

MAY 1967

# TAPE

RECORDING MAGAZINE

2<sup>1</sup>/<sub>2</sub>



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NEW PRODUCTS

HI-FI—ON THE FRINGE

ETC., ETC.

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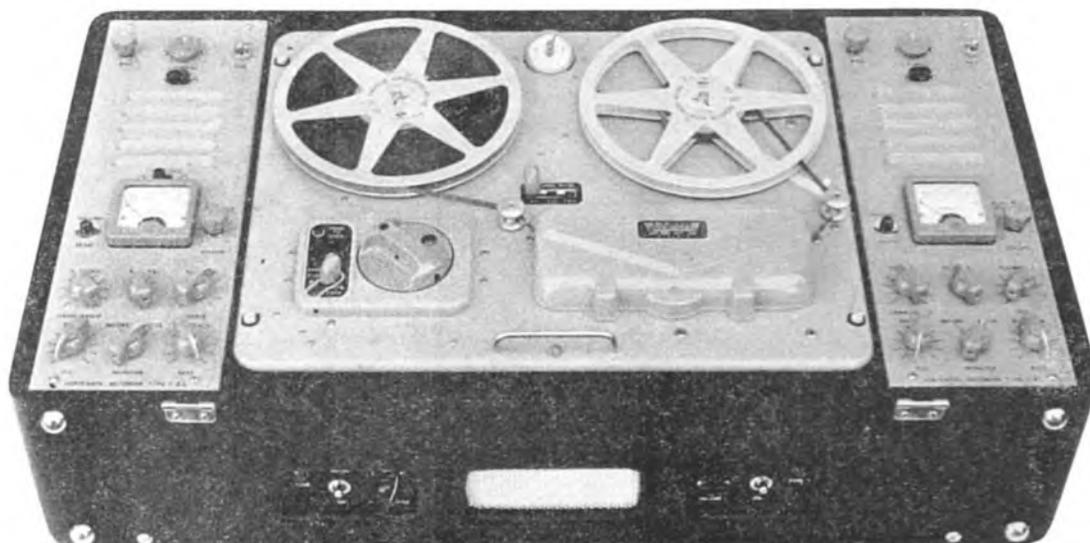
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## TYPE C.B.L. TAPE RECORDER



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All tape recorders have adjustable bias controls, low impedance mic. inputs for unlimited lengths of cable, highly accurate position indicators and meters to measure recording level and bias.

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**George Mitchell  
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**OUT OF THE  
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COLUMBIA TC-SCX 3449

**Graham Bonney**

**SUPER GIRL**

COLUMBIA TC-SCX 6052



## SONY research makes the difference

**TC260 Features:** 4 track, 2 channel, stereophonic and monophonic tape recording and playback system

- Reliable SONY solid state circuit
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- Full 7" reel capacity
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- Tape index counter, two VU meters
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- Voltage selector
- Integrated input and output connectors.

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**Power requirement:** 55 W, 110/125 V, 220/240 V, 50/60 cps.

**Tape speed:** 7½" and 3¾" per sec.

**Reel size:** 7" or smaller.

**Recording system:** 4-track stereophonic and monophonic.

**Frequency response:** 30-18,000 cps at 7½ ips. (50-15,000 cps at 7½ ips ± 3db). 30-13,000 cps at 3¾ ips.

**Signal-to-noise ratio:** Better than 50 db (at peak recording level).

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**Input:** Low impedance microphone inputs—transistorised (will accommodate any microphone from 250 ohm to 1 K ohm impedance). Sensitivity—68 db (0.3 mv) (2). High impedance auxiliary inputs. Sensitivity—16 db (0.12 v) (2).

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**Speaker:** 4" x 8" dynamic (2).

**Power output:** 5 watts x 2.

**Transistors:** 2SB381 (x6), 2SB382 (x2), 2SB383 (x2), 2SC297 (x1), 2SC298 (x4), 2SD64 (x6).

**Weight:** Approx. 34 lbs. 3 ozs.

**Dimensions:** 21 $\frac{5}{8}$ " (W) x 15 $\frac{7}{8}$ " (D) x 7 $\frac{7}{8}$ " (H).

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London Showrooms:  
70-71 Welbeck Street, London, W.1.  
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The P33 is mounted in a quick-release holder and can instantly be used as a hand-held microphone complete with a detachable, twin screened cable 16 feet in length. In addition an anti-vibration mounting is available, preventing transmission of rumble from the stand.



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### 4000 Report-L

**UHER**



An extremely versatile battery portable that gives virtually every facility of a mains-operated recorder—with many exceptional new features. Four tape speeds provide an infinite variety of recordings. Collectorless motor. Weighs only 6 lbs. Price, including microphone and tape, 103 gns.

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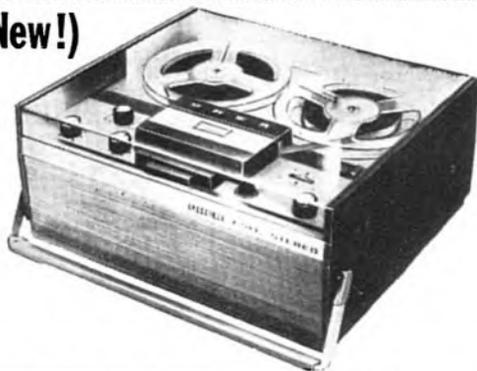
**UHER**



A tape recorder of the highest standard, specially manufactured for professional use. Ideal size, weight, performance and exceptional quality reception. Can be used to synchronise sound with film as well as reporting under professional conditions, on a wide range of voltages. Remote control stop/start. Full track. Collectorless motor. Automatic volume control. Price on application

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The latest, full stereo four track, all mains recorder, specially designed to meet the strong demand for an instrument particularly easy to understand and operate. Monophonic and stereophonic recording and playback. Suitable for use with 'hi-fi' equipment. Fully transistorised. High impedance output. Takes 7" spools. Now built in to a smart teak cabinet with a smoke-tinted perspex lid. Priced at only 75 gns.

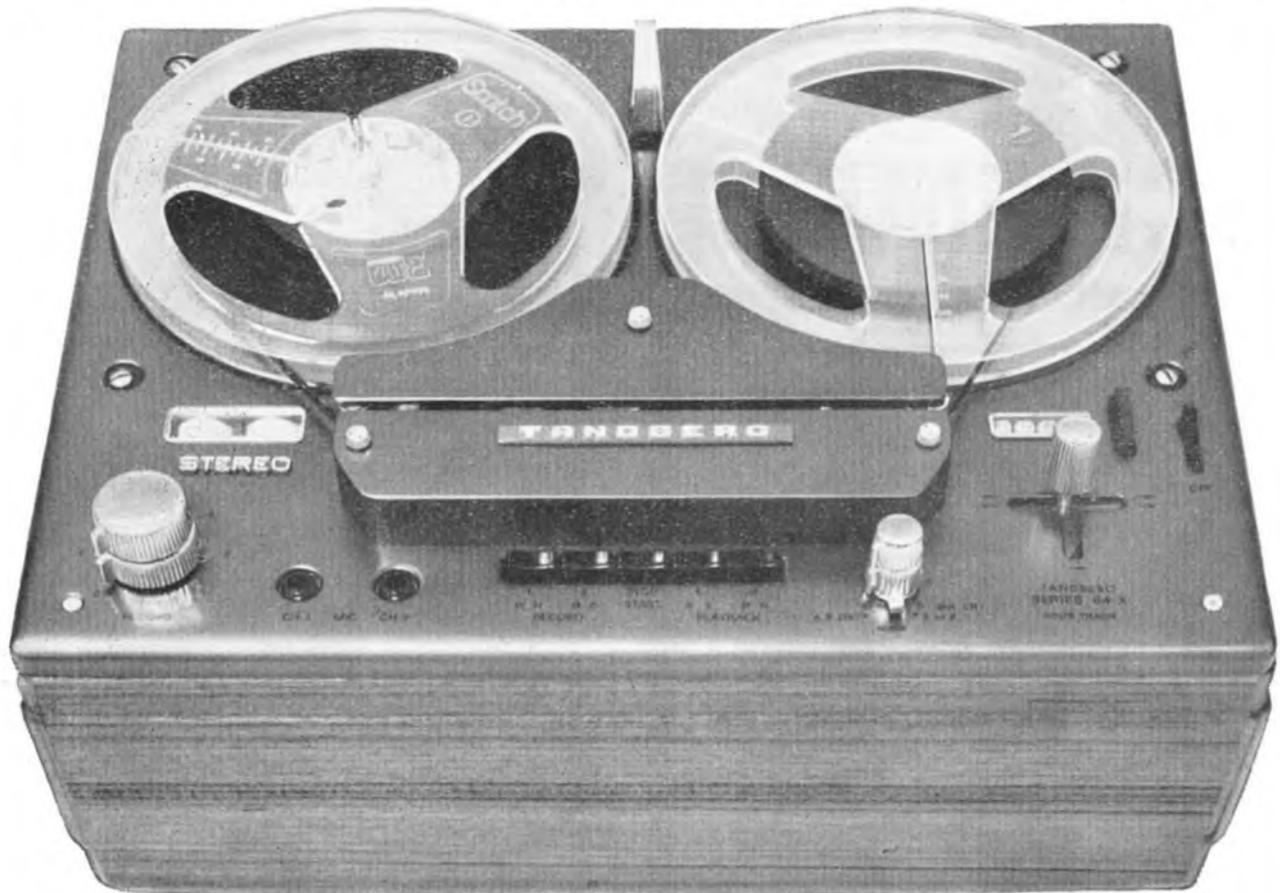
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**UHER**

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Tandberg have taken their finest tape deck, added a Bias head and refined the circuitry. The result is the Tandberg Model 64X.

**Frequency Response:**

7½" per sec: 20-25,000 c/s

(± 2 dB 30-20,000 c/s).

3¾" per sec: 20-18,000 c/s

(± 2 dB 30-15,000 c/s).

1⅝" per sec: 30-12,000 c/s

(± 2 dB 40-8,000 c/s).

**Signal to noise ratio:**

7½" per sec: 62 dB.    3¾" per sec: 59 dB.

1⅝" per sec: 56 dB.

\* Also incorporates Multiplex Filters (for stereo radio recording).

\* A centre channel amplifier for simultaneous playback of two tracks into mono headphones.

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\* 'Sound on sound' facilities.

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The Tandberg 2 or 4 track, 3 speed Series 6X. 115 Gns.

Please send me full details on the Tandberg

**SERIES 6X**

Also full details on the Series

8    9    12

tick as appropriate

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Address .....

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Hereford House, North Court,  
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SEE AND HEAR US AT THE 1967  
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**Tandberg**

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Model EL3301T is a 27 gm play-anywhere battery portable that travels in a carrying case, has simple controls including a remote stop/start switch, and can even be mounted in your car. The 35 gm Mains/Mono Model EL3310 has a teak-finished cabinet, exclusive hinged 'Sound Mirror', Automatic Recording Control

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Model EL3312 is a superb

Mains/Stereo recorder at 48 gms, with two Hi-Fi speakers extra at 10 gms plus 3/1 P.T. surcharge each. All prices cover many useful accessories.

Model EL3312

Model EL3310

Model  
EL3301T

See your Philips Dealer or write for free brochure to Philips Electrical Ltd., Century House, Shaftesbury Avenue, London W.C.2.



**PHILIPS** - the friend of the family





## this is the **ELTRA** 1001 – the new standard in home recorders

The ELTRA 1001 sets a new standard for mono home recorders. At around half the price (49gns) of current high quality machines it provides a playback quality unrivalled by all but the most expensive machines available today. The large internal loudspeaker (9x5) is driven by a most generous in-built amplifier (6 watts push-pull > 1% harmonic distortion) with full separate bass and treble control. Wide, linear frequency response (50-18000 Hz.  $\pm$  3dB @ 7½ i.p.s. to DIN 45513) and incredibly low background noise levels (– 54dB weighted @ 7½ i.p.s.) make the machine quite suitable for most discriminating recording. As for the cabinet, finish and styling, these are Danish Design at its best — just see for yourself.

The coupon will bring further details of the 1001 and the address of your nearest stockist.

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5E/TRM/67

# Your tape recorder is only as good as its microphone



## Sennheiser

make the right microphone for your recorder

### MD 411 SUPER-CARDIOID

Ultra directional microphone. Developed from the now famous Sennheiser studio microphones MD411 cuts out background noise and gives professional 'close-up' sound in difficult domestic surroundings. Triple impedance suits any recorder. Complete with table stand and zip-up case. £ 13. 9. 0.



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The finest dynamic microphone in the world. Condenser sound from a rugged dynamic capsule 40 c/s—20 kc/s. £ 35. 15. 0.



### MD 421 DYNAMIC STUDIO CARDIOID

Sennheiser's most famous microphone is used by almost every broadcasting station in Europe and over 30,000 amateurs have saved up to buy this 'acoustic Leica.' Accurate cardioid characteristic and smooth frequency response permit high quality sound recordings in difficult situations. Ideal for prestige public address sound reinforcement and stage use. Built-in dual impedance transformer and variable bass attenuator control. Only the huge amateur demand for this professional microphone has brought the price from £70 to £ 31. 12. 6.

Do you know the rest of the Sennheiser range or products? RF. condenser microphones (like the 'gun mic.' shown above) Radio microphones, Miniature magnetic microphones and earphones, Hi-Fi reproducers, Audio test equipment.

## Audio Engineering Ltd

33 Endell Street London WC2 TEM 0033

# NEW

## Did you hear the 'Ditton 15' at the Audio Fair?

The 'Ditton 15' is Celestion's new 3 element compact loudspeaker enclosure. Although only 1 cubic foot in size, this full-range 15 watt system gives improved bass performance over simple closed boxes because of a new concept in design—ABR (Auxiliary Bass Radiator).

ABR gives the following advantages:

- extended low frequency response down to 30 Hz
- high sensitivity      ■ lower distortion

In addition, the 'Ditton 15' employs an entirely new 8" bass unit, plus the famous HF1300 Mark II high frequency unit. See and hear the 'Ditton 15' at your nearest High Fidelity Dealer or complete the coupon below for illustrated leaflet and further details.

### — the latest product of Celestion know-how and enthusiasm



## Celestion

### Studio Series

loudspeakers for the perfectionist

### Rola Celestion Ltd.

Ferry Works, Thames Ditton, Surrey. Telephone: 01-398 3402

Please send me the 'Ditton 15' leaflet and details of the 'Studio Series' loudspeakers.

NAME .....

ADDRESS .....

..... TR/5.67

GD818



Vol. 11

No. 5

May 1967

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**COVER PHOTOGRAPH:** This month's feature in the "Techniques" series, entitled PROJECT BRASS, tells the story of the actual recording session at which this photograph was taken. The conductor, Geoffrey Brand, is here seen standing and partially masking the stereo pair of Sennheiser 405 cardioid condenser microphones. We could not risk disturbing the musicians with the camera flash during a "take," when, of course, he was seated. Note the boom mic covering the horns.

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DENYS G. KILLICK  
Advertisement Manager, VIVIANNE GOODING

# Tape trends and tape talk

By Douglas Brown

---

ONLY NEW talking point at this year's Audio Fair, I found, was: will tape cassettes hit spool-to-spool business? And the general answer was a categorical No. At last there seems to be a general disposition to accept the idea I've peddled here, and elsewhere, for years: that tape is going to split up into creative tape *recording* (spool-to-spool) and passive listening to tape playback (music in cassettes). Whether those newly attracted to tape as a means of reproducing music will be tempted into creative activity remains to be seen. For the moment, there are two quite distinct markets.

\* \* \*

OPPORTUNITIES for creative recording, in the form of contests, will be wide open this year. Elsewhere in this issue we print the rules and entry form for the 1967 British Amateur Tape Recording Contest. For the first time, it will be jointly sponsored by all the leading tape and audio journals, so that it should be much more widely publicised than in the past and we hope for a commensurate increase in the number of entries.

This year, too, we return to the system of categories which was a feature of the Contest in its early years, and which are based upon the pattern of the International Recording Contest (CIMES). I know this will meet with the approval of many readers of this magazine who did not approve of recent attempts to "simplify" and "popularise" the Contest.

The organisation of the Contest—and, in due course, the judging—are now to be in the hands of those who should have the best appreciation of the problems from every possible angle—the editors of the specialist magazines catering for amateurs.

\* \* \*

JUST IN TIME for the Audio Fair, the BBC announced the theme for its 1967 tape recording contest. It is "On the move"—a choice which provided a guide line while leaving open to entrants a vast number of possible subjects. I would say the scope is much wider than it was in 1966, when the subject was "Summer."

Those who want fuller information about the BBC Contest can send their names and addresses to BBC Tape Recording Competition, BBC, Piccadilly, Manchester.

THE BBC's THEORY that many amateurs need to be provided with a particular idea to set them going now seems to be gaining ground. This year the British Contest will have in addition to the six customary classes—a "set subject" category in which entrants are invited to submit a four-minute "Tape Letter to someone abroad."

A few weeks ago I travelled to Luxembourg to attend a meeting of the Council of the International Federation of Sound Hunters and there Heinz Runge, the President, came up with the same idea—that the International Contest should have an additional "set subject" class. He thought—and I am sure he is right—that this is the best way to get tapes likely to interest broadcasting concerns and also UNESCO, with which the International Federation enjoys a formal link.

On the Continent, although, unhappily, not in Britain, the need to produce a flow of amateur tapes suitable for broadcasting has become of great importance, for there are now special transmissions for amateurs in most countries.

\* \* \*

ANOTHER important development with the 1967 British Contest has been the decision of Grundig (Gt. Britain) Ltd. to merge their successful Schools' Contest in the main event. So this year there should be a dramatic increase in the Schools section.

The Minister of Education's announcement of a new organisation to "sort out" audio-visual activity with mechanical aids in British schools should also help forward tape activity in the classroom.

There is still a long way to go. The suggestion I hear from some manufacturers is that school recording needs more positive assistance and guidance at a national level, with bulk-buying to help get down the cost of the basic equipment. At present each individual headmaster or headmistress is guided by individual experience (or whim) when a recorder is being purchased.

\* \* \*

I WAS interested to have news this month of Radio New York Worldwide—"a special breed of radio news/entertainment programme, broadcast twice weekly to listeners in Western Europe, Africa and Latin America."

It has been on the air for over three years and its programmes are designed by and for the international radio ham. Features include news of international radio, new products, technical tips on electronics, information about mics, and a lot of "do-it-yourself" information.

Transmissions are at 2307 GMT on Saturdays on 15.440 and 6.015 MHz and at 1607 GMT on Sundays on 17.845, 15.440 and 17.730 MHz

# CONTEST

TEN magnificent trophies to be won. A first prize of cash and equipment to the value of £100—other valuable equipment prizes—the possibility of hearing your tape broadcast on the radio. These are the rewards awaiting competitors in the 1967 British Amateur Tape Recording Contest.

And, to give everyone a chance, whatever his or her special interest, there are seven different categories in which you may enter.

Making a Contest Tape is great fun, and it does not need to be a difficult technical exercise; some of the simplest tapes have been notable prize-winners in earlier Contest.

Start planning **YOUR** entry **NOW**.

## RULES OF THE CONTEST

1. Tapes may be entered in any of the following categories:—

### Class I. Speech and Drama.

Sketches, Playlets, Prose and poetry reading, Fantasy, Monologues. Maximum time, 10 minutes.

### Class II. Documentary.

Sound story based on fact, Informative, Imaginative and/or entertaining, Travelogue. Maximum time, 10 minutes.

### Class III. Music.

Live vocal or instrumental performance. Maximum time, 10 minutes.

### Class IV. Reportage.

Sound snapshots, Interviews, Interesting or historic sounds, On-the-spot reports. Maximum time, 4 minutes.

### Class V. Technical Experiment.

Sound compositions, Electronic music, Musique concrete, Multi-track music, Trick recording. Maximum time, 4 minutes.

### Class VI. Schools.

Recordings of any aspect of school life or activities, made mainly by the pupils. Maximum time, 10 minutes.

### Class VII. Set Subject.

A tape letter to someone abroad. Maximum time, 4 minutes.

*NOTE: The Schools class will be divided into three sub-sections—for Infants, up to 7 years of age, Juniors, between 7 and 11 years of age and Seniors, over 11 years of age.*

2. Prizes will be awarded for the best tape in each class. There will also be special prizes for the best stereo tape and the most humorous tape. The tape judged to be the best in the Contest as a whole will be selected as the "Tape of the Year" and will win a major award.

3. Tapes must not exceed in playing time the following maximum durations (but may, of course, be shorter than these limits). Classes i, ii, iii and vi, maximum duration 10 minutes; Classes iv, v and vii, maximum duration four minutes.

4. The Contest is restricted to amateurs and those with experience in professional recording studios are ineligible. The production of tapes must be entirely the work of the person submitting as regards the recording and editing processes.

5. No tapes submitted may contain anything taken from radio or TV transmissions or commercial recordings. Any competitor who has fully, or in part, used any literary or musical production of which he is not the author or composer, and which is still in copyright, must obtain authorisation from the author, composer or organisation owning or controlling the copyright and must produce proof of such authorisation. This proof must be submitted with this form and must state expressly that the author, composer or the organisation owning or controlling the copyright forgo any payment by the broadcasting organisations which transmit the recording. (This does not imply that, in the countries where they apply, the normal rights of payment arranged by the organisations owning or controlling the copyright are relinquished).

6. Recordings must be made on 1-inch tape at either 1½, 3½, 7½ or 15 inches per second speed. Stereo recordings may be entered. The programme must commence at the beginning of the tape and only one track may be used in mono, or two tracks in the case of stereo (when judging, there will be no reversal of spools to hear second tracks). Tapes should be prepared between white or coloured leader tapes.

7. Each tape must be entered in one category only, but competitors may submit entries in any or all categories. The jury is at liberty to re-allocate entries to categories other than those named by the entrants where this is considered appropriate.

8. British entries in the International Recording Contest (CIMES) 1968 will be selected by the Federation of British Tape Recording Clubs from among the entries submitted to the 1967 British Contest, but prizewinning tapes in the British Contest will not automatically go forward to the International Contest.

9. All tapes will be returned to the competitors provided adequate return postage is sent with the entries. But the Contest Organisers will retain copies of the winning tapes and runners-up tapes. Copyright of these will be the property of their owners but the Contest Organisers reserve the right to arrange for the publication of the whole, or parts, of any or all of them, by radio, disc or tape, or by any other means.

10. The Contest is open only to those normally resident in the U.K. The decision of the judges will be final and no appeal may be made, nor any correspondence entered into.

11. The closing date for receipt of tapes will be Saturday, December 30, 1967. No entries received after that date can be considered in any circumstances. All winners will be notified immediately judging is completed and a complete list of awards will be sent to all entrants.

12. Every tape entered must be adequately packed and properly stamped and addressed to the **British Amateur Tape Recording Contest, 33, Fairlawne, Maldon Road, Wallington, Surrey**, and a completed entry form and return postage included with the tape. Name and address should also be written on a small label firmly affixed to the tape spool and to the container.

**SPECIAL NOTE:** Care should be taken in reading the section of the rules covering copyright. If in doubt, consult the Mechanical Copyright Protection Society Ltd., 380, Streatham Hill Road, London, S.W.16.

## BRITISH AMATEUR TAPE RECORDING CONTEST 1967

# ENTRY FORM

(Please use block letters)

Name and Address .....

.....

Age ..... Occupation .....

How long have you been recording? .....

Details about the attached recording:

1. Title—if there is one .....

2. Exact duration .....minutes .....seconds

3. Recorded at a speed of 1½/3½/7½/15\* inches per second.  
Stereo/Mono\*

4. Category in which you wish to be entered: Speech and Drama/  
Documentary / Music / Reportage / Technical Experiment /  
Schools/Set Subject\*

\* Delete as necessary

5. Make of recorder used .....

6. Make of magnetic tape used .....

7. Any other equipment used (i.e., microphone, mixer unit, tape  
splicer, etc.). Give details and manufacturers .....

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8. When and where was the recording made .....

.....

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9. Titles of works used. Names of authors or composers, duration,  
etc. ....

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10. Names of any assistants and how they helped in making the  
recording .....

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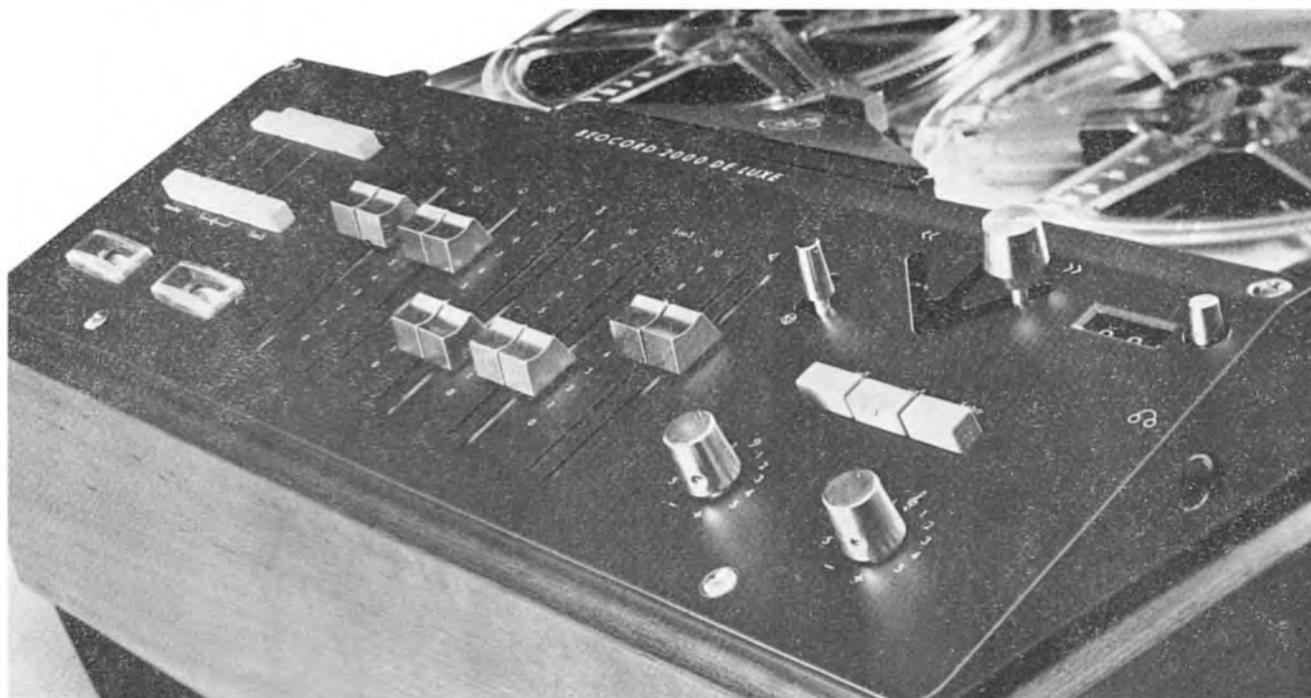
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I declare that the enclosed tape feature is entirely my own work, and that I have not included on the tape any copyright material from radio, commercial recording, or any other source, for which authorisation has not been granted.

Signed .....



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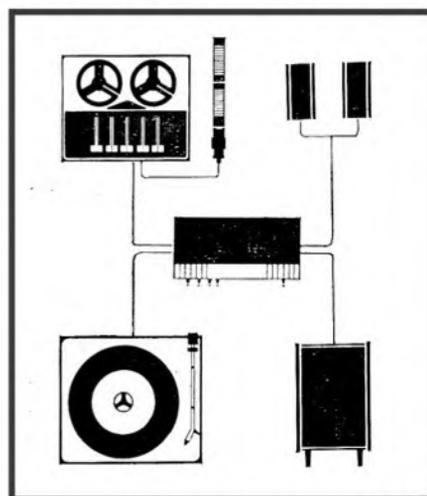
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# CROSS TALK

*By Audios*

**T**HE relationship between the nephew and his auntie is desirable and unique. Traditionally, the aunt distributes benevolence and largesse, but at the same time keeps an eye on the welfare of the youngster. She knows by instinct—or by divine right—what is good for him; without hesitation she dictates what his likes and dislikes should be.

It is not surprising that through the years the British Broadcasting Corporation should have acquired the status of aunt—my aunt and your aunt, she treats her nephews with avuncular kindness, never admitting either her bigotry or the narrowness of her mind. Utterly lacking in any sense of adventure or excitement, she waddles her portly way through the entertainment jungle, repelling the ferocious critics with well-aimed prods of her umbrella.

Like most aunts, she has performed valiant service in the past for which we owe her a great debt of gratitude. But her mind is preoccupied with the glories of bygone days and she is stolidly refusing to face up to the realities of modern life and technology. For years we nephews pleaded long and loud for a stereophonic broadcast service. At last, at long, long last, we have it. Why complain? Because to refer to the few multiplex transmissions, always on Network Three, often at impossible hours when honest citizens are about their daily business, too often of works having only a minority appeal, far too often originating from commercial stereo disc rather than live performance, to call this feeble hand-out a service is nothing more than gross exaggeration.

How do other nephews, in other countries, with other aunties, fare? In America, where a genuine stereo service is provided, it has proved to be more successful than was thought possible. The great interest shown by the public has enabled manufacturers to develop equipment for sale in large quantities—and thus at reasonable prices. In the States “Hi-fi” is accepted as a necessity of life, just as we now accept the refrigerator and the washing machine. The advantages to both industry and consumer are incalculable.

Nearer home I learn on good authority that in West Germany virtually the whole of the music transmissions will be in multiplex stereo from some time next year. The result? In Germany we have a thriving Hi-fi industry and enormous consumer interest, and demand.

Doubtless our benevolent aunt will offer plausible excuses for her failure. But if she doesn't buck up her ideas she's going to suffer the indignity of ridicule, and this I would hate to happen. So what about it, auntie?

\* \* \*

**T**HERE has been a great deal of interest in so-called “sleep learning” recently. An experiment was conducted on television, and the audience at home was left in no doubt that the young lady who was subjected to the test had benefited from her very short, seven days, sleep learning course.

*The object of the sleep learning method is to endlessly repeat, by means of a pillow speaker, the subject-matter that the student wishes to learn. Tape recording equipment is eminently suited to such applications; the playback machine can be wired to a time switch so that the programme material will be heard only during selected hours. If one is asleep at the time then perhaps “heard” is not quite the right word. . . .*

*If you imagine this to be something of a gimmick, a passing craze, then let me tell you I have just received from an organisation called Inductive Learning the specification for a multichannel playback unit designed for use in residential schools. The Console can provide an output for up to 12 pillow speakers, or through a range of add-on amplifiers it can power up to 2,000 pillow speakers. Automatic or manual reversing and built-in time switches are among the facilities this equipment offers.*

*I am relieved to hear that sleep learning is not a “lazy man's way out.” As with any form of learning it is necessary for the student to make an appropriate mental effort at the subject during normal waking hours. If this is done, then the endless repetition of information during the sleep period is said to reinforce the normal, daytime memory.*

*But the thought of 2,000 pillow speakers all operating from a single playback machine—could such a system ever be used to indoctrinate ordinary people against their will? The existing equipment has been designed for a legitimate and honest purpose: throughout history the unscrupulous have taken advantage of honest inventions and developments. It's one thing to learn a foreign language by such a method—it's quite another to be indoctrinated by some party political machine in the same way. It will be a bold man who could say with authority that such a state of affairs will never happen.*

\* \* \*

**H**AVE you ever tried recording yourself reading poetry? This is something I have tried for years to encourage people to do. Anyone who feels self-conscious in front of a microphone should practise with poetry. The reason is simple to understand. The average, prosaic, Englishman feels a complete fool when faced by poetry. To read it before the microphone requires such a mental effort that the inhibitions previously felt with “non-poetic” material will fade into insignificance.

A group in Yorkshire, the Pennine Poets, have been exchanging recorded poetry readings with a similar group in New York. Some of this work was broadcast by New York State Radio and many American listeners commented on the similarity between the Yorkshire dialect and words appearing amongst the descendants of German and Norse settlers in Wisconsin. The study of dialects is fascinating, and it is a subject which lends itself to adoption by recording enthusiasts. Would any clubs who feel they have nothing left to record care to think about both poetry and dialect?

\* \* \*

**I**f it were to be suggested that a church was haunted and that the ghost regularly played the organ, then the obvious thing to do would be to arrange for a tape recorder to be rigged up so as to catch the occult visitor redhanded. This actually happened recently in a Lincolnshire church. The vicar left a tape recorder in the centuries-old building when he locked up and went home to the vicarage at night.

Not believing in ghosts, he was in for a surprise when he played back next day. On the tape were recorded footsteps echoing through the empty church, notes sounding loud and clear from the organ and various other noises.

Unfortunately, of course, the recording doesn't prove anything at all. The sound of the organ could easily be accounted for by wind blowing across the pipes; the footsteps could be tiny noises accentuated by the acoustics of the building. Sound is a physical vibration in space and I have yet to discover anything other than a physical cause for its production. Has anyone recorded any other “ghosts”?

\* \* \*

**I** AM advised of a new club in Scarborough. The secretary is Major C. J. Wilson, M.B.E., and his address is 57, Cross Lane, Scarborough. Would enthusiasts in that area please contact him? The aim of the Scarborough Tape Recording Club is to be of service to the community; they already have a rota of people ready at any hour of the day or night to take urgent recordings of messages to hospitals or nursing homes. I am quite sure that Major Wilson will be delighted to hear from anyone interested.

\* \* \*

**I**F any reader imagines that transistors are the very last thing he had better think again. Transistors are now old hat—I.C.s are the thing. An I.C. is an “integrated circuit,” which might be no larger than the dot on an ‘i’. In theory, at least, integrated circuits could last for literally thousands of years at maintained efficiency. Because of the photographic method of manufacture, every I.C. is exactly like the next; quality standards are maintained within undreamed of limits of tolerance.

Does extreme miniaturisation to these lengths really concern us? For its own sake, probably not. However tiny the electronics department might become we are still going to be hampered by the relatively crude mechanics of the tape transport system. Unfortunately mechanical engineering calls for weighty components. I can see little prospect of meeting some future recording assignment with a piece of equipment no larger than a matchbox, although electronically this would certainly be possible.

An interesting thought—will the public be prepared to pay, say, £100 for a really top quality amplifier that is physically so small that it could be slipped un-noticed into the coat pocket?

# IN OUR SERIES "TAPE RECORDING TECHNIQUES" DENYS KILLICK DESCRIBES A PROFESSIONAL RECORDING SESSION WHICH HE CALLS

## PROJECT BRASS

**I**N previous articles in this series I have stressed the differences between professional and amateur recording. This applies particularly to the recording of music where the standard of performance of the musicians counts for so much. Live music recording can be a frustrating occupation. But professionals do not always have available the facilities of a specially designed studio, neither do they necessarily have access to unlimited equipment of astronomic cost. It sometimes happens that a thoroughly professional recording has to be undertaken under what almost amounts to amateur conditions. This article, which I have called with some pride, "Project Brass," describes just such an endeavour by the staff of *Tape Recording Magazine*.

Firstly, the invitation to undertake the recording originated from the record publishers, Apollo Sound of Hampstead. The requirement was to record two separate works for brass instruments—"Meditations for Brass," by Heinz Hershmann, was scored for four trumpets and three trombones, "Suite for Brass Instruments" by Zador was scored for four trumpets, three trombones, four horns, and one tuba. The record company was to carry out all the musical arrangements; my job was to locate suitable premises, provide the equipment, and take the recordings.

After discussions with Apollo Sound it was decided, as a matter of policy, to engage the very finest brass musicians that could be obtained and to arrange for them to attend for two three-hour periods on separate days. As the instrumentalists would not have had the opportunity of studying the scores it would be necessary at each session for one of the works to be learnt, rehearsed, and recorded. The high cost of providing top calibre musicians precluded any possibility of second chances; within the three-hour period both the performance and the recording had to be indisputably right.

Suitable premises for the recording were the very first requirement. After a long search we located a church hall in West-



**Surrounded by a complex of recording equipment, the distinguished composer of "Meditations for Brass," Heinz Hershmann, keeps a watchful eye on the score with David Howe, left. The presence of the composer at a recording session imposes special obligations on the technical staff; he knows precisely what he expects of both performers and engineers and he is likely to make sure that he gets it! The equipment seen in the photograph includes: Vortexion CBLs and 3-way microphone mixer and Heathkit signal generator. This latter was used to line up the machines with mixers. Just visible in the bottom left corner is one of the specially made attenuator boxes described in the text**

**Our instrumentalists were: Trumpets, Philips Jones, Elgar Howarth, John Wilbraham, Roy Copestake and Peter Reeve; Trombones, Arthur Wilson, Ray Brown and Raymond Premru; Tuba, John Fletcher; Horns, Alan Civil, Shirley Hopkins, Ifor Jones and James Buck**

**To assist readers who might like to hear this recording we have made special arrangements for a limited number of discs to be available at our Holborn address, cost 32s. 6d. plus 2s. post and packing**

minster where conditions were almost ideal. The acoustics were very bright and lively, precisely what is required for brass instruments; a large adjacent area could be partitioned off with double folding doors and this would provide an excellent area for the recording equipment and monitor speakers. The next practical problem was to arrange for dates when both the hall would be free and all the musicians would be available. This proved to be terribly difficult as the instrumentalists all work with the big, well-known orchestras and their free times rarely coincided—when they did we usually found that the hall had a prior booking on that date. After much telephoning and organising two Saturday mornings, three weeks apart, were finally agreed. In the meantime Geoffrey Brand, of the BBC, had very kindly agreed to conduct both the works.

Next we had to think seriously about equipment. The requirement was to pro-

vide a 15 ips half-track stereo master tape. After much thought it was decided to use two Vortexion CBLs. One machine would be used for the actual recording itself, the other would serve a double purpose as both a reserve recorder and also as an amplifier to power the monitoring speakers. We are deeply indebted to Messrs. Vortexion Limited, of Wimbledon, for their very kind co-operation in making one of these machines available to us.

Microphone equipment was obviously going to be all-important. The overtones produced by brass instruments are as delicate as they are subtle; I had to use microphones genuinely capable of producing a flat response up to 20,000 Hertz. The only possible solution to that problem was to use condensers. The final choice lay with Sennheiser cardioid 405s. The cardioid directional pattern was preferred because this gives a far greater degree of control on the precise placing of the stereo image

and additionally it enabled us to impose some degree of control upon the room acoustics, which, as I have already mentioned were very bright.

Most modern condenser microphones give a very high output; far too high to be accommodated in normal, semi-professional, recording equipment. By using a mains power pack we were able to achieve some degree of attenuation, but the sound output from the brass ensembles was obviously going to be so high that as a precaution we had attenuators especially made up to give an additional 18 dB cut. In the event these proved to be as successful as they were essential.

Minimum microphone requirements would obviously be two, one for each channel. The mains power pack which provides the polarizing voltage is designed to handle two heads. Lacking any prior information on mixing requirements it was decided that we should allow for using two microphones on each channel and we should have another pair available in reserve. Our microphone equipment therefore comprised six Sennheiser 405 condenser heads together with three power packs and the appropriate attenuator boxes. Our mixers comprised a pair of Vortexion three-way type PPM mixers, one for each channel.

A host of sundry items had to be thought of: selection of microphone stands, including long booms; all cable runs for microphones, power supply and interconnecting leads between equipment had to be carefully checked. Last, but not least, we had to decide on what tape we should use for the master recording. Following the review of Scotch Dynarange tape in our February issue it was decided to use Dynarange type 202. A couple of dozen seven-inch spools were obtained and every spool was carefully checked with the recorders to determine optimum bias levels. These were noted inside the individual tape boxes. When working professionally one cannot afford hold-ups due to trivial faults; we made sure we had available an assortment of small tools, together with soldering iron and solder, a torch (which we didn't need!) chinagraph pencils, notebooks, and all the other paraphernalia of a serious recording session.

The hardest part of recording is the sheer manual labour involved. Arrangements had been made for the musicians to attend at the hall at 10 a.m. It was vital that all our recording equipment should be installed checked and ready to operate the moment they were ready to play—and as good professionals 10 o'clock meant 10 o'clock, not half past. Allowing ourselves two hours for setting up, our rendezvous at the hall was for 8 o'clock that morning, which meant getting out of bed at six! As we erected microphone stands, ran out cables, installed recorders and closed the folding doors, the church hall began to look more like a recording studio, and the tension was mounting. With surprisingly few minor crises we were all set up and ready to go by 9.45.

We had decided to record "Meditations for Brass" by Heinz Herschmann at the first session. This work is dedicated to David S. Howe, the well-known personality in the brass band world, and was composed at his suggestion. Both Heinz Herschmann and David Howe had arranged to be present at the recording session, and I was only too glad to have their help and advice.

In the work itself the composer has followed the example of earlier masters who wrote chamber music for the enjoyment and inspiration of players and audiences alike.

Each of the seven players has an equal share of the principal melodic parts, and this constant change of melodic pre-eminence, whether by one player or instrumental group, occurs throughout each of the five movements. The aim of the composer was to use the brass ensemble in an entirely new way with regard to textures, sonorities, and melodic writing. Only too well aware of the fact I was very conscious of the obligation this imposed upon us to produce not only a "hi-fi" recording, but also to interpret the composer's intentions in recorded sound.

During the short rehearsal period we experimented with microphone placings and found that a high position produced an unpleasant acoustic effect due to room resonances, whilst too low a position made balancing very difficult. We compromised at a height of about five feet.

Whenever working out microphone positions one should always first decide how few microphones can be used, not how many. So although we had six heads available we started by using just two, one for each of the stereo channels. Positioning is critical; even a few inches of movement can make all the difference to the sound balance. As rehearsal proceeded we juggled around with the two microphones, always in consultation with Geoffrey Brand, the conductor, who freely commented on the recorded sound. Surprisingly, optimum positions were not so very difficult to achieve. Once found the microphones were not moved. The first part of our job had been done, and four microphone heads remained, unused, in their boxes.

The first real take of a proper recording session is always a great thrill. Professional musicians are a joy to work with. Not only are they as disciplined as a battalion of soldiers, but the quality of instrumental sound they produce is a joy to hear. The recording operations were now confined to merely ensuring that the machine was started and stopped at the right moments and that recording levels were not exceeded. On no account could we allow the recording to be spoiled by distortion due to over-modulation, so I decided to work within very conservative limits. The specially made up attenuators now proved their worth. Even when they were in circuit we were working at almost minimum gain. This is always a dangerous area, and I was at first concerned that distortion might be inevitable. A careful checking on the monitor speakers revealed that the signal was as clean as a whistle.

The total programme time for the work is just under 12 minutes. As it comprises five movements, each is relatively short. Each movement in turn was rehearsed, performed, recorded and checked with the conductor, performed again, and checked again, and so on, until the desired performance standard was reached. In this way, we worked progressively through the five movements. At one o'clock precisely the musicians packed their instruments and our recording was—almost—in the bag.

There then followed another three or more hours of listening and consultation with the conductor and the composer. Small alterations were made by editing sections out of one particular take of a movement and reinserting them into another take. In this way we built up the finished master tape. The end of the day brought as much exhaustion as satisfaction.

Three weeks later we were all back again to record the "Suite for Brass Instruments." The composer, Eugene Zador, has had a distinguished career; all his orchestral scores

are characterised by their brilliant orchestration which tends to favour the brass instruments of the orchestra. The work we were to record had been written in 1961, dedicated to Gustav Koslik, and is intended as a real virtuoso display for brass performers. Of roughly the same duration as the Meditations, it comprises only three movements instead of five. However, instead of seven instrumentalists we now had the addition of tuba and four horns.

In the light of our earlier experience we attempted to set up the simplest possible arrangement using again only two microphones. It immediately became obvious that with the more complex instrumentation this just would not suit. The horns could hardly be heard at all. This difficulty was overcome by mounting a third condenser head on a long boom and suspending it above, and a little behind the horn players. The bell of the horn is, of course, facing backwards behind the player. The sound of the horn is delicate and could easily be lost amongst the trumpets and trombones. Only by covering them specially in this way could a correct balance be achieved.

The difference in character between the two works now became only too obvious as performance began. Whereas the Meditations provides a thoroughly satisfactory and valid musical experience, the Suite by Zador offers a contrast in brilliance of sound that would be revealing to many a hi-fi enthusiast. The third and last movement is particularly dramatic, closing with a final chord of extraordinary brilliance closely resembling the sound of a great cathedral organ. Recording levels had to be watched with greatest care—the peril of over-modulation was constantly present.

I could easily have been lost in admiration of the wonderful performance provided by our musicians. Never before had I heard brass instruments sound so glorious. But feelings of personal excitement had to be restrained; all that mattered was the quality of the recording coming over the monitor speakers.

Looking back in retrospect I regard this recording as one of the most important, if not the most important I have ever taken. We have two highly original contemporary compositions recorded for the first time. Apart from the quality of the music, the display of virtuosity by the performers will delight the ear. So far as recorded sound quality is concerned I must leave it to others to pass judgment. For my own part I was wholly satisfied that this project has proved the standards of excellence that can be attained with the equipment used. It now remains with the critics and the public to form their own opinions.

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# ON THE FRINGE

**W**E have asserted before that all techniques relating to the reproduction of mechanically recorded sound are indeed on the fringe of tape recording. We tape enthusiasts are perhaps fortunate; there are fewer complications in the handling of our medium than are present in the reproduction of sound from conventional discs. Compared to disc tape is very much in its infancy, and yet even so a significant step forward in the handling of tape has undoubtedly been achieved in the development of the cassette systems.

Whatever the arguments for or against disc, spool-to-spool tape or cassette (and these arguments can be as prolific as they are lengthy) there can be not the slightest doubt that for ease of handling the cassette wins every time.

Recently we described in some detail the functioning of the Mellotron sound effects console. Details have now been released describing a completely new sound effects console developed and made by the BBC's own engineering and research departments. This is very interesting because it operates on a cassette system.

Let us make it quite clear, the cassettes used in the new console are not commercial products; they bear no resemblance to the standard domestic cassettes now on the market. About the size of a matchbox, each cassette contains a length of tape sufficient for 30 seconds programme time at a speed of  $7\frac{1}{2}$  ips. The tape is wound around a single, central spindle.

The cassette is inserted into the console and the play button depressed, an arm engages a lug at the beginning of the tape and rapidly draws it into the play position. Drive is applied by a standard capstan system and the tape is allowed to fall by gravity into a reservoir. At the end of playback the tape is rapidly wound back into the cassette and the equipment is ready to reproduce once again.

A standard console comprises four separate channels, each of which will accept one cassette at a time. The principle of operation is for each cassette to hold a single effects sound. Any sequence, or combination of sequences, can thus be achieved by merely inserting the appropriate cassettes into their slots and depressing the playback buttons.

As one of the channels can also be used

for recording it is possible to insert a blank cassette into that slot and record on it the sequence produced by the other three. When demonstrated the equipment can produce the most impressive sound stories with consummate ease, and this has only been made possible by adopting the cassette philosophy.



**The new BBC sound effects console, showing a loose cassette at the top right. This unit is built up of four, interchangeable modules**

But this is a highly specialised equipment which would be of little practical use to the amateur. Nevertheless, the ease with which cassettes may be handled gives them many advantages over either ordinary tape or disc. In other respects the comparative merits of the different media are by no means so obvious, but we shall do our best to establish some standard of comparison between them in forthcoming issues.

There is no doubt that the modern long-playing gramophone record is capable of producing excellent quality, provided it is used in conjunction with adequate reproducing equipment. We have already taken a look at the B.S.R. transcription turntable as an example of a low-cost unit which may be used without risking damage to precious records. At that time we promised to look at other equipment at the opposite end of the price scale.

When reproducing from disc the most important components, from the point of view of record protection, are the tone arm, the cartridge and the stylus. If we want the ultimate in gramophone equipment there are one or two firms whose products are acknowledged leaders in the field; of these one of the best known is S.M.E. Limited, of Steyning, Sussex. The S.M.E. precision tone arm is a superb example of functional engineering. It is as delightful to use as a Rolls Royce must be to drive.

There are still a few British products of which we in this country can be justly proud, and the S.M.E. arm is certainly one of them. Designed for fitting to an existing plinth, every imaginable adjustment is provided. Initial balancing of the arm is achieved by moving the counterweight at

the rear and locking it into position; tracking force is then obtained by moving a sliding weight along a calibrated arm. By this means accuracy up to a quarter of a gramme is easily achieved. The small weight suspended on a fine nylon line applies a precisely calculated counter-force against the tendency of the stylus to "skate" towards the centre of the disc. The cueing, or raising and lowering device, is hydraulically damped so that the stylus will always descend to the disc gently and safely. An armrest with a simple, efficient locking device is also provided.

Impressive in appearance and efficiently reliable in use, this tone arm has been described in some detail as an example of the truly beautiful products of the audio industry, each one of which performs the function for which it was designed as perfectly as is yet possible. Apart from considerations of audio quality, one can take a delight and pride in the ownership of such fine products. But this high quality standard must obviously be paid for, and the cost of the arm alone, just over £26, is roughly twice the cost of the BSR turntable and arm complete. One could infer either that the SME arm is far too expensive, or that the low cost complete BSR unit is too cheap to be good. Each conclusion would be equally incorrect. Just as the Rolls-Royce and the Mini both perform the same basic function of transportation, they do it differently at different levels of cost. So in the audio world we have different standards of equipment, not in any sense really in competition with each other, all performing a basically similar function and achieving the same end result but with different standards of efficiency and comfort.



**The S.M.E. precision tone arm. The plug-in connector at the base of the arm is shrouded in a screening can to eliminate hum**

In pursuing our investigations we shall be using, for some experiments, an SME arm as described here. There are doubtless certain other pick-ups that would perform equally well; our choice of the SME is governed solely by the fact that it is acknowledged by many eminent authorities to be one of the leaders in its class. The purpose of our investigation will be to discuss the relative merits between cassette, spool-to-spool tape and disc as sound reproduction media. Our conclusions are unlikely to be in any way dramatic, but they will, we hope, help to light some beacon, however small, to guide a path through the Hi-fi labyrinth.



## Donald Aldous

*Technical Editor of  
'Audio|Record Review'*

### came to see how we make the incomparable Ferrograph

*These are some\* of the things he wrote:*

**Acknowledged quality and reliability.** Quality and reliability are terms that can—as time has shown—be not unreasonably applied to Ferrograph machines . . .

. . . At last, I thought, I shall find the secret of the perennial success of these recorders leading to this rare reputation . . .

**Enthusiasm and high standards.** . . . one soon appreciated that tradition and pride of workmanship motivated this organisation. Coupled with the enthusiasm of the various heads of departments I spoke to, and the keen efforts of the workers to maintain high standards, it was readily apparent why Ferrograph has achieved its notable success over the years.

**Service and stamina.** Purchasers of Ferrograph recorders certainly buy them for keeps, as a glance in the Service Department showed a batch of early machines (2A models for example) returned for checking and to have their performance restored—where necessary—to its original level. Some of the cases had obviously received a fair bashing but the units all worked and would soon be restored to their pristine glory.

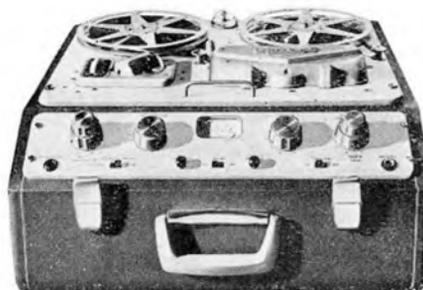
**No useless gimmicks.** The special models built for the Services have undoubtedly influenced the design of the domestic recorder from this organisation. Dependability and no useless gimmicks in the designs are characteristics that have emerged from this Forces' association.

**Made on the spot.** Self-sufficiency—in the sense that they manufacture the bulk of their own components—is another important feature . . . for me one of the highlights was the production of Ferrograph tape heads—a task not often undertaken by recorder manufacturers . . .

**Quality control.** Another contributory factor in the Ferrograph success story is the great attention paid to quality control or test procedures—from individual checks to further tests on the assembled equipment. Mechanical and electrical test methods are most extensive, with a case history sheet attached to each unit, providing information on frequency response, distortion, hum level and wow/flutter figures. This information is filed for reference . . . A speed micrograph . . . of the instantaneous velocity variation of the tape transport system, is also prepared. Incidentally it is the RMS value of this variation, as checked on a wow/flutter meter, which is the figure usually given for spec. purposes. In the Ferrograph Series 6 sample we saw, this figure came out at 0.14% at 7½ ins. p.s.

**Certificate of Test.** Certain Ferrograph recorders (and probably all models shortly) are despatched with a Certificate of Test, signed by the Chief Inspector, which summarises the performance data and includes the B & K pen-recorded frequency response curve and the speed micrograph chart. A reassuring document for any customer to receive with his machine. . . .

*\* Donald Aldous also had many other interesting observations about the Ferrograph, published in the September 1966 issue of 'Audio|Record Review'. If you would like to receive a complete reprint, with Ferrograph leaflets, please send us your name and address.*



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# Ferrograph

THE INCOMPARABLE TAPE RECORDER

WE SHOULD LIKE TO THANK THE 5,000 VISITORS WHO  
CALLED ON US IN ROOM 154



**I**S seeing really believing? The demonstration by B.S.R. of their improved UA-70 transcription unit, pictured above, was so startling as to encourage disbelief.

The unit was mounted on a camera tripod, tilted to an angle of 45°, and then allowed to run in that position. Many visitors asked for the tone arm to be raised so that by hearing the interruption of the programme they could prove for themselves that it really was that disc being reproduced through the speakers. Needless to say it was.

On the principle that both seeing and hearing could lead to believing, we are pleased to report that in demonstrating their Stereola loudspeaker system the manufacturers, Jordan-Watts Limited, reproduced pre-recorded tapes by driving it from the extension speaker sockets of a tape recorder without using a main amplifier in the chain. We would like to thank Mr. Leslie Watts for adopting this method of demonstration, which was at our suggestion. We wanted our readers to have the opportunity of hearing for themselves the quality that can be achieved from a good quality domestic tape recorder, provided it is coupled to full range speakers.

Seeing was certainly believing in the Richard Allen room, when, in the middle of their demonstration, their Mr. Walker produced a very large and battered honey tin with a hi-fi speaker module roughly fixed in the front. This was the actual "lash-up" that had been described by a reviewer in another publication. It was produced with the greatest good humour, in spite of the fact that it had originally been made to underline a critical point regarding the design of their enclosures which, as a result, have since been modified.

In reproducing their instructive microphone comparison recordings, Audio Engineering Ltd. did not tell their audiences until the end of the demonstration that the sound heard had come from a pair of very small speaker enclosures, not the big boxes that stood immediately adjacent to them. They then added, for good measure, that the miniatures were not even what they seemed to be. Designated "integrated reproducers," they combined both built-in amplifiers and specially designed speaker units. Real recording tools, these QL4 music monitors can equally well be used for precision monitoring direct from tape or can form the basis of a domestic stereo installation. Because of their very compact size it would seem that they could be ideal for field recording work. We shall be closely investigating the QL4 as soon as production models are available when a full review will appear in these pages.

Lastly, the spoken commentary for Telefunken was recorded on a standard machine using a standard microphone in the hotel room shortly before the exhibition opened. That's really trying!

# AUDIO FAIR RETROSPECT

## A TRM SPECIAL REPORT

**E**VERY year each Audio Fair is described as bigger, better and more successful than the one preceding it. Will the 1967 Fair, whose doors at the moment of writing have just closed for the last time, be an exception? It is impossible for any one person to see and hear all that is on display at the Russell Hotel. When we spoke to Mr. Thorens, of the famous gramophone transcription company, and asked him how the British Audio Fair compared with others in Europe he had no hesitation in asserting that ours was the leading exhibition of its kind in the Continent.

From the observations of our staff we are left in no doubt that the 1967 Audio Fair has indeed broken records in respect of interest. Our only regret is the remark, too frequently passed by visitors, that exhibitors had "rigged" their demonstrations.

Now it must be admitted that exhibiting at the Audio Fair is an expensive business, and every single demonstrator naturally took pains to ensure that his equipment was shown in the best possible light. Nevertheless, we should like to refute any suggestion of "rigging" any demonstration. It so happens that *TAPE Recording Magazine* was intimately involved in the preparation of demonstration tapes for a number of exhibitors, and in those cases we are in a unique position to confirm that the demonstration was as sincere as it was genuine. But we have not the slightest doubt that in other cases demonstrations were equally genuine.

Let us quote a specific instance, that of the demonstration given by S.T.C. Firstly, as we remarked editorially last month, this firm was making a noble and valiant attempt to prove the worth of their microphones by recording live and reproducing the recorded sound in their demonstration room.

Having listened to this demonstration it is our opinion that in endeavouring to show their products with such transparent honesty this firm may have done itself a disservice—the microphones they were using are, in our opinion, capable of producing better quality than was obtained under the appallingly difficult conditions of the hotel room.

But let me tell you a story of which you, the reader, will not be aware. S.T.C. gave a special demonstration for the Press early one morning before the exhibition opened. Half-way through the demonstration a representative from Neumann, a competitive firm, accidentally walked into the room. Without hesitation Bob Fisher, of S.T.C., asked him to stay and introduced him as "a representative from a firm who makes some of the world's finest microphones"—and he did this in front of some of the most influential members of the Audio Press.

We believe this typifies the gentlemanly attitude of all the members of the audio industry. It is for this reason that we, at *TAPE Recording Magazine*, are proud to play our small part, and we would like to publicly acknowledge the attitude of both Mr. Bob Fisher and S.T.C. Ltd. We quote them as examples of the conduct of the audio industry as a whole. We, too, as a publication, have our competitors, and it is our hope that we may conduct our relations with them with something approaching an equal dignity.

We mentioned this disbelief on the part of visitors to Mr. Hahn, of Brenell. He told us that, in fact, the equipment he was using for demonstration was not only standard but had been withdrawn for the Fair from Messrs. Largs, of Holborn, where it had been used on demonstration for the past twelve months. Exhibitors are nonplussed by the incredulity of their visitors. They try desperately, under difficult conditions, to sincerely show their products, and they feel honoured when members of the public show an interest in them.

So much enthusiasm for hi-fi as was shown at the Russell Hotel can be overwhelming. But of all the enthusiasts none was more ardent than Herr Kämmer, of

Grundig, who came specially from Germany to talk to his British customers. We were privileged to have two long consultations with Herr Kämmer and we were delighted to find that the common interest in quality sound reproduction cut across all national barriers, just as it did when we met the Japanese representatives of Sony and Akai. The United States of America was represented with equal enthusiasm by Mr. Buxton, of Fisher, who happily told us that we might call and see him any time—it might be in Japan, or Vietnam, or even Australia, but he assured us of our welcome.

We in this country regard ourselves as a civilised community. One of the objects of the Audio Fair is to demonstrate just one single aspect of civilisation which so many of us lack. High fidelity sound reproduction, whether it be by either tape or disc, is not only with us to stay, but is going to make an ever increasing impact as more and yet more people come to realise that this is one of the finest experiences that civilised life can offer. Although our interest may well lie in the field of tape recording it would be absurd to confine it to this single medium. It is nothing less than pedantic bigotry to argue bitterly over differences of method when the end result by either can offer a means of salvation to those enmeshed in the coils of twentieth century living.

And on the creative side of our hobby there will always be scope for expression and experiment in the field of recorded sound. We are now offered better equipment at lower prices than ever before. It is our policy to encourage all aspects of creative recording, and to encourage the use of good tape recorders, good microphones and good tape to produce good results. Which, after all, is no more than the many exhibitors at the Russell Hotel were trying to do. They found themselves in much the same position as us—it doesn't always come off!

If you still doubt the sincerity of the exhibitor, may we quote the example of Revox. Their demonstration involved the use of no fewer than four Revox machines, all of which had to operate in perfect synchronisation with each other. Switching was accomplished by means of their own "Slide-O-Matic" synchronisation unit. The outputs from the four machines were fed into four Quad Electrostatic speakers as they reproduced a single, multi-channel, stereo programme. If any machine had been out of synchronisation, or had exhibited any long-term speed variation, the resulting sound would have been most unpleasant. Mr. C. Hammond of C. E. Hammond Ltd., distributors, afterwards told me they had discovered that small variations could occur in the synchronising units due to temperature changes when the windows were opened to clear the atmosphere in the room. But their demonstration went on, before press and public alike. If this is not genuine sincerity, would some-one please tell us what is it?

Our general impression of the 1967 Audio Fair was at first, "the medicine as before." Nothing dramatically new, no sensations, in fact little change from last year. But this was no more than a superficial impression. If one looked more deeply it was not difficult to reveal some very definite trends in equipment.

We noted with interest that a number of relatively high cost amplifiers and tuners are now being imported into this country, some of which will be offered for sale in the immediate future for the first time. Both the manufacturers and their British distributors are naturally concerned to establish at what level demand will exist for equipment

at this price level. Will the British public really be prepared to pay up to £150, or in some cases even more, for a stereo amplifier? If they do, will this transistorised model offer as good sound quality as some of the traditional British valve models, which for many years were accepted as setting the standard?

It has been said that there is no point in attempting to improve audio quality beyond that achieved already by some of the famous British names in the business. This may well be true, but if transistors can offer the convenience of substantial reductions in size and weight, low current consumption and almost total elimination of heat whilst maintaining the same quality standards then someone, somewhere, is going to manufacture to that specification. So far as can be seen the foreign competition is likely to be at the upper end of the price bracket, but we have no doubt that British manufacturers will not lag far behind.

In this country we are already producing a small, compact range of transistorised hi-fi equipment, mostly at a fairly central price level. Firms demonstrating such items at the Audio Fair included Armstrong, Goodmans, Leak and Wharfedale. The latter, with their System 20 range, are entering this field for the first time.

Many loudspeaker manufacturers were showing and the trend here was an extension of that seen last year, the continued development of yet smaller enclosures offering even better quality sound. No loudspeaker manufacturer would ever suggest that tiny cabinets will produce the same quality as the larger enclosures. In fact most of them readily demonstrated the difference by offering an immediate comparison between their largest and smallest models by comparative switching. This was most interesting because it enabled us to judge precisely what is lost when we sacrifice size.

We did not expect to see anything new in recording tape, but we noted that all the larger manufacturers are now producing tape in cassette form. One very newsworthy item from Agfa is an announcement of reduction in prices. The actual reduction varies according to type and spool size, but typical examples are : 1,800 ft. 7 in. long play from £2 10s. to £2 7s., and 3,600 ft. 7 in. triple play from £5 15s. to £5 5s. We would hesitate to forecast a full-scale price war, but other manufacturers are probably watching the position.

The 3M Company, manufacturers of Scotch brand tape, ran a contest in their room, the winner's prize being a free choice of any one of the seven, high quality, tape recorders used in their demonstration. The name and address of the winner will be announced in our next month's issue. Another contest was organised by Rank Pullin, distributors of Akai equipment. The prize in this case will be an Akai M8 machine, and we hope to be able to publish details of this winner next month too.

So far as actual recording equipment was concerned, we found no real innovations. Cassette machines were present, although not strongly in evidence. The 1967 Fair has been one of consolidation, with manufacturers concentrating upon improvements in quality and reliability. We would forecast that future developments will continue to be along those lines.

In concluding these brief notes on the Fair we should like to congratulate both organisers and exhibitors alike for producing the finest show of its kind in Europe. All audio enthusiasts are grateful to you, and already look forward eagerly to the 1968 Fair.

## TRM SPECIALS!

**TAPE RECORDING YEARBOOK, 1966** edition. Sole recorder annual.

7s. 6d. (USA \$1.25)

*Lists available tape recorders, decks, mikes, etc., including specifications and prices; addresses of Clubs, Manufacturers, etc.*

**The Law and Your Tape Recorder** by Andrew Phelan (Barrister). 3s. 6d. (USA \$0.75)

*Interprets the law in UK for the tape recorder owner; what is free, forbidden, restricted.*

**REPLICAS** of very first issue of *TAPE Recording Magazine* (February 1957). Unobtainable for years. 2s. 6d. (USA \$0.65)

## TAPE HANDBOOKS

**FOR THE NEWCOMER as well as the ENTHUSIAST OF LONG-STANDING**

**Advice on Buying a Tape Recorder** by J. F. Ling.

2s. 6d. (USA \$0.65) post free.

*Chapters on preliminary considerations, tape deck, amplifier, etc.*

**Introduction to the Tape Recorder** by C. Langton.

3s. 6d. (USA \$0.75) post free.

*To help the newcomer to a working knowledge and maximum enjoyment.*

**Sound Effects on Tape** by Alan Edward Beeby.

3s. 6d. (USA \$0.75) post free.

*How to achieve realistic effects simply and economically.*

**Tape and Cine** by John Aldred.

3s. (USA \$0.75) post free.

*With practical advice on synchronising methods, etc.*

**How to Record Weddings** by Paul Addinsell.

3s. (USA \$0.70) post free.

*Illustrated. Covers preparation, mike positioning, equipment, etc.*

**Hi-Fi for the Music Lover** by Edward Greenfield.

3s. (USA \$0.70) post free.

*Aims at giving the music lover basic technical know-how.*

**How to Make Money with Your Tape Recorder** by Henry Woodman.

3s. 6d. (USA \$0.75) post free.

*How to go about getting assignments and turning events into hard cash.*

49. **Comedy Scripts for Tape Recording** by Peter Cagney ("Scotch"). 3s. 6d.
50. **Dramatape Guide** by Woodman. 7s. 6d.
37. **Tape Recording for Pleasure** by Wallace Sharps. 128 pages. 3s. 6d.
38. **Ribbons of Sound** by Karl Barleben. A USA publication and guide. 8s. 6d.
40. **More Simple Radio Circuits** by A. T. Collins, editor of *Practical Wireless*. 3s. 6d.
41. **Hi-Fi and Audio** by A. T. Collins. Useful introductory paperback. 3s. 6d.

# TAPE

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# A glossary of tape terms—part 13

BY HARRY MACK

**TALK-BACK.** Audio link between sound-proofed control room and recording studio, allowing the producer to communicate directly with performers, or via headphones, with floor managers and other studio staff. Two-way talk-back systems allow direct reply through the talk-back channel, by-passing the main recording channel. In mixer design a separate channel might be inbuilt to accommodate this facility.

**TAPE CLEANER.** Small pad, usually felt, mounted on a pivoted arm and sprung into contact with the moving tape to clear abrasive dust, etc., from the surface before the tape reaches the heads. Some types of cleaners consist of cylinders of wadding, impregnated with solvent, providing both cleansing and lubricating action.

**TAPE GUIDE.** Upright pillar, usually with flanges a little greater spaced than tape width, to maintain both vertical positioning and level (horizontal) positioning of tape along the head channel and between the spool flanges. Some adjustment of tape guide height is generally provided. The cylindrical surfaces of guide barrels are prevalent sources of wear, the resultant flat causing drag and possible wow and flutter effects. The inner angles between flanges and barrel can trap oxide particles where they build up small ramps and also impose considerable drag on the tape. Guides are usually of non-ferrous metal and plated to provide a smooth surface. Several machines employ free-rotating guides to reduce tape friction. Other models have guides mounted on pivoted arms that operate tape stops or brakes and present varying tension to clutch systems.

**TAPE LIFT.** Alternative term for pause control, where this device removes the tape from head or drive surfaces. Not strictly accurate unless referring to this particular kind of mechanism.

**TAPE LUBRICATION.** The lacquer which holds the oxide coating to the tape backing, known as the "binder," usually contains its own lubricant. This is necessary to keep the tape supple and provide good contact with head facings, to maintain high frequency response and to reduce the effect of drop-outs.

To augment the action of the built-in lubricants, especially under adverse temperature and humidity conditions, proprietary tape lubricants have been developed. Typical of these are Filmagic,

Klenzotape and the Bib preparations. Used correctly, such preparations can considerably lengthen the efficient life of tapes and reduce head wear significantly.

**TAPE MAGAZINE.** See Magazine.

**TAPE POSITION INDICATOR.** Editing and cueing aid to find a particular spot on a tape without marking. There are a number of methods, varying in efficiency. The early, crude, method was to mark divisions on the upper plate of the deck, the point at which the edge of the spooled turn cut the divisions being the required cue point. An alternative was a similar method of marking on the spool flange.

A later development was a feeler arm that touched the edge of the spooled tape, its pivoted end shaped into a pointer that traversed a scale.

From this we progress to the indicator driven by one or other of the spools, generally via a light belt coupling. These are usually digital indicators, an arrangement of cogged wheels bearing numbers and rotating to give a serial reading. An alternative is the clock-type indicator, driven by a wire coupling geared to one of the spool spindles.

Both these indicators can give only an arbitrary indication as the revolutions of the take-up and feed spools depend on the amount of tape loaded; i.e., the spool rotates faster when beginning to load, and there are thus more revolutions per foot of tape spooled. Tightness of spooling will also affect readings. But the indications are near enough for most ordinary use and can be gauged with some accuracy if a reference position is used. To assist in this, modern tape position indicators have a zeroing button that returns the indication rotors to zero when pressed.

A more accurate cueing device is the indicator operated from the capstan which measures linearly, in step with the tape.

**TAPE PRE-AMPLIFIER.** Particular type of pre-amplifier, incorporating equalisation circuits for replay, and possibly a measure of pre-emphasis for recording. Speed change characteristics may also be allowed for, and in some of the more ambitious types, mixing facilities are also available.

**TAPE RECORD.** With the growth of commercial recordings, this term is coming to indicate copyrighted recorded material on tape. These commercial tapes are recorded to strict specifications and to accepted CCIR or NARTB characteristics.

**TAPE STROBE.** Type of stroboscope used to determine speed of tape. This may be a number of segments marked on the flywheel, as used by manufacturers of Loewe-Opta, Sony and Akai machines. An alternative is a free-bearing roller adjacent to the normal tape path, again marked with segments. Free-running rollers in hand-held bearings are marketed by Metrosound and by Philips especially for this purpose.

The stroboscope is designed so that at a particular speed the pattern of black and white segment stripes appears to stand still when illuminated with a regular flash of light. The 50 Hz mains frequency is generally employed.

Formula for calculating number of segments is  $\frac{7200f}{\pi d}$  where  $f$  is mains frequency,  $d$  = diameter in inches of strobe or tape bearing spindle such as capstan and  $\pi = 3.142$

**TEACHING AIDS.** The tape recorder has entered the classroom to become a valuable aid to the teacher. In junior classes, its use to help children produce and enact their own plays, to demonstrate musical and sound effects, to give extra life to lectures, is well known. A more sophisticated use is the so-called "language laboratory" based on a number of specially arranged tape decks.

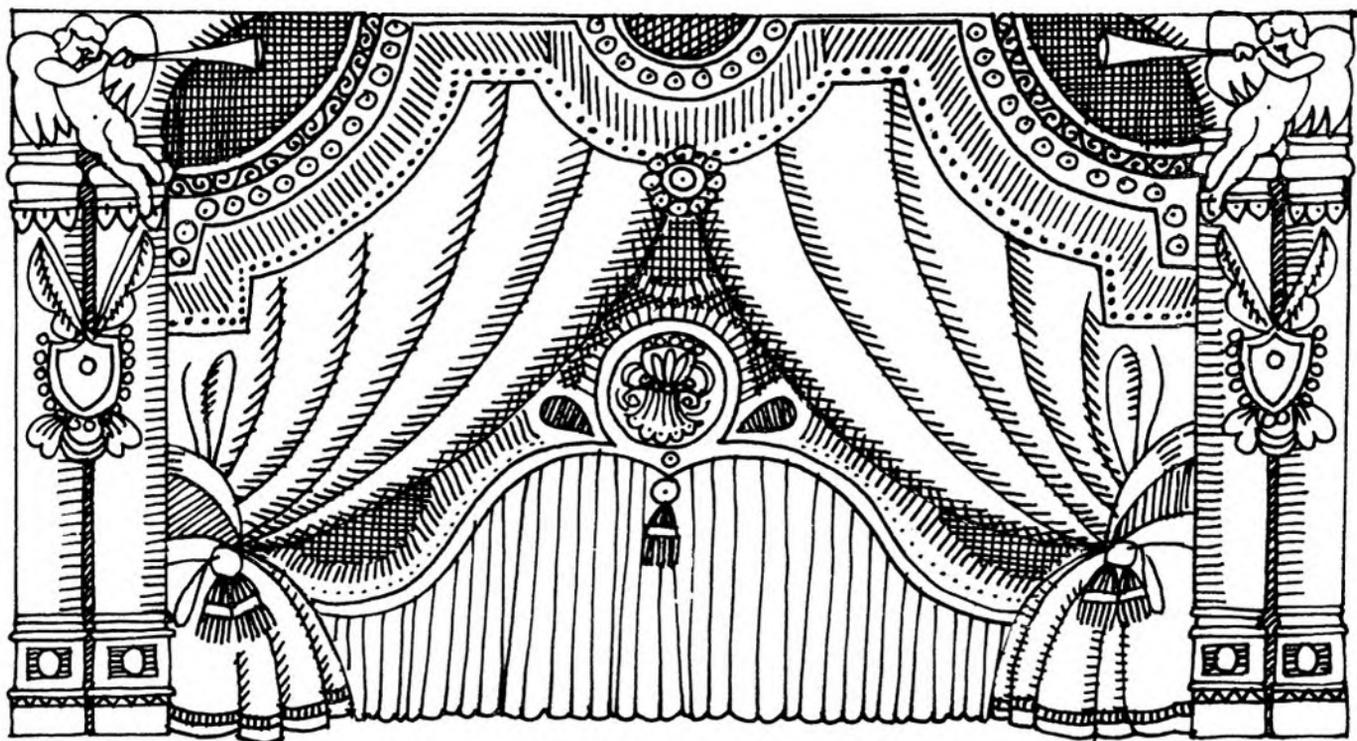
The simplest method is the "passive," where the student listens, generally through personal headphones, to the taped lecture. This method is useful where the lecturer cannot be available, or the subject is highly specialised, or for home learning, where the student can study at his own speed by controlling the tape—stopping and replaying portions as required.

An extension of this method is the monitor technique, where the student can listen and repeat, hearing his own voice in his headphones to judge e.g. pronunciation.

The best method is the "comparative" system, where the student listens, then repeats, his repeat being recorded. Both original and repeat are then replayed so that the student can analyse and criticise his own progress. Master tapes are produced and marketed, with teaching material on one track, the repeat being made on another track (this being a better method than the linear space technique, which is both wasteful and difficult, and can allow erasure of master material).

In a typical language laboratory installation, a control console for the instructor may contain a microphone, master tape unit, record player and radio tuner, for producing tapes. The sources can be selected.

Please turn to page 195



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on the greatest show  
you've ever heard!**

## **The new Grundig Hi-Fi Studio Series.**

The Grundig Studio Series is the biggest, most varied range of Hi-Fi equipment ever assembled by a major manufacturer. Loudspeakers, amplifiers, tuners, tape recorders; every one of them marking a new ultimate in looks and performance.

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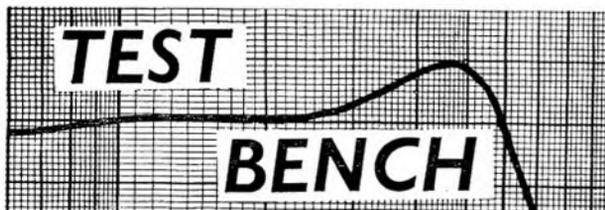
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**GRUNDIG**



# PHILIPS EL 3312

INVESTIGATED BY R. HIRST AND D. KILLICK

## Manufacturer's Specification Philips EL-3312

Mains Voltage: 110/127 and 200/250 volts A.C.

Power Consumption: 15 Watts approximately.

Tape System: Compact Cassette (twin track).

Tape Speed:  $1\frac{7}{8}$  ips.

Facility: Stereo and mono record and playback.

Playing Time: 2 x 30 minutes with Compact Cassette C-60, or 2 x 45 minutes with Compact Cassette C-90.

Frequency Response: 60 to 10,000 Hz  $\pm 6$  dB.

Signal/Noise: Better than  $-45$  dB according to DIN standard.

Wow and Flutter:  $\pm 0.3$  per cent

Fast wind/rewind: 60 seconds for a Compact Cassette C-60 (per track).

Amplifier: All transistor.

Inputs: 2 x 100 mV, 1 M ohm, for crystal or ceramic cartridges. DIN socket. 2 x 0.25 mV, 1 k ohm, for microphone/radio/amplifier/etc., in combined input/output socket.

Outputs: 2 x 1 V, 1 M ohm, for radio/amplifier/etc., in combined DIN input/output socket. 2 x 1.8 Watts, 8 ohms, in separate standard DIN external speaker sockets.

Dimensions:  $12\frac{1}{2}$  x  $8\frac{1}{2}$  x  $3\frac{1}{2}$  inches approximately.

Weight:  $6\frac{1}{2}$  lbs. approximately.

Recommended Price: 48 guineas.

## PHILIPS EL-3312 TEST CHART

Frequency Hz	Overall Response dB	Signal/Noise Ratio dB	Distortion	Crosstalk dB
40	-6.5	-50	3.2%	-49
50	-6.5			
60	-4.9			
120	-1.9			
250	0			
500	0			
1,000	0			
2,000	0			
4,000	+0.4			
6,000	+0.6			
8,000	0			
10,000	-3.0			
12,000	-6.0			
Wow and Flutter	0.26%			

Output at external speaker sockets, 2 Watts left, 2.2 Watts right, 8 ohms.

### Notes:

The Overall Response figures relate to record and playback. For Signal to Noise Ratio the tape was recorded at peak level and then the input signal was removed from the record amplifier. By reference to the signal level recorded and the resultant tape noise, the noise voltage was read off with the tape still in motion. Distortion is quoted against a 1,000 Hz signal recorded at the correct maximum level as indicated by the manufacturers, and the figure is R.M.S. value.

Wow and Flutter is also R.M.S., the test frequency being 3,000 Hz.

Test equipment used includes: Marconi Signal Generator, Bruel and Kjaer Frequency Analyser Type 2107, Gaumont-Kaylee Wow and Flutter Meter and Marconi Distortion Factor Analyser.

THE manufacturers, Philips Electrical Ltd., offer a range of machines, all designed around their "Compact Cassette" system and this, the EL3312, is their most expensive mains model. Small in size, light in weight and ingenious in design, the equipment both records and plays back stereophonically—the only facility it lacks is that of built-in speakers.

We are advised by the manufacturers that the omission of speakers was deliberate—to take advantage of only a fraction of the quality that can be achieved with this remarkable instrument it would have been necessary to incorporate a speakers system so large as to

be disproportionate. Accordingly alternative outputs have been provided, one pair for extension speakers (1.8 watts 8 ohms claimed) and the other pair incorporated in a DIN record/playback 5-pin socket at high impedance to feed an external amplifier. This policy is heartily endorsed by your reviewers. The inclusion of tiny, monitoring speakers would have been a waste of time and money.

Let us firstly clarify the recording medium as some confusion still exists about cassettes. This machine cannot be used with conventional,  $\frac{1}{4}$ -inch, spool-to-spool recording tape. It is designed specially for use with the Philips cassette

system, and only those cassettes—and no others—can be used. The tape contained within the cassette is  $\frac{1}{8}$  inch wide, and it runs at a speed of  $1\frac{7}{8}$  ips. The fact that other cassette systems might run at different speeds is quite immaterial. The only cassettes that will fit are those under the trade name "Compact Cassette." These are now manufactured by a number of firms under licence from Philips and may be bought either as virgin tape for home recording, or, under the name "Musicassette," as a pre-recorded tape record. A selection of Musicassettes are now regularly reviewed in the pages of *TAPE Recording Magazine*.

Our investigation into the machine itself was anticipated with eager curiosity. First impressions of cassette equipments have been of remarkable quality in view of the slow tape speed and the very narrow tracks. How would the machine stand up to the rigorous laboratory tests to which we would subject it?

During the fifteen-odd years that your reviewers have each been associated with the tape recording industry they have handled a diverse selection of equipments, many of which have coupled ingenuity of design with fine performance. It has, however, been some long time since we have been so surprised—so *pleasantly* surprised. From long experience one does not expect high fidelity from a tape speed of  $1\frac{1}{2}$  ips. No manufacturer, including Philips, is bold enough to promise high fidelity at such a slow speed. We therefore feel we may be excused—and indeed justified—for referring to the figures tabulated within this review as “astounding.”

The overall signal-to-noise ratio, and that includes the noise recorded on the tape by the instrument itself, is better than 50 dB below peak recorded signal. Distortion at the indicated peak level measured 3.2 per cent and the total r.m.s. wow and flutter was better than 0.26 per cent. However it was the frequency response which proved to be the most surprising item in the test procedure. Whilst one may consider that a reduction in output voltage of 4 dB at 10 kHz is not spectacular, it must be remembered that the tape speed is only  $1\frac{1}{2}$  ips. It was not so many years ago that high quality studio equipment claimed figures marginally better than this with respect to frequency response, distortion and signal-to-noise ratio—but *this was at a tape speed of  $7\frac{1}{2}$  ips*. So it can be appreciated that the results achieved by this small machine really are quite outstanding.

But technical results are only one side of the picture; ease and convenience of use, and indeed styling, are today regarded as of equal importance. In the EL3312 we have that rare combination of highest functional efficiency with modern, attractive appearance. The piano key controls which operate the mode selection, fast wind in either direction, play, record, pause and stop are sensibly large and very positive in action. A seventh key is provided, labelled “Cassette.” When this is depressed the horizontal cassette holder flips smartly up and the cassette contained within it is automatically partially ejected. It can then be completely removed by hand, and a new cassette inserted and pushed home. All that remains to be done is to snap the holder down into position and we are ready to either record or play back again. All these mechanical

movements betray the sound engineering behind them. Sturdy springs and strong hinges give a feeling of positive solidity to every action. This is no flimsy toy.

To prove the point we handed the instrument to a healthy young teenager and asked him “to give it a bashing” for a few weeks. On its return the machine showed no signs of wear, either in appearance or performance, but to be truthful we must report that the boy will never be quite the same again. His musical tastes have been dramatically changed from the pops to which he had previously been addicted to an appreciation of the classical music which he found amongst the Musicassettes we had handed to him!

To the right of the line of piano keys are found the variable controls, neatly arranged across the width of the machine. They comprise: a single tone control (top cut), volume control/mains on/off, balance control and record level control. Immediately below the record level control is a small, v.u. type, meter. This is calibrated by colour, green and red, to allow recording levels to be properly set.

First user tests were of playback only, and for this purpose a pair of Philips GL559 speakers (cost ten guineas each plus 3s. 1d. Purchase Tax surcharge) were connected to the extension speaker sockets and a Musicassette was reproduced. To be more accurate, many Musicassettes were reproduced. Let us be quite honest. This was not the superb high fidelity that many of us might have heard in the demonstration rooms at the recent Audio Fair, but it was brilliant enough and startling enough to make casual visitors with untutored ears say, “How wonderful!” and more sophisticated listeners say, “How the devil do they do it?” This may seem to be a strange evaluation, and yet we have found that comments fall broadly into those two distinct classes, depending entirely upon the knowledge and experience of the listener.

When the output was fed through a stereo amplifier to a pair of high-class speakers the quality improvement was marked. Although the little Philips GL559's offer quite a pleasant sound the cassette is capable of a wider frequency range than they can adequately handle. Even with large speaker enclosures we were still not up to top high fidelity standards, but we were in both cases producing sound which we strongly feel will be wholly acceptable to a very large number of people.

It has been rumoured that although cassette machines can reproduce, they are hopeless as recorders. So we put this to the test by re-recording on the EL3312 some high quality, 15 ips masters from a conventional tape recorder. That rumour

is false, false, false. Not only was the quality of our cassette copies as good, if not better, than that to be found in the best Musicassettes, but we also maintained an excellent stereo image. May we please repeat—this is not a toy—it is a full stereo recorder.

Included in the price of the equipment, 48 guineas, is a demonstration Musicassette, a stereo pair of cardioid moving coil microphones with clip-on bracket (ref. EL1979) and concise instruction booklet. The introduction of cassette systems into the recording scene has far more significance than many have appreciated. We hope this review will help to establish their rightful place in the scheme of things and leave the reader in no doubt that the EL3312 is a genuine piece of precision equipment which does the job it was designed to do even better than its manufacturers claim, and at the same time brings both the tape recorder and good quality sound within the reach of millions.

## GLOSSARY CONT.

from page 192

ted individually or mixed and fed out to a number of listening positions. The tutor can “listen in” or converse privately with any student in the network, or combine the network to lecture a group. He can stop or start all student tape recorders, record from them to his master machine and replay to all students, mixing material from the other sources available. He can, if necessary, record on to the student's track for close demonstration purposes. The student's machine is arranged, however, to prevent him from recording on the master track. Recording sense is generally left to right, international standard, with upper track master and lower track pupil, exceptions being made where necessary by additional switching. (See also TUTORIAL TAPES).

\* \* \*  
**TELEVISION RECORDING.** There has been a rapid growth in interest in this subject during recent months, and a number of articles have appeared in these pages. The technique is basically similar to audio recording, in that a magnetic tape is modulated and subsequently “read off,” but because of the much greater (than audio) bandwidth of a video signal, special methods have to be used to prevent noise and losses. Some of the basic points will be described later: see VIDEO RECORDING.

\* \* \*  
**TELEGRAPHON.** One of the very early recorders, using steel piano wire wound on a brass cylinder, turning beneath the field of two poles of an electro magnet which moves laterally on a guide rail. The device, by Vlademar Poulson, was shown in 1899, and is now on display at the Deutsches Museum in Munich. It created a sensation at the Paris Exhibition of 1900, and in that year a historic recording of the voice of His Majesty Franz Joseph I of Austria was made. This recording is now in the BASF archives.

*Note: We have broken the strict alphabetic sequence of this series to enable a detailed entry under “TAPE TRANSPORT” to be included in full next month.*

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## REVIEWS OF LATEST RELEASES IN MUSIC ON TAPE

**MOUSSORGSKY/RAVEL. Pictures at an Exhibition. STRAVINSKY. Firebird Suite, The Cleveland Orchestra, conducted by George Szell. Epic EC 841, 1/4-track stereo, 7 1/2 ips. 75s.**

Here is a recording to delight the most fanatic hi-fi enthusiast. The Pictures at an Exhibition is a descriptive work, expressing musically the composer's thoughts as he walked around a picture gallery. It comprises a number of episodes, many of which are linked by a promenade theme. So we hear an image of the composer strolling from picture to picture, and we hear his innermost thoughts as he contemplates the canvases. The very first picture, Gnomus, portrays a grotesque, twisted figure, and this is delightfully conveyed by the music. There is in this section a repetitive, percussive note of such depth and violence as I have rarely heard reproduced mechanically before.

Originally written as a suite of piano pieces, the version we now hear is the popular Ravel orchestration. It has been pointed out to me, by the way, that in a recent review I mentioned that Ravel died as recently as 1957. This was, of course, a mis-print for nineteen thirty-seven. Sorry about that.

Taking special care to get the dates right this time, Moussorgsky wrote his suite in 1874 but it was not until 1920 that Ravel orchestrated it. The first performance of the new version was in Paris in 1922, since when it has been a very popular item in the concert repertoire.

To complement the Pictures at an Exhibition we have the 1919 version of the Firebird suite by Stravinsky. This is a happy choice as a contrast, both in mode and composition. Linked by what is probably an equal popularity, the score, dated 1910, was revised by Stravinsky in 1919 and is therefore contemporary with Ravel's orchestration of the Moussorgsky.

Commissioned by Serge Diaghilev in 1909 when Stravinsky was 25 years old, the premiere of the ballet took place in 1910 at the Paris Opera. So successful was the music that it was soon being received as enthusiastically in the concert hall as it had been by the audiences at the ballet.

The music of the items in this album is neither heavy nor profound; we are offered in this excellent recording two popular concert items that have delighted audiences for some forty years. And as such it is a tape that can be strongly recommended.

**STOCKHAUSEN. Gesang der Jünglinge (Song of the Youths), Kontakte Part I, Kontakte Part II. Ampex DGC8811. Four-track stereo, 7 1/2 ips. 75s.**

This album is of great interest because it is devoted to electronic music by that master of the medium, Karlheinz Stockhausen. In common with all "music" of this kind it poses a vast problem for the reviewer.

Firstly, we must ask ourselves whether electronic music is to be taken seriously or not. If any readers should be in doubt on this point, let me at once make it clear that it is certainly taken seriously by those who compose it—and by some who hear it.

In the present case I find I am not assisted in my sincere endeavours to interpret the composer's intention, because the notes on the back of the box assume my ability to distinguish between "sounds," "sound-noises" and "noises." To me, this is no more than double talk, and as such does a disservice to the proper understanding of electronic music. "Noise" I have always understood to mean "unwanted sound." As such, noise has no place at all in any composition. The original scoring for the works in this album directed that they should be reproduced spatially; *Song of the Youths* calls for five groups of loudspeakers to be set up surrounding the audience. The present, two-track, stereo recording has been made from the original, five-track version.

One of the great features of *Song of the Youths* is that the work is the first to use the direction of sounds, and their movements in space, as aspects of form. Unfortunately this spatial quality is of necessity almost completely lost in the two-channel stereo version. Similarly, *Kontakte* was composed for four groups of loudspeakers, and again this has had to be reduced to a conventional stereophonic pair.

Of the two works, *Song of the Youths* was to my ear the more meaningful and the more pleasant from a listening point of view. It combines sung sounds and electronically produced ones, and at certain points in the composition the sung sounds become comprehensible words, whereas at others they retain only pure sound values. Where the speech emerges from the sound symbols of the music it is to praise God.

*Kontakte* is full of completely different feeling. Perhaps I have not yet had the opportunity to hear it sufficiently frequently to form a proper opinion. The notes refer to "new, previously unknown, sound events." Anything new requires time for assimilation. At this moment I regard *Kontakte* with cautious curiosity.

All interested in electronic music should at least hear this album. If any should be disappointed, then I can only say that appreciation of this kind of music is highly personal and individual. For me the sounds produced are opening an exciting new prospect into a new form.

**PIPE ORGAN FAVOURITES. Eddie Dunstetter. Capitol ST2068. Four-track stereo, 7 1/2 ips. 75s.**

We are told in the notes that this album will reveal to us the rich beauty and tradition of the majestic theatre organ, thrillingly captured by a man who is himself one of the masters of that tradition. Personally, I have never liked or appreciated the theatre organ as a musical instrument—in fact one could question whether it could legitimately be described as a musical instrument at all. So I prepared to listen to this recording with resigned indifference.

It required less than 60 seconds to make me sit up, very wide awake, and start to take a real interest in what was going on. Whilst not departing from my objection to theatre organs as a breed, it at once became obvious that this album offers something outstanding, and the expression "rich beauty" is not the gross exaggeration I had first imagined.

Now I am aware of the fact that a great many people are ardent fans of the theatre organ. I would say, for them at least, this album is a must. The organ in question is the 24-rank theatre organ at the Lorin Whitney Studio, Glendale, California, and the items performed are: *Charade, But Beautiful, Park Avenue Fantasy, I Don't Know Why, Sweet and Lovely, I Left My Heart in San Francisco, Whispering and Yesterdays*. Whether those who, like myself, are indifferent to the "glories" of the theatre organ could be persuaded to spend 75s. on this recording is possibly doubtful, but if they do acquire it they will be assured of a new and dramatic musical experience.

**BRITTEN. Matinées Musicales and Soirées Musicales. RESPIGHI Rossiniana. Westminster. Four-track stereo, 7½ ips. 75s.**

There are several connecting links in the programme offered on this recording. Firstly, all three items owe their original inspiration to Rossini. Secondly, all three have a close affinity to the ballet.

The towering imminence of Benjamin Britten in the international musical world is generally acknowledged at home and abroad. He has done much to secure a lasting reputation for contemporary composition. *Soirées Musicales* owes its origin to a commission for film music in the late thirties. Rescored for ballet a little later, it was quickly adopted into the standard repertoire of Ballet Rambert. Many of the melodic themes of the five movements will be only too familiar to the listener. In this album they may be enjoyed to the full, because both the performance and the recording can only be described as "exquisite."

The absence of background noise, the precision of instrumental balance and the thrilling sense of presence that pervades the whole tape embraces all that is best in mechanically recorded sound, whether it be on tape or disc.

*Matinées Musicales* was composed rather later in 1941. The orchestration is described as light and deft with some good-natured and humorous touches and with splashes of modern harmonies. This is an excellent description of the work. Obviously it de-

mands the very highest standard of recording, which is precisely what Westminster give us.

Side 2 is devoted entirely to *Rossiniana*. Divided into four parts it is based on pieces derived from the many miniature pieces composed by Rossini during the voluntary retirement of the last twenty years of his life. The third movement, *Intermezzo*, is delicately scored for strings, flute, two clarinets, glockenspiel, triangle, timpani, celesta and harp. As with the other items, the demands made upon the recording engineers are exacting; they have risen to the occasion manfully.

Although not to be regarded as a light classical album, this tape would be particularly appreciated by those who feel the wish to explore the world of classical composition a little more deeply than at the most popular level.

**OPERA BALLETS. Gounod, Verdi, Ponchielli and Tschaikowsky. R.S.O., Berlin, conducted by Serenc Fricasay. Ampex C6211, four-track stereo, 7½ ips. 75s.**

Opera and ballet, two quite separate art forms, merge delightfully together in the numerous ballets which have been written into operatic scores. Many of these, such as the ballet music from *Gounod's Faust, The Dance of the Hours from Ponchielli's La Gioconda* and the *Waltz and Polonaise from Tschaikowsky's Eugene Onegin* have become increasingly popular as items in the lighter concert repertoire.

All these favourites are included in this album, together with less well known sets of dances from *Verdi operas, Othello*, and *Aida*. This month's reviews tend to be repetitive in their approval of the albums offered. In common with all the others, the recording standards revealed in this Ampex album are of the very highest order, comparable to the very best I have heard. In all honesty one can only thoroughly recommend this collection as exceptional value for money; as so many more are in the same category the choice becomes bewildering. But the choice ultimately rests with you, the customer. With the current high standard of tape records you will not be disappointed.

## MUSICASSETTE REVIEWS

**J. S. BACH. Suites Nos. 3 and 4 in D major. R.S.O. Berlin Orchestra conducted by Lorin Maazel. Philips CPC0007, 45s.**

If anyone believes that the music of Bach is stuffy and uninteresting then they should hear the performances of these two suites. The well known Air from the Third Suite is so familiar as to be instantly recognised by most people, but apart from familiarity the music of these items has so much more to offer the listener.

Scored for brass, wind, strings and harpsichord these Suites offer a musical experience that can only be appreciated by all who hear them. Recorded quality is excellent—it demands the best quality speaker equipment for adequate reproduction. Congratulations to Philips for issuing these works in Musicassette form. Thoroughly recommended for all listeners.

**GERARD SOUZAY SINGS OPERATIC ARIAS. Philips CPC0006. 45s.**

Like so many operatic albums, this Musicassette is nothing less than a *tour de force*. Offering no fewer than 19 items, Gérard Souzay spans 300 years of operatic composition. There is just not space to list all the items by name, but to quote the composers will indicate the breadth of his programme. They include *Monteverdi, Handel, Gluck, Mozart, Bizet, Massenet, Meyerbeer, Ambroise Thomas* and *Gounod*.

The collection is said to have been designed to show off the vocalist's accomplishments—this end it achieves without doubt.

Recorded quality is wholly up to standard, and the arias, some familiar others little heard today, form a collection that would grace any music library. A must for opera lovers.

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### AN EVENING AT THE PALM COURT. Reginald Leopold and the Palm Court Orchestra. H.M.V. TC-CSD1621. 40s.

One of the first shocking things said to me by my son was when he accused me of being "square" because I liked to listen to the broadcasts of the Palm Court Orchestra. He must have been about 11 or 12 years of age at the time. With advancing years my squareness shows no rounding at the corners.

Typical of all Palm Court programmes, the items comprise, *Roses from the South*, *The Arcadians' Overture*, *Caprinella*, *Hey, for the town's factotum*, *At the dance*, *Adoration*, *Cinka Panna*, *Tabarinage*, *If my songs were only winged*, *Summer breezes*, *Go lovely rose* and *Old Chelsea*.

Traditionally, the items are introduced by the well known Palm Court signature tune, and this also rounds off the collection at the end of the album. Strangely, I thought recorded quality slightly less good on the signature tune than the content itself. However the character and blend of the well known Palm Court sound is reproduced magnificently in this album. Recommended for "squares"!

### A MAGIC HOUR WITH SEMPRINI, together with the New Abbey Light Symphony Orchestra. H.M.V. TC-CSD 1332. 40s.

Typical popular music, well recorded and evocative of those many hours spent listening to Semprini broadcasts on the radio.

The programme includes *La Mer*, *Symphony*, *Introduction and Rondo Capriccioso*, *Misty Montmartre*, *Chopin from "Carnaval"*, *My Devotion*, *Roostop Rhapsody*, *Liebestraum*, *Viva Navarra*, *Tristesse*, *To the Spring* and *Avant De Mourir*.

Now the Semprini piano is likely to offer another severe test for the 1½ ips speed of the Musicassette system. It came through with flying colours. I have commented previously on speed instability which I found to be obtrusive. In the present case I was almost wholly satisfied with the piano quality heard.

A good selection of well-known items that may be bought with confidence.

### THE SOUL OF SOUNDS ORCHESTRAL, featuring the "piano magic of Johnny Pearson." Pye CYP153. 40s.

Sounds Orchestral offers a sound that is by no means new to listeners, both in this country and in most of the world. Their interpretation of *Cast your fate to the wind* will long be remembered as a successful hit.

The collection under the title, *The soul of Sounds Orchestral*, includes — *Baubles, bangles and beads*, *Blue bolero*, *Many moons ago*, *Bugsy*, *Romance in the North Sea*, *Starglow*, *A walk in the Black Forest*, *Moonglow*, *Letter edged in black*, *Canadian sunset*, *Summer love* and *It might as well be Spring*.

To all these items the group brings its own individualistic treatment and blend of sound. Perhaps not everyone's ideal, it must be admitted that the effectiveness of Sounds Orchestral is as pleasant as it is commercial, although in a collection it may tire the unsympathetic listener.

### NANCY IN LONDON. Nancy Sinatra. Reprise CRP354. 40s.

Unlike most Musicassettes, the printed insert within the plastic container gives no programme notes at all. Perhaps the pub-

lishers feel that none are necessary. When the name is Nancy Sinatra perhaps they are right.

Nancy sings, *On Broadway*, *The end*, *Step aside*, *I can't grow peaches on a cherry tree*, *This little bird*, *Shades*, *Wishin' and Hopin'*, *Summer wine*, *The more I see you*, *Hutchinson jail* and *Friday's child*.

Here we have a selection of Nancy's art diverse enough to satisfy her most ardent fans.

Throughout the album one is wholly conscious all the time that one is listening to Nancy Sinatra in person—it is she and she alone, and no one else. This, surely, is a tribute to recorded quality, which as usual is excellent, and to the choice of programme material.

### EXOTICA. Manuel and the Music of the Mountains. Columbia TC-SCX1770. 40s.

The sound of Manuel and his Music of the Mountains is described as a "distinctive blend of lyrical romanticism and exotic Latin American rhythms." Who am I to argue with talk like that?

The Manuel recipe is undoubtedly successful. By blending strings with a wide variety of Latin percussion instruments, Manuel creates and sustains a mood that can be soothing one moment and exciting the next. As the cassette note says, it is no mean achievement in these days of stereotyped pop singers and beat groups for a musician to create and maintain a style that can be claimed to be his own.

The items in the album are *Tiko Tiko*, *La vie en rose*, *Sabara*, *The dancers of Delphi*, *Two strangers met*, *Blood and sand*, *Exotica*, *Autumn leaves*, *Life goes on*, *Cherry pink and apple blossom white*, *Dusk* and *Forget Domani*. Here, surely, is scope for an exhibition of talent, and it is for the listener to form his own opinion as to whether the claims made for Manuel are substantiated. Personally I feel they are, although perhaps to my rather jaundiced ear both the excitement and the soothing tend to be rather less obvious than the publishers wish.

### LOVE FOR SALE. Eartha Kit. Columbia TC-SCX3563. 40s.

This is hardly an unbiased criticism since I am a devoted admirer of Eartha Kit. Nevertheless, had quality been lacking in this Musicassette I should certainly have been loud in my wrath and fury. As it is I can assure you that both the sound and personality of the vocalist were projected with uncanny fidelity to my complete satisfaction.

The items offered are: *I wish you love*, *Autumn Leaves*, *The Girl from Ipanema*, *Darling*, *Je vous aime beaucoup*, *Too close for comfort*, *Guess who I saw to-day?*, *C'est Magnifique*, *Love for sale*, *My Man*, *Moon river*, *The last time I saw Paris* and *Love*.

What can one say about Eartha Kit? In my opinion she is the perfect example of contradictory femininity; in the choice of items her contradictions tumble effortlessly one after the other.

Her rendering of *Guess who I saw to-day?* is more of an epic drama than the mere rendering of a song. Her interpretation is magnificent. And then, in *Love for sale*, she offers a different, contrasting and yet eternal side of the feminine character.

If I knew how to write a rave review I would attach it to this Musicassette. In both performance and recording it is one of the finest I have heard.

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## NEW PRODUCTS

### CROWN RECORDERS NOW AVAILABLE

**T**HE new 800 series solid state tape recorders from Crown International of Elkhart, Indiana, are now available in the United Kingdom from Carston Electronics.

Of rugged construction, these recorders are available as full, half or quarter-track models for mono or stereo operation and have been designed around modular construction to enable the playback panel to be offered as a separate, self-contained, unit for building into individual systems.



Three speeds, 15, 7½ and 3½ ips are standard, but other speeds can be supplied to order. Typical performance figures are 15 ips for a two-channel half-track recorder which is quoted as ± 2 dB from 50 to 30,000 Hertz, wow and flutter better than 0.06 per cent and signal-to-noise ratio better than 60 dB.

Prices for the 800 series range from £789 for the CX822 half-track model to £1,237 for the 8-track, four-channel model.

*Carston Electronics Limited, 71, Oakley Road, Chinnor, Oxfordshire.*

### ANOTHER B.R.C. MACHINE

**B**BRITISH Radio Corporation announce a new Ferguson tape recorder, model 3224. At the recommended retail price of 25 guineas this machine is a twin-track single speed tape recorder in a metal cabinet covered with grey PVC. The grille and trim are satin silver finished.

Features include piano key operation, pause control, tape inching control, tape position indicator and tone control. A 7-inch x 3½-inch elliptical loudspeaker is fitted and the audio output is claimed as 3 watts (speech and music).



Claimed frequency response is 60 to 10,000 Hertz at output socket, wow and flutter better than 0.2 per cent RMS and signal-to-noise ratio 40 dB unweighted.

Maximum reel size is 5½ inches and the equipment is supplied complete with take-up spool, connecting leads, microphone, etc.

*Ferguson Radio Corporation Limited, Thorn House, Upper St. Martins Lane, London, W.C.2.*

### QUALITY MICROPHONE AT LOW COST

**A** COMPLETELY new dynamic cardioid microphone from the London Microphone Company is now announced at prices ranging from £4 14s. 6d. to £5 9s. 6d., depending upon impedance.

The production aim behind this microphone was to keep the price low without sacrificing quality. Frequency range is quoted as from 50 to 15,000 Hertz, plus or minus 4 dB related to the published curve; discrimination is quoted as 18 to 20 dB at 1,000 Hertz.



The microphone is available as LM200 at 500 ohms impedance price £4 14s. 6d., type LM200 50-60 ohms impedance price £4 17s. 6d., type LM200 high impedance (actually dual impedance of 200 ohms and 50 kilohms) price £5 9s. 6d. All prices include slide-in wire table stand. A wide range of accessories, including wind-shield, are available.

*London Microphone Co. Ltd., Eardley House, 182/4, Camden Hill Road, Kensington, London, W.8.*

### GOODMANS NEW TUNING UNIT

**T**O complement their transistorised amplifier introduced for the first time last year, the Maxamp 30, Goodmans now announce their AM/FM stereophonic high fidelity self powered tuner, the Stereomax.



Following the same size and styling as the Maxamp, the Stereomax is designed to be used in conjunction with it or another high quality amplifier. Special features include the virtual availability of three channels and separate tuning enables switching to other wave bands without disturbing the selected station. A tuning meter, manual precision tuning, and AFC push button control are provided.

The price of Stereomax, complete with stereo decoder, is £60 plus £11 18s. 3d. purchase tax including surcharge.

*Goodman Industries, Axiom Works, Lancelot Road, Wembley, Middlesex.*

### LATEST ARMSTRONG HI-FI SERIES

**S**EEN for the first time at the 1967 Audio Fair was the Armstrong series 400 transistorised range of tuners, amplifiers and tuner amplifiers.

The whole series has been designed for either shelf mounting or easy cabinet fitting. Power outputs are of the order of 15 watts RMS per channel and FM and AM sensitivity and performance are claimed to be improved. Inputs are provided for magnetic pick-ups, ceramic pick-ups, tape playback and radio. Facilities include rumble filter,



two treble filters, loudness control, tape monitor switching, headphone listening and inter-station quieting on FM.

The recommended retail prices for the series 400 are 421 stereo amplifier £42 15s., 423 AM-FM tuner ££37 15s., 424 FM tuner £29 10s., 425 FM stereo tuner-amplifier £71, 426 AM-FM stereo tuner-amplifier £78, M4 stereo radio decoder £9 10s. All prices are inclusive of purchase tax.

*Armstrong Audio Limited, Walthers Road, London, N.7.*

## AUDIOPLAN BY PHILIPS

AS part of the Philips Audioplan a new high quality loudspeaker is announced. Designated GL564, it is of small size,  $17\frac{1}{2} \times 9\frac{1}{2} \times 7\frac{1}{2}$  inches and yet has a claimed frequency response of from 60 to 20,000 Hertz, power handling capacity of 15 watts at 8 ohms impedance.



The enclosure contains a 7-inch low frequency pump employing a rigid light-weight expanded polystyrene cone and a 4-inch dual cone high frequency reproducer. The crossover frequency is 550 cycles.

Attractively styled to match other Philips Audioplan units, the retail price is 19½ guineas plus 10 per cent surcharge.

*Philips Electrical Limited, Century House, Shaftesbury Avenue, London, W.C.2.*

## CHARGING NICKEL-CADMIUM CELLS NOW MADE EASY

A CHARGER for energising Nickel-Cadmium cells and batteries could be a useful accessory for all who use battery portable equipment. Equipment incorporating Nickel-Cadmium cells often also includes a built-in charger, but this is unlikely to provide a sufficiently wide range of outputs to cater for a number of different types of cells.

To overcome this problem Cadmium Nickel Batteries Limited have introduced Voltabloc C.C. constant-current charger, a compact and portable unit capable of charging up to 20 cells in series simultaneously.



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*Cadmium Nickel Batteries Limited, Spedant Works, Park Royal Road, London, N.W.10.*

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circuit on the incoming signal can be switched out to present an absolutely flat response for comparative purposes. A mode selector is provided for reverse stereo, left, right, and left and right combined. Silicon transistors are used throughout and the rated output is 30 watts with a distortion figure quoted as less than 0.1 per cent. In modern styling, with an oil stained wooden case as an optional accessory, the recommended retail price is 99 guineas.



A more advanced amplifier is the type TA1120. With a higher rated output of 50 watts, the distortion figure is said to remain less than 0.1 per cent. Independent scratch and rumble filters are provided, and the switching and tone control features are similar to those in the TA1080. Priced at 136 guineas the wooden case is again offered as an optional accessory.

Also in the range is the Sony turntable, TS3000. With claimed wow and flutter figures of less than 0.05 per cent, the servo-controlled, low-speed, DC motor is said to offer vibrationless and low noise operation. The diecast turntable weighing 3 lb. 5 oz. has a neon illuminated strobe disc and electronic selection of the two speeds, 33½ and 45 rpm, with micro adjustment. Recommended retail price is 65 guineas. Sony precision tone arms, PUA237 and PUA286 are also available. The former has a pivot-to-stylus radius of  $9\frac{11}{32}$  inches, and the latter  $11\frac{1}{2}$  inches. Incorporating gimbal mounting, bias compensation, lateral balancing device, cueing device and hydraulic lowering mechanism with matching arm rest, the prices are 39 guineas for the PUA237 and 44 guineas for the PUA286. Recommended cartridge is the Sony stereo cartridge VCE8E. This is a high compliance moving coil magnetic cartridge fitted with an elliptical diamond stylus. Clean frequency response is claimed from 10 to 25,000 Hertz. The recommended tracking weight is half to 2 grammes and the recommended retail price 27 guineas.

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## TAPE EXCHANGES

Quigley, Terence (27). 7, Melrose Villas, Horsforth, Leeds, Yorkshire. Al Jolson records. 7½, 3½ ips. 7-inch spool. E.M.I. TRS1.

Rathbone, Trevor (28). 13, Crommeole Lane, Cophorne, Shrewsbury, Shropshire. Drama, walking, recording. 7½, 3½, 1½ ips. 7-inch spool. Civic, two and four-track. Male contacts required. UK, Holland, France.

Richardson, Alan (31). 85, Forest Road, Romford, Essex. Humour, c. & w. music. 3½, 1½ ips. 7-inch spool. Philips EL3549 and EL3541, four-track.

Riley, Mike (26). 39, Alexander Street, London, S.E.14. Travel, youth hostelling, cycling. 7½, 3½, 1½ ips. 7-inch spool. Marconiphone recorder.

Canada, Eire, New Zealand, Australia. Roberts, G. D. (31). Flat 4, Woodlands, Congleton Road, Alderley Edge, Cheshire. Photography, travel, outdoor life, sport, music. 3½ ips. 7-inch spool. Philips EL3541, four-track. Male contacts preferred.

Rowe, Brian C. (32). 56, Whiteley Road, London, S.E.19. Most music. 3½, 1½ ips. 8½-inch spool. Ferrograph Series 5 and Optacord 408, battery portable. Austria, Germany, Australia, USA, UK.

Ruff, Stephen (14). 185d, Rectory Road, Grays, Essex. Motor-racing, disc records. 3½ ips. 5½-inch spool. Elizabethan, four-track. Commonwealth countries only.

Scales, John (28). 28, Bournemouth Park Road, Southend-on-Sea, Essex. 3½, 1½ ips. 5½-inch spool. Marconiphone recorder.

Scott, Denis (30). Babingley, King's Lynn, Norfolk. Motoring, films. 15, 7½, 3½, 1½ ips. 8½-inch spool. Grundig TK6, Brenell Mk.5, Type M. Female contacts only in UK, Germany, Canada.

Seabury, Roy P. (20). 6, Mimosa Road, Hayes, Middlesex. Cine photography, French and German language, cartooning, pop and classical music. 7½, 3½, 1½ ips. 7-inch spool. Robuk RK44, four-track, Philips EL3514. Europe, Scandinavia.

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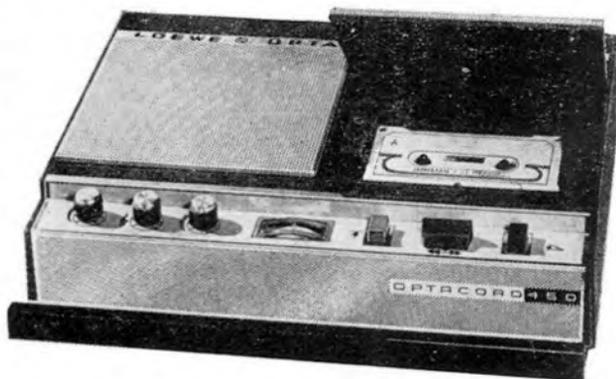
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	Ferguson 3224	15	8 0	2	11 4	44
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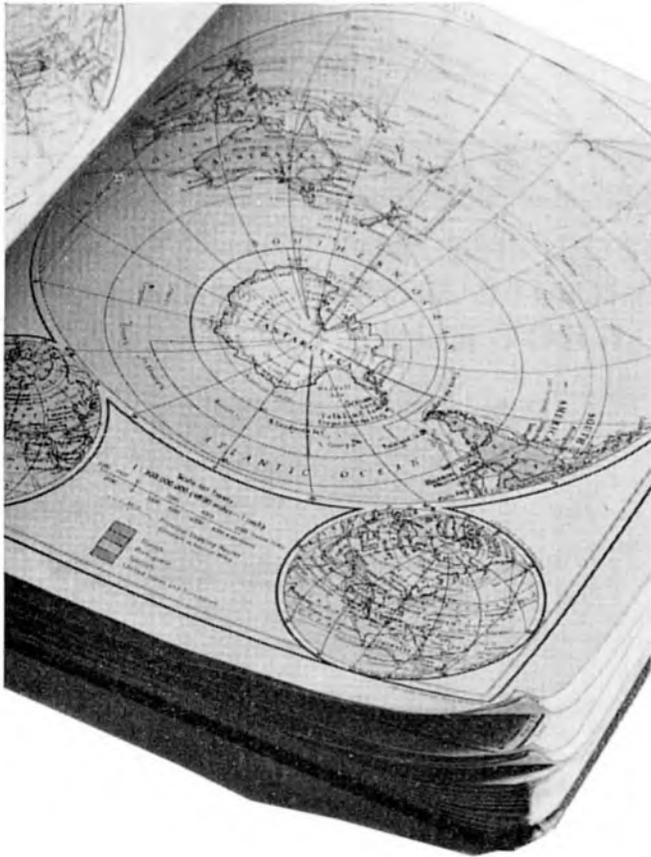
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	Akai 1710	27	13 0	4	12 2	79
	Sony TC260	33	19 0	5	13 2	97
	Tandberg Series 12	36	15 0	6	2 6	105
	Truvox PD104	36	15 0	6	2 6	105
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## Rumpus in Court

# REVELATIONS of CINECORDER'S DOUBLE LIFE

### Bench "Amazed"

*By our Special Correspondent*

A well-known tape recorder, the "Cinecorder" was found guilty yesterday of leading a double life. The case was, however, dismissed by the bench, the judge ruling that it was in the public interest for the Cinecorder to continue to play what he described as "its amazing double role."

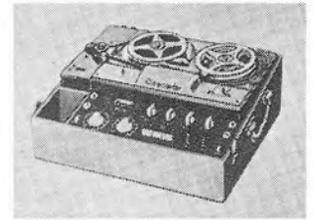
The Prosecution's case was that the name Cinecorder implied an exclusive use by the cine enthusiast. Witnesses would, however, testify that on repeated occasions they had seen and heard the Cinecorder doing the work of a high fidelity tape recorder, and on other occasions accompanying amateur cine films with synchronised sound.

#### "Impedance"

Asked in cross-examination how he could be certain on one of these occasions that it was the Cinecorder, one of the witnesses was reprimanded by the bench for impedance when he heatedly replied that only an idiot could fail to recognise the Cinecorder's smooth, clean performance.

#### Sensation

Climax of the case came when the manufacturer of the Cinecorder and one of the country's largest hi-fi and tape recorder dealers, R.E.W. (Earlsfield) Ltd, caused a sensation by testifying that the demand for the Cinecorder had been so great that he had been able to reduce the price from £75 to 59 gns. He attributed the high level of demand not only



THE ACCUSED

to the superb performance of the machine, but also to its unique features which appealed to every facet of the tape recording world.

In his summing up the judge said he applauded the manufacturer's public spiritedness in offering such value for money. This, he said, was the sort of thing the country needed today. In dismissing the defendant without a stain on its character he hoped the verdict would be instrumental in drawing the attention of the general public to the unique features of the Cinecorder.

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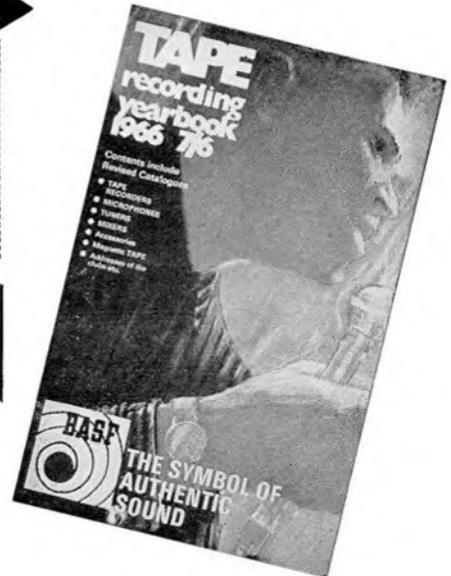
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The DP4 microphone is another winner—by performance alone it has achieved world wide acclaim. It is used regularly by P.A. engineers, broadcasting and television companies, film studios, etc., as well as by many professional and amateur tape recordists. Its winning qualities have been designed and produced by Grampian—specialists for over thirty years in the field of sound equipment. We shall be pleased to send you full technical details of the DP4 and other microphones, together with descriptions of various accessories.

Specially designed to use with the DP4, in order to cut down wind noise is the Wind-shield—as illustrated here.



There is also the "Grampian" Parabolic Reflector. Where it is not possible to place a microphone close to the source of sound such as when making recordings of bird songs, weddings, car and train noises etc. the Parabolic Reflector has been proved over and over again to be of enormous value.

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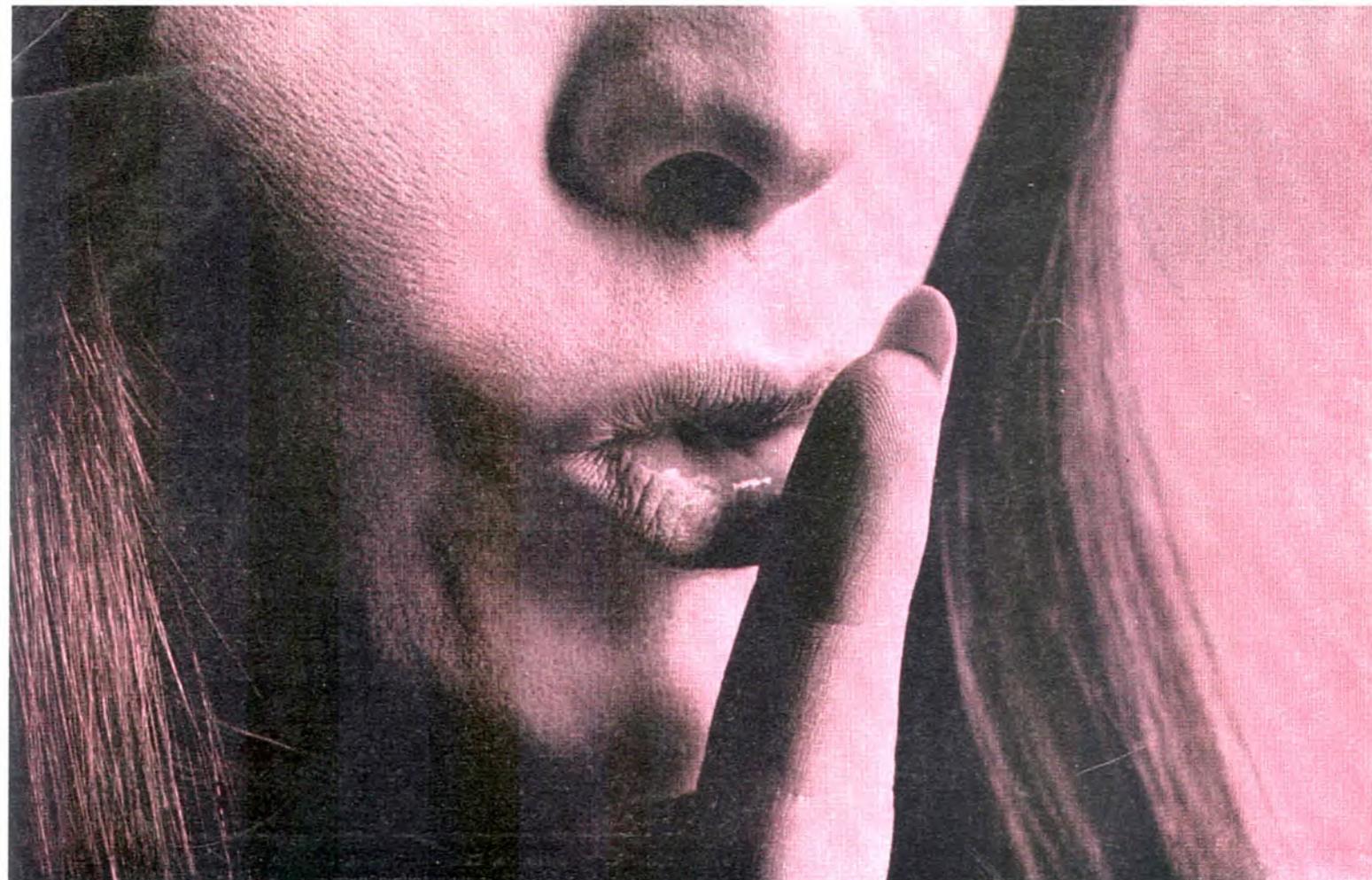
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