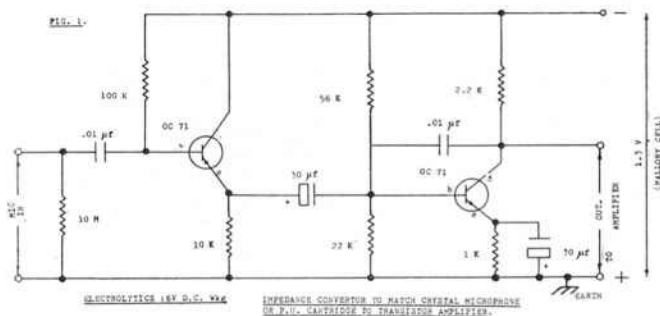
Early Closing, Wed., 1 p.m.

If you have a useful tape recording tip, send it in to 'Tape Guides', A.T.R., Ulster Chambers, 168 Regent Street, London, W.1. A guinea will be paid for each tip published. This month D. O. French qualifies with a useful angle on 'tape spooling'.

# TAPE GUIDES

## IMPEDANCE CONVERTOR FOR CRYSTAL MICROPHONES

**M**ANY small battery-operated tape recorders employing transistors have a microphone input impedance between 400 and 1,000 ohms and sometimes as high as 2,000 ohms. This means using a microphone with an output impedance of less than 2,000 ohms but not lower than 400 ohms, for example, the Grampian DP.4 which is 600 ohms. Many owners of recorders which have odd microphone input impedances would



like to use a crystal microphone which may have an impedance between 2 and 5 M.ohms. This, of course, means a very-high-impedance input, certainly greater than 1 M.ohm if the crystal microphone is to operate efficiently.

The special impedance converting circuit of Fig. 1 will allow crystal microphones such as the Acos Microphone 39, Microphone 45 and others to operate with tape recorders having 'medium-low' input impedances.

The circuit employs two Mullard OC71 transistors and will operate from a single 1.5V torchlight cell or a 1.3V Mallory cell. The whole circuit could be built into a small metal box with just an input socket for the microphone and an output socket or connecting lead for coupling to the tape recorder. Components may be all subminiature types such as those produced by Radiospares Limited. (Note: We cannot supply constructional details for this circuit.)

(Contributed by A.T.R.'s Technical Editor, who does not get one guinea for the idea.)

## TAPE SPOOLING

Here is a tip from A.T.R. reader D. O. French of Stroud Green, London. If your tape recorder takes only 3in. or 5in. spools and you have to wind off a 7in. spool, a gramophone turntable can be used to hold the unwinding 7in. spool. Thread the tape in the usual way through the guides and onto the

smaller 'wind up' spool. Switch to fast forward wind, but do keep a light 'braking' touch on the 7in. spool just in case, and to stop the turntable when you stop the tape recorder re-wind.

## MAKING A TAPE TIME CALCULATOR

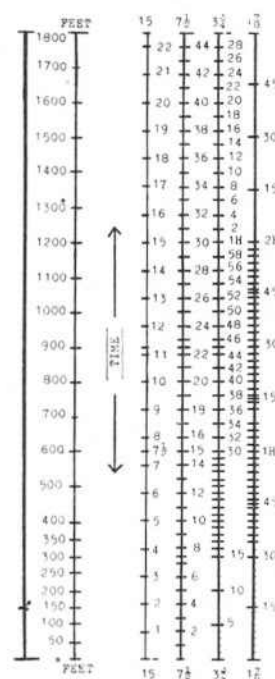
**L**AST month we gave a simple formula for calculating tape time from a known length of tape and the tape speed. The formula

$$\text{TAPE TIME} = \frac{\text{Tape feet} \times 12}{\text{Tape speed}} \div 60 \text{ gives the exact time.}$$

which for 600ft. of tape at  $7\frac{1}{2}$  i.p.s. would be 32 minutes. If we assumed an *even* 30 minutes for this length of tape, the time for 15,  $3\frac{1}{2}$  and  $1\frac{1}{2}$  i.p.s. would come out evenly to 15 minutes, 1 hour and 2 hours respectively. Now, if we make a chart based on this assumption, any time taken from the chart will always allow a little extra. For example, the chart herewith shows 800ft. of tape as providing a playing time of 10, 20 and 40 minutes for tape speeds of 15,  $7\frac{1}{2}$  and  $3\frac{1}{2}$  i.p.s. respectively with 1 hour 20 minutes for  $1\frac{1}{2}$  i.p.s. These times are actually short of the real time which leaves that small extra amount in hand. This is useful when making a recording where the time might overrun by a minute or so.

The simple tape time chart of Fig. 2 is based on an even 30 minutes for 1,200ft. of tape at  $7\frac{1}{2}$  i.p.s. It is only necessary to lay a straight edge across the chart at the desired length of tape and read off the time for any of the three speeds. One could, of course, construct a circular one like that shown in the photograph with a rotating slide and graticule.

Our example included a scale for  $\frac{1}{2}$  i.p.s., a special scale for short lengths of leader where a blank interval of given time is required and also indicated the nearest tape spool size for given lengths of tape. To make a circular scale based on 30 minutes for 1,200ft. of tape at  $7\frac{1}{2}$  i.p.s. the footage divisions come out at 15 degrees per 100ft.



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**Tape Recorders are bringing automation to education—but robots have their limits. . . .**

#### **WE RECEIVE A TAPE**

**R**EADERS' letters and reports, which tailed off during the winter, are now again increasing in volume. Among those of the past month, two of the most interesting come from Norfolk and Australia.

The first, from a Wymondham teacher, congratulates the editorial staff of A.T.R. on producing 'a splendid magazine—just what amateurs want'. For his school he has just completed a tape for Texas—which he sent us with a request for our criticism. We arranged for its consideration by a technical expert and by an experienced teacher script-writer, and for full measure played it over to a group of London schoolboys to watch 'audience reaction'. It was returned with two pages of constructive suggestions which we hope will assist this big effort.

The Australian teacher is making a special study of school-tapes, and asked for further information on matters referred to in this column as long ago as June, 1961! The information has been sent.

A London school wrote to the Scottish address we gave, and in consequence an exchange has been arranged between one of its Forms and the Fourth of a mixed French school at St. Aubigné; we hope for an account of the correspondence, and shall report any items of general interest.

#### **Poles Apart**

Thorpe Hamlet Junior School, Norwich, sent a recording to Eskimo children in Saskatchewan, Canada. A

Kent primary school has taped items of life on the farms of some of the pupils' parents, with other local matter, for a school near Newcastle, New South Wales, Australia. In each case, the return tapes should be exceptionally interesting.

#### **Robots? Not Yet!**

A Sussex paper reports that at Lewes Town Hall local teachers were given a demonstration of one of the first approximations to a robot teacher. An ordinary automatic colour slide projector had been linked to a tape recorder by means of a mechanical strip painted on the reverse of the tape. This enables, for example, a travel film to be shown, complete with commentary, without any further exposition by the teacher, which led the reporter to suggest that during such a 'lesson' the teacher could sit happily in the canteen drinking coffee. We deduce that this reporter is a nice young man unaware of the facts of life. Perhaps, of course, it is simply that Sussex boys differ from those in other parts of the country. In London and Birmingham, for instance, the teacher would remain in alert attendance, knowing that otherwise:

- (a) Briggs and Co. would pass the time with cards and cigarettes;
- (b) Mehmet and Papadoreanou would fight;
- (c) Courtney would use the record player for his pop records;
- (d) The resourceful Fred would raffle the projector.

The school might, of course, be mixed. In that case, staff vigilance would be directed towards the discouragement of other playful little practices that tend to develop when the lights are switched off for the film-showing. But our nice young reporter in Sussex wouldn't know about these.

#### **An Esperanto Tape**

The editor of this feature, when head of a grammar school many years ago, introduced Esperanto into the curriculum—being, so far as he could ascertain, the first London headmaster to do so. He was, therefore, particularly interested to learn that pupils of the Thomas Bennett school in Crawley, Sussex, have prepared a 30-minute tape, in *Esperanto*, about their school and the town.

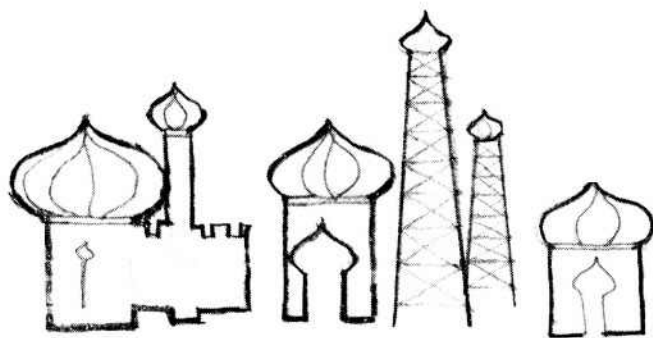
Further, they have done this at the request of a radio station in Holland, which is to broadcast it in a series of weekly Esperanto programmes from various countries for the benefit of Dutch children learning the language.

In return, the Thomas Bennett school is to receive a similar tape made by Dutch Esperanto pupils. A copy of this tape was sent to the British Institute of Blind Esperantists, and is being circulated among their branches in this country.

So this enterprising project is simultaneously promoting international friendship and bringing new interest into the lives of the sightless.

*Note.—Letters relating to this page should be addressed to : Dr. C. A. Smith, M.A., Education Division, 'ATR', Room 530, Ulster Chambers, 168 Regent Street, London, W.1.*





# TAPE RECORDER FOR THE SHEIKH

**BILL RAWLE**

Bill Rawle has 'struck oil' in his quest for tape humour with that audio conscious Eastern Potentate, the Azi of Muth.

**H**IS Royal Hi-Fi-ness, the Azi of Muth, has ordered a new tape recorder for his palace at El Ovawow. The economy of Muth is based upon oil, with an output of 9,000,000 barrels and six buckets a fortnight. The odd six buckets are used for oiling his wives' hi-fi-bicycles, so it may be said—and I force myself to say it—they spend most of their time dancing sheikh to sheikh.

All the revenue from the oil goes to the Azi personally, therefore he is able to afford a limited quantity of new tape from time to time.

The machine he has ordered is studded with rubies and all the fittings are gold-plated, even to the switch which has only to be flicked to trap baby's bawls for all time.

Due to special concessions by the Government he was able to buy it at the same cost as the one you purchased which you said should have been gold-plated and studied with rubies for that price.

The Azi insisted that the recorder should incorporate all speeds from  $\frac{1}{8}$  to 30 i.p.s., to cater for:

- (a) The Hi-Fi expert who is enraptured by a recording of a 150-piece symphony orchestra at  $\frac{1}{8}$  i.p.s. on a 3in. reel, and
- (b) "Old Big Ears", who can still detect wow in a studio recording of a theatre organ at 30 i.p.s.

## TAPE RECORDER WINS AT LE MANS

The "Aspidistra", biggest tape recorder in the world, will cause a sensation when it appears at the motor show. It is a tape recorder with a built-in sports car and will be ideal for the out-of-doors enthusiast who desires hi-fidelity and hi-speed combined.

The price has not yet been announced but is expected to be higher than anyone can afford, consequently the manufacturers have made arrangements to gear their production down to a virtual standstill.

If you order two, the cost will be less than the unannounced price each when halved. To make purchase easier, arrangements have been made with a Finance Company to allow the deposit to be paid by instalments. Alternatively, in special cases, the instalment towards the deposit may be paid by instalments.

Despite the fact that the conveyor line in the factory is a stationary plank, a mood of gloomy optimism prevails. The Manager grinned through his tears as he told me:

"We used to make cheap machines but when the bottom fell off them the bottom dropped out of the market."

"In the first month of operating we manufactured and sold 3,000 recorders but the following month we had 3,246 back for repair. I said to my boss I said 'There's something wrong somewhere'. My own feeling is that because we used mass-produced decks we couldn't tell one make of tape recorder from another, not even our own. I hope those 246 chaps have it on their conscience. It's a hard world. Have you got a fag?"

## DO IT YOURSELF

Revolutionary is the only word to describe the latest tape recorder from Russia.

The loudspeaker is not at the front or the side but at the top, in the position usually occupied by the deck.

You place the machine on a table and the sound waves strike the ceiling then bounce back down. If you happen to be looking up they hit you in the face like a wet haddock. It is a refreshing experience.

Input and output plugs and sockets are of a type never seen before. A representative of the firm said, "Our customers in Britain will expect to see non-standard plugs and sockets and we do not wish to disappoint them, therefore on all new machines we shall fit non-standard sockets as standard."

The inputs and outputs are built vertically into the left-hand side of the case. On the front of the machine, in the space usually occupied by the loudspeakers, is the tape deck proper.

This is a real Do-It-Yourself machine—if you don't like the design you simply push it over on its side, yourself, and it looks exactly like any other tape recorder.

## RECORDERS, TAPE . . .

The standard tape recorder used by Government departments has a specification, interesting, rather. For simplicity it is called the Model 1846/TR/BK/i/2497/2/89048324/J/Issue/6/6/62/House! and is finished overall in a charming shade of Drab Olive Green.

Before recording, a button is pressed which ejects three buff forms to be filled in by the person wishing to record and then forwarded to the appropriate department for authorization and signature. When it is returned the form is clipped to a special holder incorporated in the lid.

The recorder is very compact—3ft. 6in. long  $\times$  2ft. 6in. wide  $\times$  2ft. deep, and weighs 148 lbs. There is storage space in a rear compartment for microphone, spare leads, tea cups, sugar, milk, spoons, tea-strainer, tea-caddy and dartboard.

The deck will not bind itself to accept the smallest or any reel except a 3in. and the tape is threaded through the normal channels to the authorized take-up reel, the latter obtainable by filling in the necessary Stores Requisition Form in triplicate for each spool or spools as the case may be.

## IN A CLASS BY ITSELF

Brief details have been issued concerning the "Educator", a tape recorder for use in the schools.

The outer case is constructed from 2in. armourplate, bound with 1in.  $\times$  16 gauge mild steel hoop reinforced by  $\frac{1}{2}$ in. rivets. The machine has an output of 50 watts so that the teacher can hear what is being played when he is standing next to it.

An interesting feature of this recorder is that if a child touches it without authority, a pre-set mechanism rings a loud bell and a cloud of tear gas is blown out of the front. A special cleaning outfit removes chewing gum, ink, boiled sweets, opium, fag ends and chalk from the sound channel. The deck, or 'desk' as it is called by the teaching profession, will take up to 14 $\frac{1}{2}$ in. reels.

The normal practice is to use a 14 $\frac{1}{2}$ in. reel of double-play tape for the instructional material, while a 3in. reel of standard-play tape is later used to record the amount of material which has been absorbed by the class of 42 boys.

**ATR**

Frequency response is one of the most frequently quoted, yet least understood of all recording qualities.

The frequency battle starts with the apparently simple recording head . . .

THE record/playback heads used for tape recording present many problems to the tape recorder designer because the tape head is an 'inductive' device and has a somewhat peculiar response to the range of frequencies required for reproduction of speech and music. Being 'inductive' the tape head tends to tune itself to one particular frequency, not very sharply of course, but sufficiently to require the use of amplifiers with special characteristics.

#### Frequency Response

If we used a tape head in conjunction with 'linear' amplifiers, i.e., an amplifier with an even response over the whole range



# FREQUENCY FACTS

by A. LESTER RANDS

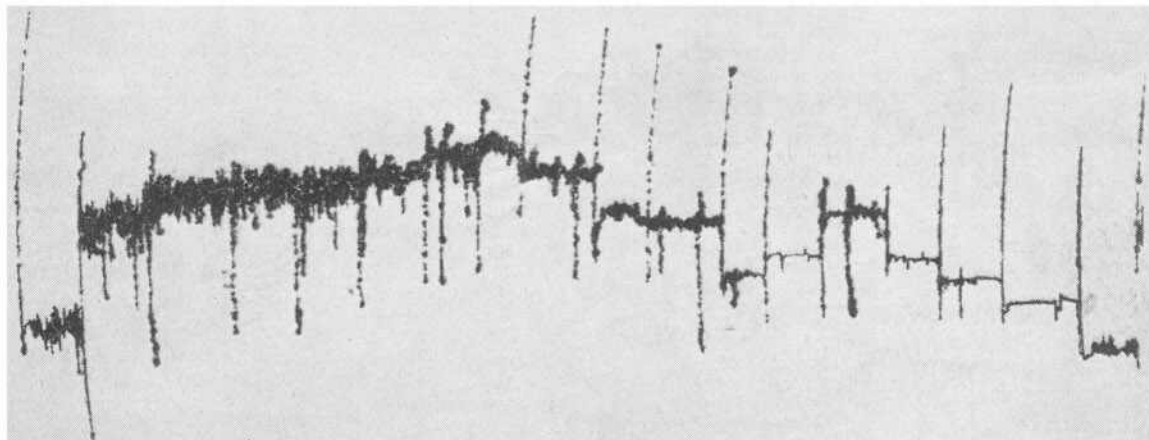


Fig. 4. Pen-graph recording which shows the noise level at the higher frequencies (left) due to over emphasis during recording. The noise amplitude is some 2 dB above the level of the recording of steady sine waves.

of audio frequencies, reproduction would have practically no bass and very little treble. The overall frequency response would look something like the solid line curve (a) Fig. 1. Compare this with the dotted line curve (b) which is a linear response and therefore almost *straight* throughout the audio frequency range. The loudness at the lower frequencies, left-hand side is the same as for the 'middle' and high frequencies (right-hand side). With the tape head most of its 'output' is concentrated at the middle frequencies.

#### Frequency Correction

As I said earlier, the tape head tends to 'tune' itself to one frequency, or at least a narrow band of frequencies. Nothing can be done to the tape head itself to make it record and reproduce with equal output at all frequencies, so we have to use amplifiers with special characteristics which offset the frequency response losses of the tape head. During *recording* the

response at the higher frequencies is emphasized and during playback the response at the lower frequencies is emphasized. By doing this the response of the tape head can be 'straightened out'.

This straightening out process presents more problems because the recording amplifier must operate at full gain at the higher frequencies and the playback amplifier must operate at full gain at the lower frequencies. Take a look at Fig. 2. This is a typical response of a recording amplifier. Starting at the left-hand side you will see that the 'gain' is quite low until the 1,000 cps. mark is reached. Then it rises to maximum at approx. 18,000 cps. and falls again at the limit of the amplifier response. Since the recording amplifier operates at maximum gain in the 18,000 cps. region, it will also amplify any thermal noise from the valves and components. This is problem number one for the amplifier designer—how to prevent the noise from reaching the tape. We have of course succeeded in lifting the response to offset the tape head loss.

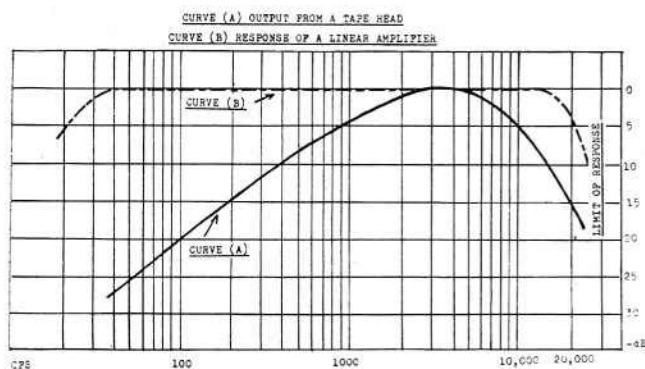


Fig. 1.

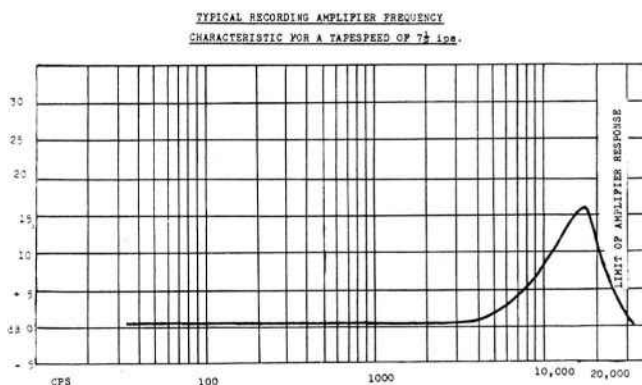


Fig. 2.

Now the low-frequency response must be lifted and this is done during playback, by the playback amplifier which operates at full gain around 30 to 40 cps. The 'gain' gradually falls as we approach the 1,000 cps. mark and remains level for the rest of the frequencies. This raises problem number two, because high amplification at the lower frequencies may emphasize hum caused by small leakages of 50 cps. AC voltage used for heater supplies etc.

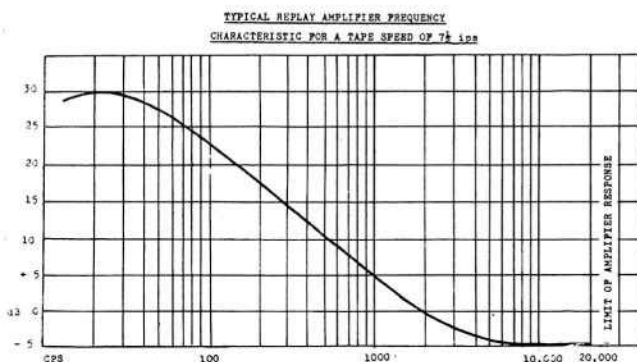


Fig. 3.

To the tape recorder designer 'hum and noise' form a combined problem but as we try to go higher in frequency the greater becomes the risk of introducing noise. Tape recorder manufacturers very foolishly attach too much importance to

frequency response. It is not necessary for a tape recorder to respond up to 20,000 cps. even for high-fidelity reproduction and a response of this order is usually only achieved at the expense of introducing 'noise' on the recording. Noise is far more detrimental to high-fidelity reproduction than a frequency response which falls off above 12,000 cps.

#### This is What Happens

In order to show the effect of over-emphasizing the high frequencies during recording our Technical Editor very kindly made the pen recording of Fig. 4. The frequency response of the tape recorder from which the pen graph was taken has an overall and level response between 40 and 20,000 cps. but the extended high-frequency response was not, unfortunately, achieved without introducing noise at the higher frequencies. The long spikes mark the frequency bands of the tape recording (pure tones). Starting at the left-hand side of the photograph, the first band is 20,000 cps., the second 18,000 cps. and so on. The first six bands are 20 Kc/s, 18 Kc/s, 16 Kc/s, 14 Kc/s and 12 Kc/s, and the thick tracing between the spike markers is noise modulating the steady tones. You will see that the noise gets less and less as the graph approaches the lower frequencies. (The last two bands on the extreme right are 60 and 40 cps. respectively.) The noise traces are as much as 2 dB above the signal level.

I have drifted away perhaps from explaining recording and playback amplifiers characteristics etc., but I felt that the reference to overdoing frequency response was necessary. As I have now dealt with the basic principles of the tape recorder, we can now move on to actual recording techniques for a while and return later to the technicalities, so next month microphones and recording will be featured.

ATR

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The "NUMIX" is a convenient mixer which enables a Ferrograph user to mix and fade at will two programmes, from microphone and radio/radiogram. Alternatively, speaker output sockets from power amplifiers can be used. Any combination of two programmes is possible with the Nusound "NUMIX" device. Price: £4. 7. 6. Radio Lead complete 7/6.

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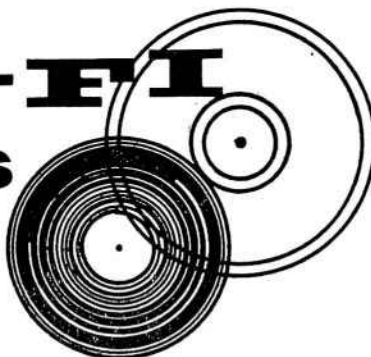
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"How Hi-Fi the Moon?" asks Russ Allen, sorting through June's rocking and romantic waxings.

# HI-FI discs

by RUSS  
ALLEN



**M**R. NELSON has taken to turning up willy-nilly and here he is helping the late *Lem Winchester* with **Lem's Beat** Esquire 32-152. Recorded 19th April '60. *Curtis Peagler*, alto, *Wendell Marshall*, bass, *Arthur Taylor*, drums, *Billy Brown* or *Ray Johnson*, piano, *Winchester*, vibes, *Nelson*, tenor, composer, arranger.

Better by far than the first Winchester album, which I liked, this has more body and coherence. Peagler is a fine sounding alto and not so overshadowed by Nelson



who has advanced much since this was cut (or taped). Hi-Fi reveals that Lem's vibes were a rattly lot but this helps to give the whole thing atmosphere.

It can never happen again so give it a try; Lem's best beat to date.

One of the best all round discs to come my way for some time is **Esquire 32-156 The Cats**, being *Tommy Flanagan*, piano, with *John Coltrane*, tenor, *Idrees Sulieman*, trumpet, *Kenny Burrell*, guitar, the late *Doug Watkins*, bass, and

*Louis Hayes*, drums. Recorded 18th April '56—you think it too bop era to be good? Don't! Everything about it is delightful.

The recording is very live and precise.

You can feel the lay-out of the group, it's so three dimensional, and I'm speaking of a mono recording. On *Tommy's Time* when the front line play the theme you can hear quite distinctly Burrell's fingers on the strings as they slide up and down. Coltrane was not blowing in such hard vein in those days and is possibly better for it.

Everyone plays well but as it should be the leader steals most of the thunder. Listen particularly to Tommy's great solo on *Solacious* with some delicious quotes.

It's tasteful, jazzy, Hi-Fi and, dare I say it? Swingin'.

I first heard him with the Benny Goodman Orchestra of the '30's though he first recorded with Ben Pollack. He was considered in his day to be a great trumpeter, he still is. Yet, ask a young jazz fan and he'll say "Who?", ask an older one and he'll likely sneer. Of whom do I speak? Mr. Betty Grable, Harry James that is. I think he still takes a lot of beating and to prove it, listen to **Harry James Plays Neil Hefti**, M.G.M. C 881. It's a big band, 16 men and Harry playing all Hefti originals written especially for the session.

To quote the sleeve, "Harry James plays Neil Hefti and everybody won." Get a copy, dig the match and I reckon you'll applaud from the side lines as I did.

**Gerry Mulligan Presents a Concert in Jazz is the title**, H.M.V. CLP 1549 the number, and excellent the result.

This is again a big band, 13 musicians featuring mostly Gerry himself and Bob Brookmeyer. The six tracks were all written and/or arranged especially for the group and they don't just play them, they live them.

There's a lot of highly interesting music to be heard here and I suggest you do.

The tonal range is wide and the recording, though a trifle boxy, gives full value to all instruments from flute to bass drum.

The scoring is intricate in the ensembles but there's excitement through-

out. It gets out of the rut; you get out yer lolly and enjoy it for yerself.

Remember *Lionel Hampton's* hard-blowing big band? Yea? Well you'll get a tiny reminder here from **Arnett Cobb's Party Time**, Esquire 32-154. Recorded 14th May '59. *Cobb*, tenor, *Ray Bryant*, piano, *Wendell Marshall*, bass, *Arthur Taylor*, drums, *Ray Barretto*, conga drum.

Because of his association with Hampton I've always thought of Cobb as one of those over-blowing exhibitionists (you'll hear what I mean on *Flying Home*), and I didn't particularly want to



review him, but I must confess I enjoyed him tremendously. In fact, but for that conga drum I thoroughly enjoyed the lot. Bryant contributes some fine mainstream piano, Mr. Marshall some fine bass. It's hard-blowing, honest jazz. Mainstream and exciting.

## The Music Goes Round . . .

National Association of Boys Club members are getting professional coaching in pop singing—by tape recorder. The Keystone Harmony Group issues tapes prepared by Frankie Vaughan's pianist, Basil Tait, giving the boys singing tips and examples by the Polka Dots.

A tape recording of church music in the modern idiom sparked off a lively debate among young people at Egham Methodist Church. The majority were against this method of brightening services.

Beethoven's Fifth Symphony—the 'V for Victory' music of war-time—was played between tape recordings of Labour candidates' speeches during the Putney local election campaign.

Amateur Tape Recording & Hi-Fi



# Sounds dramatic and domestic

Whether it is behind the footlights or the kitchen sink, the tape recorder can act as its owner's hand-maid, assisting rehearsals, passing on messages, repeating instructions—and never tiring or asking for a rise!

By Rachel Lindsay

I'VE had so many interesting letters from you lately full of good ideas, that I thought I'd like to pass them on to all my readers. Mr. King's letter was duplicated by many people, but as his was the first to arrive, he gets the gift of the Chance glassware. The same applies to Miss Jones and Mrs. K. Perry.

Mr. King writes: 'My two sons aged seventeen and fifteen are very fond of amateur dramatics, and they are always busy learning their lines for one play or another. At one time they used to ask us to help them, but now they use the tape recorder, and record all their cues on to it, leaving a space in between for their own parts. Then they switch to playback, and are able to speak their lines in the right places, using the pause button if necessary to give themselves more time. This helps to produce that essential feeling of continuity and seems to work well.'

The glasses are on their way to you, Mr. King, to drink a toast to your two sons for me.

## Alone Together

Miss Jones is the Hon. Secretary of the Leamington and Warwick Tape Recorder Society, which was one of the first societies to be founded. She has a very novel idea indeed.

"Since I bought my first tape recorder in 1958 I have done many things with it. For some time I had slide shows of my

travels abroad with authentic sounds to go with each picture, which I recorded on my battery recorder. Recently I developed another use for my machine, which gives me even more pleasure, and certainly fewer hours of hard work than making up those film shows.

"I play a concertina and also bamboo pipes—but playing alone isn't very much fun. The trouble is that it's extremely difficult to find anyone who plays any musical instrument at all these days. Now and again, however, I can prevail upon a friend to record me some piano accompaniment which I can use over and over again whenever I need it. My latest use for my machine, though, is to play and record one part of a duet, and then play the other part myself to the accompaniment of the recorded part. It's great fun, for now I can give myself a concert all alone whenever I please."

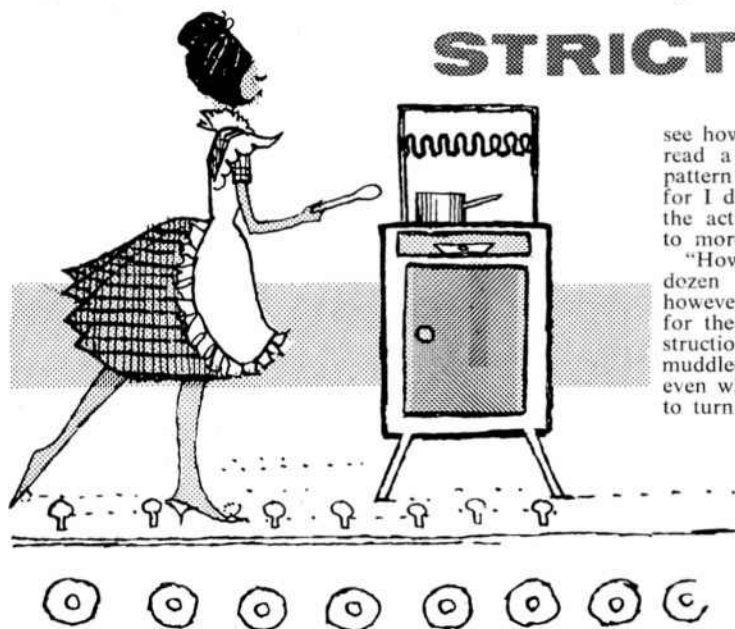
I hope you won't have to drink a toast to yourself all alone, Miss Jones.

'Knit one, purl one . . .'

Mrs. Bruton of Southampton had a very interesting suggestion which I for one have already copied and have found exceptionally useful.

"I do a lot of knitting and my husband does a lot of tele-viewing—when he isn't fiddling around with the recorder. But when he views the TV he only likes me to have a very dim light on. It's just about bright enough for me to be able to

## STRICTLY FEMININE



see how to knit, but it certainly isn't bright enough for me to read a complicated knitting pattern. So now I record the pattern on my machine. This isn't as complicated as it sounds, for I don't record how to make up the garment, etc., merely the actual pattern design itself, which generally doesn't run to more than half a dozen lines.

"However, I like very complicated patterns and those half dozen lines are too difficult for me to memorize. Now, however, I switch on my recorder, listen to the instructions for the first line and then knit it. Then I switch on the instructions for the second line. It also means that I don't get muddled up as to what line I'm on. This always happened even when I used a knitting counter, for I would often forget to turn it at the end of each line. With my recorder there is no such problem, for when I've come to the end of the pattern I switch the whole thing back to the beginning and start again."

One thing Mrs. Bruton forgot to say was that she keeps the recorder very low. Knitting instructions are apt to spoil the best TV show. Can you imagine listening to Highway Patrol at the same time as your better half is knitting away in the corner? "This is Highway Patrol calling Car 024 . . . . Knit three, slip one, purl two together . . . ."

ATR

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Covering 1,700 miles and pioneering as far north as Dundee, A.T.R.'s Technical Editor has been on a special visit to the tape clubs of Northern England and Scotland. Don't miss his fact-filled report, which includes details of field trials he conducted with the latest portables.

## MUSIQUE CONCRETE

News straight from the studios of the latest fascinating techniques in experimental music.

## HOW MICROPHONES WORK

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Amateur Tape Recording & Hi-Fi

# THE TAPE DIRECTORY

the tape directory

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## AUSTRALIA

ERIC SUTHERLAND ROSS, age 48, air traffic controller, 5 Wiseman Street, Rockhampton, Queensland. Amateur radio, aviation, boats and boating, collecting stamps, model railways "00", 35mm. photography, still B. & W. slides, 8mm., world affairs, travel tapesponding, DX short wave listening, member Australian Tape Recording Association. All types. Philips EL3541 4-track, 7in. 3½. National 2-track, 7in. 1½, 3½, 7½. **Any part of world where English is spoken.** All tapes answered within 48 hours of receipt, no letter required, just stacks of tapes.

## EIRE

MISS MARY B. LYNCH, age 22, secretary, 3 Lavarne Road, Terenure, Dublin 6, Eire. Photography, motoring, gardening, arts, reading, general. Almost any kind. Grundig TK14, 5in. 3½. **Anywhere English speaking.**

## NEW ZEALAND

W. L. DEWHURST, age 46, radio, 553 Karangahape Road, Auckland. Learning Esperanto, sacred music, choirs, organ, light music, Gilbert & Sullivan, general topics. MR1 2-track, 7in. 3½, 7½. **Anywhere.** All tapes answered, no letters required.

RON SAUNDERS, age 34, married with 2 children, builder and contractor, Ohauiti Road, R.D.3, Hairini Tauranga, North Island. Photography, people and places, folk music (Continental) and general. Jaycee (Junior Chamber of Commerce). Grundig TK35, 7in. 1½, 3½, 7½. **Great Britain, Continent, anywhere in world.** No letter necessary, all tapes answered. English only spoken.

## RHODESIA

C. H. DAVIES, P.O. Box 8050, Woodlands, Lusaka. Collecting match and beer, wine and spirit labels. Folk music, light classics, popular. Philips twin-track and Philips 4-track, 5in. 3½. **Anywhere.** Anxious to build up a tape of sound effects.

## SCOTLAND

THOMAS CAMERON, age 33, instrument artificer, 101 Wall Street, Camelon, Falkirk, Stirlingshire. Tape recording, music, delicate mechanism, sport, dancing. Classical, choral, pop, trad, jazz etc. Cossor 4-track, up to 5in. 3½. **Anywhere English speaking.**

ROBERT MASON, age 26, postman, 39 Gifford Road, Haddington, East Lothian. Amateur opera, bowls. Show tunes, folk, Gilbert & Sullivan. Grundig TK25, up to 5½in. 1½, 3½. **Any female anywhere.** No older than 30.

ROY TAYLOR (and wife Marjory), age 30, printing paper rep., Idlewild, Eastfield Est., Eastfield, Cambuslang, Lanarkshire. 8mm. cine, travel, S.W.L., reading and gen. conversation. All except heavy classical. Philips EL3541 4-track, 3in.-7in. 3½. **Anywhere outside U.K.** All tapes answered promptly.

## SOUTH AFRICA

J. R. ANDERSON, age 22, insurance clerk, 6 Bayview Avenue, Port Elizabeth. Hitch-hiking, recording, tapespondence, B.B.C. variety. Enjoys all types of music—the international language. Philips EL3542, 7in. 1½, 3½, 7½. **England, N. Africa, U.S.A., Norway, Israel, Germany.** Anyone, any age, men and women.

DENIS BARD, age 39, radio engineer, P.O. Box 6, Margate, S.C. Natal. Tape recording, tournament SHRF, casting and fishing, squash and music. Boogie to Bach. Telefunken, 9in. 1½ to 15. **Any English speaking.** Don't write first—just send tape.

NORMAN RAATH, age 27, clerk, P.O. Box 402, Pretoria. Motor racing, people, tape, just talking, practically anything. Jazz (piano and vocal). Tandberg 4-track, up to 5in. 1½, 3½, 7½. **Anywhere English speaking—especially young sweet voiced angels to talk to.** No need to write first, all tapes promptly answered.

## WALES

DAVID DAVIES, age 22, technician, 12 Mardy Road, Mardy, Rhondda, Glam. Records, recording, films. Rock, pop,

musical shows. Philips 4-track, 7in. 1½, 3½, 7½. **U.S.A., Canada. Anywhere! Any sex!**

## BUCKINGHAMSHIRE

686106 A/A M. J. BARKER, age 19, R.A.F., Block 11, Room 2, 1(A) Wing 2SOD, A. FLT, 94th Entry, R.A.F. Halton, Aylesbury. Guitar playing, general topics, C. & W., pops, folk songs. Clarion 2-track, 3in. 3½. **U.S.A. only.** All tapes answered.

## CHESHIRE

KEITH ELLIS, age 18, 30 Walker Street, Hoole, Chester. Cars, world affairs. Jazz (mod, trad), rock, light classical. Philips 4-track, up to 7in. 3½. **Anyone, anywhere.**

EDDIE KANES, garment maker, 16 Millwood View, Stalybridge. Anything that's going. Pops to classics. Truvox R2, up to 7in. 3½, 7½. **Any part.** No need to write. All tapes answered.

NEIL KENNEDY, age 20, accounts clerk, 12 St. Hilda's Drive, Frodsham. Tennis, swimming, youth and Sunday School work. Mario Lanza, Harry Secombe. Prefer classical music, but like Adam Faith, Cliff Richard and Ruby Murray. Grundig TK24, 5½in. 3½. **Any.** All tapes answered.

M. MCINTOSH, age 20, radio and TV engineer, 8 Brancote Gardens, Bromborough, Wirral. Stage lighting, church activities, Scouts and recording. Light classical, organ (church & theatre). Ferrograph 4AN, 3in.-8½in. 3½, 7½. **Great Britain.**

## DEVON

KEITH ROBERT CROOK, age 17, sprayer (paint), 11 Hugh Squier Avenue, South Molton, N. Devon. Boy Scouts, sports cars, travel. Pop in general. Elizabethan FT3, 7in. 1½, 3½, 7½. **U.S.A., Canada. Any foreign country where English is spoken.**

C. MITCHELL, age 34, manager (paint & wallpapers), 'Westholme', 26 Admiralty St., Keyham, Plymouth. Records, speedway, walking, general. Light and modern. Philips EL3536 Stereo 4-track, 7in. 1½, 3½, 7½. **Male, English speaking anywhere.**

IAN A. NIVEN, age 17, student, Roselea, Combe-in-Teign Head, Newton Abbot, S. Devon. Motoring, recording, science. Almost any type of music. Telefunken 5½in. 1½, 3½. **Anywhere, especially U.S.A., Canada, New Zealand, Australia.**

## ESSEX

W. F. MADDEN, age 33, storekeeper, 170 Daiglen Drive, South Ockendon, Romford. Collecting records of Perry Como. Ferrograph 4A in Hi-Fi. Brenell Mk. V Portable. 8½in. All. **Anywhere.**

## GLOUCESTERSHIRE

JOHN RIGGALL, age 39, hospital officer, 7 Purley Avenue, Cirencester. Amateur revues, pantos, script-writing, designing costumes and masks. Popular

& jazz. Ferrograph 4A, any, 3½, 7½. **Anyone, preferably male, in British Isles.** All tapes answered. No need to write first.

MICHAEL WATSON, age 18, trainee toolmaker, 65 Juniper Avenue, Matson. Photography, do-it-yourself. Trad jazz, pop, light classical. EAP Major, 7in. 1½, 3½, 7½. **Anywhere English speaking.**

## HAMPSHIRE

BRIAN HOLLEY, age 22, Army bandsman, 121 Vigo Road, Andover. (To be posted to Malta Nov. '62). Guitar playing, archaeology, good music. Light, piano concertos, some jazz. Telefunken 75, 5½in. 1½, 3½. **Any English speaking countries.**

KENNETH REED, age 23, invalid, 38 St. Patrick's Road, Basingstoke. Amateur astronomy, sport. Light classical, trad jazz. Robuk RK3, up to 7in. 1½, 3½, 7½. **would be interested to hear from any English speaking country with a view to exchanging general information and chat.**

## HERTFORDSHIRE

PAUL BRANSOM, age 15, lens grinder, 73 New Park Drive, Hemel Hempstead. Guitar playing, astronomy. All types, mod & trad jazz. Portable, 4in. 1½. **Especially U.S.A.**

## KENT

WENDY ELIZABETH REEVES, age 21, secretary, 8 Stanhope Road, Sidcup. Motoring, theatre, dancing, cinema, reading. All types—not too serious. B.S.R. Majestic, 5½in. 3½. **U.K., U.S., Australia, New Zealand, Continent.**

W. C. STAMPTON, age 42, telephone linesman, 67 Park Place, Gravesend. General—no sport. Light, folk, jazz (no pop). Telefunken, 5½in. 1½, 3½. **U.S.A., Australia, New Zealand, Pacific.**

## LANCASHIRE

FRANK MASON, age 37, supervisor, 1 St. Barnabas Street, Blackburn. Musical shows, amateur theatre, opera. No rock. Carousel, 7in. 1½, 3½, 7½. **U.S.A. if possible. Anywhere.**

JEAN WILLIAMS, age 19, library assistant, 225 Burnley Lane, Chadderton, Oldham. The theatre, reading, writing. Everything, except jazz. Grundig TK20, 3in. 3½. **Anyone. Anywhere (preferably male).** No need to write. All tapes answered, especially H.M. Forces. Anywhere—the more tapes the better.

## LONDON

NEIL CHESTOCK, age 21, student, 2 Onslow Gardens, South Kensington, S.W.7. Films and tape recording. Trad jazz, some pop. Telefunken, 5½in. 1½, 3½. **Any.**

F. A. GAY, age 34, meteorologist, 77 Mayes Road, N.22. Politics, art, religion.

Classics, shows, jazz. Fidelity Argyll, maximum 5½in. 3½. **England, France, Spain, Caribbean.**

GEORGE W. HATTLEY, age 32, auto electrician, 57 Harleyford Road, The Oval, S.E.11. Photography, HAM radio, music. Pops, swing & trad. Balmoral, 3in.-7in. 1½, 3½, 7½. **Anywhere with anybody.** No need to write first. All tapes answered.

M. KEMBER & MISS M. PLUMB, salesman and receptionist, 16 Chestnut Avenue, Hornsey, N.8. Amateur dramatics, boating. Anything, except rock 'n' roll. Philips TR3541, up to 7in. **Any young couples. Anywhere English speaking, particularly U.S.A. and Africa.**

CYRIL R. RAPHAEL, age 22, clerk, 108a Darwin Road, South Ealing, London, W.5. Travelling, all sports, photography. Light classical, pops and trad jazz. BSR, 5in. 3½, 7½. **Any country, particularly Africa (East, South).**

## NORTHUMBERLAND

ROBIN IBBOTT, student, 47 Hedley Street, Gosforth, Newcastle-upon-Tyne. Music, females, tape recording. All except trad jazz. Philips 3in.-7in. 3½. **You, whoever or wherever you are.**

## NOTTINGHAMSHIRE

MISS JOAN M. SANDERS, age 22, shorthand/typist, 10 Harby Drive, Wolaton Park. Horse riding, animals, 35mm. photography, tape recording, films. Some pop, folk music, Western songs. Philips 4-track, up to 7in. 3½. **Anywhere, but only English spoken.** All tapes answered.

## STAFFORDSHIRE

MRS. JOAN WALFORD, age 24, secretary, 41 Mill Road, Pelsall, Walsall. Tapesponding, car racing, travel. Classical, light opera. Ferrograph, Fi-Cord, 8½in. 1½, 3½, 7½. **Any male or female.** (Trying to run a tape recording club.)

## SUSSEX

JOHN D. F. KNIGHT, age 18, civil servant, 40 Victoria Gardens, Eastbourne. Classical music, writing, modern history. Classical, comedy opera. Westminster 'J', up to 5½in. 3½. **Germany, Norway (a little German spoken).**

## WARWICKSHIRE

THOMAS C. BAGLEY, age 41, machine setter, 16 Hallam Road, Holbrooks, Coventry. Reading, travel & people. Light & humorous. Philips, Fi-Cord, 7in. 1½, 3½, 7½. **Germany (I speak Kriegsgefangene Deutsch), U.S.A., Canada.**

BRIAN SKINNER, age 31, TV engineer, 10 Onslow Crescent, Solihull. Photography, motoring. Light classics, pops. Truvox, 7in. 3½, 7½. **Anywhere.**

# Spool Talk

the treats and teasers of tapesponding

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## Getting Under Way

The first reply is always the hardest. You suddenly discover a stutter you never had before, your voice changes to a nervous high-pitched quaver continually attacked by 'frogs', and you run out of inspiration before you are halfway through the tape. After listening to the playback peppered with blanks and pause button clicks you erase and start again. But how can you do better next time? One way which may suggest itself is to write out everything you want to say and then read it on to the tape. It is best to regard this as a last resort, as the result by anyone except the most experienced recordist is quite lifeless. Both spontaneity and personality vanish under this approach. Try this instead—

## A Talking Framework

Run through the tape you have received and note the main points mentioned. Underneath, list the points you wish to raise yourself with just a few words on each—never a complete sentence. Family, hobbies, pets, holidays, chat about each subject as you have listed and move on to the next every time you feel yourself drying up.

Don't forget to finish up with a couple of questions for your tape pal to answer. They will then start him off on his next reply.

**ATR**



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**amateur**  
**TAPE RECORDING AND HI-FI**  
**magazine**  
**THE SOUND MONTHLY**

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