

TAPE

RECORDING AND HI-FI MAGAZINE

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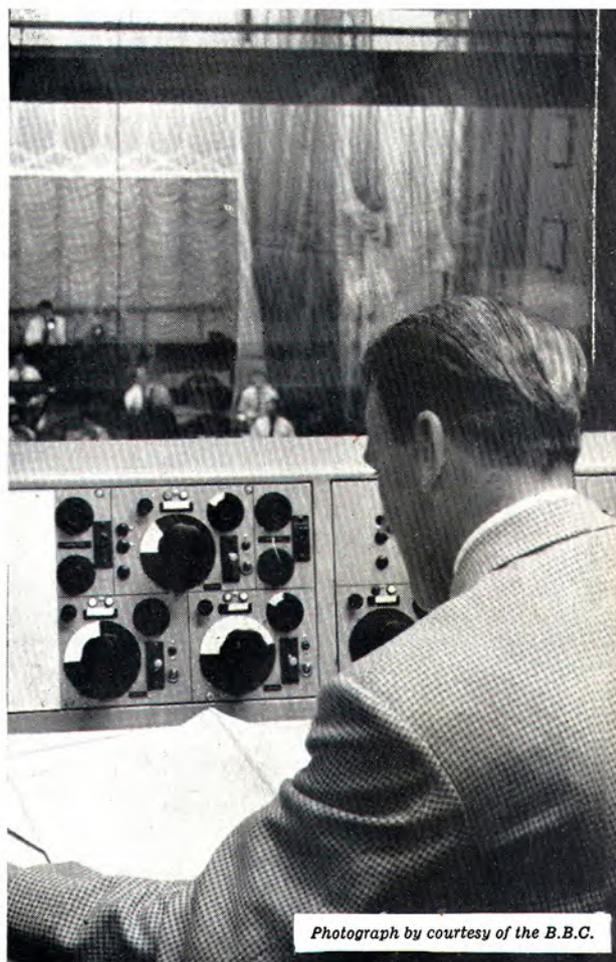
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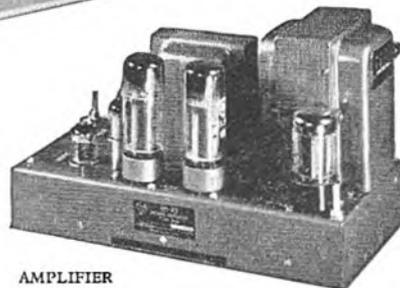
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Telefunken 75 with mike	55	7 5 0	4 3 4
Saja Export	56	7 6 0	4 5 10
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Veritone Venus*	66	8 9 0	5 2 6
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Power Consumption: 15W approximately.
Valves: ECC 83, PCF 80, EM 840/EM 81 Plus Selenium Rectifier.
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Output Impedance: 1000 Ohms approx.
Output Level: (for full recording level) 65 MV.

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Reflectograph



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R.20 62gns. with magic eye record indicator.

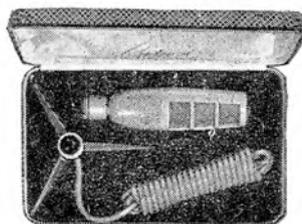
R.30 66gns. with meter record level indicator.

R.40 70gns. as R.30 but with push/pull sound output.



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- 12 **It's the best, it's...**

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Ribbon microphone 10 gns.

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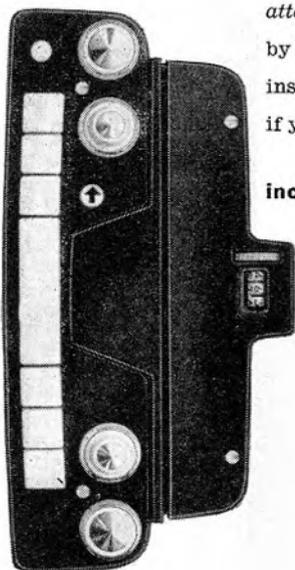
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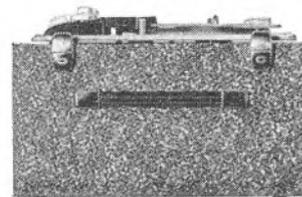
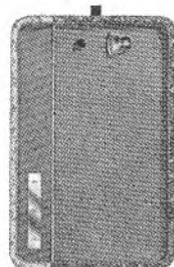
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The lid is detachable. Both case and lid are covered with genuine Rexine in attractive dual tone colours. Styling: Peter Bell, M.S.I.A.

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Dual impedance head, output sensibly flat between 50-12,000 cps. In handsome presentation case, head only 8½ gns. or with tripod desk stand 10 gns.



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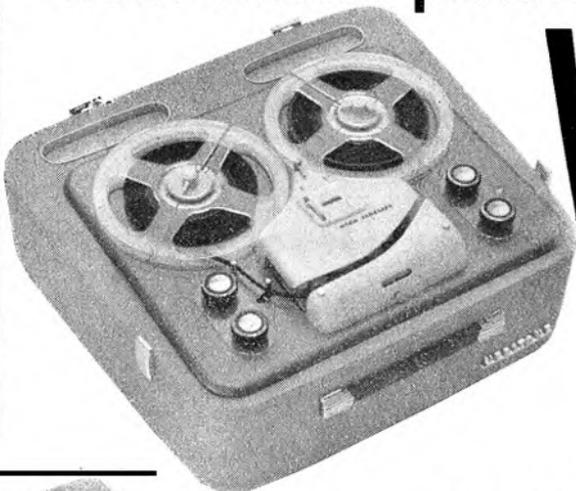


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With the Venus Portable you can re-record over an existing sound track, actually hearing the first track as you record the second—and add many layers of sound with no loss of clarity.

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TAPE RECORDS

S U P P L E M E N T

THE CLASSICS

by **Edward Greenfield**

(recorded music critic of the *Manchester Guardian*)



THE first tape in my list this month did not strictly come within my province, but it reached me with the others and I have been interested to hear it. It is of the band of the Royal Horse Guards playing a selection of marches, fanfares and other pieces and is a Delysé issue (SE 8). I cannot say I often enjoy listening to military bands. For one thing, the music specially written for them is not usually very interesting (the pieces Holst and Vaughan Williams wrote are notable exceptions). But the bands have to fall back on arrangements of orchestral pieces, and nothing will shake me from the view that the Grand March from "Aida" or "Nimrod" from Elgar's "Enigma" Variations, for example, are infinitely preferable in the original instrumentation.

As it happens, these are two of the items played by the Horse Guards Band on this tape. I do not want to deter those who will enjoy this band music on its own terms but, for me, the outstanding thing about the tape is the quality of the stereophonic sound.

From the earliest days of pre-electric disc records, military and brass bands have been easier to record than full orchestras, but, even allowing for that, I think this Delysé tape is a remarkable achievement. The frequency range is as wide as on any 7½ ips tape I have heard, and the stereo wonderfully firm. The directional effects are there, but not distractingly so, and the balance and definition between instruments as near the real thing as I have heard on tape.

I am glad that the name of the recording engineer—Allen Stagg, of I.B.C.—is on the label; he deserves this mention. Apart from that, though, the labelling is ridiculously inadequate—and that is a fault sometimes noticeable with tapes received from other companies. I realise that when there is no question of mass-producing stereo tapes in a comparable way to stereo discs labelling may be a bore to those who have monitored the dubbing. Yet manufacturers really should see to it that full details are given of all the items and of the performers.

On some tapes I have heard, for example, a concerto is

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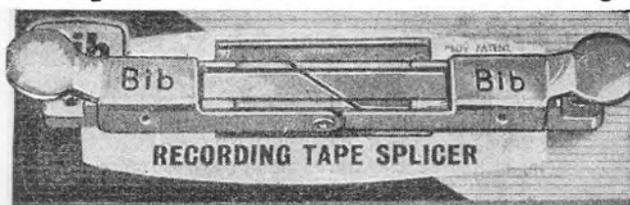
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The technical experts say . . . "Everyone who uses a tape recorder will need this little tool. It is indispensable." P. WILSON, Gramophone.

"As a test I asked a non-technical person to splice some tapes and, after a couple of practice joints, perfect splices were made. A really useful gadget." D. W. ALDOUS, M.INST.E., M.B.K.S., Gramophone Record Review.

"The Bib Tape Splicer . . . produces a perfect joint with the minimum of effort." WIRELESS WORLD.

18/6

each (subject)



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listed, followed by the phrase "and piano pieces." This is quite useless without information on what the piano pieces are.

On this Delysé band record there was no information about what items were played. This fault may, of course, be confined to review copies but, if not, Delysé should consider the problem.

The three Saga stereo issues in my batch this month are disappointing after the very good ones I heard last month. The first is of Arne's comic opera **The Cooper** in a very free adaptation made specially for the Intimate Opera Company (STF 1003). I know the disc version of this charming but naive eternal triangle story which Saga brought out a couple of months ago, and I am sure that the performance under Antony Hopkins' direction, though hardly polished, will please all who have enjoyed the Intimate Opera Company's productions.

I was looking forward to hearing the recording in stereo. Opera has more to gain, perhaps, from the freer, wider atmosphere of stereo than most musical forms, but I am very doubtful whether there is any gain here. The range is good for 7½ ips, but from the start there is far too much separation between the channels. This is especially noticeable when the three solo singers come in. One has the impression of soprano and tenor stuck firmly to a microphone on the right hand side of the stage, and the baritone just as rigid on the right.

I understand it is an American technique to separate the channels as much as possible, but if it is, I urge any British companies to abandon it as soon as they can. The whole point of stereo is that the sound should come, not from one or two single points where there happen to be loudspeakers, but from a whole expanse.

The other major fault on this tape may have been confined to the particular copy I heard; I hope so. There were some distracting upsets in the recording; a loud burp followed by a sudden increase in volume and a change of quality, and some passages rather like a film that keeps going in and out of focus. In focus, I hasten to say, the recorded quality is excellent.

The other two tapes are Frandsen and the Royal Danish Orchestra playing **Brahm's Tragic Overture** and **Mozart's Marriage of Figaro** overture on STC 1001, and the same performers doing two more overtures, **Mendelssohn's A Midsummer Night's Dream** and **Glinka's Russland and Ludmila** on STC 1002.

The excessively "boomy" bass may in part have been the fault of the equipment I was using, but that certainly did not explain the rather flat acoustic. I suspect that the recordings were made in a broadcasting studio deadened deliberately. It reduces very much the usual lively atmosphere of a stereo recording.

The performances are vigorous, but perfunctory. The strings are none too well drilled (I think particularly of "A Midsummer Night's Dream"), but, much more important, Frandsen in these performances seems rarely to shape the phrasing in the way that distinguishes an "interpretation" from a mere "run-through."

With volume turned up, I found I was less critical of these defects in performance, but for repetition on record—whether tape or disc—one really does want more distinguished performances than these. On the review copy of the Tragic Overture the last chords flatten badly. I suspect some trigger-happy engineer may have been half-depressing his switch before the end.

SOUND STORIES

by Stanley R. White

STANLEY SCHOFIELD, specialist producer of documentary motor sport recordings, has just announced his releases for 1959. Each of the **Sound Stories** pre-recorded tapes and EP records has been produced by the firm's own mobile recording units.

Apart from their appeal to the enthusiast the records will undoubtedly be invaluable to future motor historians. **The Mercedes at Oulton Park** (EP 508), for example, is already a collector's item. It holds the characteristic sounds of the Mercedes and to ensure that reproduction was undistorted and clean, special demonstration runs were made with the cars before recording. The results are thrilling. Neville Lloyd tells the story and Laurence Pomeroy interviews the drivers.

Two other releases are permanent reminders of outstanding events in the 1958 motor sport calendar: **The Grand Prix D'Europe at Spa, Belgium** (EP 506), and the **British Grand Prix at Silverstone** (EP 507). Commentary for each is by John Bolster.

Sounds of a different kind, but no less exciting, are interwoven with Graham Walker's account of the **1958 Isle of Man Senior T.T.** This record, unlike others in the series, is a 10 inch (LP 550) (tape available as well). Apart from the race itself, the commentator introduces a number of riders who talk about their machines and the circuit.

Both records and tapes are supplied with glossy sleeves containing details of the event, results, times, maps of the circuit and, in the case of the Mercedes E.P., an additional leaflet containing the history of the cars.

Prices: *EP Records*—17s. 6d. each; 600 ft. tapes at 7½ ips—£1 10s. *LP 10 inch Record*—£1 5s. (Details of tape on request).

The above prices include postage and tax within the United Kingdom. Stanley Schofield Productions Limited, 6, 7 and 8 Old Bond Street, London, W.1.

BEAT AND OFF-BEAT

by Don Wedge

(of "New Musical Express")

THE storage of instrumental and vocal music in a permanent form has been the usual function of the commercial record—disc or tape. The statesman's oration, the poetry or dramatic reading, or the performance of a play cannot be a very rewarding venture. If it were then more examples of such would be marketed.

But Columbia have made an effort to widen the application of recording to embrace "act-it-yourself." They have introduced a new range of 12 inch L.P.s, recorded in America, and given the general title Co*Star.

Hollywood stars act scenes from plays or films, complete with narrator, music and sound effects. Missing is half the dialogue. There is a script for the budding actor to fill in the pauses left on the disc.

Six L.P.s have already been issued. They involve Sir Cedric Hardwicke, Tallulah Bankhead, Paulette Goddard, Fernando Lamas, George Raft and Arlene Dahl. No mug, I chose to experiment with Miss Dahl.

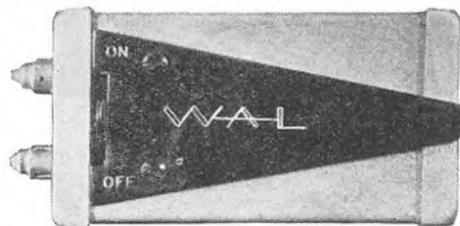
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Percy Wilson, M.A.,
The Gramophone,
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blanca," quite a torrid war-time epic set at the time of the German invasion of France. The adaptation is well done although some of the pauses seem longer than necessary. The required atmosphere is soundly created.

Co*Star discs could be taken very seriously, though I doubt if that was the idea behind them—or the way in which they will be accepted. Miss Dahl became a welcome star at my parties.

* * *

THE OUTPUT of pre-recorded pop music on tape is regretfully small, I welcome two stereo tapes from Delysé-Envoy, but am sad to report one appeals to a limited field and the other does not reach a very high standard.

Accordiana features accordionist Henry Krein, best known for his broadcasts with the Montmartre Players. It is brilliantly played and there is a high standard of recording (Allen E. Stagg did the balancing). Somehow the accordion sound seems dated and foreign—gypsies or a small boulevard cafe. But it grew on me as I listened.

The thirteen numbers on the tape were varied but retain an over-all mood. "Mountain Greenery," "Le Grisbi," "Huckleberry Fingers" and "Charleston Parisien" somehow avoid incongruity and the whole makes pleasant, if not compulsive listening unless you are a real accordion addict.

The other stereo tape I heard was **Sweet and Hot** by the Malcolm Lockyer Octet. This did not come up to the same standard. The mood continually varied from the punchy "C Jam Blues" to a mellow "There's a Lull In My Life."

There are too many styles of music involved. Some numbers are very danceable, ideal for a party, but this advantage is spoilt by changes of tempo in others. Unfortunately, performance by the soloists doesn't reach a high enough level to justify it for this alone. Lockyer and friends are capable of much better.

* * *

PERHAPS the outstanding news of recent weeks was Philips' announcement that 250,000 copies of the **My Fair Lady** LP had been sold in Britain alone. Julie Andrews, one of the stars, received a gold copy when she appeared on "What's My Line?" recently.

The album features the original Broadway cast, including Rex Harrison and Stanley Holloway, as well as Miss Andrews, who repeated their Broadway roles when the show came to London last April.

Philips' claim that it was the first L.P. to reach the quarter-million figure in Britain was challenged only by Capitol, who nominated **The King and I** (the film sound-track) which reached the mark last September. It had, of course, been on sale much longer.

Both are records that should be included, in some version, in collections of today's music. The "My Fair Lady" L.P. also leads to expectation of great things from the new work of the same composers, Frederick Loewe and Alan Jay Lerner—the music of the film "Gigi."

The sound-track L.P. (MGM C-770) Maurice Chevalier, Leslie Caron, Louis Jourdan and Hermione Gingold, makes up in personality what the stars lack through not having singing voices in the legitimate sense. The music almost reaches the standard of the composers' masterpiece.

* * *

JONAH JONES brings swing up to date on **Jumpin' With Jonah** (Capitol, T 1039). This quartet combines entertainment, taste and drive. It is an ideal reviver for a dull moment.

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This is no idle statement, it virtually sums up the REPS recorders, for high quality products such as these cannot possibly be mass produced. Our production capacity is therefore strictly limited, and for this we make no apology; rather we pride ourselves that all models manufactured comply with this published technical specification.

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THE EDITORS' VIEW

The role of the B.B.C.

THE NEW B.B.C. PROGRAMME "Sound" is off to a good start, and its introduction is an important step forward in the development of tape hi-fi in Britain. The inaugural programme, with its careful blend of stereo, *musique concrete* and tape recording, reflected great credit on the producer, Marguerite Cutforth, and her team.

Inevitably, in view of the pioneering role of this magazine, the section on amateur tape recording rested heavily on material inspired and brought to public attention in the British Amateur Tape Recording Contest, which we organise annually. A much wider circle of listeners has now heard extracts from our "Tape of the Year," with an interview with Mr. Basil Harley explaining his methods of planning and production. Another winner, Mr. Roger Charlton, was also featured in the first programme.

We expect this new B.B.C. programme to stimulate wider interest in the amateur production of sound features. We are preparing, therefore, for a much higher entry in all sections of the Contest this year, and an ambitious programme will be arranged.

On the Continent, a number of radio stations not only broadcast outstanding amateur tapes; with the privilege of using such material, they accept a responsibility to play a more active part in encouraging individual enthusiasts. A number of them have given their formal patronage to the International Tape Recording Contest (CIMES), and play their part in building it up. Several of them have found direct, as well as indirect, benefit, in that they have discovered valuable talent which has been recruited to professional staffs.

There is evidence that the B.B.C. is too cautious to match the activities of these Continental radio concerns; but they have made a good start, and we adjure them to boldness in the future.

Tape Recording and Hi-Fi Magazine is engaged in negotiations to bring the International Contest to London in the not too distant future. When that happens, we hope to be able to show that amateurs receive as much encouragement here as anywhere in the world. Nothing else would be appropriate in a country which prides itself on having set the pace in tape and hi-fi development.

Ourselves

ONCE AGAIN we are proud to publish a bumper issue—the largest in our history. It is a taste of things to come. Month by month we shall unfold plans to keep this journal in its leading, pioneering position in the field.

It is necessary that we should counsel our readers to make sure that they have a standing order for *Tape Recording and Hi-Fi Magazine* and—in the words of the patent medicine advertisements—to "refuse all imitations."

Tape Recording and Hi-Fi Magazine will continue to be published on the 20th of each month and will thus be able to publish the latest possible news from manufacturers, clubs, and other interested organisations and individuals.



JAMES MOIR, one of the great names in the world of hi-fi, here discusses the design and performance of

TAPE



RECORDERS



OF THE



FUTURE



★ *There will have to be more thought for "Mrs. Hi-Fi" . . .*

☆ *Hi-Fi means stereo . . .*

★ *Cassettes may replace discs—but the present recorder has at least ten years more useful life . . .*

☆ *Attention will focus on threading, automatic stops, better braking, marked tapes . . .*

IT is always an interesting occupation to try to forecast the path along which a product will evolve although, in attempting this, one could well wish for a good working agreement with a knowledgeable witch. No such necromantic assistance is required to decide that stereophonic sound systems will completely displace the existing single channel reproducers in those installations where the description "high fidelity" is something more than an advertiser's catch-phrase. A close approach to the original is impossible without stereophony, but more on this point later.

Tape recordings have clearly failed to displace gramophone records as home entertainment, in marked contrast to the situation in the professional field where magnetic recording is pre-eminent.

This rather suggests that though tape may have most of the technical advantages, it loses in other respects when compared to gramophone records. Illogical though it may be to the engineer, the public will always prefer the convenient to the technically perfect and, moreover, they are generally prepared to pay a high price and sacrifice a good deal of possible performance for the sake of their personal convenience. Hence television with its technically imperfect grey picture is gradually supplanting the high definition sound film even though the latter is presented in "glorious technicolor."

If this thesis is correct, then future development of the tape recorder will be concentrated on improving operational convenience even at the expense of some loss in performance, though technical development may make it unnecessary to consider any such compromise.

In what respects does the existing tape recorder fail to meet the user's convenience? This is a point on which there are many different opinions, but the difficulty of threading the tape through the heads and the driving system is probably the most troublesome to Mrs. Hi-Fi, though it may not worry the proud owner of a machine. Thus threading-up procedures are likely to receive the close attention of designers in the next few years. Let us consider what might be done.

The present troubles fall into two major categories: sheer inattention to the details of the tape run and the superficial approach to the whole problem of tape threading. Inattention to mechanical detail is regrettably common, the tape path is not obvious to the unskilled user, the tape lodges all too easily on top of guides, pressure pads, rollers, levers and all the miscellaneous screw heads that can infest the tape slot if care is not taken at both the design and inspection stages.

High marks (and large sales) will be scored by the first designer to open up the user side of the tape slot and eliminate the mass of levers, springs and pressure pads that now bedevil the near side of the tape path in almost all machines. While these mechanical details are present, the attainment of good appearance demands that the tape run be enclosed and thus threading is made doubly difficult by poor visibility.



A solution to this problem is clearly not beyond the capabilities of any competent mechanical engineer once he forgets his own manipulative skill and approaches the problem of "How do I put this tape into that slot?" with the (very) open mind of the completely unskilled user of a tape recorder.

The facility of being able to play twin track tapes in both directions without the necessity of rewinding has proved invaluable to the non-engineering side of the household, no doubt because it reduces the amount of threading-up by half. It is thus tempting to expect that "both-ways playing" will be a feature of the tape recorder of the future and it would be a bold prophet who would dismiss this development. There are a few disadvantages, however, that may retard its appearance. Two sets of erase and record/replay heads and two sets of push buttons are required, a not inconsiderable item in the total cost, and the performance that can be secured is never quite the same in both directions of tape travel.

As a corollary to the "both-ways playing" facility, some form of automatic "end of reel" stop is required. There are two forms of this device now in limited use: the tape pressure operated switch fitted to the Ferrograph and the Revox machines and the continental form of stop switch electrically operated by a piece of metal foil tape spliced into the end of each reel of tape. Both are satisfactory, but there is a preference for the tape pressure switch as requiring less attention on the part of the user and it is his convenience that we are studying. Apart from eliminating the re-threading of the tape when it has been allowed to over-run, an end-of-reel stop makes it unnecessary for the user to get out of his chair and shut the machine down on those occasions when he does not wish to continue with another selection.

No special communication from our knowledgeable witch is required to forecast that end-of-reel stops will appear on all machines in the not far distant future.

A simple but important change that has a real appeal and the additional merit of costing nothing (a unique combination) is the grouping of controls to bring all the recording controls together on one escutcheon plate, with all the replay controls on a second plate well spaced from the first group. One otherwise excellent machine has no less than eighteen knobs and push-buttons on the front panel with little obvious attempt to separate the recording and replay controls. Even an experienced user finds this a little confusing.

A final point that has raised criticism among all my tape enthusiast friends is the irritation engendered by a slow

speed rewind. Contemplation of three minutes standing by a machine while it rewinds leads too often to the tape being restored to its box without being rewound, conscience being salved by an unspoken resolution to rewind the tape after the visitors have gone.

There are some considerable engineering difficulties in the way of shortening the rewind time, for a high speed rewind imposes considerable stresses on both tape and mechanism. The tape is already highly stressed by many machines, and the improvements that have taken place in the tensile strength of tape material as a result of the newer plastic formulations have been absorbed in reducing the tape thickness to increase playing time per spool, a trend that is likely to continue. A high-speed wind is not in itself injurious to the tape; the dangerous stresses are imposed by the braking system in making a sharp stop.

A high-speed wind or rewind can be perfectly harmless if the final point is approached slowly, a facility that has been available in the Reflectograph for some years. A general improvement in braking systems would allow a further reduction in tape thickness and a consequent increase in playing time per spool.

These difficulties have not gone unnoticed in the laboratories and sales departments of the major producers of tape recordings, and their engineers have come up with a radically new solution of the problems—cassette loading of the tape.

As this development is likely to change the whole aspect of tape recording, it is worth more detailed comment. In brief, tape of the standard width and thickness is retained, but four tracks, each .043 in. wide, are recorded, separated by "lands" .025 in. wide, the tape speed being $3\frac{1}{2}$ ips—half the current standard for commercial recording. Four tracks and the lower tape speed allow one hour's recording of a two-track stereo signal to be stored in a cassette that it is proposed to sell at about the same price as a standard L.P. disc.

Adoption of cassette loading removes most of the major objections to tape recordings. The cassette is pre-loaded at the studio and the tape user need never see the tape, for an automatic stop or reverse trip is included to bring the tape to a standstill, or, if required, to reverse the tape at the end of the speed. Threading-up is completely eliminated, for nothing more is involved than dropping the loaded cassette on to the two spindles.

No doubt there will be a few production troubles and it may prove difficult to meet the price target, but even a near

(Continued on page 20)

ABC OF SOUND EFFECTS

B for birds

B FOR BIRDS. We will not attempt to tell you how to make bird calls vocally. This is an impossible task except for a few gifted people. The incomparable Percy Edwards only obtained his mastery after years of application, a musical ear and a great love of wild life.

One very useful multi-purpose sound effect in the ornithological field is that of the movement of a bird's wings in flight. It is simple to create.

Sit at the dining room table with a cloth spread on top. Anchor it with several heavy objects. Hold the cloth lightly with both hands, then move them alternately up and down slowly increasing speed for the required effect and tapering off to give an impression of a bird moving away. The length of the overlap of the tablecloth and the tightness with which you hold it will vary the acoustic.

To re-create the pinions of a swan in flight the simple

opening and closing of an umbrella will prove effective. Thin paperback books, gripped by the back of the spine in each hand and flapped rapidly will also create a similar effect.

The raising or lowering of a domestic window **BLIND** is another commonplace sound effect often needed. Pin a length of corrugated paper firmly to a wooden surface. Place the microphone about eighteen inches away. Then pass a finger nail from top to bottom. The sharp rap at the end of such a movement can easily be made with a two foot length of lath.

A **BODY** falling is another sound frequently required by producers of feature tapes. Use a heavy sash weight surrounded with a four inch layer of old clothes or rags. Make a firm parcel tied with rope and throw it slantwise so that it hits the floor on its side. This is even more effective if you bear in mind that a body has two feet and ask a seated colleague to drop one foot after the other as the "body" comes to rest.

TAPE RECORDERS OF THE FUTURE

(Continued from previous page)

miss would make the cassette a competitive device in view of the longer life of a tape recording.

Will the cassette sweep tape recorders of the present type out of the field? A difficult question, but I think that the answer is a definite "No." Perhaps it would be safer to qualify the "No" by saying that the existing type of machine will be with us for at least another ten years. The difficulties with existing machines discussed in the earlier part of this review are all capable of solution without a radical change and at a much lower cost than the major re-design needed if cassette loading is introduced.

Though the commercially recorded tape has failed to displace the disc from domestic favour, sales of machines are running at a very high level, rather indicating that tape recorders find favour because of the facilities they offer for home recording. In this application, cassette loading has little advantage; thus we may well find that cassette loading mechanisms will replace the disc player in the 1962 version of the radiogram, while the large market for home recording machines is met by improved types of the existing twin-track machines.

At a later date cassette loaded blank tapes may find usage in the home recording field if designers do not find some other way of dealing with the problems now existing, but in this, as in many other fields, competition is the best sharpener of wits. Thus it would appear that cassette loading and spool loaded tapes and mechanisms will continue to exist side by side for many years.

Minor points that experience suggests need attention in current designs of tape recorders are the type and location of plugs and sockets. In respect of quality, the type of continental plug and socket fitted to Telefunken and Grundig machines are substantially in advance of the types fitted to most British machines. It is almost universal practice to fit the sockets for microphone, radio, or extension speaker to the back of the machine, but this proves inconvenient in practice. Sockets along the front of the machine as in the Ferrograph or, if they must be at the back, on a narrow panel along the back of the top deck, are much more convenient than in the conventional position, for this necessitates the machine being turned round each time a plug is inserted. Other readers' experience on this point would be valuable.

Technically speaking, current tapes maintain a good commercial standard, but their use could be made more convenient if separate sections of the tape could be clearly indicated. At the moment there is no really satisfactory method of locating the selection required in a tape carrying a number of separate items. The use of sections of tape having a base of different colours would be an ideal solution, but at the moment it is hardly feasible.

Sectionalising the tape, the standard practice with test tapes, is technically satisfactory, but joints are a weakness and the jointing procedure is expensive in time. Marking of the back of the tape is not very satisfactory, but it may be possible to add a coloured marker on to the back to indicate the start of each section.

Magnetic recording possesses practically all the technical advantages over disc recording and it would be a great pity if these advantages were lost to the public because of the irritation aroused in the tape user by the inconvenience of operating current tape recorders.

HOMO TAPIENS

by

Douglas Gardner

I WONDER how many readers are already immersed in the job of recording for the 1959 Amateur Tape Recording Contest—and how many have even reached the stage of suspecting that they are on the wrong track and would have done better to have chosen an entirely different subject.

Those who have already reached the latter stage, and those who are due to do so during the next few months will do well to remember that most of last year's successful contestants had periods of doubt and despair, and some of them came very near to throwing up the sponge and starting something new.

When I heard the number of confessions on these lines I couldn't help wondering how many three-quarters-finished masterpieces lay blushing unheard in the dark, unfathomed caves of echo-chambers all over the country. But that is part of the natural order of creation. One of the chief ingredients of true genius is the ridiculous habit of keeping on at a thing long after it has apparently proved itself to be a hopeless cause.

Of course, an element of adaptability is another ingredient, and at least one of the 1958 winners got himself out of an unduly long bad patch by adopting a radical change of approach while retaining most of the original basic material.

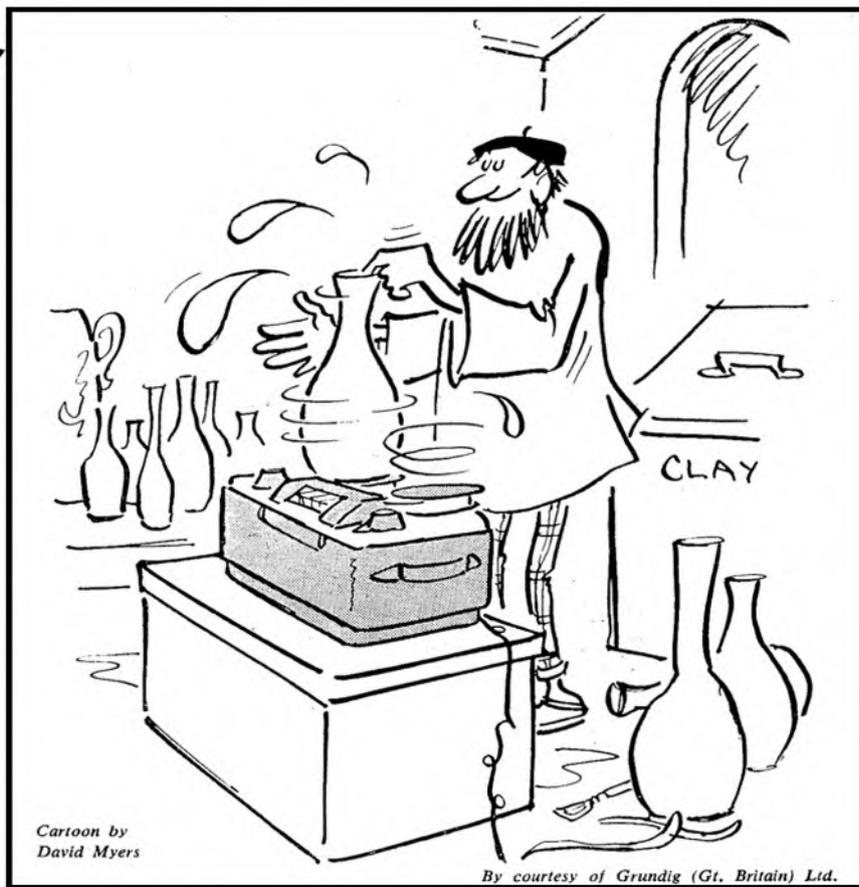
Another way of getting over staleness is to take a complete rest from the work for a week or two. If you forget about it firmly you will probably find that some new inspiration will arrive suddenly, and you will then know that it is time to begin again.

It is also important, I think, to avoid taking too optimistic a view of the amount of detail work involved in any line of approach under consideration. It is sometimes possible to find a simpler way of achieving approximately the same objective, thereby reducing the wear and tear on nerves and gaining from a surer touch.

ABOVE all, you should be ruthless with "cuts" in the preliminary stages. A lot of your spiritual resources can be poured into the perfection of a section that eventually has to come out. And tied up with that one is the fact that many a tape is marred by the inclusion of irrelevant or stretched-out material—retained because so much work has gone into it and the author could not bear to throw it away.

Never forget that the maximum times laid down for competition tapes are not an indication of the ideal lengths. Within the maximum limit each tape should be the right length for itself alone, and not five seconds longer. And for every tape that is a bit too short there are a hundred that are much too long.

During the preliminary planning stage you should already be thinking of the supreme importance of using telling sequences that leave the listener wanting



Pitfalls to avoid when preparing contest tapes

more, and of avoiding anything that seems like repetition. And all the way through to make pruning the first priority. Pruning before polishing saves work and heartache. If possible, work on the shortest version you can conceive and keep extra material for grafting in later if necessary.

For a revelation of how much can be conveyed in two and a-half minutes, I commend Mr. B. W. Harley's winning Actuality tape in the 1958 contest. And then I suggest that you play "Dialogue for Cats" and Mr. P. Copinger's "Escape Fantasy" to spot the places where further cuts could be made, if they had to be, without doing any harm.

You can obtain a 7½ ips tape of these three prize-winning entries and Mr. R. Charlton's winning entry in the Speech or Music Section, from *Tape Recording and Hi-Fi Magazine*, 426, Camden Road, London, N.7., price 36s. post free.

MUCH contemplation of the rugged strength of that social phenomenon, the popular misconception, has conditioned me to an acceptance of the fact that the basic fallacies concerning the tape recorder will probably be with us to sicken our lives slightly for at least a generation.

I have not been surprised, therefore, by their emergence in assorted quarters among the generally very complimentary notices enjoyed by "Tape Recording as a Pastime."

Just as some people will always believe that Germany is almost completely covered with beer gardens, some that London is always completely covered with fog, and some that punters always finish up clinging to the end of the pole in mid-stream (I've *tried* to do the trick many times but never managed it) so there are people who will remain convinced, in spite of all one can do, that owners of tape recorders are, to a man, out for mischief.

Probably the idea was born in the first place out of a mixture of fear, guilt and egotism. "Here," says Ego, "is a machine with which my enemies can record what I say and turn it against me; and as I am sure I often say things I shouldn't say, the threat is manifest."

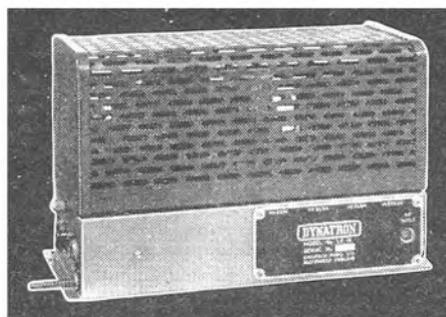
And in the face of all the evidence in the world that the tape recorder is used in a thousand different ways, Ego will cling fearfully to his belief that people who pay from forty to one hundred pounds for a tape recorder do so mainly to confound and embarrass Ego.

DYNATRON

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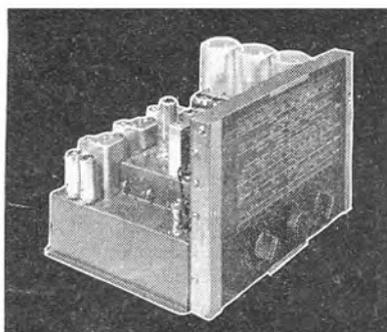
AMPLIFIER LF.15.CS



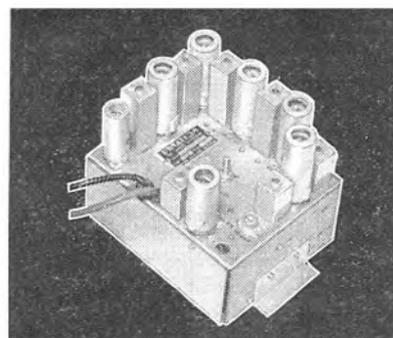
AMPLIFIER LF.16.CS



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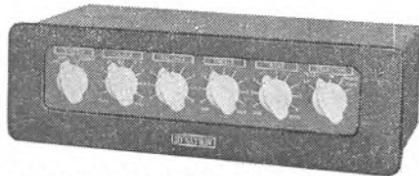
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TUNERS

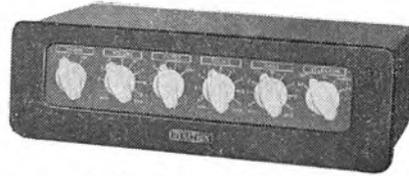
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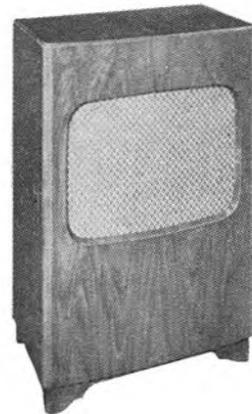


TONE CONTROL UNIT TC.15.CS



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MOST AMBITIOUS TAPE HI-FI SET-UP?

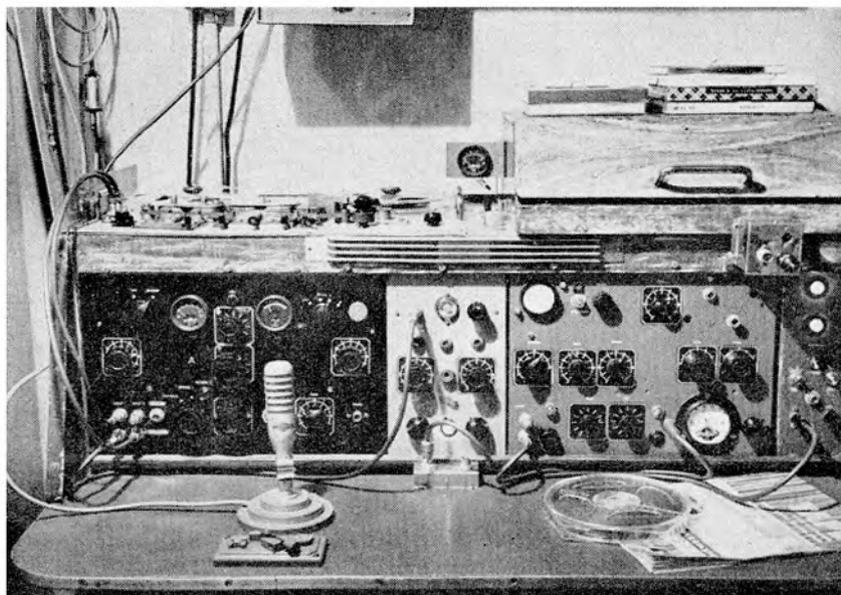


FIGURE 1—A photograph showing the layout of the recording console described in this article. Top left, is the tape deck and top right, the turntable and pick-up housing. Under the tape deck is the RH channel amplifier, the chassis containing bias oscillators for record and erase. Under the turntable is the LH channel tape head playback amplifier and LH channel recording amplifier, the chassis also containing "line-up" tone generator. Between these two is the RH channel recording amplifier. To the right of the central panel can be seen the scope tube. On the desk, a Lustraphone "Ribbonette" microphone, a reel of Emitape, and, of course, a copy of *Tape Recording and Hi-Fi Magazine*.

MY active interest in recording began long before the introduction of magnetic tape as a recording medium. Other than disc or film, the only other material then available, but better suited for amateur use, was steel wire. High fidelity was still the "sound of things to come."

The subsequent development of magnetic tape, vastly superior amplifiers, and tape transport mechanism, has, of course, established a high degree of realism in sound recording; *ne plus ultra* is more usually the demand of the discriminate enthusiast of to-day.

The very complete and versatile equipment briefly described in this article has been designed to meet the standards required for high fidelity, plus extreme flexibility in operation.

Stereophonic or single channel recording and playback, plus all the facilities required for multiple recording techniques, are the main features, as may be clarified a little by consulting the block diagram (fig. 1) and photograph

The author of this article, F. C. JUDD, A.Inst.E., has built himself a system that seems to have everything—even the facility to record automatically signals sent ten miles by radio transmitter.

(fig. 2). Equipment includes "built-in" FM, AM and TV sound receivers, a turntable and pick-up, and an oscilloscope and audio frequency signal generator, both these items being invaluable for checking performance quickly and regularly.

RECORDING FACILITIES

Two complete amplifiers, based on circuits recently published by Mullard Limited, cater for stereo or single channel recording. Direct switching of tape heads from recording to playback amplifiers is provided, although the heads may be independently connected to either channel by co-axial leads.

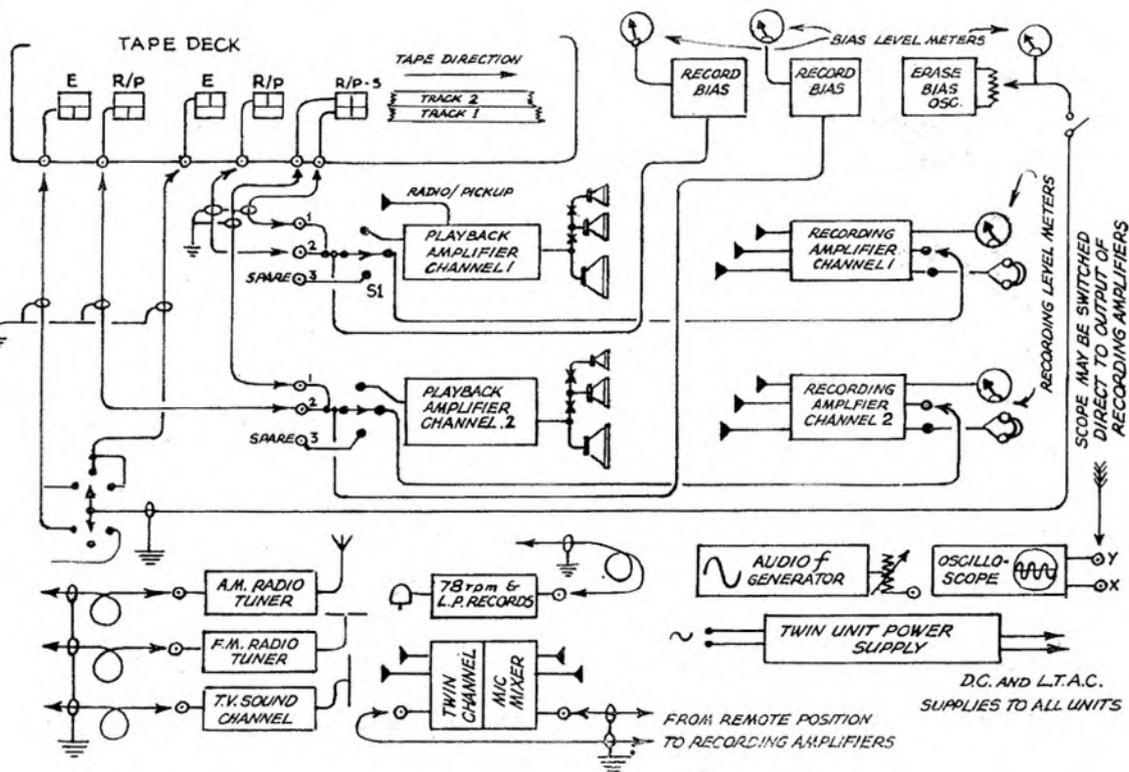
Most of the interconnection between units is effected by a standardised system of screened patch cords and jacks and co-axial leads and plugs. A recording can, therefore, be made on one track for transference to the other with added material, and five tape speeds allow music recordings made at a particular speed and pitch, to be dubbed on to the opposite track in relative key and pitch at a higher or lower speed. This is one of the secrets of the Les Paul records and a trick now widely used by the "gimmick" specialists.

Echo effects are, of course, obtained by feed-back from a tape head placed after the one being used for recording.

Each recording amplifier has provision for one high and two low level inputs, with separate faders for each, and recording levels are directly monitored by meters or the

SYMBOLS

- E ERASE
- R/P RECORD PLAYBACK
- R/P-S STEREO HEAD
- ⊖ CO-AX SOCKET
- ▶ MIC JACKS ETC
- X CROSSOVER NETWORK
- ⊥ SCREENED LEADS



oscilloscope. Either of the playback amplifiers, complete with its equalisation circuit plus bass and treble response controls, may be patched from a low level output to a recording amplifier.

Three bias oscillators, independently switched, add to the flexibility of the system, and a rather novel method of fading out a recording that has otherwise ended abruptly is achieved by controlling the erase bias oscillator output—a facility useful in tape editing.

PLAYBACK AMPLIFIERS

Two complete 10-watt amplifiers, having identical frequency response, provide separate playback channels for stereo; either one may be used for single track operation. The remaining channel provides for continuous monitoring, whilst recording on the other track.

The usual bass and treble control circuits are included in each amplifier and the main gain controls are calibrated in dB.

Suitable high level input sockets cater for direct connection from a radio tuner or pick-up.

THE TAPE DECK

The deck has been built to accommodate an erase and record/playback head for each half of the tape, as well as an "in line" stereo head which may also be used for monitoring during recording on either track.

Each combination of record/erase heads has its own

pressure pads and tape release mechanism and, with the exception of the tape heads, the entire deck was built by the writer, although the purchase of a semi-professional deck is now being contemplated for inclusion in more portable equipment.

AUXILIARY EQUIPMENT AND RECORDING

All the equipment so far mentioned, including two power supplies, is housed in a console (see photograph). A twin channel, self-contained microphone mixer/amplifier, which can be coupled back to the main recorder via co-axial lines, is available, together with one ribbon and two high-fidelity crystal microphones.

The loudspeaker system comprises two units, each with three speakers and associated cross-over networks.

The recorder is often used in conjunction with the writer's amateur radio activities, where re-transmission of the recorded signals of another station provides the operator with more useful information about his transmission than can be given by verbal report. The transmitting licence also permits operation of a mobile transmitter, from which a good signal can be received from more than 10 miles away.

Sounds from town or countryside, street or farmyard noises, traffic or trains, can all be obtained by simply transmitting them back to the home station receiver which is patched directly to a recording amplifier.

(Continued on page 28)



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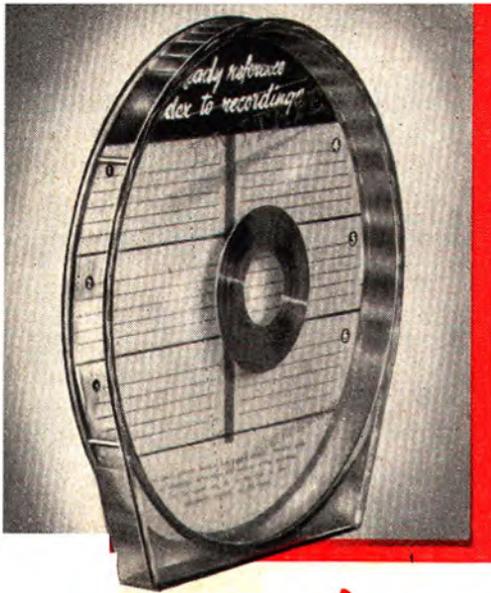
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88/3N		3 1/2" dia.	175'	—	7 6
99/3N		3 1/2" dia.	250'	—	9 6
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99/9		5" dia.	850'	£1 10 6	£1 8 0
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*Frequency response:— 50 c/s to 12 kc/s 3db at 7 1/2 ips.
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Three speeds, twin track, push-button change-over. Low and High impedance outputs corrected to international standards. 10" x 6" elliptical speaker in lid, detachable from operating unit. Luminous-target record-level indication. Automatic switching for monitoring facilities. Resettable tape-position indicator. Takes up to 7" spool. Attractive cabinet covered in coffee and cream colour PVC leathercloth. Storage space for leads and microphone.



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*Frequency response:— 50 c/s to 14 kc/s 3db at 7 1/2 ips.
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Four push-buttons and stop bar for control of tape deck. Separate heads for Record/erase, Playback and Monitoring. Counter type position indicator. Separate controls for Record and Playback volume. Separate Bass and Treble controls. 'Luminous target' record level indication. Three matched speakers - 10" bass unit, 9" x 5" middle unit, and 4" treble unit - mounted in reflex enclosure. High quality crystal microphone with storage compartment. Precision built drive motor for capstan and tape reels. Takes up to 7" spool. Contemporary design console cabinet with oak-framed speaker fret.

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(Continued from page 25)

The entire link is an electrical one, the only microphone in circuit being that at the transmitting end, so the quality of reproduction is not greatly impaired.

STEREOPHONIC RECORDING

Making stereo records is a fascinating process, requiring an entirely new technique in recording, and it would involve more explanation than is possible here. A brief outline of the production of an amusing but simple story in sound is included, however, for the sake of interest.

Title: "MURDER IN 3D" (Short story in sound, no speaking.)

Introductory music: "Mystery Street" (Eddie Calvert recording).

(1) Fade-in music on right-hand channel, fade-out after first few bars and bring in sound of grandfather clock ticking, with slight echo on recording (recording of cheap alarm clock slowed down) on the left-hand channel.

(2) Owls hoot in background, slight echo (central).

(3) Fade-up sound of breathing with slight snoring (right-hand channel), with background of small bedroom clock ticking. Fade down on G.F. clock as it chimes. Keep up occasional owl hoot in background.

(4) Continue quiet background for few moments, then; sharp squeaking sound of doorhandle being turned and door creaking comes sharply and loudly from L.H. side (pause); footsteps slowly move from left to right.

(5) Sharp intake of breath from R.H. side, plus rustling noise of someone moving cautiously.

(6) Owl hoots, heavy steps, door creaks on R.H. side; loud bang (central) followed by scream and thud of falling body (the wife didn't go much on the falling body idea, but provided some very effective screams).

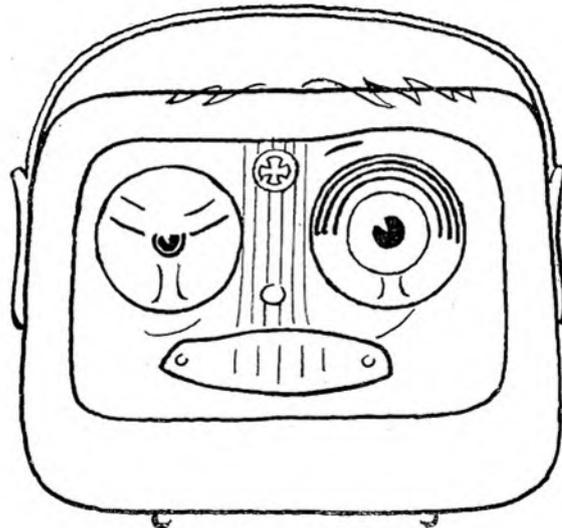
(7) Sound of hasty and heavy footsteps (R to L), door slam (L.H.), silence, owl hoot, fade-up mystery music.

Whilst parts of this recording are not strictly stereo (the footsteps, door sounds and screams, etc., are), it is nevertheless most effective when played to unsuspecting friends in semi-darkness or the glow of firelight and calls for fairly expert recording, mixing and editing.

One other recording that I feel worthy of mention is a sort of "Stereofantasia" which includes a most heterogeneous collection of moving sounds arranged *à la* "Goon Show."

Some experiments have also been made to provide a third channel, so that sound will travel towards, or at the back of the listener; similar to the effects produced in "Cinerama Holiday" and other films. Many otherwise excellent stereo recordings have been made of small music groups and all the usual moving sounds of cars, lawn mowers, footsteps—not forgetting the B.B.C. train, which was recorded from the FM/TV experimental stereo transmissions.

I hope now that the experimental E.M.I.-Percival system of stereo transmission will be adopted by the B.B.C. and that the not too distant future will see—or should one say hear—regular transmission of suitable programmes.



"All set for the Yukon . . ."

I HAVE just returned from an 18,000-mile, six-weeks trip across Canada, up as far as Yukon territory, with my friend, Stuzzi. Except on one extremely dangerous outing, when I didn't want to risk his life in a canoe down some of the rapids of the Peace River in north-eastern British Columbia, he and I were quite inseparable.

Stuzzi is a light portable tape recorder whose full name it would be unethical to mention here. We were introduced when in my capacity as a journalistic schoolmaster I was engaged in reviewing about a dozen kinds of tape recorders as aids to education for an education journal. He was the last I met and arrived only a few weeks before the end of my summer term at the time when I was due to climb into a B.O.A.C. plane for Montreal for my biennial summer-holiday tour in search of "copy."

Let me say now that I think of Stuzzi as human, not because he can speak my language, as well as a number of others, but because he *looks* far more human than several people I could name and is far more intelligent when he's silent than when he is not.

Stuzzi needs no umbilical cord to the mains. He is dependent entirely on his own little batteries which seem never to tire, though they are said to last from 30 to 90 hours of his working time. Stuzzi is unique in my experience in sitting up, rather than lying down, while at work, and it is for this reason that I find him so endearingly human.

It means I am being watched by him from the most expressive, most profound, owl-like eyes you ever saw. They are never the same. This last attribute I failed to take in fully until a morning in Toronto when I woke up in my room in the university to find him staring in the most lop-sided way imaginable; his teeth seemed set grimly, and the whole expression presaged a day of endurance and ordeal.

That afternoon was, in fact, a tremendous ordeal for him. We were in the control room of the new hydro station at Niagara Falls, Ontario. An enthusiast was explaining to me, while an almost deafening roar of turbines and earth-moving equipment and dynamite explosions from the American side competed for attention, what innumerable gauges and coloured buttons meant. He was

“My friend Stuzzi”

JOHN USBORNE took a portable recorder to keep him company on a tour in Canada. Here he tells amusing anecdotes of their exciting experiences together.

using, as far as I could make out, lots of technical terms which went right over my head.

Suddenly I said to the enthusiast—or rather, bellowed: “Would you mind saying all that over again into this machine?”, and I handed the whole business over to Stuzzi, while I relaxed by studying a new picture of Marylyn Monroe which one of the three push-button boys had pinned up over a gauge which measured the amount of cloud over Toronto. All I had to do from then on was to nod intelligently and answer politely when an official asked me what I wanted to see next.

That night, in the quiet of my cousin’s home in up-state New York, by the Erie Lake-shore, I got Stuzzi to tell me the whole story over and over again till I had it condensed into my notebook with suitable quotes *verbatim*. Through him, as I reclined in a comfortable bed after an excellent dinner of Erie blue pike, I didn’t mind the grating noises and minor explosions which those poor people working at Niagara Falls have to endure every day. I got an excellent story.

But the look of relief he gave me when I finally put him on the table by the bed was most touching.

You see, my original intention, after the Rothwell House section of Broadcasting House had passed Stuzzi as being up to standard for B.B.C. purposes, was to use him for collecting the songs of birds and the noises of wild animals and the more exciting experiences of people, for various talks I would do when I returned.

But after Niagara Falls, Stuzzi more or less took over and enabled me to bag about three times more “copy” than I would have had the energy for otherwise. I learned about the chemical industry in Sarnia through him, about the St. Lawrence Seaway *via* several workers and officials during noisy accompaniments. I got men on planes, women on buses, children on trains, all talking good “copy,” but all too much to take in at the time.

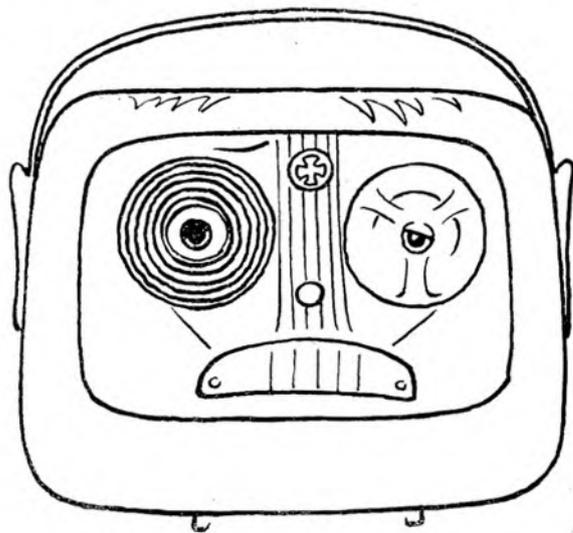
I treasure a number of services Stuzzi did for me. I still enjoy playing back, for instance, the interview I had with a Dutchman called Dr. Blom, who was showing me the huge area of rich farmland his firm were reclaiming from the Fraser River outside Vancouver.

At one point where he was explaining the payments made for milk to the “new” farmers, a cow moored approvingly from a barn 30 yards away and a party of migrating warblers settled in a spinney a few yards away and burst into song.

Up in the Yukon, not far from the Alaska Highway,

was a mynah bird captured in Central India which said: “Wanna smoke?”, “Go to bed,” and one or two unrepeatable things, in an accent learned from a Russian who had escaped from the Soviet Union five years ago. He warmed to Stuzzi at once but, unfortunately, owing to an oversight a few hours later, most of the Mynah bird was erased by excruciating yells coming from a square dance.

My biggest triumph with Stuzzi, however, although quite unsuitable for the B.B.C., was in Calgary, Alberta, when the taxi-driver who was driving me from the railway station to the airport, about seven miles away, opened up about inflation, cost of living, hire purchase, Diefenbaker, the Americans, the Quemoy affair and Chiang Kai Shek. As it was dark inside the taxi, I quietly and imperceptibly reached into the back seat for Stuzzi, whom I settled on



“Oh, my eye, what a taxi-driver”

my knee, and made him record some of the richest talk I’ve heard in years.

The mating cry of the bull elk, obediently bagged up in Banff the previous day, was Sunday school talk compared with it. I wouldn’t be sure, but I thought I saw Stuzzi looking something like this when that taxi-man had quite finished.

We went through a lot together, Stuzzi and I.



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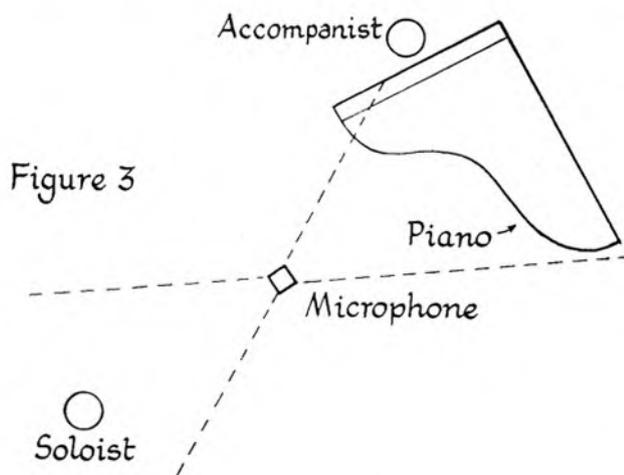
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Some common problems when recording soloists

ARMED with the information given in the first two articles in this series, we can consider the set-up required for recording a soloist with piano accompaniment. The aim is to achieve a satisfactory rendering of the quality of the voice and the tone of the accompanying piano; to establish an acceptable balance between the two; and to produce a recording which has "atmosphere" derived from the room acoustic, without loss of clarity in the words. This apparently simple project requires, for its successful completion, careful attention to all these points.



Although it is perfectly possible to achieve a recording of high quality, there are a number of "arrangements" which you will be wise to avoid. First, don't attempt a serious recording session in the average sitting room. From the singer's point of view, such a room is too small, and the acoustic gives a peculiar "dead" quality to the result. Again, don't allow your singer to accompany him- or herself at an upright piano; a satisfactory balance is impossible to achieve. Third, don't allow your singer to try to look over the pianist's copy; this again is impossible to balance properly. It is probably due to trying unsuccessfully to record music under conditions such as these, that many people are disappointed.

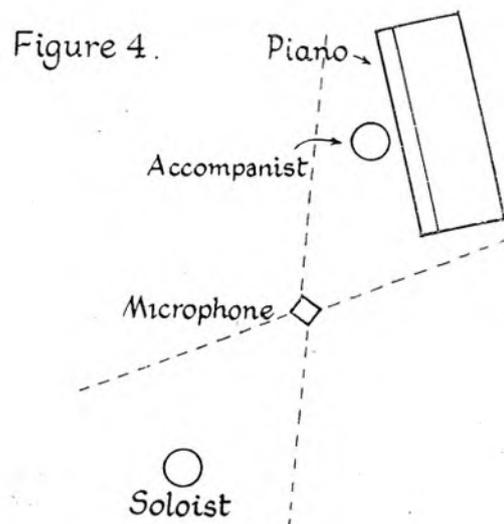
The choice of room is, then, the first matter to be considered. It should not be too small for comfort, while, at the same time, you don't require to hire the local town hall! A school may be able to help you here, though choice may then be restricted by the availability of a piano.

If you can possibly obtain a grand piano (even a baby grand) for the recording, this will make a great deal of difference to the final result. The tone quality of the average baby grand is usually better than that of a very good upright, and is easier to balance, too.

A trial set-up can now be made. The exact arrangement will depend on the number of microphones used; two possibilities employing one mic are shown in the accompanying diagrams.

Using a grand piano (see Fig. 3), the balance can be altered by adjusting the microphone distances. The piano lid should be up on a short stick—never record with the lid down, this kills the brilliance. Knowledge of the music sung is a great help here. If the piano is merely an accompaniment, it can be further away; but if the piece is essentially a duet (e.g., "The Fiddler of Dooney"), the microphone can be moved closer to the piano while still maintaining a satisfactory balance. In this way, the correct impression of soloist and piano as equal partners will be achieved.

With an upright piano, the set-up may require more experimentation. Figure 4 provides a starting point. The mic should never be placed on the bass side of the keyboard, or an incorrect balance between the treble and the bass will result. If you are using a ribbon mic, *never* try to achieve a good balance by placing the piano on the edge of the beam. The balance of *volumes* may be quite good; but the effect is that of a singer (close) accompanied by a





By Michael Woodhouse

piano (twenty feet away). The actual recording session should be straightforward. Soprano high notes may need to be watched carefully; they are often stronger, and consequently more liable to over-record, than the human ear suggests.

If you can afford the tape, record only on one track, so that editing can be carried out easily. As I said earlier, the amount of editing which can be carried out on a music recording is very much less than is possible on speech. In speech, it is often possible to alter the tempo and overall effect of a performance by cutting out or inserting pauses. A music performance, however, is incapable of such changes, except by making a fresh recording. All that can be done with the scissors is to re-time gaps between verses of a song or items at a concert; and to replace a "fluffed" verse of a song which has been repeated.



There is one very fascinating addition which can be made to any recorded tape, if you can obtain a mixer and a second recorder. This is to add a commentary on the events taking place; it is most effective for recordings of a complete concert or other special musical event, and adds the finishing touch to the tape as a memento of the occasion.

Let me enlarge on this by referring to a recording I made some time ago, of a Carol Service at Mansfield College,

Oxford. In the final version, an introductory "studio" announcement was made; then the organ prelude, with which the original recording began, was slowly faded up and held at a low level, while a "commentator" set the scene. The organ prelude came to an end; the ministers entered, and the service began. The concluding voluntary provided opportunity for a closing announcement, so that the tape now stands complete as a souvenir of the service.

The great merit of this technique, which can be quite easily carried out single-handed, is its convenience. Any errors in the synchronisation or balance of the verbal description or performance can be rectified by repeating the particular section; while the original recording is not affected. This is particularly important with valuable originals. For the introductory "studio" announcement ("We are now taking you over to Mansfield College, Oxford, for the annual Carol Service . . ."), the speaker should be about three feet from the microphone, to take advantage of the room acoustic. For the "commentator" at the performance the voice should be kept low and quiet and a close mic position (nine inches to one foot) used. Care is necessary if a ribbon mic is employed for this, because of the risk of "shatter"; the dead face of the mic must be used.

So we have reached the final stage; the recording has been made, editing carried out, and a commentary added to the final dubbing. The tape is complete and useful experience has been gained for future productions. No two performances are exactly alike; each one calls for skill and ingenuity on the part of the recording engineer; but the satisfaction of a tape which faithfully mirrors a good performance is recompense indeed.

Tape and disc recording

THE owner of a tape recorder who has it in mind to record from disc must pay the most careful attention to the law of copyright. He will find that most commercial discs carry a clear injunction against any sort of copying, even for purely personal use. But where this disqualification does not exist, there is an obvious advantage in making a tape copy so that the recording may be repeatedly played back without causing deterioration.

L.P. discs should be recorded at $7\frac{1}{2}$ ips, which, on a standard 1,200 feet tape, will give 30 minutes of unbroken recording per track. An l.p. tape on the same size reel will give 45 minutes per track at the same speed. Popular music can be recorded at $3\frac{1}{2}$ ips, thus getting double these playing times. This means that about fifteen 78 rpm gramophone records may be recorded on one standard tape running at $3\frac{1}{2}$ ips, and, of course, the tape occupies less space than the discs.

by
Charles

Langton, A.M. Brit. I.R.E.

The majority of gramophone pick-ups in use are of the crystal variety, and have a high impedance. They also give a comparatively large output, and will give results when connected directly to the "P.U." socket on most recorders. To connect up, first unplug the radiogram from the mains, remove the back of the cabinet, and then withdraw the two wander plugs which connect the screened lead from the pick-up to the P.U. sockets on the rear of the chassis. Make a note of the order in which they came out and when replaced later, ensure that they go back the same way round. The screened lead from the pick-up now has to be connected to the input of the tape recorder. This may appear awkward, as the recorder will be designed for a jack plug or coaxial plug connection, whereas the pick-up lead terminates in two wander plugs.

It is recommended that, to avoid any inconvenience in the future, a simple adapter be constructed, which will enable future recordings to be made without having to keep plugging the pick-up in and out. Furthermore, with this device, the radiogram will function quite normally and recordings may be made at the same time as music is being played through the radiogram, if desired.

The components required are: one two-pin pick-up socket strip, two wander plugs (to fit the radiogram P.U. sockets), one jack plug or coaxial plug (to fit the recorder input), one metal box about $2\frac{1}{2}$ in. x $1\frac{1}{2}$ in. x 1 in., and two short lengths of coaxial cable. The whole should be assembled according to Fig. 1, and when completed may be permanently fastened inside the radiogram cabinet.

The two plugs from the pick-up lead may then be inserted into the adapter, whilst the two new wander plugs on the end of the short coaxial lead are plugged into the P.U. sockets on the rear of the chassis. Left in this manner, the radiogram should work normally, but make sure the long

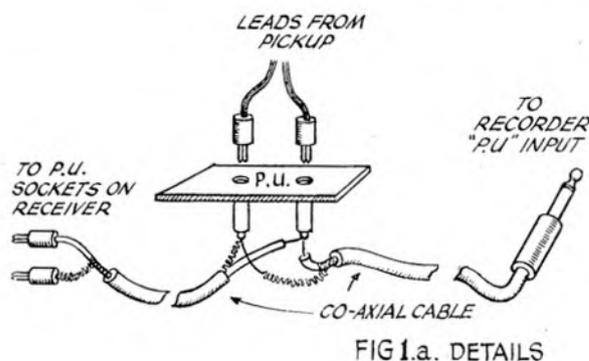


FIG 1.a. DETAILS

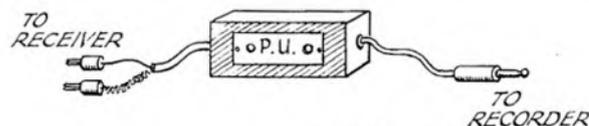


FIG 1.b. COMPLETE UNIT

FIG 1. ADAPTER FOR RECORDING FROM GRAMOPHONE PICKUP

coaxial lead containing the jack plug does not dangle near to mains leads or transformers, otherwise hum may be picked up. It is best to coil this lead up and support it on a hook fastened to the outside of the back of the cabinet, when not in use for recording. When required, it is only necessary to plug this lead into the tape recorder input socket marked "P.U."

This method will obviate the necessity of removing the radiogram chassis, but for the more technically-inclined it

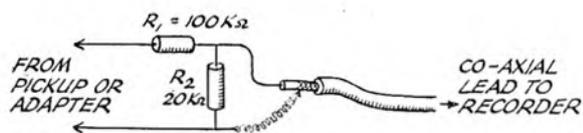


FIG 2. POTENTIAL DIVIDER TO PREVENT OVERLOADING THE RECORDER

may be mentioned that the methods outlined in last month's *Tape Recording and Hi-Fi Magazine* for recording from radio may be applied to recording from disc. In particular, the method of tapping off the signal from across the volume control will enable high quality recordings of radio or disc to be made at will.

If there is no P.U. input on the tape recorder, the pick-up may be plugged into the "radio" or "microphone" socket, under the following conditions. In either case, the pick-up should be matched to the input. That is to say, as the "radio" socket is a high impedance, the pick-up should also be a high impedance model. Thus, crystal pick-ups and the old type of magnetic pick-ups may be used directly. The modern moving coil and variable reluctance models are low impedance, and give a low output

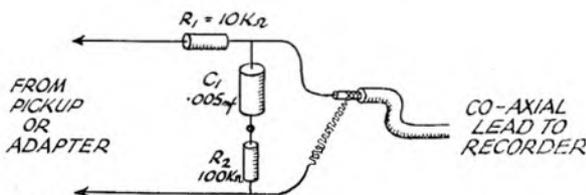


FIG 3. TONE CORRECTOR

voltage, and they may only be used with the aid of a suitable matching transformer. This may be fitted on the receiver chassis, in which case the most satisfactory way out is to use one of the methods in last month's article, already referred to above.

As the output from the pick-up may be insufficient when plugged into the "radio" socket, try the "microphone" input. This is normally high impedance and is much more

sensitive and the chances are that the pick-up will overload the recorder. To prevent this, a simple potential dividing circuit should be included between the pick-up leads and microphone socket, as shown in Fig. 2. The resistors are half-watt carbon, and the values shown will be satisfactory in most cases. If there is still overloading, R2 may be decreased to 10 or even 5 kilohms.

In any of the above applications, judicious use of the tone control should be made. If it is not possible to obtain sufficient bass response, due to the disc recording characteristic, the filter circuit shown in Fig. 3 may be included between the pick-up and recorder. The capacitor should be a good quality tubular, whilst half-watt resistors will suffice.

A useful addition to a tape recorder which will give extra pleasure is a mixer-fader box. This can be constructed so as to give mixing and fading facilities on any number of inputs, although the unit to be described will accept three, i.e., two microphones and one radio or pick-up.

The unit should be constructed in a conveniently sized metal box, although a wooden or plastic container may be used with slightly more risk of hum. Three coaxial

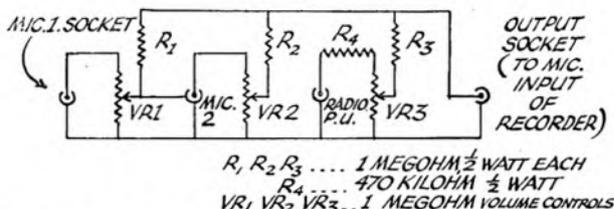


FIG 4. MIXER CIRCUIT

R₁, R₂, R₃ ... 1 MEGOHM ½ WATT EACH
R₄ ... 470 KILOHM ½ WATT
VR₁, VR₂, VR₃ ... 1 MEGOHM VOLUME CONTROLS

sockets are used for inputs, and one for output. The output is fed to the *microphone* socket on the recorder by means of a length of coaxial cable, or screened microphone wire. The circuit is shown in Fig. 4.

In operation, it is possible to adjust the level of each individual channel (i.e. microphone or radio) from zero to full modulation by turning the appropriate volume control. Thus it is possible to blend one programme with another, provide background music to suit a commentary, etc. Each control will be independent of the others. Extra inputs may be added as desired.

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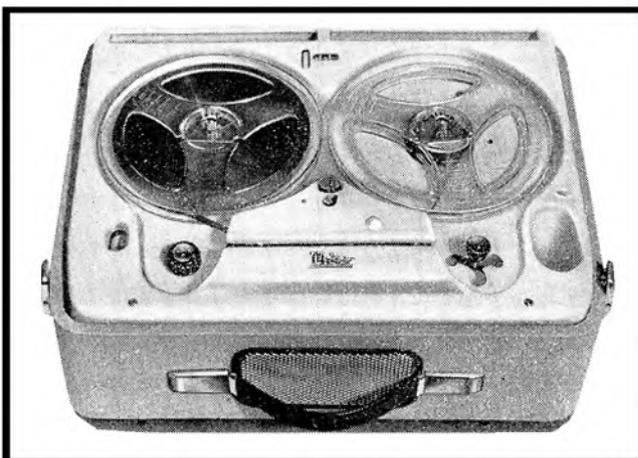
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★ ★ ★

NEXT month's issue will again be an enlarged number. The special Stereo section will contain the second of Angus McKenzie's articles on **Stereo recording.** Charles Langton will conclude his series on **Tape in a Hi-Fi System** with a practical article on fitting a time switch and tape recorder maintenance; Don Wedge makes an important contribution in his feature **Beat and Off Beat**; a new style column is introduced, together with some important technical reviews including the **Simon SP4.**

Avoid disappointment. Make certain of your March issue by placing a firm order now.

**Tape Recording Hi-Fi
Magazine Advice Bureau
February 1959**

Times to tune in

A new monthly feature giving details of radio programmes you may like to record

FOR opera-lovers the B.B.C. Third Programme will present Prokofiev's **The Fiery Angel** on Monday, 2nd February, in English. In this studio performance Marianne Schech will sing the role of Renata, the possessed heroine. Stanford Robinson will conduct the Royal Philharmonic Orchestra.

Six days later, also on the Third Programme, Maria Meneghini Callas can be heard on gramophone records in Cherubini's **Medea**, with the Chorus and Orchestra of La Scala, Milan, conducted by Tullio Serafin.

Verdi's **Un Ballo in Maschera** will be broadcast in the Third Programme on Tuesday, February 17. Francesco Molinari Pradelli conducts the Chorus and Orchestra of the Netherlands Opera for this performance which was recorded at the Holland Festival.

Leo Wurmser conducts the B.B.C. Midland Orchestra in a recorded studio performance of Benjamin's **Primma Donna** with Joan Sutherland, June Brunhill and Marion Lowe. To be broadcast

on 22nd February in the Third Programme.

The first in the series of broadcasts of Shakespeare's sonnets was heard on Sunday, January 18th. The remaining broadcasts can be heard, at roughly monthly intervals, on Sundays at 8.20 p.m. in the Third Programme. Exact dates will be printed in the *Radio Times*.

The whole of the new series of "Background to Music" talks, which began last month in Network Three is to be devoted to Beethoven. There are thirteen programmes in all and they are broadcast on Saturdays at 4 p.m.

Beethoven's Third Symphony can be heard on Wednesday, February 4th in the Third Programme. His Seventh Symphony in the Home Service on March 29th.

A concert programme from Boston, Massachusetts, is to be relayed direct to B.B.C. audiences, on Friday January 23, by transatlantic cable. Pierre Monteux will conduct the Boston Symphony Orchestra for the broadcast, starting at 7.15 p.m. in the Home Service.

The programme will begin with Brahms' "Tragic Overture," followed by the "Nobilissima Visione" of German composer, Paul Hindemith. After an interval Monteux will conduct a performance of "Don Quixote" by Richard Strauss. Soloists in the programme will be Joseph de Pasquale (viola) and Samuel Mayes (cello).

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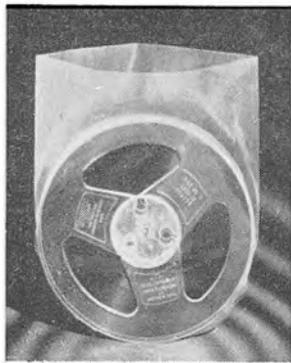
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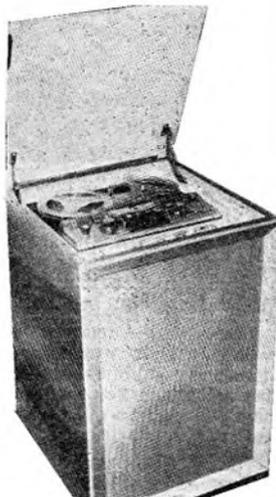
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PRODUCTS REVIEW

Connaught recorders



Above: the new Connaught Tape O-Gram, and, right: the Connaught Console



A NEW firm enters the field in a new year. It is Connaught (Tape Recorders) Ltd. who announce two machines in the higher price range.

The Connaught console incorporates the well known Harting deck with Dulci conversion. Main facilities are well known to *T.R. and Hi-Fi Magazine* readers, briefly: two speeds $3\frac{1}{2}$ and $7\frac{1}{2}$ ips providing claimed frequency responses of 30-10,000 cps and 30-16,000 cps respectively, provision for superimposition, magic eye recording level, fast rewind and digital counter.

There are four controls on a control panel providing adjustment of volume, bass and treble control during replay. A selector switch is used for recording from external source. Controls also provide erase cut-out, tape speed selector and tape transport. Monitoring facilities are from a separate replay head.

Ten watts output, 12-14 watts peak. Amplifier range 30-20,000 cps. Three speaker system, one 12 in. bass and middle frequency reproducer, and two high frequency units in a pressure controlled cabinet. Finish in straight-grained walnut. Price £125, including ribbon microphone and table stand.

The Connaught Tape O-Gram comprises the same deck, a four-speaker system (one 15 in. bass reproducer), an AM/FM tuner, power amplifier and Garrard four-speed auto-change unit. Model 1A with moving coil microphone is £210. Model 1B is fitted with the Garrard transcription motor and a variable magnetic pick-up with diamond styli for all speeds. A monitoring head is also fitted on this machine. Supplied with ribbon microphone at £240.

* * *

CONNAUGHT (Tape Recorders) Ltd. are members of the Connaught Group. The parent organisations are producers of entertainment and documentary films.

One of their interesting future planned ventures is a 35 and 16 mm. Eastmancolor documentary film on *The Story of Hi-Fi*. This will go out on cinema and industrial release.

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Telefunken studio model



ANOTHER machine in the higher price range announced this month is the Magnetophon M 23 from Telefunken. They claim that the M 23 closes the gap between domestic recorders with convenience features and larger recording machines used for broadcasting.

The machine has two speeds $3\frac{1}{2}$ and $7\frac{1}{2}$ ips (selected by switch), a short rewind time due to separate winding motors, monitoring facilities during recording, super imposition, a four-channel mixer, rev. counter, voltage selector for five different mains voltages, a quick stop button, precise modulation control and facilities to take $8\frac{1}{2}$ in. reels.

The chassis of the machine costs £140. Mounted in a wooden cabinet design £150.

A portable version with power stage and four built in speakers will be available in April at £180.

Welmec Corporation, 147, Strand, London, W.C.2.

* * *

James Moir has left British Thomson Houston after twenty-nine years with the firm to join Goodmans Industries Limited as technical director and technical consultant to Relay Exchanges, the parent concern.

Mr. Moir, one of the foremost authorities in the sound recording world, writes on pages 18-20 regarding future trends in tape recording.

Mixer units

TWO TRANSPORTABLE MIXER units suitable for tape recorders are being produced by Sound News Productions. The Unimix 1 has three independently controlled inputs, two for microphones and one for gramophone or similar unit. The microphone inputs are duplicated for use with any microphone except capacitor types. Price £9 9s.

The Unimix 11 has the same specification as the model described above, but the two microphone channels are amplified before mixing. Price £15 15s.

Sound News Productions, 10, Clifford Street, London, W.1.

* * *

BEAM-ECHO Limited, makers of "Avantic" hi-fi equipment, has moved to Essex Works, Essex Place, Newhaven, Sussex. Offices are at 13, South Molton Street, London, W.1. MAYfair 1039.

THE TAPE RECORDING CENTRE, 75, Grand Parade, London, N.4 has just issued one of the most comprehensive catalogues of equipment yet published. Its 40 illustrated pages contain more than 100 items of equipment. It is supplied free on application to the Centre.

MINNESOTA Mining and Manufacturing Co. Ltd., makers of Scotch Boy tape have introduced a new silicone "dry lubrication" treatment for their acetate, PVC and polyester-based recording tapes. They claim this lasts the life of the tape as the lubrication is "built in" during manufacture.

NEW FI-CORD Battery Portable sells at 59 gns.

FI-CORD announce a new pocket-sized tape recorder at 59 gns. It weighs only 4½ lb—the same as Fi-Cord's first pocket model introduced last year—and measures 9½ ins. long x 5 ins. wide x 2½ ins. deep. It records at standard speeds of 7½ and 1½ ips and claims a frequency response of 50 to 12,000 cps (± 3 dbs.).

The set is fully transistorised and an automatic charger is supplied to recharge each of the four 2v accumulator batteries from normal A.C. supplies of 110-240v. The batteries weigh only 5 ozs. each and live 1½-2 hours without recharging during recording at 7½ ips, and 3-3½ hours at 1½ ips.

The recording time varies from 18 mins. per spool (9 mins. each track) at 7½ ips, to 72 mins. (36 mins. on each track) at 1½ ips.

There is an output socket for linking the set to a hi-fi set-up. The microphone is carried in a pocket on the shoulder strap. The Fi-Cord records in any position—including upside down with the lid open or shut.

Fi-Cord Ltd., 40a, Dover Street, London, W.1.

Design and appearance



DESIGN and appearance are among the first changes announced by manufacturers for 1959.

Elizabethan have given a "new look" to their popular Escort tape recorder by restyling. Current production models have a two-tone fabric finish in contemporary style. They use two matching shades of blue. Price remains unchanged at 45 guineas, including microphone, tape and accessories.

E.A.P. (Tape Recorders) Ltd., Bridge Close, Oldchurch Road, Romford, Essex.

FERROGRAPH are changing appearance as well as design. Their traditional black and grey, or bronze and cream finish, is being replaced by "two-tone grey." The panel will continue to be in the grey at present used but the case will be of a darker shade. Fittings and knobs will match the casework.

Modifications to the range are as follows: the capstan motor is being mounted on a different base to reduce noise; head-covers are being made in one moulding so that they lift to thread tape; the brief stop becomes a standard mechanism on all instruments; the index counter is being geared so that it is absolutely accurate to a stop.

These revised 4A/N models range from 81 guineas upwards. The 4A/NCON is a console model.

British Ferrograph, 131, Sloane Street, London, S.W.1.

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J. H. WOOD

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Highcliffe-on-Sea, Hants. Tel:- 2040

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THE NORTH-EAST

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MANUFACTURERS' NEWS IN BRIEF

AN INTERESTING development in the cine field likely to prove of interest to tape enthusiasts is the announcement by Kodak of the Brownie Eight-58 projector. At its low price of £25 this means that a complete 8 mm. cine outfit can now be obtained for £41 14s. 7d. (The Kodak Brownie movie camera model 11 has been reduced to £16 14s. 7d.)

The projector is built into a streamlined case weighing about 9 lb. It can be operated on any 50 cycle A.C. supply, 200 to 250 v. Supplied complete with lamp, 50 ft. take-up reel and 8 ft. 6 in. of cable.

Kodak, Kingsway, London, W.C.1.

HUMIDITY may cause tape to unwind in jerks although this cannot always be recognised. Atmosphere can be responsible for reducing the bonding of the oxide to the plastic base.

Tapes kept in polythene film when not being used are not exposed to such risks. Swains Papercraft are marketing polythene envelopes rounded at one end to facilitate insertion of tape cartons. The price, per dozen, depends on spool sizes. 5 in. at 1s. 9d.; 5½ in. at 2s.; 7 in. at 2s. 4d. and 8¼ in. at 2s. 8d.

Swains Papercraft, Buckhurst Hill, Essex.

TANDBERG tape recorders were recently given second place on a list of makes recommended to U.S. buyers in the American journal, *Consumer Report*. The firm (Oslo Norway) exported tape recorders worth Kr.2m. to the U.S. last year. This year the figure should reach Kr.3m. In Norway, where ownership of tape recorders is higher, in proportion to population, than any other country in the world, sixty per cent of all models sold are Tandbergs.

Technical Suppliers Ltd., 63, Goldhawk Road, W.12.

SIMON SOUND LTD. announce arrangements with Bow-maker (Commercial) Ltd., for hire purchase facilities on the Simon SP/4 tape recorder, Cadenza microphone and accessories. Terms provide for a down payment of ten per cent with a repayment period of up to twenty-four months.

Simon Sound Service Ltd., 46, George Street, London, W.1.

R. F. COLLINS has been appointed sales manager of a newly formed department of R.C.A. to be known as cinematograph and sound products sales.

The group will centralise the sale of all high fidelity, cine, and public address apparatus. Bob Collins has been cinema sales manager for R.C.A. since 1956. He joined the firm in 1950.

R.C.A. (Great Britain) Ltd., Lincoln Way, Sunbury-on-Thames, Middlesex.

REPS (TAPE RECORDERS) LTD. point out that the output wattage quoted at four-and-a-half watts in *Tape Recording Hi-Fi Year Book* should read ten watts.

Reps (Tape Recorders) Ltd., 118, Park Road North, Acton, London, W.3.

A NEW "TALKING" SALES AID has been developed by Walter Instruments Ltd. for their tape recorder range. A continuous length of recording tape is placed round the two reels of the recorder and passes the recording head. Retailers can record a sales message on to the tape and put the recorder back in the play position. Two arrows fitted over the reel retaining nuts revolve as the message is being played to give an additional visual attraction.

The device is suitable for the Walter 303 De Luxe, 101 and 505 models.

Walter Instruments Ltd. intend to appoint selected dealers all over the country to act as Walter Service Centres. There will be one in each area of the country; qualifications of dealers who apply for selection will be carefully checked.

Where necessary, Walter are prepared to give special training at their Morden factory to engineers of selected dealers. Interested dealers should contact the Sales Manager of the Walter Tape Recorder Division.

Walter Instruments Ltd., Garth Road, Morden, Surrey.

TESTED IN THE LAB.



The Reps R.30

FIRST impressions of this machine are that for its price, it has a very competitive performance with similar machines. I was particularly struck with the performance at $7\frac{1}{2}$ ips. The main inputs are easily accessible on the front and at the back there are outputs for an extension loudspeaker (15 ohms) and a line out for a hi-fi amplifier system. A set zero for the meter control is also provided on the back, as is the mains off switch and mains voltage adjustment. The appearance of the entire machine is most pleasing and the style obviously modern. I like in particular, the styling of the front of the machine and the contrast between colours on the side of the machine.

The microphone supplied is an Acos stick crystal mike which, when used with this machine, sounds very fine indeed. There are four main controls on the front panel, on either side of the peak signal level meter. The gain control has also the facility of disconnecting the bias supplied to the record head on recording so that at the end of any recording, if the volume control is turned to zero, it will also inherently tend to demagnetize the head, which is a very useful feature.

The internal loudspeaker can be disconnected at the turn of another switch, whilst two more knobs control bass cut re-play and treble frequency cut and boost on re-play.

The Reps R.30 recorder uses the latest Collaro 3-speed deck and I would again this month draw attention to the fact that this deck uses a new type of head which has very fine performance. The recorder can be instantly stopped and started in the middle of the recording with the pause control and may be reversed in direction in a matter of a second or two, which means that a more or less continuous recording of up to two hours' duration at $7\frac{1}{2}$ ips, may be made, using double-play tape on a 7-inch spool.

A little wow was present on this particular deck, but the deck was well within the manufacturer's specification. The wow that was present was of a very low frequency and probably due to the flywheel. The re-play response was held very closely to the CCIR specification at $7\frac{1}{2}$ and 15 ips, i.e., ± 3 db all the way from 40 c/s to 10,000 c/s, in the case of $7\frac{1}{2}$ ips, and 40 c/s to 16,000 c/s ± 2 db at 15 ips. However, to obtain a level response at 15 ips, it was necessary to keep the treble control at +1. It is interesting to note that with treble +1, the recorder was equal in output at 15,000 to the output at 1 kc, which shows that the response on the re-play extends well beyond 15 kc's at 15 ips.

Also, at 15 ips, the bass response was a little too great, but this could be made within the CCIR curve, by cutting a very small amount of bass which would also instantly improve the signal noise ratio.

The overall frequency response, including the recording channel, was not quite so satisfactory. At $7\frac{1}{2}$ ips the response was within the specification on track 1, up to 11 kc's, as will be seen in the frequency response tables at the end of the review. On track 2 there was a very pronounced peak at 8 kc's on the record channel. At 15 ips, on both tracks, the recorder had a very pronounced peak between 10 kc and 12 kc, which tended to give slightly too much presence to instruments having harmonics in that region. However, the response of the instrument, except for that peak at 15 ips, went as high as

18 kc's, at which frequency it was only an average of 4 db down.

This machine has really been judged by professional standards and I would like to stress again that for the price of the machine, this criticism is very severe. At $3\frac{1}{2}$ ips over all, this machine was not as good as I might have expected. The response fell seriously above 3,000 c/s, and as the machine was urgently required back by the manufacturers, I did not have an opportunity to pursue this particular point. However, the bass response was well maintained down to 40 c/s. I am sure that the bad response on $3\frac{1}{2}$ ips is only due to an equalizer being wrongly set. The hum level on this machine was barely noticeable at $7\frac{1}{2}$ and 15 ips. There was a very low background hiss on all recordings made with this instrument, this being due to the very well designed erase and bias oscillator. All the tests were made using the tape supplied by the manufacturer.

The front panel, containing an elliptical loudspeaker made for Reps by Elac, when unscrewed, exposes the internal part of the recorder. The workmanship is very neat and it is obviously very easy to service—a point which is so often forgotten by many continental manufacturers. The mains transformer is a high quality one with a relatively low external field. The recorder is easily portable and obviously a machine as light as this would be most useful to take to parties. It is unfortunate that the on/off control is at the back, because when this is installed in the home, it is a little difficult to touch round the back sometimes to turn the machine on. It is unfortunate too that when making a recording, it is apparently essential to take out any jack that may be inserted in the line output socket. This is extremely inconvenient when the recorder is wired up to work into a hi-fi system, because it means that every time a recording is made from that system, the line out socket must be withdrawn and then one's hand has to fumble around the back to pull the jack out. This is a matter which the manufacturer, I am certain, can do something about. In the front, on either side of the control panel, there are two compartments which are very useful for storing connecting cables and the microphone.

TECHNICAL REPORT (a) Re-play only (both tracks) $7\frac{1}{2}$ ips: ± 3 db from 40 c/s to 10,000 c/s, ± 1 db from 60 c/s to 8,000 c/s (a very good response). **15 ips:** ± 2 db from 40 c/s to 16,000 c/s.

(b) **Overall record replay response:** $7\frac{1}{2}$ ips, **track 1:** ± 2 db from 50 to 10 kc's (12 kc—6db). **Track 2:** ± 3 db from 50 to 12 kc's.

15 ips: ± 3 db from 50 to 6 kc's, to a peak of 8 db at 12 kc's on track 1 and a peak of 6 db at 10 kc on track 2. Above 12 kc, the response was within specification to 17 kc (i.e. ± 2 db). At 20 kc the response was only minus 6 db.

$3\frac{1}{2}$ ips: I have referred to the response at this speed above.

(c) **The Signal noise ratio** at $7\frac{1}{2}$ ips was -45 db's on one track and -52 db's on the other. Signal noise at 15 ips, was 47 db's on one and 50 db's on the other.—A.M.

The manufacturer writes:—

(It is rather unfortunate that this particular model was reviewed as it does not represent present-day production. On this model record boost was fixed at $7\frac{1}{2}$ ips and the replay characteristic only adjusted at each speed. However, a separate record amplifier has now been incorporated with individual equalisation at each speed. This results in a smooth and extended treble range. (See our advert, page 16.)

On model R. 40 it is not necessary to remove jack from line-out socket whilst recording, but on R. 30 this operation is still required.

It was found that siting the main switch on the front panel very often resulted in accidental operation. This forms a large loop of tape—when the mechanism is operating—between take-up spool and tension arm. The individual action of switching on again causes take-up spool to snatch at the loop so formed which either stretches or winds tape under the tape spool.

The response for the present production model of the R. 30 will be given next month.)—T.R.

(Continued on page 46)

The New Improved COLLARO TAPE TRANSCRIPTOR

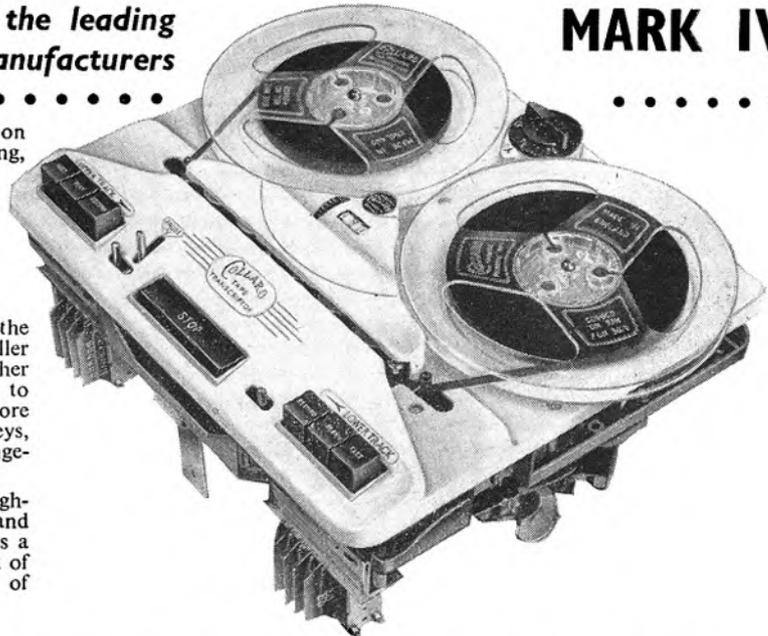
... as used by many of the leading
British Tape Recorder Manufacturers

MARK IV

This High-Fidelity Tape Transcriptor, designed on Transcription quality principles for live recording, recording from F.M. Broadcasts, etc., and for reproducing pre-recorded tapes, is a twin-track model fitted with two sets of heads, and runs at speeds of 3 $\frac{3}{4}$, 7 $\frac{1}{2}$ and 15 inches per second.

Several new modifications are incorporated in the MARK IV. The new interconnected Micro Switch and Fly-Wheel Brake switch off both motors and stop the flywheel immediately the "stop" button is operated. Any one of the six smaller knobs will then re-start the machine in either direction, without overloading the motors. Due to reduced wattage input, these are cooler and run more quietly. The enlarged diameter of the motor pulleys, new type re-wind pulleys and new springing arrangements make for more active re-wind.

The COLLARO STUDIO MICROPHONE is a high-fidelity, super-sensitive crystal type miniature hand microphone. Finished in maroon or cream, it has a frequency range of 30—10,000 c.p.s. with an output of 1.8 mv/ub at 1,000 c.p.s. It has an equivalent of 1,500 pf.



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Wyndor Dauphin	89gns.	Verdik	45gns.	Walter 101	29gns.
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Philips 8109	39gns.	*Vortexion WVA	£93 13 0	Walter 505	57gns.
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Truvox R.2	59gns.	*Ferrograph 3AN	79gns.	Perth-Saja De Luxe	56gns.
Sound 444	45gns.	*Ferrograph 3ANH	86gns.	Sound Belle	26gns.
Sound A20	55gns.	Ferrograph Stere-a-1	30gns.	Spectone	76gns.
Sound 555	65gns.	Ferrograph 3AN/S	86gns.	*Reflectograph	94gns.
Magnafon Courier	49gns.	Grundig TK20	50gns.	Stuzzi Magnette	69gns.
Magnafon Diplomat	59gns.	Grundig TK25	62gns.	Telefunken KL85	75gns.
Elizabethan Escort	45gns.	*Grundig TK30	72gns.	Telefunken KL65	57gns.
*Elizabethan Essex	65gns.	*Grundig TK35	82gns.	Telefunken KL75	50gns.

* Microphones extra.

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HINTS ON ADJUSTING THE COLLARO TAPE DECK

IT is a decided asset to be able to adjust the tape transcriber when removed from its cabinet or housing, but this generally involves propping the deck up in some precarious position with a 50/50 chance of doing more damage than adjustment. For the reader not wishing to chance his luck a sketch of a simple rack is given which is self explanatory. Arrangements have also been made for those without the necessary facilities to obtain the rack in ready-made parts.

ALIGNMENT OF 3-SPEED MECHANISM

Without repeating information already contained in the Collaro service manual which should be kept to hand for reference, points to note are as follows: First check pulley adjustment as contained on page 5 of the Collaro service manual, then set machine to 15 ips and note the clearance (1/16 in.) between under side of idle wheel and idle release bearing shaft, contact will not only prevent free rotation of the idle wheel but a vibration or "chattering" will occur with consequent damage. However, should clearance greatly exceed 1/16 in., when the machine is switched back to 3 1/4 ips there is a possibility that the idle wheel and release lever will come adrift or operate at some angle which is not horizontal. To adjust this shaft slacken screw located just above "C" on Fig. 3, Collaro service manual.

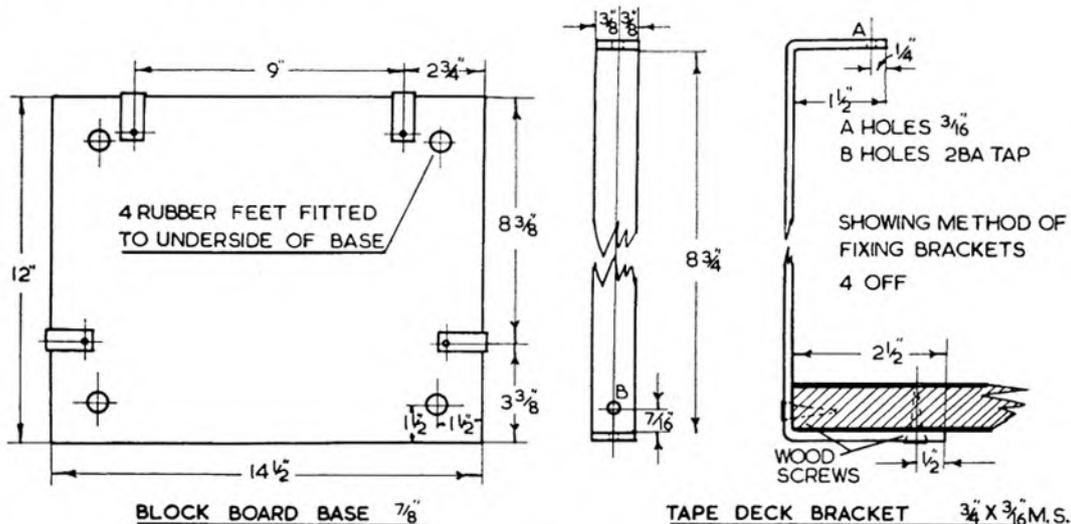
Insufficient pressure between idle wheel and three step pulley may reduce tape speed or allow slow starting of tape motion. First ascertain that the periphery of the idle or flywheel is free from dust or oil as this will give the same effect. Too much pressure will cause premature breakdown to rubber covering on idle wheel, or prevent mechanism returning to neutral when the stop bar is depressed.

Pressure is controlled by spring 374 (Fig. 3, Collaro service manual). When pressure is insufficient it is recommended that two coils of the spring are removed at a time and for those with a tension gauge, 100 gms measured against outer fixing screws on idle release lever is sufficient. Judicial stretching of spring 374 at lower end will reduce tension, but this must be performed with care.

REDUCING MECHANICAL AND MOTOR NOISE

Motors are the principal source of noise on the tape transcriber, although a distorted idle wheel can be objectionable, especially at 15 ips. However, this is just a matter of replacement to effect a cure, whereas a certain amount of motor noise is inevitable. This noise is both mechanical and electrical (the former taking the form of a knocking) and is caused by wear on the scintillated iron bearings, particularly the upper one, as this withstands a side thrust load (i.e., idle wheel and re-wind pulley).

An asymmetrical magnetic field produces the majority of vibrations associated with the motor apart from an unbalanced rotor, although the latter is unlikely. This vibration is transmitted by the tape transcriber diecasting to the cabinet from which radiation occurs. Suspending the motors on rubber mountings will absorb this vibration but thermal contact is required between motor and transcriber chassis to dissipate heat. So the alternative is mounting the whole mechanism on rubber. This is not as effective as mounting the motor separately as a certain amount of noise radiates from the diecast chassis; however, a noticeable improvement will be obtained. T. R.—(To be continued.)



Grundig GM3U Mixer

THIS is a well-made four-channel electronic mixer designed to accept and mix up to three high impedance microphones and one high-level input, such as the output from a tuner unit. There are thus four input sockets and four volume controls. The combined output is taken from a fifth socket. A good feature is the duplication of each socket, so that ordinary jack plugs or Grundig type plugs may be used.

Two valves are employed, plus a type EMB40 cathode ray volume level indicator. The first valve is an ECC83 double triode, one section of which acts as a pre-amplifier for microphone one. Microphones two and three are connected via their respective volume controls to the second section of the ECC83, the output from both halves of the valve being combined and further amplified by the pentode section of a PCF80 valve. The high-level channel is taken straight to the grid of this valve, and so mixed with the other three inputs. The triode section of the PCF80 is used as an amplifier to operate the volume indicator. Negative feedback is incorporated. The unit is for AC mains operation only.

In operation, the mixer provides very smooth control of each channel, and mixing could be accomplished to any desired degree, the controls being completely independent. A useful amount of gain is obtained in addition to the mixing facilities, and the hum level was very low. As a practical indication of the capabilities of the amplifier, normal speaking into a low-sensitivity ribbon microphone produced a peak to peak output of about 0.5 volts.

The wiring and layout of the instrument are first class and, in general, should be simple to service. It is a pity, however, that the four knobs and volume-control fixing nuts have to be removed in order to extract the valves for testing or replacement.

The appearance of the well-finished metal cabinet with sloping control panel lives up to the high standard set by Grundig, and the instrument can with confidence be recom-

mended to all who require such a mixer which, incidentally, is suitable for use with any make of recorder or high-fidelity equipment. C. L.

Manufacturers: Grundig (Gt. Britain) Ltd., Kidbrooke Park Road, London, S.E.3.

HEARD IN THE HOME



The Sound 555

The Sound 555 tape recorder is a smart-looking machine. The tape deck used is the Collaro, described in the *Tape Recording Hi-Fi Magazine* for November 1958. The main points of this deck are: it has three speeds, 15, 7½ and 3½ ips, an electronic level indicator, numerical footage indicator, pause control and double tracking which obviates manual change of spools at the end of a track.

Extended tests were made using a variety of signal sources and equipment of a very high standard, comprising a high-grade P.U., a quality amplifier, VHF/FM radio, and a three loud-speaker combination and various microphones.

The Sound 555 tape recorder came through all these tests with high marks.

Reproduction of recordings at 15 and 7½ ips was excellent. Recordings made at 3½ ips were satisfactory for music of the "pop" variety.

The supplied microphone of dynamic type has a wide frequency response.

The Sound 555 houses three matched speakers designed to give a faithful response over the entire audio frequency range. Even so, there is an advantage to be gained by using an extension speaker of 3 ohms and of good make; sockets are provided for this purpose.

The action of plugging in an extension speaker mutes the internal speakers.

At the rear of the recorder is a monitor socket for use during a recording or on playback by using the stethoset supplied. This is well constructed and comfortable and very efficient. The monitor socket can also be used to feed into an external amplifier.

Apart from the push-buttons on the tape-deck, there are only two controls to operate, an on/off switch combined volume control and a positive action tone control. These are mounted as one unit.

An ivory panel on the right-hand side of the recorder carries the mains selector, mains plug of special safety type, sockets for microphones, radiogram and external speaker.

The case is of pleasing design of two tone with gilt fittings and a neat, yet strong, carrying handle. The lid is detachable and is fitted with pressure pads to retain spools of tape while the machine is being transported. Pockets are provided for the accessories: microphone, stethoset, P.U. leads and mains leads.

A well-illustrated leaflet is supplied and should be read before connecting up. The weight is 35 lb. Cost 65 guineas, complete, ready for use. G. P.

Manufacturers: Tape Recorders (Electronics) Ltd., 784-788, High Road, Tottenham, London, N.17.

TeleTape



NEW H'Q at MARBLE ARCH

This is where the enthusiasts go. To the new Teletape headquarters at Marble Arch. Where every day they can look at—and listen to—every type of tape recorder made. Where they can ask questions and get sensible answers. And where they can buy on H.P. terms at cash prices.

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If Marble Arch is too far away, write for address of your nearest branch. Or send for free details of the tape recorder that interests you. Seven days free trial for cash customers.

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NEWS FROM THE CLUBS

The Federation

THE response to last month's item about taping with a German boy has been most heartening. Boys of 12 to 13 years of age who would like to start an exchange of tapes are still invited to write to the secretary for further details.

Chairman, John Amphlett recently paid a visit to Luton Club where he gave an illustrated talk on "The Use of the Tape Recorder." He reports that Luton has a small but efficient club and that he thoroughly enjoyed his short stay.

The Federation urges all Clubs to support the 1959 Amateur Tape Recording Contest by submitting entries to the Club Section, the theme of which is "Our Town." Although this feature tape is limited to fifteen minutes, many months of hard planning and work is involved, so start on it now. Member Clubs of the Federation are reminded that technical help is available to them (short of actually producing the programme), and a limited number of sound effects can be had. Enquiries should be as short as possible and to the point.

Secretary: Roy Penfold, 48, Holbrook Lane, Coventry.

Bristol

THIS club has reorganised itself as the Bristol Tape Recording Club. Already they have launched a monthly journal called *The Bristape Magazine*.

Anyone interested in becoming a member should contact Secretary R. F. Beaton, 12, De Clifford Road, Lawrence Weston, Bristol. (Avonmouth 2350.)

Coventry

AMONG tapes played at a recent meeting of the club were two brought along by the secretary. The first, entitled "Strange to your Ears," was a recording of various sounds which had been altered in pitch making them scarcely recognisable from the original recordings. Included were sounds of animals, musical instruments and human voices. The tape concluded dramatically with the sound of a pin dropping which reverberated like a clap of thunder.

Four dogs barking in tune to a well-known song made up the second tape, another edition of which was heard at a later meeting.

Two tapes have so far been heard in the competition series devised by the chairman. Howard Freer has gained most points so far in this fascinating game comprising questions on general knowledge.

The second track of Brian Bayliss's tape of a weekend walk was also heard at this meeting and members complimented him on his originality.

Recordings to link up with the Christmas theme were provided by the club at a gathering of the International Friendship League. Members had been invited along for the League's "Christmas in other lands" meeting.

At a later meeting the secretary introduced a tape on "Sounds of Holland."

Secretary: Roy Penfold, 48, Holbrook Lane, Coventry.

Hereford

PLANS are in hand to form a club in this area. Those interested are invited to get in touch with Mr. J. Pegg, 58, Homestead, Putson, Hereford.

Kettering

THE announced talk by club member Mr. Andrews on recording Church services was postponed owing to his illness. In its place a film on the construction of the Crystal Palace T.V. mast was presented by the Chairman, Mr. Potter.

Members recently paid visits to clubs at Rugby and Luton. At Rugby they heard a version of *This is Your Life*. Afterwards Mr. Webb outlined the progress of the club for Rugby members.

A bi-monthly news-sheet has recently been introduced.

Secretary: A. M. Webb, 93, Regent Street, Kettering.

London

DECEMBER saw the first meeting of the club in their new "home," the Abbey Community Centre, near Westminster. Several new members were welcomed as well as a visitor from Luton club. Machines on view included a Ferrograph, Grundig, Phonotrix and a Truvox.

Members had been asked to take along eats and drinks for this meeting; this they did in abundance—providing for all a truly social evening.

Future meetings of the club are to be held on the first Thursday in each month.

At a more recent meeting members discussed buying equipment for the club. The main snag, of course, was finance, but the discussion produced some really enterprising suggestions.

Secretary: E. Roger Aslin, Fairlea, Boar's Head, Crowborough, Sussex.

Luton

CLUB members recently heard a tape of a lecture on microphones, recorded by the Kettering club. Afterwards they accepted an invitation to visit Kettering to hear a stereo demonstration.

Among other recent visitors was John Amphlett, Chairman of the Federation, who gave a fully illustrated talk on uses of a recorder.

Rugby club asked members to co-operate with them for their "This is Your Life" presentation. As a result the "victim" was visited and a message taped for use in the programme.

Secretary: Maurice Nichols, 53, Sundon Park Road, Sundon Park, Luton.

Rugby

AT their December meeting, after much behind-the-scenes work, the club produced their tape version of the T.V. Show "This is your Life."

The subject for the tape was Mr. S. S. Fishlock, the President of the Club. The programme had been kept secret from all but the Chairman, Secretary and Treasurer, secrecy being maintained by supplying a faked programme of items for the meeting.

Tapes had been obtained from various parts of the country through tape clubs, individuals and the B.T.R.S. Hospital Service. Local relatives and friends were introduced after playing of their message.

The whole programme was recorded and the master tape presented to the President by the Chairman, Mr. J. O. Bannister.

Progress of Clubs in Luton and Kettering was outlined by representatives who were invited along for this unique programme.

Four new members joined during the evening bringing membership up to twenty-five and the machines owned by members to twenty-one.

The play-reading and Hospital service sections are progressing rapidly and now a technical group is proposed.

Secretary: Mike Brown, 219, Clifton Road, Rugby.

Warwick and Leamington

THE Society is forging ahead with its "sound picture" of Warwick and Leamington Spa being recorded for a blind club in Luton. Members are so impressed with the result so far that they are considering entering the tape in the club section of the 1959 British Amateur Tape Recording Contest.

Material for a sound effects library is being collected. The library is to be made available to local dramatic groups.

Secretary: B. J. Race, 30, Ashford Road, Whitnash, Leamington Spa, Warwickshire.

West Middlesex

FROM this club comes the first news of a splicing in other than the accepted sense. Two members of the club, Doreen Hendley and Bernard Clow, were married in December. The Club Secretary reports a loss of revenue for the club in that

(Continued on page 49)



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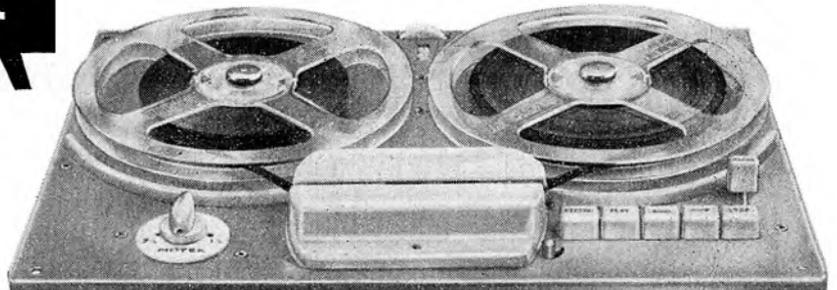
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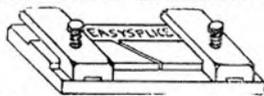
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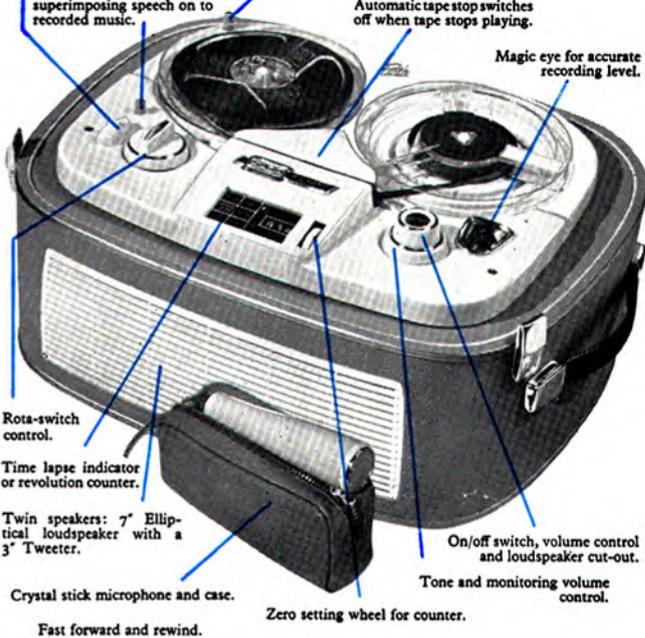
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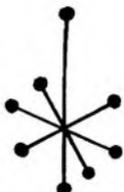
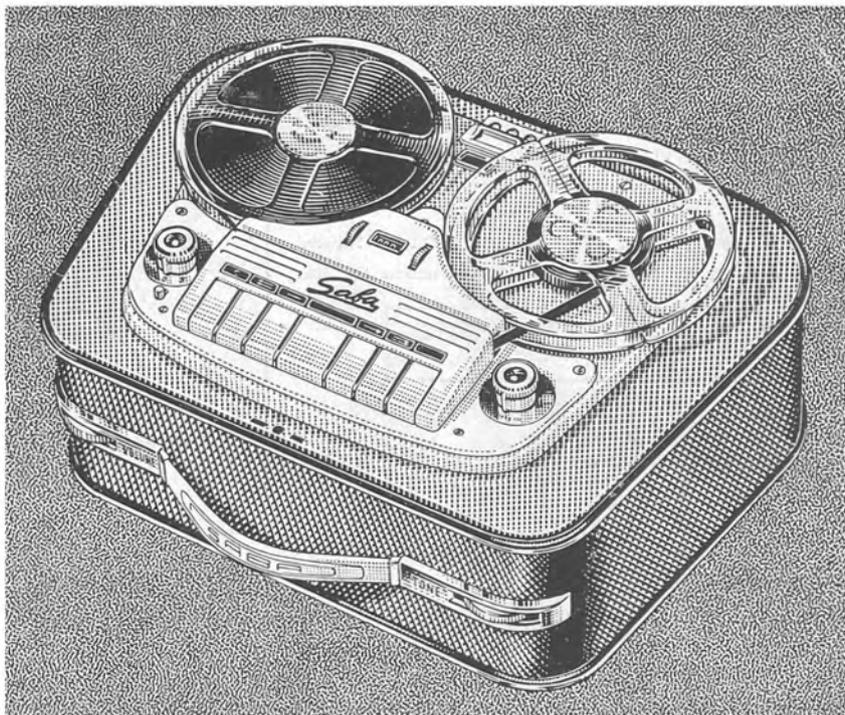
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