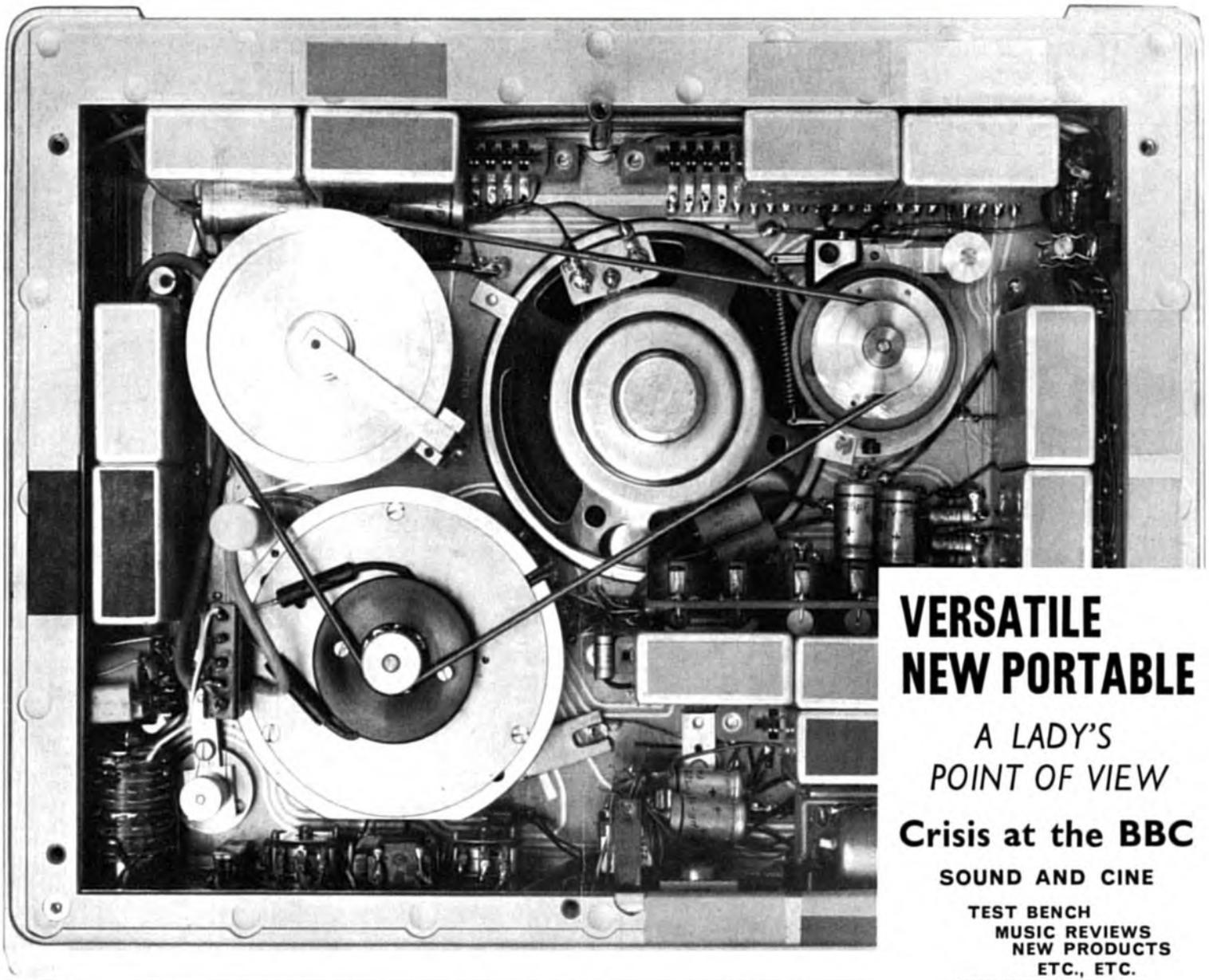


AUGUST 1969

TAPE

RECORDING MAGAZINE

2¹/₂



**VERSATILE
NEW PORTABLE**

*A LADY'S
POINT OF VIEW*

Crisis at the BBC

SOUND AND CINE

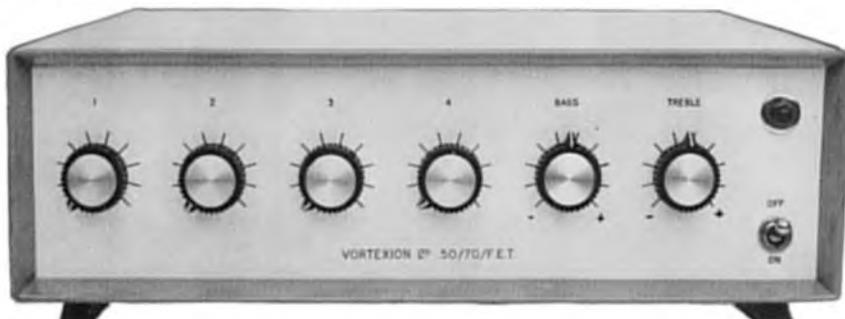
**TEST BENCH
MUSIC REVIEWS
NEW PRODUCTS
ETC., ETC.**

*Second class postage paid at
New York Post Office, N.Y.*

Vortexion

This is a high fidelity amplifier (0.3% intermodulation distortion) using the circuit of our 100% reliable – 100 Watt Amplifier (no failures to date) with its elaborate protection against short and overload, etc. To this is allied our latest development of F.E.T. Mixer amplifier, again fully protected against overload and completely free from radio breakthrough. The mixer is arranged for 3-30/60Ω balanced line microphones, and a high impedance line or gram input followed by bass and treble controls. 100 volt balanced line output.

THE VORTEXION 50/70 WATT ALL SILICON AMPLIFIER WITH BUILT-IN 4 WAY MIXER USING F.E.T.s.



Size 14" × 11½" × 4½"
100uV on 30/60 ohm mic. input.
100mV to 100 volts on gram/auxiliary
input 100KΩ.

Weight 20lb.

100 WATT ALL SILICON AMPLIFIER. A high quality amplifier with 8 ohms-15 ohms and 100 volt line output for A.C. Mains. Protection is given for short and open circuit output over driving and over temperature. Input 0.4v on 100K ohms.

100 WATT MIXER AMPLIFIER. with specifications above is here combined with a 4-channel F.E.T. mixer, 1 gram, 1 tape and 2 mic. inputs with tone controls and mounted in a standard robust stove enamelled steel case. A stabilised voltage supply feeds the tone controls and pre amps, compensating for a mains voltage drop of over 25% and the output transistor biasing compensates for a wide range of voltage and temperature. Also available in rack panel form.

200 WATT AMPLIFIER. Can deliver its full audio power at any frequency in the range of 30 c/s-20Kc/s ± 1db. Less than 0.2% distortion at 1 Kc/s. Can be used to drive mechanical devices for which power is over 120 watt on continuous sine wave. Input 1 mW 600 ohms. Output 100-120v or 200-240v. Additional matching transformers for other impedances are available.

CP50 AMPLIFIER. An all silicon transistor 50 watt amplifier for mains and 12 volt battery operation, charging its own battery and automatically going to battery if mains fail. Protected inputs, and overload and short circuit protected outputs for 8 ohms-15 ohms and 100 volt line. Bass and treble controls fitted.

Models available with 1 gram and 2 low mic. inputs. 1 gram and 3 low mic. inputs or 4 low mic. inputs.

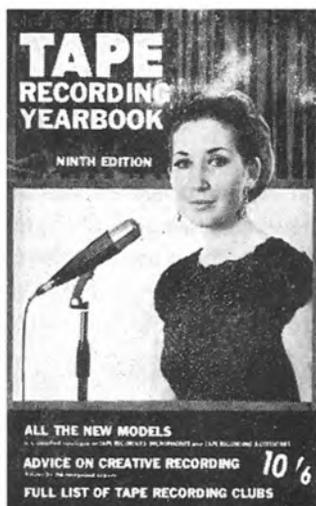
20/30 WATT MIXER AMPLIFIER. High fidelity all silicon model with F.E.T. input stages to reduce intermodulation distortion to a fraction of normal transistor input circuits. The response is level 20 to 20,000 cps within 2 db and over 30 times damping factor. At 20 watts output there is less than 0.2% intermodulation even over the microphone stage at full gain with the treble and bass controls set level. Standard model 1-low mic. balanced input and Hi Z gram.

ELECTRONIC MIXERS. Various types of mixers available. 3-channel with accuracy within 1 dB Peak Programme Meter. 4-6-8-10 and 12-way mixers. Twin 2, 3, 4 and 5 channel stereo. Built-in screened supplies. Balanced line mic. input. Outputs: 0.5 V at 20K or alternative 1 mW at 600 ohms, balanced, unbalanced or floating.

VORTEXION LIMITED, 257-263 The Broadway, Wimbledon, S.W.19

Telephone: 01-542 2814 and 01-542 6242/3/4

Telegrams: "Vortexion London S.W.19"



NOW
AVAILABLE
 *
TAPE RECORDING
YEARBOOK

COMPLETELY NEW NINTH EDITION

PRICE 10/6 POST FREE

A Must for all Recording Enthusiasts

Not only a Comprehensive Catalogue Section but also important Articles by *TAPE Recording Magazine's* Team of Experts, including:—

- JOHN BORWICK**
- DOUGLAS BROWN**
- ROBERT HIRST**
- FRED JUDD**
- DENYS KILLICK**

*

MAKE SURE OF YOUR COPY NOW by posting this coupon and remittance to:—

TAPE RECORDING YEARBOOK,
PRESTIGE HOUSE,
14-18 HOLBORN, LONDON, E.C.1

TAPE RECORDING YEARBOOK

NINTH EDITION, PRICE 10/6d. POST FREE (U.S.A. \$1.75)

Please supply me with.....copy/ies.

I enclose my cheque/postal order for

TO:

.....

.....

REMITTANCE MUST ACCOMPANY ORDER

Cheques and Postal Orders to be made payable to **Print and Press Services Ltd.**

Now on sale . . . Documentary programmes on tape

A new Tape Recording Handbook

by Peter Bastin, who has produced several prize-winning documentary tapes in the British Amateur Tape Recording Contests.

Contents include: **Setting yourself up** (machines, microphones, speeds, hazards, preparing a studio); **The idea and the script** (preparing a script, interviews, narrations, inserts, music); **The job of recording** (setting up, speaking the narrative, techniques, adding other tracks, reverberation, effects, outdoor recording); **And the next time** (examining the results, contests, BBC); with an appendix suggesting equipment for different types of studio

Price 5s Available now from **Print and Press Services Ltd,**
Prestige House, 14-18 Holborn, London, EC1

Cheque or postal order must accompany all orders and be made payable to Print and Press Services Ltd

Other titles in preparation: ABC of Audio; Advice on script-writing; Natural history sound recording

FRANCIS OF STREATHAM

We are specialists for all TANDBERG Equipment
The new I600X Stereo Deck and Pre-Amp now in stock

MAINS OPERATED TAPE RECORDERS

Ampex 1100 Stereo
Ampex 2100 Stereo
*Akai 1710W Stereo
*Akai 4000D Pre-amp Deck Stereo
*Akai M.9 Stereo
*Akai 1800 Dual-purpose stereo 8-track cartridge and tape recorder
*Brenell Mk. 5 Series III Mono
*Brenell ST200 2Tr. St.
*Brenell ST400 4Tr. St.
Ferguson 3232 Stereo 4 Tr.
Ferguson 3226 Mono
Ferguson 3224 Mono
Ferguson 3216 Mono
*Ferrograph 713
*Ferrograph 702/4
*Ferrograph 722/4
Fidelity Studio 4 Track Mono
Fidelity 'Braemar' 2 or 4 Tr. Mono
Grundig TK120 DL 2 Track Mono
Grundig TK144 DL 4 Tr. Mono
Grundig TK149 DL 4 Tr. Automatic
*Grundig TK245 DL Stereo/Mono
*Grundig TR247 DL 4 Tr. Stereo
*Grundig TK 340 DL 4 Tr. Stereo/3 sp.
Philips 4307 4 Tr. Single speed Mono
Philips 4308 4 Tr. 2 sp. M.
*Philips Professional PRO.12
Philips Stereo 4404 2 sp. 4 Tr.
Philips Stereo Cassette 3312 with 2 sp.
Philips 4407 St. 3 sp. 4 Tr.
*Philips 4408 Prof. 3 sp. 3 Tr. Stereo
*Revox 77 Stereo 2 or 4 Tr.
Sanyo 801 St. Pre-amp.
Sanyo 929 4 Tr. 2 sp. Stereo
Sanyo 939 4 Tr. 2 sp. Stereo

*Sanyo 990 3 sp. 4 Tr. Stereo
Sharp RD.706 2 sp./2 Tr./Batt. Mains
*Sony 801 Pa/Deck 3 sp. 4 Tr. St.
Sony TC230W
*Sony 335 Deck and Stereo Pre-amp.
*Sony 255 Deck and Stereo Pre-amp.
Stella 9123 4 Tr. 2 sp.
Tandberg IS 2 or 4 Tr. 3 sp./M.
*Tandberg Series 6X Pr. A/Dk Stereo 3 sp. 2/4 Tr.
*Tandberg Series 12X 3 sp. 2/4 Tr. St.
Telefunken 204 T.S. 4 Tr./St.
Telefunken 501 4 Tr./M.
Telefunken 203 Stereo/Mono 4 Tr. 2 sp.
Telefunken 201 Mono 4 Tr.
*Uher Royal De Luxe 4 Tr. 4 sp. St.
*Vortexion WVB/7 3 sp. 2 Tr. Mono
*Vortexion CLB/7 Stereo 2 Tr. 3 sp.
Wyndor Vanguard 3 sp. 4 Tr. Mono

BATTERY PORTABLES AND CASSETTE TYPES

*Philips 2205 Batt/Mains Cassette
Philips EL3302 Cassette
Akai 10 V 4 Tr. St./BM
Tandberg Cassette Series II 2
Ferguson Cassette 3236
Grundig Cassette C200
Sanyo Cassette
Aiwa Cassette/Batt. Mains
Sharp 504 2 Tr. 2 sp./Batt. Mains
Sharp 505 2 Tr. 2 sp./Batt. Mains
Stella 473 Cassette
National 4 Tr./2 sp./Batt. Mains
National Cassette Batt./Mains
Telefunken 302 4 Tr. 2 sp. Mono
*Uher 4000L. 4 Tr. 2 sp. Mono
*Uher 4200/4400 2/4 Tr. 4 sp. Stereo

*Microphone extra

FOR A FAIR AND DEPENDABLE DEAL IN TAPE and HI-FI

- ★ Minimum Deposit and no Interest or Service Charges on H.P. up to 18 months
- ★ Free Service during Guarantee Period
- ★ Fair Part Exchange Allowance on your old Recorder
- ★ Reconditioned Recorders available to personal shoppers only

● MICROPHONES, MIXERS, etc. by

AKG, Hammond, Grampian, Reslo, Acos, Film Industries, Telefunken, Beyer, Sennheiser, etc.
Bib and E.M.I. splicers, Matching transformers, Defluxers, Bulk Erasers, etc.
Uher Mixer
Eagle Mixer
Hammond 5-way Mixer
Philips Pre-amp.
Also stands, booms, fittings.
Pre-recorded tapes and music cassettes by Columbia, H.M.V. and all E.M.I. labels, etc.
Tapes in all grades and lengths by: B.A.S.F., Scotch, Philips, E.M.I.
Cassettes by Philips, etc.
Headphones by AKG, Ampex, Akai, Sansui, Nikko, Philips.

MAINS POWER PACKS

Philips Stella
Telefunken 300 with cell
Uher 4000 with cell

NOTE. When writing, please quote TRM 8 and include s.a.e. for reply.

GARRARD SP25 MARK II
Less Cartridge, Special Price
£12 0 0

Brand new, in maker's carton.
Guaranteed.

HI-FI DEPT.

● AMPLIFIERS

Quad Rogers Arena Philips
Goodman Nikko Leak Armstrong
Tripletone Arena Philips
Sansui Sanyo English Audio
Linear Sinclair

● TUNERS

Quad Rogers Leak Armstrong
Tripletone Arena Philips
Nikko Goodman Huldra

● LOUDSPEAKERS

Quad Rogers Kef Wharfedale
Goodman Tannoy Lowther
Leak Celestion Tandberg
Arena

● MOTORS, PICKUPS

Garrard incl.	Sonotone
SP.25 401, etc.	SME Mk. II
Goldring	BSR
Connoisseur	Pickering
Thorens	Audiotec
Shure	Neat TTC
Empire	Acos

All types of Diamond and Sapphire styli, stereo and mono. Microlifts, Garrard, Goldring and Acos Pressure Gauges. Disc Preener, Acos Dust Bug. Cabinets by Clearview

169-173 STREATHAM HIGH ROAD, LONDON, S.W.16

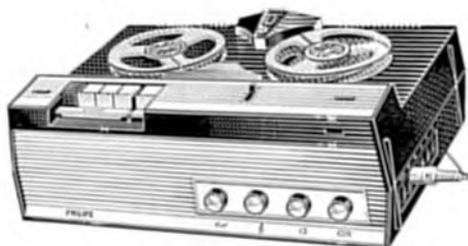
Between St. Leonard's Church
and Streatham Station

01-769 0466: 01-769 0192

Please note this is our only address ● Free parking Prentis Road, 2 mins. away
OPEN ALL DAY SATURDAY—EARLY CLOSING WEDNESDAY

Don't miss this
**Value for
 money offer**

only from
R.E.W.



PHILIPS Family Tape Recorder

N.4305

List price £46. 13. 11

OUR PRICE only 36 gns.

Available to personal callers and on our fast, free Mail Order Service—Cash or Interest Free Terms

One of a famous line of high quality, low-cost family tape recorders, this model is handsomely styled in black, with a grey lid and brushed aluminium control panel.

Records and plays back on four tracks at two speeds: $1\frac{7}{8}$ and $3\frac{3}{4}$ ips. Mixing, monitoring, personal listening and parallel track facilities.

All transistor for instant recording and playback.

Push-button controls for record (with safety interlock), playback, fast wind, re-wind, pause and stop. Separate controls for on-off/volume, tone microphone and radio/gramophone recording level. $8'' \times 3''$ loudspeaker for full, rich sound.

Excellent frequency response. Illuminated recording level indicator. Mains on-off lamp.

Tape position indicator with push-button zero re-set.

Sockets for microphone, gramophone, radio, second recorder, external loudspeaker, headphones amplifier and stereo pre-amplifier (for stereo playback, duoplay and multiplay).

Suitable for use under tropical conditions.

Supplied with moving coil microphone, reel of long-play tape, empty spool and direct recording/playback lead.

List Price £46 13s. 11d.

Our price only 36 gns.—superb value for money!

Also from R.E.W. the complete PHILIPS range including:

Philips EL 3302 Cassette Battery Tape Recorder, list price £32 1s. 7d., our price only 25 gns.

Philips EL 3575 Stereo Tape Recorder, list price £101 19s. 4d., our price only 72 gns.

Philips EL 3310 Mains Mono Cassette Recorder—few only—special price! 29½ gns.

Philips N 4407 4-track, 3-speed complete stereo recorder £103 15s. 4d.

Philips N 2200 Cassettephone Battery Portable Cassette Player, list 13 gns, our price only 9½ gns!

ALL ON
 INTEREST FREE
 TERMS!

Philips RB 960 AM/FM Stereo Tuner/ Amp., list £105 7s. 7d., our price only 75 gns!

Always full range of Philips in stock—everything on interest free terms, one third cash price deposit, balance over twelve months.

HEADQUARTERS SHOWROOMS AND MAIL ORDER: DEPT. TRM, 266-8 UPPER TOOTING ROAD, LONDON, S.W.17. Telephone: 01-672 4471/2 & 9175.

WEST END SHOWROOMS: 146 CHARING CROSS ROAD, LONDON, W.C.2. Telephone: 01-836 3365 (opposite Astoria Cinema)



TAPE
 RECORDING
 MAGAZINE

Incorporating TAPE RECORDING & HI-FI MAGAZINE and STEREO SOUND MAGAZINE

Vol. 13

No. 8

August 1969

IN THIS ISSUE

Tape trends and tape talk	258
Douglas Brown	
BATRC '69 RESULTS	259
THE MACHINE THAT CAN DO—ALMOST—ANYTHING	260
TRM Report	
Cross Talk	262
By Audios	
MUSIC, MONEY AND THE BBC	263
The Editor	
DEFINITELY NOT FOR MEN ONLY	264
Olive Stanley	
SOUND AND CINE	266
NATURE NOTES	268
Test Bench—LAFAYETTE RK-870	269
AND LR-500 TA	271
Music on Tape—Musicassettes	273
7½ and 3¾ ips Stereo	274
New Products	275
Advertisement Inquiry Service	277

FRONT COVER: Here we see the underside of a brilliant new professional battery portable, the Stellavox. Manufactured in Switzerland this machine was shown in London recently for the first time. It is described in detail on Page 260 of this issue under the title: "The Machine that can do—Almost—Anything."

"TAPE Recording Magazine" is published on the third Wednesday in the month, by Print and Press Services Ltd., from Prestige House, 14, 18 Holborn, London, E.C.1.

"TAPE Recording Magazine" is available by a postal subscription of 25s. per annum (U.S.A. and Australia \$3.75) including postage, or it can be obtained at newsagents, bookstalls and radio and music dealers. In the event of difficulty, write to the Publishers at Prestige House, 14, 18, Holborn, London, E.C.1.

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

Address all communications

PRESTIGE HOUSE,
 14 18 HOLBORN, LONDON, E.C.1

EDITORIAL

01-242 4742

ADVERTISING

01-242 4851

Publisher,
 R. DOUGLAS BROWN

Editor,
 DENYS G. KILLICK

Advertisement Manager, VIVIENNE GOODING

Tape trends and tape talk

By Douglas Brown

THE LAST bastion is about to fall. By the end of this year I believe we shall see all the big record manufacturers totally committed to the idea of producing their catalogues on tape in cassettes.

A variety of circumstances now conspire to give cassettes a big boost in the coming months. Not only is another of the big recording companies entering the field; a battle for the car radio market just about to develop will inevitably draw attention to the good sense of having tape-play as well as radio facilities. It is surprising, in fact, that motor manufacturers here have trailed in this respect. In the United States manufacturers made a package deal long ago to include tape-players as a normal accessory in new cars.

The disc is now really fighting to maintain its pre-eminence as a medium for music reproduction. Just five years ago I wrote on this page:

"I feel sure myself that a cassette of the type used in the new Philips battery recorder is likely to be generally accepted. It will not surprise me if during 1965 we see the first small-scale mains recorders using this tape cassette; and not long after that I should expect to witness the first really successful marketing of tape records, using this same cassette."

I recall quite clearly that these words were received sceptically by many of my friends. And certainly it has taken rather longer than I anticipated for things to get moving. But that has been a question of marketing policy, rather than technical capacity. Not only in America, but also in Germany, France, Holland and Japan the cassette revolution has gone much farther and much faster than here.

Now, I think, we are going to make up lost ground. Everyone knows, of course, that the real market for music in cassettes, are the eight million regular record buyers. Until now, there has been a marked reluctance in certain quarters to complicate the market pattern by boosting cassettes in relation to discs.

The ending of retail price maintenance is just one of the factors that is now affecting the market pattern, anyway. I doubt if the prices of cassette records will be much reduced, for profit margins on them are much more slender than on discs.

* * *

A NEW organisation has appeared: the British Society for Electronic Music. A concert at the Royal Festival Hall on June 30 inaugurated its programme, but its principal aim, I understand, is the establishment of a well-equipped studio in which the composer of electronic music can work. Such facilities have been almost non-existent in the past.

A target of £300,000 has been fixed for an "electronic centre." It would include a fully-equipped studio with tape room and processing room, a laboratory able to deal with all aspects of acoustical research, a lecture hall, a recital hall able to handle "mixed media" performances, and a library and archives.

* * *

THE FEDERATION of British Recordists and Clubs resolved, at its recent annual general meeting,

to sponsor a new Tape-and-Slide Contest. The South Devon Club, which has had several years' experience of organising such a contest, will look after the organisation, but full information will be available in due course through the Federation.

The tape-slide show has been a slow starter in this country, but is popular on the Continent. In Belgium there is an annual festival linked to a tape-slide contest and I am told that some of the entries have achieved artistic distinction.

I am no expert on the subject, but I gather that photographs need to be taken with due consideration to the way in which a sound track will be added; for example, it is often necessary to take a series of shots of the same subject. A casual assembly of random slides to form a "programme" and a later and quite separate exercise of adding sound will not produce good results.

* * *

MY PONDERINGS in the June issue on the slow growth of the British Amateur Tape Recording Contest have prompted Mr. J. Bamford-Smith, of Redhill, Surrey, to write:

"Genuine creative artists are restrained from entering any contest as they know their musical ability plays a very second fiddle against the man who is a genius at cutting and splicing tape, recording something or other going down a drain, cats on the tiles at night, or the screech of an owl or nightjar—none of which the tape expert creates, he only *copies*."

"A creative artist could be exemplified by one of the great pianists when, in the mood to extemporise and with a recorder at his side, he could capture the musical pictures in his mind, with its melody."

If I understand Mr. Bamford-Smith rightly, his thought is concentrated on musical composition to the exclusion of the other forms of creative tape recording. The British Contest is not intended as a competition for composers. But they certainly should not be discouraged from entering. Three of the winning tapes in this year's Contest, as will be seen on another page, were the work of musicians, arranging or adapting familiar tunes or, in one case, using an original composition but adding an extra dimension in a way which only the creative approach to recording makes possible.

* * *

WE APOLOGISE to readers who, in recent months, may have received their copies of *TAPE Recording Magazine* later in the month than usual. Our printers have been going through a difficult time and deliveries have been affected.

In March 1968 I promised that, in spite of other magazines' decisions to increase their selling prices, we would hold our own at two shillings for as long as possible and for at least six months. In face of rising costs, that was as long as I felt we could manage to resist the general trend. We have kept our promise for 18 months, but as from the next issue we must, with regret, increase our price to half-a-crown. Postal subscriptions will, for the present, remain unaffected.

BATRC '69 RESULTS

Douglas Brown

THE final judging in the British Amateur Tape Recording Contest took place at the Mullard Theatre in London last month and a 16-year-old Sanderstead schoolboy, Robert Prizeman, lived up to his name by walking off with the top award for a documentary tape about the Royal School of Church Music.

It was a good subject and Robert Prizeman skilfully caught the atmosphere of the place, as well as conveying a great deal of factual information, in his nine-and-a-half-minute production. Naturally, the choral content of the tape played an important part.

The judges weighed their verdict very carefully. Film critic Matthew Norgate pointed out that the youth of the competitor should not be allowed to tip the balance. Ann Duchene, former *Guardian* Radio Critic, pondered whether the tape might have leant too heavily on a familiar BBC pattern.

But the considered verdict was that this was a brilliantly-executed feature tape which well deserved first place.

Eric Robinson summed up: "A very smooth production . . . the only tape of real professional quality we have heard."

So Robert Prizeman's entry became the Tape of the Year and carried off the Emi-tape Challenge Cup and a cash award of £100.

Prizewinners, class by class, were as follow:—

Speech and Drama

"Have a drink," by Peter L. Bastin, of Barbourne, Worcester.

Documentary

"Addington Palace," by Robert Prizeman, of Sanderstead.

Music

"Black Velvet," by Ken McKenzie, of East Herrington, Sunderland.

Reportage

"January Storm," by John and Peter Douglas, of Scotland.

Technical Experiment

"On the Blaydon Beat," by Ken McKenzie, of East Herrington, Sunderland.

Schools

"Story of Samson," by Joseph Hood Junior School, London, S.W.15.

Set Subject: "Home, Sweet Home"

Janet Wood, of Oxfordshire.

The best tape submitted by a club was judged to be "With tape in Tangier," from Barrow Soundtrack; the best tape from a handicapped person "Greensleeves," entered by Mr. Dudley Kitching, of the West Riding Council Residential Home at Carcroft; the best humorous entry "Septimus Jones," by Peter L. Bastin; and the best stereo tape "Shaftiana," entered by M. T. Axtell, of London.

Many of the competitors whose entries were shortlisted for the final judging—

when 22 tapes were played—had made their names familiar in earlier contests; but there were newcomers, too.

Peter Bastin's winning tape in the Speech and Drama class was a gem—only 90 seconds long but full of imagination and ingenuity and showing great technical competence. A man and a woman discuss what drinks to order, the man speaking in English, the woman in German. The alternating phrases of their dialogue are made to rhyme and a musical tune is woven into the pattern of the conversation.

Ken McKenzie's winning tape in the music section, "Black Velvet," also depended substantially on the blending of two elements: the song of a blackbird and the song of a young lady, Carol Goodfellow, addressing herself to the blackbird. Miss Goodfellow wrote and sang the song and a very appealing little melody it was.

Ken McKenzie also submitted the winning technical experiment tape, "On the Blaydon Beat," a notable piece of multi-tracking with music based on "Blaydon Races."

The twin brothers Douglas took first prize in another class with the most effective example of reportage I have yet heard in a tape contest. One recent winter a hurricane hit the West of Scotland, where they live. They went out into it in their car, taking along their portable recorder and recording their impressions against the background of storm noise. This tape had an exciting immediacy which is very rare in either amateur or professional tapes.

The Schools' section produced another winning tape using a biblical story, this time that of Samson. It was made in a well-established idiom and style; the children had prepared their own script and read it with the customary zest.

The "set subject" is a new feature of the contest. This year competitors were invited to produce a feature on the theme "Home, Sweet Home." Janet Wood, the winner, is 14 and she showed versatility by devising, scripting, performing in several roles and recording, without assistance from anyone else. Her idea was a good one, too: the musings of an "old lag" as he engineered his way back to the prison cell which was his only "home."

The club tape, "With tape in Tangier,"

was a very good five-minute travelogue, with good narrative and varied and well-recorded effects. Shaftiana, the best stereo entry, was a special arrangement of "Bobby Shafto."

Dudley Kitching, who submitted the best tape from a handicapped competitor, restricted himself to a simple narration of an experience in his hospital life, but did it so effectively that it had enormous impact.

Finally, a word about humour. This is a quality which, as I have frequently remarked in these columns, is rarely achieved by amateurs. This year there was an interesting encounter between tapes from Terry Devereux and Peter Bastin.

Mr. Devereux produced a feature called "A visit to No. 32" which presented, in elaborately melodramatic terms, the "story" of the ordinary suburban house in which he lives. He used every effects trick he knew, and the judges recognised in it a "take-off" of the ambitious production, "Drakesbroughton Hall," which gained Peter Bastin a top award the previous year. It was an "in" joke, but the tape was a strong runner for the humour prize. . . .

Until the judges heard "Septimus Jones, Esq.," a feature about a character of this name who introduced himself as "a stomach inspector" and proceeded to take listeners on a guided tour of his territory! After the first few sound effects, one was inclined to accept Septimus Jones' verdict: "Isn't it disgusting." But soon, as one listened to the effects of pips flying around, nuts ricocheting, indigestion tablets exploding, the judges could not stifle their grins and the overall effect was splendid.

The producer of the tape? Peter Bastin. An effective turning of the tables on Terry Devereux!

The first judging of entries was performed by a team comprising Brenda Marriott, John Borwick, John Crabbe, Donald Aldous, John Bradley, Fred Judd and myself. After they had selected the winning tapes in each category, these were replayed to a panel consisting of Eric Robinson, Timothy Eckersley, Matthew Norgate, Anne Duchene and George Cooksey, who picked "The Tape of the Year."

Cyril Rex-Hassan acted as chairman.



The new Stellavox battery portable recorder, designated Sp 7, measures only 3 ins. x 8½ ins. x 10½ ins. overall and weighs under 8 lb. complete with tape and batteries. A truly professional machine it will be available only to studios and industrial users, but it embodies many features of great interest to all amateurs

THE MACHINE THAT CAN DO —ALMOST—ANYTHING

IT was recently our privilege to examine and handle a machine that can literally do what is claimed in our title—almost anything. Let us first explain that this is a piece of professional equipment. It will be sold only by the distributors directly to studios and other commercial users; it will not be available to the general public through retail or other channels.

Nevertheless this new machine embodies such brilliant new design features it cannot fail to interest all amateur recording enthusiasts, apart from which our many professional readers will have good reason to learn of its existence.

Whilst on our way to meet M. Georges Quellet we decided our very first question would be to ask why he considered it necessary to design, manufacture and market yet another professional portable battery tape recorder. As soon as we set eyes on the Stellavox the question answered itself. This machine is dramatically smaller and lighter than any other comparable equipment currently available. As we discussed the design features of the Stellavox it immediately became apparent that so much ingenious new thinking had been devoted to its conception that it can really only be thought of as a breakthrough—and a very significant breakthrough at that—in modern design techniques.

The Stellavox incorporates so many new ideas it would be quite impossible for us to enumerate them all here. Consider just two of the most vital components of any tape recorder: the motor and the head assembly.

In order to achieve speed stability the capstan drive motor on most tape recorders is fitted with a heavy flywheel. But the rule of thumb is that the bigger



The “works” of the Sp 7 showing remarkable miniaturisation and space economy. Note the fully encapsulated removable electronic modules, colour coded for easy reference. By reducing size and weight whilst strictly maintaining professional quality standards and incorporating a unique range of versatile facilities, the manufacturers have achieved a significant break-through in this class of equipment

and more weighty the flywheel the greater will be the efficiency of operation. The last thing we want in our portable machine is a heavy flywheel; it increases both size and weight disastrously. Recently methods of electronic speed control have been developed and are currently in use on production models of various makes. Stellavox has gone one better by employing optical speed control. As a result not only is the wow and flutter exceptionally low but the machine can be satisfactorily operated in any position and even under conditions of severe vibration. The motor itself, designed and manufactured by M. Quellet, is not only highly efficient but is “flat” in shape. This flatness is all important

for it is to be housed within the chassis of a tape recorder that is only about 1½ in. deep. But with simplicity the over-riding criterion, complete removal of the motor involves undoing just three retaining screws. Replacement should take no more than 60 seconds.

And that is not all. The motor operates at four standard tape speeds, 3¼, 7½, 15 and 30 ips, speeds whose accuracy can be checked by means of *two* stroboscopes fitted to the two freely revolving tape guides (not to the top of the capstan where tape-slip can affect the reading) and precise adjustment of motor speed can be made by means of an accessible pre-set control at the side of the machine. A visual indicator on the control panel gives immediate warning of gross speed variation due to exhaustion of batteries, etc. If this were not enough there is also provision for the external connection of a capacitor, the critical value of which will immediately convert the machine to run at selected non-standard speeds. We nearly forgot to mention that the single drive belt is fabricated from stainless steel!

Now let us take a look at the head assembly, one of the most interesting and brilliantly designed we have ever seen. The professional requires maximum versatility in his portable recording equipment to suit a vast range of applications. One day he might want full-track mono, another day ½-track stereo; the next ½-track stereo with a pilot tone and yet again ½-track stereo with a spare third track available for commentary. At one time this meant using a number of different machines. The Stellavox meets all these requirements (and many more) with a single standard model.

All Stellavox machines are basically identical being wired and metered for full stereophonic recording plus pilot tone facilities. The key to the machine's unique versatility lies in the plug-in head assemblies. Of course this is not a new idea; many professional machines and at least one domestic equipment use the same principle. A couple of screws are undone and the full set of heads mounted on their own rigid die-cast chassis is removed for replacement with another set of different track configuration. Although such a facility is useful it is not particularly flexible since it makes no provision for changes in equalisation characteristics, etc. With the Stellavox all the equalisation circuitry is built into the top of the removable aluminium die-cast head assembly chassis. The implications of this new system are enormous. To convert a machine literally from anything to anything one merely changes head assemblies. And the top plate of each head block is clearly inscribed with the equalisation characteristic it provides and (*all amateurs please specially note!*) the brand and type number of the recording tape for which the bias level provided will be approximately accurate. Fine adjustment of bias can of course be carried out manually.

Handling the machine is a remarkable experience. The precision of its mechanical action is a delight to the hand and eye. It reminded us of one of those very, very, expensive prestige cameras whose engineering is of such a high standard it would be a delight to own even if never used. To demonstrate its rugged strength the designer, a burly gentleman whose weight must be between eleven and twelve stone (at a polite estimate!), obligingly stood on the demonstration model. It accepted his weight as though it had been designed for such abuse.

We have said nothing as yet of the electronic construction. Beneath the chassis there appear to be no electronic "works" at all—just a number of totally enclosed rectangular containers, colour coded for easy reference and plugged into retaining sockets. Each container is an encapsulated module; if a fault arises in, say, the record pre-amplifier on one channel the module is pulled out and replaced by another. There is even provision for plugging in a quartz-crystal control unit for camera linkage, although this item is not supplied as standard. One need hardly mention that unlike some machines there is not an array of mechanical levers on the underside of the deck plate. All component movement on the top side is servo-controlled, even down to the movement of the twin tape-tensioning arms.

Attention to detail is truly staggering. Have you ever worried about the accumulation of chinagraph pencil marks on

a playback head following a long editing session? The designer of the Stellavox did. In fact the playback head is masked by the arm carrying the pinchwheel, but this is deliberate. When editing, the tape is "inched" past the head in the usual way to locate the cutting point. It is then moved back in relation to special coded markings to bring that critical point up against a fixed tape guide against which the chinagraph pencil can be used with impunity. All input and output sockets as well as control knobs are recessed so they will not accidentally catch on clothing or other equipment. The twin PPM-type meters have their own built-in switchable illumination. Why waste battery power lighting meters in broad daylight?

We could talk about this machine all day. In spite of its size it can easily be adapted to accept 10½-inch NAB spools with accessory arms. Its Automatic Gain Control, which of course can be switched in or out at will, is claimed to be so good as to make recording of musical programme material a feasible possibility, although such use is not recommended. The power source for all this ingenuity is just 12 pen-type cells—ordinary flashlight batteries that can be bought in any village store. On these cells operational life would be approximately two-hours continuous use or five-hours at a rate of about ½-hour daily. The more costly manganese alkaline cells will give proportionately longer running times. Rechargeable nickel cadmium accumulators can also be used. Maximum power consumption by the way, when flat out in all departments, is as little as about 100 milliamps.

Details of technical performance as claimed by the manufacturer are not yet available but we have had access to a set of independent figures from the Swiss Broadcasting Research Laboratories (P.T.T.).

Wow and Flutter figures at 7½ ips weighted to DIN standards are quoted as better than 0.07 per cent (peak to peak). This reading was obtained under normal temperate conditions. At the extreme limits of its operating temperatures, that is 75° Centigrade to minus 20° Centigrade, the results were identical in extreme heat but there was a deterioration to 0.25 per cent in extreme cold. With teeth chattering at 20° below we could hardly complain about that. Signal to Noise is referred to as 56 dB for ½-track stereo recording at peak level. Since there is provision to modulate up to +4 dB above peak the effective Signal to Noise could be improved to 60 dB. When working mono there is a further advantage of +5 dB. Distortion at peak recording level is quoted as 1.1 per cent with an average of 2.0 per cent when working +4 dB. Overall Frequency Response at 7½ ips is

shown as from 20 to 15,000 Hz. within the very tight professional tolerance of +1 -2 dB. At 15 ips that response could reasonably be expected to extend to up to around 20 to 22,000 Hz.

Statistics and facts about this machine are quite bewildering. For instance the "run-up time" from stationary to wow-free operational speed at 7½ ips is as little as 0.1 seconds. If the owner should wish to use Sennheiser Series 5 condenser microphones he will not need a power pack—the facility is built into the tape recorder. In spite of its tiny size a monitoring loudspeaker with its own amplifier module and volume control is provided. There was only one facility we found to have been omitted: there is no provision for a rev. counter or other form of tape position indicator. We queried this with the designer who explained that a tape position indicator had been planned for insertion in the meter panel but in the event there just was not space to accommodate it without sacrificing more important facilities.

The Stellavox is now being manufactured in Switzerland and the model examined was not a prototype but a genuine production sample. The United Kingdom distributor is Audio Engineering Limited, 33 Endell Street, London, W.C.2 and they advise us that first deliveries have already been sold to important commercial and institutional users. It is anticipated that supplies will become available to studios in the latter part of this year and the cost, which will vary according to the head assembly(s) required, will be in the region of £436 for the basic machine plus one complete set of ½-track stereo heads.

When handling the Stellavox it occurred to us that although its unique features are naturally covered by patents and so cannot be copied, many manufacturers of domestic equipment would be well advised to devote the same careful thought and research to solving some of their problems. In general domestic tape recorders tend to follow a monotonously similar pattern. The Stellavox is a startling example of what can happen when a real effort is made to design something that is tangibly better than its antecedents. Many of its facilities would be out of place on a domestic recorder; nevertheless we suspect that if M. Georges Quellet were to be designing for the consumer his products would bear little relation to the stereotyped machines with which we are all so familiar.

We at *TAPE Recording Magazine* would like to thank M. Quellet and Audio Engineering Ltd. for permitting us this fascinating pre-view of a machine that is going to set new standards of efficiency and versatility in the future.

INVOLVEMENT of the ladies with tape recording is a subject that has cropped up once or twice recently and it is now brought to our attention again with Olive Stanley's piece this month "Definitely Not for Men Only." The more one thinks about it the more illogical it is that sound recording should be regarded as an almost exclusively male activity. Even more illogical is the predominantly male interest in "hi-fi" as distinct from recording.

The reason for this antipathy on the part of the ladies is not very hard to find. In the early days of audio and sound recording the enthusiast did need to have a certain amount of technical knowledge and ability. Frequently he was forced to build his own equipment if for no other reason than the fact that in those days there were so few manufactured products commercially available. Although times have changed, fixed ideas die hard and the majority of people still have the utterly false impression that audio equipment cannot be operated by anyone who does not have a basic knowledge of electronics and a deft hand with soldering iron and screwdriver.

Is it surprising that the majority of ladies draw back in terror at such a prospect? Unfortunately to boost their own ego the men in these ladies' lives tend to emphasise the difficulties and dangers of handling audio equipment, often to such a point that the females are scared to death to even touch it. Ladies, permit me to inform you that the complexity of audio equipment exists solely in the imagination of men. I have yet to find the tape recorder, amplifier, tuner or other standard piece of domestic equipment that could not be operated by a child of seven—of either sex—after five or ten minutes simple instruction. The mystique surrounding the subject, amounting in many cases to something approaching a religious cult, is nothing more than the manifestation of an inferiority complex on the part of those who foster it. Modern equipment is carefully designed for maximum simplicity of use and in fact with their (alleged!) finer sensibilities there is not the slightest reason why the fair sex should not be even more interested in sound reproduction than their brothers, boyfriends or husbands.

One lady of my acquaintance has a certain favourite recording which she has played many times. When I made some comment to her about an item on track 2 of the tape she looked at me in vague surprise. It transpired that although she had played the tape (on her husband's equipment!) many times she had not yet dared to turn the tape over and come back on the second track. Following a little gentle castigation from me she promised to get her nine-year-old son to show her how to do it.

CROSS TALK

By Audios

I have quoted this incident because it is typical of too many ladies' response to audio. There seems to be some sort of mental blockage which is only overcome with the greatest difficulty. At one time the motor car was an exclusively male concern and no lady would have dreamed of soiling her hands at the steering wheel. Today the lady non-drivers are in the minority. My friend who could not turn over a spool of tape will happily drive a large car through the worst traffic jams of London and Paris. But turning over a spool of tape defeated her. This attitude is a crashing condemnation of the male approach to audio. Somewhere down the line we men have brainwashed our female companions into believing they are inept, incapable and—where audio is concerned at least—just plain stupid. In doing so we have conspired to deprive them of partaking in pleasures which we unashamedly enjoy so much. Let us hope that persuaded by the success of Olive Stanley and her friends that the ladies will once again show how militant they can be when aroused by revolting against male domination in this sphere to claim an equal right to equal participation. Who knows, perhaps the wheel will eventually turn full circle so that ultimately it is the lady of the establishment who controls and dictates in matters of sound reproduction. And if that should ever happen the blame will surely be ours.

* * *

AT the present time all manner of rumours are flying around the trade. Summer time is always regarded as the "silly season" when the most unlikely stories are given the status of news.

So let me offer you two silly stories which might—just might—come true. The first is a rumour that one of the big record companies, a firm renowned for its opposition to magnetic tape, is toying with the idea of issuing repertoire in that very medium. It is profoundly to be hoped that this story will, by materialising, prove itself not to have been so silly after all. New names in the tape world are more than welcome and we feel that any major record company who refuses to admit the existence of an enormous potential market in tape recorded repertoire is burying its head in the sand.

My second silly story relates to a rumour that a large but necessarily nameless concern is giving serious thoughts to the production of a 3 $\frac{1}{2}$ ips cassette system. With the brilliant success achieved by the Philips Compact Cassette running at 1 $\frac{7}{8}$ ips it does not take a genius to work out the simple fact that by doubling tape speed there would be an immediate advantage in improvements in technical performance. Better speed stability, fewer dropouts, wider frequency response, better signal-to-noise ratio, etc., etc.

However true this might be there would still remain the colossal problem of introducing and marketing a 3 $\frac{1}{2}$ ips cassette which by its very nature would not be compatible with any existing record or playback equipment. It is that fact alone which enables me to classify this particular story as "silly"—that is unless it were to be taken up by one of the giant millionaire corporations prepared to spend upwards of half-a-million pounds on publicity. And if that should happen then my second story, too, will be proved to be not quite so silly after all.

* * *

THERE can be few readers who are unaware of the fact that this year's Audio Fair will be held in October at Olympia in conjunction with the Photo-Cine Fair. Just in case anyone should have missed the dates, they are from Thursday, 16th, to Wednesday, 22nd, of that month and, unlike previous years, it is regretted that we shall not be in a position to issue readers with complimentary tickets. For the first time there will be an admission charge of 4s. 6d. This gives entry to both the audio and photographic sections and, from all the information so far to hand, it looks like being extremely good value for money.

Looking ahead to 1970, I have now received advance notice of something completely new. Described as the 1970 High Fidelity Show, it announces that the Federation of British Audio will hold a High Fidelity Exhibition at the Skyway Hotel near London's Heathrow Airport from the 23rd to 26th April, 1970. It is added that a Company has been formed for this purpose and full details will be announced shortly. The notice is signed by Raymond E. Cooke (Managing Director K.E.F. Electronics Ltd.), Secretary to the Exhibition Company.

So it looks as if our traditional Audio Fair will have some competition during 1970. I shall be watching with interest to see how much support the High Fidelity Show is able to command; for my part I will always be enthusiastic about any exhibition or show which helps to spread the good word amongst those who might otherwise not know what audio is all about.

* * *

IT is interesting to note the subtle distinctions made by the BBC between the Home Service and the Third Programme. In a recent news bulletin transmitted on the Home Service reporting on the failure of the two pandas An-An and Chi-Chi to mate it was stated that possibly neither animal recognised the other as a panda. When the same news item was broadcast in the Third Programme it was said that neither animal realised that the other was of the same species. Home Service listeners could not of course be expected to understand such learned expressions!



MUSIC, MONEY AND THE BBC

By The Editor

NEVER before have there been so many rumours circulating about the drastic financial predicament of the British Broadcasting Corporation. Well publicised in the National Press as the result of a series of "inspired leaks" there can be few unaware of the fact that serious consideration has been given to the abandoning of the Music Programme.

This suggestion raised such a storm of protest from the public that an official denial has been issued. Many famous BBC orchestras were thought to be in danger of being disbanded. This too has been denied. But the fact remains that the Corporation is (apparently) obliged to cut down somewhere and good music is an obvious first choice since it is both expensive to produce and satisfies only a minority interest.

We would like to suggest a simple means of taking the BBC out of the red and putting it firmly and permanently into the black. All that has to be done is to collect the licence fees that are due but which remain unpaid. Of course this is not easy but it does represent the crux of the entire problem. To seek solutions in other ways is to leave the malignant disease untreated whilst applying palliatives to a minor ailment. A way must be found to enable the Corporation to get its hands on the millions owed by the so-called pirate listeners and viewers. Touring the suburbs with a few detector vans is doing little more than scratching at the surface of the problem.

Motorists have to display current licence discs in a visible position on their vehicles; why should the householder not display a similar receiving licence on the front door of his dwelling? If we accept the need for such an arrangement with the motor car and do not regard it as an undue infringement of civil liberties there can be no objection to adopting the same

method for licensing broadcast reception. That is only one suggestion—doubtless there could be others very much better. Somehow a positive new approach to licence collection should be worked out and implemented *now* before the BBC's deficit becomes quite unmanageable.

What of the Music Programme itself? In spite of official denials it is our belief that within the foreseeable future this programme will be at least severely truncated if not totally abandoned. It is ironic that the Corporation should have employed an American firm of business consultants to advise them. Ironic because the quality and scope of our domestic sound and vision broadcasts is the envy of most other peoples of the world—not least the Americans! Nowhere can one find such a consistently high standard of programme material without the continual accursed interpolation of moronic advertising jingles. The truth is we just do not know how lucky we are—we take it all for granted. And we ask Americans to tell us how to make the whole thing work financially.

Now we said earlier that the Music Programme caters for a minority interest. Because of the specialised nature of serious music its audience will always be in a minority. But surely there are degrees of minority? Little or no attempt is made by the Corporation to adequately publicise forthcoming events. Information tabulated in the National Press is invariably minimal and in any case is printed in such a small size type as to be totally illegible to all but those with the keenest eyes.

How many people are really interested in good music in this country? And how many people listen to the Music Programme? We have a suspicion that these two figures would reveal an enormous disparity and if this should be the case then it indicates a strong possibility that there

is something radically wrong with the choice of repertoire broadcast. There must be time available for the performance and transmission of new and exciting works by new and perhaps unknown composers. This in itself is not sufficient to stimulate listener interest. What is needed is a "sense of occasion." Just look at the response to the annual Promenade season at the Albert Hall. Good music might be a minority interest, but you won't think so when you find you cannot get a ticket for love nor money. And look at the Promenaders themselves—not middle-aged or elderly fuddy-duddies but a very much-with-it cross-section of the younger generation.

These are the people who are being let down by the Music Programme in its present form; these are the people whose wishes will be completely ignored if the programme disappears altogether. It is incredible that the magnificent cultural tradition of the Corporation built up so lovingly over decades should stand in jeopardy through mere financial considerations. It is intolerable that a Board of Governors should even consider destroying the musical heritage which we in our innocence imagined to be ours by right. It is deplorable that in times of crisis the executive power can only think negatively in terms of "thou shalt not." For the sake of all recording enthusiasts who are also lovers of fine music we implore the BBC to think again, to think positively and to increase audiences by improvement rather than annihilating them by decapitation. You too can help to influence this judgment by expressing your own opinions clearly and concisely in writing and addressing the letter to Broadcasting House, London.

Let us not forget the BBC belongs to us and ultimately it is we who must safeguard our own interests.

MAKING sound recordings is a creative hobby which is both absorbing and fascinating.

My husband became an enthusiast many years ago but for a long time I remained a mere spectator on the sidelines. An interested spectator, admittedly, but I took the view that the technicalities of recording were much too complex for a woman to understand, and that it was a hobby which had been clearly labelled "For Men Only." How wrong I was!

Not that I became burned up with enthusiasm overnight; my interest built up gradually from a small—almost menial—beginning, as I slipped into the role of a not-unwilling pack-horse on sound recording expeditions.

And so began my initiation in the art of recording sounds. This, I discovered, entailed rather more than switching on. I had to acquire the technique of adjusting recording levels so that sounds were neither under or over-recorded. But finding the recording level was quite simple; all I had to do was to make several test recordings of a given sound before embarking on the real one. In the early days my memo pad would be filled with the notes I had made on numerous tests, but in time I was better able to judge recording levels in relation to distance so fewer tests were necessary, but I never underestimated the value—or the wisdom—of test recording.

In mastering the art of recording sounds I developed a very critical ear, and this enabled me to judge whether a recording was really good or whether it fell short of perfection. The ability to appraise the quality of a recording was, of course, all-important.

My husband encouraged my growing interest, and he took time out to explain the meaning of "wow and flutter"; why microphones and loudspeakers have to be "matched"; the reason for three speeds; and so on, all of which was really quite easy to understand. And on one recording expedition he made "twin" recordings (from the same distance and at the same recording level) with and without the use of a parabolic reflector so that I could really appreciate the worth of this particular piece of equipment. For this demonstration he chose a blackbird singing from its perch in a far distant tree. On the recording taken *without* the use of the reflector the bird was barely audible, but on the one taken *with* the aid of the reflector the bird sounded as though it had been within more than touching distance.

And so, bit by bit, I learned my abc, and in time I became less of a hindrance and more of a help. Eventually sound recording and the making of tapes became "our" hobby, and if I may be forgiven a bit of sentiment at this point I would add that it gave both of us immense pleasure.

DEFINITELY NOT FOR MEN ONLY

By Olive Stanley



Knowing that good out-of-doors recordings are not always made at the mere press of a button, we decided to commence building a library of various sounds from which we could draw when the need arose. This, we reasoned, would consequently save us much dashing around in a panic-stricken race against time when we required certain sounds in a hurry.

Over the months we collected numerous recordings of trains, from slow chuggers up to screaming expresses; and air displays provided the opportunity to record all types of 'planes from small ones up to thundering giants.

In contrast to these noisy sounds, we recorded the dawn chorus of the birds. At the time the prospect of being out and about before the world had woken up wasn't particularly appealing, but our sacrifice in leaving a comfortable bed was well rewarded. After setting up our equipment in the woodland we chose for this recording we watched the changing colours in the dawn sky; the sun rose slowly, and the heavens became a powdery blue. The birds by then had greeted the new day, but we left the microphone on its stand with the recorder still switched on, and walked the short distance to the car to have our coffee and sandwiches. When we played back the recording later we found we not only had an excellent dawn chorus, we had also collected the distinctive pneumatic-drill sound of a busy woodpecker and the repetitive call of a cuckoo. And we were pleasantly surprised

to find we had a very acceptable bonus sound—that of an inquisitive bumble bee who had buzzed around the microphone head for quite a time.

Our library of sounds recalls many pleasant trips. The surging waterfall we discovered when week-ending in Wales; the mellow pealing of bells from an old church in a picturesque village; the babbling brook by which we sat for a picnic lunch.

But all of our expeditions were not blessed with perfect weather. On one occasion we were caught in a heavy thunderstorm in the Malverns, but the day had its compensation as we were able to get a wonderful recording of thunder rolling round the hills.

To date we have quite an extensive range of sounds, many of which have been put to good use in tapes we have made. In addition to those I have already mentioned we have made many more; the roar of peak-hour traffic; the mournful hoot of a ship's warning siren; the squalling of seagulls; the crashing of an angry sea against the rocks; various animal sounds; the clip-clop of horses; the clatter of hurrying footsteps.

We were particularly pleased with our recording of the latter, which we made in one of the subways of our town. The subway tunnel "bounced back" the sound and gave the footsteps a delightful staccato-like briskness. Our previous recording of footsteps at ground level is

DEFINITELY NOT FOR MEN ONLY

Continued from previous page

insipid compared with the subway version. So, to enthusiasts who would like to collect this particular sound I would say first find your subway and take it from there choosing, of course, a busy period.

Although we now have quite a good library it is by no means complete. Indeed, our "sound list" grows rather than diminishes. Owning a basset-hound we now have a desire to record a pack; their musical baying when they get the scent of a hare will be worth the ankle-deep squelching over muddy fields. Perhaps I had better point out that the Master of such packs is always on foot, so we shan't have to keep apace with galloping horses!

For out-of-doors recordings we use a Grundig TK6 battery/mains portable in conjunction with a Grampian DP4 microphone and—except when we are abroad—we usually tote along our parabolic reflector which is essential for collecting distant sounds.

On two of our trips abroad we took with us the Grundig portable, which weighs eleven pounds, but we discovered that carrying this around in intense heat seemed to double its weight. And it never escaped the eagle eye of the weigher-in at the airport; on both occasions it was put on the scales along with our baggage! On subsequent continental journeys we used a lightweight Philips Cassette EL3301 battery recorder (similar to the present EL3302), and we found that when these recordings were played back through an

additional amplifier and loudspeaker we had excellent results.

When we visited Yugoslavia we obtained permission to record the wonderful singing at the world-famous Dubrovnik Summer Festival of Folk Songs and Dancing, at which we spent a memorable night under a warm star-lit sky. This festival was held in a flood-lit courtyard of the fortifications, the old grey walls making a perfect setting for the colourful and richly embroidered national costumes. Memories on tape can be sweetly nostalgic; time and again we relax in our chairs to relieve an evening of sheer enchantment.

Then we have a recording of the eighty-year-old wooden-seated train in which we were jolted around in Spain. This was a

so we had no option but to take shelter in the church porch, but the five minutes or so we spent there was not wasted as we took the opportunity of recording the rain as it pounded fiercely on the cobblestones. In the past we had made many attempts to record rain but were never over-pleased with the results; the sound was always like that of bacon frizzling in a pan. We now have a perfect recording. Agreed, it was a stroke of good fortune and we travelled a long way to get it, but the moral is to always have a recorder handy—you never know what sounds you may be able to collect on your travels or, for that matter, just around the corner.

These recordings, and many more besides, not only "bring back" our holidays, they have proved invaluable when making the sound tracks to our holiday films. To us "journey's end" means the beginning of weeks of careful editing and splicing, but, having film *plus* sound, the time we spend on this painstaking task is most worthwhile.

Our two portables, plus the large mains recorder we have for general use at home, certainly earn their keep. They not only provide us with memories galore, but also



real museum piece. The slightest incline would cause it to puff laboriously, and when it was flat out on the straight (touching all of 15 m.p.h.!) it sounded as though its boiler was going to burst. We have what must surely be a unique recording. On the same holiday we trapped the "atmosphere" of a bullfight by recording the olé's and shouts of the crowd.

When we were holidaying on the Adriatic coast of Italy we made a trip to the exquisitely lovely mountain-top Republic of San Marino. We recorded the voice of our guide as he escorted us through steep and narrow cobbled streets to Government House, where he explained the mysteries and working of this minute fairy-tale principality. He then took us to the tiny church where lay the entombed body of Saint Marino, the founder of the community. Whilst we were in the church the sky darkened ominously, and when we were about to depart we were faced with a really heavy deluge of rain. This was something for which we were not prepared

a deeply satisfying and fascinating hobby.

I was very fortunate in having "on the spot" tuition and advice, but anyone who is interested in sound recording and the making of tapes can get all the help he or she needs by joining a tape recording club. Camaraderie is never lacking in club members, and their eagerness to give helpful demonstrations and other assistance is second only to their enthusiasm for competitive tape making.

And the road to success isn't a road for men only. Lady readers may be greatly encouraged to know that one year the feminine element in our club proved their worth by winning first and third awards in the club's annual competition. Proof indeed that a woman can equal her opposite number in collecting and putting together the various sounds which go into the making of a successful tape.

As I well know, it is not a hobby for men only, but is one in which both sexes can participate with equal success and enjoyment.

THOSE HOLIDAY FILMS NEED A SOUND TRACK

SOUND AND CINE

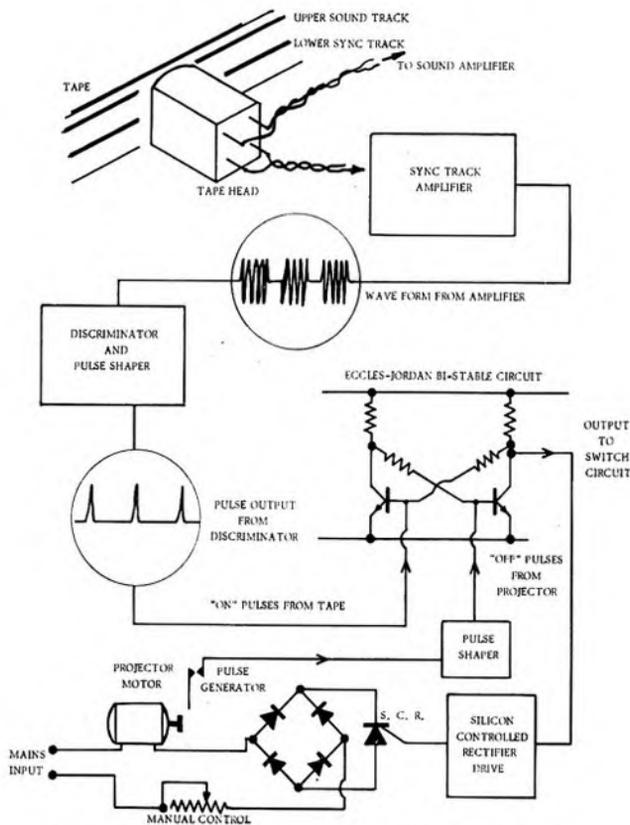


Fig. 1. Block diagram of basic Electronic tape/film synchroniser system

MAKE your own Talkies” is the title of a book published by Contronics Limited of Deepcut, Camberley, Surrey. It is described as an introduction to electronic tape/film synchronisation and an explanation of the “Carol” Cinesound system. It costs 7s. 6d. which will be refunded if the purchaser ultimately buys the synchronising equipment described.

“Make your own Talkies” is a much-maligned suggestion. When 8mm stripe projectors first became generally available at reasonable prices a few years ago prospective purchasers were persuaded to buy through the use of just such a slogan. Unfortunately, as they found to their cost, it takes rather more than a simple stripe projector to produce a “talkie.”

Anyone who has experimented with sound and cine will know the crux of the problem lies in the difficulty of synchronisation. With the sound track, possibly including spoken commentary, on tape ready for playback on a tape recorder and with the film loaded into the projector some mechanical arrangement has to be used to start both pieces of equipment at precisely the same moment (and to account for any differences in “run up” time) and then to maintain them at exactly and precisely the same speed.

Without an external synchroniser of some sort it will be found that the audio programme on tape and the visual programme on film will gradually drift apart—so much so that the two could be as much as 30 seconds or more out of synchronisation in, say, an hour’s programme time.

This might not seem to be a very great deal; 30 seconds in relation to an hour. In fact it is more than enough to render a spoken commentary absurdly meaningless; sound effects will appear against the wrong visual images and the whole thing will degenerate into farce.

Lip synchronisation is quite a different matter. For words to be heard at the loudspeaker at precisely the same instant in time as the movement of the lips in the projected image a very precise and sophisticated synchronisation system must be used. Even the professionals trip up here sometimes. How often have we not heard a BBC announcer apologise for lack of synchronisation in a particular programme? And how absurd it is if the sound from a loudspeaker is only a fraction of a second before or after the movement of the lips. The illusion is utterly destroyed and we are left merely with the inadequacies of modern technical cleverness.

With television as an accepted part of everyday life throughout the land, we have been conditioned to accept sound synchronised with a visual image as a matter of course. When such a phenomenon was restricted to the cinema—a specialised place removed from the home environment—a few amateur cine enthusiasts gave a thought to adding sound tracks to their films. But today the lack of sound is only too obvious to the most unsophisticated audience. We expect moving pictures to be accompanied by a sound track and the small home cine screen appears to be woefully inadequate without it.



Fig. 2. The lightweight separate Record Unit R1 for use in the field measures only 4 in. x 2 in. x 1½ in. and complete with batteries weighs just 5½ ozs.

Even when problems of synchronisation are overcome it must be stressed that the preparation of a really good sound track is by no means easy, requiring considerable skill and patience. Professional cinema and television sound engineers are experts who have probably been doing this sort of work for most of their lives. It would be unreasonable to expect that you or I, as beginners, could achieve the same high standard without the expenditure of a good deal of blood, sweat and tears. The truth is that no one—or no equipment manufacturer—can really help you to produce a first-class sound track

SOUND AND CINE

Continued from previous page

Fig. 3. The Electronic Synchroniser Model C/S2 is a complete Record/Playback unit with many facilities

for a film. But what the equipment manufacturer can do is to provide the synchronising gadgetry that will at least remove or ameliorate the first big mechanical problem. The creative work will depend for its success on the man who is doing it and very little else.

So this booklet "Make your own Talkies" concentrates entirely on mechanical problems. In the simplest possible terms it explains the need for synchronisation and then continues to describe the operating principle of a basic electronic tape/film synchroniser. Quoting verbatim it reads as follows:

"If an electric motor is switched On and then Off the motor will obviously start running and then stop again, but if it is switched On and Off continuously then it will continue to run at a speed which will be slower than if it were switched On. Now if the motor is switched On and Off in this manner whilst the total time of this On/Off cycle is held absolutely constant the motor speed will be in direct relation to the total on time. Whilst still maintaining a constant time of the On/Off cycle the proportion of On time to Off time may be varied and the speed of the motor controlled in this way. If the time of this On/Off cycle can be made to be in direct relationship to the frames speed of the projector and the tape recorder perform the On switching and the projector the Off switching then the projector will run in 100 per cent synchronisation with the tape."

Does this sound complicated? A little thought will soon reveal the underlying truth of such an arrangement. The firm who took this basic principle and from it developed their own patent synchroniser suitable for operation under typically domestic conditions in conjunction with



a wide range of different projectors and tape recorders was Contronics Limited of Camberley. Typical of the equipment now marketed is the "Carol." Cine-sound electronic synchroniser Model C/S2.

The system operates on the simple concept of comparing electrical impulses from the tape instantaneously with similar signals from the projector to maintain frame by frame synchronisation. These signals are initiated by the camera or projector by a device which might be a simple On/Off contact, i.e., Reed switch or photo cell arrangement producing impulses in direct relationship to the frames speed of the film. So versatile is this model that it enables the operator to apply this basic principle to his own choice of normal or sprocketed tape, tape speed, film speed and film gauge as well as allowing him to prepare sound tracks by normal post-synchronisation dubbing, camera synchronisation, transfer of tape to stripe or magnetic film. It will even synchronise automatic slide projectors to tape without any modification.

For camera synchronisation on location the tiny battery-operated record-only unit—a cream plastic case weighing only 5½ ozs. with battery and not much larger than a cigarette packet costing as little as £5 1s. 6d. including purchase tax—can be used. For playback of the tape at home the CS/2 is used. Since it is possible to locate pulses on the tape by monitoring

Please turn to page 268

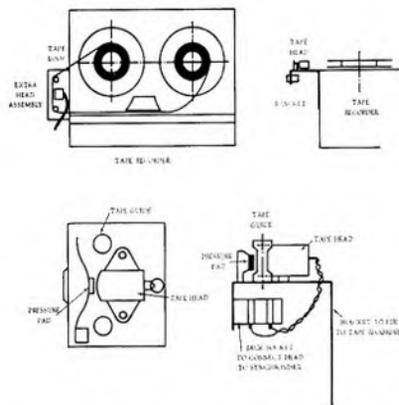


Fig. 4. Method of fitting an extra head to a half-track recorder

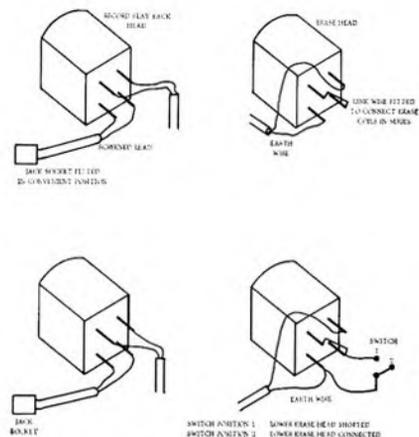


Fig. 5. A switch to prevent erasing the sync. track when recording sound



NATURE NOTES FOR AUGUST

BY RICHARD MARGOSCHIS

FOR the last ten days of May we had our caravan parked in a pleasant part of what was once park-land near the town of Sedbergh, in Yorkshire. Our journey north from the Midlands had been made easy by the motorway. After setting up camp well before midday on the Saturday we immediately started a reconnoitre of what was, to us, new country, but having already studied in detail the one-inch Ordnance Survey map we had a good idea of what to expect. Within easy reach we had open pasture, fells and river valleys, some rugged with fast flowing streams and others with more peaceful waters; not far away were the Yorkshire Dales and the Lake District.

We were considerably helped in our search for good locations by visiting a well-known local naturalist who was soon found after a few inquiries. His name is Mr. Wightman and his wife is a keen nature photographer. Such a contact can save a lot of time when in strange country and so before the day was out we had located several likely places in which to find the birds we were looking for. We did not intend to waste time in recording the species which we expect to find nearer home.

There was a good stretch of water not far away, a reservoir, and this provided some good recordings on a pleasant still evening. Luck was with us on that occasion because in the

middle of an atmosphere recording a party of some thirty Canada geese decided to take off, a few at a time, from a nearby field and fly right over the microphone on their way to the other side of the water, calling loudly all the time.

We spent one day in the Lake District. Grizedall Forest looked an interesting place and in the Forestry Commission Office I spoke to a young man who was most helpful in showing me the layout and the tracks along which we were allowed to go. Half an hour's walking around in an area of oakwood, listening to the bird song, resulted in our locating both the redstart and the pied flycatcher, the latter inhabiting one of the many nest boxes which have been placed in this area by a local bird-watching club especially to attract such birds. Conditions were just right and we made some very good recordings as the male sang almost continuously either from the nestbox or one of several song posts on nearby trees.

Later in the week we made our way into Grisedale (note the different spelling) and here we found the nearest thing to perfect peace and quiet that we have known for some long time. Within a distance of half-a-mile we heard the calls of wagtails, ring-ousel, grouse, lapwing, sand-piper and golden plover, and we made an atmosphere recording which included the sound of a horse and cart being used to spread farm-yard muck!

We knew we were too late in the year to hear the song of the dipper, a fascinating bird which lives on rocky, fast flowing moorland streams but we thought we might have a chance to record its call. We saw dippers on several occasions and then, on the very last day of our holiday, we found a pair feeding a very noisy youngster. We both had recording equipment and so stationed ourselves a couple of hundred yards apart and eventually secured some good recordings as the birds moved to and fro along the river.

Now the next part of the work has to be done—the selection and editing of the cuts to be kept from the several hours of recordings made.

SOUND AND CINE

—from page 267

the synchronising track audible editing can be carried out with comparative ease. By moving the tape slowly over the sound head individual frames may be counted and located. In the record position the equipment generates a continuous tone which is "chopped" at the pulse frequency when the camera commences to run. The start and finish of each shot can therefore be easily located. Recommended retail selling price of the CS/2 is £46 13s. 6d. inclusive of purchase tax.

Before one can actually start making talkies three other vital pieces of equipment are obviously required; a tape recorder for the sound programme, a cine camera for shooting the film and a projector for showing. This excellent little booklet fully describes the specialised requirements of these three items and also gives notes for suggested modifications where these might be necessary.

In the sound department it is said that almost any tape recorder may be used either by accurately recording the synchronising track or by using perforated tape as a prerecorded sync. signal and having a photo cell and excitor lamp assembly to detect holes in the tape. To

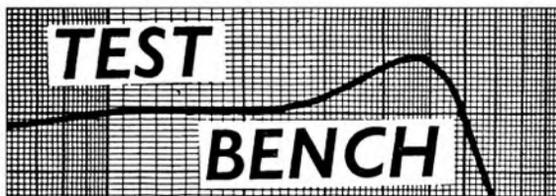
operate on the first method it is essential that two tracks can be recorded simultaneously, one for the sound and the other for the synchronisation. Most stereo machines provide this facility and can therefore be used without modification. A half-track mono recorder needs another magnetic head to be fitted. This might be either permanently attached to the machine or could be mounted on a fixture at the side so that a loop of tape can be covered by extending the tape path.

Most quarter-track tape recorders use heads which have two separate gaps and can therefore operate on two separate tracks of the tape simultaneously provided the necessary additional electronic circuitry is employed. Many machines of this type have a socket on which the unselected track of the tape is connected so that pre-recorded stereo tapes can be replayed. The tape socket of the synchroniser can normally be connected here so that the tape recorder can be used without any further modification. However, a more versatile arrangement can be achieved by incorporating minor modifications. If the switch is connected to the two tracks of the erase head as shown in **Figure 5** it is possible to switch the two

tracks so that they are connected in series and will, when in the record position, erase both upper and lower tracks simultaneously. In the other position of the switch only the top track is effective and recordings can be made on tracks 1 or 4 of the tape without erasing tracks 2 and 3 which may be used to synchronise the projector whilst making a sound track. Owners of equipment considering carrying out such modifications must understand that although comparatively simple to experienced technicians it is essential to seek advice and assistance of a qualified engineer if in the slightest doubt as to one's own ability.

Modifications to both the projector and the camera are equally simple but in the latter case the manufacturers of the synchronising equipment stress they should be trusted only to an expert.

We can do no more than explain these principles of operation and use in this short article. Those who are interested enough to explore the possibilities of synchronising sound with cine films are urged to contact the manufacturers Contronics Limited of Garth Works, Deepcut Bridge Road, Deepcut, Camberley, Surrey. They will be only too pleased to assist and advise.



LAFAYETTE RK-870

INVESTIGATED BY R. HIRST AND D. KILLICK

MANUFACTURER'S SPECIFICATION

Lafayette RK-870

Power Source: AC Mains, 50 Hz.
 Power Consumption: 70 VA.
 Tape Width: $\frac{1}{4}$ inch.
 Maximum Reel Diameter: 7 inches.
 Heads: One four-track lamination-type stereo record/playback head; one four-track double-gapped efficiency erase head.
 Tape Speeds: $7\frac{1}{2}$, $3\frac{3}{4}$ and $1\frac{7}{8}$ ips.
 Frequency Response: 30 to 22,000 Hz at $7\frac{1}{2}$ ips, 40 to 18,000 Hz ± 3 dB at $7\frac{1}{2}$ ips, 40 to 12,000 Hz at $3\frac{3}{4}$ ips.
 Signal to Noise Ratio: Better than 50 dB.
 Wow and Flutter: Less than 0.2 per cent RMS at $7\frac{1}{2}$ ips.
 Overall Distortion: Less than 1.5 per cent at 0 VU.
 Crosstalk: Better than 60 dB.
 Erase Ratio: Better than 60 dB.
 Bias and Erase Frequency: 105 kHz.
 Equalisation: NAB Standards.
 Sensitivity and Impedances: Microphone 0.15 mV for 0V U, 600 ohms; Auxiliary (Low) 100 mV for 0 VU, 150 kohms; Auxiliary (High) 500 mV for 0 VU, 700 kohms; Ext. Amp. Output 1 V—2.5 V variable 5 kohms; Headphone Output 10 kohms.
 Dimensions: $12\frac{3}{8}$ inches wide, $10\frac{5}{8}$ inches high, $5\frac{5}{16}$ inches deep.
 Distributors: Barnet Factors Ltd., 4, Lisle Street, London, W.C.2.
 Price: £74 7s. including purchase tax.

LAFAYETTE RK-870 TEST CHART

Frequency Hz	Overall Response dB			Playback Only dB	Signal/Noise Ratio dB	Distortion	Crosstalk dB
	$7\frac{1}{2}$ i.p.s.	$3\frac{3}{4}$ i.p.s.	$1\frac{7}{8}$ i.p.s.	$7\frac{1}{2}$ i.p.s.			
50	-1.9	-1.8	-1.5	+0.6	52	3.8%	52+
100	+0.6	-0.8	+0.8	+1.4			
250	-0.9	+0.5	+1.6	-1.1			
500	+0.9	-0.5	+1.2	+0.3			
1000	0	0	0	0			
2500	0	0	-1.3	-0.5			
5000	+1.0	+0.1	-5.2	-0.7			
7500	+1.8	-0.8		-0.5			
10000	+2.4	-3.2		0			
12000	+2.6	-7.4		+0.5			
15000	+2.3			+1.5			
18000	+1.2						
20000	0						
22000	-1.5						
Wow and Flutter	0.19%	0.25%					

NOTES.—The Overall Response figures relate to record and playback. Playback Only relates to the reproduction of a 50 microsecond test tape at $7\frac{1}{2}$ i.p.s. (N.A.B.).

For Signal-to-Noise Ratio the tape was recorded at peak level and then the input signal was removed from the record amplifier, but see text for further information. 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 an R.M.S. value (see text).

Wow and Flutter is also R.M.S., the test frequency being 3,000 Hz. Test equipment used includes: Bruel and Kjaer Signal Generator, B & K Frequency Analyser Type 2107, B & K Level Recorder Type 2305, Marconi Distortion Factor Analyser and Gaumont-Kaylee Wow and Flutter Meter.

IT is our opinion that there is no such thing as a "good" cheap tape recorder; but some are less costly than others and so this month we are examining a machine with a relatively modest price tag. The Lafayette RK-870 is a mains four-track, three-speed, two-head stereo record/playback unit, complete up to, but excluding, the final output stages and so requiring the use of an external amplifier and loudspeakers. As we have so often said before, "units" or "decks" of this kind now serve a special purpose by offering recording facilities without inflating cost by including features that might be superfluous to owners of existing good quality audio equipment. And in these times of purchase tax that is a most important consideration.

In recent months we have reviewed a wide selection of similar machines, but the Lafayette RK-870 is significantly less

expensive than most and so is of particular interest. Manufactured in Japan it is one item of a range of equipment now being imported by Barnet Factors Ltd. as reported in our New Products section this month. For user applications we shall couple the RK-870 to another Lafayette product, the stereo tuner/amplifier model LR-500TA. But first we will look at the results of the laboratory investigation in conjunction with the manufacturer's claimed specification.

It will be seen that the frequency response tables, both Overall and Playback, are well within the stated figures of from 40 to 18,000 Hz ± 3 dB at $7\frac{1}{2}$ ips and 40 to 12,000 Hz at $3\frac{3}{4}$ ips. At the latter

speed the curve drops sharply from 10,000 Hz as compared to some more expensive machines but at $7\frac{1}{2}$ ips the Overall response is of an exceptionally high standard. Deviation from flat takes the form of a gentle upward rise with a maximum of plus 2.6 dB at 12,000 Hz from which point the trend is reversed to show minus 1.5 dB at 22,000 Hz. Such a curve indicates the probability of top grade recorded quality.

Once again, however, we have to complain that the new owner is given no guidance in the instruction manual on the kind of tape for which the machine is best suited. For test purposes we used Scotch 215, a tape of fairly low coercivity;

had we used, say, Scotch 202 or 203 we should probably have noted a much more steep rise to the curve so as to bring it outside specification. Perhaps the distributors would bear this point in mind and include an amendment slip in the instruction book.

This question of which tape to use is of vital importance to both reviewer and user. With the wrong tape we shall get a set of figures that will do less than justice to the machine and the user will not get the quality standard he has paid for. It is suggested that any reader who purchases a machine of any make without this information should contact the dealer or distributor (not us *please!*) and enquire which is the preferred kind.

When we start comparing signal-to-noise and distortion to the claimed specification we run into certain minor difficulties relating to the operation of the VU "type" meters. For instance the manufacturer refers his distortion figure of 1.5 per cent to O VU but does not quote a reference for his signal-to-noise reading of better than 50 dB. In our review both these measurements have been referred to a signal 10 dB above O VU to give signal-to-noise of 52 dB and distortion at 3.8 per cent. Although this latter figure is higher than that claimed (as it is bound to be when comparing a reading at plus 10dB with one taken at O VU) it still represents a highly commendable performance, indicating a good distortion factor and exceptionally low noise levels on music and speech programme material. Wow and flutter of 0.19 per cent and 0.25 per cent RMS at 7½ ips and 3¼ ips respectively are not quite so good as we might hope for today, although a year or two ago they would have represented good "hi-fi" standards. Nowadays we have come to look for a figure much closer to 0.1 per cent at 7½ ips and a correspondingly low reading at 3¼ ips. With extended frequency responses this has helped to popularise the recording of serious music at the slower speed. With the RK-870 we have to note the roll-off above 10,000 Hz and the speed fluctuation that gave us 0.25 per cent wow and flutter and then proceed with some caution. On the other hand it must be remembered that few FM transmissions carry very much effective content above 10,000 Hz!

Crosstalk gave us an interesting result. It was so low it lost itself in the system noise down below 52 dB and so for all practical purposes can be ignored.

To summarise our technical findings we can say that the Lafayette RK-870 has given us all that could be required for thoroughly satisfactory recording and listening at 7½ips with a performance that compares favourably with much more expensive equipment. At 3¼ ips there are

several machines that will offer both a better frequency response and speed stability but they will cost more money. Even so the figures quoted for 3¼ ips indicate a performance standard that should be acceptable to all but the most dedicated hi-fi addict—and he has no business to be fooling around with slow speeds anyway. On the whole results exceeded expectations and so we turned to our applicational study with some enthusiasm.

First impression was one of surprise at the smallness of the machine. Measuring only 12½ in. wide by 10½ in. high (in vertical operation) and with a depth of only just over 5 in. it presents a much more compact format than most other makes. Of course this means that 7 in. spools will overhang the deck and in fact they project some 1½ in. at the top but rather less at the sides.

In general appearance the deck is not so "flash" as some other current models having a minimum of fittings and controls combined with a severe matt black finish relieved only by small areas of equally dead looking silver. The pair of VU type meters are very small and although lit (a candle would give more illumination) the red needle moving over a black ground against a white and red scale is one of the most difficult to read we have come across. This situation is not made easier by the fact that red warning lights come on in the record mode, flooding the white scale with red to render the red needle quite invisible on its black ground. That is a design boob which could be very simply corrected at little or no expense, and we do wonder how any manufacturer could fall into such an obvious trap.

For some reason bright blue has been chosen for the two square Record buttons placed immediately below the low half of the head cover and in the centre of the panel. These too tend to cheapen the appearance. Level control is by a pair of rotary knobs which are not too difficult to handle as although on the small side they are knurled. They do not move against a numbered scale of any other reference and so accurate setting is made needlessly difficult. Again these are elementary things that should not be overlooked at the design stage of manufacture.

Tape transport and mode selection is by a single large rotary control with positions for Rewind, Stop, Play/Record, Pause and Fast Forward. This lever is linked to the Record buttons, depression of which both illuminates the red warning lights in the meters referred to previously and also engages the Record function. Provision of two Record buttons, one for each track, enables individual Record and Playback to be selected simultaneously. Two standard jack sockets for Microphone, one for monitor, a three-

digit rev. counter, three-speed change lever and mains On/Off complete the deck fittings.

As the machine is intended for horizontal or vertical operation spool retaining caps are provided and these are of the standard rubber type. The mains cable, two-core and permanently fixed, exits from the underside where the phono In and Out connections are also located. As will be seen from the specification the line sockets are duplicated, one for high gain and the other for low. A pair of sensible "skids" with hard rubber centres protect furniture in the upright position.

We were very pleased to note the provision of a simple pre-set control to enable the user to adjust output level (which is metered) from 1 V to 2.5 V and a microswitch for cut-off at the end of a spool of tape. This latter is a lightweight bent wire fitting which "rides" the tape—if power should be cut as soon as Playback or Record are engaged it is because the tape has bypassed this little lever and is therefore not threaded up correctly.

We have taken care to stress the fact that to us the RK-870 is not one of the handsomest of machines. Since we are told that beauty is in the eye of the beholder the fault might well be ours, but in case the reader should come to the same conclusion we must emphasise the fact that one can too easily be mistaken by modest outward appearances.

The moment the machine is switched on one is impressed by the quietness of the motor. It is undoubtedly as smooth and as soundless as that in any machine we have reviewed. The only slight question in our minds relates to the operation of the rotary function control lever. It worked efficiently but did not have quite the feeling of positive action found in some others. By the way there is a delay mechanism in the linkage that prevents crashing through Stop when moving from Rewind to Play/Record. A pause of 1½ to 2 seconds is required in the Stop position to release the mechanism.

An electronic delay also occurs when moving from Stop into Play/Record and this is unfortunate since several inches of tape pass the heads before the respective amplifier circuit has reached operating condition. As a result recordings will tend to open with a "slur" if a signal is present at the moment of starting. Use of the Pause position removes this trouble and is therefore preferred.

For user tests we carried out our usual drill by copying from 15 ips masters, dubbing "off the air" and reproducing pre-recorded tapes of known good quality. The RK-870 was connected to the Lafayette stereo tuner/amplifier LR-500TA mentioned earlier which in

turn powered a pair of full-range loudspeakers. The promise of good performance indicated by the technical findings was met in every respect. Perhaps one could say exceeded, because the somewhat spartan appearance and fairly low cost condition the user to expect little. In fact he gets a very great deal.

Worst feature is the "invisible metering". They can be read if one peers closely enough; from any appreciable distance the needle vanishes completely. Pity, because there is not very much that can be done about it. Next worst is the

added difficulty of setting levels due to the type of knobs provided. However these could be thrown away and replaced with something sensible with a cursor travelling a numeric scale—there is plenty of space for such a change on the deck plate. Also on the debit side is the overall design which does not inspire confidence—in us at least.

But our credits more than compensate for what are, after all, mainly failures in superficial detail. Audio quality—the thing that *really* matters—is so good as to place this machine up in the top rank

of domestic recorders. Certainly one misses the luxury of the third head and A/B monitoring but this lack is reflected in the low price. We were delighted with the clean, crisp and low noise level. As so often happens with modern equipment such noise as there was took the form of unobtrusive hiss without a trace of hum.

Our conclusion is that the prospective purchaser who requires a standard of audio quality that will bear comparison with the better-known top-flight equipments need look no further.

LAFAYETTE LR-500TA

MANUFACTURER'S SPECIFICATION Lafayette LR-500TA

Tuning Range: FM 88 to 108 MHz, AM 550 to 1,600 kHz

Power Output (IHF): 60 watts at 4 ohms, 50 watts at 8 ohms.

Functions: FM Mono, Automatic FM Stereo, AM. Inputs for Stereo Phono (magnetic and ceramic) Stereo Tape inputs plus Stereo Auxiliary inputs.

Outputs: Stereo tape recorder outputs (front and rear), main stereo speakers and remote stereo speakers (4, 8 or 16 ohms impedance), stereo headphones (4 to 16 ohms).

Controls: Tuning, Speaker Mode, Volume/Balance (concentric), Master Bass, Master Treble, Selector, Loudness, Tape Monitor, Mode and H Filter.

Solid State Devices: 4 ICs, 30 transistors, 22 diodes, 2 thermistors.

Power Requirements: AC Mains, 50/60 Hz.

Dimensions: Overall, including all protrusions (excluding knobs) and legs: 15 inches wide, 12 inches deep and 5 inches high.

Weight: 15 lb.

Recommended Retail Price: £94 9s. 11d. including purchase tax.

Distributors: Barnet Factors Ltd., 4, Lisle Street, London, W.C.2.

AS reported in our review of the Lafayette RK-870 tape unit we coupled that machine to a stereo tuner/amplifier by the same manufacturer for user tests and so it is appropriate to append some notes on the performance of this piece of equipment. Integration of the tuner and amplifier into a single attractive piece of equipment is one of the many benefits we have derived from the development of solid state circuitry. With components getting smaller and smaller and generating less heat there is no longer any reason why the tuner and amplifier should be presented as separate, self-container units. Apart, that is, from the ultimate advantage of the flexibility of separateness. When investing in a single piece of equipment which serves the dual function of both tuner and amplifier it must be remembered that one loses the possibility of selection. One might wish to acquire a different tuner for use with the amplifier or vice versa. In that sense the choice is restricted. And it must be remembered that if the day comes when the equipment is

to be discarded the combination of tuner together with amplifier means that in effect there will be two items to be disposed of.

Coming now to the model under consideration, Lafayette LR-500 TA, one is first impressed by the smart layout and appearance of the front panel. It is an appliance that holds special interest for recording enthusiasts because not only does it incorporate full record monitoring facilities (for use with tape recorders fitted with three heads) but it also features a standard stereo jack socket on the front control panel—labelled Tape Out—which provides the owner with the convenience of immediate connection of an external tape recorder for recording. This is in addition to the normal Tape Out connections at the rear.

A few years ago amplifier manufacturers invariably provided tape recorder connections in the front panel; unfortunately as styling and design became more important they were persuaded to "clean up" the control panel and in the process frontal tape-recorder connections disappeared. This doesn't matter when the amplifier is always used in conjunction with a "static" tape recorder which can be permanently connected. But the owner who wishes to continually connect and disconnect his machine finds himself perpetually groping around in the gloom at the rear of the amplifier. Lafayette have gone part of the way towards curing that trouble by giving us an additional Tape Out jack on the front, but it is a pity they did not go all the way by including another stereo jack socket for Tape In. However let us be thankful for small mercies.

Cabinet work to the LR-500 TA might appear at first glance to be the usual teak enclosure but in fact it is a metal box covered in some timber-simulating material. Where the equipment is to be built into a cabinet this is of no consequence since the container would be discarded anyway. Where it is to stand exposed on a piece of furniture in the

home it might be thought that the body-work is not prepossessing.

The tuner section, offering AM as well as FM includes a smart uncluttered single tuning scale which is used in conjunction with a beautifully clear meter serving as signal-strength indicator (what a pity this manufacturer did not use a similar arrangement for level indicators on his tape recorder!) and the usual illuminated FM stereo beacon. Controls on the front panel include a rotary selector for Auxiliary Phono, FM, MPX Filter and AM separate Bass and Treble controls, a "split" Volume/Balance control and press keys for Loudness, Tape Monitor, Mono or Stereo mode and HF Filter. Above these are positioned the tuning knob and a speaker-mode control which incorporates the mains On/Off and switches the output through to either the main speakers, main plus remote, remote only or phones only. At the rear of the chassis the usual phono type connections are provided for Auxiliary, Ceramic Cartridge, Magnetic Cartridge, Tape Record and Tape Playback. Speaker connections are by screw-type terminals and there is provision for using either the built-in FM antenna or connection of 300 ohm twin lead external antenna and also for internal AM loopstick antenna or alternative external AM aerial. Two power outlets are also provided to provide mains supply for other equipments, one is switched the other unswitched. The output transistors are protected by two 2 amp fuses, one for each channel.

It will be noted from the specification that the power output is quoted as 50 watts (that is 25 watts per stereo channel) at 8 ohms, a measurement qualified by the initials IHF. This refers to the American Institute of High Fidelity standard of measurement which results in a very much higher figure than the British RMS rating. It is for this reason that many amplifiers designed for the American market appear from the literature to be such enormously powerful brutes. There is a habit on that side of the Atlantic of quoting the power of an amplifier in terms of the total output of both channels. Therefore one first divides by two to arrive at the individual power per channel

and then by two again to approximate an RMS rating. In the present case we have 50 watts total IHF that is 25 watts IHF per channel which then becomes around 10-12½ watts RMS.

The instruction manual with the LR-500 TA is excellent. It includes a separate detailed instruction entitled "The care and feeding of tone controls." To meet public demand amplifiers have to have a wide range of frequency response control although in practice the user should apply correction with the greatest care and discrimination. This important point is stressed in the manual. In addition a comprehensive explanation is given on the effect of multiple speakers on impedance together with a comprehensive chart of permissible speaker combinations.

By chance there happened to be an FM multiplex stereo transmission in progress when the tuner/amplifier was first switched on. To our amazement we found we were receiving a reasonably acceptable stereo signal from the built-in FM antenna. Location naturally plays an important part in FM reception so we must add that the equipment was being used in a second-floor flat in South West London in a situation not particularly favoured for the strength of its FM signal.

Intrigued at this discovery (we have rarely come across any other equipment capable of producing a "listenable" stereo signal without the use of external aerials) we disconnected the internal antenna and used an odd length of coaxial cable to form a crude dipole at the external aerial terminals. There was an immediate improvement in reception with the hiss-and-mush level barely discernible. We regard these results as absolutely excellent since they far exceed what we have come to expect from certain British tuners.

In all other respects the tuner/amplifier operated smoothly and efficiently apart from a rather disconcerting component hum from the amplifier itself which tended to persist until the equipment had reached operating temperature—a period of some 30 seconds or so. After this time the hum was scarcely audible. We must stress the fact that this was not hum at the loudspeaker outlet but was heard directly from the equipment itself. The signal strength meter and the FM stereo beacon are really a joy to use with stations tuning-in positively as the needle flicks across to maximum strength. Hiss level on multiplex is so low that the multiplex filter position on the selector is almost superfluous.

The only real criticism is of the control knobs. Volume control is a combined volume/balance with the two halves (upper and lower) of the knob rotating independently. Unfortunately there is no friction mounting of any kind and so both halves revolve freely. Owing to the design of the knob one can be seriously out of balance without realising it unless care is taken in the adjustment.

We must be honest and admit that when the Lafayette LR-500 TA tuner/amplifier was received we did wonder what standard of performance it would provide. Although not to be regarded as cheap at £74 2s. 3d. plus £20 7s. 8d. purchase tax we are delighted to be able to report that it offers a quality standard and efficiency that places it firmly in the "best value for money" class. Stereo reception without quality degradation is so important for the recording enthusiast. With the LR-500 TA he will not be disappointed in this respect and at the same time he will acquire all the main amplifier facilities that are either necessary or will be found on more costly equipment. And as an extra bonus there is the additional AM tuning facility which although somewhat rudimentary does offer an alternative to the three VHF programmes. We can summarise our feelings by saying that this is a piece of equipment we have been delighted to use and which will be sorely missed when it is returned to the distributors.

UP TO 50% OFF!

BRITAIN'S ONLY TAPE RECORDER AND HI-FI MART

specialising in the SALE, EXCHANGE and PURCHASE of every make of high quality Tape Recorder and High Fidelity Equipment. Brenell, Ferrograph, Ampex, B. & O., Quad, Leak, Rogers, Goodmans, etc., we have the lot! Fantastic savings of up to 50% off original list prices for Personal Callers only. Our stocks change daily—call today—well over 100 models to choose from—all guaranteed!

TYPICAL BARGAINS

ALL WITH 3 MONTHS WRITTEN GUARANTEE

● TAPE RECORDERS ●

Note: M=Mono, S=Stereo, BP=Battery Portable, 4=4 track, 2=2 track

BRENELL STB2 (S/2)	89 gns.	SONY TC260 (S/4)	
REPS R10 (M/4)	35 gns.	(Brand New)	79 gns.
FERROGRAPH 63T (M/2)	69 gns.	VORTEXION WVVB (M/2)	55 gns.
SONY TC500 (S/4)	59 gns.	AKAI M8 (S/4)	79 gns.
PHILIPS EL3301 (BP/M/2)	17 gns.	TELEFUNKEN 85KL (M/2)	39 gns.
FERROGRAPH 5/AN (M/2)	59 gns.	PHILIPS EL3536 (S/4)	45 gns.
REVOX E36 (S/4)	69 gns.	FERROGRAPH 4/AN (M/2)	49 gns.
SANYO MR939 (S/4)	72 gns.	BRENELL Mk. 5 (M/2)	39 gns.
AKAI M7 (S/4)	69 gns.	TELEFUNKEN 204E (S/4)	69 gns.
REVOX 736 (S/2)	85 gns.	AKAI M6 (S/4)	62 gns.
		TANDBERG 1241 (S/4)	69 gns.

● HI-FI EQUIPMENT ●

QUAD 22 Control	15 gns.	ARMSTRONG 226 Stereo	
ROGERS Cadet III	25 gns.	T amp.	39 gns.
ARMSTRONG 127 FM Tuner	29 gns.	ROGERS Master Stereo	
ARMSTRONG 221 Stereo		Amp and Control	39 gns.
Amp.	22 gns.	ARMSTRONG 222 Stereo	
ROGERS HG88 Mk. 3	29 gns.	Amp.	15 gns.
GOODMANS Maxim Spkr.	14 gns.	QUAD Electrostatic	29 gns.
WHARFEDALE Denton		LEAK Sandwich Spkr.	25 gns.
Speaker	22 gns.	K.E.F. Duette Spkr.	22 gns.
GARRARD LAB80	15 gns.	GOLDRING GL70 Motor	18 gns.
LEAK Troughline FM Tuner	29 gns.	GARRARD A70	12 gns.
QUAD 22 Mono Amp.	15 gns.	QUAD 22 FM Tuner	15 gns.

PERSONAL CALLERS ONLY

THE **TAPE**
RECORDER
MART

242/4 PENTONVILLE ROAD, LONDON, N.1

(200 YDS. KINGS CROSS)

TERminus 8200

(HALF DAY THURSDAY)

MUSICASSETTE

REVIEWS

TELEMANN. Suite in A Minor for flute, Concerto in G Major for viola and Concerto A7 in F Major for 3 violins. I Musici. Philips CPC 0050. 55s. 11d. including purchase tax.

Frequently in these reviews I have referred to the pleasure to be derived from the Baroque Concerto and this Telemann album offers much that is best in that form. One of the delights of music is that it is all things to all men. Whether one finds intellectual satisfaction in the elegant precision of Telemann and his contemporaries, in the grandiose magnificence of the more modern Mahler or indeed in the gravelled artistry of Louis Armstrong is immaterial—in all its forms music offers solace to the troubled and inspiration to the questing.

Perhaps it is as balm to the restless spirit that the Baroque Concerto is best appreciated. With infallible logicity it conveys a sense of irrefutable law and order which it imposes on the listener. When written the world was a logical place. Today we have lost that reassurance; no longer is man at the centre of the universe. All values have changed and the laws of physics have replaced the once immutable Heavenly Dictate. Not that this is necessarily a bad thing, but in the chaos of materialism one needs some intellectual straw at which to clutch. Telemann offers a most substantial straw.

Recording is excellent, apart from a fractional drop-out in the opening of my copy. A minor thing, forgotten as soon as it has passed. Apart from this, when listening I was blissfully unaware of whether the medium was cassette, tape or disc. With fine, rich string tones and delicate internal balance the music proceeds with supreme self-confidence to inform that all is well in this the best of all possible worlds. Surely one can be excused for indulging in such an elusive fantasy for a few brief minutes? "Music, when soft voices die, vibrates in the memory." It is this memory referred to by Shelley that can do much to encourage a lost and bewildered humanity to rediscover its purpose. One of the most effective vehicles in the search is the Baroque Concerto.

Having made quite clear just how much I expect from this music it is hoped that the fact that the record under review did not in any way disappoint will be given added significance. It is an excellent example of the form and as such will find a place of honour in my music library. And to any readers who might not be familiar with the music of that period I would enthusiastically recommend it; remember it is best heard in those quiet, introspective moments when the mind is open to receive reassurance.

CESAR FRANCK. Symphony in D minor and Les Eolides. Concertgebouw Orchestra, Amsterdam, Willem Van Otterloo. SCHUBERT. Overture in the Italian Style No. 2. Dresden State Orchestra, Wolfgang Sawallisch. Philips CPC 0066. 55s. 11d. including purchase tax.

Heavy with ominous threats the sombre darkness of César Franck's one and only

symphony is relieved by sudden flashes of brilliant sunlight. A clouded sky, oppressive with thunder, releases its electric storms to reveal a finely-coloured rainbow. It is very moving, but never superficial.

Orchestral works of this magnitude demand the utmost care on the part of the recording engineers. Great founts of instrumental sound can so easily degenerate into a muddy flood of confused noise. In spite of the slow speed and narrow tracks of the cassette system Philips have really honoured their obligations to the listener with this album. The dynamic range is enormous, and one might first get the false impression that the album has been wrongly under-recorded. Not so. There's more than enough full-blooded sound to come—sound that will excite through its contrasts. Hark at the thunder, but watch for the rainbow.

In lighter mood we have the symphonic poem, "Les Eolides." This was not in my mind when I used the unrestrained power of the natural elements to describe the symphony, but it must have been a happy choice of metaphor because Les Eolides is named after the light winds of the Greek god, Aeolus, from which the name of the Aeolian harp is also derived. As might be imagined, this work is in direct contrast to the weight of the symphony, nicely coupled to offer tranquility in place of storm and tempest.

Finally, we have the second of Schubert's two Overtures in the Italian Style to round off the album with lively rhythms and singing melodies. The choice of repertoire displays great taste and a fine sense of discrimination to give an added value to the record.

After listening carefully to this programme several times I find it tends to "grow on one." There's certainly little of which I could complain, apart perhaps from rather obtrusive and noisy clicks at the beginning and end. But if that is the only grumble then both the manufacturer and the purchaser should be happy. Perhaps its appeal is not so universal as that of the Telemann but it is a nonetheless substantial offering that will be welcomed by many—including me.

RAVI SHANKAR. Portrait of Genius. Sitar. Liberty C 0775. 55s. 11d. including purchase tax.

I have attempted to review Indian music before, and on those occasions the enterprise has been chiefly remarkable for my own confession of ignorance of the subject. In spite of being able to claim close friendship with one of the most charming ladies ever to have been produced by that Continent (where should we be without the ladies?), and in spite of having sincerely tried to learn something of the culture I am still appalled at my own lack of knowledge, a situation that I suspect will find parallels amongst many of my readers.

The appreciation is there, but not the understanding. Which, of course, is the finest argument in the world for hearing more and more Indian music. This musicassette offers an excellent opportunity to do just that, with its dramatically good recorded quality and detailed sleeve notes. The titles of the items are: *Tala Rasa Ranga*, *Tala-Tabla Tarang*, *Song from the hills*, *Raga Multani*, *Gat Kirwani*, *Tabla Dhvani* and *Dhun*. Instrumentation comprises: sitar, flute, tamboura, tabla-tarang, dholak and kartal.

Quoting directly from the sleeve notes, it is said that the album was recorded by Ravi Shankar during his seventh and most suc-

cessful visit to the United States. Hailed as a musical genius throughout the world, Shankar has shown his mastery not only in performance on the sitar but also as a composer, conductor and educator. He has taught us to love and understand India and its art in the purest and most orthodox terms, as taught to him by his guru, Ustad Allaudin Khan of Maihar.

All this I believe and accept. None who have seen his several appearances on British television could have failed to be impressed with his sincerity and artistic ability. Certainly he is performing his educational task in the best possible way by bringing his music right into our homes. We should all have an understanding of cultures other than our own and this album is a starting point. By no means difficult to enjoy it is a more than welcome change from some of our more familiar Western sounds. One should never shrink from new experiences, so why not try this one? You might find yourself very pleasantly surprised.

JOHNNY CASH AT FOLSOM PRISON. CBS 40-63308. 55s. 11d. including purchase tax.

My first reaction to a record, a commercial record, of a real prison concert was one of revulsion against such a tasteless artifice. Why should the artist or the record company profit from the misfortune of the inmates? What has a prison to do with either music or entertainment?

Now I know the answer. On reflection, a prison is the visual, concrete symbol of society's own failure. Many of us who make up that society resent being reminded of the existence of such places. Johnny Cash brings us back to our senses by making so very clear what should be obvious: the prisoners are people like you and I, more unfortunate perhaps, but people with all the human complement of laughter and appreciation just like those of us on the "outside." Except that they are perhaps more honest. The numbers they enjoy most are those with a prison connotation. They are not afraid to admit and acknowledge their own dispute with society.

Johnny Cash obviously felt the need for some explanation of the choice of a prison for his recorded concert. He speaks in the sleeve notes so sincerely that I had been almost won over to his point of view before hearing the album. Once one has listened to the audience reaction there can be no doubts left. He was right, so very right, to record in Folsom Prison. Perhaps more of this kind of thing could lead to quicker and more effective prison reform. If so, let us have all the prison recordings the publishers can produce.

Johnny's choice of concert programme gives us: *Folsom Prison blues*, *Dark as a dungeon*, *I still miss someone*, *Cocaine blues*, *25 minutes to go*, *Orange blossom special*, *The long black veil*, *Send a picture of mother*, *The wall*, *Dirty old egg-sucking dog*, *Flush from the bathroom of your heart*, *Jackson*, *Give my love to Rose*, *I got stripes*, *Green green the grass of home* and *Grey-stone chapel*. Hardly inhibited, is he? And the way these prison songs are received can only be described as tremendous.

What could so easily have been a tragic mistake is a resounding success, and the credit for that goes entirely to the sympathy and sincerity of Cash. A remarkable album that must have required great courage to produce. I for one am glad that there are still people who can find that kind of courage.

MUSIC ON TAPE

7½ ips STEREO

Equipment used for review tapes: Amplifiers—Quad valved and Wharfedale transistorised. Loudspeakers—Celestion and Jordan-Watts. Tape Recorders—Akai 3000 D and Tandberg 64X.

THEODORE BIKEL ON TOUR. Elektra EKTP 7230 7½ ips, four-track stereo. 57s. 5d. including purchase tax.

Every now and then one makes a startling discovery; a truly brilliant artist appears on record and yet with a shock one realises that the name is not familiar. Such is the case with Theodore Bikel, although I should have known better because he has recently appeared on BBC television.

What a performer he is? With a delightful sense of humour he sings in Yiddish, English (and authentic Cockney it is too), French, slightly dubious Hungarian (but then Hungarian is an improbable language as he points out), Spanish, Italian, and so on. The whole is linked with a delightfully humorous continuative monologue, and with audience reaction the listener is drawn into the fun and jollity whether he likes it or not. How anyone could not like it I just do not know.

The route for the tour is: *Polyushka, She was poor, J'ai perdu le do, Ti n'avo, Que bonita, Hassade Netsé, Az a szép, Tshiribim, El burro, Doina/Pe ulita, Pakom Pakom, Zvyozdochka, Yankele and Chapt un nemt.*

It is a joy to hear the polished, easy professionalism of this performer. A genuine trouser to his fingernails, he is a real entertainer. With perfect timing the Theodore Bikel concert slips happily by. I played this tape to some friends who have a good knowledge of all the languages he uses and they assure me that the more esoteric items are authentic.

The only complaint came from a very charming Hungarian lady who pointed out to me that he was in error in his description of the difference between Hungarians and Rumanians. Bickel says that they will both try to sell you their own grandmothers—but the Rumanian will deliver. My friend insists he has it the wrong way round; it is the Hungarian from whom delivery could be expected!

For light-hearted gaiety this album is second to none. Recorded sound quality is very good; the only reservation being a slightly over-emphasised top which can easily be corrected at the amplifier. At the price this is really top value for money—it's so good it would still be a good buy at double the cost.

THE BEST OF BIKEL. Elektra EKTP 7225 7½ ips, four-track stereo. 57s. 5d. including purchase tax.

The second Bikel album to be reviewed this month contains one or two selections from many of his twelve Elektra recordings. The sleeve notes point out, quite rightly, that the art of folk singing has now expanded to cover the globe and one is no longer surprised when presented with songs in strange languages. But one doesn't need to understand the language to enjoy Bikel. With beautiful presentation and consummate artistry he glides through the repertoire without putting a foot wrong.

His versatile voice and guitar deal nonchalantly with *Dodi li, Beryuzoviye Kal-*

yechke, Unter a kleyn beymele, Rue, Polerita, Hej pada pada, Piyus, Hulyet hulyet kinderlech, One Sunday morning, Yamshchik gani-ka k yaru, Mangwani mpulele Kum aher du filozof, Ken yovdu and Padrushka milaya. With accomplished ease he slips from broad Irish brogue into some incomprehensible language that is meaningless to me. It doesn't matter. The songs go on and on with all the dedication of the true folk singer. And when the tape is finished one is left feeling more happy and content than when it started.

These Elektra tapes, by the way, are imports from America, and that possibly accounts for the need to apply a little top cut. The Americans prefer their "fi" to be somewhat higher than is generally acceptable in this country, so once again judicious correction is called for.

Let us hope we hear more of Bikel in the U.K. Until then we shall have to make do with these excellent recordings.

3¾ ips STEREO

THE WORLD OF PIAF. Edith Piaf. Columbia TA-SX 6317. 3¾ ips half-track mono. 41s. including purchase tax.

It is impossible to "review" Piaf records. One can only note their existence and then pay yet another tribute to one of the greatest artistes who ever charmed the ear and the heart. Unique as a singer and as an essentially human character she brought delight to millions until her career was cut short by her tragic and untimely death. Throughout her work there is an underlying melancholia, a wistful recognition of the fact that love and life can be as painful as they are joyful. For Piaf the pain ultimately overcame the joy, and the world is sadder for it.

Thanks to modern recording techniques the voice of Piaf lives on and in this album we have: *Padam padam, Les trois cloches, Traque, La belle histoire d'amour, Le diable de la Bastille, Les amants d'un jour, T'es l'homme qu'il me faut, C'est à Hambourg, La vie en rose, Exodus, Les gens, Les fions-fions du bal, Milord, A quoi ça sert l'amour, L'homme de Berlin and Non, je ne regrette rien.* Some of the numbers have obviously been taken from elderly masters of the pre-l.p. days and they suffer a quality loss for that reason; others are surprisingly good with excellent presence and low background noise.

But mere technicalities are as nothing compared to the vibrant personality of the singer. Piaf would still be Piaf whatever the audio quality might be. Since this tape came in for review hardly a day has passed on which it has not been played. In some inexplicable way Piaf manages to sum up all that most of us feel—but cannot express—about the most private moments of our lives. It is impossible to resist the sincerity of Piaf, through her a window is opened to reveal a familiar world of human experience and emotion.

This is a record about which I feel so deeply that any mere recommendation would be too banal for words. All I can say is that Piaf is Piaf and there can be few who will not accept what she has to offer with grateful thanks.

SHINE ON BRIGHTLY. Procol Harum. Regal Zonophone TA-LRZ 1004. 3¾ ips half-track mono. 41s. including purchase tax.

Don't panic when you first play back this tape. The recording has not somehow

mysteriously reversed itself, although that is most certainly the impression given by the opening notes. Fear not; all is well. Just relax and allow the Procol Harum to shine as brightly as they can.

And shine they do. With perfect diction and balance every word can be heard, a pleasant change from certain other groups who appear to revel in noisy unintelligibility. There is both humour and pathos in this collection, together with a leavening of more-or-less hippy philosophy. In the collection are: *Quite rightly so, Shine on brightly, Skip softly (my moonbeams), Wish me well, Rambling on, Magdalene (my Regal Zonophone), and In held 'twas in I—Gimp-ses of Nirvana, 'Twas tea time at the circus, In the autumn of my madness, Look to your soul and Grand finale.*

The whole is a good example of the modern idiom with young people taking a serious look at their own problems and transmuting them into the language of music and song. What a pity so many of the older generation find it impossible to extend a hand across the dividing gulf of years that separates. Actually the only difference is that youngsters today are far more articulate than they were a decade ago. If the general impression is surrealistic, then that is undoubtedly the intention and as such is a faithful representation of what is seen and experienced. Personally I found this tape to have some very moving moments, in spite of some rather transparent recording gimmicks. I like it—very much.

THE SOUND OF LOVE. Liberace. DOT TA-LPD 528. 3¾ ips half-track mono. 41s. including purchase tax.

In recent reviews I have been pleased to comment on the excellent quality of the new E.M.I. 3¾ ips four-track stereo albums. Now we have an issue of half-track mono tapes of the same high technical standard. Some of the credit must go to the new E.M.I. Afonic tape on which the copies are made, but even a top grade tape would not give us such a dramatic improvement unless the high speed copying machines were capable of "delivering the goods." Whatever the methods used it must be admitted that these tape records are a joy to listen to.

Our old friend Liberace returns on this album to give us: *A man without love, The look of love, Honey, By the time I get to Phoenix, Tip-toe through the tulips, Try to remember, Sunny, My man, Live for life, I left my heart in San Francisco, Bye-bye blackbird, Harp étude and It was a very good year.* Plenty of hardy annuals here; in fact ladies and gentlemen, a commercial product that cannot fail to please. Unless, that is, one is looking for something a little deeper and more significant.

Thanks to the fine sound quality the whole is a pleasant, if somewhat innocuous, experience. I was not moved to transports of delight, but the name of Liberace hardly holds out such an expectation. Like so many issues today it is wholly successful as a cheerful and slightly nostalgic background noise that could offend no-one. For which purpose it can be recommended.

Elektra are distributed by Ronlex Productions Ltd. of 36, High Street, Salisbury, Wilts. Columbia and DOT are distributed by E.M.I. Records Ltd. of 20, Manchester Square, London, W.1. Philips CPC, Liberty and CBS are all distributed by Philips Records Ltd. of Stanhope House, Stanhope Place, London, W.2.

YOUR LOCAL DEALER

THE NORTH

CHESHIRE

Charlesworths
HI-FI & CINE CENTRES

112 FOREGATE STREET, CHESTER. Tel. 25075
and 28 HIGHTOWN, CREWE. Tel. 3327

*For all leading makes of Audio and
Photographic equipment*

*Spacious demonstration studio *Easy Parking
*Half Day Wednesday

**CUSSINS &
LIGHT LTD.**

YORK'S LEADING RADIO
TV & ELECTRICAL STORE

Visit our First Floor
TAPE RECORDER
CENTRE

LARGEST RANGE
OF RECORDERS
& ACCESSORIES
IN THE NORTH

**KING'S SQ.
YORK**



TEL.
55666

**TAPE RECORDER
CENTRE (HALIFAX)**

stock all the best
Tape Recorders, Hi-Fi Equipment
Tape, Pre-Recorded Tape, etc.

REVOX
specialist

30 King Cross Street, Halifax
Phone 66832

MUSICASSETTES

- LIBRARY SERVICE
- PART-EXCHANGE
- MACHINES
- LANGUAGE COURSES

Send 1/- stamp for comprehensive list.

THE MUSICCASSETTE SUPPLY COMPANY
2, Hopmarket Yard, Worcester
For Jiffy-fast Postal Service

NEW PRODUCTS

**LOUDSPEAKERS
FROM TRUVOX**

A NEW and larger loudspeaker designated the LS300 has been introduced by Truvox Limited of Hythe, Southampton. It is a floor- or shelf-mounting unit designed to complement the existing Truvox Series 200 range of hi-fi equipment. The smaller Truvox LS200 "bookshelf" loudspeaker continues to be available for users with limited space. The larger LS300 is said to enable discerning users to extract the ultimate in performance from their Truvox TSA200 amplifier.

The manufacturer claims that compared to smaller enclosures the LS300 not only gives greater fidelity but greater "depth" and "presence" to the reproduced music, the effects which are most apparent in stereophonic listening. It is said that a pair of LS300's rapidly create the illusion that one is actually in the presence of the orchestra, adding a new and exciting dimension to listening pleasure.



Impedance of the new unit is 8 ohms and power handling capacity is given as 20 watts RMS (40 watts music power) thus making it suitable for use with the majority of good quality amplifiers. Low frequencies are reproduced by a 13 in. x 9 in. rectangular bass drive unit and high frequencies by a 1½ in. diameter tweeter. Cross-over occurs at 1500 Hertz.

The enclosure is a well-damped infinite baffle having a system resonance of 45 Hertz and it is claimed to be capable of reproducing the full audio frequency range from 45 to 20,000 Hertz with minimum colouration.

The new loudspeaker is housed in a teak cabinet with grey trimmed front panel matching the Series 200 range. Dimensions are 22 in. x 14 in. x 10½ in., weight is 35.5 lb. and the recommended retail price is £46.

In their product-release note the manufacturers stress the fact that loudspeaker preferences are notoriously personal and they entirely agree that prospective purchasers should assess differences between various models by demonstrations—preferably in one's own home. They also add that the Truvox TSA200 amplifier has recently had modifications carried out to the output stages. This now enables the amplifier to accommodate all types of loudspeakers with impedances down to 4 ohms as well as electrostatic models. Truvox will be happy to supply details of this modification to existing owners of their equipment.

Truvox Limited, Hythe, Southampton.

YOUR LOCAL DEALER

LONDON

Masseys Centre
of Sound

West London's Hi-Fi Tape Recorder Specialist
—Demonstration Room with Comparator
APPOINTED FERROGRAPH DEALER

**AT
CHISWICK, W.4**

Accessories, All Kinds—Servicing—Pre-Recorded
Tapes Mono/Stereo

121-123 High Road—10 a.m.—7 p.m.

◀ TEL: CHI 2082 ▶

(not closed for lunch)

LONDON

TAPE RECORDER HI-FI CENTRE
(SHEEN) LTD.

HI-FI EQUIPMENT

TAPE RECORDERS

ACCESSORIES

SERVICE

3 & 4 STATION PARADE, CLOSED WEDNESDAYS
SHEEN LANE, SHEEN, 01-876 0985
LONDON, S.W.14 *Opposite Mortlake Station S.R.*

Lee Electronics

**THE TAPE RECORDER &
HI-FI AUDIO SPECIALISTS**

400 EDGWARE RD., LONDON, W.2 (PAD 5521)

London's leading Stockists of High-Fidelity
and Audio Equipment. Many bargains in
new and reconditioned equipment.

SEND FOR FREE LISTS OF RECORDING
TAPES, RECORDERS, AMPLIFIERS, ETC.
APPOINTED B. & O. AGENTS

THE SOUTH

**THE SOUTH WEST
TOM MOLLAND LTD.**

Invite you to visit their
well-equipped
Demonstration Theatre and
compare all the leading makes of
Hi-Fi and Tape Equipment at
110 CORNWALL ST., PLYMOUTH
Telephone 69285
Immediate delivery to ALL Areas

CLASSIFIED ADVERTISEMENTS

Rate.—One shilling per word: box numbers, 2s. 6d. extra. Payment with copy, which should be sent to Advertising Department, "TAPE Recording Magazine," Prestige House, 14-18, Holborn, London, E.C.1.

FOR SALE

BLACKBURN has Lancashire's leading Hi-Fidelity/Tape Recorder stockists and Electronic Engineers at HOLDINGS AUDIO CENTRE, MINCING LANE/DARWIN STREET, BLACKBURN (Tel.: 59595).

MINIFLUX 4-Track stereophonic/monophonic record / playback heads. List Price 6 gns.—Special Offer 55/- each. **MINIFLUX** 4-Track stereophonic/monophonic Ferrite Erase Heads. List Price £3 10s. — Special Offer 32/6 each, or supplied together (one of each) at £3 17s. 6d. **SKN4** ½-Track stereophonic record/play heads for Transistor Circuits 55/- each. Also ½-Track and full-track monophonic Ferrite Erase Heads complete with technical specifications. SAE for details. **LEE ELECTRONICS**, 400, Edgware Rd., Paddington 5521.

WANTED

GOOD QUALITY TAPE RECORDERS PURCHASED FOR CASH. TELEPHONE: 01-472 2185.

TAPE RECORDS

ABSOLUTELY EVERY AMERICAN 4-TRACK STEREO TAPE released in America can be obtained through our special postal service. For complete and up-to-date catalogue of all releases send only 4s. to: **MUSIC U.S.A.**, 146a, Lower Baggot Street, Dublin 2, Ireland.

TAPE DUBBING

J. & B. RECORDINGS. Tape to Disc—latest high level disc cutting, all speeds. Mastering, pressings, studio, mobile. 14, Willows Avenue, Morden, Surrey. Telephone: 648 9952.

GRAHAM CLARK RECORDS. Tape to Disc Pressings. 23, The Grove, Walton-on-Thames, Surrey. Tel.: WALTON 25627.

JOHN HASSELL RECORDINGS. Tape-to-Disc Service using latest high level disc-cutting system. Quality pressings made. Studio with Bechstein Grand Mobile unit. 21, Nassau Road, London, S.W.13. RIVERSIDE 7150.

YOUR TAPES to DISC, 7 in. 45—22s., 10 in. LP—55s., 12 in. LP—65s. 4-day postal service. Top professional quality. SAE photo leaflet: **DEROY STUDIOS**, High Bank, Hawk St., Carnforth, Lancs.

REPAIRS

SERVICE and professional independent evaluation of "quality" equipment. Normally 3-day turn-round. On-site service by appointment. **HF ENGINEERING**, 3, Willowbank, Sunbury-on-Thames, Middlesex. Telephone Sunbury-on-Thames 83232 (24-hour service).

EDUCATIONAL

Tapespond with the **COUNTRY OF YOUR CHOICE** by means of **ESPERANTO**. Details of Correspondence Course from **British Esperanto Association (TR)**, 140, Holland Park Avenue, London, W.11.

TAPE EXCHANGES

FRIENDLY FOLK ASSOCIATION, Torquay (Est. 1943). Social introductions, Pen-friends, Book-lovers, Stamps, Photography, Tapesponding. Members 100 countries.

THE LONDON TAPE RECORDING CLUB had its eleventh birthday last year. Our meetings, held monthly in the Charing Cross area, are lively, creative occasions, and prospective new members will be welcome. Please write for details to: **The Secretary, Mr. C. Clements**, 36, Hubert Road, London, E.6.

"**ESPERANTO TAPEFRIENDS**" **HORLEY**, Surrey, links the continents with one language.

WORLDWIDE TAPESPENDENTS. FREE SOUND MAGAZINES. **FAR & WIDE RECORDING CLUB**, 117, Plains Avenue, Maidstone. SAE.

MAKE INTERESTING NEW FRIENDS. ALL AGES OVER 17. Send SAE for free details. **VICTORY BUREAU**, 34, Honeywell Road, London, S.W.11.

MISCELLANEOUS

ALWAYS BE CAREFUL (and money wise) before buying quality equipment. Send your requirement list to **AUDIO SUPPLY ASSOCIATION** for evaluation and quotation. See below

HIGHEST CASH PRICES offered for good quality Tape Recorders and Hi-Fi. See our advert. page 257 this issue. **R.E.W.**, 266-8, Upper Tooting Road, London, S.W.17.

IF QUALITY MATTERS consult first our 70-page illustrated catalogue with technical specifications (5s. 6d.). Members enjoy unbiased advisory service, preferential cash terms. Membership 7s. 6d. Our Associates also manufacture records from your own tapes, or record the Master at our studios (Steinway Grand). Bulk terms for choirs. (Excellent fund-raiser). Please specify requirements. **AUDIO SUPPLY ASSOCIATION**, 18, Blenheim Road, London, W.4. 995 1661.

PLEASE MAKE USE OF THE ADVERTISEMENT INQUIRIES COUPON BELOW

Complete details of products in which you are interested, fill in your name and address, fold and post. No stamp required when posted in U.K.

For more information on our new Handbook "Documentary Programmes on Tape" please turn to page 256 in this issue



makers of the famous
PARABOLIC REFLECTOR

FOR WILDLIFE RECORDING

JACW/X/1



FULLY GUARANTEED

Size Base	Standard		Long	
		P.V.C.		
3"	150'	2/6	225'	3/3
4"	300'	4/3	450'	5/6
5"	600'	8/9	900'	10/3
5½"	900'	10/6	1200'	12/6
7"	1200'	12/6	1800'	17/9

Size Base	Double		Triple	
	POLYESTER			
3"	300'	4/6	600'	9/3
4"	600'	8/6	900'	13/3
5"	1200'	15/9	1800'	23/6
5½"	1800'	19/9	2400'	29/9
7"	2400'	22/6	3600'	39/9

Factory Fresh. Superb Quality. Leaders, Trailers and Stop Foils on all sizes 5" and above. We supply many local authorities and professional recording studios. May we supply you? P. & P. 2/6 per order. S.A.E. Full Lists.

LEDA TAPES (T), 17 Leigh Pk. Rd., Leigh-on-Sea, Essex
LONDON OFFICE: Phone: 01-226 7004

RAPID RECORDING SERVICE

LPs FROM YOUR OWN TAPES
48-HOUR SERVICE

MASTER DISCS AND PRESSINGS
RECORDING STUDIO DEMONSTRATION DISCS
MOBILE RECORDINGS—ANY DISTANCE

Multi-channel facilities for transfer to 8 or 16mm film tracks. Sound effects library on discs.

Brochure on request from

Rapid Recording Service
21, BISHOPS CLOSE, LONDON, E.17

● TRM BINDER

Tape Recording Magazine Binder in two-tone green, gold stamped on sturdy spine. Insert your copies of TRM month by month as they are received to form a smart, complete and tidy volume.

14/6
Post Free
16/3
Outside UK

PRINT & PRESS SERVICES LTD.
Prestige House, 14-18 Holborn,
London, EC1

WIMBLEDON'S TAPE RECORDER CENTRE

SKILLED TAPE RECORDER REPAIRS carried out by expert personnel of many years' experience backed by extensive test equipment—Wow and Flutter Meter, Audio Valve Voltmeter, Audio Generator, Oscilloscope, etc. with final test performance figures quoted if required. Ferrograph specialists.

Tape Recorder Centre TEL-LEE-RADIO
220 The Broadway, Wimbledon, S.W.19. 01-542 4946

RAPID RECORDING SERVICE

L.P.s from your own tapes. Master discs and pressings. Recording Studio. Multi-channel facilities for transfer to 8 or 16 mm film tracks. Sound effects library on discs.

Associated Company
EDUCATIONAL RECORDINGS LTD.

The Art of Conversation

Many people suffer from loneliness simply because they are unable to express themselves as they would wish. These people are missing things in life. Happiness and success go hand in hand with the ability to make good conversation.

Send for particulars of this and 20 other tapes on self-improvement.

Distributors of the Cassette battery mains Sleep-o-matic Unit, Pillow speakers, Time Clocks.

Publications: "Sleep-learning. Its Theory, Application and Technique."
"Mental Power through Sleep-suggestion."

Brochures from:

RAPID RECORDING SERVICE, 21 Bishops Close, London, E.17

The Berean Tape Service

(NON-DENOMINATIONAL)

Loan of over 1,000 reliable expositions of the Bible available on tape (3½ ips) for cost of postage only. For Bible Study groups or private meditation. Supporting literature also available. Details from: Miss R. Hammond (TRM), Burwood, Blofield, NORWICH, Norfolk. NOR 84Z.



To all TAPE Recordists: P.V.C. & Polyester Tapes
BUY BRITISH
YOU SAVE MONEY AND



SAVE THE POUND

"A STERLING IDEA"
"... high quality and rapid service I have found in you ..."

N.F.H. of Canterbury.

The playbacks are crystal clear and I am sure no better results could be obtained by other dearer brands on the market.

Yours sincerely,
W.S., Hants.

FREE Library case with £5 orders

New	3"	5"	5½"	7"
Standard Play each	150'	600'	850'	1200'
3 for	2/-	5/6	7/-	8/6
6 for	5/9	16/-	20/-	25/-
	11/3	31/9	39/6	49/-
Long Play each	240'	900'	1200'	1800'
3 for	3/-	7/6	9/6	12/6
6 for	8/6	22/-	27/9	36/9
	16/9	43/3	54/9	82/6
Double Play each	300'	1200'	1800'	2400'
3 for	4/3	11/-	15/-	19/9
6 for	12/3	32/3	44/-	58/3
	24/6	63/9	87/-	115/3

Mora Trading Co. (T24) Postage 1/9 per order.
Mora Works, Mora Road, N.W.2
Posted the same day.
Money-back gtd.

ADVERTISEMENT INQUIRIES SERVICE

I should like further information about
Messrs 's advertisement
on page..... of TAPE Recording Magazine
about..... (product)
NAME.....
ADDRESS

August 1969

This is a special service for readers of "TAPE Recording Magazine." It enables you without cost to get fuller information about those products in which you are particularly interested. Fill in one coupon below for each inquiry, with your name and address in block capitals in each case. Then cut out the whole of this section, following the dotted line, fold as indicated overleaf and post to us.

I should like further information about
Messrs 's advertisement
on page..... of TAPE Recording Magazine
about..... (product)
NAME.....
ADDRESS

August 1969

I should like further information about
Messrs 's advertisement
on page..... of TAPE Recording Magazine
about..... (product)
NAME.....
ADDRESS

August 1969

I should like further information about
Messrs 's advertisement
on page..... of TAPE Recording Magazine
about..... (product)
NAME.....
ADDRESS

August 1969

I should like further information about
Messrs 's advertisement
on page..... of TAPE Recording Magazine
about..... (product)
NAME.....
ADDRESS

August 1969

DID YOU KNOW—

- That **TAPE RECORDING MAGAZINE** was the First Publication of its kind in Europe.
- That it is still the Best Tape Recording Magazine.
- That it is the only Tape Recording Magazine staffed by Enthusiasts for Enthusiasts.
- That you can ensure receiving your regular monthly copy by completing one of the two coupons opposite.
- **THAT TAPE RECORDING MAGAZINE POSTAL SUBSCRIPTION IS STILL ONLY 25/- PER ANNUM.**

TO MY NEWSAGENT

I would like to be sure of receiving **TAPE Recording Magazine** regularly. Please order it for me.

NAME

ADDRESS

*TAPE Recording Magazine is distributed by Seymour Press Ltd.
334 Brixton Road, London, S.W.9.*

TO THE PUBLISHERS

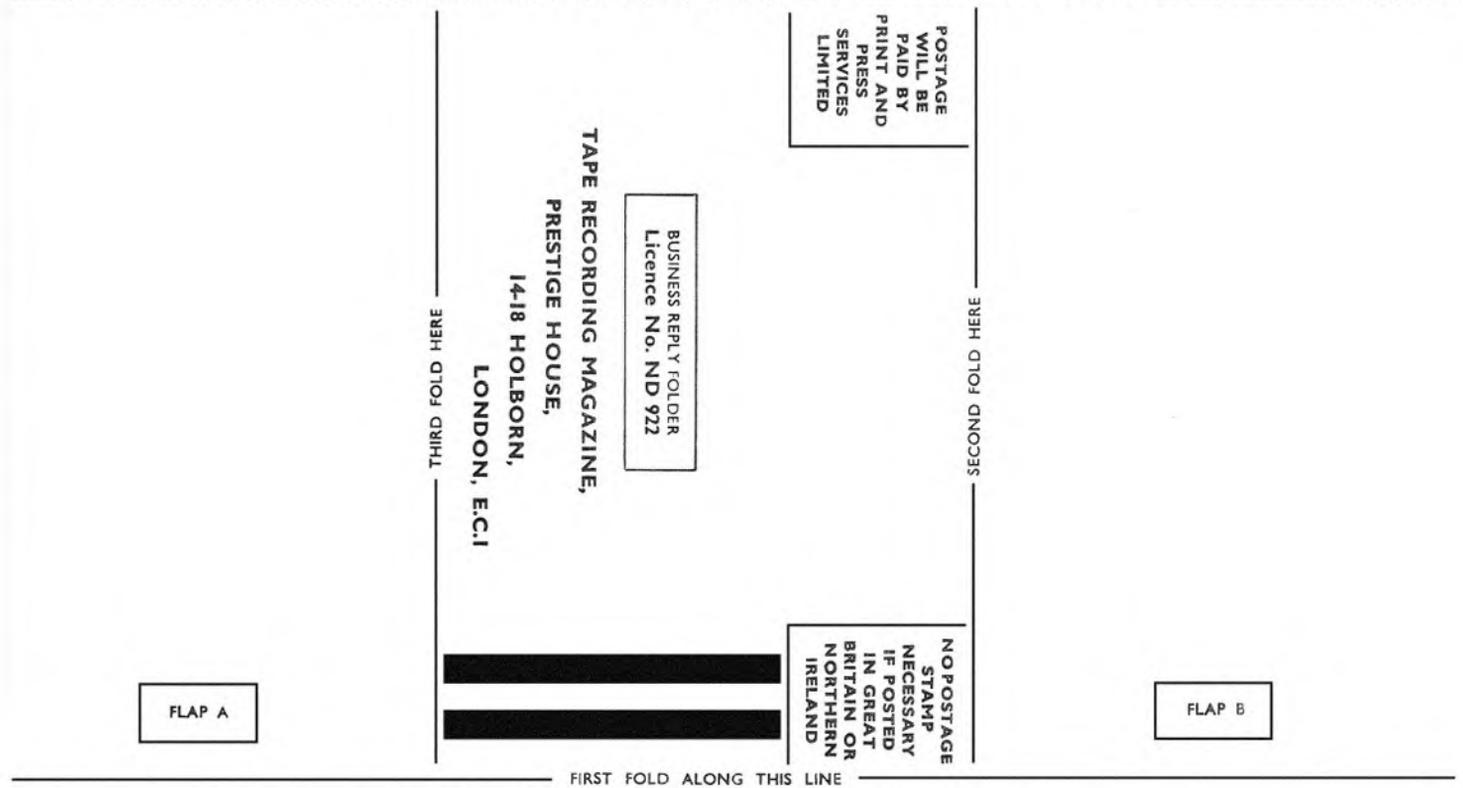
Please post me a copy of **TAPE Recording Magazine** regularly. I enclose 25/- as a subscription for one year (USA \$3.75, AUSTRALIA \$3.75).

NAME

ADDRESS

Post to: TAPE Recording Magazine, Prestige House, 14-18 Holborn, London, E.C.1.

CUT ALONG DOTTED LINE



Fold along lines as indicated and then tuck Flap A into Flap B

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.

How to Record Weddings by Paul Addinsell.

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

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

Documentary Programmes on Tape
By Peter Bastin

5s. (USA \$1.25) post free

The Law and Your Tape Recorder by Andrew Phelan (Barrister).

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

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

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 Recorder by Henry Woodman.

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

MAIL ORDER ONLY

REMITTANCE MUST ACCOMPANY ORDERS

Send Orders to—

PRINT & PRESS SERVICES LTD.
Tape Bookshop, 16a Bevis Marks,
London, E.C.3.

**TAPE
BOOKSHOP**

THE CITY TAPE RECORDER CENTRE

**228 BISHOPSGATE
LONDON, E.C.2**

Telephone: 01-247 2609

Opposite Liverpool Street Station

Hours of Business:

MONDAY to FRIDAY 9 a.m. to 6 p.m.

Closed all day Saturday

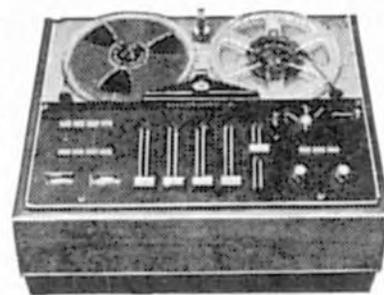
OPEN SUNDAY

10 a.m. to 2 p.m.

At the City Tape Recorder Centre you can see one of the finest selections of tape recorders on display in London. Every leading make and model from Akai to Vortexion.

We are easy to get to, being almost opposite Liverpool St. Station and remember we are the only tape recorder specialists in Gt. Britain open on Sunday!

Do your weekly rush shopping on Saturday with your wife and visit us on Sunday at your leisure!



NOW IN STOCK

The complete range of B. & O. Tape Recorders and Audio Equipment including the latest B. & O. 2400 T listed at £210.

STILL AVAILABLE—Limited number of B. & O. 2000K and T at 152 gns. and 158 gns. Personal callers only.



Our manager, Bob Hookings, is a keen tape recording enthusiast. Bang & Olufsen's are his speciality, having used B. & O. equipment for several years, his knowledge of this wonderful range is second to none. He is able to give personal callers his expert advice (please avoid telephoning) not only on B. & O. but on any other re-order suitable to your individual requirements and pocket.

- ★ GENEROUS PART EXCHANGES
- ★ FREE AFTER SALES SERVICING
- ★ UNBEATABLE SPECIAL OFFERS
- ★ EXPERT STAFF EXPERT ADVICE

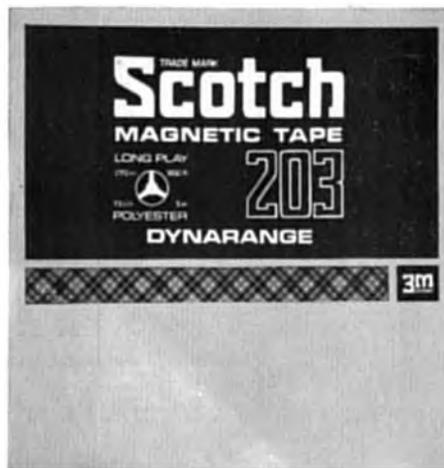
THE BANG & OLUFSEN SPECIALISTS

When in the City — call in at the City!



If you can't hear the difference

**in 'Scotch' 'Dynarange'
tapes, maybe you should
have your ears checked**



'Scotch' low noise 'Dynarange' magnetic tape is the one professionals prefer. It has been manufactured to the highest standards of the expert who wants to get the best from his equipment.

Scotch | **3M**
MAGNETIC TAPE | COMPANY

Professional Recording Studios use it every day

3M, 'Scotch' and 'Dynarange' are trademarks