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FOR CRAFTSMEN OF ALL AGES

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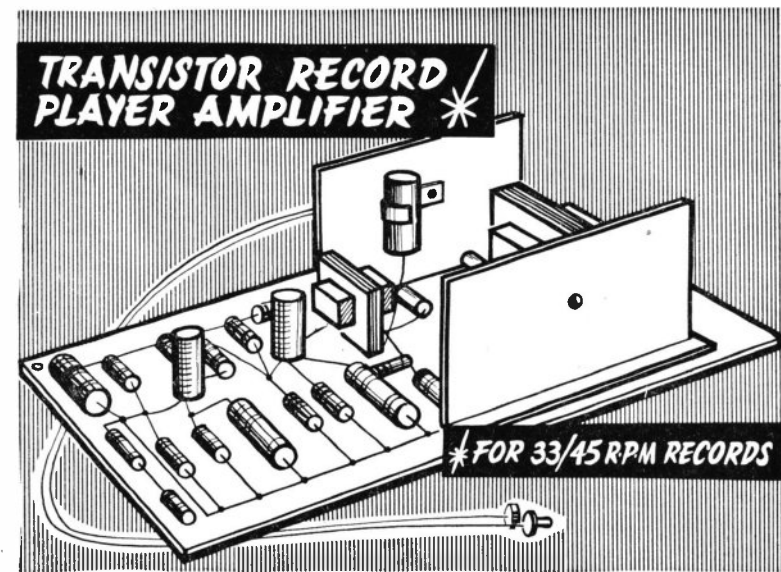
WE give here details for building an amplifier with a powerful output, for 33 r.p.m. and 45 r.p.m. records. Details of the turntable, pick-up, and player case will be given next week to complete the record player. The whole equipment (including the turntable motor) runs from a single 9V. dry battery, and is completely portable.

The amplifier described here, though especially intended for the record player, may be used for other purposes. It can be employed with a microphone, a pick-up in a separate cabinet, or a radio tuner or crystal set. The output is up to about 1 watt, which is easily sufficient for all home purposes for which this kind of equipment is used. Connections are taken to a 2 ohm or 3 ohm speaker. With the portable player, this is an elliptical unit, mounted inside the case. But for other purposes, there is no reason why a separate loudspeaker, in its own cabinet, should not be wired to the amplifier instead.

Circuit

This has four transistors, and is shown in Fig. 1. Cheap surplus transistors may work quite satisfactorily in a circuit of this kind. However, genuine new transistors, of the correct types and guaranteed efficiency, are now quite inexpensive, and are recommended.

The first transistor OC71 gives high amplification, to raise the signal level of the pick-up. A cheap, poor transistor is likely to cause bad background noise, if fitted here. The second transistor is an OC81D, transformer coupled to two OC81 output transistors in a push-pull



FIRST STAGES DESCRIBED BY 'RADIO MECH'

circuit. The transformer T2 couples the loudspeaker. This type of circuit is very economical to run, as the battery drain is quite small. Negative feedback is applied through resistor R12, and this improves quality of reproduction, which is good.

Components

All the resistors are the very inexpensive midget $\frac{1}{4}$ -watt types, and they are

colour coded. As a wrong resistor can completely upset working of the amplifier, the colour coding is given in full, for each resistor, in the component list. In particular, note that R10 and R11 must be within 5 per cent of marked value (that is, have a 5 per cent tolerance) so they have a gold band. All the other resistors are to be within 10 per cent, and so each has a silver band.

Fixed capacitors normally have values marked on them, so there is no difficulty here. C6 is a small paper capacitor, and can be connected either way. But the other capacitors have positive and negative ends, and the positive ends must be taken to the circuit points shown. C3 and C5 may be 6V. capacitors, but as the 12V. types are needed for C2 and C7, and are inexpensive, this kind has been fitted throughout.

The driver transformer T1 will have coloured leads, in the positions shown, if of the make given in the component list. It is then possible to follow the circuit diagram exactly. This does not mean that other transistor driver transformers, if to hand, may not be employed. But if the transformer is of different manufacture, its leads will have a different colour coding, and come in different positions. So it will then be necessary to follow the maker's instruction leaflet or connecting data. Similar points apply to the output transformer T2.

Transistors

The circuit, Fig. 1, and component list, give the types for which resistor

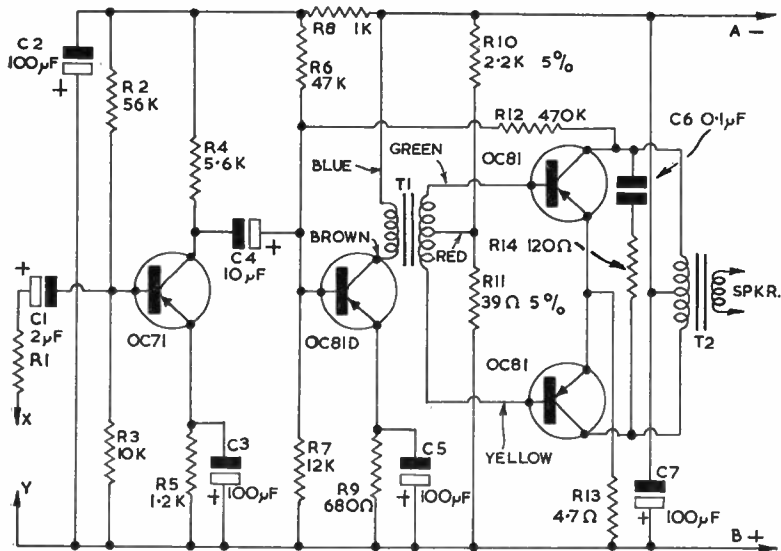


Fig. 1—Record player amplifier circuit

values are intended. If other transistors of good make are to hand, they may prove suitable. It will usually be necessary to change the values of R10 and R11, to suit the actual output transistors fitted, if these are not OC81's. For OC72's, R10 must be 2.7k, and R11 100 ohms.

The transistors listed each have a red spot. This shows the collector lead, as in Fig. 2. The centre lead is for base, and the remaining lead emitter.

Heat sinks

These are cut from 16 s.w.g. aluminium, and conduct away the heat generated in the output transistors. Each plate is about 2 in. by 3 in., and each output transistor is placed in a clip, which is bolted to the plate, as in Fig. 2. Clips can be purchased for this. With the transistors attached to the plates in this way, the amplifier can be run with an output of 1 watt.

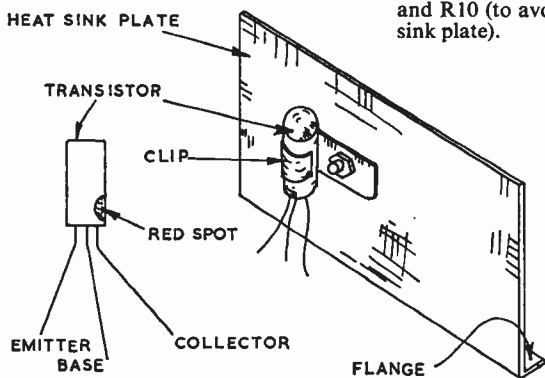


Fig. 2—
Transistors and
heat sink plates

If preferred, the heat sink plates can be omitted. Volume should then be kept down to $\frac{1}{2}$ -watt or less, so that the output transistors are not felt to grow warm. For many purposes the $\frac{1}{2}$ -watt will easily be sufficient, so the heat sinks are to some extent optional. Each has a flange, so that it can be bolted to the amplifier panel.

Paxolin panel

This is 6 in. by 3 in. and cut from $\frac{1}{8}$ in. paxolin, so that components can be arranged as in Fig. 3. Wiring up will be quite straightforward if carried out carefully and systematically. Leave the heat sink plates, and all transistors, until last.

First mount the large transformer T2, by making slots for its fixing lugs. These can be produced by drilling two or three $\frac{1}{8}$ in. holes close together, and then forming a slot with a Hobbies mouse-tailed file. The transformer has two fairly stout wires one side, and these will go to the speaker. The three connec-

tions the other side go to OC81 collector, C7, and 2nd OC81 collector. CT is the centre tap.

The driver transformer has five coloured leads, and it is placed with these emerging downwards against the panel. It can be held with adhesive, or by drilling small holes for the leads to pass through. Fig. 3 shows how the colours should come.

Resistors and capacitors can then be added one by one. It is quite a good plan to mark each component on Fig. 3 with a coloured pencil, as it is added. Leads and joints are also marked, as they are cut and soldered. It is then unlikely that any mistake will be made, or anything overlooked.

The resistors and capacitors are held by pushing their wire ends through $\frac{1}{8}$ in. holes in the panel. Excess wire is snipped off. Pieces of 1 mm. sleeving can be placed on any wires which may short to other connections. This is particularly necessary with C1 negative, R12 and R10 (to avoid contact with the heat sink plate).

If a small electrically heated iron is used, with radio type cored solder, joints can be made easily. The soldering iron must be removed as soon as a joint is properly made, to avoid overheating components.

A few leads are underneath the panel. One is from R12 to C6. Another wire passes from 3 on T1 to the output transistor base. A connection also goes from R10 to C7 negative.

Fitting transistors

The wires of the OC71 are cut about 1 in. long, and about $\frac{1}{4}$ in. of sleeving is placed on the centre lead. Solder the base lead to R3, emitter lead to R5, and collector lead to R4, as in Fig. 3. It should only be necessary to keep the iron in contact with the joint for one or two seconds. Lengthy heating may damage the transistors.

Fit the OC81D in a similar manner, with base to R7, emitter to R9, and collector to brown on transformer T1.

The output transistor wires are left

nearly full length. The transistors are fixed in their clips, which are bolted to the plates. Each plate is fixed with two short bolts. The three bolts Z form joints in the positive circuit, and are connected with wire under the panel.

Join both output transistor emitters E to R13. One base goes to 3 on T1 (green) and the other base to 5 (yellow). One collector is taken to each primary lead of T2.

Loudspeaker

A convenient length of thin twin flex is anchored at the points S, and taken to the loudspeaker. Any 2-3 ohm unit is satisfactory. If a speaker is to be purchased, a reasonably large one is best. That is, 5 in. to 7 in. in diameter, or about 7 in. by 4 in., or larger. (The latter is required for the completed record player.)

For proper results, the speaker must be attached to a baffle board, or included in a cabinet. That is, if the unit merely stands by itself with no cabinet or baffle, best results must not be expected.

Battery leads

Use red flex for positive, anchored at Z, and black for negative, anchored near R8. If the amplifier is to be used with the record player, a 9V. battery is required, since the electric turntable motor needs this. A PP9 battery is satisfactory. This has snap fasteners.

When the amplifier is to be used with a radio tuner, or for other purposes, a $7\frac{1}{2}$ V. battery can be employed, if preferred. An AD38 or similar battery is satisfactory. This has a twin socket, the larger socket being positive, so a 2-pin plug is attached to the battery leads. The correct type of plug or fasteners can be bought cheaply, and should be used, as this avoids any danger of reversing connections. The battery must never be connected the wrong way round.

Battery switch

With the completed record player, the automatic switch of the turntable controls both the motor and amplifier. It is thus only necessary to place the pick-up on a record. When the record is finished, the auto-switch opens, switching off both motor and amplifier.

If the amplifier is used with other equipment, an on/off switch is simply included in either battery lead. A volume control with switch is often used.

Input circuit

A screened lead is used for this, the inner wire going to R1, and outer braiding to Y, Fig. 3. For a crystal pick-up and any similar high impedance unit, R1 can be 220k (red-red-yellow). A volume control, conveniently situated

1=BLUE. 2=BROWN. 3=GREEN.
4=RED. 5=YELLOW.

LEADS TO BATTERY (VIA SWITCH)

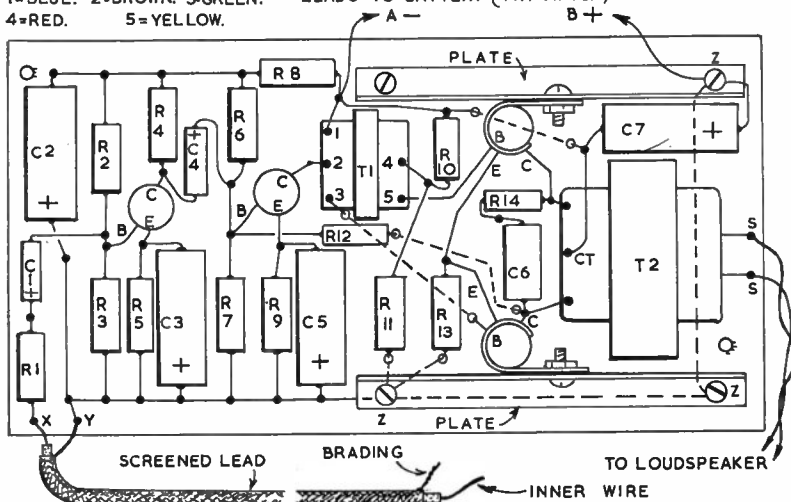


Fig. 3. Wiring plan of the amplifier

near the turntable, is added between pick-up and amplifier. This is done as shown for the record player in the next article.

If it is wished to use the amplifier right away, with a pick-up or tuner, etc., connect the inner wire, Fig. 3, to the volume control slider. Take the braiding to the earthed outer tag of the control. The remaining control tag goes to the pick-up, or tuner. For a crystal pick-up or other high impedance unit, the volume control can be 500k ($\frac{1}{2}$ megohm).

Should the amplifier be run from a crystal diode tuner (crystal set) or any low impedance unit, R1 should be 5.6k (green-blue-red). If a volume control is added, it should be 5k or 10k.

There is no difficulty at all in providing a suitable input circuit. However, R1 serves to match the impedance of the

pick-up or other source of programme, so has to be chosen to suit this.

Testing

If resistors have been placed in the correct positions, and all wiring is carefully done, the amplifier should work at once, when first tried. If a meter is to hand, it can be placed in one battery lead, for the first test. The current taken by the amplifier should be about 8mA to 15mA, with no signal, or with low volume. When volume is turned up, the current will increase. At good volume, current peaks will be 20-30mA. With really loud results, current will rise to 45mA or more. The current drops immediately to its original low level of only a few milliamperes, at each quiet instant, and this is one reason why such a long life is obtained from the dry battery.

COMPONENTS NEEDED

- Resistor Colours.**
 R1 See Text.
 R2 56k green-blue-orange.
 R3 10k brown-black-orange.
 R4 5.6k green-blue-red.
 R5 1.2k brown-red-red.
 R6 47k yellow-purple-orange.
 R7 12k brown-red-orange.
 R8 1k brown-black-red.
 R9 680 ohms blue-grey-brown.
 R10 2.2k red-red-red-gold.
 R11 39 ohms orange-white-black-gold.
 R12 470k yellow-purple-yellow.
 R13 4.7 ohms yellow-purple-gold-silver.
- Capacitors.**
 C1 2 μ F 6V.
 C2 100 μ F 12V.
 C3 100 μ F 12V.
 C4 10 μ F 6V.
 C5 100 μ F 12V.
 C6 0.1 μ F 150V.
 C7 100 μ F 12V.
- Transistors.**
 TR1 OC71. TR2 OC81D.
 TR3 & TR4 Pair OC81
- Transformers.**
 T1 Osmor Radio OXD1.
 (540 Purley Way, Croydon, Surrey.)
 T2 Osmor Radio QXO2.
- Loudspeaker.**
 7 in. by 4 in. 3 ohm permanent magnet.

- Sundries.**
 Paxolin $\frac{1}{2}$ in. thick,
 1 yard. 1 mm. insulated sleeving.
 Pair 9V. battery fasteners.
 Thin flex, connecting wire.
 Two heat sink plates about 3 in. by 2 in. with transistor clips.
- Addresses of firms who supply components through the post are:*
 Radio Component Specialists, 307 Whitehorse Rd., W. Croydon, Surrey. Apha Radio Supply Co., 103 Leeds Terrace, Wintoun St, Leeds.
 Astra Radio, 82 Centurion Rd, Brighton. Post Radio Supplies, 33 Bourne Gds., London, E.4.
 Premier Radio, 207 Edgware Rd, London, W.2.
 Coventry Radio, 189 Dunstable Rd, Luton, Beds. Home Radio (Mitcham) Ltd., 187 London Rd, Mitcham, Surrey.

If a different driver transformer is used and the amplifier oscillates when first switched on, switch off at once. Then reverse the secondary connections. That is, change over leads to 3 and 5 in Fig. 3.

IMPROVED BAR CRAMP

THERE are occasions when a job of work demands the use of a bar-cramp, but, unless the need is likely to recur frequently, it may not warrant the expense of buying this tool. Quite a useful substitute can be made from a pair of ordinary small clamps, as figured in our illustrations. The ends of the clamps must be sawn off to allow sufficient clearance for the screws where they engage the work.

Fig. 1 shows the normal set-up, using an appropriate length of wood with a hole bored out at each end to take the clamps. If only one clamp is available,

a bar clamp can still be made, as seen in Fig. 2. Here only one hole is bored through the wood to take the clamp, the other end terminating in a screwed-on small block of wood, or an iron angle bracket can be utilized.

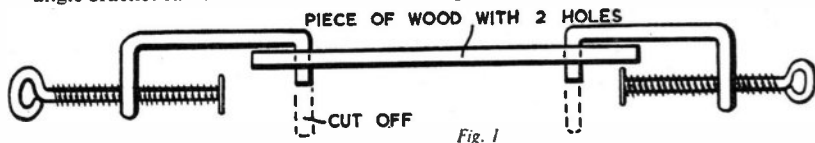


Fig. 1

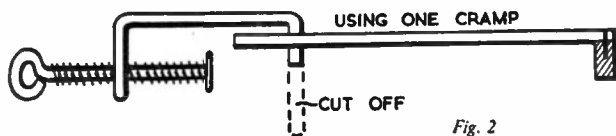


Fig. 2

FAIRS or trading festivals have held all over the world since long before history began to be written. It is a rather exciting idea to think that by going to the fair we are carrying on one of mankind's oldest and most enjoyable social customs.

Many stamps and labels appear every year to mark various fairs and a collection of these should prove interesting.

When fairs first began, men were primitive tribesmen continually warring with each other. Sometimes they called a truce, and came together on a truce or fair ground to exchange their goods. During these times the peace was never broken. These events became connected with religious occasions and strict rules of honesty and good behaviour were imposed. So the word fair really does in its origins mean just that, in the sense of honest business. Many of our present day laws can be traced a thousand years back to ancient rules that governed fairs.

Festivals at Mecca

Folk songs and stories are full of references to famous fairs. If one goes back in time, one finds the fabulous festivals at the Arabian city of Mecca, which attracted pilgrims from throughout the Eastern World. Greek fairs were periodic events honouring the gods and reached their highest point in the Olympic games. Rome had a huge Latin Fair every year in April, in honour of Jupiter. When Christianity began to spread, the church changed the names of fairs, so that instead of honouring a pagan god, they honoured a Christian saint. Our own Bartholomew Fair is a good example.

The adventurer Marco Polo brought back news of the great fairs he saw in China. His descriptions of gigantic festivals attracting a half million people were so astonishing to European listeners that they could not believe him.

Old Irish and Scottish fairs were wrapped up in matters of magic and sun worship, and as in some other countries they were commonly held at burial places of long-dead kings and queens. The only time the Scottish and Irish clans stopped fighting each other was during a fair. But there they participated together in trading and great athletic contests.

Vaudeville in London

Germans maintain that it was at their Leipzig fair that the amusement arts of tightrope dancing, fire eating and acrobatics were perfected. Bartholomew Fair, held in London, was the first one to put amusement above anything else — vaudeville acts of all kinds were developed and the performers were known far and wide.

In North America, the first fair was



COME TO THE FAIR

put on by the Berkshire Agricultural Society in 1810. It was called a cattle show; but prizes were given for farm products besides livestock. For the first time women took part in the activities by bringing jellies, mincemeat, pickles, needlework and other household products to be judged. This type of fair became popular all over America and today there are thousands of such fairs. Hardly a country is without its fairs now and people save all through the year for the fun of going to the fair.

In the last hundred years we have had a number of world fairs. The glittering Crystal Palace was built for the first International Exhibition in London in 1851. New York's first World's Fair was held in 1853. The Eiffel Tower was built for the Paris World's Fair, which opened



The Olympic Games were the climax to Greek fairs

in 1889. In 1904 St. Louis, U.S.A., held a world's fair to celebrate the Louisiana Purchase, and in 1915 San Francisco had a Panama — Pacific International Exposition. In 1933 Chicago was the site of a world's fair under the name of the Century of Progress Exposition. The International Paris Exhibition was held in 1937, and in 1939 America had two world's fairs at once — The Golden Gate Exposition in San Francisco, and the World's Fair in New York.

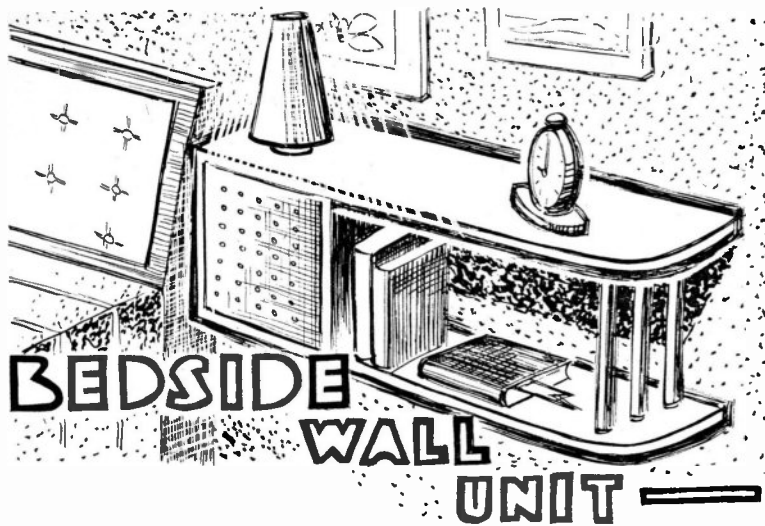
The Festival of Britain held in 1951 was one of the largest and most popular fairs the world has ever seen. (R.L.C.)

SOME FINE OLYMPIC STAMPS



Olympic sets have arrived from British Guiana, Bermuda and the Bahamas — They are of fine quality and collectors are advised to get these sets as soon as possible. The British Guiana 5c features weight lifting and the lovely blue 3d. from Bermuda shows a yacht. The 8d. from Bahamas (1s. overprinted) also shows yacht racing in progress.

Issues from Japan, the host country for the Olympics, featured various aspects of the Games.



A FEATURE FOR THE BEDROOM INCORPOR- ATING EXTENSION SPEAKER & LIGHTING

Described by
R. G. Canham

THIS project has proved both useful and decorative. The measurements specified are flexible, and can be increased to adapt to personal requirements. This also applies to the section which is shown as housing an extension radio speaker. Should this not be desired, or if not practical or is prohibitive, the alternative layout of shelving can be used as shown. Indeed, by constructing both layouts, satisfactory dual units (one for either side of the bed) are obtained.

All diagrams (including those for alternative suggestions) are shown on the centre pages.

Materials used are all readily obtainable, and all sections are pinned and glued, unless otherwise shown.

The speaker housing is designed to accommodate a 5 in. permanent magnet (P.M.) speaker, which is screwed to a $\frac{1}{2}$ in. plywood 'baffle'. This 'baffle' is first perforated with $\frac{1}{4}$ in. diameter holes, details of which are given on the squared diagram F. After cutting and painting, the rear side of baffle F is covered with radio speaker fabric, stretched and secured by a little contact adhesive. The speaker is then screwed into position over the fabric and completed baffle section is secured to the speaker housing with small wood screws upon completion of the project.

Sections A, B, C and F are cut to sizes shown on the cutting list, from $\frac{1}{2}$ in. plywood, then assembled in the manner

WOOD CUTTING LIST

- A — 18 in. by 6 in. by $\frac{1}{2}$ in. Plywood.
- B — 9 in. by 6 in. by $\frac{1}{2}$ in. Plywood.
- C — 9 in. by 6 in. by $\frac{1}{2}$ in. Plywood.
- D — 9 in. by $\frac{3}{4}$ in. by $\frac{1}{2}$ in. Stripwood.
- E — Three lengths — 9 $\frac{1}{2}$ in. by $\frac{1}{2}$ in. Round Rod.
- F — 9 in. by 6 in. by $\frac{1}{2}$ in. Plywood.
- G (if required) — 6 in. by 6 in. by $\frac{1}{2}$ in. Plywood.

shown on the diagrams. Pieces D, to which the speaker baffle is finally screwed, are cut from $\frac{3}{4}$ in. square stripwood to 9 in. lengths, then pinned and glued to pieces B, $\frac{1}{2}$ in. in from the facing edges to permit the baffle F to fit flush. The baffle is secured to pieces D with $\frac{1}{2}$ in. fretwork screws.

Pieces A are from $\frac{1}{2}$ in. plywood, cut and drilled according to the squared diagram. Holes $\frac{1}{2}$ in. in diameter are drilled in both top and bottom sections to accommodate the dowel rods, but different positioned holes are required to provide entry for the lamp flex in the top A section, and entry for both lamp and speaker supply flex in the bottom A section. The positions are shown on the diagram for these flex entries, a $\frac{1}{2}$ in. or $\frac{3}{4}$ in. diameter hole being sufficient in both sections.

The drawing showing the inclusion of a shelf to replace extension speaker unit, should this be required, shows the shelf piece G in position, pinned and glued to pieces B and C. The exact position is, of course, left to personal taste, and in this case pieces D are not required.

In wiring the unit small plastic connectors can be used for ease in connection of flexibles, enabling short lengths of

flex to be fitted to the lampholder and speaker tags (soldering the flex to these tags is, of course, necessary) and connecting the other ends into the connectors before the completed unit is fitted to position. Longer lengths of flex taken from the radio extension speaker socket and nearest wall socket for the light can then be added when ready. It is necessary to keep the short length of flex from speaker to connector long enough to enable the speaker baffle F to lift away from the housing to give access to its interior for the final connections and switch fitting to the speaker circuit.

Due to the use of mains wiring, the following must be observed, as even with simple circuits care in the use of electricity is always vital.

1. Flat twin plastic covered lighting flex is used throughout. No earthing conductor is necessary as it is intended that an all insulated plastic lampholder and cord switch be used.
2. Ensure that cord switch connections are correctly made.
3. Connect the lighting flex for the lamp to either a 2 amp, 5 amp or 13 amp wall socket. The 13 amp domestic system widely used nowadays (generally with the flat pin type fused plug), is suitable provided the cartridge fuse in the plug is rated at 2 amp or 5 amp capacity as indicated on the cartridge casing.
4. Keep flex runs as short and tidy as possible, not permitting the mains supply flex to be hidden under carpets. The runs can be secured at intervals to the skirting board by the use of insulated staples. But under no circumstances allow it to be left unsecured on the floor.

LIGHTING ACCESSORIES

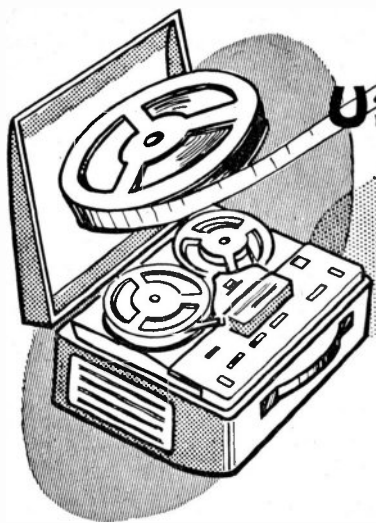
(obtainable from Electrical & Radio shops)
5 in. Permanent Magnet Extension Speaker, lighting flex (flat twin, plastic covered), 1 plastic type batten holder, 1 cord switch, small length speaker fabric, 1 15 watt/25 watt lamp bulb, 1 lampshade, 1 low voltage switch.

5. It is intended that the lamp fitting be only incorporated in situations where a wall socket is already properly provided. No attempt should be made to connect to other points in the house wiring.

6. Avoid the use of twisting cable ends together to form joints, then binding with tape as this can be dangerous. Also ensure that no bare wire is visible at all connecting points.

7. The speaker supply does not naturally involve mains voltage. But the speaker can only be used where the radio is equipped with an extension speaker socket. Furthermore as the radio may be some distance from the bedroom care should be taken to choose the most suitable run for the flex — and the shortest. The actual method used will

● Continued on page 247



USING YOUR TAPE RECORDER

NO NEED FOR TOO MUCH SOUND

A READER of this magazine once wrote to me telling me of the time when he had to turn his wireless down when recording, because of his children, and forgot to make a compensating adjustment to his recorder volume intake. When he played it back he was surprised to hear that not only was there no decrease in volume, but the quality of the recording had improved.

I pointed out to him that too much sound can spoil a recording by causing various internal components to vibrate.

Quite likely this man, as I do myself, loves a dancing Magic Eye. When I see those segments react to the least little sound I know the recording is working, that I have not forgotten the sensitivity button, or plugged the cable in the

wrong socket, or left the microphone tab down.

However, more likely than any of these imaginary horrors, is the likelihood that I am overloading. The Magic Eye is not much help, because the segments begin to overlap well above the vibration stage.

However, this too much sound business is more likely to occur with audio link-ups, i.e., transistor portable to mains via the mixer, than under any other circumstances.

The recordist is always conscious of the difference between the transistor portable and the mains machine, and the ever present need for boost. The temptation to start that boost right at the location recording is very strong, and it

is very, very wrong; and the final results, when it gets to the mains machine, is that you have picked up more atmospheres than ever steam radio did in a thunderstorm!

Actually I have always found 6 a good volume for a transistor portable for general purposes, with a Telefunken D 9A. With traffic I have to come down to 2. When recording in a railway carriage, I had to cut down to 2, and also discard the D 9A for the little microphone that went with the machine.

It does not really matter if the transistor recording is quiet, because in its passage to the mains it gets a double boost anyway, so that it is quite easy for 3-5 recording on a transistor to be as adequate when it gets to the mains as, say, a direct cable from the wireless to the mains.

Consider the boosts. A reasonably good mixer will raise the volume considerably, and even appear to have a refining influence on the quality. Then at the mains there is adequate scope to raise the sound from any reasonable level, such as the sound should be coming straight from the mixer, to the full volume required.

However, the sole key to successful transmission from the mains machine to the portable, which is also a very useful thing to be able to do, is rigid control of volume.

I remember once I was doing this, with the object of dubbing back onto the mains again in the correct dramatic context. I tried several times, before I eventually succeeded completely without effort. I looked about to see what I had done right. I had knocked the mixer volume control down to almost zero with my elbow!
(G.E.G.)

•Continued from page 246

BEDSIDE WALL UNIT

depend upon individual circumstances and construction of the dwelling.

The completed unit is screwed to the wall by a 1 in. glass plate and at positions marked X in diagram. Finish can be made to harmonize with existing decorations after sanding down. If a gloss finish is desired — 1 coat of primer and undercoat should be applied before the finishing coat.

To isolate the speaker a switch is fitted and wired as shown, enabling the speaker to be switched on or off as required. The switch used is of the low

voltage type. A $\frac{1}{4}$ in. hole being made in the outer piece B. The flex is brought into the switch through this hole from the inside of the speaker housing. The position of the hole and switch can be made according to choice but kept as inconspicuous as possible. Both speaker and light switches should, however, be situated so as to enable them to be operated with ease from the bed.

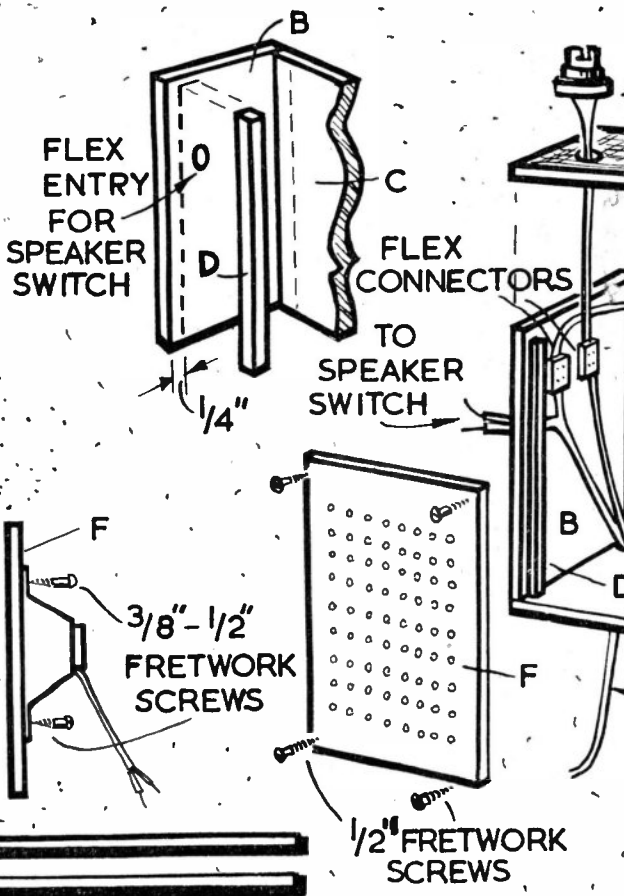
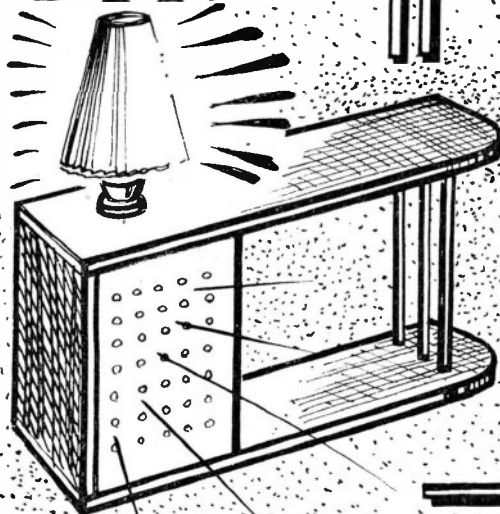
Finally it is to be remembered that the addition of extension speaker and light is optional in either case and either can be dispensed with without detracting

from the usefulness of the unit.

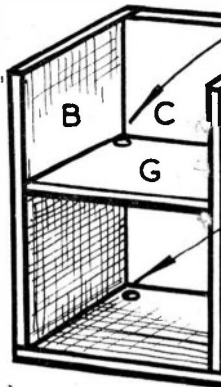
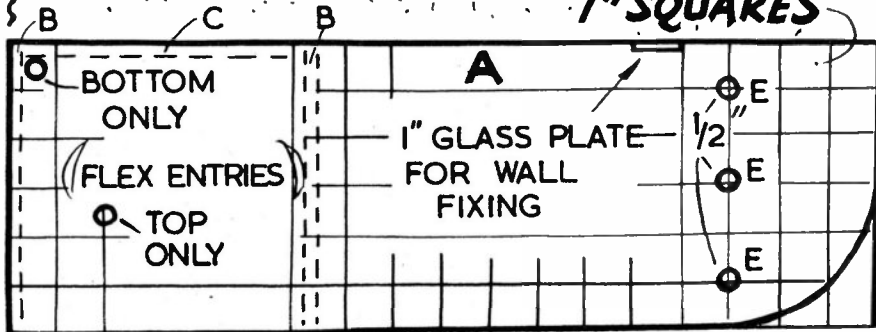
Should the light fitting be required without the speaker, and the shelving is thus included the mains supply flex is brought into the unit direct. A $\frac{1}{4}$ in. diameter hole in the left hand corner (facing) of the shelf G is all that is required for a flex entry in conjunction with the corresponding entry in the lower A section. This will also mean that the flex entry for a speaker switch will not be required in piece B.

Should the speaker, on the other hand be included, without the lamp fitting, then the flex entry in the top section A can be omitted. Again if neither lamp fitting or speaker are desired then all flex entry holes can be ignored.

BEDSIDE WALL UNIT



1" SQUARES



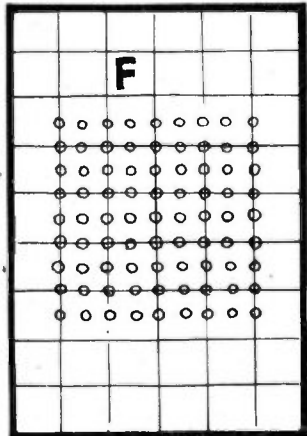
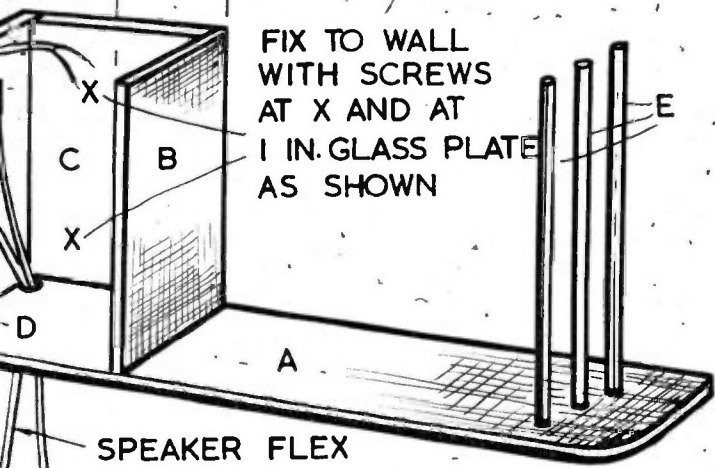
"A HOMELOVERS PROJECT"

BATTEN LAMP HOLDER
SCREW TO A

1/2" DIA. HOLES

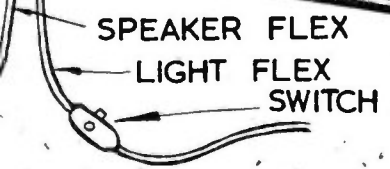


FIX TO WALL
WITH SCREWS
AT X AND AT
1 IN. GLASS PLATE
AS SHOWN

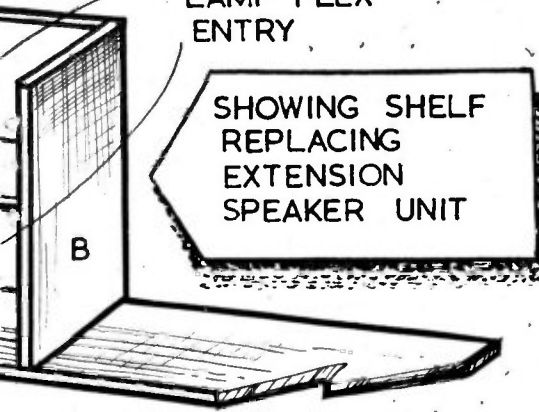


1 IN. SQUARES
1/4 IN. HOLES

SPEAKER FLEX
LIGHT FLEX
SWITCH

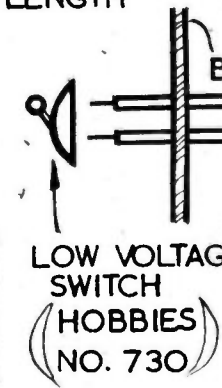


HOLES FOR
LAMP FLEX
ENTRY



SHOWING SHELF
REPLACING
EXTENSION
SPEAKER UNIT

SHORT
LENGTH



TWIN
FLEX

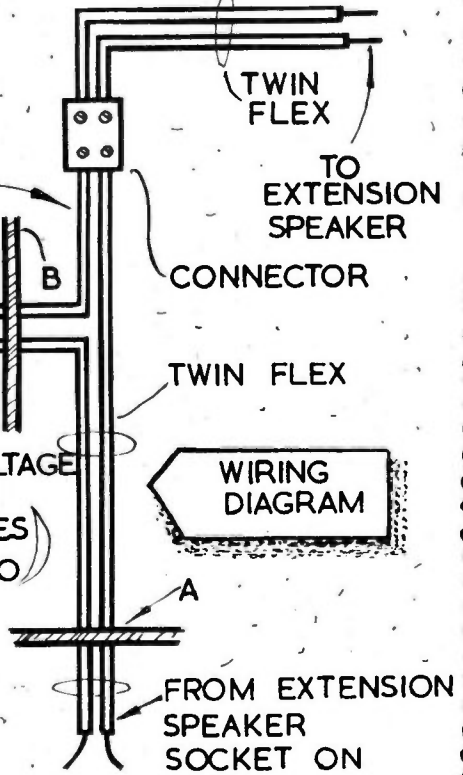
TO
EXTENSION
SPEAKER

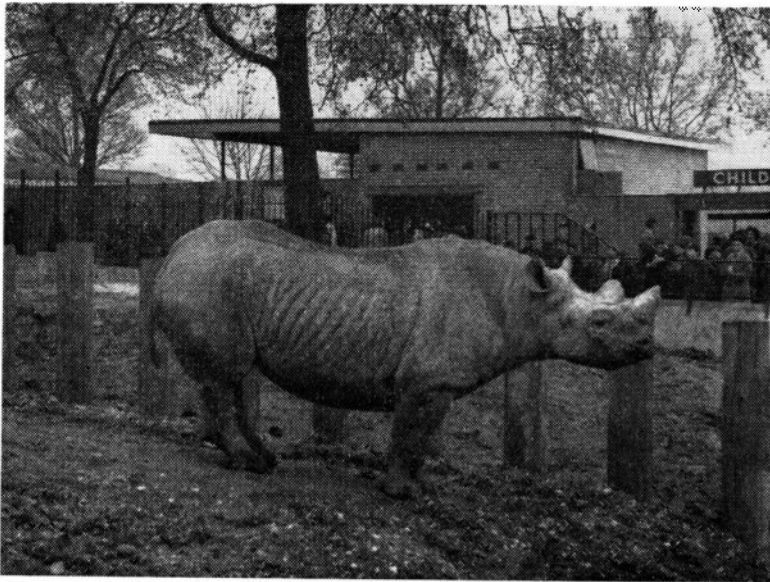
CONNECTOR

TWIN FLEX

WIRING
DIAGRAM

FROM EXTENSION
SPEAKER
SOCKET ON
RADIO





and lay this alongside the print so that the surface of the Dry Colour which is not to be used will lay on same. Apply the dry colour to the photograph so that the film covers the area requiring to be suppressed and pressing gently with the finger tips. This will be sufficient to keep the film in position.

You will require a needle stylus for tracing the outline of the image, slowly but surely. Work in good daylight and you will find that the photographic

The original photograph with background which detracts attention from the animal subject

image is easily visible through the dry colour film. Do not apply too much pressure with the stylus or you will cut through the film and mark the print, although plate glass obviates this. If you happen to be really heavy handed place a sheet of transparent tracing paper on top of the dry colour film. I must emphasize that scoring should always be extended beyond the corners. In other

Enhance the photo subject by . . .

SUPPRESSING BACKGROUNDS

THE usual methods of suppressing or eliminating a background to enhance a subject on a photograph are by bleaching, painting out with process colour or treating the negative. The latter is a difficult job with small images on 35 mm. film and you may be interested in a new method involving the use of Letraset Instant Dry Colour.

This material is primarily used by draughtsmen and is prepared in 40 colours. After experiments it has been found that white and the four shades of grey in the range are eminently suitable for monochrome work, while the colours could well be used for colour prints. These 'ghost' the background, although the white will practically eliminate, with a perfectly even coating. There is no

The same picture after toning down the background with different applications as described in the text

mixing of colours, chemicals or brush-work.

Our photographs show an original print, where it will be seen that the background is to the detriment of the subject, and the result after treatment, one half being treated with dark grey colour and the top right corner with white. compare the two illustrations to note the effects.

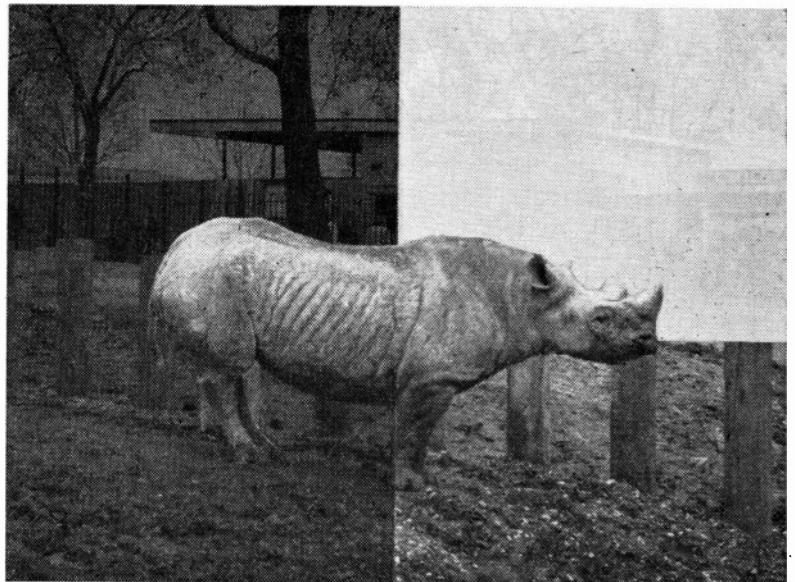
The method is simplicity itself. The

dry colour is attached to a film, not unlike a transfer, and protected by a backing sheet. I find it best to lay the photograph selected for treatment on a sheet of plate glass which has a hard, level surface.

Remove the protective backing sheet

words, when you come to a corner the two scorings should cross so that the corner to be left will be cleanly cut.

When the outline has been traced rub the fingers over the area where you desire the colour to adhere. This will be sufficient to afford adhesion and bring the



film in contact with the photograph. Now lift up the film at its narrowest point gently rubbing the back with the fingers while lifting. The dry colour will adhere to the background in one piece providing you peel off the film slowly. When dealing with large areas — as in the example — you may find a small air bubble or a crease may appear. Such can be eliminated by further burnishing. I recommend that you now take the backing sheet between thumb and fingers — just like you may hold a piece of sandpaper — gently rubbing over the dry colour in a circular fashion. Air bubbles will ease out and creases vanish to leave a perfectly flat, smooth finish. Should your original scoring have missed a point or so here and there you may always resort to spotting colours or process white to complete the work.

A rapid method

This method is extremely rapid, may be used to eliminate or subdue backgrounds for portraits or technical photographs. And if you like you may always make a copy of the treated print to make a new photograph.

Letraset Dry Colour is usually obtainable at most stationers and those shops dealing in drawing office materials. A large sheet will cost 3s. 9d. and will be sufficient to treat a number of prints. Should you experience any difficulty in obtaining this material you should enquire of Letraset Ltd., Valentine Place, Webber Street, London, S.E.1.

Miscellaneous Advertisements

INDIA'S largest hobby club provides congenial penfriends in all countries. Send self details to: FRIENDS' WORLD, postbox 708, Calcutta, India.

UNDER 21? Penfriends anywhere — details free.—Teenage Club, Falcon House, Burnley.

PENFRIENDS home and abroad all ages. S.a.c. for details. — European, Friendship Society, Burnley, Lancs.

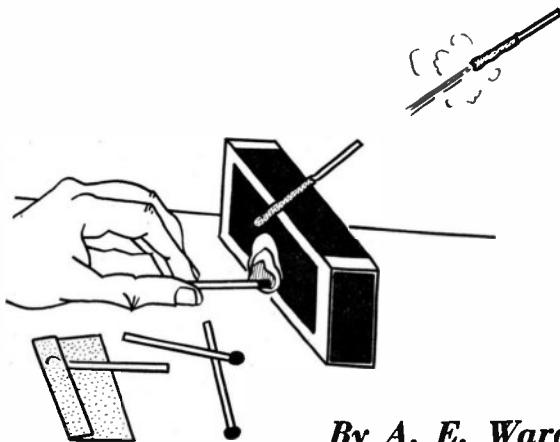
ATTRACTIVE STAMPS from approvals, 3/6d. per 100. Satisfaction assured! "Brooklyn" Shore Road, Gronant, Prestatyn, Flints.

BUYING OR SELLING

Classified advertisements on this page are accepted at a cost of 4d. per word prepaid. Use of a Box No. is 1/- extra. Send P.O. with advertisement to *Hobbies Weekly*, Advert. Dept., Dereham, Norfolk. Rates for display advertising on application.

A ROCKET RANGE

A TRICK WHICH SHOULD ONLY BE TRIED OUT IN THE GARDEN



By A. E. Ward

THE magician and escapologist Houdini knew a trick with a match, which looks exceedingly up-to-date in these modern times of ballistic missiles and space rockets.

Wrap the greater part of a live match at the 'head' end in a strip of aluminium foil taken from a chocolate bar or cigarette pack.

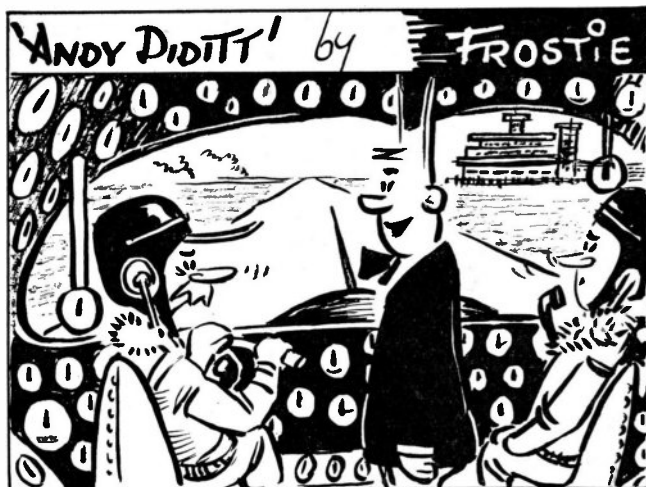
Tuck up the edge of the strip to cover the match head before encasing the stick — and make sure that the metal foil is pressed hard against the wood.

Rest the object, with its bound part pointing to your left, across the top of a matchbox stood upon its side.

When you hold a lighted match beneath the end of the 'silver' casing, heat will be conducted by the metal to the chemicals in the match head, which will suddenly ignite.

Expanding hot gases burst out of the casing's end — and the force of reaction to this fiery jet will propel your match forward like a rocket-driven missile.

Set up your own miniature Woomera Rocket Range in the garden and hold contests with your friends. For the longest distance shots and accuracy of aim, shoot at a pencil stood upon end two feet away from your 'rocket launcher'.



"I DON'T REALLY KNOW IF I COULD PILOT ONE OF THESE SUPERJETS OR NOT — I'VE NEVER TRIED!"

MAINLY ABOUT MODELS



**NEW LESNEY
MINIATURES
INCLUDE THIS
GERMAN FARM
TRACTOR-TRAILER**

AIRFIX WARPLANES AND JETLINER

LAATEST additions to the Airfix range of aircraft kits include a flying boat — the famous Catalina, which was of American origin. This 1/72nd scale model is composed of 129 pieces and has a crew of four. Two waist blisters rotate to enable the guns to turn in any direction. The cost of the kit is 7/6.

That rugged fighter from the Western Desert, the Curtiss Kitty Hawk, is available as a low altitude bomber version. In 1/72nd scale there are 34 parts and the cost is only 2s. 0d. Transfers include the sharks teeth which gave the plane such a fearsome appearance.

The B.A.C. One Eleven, the world's first jetliner purpose built for short-haul passenger work, is a 1:144 scale model in the Airfix Sky King series priced at 3s 6d. The 50 piece kit contains transfers and suggested colour scheme to finish the model in British United Airways livery.

range include five further tanks, field guns, and a guided missile carrier — enough to start your own model army.



The B.A.C. Jetliner



German armoured car

For ground models Airfix have introduced an 8-wheeled German armoured car costing 2s 0d. The kit contains 57 pieces and there is a crew of three. This is in 00 scale, as is that outstandingly successful British Centurion Mark 8 Tank, consisting of 103 parts for 2s 0d. The completed model features a fully revolving turret.

Other fighting vehicles in the Airfix

ALTHOUGH Mr C. Peers of Priory House, 1 Church Street, Leamington Spa is 84 years of age, he still derives much pleasure in intricate fretwork cutting, recent examples of which are seen in the photograph. These consist of two models of Hobbies Gothic Clock (No. 3538) and an exquisite large design published about the year 1897 but which is unfortunately now out of print.

These examples of fine craftsmanship pay great tribute to such a keen fretworker who still finds much pleasure in using his Hobbies handframe. This work gives Mr Peers a great deal of pleasure and interest. His activities are not confined to this type of model for he says he has just completed Hobbies Swiss Water Wheel Musical Box (No. 265 Special) and also the Secret Money Box (No. 2670) the design of which he thinks is unique.

THIS Matchbox model of a German farm tractor (No. 50) finished in bright yellow and green with authentic balloon tyres, costs 1s. 11d. It is 2 in. long and to a scale of 61 to 1. Matchbox model No. 51 consists of a trailer to match the tractor. It tips to any position and has 3 unbreakable plastic barrels. The length of the trailer is 2½ in. and the price is 1s. 11d.

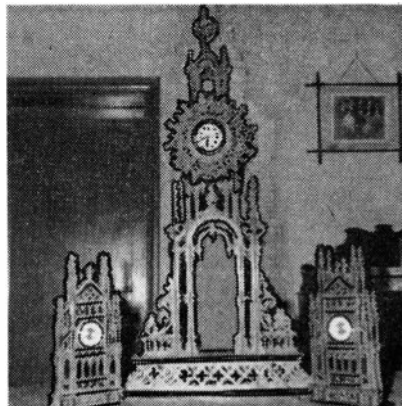
Another new Matchbox model (No. 31) is the Lincoln Continental car complete with nickel plated grille and bumpers, independent spring suspension and opening boot. The length of this model is 2¾ in., the scale 74 to 1 and the price 1s. 11d.

The Matchbox king-size model No. K2 is a KW-Dart Dump Truck with giant balloon tyres and working rear section operated by twin hydraulic rams. Priced at 7s. 6d., the overall length is 5½ in. and the scale of the model is 96 to 1.

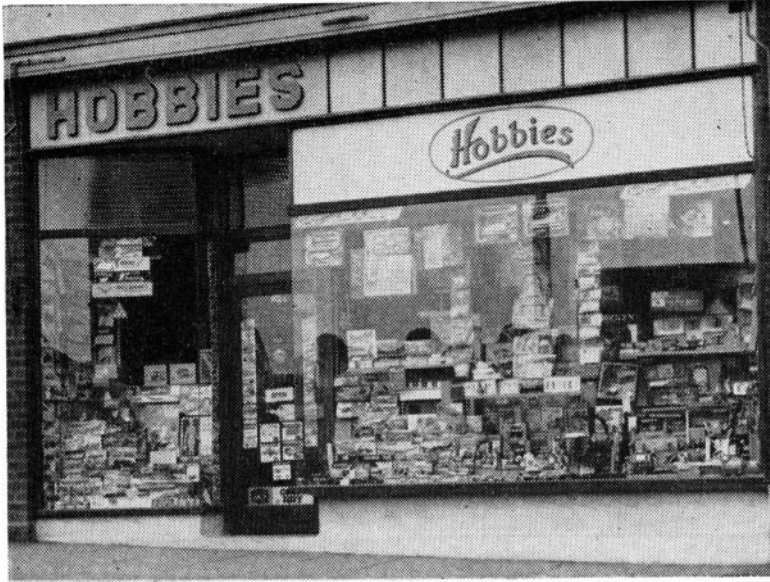
OLD MODEL WANTED

WE have received a request from Mr. G. Spencer, 46 Helen Street, Glasgow, S.W.1. Scotland, concerning a design for a 4 turret and domed bird cage. This is not now in print but Mr Spencer would like his son to try and make this project. He recalls it as a design published over 30 years ago and maybe one of our readers might have this in his collection and would be willing to let Mr Spencer have a look at it.

CRAFTSMAN AT 84



CALLING BIRMINGHAM . . .



The well-stocked windows of Hobbies branch at 18 Moor Street, Ringway, Birmingham, contain kits and models to fascinate all hobbyists. This branch specializes in plastic and wood kits of all descriptions and is, of course, the main Birmingham centre for all Hobbies tools, kits and materials.

Here, as at all Hobbies branches, you can choose from a wonderful selection of toys, games and pastimes, suitable as gifts on all occasions throughout the year. Go to a Hobbies branch for your Matchbox and Budgie models (see back page).

Here are the addresses of all Hobbies Branches

LONDON

78a New Oxford Street, W.C.1
TEL: MUSeum 2975 (Early closing Sat.)

87 Old Broad Street, E.C.2
TEL: LONdon Wall 4375 (Early closing Sat.)

81 Streatham Hill (Opp. Locarno), S.W.2
TEL: TULse Hill 8796 (Early closing Wed.)

151 High Street (Bateman's),
Walthamstow, E.17
TEL: COPpermill 3928 (Early closing Thurs.)

GLASGOW

328-330 Argyle Street, Glasgow, C.2
TELEPHONE: CENTral 5042

MANCHESTER

10 Piccadilly, Manchester, 1
TELEPHONE: CENTral 1787

BIRMINGHAM

18 Moor Street, Ringway
TELEPHONE: MIDland 0219

SHEFFIELD

4 St. Paul's Parade, Sheffield, 1
TELEPHONE: 26071

LEEDS

10 Queen Victoria Street, Leeds
TELEPHONE: 28639

HULL

42 Savile Street, Hull (only address)
TELEPHONE: 23854

SOUTHAMPTON

134 High Street (Below Bar)
TELEPHONE: 25947

BRISTOL

65 Fairfax Street, Bristol, 1
TELEPHONE: 23744

NEWCASTLE

42 Dean St, Newcastle-on-Tyne, 1
(continuation of Grey Street)
TELEPHONE: 21465

EXETER

9 North Street
TELEPHONE: 76661

LEICESTER

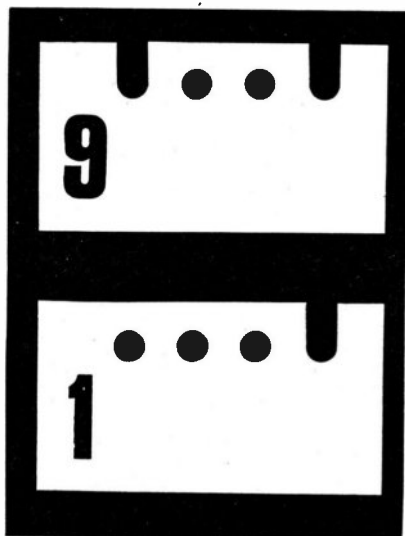
25 Charles Street (Opp. Safeway Supermarket)
TELEPHONE: 24830

A MECHANICAL BRAIN

MY newspaper has 10000 pages, it weighs four ounces, and I always read it easily in half an hour. The facts sound crazy until you realise that 10000 really stands for a mere 16. But the figure is written in the Binary Number system, where the only numerals are one and zero, and all counting is done on a basis of twos. Counting, as usual, in tens, we write one to nine before shifting a place to the left and adding a zero to indicate the first ten (10). Then we count on ten more digits before raising the value of the ten's place by another ten, to make 20. Eventually we reach 99, after which we shift another place left and add on two zeros, to make one hundred (100).

If human beings had two fingers, instead of ten, all our counting from the dawn of history might have been binary.

To write a sequence of numbers in the binary notation you would need to shift a digit one place left every other time you counted consecutively. Thus: 1, 10, 11, 100, 101, 110, 111, 1000, 1001 and 1010 would stand for the numbers one to ten. Counting six more — 1011, 1100, 1101, 1110, 1111 and 10000 — you would attain sixteen.



For centuries binary counting has been no more than a curiosity but in recent years a use has been found for binary numbers in the operation of electronic computers, where it is convenient for an electric circuit 'on' to stand for one, whilst the same circuit 'off' will

signify zero. Any number can be represented by a sufficiently long 'row' of circuits on and off.

However, you can gain a little more insight into this 'computer principle' by employing a code of punched holes and slots representing binary numbers, to work an amazing 'Mechanical Brain' made with postcards.

Punch a row of four holes with even spaces between them near the upper edge of a postcard — and prepare nine other identical cards. Number the cards from one to ten. Now on each card convert the punched holes into the binary code equivalent for the number written on that card, in accordance with the key given here. Where the key gives a one cut the appropriate hole into a slot. Unspoilt holes will stand for zeros. Two examples are given in the illustration.

Shuffle the cards, then use the code of holes and slots to help you sort them out again.

To do this hold the cards together and push a knitting needle through the fourth hole. Lift all the cards it catches and put them on top. Repeat after inserting the needle in the third hole. Then repeat again, after inserting the needle in the second hole — and, finally, after putting it through hole one. Afterwards you will be intrigued to find that all the cards are arranged in correct numerical order. (A.E.W.)

1 — 0001	6 — 0110
2 — 0010	7 — 0111
3 — 0011	8 — 1000
4 — 0100	9 — 1001
5 — 0101	10 — 1010



THE Cherokees used to live in a van parked in Pudding Lane, Chigwell. They now have a large house in Golders Green in which all the group live with their road manager. Mickie Most produced their "Seven Daffodils" for the Columbia label.

THE CHEROKEES



TAPE RECORDING AND HI-FI BOOK

By Frederick Oughton

THE author gives advice on all aspects of sound reproduction from the choice and purchase of equipment to its trouble-free operation.

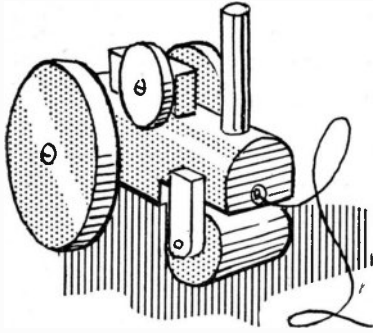
The scientific basis of recording on magnetic tape is explained, and the enormous variety of uses to which it can be put is shown.

The actual process of recording, editing, and classifying is considered, together with the merits of pre-recorded tapes.

The book includes a comprehensive glossary of technical terms, and the text is illustrated with photographs and diagrams.

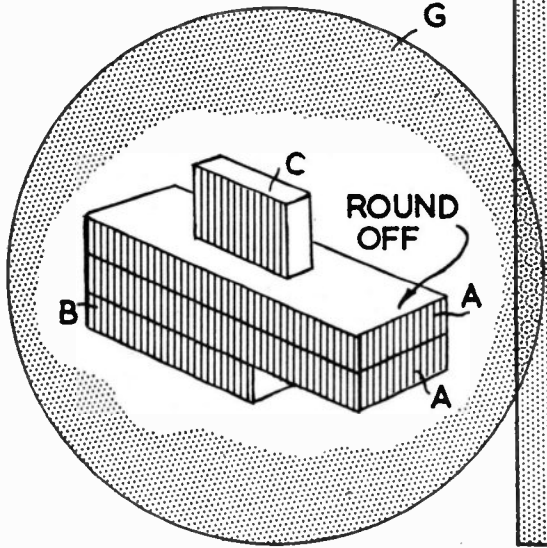
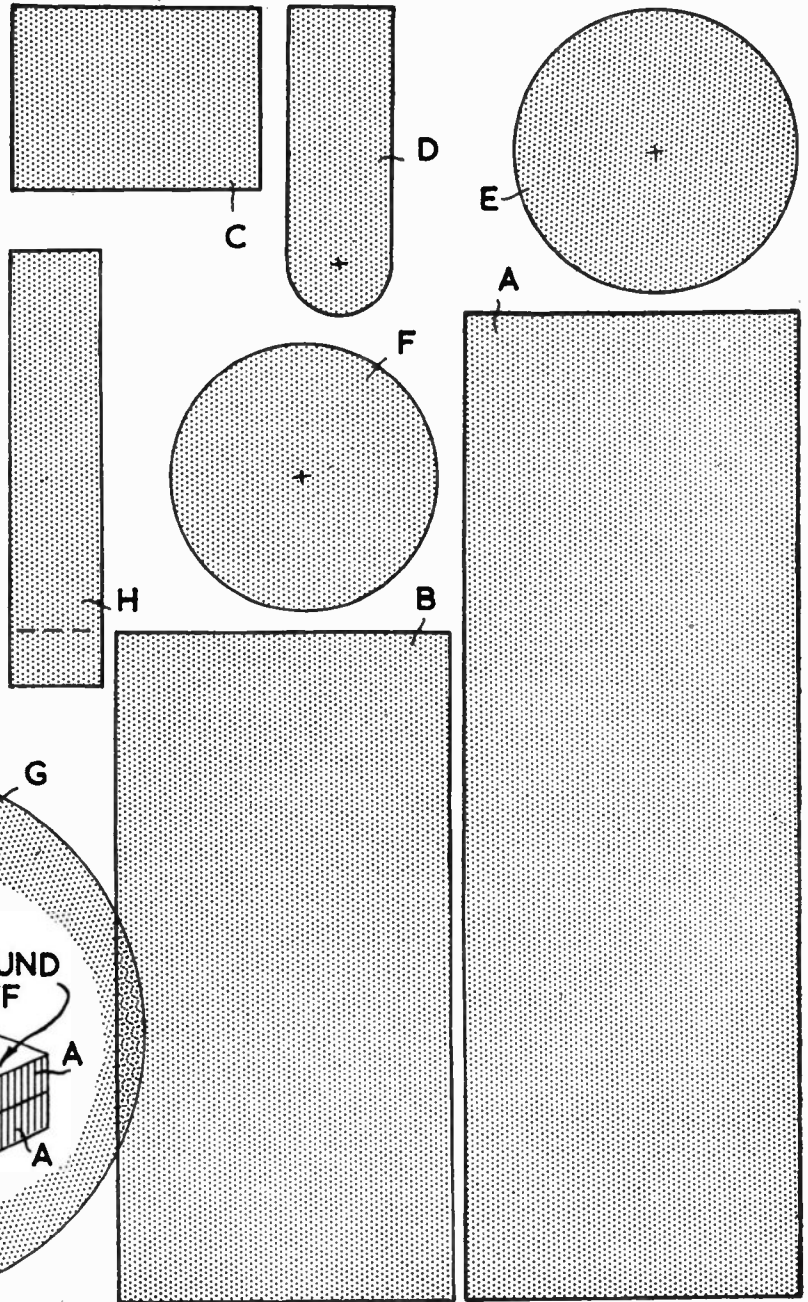
Published by Collins Ltd. 144 Cathedral Street, Glasgow, C.A. Price 5s. 0d.

MAKE THIS TOY STEAM ROLLER



MAKE this little pull-along toy from odd pieces of wood, cut out with a fretsaw. First cut two of A, one of B and one of C from $\frac{1}{4}$ in. wood. Glue them together as shown in the detail and round off the boiler portion as suggested. Cut three of E and glue together to form the roller and pivot between the two pieces D, cut from $\frac{1}{4}$ in. wood. The driving wheels (G) are cut from $\frac{1}{4}$ in. wood and are pivoted to pieces B. The wheel F is $\frac{1}{4}$ in. thick and is pivoted to piece C. The funnel is $\frac{1}{4}$ in. round rod and glued into a hole bored in piece A. Finish off by painting in bright colours and fixing a cord to a screw eye at the front. (M.p.)

**USE A FRETSAW
FOR CUTTING OUT**



BUDGIE MODELS

are really wonderful



**'THEY SPEAK
FOR THEMSELVES'**

Budgie models are strongly made in die-cast metal. They are true to life, well detailed and beautifully finished. See what a marvellous selection there is to choose from.

No.	Price
202 Refrigeration Truck 00 Scale.....	4/11
214 Mobile Salvage Crane.....	4/6
220 Cattle Truck.....	4/11
222 Tank Transporter.....	4/9
224 Locomotive.....	4/6
226 Foden Dump Truck.....	4/3
230 Timber Transporter.....	4/9
232 Cable Drum Transporter.....	4/9
234 Tractor Transporter.....	4/9
236 Routemaster Double-decker Bus.....	5/6
238 British Railways Delivery Van (Hard Top) Articulated.....	6/6
242 Euclid Tipper.....	5/11
244 Breakdown Truck.....	6/6
252 British Railways Container Transporter 00 Scale.....	4/9
254 Merryweather T/ Table Ladder Fire Escape 00 Scale.....	5/3
256 Esso Aircraft Refuelling Tanker 'Pluto' 00 Scale.....	6/11
266 Express Delivery Sidecar Outfit.....	4/11
270 Esso Tanker 00 Scale.....	5/11
272 Supercar.....	6/6
274 Refuse Truck.....	6/6
276 Bedford L.W.B. Tipper.....	5/11
280 Air B.P. Superfueller 00 Scale.....	7/11
282 Euclid 21-yard Scraper 00 Scale.....	6/11
288 Bulk Flour Tanker 00 Scale.....	5/11
292 Bulk Milk Tanker 00 Scale.....	5/3
294 Horse Box 00 Scale.....	6/11
296 Motorway Express 00 Scale.....	4/11
298 Alvis Salamander Fire Crash Tender.....	5/11
300 Lewin Sweepmaster.....	6/11
302 B.O.A.C. Cabin Service Lift Truck.....	6/11
304 Plate Glass Transporter.....	4/11
306 Tractor (with fork-lift shovel).....	4/11
308 Pitt Alligator Low Loader.....	6/11
310 Leyland Cement Mixer.....	5/11

Postage 9d. extra on each model.

Budgie models are also obtainable in Gift Sets. These contain a selection of the most popular models in attractive boxes with slide-off lids. An ideal collection for a lucky youngster.

GIFT SET No. 4 containing four Budgie models. 19/11 (post 2/-)

GIFT SET No. 5 containing five Budgie models. 22/11 (post 2/-)

GIFT SET No. 8 containing eight miniature models. 9/11 (post 1/3)

GIFT SET No. 12 containing twelve miniature models. 14/11 (post 1/6)

ORDER NOW from your nearest Hobbies Branch
or Hobbies stockist

By post direct from **HOBBIES LTD, Dept 99, Dereham, Norfolk**

Please send me the following Budgie Toys:

No. Price No. Price

No. Price No. Price

Gift Set Price Remittance for enclosed
(including postage)

Name

Address