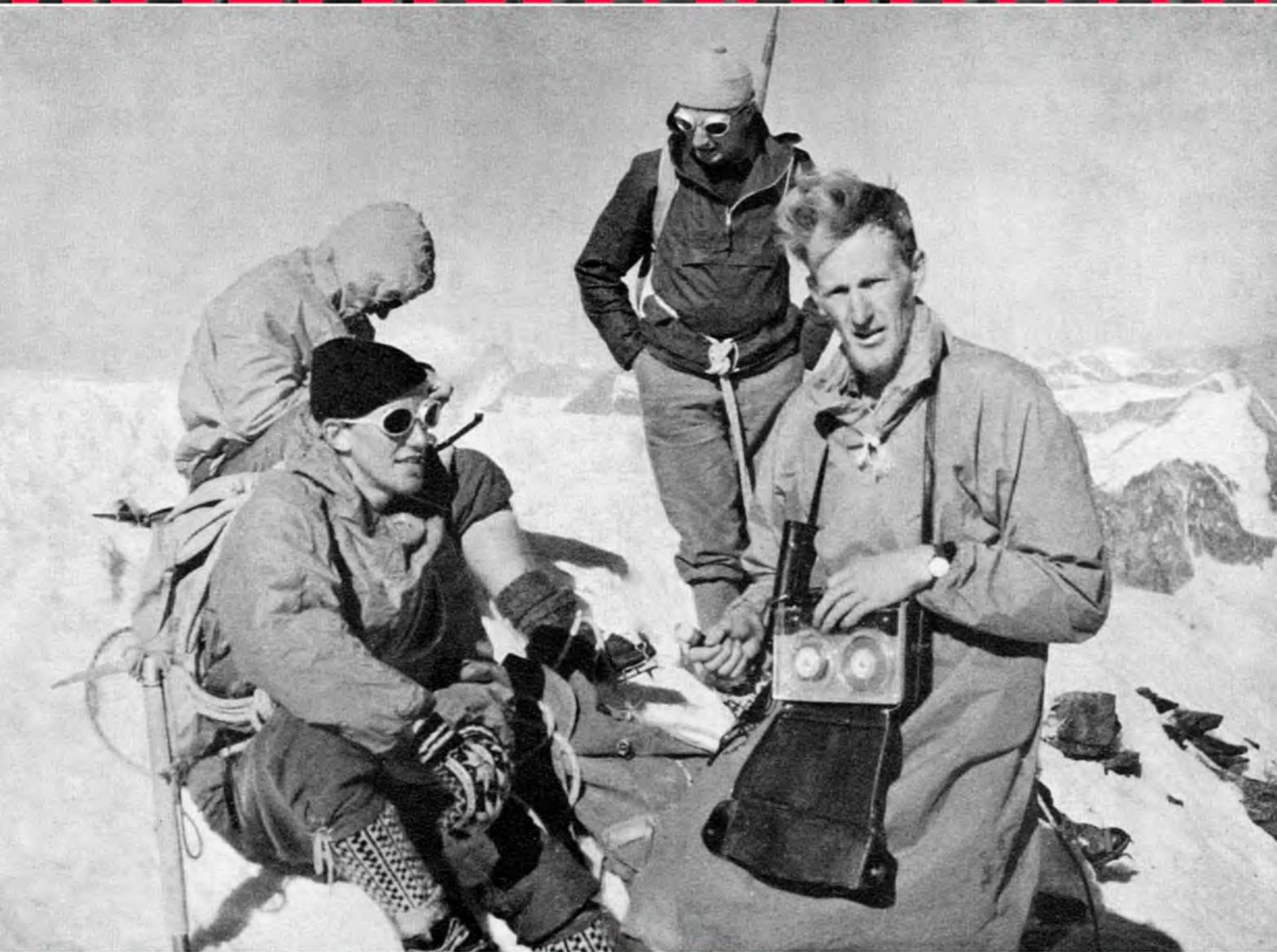


JANUARY 1964

TAPE

RECORDING MAGAZINE

24



IN THIS ISSUE

- Recording for the B.B.C.
- Producing a contest tape
- Transistors in tape recording
- Equipment tested
- Reviews of tape records
- Drama production on tape
- New Products
- Do-it-yourself feature
- Club news

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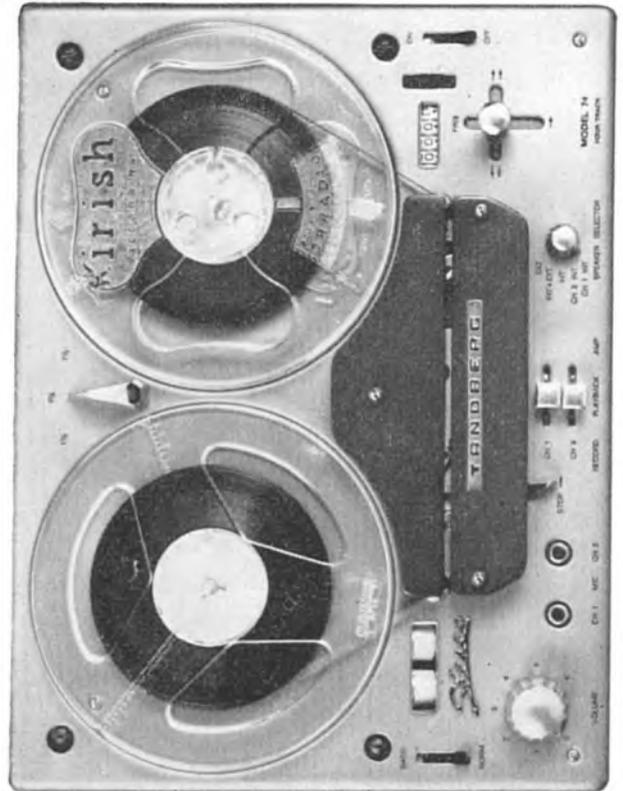
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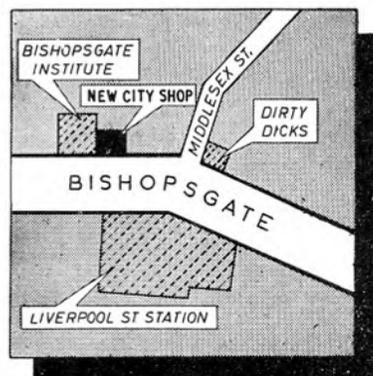
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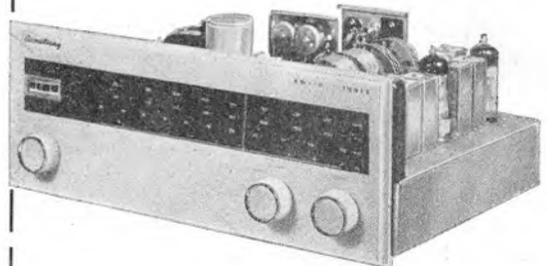
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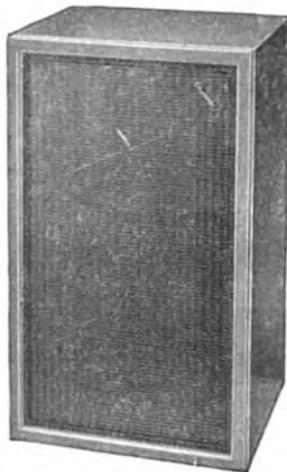
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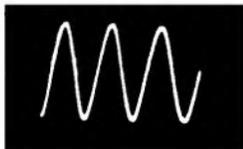
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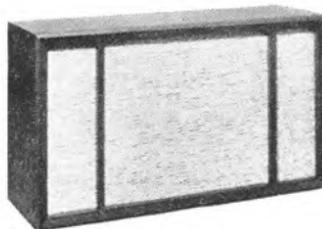
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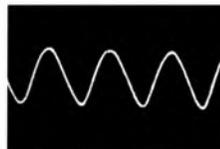
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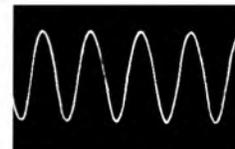


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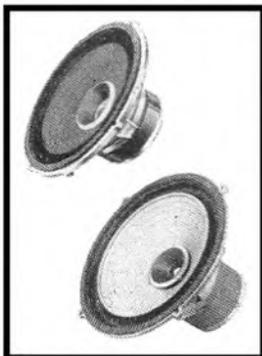


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TAPE

RECORDING
MAGAZINE

Vol. 8

No. 1

January 1964

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COVER PHOTOGRAPH: A truly hi-fi recording with a Fi-Cord 202 as Hamish MacInnes interviews Peter Gentil, a British mountain guide, on the summit of the Matterhorn. Mr. Gentil led a party collecting film material for B.B.C.-TV.

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Back numbers, if still in print, are available at 2s. 6d. per copy for issues up to November 1959, and 2s. per copy for later numbers.

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EDITORIAL

Editor,
R. DOUGLAS BROWN

Assistant Editor, FRED CHANDLER

ADVERTISING

Advertising Manager,
MISS PAMELA DURHAM

Tape trends and tape talk

By the Editor

IN THE NEW YEAR the BBC Network Three programme *Sound* is to be transmitted twice each month; as in the early days of the series, each programme will be repeated a fortnight after its original transmission, and at a different time. This should extend the audience, as the present Sunday teatime transmission may not be convenient to everyone.

With this decision, *Sound* seems to have re-established its claims as an important and valuable programme for the amateur radio and recording enthusiast. I know that it has many listeners overseas, as well as its home audience. In many other countries this programme—like much of the BBC output—is regarded as a model to be imitated.

George Angell, the present producer, has some ambitious ideas for future programmes and I think that *Sound* is developing an appeal to a much wider audience than ever before.

I was astonished to discover, however, when I spoke to John Clarricoats, the secretary of the Radio Society of Great Britain, recently, that most of his members were unaware of the programme. Clearly if it can be publicised more vigorously there is a bigger audience waiting.

Recently I made acquaintance for the first time with a BBC Overseas programme called Short-Wave Listeners' Corner. This is another programme which caters for the amateur enthusiast and it has listeners throughout the world. I was delighted to report to them on the recent International Recording Contest.

LAUGH WITH JEEVES



"I said that I'd let you record the bull, but I didn't say that he would."

Tape and the Law

MR. GERALD GARDINER, Q.C., has raised an interesting point with his suggestion that statements made to the police by persons arrested should be tape-recorded. Readers may have seen the report in the *Observer* in which I gave my view that this is technically possible now and heard the discussion which I had subsequently with a lawyer in a BBC current affairs programme.

Much of the disquiet which appears to have developed recently about police methods might be dispersed if tape were used in this way.

The only difficulty, of course, is to get a tape which cannot be interfered with in any way.

The tape cassettes which are already in use in this country for broadcasting "canned music" in factories, using the continuous loop principle, appear to meet the need.

The type of cassette used is sealed and tape movement is in one direction only—the tape cannot be reversed. After ninety minutes of playback the loop is completed and the programme is repeated.

It would clearly be possible to adapt this arrangement to give ninety minutes of recording time. Once the tape had passed the recording head it would be impossible to draw it back or to erase it or to remove it from the cassette without damaging it.

With the existing type of continuous loop, it would, of course, be possible to tamper with the tape on a subsequent run-through, but it would seem a simple matter to break the loop so that when the available length of tape has been recorded the machine would cease to function.

In this way, statements could be taken from prisoners and not only their words but the questions put to them and the tone of voice of the questions and answers would be preserved for subsequent examination.

Tape may be at the point of breakthrough on another, important, front.

Stereo and the BBC

WHAT OF STEREO broadcasting?

There is still no firm news that the BBC will inaugurate regular stereo programmes in the next year or so—European agreement seems to be still some way off.

But I find a general disposition to accept that the Zenith Multiplex which is the subject of current BBC experiments and which has been officially adopted in America is likely to become a world-wide standard.

If one of the European broadcasting concerns decided to break away and go ahead with a stereo service using this technique, I believe the BBC might decide to follow.

Although, officially, we may yet be several years away from regular stereo broadcasts, it would not surprise me if they started up at quite short notice.

Dramatape miscellany

By PERSPECTIVE

THIS month an inquiry from D. S. Hart, of Blackheath, London, is important enough to merit full discussion. He recently wrote to ask which branch of Dramatape would suit his "lone-wolf" temperament. He describes himself as "not very good at acting, having weak diction," and asks if "there is something creative a person can do, on his own, with a recorder. After all, a person can work alone with a camera."

This question has a familiar ring. So does a shrewd observation I'll quote from J. B. Cartmell's Magazine-in-Sound, *Concord*, which circulates from Rochdale: "Unfortunately, we often find people who claim tape recording for a hobby but inexplicably find very little to record."

The answer (I suggest) is a medium we'll refer to as *aural mime*. Put simply, this is the art of telling stories in sound effects. No speech is used whatsoever—except for the announcement of the title. All you need is a tape recorder and (possibly) a well-stocked kitchen. The "ingredients" are simply household articles: rice, egg-beaters, corn-flakes, etc.

Mime, of course, is an international art; and it's usually presented (on stage) without any sound at all. *Aural mime* is simply a form in which the action is invisible. It presents a sequence of "audible actions"—the kind we make every day around the home. Hang a picture on the wall and your unseen neighbour can often follow every move. The steps are dragged into position . . . a nail is hammered in . . . and so on. There are dozens of similar audible actions: chopping wood, scrambling eggs, scrubbing floors, peeling potatoes. Try recording them for practice—you'll learn a lot about sound-effects this way.

These audible actions only become *mime* when you use them to depict character and situation. Hanging that picture, for example. An efficient young housewife will sound completely different from a crusty old bachelor. You can bring both these characters to life by operating suitable effects in a suitable manner. The housewife

will mount the steps confidently; she will tap at the nail delicately but smartly; then she will dismount, neatly. But the old bachelor will clamber up slowly . . . he will drop the nail ("ting!") and clamber down. Possibly the nail will roll under the piano . . . so he lugs the piano aside. A vase of flowers topples and hits the keys with a crash . . . dripping water is heard; he gets a bucket and mops up. Eventually, he remounts the steps and bangs away with the hammer. The wall disintegrates; he is compelled to descend and mix some fresh plaster . . . and so on.

You can actually produce half-a-dozen versions of these simple incidents—according to the type of character you portray. You are, of course, "acting" through sound effects. It's no good mixing ingredients together and "hoping for the best." The acoustic and perspective elements of drama-in-sound must still apply.

You can often enact the literal movements of the characters—although this tends to lessen your control over extraneous noise. Obviously a hammer-and-nail can be the real thing; but sawing down a tree or blowing up a bridge are best performed on the effects-bench. But don't think each sound must necessarily be the actuality-sound. You'll often need to stylise them. The *ting* of that falling nail is an example where exaggeration is called for. Remember the

need for sub-audition, however—the art of leaving certain sounds to the listener's imagination. Never try to include *every* sound; all you need is a strictly selective sequence.

Invisible mime is a strange dimension at first; but you'll soon progress to complete sketches if you practise simple exercises. A typical sketch is published on this page.

Although the emphasis is usually on comedy, there's no reason why you shouldn't develop more serious (even poetic) narratives. Direct speech should be excluded from the convention, but the distant murmur of crowds, talking birds, audio-apparatus, etc., can obviously be classified as legitimate effects.

The title is very important—it's there to influence the listener's association of ideas. Choose it carefully. ("The Apprentice Fireman," "Smash and Grab," "The Last Bottle of the Vintage," "It was Only His Income-Tax Demand," are typical titles we hope to include in the series.)

A final tip: make your mimes at leisure. *Let the tape run* while you prepare the manipulations. A knight-in-armour falls down a spiral staircase . . . all right. You can't dash down a passage (beating a bucket with a stick) *and* attend to the recorder! But you can always edit-out the intervening surplus—and splice your tape into a close-knit sequence.

Two-minute tape sketch by David Haines

THIS month's sketch is a simple example of "aural mime." Note that it's written in a subjective form known as a *treatment*. Your job is to examine this treatment and list all the sounds in consecutive order—with notes on how you'll tackle them. And that's your *recording-script*. It's possible to work straight from the treatment, but a script is more systematic.

Announce the title twice—first, in a normal tone; then again with a deliberate enunciation.

PRODUCTION NOTES:

1. Note the perspective construction, i.e. the microphone is supposedly set up by an imaginary bed. All movement is in relation to this position.

2. The cockerel can be made to "keel over" by deliberately slowing a disc of the effect. Alternatively, the same impression can be achieved vocally.

"DAWN ON THE FARM"

We hear a distant cock crowing. It crows again, louder. And again, louder still.

We hear someone getting heavily out of a nearby bed. Feet are shoved loosely into boots. The cockerel crows again. Footsteps clump across a wooden floor to the window; the window is slid shut. The cockerel crows again—but distantly and muffled. The footsteps clump back to the bed. Boots are kicked off. We hear the creak of springs as the bed is re-entered. Silence. . . .

The muted cockerel crows again. The bedclothes rustle defensively, as of someone snuggling deeper. The cockerel crows again, slightly louder. Then again, louder still.

After a moment's silence, it crows yet again—clear and strident.

The bedclothes are thrown back. Feet are shoved into boots. Footsteps clump to the door. A latch is raised and the footsteps depart down wooden stairs. The cockerel crows again. We hear a distant door open. The cockerel crows once more. . . . But this time there is a gunshot—and the cockerel is checked in mid-crow.

The downstairs door is then shut. Footsteps clump steadily up the stairs, re-approaching us. The bedroom door is then shut. The footsteps clump across to the bed. Boots are kicked off. The bed is re-entered with a creak of springs. Silence. . . .

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TRANSISTORS IN TAPE RECORDING

THE HISTORY AND
DEVELOPMENT OF
TRANSISTORS WITH SPECIAL EMPHASIS ON
AUDIO TRANSISTORS. FIRST PART OF A
SPECIAL FEATURE BY HARRY MACK.

THE transistor has been with us for fifteen years. In that time, it has revolutionised the electronics industry. Its smallness and low-power demands have made possible the development of truly portable equipment. Not only has it invaded our beaches in the form of the "personal" radio set; at the last Radio Show there was at least one fully transistorised television receiver in view, and the audio field is gradually succumbing to the special advantages claimed for semi-conductors.

Tape recorders have always rejoiced in their special virtue of portability—even though many so-called portable models need a strong-arm approach.

OF major importance in the production of transistors is the metal Germanium. Deriving from such widely differing sources as Katangan copper ore and the flue dust from Northumbrian coal, the raw material comes to the factory in the form of germanium oxide, a white powder. The germanium in a transistor takes the form of a minute wafer, maybe only $1\frac{1}{2}$ mm in diameter, and the two most important things about this wafer are its purity and thickness. Traces of impurity have a considerable effect on the conductive properties of the germanium and they must be carefully controlled by various refining processes. The thickness of the wafer determines the type of transistor in which it is to be used and it undergoes several accurate cutting, grinding and etching processes before it is graded according to thickness.

The pictures on these pages were taken at the Mullard factory

Yet there has not been a startling take-over from valve techniques, and it is only now that a number of "domestic" models are reaching the market with mains-operated, transistorised circuits and the high class performance the enthusiast has come to expect.

Part of the reason for this slow development was undoubtedly the paradox of the transistor's rapid progress. Designers are understandably reluctant to commit themselves to quantity production that may be out of date before the ink on the drawings is dry. But the situation at present is that transistor circuit design has become more settled. We shall see a wider use of transistors as the production programmes enable their prices to come down, and as designers of the associated components and circuits pass on the benefits of their research. It is up to us, therefore, to get a little more

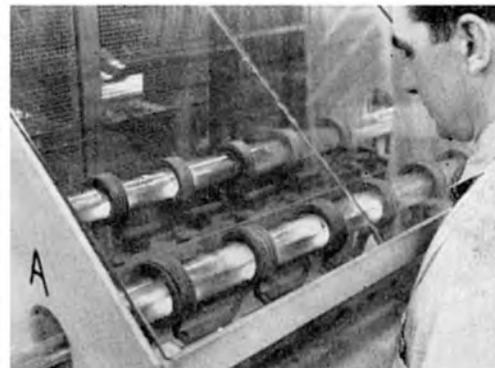
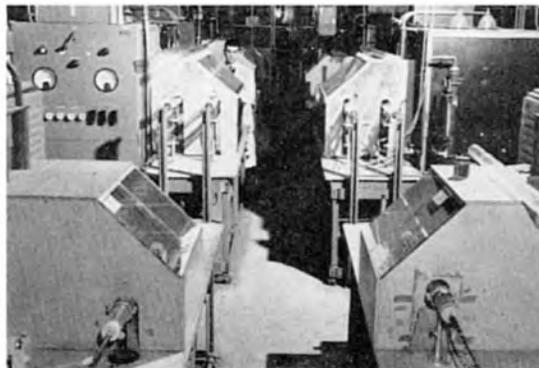
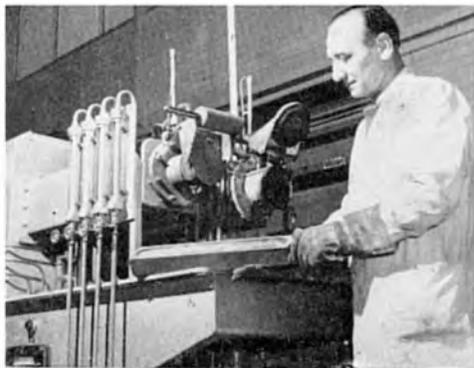
closely acquainted with the transistor, and some of its circuits.

"SOLID-STATE" ELECTRONICS

The transistor is a semi-conductor. In some respects it may be regarded as a development of the crystal detector used in the early days of radio, and now, in slightly different form, the semi-conductor diode. As the name implies, a semi-conductor has the peculiar electrical property that it is neither a resistance nor an insulator to the flow of current. Its characteristic is that it offers a high resistance to the flow in one direction and allows a greater current flow in the opposing direction by offering a different resistance. The semi-conductor diode *D* in Fig. 1(a) is used to rectify a small a.c., applied from the secondary winding of the transformer *T*. Rectifying action takes place at every half-cycle, when the voltage applied to the anode end of the rectifier is positive. Current flows freely,

and show some of the complex chemical and physical operations required before a germanium wafer is ready for use.

The germanium dioxide powder is reduced to germanium by heating in an atmosphere of hydrogen gas. Our first photograph shows a tray of germanium powder removed from the reducing furnace. Subsequently it is fused into a bar, and it is then ready for a purification process known as zone refining. The next photograph is a general view of the zone refining and levelling sections. The zone refining process purifies the germanium to 99,999,999.99 per cent pure, a higher degree of purity than for any other manufactured article. The levelling process entails "doping" the germanium with a measured quantity of antimony, to give it the correct conduction properties, and at the same time recrystallising the bar to give it consistent electrical properties.



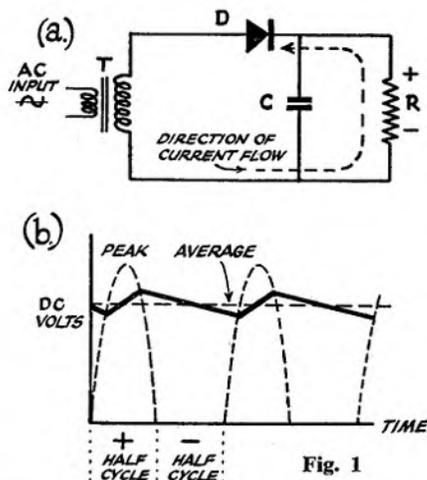


Fig. 1

and the condenser *C* charges up. During the negative-going swing of the applied voltage, the diode acts as a high resistance, opposes the current flow, and *C* tends to discharge through its load *R*. The values of these components may be chosen to give a controlled rate of discharge, so that the positive-going swing of the next half-cycle recharges *C* before too much of the charge is lost. We say that *C* charges up to a certain proportion of "peak voltage." Thus, from the alternating input of *T* we obtain a unidirectional voltage across *R*, its value fluctuating slightly about the mean rectified voltage as shown in Fig. 1(b).

All this is old hat. The properties of semi-conductors were familiar to the early Victorian scientists, long before the many practical applications of their use became possible. Indeed, it is said that the rectifying action of certain solid substances was discovered in 1835, although it was not until the early 1870's that science sat up and took notice.

In 1873, Willoughby Smith, testing underwater telegraph cables, found that selenium varied in resistance according to the amount of light shining upon it. A year later, F. Braun did some experiments with semi-conductor rectification and in 1876 the efficient rectifying property of selenium was established.

For some years this, and other properties

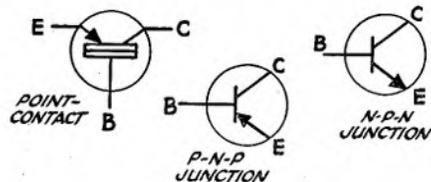
of similar materials, interested the scientists, but the next significant date is 1904, when Fleming produced the thermionic valve diode, as a detector, and J. C. Bose simultaneously patented a crystal diode for the same purpose.

We all know the immense popularity of the crystal diode detector in radio's early days. Images of Grandad hunched over the "cat's-whisker," a tangle of wires and earphones, provides us with some amusement. But the silicon diode used in those days, as invented by Pickard in 1906, and improved and patented by him three years later, was a direct forerunner of modern devices. Silicon and germanium have been, for many years, the principal materials used in the construction of semi-conductors.

World War II brought rapid developments, and in 1941 the junction diode was born. (Previous types were known as "point-contact.") Immediately after the war, intense research activity was brought to bear on the subject of germanium junctions, particularly by the Bell Telephone Laboratories, in the USA.

It was found that when a current was passed through a piece of germanium via a pair of contacts on one surface, the flow through one contact affected that through the other. This is in some ways analogous to the effect of valve currents, when a change in grid conditions causes a change in anode conditions. In 1947, Bardeen and Brattain demonstrated a new device, a crystal amplifier.

This first transistor—the name derives from a combination of the two words *transformer* and *resistor*—was of the point contact design, as shown in Fig. 2(a). The block *B* is a wafer of N-type germanium, to which the two thin contacts are applied. The whole thing is rather like a pair of diodes with the single wafer of germanium in com-



Transistor symbols

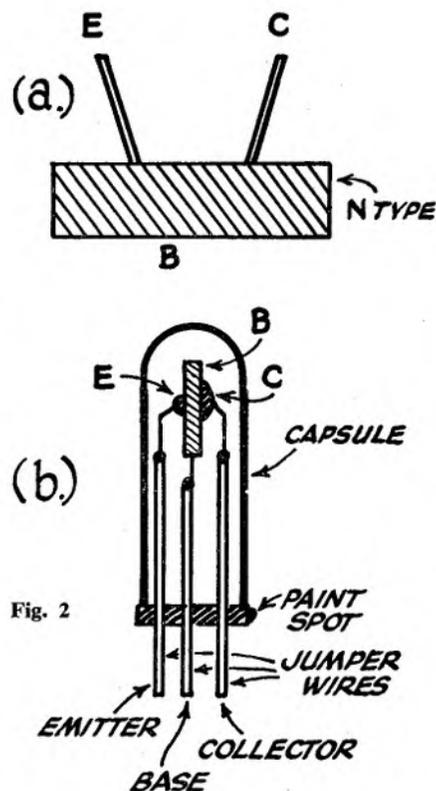


Fig. 2

mon—with the important difference that correct choice of operating potentials can produce a controlled amplification.

N-type material has been mentioned. Without going too deeply into atomic theory, we may consider this a material with negative carrier current and its partner, P-type, with positive carrier current. The formation of P and N semi-conductors requires considerable explanation which would not advance our main theme. It is sufficient to describe the formation of what is perhaps the most widely used type in transistors used for tape recording—the p-n-p. Fig. 2(b) shows the physical arrangement.

(Continued on page 23)

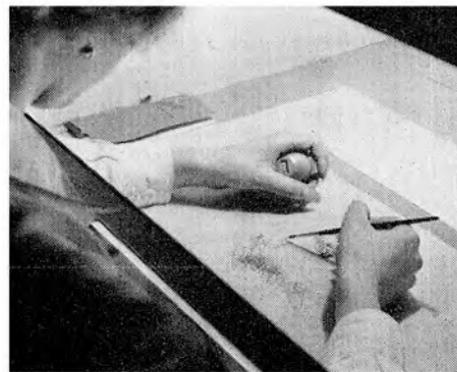
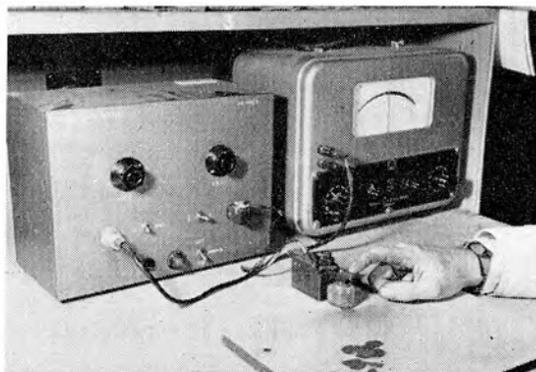
Next is a close-up on a zone refining unit. The radio frequency heating coils produce zones of molten germanium and as the bar is drawn slowly through the coils these molten zones travel the length of the bar, "sweeping" the impurities to one end. This end portion is then cut off. Zone refining is followed by levelling, whereby a previously refined "seed" crystal of germanium is placed at one end of the bar and small pellets of antimony are inserted between the two. The antimony is then evenly distributed throughout the bar by a process similar to zone refining, but using only one molten zone.

The refined and levelled bar is cut into thin slices by a highly accurate machine something like a miniature bacon slicer. This machine has cutting wheels of diamond and the bar is positioned by means of x-rays. After this the slices are lapped (photograph four),

a form of accurate grinding whereby any crystals damaged by the cutters are removed from the faces of the slice.

After lapping, the resistivity of each slice is measured to determine the type of transistor for which it will be suitable. After resistivity testing (photograph five), the large slices are cut into square or round wafers, by diamond cutters or ultrasonic drills. These wafers may be only 1½ mm across, and are worth more than their weight in gold.

The final photograph shows the counting and sorting of the tiny wafers of germanium which form the base of the transistor. The girls who do this exacting task are highly trained and can tell at a glance, by eyesight alone and without the help of any mechanical aids, whether a wafer is at all "off square" or has been damaged in any way during its processing.



ON July 2, 1958 the BBC Home Service broadcast "The Ballad of John Axon." This was the first essay, by Ewan MacColl, Peggy Seeger and I, in the form which has since become known as the radio ballad and which, from this first story of a railwayman, has been extended to civil engineering workers, herring fishermen, coal miners, polio sufferers, teenagers, boxers, and currently, gypsies and tinkers.

It is a form which consists essentially of field tape recordings, nearly always in the vernacular; songs written in or derived from the traditional modes organically related to the field recordings; and orchestration similarly dictated by the material and its acoustic environment (i.e. "sound effects") and ranging from the most austere and "ethnic," for example the Uilean pipes, to out and out jazz instrumentation.

John Axon was an engine driver who was killed in a runaway goods train crash in the Peak district in 1957, and posthumously awarded the George Cross for his gallantry, and in "The Ballad of John Axon," we tried in telling of him to tell of the whole way of life of the railwayman. The response to the programme was staggering. It was immediately apparent that here was a form which could achieve something of a breakthrough in popular art; for by speaking in the unquestionable accents of everyday experience, we were able to evoke that thrill of recognition by which a listener was able to identify himself with the action; at the same time the musical setting gave overt dramatic or lyrical significance to that everyday experience, and in musical accents entirely appropriate to the speech, and able to awaken echoes of traditional popular modes—folk echoes if you like—in the listener. The effect was to infuse ordinary life with the sense of an ultimate reality, and judging by the response, this, despite Denmark Street and all their works, was what people wanted!

One of the most significant features of the radio ballad is that it dispenses entirely with scripted narration or dramatisation, relying entirely upon the field recordings and the song lyrics deriving from them to carry the story. For this first programme we recorded in engine sheds and back kitchens and pubs and canteens, on the footplate and on the permanent way, talking with friends and neighbours and workmates, and with his widow, about John Axon himself, but even more about the railwayman as such and the customs, mores, social habits of his society. We began these field recordings as a convenient means of acquiring authentic background information on which to base a script; but almost immediately the calibre of the speech which we began to capture on the tape recorder forced us to reassess their function, and acknowledge that these field recordings cried out to be used as a direct element in the work. Within a few minutes of our first visit, an old steam engine driver was saying with tremendous passion:—

The old railwayman—it was a tradition, it was part of your life, it went through . . . railways went through the back of your spine like Blackpool went through rock.

And another driver, a little later on:—

What a feeling you have when you get off the shed. You've got the engine,

The radio ballad

By CHARLES PARKER

you've got control of it, and what a feeling! I'm Cock of the Bank, there's nobody can take a rise out of me now. She's mine! Come on me owd beauty—and off we go.

It was this, deceptively simple, expression of authentic and deeply felt experience which MacColl had to try and match . . .

*John Axon was a railwayman
To steam trains born and bred
He was an engine driver
At Edgeley Loco shed
For forty years he followed
And served the iron way,
He lost his life upon the track
One February day . . .*

The printed page is a dangerously inadequate means of conveying that which is, of its essence, oral, but the above can perhaps give something of the flavour of the original and enable me to proceed to my argument. I contend that the radio ballad is, potentially at least, a new art form; that as such it has implications for an emergent popular art extending far beyond the confines of radio; and that its affinities with social science (i.e., as an ordering of directly recorded social experience) are not fortuitous but fundamental to its nature as an art form.

Not just a documentary

At first sight, the radio ballads might seem to fall simply into the category of documentary—documentary with musical illustration perhaps—but certainly not into any existing category of art. Art, we feel, must imply an act of individual creation so that the use of field recordings, by precluding the radio ballads from the possibility of being attributed to any individual genius, means that they cannot be accepted as art. If, in other words, you tie yourself as remorselessly as we do, to the tangible evidence (i.e., on tape) of what people actually say about their actual experience, then you deny yourself the opportunity of honest creative work, and limit yourself to the role of being a more or less talented representer of second-hand information.

But mark what underlies this line of reasoning. First, that to give an artist the technical means of making a direct use of immediately perceived actuality, is to diminish, if not totally destroy, his creative powers. Which is surely like saying that once man was able technically to add colour to line and no longer have to suggest colour by line (or vice versa, I am no art historian!) his powers were by so much diminished, since he was thereby forced to present colour direct instead of by suggestion! Or that there can be no art of the cinema, for instance, since the artist is, in film, condemned to mere photographic representationalism.

But perhaps more crippling for the artist is the second presumption which seems to me to underlie our accepted ideas of Art: namely that the artist's preoccupations must properly be with the personal act of creation as an end in itself, and that his terms of reference for this act must not extend beyond his own imagination. This is to deny utterly any suggestion that the artist has a responsibility to discover, order, and give purposive expression to, the existing, everyday reality around him, and is tantamount (and in the space age at that!) to demanding that a fully equipped and qualified astronomer limit his field of activity to what the stars foretell.

Now in this first matter—of the artist's tools—I cannot see that a tape recorder is fundamentally any less respectable a tool than, say, a novelist's notebook; indeed in capturing, not only the thing said but the way in which it was said, it is that much more comprehensive a record. Furthermore, the novelist, surely, transfers whole passages from his notebook into the final work, selected, ordered, placed in a significant context, agreed—but precisely the same process must be gone through before field recordings can appear in a radio ballad. In fact, only the amazing techniques of tape editing, with all this implies in the meticulous ordering and selection of material, make such use of field recordings possible.

The nub of the matter is the nature of the material, being as it were one stage nearer to the actuality of the subject, i.e., the actual voice of the speaker, and therefore something of his presence, captured on the tape. This it is which—so it seems—discredits the tape recorder as a tool for the artist. If he tries to make use of it,

then he is accused on the one hand of, at best, journalism, at worst, technical mimicry, and on the other hand of an overbearing presumption in daring to reorder the "natural" phenomenon of speech in a real life situation. That these two attitudes are quite irreconcilable doesn't seem to debar anybody from holding them simultaneously. And there is another fact to be taken into account: the devastating calibre of real life speech, once we dare to give it controlled utterance in works such as the radio ballads, and all that *this* implies in triumphantly re-asserting the oral tradition after five centuries of submergence by the printed word.

The business of the artist is to understand the nature of reality, and to command, in his chosen field, the means of sharing that understanding with his audience by enjoining them momentarily to share his experience of reality. Can he, therefore, possibly know too much? Or come too close to the actuality of his subject? What, for example, could now be our position did we possess a tape recording of the Sermon On The Mount? Of Shakespeare in rehearsal? (Or if you like, of the first performance of *The Magic Flute*?)

The implications may be daunting, but no more so, I believe, than those behind the social sciences which, as I understand it, assert by their very existence that it is no longer enough to create brilliant social theories on the basis of personal experience plus imaginative flair; they must and can only be based on an ordering of the maximum available evidence. The challenge which the developing techniques of social science present to the traditional philosopher is, I contend, of the same order as that presented by the tape recorder—and, of course, the camera—to the artist.

Let me take a sequence from *Song Of a Road*—a radio ballad on the building of the M1. A maintenance fitter, working on the heavy, earth-moving equipment, tells how he came into public works:

... after the War of course, well I didn't want to go back inside again. A garage is alright but it's a rusty old life. So I went back to India and worked in open cut coal mine, finished the contract in India, went to Australia. Spent some time up in the Northern Territories, uranium mines, and down on the Snowy River . . . and been roving around Australia until I came back here.

(Singer)

I am a roving rambler, a fitter to m'trade,
I can fix you anything—a camshaft to a spade,
I can fix a dodgy gearbox or mend a broken tread,
Decoke a Leyland engine while I'm standing on m'head.

Here MacColl is striving for a song which matches the laconic, wry, Newcastle/Australian tones of the fitter, to provide the singer in the studio with a form that enables him to stand alongside the voice of real life, and dare to match in his performance, the experience being related. And by so doing, the singer places that experience in an overt emotionally-charged context, to highlight and intensify the emotional implications of . . . "A Garage is a rusty old life" . . . and . . . "I've been roving around Australia." In this way, the recognisably familiar in the real life speech, begins to take on the excitingly unfamiliar (but not less true) quality of the epic, and it is this interaction between field recorded speech and studio performed music which provides the essential dynamic of the radio ballad form.

This technique takes a moment of "just

sits for fifteen minutes" and develops it; extends it into a musical performance, sets it over against other comparable moments to build up a complex pattern of speech, music and effects to comprehend—in *Song Of a Road*—the experience of working on a big civil engineering contract, in a way which draws the listener right into that experience to share it at first hand.

Extensive editing

These field recordings first undergo a process of ruthless selection (from 70 to 80 hours of material we cull—at the most—25 minutes for direct use) and are then subjected to extensive and meticulous editing; each individual extract must be concise and viable, its rhythms subtly amended so that it no longer requires its original, conversational context, but achieves an identity of its own. But, essentially, these extracts derive from the moments, during the field recordings, when the particular speaker, under the pressure of the moment, relives in his or her own language, some deeply-felt experience; is brought, in fact, to the point of creation in speech, and by intonation, rhythm, imagery or all three together achieves a shattering degree of immediate communication.

A herring fisherman, eighty-year-old Sam Lerner of Winterton, Norfolk, tells of a storm at sea in a sailing lugger—

We went in this boat, and that came on a gale of wind; that came down the Saturday night; and that blew for three or four days a living gale, and we were in these little boats.

Or again, a Yarmouth fisherman talks of hauling the nets—

There's nothing more sightly I don't think, or stately, than a shoal of herring a-coming over the side.

Consider that use of the word "stately" applied by Ernie Bowles of Yarmouth to the shimmering silver of herring in the drift net. But the coalminer, we found, surpassed the fisherman in richness of imagery and power of expression, and some of the most remarkable recordings we have ever made were from miners for *The Big Hewer*. Here, for instance, is Ben Davies, an anthracite miner from Onllwyn, Glamorgan, talking of pneumoconiosis—

The curse of the underground is dust. Dust is the giant killer, but it doesn't strike all at once, but he likes . . . his time, and he do takes his time, and he stealthily walks into your human system . . . into your lungs. He is the real enemy, so minute in its form, and yet so strong in its ravaging powers.

And in a subsequent radio ballad *The Body Blow* which dealt with the experiences of five people stricken with polio, Ewan MacColl in what is, for me, one of his finest ballads, has a verse on the onslaught of the polio virus markedly reminiscent of Ben Davies—

Blow by blow his cruel foe does strike with grim intent
Until the body is laid low, all strength and courage spent.
The citadel is occupied, the road from brain to hand
Is blocked now by the enemy and death is in command.

The Body Blow marked a dramatic departure from previous radio ballads, all of which had drawn, for the field recordings upon rich vernacular areas and traditional ways of life, whereas four out of the five polio sufferers came from the South East. But the flattened, cockney related speech revealed its own strengths. Norma Smith of Southend, for instance, speaking of her first intimations of utter physical helplessness:—

You see, when you're lying down, you feel so much like a landed dab . . . or like a moth on a pin down there, you don't feel—equal to anyone you see, you're lying so flat . . . terribly laid out!

On the whole, however, such compelling language was the exception, although the nature of the subject, and the still sufficiently graphic terms in which the five talked of it, enabled us to experiment with a form of speech montage which has since become an accepted part of radio ballad technique. And I am convinced that a work like *The Body Blow* could be of immense value to hospitals as an aid in training, giving the nurse an entry into the real feelings and human qualities of her patients in a way which, I believe, nothing else can.

It is significant, for instance, that three of the five patients who figured in *The Body Blow* had also figured in a documentary film on polio *Four People*. The film, however, never used their own voices, but dubbed in scripted actors voices, and the contrast between the respective identities and attitudes of those three people as presented in the film, and as heard in the radio ballad, is quite startling.

This operates not only at the level of personalities but also, for instance, with such images as that of the iron lung, visually frightening in the film, spoken of by the actual polio patient as:—

... like a long, iced drink on a hot Summer's day—you were able to breathe.

The next subject we tackled was adolescence, and here we found, with I imagine everyone who has ever sat and listened to teenagers talking freely about and among themselves, that their devastating frankness and manifest hunger for understanding, make it a chastening and heartening experience for an adult, just to make the field recordings. Consider, for instance, this Scots girl on religion.

I think I could believe in angels more than I could ever believe in God, because angels seem to me more like heaven. You know, little children that die become angels and cherubs and things. They float around an it's all very nice, but I never quite got used to the idea of some one that had been there from the very beginning just sitting there, waiting for everyone else to arrive. . . .

It was in this programme, which we called *On The Edge*, that Ewan MacColl went furthest in his insistence that we recognise the epic event in the commonplace. He made his main theme a Quest ballad, hauntingly set by Peggy Seeger to the dulcimer, and grounded in the folk-lore of the eternal search for some passionately longed for touchstone of truth, for the Holy Grail, for the Philosopher's Stone, for Eldorado . . . but applied to the searchings for these adolescents . . .

The tale of the children of a troubled world
The tale of the search and the long journey.
Leaving the safe and guarded fortress
The searchers walk in the trackless places
From the world behind the wall,

(Continued on page 23)



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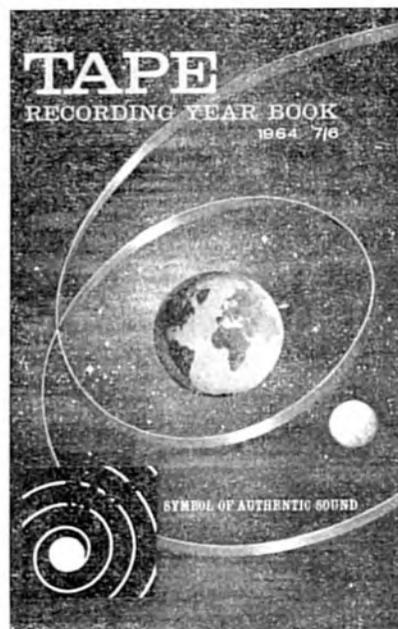
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By C. L.
APPLEBY

Modifications to the Fi-Cord Model 1A

WHEN I first took delivery of my Fi-Cord I was not unfamiliar with the technique of using a battery portable recorder. I had designed and built one in 1952 and that had been used to make eight hours of recording at $7\frac{1}{2}$ ips during the four weeks sea voyage to Australia. With a heavy double-spring motor and relatively heavy "A" and "B" batteries, this was quite an innovation at that time. It weighed about 35 lbs.

Imagine my delight at the lightness and superb portability of the little Fi-Cord. So great was my enthusiasm that I was soon using it in my profession of advertising consultant for survey interviews and auditioning radio commercials.

Whilst I was never in any way critical of the machine's technical performance I did find, as I went on to use it more and more, that several design features could be

modified with advantage. I started putting these into practical effect with a simple control knob change and I now find that each one has become quite indispensable to me and enables concentration of all my attention on producing an artistically good tape.

So successful were these modifications that, although this model has been superseded, there must be many 1A owners who would be interested in similar modifications. None really affects the circuitry and most can be done by any handiman with little more than a vice, file, hand-drill and a few small taps and dies. The first thing I did was to change the control knobs for miniature "pointer" knobs. This meant I could feel their exact position without having to look down at the panel. This saved me many spoiled tapes and lost effects. A little work with a file on the underside of the volume control knob allowed the point to clear the case at the extreme edge.

The "Record/playback" knob needed no

work on it whatsoever. On more than one occasion, in the excitement of the moment, I had forgotten to switch on but remembered to switch off which resulted in inadvertently running the tape through on "play-back" thinking it was static. With the pointer knob, a touch of the finger becomes automatic to determine the position of this knob before starting a recording. This very simple alteration was so successful that it led me to think of an external pause control which could be operated without opening the lid.

This was a little more involved but proved very simple and efficient when worked out. It meant that the knurled knob operating the pressure-roller arm could be left in the "forward" position and a simple "cam" device worked by a lever extended to the outside of the cabinet would lift the roller off the capstan.

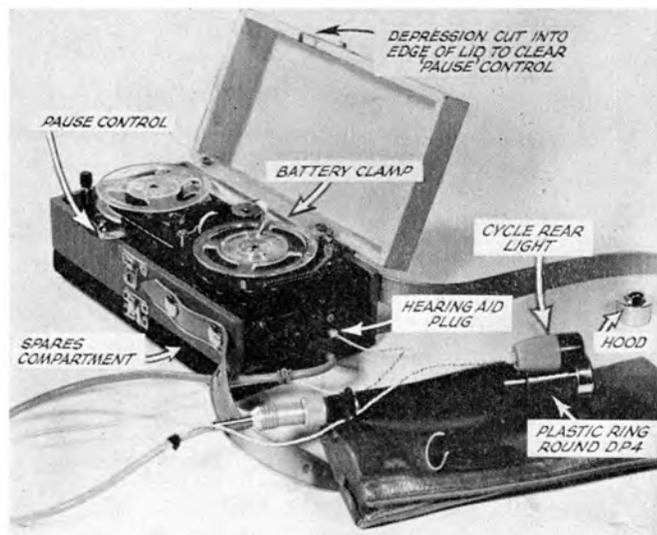
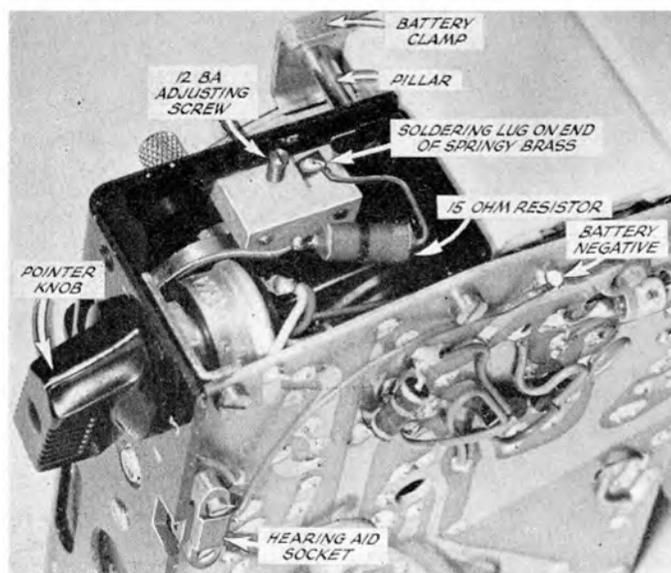
I raked about in the junk box and found a piece of soft 16 gauge brass half-inch wide by $1\frac{1}{4}$ inches long. I also found some brass $\frac{1}{4}$ -inch thick which I cut into a block about $\frac{1}{2}$ -inch by $\frac{3}{4}$ -inch.

This was sweated to one end of the strip and a hole drilled through the block to take a $\frac{1}{4}$ -inch 4BA bolt—long enough to go through the block, strip and the baseboard of the Fi-Cord.

Before drilling the baseboard, it was necessary to shape the block into a cam and clean up the strip with a file (Fig. 1). However, before finishing this right off, the pressure-roller arm was carefully removed by unscrewing the knurled knob and the screw forming the pivot of the arm. This arm is of "U" section and gives a convenient overhang on the left-hand side for the cam to operate. That flat of this "U" section nearest to the baseboard was cut back carefully with a file (Fig. 1b) to allow the cam to work yet, at the same time, clear the edge of the take-up spool. Great care was taken to prevent any filings getting into the pressure-roller bearing.

I decided that it would be advisable for the "run" position of the cam lever to be UP when the machine is being carried by the shoulder-strap so that, should the lever be knocked accidentally, it is more likely to release the pressure-roller than otherwise. At this point, reference to the diagram will probably save many words.

It had to be borne in mind that, in the "pause" position, the cam should hold the



Two views of the modifications carried out by the Australian author.

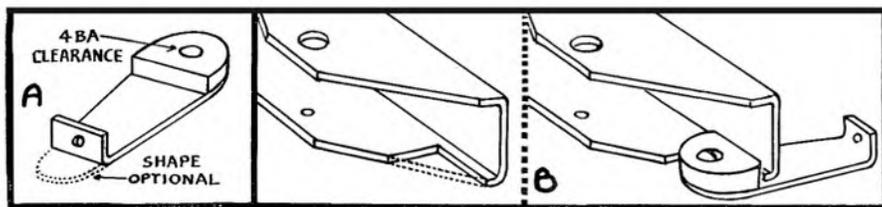


Fig. 1. The external pause control arrangement (see also Fig. 2)

pressure-roller just off the capstan. In the "forward" position (UP), the cam should not touch the arm at any point, leaving at least 1/64-inch clearance along its length, otherwise a very slight movement of the lever will cause the tape to slip. Further work was now done on shaping the cam and the arm replaced in position.

To determine the position to drill the hole in the baseboard, the cam lever was roughly placed in position with the shank of the drill used through the hole and resting on the baseboard. By holding the drill firmly and rotating the lever the position to drill the hole was found. The pressure-roller arm was again removed and *very carefully* a hole was drilled in the baseboard and tapped 4BA. The cam lever was now mounted with a 4BA bolt acting as a pivot. This could be adjusted not too tight and not too loose and locked with a nut under the baseboard.

On replacing the pressure-roller arm, final shaping of the cam lever gave a smooth and effective action. It now only remained to restrict the movement through the effective arc by drilling the baseboard again and inserting two tiny cheese-headed screws to act as stops which enabled the lever to be thumb-operated with complete confidence. In my case, I bent the end of the lever to a right-angle and screwed on a small chrome knob—the cap of a mirror-fixing wood screw.

The lid of the Fi-Cord is a good fit and it was necessary to cut a shallow depression in the edge of the lid to allow the lever to work without obstruction when closed with the catch fast.

Using this "Pause" control, I have recorded a five-minute interview with fourteen pauses only two of which could be detected and then only on account of background noise of cars passing during the pause.

My next problem was the only one in which I can seriously criticise the manufacturers' design. This concerns the battery clips. I always had difficulty in inserting battery No. 3 (from the left) owing to insufficient clearance between the idler guide roller and the clip. The constant strain ended in the clip breaking off and I found myself in serious trouble.

The solution was drastic but effective. I broke off the three remaining clips and

removed the counter-sunk screws in the baseplate at either end of the battery compartment. These screws were replaced by a one-inch length of 6BA studding on which was threaded a 3/4-inch length of tubing to act as a pillar leaving 3/16-inch of studding protruding above the pillars. A bar was now made from a six-inch length of shallow "U" section aluminium curtain rail with one angle filed off. (This was a pity but the batteries were just too wide to fit into the "U".)

This bar was drilled at each end to fit over the studding at the top of the pillars. With the batteries inserted, this clamps across them and is held by two 6BA terminal heads. The batteries are now held very firmly in place and always give positive contact irrespective of the position of the recorder.

Carrying spare tapes has always been a problem with me. Operating in the Queensland climate, one seldom wears anything with yoluminous pockets and I figure that a couple of spare tapes is the minimum to be carried on location. Therefore, a reversed "lid" was made. This was deep enough to hold a spool inside, and hinged to the bottom of the recorder after transferring the rubber feet.

It was covered in black self-adhesive plastic and held in position by two small hinges and a matching clip. This compartment holds two spools of tape, the re-wind handle, monitoring earphone and a china-graph pencil for identifying the spools.

Of course, this adds three quarters of an inch to the overall depth of the machine and a few ounces in weight but I have found that the advantages more than justify the addition.

This compartment will also accommodate six RM501 mercury cells which, with suitable contacts could be used as an emergency battery supply. This is a point which seems worthy of consideration as, here at least, one could easily be hundreds of miles from a source of mains supply to use the charger.

I have recently completed a design and prototype of a six-battery cassette to fit into the Fi-Cord battery compartment. On the face of it, this seems ideal but until this has been proved 100 per cent efficient I will not attempt to describe it further.

My last and for me the most useful addition is the provision of a distinct and

positive warning that the tape is nearing its end. For interviews, I feel that this is essential. The indicator as supplied by the manufacturers is very difficult to interpret accurately.

An interviewer who is trying to do a good job must have adequate but not too much warning when to wind up without having to break his train of thought or distract his subject by peering at the indicator or opening up the machine.

I decided that a warning light on the microphone would fill the bill. The eccentric disc which carries the white position pointer was the obvious choice as it is the only thing under the baseplate which moves with the amount of tape on the reservoir spool. Another advantage of this is that it is, perhaps, the only place where anything can be added to the compact layout of the "works."

The device itself is simple being nothing more than a small block of plastic and some springy brass. Fundamentally, the springy brass is one contact and the eccentric disc

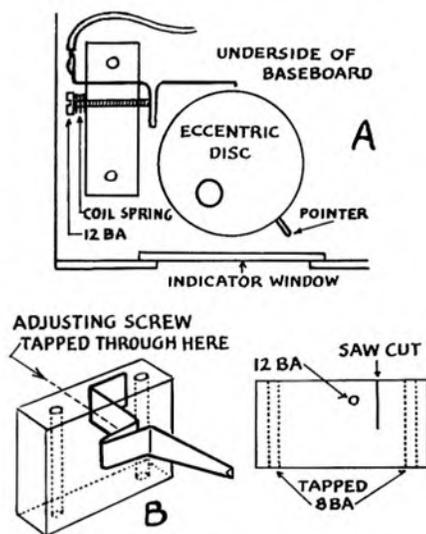


Fig. 3. The microphone warning light

the other. As the tape is used, the disc rotates and, at a predetermined point touches the springy brass and lights the lamp. Once again, reference to the diagram (Fig. 3a) will save much explanation.

A piece of 1/4-inch perspex was cut squarely to 1/2-inch x 3/4-inch. This had to be bolted edge-on to the underside of the baseplate 5/16-inch from the back edge and parallel to it (I used eight BA bolts tapped into the perspex). A quarter-of-an-inch from one end a very fine fret saw cut was made to depth of 1/4-inch from the baseplate. An 1/4-inch strip of the springy brass was cut and fitted into this slot then bent over on the outside edge to form a soldering lug (Figs. 3a and b).

The spring was sealed into the block with plastic cement and allowed to set hard. The strip of brass on the inside face of the block was then bent over and back on itself to form a right-angle projection. A hole was drilled and tapped 12 BA through the flat side of the block and immediately over the projection so that a bolt screwed through this hole would impinge on the projection and alter the position of the contact end of the springy brass (Fig. 3a). A tiny coil spring under the head of the 12 BA bolt

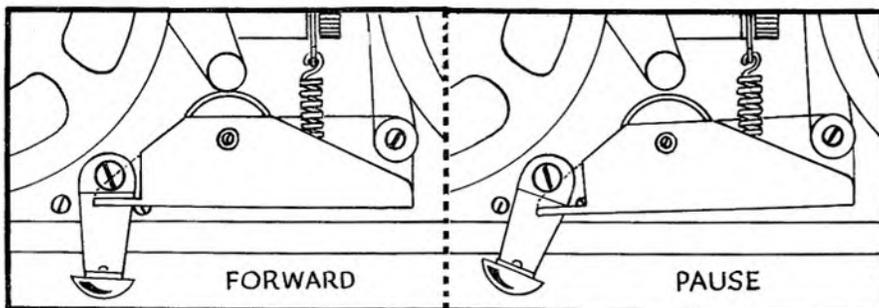


Fig. 2. How the external pause control operated

(Continued on page 23)



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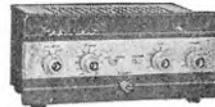


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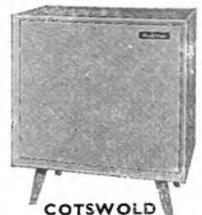
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T.1

Transistors in tape recording

(Continued from page 13)

The N-type material is a slice of germanium, which may be square, oblong or round, only one or two millimetres across and a mere tenth of a millimetre thick. It has been zone purified to a state where chemical analysis would show absolutely no impurity, but special resistivity checks reveal a controlled impurity of one part in ten thousand million (1 in 10^{10}), made by adding a minute amount of antimony. This is ground, cut and etched into shape with precise and delicate machinery. At the etching stage in fact, the "dice" of refined germanium are worth more than their weight in gold.

The additive for P-type germanium is the silvery metal indium. As shown in Fig. 2(b), there are two pellets of P-type material, marked *E* and *C*, with the latter portion three to five times the size of the former, depending on the type of transistor. First the collector *C*, then the emitter *E* is alloyed to the N-type base *B*. Then the jumper wires are soldered, the whole assembly encapsulated, and the capsule sealed and painted. (The last point is important, for transistors are sensitive to light.)

The finished capsule may be no more than a half-inch long, with its fine connecting wires left through the seal. The spacing of the leads usually indicates which is base, emitter and collector, as shown in Fig. 2(b), but the capsule may have a spot painted on one side, near the seal, indicating the collector lead. Connecting these leads to the circuit requires the use of a heat shunt, such as a pair of pliers clamped on the wires at a point between the heat source (soldering iron) and the seal.

Because these little wonders are compact and virtually solid when sealed in their capsules, they are unusually rugged, but are easily damaged by the application of wrong potentials—a factor which must be allowed for during servicing. Quite apart from its

small size, the obvious advantage of the transistor over the valve is the absence of a need for a heater for producing thermal emission. Some types of valve need as much as eighty per cent of the total power consumption for heating the cathode to produce the emission of electrons (current flow).

The secondary advantage following from this, which is important in tape recorder applications, is the absence of warm-up time. The transistorised amplifier is ready for use the instant it is switched on.

Operating voltages of transistors are low, which means that quite compact batteries can be employed, making a great saving in weight. Contrary to general opinion, the amount of power output from them is quite adequate for domestic listening—in fact, several public address systems have been developed around transistorised equipment. Because of the smallness and practically unlimited operating life if undamaged by applied voltages, they are particularly suitable for portable equipment, and lend themselves easily to being incorporated in compact circuitry.

The main disadvantage is their sensitivity to heat. For germanium transistors, the maximum temperature is about 75 degrees C. Overheating, through mounting transistors too near motors, etc., results in drastic change in operating conditions, and possibly self-destruction. Another disadvantage which must be allowed for in circuit design is a fairly high noise level (compared with a thermionic valve used under similar conditions). But recent design has reduced this noise factor to well within normal equipment tolerances.

The secret is good circuit design, and in the second part of this article we shall take a look at some of the popular circuits used in transistorised tape recorders.

Modifications to the Fi-Cord 1A

(Continued from page 19)

obviates the need for a lock-nut and assists adjustment. Care had to be taken to see that the springy brass contact arm did not foul the spring tensioning the tape arm.

I now had a contact that would "make" with the eccentric disc at a position which is adjustable by the screwing in or out of the 12 BA screw. I decided that it would be simpler to use the eight volt supply for the indicator lamp which, for minimum load I chose a six volt 50 mA cycle rear light bulb.

A miniature hearing aid two-pin socket was fitted to the amplifier base immediately under the output socket on the main control panel. A slot 5/16-inch x 1/4-inch was cut in the edge of the front panel to give access to it. One pin was wired through a 15 ohm resistor to the tag end of the springy brass strip. The other was wired to the battery negative contact on the printed circuit.

The warning lamp housing and general set-up are matters of personal taste but I used a complete plastic cycle rear light mounted to a plastic ring which forms a snug fit over the Grampian DP4 microphone. For my own use I fitted a metal hood over the top of the rear light. It

has an aperture in the side (away from the interviewee) so that I can see the warning light but the other person is not distracted.

The 15 ohm resistor plus the resistance of the hearing aid cord which I am using reduces the load of the lamp to about 35 mA and as it only operates for fifteen seconds for every tape side, the drain is not worth worrying about.

The adjustment of the 12 BA screw for a fifteen seconds warning is fairly tricky but once set remains consistent within a second or so. I have found that a quarter of a minute is ample time to round off and wind up any interview. Any slight irregularity in the spooling of the tape on the reservoir spool causes an intriguing flashing of the warning but does not seem seriously to affect the timing.

Whilst these notes on modifications to the Fi-Cord do not attempt to give full instructions and exact measurements, it is hoped that there is sufficient information for anyone interested in making them to be able, with a little discretion and ingenuity, to be as successful as I was in making the 1A an even better friend and faithful companion.

The radio ballad

(Continued from page 15)

*Out from the shelter of green oasis.
Each one comes and walks alone
High on the stony ridges, stumbling across
the broken ground,
Searching for peaks of fabled mountains. . .*

We met much criticism for this; we were accused of sentimentalising the teenager, of ignoring the "pop" culture held to be alone expressive of the teenager, of engaging in an idealised adult-centred view of the teenager—we had obviously touched a sensitive spot in the adult audience! By and large, teenage listeners accepted our image as an accurate one, and certainly, the things they said in the work itself, in attempting to express their visions of a life trembling on their own horizons, seemed to bear us out.

We conceive it to be our business to recreate the actual experience, not simply convey, in an attractive or exciting manner, information about that experience. When we succeed, the result is to give the listener an understanding of the subject that must permanently change his attitude towards it. His response is not "how interesting" or "how exciting" or "how intellectually stimulating"—but "this is what it is like!"

Finally, with *The Fight Game* we deliberately entered the area of the supposedly inarticulate, the prize fighter; of the professionally articulate—the promoter, manager, sports journalist and ringside commentator; and of the frenetically articulate—the boxing fan!

Here we sought to extend the form by making use of irony, and by the deliberately antithetical use of field recordings

*The adulation of the mob! We're all
a mob—don't let us give ourselves airs,
we're all the same! I love the mob as
much as I love anything, they've always
supported my fighters and myself, and
without the mob I couldn't live. . .*
to set against

*When you're taking a good hiding—on
the receiving end, you know, the sticky
end—you think "What's all this for?"
There's all these people there who've
never had a glove on, they're laughing
and shouting at you . . . you're there to
entertain them. It's so much engrained
with tradition, man against man. . .*

I began with a railwayman, I finish with a prize fighter. The one a hero in real life—but recognised as such only because of a wasteful and unnecessary tragedy; the other a hero under the arc lights, satisfying a society's lust for vicarious violence—but recognisable as the victim of that lust as soon as the arc lights are switched off. These two sides to the prevailing coin of human values are revealed in what such men say of themselves, and it is to make this revelation potent in art, that we strive to sing alongside them in the radio ballad.

*The battle is done with, the fighters
departed
Leaving the litter and the spoils of the
crowd,
The empty beer bottles, the torn silver
paper,
The spent cigarette smoke that hangs like
a shroud. . .*

(Reprinted from "New Society")



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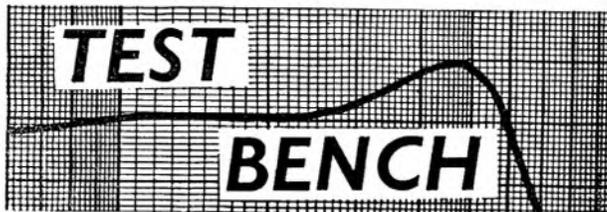


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PHILIPS EL3549

By H. Burrell Hadden

THE Philips EL3549 is a portable, mains-operated tape recorder, with fully transistorised amplifiers. It operates on the four-track system, and has four speeds, $7\frac{1}{2}$, $3\frac{3}{4}$, $1\frac{7}{8}$ and $15/16$ ips. A track selector gives the choice of tracks 1 or 4, 2 or 3, or "parallel," giving the output of the two "forward going" tracks added together. The machine is suitable for long play or double play tape on any sized reel from three to seven inches in diameter, and the maximum playing time is eight hours per track.

The fast rewind time was three minutes for a seven-inch reel of long play tape. Automatic stop facilities of the foil operated type are provided, and these operate in all running conditions. Input mixing facilities for microphone and radio/gram are provided, and the equipment can be used as an amplifier for microphone or record player if desired.

All the controls of the EL3549 are situated on one easily operated panel on the top of the machine. The speed selection control also operates the "on/off" switch, so that the machine cannot be easily left with the idler wheels engaged. The controls for setting the tape in motion are of the "piano key" type. There are six of these, three on each side of the recording level meter. The first of the keys, from left to right, is the red coloured record control, which has to be pressed at the same time as the third key, the "play" key, in order to make a recording. The second key, in between these two, is the pause control. The remaining three keys control fast rewind, stop, and fast forward respectively. There are four other controls: on the left of the panel is the playback volume control, which also varies the loudspeaker monitor level on record, and this is accompanied by the playback tone control. On the right-hand side of the panel are the microphone and radio/gram record level controls. A digital type tape position indicator is placed between the tape reels, and has a magnifier in front of the scale, a very useful feature.

A storage compartment at the rear of the machine is large enough to carry the mains

lead, microphone, and radio input lead, and also contains all the input and output sockets. Seven of these, of the now standard Continental type, are incorporated. To take the input sockets first: two alternative sockets are available for gramophone pick-up connection, one for the flat Continental plug and the other for the round DIN plug. The microphone plug is also of the DIN type, and so is the "diode" input, which gives record and playback connections for receivers and amplifiers fitted with the neces-



sary socket connections. The playback output from this socket is at a fixed level, and must be controlled on the external equipment. The record input is controlled by the radio/gram level control. The input impedances are: "diode" 0.02 megohm, at a level of 3 mV; record player 0.5 megohm, at a level of 150 mV; and microphone 1,000 ohms, at a level of 1 mV. In addition to the diode output, three other output sockets are provided.

The first of these is a "banana" plug type extension loudspeaker socket; inserting the plug mutes the internal loudspeaker. The output impedance at this socket is 3-7 ohms. The other two sockets are of the DIN type, one being a socket for headphone monitoring available as an accessory, and the other giving a direct connection to the two halves of the replay head. This socket is labelled "stereo," but a word of warning must be

inserted here, since the level at this socket is so low that a pre-amplifier, also available as an accessory, must be used. This

Record/replay characteristics of the Philips EL3549.

$7\frac{1}{2}$ ips ————;
 $3\frac{3}{4}$ ————;
 $1\frac{7}{8}$ ips - - - - -;
 $15/16$;

head and pre-amplifier can also be utilised for Duoplay and Multiplay purposes.

A further socket is provided for an accessory foot-operated switch, useful to control the machine when it is being used for dictation purposes.

As might be expected, a machine with such a formidable specification is of necessity somewhat large, the dimensions are $16\frac{1}{2} \times 15\frac{1}{2} \times 8\frac{1}{2}$ inches. Due to the transistorised electronics, however, the weight of the machine is not excessive, only 28 lb. The case is finished in an attractive two-tone grey, very pleasing to the eye.

The machine was given the usual practical and technical tests. In all cases it performed exceptionally well. Even at $1\frac{7}{8}$ ips some very good music recordings were made, and the quality of reproduction at $7\frac{1}{2}$ ips left very little to be desired. The quality of speech reproduction at the extremely slow speed of $15/16$ ips was perfectly adequate for dictation purposes. The overall frequency response from record input to replay output at the four speeds is shown on the accompanying diagram, and it can be seen that the maker's specification was met in all cases. The signal-to-noise ratio was 43 dB. No wow and flutter figures are specified, but the performance on music at even the slower speeds indicates that this is satisfactory.

A moving coil cardioid microphone is provided, which though good of its type, does not really do the machine justice, especially at $7\frac{1}{2}$ ips. A word of praise must be reserved for the instruction book, which is exceptionally clearly written, and well illustrated with step by step photographs.

All in all, this machine can be thoroughly recommended as a good buy at £65 2s. 0d.

Manufacturer's Specifications

Maximum pool size: Seven inches.
 Playing time: Two hours per track using double-play tape at $3\frac{3}{4}$ ips.

Frequency response: 60-16,000 cps \pm 3 dB at $7\frac{1}{2}$ ips, 60-13,000 cps \pm 3 dB at $3\frac{3}{4}$ ips; 60-10,000 cps \pm 3 dB at $1\frac{7}{8}$ ips; and 60-4,500 cps \pm 3 dB at $15/16$ ips.

Signal-to-noise ratio: Better than 40 dB.
 Wow and flutter: 0.6 per cent peak to peak.

Speaker size: 7 x 5 inches elliptical.
 Power output: $2\frac{1}{2}$ watts.
 Power supply: 110, 127, 200-250 volts, 50 cycles. (Adaptable by dealer for 60 cycles.)

Power consumption: Approx. 55 watts.
 Dimensions: $16\frac{1}{2} \times 15\frac{1}{2} \times 8\frac{1}{2}$ inches.
 Weight: 28 lbs.

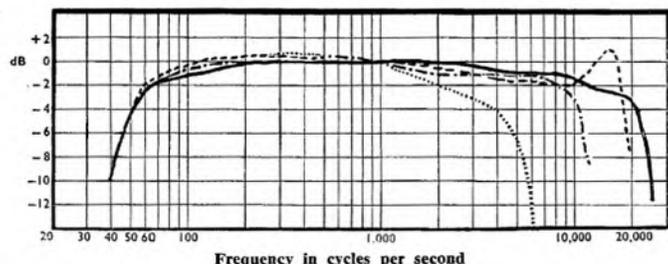
Philips Electrical Limited, Century House, Shaftesbury Avenue, London, W.C.2.

WYNSOR TRIDENT

By John Borwick

THE WyndSOR Trident follows in this company's tradition of tape recorders bearing the names of famous aeroplanes. Others I can think of were the WyndSOR Victor, Viscount and (still current) the Heron.

There are no strikingly new features of this present machine, the makers presumably having set themselves the task of giving reasonably good value for money using a well-tried technical specification. The cabinet of the Trident is very smart, however, and a modern



effect is obtained by fitting a sloping lid, the top surface of which is ribbed and quilted.

The deck used is the familiar, and very successful, Collaro Studio. I suspect that many readers of *Tape Recording Magazine* will know from this that, mechanically speaking, the Trident may be taken to compare directly with many British machines in the low to medium price bracket. The Studio deck has three speeds, $7\frac{1}{2}$, $3\frac{1}{2}$ and $1\frac{1}{2}$ ips, pause and superimpose buttons, a three-digit position indicator, and can be supplied in either two-track or four-track versions.

In the latter, which was the version I tested, tracks 1-4 or 2-3 are selected by moving a simple slider switch mounted on top of the head cover. This changes over connections to the conventional twin, stacked heads as required. I like the separate "record" switch on this deck. It means that you can line up the recording level from microphone, radio, etc., on the magic eye level indicator, without the tape running. Then, when you are satisfied that the



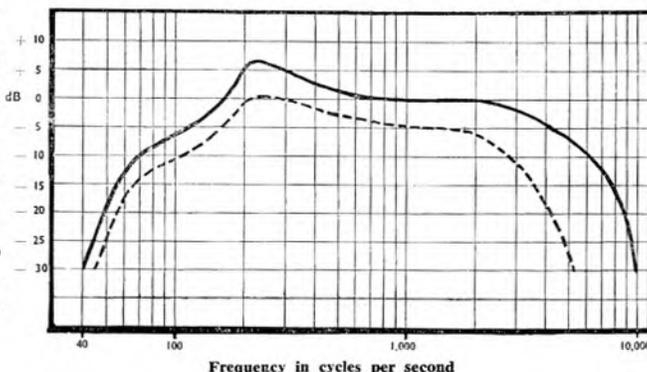
volume control is at the best setting, you pull down a tag marked "R" on the start key, and you are recording.

Superimposing, which is a popular form of trick recording, is achieved by leaving the "R" tag alone simply pressing the start key. You then record on top of any previous recording without erasing it, so that on playback you hear the two recordings at about equal volume.

The speed of the fast wind and rewind was almost frightening for a recorder in this class—more than twice that of my own semi-professional machine. The 1,200 ft. reel of Standard Emitape supplied was re-wound in only 48 seconds. I must say, however, that the resultant wind at full speed was rather loose and uneven. On rewind particularly, odd turns of the tape were thrown up a fraction of an inch out of alignment with the rest. During recording and playback, on the other hand, an admirably even wind was achieved.

The microphone supplied is the Acos Mic. 45 type. Recordings made through this and from radio produced reason-

Record/replay response of the Wyndor Trident at $7\frac{1}{2}$ ips
Max. treble _____
Min. treble -----



ably good quality at the $7\frac{1}{2}$ ips speed. Results at the slower speeds were limited, not so much by the loss of high frequencies, which inevitably occurs, but by the noticeable rise in wow and flutter on certain types of music.

The microphone was found to be slightly directional, which is a useful feature when recording some types of voice or musical instrument, as various angles can be tried to find which gives best results. The Trident also permits the use of the microphone as a monitoring earpiece. Since many microphones are constructed in much the same way as a loudspeaker, feeding an electrical signal into them, instead of taking out of them the signal generated by sound waves, makes them radiate a faint sound signal of their own. On the Trident, plugging the microphone into an output socket marked "Hz" (high impedance) enables it to be used for listening to (monitoring) any signal which you are recording via the Radio input socket.

FREQUENCY RESPONSE

Subjective impressions on recording and playing back a wide range of material were that the Trident performs as well as other recorders at the price. Using an external loudspeaker and/or hi-fi equipment produced the expected improvement. The built-in 7 x 4 inch loudspeaker gives ample volume, but of course no portable recorder can be given a large and heavy enough cabinet for full bass reproduction.

A slightly unusual effect noticed was that the Tone control appeared not only to reduce treble, when wound full clockwise, but to reduce overall volume as well. This subjective effect was confirmed when the usual frequency response curves were plotted. The accompanying graph shows that the plot for minimum treble is below the maximum treble line at all frequencies.

To sum up, the Wyndor Trident is a worthy addition to the Wyndor fleet and incorporates all the features most frequently demanded on domestic recorders. It costs 35 guineas (four-track) or 33 guineas (two-track version).

Manufacturer's Specification

Power supply: 200-250V, 50 cycles A.C. (other supplies on export models).

Output power: Four watts.

Input sockets: microphone and gram/radio.

Output sockets: External loudspeaker and amplifier/headphones.

Dimensions: $14\frac{1}{2}$ x $15\frac{1}{2}$ x $7\frac{1}{4}$ inches.

Weight: 25 lbs., including microphone, tape and radio lead.

Manufacturer's: Wyndor Recording Company Limited, Wyndor Works, Bellevue Road, Friern Barnet, London, N.11.

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Alan Edward Beeby's TAPE TALK

FROM time to time, readers write to ask whether it's in order to submit samples of their taping talents to the BBC. A spokesman told me: "We are prepared to consider, without commitment, all material sent to us. However, owing to the great amount submitted, many of our producers regret that they cannot undertake to consider tape recordings. Generally speaking, therefore, we prefer to consider all 'talks' material in manuscript form in the first place."

The BBC Handbook, incidentally, offers the following advice: "Typescripts of talks or short stories for broadcasting in sound radio should be addressed to: Head of Talks Department, BBC, Broadcasting House, London, W.1. In the case of radio plays, complete scripts (or a brief synopsis with specimen dialogue) clearly typed, should be sent to: Script Editor, Drama (Sound). All original contributions in the form of scripts, etc., are considered by competent readers and by the appropriate programme authorities."

A TELEPHONE-CALL two days ago brought me the sad news that one of our readers in the South of England has wound up in hospital, suffering from burns and shock—the electrical variety. He was endeavouring to connect the terminals of his television loudspeaker to the radio-input socket of a tape recorder in order to record "direct" the soundtrack of a TV-film.

Which is probably as good a point as any

to pre-warn anyone else harbouring similar ideas that such a practice is *extremely dangerous*, and can, in fact, *kill*. It's sitting up and begging for trouble merely to remove the inspection-cover of any TV-set while it is switched on, since the chassis itself is permanently "live," and the odds are that you won't even get as far as the speaker terminals before being hurled bodily across the room by a 240 V haymaker!

If you really want to make recordings direct from TV-sound, and the set is your own (i.e., not a rented model), any competent TV-engineer will fit an isolating transformer from which such tappings may safely be taken. But DON'T go experimenting on your own. Believe me, it's not worth the risk.

END-NOTE: Our unfortunate reader was, at the time of the accident, preparing to record the soundtrack of Sir Laurence Olivier's film, "Richard III." He needn't have bothered. The whole thing is available in LP Disc-form (HMV).

FOLLOWING a recent "Tape Talk" appeal for information concerning reasonably-priced microphone booms, Mr. B. Hilton, of Freedman's Musical Instruments, tells me that his firm will supply from stock a studio-type floor stand fitted with a 3 ft. boom.

Constructed of nickel-plated steel, the floor stand may be used without the boom attachment if required. Unfortunately, no illustrated leaflets are at present available, although the boom can be seen quite frequently, I understand, on ITA-TV, where it is employed to hold the microphone over drummers, etc.

The combined stand and boom retails at £13 10s. 0d., but is also available on HP-terms: £5 0s. 0d. deposit, and twelve monthly payments of 16s. 11d. Inquiries, please, to Freedman's Musical Instruments, 534 High Road, Leytonstone, London, E.11.

Following my recent note in the October issue that the SCOTCH 3M Company had reduced the prices of their recording tapes, I am pleased to be able to report that the MSS Recording Company Ltd. have done likewise. The firm's commercial manager, Mr. P. Burden, told me: "The reductions cover our full range of tapes, including empty spools in boxes and splicing kits, and are concrete evidence of our efforts to encourage the purchase of larger quantities of tape by the consumer."

BACK in April of this year, I suggested that readers might like to write and tell me about any tips or brainwaves of their own which they considered would be of interest to other recording enthusiasts. I added that one should *not* allow oneself to be discouraged from writing by the mistaken idea that such suggestions might seem elementary or absurd to hardened practitioners. The simplest brainwave can, and, in fact, has proved a winner before now. Look at the bloke who invented the simple, uncomplicated item of machinery called the hair-pin. A piece of bent wire. Made a fortune, he did! However . . .

Some weeks ago, one of our readers from Nottingham called to see me. He said he'd had a "bit of a screwy idea," and that he "didn't suppose anyone would be interested," but that he'd decided to call and tell me about it anyway. "And what's this 'screwy idea'?" I asked. "This," he replied, and dropped a small square of grey, paper-like material on to the table. It was,

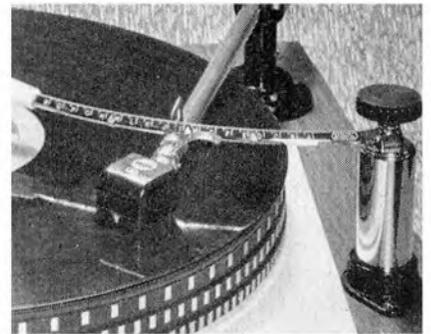
he told me, known in the furnishing trade as "Dry Felt Underlay," or "Paper Felt," and could be purchased in two-yard widths, any length, at most furnishing stores for 2s. per square-yard.

The idea? Remember the old dodge of sound-deadening a "live" room or recording den with packing-layers from egg-boxes? Simply use *this* stuff instead. It can be stuck on to the wall quite easily, like ordinary wall-paper, using cold-water paste, and emulsioned afterwards. What's more—it works! A colleague of mine who tried it recently reports excellent results.

So, if anyone else reading this has any "screwy ideas," would they please write and tell me about them!

I'VE been hearing good reports about a gramophone pick-up control unit called the "Auriol." This small but useful little item of equipment should help to soothe the brows of quite a few harassed sound-effect bods faced with the problem of cueing-in effects from disc, whether "78" or microgroove.

It consists simply of an upright cylinder which is mounted on the right-hand side of the record-deck, from which a calibrated arm extends over the disc itself. The pick-up traverses this in its journey across the disc, thus making it possible to pre-select any single groove by "locking-on" to starting-points marked, in turn, by three sliding cursors.



Another of the "Auriol's" functions is to lower the stylus pneumatically on to the record's surface, thereby eliminating the risk of either dropping the pick-up accidentally, or "sweep" scratches caused by handshake.

There are two models: The Standard at £3 11s. 6d., and the Mk.II at £4 4s. A fair enough price to pay, it seems to me, for an almost cast-iron guarantee against damaged discs, plus the cueing-in feature mentioned. A 3d. stamp will bring a copy of the manufacturer's brochure from Auriol (Guildford) Ltd., Trading Estate, Farnham, Surrey.

BEEBY'S PREDICTIONS FOR 1964:

★ The problem of high tape-speeds on domestic video equipment will be solved. ★ Nobody'll be any the wiser about Copy-right. ★ There'll be news of developments in local broadcasting in which a certain Tape Recording Club will figure prominently. ★ We'll see far more use made of the radio-microphone by amateur tape enthusiasts. ★ BASF's smash-hit film, "The Magic Tape" will have a sequel entitled, "The Son of Magic Tape," followed by "The Magic Tape Comes Back," ★ and John Borwick will retain his title as the most common-sense, down-to-earth, no-nonsense writer, broadcaster and commentator on amateur tape recording matters. I have spoken!

Happy New Year.

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Tape records reviewed

This work has strength and gaiety

CLASSICS



By Edward Greenfield

MOZART. Symphonies Nos. 29 and 39. Sinfonia of London conducted by Colin Davis. WRC (TT 43) 3½ ips, mono. 29s.

These are two of the most warmly attractive works that Mozart ever wrote. The Symphony No. 39 is first of the last three symphonies, masterpieces that Mozart somehow managed to write in a mere six weeks. From this very contrasted trio of works this represents Mozart's sunniest, happiest mood. Yet, as Colin Davis's performance makes plain, the work has strength as well as gaiety.

No. 29 is a much earlier work, written when Mozart was still in his teens at Salzburg. It has always been my favourite among Mozart's early symphonies with a delectable slow movement in which the strings are muted, a bold minuet (so bold it points the way to Beethoven rather than back to the stately dance) and a rushing finale which is as high spirited and joyous as anything in Mozart.

In this work, I am afraid, Davis does not quite convey the lightness required, but it is still a tasteful performance worth sampling as an antidote to more hectic readings. The recording, made several years ago, still sounds more than adequate.

BRAHMS. Cello Sonatas No. 1 in E minor, Opus 38; No. 2 in F major, Opus 39. Janos Starker (cello) and Gyorgy Sebok piano. WRC (TCM 43), 3½ ips, mono. 29s.

These are among the greatest works ever written for the cello. Although he was writing for an intimate chamber atmosphere Brahms still presented expansive, tough arguments of a sheer size and drama that would befit a symphony.

The opening of the second sonata, a late work in Brahms's output, is grander and more heroic than almost anything else in cello literature, and Janos Starker, unlike many who have attempted to scale the work, triumphs completely over the technical difficulties so that the heady exhilaration of the music comes over with full intensity and not the soloist's own technical difficulties. It is the same all through, and I cannot think of any works more likely to win anyone over to Brahms's rich and forceful chamber music. Both are long works so that good value is provided too.

The recordings are a few years old, but the sound is direct and immediate which matters more than anything in chamber music.

BERLIOZ. Grande Symphonie Funebre et Triomphale. Musiciens des Gardiens de

la Paix (with chorus) conducted by Desire Dondeyne. WRC (TT251), 3½ ips, mono. 29s.

This is a marvellous work, neglected only because of the problems of presenting it at modern concerts. Berlioz wrote it for a special occasion, the reinterment in 1840 of the dead of the 1830 revolution. It is outdoors music, beginning with a heroic, extended funeral march, that completely captures the atmosphere of national mourning while pointing to hope in the future. Even the first performance was ruined by the mismanagement of the procession and when later Berlioz added string parts for concert-hall (or bandstand) performances the work failed to be regarded as more than a curiosity.

But recordings can bring us such works with great intensity and this French performance is most impressive in its drama and depth of feeling. The final Apotheosis brings in a chorus to proclaim the ultimate glory and triumph of the fallen heroes. The recording is very good indeed considering the size of the forces, and I recommend the issue strongly.

The mellow magic of Glenn Miller

POPULAR



By Don Wedge

THE GLENN MILLER LEGEND. Glenn Miller and his Orchestra. WRC (TT 252) 3½ ips, mono, 29s.

The mellow magic of the real Miller band, short of some of the sound fidelity of more recent imitations, is here in sound-track excerpts from its two big Hollywood films, "Sun Valley Serenade" and "Orchestra Wives."

There are long versions of *I've got a Girl in Kalamazoo* and *American Patrol* from the latter; *At Last* and *I Know Why* (surely a period masterpiece) from "Sun Valley Serenade."

(I wished the thrilling title song had been included—long, brassily happy in the film and featuring many of the band and singers in one number.)

But I smiled again at the clever lyric of *That's Sabotage* (very 1942) and thrilled once more as a harp introduced *Moonlight Serenade*.

ORGAN GEMS. George Ryan. Crown (ST 138), 7½ ips, four-track stereo, 55s.

The delicate, gimmicky organ on this record could have taken more advantage of availability of stereo.

The trappings of a large organ are not neglected. There are lots of drums, tympani and even accordion. A cuckoo puts in an appearance.

But when the gimmicks are put away, there is pleasant listening of *The Breeze* and *I, El Relicario, La Paloma* and the like.

PRESENTING THE SILVER DOLLARS. Northern Stars (SA 0002), 3½ ips, mono.

The Breeze and *I* is here too—and a mini organ, a clavoline. But used very differently. This features a latter-day beat group complete with a very competent singer.

With the organ-guitar blend there is an

affinity to the Tornados. But not the originality.

With so little beat music on tape, the Newcastle company, which issued it, Graphic Sound, should be happy. Liverpool is not the only city with pop talent.

A SHOT OF RHYTHM AND BLUES. The New Vikings. Northern Stars (SC 0003), 3½ ips, mono.

The Beatles have a shot of rhythm and blues in them. They dominated 1963's pop music, but them apart, the trend was to r. & b., particularly as the year closed.

It was usually heard a little more forceful than on this record, although *Mobile Alabama, Money* and *Talkin' About You* gives full value.

The shot misfires with a much too pretty *Summer Place* and *Deadwood Stage*—a one-time Doris Day hit, and not rhythm and blues.

GATHER ROUND. Tennessee Ernie Ford. WRC (TT316), 3½ ips, mono, 29s.

The distinctive powerful bass of Tennessee Ernie in a recital of country blues and the like in a bumper collection of eighteen songs.

Despite the basic solemnity of Ford's material he has a characteristic light touch to save it from becoming banal.

There's the occasional bright song—such as the frankly pop *Pretty Little Pink*. But my highlight is the whimsical *My Grandfather's Clock*.

Intriguing backings vary from guitar only to screaming brass and girl choirs.

The tapes reviewed this month are issued by the following companies:
 "Crown": Teletape Ltd., 33, Edgware Road, Marble Arch, London, W.2.
 "Northern Stars": Graphic Sound Ltd., 37, Jesmond Road, Newcastle-upon-Tyne, Northumberland.
 "WRC": World Record Club, Box 11, Parkbridge House, The Little Green, Richmond, Surrey.

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MAGNEGRAPH

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NEW PRODUCTS

TWO NEW UNITS BY TRIPLETONE

A NEW stereo control pre-amplifier has been introduced by Tripletone. The new unit, SCP2, has inputs available for pick-up, tape recorder, and radio in stereo or mono, selection being made by a six position front panel switch which also enables a filter position to be selected.

The filter gives a steep slope high frequency roll-off. Boost and cut is provided on all three treble, middle and bass tone controls which can be varied independently on each channel. Accurate balance between channels can be achieved, and the unit can be used as an electronic crossover unit. A neon indicator is incorporated.

The fascia plate is in a "coffee and cream" colour combination with gold trimmed continental styled knobs.

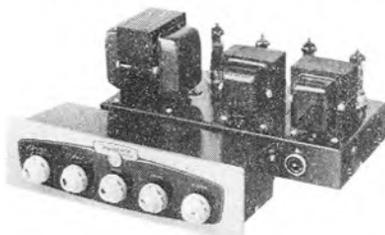
Technical specifications include a quoted frequency response ± 1 dB. from 30-20,000 cps; hum and noise, -62 dB; distortion, 0.05 per cent; negative feedback, 25 dB. Sensitivity for 500 mV is: Disc, 80 mV into 2 M ohms; radio, 200 mV into 100 K ohms; and tape, 80 mV into 100 K ohms. The bass control is continuously variable from $+18$ dB to -18 dB at 30 cps; middle control from $+12$ dB to -12 dB at 400 cps; and



treble control from $+18$ dB to -18 dB at 10,000 cps. The tape output is 500 mV into 100 K ohms ± 1 dB 30-20,000 cps.

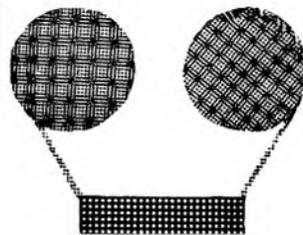
Guaranteed for twelve months, the Tripletone SCP2 (illustrated above) measures 11 x 3½ x 2½ inches, uses two ECC83 valves, and costs £10 18s. 9d.

Another recent introduction is their new stereo 8-8 two-unit amplifier. The new unit (illustrated below) has inputs for tape recorder, pick-up and radio in stereo and



mono. The desired use being selected by a six-position front panel switch which also enables a filter position to be selected.

The Tripletone Stereo 8-8 has a total power output of sixteen watts and matching



facilities for 2-3 ohms and 15 ohms as desired. All controls are on the separate pre-amplifier unit, which facilitates mounting even in the most awkward places.

The quoted frequency response is 30-20,000 ± 1 dB; hum and noise is rated at -65 dB referred to eight watts; and distortion is given as 0.2 per cent. Sensitivity for eight watts per channel is tape (80 mV into 100 K ohms); disc (80 mV into 2 M ohms), and radio (22 mV into 100 K ohms). Continuously variable tone controls are available for treble ($+18$ dB to -18 dB at 10,000 cps); middle ($+12$ dB to -12 dB at 400 cps), and bass ($+18$ dB to -18 dB at 30 cps).

The valves are two ECC83, four ECL86 and one EZ81. The main chassis measures 12 x 6 x 5½ inches, and the pre-amplifier chassis measures 11 x 3½ x 2½ inches. The price is £25 18s. 9d.

Tripletone Manufacturing Co. Limited,
241a, The Broadway, Wimbledon, London,
S.W.19.

BAIRD ANNOUNCE FIRST TAPE RECORDER

BAIRD, the first name in television, announces the introduction into its wide range of products of the Tapemaster Twin tape recorder (illustrated below). The Model 280 is a single-speed recorder incorporating the BSR Monardeck.

Accommodation for 5½-inch spools is available, allowing a playing time of up to 1½ hours for each of its two tracks, using double-play tape at 3½ ips.

Supplied complete with a high-gain crystal microphone, the 280 features a magic eye recording level indicator, an automatic safety lock against accidental erasure and a



digital rev. counter. Sockets are supplied for an extension loudspeaker and radio input. Other features include an 8 x 3-inch elliptical loudspeaker and a combined tone control.

It measures 14½ x 12 x 5 inches. The price is 22 guineas.

Baird Television, Seymour Mews House,
Wigmore Street, London, W.1.

LATEST MODEL BY FERGUSON

A NEW recorder, model 3204, is announced by Ferguson. It is a two speed, four-track recorder, incorporating the de-luxe FTD4 tape deck designed by Ferguson.

Quoted frequency response at the top speed of 3½ ips is 80-10,000 cps ±5 dB, at 1½ ips it is 80-5,000 cps ±5 dB. Signal-to-noise ratio is given as 40 dB, with wow and flutter better than 0.2 per cent rms.

The 3204 will accommodate up to 5½-inch spools. Maximum playing time per track, using long-play tape, is just over two hours.

Among the many features are facilities for superimposition, monitoring through the built-in 7 x 3½-inch loudspeaker, stereo playback with additional amplifier, remote control operation from the crystal microphone, straight-through amplification, syn-



chronisation with film projector, pause control, safety erase lock, automatic tape end stop, digital rev. counter, and a magic eye recording level indicator.

Other features include wafer piano key controls, fast spooling during rewind, and the location of the microphone socket on top of the tape deck for easy access.

The built-in loudspeaker provides a power output of three watts, and there is a three ohm socket for an extension loudspeaker, as well as an external amplifier socket.

The 3204 measures 13½ x 12 x 6½ inches, and weighs 19 lb. Included in the price of 33 guineas is an 850 ft. spool of tape, spare spool, and radio connecting leads. The two-tone blue cabinet has a rear storage cabinet for microphone and leads.

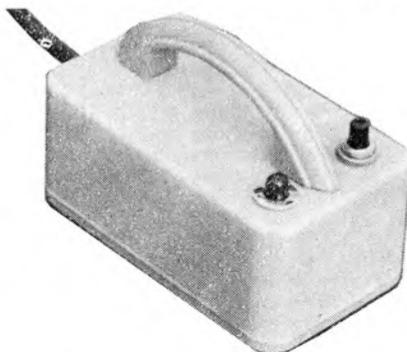
Ferguson Radio Corporation Ltd., Thorn House, Upper Saint Martin's Lane, London, W.C.2.

GLOBAL INTRODUCE TAPE SOUND EFFECTS

GLOBAL PRODUCTS announce the introduction of the first of a new series of sound effects on tape. The first tape, plays for approx. one hour and is available at either 7½ ips (42s. 0d.), or 3½ ips (32s. 8d.). The contents include a bath sequence, aeroplane, waterfall, main line express, fire sequence, among the forty-odd items. A further tape, "Sound Effects No. 2" is being prepared. This is to include low flying aircraft and unique air raid warning siren sounds.

Two other items have also been announced by Global. First is the Bulk Tape Eraser Mk 2, illustrated above, a larger and

improved version of the Mk 1 announced in our August issue. The new model operates from AC mains, 100-250 volts, and has a red neon indicator which lights when the eraser is in use. The reel of tape being erased can be placed on a flat non-metallic surface, or held in the hand. The eraser is switched on at a distance of three feet from the tape, moved slowly towards the tape, held there for 15 seconds and then slowly withdrawn again. The procedure should be repeated on the reverse side of the tape reel,



for complete erasure of the tape. Like its smaller version, the Mk 2 may also be used to de-magnetise tape heads.

The third new Global product is a tape splicing block. All metal, and some five inches in length, the "Tape Splicing Block" has right-angle and oblique cutting slots, and clamps to hold the tape in the channel.

Fixing holes are provided to mount the block on to a wood base, or to a recorder. The price is 15s. 6d.

Global Products, 13, Stanley Street, Rothwell, Northamptonshire.

ANOTHER RECORDER FROM KOLSTER-BRANDES

KOLSTER-BRANDES LTD. have announced a new twin-track recorder, the WT 20. Their latest model has the single speed of 3½ ips, and accommodation for up to 5½-inch spools. Maximum playing time available, per track, using long-play tape, is 64 minutes.

Among the features are facilities for mixing, straight-through amplification, magic



eye recording level indicator, combined tone control, and an extension speaker socket (3-5 ohms). The built-in loudspeaker, a 7 x 3½ inch unit, handles an output of two watts.

The WT 20 measures 16 x 12 x 6 inches, and weighs 19 lb. Included in the price of 24 guineas is a crystal microphone.

Kolster-Brandes Limited, Footscray, Kent.

(More "New Products" on page 32)

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NEW PRODUCTS

(Continued from page 31)

ARMSTRONG AUDIO ANNOUNCE NEW TUNER RANGE

ARMSTRONG AUDIO LTD. announce the introduction of three high fidelity tuner-amplifiers.

First of their three new units is the 227 AM-FM stereo tuner-amplifier (illustrated below). Selling at £48 15s., this provides twenty watts output and covers the FM and medium wavebands. It is designed to accommodate the new high-quality ceramic pick-ups such as the Decca Deram. The 227 M is a mono version of the 227, and sells at £33 18s.

The 226 AM-FM stereo tuner-amplifier, price £56, is basically the same as the above units, but with the additional sensitivity required for magnetic pick-ups. It also incorporates treble filter, tape monitor inputs and switched loudness compensation.

The two stereo models have full provision, including space on the chassis, for adding a stereo multiplex decoder when regular stereo transmissions begin.

Also recently introduced by Armstrong are a range of separate amplifiers and tuners.

These are the 222 integrated stereo amplifier, price £27 10s., which provides twenty watts output; the 224 FM tuner, price £22 10s., with two IF stages, limiter stage



and Foster Seeley discriminator, which provides a sensitivity of 1.5 mV and has twin variable outputs for future stereo radio. Tuning is by meter.

The 223 AM-FM tuner, price £28 15s., is of the same specification and styling as the 224 with the addition of the medium waveband.

Also announced are restyled versions of the A20 and PCU25 stereo pre-amplifiers. These are the 220 stereo power amplifier, price £24 12s., and 225 stereo pre-amplifier, price £22 18s.

Armstrong Audio Limited, Warlters Road, Holloway, London, N.6.

MORE MICROPHONES BY COSMOCORD

TWO new microphone inserts from Cosmocord are the Mic 61 magnetic microphone and the Mic 49 crystal microphone, which can also be fitted with a ceramic element.

The Mic 61 is a moving iron unit developed for use in transistorised hearing aids. It can be fitted to the Acos Mic 40, Mic 60 and Mic 55 microphones. The impedance is 2,000 ohms, and the output -78 dB ref. 1V/dyne/cm.

The Mic 49 insert is used in the Mic 60 stick microphone and the Mic 55 lapel microphone. The output is 58 dB ref. 1V/dyne/cm, and the frequency response is

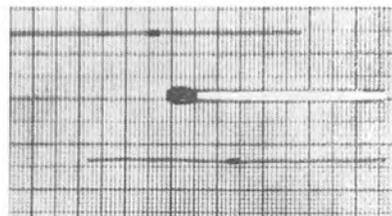
30-10,000 cps when fed into 5 M ohms. A ceramic version is available with similar characteristics, except that the output is 6 dB lower.

Cosmocord Limited, Eleanor Cross Road, Waltham Cross, Hertfordshire.

WORLD'S SMALLEST HIGH STABILITY RESISTORS

CLAIMED as the world's smallest high stability resistors are the type which have been introduced in the UK by G. A. Stanley Palmer.

The resistors, illustrated below, are available with tolerances of ten and twenty per cent. They measure approx. 2 mm. long by



1 mm. in diameter, and the production range is 100 ohms to 220 K ohms.

G. A. Stanley Palmer & Company Limited (GASP), Maxwell House, Arundel Street, London, W.C.2.

BELLING AND LEE INCREASE THEIR PLUG RANGE

ATINY r.f. co-axial connector (1/8-inch diameter) is one of a large range of miniature plugs and sockets produced by Microdot Inc., and distributed in the UK, Australia and New Zealand by Belling and Lee Ltd.

In addition to standard sizes of co-axials, there is now also extensive series of screened multi-pole plugs and sockets. These are available with up to 61 power or 19 co-axial poles, or any combination of these, contained in a housing only one inch in diameter.

Fool-proof instant lock or release mating mechanism is one of the features of the new range.

Belling and Lee Ltd., Great Cambridge Road, Enfield, Middlesex.

SAJA ANNOUNCE THEIR NEW AGENTS

THE Tape Recorder Centre (Blackpool) announce that they are now the sole UK agents for the Saja tape recorders, manufactured in South Germany.

A comprehensive selection of all spares for the Saja range is held by this company, and orders received will be met by return post.

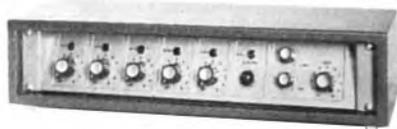
The Tape Recorder Centre (Blackpool), 266, Waterloo Road, Blackpool, Lancashire.

AUDIX INTRODUCE NEW HI-FI RANGE

A NEW range of Audix Modular Amplifier equipment is announced. Designed to meet every requirement, the new assemblies are claimed to be the most advanced equipment of its type. They can be easily installed in any combination of up to six units in a standard assembly and up to 14 as a maximum.

The transistorised pre-amplifiers operate from a supply within the main power amplifier. They are for microphone, tape, radio, gramophone, etc. The combining unit (illustrated below) into which all module pre-amplifiers are coupled is equipped with a master gain control and treble and bass tone controls. This unit, along with pre-amplifier stages, is being marketed in a self-contained cabinet operated by either an integrated mains operated power supply or from external dry battery.

Power amplifiers of 15, 30, 60 and 120 watts are designed to operate with the mixing



assemblies and can be either mounted in a console cabinet or in standard 19-inch racking.

The tape input unit (TU/1) is designed for use where it is required to mix tape recorder outputs with other input channels and for use with all standard tape output conditions. Termination is by a two-contact jack socket. The quoted frequency response is 30-20,000 cps, with signal-to-noise ratio given as better than -70 dB. Sensitivity is 0.25 volts, and the input impedance is 250,000 ohms.

Microphone units (MU/30 and MU/200) for input impedances of 30 and 200 ohms respectively are also available. Sensitivity is given as better than 150 microvolts and 300 microvolts for the two units, with signal-to-noise ratio rated at better than -65 dB and frequency response as 30-20,000 cps ± 1 dB.

Prices and further specifications on the other units are available direct from the manufacturers.

Audix B.B. Limited, Stansted, Essex.

NEW TAPE FROM AMERICA

G. W. SMITH & CO. (RADIO) LTD. announce the availability of the American-manufactured Lafayette magnetic recording tape.

At present only five- and seven-inch spool sizes are available, 5 $\frac{1}{4}$ -inch reels will be introduced shortly.

The reels of standard acetate tape are supplied in 600 and 900 ft. lengths on a five-inch reel at 8s. 6d. and 10s. respectively. Long-play acetate (1,800 ft.) on a seven-inch spool costs 15s.

Other tapes are: Five-inch reels: Long-play Mylar (1,200 ft.), 12s. 6d.; Double-play

Mylar (1,800 ft.), 15s. Seven-inch reels: Standard Mylar (1,200 ft.), 12s. 6d.; Long-play Mylar (1,800 ft.), 20s.; and Double-play Mylar (2,400 ft.), 25s.

*G. W. Smith & Co. (Radio) Limited,
3, Lisle Street, London, W.C.2.*

S.T.C. MICROPHONES FOR DOMESTIC USE

STANDARD TELEPHONES & CABLES have introduced a new high quality microphone aimed at the popular market. The new unit, the STC 4118 is a moving coil microphone retailing at £4 19s. 6d. It weighs 2 $\frac{1}{2}$ ounces and is suitable for use in the hand or as a neck microphone. A stand is also available.

Two versions are available. One of 200 ohms and the other 50,000 ohms impedance. The quoted frequency response is 100-10,000 cps ± 4 dB.

*Standard Telephones & Cables Limited,
Electro-Mechanical Division, Temple Fields,
Harlow, Essex.*

TRANSISTOR TESTER FROM K.L.B. ELECTRIC

K.L.B. announce the introduction of a simple, inexpensive transistor tester designated the "Transistor Check." As its name implies, this instrument is not a comprehensive analyser, but is intended for use by service engineers and maintenance technicians to locate a transistor failure in equipment that has developed a fault.

The pocket-sized instrument has recessed controls to prevent accidental battery drain. AC gain is measured, and indication of a



good transistor is shown on a miniature cold cathode tube.

Both P.N.P. and N.P.N. transistors can be accommodated; wire ended types can be inserted directly into the sockets, whilst special plugs are provided with the unit to allow extension leads to be used for in-circuit checks where required. The price is £4 12s. 6d.

K.L.B. Electric Limited, Holloway Engineering Works, Parkhurst Road, London, N.7.

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5½in. 1200ft. 35/-	<input type="checkbox"/>	5½in. 2400ft. 90/-	<input type="checkbox"/>
7in. 1800ft. 50/-	<input type="checkbox"/>	7in. 3600ft. 115/-	<input type="checkbox"/>

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Grundig TK46 ...	10 12 0	7 15 7	99	Reps R10 ...	7 5 0	5 8 8	69
Telefunken 97 ...	10 0 0	7 9 7	95	Fidelity Major de Luxe ...	3 13 6	2 15 2	35
Sony 464 CS ...	10 0 0	7 7 10	94	Philips EL3549 ...	6 12 0	4 17 6	62
Siemens Mod. 12 ...	9 16 0	7 9 5	93	Grundig TK23 ...	4 15 0	3 10 10	45
Philips EL3534 ...	9 16 0	7 4 8	92	Philips EL3541/H ...	4 12 0	3 5 10	42
				Truvox R64 ...	4 2 0	3 1 5	39
				Elizabethan LZ29 ...	4 0 0	2 19 10	38
				Philips EL3541 ...	3 15 8	2 16 9	36
				Ferguson 3202 ...	3 10 0	2 11 11	33
				Philips "Star Maker" ...	2 16 9	2 2 7	27
2-TRACK STEREO/MONAUURAL				BATTERY			
Brenell STB 1 ...	12 0 0	9 0 0	£120	Uher 4000S ...	9 16 0	7 6 5	93
Ferrograph 422 ...	11 12 0	8 13 2	110	Ficord 202 ...	7 0 0	5 3 10	66
Telefunken 98 ...	10 0 0	7 9 7	95	Butoba MT5 ...	7 0 0	5 3 10	66
				Stuzzi Magnette ...	6 4 0	4 12 11	59
				Optacord 414Bat./Mains ...	4 19 0	3 14 0	47
				Grundig TK6 ...	6 17 0	5 2 4	65
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MAINS TWIN-TRACK				TRUVOX HI-FI TAPE UNITS			
Brenell 5 Type "M" ...	9 5 0	6 18 7	88	TWIN-TRACK	£ s. d.	£ s. d.	£
Ferrograph 5A/N ...	8 19 0	6 13 10	85	PD.82 Standard ...	4 4 0	3 3 0	42
Telefunken 85 ...	8 15 0	6 10 8	83	PD.87 Stereo ...	6 6 0	4 14 6	63
Grundig TK41 ...	8 0 0	5 17 11	75	FOUR-TRACK			
Brenell 5/2 (Meter) ...	7 15 6	5 16 7	74	PD.84 Standard ...	4 12 0	3 9 0	46
Brenell 5/2 ...	7 5 0	5 8 8	69	PD.86 Stereo ...	6 6 0	4 14 6	63
Reps R10 ...	6 4 0	4 12 11	59				
Telefunken 95 ...	6 4 0	4 12 11	59				
Truvox 92 ...	7 5 0	5 8 8	69				
Grundig TK18 ...	4 2 0	3 1 5	39				
Truvox R62 ...	4 2 0	3 1 5	39				
Grundig TK14 ...	3 13 6	2 15 2	35				
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News from the Clubs

CATFORD

Recent meetings of the Catford club members included a talk and practical demonstration of machine maintenance, given by John Porter, and the compilation of an hour's entertainment for the local Old People's Home. They have also had an evening devoted to practical session on dubbing and an entertaining programme which included the playback of a fictitious "Old Folk's Tape" in mono and stereo.

Earlier, the Catford members were hosts to the clubs at Bethnal Green, Ilford, and Walthamstow for a round table discussion. Over thirty persons took part and were entertained for the first half of the evening by a film of a holiday in Jersey, culminating with the Battle of the Flowers. Lasting thirty minutes, this was made more interesting by having an unsynchronised sound track of music and sound effects.

Plans are now in hand to relay a Christmas service from a local church to the patients of Lewisham Hospital. This will be done "live" on the first Sunday after Christmas.

Secretary: B. W. Blakeney, 246, Ardgowan Road, Catford, London, S.E.6.

GREAT YARMOUTH

News of a new club is received from Norfolk where the Great Yarmouth group has been formed. Interested persons are invited to contact the secretary, G. M. Wykes, 7, The Pastures, Gorleston, Great Yarmouth, Norfolk.

I.T.C.S.

The International Tape and Cine Society recently celebrated the first anniversary of its formation. Tape exchanges are the main activity of this club, with round-robins, magazine tapes, and films being exchanged at regular intervals. Members are resident in Australia, Canada, New Zealand, USA, South Africa, and the UK.

A change of secretary is announced with Roger Pirie replacing the club's first official and founder Victor Bull.

In the fifth edition of their club magazine, *Tape and Cine Reel*, which is circulated free, the new secretary lists the sound effects available to members, together with a number of tape publications available from their library. Yearly membership is 7s. 6d.

Secretary: Roger Pirie, 83, Warrens Hall Road, Dudley, Worcestershire.

LEEDS

A change of venue and a change of secretary is announced for the Leeds club where Mr. Turner has resigned. The club now functions with Mr. W. H. Rowe at the reins, and meets at the Ashley Road Methodist Centre, Leeds 9.

At a recent meeting of the club, chairman Mr. Plant used two Revox recorders and a Butoba battery machine to provide a programme of *musique concrète*. Mr. Selby-Smith later gave a demonstration of his Planet U1 tape deck, when the Leeds members were joined by members from the Huddersfield club.

At a later meeting treasurer Mr. Crossley presented a coloured tape/slide show of his visit to the Isle of Man. He used two projectors and a Ferragroup recorder for his highly entertaining show which included a summer scene transformed into winter and back into summer.

Other activities of the club have included the construction of a studio in their new headquarters, and location recording for their programmes produced with the assistance of a local hospital services organisation.

Lined up for the future are programmes on how microphones work

(January 3), and sound and cine (January 17). December 20 was the date set for their annual party.

Secretary: W. H. Rowe, 34, Bristol Road, Leeds 7, Yorkshire.

NORTH LONDON

Mr. Timothy Eckersley, Assistant Head of BBC Programme Operations (Recording) was the guest during one of the October meetings of the North London tape club. He played extracts of dozens of famous voices from the BBC archives, including Churchill referring to "our finest hour," a two-year-old boy's impressions reading from Yeats, and a girl speaking about her time in Auschwitz. John Betjeman and the Goons also featured in his talk.

For an earlier meeting members travelled to London's Euston station where enthusiastic drivers encouraged their trains to sound louder and better for the members' microphones. Recordings of many of the steam trains were collected on four battery portable recorders. Other meetings have included a maintenance session on Brenell and Ferguson recorders; and the work of an audio oscillator which was described by vice-chairman Keith Parker. He also demonstrated an oscillator which he had built himself.

A large-scale reorganisation scheme for the Enfield Tape News Service is planned. This was decided following a meeting with the Apollo Blind Club who are responsible for the Service's finance and transport system. The *Enfield Microphone* a fortnightly sixty-minute news programme for the blind now has approx. seventy listeners. The committee are to write to local churches and organisations asking for further help in transporting tape recorders to the homes of the blind who wish to hear the programme.

One of the November meetings included the presentation of an inscribed trophy awarded for the best four-six minute tape on the subject of Christmas. The club's AGM was held on December 4, and this was followed a week later by their annual party.

Secretary: Richard Collinson, 30, Ridler Road, Enfield, Middlesex.

PIETERMARITZBURG

The latest newsletter from the Pietermaritzburg, Natal, tape club begins this month with a locuacious description of the club's part in the "Azalea Festival and Audio Fair."

It describes their apparently fairly gaudy float depicting world wide tape correspondence. This included members and relatives representing various countries wearing the relative national costumes. I am mystified how they dressed the "English gentlemen" who feature quite often in the story; and I am sympathetically amused by the removal by an unknown saboteur who deleted the "T" from the banner announcing the PMB Tape Club.

Max Nicholls then describes his anguish during a recent holiday when he climbed the 9,800 ft. Cathedral Peak without a battery portable and accordingly missed recording the expert yodelling performed by his Zulu guide, as well as perhaps the only occasion bagpipes have been played at the peak, when a visiting Scotsman performed for an audience of two.

The letter also describes the club's plan to provide a year's free membership to anyone introducing three new members.

For their September 25 meeting the members were to welcome a visitor from the Natal Museum to give a talk on the wild life of Natal. Arrangements were made to record his lecture. Second item on the programme was a documentary feature on the Victoria Falls. This was provided by Max Nicholls.

Secretary: Tony Hofmeyr, P.O. Box 273, Pietermaritzburg, Natal, South Africa.

READING

The new season for the Reading tape and cine society began in September.

To date members have enjoyed a survey of available equipment on the cine side, with an exhibition of some of the latest devices; a show of members' first films; and one evening devoted to a showing of the Top 8, which gave the cine enthusiasts examples of the standards that can be achieved.

On the sound side Douglas Noyes gave an informative talk on tape recorders, and a practical test was made on a selection of transistorised battery-operated machines for comparison. On a subsequent evening J. B. Helder lectured and demonstrated on stereo recording.

One of their latest ventures is the production of a film involving the entire society. There should be no shortage of extras when the cameras start rolling on the epic production of "The Great Escapade."

The membership covers a wide range of interests including cine or colour slides with sound-track, cine animation and cartoons, plus tape recording and hi-fi reproduction.

Secretary: T. Fisher, 5, Mapledurham Drive, Purley, Reading, Surrey.

RUGBY

Latest meeting of the Rugby club saw members being entertained to a tape recorded account of John Bannister's August holiday touring Belgium, France and Luxembourg. Actuality recordings were made throughout on a Stuzzi Magnette and he also exposed some fifty colour transparencies. These were edited and compiled into a two-hour programme, using a Philips four-track recorder for the master tape. Eddie Smith provided the projector and screen.

A week earlier nine members of the club visited the BBC studios at Birmingham. There they were shown the control rooms and given a chance to examine the mixing consoles, together with the studios from which emanate *The Archers*. The members also saw the tape library, and an editing room which contained a tape machine suitable for four large spools—very helpful when editing from more than one tape.

At an even earlier meeting members welcomed along enthusiasts from the Hinckley club. These heard Jack Willis present a programme on the old time music hall, including such famous voices as George Formby, Billy Williams, and George Lashwood. His programme was followed by a Round-Robin tape brought along by the Hinckley members. The tape comprised such items as talks on the technical aspects of tape recording (Stanley Unwin style); how not to communicate by tape; a holiday in Devon; a selection of music by a lady member; and an amusing account of a doctor's prescription.

Their October 24 meeting included tapes, slides and cine film of a Rag procession, and the members' visit to the Wild Fowl Trust at Slimbridge.

The December 5 meeting was scheduled to include a visit by Mr. A. C. Griffith, Recording Manager of the World Record Club. A fortnight later members were to hold their Christmas social meeting.

Secretary: Mike Brown, 219, Clifton Road, Dugby, Warwickshire.

SOUTH AFRICA

An AGM with a difference was scheduled for the members of the Tape Recording and High Fidelity Club of South Africa who were promised a five-course dinner/dance for their October meeting. Guests limited to two per person, were invited to the meeting at which the Chief Engineer of the South African Broadcasting Corporation was guest of honour.

In addition to the "banquet," members were also promised a floor show and dance music "played through a high fidelity PA system off professional tape recorders."

Prior to the occasion members were invited to nominate new members for the club council.

Chairman: Billy Stuart, c/o P.O. Box 11326, Johannesburg, South Africa.

SOUTH DEVON

A party of members from the South Devon club visited the Torquay telephone exchange and GPO sorting office recently. Although not permitted to make recordings during the visit, GPO member Laurie Sweeney made a realistic reconstruction afterwards in the form of a documentary tape.

On October 9 president Jack Stockman presented a programme of mono and stereo tape records from his collection. Two Tandberg stereo recorders, and a pair of C.Q. Audio loudspeakers were used for his demonstration.

A fairly comprehensive programme of events is lined up for members, and these are detailed in a programme card. Among those listed are a practical session of editing and recording; demonstration of loudspeakers and enclosures by a local dealer; and the fundamentals of good recording discussed and demonstrated by Joe Pengelly, Peter Cox, and John Penty.

Other items for the future include a lighthearted quiz contest between members and visiting teams from other local societies; an entertainment programme for the blind; and a dinner and social on January 17. A special programme entitled "Natural History and Outside Recording," is to be presented on January 29.

Secretary: Gordon Furneaux 45, Kenwyn Road, Torquay, Devon.

TAPE EXCHANGES

TAPE recorder owners who wish to contact others with similar interests, to exchange news and views by tape are invited to fill in and return the form shown on page 38, giving their name, age, address, special hobby or interest for this section.

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

Bekier, Sam (22). College House, Main Road, Rosebank, Cape Town, South Africa. Photography, science, films, music. 3½, 1½, 15/16 ips. 5-inch spool. Uher Universal.

Bordman, Miss Amy (29). 2, Leberston Gates, Scarborough, Yorkshire. Cine and 35mm photography, light music. 3½ ips. 5-inch spool. Stella.

Bunce, T. F. (30). 28, Lydbrook Road, Acklam, Middlesbrough, Yorkshire. Organ music, 3½ ips. 5½-spool. Grundig TK20, Benkon 77. Overseas.

Cartmell, J. B. (31). 21, Maldon Street, Rochdale, Lancashire. Outdoor recording, motoring, canoeing. 7½, 3½, 1½ ips. 7-inch spool. Philips AG8108, EL3585, EL3536; Grundig TK1. UK. Male contacts only.

Cordier, Miss Pat (38). 79, Elizabeth Street, Corby, Northants. Cine and still photography. 15, 7½, 3½, 1½ 15/16 ips. 7-inch spool. Grundig recorder. South Africa.

Crayden, James (42). 60, Rock Road, Sittingbourne, Kent. Theatre, humour, sport, popular and light classical music. 3½ ips. 5-inch spool. G.E.C. recorder. UK, Europe.

Fawell, Harry (25). "Treeway," St. Seiriols Road, Llandudno, Caerns., Wales. Aero-modelling, motorcycling, music. 7½, 3½, 1½ ips. 7-inch spool. Reps 10.

Fink, Tom (36). 1717, North Normandie, Hollywood 27, California, USA. Physical culture, travel, old films (early talkies). 7½, 3½, 1½ ips. 7-inch spool. Tandberg recorder. Scandinavia, Holland.

Fletcher, Bob (20). YMCA, Colston Street, Bristol 1, Gloucestershire. German language. 3½, 1½ ips. 5½-inch spool. Ferguson 3202. Germany, Austria, Holland.

Harley, Peter (30). 95a, 6th Street/4th Avenue, Maitland East CP, RS Africa. Travel, history, chess. 7½, 3½ ips. 7-inch spool. Sony 464.

(Continued on page 36)

CLASSIFIED ADVERTISEMENTS

Rate—Sixpence per word (minimum 5s.); Trade, ninepence per word (minimum 10s.); box numbers, one shilling extra. Payment with copy. Copy should be sent to Advertising Department, "Tape Recording Magazine," 7, Tudor Street, London, E.C.4.

TAPE TO DISC

TAPE-TO-DISC RECORDING SERVICE. All speeds. 50-minute LPs. Photographic sleeves with all recordings.—E.R.S., 162, Shirland Road, London, W.9.

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TAPE TO DISC RECORDING
Reduced prices. Finest professional quality. 10-inch LP—35s. (32 mins.), 12-inch LP—40s. (45 mins.), 7-inch EP—17s. 6d.

48-HOUR POSTAL SERVICE
S.a.c. for leaflet to Deroy Sound Service, 52, Hest Bank Lane, Hest Bank, Lancaster. Tel.: H.B. 2444.

TAPE EXCHANGES

(Continued from page 35)

Oliver, David John (20). 100, May Lane, Kings Heath, Birmingham 14. Gilbert and Sullivan Operas. 7 1/2, 1 1/2 ips. 7-inch spool. Elizabethan L229. Alba R15. Female contacts preferred.

Shipway, Wilfred H. (42). 94, Waterloo Road, 1st floor, Kowloon, Hong Kong. 35mm photography, travel, fire-fighting, Budgerigars. 3 1/2, 1 1/2 ips. 4-inch spool. Grundig TK6E. Overseas, especially Canada.

Small, Michael (34). 19, Deacon Road, Kinson, Bournemouth, Hampshire. Photography, philately, chess, music. 7 1/2, 3 1/2, 1 1/2 ips. 7-inch spool. Philips AG8109, Civic Major.

Sutherland, Dennis (29). 5, North Common Road, Ealing, London, W.5. 35mm photography, languages, guitar, music. 7 1/2, 3 1/2, 1 1/2 ips. 7-inch spool. Philips. France, Germany, Italy, Spain.

Taylor, Tony (23). 186, Pennymead, Harlow, Essex. Science fiction, trad jazz. 3 1/2, 1 1/2 ips. 3-inch spool. Fidelity Argyll Minor, Philips EL3585. USA, USSR, Australia, New Zealand.

Upfold, Arthur E. (46). 20, Branch Road, Hford, Essex. Spanish language, travel, musicals. 7 1/2, 3 1/2, 1 1/2 ips. 7-inch spool. Philips EL3538.

Walker, Ron (49). 174, Middlemarch Road, Radford, Coventry, Warwickshire. Outdoor recording. 3 1/2 ips. 3-inch spool.

Watson, Stanley (30). 2, Bunhill Road, London, E.C.1. Cine and transparencies, scootering, pop music. 7 1/2, 3 1/2, 1 1/2 ips. 7-inch spool. Repts R10, Grundig Cub, Fidelity Playmaster.

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

Name Age

Address

Special interests

Speeds to be used Maximum spool size

Recorder owned

Special areas to be contacted

(Unless otherwise stated, I am prepared to accept tapes from any part of the world)

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Taped "Sound Effects" No. 1: 35 Sounds, 1 Hour. "Light Switch" to "Thunder Storm." 3 1/2 ips 32s. 8d. 7 1/2 ips 42s. 2 Track Monaural. Global Products, 13, Stanley Street, Rothwell, Northants.

Watts, Alan (30). 25, Cherrytree Road, Rainham, Kent. Photography, art, music. 7 1/2, 3 1/2 ips. 7-inch spool. Truvox recorder. France.

Wharton, H. W. (36). 2220, Coventry Road, Sheldon, Birmingham 26. Warwickshire. Cine and still photography. 3 1/2 ips, 7-inch spool. Philips recorder. UK, America, Italy. Male contacts only.

Whittington, Philip (35). 44, Castle Street, Barry, Glamorgan. Photography, art, music. 3 1/2 ips. 5 1/2-inch spool. Grundig TK23.

Wilcock, Thomas (30). 9, Grosvenor Crescent, Arksey, Doncaster, Yorkshire. Horticulture (orchids and ferns). 3 1/2 ips. 5 1/2-inch spool. Grundig TK20, Fi-Cord 202. Australia, Hawaii.

Williams, F. J. (38). 33, Princess Street, Wrexham, Denbighshire. Hymn singing. 3 1/2 ips. 5 1/2-inch spool. Ferguson 442. Canada, Hong Kong.

Wilson, Gerald (26). 3, Burdie House, Crossway, Edinburgh 9, Scotland. Travel, world affairs. 3 1/2 ips. 5 1/2-inch spool. Fidelity Argyll Minor. USA (West Coast), Norway.

Winn, James (34). Temple Watch Company, Kimberley House, 14-17, Holborn Viaduct, London, EC1. Historic buildings, light music. 7 1/2, 3 1/2, 1 1/2 ips. 5-inch spool. Grundig TK20 and Studio four-track. America, UK, South Africa.

Wright, G. (38). 49, Malthouse Road, Portsmouth, Hampshire. Flying saucers. 3 1/2 ips. 5 1/2-inch spool. Sobell recorder. Letters first please.

Wright, R. (42). 38, Reynell Road, Manchester 13, Lancashire. Photography, tape-play production, rambling, football, music. 7 1/2, 3 1/2, 1 1/2 ips. 3-inch spool. Collaro Studio, four-track, and Ferguson recorder.

MISCELLANEOUS

8 mm. Home Movies. Send 1s. for fully illustrated catalogue. (Dept. 31), Mountain Films Ltd., 1, New Burlington Street, London, W.1.

Good cash prices for tape recorders —Tel: Maryland 5879. (See page 5.)

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LEE ELECTRONICS, The Tape Recorder and Hi-Fi Specialists, can now undertake Wow and Flutter Tests with their latest "Gaumont Kalec" Wow and Flutter Meter. Test Report Supplied. 24-hour Service. Price 25s. 400, Edgware Road, Paddington, W.2. Paddington 5521.

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TAPE EXCHANGES

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What is Jay Williams doing now?—see advertisement on page 30.

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