



LAMPHOUSE

ANNUAL 1951-52

PRICE TWO SHILLINGS

The NEW DE LUXE

VICTORY AMPLIFIERS

**NEW ZEALAND'S
GREATEST AMPLIFIER
VALUE!**

"VICTORY" AMPLIFIERS are ideal for use in Dance-halls, Cafeterias, Factories, Church Meetings, Office Systems, Auditoriums, etc.

These high quality, low cost Amplifiers incorporate all the latest in circuit design. Because of their excellent fidelity of tone and the wide range bass and treble boost controls, we have no hesitation in recommending these Amplifiers for use in the reproduction of recorded music of all types.

"VICTORY" SENIOR DE-LUXE

**Beam Power Output—
Full Tone Control**

Look at these Features!

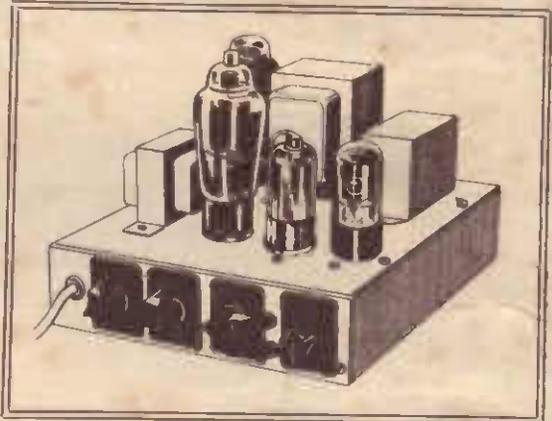
Dual channel Microphone and Gramophone input with individual volume controls. Beam power output and incorporating negative feedback.

**Full 10 Watts
Undistorted Output!**

Fitted with multi-match output transformer allowing for correct matching to any Speaker.

VALVES: 5Z3, 807, 6J7, 6N7.

HERE IT IS!



Variable tone controls are provided to accentuate bass or treble as desired and to aid in compensating for varying acoustical conditions.

Cat. No. AR834 **£15/15/-**

A suitable speaker for the above Amplifier is the ROLA Model 12-0 12in. P.M. (Extra), or the ROLA G12 12in. Heavy Duty (Extra).

15 WATT DE-LUXE

Has all the above features but uses two additional valves giving 15 watts undistorted output and incorporates extra Pre-amp stage.

VALVES: 5Z3, (2) 6SJ7, (2) 807, 6J7, 6SN7.

Cat. No. AR855 **£19/12/6**

Suitable Speaker for above, ROLA Model 12-0 12in. P.M. Speaker, or the ROLA Model G12 12in. Heavy Duty.

(Both extra.)



"VICTORY" JUNIOR AMPLIFIER

A small Amplifier which will give outstanding reproduction. 5 Watt Output. Compact and attractive, suitable for Velocity, Crystal and Dynamic Microphones, continuously Variable Tone Control. Wide range frequency response, Hi-Fidelity Phone Reproduction.

TECHNICAL SPECIFICATIONS

Rated Output, 5 watts; Input, Microphone and Gramophone; Gramophone gain, 76 D.B.; Hum Level, 55; Variable Tone Control; Output Impedance, 5,000 ohms to Speaker Transformer.

Control is provided for compensation of acoustics when using in various locations.

The Victory Junior Amplifier offers for the first time an intermediate Power Amplifier with every feature usually found in units selling at double the price. Splendid for use in Meeting Halls, Office Systems, Night Clubs, Auction Rooms, etc.

Cat. No. AR851 **£9/9/6**

Suitable Speaker for the above Amplifier is ROLA Model 8M 8in. P.M. (Extra.)



We design and manufacture Amplifiers and Public Address Systems for all purposes—let us quote you for your requirements.



THE LAMPHOUSE ANNUAL 1951 1952

Never, even in the darkest war days, have we produced our Annual against so many difficulties. Our two main concerns are:—

1. Prices are altering overnight, and even as this is being printed a number of the prices in the Annual will be obsolete.
2. Shipping troubles have delayed many cases of goods which should now be on our shelves.

However, come what may, your orders will be executed at the best prices ruling at the time your order is received, and come what may the Lamphouse Money-back Guarantee remains unaltered.

"Any goods which are in any way unsuitable may be returned within seven days (from receipt) and your money will be refunded in full."

ELECTRIC LAMP HOUSE LIMITED

11 MANNERS STREET

WELLINGTON, C.I.

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GENERAL INFORMATION

PRICES:—The prices in this Catalogue should be taken as an indication only. Prices are fluctuating rapidly and all orders will be executed at the prices ruling at the date of supply.

TERMS OF BUSINESS.—Our terms are cash with order. We buy for cash and sell for cash that's why our prices are lower. If it is desired we will hold any moneys of regular customers in a deposit account for future purchases, otherwise any balance due will be returned with the goods.

HOW TO ORDER.—Order forms are always available for your convenience. It is only necessary to quote the catalogue number and short description when ordering, such as AE415 Iron Element.

CATALOGUE NUMBERS.—The first letter (A) of the number is for our reference. The balance of the catalogue number will always remain the same for the same article.

FREIGHT.—We pay freight on all retail orders over £1 value. Please include sufficient cash for postage on small orders.

GUARANTEE.—Any goods that prove in any way unsuitable may be returned undamaged within seven days from receipt and your money will be refunded in full.

REFERENCE.—Our Bankers are the National Bank of New Zealand, Ltd., Courtenay Place, Wellington.

RETURNS.—Should it be necessary to return goods, always put in a slip of paper with your name and address. When returning goods for credit or exchange, state invoice number in covering letter to ensure prompt attention.

TELEGRAMS.—Address telegrams to "Lamphouse," Wellington.

REMITTANCES.—Enclose cheque, pound notes, postal note, or money order to the full amount of your order. If you send coin or bank notes, be sure to register the latter. Make cheques and postal notes payable to the "Electric Lamphouse, Ltd., and keep numbers for reference.

DELIVERY. We endeavour to maintain a same day dispatch service. This is not always possible as at times goods have to be specially procured, and at times exceptional rushes take place. It is very seldom, however, that an order is held for more than one day after receipt.

SUBSTITUTES. As at times we may be out of stock of the exact article you require we suggest that you indicate on your order whether or not you wish us to substitute with similar articles in the event of the goods ordered being out of stock.

POSTAL ADDRESS.—All orders and general correspondence should be addressed to—

The Electric Lamp House Limited

11 MANNERS STREET - - - WELLINGTON, C.I.
Telephones 43-015 and 43-016

A SUGGESTION

As it is much easier for us to make a refund along with your receipt than for you to get stamps or postal notes to remit a small balance that may be left owing when your receipt is sent, would it not save you inconvenience if you were always to send ample cash to allow for freight, etc.? We will refund the difference, or place it to your credit, according to your instructions. Do as hundreds of our customers do, send a blank cheque, which we will fill in when we have totalled your order. You can write across the top of the cheque "Not to exceed £5"—or £10, or £20, as the case may be.

THE LAMPHOUSE CATALOGUE

1951

1952



FANCY UNIT, 4 1/2 in.
Fitter. Max. size
globe 150 watts.
Metal work extra, 8 in.

Cat. No. 13008 **21/-**

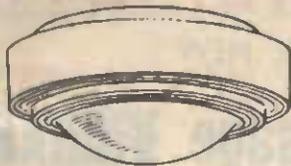
PLAIN BALL, 6 in.
diam., 3 1/2 in. fitter,
max. size globe, 60
watt.

Cat. No. AF106—
10/6 each

8 in. diam., 4 1/2 in.
fitter, max. size
globe, 150 watt.

Cat. No. AF108—
16/6 each

Metal work extra.



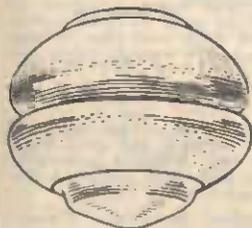
BOWLS FOR 3-CHAIN SUSPENSION.

Cat. No. 15612—12 in. diam.
Glass only **37/6**

Cat. No. 15612A—Complete **54/-**

Cat. No. 15614—14 in. diam.
Glass only **44/-**

Cat. No. 15614A—Complete **60/6**



FANCY BALL
8 in. diam. 4 1/2 in.
Fitter. Max. size
of globe 150 watt.
Cat. No. 32908.

15/9

6 in. diam., 3 1/2 in.
Fitter. Max. size
of globe 60 watt.

Cat. No. 32906.

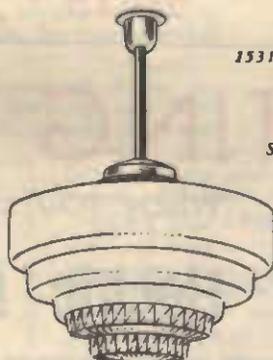
11/-

Metal work extra.

METAL FITTINGS

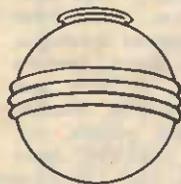
Prices on this page are for glass-ware only. To complete the fittings add to each the following, according to type of suspension required. All metal work chrome.

- 3 1/2 in. Galleries for Cord Suspension. **4/9**
Cat. No. AF358
- 4 1/2 in. Galleries for Cord Suspension. **5/9**
Cat. No. AF359
- 3 1/2 in. Galleries for Ceiling Fitting. **7/6**
Cat. No. AF360
- 4 1/2 in. Galleries for Ceiling Fitting. **8/9**
Cat. No. AF361
- 3 1/2 in. Galleries with Rod and Fittings. **22/-**
Cat. No. AF500A
- 4 1/2 in. Galleries with Rod and Fittings. **23/-**
Cat. No. AF500B



15310—
**FITTED
WITH
ROD
SUSPENSION**

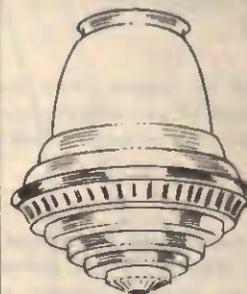
CRYSTAL BASE UNITS—10 in. diam. 4 1/2 in.
fitter. Max. size of globe 150 watts. **24/9**
Cat. No. 15310
Metal work extra.



FANCY BALL.
8 in. diam., 4 1/2 in. fitter,
max. size globe, 150
watt. **17/9**
Cat. No. 35308
6 in. diam., 3 1/2 in. fitter;
max. size globe, 60
watt. **13/6**
Cat. No. 35306
Metal work extra.



16508—
**CRYSTAL BASE
UNIT—8 in. diam.**
max. size of globe
150 watts, 4 1/2 in.
fitter. **21/9**
Cat. No. 16508
Metal work extra.
16508
**FITTED WITH
CEILING
FLANGE.**



**CRYSTAL BASE
UNIT, 6 in. diam.,**
with chrome band,
3 1/2 in. fitter, max.
size of globe 60
watts.

Cat. No. 37406
21/9

Metal work extra.

STEPPED UNIT

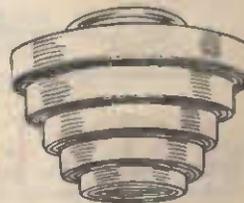
8 in. diam., 4 1/2 in.
fitter, max. size of
globe 150 watts.

Cat. No. 15308.
15/3

6 in. diam., 3 1/2 in.
fitter, max. size of
globe 60 watt.

Cat. No. 15306
10/3

Metal work extra.



18508—
**WITH
GALLERY
FOR CORD.**



**CRYSTAL BASE
UNIT,**

8 in. diam., 4 1/2 in.
fitter, max. size of
globes 150 watts.

Cat. No. 18508—
22/9

Metal work extra.

LAMPHOUSE GUARANTEE

Any goods that prove in any way unsuitable may be returned undamaged within seven days from receipt and your money will be refunded in full.

"PIFCO" HAIR DRIER

A Masterpiece of Design and Construction!

A Delight to use

Light in weight and perfectly balanced, does not tire arms or hands when using. Easy grip handle with switch control which supplies an instant flow of hot or cold air. Dries the thickest hair in the minimum of time.

Beautiful to see

Styled in lustrous Ivory plastic with flowing streamlined contours, designed for ease and pleasure to hold and to use. Packed in handsome presentation carton, a fitting home for a Pifco Drier of lasting beauty.

Technical Perfection

The motor which is Universal for A.C. or D.C. is designed for reliability with self-aligning and self-lubricating bearings. Two yards flex and adaptor fitted. Operates on any voltage 200/250. Low current consumption, 50 Watts cold and 550 Watts hot. Overall Dimensions: 7 x 8½ x 3½ ins.

Cat. No. AE214

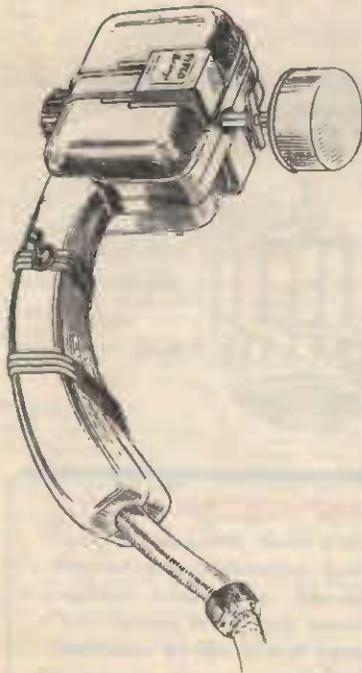
£6/15/-



INVIGORATING HEALTH

WHEN YOU USE THE NEW

"PIFCO" Electric Massage VIBRATOR



The clear, fine textured youthful complexion that everyone admires and every woman envies originates deep in the tissues below the surface. Unless this tissue is constantly and healthily renewed by the blood stream the visible skin loses its fresh colour and vitality. Age lines develop and curves tend to sag. The Pifco Electric Massager stimulates a healthy circulation of the blood, invigorating the tissue, washing away waste products, keeping it vital and healthy. It tones up the underlying muscles, promotes the removal of fatigue poisons, and stimulates the dispersal of unwanted fatty accumulations. It loosens up tight, strained shoulder and neck muscles; sends relaxed waves over tired faces; tingles the scalp to a lively glow, makes the skin feel fresh and alive, and it is so simple and easy to use. Eases pain and acts as a tonic to the system.

An instruction booklet giving full details plus Two Charts on how and where to use for different ailments is supplied with each Vibrator. FOR A.C. CURRENT—ON 200 TO 250 VOLTS INCLUSIVE.

MODERN BEAUTY TREATMENT IN YOUR OWN HOME.

Four Special Applicators:



FOR FACE MASSAGE.

The sponge rubber applicator for gentle massage. It sends soothing and relaxing waves over tired faces.



FOR NECK MASSAGE.

The flat rubber applicator loosens up strained or tight shoulder and neck muscles, and is also used for bust development.



FOR BODY MASSAGE.

If your body is fatigued or your limbs ache, the hard applicator will drive away that lethargy and make the muscles supple and active.



FOR SCALP MASSAGE.

The spiked rubber applicator imparts strength and gives lustre to the hair. Dandruff is removed and the scalp made healthy. It lifts your head into the clouds.

Beautifully finished in Ivory Plastic Casing.

Cat. No. AE79

£5/12/6

R HEALTH FROM YOUR POWER POINT!

SIMPLE, ABSOLUTELY SAFE, AND EFFICIENT.

Unlike Ultra-Violet, which must be used with infinite care and under medical supervision, Monarch Infra-Red Ray Treatment may be used by anyone, old or young, with perfect safety and most beneficial results.

No installation required: just plug in to any light point . . . simplicity itself. Designed on scientific lines with a view to simplicity, absolute safety, and economy.

ASK YOUR DOCTOR

Infra-Red Treatment is today accepted by Medical Authorities as of great benefit. Its rays are invisible but they penetrate deep down to the seat of trouble.

The **MONARCH STANDARD MODEL** is designed on simple yet effective lines. The use of Infra-Red Ray is absolutely safe—no shocks, burns or destruction of tissue can possibly follow even when used by a novice. Its value is amazing; although low in price it functions as efficiently as lamps of much higher price used in hospitals.

Specification: **REFLECTOR**.—9in. diameter in spun aluminium with tubular extension. Made to revolve to any angle. Parabolic in shape to reflect the rays in parallel lines. Insulated handle.

Each equipment includes Infra-Red Element and Radiant Heat Bulb, 9 feet flexible cord.

The **MONARCH MEDICAL LAMP** is designed to combine Heat Therapy with its concomitant Infra-Red Therapy. Any reliable medical dictionary will explain these terms with elaborations, but as this is not a treatise on the subject, we simply enumerate the diseases and tabulate the recommended duration of treatment.

INFRA-RED THERAPY is the treatment of disease by infra-red rays, an invisible emanation. Infra-red rays have greater power of tissue penetration than Ultra Violet Rays and,

therefore, are invaluable in effecting a deep, enduring hyperaemia. Locally infra-red rays promote increased circulation by the dilation of the blood vessels, and stasis is effectively overcome.

HEAT TREATMENT is the treatment of disease by the suitable application of heat to the part affected. Radiant heat embraces all instruments which give out a bright light as well as heat; in other words, soars amongst visible and invisible infra-red rays. One of the most outstanding forms of heat generators which are of practical medical value are Radiant Heat Lamps. Some of the medical uses to which the heat can be put are:—

- (1) Dilation of superficial vessels and glands.
- (2) Removal of venous stasis and promotion of normal circulation.
- (3) Bactericidal on superficial treatments, and as a practical result of these you—
 - (a) Get relief from pain.
 - (b) Restoration of functional activity both in the skin and in the deeper glands.

ASK YOUR DOCTOR

The **MEDICAL Lamp** diminishes the sensibility to pain, and relieves congestion with remarkable speed. Because of these powers, the lamp is most valuable for treatment of joint injuries, and pains of an arthritic or rheumatic origin. This power to relieve pain quickly is also important in the treatment of non-articular manifestations of rheumatism, in cellulitis, torticollis, lumbago, and tarsalgia.

The **MONARCH MEDICAL LAMP** also produces excellent effects in all types of neuritis cases.

Complete directions for successful use with each Lamp.

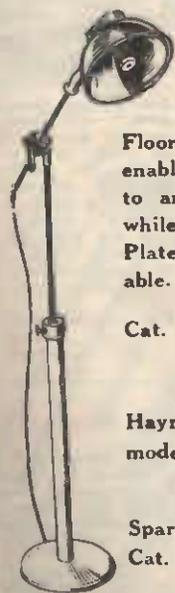
CAT. No. AE100 **£6/12/6**

SPARE INFRA-RED ELEMENTS—Cat. No. AE101 **25/-**

SPARE RADIANT HEAT BULBS—Cat. No. AE102 **22/6**



HAYMAN INFRA-RED LAMPS



Floor Model Lamp, which enables rays to be directed to any part of the body while patient is lying down. Plated arms, easily adjustable.

Cat. No. AE85—
£11/8/9

Hayman Infra-Red Table model. Cat. No. AE86—
£5/8/3

Spare Elements.
Cat. No. AE87—
£1/5/9

THE ELECTRIC LAMP HOUSE LIMITED, 11 MANNERS ST., WELLINGTON

NEW-AMAZING!
Just plug in and Spray
"BURGESS"
VIBRO-SPRAYER
Sprays PAINT, VARNISH,
 LIGHT OILS, INSECTICIDES



BURGESS HOME SPRAYER

The motor is the vibrating type and the principle is revolutionary, yet simple. Designed for use by amateurs, the "Burgess" Sprayer plugs directly into any 230v. A.C. power point or light socket. It is designed for use with light paints, lacquers, insecticides, and light oils, and should not be confused with the more expensive type of commercial sprayers. Used within its limits this sprayer will do hundreds of paint and spray jobs about the home and give years of satisfaction. Supplied with instructions and complete ready for use. Cat. No. AU355 ... **£4 each**

PHOTO LAMP



Photographic Darkroom Lamp, with built-in transformer. This Photo Lamp is the quickest and safest way the amateur can obtain a safe light for his dark room. Stood up it cuts out all light. Hung down the red disc emits a safe light for bromida paper. Plugs into standard lamp socket. 6-volt lamp is enclosed in plastic casing. Supplied complete ready for use.—Cat. No. AF752 ... **14/- each**

MODERN TABLE LAMP



In ivory-white, durable plastic. Admirable for bedroom, table, lounge, or hall. Height 14in. Shade diameter 14in; 3 yards flex with cord switch. Practical! Different! Complete ... **45/-**
 Cat. No. AF887

2-SPEED GRAM. MOTORS

The high degree of manufacturing precision and inspection maintained throughout all stages of production make it ideal for long playing (33 1/3 r.p.m.) and standard (78 r.p.m.) recordings.

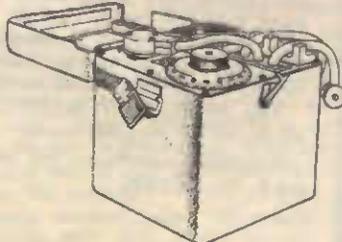
SPECIAL FEATURES.

- De Luxe 4-pole motor of advanced design assures low rumble and vibration factor.
- No stray field radiation noticeable with any type of pick-up.
- Uniform turntable speed under sidely varying record loads.
- Instantaneous speed variation (wow) at an absolute minimum.
- Self lubricating bearings employed throughout ensure quiet running, long life, and freedom from oiling.
- Speed change from 78 to 33 1/3 R.P.M. effected in a few seconds by merely reversing main drive pulley.
- 10in. dia. heavy pressed steel turntable fitting on precision ground taper steel spindle.
- Shaft revolves with turntable and is grooved for clip.
- Ideal for use with any type of magnetic or crystal pick-up.

Forwarded complete with mounting plate ready for installation.

Cat. No. AP292 ... **57/6**

AERIAL COUPLING UNITS



From No. 11 Army Transceivers. Comprises 0.350 M.A. Ferranti 2 1/2in. H.F. Theemo-coupled Ammeter and Small Variometer. Circular calibrated dial 0-360. Housed in metal box, 7in x 5 1/2in. x 3in. ... **£3/19/6 each**
 Cat. No. AX1549

BLUE SEAL IRONS



These Gleaming Chromium-plated Irons are the housewife's delight. Designed on streamlined lines they incorporate a thermostat, which maintains the heat at any determined temperature. This modern "control" enables silks, satins, and the finest material to be ironed better than new, with the slightest risk of scorching. Supplied complete with 3ft 3-wire cord.

Cat. No. AE273 ... **84/6**

CHIMING CLOCK



The Smith "ENFIELD" Chiming Electric Clock (Westminster chimes) is housed in an attractive walnut veneer mantel cabinet. Chimes every quarter-hour and strikes on the hour. Smith's reputation is carried a step further with this example of fine British workmanship.

Cat. No. AE855 ... **£15/7/-**

NIGHT LIGHTS



Just landed from England. 600 hours for one penny. Shows to plug into a standard socket. The small transformer reduces 240 volts to a 6-volt 3 amp screw-in torch bulb. Just the thing for the cupboard, child's room or sick room. 4in. x 1 1/2in.

Cat. No. AF750—
11/6

UNBREAKABLE TORCHES

All-Rubber Torches, which can be thrown on floor without damage. Ideal for workshop and in any place where torches are liable to be damaged. Positive action switch. British made. Switch easily accessible. Supplied complete with batteries and lamp. ... **19/6**
 Cat. No. AT865A

ALL PRICES IN THIS CATALOGUE ARE SUBJECT TO ALTERATION WITHOUT NOTICE.

Great Labour Saver!

Lightens Mum's Load!

The low price of these ENGLISH SEWING MACHINE MOTORS brings them within the reach of every housewife. Transform that old-fashioned treadle or hand machine into a MODERN ELECTRICALLY OPERATED UNIT by fitting this English Motor. Fits all makes of household sewing machines and is supplied complete with a variable Foot Control for regulating the speed. Operates on 250 volts A.C. Pigmy light fitted on a swivel bracket enables light to be thrown directly on to the work in hand. Plugs into either hotpoint or light socket and the current consumption is almost negligible. Complete with flexible cord already to go. Hundreds of these units have been sold throughout the country to satisfied users. MEN! This is a grand gift for wife or mother.



And Look at the LOW PRICE!

Cat. No. AM663—
NOW **£5/17/6** complete.

Cat. No. AM664—Spare Foot Controls for above **55/-**

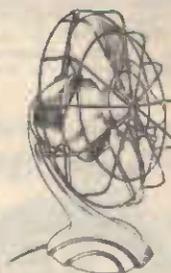
WHY WASTE MATCHES?

The "Firefly" Gas-lighter is operated by simply pressing the bottom, which connects a self-contained torch battery to the lighting filament. Ordinary torch battery used as a refill, costs 113d., lasts approx. 6 months. N.Z. made and patented.



Cat. No. AE39 **6/-**
Spare Filament Tips—Cat. No. AE40 **2/-**

DELCO 8-INCH DESK FANS



Delco 8in. Desk Fans are modern, streamline fans, attractive to both the home and office, silent, balanced and exceedingly useful. These fans are the best on the market.

Incorporating the shaded pole motor, these fans give trouble-free operation. Controlled from a simple on/off and 2-speed switch mounted in the base to regulate the airflow.

All fans are supplied with a protective guard and approximately five feet of plastic cable.

The mounting consists of a sturdy pedestal of aluminium construction, with rubber pads on the base to prevent scratching or marking of polished surfaces. **£3/16/6**
Cat. No. AE118

TOASTER TRAYS

Made of Moulded plastic in following colours: Red, Cream, Black, Green. For standing under toasters to catch crumbs, etc.—as well as many other home uses. Size (overall) 10 1/2 in. x 7 in. 2 holes for fitting to Speedee Hostess Toasters.



Cat. No. AE303 **6/6**
Special Trays (drilled) for "Speedee" Tiffen Toasters.—Cat. No. AE305 **6/6**

SPEEDEE COFFEE PERCULATOR



The gleaming plated finish of this new Perculator makes it an ideal gift for any occasion and will add tone to any table, and of course it makes wonderful coffee. Complete with 3-wire cord and plug. **£5/19/6**
Cat. No. AE185

Floor Polisher

Saves hours of back-breaking labour. No more sore knees. The Tecnico Polisher will quickly polish any floor of lino, wood, tiles, etc. Can also be used for wet scrubbing of floors. The two brushes revolve at high speed and soon obtain a brilliant polished surface. Supplied complete with flex. 230 volts. Guaranteed for 12 months.

Cat. No. AE230 **£17/7/6**



Empire Electric Vacuum Cleaner

Electric cleaning is now within the reach of every home. The Empire is a high grade stream-lined modern cleaner, low priced for such an efficient machine. Comes complete with 20ft. extension cord. Straight and bent extension tubes, oval brush, nose parker, etc., etc. Send for an Empire Cleaner for seven days' free trial, and if you are not fully satisfied return it and have your money refunded in full.

Cat. No. AE198 **£19/5/-**



ons are modern thermo-py pre-heat the finest without ed com-
6 each

Electric ed in an t. Chimes the hour. urther with anship.
7/- each

from Eng- hours light Spaped a light small trans- ces 230 0.3 amp- ch bulb. for dark d's room, om. Size,
1/6 each

CHES
thrown on workshops are liable to ritish made. id complete
19/6

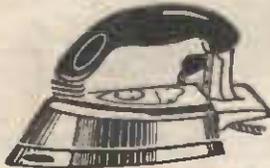
LOGUE
RATION

"SPEEDEE" GEM



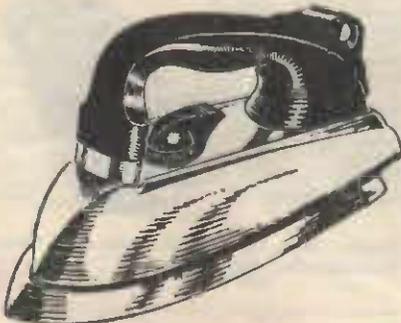
Gleaming white tableware immaculately smooth, linen crisp clothes without a wrinkle, reward the housewife who chooses the "Gem." Easier to use, too, because of its chromium-plated mirror surface. Perfect balance makes ironing easy. Rapid heating does the work better and quicker. Cat. No. AE250—
Complete with 5ft. flex. **49/6**

NEECO "MODERNE" IRON



You take the "drudge" right out of ironing when you use a NEECO "MODERNE" IRON. Beautifully finished in glittering chrome and fitted with a black stream-lined plastic handle. Supplied complete with 5ft. flexible cord and a 3-pin plug—already to plug in. We can really recommend this Iron as being a first class "Neeco" product and the pride of every user. Guaranteed 12 Months
Cat. No. AE255 **71/10**

MORPHY RICHARDS
AUTOMATIC IRON



Make ironing a pleasure with one of these DE LUXE AUTOMATIC ELECTRIC IRONS. Thermostatically controlled, this Iron can be set to the correct temperature for the material you are ironing. Five different settings: for Rayon, Silk, Cotton, etc. Beautifully moulded Plastic handle with Indicator Light insetted. Highly polished chromium base. Complete with 5ft. flex.

Cat. No. AE265—
With Chrome Body **77/6**

Cat. No. AE263 — With
enamelled pastel coloured body **79/6**

MAJESTIC LAUNDRY IRONS

10 1/2 lb. Heavy Irons for Tailors, Laundries, etc.
Supplied Complete with cord.

Cat. No. AE264 **58/6 each**

ENGLISH IRONS



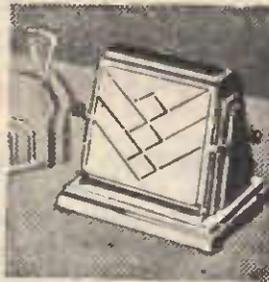
5lb. BRITISH MADE IRONS, complete with 6ft. best Cord and Appliance Plug. Reduced from 42/- because of a few rust spots. This small damage in no way affects the efficiency of the iron but it saves you 12/-
Cat. No. AE254
Were 42/- NOW **29/11**

PROTECT YOUR TABLE



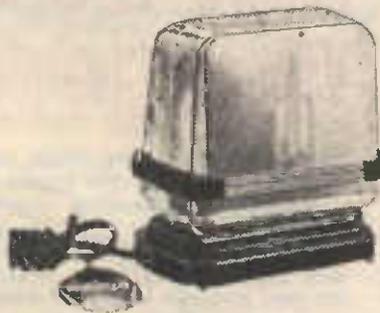
Stands for irons—insulated with asbestos. Suitable for use with all types of irons.
Cat. No. AE403 **5/9 each**

"NEECO" CHEVRON TOASTER



Two-slice Toaster of latest design and finished in gleaming chrome. Crisp brown toast is yours with a flip of the holder. Guaranteed 12 months. Supplied complete with 5ft. flexible cord and plug.
Cat. No. AE311 **51/3 each**

"ULTIMATE" DE-LUXE TOASTER



The same in Electric Toasters, the "Ultimate" is a beautifully designed toaster, the body being glittering chrome while the base and trimmings are in black plastic. The doors are fitted with stream-lined handgrip handles which make for easy opening and closing. Each Toaster is supplied complete with flexible cord and carries a 12 months guarantee.

We can recommend this for both its service ability and attractive design
Cat. No. AE310 **66/6**

"SPEEDEE" HOSTESS TOASTER



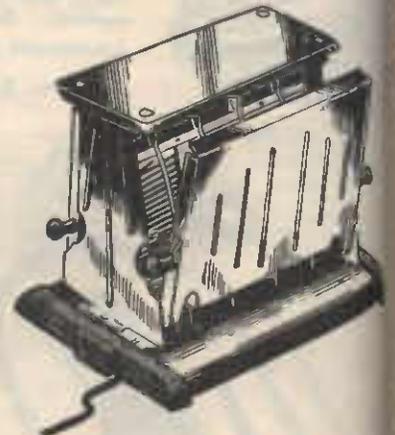
Another attractive and practical Speedee Toaster. Its moulded base in the form of a tray is designed to prevent the crumbs which fall on the table when using other toasters. The body of the Toaster, beautifully stream-lined chromium plated, conserves all the heat, supplies crisp golden brown toast in a minimum of time. Complete with 5ft. of flexible cord.
Cat. No. AE301 **45/6**

"SPEEDEE" TIFFIN TOASTER



Two-slice Chrome Toaster, with plastic tray and toast rack. Complete with 5ft. flexible cord.
Cat. No. AE302 **59/6**

"SPEEDEE" TABLE TOASTER



A beautifully finished two-slice Toaster of turnover type, constructed of heavy-gauge nickel-plated, and provided with four bakelite knobs for turning bread. Moulded plywood provided to prevent scratching of highly polished table surfaces. Complete with five three-core Hester Flex and 3 pin plug.
Cat. No. AE300 **37/6**

ALL PRICES IN THIS CATALOGUE
ARE SUBJECT TO ALTERATION
WITHOUT NOTICE.

TOASTER



edee Toaster. of a tray is which collect toasters. The streamlined and the heat and in a minimum flexible cord.

45/-

TOASTER



lastic tray and flexible cord.

59/9

TOASTER



Toaster of the avy-gauge metal, h four bakelite ded plyths are ng of highly te with five feet in plug.

37/6

CATALOGUE
OPERATION
PRICE.

"SPEEDEE" ENAMELLED
ELECTRIC JUG



This pioneer in the unbreakable jug field is still one of the most popular jugs on the market. Fast-boiling—economical—unbreakable, this "Speedee" Jug is great value for a household boiling utensil. Each jug is complete with six feet Asbestos Flex and Appliance Plug. Current consumption 1,500 watts. Available in either Brown or Green enamel. Guaranteed 12 months. Capacity 3 pints.

Cat. No. AE167 ... 59/6

Cat. No. AE168—5-pint ... 69/6

"ULTIMATE" ELECTRIC
KETTLES



These highly plated Electric Kettles are fast-boiling, and are made in accordance with "Ultimate" usual high manufacturing standards. Chromium plated with black plastic handle and knob. Capacity 3 pints. A robust and pleasing design. Supplied complete with flexible cord and plug.

Cat. No. AE190 ... 105/-

NEW SPEEDEE KETTLE



Three-pint, Chrome-plated, complete with cord and appliance plug. £3/15/- each

Cat. No. AE193 ... 96/- each

EUTRON IMMERSION HEATER



A better class Immersion Heater. Can be placed in a vessel containing water, milk or other liquid. Boils quickly and economically—1000 watts. Length 8½ inches. Twelve months' guarantee. 25/- each

Cat. No. AE153

"DEBUTANTE" CHROME JUG



A modern aristocratic design of chromium jug that combines both beauty and utility. You will quickly become enamoured with its graceful design and swift efficient service. Boils 3 pints in 3 minutes. Handle, knob and base are moulded from coloured plastics. Guaranteed 12 months and supplied complete with flexible cord and plug.

Cat. No. AE171 ... 96/-

NEECO PORCELAIN JUGS



These Porcelain Jugs are well known for their high quality. Made of strong porcelain and attractively glazed. Hold 3 pints.

Supplied complete with Plug and Cord. Note new reduced price. 29/6 each

Cat. No. AE160

Boils 1 pint in about 2½ minutes

"SPEEDEE" IMMERSION
HEATERS



A real boon to the housewife. Fast, safe, dependable and economical. Can be used in any class of vessel containing water—either glass, porcelain, aluminium or other metals. Length, 10in. Rating 1000 watts. 15/- ea.

Cat. No. AE150 ... Complete with 3ft. Flex.

Large Type

Special type giving heavy wattage rating 2000 watts. Length 20in. Boils 4½ gallons water (summer temp.), in 1 hour, winter approx. 4 gallons. 37/- ea.

Cat. No. AE152

IMPORTANT!

Owing to existing conditions prices in this book are given as a guide only. All orders will be executed at the rate ruling at the date of supply.

"SPEEDEE" CHROMIUM-PLATED
JUG



Beauty is much more than skin deep with the SPEEDEE "PREMIER" 111 chrome electric jug. An attractively designed jug that will be the envy of all your friends. The trimmings, such as handle, base, and knob, etc., are moulded in coloured plastics while the body is finished in glittering chromium.

Capacity 3 pints. Guaranteed 12 months. Boils in approximately 3 minutes. Supplied complete with 5ft. flexible cord and plug.

NEW LOW PRICE!

Cat. No. AE170 ... 79/6

ULTIMATE "SAFEGUARD"
ELECTRIC JUG



A 3-pint jug of spun copper heavily chromium plated. Robust 1500 watt element fitted with exclusive double earthing safety clip. Black moulded handle and base give pleasing contrast. Exceptionally fast boiling jug.

Special feature is safe-guard clip and base—anchors jug to bench whilst in use—protects kiddies from accidental scalds if flex is pulled or jug knocked. Jug slides on and off clip quite easily. £4/18/6

Cat. No. AE173

ELECTRIC URNS



Highly polished Nickel-plated Electric Urns, for use in factories, schools, restaurants, hotels, boarding houses, social clubs, etc. Fast Boiling. Operate from standard hotpoint. Prices are quoted without flexible lead. Add 2/- per yard for length of flex required.

Two, three, and four gallon urns are fitted with 3-heat switches.

"SPEEDEE" URNS

Cat. No.		
AE130—1 gallon, 1500 watts	..	45/7/6
AE131—2 gallon, 2000 watts	..	48/6/6
AE132—3 gallon, 2000 watts	..	48/13/-
AE133—4 gallon, 2000 watts	..	49/15/-
AE134—"Speedee" replacement Elements, 2000 watts	..	28/6
AE135—"Speedee" Replacement Elements, 1500 watts	..	26/6

ULTIMATE RANGETTES

Your "ULTIMATE" choice.

Solid—Durable—Practical. This fine Ultimate Rangette incorporates many new and improved features seldom found outside the high price field of electric ranges. Just think how these improvements will save you time and money. Here, without doubt, is outstanding value in Rangettes.

MODEL 341

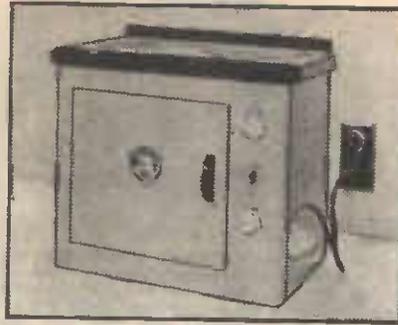
Compact and portable—plugs into any power point. Large area hotplates giving 186 square inches of cooking surface.

Easy-clean enamelled oven—1,300 cubic inches of baking capacity.

Fully lagged for power economy and efficiency. Glass wool lagged one inch thick oven walls.

Swing-away lagged oven door allows full oven access and is fitted with temperature indicator.

Three-heat rotary switches control oven and one hotplate. Single on/off switch controls other hotplate.



Complete with oven tray, grill, and equipped with cool moulded door handle.

Cat. No. AE452 .. **£22/11/-**

America's Finest Pressure Cooker is here . . . !

HAWKIN'S UNIVERSAL PRESSURE COOKERS



Available in 3 sizes—7 pints; 8½ pints; 10½ pints. The latter size has specially ground base for use on Electric Ranges.

Look at these Features!

- **SAFE-T-SEAL COVER** is sealed by cooking pressure and cannot be opened until pressure is lowered and it is safe to open.

- **VENT-WEIGHT** maintains correct cooking pressure automatically.
- **'OVER-TEMPERATURE' PLUG** provides complete safety by releasing pressure automatically if, through serious inadvertance, simple instructions are not followed.
- **COVER LOCKING DEVICE** permits single-handed operation. Handles are made of bakelite, always cool to the touch. Pressure Cooking gives Perfect and more Nutritious Cooking.

Illustrated booklet giving full cooking details supplied with each unit.

The Hawkins Universal is built under License from Lenders, Fray and Clark, of New Britain, U.S.A., by L. G. Hawkins & Co. Ltd., London.

Cat. No. AE54—7 Pint .. **£5/7/6**

Cat. No. AE55—8½ Pint .. **£6/5/6**

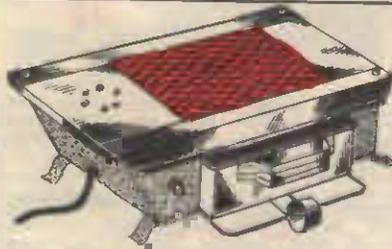
Cat. No. AE56—10½ Pint .. **£7/8/-**

Sets of Food Baskets for above Cookers.
Cat. No. AE57—Extra .. **13/6**

"SPEEDEE"

COMBINATION BREAKFAST COOKER-RADIATOR

For quick service—the "Speedee" as a Cooker—it toasts, boils, fries, grills and pot-roasts. This is an ideal combination for the small household or flat, and is convertible into a radiator by simply standing it on end. It is beautifully finished in highly polished nickel steel. The two-element switch gives complete heat control. The last word in Electrical Devices—has the fastest, most efficient, yet cheapest replaced element yet invented. As a Radiator it gives maximum of comfort and convenience at minimum cost.



Breakfast Cooker Radiator—

Cat. No. AE457 .. Each **£4/2/6**

GREMLIN FOOD MIXER



Incorporating the following features:— Beautifully finished in cream stove enamel. Handles in green or red relief. Equipped with highly efficient field control motor.

Complete with two plastic bowls—6in. and 9in. Detachable head and paddles.

Special flat type stainless steel beaters with serrated groove.

Adapted for fruit juice extractor.

Three-speed control.

Spare parts and bowls always available.

Fully guaranteed for twelve months.

Cat. No. AE222 .. **£21/10/-**

HAWKIN'S PRESSURE COOKER SPARES

Cat. No. AE1270—Safety Plugs .. **1/6**

Cat. No. AE1271—Rubber Caskets .. **1/6**

Cat. No. AE1272—Recipe Instruction Book .. **1/6**

Cat. No. AE1273—Vent Weights (Jigglers) .. **1/6**

Cat. No. AE57—Set of 3 Baskets .. **1/6**

"SPEEDEE" TABLE STOVE



This compact, sturdy, reliable Table Stove has countless uses in every home. Living to the motto that "Speedee" appliances are definitely faster," it has its most useful moment when making the bowl of hot soup for winter afternoons, or when making the "cup" before bedtime.

12 MONTHS' GUARANTEE!

Cat. No. AE459—2-heat .. **37/-**

Cat. No. AE458—Single heat .. **29/-**

MIXER



Features:—
—ove enamel.
field control
—6in. and 9in.

l heaters with
available.
months.

£21/10/-

COOKER

Each
lugs ... 1/10
Caskets ... 1/5
struction ... 1/-
Weights ... 9/-
Baskets ... 13/6

STOVES



ble Table Stove
ome. Living up
' appliances are
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making the "fast

WARRANTY!

37/6
29/6

"ULTIMATE" IMITATION COAL FIRES



A well made 2000 watt Radiator incorporating the imitation "heaped-coal" effect. Switch on side enables elements to be controlled individually. The fire is finished in a light crackle finished grey or cream colour while all the trimmings are in chromium. Dimensions: Height 26in., Width 20in., Depth 8in.
Cat. No. AE381 **£15/15/-**

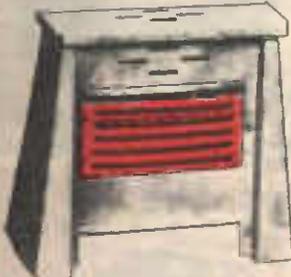
ELECTROWAY WALL INSET FIRE



This inset fire with its flush-fitting chromium-plated front panel adapted to accommodate an opening in standard tile slabbing, is most suitable for the modern type of building. The chromium-plated reflector and the pencil rod elements complete the handsome design, entirely obviating that "flatness" of appearance so customary with many wall heaters. The dimensions for the two types are as follows: 1kw., Overall 16in. x 5in., Back Box 16in. x 4in.; 2kw., Overall 16½in. x 16½in.; Back Box 16in. x 16in.
Cat. No. AE365—1kw. type **63/-**
Cat. No. AE366—2 kw. type **120/-**

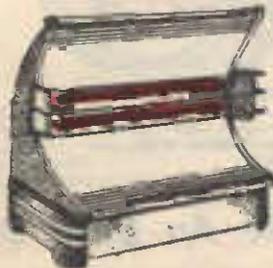
The fires above are not supplied with heater flex, as they are designed for permanent building-in.

"ELECTROWAY" TILE RADIATOR



A well constructed, serviceable, Radiator that will give years of trouble-free comfort. 1000 watt Tile Element. Finished in a wide range of flecked colours, including Red, Slate, Green, Cream, etc. Complete with 4 feet flexible 3 core cord.
Cat. No. AE371 **46/-**

"ST. MARTINS" RADIATOR



A gracefully designed Radiator incorporating the maximum reflector surface for greatest heat radiation. Chrome reflector and trimmings. Base crackle finished. 2000 watts. Complete with 5ft. flex.
Cat. No. AE352 **59/-**

"ULTIMATE" CABIN FIRE



Well-constructed Fire. Carrying handle, chrome reflectors. Finished in following colours: Ox. cop, Blue Green, Black and Silver, and Ivory. 850 watts. Complete with 5 feet cord and plug.
Cat. No. AE377 **65/- each**

ELECTROWAY, MODEL 72



A superior 2 kw. fire with large welded steel frame and 15 amp. switch.
Cat. No. AE369 **£3/18/-**

"ULTIMATE" DE LUXE RADIATOR



Chrome reflector. 2000-watt. Fire of attractive appearance. Frame finished in black. Has two elements, each of 1000 watts, and switch so that one element can be turned off if not required. Complete with 3-wire flex.

Cat. No. AE375—Two Elements **£5/2/6 each**
Cat. No. AE376—1 Element **£4/10/- each**

ELECTROWAY "PLINTH" FIRE, 2000 watts.



Chromed brass disc, 15in. diam. x 18g., on coloured steel plinth, with chromed relief. With two reflector elements as illustrated. Switch and two yards 3-core flexible fitted to each fire.
Cat. No. AE368 **£6/4/6**

**SCOOP!
CATHODE
RAY TUBES**

Because they are war surplus and we have no bases they are offered at a fraction of their original cost.

Type VCR97, 6in.
Cat. No. AX1634 **39/6**

SWITCHES

All our Two Element Radiators are fitted with a switch so that either one or two elements can be used.

Boiled Clothes are Cleanest

A very popular handsome model of modern design. Efficiently lagged. Attractive nickel-plated rim, spun lid, 2-heat switch. Red Pilot Lamp, drain tap, 2yds. flex cord. A very sturdily built washer for a lifetime of service.

Diameter 21in., height 2ft. 8in. Elements, 2,200 watts, 230 volts. 14 gallon capacity. Plugs into standard 3-pin plug socket.



Cat. No. AE65— £19/17/-

De Luxe Model in square container.

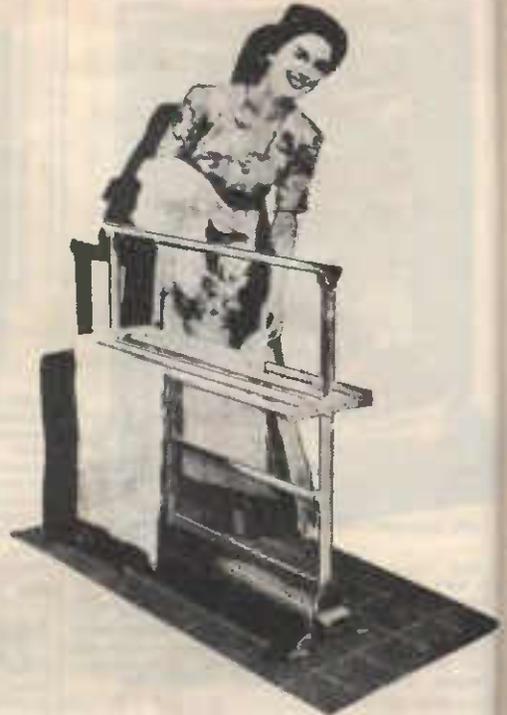
Cat. No. AE67— £32/11/-

NOTE THESE UNIQUE FEATURES:

Boils Electrically.
Hygienic, Snow-white Wash.
No Damaged or Torn Garments.
Ideal for New Homes (no chimney or Hearth needed).
Low Running Cost (less than 3d. wash).

Everlasting—Copper throughout.
Fast Boiling.
Washes Woollen and Coloured Garments.
Reasonably Priced.
Wonderful for Bottling Fruit, etc.

"HAYMAN" CLOTHES DRYER

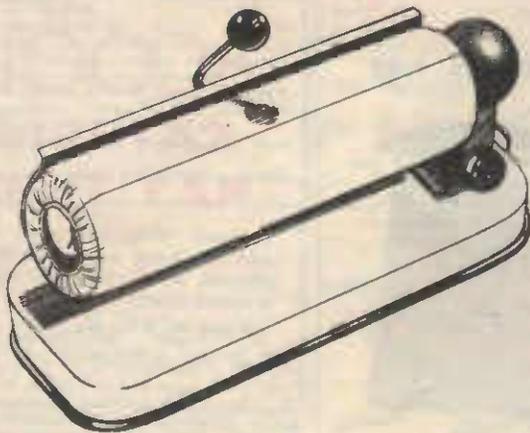


THE SOLUTION TO WET WEATHER WASH DAYS

An electrically heated Airing and Drying Rack with 18ft. of Drying Rods in a floor space of 3ft. x 1ft. Children's Clothing, Bed Linen, Towels, Socks, Napkins—anything from a Bib to a Blanket made bone dry indoors, Day or Night, Wet or Fine. Operates for 5 hours for 1d. Gives a constant stream of warm, dry air, rising through the garments. 12 months guarantee. Fitted with 6ft. flex and 3-pin plug top.

Cat. No. AE288 £6/8/6

Ironing Day Can Be An Easy Day If You Use An "IRONETTE" ELECTRIC IRONER



Iron at Leisure—Have More Time for Pleasure with an "IRONETTE"

With the "IRONETTE" any woman can easily cut one or two hours off her usual ironing time; can iron from 50 to 200 lbs. of laundry each week without the least bit of fatigue.

You, like thousands of other housewives, can dispense with the ironing day "lame back", sore feet, and that "all in" feeling, by investing in an "IRONETTE".

Here are 5 FEATURES of the HOUSEWIFE'S DELIGHT:—

1. It irons everything—sheets, shirts, ruffled curtains, cottons, silks, woollens, etc.
2. It's portable. Dimensions: Length 29in., height 10in., width 15in. Plugs into an ordinary Hotpoint.
3. It's Safe; it's easy to Operate.
4. It's Economical—uses the same amount of electricity as the ordinary household iron.
5. Each "Ironette" is covered by a 12 months' guarantee.

Cat. No. AE280 £35/7/6

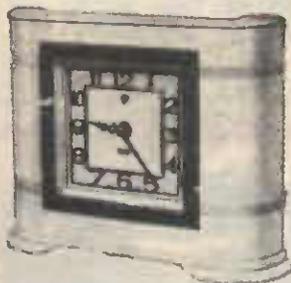
DRYER

"SMITH" ELECTRIC CLOCKS

MANUFACTURED BY ENGLAND'S LEADING CLOCK DESIGNERS.

The illustrations below show four of the many Electric Clocks produced by Smith's, England. The designs are very attractive and the workmanship the best.

THE "SOVEREIGN"



Beautifully designed in an ivory plastic case. Height 6in.; width, 7 1/2in.; depth 2 1/2in. Gilt Bezel—Striking figures. Ideal as mantel clock for Dining Room. Cat. No. AE891

£3/6/-

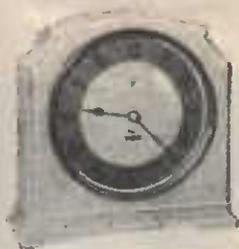
THE "RADLEY"



Another small mantel model for any room in the house. A neat and attractive shape. Height, 5in. Width, 5in.; Depth, 2 1/2in. Cat. No. AE892

70/-

THE "RAMSAY"



A small clock for the bedroom, Dining room, office, etc. Walnut Plastic Case. Height 5 1/2in.; width, 5 1/2in.; depth, 2 1/2in. Two tone dial face with gilt trimmings. Cat. No. AE883

64/7

THE "EXMOOR"



An attractively designed clock in Chrome and Plastic that would be an added beauty to any room. 6in. diameter circular dial is easily read with bold black numerals on a silvered background. Height 6 1/2in. Plastic Base 7in. 1 1/2in. The plastic is toned in walnut and the trimmings are chromium. A clock we can recommend for your lounge, dining room, sitting room, etc. Cat. No. AE882

89/11

THE DURBAN



DURBAN—Popular Bathroom or Kitchen Wall Clock in moulded case with ivory, blue, green, walnut, or primrose finishes. Overall dimensions 6 1/2in. Cat. No. AE893

72/6 each

ROSS BATTERY CLOCKS

These clocks are powered by a single torch cell. No winding. No connections to electric supply. No attention whatsoever, except once every 6 months you put in a new cell costing ninepence. Wall model clocks available in red, ivory and green plastic. Diameter of case 8 1/2 inches. Cat. No. AE879



£5/19/6

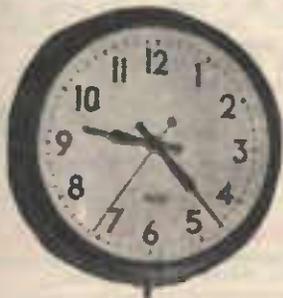
THE DELHI

The ideal Clock for shops, offices, factories. Mounted in moulded case, ready for wall hanging.

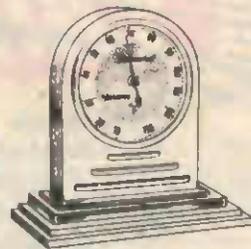
Cat. No. AE887—6in. diam. **£3/19/-**

Cat. No. AE888—9in. diam. **£5/4/9**

Cat. No. AE889—12in. diam. **£8/17/-**



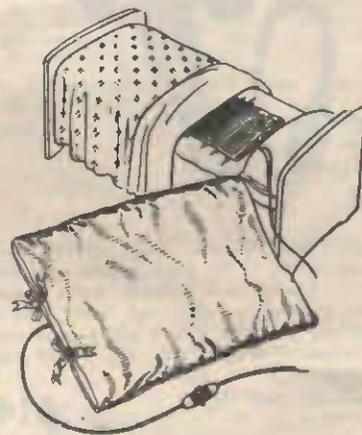
COLD! HOT! ISN'T IT?



Tell how really cold or hot it is with a "Thermodial". Attractive plastic cased clock face. British made thermometer, 4 1/2in. high, 5in. wide, 1 1/2in. deep. Very attractive and useful gift. Cat. No. AU169

31/- each

RHEUMATISM DEFEATED



Electric Pillows (bed warmers) are supplied complete with switch and washable cover. Damp and clammy beds with their danger of rheumatism, chills, etc., need no longer be endured. A continuous supply of heat at all times. Supplied complete with cord. Cat. No. AE83

57/6 each

WHO'S GOT COLD FEET?



Warm comfort on cold days with a "Hayman" ELECTRIC FOOT WARMER. Gives warmth where it is wanted! Cold feet banished. Increases efficiency in Offices and Factories. Gives comfort in the Homes and to aged or infirm. Will dry wet shoes without damage to sole.

POWER SAVER—OPERATES FOR 20 HOURS ON ONE UNIT of Electricity—uses less current than the average Lamp.

TWELVE MONTHS' GUARANTEE! NO PERMIT REQUIRED.

Cat. No. AE291 **63/6**

WASH DAYS

Rack with 18ft. 1ft. Children's skins—anything indoors, Day or hours for 1d. rising through with 6ft. flex

£6/8/6

ER

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months'

7/6

THINGS TO COME

THE goods on this page were not in stock when the Catalogue was published, but are on order, and we expect them to be available later in 1951. Full particulars will be sent to anyone interested, and they will be advised when the goods come to hand.

HEDGE CLIPPERS



Electric Hedge Clippers, which operate from 230-volt mains. No more aching arms and backs. The Bylock Clipper makes hedge cutting a pleasure. Safe and fast. Buy a Bylock and your wife will be glad to take over the hedges. Weighs only 3lb. 230 volt A.C./D.C. Cat. No. AU420

Approximate Price **£14**

(Delivery expected Sept., 1951.)

PIFCO NURSERY LAMPS



600 hours light from 1 unit of electricity! For the nursery or sick room. Provides a soft friendly glow of light at negligible cost. Switch incorporated in base; 6ft. flex adaptor included. Self-contained transformer feeds the 6-volt screw bulb supplied; 5 1/2 in. high, 3 1/2 in. base, with 3 1/2 in. diam. shade.

Cat. No. AE770
Approx. Price **21/-**
(Supplies expected July-August, 1951.)

MAKE YOUR OWN CLOCK CASE!

Smith's Electric Clock Movements for standard 230-volt 50 cycle supply. This movement is supplied complete with cover, has square spindle (for hands). Movement can be purchased separately or complete with hands, dial, and glazed Bezel.

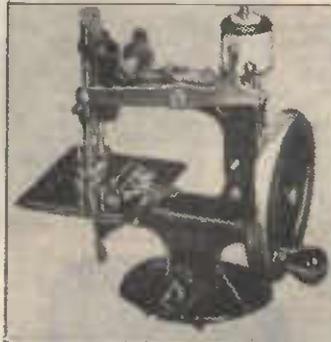
Cat. No. AE862—Clock unit only—
Approx. Price **52/6** each

Cat. No. AE863—6in. Round Chrome Bezel, with 6in. glass, silver zone dial and hands.
Approx. Price **18/-** set

(Stocks expected September/October.)

Gift for Girls!

VULCAN SEWING MACHINES



The Vulcan Sewing Machine is more than a toy; it has been expertly designed and is mechanically perfect, and small jobs such as hemming handkerchiefs and patching can efficiently be carried out with this machine. Your daughter can make all her own doll's clothes, thus training her for the practical sewing required later in life. Vulcan is the perfect miniature sewing machine—fascinating, instructive, and safe. Complete with full instructions.

Cat. No. AU112 **45/-**

(Stocks expected August/September.)

BRITISH POLISHERS AND GRINDERS



Sew Tric Electric Combined Polishers and Grinders, will prove invaluable in any workshop or home. Supplied complete with variable speed control.

Cat. No. AU341—1/15 h.p.
£6/4/6 approx.

Cat. No. AU342—1/6 h.p.
£9/12/- approx.

(Stocks expected October/November, 1951.)

DISPLAY TURNTABLES



Revolving Turntables operated by self-contained 230-volt electric motor, work off any light or power point. Simple and dependable mechanism ensures long trouble-free service. No other form of advertising attracts so much attention and sells so many goods. Certain to bring increased business whenever it is used. 8in. model is recommended for light display work, such as toys, cosmetics, fancy goods, etc., and for decorative effects. It will carry up to 20lb. The 12in model will carry up to 84lb. Revolves at 3 revolutions per minute.

8in. MODEL, with Felt Top Crackle Finish.
Cat. No. AM530—
Approx. Price **£6/10/-**

12in. MODEL, mirror glass finish.
Cat. No. AM534—
Approx. Price **£13**

Delivery—September/October.

THREE SPEED GRAMOPHONE MOTORS



Yes, British made, 78-45-33 1/3 R.P.M. speed change is positive, smooth and achieved by a movement of a knob. No belts. 4-pole motor, 10in. diam., pressed steel turntable on a precision ground, taper steel spindle. Self-lubricating bearings. This is the most up-to-date unit available.

Cat. No. AP293
Approx. Price **£4/17/6**

(Delivery expected October.)

Try any line in this Catalogue at OUR RISK!

Any goods that prove in any way unsuitable may be returned undamaged within seven days from receipt and your money will be refunded in full.

REMINGTON SHAVERS

HOW TO BE LAZY

15 MINUTES LONGER EACH MORNING.

Let the "Remington Foursome" Four Head Electric Shaver cut your Shaving Time to Seconds!

Gives a smooth, clean shave without the use of soap and water. Fitted with the famous "BLUE STREAK" 2 in 1 CUTTING HEAD!

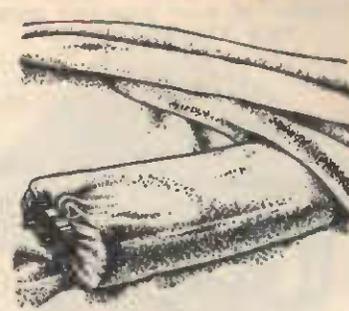
The complete unit is enclosed in a beautiful New Leather and Chrome Case and is fitted with a snaplite, lucite head-guard to protect the heads when not in use. Manufactured by a subsidiary company in England for the well-known American firm. Supplied complete with 6ft. rubber flex all ready to plug-in to your light socket or hotpoint. 230 v. AC/DC. Cat. No. AE490—

£10/10/-

Shave the MODERN WAY



MONARCH BED COMFORT



This new electrical device dispenses with the old-fashioned hot-water bottle. To heat it you simply connect it to the power supply and leave it for three minutes. It is then disconnected, and will retain a comfortable heat under the bed clothes for a number of hours. May be taken in your motor-car to add comfort to travelling, or to the pictures as a foot-warmer. Inexpensive to run, and, of course, invaluable in the sick room. It is extremely handy for people working at desks, tables, etc., who suffer from cold feet. Cost about 1d. per week for current. Can be bought without plug or cord or complete.

(The household iron or toaster cord set will fit the Monarch Bed Warmer.)

Cat. No. AE82—

22/6

Cat. No. AE82A—Monarch Bed Warmer, with 3-pin Plug and Cord Set

31/-

ULTIMATE ELECTRIC CUPBOARD HEATERS



Keep your Household Linen dry and free from dampness. Here is a Cupboard Heater that will operate at almost negligible cost; can be mounted on the floor or screwed to the wall in a vertical or horizontal position. Emits warm, dry air from a large low temperature heating surface.

Operates for seven hours for One Penny

Size actual unit: Length 21in., Diameter 2in.; 2 1/2in. high x 3 1/2in wide; 230v.—250 watts. Supplied without flex

41/-

Cat. No. AE296

REMINGTON SHAVER SPARES

- Blue Streak Twin Heads (T3/5) Cat. No. AE579 ... 31/-
- Oval Heads (5U)—Cat. No. AE580 21/5
- Condensers (.05 900 v.)—Cat. No. AC780 ... 6/2
- Cords with Plugs—Cat. No. AE1320 14/11
- Cleaning Brushes—Cat. No. AE582 11d.

Massage Your Aches and Pains with a

PIFCO ELECTRIC HEAT MASSAGER



The PIFCO HEAT MASSAGER relieves pain and brings comfort in a simple and ingenious way. Heat is soothing, massage is stimulating—and now, for the first time, the two are combined in this new Appliance.

For COLDS, STIFF NECK, TOOTHACHE, NEURALGIA, SCIATICA, SINUS, ACHING WRISTS or ANKLES, etc. . . all will derive relief from its comforting heat.

So SIMPLE TO USE—Just plug into any light socket, A.C. or D.C. 200 to 250 Volts inclusive. As soon as you feel the heat developing apply curved head with firm slow strokes, keeping the Massager on the skin.

Massage gently without applying pressure where the pain is experienced, allowing the heat rays to penetrate. After about ten minutes the maximum temperature will be reached, and there is no danger of overheating.

Cat. No. AE80 ... **29/6**

"SOLTAN" VIOLET RAY MACHINE



This high frequency medical outfit is complete, as illustrated, in black. Rexine covered wood case. Supplied complete with 4 electrodes, rake, surface, fulguration, metal saturator. The Soltan is the last word in electrical-medical research. We strongly advise that you obtain your doctor's advice regarding the use of these machines for the cure and prevention of many ailments. Supplied complete with instructions for operating and treating.

Cat. No. AE77 ... **£10/10/-**

SMOOTHIE PORTABLE TRAVELLING IRON

For use almost anywhere in the world: 110-240 volts A.C./D.C. 75 watts. Streamlined, black bakelite handle. 4in. x 2in. Attractive leather zip fastener case. From hotpoints or light socket. Complete Total weight only 1 1/2lb.



Cat. No. AE279 ... **48/6** each

MUSCULAR PAINS? Try a "PIFCO" MASSAGE VIBRATOR

SEE PAGE 6

contained light or mechanical. No so much certain to is used. display ods, etc., try up to to 84lb.

Finish. 10/-

£13

HONE

M. speed red by a 4-pole ble on a Self-st up-to

17/6

K! seven

FLOOR STANDARDS

TURNED IN NEW ZEALAND FROM
NEW ZEALAND WOOD



Height to base of Lampholder, 61in.; diameter of base, 14in. Supplied complete with 12ft. flexible cord. Lampholders with switch and shade holder.

The Lamp Shades are NOT included in the price. Refer to page 12 for suitable shades.

VARNISHED — HIGHLY POLISHED

Cat. No. AF920 **£4/19/6**

UNSTAINED FLOOR LAMPS

Similar to above but unstained.—
Cat. No. AF 919, Plain Turned ..

59/6

Cat. No. AF918 Jacobean Twist
(Spiral)

79/6

**ASH-TRAY
CHROME
STANDARD
LAMP**

A distinctively designed Standard Lamp 3ft. in height for use as a Reading Lamp beside armchairs, settees, etc. Designed to meet the demand for a bantam size Standard these Lamps would make an attractive addition to any well furnished room.

Chrome tubing measures 3ft. from floor to lampholder; black coloured wooden base is 8½in. diameter. The Lamp is supplied complete with 6ft. flexible cord, switch on lampholder, globe and waved shade. (State colour preference when ordering.)

Cat. No. AF715—

COMPLETE **£4/12/6**



ASH TRAY READING LAMP



Chromium tube fitted to black, wooden base, 7½in. diam. Chrome ash tray and flush ivory push switch mounted. Supplied complete with 9ft. silk covered flex, parchment shade, globe and adaptor.—Cat. No. AF923 .. **35/-**

STATE YOUR SHADE COLOUR
PREFERENCE WHEN ORDERING.

**"PERLUX" DUAL PURPOSE
LAMPS**

A really handy reading Lamp which will clip on the bed rail or stand on a table. The shade is on a swivel and may be turned up or down. Finished in mottled colours. Complete with switch, lampholder, shade and globe, with approx. 6 feet flex. Moulded in plastic.

Cat. No. AF909—

17/6

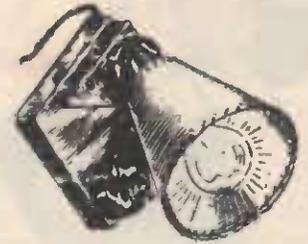
Cat. No. AF909A—

Complete with adaptor or plug

18/6

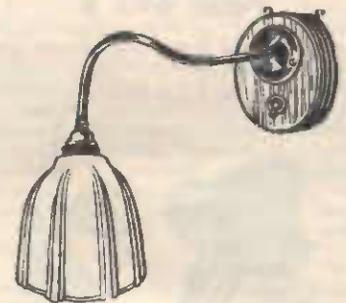


**"DIAMOND SHAPED" READING
THE LAMPS**



A neat Wall Lamp. Has "Diamond" shape wooden base with switch and lampholder mounted. Attractive Parchment Shade can be supplied in different colour tonings. Nine feet flexible cord, globe and adaptor on each Lamp. Cat. No. AF910 **29/6** ea.

**"SWAN NECK" READING
LAMPS**



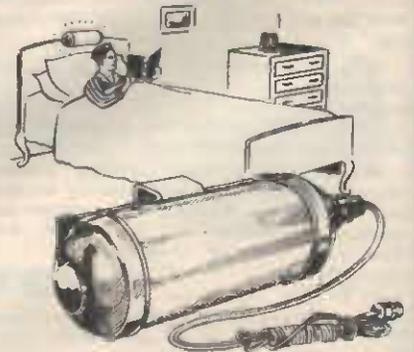
WALL LAMP, supplied with 3 yards flexible cord. Polished wood base, 5½in. diam. Bracket extends 9in. Parchment shade. Switch mounted flush in base.

Cat. No. AF902

35/- each

Ditto, but using smaller 6in. Chrome-plated Bracket.—Cat. No. AF901 **33/6**

**"LORAINÉ" TUBULAR PLASTIC
BED LAMP**



A superior quality Tubular Bedlamp of attractive and pleasing design. Comprises two circular end pieces of glittering chrome, a pastel tone plastic shade measuring 9in. in length, 4in. in diameter, with a heavy plastic back and clip for attaching to bed-rail. Switch is incorporated on the cord set fitting at one end of lamp. Each lamp is supplied complete with 10ft. flexible cord, light adaptor and globe.

Utility and Attractiveness Combined!

Cat. No. AF899 .. ONLY **29/6** each

"COOL lighting factory. one pi steel. to fit o sories and wi 9in. globes 11in. globe.

This except oname white 9in. lamp. 11in. lamp.

For re with lamph Cat. N

Me for u 32in. Cat.

THE "PLASTIC COOLICON"



"COOLICON" Lampshades are ideal for all lighting, whether in the home, warehouse or factory. There are two types in these fittings; one plastic and the other vitreous enamelled steel. The plastic type shown above is ready to fit on to the standard lampholder—no accessories are necessary. The plastic is strong, and will not discolour with the heat.
 9in. Type—Takes 40/75 watt globe. Cat. No. AF950 .. **6/6** each
 11in. Type—Takes 100/150 watt globe. Cat. No. AF951 .. **7/9** each

THE "METAL COOLICON"



This shade is similar to the plastic version, except that the framework is of a green vitreous enamelled sheet steel. The inside is coloured white to give the maximum in lighting efficiency.
 9in. Size—Takes 40/75 watt lamp.—Cat. No. AF952 .. **7/6**
 11in. Size—Takes 100/150 watt lamp.—Cat. No. AF953 .. **8/6**

HORIZONTAL REFLECTOR



For reading and working lamps, etc. Provided with standard 1 1/2in. hole for fitting on to lampholders. 6 1/2in. diameter.
 Cat. No. AF966 .. **10/9** each

ANGLE LAMP SHADE



Metal lampshade, white inside. Designed for use with flexible arm and other desk lamps, 3 1/2in. diameter.
 Cat. No. AF967 .. **6/-** each

BULK PURCHASE IN SHADES!

10in. ENAMELLED LAMP SHADES

10in Lampshades, white enamelled interior and blue enamelled outside. This type of shade is very popular for general use in the home, office, factory, warehouse, etc.

A Bulk Purchase of over ten thousand of these shades enables us to sell them to you at approximately half the price they cost to manufacture.

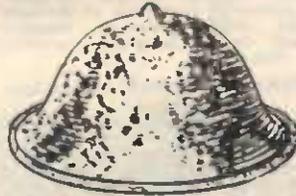
Cat. No. AF600—

GREAT VALUE!

1/7 each or **16/11** dozen

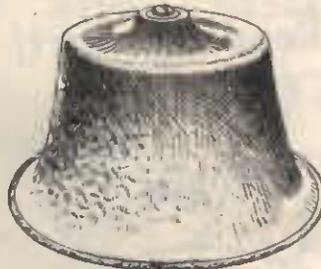


"NIPPY" LAMP SHADES



Made of translucent plastic, these shades are fitted with a wire clip which clamps direct on to the lamp bulb, making them ideal for adjustable table lamps, etc. Available in most popular colours. Diam. 3 1/2in.
 Cat. No. AF255 .. **2/-** each

"CLIP-ON" SHADES



Another fancy shape in Plastic Shades. Several pastel tonings. Provided with clip for attaching to Reading Lamp bulb, etc. Dimensions: Diameter, 6in.; height, 3 1/2in.
 Cat. No. AF256 .. **2/6** each

TERRACED PLASTIC SHADES

4 1/2in. high, 4 1/2in. diameter, available in Ivory, Pink, and Green.

Cat. No. AF662—
2/- each



"TULIP" PLASTIC SHADES

5in. high, 4 1/2in. diameter. Moulded in attractive pastel tonings, pink, green, or white.

Cat. No. AF663—
3/10 each



BEAUTIFUL SHADES



Attractive translucent Plastic Lamp Shades in the following colours: Pink, Mauve, White, Green, Blue, Yellow. Size 7in. diameter, 5in. high.
 Cat. No. AF259 .. **1/9** each

OPAL TYPE SHADE

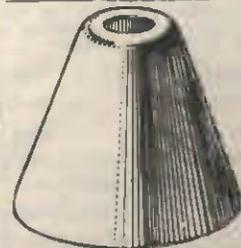


Moulded in New Zealand these Plastic shades take the place of the old glass opal shades. Very strong and light. Supplied in plain white and pastel tints.
 White—Cat. No. AF360 .. **1/6** each
 Tinted—Cat. No. AF361 .. **1/9** each

PLASTIC SHADES

Cat. No. AF661—
 4 1/2in. high, 3 1/2in. diam. Green, Ivory and Pink.

2/1 each

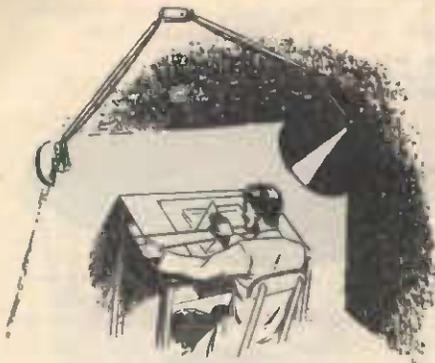


PRICES ARE SUBJECT TO ALTERATION

All Prices in this book must be regarded as an indication only—
 all orders will be executed at ruling prices.

THE ELECTRIC LAMP HOUSE LIMITED
 11 MANNERS STREET,
 WELLINGTON, C.1.

MOVABLE ARM LAMP



A Bracket Lamp, jointed at base, centre and head to allow the light to be directed at any angle. May be swivelled up, down, in, out—just wherever you want it. Bracket is manufactured of enamelled iron tube, and will project over any length up to 30in. Circular flange at base for screwing bracket to wall. Can be supplied with or without flex and lampholder, etc., as priced below.

Cat. No. AF891—Bracket only without fittings **38/6**

Cat. No. AF892—Bracket complete with 10ft. flexible cord, lampholder with switch and light adaptor **48/-**

THE "HOLMWOOD" LAMP



Attractive Portable Lamp, with chrome base and stand. Glass is 6in. opal ball. Supplied complete with 9ft. flexible cord and adaptor. Overall height 13in.

Cat. No. AF886 **52/11** complete.

CHROME PENDANT RODS.

Chromium plated Rods for supporting glass fittings. Supplied in several different lengths as given below. Each Rod is fitted with a lampholder, attachment for mounting to the ceiling and a chromium metal cup to slide up the rod, covering the ceiling mount and giving a finished appearance. Rods 3/4in. diameter.

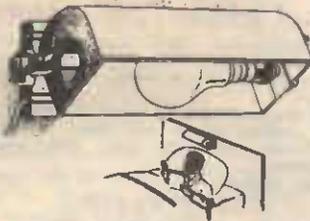
- Cat. No. AF500—18in. Rod .. 17/4
- Cat. No. AF501—24in. Rod .. 18/11
- Cat. No. AF502—30in. Rod .. 20/4
- Cat. No. AF503—36in. Rod .. 21/10

PRICES ARE SUBJECT TO ALTERATION

All Prices in this book must be regarded as an indication only—all orders will be executed at ruling prices.

THE ELECTRIC LAMP HOUSE LIMITED,
11 MANNERS STREET,
WELLINGTON, C.I.

"BARONESS" PLASTIC LAMPS



Moulded in Plastic the "Baroness" is a new dual-purpose Reading Lamp to meet every need. Two rubber covered clips (covered so as not to mark your furniture) enable the "Baroness" to clip on the bed-head while special grooves in back plate of the lamp allow also for wall mounting. Standing the "Baroness" on a table gives an excellent bedside or desk-lamp.

ATTRACTIVE—YET VERSATILE!

The shade is swivel mounted to allow you to concentrate the light just where you want it. Lamp measures: Length, 9 3/4in.; Width, 3 3/4in.; Height, 6in. ON-OFF Switch mounted in base. Supplied complete with 9ft. flexible cord. Moulded in three Colours: Pink, Green, White.

Cat. No. AF912 **38/6**

(Without Globe.)

40-watt Globe .. **1/10** extra

Lighting EXTENSION CORDS

Read in Comfort!



For taking the light where you want it. Ten feet long and supplied with an insulated shock-proof lampholder. Extra long lengths can be made up at 9d. yard extra.

Cat. No. AE51 .. **5/9**

Cat. No. AE52 (with switch holder) **8/9**

"NIPPY" CLIP-ON LAMPS



An excellent little Clip-on Lamp for the back of the bed—or any other situation—table, bookcase, etc. Adjustable Plastic Shade throws the light wherever you want it. Shades are available in numerous mottled colours, while the bracket is chromium plated. Complete with 3ft. flex, switch and globe.

Cat. No. AF906 .. **15/6**
Cat. No. AF906A Complete with adaptor or plug **16/6**

SPHERE LAMP



Black wood base 6in. diam. Glass Ball 6in. diam. Supplied complete with 9ft. flexible Cord. A novel decorative lamp.

Cat. No. AF898 .. **49/6**

LAMPHOUSE GUARANTEE

Any goods that prove in any way unsuitable may be returned undamaged within seven days from receipt and your money will be refunded in full.

WELL-GLASS WATERTIGHT FITTINGS

For OUTSIDE LIGHTING



Cat. No. AE842—60 watt size. Complete with holder. **14/-** each

Cat. No. AE841—150 watt size. Complete with holder. **19/6** each

Similar to above, but with enamelled reflector. Cat. No. AE847—150 watt size. Complete **22/6**

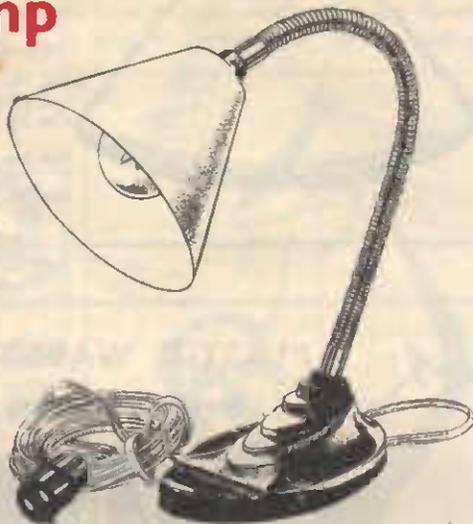
SPARE GLASSES Cat. No. AE844—60 watt size **7/-**

Cat. No. AE843—150 watt size. **8/9**



The "ENSIGN" Flexible Arm Reading Lamp

A popular general purpose Flexible Arm Reading Lamp. Consists of a heavy cast base with a 15in. Chrome adjustable arm which may be moved or set to any angle required. Its flexibility makes it ideal as a Desk Lamp for the student, the reader and business man, or any engaged in close work at the office or in the home.

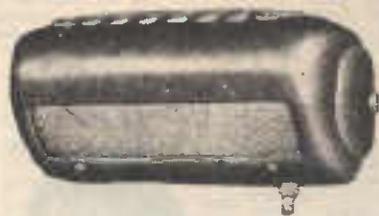


All Lamps have Chrome Arms, but bases are in different colours, including antique, black and silver, flecked gold, etc. Supplied complete with 9ft. cord, adaptor, shade and globe. Switch is mounted on lamp holder.

Cat. No. AF900 - **35/6**

PRACTICAL AND NEAT!

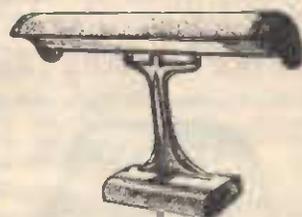
FIREFLY PLASTIC BED LAMPS



Fastens to bed-rail by means of two spring loaded covered arms. Moulded in three attractive pastel colours. Pink, Green, and Ivory. Frosted light outlet. On-off Switch. Complete with globe, 8ft. cord and adaptor.

Cat. No. AF889A - **36/9** each

"FLUORESCENT" DESK LAMP



"Electroway." A really attractive Lamp for an executive's desk or for the home study. 15 watt fluorescent tube. Lamp is 13in. high, with an 8½in. base. On-off switch, and length of flex fitted.

Cat. No. AF870 - **98/6**

LUMINOUS TABLE LAMP



The Lamp Stand itself is luminous and even when the light is switched off the stand glows. Ideal for bed-sides, sick rooms, nurseries, etc. Supplied complete with attractive waved plastic shade, flex, and lamp. Height of lamp to top of shade 15in. Diam. of shade 11in.

Cat. No. AF888A - **37/-** each

"ENSIGN" Chrome and Plastic Reading Lamps



Plastic Shades in all Colour Tonings

Here is a DUAL-PURPOSE READING LAMP for use either on a Bedside-Dressing Table, or for hanging on the wall over the bed.

The PASTEL TINTED PLASTIC SHADE is mounted on a swivel so that you may have the light just where you want it.

An Ivory-topped ON-OFF Switch is mounted in the base in an easily accessible position. Each Lamp is fitted with 9ft. of flexible cord and a plug for either the light or hot-point—which ever you desire.

The glittering reflection from the combination of CHROME and PLASTIC make this lamp a

BEAUTIFUL ADDITION TO ANY ROOM.

Cat No. AF921 - NEW REDUCED PRICE **49/11**

OUR GUARANTEE!

The Lamphouse 7-DAY MONEY BACK GUARANTEE protects your every purchase.

COLOURS

All shades on this page can be supplied in the following colours. Red, Pink, Orange, Lemon, Pale Green, Pale Blue, as well as plain White. Please state colour when ordering.

SMALL EMPIRE

Small shades for bracket lights or hanging lights in small rooms.
Diameter 3½in.;
Height 4½in.

Cat. No. 7/P/R—Parchment **2/9** each

Cat. No. 7/P/Z—Plastic **4/6** each



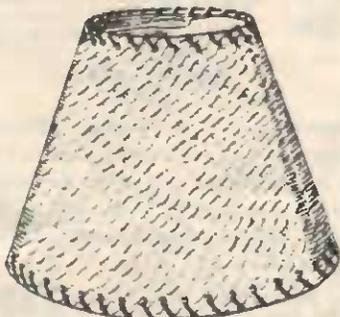
Shades similar to above but supplied with clip for clipping directly on to upright lamp bulbs.

Cat. No. 7A/P/R—Parchment **2/9** each

Cat. No. 7A/P/Z—Plastic **4/6** each

EMPIRE SHAPE 8in.

Height 8in. Diameter 8in. Laced with Rayon.



Cat. No. 3/P/R—Parchment **3/6** each

Cat. No. 3/P/Z—Plastic **6/-** each

EMPIRE SHAPE 10in.

Height 7in. Diameter 10in. Laced with Rayon.



Cat. No. 1/P/R—Parchment **3/9** each

Cat. No. 1/P/Z—Plastic **7/11** each

CLIP FITTINGS

All shades up to 14in. diameter can be supplied with clip fitting for use with table lamps at no extra cost.

SQUAT EMPIRE

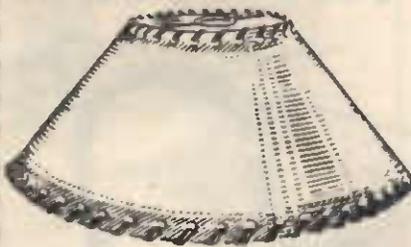
Low and wide shape which allows for maximum of light. Available in 10 and 14in. diameters as follows.

Cat. No. 15/P/R—Parchment 10in **3/9**

Cat. No. 15/P/Z—Plastic 10in. **7/6**

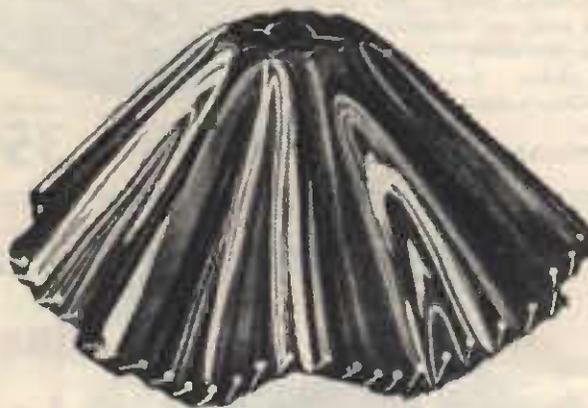
Cat. No. 6/P/R—Parchment 14in. **6/-**

Cat. No. 6/P/Z—Plastic 14in. **12/6**



PLASTIC WAVED SHADES

Modern Gleaming Plastic



Made in six soft pastel colours and its "chic" shape makes it universally popular for lounge, breakfast room, or Milady's Boudoir. The fine tinting on the translucent plastic enables you to obtain the maximum, yet a soft light. Bound with rayon to match.

Cat. No. 36/P/R—12in. diameter **13/6** each

Cat. No. 49/P/R—10½in. diameter **12/6** each

Cat. No. 48/P/R—9in. diameter **7/6** each

FLOOR LAMP SHADES

Two sizes available. Especially suitable for floor standards but can also be used as hanging shades in large rooms, halls, etc. Rayon braid.

Cat. No. 32/P/R—20in. Diameter Parchment **21/-** each

Cat. No. 32/P/Z—20in. Diameter Plastic **29/6** each

Cat. No. 30/P/R—24in. Diameter Parchment **30/6** each

Cat. No. 30/P/Z—24in. Diameter Plastic **44/-** each



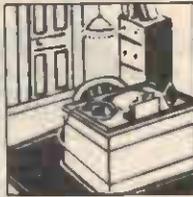
Mazda LAMPS

Never be caught in the dark, always have a good supply of spare Mazda Lamps on hand. Yours will be a brighter home with Mazda Lamps.

MAZDA GAS-FILLED GLOBES

Clear or Frosted. 240 v.

A gas-filled globe suitable for every purpose. Clear types as used for ordinary house lighting in sizes to sufficiently illuminate any room, no matter how large or small. Used extensively in shops, stores, and factories. The pearl type is used mainly in confined spaces, where a large amount of close work is done, or where work under artificial light for long periods is necessary. Frosted just sufficiently not to impair the efficiency of the Lamp, but to keep the sharp glare from the eyes. Ideal for Reading Lamps, Desk Lights, Offices, etc. STANDARD BAYONET BASE.



- Cat. No. AL215—40 watt .. at 1/10 each
- Cat. No. AL216—60 watt .. at 1/10 each
- Cat. No. AL217—75 watt .. at 2/6 each
- Cat. No. AL218—100 watt .. at 3/- each
- Cat. No. AL219—150 watt .. at 5/- each
- Cat. No. AL220—200 watt .. at 8/- each

MAZDA STANDARD VACUUM BULBS

Clear or Frosted. 240 v.



Low intensity, small consumption lamps for passages, halls, etc., or where it is necessary to have a small lamp burning over a long period. Standard Bayonet base.

- Cat. No. AL201—15 watt 1/10 each
- Cat. No. AL202—25 watt 1/10 each

SCREW-IN GLOBES

The same type of Gasfilled Globes as previously described, but using the Edison Screw (E/S) Standard Screw Base.

- Cat. No. AL602—40 watts .. 1/10 each
- Cat. No. AL603—60 watts .. 1/10 each
- Cat. No. AL604—75 watts .. 2/6 each
- Cat. No. AL605—100 watts .. 3/- each
- Cat. No. AL606—150 watts .. 5/- each
- Cat. No. AL607—200 watts .. 8/- each
- Cat. No. AL608—300 watts .. 14/8 each

G.E.S. (GOLIATH) LARGE SCREW BASE Globes fitted with this special base for use in halls, factories, floodlights, etc.

- Cat. No. AL211—300 watt .. 13/- each
- Cat. No. AL212—500 watt .. 18/9 each
- Cat. No. AL180—1000 watt .. 30/3 each

VACUUM SCREW-IN GLOBES

Similar type of Vacuum Bulb as described above but using the Edison Screw (E/S) Standard Screw Base.

- Cat. No. AL600—240 volts, 15 watts .. 1/10 each
- Cat. No. AL601—240 volts, 25 Watts .. 1/10 each



ROUGH SERVICE LAMPS

Vacuum type Lamps with special reinforced filaments for places where ordinary lamps have a short life, due to excessive vibration. Mainly used in garage hand-lamps, or machine lights.

- Cat. No. AL237—40 watt B/C Base 2/3 each
- Cat. No. AL238—60 watt B/C Base 2/3 each
- Cat. No. AL609—40 watt E/S Base 2/3 each
- Cat. No. AL610—60 watt E/S Base 2/3 each

RADIO DIAL LAMPS

See Page 66

Mazda Gas-Filled 110 Volt Lamps

Low voltage globes as used on ships. Several districts not converted to the 240 volt supply still use this voltage. Available in B/C or E/S Base.

110 VOLTS.

- Cat. No. AL580—15 watt .. 1/10 each
- Cat. No. AL581—25 watt .. 1/10 each
- Cat. No. AL582—40 watt .. 1/10 each
- Cat. No. AL583—60 watt .. 1/10 each
- Cat. No. AL584—75 watt .. 2/6 each
- Cat. No. AL585—100 watt .. 3/- each
- Cat. No. AL586—150 watt .. 5/- each
- Cat. No. AL587—200 watt .. 8/- each

110 VOLTS. Special G.E.S. ("Goliath") Base.

- Cat. No. AL588—300 watt .. 13/- each
- Cat. No. AL589—500 watt .. 18/9 each
- Cat. No. AL590—1000 watt .. 30/3 each

Pigmy (Pilot Lamps)

15 WATT: SMALL SIZE BULB.

- Cat. No. AL200—Bayonet Cap Base 1/9 each
- Cat. No. AL599—Screw-in Base .. 1/9 each

Coloured Lamps

For displays, decorative purposes, etc. Sprayed colours in red, blue, green, orange, white yellow—

Standard Bayonet Cap—Vacuum Type

- Cat. No. AL249—15 watt .. 2/1 each
- Cat. No. AL250—25 watt .. 2/1 each

Natural colour glass for decorative purposes, photography, etc. Gasfilled. Colours—red, amber, blue, green.

- Cat. No. AL258—40 watt .. 3/9 each
- Cat. No. AL259—60 watt .. 4/5 each

Lamps for House Lighting Plants

Low voltage globes with Standard bayonet cap base. Used mainly for house lighting plants in country districts. The 6 and 12 volt types can be used from a car battery for tent lighting, or in conjunction with wind-charger installations.



6 VOLTS.

- Cat. No. AL500—10 watt .. 2/4 each
- Cat. No. AL501—15 watt .. 2/4 each
- Cat. No. AL502—25 watt .. 2/4 each
- Cat. No. AL503—40 watt .. 2/4 each

12 VOLTS.

- Cat. No. AL504—10 watt .. 2/4 each
- Cat. No. AL505—15 watt .. 2/4 each
- Cat. No. AL506—25 watt .. 2/4 each
- Cat. No. AL507—40 watt .. 2/4 each
- Cat. No. AL511—60 watt .. 2/10 each

25 VOLTS.

- Cat. No. AL550—15 watt .. 2/6 each
- Cat. No. AL551—25 watt .. 2/6 each
- Cat. No. AL552—40 watt .. 2/6 each
- Cat. No. AL553—60 watt .. 2/6 each

32 VOLTS.

- Cat. No. AL560—15 watt .. 2/6 each
- Cat. No. AL561—25 watt .. 2/6 each
- Cat. No. AL562—40 watt .. 2/6 each
- Cat. No. AL563—60 watt .. 2/6 each

50 VOLTS.

- Cat. No. AL570—15 watt .. 2/6 each
- Cat. No. AL571—25 watt .. 2/6 each
- Cat. No. AL572—40 watt .. 2/6 each
- Cat. No. AL573—60 watt .. 2/6 each



TORCH LAMPS

Standard Types

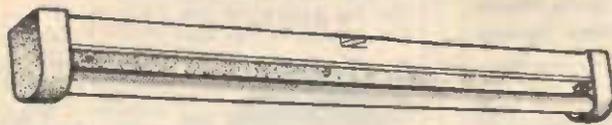
Best Quality

- Cat. No. AL112—2.5 volts .. 8d. each
- Cat. No. AL113—Focus 3.5 volts .. 8d. each
- Cat. No. AL103—4.5 volt Torch Lamps .. 6d. each
- Cat. No. AL109—Focus 6 volts .. 1/- each
- Cat. No. AL99—2.5 volts, pre-Focus type (American Fixed Focus) .. 1/9 each
- Cat. No. AL1—6 volt 3 watt Cycle Dynamo Lamps .. 1/7 each
- Cat. No. AL2—6 volt 1.8 watt Cycle Dynamo Lamps .. 1/7 each

19 VOLT LAMPS

- Cat. No. AL126—Ideal for Christmas light strings. Standard Torch globe base. M.E.S. .. 1/6 each

FLUORESCENT LAMPS



SAFE — RELIABLE — MODERN

The well-known Neon fittings and lamps available from stock. Our fluorescent tubes are available in two lengths—two feet and four feet. The two foot tubes consume 50 watts and give about as much light as a 75-watt lamp, and the four foot consumes 40 watts and gives more light than a 100-watt lamp.

All fittings are complete with everything needed to install them by an electrician, but they can also be supplied complete with flex and plug for plugging into an existing light point at an extra charge of 7/6.

Cream enamel fittings, ceiling mounting.

TUBE COLOURING

Tubes can be supplied in three different tonings—Daylight, Warm-white or White. Give your preference when ordering.

- Cat. No. AL710A—Single 4ft. **£5/3/6**
- Cat. No. AL709A—Single 2ft. **£4/18/-**
- Cat. No. AL711A—Double 4ft. **£7/19/-**

Decorative type, with attractive translucent reflector.

- Cat. No. AL714A—Single 4ft. **£8/18/-**
- Cat. No. AL712A—Single 2ft. **£7/7/-**

SPARES

- Cat. No. AL698—Spare 2ft. Tubes **10/6** each
- Cat. No. AL700—Spare 4ft. Tubes, white **12/-** each
- Cat. No. AL700—Spare 4ft. Tubes, Daylight **12/-** each
- Cat. No. AL721—Spare Starters **3/6** each

FREIGHT

We pay Freight on all retail orders over £1 value. Please include sufficient cash for postage on small orders.

PIFCO DECORATION SETS



Comprising 12 lights with bell-shaped bakelite shades in assorted pastel colours and decorated with 12 different nursery rhyme scenes in artistic colourings. Complete with 17 feet of flex, spare bulb and adaptor to fit light socket. Attractively cartoned; for 200 to 250 volts. **45/-** set

Cat. No. AF932

NIGHTLIGHT

Burns for 600 hours and only consumes one unit of electricity. Save on your light bills—save electricity. Leave a light burning all night at practically no cost. Plugs into any light socket. Transforms 230 volt current to 6 volts and torch-type bulb screws into end. Length 3 1/2 inches. Diameter, 1 1/2 inches. Ideal for sick-rooms, night lights, passages, lavs., etc., etc.

Cat. No. AF750—Nightlight complete with bulb.

10/6



MAZDA NEON INDICATORS

Neon Indicator Bulbs, with standard bayonet base, for use in test instruments, as indicators and as night lamps, 230 volt.

- .5 watt Pigmy Type Indicator, B.C. **5/11**
- Cat. No. AL20
- .5 watt Standard Bulb, for night lights, etc., B.C.—Cat. No. AL21 **5/11**
- .5 watt Pigmy Type, with small base (S.B.C.)—Cat. No. AL19 **5/11** ea.

CANDLE LAMPS



These lamps are 1in. long overall, 1 1/2in. diam. Fit a standard lamp-holder and have opal glass. Make ideal wall lamps, etc. Lamp only.

- Cat. No. AL640 40 watt **8/6** each
- Cat. No. AL641 60 watt **8/6** each

Chrome Plated Wall bracket Fitting, an illustrated, and complete with candle lamp. Diam. of base 4in.—

Cat. No. AF690 **28/6** each

ARCHITECTURAL LAMPS



Opal Glass Lamp, with special contacts which fit into sockets which are mounted on attractive plastic wall fitting and is wired ready for use. Size 13in. x 2 1/2in.

- Complete Fitting and Lamp. **46/7**
- Cat. No. AF691
- Spare Lamp, 35 watts **17/7** each
- Cat. No. AL631

DAYLIGHT LAMPS

Lamps with DAYLIGHT BLUE glass which filters light, giving the same effect as daylight. Useful for colour matching, sewing, etc.

- Cat. No. AL232—240 volt, 100 watt B.C. **4/5** each
- Cat. No. AL233—240 volt, 150 watt B.C. **7/6** each
- Cat. No. AL234—240 volt, 100 watt E.S. **4/5** each
- Cat. No. AL235—240 volt, 150 watt, E.S. **7/6** each

INFRA-RED LAMP BULBS

As used for medical lamps, industrial purposes, such as paint drying, chicken brooders, etc., etc.—230-volt.

- Cat. No. AL651—With E.S. Cap **19/-** each
- Cat. No. AL650—Standard Bayonet Cap **19/-** each

METRO SINK WATER HEATER



What is the greatest boon to the busy housewife and to the mother of small children? **HOT WATER!**

The Metro Automatic Electric Water Heater gives you oceans of hot water—whenever you want it—day or night—without running up expensive power bills.

The Metro provides a constant supply of near-boiling water for washing up, for food preparation, for your kettle or electric jug, for baby's washing, for floor scrubbing, for dozens of uses throughout the day.

Metro is controlled by a thermostat. It uses a minimum of power. Most people hardly notice the difference to their electric bills. You can leave the silent automatic Metro switched on from one year's end to the other sure in the knowledge that you are **NOT WASTING POWER**. Invest in a Metro!

POINTS ABOUT THE METRO

The very best long-life element and the first grade thermostat—strong copper cylinder with brazed joints without rivets or solder—Metro has ALWAYS had this quality feature—heavy gauge galvanised outer jacket—enamel finish **BAKED ON** in electric ovens—quality again—standard finish cream with chromium trim—plugs into any electric point or can be permanently wired-in—3 gallon.

Cat. No. AE127 **£16/15/-**

REFRIGERATOR LAMP

Special Lamp for certain makes of American refrigerators, 120 volt, 15 watt, small bulb. E.S. Base **3/6** each

Cat. No. AL295

The "Vibro-Tool" De Luxe

GIVES YOU POWER TO DO FAST WORK OF FINE QUALITY!

Writes on . . .
Watches, Glassware, Tools, Leather, Plastics, Jewellery, Pots and Pans, Sporting Equipment, etc., etc.



Engrave your name . . . etch letters or designs . . . place permanent identification marks on anything with this unique hand tool. Carves Wood and linoleum, cuts cardboard and balsa, tools leather. Just plug in on any 230 volt A.C. line. No Workshop is complete without a Burgess Vibro-Tool.

For the first time, the simple principle of vibration is applied in a hand-tool that secures results never before accomplished so easily.

Amazingly versatile, the BURGESS VIBRO-TOOL enables many difficult industrial jobs, as well as the simplest home workshop tasks, to be carried out with speed and efficiency. For embossing thin gauge metals, frosting glass, designing on plastic, you can't beat the "VIBRO-TOOL" DE-LUXE.

The De-Luxe Kit is supplied complete with 19 attachments in a highly polished wooden case
Cat. No. AU360 . . . ONLY **£5/12/6**

STANDARD VIBRO-TOOL

The Standard model is similar to above but is supplied with a general purpose engraving point only.

Cat. No. AU361 . . . ONLY **51/9**
Both Units Supplied Complete with Illustrated Booklet.

SPARE ACCESSORIES SAME AS USED WITH DE-LUXE "VIBRO-TOOL"

Cat. No. AU362—Standard point (V5) for most types of engraving . . . 8d. ea.

Cat. No. AU363—Hard Point (V3) for hardened metals, glass, etc. . . 6/3 ea.

Cat. No. AU364—Knives—Straight for gasket and stencil cutting . . . 1/9 ea.

Cat. No. AU365—Knives—Curved (V24) for general purpose cutting . . . 1/9 ea.



Cat. No. AU366—Ball Points (V44/48) assorted sizes for embossing metals, hammering, working leather, etc.

SET OF 5 . . . 2/10

Cat. No. AU367—Carving Chisels (V51/56) for wood carving, lino-block cutting, etc.

SET OF 4 . . . 6/10

Cat. No. AU368—Diamond Point (V80) Not supplied with De-Luxe Kit. This is actual diamond inset for continuous glass work, fine engraving on jewellery, etc. . . 28/9

Cat. No. AU369—Abrasive Point (V81) for frosting glass, smoothing other surfaces . . . 5/3

Cat. No. AU370—Leather Tools (V82/87) for all types leather work, includes slotter, punch, liner, deerfoot, spoon, combination double liner and cutter.

Set of 6 . . . 5/9 set

Cat. No. AU371—Foot Gauge (V101) for use with knives to regulate depth of cut. 4/9

Cat. No. AU372—Knife Adaptor (V25) 8d. ea.

THE "ENSIGN" BATTERY WELDER

SAVE TIME! — LABOUR! — MONEY!

Works from any 6 to 12 volt storage battery providing instant and even heat. Do your own soldering, welding, brazing, with this useful tool.

The welder is of rugged construction. Battery leads are of heavy rubber-covered low-potential cable, giving maximum transfer of power to the welder.

The Welder is especially applicable for auto repairs, mudguards, radiators, etc., and also light inside work—for the farm it is invaluable for mending buckets, cans, and light farm implements. Battery firms use it for lead burning; especially useful for battery repairs on the roadside. Supplied with full instructions.

Cat. No. AE8 . . . **39/6** complete

Spares:

Cat. No. AE9—Carbon Electrodes . . . 2/6

Cat. No. AE10—Brass Electrodes . . . 6d.

Cat. No. AE11—Steel Electrodes . . . 6d.

Cat. No. AE12—Packets of Flux . . . 6d.



Poker Sets



THE "HOMECRAFT" POKER WORK SET

For use from standard 230-volt light socket or power point. Tip gets very hot and by changing leads on to different terminals heat can be varied for different classes of work. Metal box measures 3 1/2 in. x 3 in. x 4 1/2 in.

The introduction of the Homecraft Poker Machine will undoubtedly advance this art in New Zealand. By using this machine the artist can concentrate all his or her attention on the pokerwork itself, as, when the heat is regulated to the required strength it automatically remains at the same heat. This enables the work to be executed at great speed. Homecraft Machines are perfectly safe in use.

Cat. No. AE90 . . . **59/6**

Cat. No. AE91—Spare Tips for above . . . 4 D. each

Cat. No. AE92—Spare Handles (complete with flex) . . . **12/-** each

MOTOR PULLEY

Cast Aluminium Pulleys, 4in. diam. for "V" Belts.

Cat. No. AM600 for 1/2 in. shaft. . . ALL

Cat. No. AM601 for 3/4 in. shaft. . . **5/9** each

Cat. No. AM602 for 1 in. shaft. . . **3/4** each

Cat. No. AM603 2in. diam. for 1/2 in. shaft . . . **3/4** each

Cat. No. AM604 2in. diam. for 3/4 in. shaft . . . **3/4** each

ELECTRIC MOTORS



230 v. 30-cycle 1440 r.p.m. Fractional H.P. Motors. Ideal for saw benches, pumps, drills and many other purposes.

Cat. No. AM560 "Hoover" 1/2 h.p. Split Phase . . . **£6/9/9**

Cat. No. AM561 "Hoover" 1/2 h.p. Split Phase . . . **£6/12/9**

Cat. No. AM584 "Hoover" 1/2 h.p. Split Phase . . . **£8/17/9**

Cat. No. AM579 "Hoover" 1/2 h.p. Capacitor Start Motors **£10/11/-**

Cat. No. AM585—"Hoover" 1/2 h.p. Split Phase, Ball Bearing . . . **£9/8/9**

FROST WORKSHOP GRINDER



This British 4in. bench grinder is designed for use in the small workshop. Powered by a robust, quiet-running electric motor running at 2,800 R.P.M. Consumption only 60 watts. Bearings are oil-retaining sleeve type. Motor is totally enclosed and the windings are vacuum impregnated. Treated correctly and used within the limits of its size, this grinder will give you years of useful service. Complete with switch, tool rests, wheel guards and connecting flex. Size 7in. x 6in. x 5 1/2 in. **£6/2/6** each

Cat. No. AU340 . . . **£6/2/6** each

ELECTROTOR

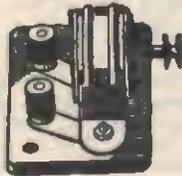
The little chap with the big heart !

The illustrations give the actual size of the AMAZING, WORLD STARTLING, LITTLE ELECTROTOR !

ENGLAND'S LATEST IN MODEL MOTOR DESIGN.

Measures only $\frac{7}{16}$ in. in diameter and $\frac{1}{16}$ in. in width.

This ELECTROTOR is universally popular for model driving of all descriptions. Use it in your Meccano Units, Aeroplanes, Motor-Boats, and all other mechanised models. Requires only 3 to 4½ volts to drive it, and consumes less than a Torch Bulb—operates efficiently on 2 Penlite Cells. AND LOOK AT THE WEIGHT—3 oz. ! 4000 R.P.M. You won't believe it till you see it and use it. The ELECTROTOR first came into prominence in the public eye when used throughout the tests conducted by the "Daily Mail" in England of the Radio Controlled Power Boat.



AM596



IT IS NOT ONLY STARTLING—BUT IT IS PROVEN, and the Price for all this—Look!

Cat. No. AM595—Without Base **8/6**

Cat. No. AM596—Electrotor mounted on base, with terminals **11/6**



AM595

GAS LIGHTER



"Perlux" Gas Lighter, uses single standard size torch cell. Saves thousands of matches. Always handy and safe than having matches lying around.

Cat. No. AE46 **5/6**

Spare Filament Tips **1/-** each

Cat. No. AE47

SCREWDRIVERS



Plastic Handles with space for screws etc. British made.

Cat. No. AU333 4½in. blade (light)	Each	1/3
Cat. No. AU332 4½in. blade (heavy)	2/-	
Cat. No. AU331 6in. blade (light)	1/6	
Cat. No. AU330 6in. blade (heavy)	2/3	

(Light blades are most suitable for radio work).

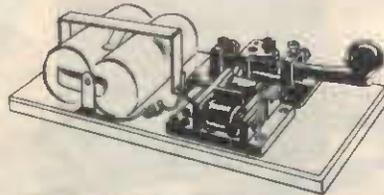
LAMPHOUSE GUARANTEE

Any goods that prove in any way unsuitable may be returned undamaged within seven days from receipt and your money will be refunded in full.

THE ELECTRIC LAMP HOUSE LIMITED

11 MANNERS STREET,
WELLINGTON, C.1.

PROFESSIONAL MORSE PRACTICE OUTFIT



The ideal practise set for those wishing to learn the morse code. Outfit comprises of full size, heavy morse key, adjustable buzzer, with high frequency note, 3 volt battery all mounted on wood base. Diagram of connections provided. Provision made for connecting headphones or communication between two sets.—Cat. No. AH112 **17/6**

RADIO SCREWDRIVERS



Insulated Handle Screwdrivers. Best steel, fine points, moulded handle that remains fast. 5000 volt test.—Cat. No. AU314 **9D.** each

IMPORTANT !

All prices in this book must be regarded as an indication only—all orders will be executed at ruling prices.

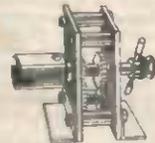
Motor for Models! THE TAYCOL STAR ELECTRIC MOTOR



The only motor with variable speed control and reverse switch combined. It has power in plenty to drive all the usual working models. Overall dimensions: 3½ x 2½ x 1½in. Work from 4½- to 9-volt battery; consumption .8 amp R.P.M. variable. A little masterpiece! One control arm switches on the current, decides the direction and controls the speed. No complicated wiring—only two leads to connect to the battery. Each motor individually boxed.

Cat. No. AM592 **13/3**

REDUCTION GEAR UNIT



Adaptable to any model electric motor. Ratio 4/1, precision gears. A boon to model builders, etc. Dimensions 2½in. x 1½in. x 2½in.—Cat. No. AM594 **8/9**

FOAM WRAITH



Miniature Electric Outboard motors. Beautifully constructed. Will drive working models. Overall depth 5in., 3-blade propeller. Will drive large scale models, either of your own design or made from one of two designs supplied with each motor. Require A 4½ v. to 6 v. battery

Cat. No. AM597 **59/6** ea

BIG BARGAIN! MORSE PRACTICE SETS



British-made Morse Practice Set, has Morse Code embossed on base. Stroke of key can be adjusted to individual requirements. Terminals are provided so that the Set can be used in conjunction with another set. Containing Key and Buzzer on One Base. Light Pattern. Measurements 4½in. long, 2½in. wide, 1½in. high.

Cat. No. AH110—Only **5/11** ea.

BELLS — BELL MATERIAL

DING-DONG!



CATHEDRAL ELECTRIC DOOR CHIMES

Here's the latest thing in Door-Calls. Instead of the usual clacker of a door knocker or the clang of a bell the "CATHEDRAL" DOOR CHIME gives a clear and mellow two-tone chime, sounding once for a back door caller and twice for the front door. The head-piece is beautifully moulded in translucent plastic in three colours

—Walnut, Cream, and Brown—to blend with all interior finishes. The two tubes are of a polished gleaming, brass, laquered to withstand tarnishing, machined to provide resonant tones. The unit works in conjunction with a 6 Volt supply (4 No. 6 Cells) and two bell pushes. Full instructions with each set.

Say Goodbye now to all that noise and clutter and invest in a "CATHEDRAL" DOOR CHIME. Cat. No. AG323 **67/6**

Supplied complete with batteries Cat. No. AG323A and two bell pushes **£4/16/9**

Best British BELL

British. Pressed iron frame. Silver contact points. Terminals under cover. Nickel-plated steel gong, 2 1/2 in. diameter. Bakelite case. For battery or 4-volt A.C. operation.

Cat. No. AG320 **7/6**



BRITISH BUZZER

British good quality Buzzer in bakelite case.

Cat. No. AG319 **6/-** each

BELL BATTERIES
See Page 44

SQUARE BELL PUSH

Attractively designed in moulded Bakelite. Size, 2in. square. No. AG333 **1/9**



"ROUND" BELL PUSH



Good quality Brown Bakelite Push; 1 1/2 in. diameter.

Cat. No. AG334 **1/6** each

"Cubist" BELL PUSH

Bell Push of exceptionally attractive appearance, suitable for inside or outside use. Moulded Bakelite. Size 2 1/2 in. x 2 in.

Cat. No. AG332 **1/6** each



BAKELITE PEAR PUSHES

Bell Pear Push for cord suspension. Attractively finished in moulded bakelite. The plunger is of polished bone.

Cat. No. AG335 **1/11** each



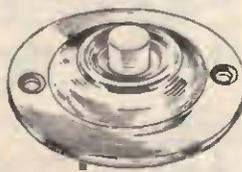
BELL PUSHES

Brass barrel-type bell push for mounting on front doors, or other positions exposed to the weather. Round type. Diameter 2in.; diameter of barrel, 1 1/2 in. Cat. No. AG336 **5/6** each

CHROME PUSH

Round Surface Mounting Chrome Ball Pushes, 2 1/2 in. diameter.

Cat. No. AG337. **5/6** each



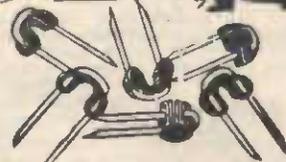
BELL TRANSFORMERS



Midgat type bell transformers Bakelite cased. 230 volt Primary 3/5/8 volt Secondary. Cat. No. AG340—**8/11** each

BELL STAPLES INSULATED STAPLES

Make a Neat Job!



Insulated Staples for tacking up bell wire. Cat. No. AS118 **2** D. doz.

Packets of 100 **11** D. packets

TWIN WIRE

Twin twisted flexible cable. Rubber insulated and covered overall with a black waterproof braid. Excellent for bell and telephone work and for all low tension circuits. Cat. No. AW87 **4** D. yd.

BELL WIRE

Best quality British Bell Wire. Well Insulated Waxed Covering. Single Strand.

Cat. No. AW113—1/22 S.W.G. **2** D. yd.

Cat. No. AW113A—1/22 S.W.G. **2/6** coil 60ft. coil

PLASTIC BELL WIRE

Single strand Plastic covered English Bell Wire. Several colours. In 60ft. coils only. Cat. No. AW108 **2/8** coil

BELL FLEX

Twin twisted Bell Flex Art Silk covered. Cat. No. AW120—**5** D. yard

FRONT DOOR! BACK DOOR!

Combined bell and buzzer in attractive moulded plastic case. Will operate either from batteries or from bell transformer. Bell rings from front door; buzzer rings from back door. Dimensions 4in. x 2 1/2 in. x 1 1/2 in. Supplied complete with instructions and wiring diagram.

BUZZ—DING!

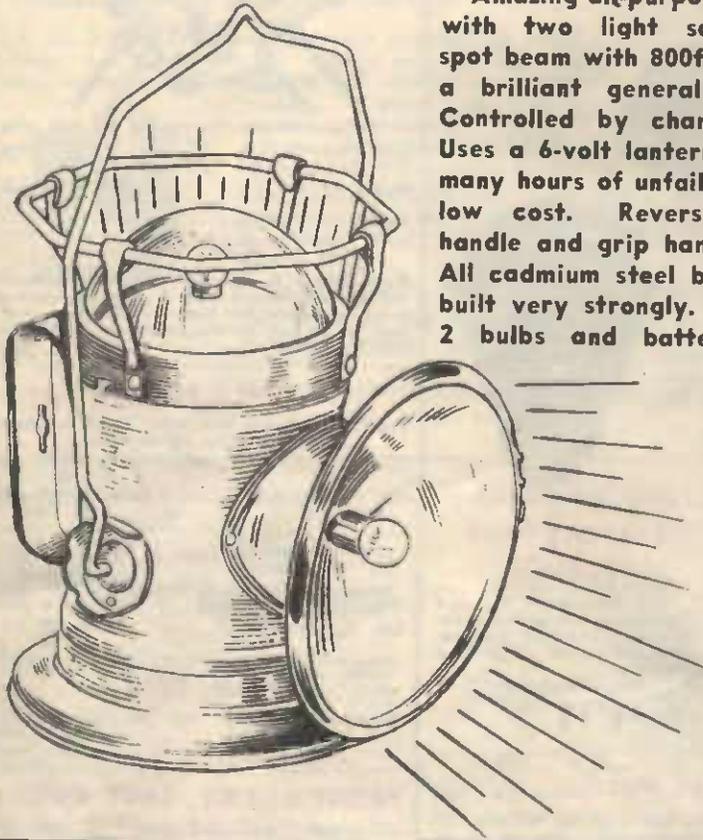


Cat. No. AG317 **9/-** each

COMPLETE OUTFIT

Combined bell and buzzers as described above with all necessary equipment for installation. Outfit comprises bell and buzzer unit, 2 60ft. coils bellwire, packet insulated staples, 2 bell pushes, 4 1/2 volt Battery. Buy it and install it yourself. Complete Buzz-Ding Outfit. Cat. No. AG318A **22/6**

THE "PIFCO" DUALITE LANTERN



Amazing all-purpose lantern with two light sources—a spot beam with 800ft. penetration or a brilliant general purpose light. Controlled by change-over switch. Uses a 6-volt lantern battery giving many hours of unfailing light at very low cost. Reversible wide arm handle and grip handle at the rear. All cadmium steel body, grey finish, built very strongly. Complete with 2 bulbs and battery. Dimensions, 9in. x 6½in. x 7in. Weight 2½lb.

THE "FARMERS FRIEND"

FOR FISHING CAMPING TRAMPING

Cat. No. AT790A—47/6

Spare batteries.

Cat. No. AB223—8/6

EVEREADY



EVEREADY TORCH BATTERIES

Always keep spares on hand.

- Cat. No. AB200—Standard Unit Cells (950) ... **11 1/2** D. each
- Cat. No. AB201—Baby Unit Cells (935) ... **11** D. each
- Cat. No. AB204—Flat Pocket Torch Battery (703) ... **3/4** each

- Cat. No. AB205—Cycle Lamp Battery (701) ... **2/6** each
- Cat. No. AB202—Penlite Unit Cells (915) ... **10 1/2** D. each
- Cat. No. AB270—U14 Gas lighter cells to fit "Eveready" Gaslighters ... **6/3**
- Cat. No. AB223—Type 409 6-volt Battery. Height 3½in., width 2½in., depth 2½in. Constructed for Hand Lanterns etc. ... **8/6**



TORCH LAMPS

Standard Types. Best Quality.

- Cat. No. AL112—2.5 Volts ... 8d. each
- Cat. No. AL113—Focus 3.5 volts ... 8d. each
- Cat. No. AL109—Focus 6 volts ... 1/- each
- Cat. No. AL99—2.5 volts, pre-Focus type (American Fixed Focus) ... 1/9 each
- Cat. No. AL1—6 volt 3 watt Cycle Dynamo Lamps ... 1/7 each
- Cat. No. AL2—6 volt 1.8 watt Cycle Dynamo Lamps ... 1/7 each

BIG OFFER!

4-5

Torch Globes

We have purchased a large quantity of AMERICAN MADE "MATCHLESS" 4.5 volt .3 amp. Standard M.E.S. Base Torch Globes.

These globes are slightly rusted on the base (which in no way affects their operation) and we managed to get them at a greatly reduced price.

NOW YOU TAKE ADVANTAGE OF IT!

Cat. No. AL103—Normally 11d. each.

NOW **6** D. each

Just la Heavy

Cat. No.

GEN

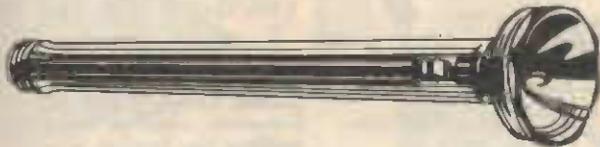
For po shaped g metal cas x 1½in. x Cat. N with bar

THE O

A well-sprayed Set. 3in. polished maximum incorporate switching for statio Ruby Ta fixing bw Cat. No.

TORCHES

Just landed—dependable torch cases from Hong Kong—well known "Telephone" brand. Heavy brass, bright nickle-plated bodies. Reliable turn head focus. Good switch. All prices include bulb and batteries.



Cat No. AT851A—5-cell ... 19/6



Cat. No. AT838A—2-cell Standard ... 9/—

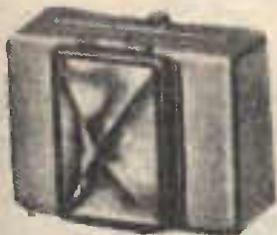


Cat No. AT839A—2-cell Large Head 11/—



Cat No. AT842A—3-cell Large Head ... 14/6

GEM HANDBAG TORCH



For pocket or handbag. Effective diamond-shaped glass lens, with plated bezel. Assorted metal cases anodised finish. Dimensions, 2 1/2in. x 1 1/2in. x 1 1/2in.

Cat. No. AT820A—Complete with battery ... 7/11

THE "STARLITE" DYNAMO OUTFIT



A well-designed, black sprayed 6-volt Dynamo Set. 3in. diameter, highly polished Reflector to give maximum efficiency. Incorporates space and switching arrangement to convert headlamp for stationary battery operation. Complete with Ruby Tail Lamp, connecting leads, globe and fixing brackets. A first rate English product.

Cat. No. AT807 ... 37/6 set

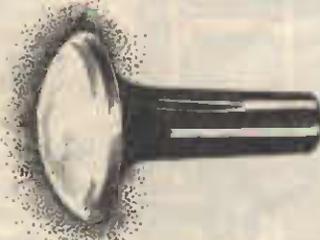
THE RAILROAD TORCH



Red, green, or white light just by sliding the top glasses. Ideal for railwaymen, Boy Scouts, boats, etc., etc., and any child between four and 60 will have lots of fun with it. Supplied complete with 3-cell pocket lamp battery and globe. Size, 4in. x 2 1/2in. x 2in.

Cat. No. AT819A ... 7/11

"DARNALITES"



Illuminated Darnar. Ladies! This is just the ideal thing for darning stockings or other fine work. The rays from the lighted top really penetrate the material you are darning, making "light" work of an otherwise tedious job. Complete with battery and globe.

Cat. No. AT770—Complete ... 7/11

"PIFCO" CHROME PENLITE TORCHES



An English made chrome Pen Torch that will clip into a man's coat pocket or slip into a lady's handbag. Small. CONVENIENT!

Supplied complete with Globe and (915) Eveready Batteries.

Cat. No. AT821A— 5/11 complete

NEW LOW PRICE! ..

PERLUX "CHIC" TORCHES



Here's a super little Torch for a Ladies' Handbag or a Gent's pocket. Designed in attractively coloured plastic and using the "Eveready" 712 Battery the "Chic" measures only 4 1/2in. x 1in. Excellent value at the price. Complete with battery and globe.

Cat. No. AT817A— 4/4 each

"COMMANDO" TORCHES



Something new in the way of a Torch. Novelty and usefulness combined. The base of the Torch slides back, leaving a space for Cigarettes or, for the Ladies, a neat Powder-puff Container. Uses the Standard Eveready Bijou Battery (type 712). Measurements of Torch, Length 4 1/2in., Depth 4in. Available in several different colours, complete with Bulb and Battery.

Cat. No. AT816A— 7/10

PHOSPHO-GLO TORCHES



Phosphor powder included in the plastic case. Glows in the dark so that torch can be readily found. Fitted with the American Fixed Pre-focus Bulb. Firm, quick-acting Switch. Length of Torch, 7in. Uses two standard size Torch Cells (Eveready 950).

Cat. No. AT814A— 12/3 each

"PERDUR" UNBREAKABLE TORCHES

Similar in size and shape to the Phospho-glo Torch described above, but with a specially moulded unbreakable body. Several colours. Not Phosphoglo.

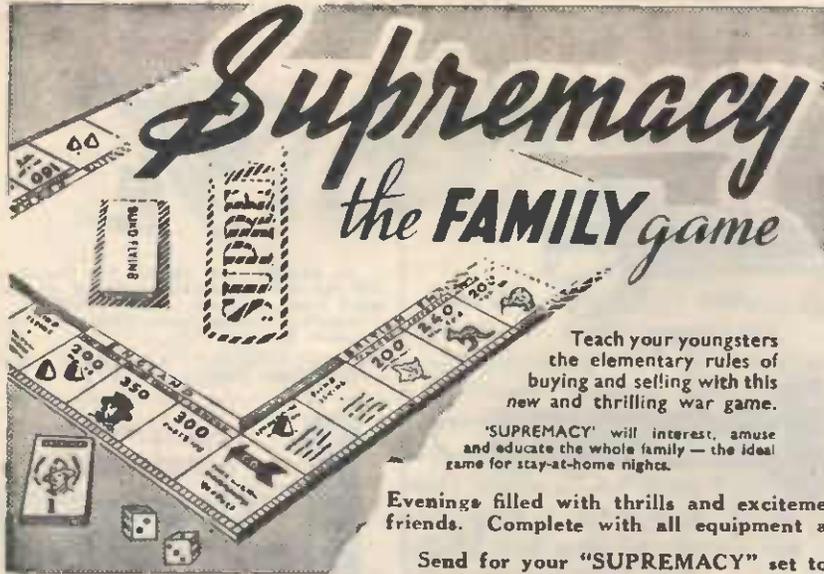
Cat. No. AT818A— 12/3 complete

QUALITY CYCLE LAMPS

Metal-cased English Cycle Lamp. A well-constructed job, with a 2 1/2in. diameter highly polished, nickel-plated reflector; case coloured black. Fixing bracket and carrying handle provided. Complete with Battery and globe.

Cat. No. AT804A 8/11





Supremacy

the FAMILY game

Teach your youngsters the elementary rules of buying and selling with this new and thrilling war game.

'SUPREMACY' will interest, amuse and educate the whole family — the ideal game for stay-at-home nights.

Evenings filled with thrills and excitement for your family and friends. Complete with all equipment and printed instructions.

Send for your "SUPREMACY" set to-day. The game that no one can resist.

Complete with all equipment and printed instructions.



Cat. No. AU100—
Post free **19/6**

Recognised Dealers who have not already obtained supplies should write at once for our terms.

SAVE TIME AND TEMPER!

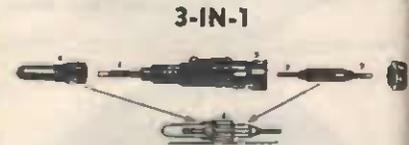
Get one of these



ALL-STEEL Handy Tool Boxes

19in. long, 6in. wide, 6½in. deep. Finished in green lacquer, solidly constructed, stout metal handle, and with a place for everything. Tools go in the bottom, and all the small things in the removable tray. It's a dandy job—good for a lifetime. Send for one today, and if you don't think it just the thing and grand value—return it, and we will refund your money.

Cat. No. AU141 **47/6**



3-IN-1

The large blade (1) is firmly fixed in barrel (5) and cannot be removed. The combine medium and small blades (2 and 3) can be used separately, or to give better grip, inserted either way into protector cap (4) which is specially shaped inside to hold them firmly.

Screwdrivers, plastic case. Three different size blades invaluable for those small jobs at home and in workshop where you want a fine screwdriver for small slots, etc. Clip for your pocket.
Cat. No. AU313 **2/6**

FREIGHT

We pay Freight on all retail orders over £1 value. Please include sufficient cash for postage on small orders.



PLASTIC PRESS

THE WONDER SCIENTIFIC TOY OF THE AGE



PLASTIC KIT-SET

Fun and Instruction for Young and old

Mould your own plastic novelties with this modern plastic kitset. Outfits consist of seven different colours of plastics, heating lamp, hand press, dies, and complete instructions. Great hobby for young or old.

Cat. No. AU220 **29/6**

WITH THIS SET MOULD THESE ARTICLES IN MODERN PLASTICS

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IRON SPARES

"EVEN-GLO" IRON ELEMENTS



The Element in the iron is the part that does all the work and practically the only part that goes wrong. These Elements are specially constructed for long service, and will fit all standard makes of irons.

FITALL TYPE IRON ELEMENTS.

Cat. No. AE415 **5/6** each

Iron Elements, 110v.—
Cat. No. AE420 **6/11** each

"HOTPOINT" IRON ELEMENTS, 240v.
Cat. No. AE417 **6/4** each

H.M.V. IRON ELEMENTS
Cat. No. AE418 **7/7** each

MORPHY-RICHARDS IRON ELEMENTS
Cat. No. AE419 **7/2** each

APPLIANCE TERMINALS



Appliance Terminals, for fitting in the back of electric irons, etc. Supplied complete with nuts. Cat. No. AE400 **8** D. each

ELECTRIC IRON HANDLES

Wooden handles for electric irons—will fit practically all makes.

Cat. No. AE405 **1/9** each

BAKELITE IRON HANDLES

Spares for Majestic Irons. Cat. No. AE406 **10/-**
Spares for Morphy Richard Irons Cat. No. AE409 **4/10**

APPLIANCE PLUGS

Appliance Plugs and Plug Tops. See Page 35.

APPLIANCE CORDS

Cords for electrical appliances, irons, toasters, jugs, etc., etc. Fitted with "Fitall" type appliance plug on one end and a wall plug on the other end.



Cat. No. AE800—Cord with 2-pin parallel Cap **7/6**

AE801—With two-pin tee cap **7/6**

AE803—With three-pin cap **8/6**

AE804—With part Rubber enclosed three-pin Cap **9/9**

(Note.—The above are fitted with 6 feet net cord. Extra long cords can be supplied. Add 1/10 for each yard required.)

TOASTER SPARES

"EVEN-GLO" TOASTER ELEMENTS



There's an "EVEN-GLO" ELEMENT to fit every make of Toaster. Made with good quality mica and English Nichrome Ribbon, these elements are a first grade production.

Cat. No. AE1003—Speedee type **6/4** each

Cat. No. AE1004—Hotpoint type **8/-**

Cat. No. AE1006—Hi-speed type **7/2**

Cat. No. AE1007—Magnet type **8/2**

Cat. No. AE1009—Universal 4-Strip **7/2**

Cat. No. AE1012—Servex **7/2**

Cat. No. AE1013—Ultimate **8/-**

Cat. No. AE1014—Majestic type **6/8**

Cat. No. AE1015—Monarch type (2-strip) **7/2**

Cat. No. AE1017—"Necco Chevron" type **8/-**

Cat. No. AE1018—Electroway type **6/8**

TOASTER TRAYS

Cat. No. AE303—For "Speedee" Toasters (Size overall 10 1/2 in. x 7 in.) **6/6** each

Cat. No. AE305—For "Speedee Tiffin" Toasters **6/6** each

TOASTER SPRINGS

Coiled Springs. Suitable for practically all makes of Toasters. Cat. No. AE985 **7** D. each

TOASTER KNOBS

ROUND KNOB. Suitable for Toaster Doors, Kettle Lids, Saucepan lids, etc. **5** D. each
Cat. No. AE984

FLAT KNOB. For "Speedee" Toaster Doors. Cat. No. AE983 **6** D. each

"DORMEYER" MIXER BOWLS

Spare Bowls, Clear Glass for Dormeyer Electric Mixers.

Cat. No. AE821—Large **23/3** each

Cat. No. AE822—Small **12/9** each

INSULATING BEADS

Fishshine White Porcelain Insulating Beads. Used for insulating wires particularly in heating appliances such as irons, grills, ranges, soldering irons, etc., etc.

Cat. No.	Overall Length inches	Size of Hole inches	Diam. inches	Max. S.W.G. Wire	Approx. Number to Cover one inch	Approx. Quantity per Packet	Price per Packet
AE1250	.125	.056	.125	18	10	72	9d.
AE1252	.201	.092	.201	14	6	60	9d.
AE1254	.323	.123	.323	11	4	12	9d.
AE1256	.438	.175	.438	8	2.8	12	1/3
AE1258	.532	.235	.532	4	2.5	12	2/3

VACUUM CLEANER SPARES

To suit Knight, Dome and many other brands of English cleaners.

Cat. No.	Description	Each
Cat. No. AE204	Round Brushes	9/6
Cat. No. AE207	Oval Brushes	11/9
Cat. No. AE206	Nosie Parker Attachments	4/-
Cat. No. AE203	Flexible Hoses with metal ends	£1/8/6
Cat. No. AE208	Carpet Attachment	5/-
Cat. No. AE209	Motor Housings	7/6
Cat. No. AE210	Dust Bags	4/6
Cat. No. AE212	Spraying Attachment	10/-
Cat. No. AE240	Caps for Carbon Brushes	9d.
Cat. No. AE238	Carbon Brushes	1/3
Cat. No. AE239	Springs for Carbon Brushes	10d.
Cat. No. AE233	Rubbers rings for "Knight" Cleaner Dust bags	2/3
Cat. No. AE201	Armatures	45/-
Cat. No. AE202	Field Coils	19/6

SEWING MOTOR SPARES

Cat. No.	Description	Each
Cat. No. AE245	Carbon Brushes for English Sewing Machine Motors	1/3
Cat. No. AE246	Springs for above	10d.
Cat. No. AM565	Rubber Belts	1/4

"FITZALL" RANGE ELEMENTS

Electric Range Hot Plates. Elements that will fit all makes of ranges. Speedee to fit any make of range, 8in. to 11 1/4 in. diameter. 1750 watts.

Cat. No. AE1220 **46/6**

Ditto, 6in. to 8in. diameter, 900 watts.
Cat. No. AE1221 **36/6**

"ULTIMATE" ELEMENTS FOR RANGETTES

OVEN FLAT ELEMENT. Cat. No. AE1226 **23/9**

HOTPLATES FOR RANGETTES.
Cat. No. AE1222—Ultimate 6in. **28/3**

Cat. No. AE1223—Ultimate 8in. **39/6**

KETTLE ELEMENTS

"HECLA" KETTLE STRIPS

Most kettles are fitted with two of these strips and several are fitted with three.

Cat. No. AE1030 **7/6** each

CARBONS FOR HEALTH LAMPS

Spare Carbons for Pifco and other Arc type Health and Sun-tan lamps. Cat. No. AE599 **4/-** pair

SPARES

We have only listed on these pages spares for the more popular type of appliances. If you need a spare part for any electrical appliance please write. **WE MAY BE ABLE TO HELP YOU!**

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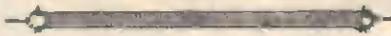
RADIATOR SPARES

SPIRAL ELEMENT WINDINGS

Spiral Element Windings for re-winding Radiator, Stove, and Hotplate Elements, etc., etc. Made of first grade English Resistance Wire.

- Cat. No. AE1111—230 volt, 600 watt **2/-**
- Cat. No. AE1112—230 volt, 750 watt **2/3**
- Cat. No. AE1113—230 volt, 1000 watt **2/6**

PENCIL ROD ELEMENTS



"Even-Glo"

8 1/2 in. Element, 800 watt with end cap and Fixing Screws
Cat. No. AE1118 .. **7/6**

10 in. Element, 1000 watt, with end caps and fixing screws.—Cat. No. AE1117 .. **7/6**

Ditto, 12 in., 1000 watts. **12/6**
Cat. No. AE1119 ..

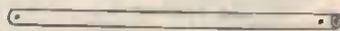
"OXFORD"



9 in. Replacement Element, without end caps. Heavy twisted end leads for secure contact. Made for "Speedee" and similar Radiators.

1000 watts.—Cat. No. AE1116 **5/6** each

PORCELAIN ELEMENT BARS



Round Porcelain Bars for Radiator Elements, etc. Unwound. Size 9 1/2 in. x 1/2 in. diam.
Cat. No. AE1101 .. **3/-** each

Cat. No. AE1100—8 1/2 in. x 1/2 in. **3/-** each

METAL END CAPS

Metal End Caps for Radiator Elements. The small cup measures 1/2 in. diameter with a depth of 1/2 in. Holes either side of lip and main centre hole to take holding bolt.
Cat. No. AE1102 **5d.** ea.



ELEMENT FORMERS

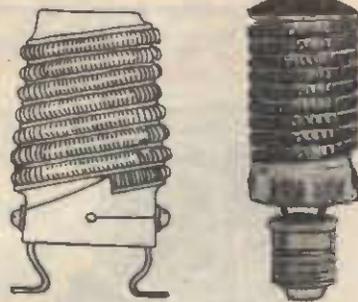
Cone-type formers for bowl-type electric fires, etc. Porcelain, with grooves to take standard windings (750-watt suggested). No base or supports are included. Former is drilled bottom and top to simplify attaching the spiral. Height 3 in., diam. 1 1/2 in.

Cat. No. AE1109—**5/6** each



BOWL FIRE ELEMENTS

"FITZALL" BOWL FIRE ELEMENTS



This type of Element can be adapted to numerous makes of Bowl Fire Radiators. Radiators with elements using the plug-in or screw-in base may, with slight adaption, take this type of element. Distance between screw holes on legs of former 1 1/2 in. 750 watt spiral.
Cat. No. AE1104 .. **7/9** each

Similar to above but fitted with a screw-in base.
Cat. No. AE1105 .. **8/3**

RADIATOR ELEMENTS



Large tile, 9 1/2 x 3 1/2, 1000 watts. Complete.
Cat. No. AE1133 .. **14/6**

Small tile, 7 1/2 x 3, 1000 watts.
Cat. No. AE1134 .. **12/3**

ELECTROWAY RADIATOR ELEMENTS

Short tubular Pencil Element 8 in. x 3/4 in.
Cat. No. AE1120 .. **9/6**

Long tubular Pencil Element 11 in. x 3/4 in.
Cat. No. AE1121 .. **10/6**

Small Tile Element 7 1/2 in. x 3 in.
Cat. No. AE1136 .. **11/-**

Large Tile Element 9 1/2 in. x 3 in.
Cat. No. AE1137 .. **12/6**

JUG SPARES



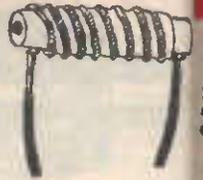
THE "WIRELESS" JUG ELEMENT

The Element that can't burn out even if the jug is boiled dry. No spiral windings, etc. Can be easily fitted to any make of porcelain jug. Instructions with each element. Patented principle.
Cat. No. AE1181 .. **10/-** each

JUG SPARES

ELECTRIC JUG ELEMENTS

Spiral Windings for Electric Jugs, 230 volt.
Cat. No. AE1171—**1/-**



Porcelain Bobbins for Jug Elements.
Cat. No. AE1174—**1/6** each

Complete Jug Elements, consisting of winding on bobbin and connecting rods.
Cat. No. AE1175 .. **4/3** each

TERMINAL PINS

Contact Pins as used on the "Neeco" and similar makes of Porcelain Jugs. Comprise 1 1/2 in. Brass Bolt with Contact Stud and two Brass Washers.
Cat. No. AE1189 .. **1/-** each

ELECTRIC JUG LIDS

Bakelite lids as used on "Neeco" Jugs
Cat. No. AE1188 .. **7/6**

"SPEEDEE" JUG ELEMENTS

Coiled Copper Elements, for Enamelled and Chrome Jugs, "Speedee" Kettles, etc.
Cat. No. AE1176 .. **14/6** each

Cat. No. AE1179—For "Debutante" Jugs **14/6**

EUTRON JUG ELEMENTS

Similar to above 2 Years' guarantee
Cat. No. AE1177—**16/-** each

Nickel plated Ferrules for Eutron Elements
Cat. No. AE1169 .. **1/9** each

RUBBER RINGS

For fixing Elements in metal jugs, such as Speedee, Ultimate, etc.
Cat. No. AE1170 .. **6d.** each

SPARES FOR "SPEEDEE" CHROME JUGS

- Cat. No. AE1195—Spare Lid Knobs for "Premier" Model .. **7d**
- Cat. No. AE1196—Spare Plastic Handles for "Premier" Model .. **4/-**
- Cat. No. AE1197—Spare Plastic Bases for "Premier" Model .. **4/-**
- Cat. No. AE1195—Spare Lid Knobs for "Debutante" Model .. **7d**
- Cat. No. AE1198—Spare Plastic Handles for "Debutante" Model .. **4/9**
- Cat. No. AE1199—Spare Plastic Bases for "Debutante" Model .. **4/9**

"COYLROD" TANK HEATERS



Water Heaters for permanent installation in Tanks, Water Cylinders, etc. **22/-** each
Cat. No. AE540—750 watt .. **22/-** each
Cat. No. AE541—1000 watt .. **22/-** each

Cat. No. AE547—1500 watt, **37/6** each
3 heat types .. **37/6** each
Brass Flanges for fixing above. **5/9** each
Cat. No. AE543 .. **5/9** each

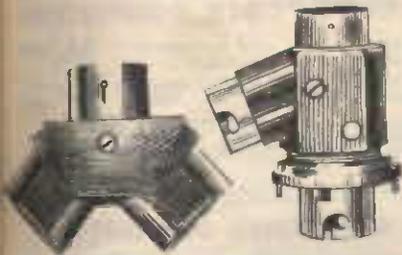
ELECTRICAL ACCESSORIES

ADAPTORS

For end of cords to fit into light socket for extensions, etc.
Cat. No. AG210 ... 9D. each



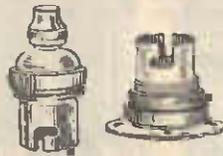
TWO LIGHT ADAPTORS



G218

G222

LAMP HOLDERS



A

B

Small Size Lampholders to fit motor-car lamps, etc.
Brass Cord Grip (Illus. A)—
Cat. No. AG280 ... 2/5 each

Plastic Cord Grip (Illus. A)—
Cat. No. AG282 ... 1/5 each

Brass Batten Type (Illus. B)—
Cat. No. AG281 ... 2/5 each

Plastic Batten Type (Illus. B)—
Cat. No. AG283 ... 1/5 each

BATTEN HOLDERS



G 260

G 256

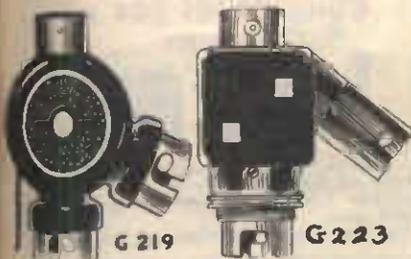
FOR FIXING TO CEILING, WALLS, ETC.

Plastic, without switch—Cat. No. AG256 ... 1/11 ea.

Brass, without switch—Cat. No. AG257 ... 2/9 ea.

Plastic, with switch—Cat. No. AG260 ... 5/3 ea.

Metal, with switch—Cat. No. AG259 ... 6/6 ea.



G 219

G 223

Without switch—Cat. No. AG218 ... 2/6 each

With single push button switch
Cat. No. AG222 ... 3/6 each

With single pull cord switch
Cat. No. AG219 ... 3/6 each

With double push button switches (enables both lights to be switched independently).
Cat. No. AG223 ... 7/- each



C



D

Cordgrip Lampholder for fixing to Cord. Plastic, (Illus. C).
Cat. No. AG251 ... 1/- each

Ditto with switch (Illus. E) ... 3/6 each
Cat. No. AG253

Threaded Lampholder, Bin. Plastic (Illus. D)—Cat. No. AG261 ... 1/9 each

Threaded Lampholder, Bin. Plastic (Illus. D)—Cat. No. AG269 ... 1/9 each



E



F

Threaded Lampholder, Bin. Chrome (Illus. D).
Cat. No. AG263 ... 2/9 each

Threaded Lampholder, Bin. Brass, Conduit thread (Illus. D)
Cat. No. AG268 ... 2/9 each

Threaded Lampholder, with switch, Bin. Plastic, (Illus. F)—Cat. No. AG264 ... 3/11 each

Threaded Lampholder, with switch, Bin. Chrome (Illus. F)—Cat. No. AG265 ... 5/11 each

ANGLE BATTEN HOLDER



Angle Type Batten Holders.
Cat. No. AG258 ... 2/6 each

EDISON SCREW HOLDERS

Cat. No. AG273—Batten type ... 3/6
Cat. No. AG274—Cordgrip type ... 3/9
Cat. No. AG275—Bin. Bakelite ... 3/6
Cat. No. AG278—Goliath screw type ... 7/9

OUR GUARANTEE!

The Lamphouse 7-DAY MONEY BACK GUARANTEE protects your every purchase.

HOLDERS WITH SKIRTS

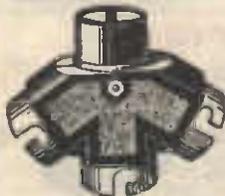


CORDGRIP, Plastic—Cat. No. AG250 ... 1/6 each

CORDGRIP, Plastic, with switch—Cat. No. AG252 ... 4/11 each

BATTEN Plastic, without switch. Cat. No. AG254 ... 2/4 each

3-LIGHT ADAPTOR



Allows 3 lights from one socket.

Cat. No. AG225 ... 4/9

ES TO BC ADAPTORS

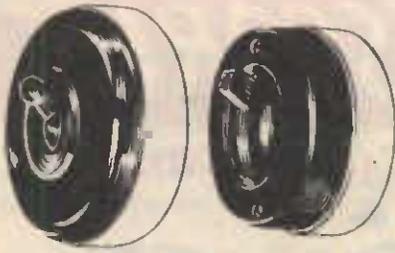


Adaptors for converting Edison screw holders, etc., to bayonet, and vice versa.

Cat. No. AG485—ES to BC (as illustrated) ... 4/- each

Cat. No. AG484—BC to ES ... 4/- each

SWITCHES



A B

- 5 Amp 230v. Wall Switches, plastic covers. (Illus. B).—Cat. No. AG 232 **2/9**
- 10 Amp. (Illus. A) Cat. No. AG235 **4/6**
- 15 Amp Ditto (Illus. A) Cat. No. AG239 **7/6**
- 5 Amp 2-way Ditto. Cat. No. AG230 **3/6**

CEILING SWITCHES



- ENGLISH CEILING SWITCHES**, plastic covers supplied, complete with full cord. 1-Way—Cat. No. AG245 **4/11** each
- 2-Way — Cat. No. AG246 **8/9** each
- Spare Cords for ceiling switches.—Cat. No. AG116 **8D.** each

TABLE LAMP SWITCH

Small Push Button Switch for mounting in the base of table lamps, etc. Single hole mounting. 230 volts—2/3 amp.



- Cat. No. AG117— **1/9** each

RADIATOR REPLACEMENT SWITCH

Flush mounting switch for "Speedee" Radiators. Cat. No. AG138 **3/9** each

3-HEAT SWITCH

Flush Range Switch, suitable for Neego and other ranges, grills, etc., employing 3 heat flash switches. Dimensions 1 1/2 in. x 1 1/2 in. Complete with lock nut and black pointer knob. Cat. No. AG135 **17/-** each

See diagram in Reference Section on how to connect a Three-Heat Switch.

ARROW 3-HEAT SWITCH

Three-heat, flush mounting switches for replacements in electric stoves and similar appliances. 230-volt, 10 amp. Cat. No. AG136 **14/-** each

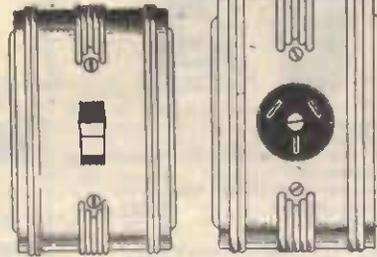
FLUSH SWITCHES AND PLUGS

SWITCHES ONLY.

- Cat. No. AG173—5/10-amp. Ivory **2/5**
- Cat. No. AG174—5/10-amp. Brown, 2-way **3/-**
- Cat. No. AG175—5/10-amp. Ivory 2-way **3/9**

PLUG BASES ONLY.

- Cat. No. AG177—3-pin, Brown Bases **2/3**
- Cat. No. AG178—3-pin, Ivory Bases **2/8**



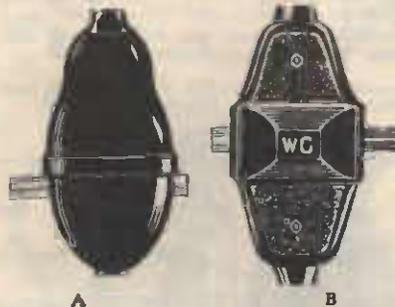
PLATES FOR SWITCHES AND PLUGS.

- Cat. No. AG186—Ivory Bakelite, Classic type, for 1 switch **1/4**
- AG187—Ivory Bakelite, Classic type, for 2 switches **2/7**
- AG189—Ivory Bakelite, Classic type, for 1 switch and 1 plug **2/7**
- AG194—Ivory Bakelite, Classic type, for 1 plug **1/4**
- AG195—Brown Bakelite, for 1 switch, Classic type **1/2**
- AG196—Brown Bakelite, for 2 switches, Classic type **1/9**
- AG193—Brown Plate for 1 plug **1/2**
- AG185—Brown Plate for 1 switch and 1 plug **1/9**
- AG197—Brown Fancy Screws **3d.** each
- AG198—Ivory Fancy Screws **4 1/2d.** each

METAL MOUNTING BOXES

- AG190—Single Gang Boxes **1/9**
- AG191—Double Gang Boxes **3/-**

CORD SWITCHES



A B

- Egg Cord Switches, for attachment to end of Cord (Illus. A). Cat. No. AG132 **3/1** each
- Through Cord Switch for insertion in centre of 2-wire cord (Illus. B) Cat. No. AG131 **3/-** each

MINIATURE SWITCHES

Here's a handy little switch suitable for radio and motor-car work and general low voltage electrical circuits. Positive action. Nicely finished (nickel plated). British made. Cat. No. AG118



1/10

CORD CONNECTORS (3-Wire)



- Cord Connectors for joining three-wire cord. Moulded in bakelite. Titegrip. N.Z.-made
- Cat. No. AG25/416—Complete **2/6** each
- Cat. No. AG25—Body only **1/9** each
- Cat. No. AG416—Plug Top. **9D.** each

ENGLISH CORD CONNECTORS

- Sperryn 3-wire cord connectors—2-piece—Cat. No. AG23 **5/-** each
- Sperryn 2-wire Cord Connectors (2 piece), parallel pins.—Cat. No. AG22 **5/-** each
- Sperryn 2-wire Cord Connectors (2 piece), toe pins.—Cat. No. AG24 **6/6** each

INDUSTRIAL CONNECTORS

- Consisting of all-rubber three-pin Plug and rubber-covered Connector body. Cat. No. AG26 **8/6**

CONNECTORS FOR A.C. MAINS



- This two-piece Connector gets over the difficulty of joining two power leads, etc. Made of best bakelite, they are strong and easy to pull apart. Cat. No. AG18—Complete **2/-**

CONNECTORS—2-WIRE BLOCK



Porcelain Insulated Connector for joining wires, etc.

- Cat. No. AG29—Single Wire **8D.** each
- Cat. No. AG28—Two Wire **1/-** each
- Cat. No. AG27—Three Wire **1/4** each

CONNECTOR STRIPS

These constitute 12 connectors (similar to above) moulded in bakelite on long, narrow Strip. Strips can be subdivided to give any number between one and twelve connectors. We can break strips to whatever number of connectors you require.

- 5/-** STRIP OF 12 OR **5D.** per connector
- Cat. No. AG30

CEILING ROSES



- Bakelite Ceiling Roses for electric light pendants.
- Cat. No. AG32—2-plate **1/4** each
- Cat. No. AG33—3-plate **1/6** each

3-Wire)

3-wire cord.
N.Z.-made
2/6 each
1/9 each
9D. each

RECTORS

5/- each
(2 piece),
each
5/- each
(2 piece),
6/6 each

TORS

Plug and
8/6

A.C.

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etc. Made
and easy to
2/-

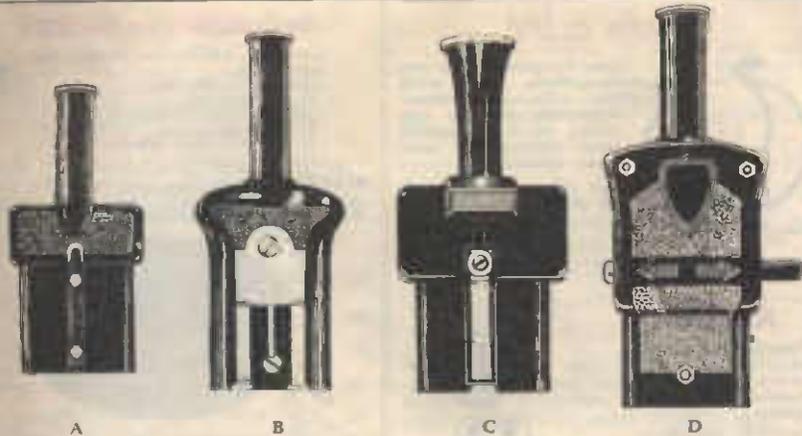
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1/- each
1/4 each

PS

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APPLIANCE PLUGS

PLUGS TO FIT IRONS, TOASTERS, JUGS, AND OTHER APPLIANCES

- Unearthed Appliance Plug (2 wire) (Illus. A)—Cat. No. AG457 ... **1/7 each**
- Standard Earthed Appliance Plug (3 wire) (Illus. B)—Cat. No. AG453 ... **2/6 each**
- Heavy Duty Earthed Appliance Plug (3 wire) (Illus. C)—Cat. No. AG452 ... **3/3 each**
- Switch Appliance Plug (Illus. D)—Cat. No. AG465 ... **4/8 each**

CONVERSION ADAPTORS



These conversion Adaptors will be found useful to the general public, besides appliance salesmen, etc. They enable a radio set with a three-pin plug to be used from a two-pin socket, etc.

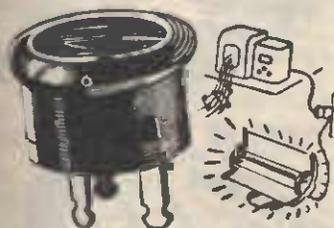
Cat. No.	Fits into.	Takes.	Price.
AG500	3-pin	2-pin Tee	8/-
AG501	3-pin	2-pin Prll.	7/-
AG502	3-pin	Lamp Socket	3/9
AG503	2-pin Tee	2-pin Prll.	7/-
AG504	2-pin Tee	3-pin	4/-
AG505	2-pin Tee	Lamp Socket	3/9
AG506	2-pin Parallel	3-pin	4/-
AG507	2-pin Parallel	2-pin Tee	8/-
AG508	2-pin Parallel	Lamp Socket	3/9
AG509	Lamp Socket	2-pin Tee	8/-
AG510	Lamp Socket	2-pin Prll.	4/-
AG511	Lamp Socket	3-pin	4/-

PLUG TOPS



- 2 Wire Parallel Pin Plug Top (E)—Cat. No. AG410 ... **10D. each**
- 2 Wire Tee Pin Plug Top (F)—Cat. No. AG412 ... **9D. each**
- 3 Wire Light Plug Top (G)—Cat. No. AG416 ... **9D. each**
- 3 Wire Side Entry Plug Top (H)—Cat. No. AG414 ... **1/2 each**
- 3 Wire Rubber Covered Plug Top (I)—Cat. No. AG425 ... **1/11 each**
- 3 Wire Heavy Duty Plug Top (J)—Cat. No. AG417 ... **2/6 each**
- 3 Wire All Rubber Plug Top (K)—Cat. No. AG428 ... **3/6 each**

PLUGS, DOUBLE THREE-PIN

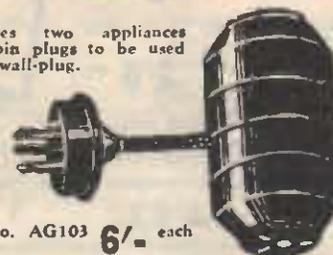


A useful plug where it is desired to take two leads from one three-pin socket. The plug illustrated is fitted to the appliance or radio cord. A standard 3-pin plug can then be inserted into the top of it.

- Cat. No. AG433 ... **1/11**
- Heavy Duty Type, as above ... **3/9 each**
- Cat. No. AG432

LAMPHOUSE 2-WAY ADAPTORS

Enables two appliances with 3-pin plugs to be used from a wall-plug.



- Cat. No. AG103 ... **6/- each**
- Similar to above but for two pin (Tee) plugs ... **6/-**
- Cat. No. AG104

WALL BASES

- TITEGRIP 10/15 amp. 3-pin PLUG BASES ... **1/6 each**
- Cat. No. AG402
- TITEGRIP "TEE" 2-pin PLUG BASES ... **1/6 each**
- Cat. No. AG100



NEW DOUBLE PLUG

New type of double, three-pin plug which allows 2 appliances etc., to be used from one socket.

- Cat. No. AG435 ... **4/9 each**



"3-IN-1" OIL

Motors, Lawnmowers, Vacuum Cleaners, etc., are all very hard to replace. Keep them in Al order with "3-in-1."

"3-in-1" also works miracles in brightening dull furniture and woodwork. A few drops on any soft cloth wrung out in water gives you a dusting and polishing cloth that not only polishes but also cleans and protects the finest finish.



- Cat. No. AU151—3oz. Can ... **1/9**

SHAVER ADAPTORS



Adaptors to fit standard bayonet lampholder and to take standard parallel pin plug top. Used mainly in connection with electric shavers and other American appliances

- Cat. No. AG486 ... **5/10**

GALLERIES FOR GLASS LAMP SHADES

All the following have a standard 1 1/2 in. hole for fitting on to standard size lamp-holders.

Brown Bakelite Moulded Gallery 2 1/2 in.—
Cat. No. AF350—
2/6 each



Cat. No. AF351—Ditto, 3 1/2 in. ... 3/9
Cat. No. AF352—Ditto, 4 1/2 in. ... 4/—
Cat. No. AF356—Ditto, 4 1/2 in. white ... 4/3

METAL GALLERIES AS ABOVE
Oxidised Copper

Cat. No. AF353—2 1/2 in. ... 2/6
Cat. No. AF354—3 1/2 in. ... 3/6
Cat. No. AF355—4 1/2 in. ... 4/9
Cat. No. AF379—Ditto, with hook ... 6/—

CHROME FINISH

Cat. No. AF357—2 1/2 in. ... 3/9
Cat. No. AF358—3 1/2 in. ... 4/9
Cat. No. AF359—4 1/2 in. ... 5/3

CHROME CEILING GALLERIES

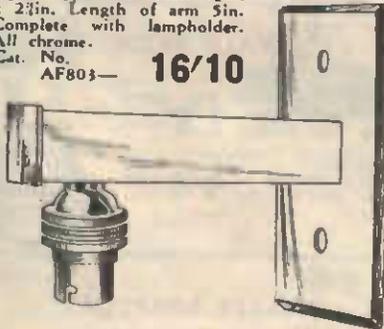
Cat. No. AF360—3 1/2 in. ... 7/6
Cat. No. AF361—4 1/2 in. ... 8/9

FITTING ACCESSORIES

3 Hook Deep Ceiling Plates—
Cat. No. AF310 ... 4/3 ea.
3 Hook Shallow Ceiling Plates—
Cat. No. AF309 ... 3/10 ea.
1 Hook Nickel Ceiling Plates—
Cat. No. AF313 ... 3/9 ea.
Chrome Chain, 1 in. Link
Cat. No. AF316 ... 3/3 yd.
3 in. N.P. Bowl Hooks and Nuts—
Cat. No. AF323 ... 1/9 ea.
Bowl Buttons with Washers and
Nuts—Cat. No. AF325 ... 5d. ea.
Gravity Bowl Hooks—
Cat. No. AF320 ... 9d. ea.

WALL BRACKET

Square type. Back Plate 4 1/2 in. x 2 1/2 in. Length of arm 5 in. Complete with lampholder. All chrome.
Cat. No. AF803—**16/10**



WALL BRACKETS



Chrome 9 in. Wall Brackets, complete with Lampholder. Best quality.
Cat. No. AF801 ... **12/—** each
Cat. No. AF802—Ditto 6 in. size complete with Lampholder ... **8/6** each

SHADE CLIPS



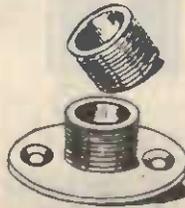
Can be attached to any Lamphade. By using this Clip an ordinary lamphade can be converted to fit a reading lamp without the usual shade carrier.
Just clips straight on to the globe.

Cat. No. AF381 ... **6D.** each

NIPPLES

Threaded Brass Tube for making table lamps, etc. Fit standard 3/4 in. lamp-holders.

Cat. No. AG300—
6D. each



FLANGES

Cat. No. AG306—3/4 in. ... **9D.** each

REDUCERS

Brass Reducers—Male fits standard 3/4 in. conduit thread. Female fits 3/4 in. brass thread.
Cat. No. AG301—3/4 in. x 3/4 in. Reducers

Reducers, Brass, 3/4 in. Female; 3/4 in. Male.
Cat. No. AG299 ... **4D.** each

BUSHES

Plastic Bushes for Bushing holes, etc.—
Cat. No. AG309—3/4 in. ... **6D.**

Cat. No. AG310—3/4 in. ... **6D.**

FLANGES

Metal Conduit Flanges to fit 3/4 in. Conduit.
Cat. No. AN1—w/male thread ... **7D.** each

Cat. No. AN2—w/female thread ... **7D.** each

SHADE HOLDERS

Shade Holders for table lamps. Oxidised finish. Hinged, in the centre so that the shade can be tilted.

Cat. No. AG36 ... **2/—** ea.

Similar to the above, but chrome plated.
Cat. No. AG37 ... **2/6** ea.



SHADE HOLDERS

For fixing Shades to table lamps. Non adjustable type.

Cat. No. AG38 ... **1/3** each

INSULATED SCREW EYES

The wiring regulations state that all flexible cords running along walls and ceilings must be supported by an insulated screw eye every 12 inches. Wall, here they are, moulded in plastic. Clear, Cream, and Amber colours.

Cat. No. AS353 ... **4D.** each



CABLE CLIPS, BUCKLES

Cat. No. AG514 ... **1/2D.** each, **5D.** doz.

WOODEN ERA BLOCKS

Cat. No. AG78—Era Blocks, with connectors ... **3/—**

WOOD BLOCKS

ROUND AND RECTANGULAR WOOD BLOCKS, for mounting switches, ceiling plates, etc. Carefully made and well finished. Recessed. (Made in N.Z.)



Cat. No. AG79—3 1/2 in. Round ... **7D.** each

Cat. No. AG83—3 1/2 x 3 1/2 square ... **8D.** each

Cat. No. AG80—6 x 3 rectangular ... **1/—** each

Cat. No. AG81—9 x 3 rectangular ... **1/4** each

Cat. No. AG82—6 x 6 square ... **1/9** each

FUSES FOR SWITCHBOARDS, ETC.



2-piece Fuse Blocks.
Cat. No. AG160—5 amp. ... **2/—** each

Cat. No. AG161—10 amp. ... **2/—** each

FUSES, ELECTRIC RANGE



Screw Type Fuses are used on nearly all makes of electric ranges and other electrical appliances.

Cat. No. AG41—10 amp.
AG42—15 amp.
AG43—20 amp.
GLASS TYPE—
8D. each

Set of Five costs ... **3/—**

FUSE WIRE CARDS & REELS



AG46—5 amp., on card ... **3d.** each
AG47—10 amp., on card ... **3d.** "
AG48—15 amp., on card ... **3d.** "
AG350—3 amp. (1lb. reels) ... **2/6** "
AG351—5 amp. (1lb. reels) ... **2/6** "
AG352—10 amp. (1lb. reels) ... **2/6** "

CABTYRE RUBBER FLEX

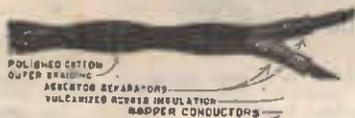


Heavy rubber-covered Circular Flex for extensions in workshop. Flexible. 11/.012.
 Cat. No. AW150—2-wire **1/4** yd.
 Cat. No. AW151—3-wire **1/10** yd.
 Cat. No. AW152—3-wire 40/.0076 **2/2** yd.
 Cat. No. AW155—3-wire 70/.0076 **3/-** yd.

CABTYRE P.V.C. FLEX

P.V.C. Insulated Circular Flex 3-wire for extensions, etc., 23/.0076 **1/8** yd.
 Cat. No. AW148

WIRES, HEATING



23/.0076 Rubber-insulated Asbestos-covered heating flexible. Covered overall with a glazed cotton braid. Used for toasters, and other appliance cords.
 Cat. No. AW230—2-wire **1/4** yd.
 Cat. No. AW231—3-wire **1/10** yd.
 Cat. No. AW240—40/.0076, 2-wire **1/9** yd.
 Cat. No. AW241—40/.0076, 3-wire **2/2** yd.
 Cat. No. AW245—70/.0076, 3-wire **2/8** yd.

FLEX for EXTENSIONS



For 230-volt supply. Handy for extending lights, etc. 23/.0076.
 Twin Twisted Cotton-covered Eng. Rubber Insulated. **9** D. yard
 Cat. No. AW270

CAT'S EYES!

Yes, like a cat's eye it glows in the dark. Rubber attachment allows it to be pushed on to switch knobs and luminous eye glows in the dark saves you groping for switches and marking the wall paper, etc. Fit a Cat's Eye to every switch in the house—Cat. No. AG295 **1/3** each



**RADIO WIRES
SEE PAGE 71**

ART SILK FLEX

LIGHTING FLEX, 23/.0076. Twin wires enclosed in single braided casing. Available in Pink, Green, or Blue flecked. Ideal for ornamental fittings, reading lamps, etc.
 Cat. No. AW274 **10 1/2** D. yard

WIRE, FLEXIBLE

Three-wire, 23/.0076 P.V.C. Flexible for extensions, appliances, etc. Each core is P.V.C. insulated braided overall **1/7** yard
 Cat. No. AW237

RANGE WIRE

Asbestos covered wire for internal wiring of electric ranges, fires, etc. Can be used in any position subject to heat.
 Cat. No. AW84—23/.0076 (Flex) **1/-** yd.
 Cat. No. AW86—7/.029 (Wire) **1/-** yd.

BLACK INSULATING TAPE



Has many uses, such as binding hockey sticks, axes, etc., besides being an excellent means of insulation.

roll
 Cat. No. AS239—10yds. x 3in. **1/-**
 Cat. No. AS237—10yd. rolls x 3in. **1/3**
 Cat. No. AS238—8oz. rolls x 2in. **2/7**

T.R.S. CABLE

Tough Rubber Cable for house and general wiring.

Cat. No. AW60—1/.044 Twin, 1/2 yd. **86/9** 100yd. coils
 Cat. No. AW61—1/.044 Twin and earth, 1/2 yard **106/-** 100yd. coils
 Cat. No. AW64—7/.029 Twin, 2/3 yd. **£9/4/-** 100yd. coils
 Cat. No. AW67—7/.036 Twin, 2/7 yd. **£11/17/-** 100yd. coils
 Cat. No. AW70—7/.044 Twin, 3/5 yd. **£16** 100yd. coils

RESISTANCE WIRE

100 yard Reels of Nichrome Resistance Wire for winding your own Resistors, Shunts, Elements, etc.
 Cat. No. AW380—37 S.W.G. (45 ohms per yard) **1/6** reel
 Cat. No. AW383—40 S.W.G. (200 ohms per yard) **1/6** reel
 Cat. No. AW377—33 S.W.G. (19.5 ohms per yard) **100ft. reel.**

RESISTANCE WIRE

For making Resistor Shunts, Elements and other items requiring high-grade Resistance Wire.
 Cat. No. AW368—24 S.W.G. (4.20 ohms per yard) 40ft. reel **2/6**
 Cat. No. AW370—26 B. & S. 7.562 ohms per yard) 50ft. reel **1/6**
 Cat. No. AW373—28 B. & S. (12.16 ohms per yard) 50ft. reel **1/6**
 Cat. No. AW378—34 B. & S. (45.8 ohms per yard) 100ft. reel **1/6**
 Cat. No. AW379—36 S.W.G. (34.20 ohms per yard) 100ft. reel **1/6**
 Cat. No. AW382—39 S.W.G. (145.6 ohms per yard) 100yd. reel **2/6**
 Cat. No. AW384—40 B. & S. (205 ohms per yard) 100yd. reel **2/9**

TELEPHONES

All Plastic "Magnet" brand wall pattern, hand-set, direct working Telephone, with buzzer and ring key.
 Requires 43 volts per phone to energize. Connect with bell wire. Ideal for inter-office communication, between factory and office, shop and warehouse, etc. Plastic case of modern attractive appearance. Complete with wiring diagram.
 Cat. No. AU50—

£3/19/6 each

SUITABLE BATTERIES FOR ABOVE

Cat. No. AB210—
 3 No. 6 Cells **6/-** each

BELL WIRE

Cat. No. AW113A—60ft. Coils Waxed Cotton covering **2/6** coil



EARPIECES

Heavy Bakelite Earpieces low impedance winding with strong magnets. Complete with diaphragm — without cord.

Cat. No. AX119 **3/11**



TRU-RIP FLEX

Thin Plastic-covered Flex. Two wires laid flat. Handy for wiring Table Lamps, etc.
 Colours: Brown, Black, Red, White, Clear.
 Cat. No. AW272 **9** D. yard
 Cat. No. AW271—Similar to above but 3-wire **1/5** yard

RESISTANCE RIBBON

The following resistance ribbons are available from stock:—

Cat. No.	Resistance Ribbon (approx.)	25 ft. coils	7.587 ohms per yard
AW385	1-16in. x .0035	25 ft.	7.635
AW386	1-16in. x .004	25 ft.	5.709
AW387	1-16in. x .0045	25 ft.	14.17
AW389	1-32in. x .0035	50 ft.	10.04
AW390	1-32in. x .005	50 ft.	8.072
AW391	1-32in. x .006	25 ft.	4.2
AW395	1-32in. x .010	25 ft.	36.07
AW398	1-64in. x .003	100 ft.	

ALL PER REEL 2/6

MOTOR CAR ACCESSORIES

6/8 VOLT SINGLE CONTACT SINGLE FILAMENT LAMPS.

Cat. No.	Candle Power.	Equivalent Wattage.	Location.	Price.
AL300	6	5	Tail	1/6
AL302	15	12	Stop	2/11
AL303	21	20	Head	2/11
AL304	32	25	Head	2/11
AL305	50	35	Head	2/11

6/8 VOLT DOUBLE CONTACT SINGLE FILAMENT LAMPS.

Cat. No.	Candle Power.	Equivalent Wattage.	Location.	Price.
AL306	6	5	Tail	1/6
AL308	15	12	Stop	2/11
AL309	21	20	Head	2/11
AL310	32	25	Head	2/11
AL311	50	35	Head	2/11

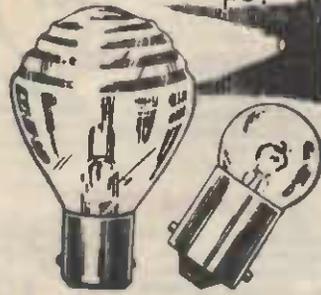
12/16 VOLT SINGLE FILAMENT SINGLE CONTACT LAMPS.

Cat. No.	Candle Power.	Equivalent Wattage.	Location.	Price.
AL312	6	5	Tail	1/6
AL314	15	12	Stop	2/11
AL315	21	20	Head	2/11
AL316	32	25	Head	2/11
AL317	50	35	Head	2/11

12/16 VOLT SINGLE FILAMENT DOUBLE CONTACT LAMPS.

Cat. No.	Candle Power.	Equivalent Wattage.	Location.	Price.
AL313A	6	5	Tail	1/6
AL315A	15	12	Stop	2/11
AL316A	21	20	Head	2/11
AL317A	32	25	Head	2/11
AL318	50	35	Head	2/11

Motor Car Lamps!



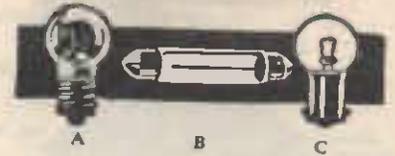
6/8 VOLT DOUBLE FILAMENT HEAD LAMPS WITH STANDARD DOUBLE CONTACT CAP.

Cat. No.	Candle Power.	Equivalent Wattage.	Price.
AL319	21/3 (Ford)	20/3	3/2
AL320	32/6	25/5	3/2
AL321	21/21	20/20	3/7
AL322	32/32	25/25	3/7
AL323	50/50	35/35	3/7

12/16 VOLT DOUBLE FILAMENT HEAD LAMP WITH STANDARD DOUBLE CONTACT CAP.

Cat. No.	Candle Power.	Equivalent Wattage.	Price.
AL327	21/3	20/3	3/2
AL328	32/6	25/5	3/2
AL329	21/21	20/20	3/7
AL330	32/32	25/25	3/7
AL331	50/50	35/35	3/7

SPECIAL INTERIOR LAMPS, Etc.



- A—Ignition Indicator Min. Screw.
- B—Traficator.
- C—Ignition Indicator Min. Bayonet Cap.

6/8 Volts

Cap. No.	Location.	Size, M.M.	Cap.	Price.
AL335	Traficator	38 x 7 1/2	B	2/11
AL336	Festoon	43 x 15	B	2/7
AL337	Festoon	32 x 15	B	2/7
AL338	Ignition Indicator	—	A	1/5
AL339	Ignition Indicator	—	B	1/5
AL340	Dash Board Dial	—	C	1/5

12/16 Volts

Cap. No.	Location.	Size, M.M.	Cap.	Price.
AL341	Traficator	38 x 7 1/2	B	2/11
AL342	Festoon	43 x 15	B	2/7
AL343	Festoon	32 x 15	B	2/7
AL344	Ignition Indicator	—	A	1/5
AL345	Ignition Indicator	—	C	1/5
AL346	Dash Board Dial	—	C	1/5

GARAGE HANDLAMPS



The ideal INSPECTION LAMP for work-shops, garages, factories, etc. Take the light where you want it most. Wooden handle, strong wire protective frame. Fitted with bakelite shockproof lampholder. Globe and Flex extra.

Cat. No. AE95 .. 14/6

"TAR-MAG"

Battery Tonic



Use "TARMAG" to give new life to old batteries, and added life to new ones. It dissolves the basic lead sulphate crystals which prevent electrolyte contact and helps your battery to give its best. For better lighting and better starting — TARMAG.

Cat. No. AA70
6 volt charge, 1 bottle .. 2/9
12 volt, 2 bottles .. 5/6

LIGHTING ACCESSORIES



M.B.C. ADAPTOR
Fits into standard motor car double contact lamp socket for taking extension light leads etc.
Cat. No. AG212 .. 1/9

M.B.C. BATTEN HOLDER

Motor Car lamp holder for Double contact lamps. Batten type. Brass
Cat. No. AG281 .. 2/5

Bakelite, Cat. No. AG283 .. 1/5



M.B.C. CG HOLDER

Motor Car lamp holder for Double Contact lamps. Cord type. Brass Cat. No. AG280 .. 2/5

Bakelite, Cat. No. AG282 .. 1/5

GENERATOR CONDENSERS



Special Condensers for noise suppression on motor cars. 25 mfd. Metal case, Pigtail connection.—Cat. No. AC658 .. 3/6 each

Mail all Orders to—
THE LAMPHOUSE,
11 MANNERS STREET,
WELLINGTON, C.1.

MOTOR CAR RADIO SUPPRESSORS



Spark Plug Type (top illustration). A sturdy unit which meets the most exacting demands for spark plug suppression.

Cat. No. AR229 .. 1/8
Distributor Type—Cat. No. AR228 .. 1/8

The above suppressors will not affect power or petrol consumption of your engine.

MINIATURE SWITCHES

Here's a handy little switch suitable for radio and motor-car work. Positive action. Nicely finished (nickel plated). British made.



Cat. No. AG118 .. 1/10

MOTOR-CAR FUSES



Cat. No. AS200—5 amp.
Cat. No. AS201—10 amp.
Cat. No. AS202—15 amp.
Cat. No. AS203—20 amp.
5 D. each
Length 1 1/2 in.

MOTORIST TROUBLE LAMP

Wood handle and strong wire guard protect the lamp from damage. Will take any standard double-contact motor-car lamp. Can be used from battery or dash-board or used in conjunction with our voltage reducer, Cat. No. AT623. Supplied complete with nine feet twin-flex cord. **10/-** each
Cat. No. AE96



FANS FOR YOUR CAR



Master auto fans—work from your battery. Supplied complete with mounting brackets.
Cat. No. AE117—6-volt .. **£3/19/6**
Cat. No. AE116—12-volt .. **£3/19/6**

BATTERY TESTERS



Hydrometers for testing Car or Radio Batteries. Full size, glass tube type giving an instantaneous, accurate reading. Rubber bulb and nozzle. Don't be stuck—keep a check on your Car Battery yourself. **8/6**
Cat. No. AM305

MOTOR CAR CABLES

The cables offered below are rubber insulated and covered overall with a Glased oil and water proof braid. Ideal for all car wiring jobs whether above or below the chassis.
Flexible Standard Cores.



Cat. No. AW300—9/012 (No. 18) Single (approx. 4M.M.) .. 5d. yard
Cat. No. AW301—16/012 (No. 16) Single (approx. 5M.M.) .. 7d. yard



Cat. No. AW311—9/021 (No. 18) Twin .. 8d. yard
Cat. No. AW312—16/012 (No. 16) Twin .. 9d. yard

7 M.M. HIGH TENSION CABLE



Latest style 7M.M. P.V.C. High Tension cable for spark plug leads etc. **6** D. foot
Cat. No. AW303A

OXFORD MOTOR CAR BATTERIES



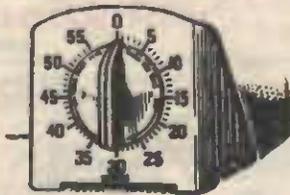
Eighteen month's unconditional guarantee. Solidly built H.D. leak-proof Batteries. Thick plates, built in New Zealand for N.Z. conditions.

CAREFULLY SEALED CELLS
THICK PLATES
LONG LIFE GUARANTEED

Cat. No.	Price.
AA40—6-volt, 9-plate. Width 7in. x length 7in. x height 9in.	£5/1/6
AA41—6-volt, 11-plate, 7in. x 7in. x 9in.	£5/18/-
AA42—6-volt, 11-plate. Squat. 7in. x 7in. x 7in.	£5/7/6
AA43—6-volt, 13-plate. 7in. x 9in. x 9in.	£6/11/6
AA44—6-volt, 13-plate. Squat. 7in. x 9in. x 7in.	£6/1/9
AA45—6-volt, 15-plate. 7in. x 10in. x 9in.	£7/12/6
AA46—6-volt, 15-plate. Squat. 7in. x 10in. x 7in.	£6/18/3
AA47—6-volt, 17-plate, 7in. x 11in. x 9in.	£8/14/-
AA48—6-volt, 17-plate. Squat. 7in. x 11in. x 7in.	£7/18/6
AA49—6-volt, 19-plate, 7in. x 12in. x 9in.	£9/7/6
AA50—12-volt, 7-plate. 7in. x 11in. x 9in.	£7/18/-
AA51—12-volt, 9-plate, 7in. x 12in. x 9in.	£9/5/-
AA52—12-volt, 11 plate, 7in. x 14in. x 9in.	£11/2/6
AA53—12-volt, 11-plate. Squat. 7in. x 14in. x 7in.	£10/3/-
AA54—6-volt, 7-plate. Motor Cycle, 3in. x 4in. x 6in.	£2/13/-

3/- ALLOWANCE WILL BE MADE ON OLD BATTERIES RETURNED.

"SMITHS" MINUTE TIMERS



For Housewives, Photographers, etc. Rings bell when required time elapses for any period up to 55 minutes. Essential for perfect sponges or pressure cooking. Made by world-famous manufacturers of clocks and instruments. Setting pointer to number of minutes required, automatically winds timer which rings single gong after minutes have expired. Size 3in. x 3in. x 2in. deep. **26/6** each
Cat. No.—AU118

AMBERLITE SCREWDRIVERS

Pocket sizes in Amberlite Screwdrivers, all with pocket clips.

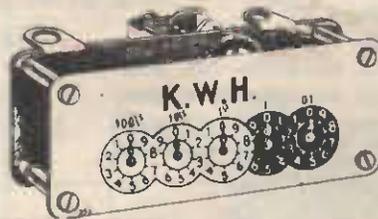
Cat. No. AU316—1in. stem	} ALL 1/4 each
AU317—2in. stem	
AU318—3in. stem	

"KITCHEN TIDY"



The modern version of a small hygienic rubbish bin. Outside metal container sprayed either Cream or Green. A handy sized galvanised bin (8in. x 9in.) complete with handle, slips inside this container and can be removed and emptied at frequent intervals. Just press the metal lever as illustrated and the lid swings open. So attractive, clean and convenient. Height 13in., diameter 9in. **27/6**
Cat. No. AU391

K.W.H. COUNTERS



An exceedingly useful unit, which can be put to a variety of uses by the average experimenter. Can be adapted to count turns when winding coils, chokes, transformers, etc. Will register up to 999 and 99/100th and down to 1/100th of a turn. Removed from electricity measuring meters.—Cat. No. AU140 .. **2/6** each

MAGNETS



Strong Magnets removed from old meters. Useful in every workshop, office, etc., for picking up nails, screws, pins, etc. Every youngster will find dozens of other uses.

Cat. No. AU4 .. **6** D. each

HACK-SAW BLADES
BEST QUALITY.

Cat. No. AU300 .. **6** D. each

RADIO ACCESSORIES

COPPER AERIAL WIRE



- Cat. No. AA496—25ft. Coils 7/23 (7 strand 23 gauge) aerial wire Tinned Copper .. 2/4
- Cat. No. AA497—50ft. coils 7/23 (7 strand 23 gauge) aerial wire Tinned Copper .. 4/4
- Cat. No. AA499—100ft. coils 7/23 (7 strand 23 gauge) aerial wire Tinned Copper .. 6/11

ENSIGN LEAD IN WIRE

Heavy covered, insulated lead in wire. Will stand plenty of swaying and rough weather. Core is of pure copper stranded flexible wire. Ideal for lead-ins and also suitable for motor-car wiring and all other purposes requiring a well-insulated single flexible wire.



- Cat. No. AA504 .. 11d. ft.
- Cat. No. AA505—25ft. Coils .. 2/7 ea.
- Cat. No. AA506—50ft. Coils .. 5/- ea.
- Cat. No. AA507—75ft. Coils .. 7/6 ea.
- Cat. No. AA508—100ft. Coils .. 9/- ea.

"BRONZO" AERIAL WIRE INSULATED

ITS NEW—ITS DIFFERENT—ITS BETTER

BRONZO is different because it is wire made especially for aeriels. Made from phosphor-bronze it will last practically for ever. Core consists of six groups each containing seven fine wires making 42 strands of wire, which not only makes for highest tensile strength, but also ensures best possible reception through improved "skin effects" (radio frequency currents travel along the surface skin) of the wire. Ideal for lead-ins, as it can be bent and swayed almost indefinitely without breaking. Insulated overall with a waterproof braid.

BRONZO—Ideal for Aeriels

BRONZO—Ideal for Lead-ins

Costs a little more, but is worth many times more than ordinary copper wire.

- Cat. No. AA520—25ft. Coils .. 3/- each
- Cat. No. AA521—50ft. Coils .. 5/6 each
- Cat. No. AA523—100ft. Coils .. 9/6 each

WIRE. TINNED EARTH

- 7/029 (7 Strand) Bare Tinned Copper Earth or Aerial Wire. .. 1 1/2
- Cat. No. AA509 .. 1 1/2

AERTRAX HOUSE AERIAL



Two-piece house aerial is designed for universal mounting and fixing under all conditions, being easily adjustable as required. May be fixed to a wall, window sill, caravan, car, etc., and the aerial can be retracted in a few seconds. The aerial is of robust construction and extremely resilient as it is made from duralium tubing, 7ft. 6in. in length and made in two sections. Wing nut permits easy adjustment, while a O.B.A. screw provides a connection for the lead-in wire.

- Cat. No. AA340 .. 32/- each

AERONET AERIAL



Here's a new aerial. The Aeronet is made of woven metal net, 2 1/2in. in diameter. Although only 25ft. long, it contains over 2,000 feet of copper ribbon wire. It is this enormous collective surface area in such a short overall length that makes it so efficient as an aerial, both for broadcast and short-wave. For outside or inside use.

- Cat. No. AA290— 19/6

THE "NOTENNA" AERIAL ELIMINATOR



Equally successful on both broadcast and shortwaves. Replaces aeriels of all types. Very compact size. No lightning arrester required. Reduces noise, interference and man-made static. Simply attached between aerial and earth terminals on your set and to earth wire. Money back if you are not more than satisfied. Dimensions 4in. x 2 1/2in. x 3in.

- Cat. No. AA110 .. 9/6

The "LAMPHOUSE AERIAL KIT"



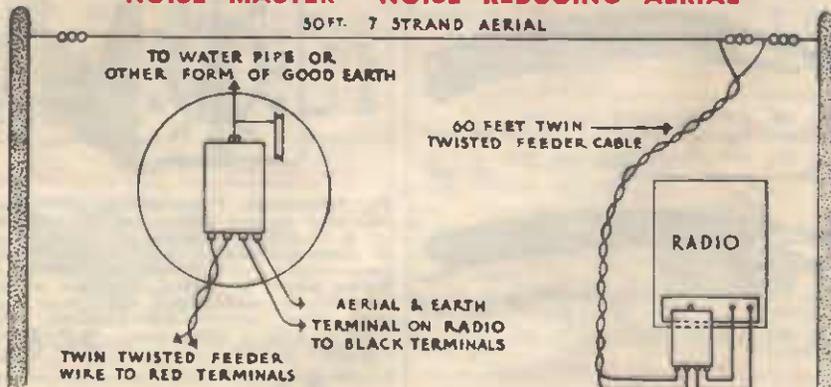
The "Everyman" Aerial Kit consists of standard equipment used in conjunction with all short-wave and broadcast receivers.

Contains: 100ft. 7/23 7-strand Aerial Wire, 4 Egg Insulators, 1 1in. Pulley, 1 Lightning Arrester, 1 Lead-in Strip, 20ft. Lead-in-Wire, 2 Nail Knobs. Actual cost of components if purchased individually, 16/-.

- SPECIAL KIT PRICE— Cat. No. AA599 .. 14/11

"NOISE MASTER" NOISE REDUCING AERIAL

50FT. 7 STRAND AERIAL



For both Broadcast and Dual-wave Receivers. A complete Noise Reducing Aerial System incorporating a Aerial Coupler Interference Eliminator. No wiring or assembling necessary—the aerial system is supplied complete ready to put up. Includes everything necessary with the exception of the supports. A clear diagram is supplied with each unit. Comprises 50ft. aerial with 60ft. of twin lead-in feeder line; two sets of halyard

ropes 24ft. each; Coupling Transformer; insulators, etc.

Ideal for city, suburban and country use as it will combat interference from trams, trains, neon signs, electric motors and other man made static. ALSO, acts as a station booster giving extra volume to weak stations.

- Cat. No. AA590 .. 37/6

The 3 in 1 RADIO TUNER

SERVES 3 BIG PURPOSES

1. Aerial Eliminator.
2. Station Booster.
3. Separates Interfering Stations.

The New DE-LUXE
3 in 1 Tuner

Use as an Aerial Eliminator! **BOOSTS WEAK STATIONS!**

Besides making an excellent variable Coil for Crystal Sets, etc. Depending on the manner it is connected, this useful piece of apparatus serves any of the above functions. Operates on any make or model of radio receiver, greatly enhancing the performance. As an aerial tuner it will improve the reception of weak stations.

As a wave trap it will prevent interference between stations and improve selectivity. As an aerial eliminator it makes an outdoor aerial unnecessary. The tuner can also be used as the tuning coil of a crystal or other small set. Supplied complete with instructions and can be fitted by anyone in a few minutes. Size 5in. long x 2½in. high and 1½in. wide. Printed details with each Tuner.

Money Back Guarantee!
Buy Under Our 7-day

DE-LUXE MODEL
Cat. No. AC300— **ONLY 7/11**

AUTO AERIALS—3 TYPES

"WALBAR" Australian made Motor Car Aerials. Gleaming Chromium plating—Guaranteed Rustless. 3 different models.

3 PIECE DE-LUXE SIDE MOUNTING

A really finished article. Extends in three pieces to 5ft. 6in. First section 2ft., second section to 4ft. and third section to 5ft. 6in. Heavy rubber and chromium mounting plate for side mounting. We can recommend this as a first class De-luxe Aerial.

Cat. No. AA324

52/6

3 PIECE STANDARD SIDE MOUNTING

Extends the same as the De-luxe model to 5ft. 6in. in three sections. Has two sliding plastic cups for firm mounting to side of car.

Cat. No. AA325

42/6

2 PIECE WINDSCREEN MOUNTING

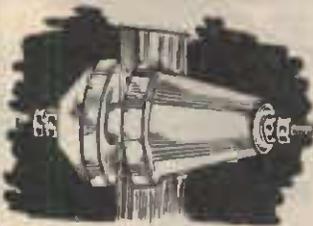
Extends in two pieces to 3ft. 9in. First section 2ft., second section 1ft. 9in. Provided with fastening bolt and clip to attach to centre metal strip on windscreen.

Cat. No. AA326

32/6



JOHNSON'S "FEED THRU" INSULATORS



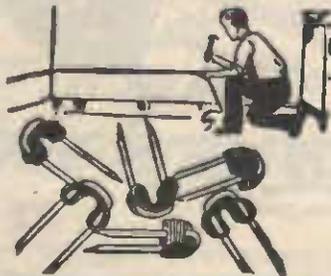
American porcelain "Feed Thru" insulators for feeding wires, etc., through metal panels, etc.

Cat. No. AA620—(Johnson 45) 3in. long
1½ in. Diameter .. **2/6** each

Cat. No. AA619—(Johnson 52) 4in. long
2in. Diameter .. **4/6** each

Cat. No. AA621—(Johnson 47) 7in. long
2in. Diameter .. **7/6** each

INSULATED STAPLES Make a Neat Job!



Insulated Staples are used by all who wish to make a neat job. The fibre insulation in these staples protects the wire and guards against loss of signal strength. British made.

Cat. No. AS118—
2 D. doz. or 11 D. packet, 100

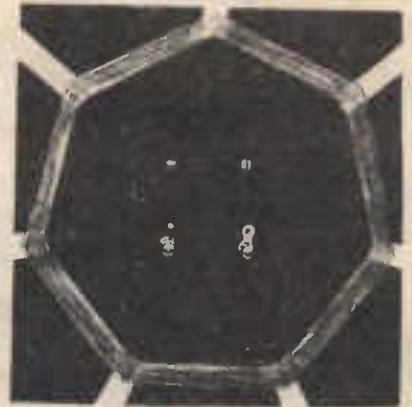
STAPLES

Coppered Staples (not insulated), for fastening earth wires, etc.

Cat. No. AS119— **1½ D. doz.**



AERIAL FOR PORTABLES



Loop Aerial for portable receivers, matched for standard Ensign Coils and fitted with primary winding for use with ordinary aerial when required. Physical dimensions 8in. x 7½in.
Cat. No. AA300 .. **9/6**

Coils to Match

Cat. No. AC306— **8/11**
Ensign Oscillator Coil ..
Cat. No. AC340— **15/6** each
Iron Core I.F. Transformers ..

HI-Q PORTABLE AERIAL

Another first class Portable Radio Aerial. Oval in appearance, measuring 7in. in length with a width of 5½in. A highly efficient diamond weave wound on a linen bonded insulating board, tropicalised and incorporating a primary winding so that an external Aerial and Earth can be added if wanted. Wound for 440 mfd. gangs.
Cat. No. AA303 .. **10/6**

THE "SIDNEY" WAVE TRAP

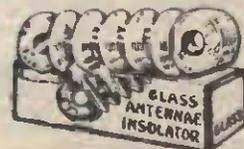


Used to separate stations which interfere or overlap each other. Gives sharper tuning to all size Receivers from Crystal Sets onwards. Will also act as a booster for strengthening weak stations.

Components mounted on a 4in. x 3½in. wooden baseboard. Front panel of light bakelite. Neat appearance. Printed instructions with every set.

Cat. No. AA12 .. **Price 17/-**

PYREX INSULATORS



Pyrex Glass 4in. Insulators

2/6 each



INDOOR AERIAL!

An indoor spring type aerial that will stretch out to about 12 feet across an ordinary room, and will remain in its spiral form. Made from pure copper wire.
Cat. No. AA285

3/10 each

MASTLESS AERIALS



A neat, compact Aerial designed for use in crowded areas, where it is impracticable to erect a pole or horizontal type Aerial. Ideal for flat dwellers, etc. Comprised of several 12 gauge solid copper leads mounted in heavy service insulator. The insulator can be simply attached to any firm structure. Supplied with 25 feet lead-in wire. The Mastless Aerial can be erected in a space of 20 minutes.

Cat. No. AA296

19/-

SHACKLE

Useful iron shackle, clear lacquered, 2in. overall x 7-16in. between arms. Removable pin is threaded. Because they are a War Surplus line, we can sell them for only sixpence each!

Cat. No. AU10—

6D. each



"MARQUIS"

LIGHTNING ARRESTORS



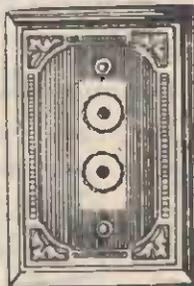
Prevention is better than cure. Make sure your aerial system has a lightning arrester in it to safeguard your set should lightning strike the aerial wire. Australian made Bakelita cased with two connecting terminals. Instructions for fitting with each Arrester.

Cat. No. AA428

2/-

AERIAL AND EARTH PLATES

Eliminate those unsightly wires leading to your set by having them concealed in the wall. This beautiful moulded plate is fitted with two terminals on to which the Aerial and Earth leads to your set connect. The Aerial and Earth proper are connected at the rear of the plate. Moulded in Ivory or Brown Plastic. Modern design.



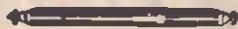
Cat. No. AA460—Brown plastic

2/11

Cat. No. AA461—Ivory plastic

3/3

LEAD-INS, EBONITE



Lead-ins are used for putting through the wall. Consists of brass rod insulated with ebonite. With a nut and washer on each end. Diameter 3/16in. Ebonite Lead-in, 9in. long.
Cat. No. AA404

1/11 each

FLEXIBLE LEAD-IN STRIPS



Flexible Lead-in Strips that can be fitted under windows, when it is not desired to bore a hole through the wall to install a permanent lead-in Tube. Length 9in.

Cat. No. AA405

1/6 each

EGG INSULATORS



Egg Insulators are almost universally used in N.Z. To secure good results you should put two or three on each end of the aerial. N.Z. made.

Cat. No. AA600

5D. each

LARGE EGG INSULATORS

2in. long and 1 1/2in. diameter. Brown glazed.
Cat. No. AA606

10D. each

CLAMP INSULATORS

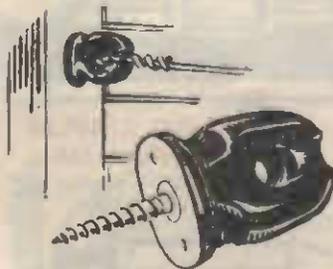


Used for taking wires along outside walls, etc. Made in two pieces, and when screwed up, grip the wire and make a neat and efficient job. 1 1/2in. high, 1 1/8in. diameter.

Cat. No. AA603

7D. each

HOUSE INSULATOR



Used for insulating electrical equipment from the house. Very solidly constructed; has a screw of 2in. length and the porcelain portion measures 3in x 2 1/2in.

Cat. No. AA602

2/2 each

"BUTTON" INSULATORS

For use on Electric Fence installations and for installing wires run along walls, etc. N.Z. made. Brown glazed.

1 1/2 x 1 1/2—Cat. No. AA604
4d. ea., 3/10 doz.
(Screws not included)

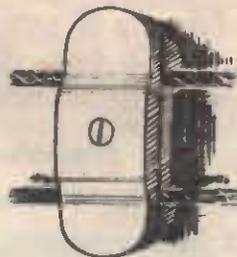
Cat. No. AT588 2in. x 1 1/2 wood screws for use with above



8d. doz.

"CLEAT" INSULATORS

Cleat Insulators for running two wires along walls, etc. 2 1/2in. long, 1 5/16in. wide, 3in. high.



Cat. No. AA605

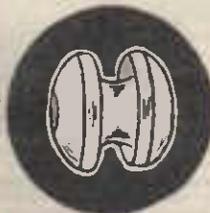
7D. pair

SHACKLE INSULATORS

Used for corner insulators on Electric Fence Units and for other purposes requiring a substantial insulator. Size: 2 1/2in. diam., 1 1/2in. high, 3in. hole.

Cat. No. AA607

1/2 each



3 Link Plastic Chain INSULATORS



AS USED IN ARMY RADIO AERIALS.

Very effective insulators. Put one chain on each end of your aerial. Worth 2/6 each but because they are surplus war stocks, to be sold for a song. Length of 3 links, 9 inches. Weight 3 ozs. only.

Cat. No. AA601

5D. set

PULLEYS— GALVANISED



Cat. No. AA411— 7-inch Galvanised Pulleys

6D. each

Cat. No. AA412— 1-inch Galvanised Pulleys

1/3 each

Cat. No. AA413— 1 1/2-inch Galvanised Pulleys

2/3 each

EARTH CLAMPS

Heavy brass type, N.Z. made. Will ensure a good permanent earth on a water pipe, etc., 1/2in. water pipe size (will fit pipes up to 3in. outside diameter).

Cat. No. AA436—

1/- each

2in. water pipe size (will fit pipes up to 1 1/2in. outside diameter).

Cat. No. AA437—

1/1 each

1in. water pipe size (will fit pipe up to 1 1/2in. outside diameter).
Cat. No. AA438—

1/4 each

EARTH CLIPS



Light adjustable pattern. Has a number of holes so that screw can be shifted. Fits practically all sizes of pipes.

Cat. No. AA434

5D. each

HERE'S 5 GOOD REASONS why you should use an "AERITROL"



A Truly Marvellous "Aid to Better Reception"

1. It will separate interfering stations.
2. It will reduce noise level and interference.
3. It will increase volume of weak stations.
4. It will eliminate outdoor and indoor aeriels. Acting as a perfect aerial eliminator.
5. It controls volume from powerful local stations.

INSTALLED IN A FEW MINUTES, WITHOUT TOOLS!

IT'S SAFE!

IT USES NO ELECTRICITY!
IT COSTS NOTHING TO RUN!

Works on all types of Receivers, battery or electric—old and new. Constructed in strong metal case 4in. x 4in. x 4½in. high. Black crackle finish.

Cat. No. AA1 ... **39/6 only**

**FREE
7-DAY OFFER**

FULL DIRECTIONS
SUPPLIED WITH EACH UNIT

TRY IT OUR RISK!

Send for an "AERITROL" today; try it in your own home for 7 days. If at the end of that time you are not thoroughly satisfied with it return it, and we will refund your money in full.

Cut Out Interference!

"The ENSIGN" LINE FILTER



The best place to stop interference is at its source and if you have a small motor or other Appliance which causes interference in your own or anyone else's Radio, it may be successfully cured by installing an Ensign Filter. The Filter is plugged in to the Power Point and the offending appliance plugged into the Filter. No other installation is required. It can be used on any appliance not exceeding 750 watts. Should it be impracticable to stop the trouble at its source, we must try and stop it from entering the Receiver.

We must decide whether the man-made static, which is proving so troublesome, is being picked up by the aerial or is coming over the power lines or both. A good test is to tune the set to a point where the noise is particularly bad and turn the volume control well up. Now remove the aerial wire and attach it to the earth terminal, but do not remove the earth wire. The effect will be to reduce the noise level, but if the man-made static continues to be very severe you will at once know that at least a portion of the interference is coming over the A.C. power mains, and you will at least need an Ensign Line Filter before you can overcome the trouble. On the other hand, if the noise is entirely eliminated you will know that the noise is being picked up by the aerial and some form of noise-reducing aerial will be required.

Designed for use with electrically operated radio receivers. Simply fits between the receiver and the wall plug. It will definitely stop all man-made static entering through either A.C. or D.C. Mains. Particularly successful in D.C. and on ships with D.C. generators.
Cat. No. AA4 ...

Try this "Policeman of the Airways" at our Risk!

These useful Units have two distinct purposes:

1. To stop interference entering the A. C. Mains at the source of the trouble.
2. To stop interference coming over the Mains from entering the Receiver.

MONEY BACK OFFER

There is no risk in this purchase. Send for the "ENSIGN" LINE FILTER now and try it out. If you are not completely satisfied (You're the Judge) return it within 7 DAYS and we will refund your MONEY IN FULL!

23/6

RENEW THOSE WORN BATTERIES!

"A" BATTERIES

No. 6 DRY CELLS

1½ volt IGNITION or BELL BATTERY.

Size 6½in. high; 2½in. Diam. Weight, 2lbs. 2oz.

Cat. No. AB210—

6/- each



"A" BLOCK BATTERIES

1½ v. "A" Battery, for use in Portable Receivers. Eveready type (742). Size 3½in. x 2½in. x 2½in. Weight 1lb. 10oz.

5/9 each



Cat. No. AB211

1½ v. "A" BATTERY, for large Portables, etc. Eveready type (741). Size 4½in. x 2½in. x 5½in. Weight 5lb. 2oz.

11/1 each

Cat. No. AB212

1½ v. "A" BATTERY, for Home battery-operated Receivers. Eveready type (X250). Size 9½in. x 4½in. x 5½in. Weight 10lb. 12oz. Cat. No. AB214

34/-

SPECIAL "A" BATTERIES



Designed especially for use with Portable Receivers. 1.4 volts. Weight 2lb. 12oz. Length 10½in., width 3½in., depth 1½in.

Eveready Type (No. 745). Cat. No. AB213 **10/3**

"HOTSHOT" BATTERIES

6-volt "HOTSHOT" IGNITION BATTERIES. Eveready type (1461). Size 7½in. x 10½in. x 2½in. Weight 9lb. Complete with canvas carrying handle.

Cat. No. AB224 **31/4**

NEW A-B BATTERY

90-volt B Battery, tapped at 7½ x 9 volts for A supply. Specially made for certain types of portables. Size 9 x 4½ x 2½ (ER753).

Cat. No. AB254 **47/6 each**

9-volt A Battery (ER C16) for use in portables, etc. Size 4½in. x 3½in. x 1½in.

Cat. No. AB227 **9/3 each**

"B" BATTERIES



"Superdyne" 45-volt Heavy Duty "B" Batteries. For home receivers, etc. Extra long life. Eveready type (770).

Size 7½in. x 4½in. x 8½in. Weight 11½lb. Tapped at 22½ volts.

Cat. No. AB235

34/6

The . . . "PORTABLE 45"

45-volt Light Duty "B" Batteries, for use in Portable Radios, etc. Eveready type (762). Size 5½in. x 2½in. x 4½in. Weight 2½lb.

Cat. No. AB237

23/1



"MINIMAX" BATTERIES

45-volt SMALL "B" BATTERY. Used extensively in portable sets. (Eveready type 482).

Size 5½in. x 3½in. x 1½in. Cat. No. AB238— **22/6 each**

3-pin Plugs for above 482 batteries. Cat. No. AT90— **8d. each**

67½ volt "MINIMAX" "B" BATTERIES. For Miniature Portable Receivers. Eveready type (467). Size 3½in. x 1½in. x 2½in. Weight 12oz. Cat. No. AB250 **21/- each**

MOTOR-CAR BATTERIES

We have a full range of Motor-car batteries available. Refer to page 39 for prices and particulars

"C" BATTERIES

(BIAS)

9-volt "C" BATTERY (793). Size 3½in. x 1in. x 5½in. Tapped at 1½, 3, 4½, 6, 9 volts. Cat. No. AB225 **6/6 each**

4½ volt "C" BATTERY (761). Size 3½in. x 1½in. x 4in. Tapped at 1½, 3, and 4½ volts. Cat. No. AB220 **4/7 each**

9-volt "C" BATTERY (739). Special type, now used in many modern portable sets. Size 8½in. x 3½in. x 1½in. Cat. No. AB226 **9/8 each**

NEW LIFE

FOR OLD BATTERIES!



TAR-MAG

TAR-MAG dissolves the gradual deposit of Basic Sulphate of Lead crystals which impregnate the active paste material on the plates, thus preventing the electrolyte contacting with it, with the result the battery ceases to function although there is still plenty of life and usefulness.

TAR-MAG dissolves the crystals and enables the battery to function as new.

TAR-MAG will bring your old battery up to full strength—will increase life of new batteries up to 50 per cent.

For Better Lighting Split Second Starting, try TAR-MAG.

TAR-MAG is a liquid which is simply poured into the cells. Complete with instructions.

Cat. No. AA70— Charge for 6-volt Battery **2/9**

Cat. No. AA70A— Charge for 12-volt Battery **5/6**

TORCH BATTERIES
ALL TORCH BATTERIES ARE LISTED ON PAGE 28.

LAMPHOUSE GUARANTEE

Any goods that prove in any way unsuitable may be returned undamaged within seven days from receipt and your money will be refunded in full.

" OXFORD " RADIO BATTERIES

'OXFORD' Non-Sulphating Special Type RADIO BATTERIES

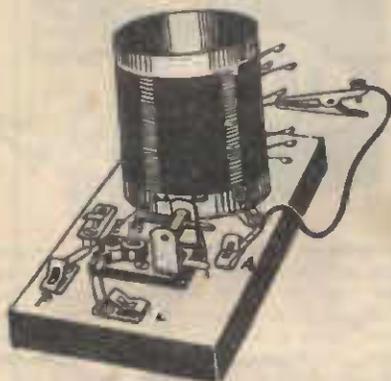
Heavy duty solidly constructed leak-proof Batteries that deliver maximum power. Thick plates, carefully sealed cells; built for long, enduring, trouble-free service. With radio type terminals; 18 months' unconditional guarantee. Batteries are supplied dry unless specially requested otherwise. They can also be supplied charged and filled with acid, at no extra cost, but freight is payable by purchaser on all charged batteries.

Cat. No.	AA20—2-volt, 100 amp., 4½ x 7 x 9½	£2/10/3
AA22—2-volt, 14 amp., 4½ x 7 x 9½	£3/2/-	
AA23—6-volt, 100 amp.; 7 x 9½ x 9½	£6/8/-	
AA24—6-volt, 140 amp. Type for Vibrators— 7 x 11½ x 9½	£8/7/6	
AA26—6-volt, 160 amp. Type for Vibrators— 7 x 12½ x 9½	£9/4/9	



CRYSTAL SETS AND HEADPHONES

"ECONOMY" CRYSTAL SET



A very simple and inexpensively designed but efficient Crystal Set, comprising a multi-tapped Coil and Catwhisker type Crystal Detector mounted with Fahnestock Clips on wooden base-board. Simple in operation. Full instructions enclosed with each.

Cat. No. AC290 ... **15/6** each

Price does not include Headphones.

"DIAMOND" CRYSTAL SET



Originally designed for areas where the ability to separate local stations was a prime consideration, these Crystal Sets will be found quite suitable for use in districts at a considerable distance from powerful broadcast stations. Our test model worked well 100 miles away from 2YA's arial. Complete with instructions.

Cat. No. AC293 ... **29/6**

(Price does not include headphones.)

"RED DIAMOND" DETECTORS



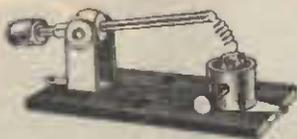
Red Diamond Detectors are the semi-permanent type. Can be adjusted by moving the plunger. Sensitive, and give good results.

Cat. No. AC270 ... **5/9**

Spare Pairs of Crystals for Red Diamond Detectors—

Cat. No. AC271 ... **3/6**

DETECTORS



Oxford Crystal Detectors, complete with catwhisker and crystal. **4/3**
Cat. No. AC255



Galena Crystals, in packets. **6D.**
Cat. No. AC287

CRYSTALS

"LUCERNE" Crystals. Packed in small packets and supplied complete with Catwhisker. British manufacture.

Cat. No. AC286—**8D.** packet

CRYSTAL SET COILS



Coils for Crystal Sets. Consist of 70 turns, 24-gauge D.C.C. Wire on 3in. diam. bakelite former. Tapped every tenth turn.

Cat. No. AC266 ... **4/-** each

LOGGING D.X.



BROWN'S ENGLISH HEADPHONES

A really first-class pair of Headphones; comfortable and easily adjustable. All bakelite headpieces. Total impedance 2000 ohms. Fitted with 3ft. flexible cord. Excellent quality reproductions.

Cat. No. AC245 ... **25/-** pair

HEADPHONE CORDS

6ft. Headphone Cords Two lots of 2 leads for connecting to phones and terminating at other end in two leads for attaching to set. Plastic wires, braided and cotton braided overall.

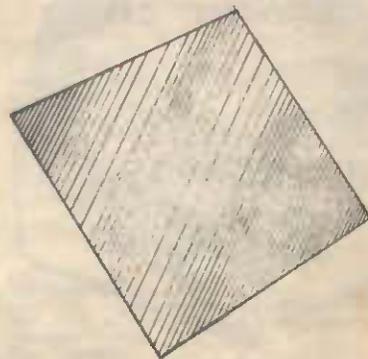
Cat. No. AC203 ... **3/6**

SPARES FOR "BRANDES" HEADPHONES

Spare Caps for Brandes Phones. **3/6** each
Cat. No. AC206

RADIO PANELS

"PANICA" RADIO PANELS



Panica Radio Panelling is practically indestructible. It has high insulating properties, is non-hydroscopic, and has great tensile strength. Panica is easily worked and can be cut, sawn and drilled, has a high polished black mirror finish on both sides, suitable for panels of Radio Sets, test instruments and other apparatus. The sizes given below are approximate, but each panel supplied will cut to size stated.

- Cat. No. AP510—32in. x 62in. x 1/16in. **2/-**
- Cat. No. AP511—82in. x 62in. x 1/16in. **3/-**
- Cat. No. AP512—112in. x 62in. x 1/16in. **4/-**
- Cat. No. AP513—32in. x 62in. x 1/16in. **4/-**
- Cat. No. AP514—82in. x 62in. x 1/16in. **6/-**
- Cat. No. AP515—112in. x 62in. x 1/16in. **8/-**
- Cat. No. AP516—32in. x 62in. x 3/16in. **6/-**
- Cat. No. AP517—82in. x 62in. x 3/16in. **9/-**
- Cat. No. AP518—112in. x 62in. x 3/16in. **12/-**

BAKELITE SHEETS

Thin Bakelite Sheets for all insulating purposes.

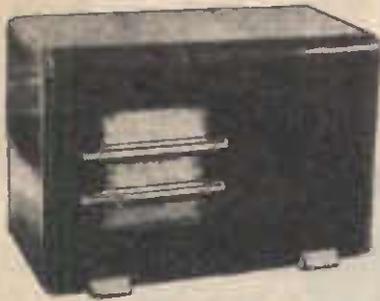
- Cat. No. AP532—12in. x 12in. x 1/32in. **2/10**
- Cat. No. AP533—6in. x 6in. x 1/32in. **10d.**
- Cat. No. AP535—6in. x 33in. x 1/32in. **6d.**

MICARTA PANNELLING

A beautifully finished Radio Panelling. Laminated, with a very shiny surface. Coloured brown. You can find many uses for panelling such as this at a price like this.

- Cat. No. AP526—6in. x 6in. x 1/16in. **1/-** sheet
- Cat. No. AP525—12in. x 12in. x 1/16in. **2/6** sheet
- Cat. No. AP524—12in. x 24in. x 1/16in. **5/-** sheet
- Cat. No. AP523—24in. x 24in. x 1/16in. **10/-** sheet

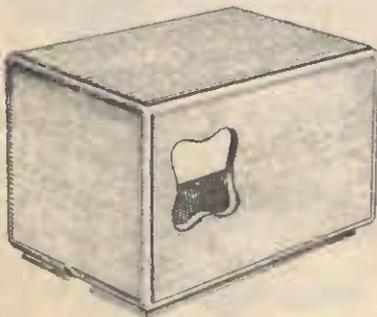
"COVENTRY" MANTEL CABINET



A modern Mantel Cabinet to take a small broadcast or shortwave receiver. Richly veneered. Well made. Takes 5in. speaker.

Dimensions: Length 16in., depth 7½in., height 10in. Cat. No. AC152 .. **70/-**

"ECONOMY" CABINET



An attractively designed low price cabinet to take small electric or battery sets of 3 or 4 valve size. Finished in a glistening ivory enamel and with a cut-out to take a 5in. Speaker. Cabinet measures 10½in. long, 6½in. high, and 7½in. wide. Similar cabinet to that used with our New "Easy Built Bedroom 3." Cat. No. AC156 .. **27/6**

"CLASSIC" SPEAKER CABINETS



The "Classic" is a well-made, richly-veneered cabinet made for extension speakers or for call-systems which are being used so extensively at present. Will take an 8in. or a 5in. Speaker and are supplied with fawn speaker cloth. Honey coloured trimmings. Dimensions: Length 12in., depth 6½in., height 10in. **49/6** each Cat. No. AC151

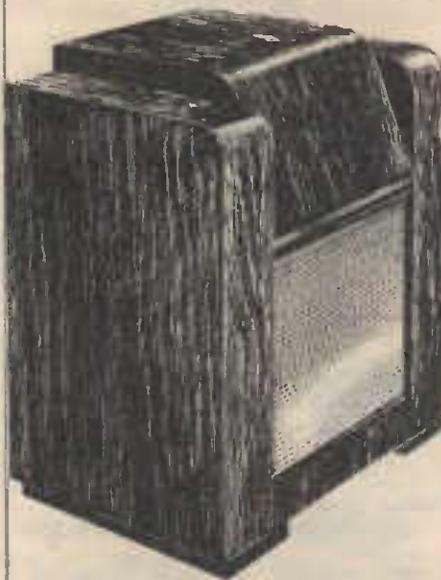
SPARE BULBS FOR BATTERY CHARGERS

(TUNGAR TYPE.)

Cat. No. AA189—2 amp. .. **£1/7/6**

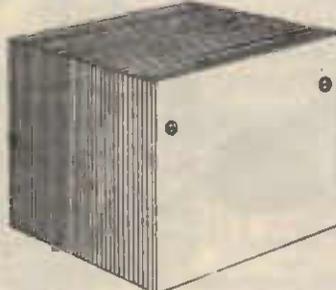
Cat. No. AA190—6 amp. .. **50/-** each

"COLORADO" CONSOLE CABINET



Beautifully Veneered Console Radio Cabinet of modern design. Height 34in., width 22in., depth 13½in. A well-made Cabinet at the right price. **£14/10/-** Cat. No. AC160 ..

"HIKER'S ONE" CABINET



A neat compact little Wooden Cabinet to take the "Hiker's One" or sets of a similar nature. Measurements: Width 7½in., height 7in., depth 6½in. Gives your little receiver that finished look. **14/6** Cat. No. AC154 ..

"OXFORD" VIBRATOR PACK



This pack has been designed specifically for the conversion of battery radio receivers to vibrator operation and contains the necessary high tension and low tension filtering.

ELECTRICAL SPECIFICATIONS: Input, 6 volts 1 amp.; Output, 135 volts 30 milliamp.; Reed, 5 pin synchronous.

FILTERING: Complete filtering is provided both for R.F. and Audio. This means to say that in addition to the normal R.F. chokes, there is included in the unit a high tension filter choke and a low tension filter choke.

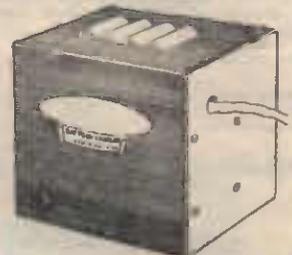
MECHANICAL ARRANGEMENT: The reed, transformer and R.F. chokes are contained in a completely enclosed box which is rubber-mounted on to the base chassis. The rubber mounting eliminates mechanical noise due to the vibrator operation. Totally enclosed in a heavy aluminium case measuring 9in. x 5½in x 3in. **£7/19/6** Cat. No. AA213 ..

THE "ENSIGN" ½ AMP CHARGER



You never need to be stuck with a run-down Car or Radio Battery. These units will charge all types of 6-volt Batteries. Operate from 230 volt A.C. Current. Connect direct to Battery. Uses ½ amp. Dry Metal Type Rectifier. Size of Sprayed Metal Case: Length 8in., Height, 5½in.; depth, 4in. **£4/15/-** Cat. No. AA220 ..

ENSIGN 5 AMP. CHARGERS



Heavy Duty 6-volt 5 amp. Ensign Chargers. Will charge all types of 6-volt Wet Batteries. Operates from 230-volt A.C. Connect direct to battery. Uses a 5 amp. "Westinghouse" Dry Rectifier. Mounted in crackle finished metal case, length 6½in., height 6½in., width 4½in. **£6/10/-** Cat. No. AA236 ..

VIBRATORS



Vibrator Units for replacements or for constructors. Positive starting long-life Vibrators. Low cost per hour. Trouble-free operation.

6-volt Non-synchronous 4-pin type. Cat. No. AB60 .. **25/-**

6-volt Synchronous 5-pin type (for special socket). Cat. No. AB61 .. **27/6**

6-volt Synchronous 5-pin type (standard socket). Cat. No. AB62 .. **27/6**

6-volt Synchronous 6-pin type. Cat. No. AB64 .. **27/6**

Sockets for Vibrators—5-pin special type. Cat. No. AB63 .. **1/-** each

12-volt 6 Pin Vibrators. Cat. No. AB67 .. **9/11** each

DRY RECTIFIERS

6-volt, 1-amp. METAL PLATE RECTIFIERS. Suitable for Resistance or Inductive loading and Battery Charging, etc. For use with C.T. Transformer. Voltage across Secondary, 19 volts. C.T. at 9.5 volts. Copper on Secondary carries .35 amp. continuous running.—Cat. No. AA175 .. **18/6** each



6-volt, 2-amp. similar to above. Suitable for 2-amp. Battery Chargers. Copper on Secondary carries 1.4 amp. continuous use.

Cat. No. AA176 .. **33/6** each

SHERLOCK HOLMES SAYS..

"Don't guess at the trouble
TEST WITH
PIFCO
RADIOMETER"



Pifco goes straight to the heart of the trouble, testing sets and components with equal ease and speed. Any radio set can be tested, either A.C. or D.C. Mains or Battery operated. Solidly constructed in a fine bakelite case 4in. x 2½in. overall. The Pifco Radiometer has readings for high and low voltage, milliamperes, continuity test, etc.

The "ALL-IN-ONE" RADIOMETER for A.C. or D.C.—For testing electric or battery radio sets. Anybody can trace faults with this wonder instrument. Finished in black bakelite. Size of dial 1½in. by ½in., complete with leads. Ranges: 0-240 volts, 0-6 volts, 0-30 M.A., and continuity test.

Amazing Value at the Low Price!
Cat. No. AM103 **39/6**

Cat. No. AM50—
Spare Fuses for Meters **1/3 ea.**

The "RADAMETA" VALVE-TESTER and MULTI-METER

Another Great Value in Test Equipment the "RADAMETA" Mutual Conductance VALVE TESTER and MULTI-METER

This Tester is a modern instrument, featuring a Roller-Chart Dial.
Tests modern Octal-based Tubes. Multi-Meter reads over 21 ranges.

IT'S PORTABLE! WEIGHS ONLY 13lb.
Four ranges milliamperes 0/1, 0/10, 0/50, 0/250. Three ranges ohms 0/300, 0/50,000 0/10 megohms. Five ranges D.C. volts (1000 O.P.V.), 0/10, 0/50, 0/250, 0/500, 0/1000. Five ranges A.C. volts (1000 O.P.V.) 0/10, 0/50, 0/250, 0/500, 0/1000, (all at 50 cycles). Five ranges output volts at 400 cycles 0/10, 0/50, 0/250, 0/500, 0/1000. Three ranges electrolytic and paper condenser tests. Line check for 240 volts A.C., 50 cycles.

Inter-element shorts test on all valves. Trans-conductance tests on valves direct reading in MA/V. Emission test on rectifier and diode valves. Gas test on all types of valves tested by trans-conductance method. Current consumption 240 v. 50 cycle 40 watts. 6 volt D.C., 2 amps.

Cat. No. AM405 **£37/10/-**



"BURLINGTON" 0-1 m.a. Meters



3in. Square Bakelite Case "Burlington" (U.S.A.) Meters, 0.1 m.a. D.C. 85 ohms internal resistance; 1000 ohms per volt.

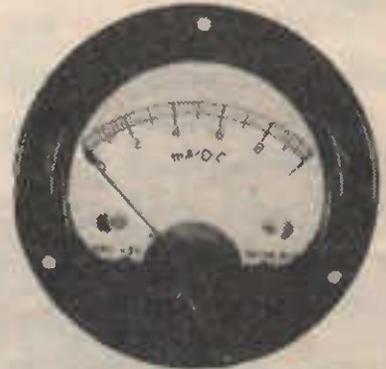
Cat. No. AM17—
59/6 each

"WESTON" 0-1 M.A. METERS

3in. Square Bakelite cased "Weston" Meters. 0.1 M.A.; D.C.; 105 ohms internal resistance; 1000 ohms per volt.

Cat. No. AM10 **62/6 each**

0-1 M.A. METERS



0-1 M.A. Moving Coil D.C. Meters. 1000 ohms per volt. Internal resistance 60 ohms. DE JUR (U.S.A.), 2½in. Round Scale, 3½in. Outside Diameter.
Cat. No. AM15 **£2/10/-**

WAR BARGAINS!

METER RECTIFIERS



5MA COPPER OXIDE METER RECTIFIERS.

Mounted on plastic sheet 1½in. x ½in. Ex-Army stocks, at a fraction of their true value. **8/6 each**
Cat. No. AM45

METER SPECIAL!



"Weston" 0/100 M.A. 2½in. round R.F. thermo-coupled milliammeter. Flush mounting—plastic case.

GREAT VALUE!
Cat. No. AM23 **29/11 each**

"Ferranti" 0/100 M.A., D.C., 2½in. round meter with luminous dial. **35/11 each**

Ferranti 0/500 Micro-Amps, 2½in. moving coil meters.—Cat. No. AM24 **24/11**

GOLDRING PICK-UPS

Combine advantages of light weight with standard model. Have high outputs, good bass response and easy needle changing. Wide-frequency range and light record wear. Suitable for use with steel, fibre, or sapphire needles.

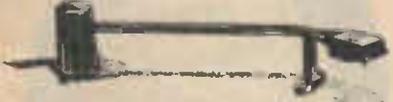


Bentam model, brown plastic. **30/9** each
Cat. No. AP312



Supree ivory plastic model. **40/6** each
Cat. No. AP313

NEW LIGHT WEIGHT MODEL



Features moulded base and head with chrome arm. Has pressure of less than one ounce ensuring minimum record wear. High fidelity reproduction with good volume makes this an ideal pick-up for use with all types of radios and amplifiers. Supplied complete with sapphire permanent needle. **55/-** each
Cat. No. AP311

"ACOS" CRYSTAL PICK-UPS



Another top line Cosmocord Crystal Pick-up. Gives crystal clear reproduction to all recordings. Play the records you like when you like, through your own radio by using the "Acos" Crystal cartridge is fitted in a streamlined plastic arm. Needle pressure 35 gms. English manufacture. **44/-**
Cat. No. AP308

Cat. No. AP335—Spare Crystals **18/6** each for above

PICK-UP NEEDLES

"Songster" brand Bronze Pick-up Needles. Play approximately 8 records per needle. Packed in tins of 100. **1/5** tin
Cat. No. AP330

GOLDRING SAPPHIRE NEEDLES

Jewel point used with good recordings these needles will play thousands of records. The answer for a permanent needle. Eliminates constant needle changing. Guarantees high fidelity reproduction and gives longer life to your records. Trailer type. **11/-** each
Cat. No. AP332

CRYSTAL MICROPHONES



Technico Crystal Microphones. Diameter 2in., depth 3in. Chrome fittings. Head swivels on mounting connecting piece which is threaded for fitting on to stands. Supplied complete with connecting cable. Ideal for use with Lamphouse and other amplifiers. Full instructions for use with different types of circuits. **149/-** each
Cat. No. AM167

"GARRARD" RADIOGRAM UNITS



Model A.C.6

Consisting of an **ELECTRIC GRAMOPHONE MOTOR** with a Magnetic Pick-up mounted. On-off switch is incorporated in the tone arm and a variable speed regulator is attached to the frame. 230 volt A.C.; 10in. Turntable; Induction Motor. Just plug it into a light socket or power point, connect to your Radio and you play the music you like. **56/4/6**
Cat. No. AP299

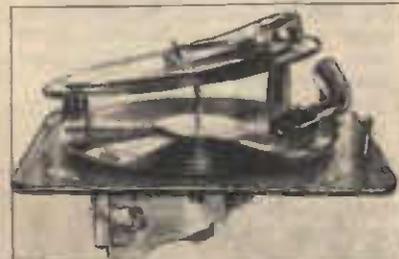
Model "S"

Similar in most ways to the A.C.6 described above but using a drum drive motor. Maintains a speed of 78 R.P.M. with ample torque to play the heaviest recordings. Automatic stop. Magnetic Pick-up. A simple, inexpensive unit maintaining the well known Garrard standard of quality and reliability.

NEW LOW COST! **£4/17/9**
Cat. No. AP298

"GARRARD" AUTOMATIC RECORD CHANGERS

Model A.C.65



"GARRARD" Units and Changers are recognised throughout the world as the peak in Radiogram Units. The Electric Motor, Magnetic Pick-up and Automatic Record Changer combined (as illustrated) will take 8 records, either 10in. or 12 in., and play them through from start to finish without any attention whatsoever. Automatic devices lift tone arm from record when finished and place the next disc in position. Induction motor 230 volts A.C. Complete with full details. **£15/1/3**
Cat. No. AP301

Model R.C.70

Similar to the AC65 model described above but using the new Garrard Drum Drive Motor and maintaining a constant speed of 78 R.P.M. Plays up to 10 recordings either 10in. or 12in. Will not stack mixed recordings. No electrical interference when motor is running.

GREAT VALUE! **£9/16/9**
Cat. No. AP302

METER SHUNTS

Meter Shunts wound for use with 0.1 M.A. Meters, with internal resistance of 100 ohms. Bobbin wound. Accurately adjusted. Length 1 1/2in. Diameter 3/4in.

Cat. No. AM70—25 milliamp } **5/-**
Cat. No. AM71—50 milliamp } each
Cat. No. AM72—100 milliamp }
Cat. No. AM73—250 milliamp }

Special sizes may be made to order.



"NE-O-LITES"

Every Experimenter and Serviceman should have one!

Neon Indicator attached to prods.

Here's what it does:

1. Will test any current from 110 v. to 550 v., and will indicate the voltage.
2. Will tell instantly whether A.C. or D.C. current.
3. Will detect live and earth wires.
4. Will give a temporary pilot light on any electrical apparatus.

Cat. No. AM254 **5/11** each

GUIDOR HYDROMETERS



For testing acid in car and radio Batteries. British Patent guide in glass container prevents float from sticking and gives instantaneous dead-beat reading. Float protected by rubber guide ring to prevent breakage. Hexagon rubber bulb prevents rolling. Full directions.

Cat. No. AM305— **8/6** each

Cat. No. AM304—Spare Floats **1/9** each

"OXFORD" TEST PRODS



Polished Ebonite Handles and complete with flexible leads. **7/-** pair
Cat. No. AM1

"MARQUIS" TEST PRODS



Plastic handled Test Prods. Coloured Red and Black. Length 4in. Diameter 3/4in. Supplied without leads. **3/8** pair
Cat. No. AM5
Suitable flexible leads would be Cat. No. AW300 Cellulose Covered Lead 5d. yard

"COILVARN"

QUICK DRYING INSULATING VARNISH



Coilvarn is a fast-drying moisture-proof Coil Dope. Painted over Coil Windings it will hold them rigidly in place and prevent the atmosphere getting at the windings. Excellent for coating Coil Formers before they are wound, and for impregnating wood panels so as to ensure they do not absorb moisture. Coilvarn can also be used for mending Speaker Cones, and a hundred and one other Radio jobs, requiring a first-class insulating varnish or cement.

Every experimenter or serviceman should keep a jar of COILVARN on hand.

Cat. No. AU200 **2/-** jar

8 MONSTER PAGES



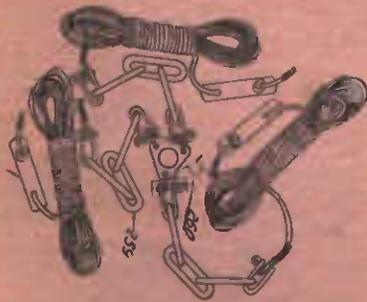
GREAT Values!

★★★

WAR SURPLUS BARGAINS!

BARGAINS WE WON'T BE ABLE TO REPEAT!

GREAT BARGAIN! AERIAL STAY SETS



Complete 3 rope Aerial Stay Set to give rigid support to your Aerial Mast. Comprises 3 sets of proofed halyard ropes each 24ft. in length with a 3 Link Plastic Chain Insulator on end of each rope. Insulators fasten to canvas mounting plate (as illustrated) by means of two U shaped shackles. A wooden tightener is attached to each rope. These Aerial Stay Sets would be great value at 10/- but another bulk purchase from War Surplus enables us to sell at the gift price of **3/11** set
Cat. No. AX1067

BARE COPPER WIRE

8 A.W.G. Bare Copper Wire. **1 1/2** D. ft.
Cat. No. AX1560

METAL STAY PLATES

Metal plates triangular in shape 2in. x 2in. x 2in. with small ringlets attached to each corner to take ropes (As illustrated with Aerial Stay Set across page). Has 1in. hole in centre. Handy little junction piece for Aerial systems.
Cat. No. AX1299 **4** D. each

ZC1 WHIP AERIAL ADAPTOR
Used for joining whip section to main mast section on ZC1 Aerials. **3/6** each
Cat. No. AX1073

O.S. EGGS

Egg Insulators, large size. 5in. long x 3 1/2 in. diameter. **2/6** each
Cat. No. AX1474

BRASS AERIAL RODS

Three foot lengths brass tube, 1/2 in. diameter, threaded so that each end will fit into next section and thus make a continuous length. The experimenter will find many uses for these rods. **2/6** each
Cat. No. AX1509

ROPE WAR BARGAIN

23ft. lengths, light rope with eye bound into one end. Treated to withstand weather. Originally intended for aerial stays. New. **6** D. each
Cat. No. AX1532

"UMBRELLA" ANTENNA

USED WAR EQUIPMENT.
Aerial System as Originally Used in Army, No. 11 Transceivers.



Comprises 5 three-foot lengths of 1/2 in. heavy-weight copper tubing which are screwed into each other giving a total length of 15ft. A Special Adaptor fastens to the top tube and provides for the connection of the 4 whips which mount at right angles to the tubing. Each of the 4 whips is 35in. in length, 1/2 in. diameter. A heavy rubber mounting base and spike is provided for mounting and a complete Stay Set, together with insulators, halyard tighteners, etc., is also included to give added support to the mast.

An excellent house Aerial. **45/-**
Cat. No. AX1552

ARMY ZC1 TRANSCEIVER AERIALS

Excellent as House or Car Aerials

Comprises three 6ft. lengths 1/2 in. pipe, four 4ft. lengths metal tubing, size varying from 1/2 in. at one end to 1/4 in. at the other; set of aerial stays, reducer (for fitting thin section of aerial into heavy section), one rubber sorket for heavy section, one rubber socket and insulating condenser for mounting thin (whip) section only. May be used as a vertical house type antenna, or whip section. Could be used as car or caravan aerial. Supplied complete with carrying bags.—Cat. No. AX1085. Price **£3 2/6**

Whip Section Only

Consists of four 4ft. sections Metal Tubing varying from 1/2 in. to 1/4 in. diameter. These being approx. 16ft. long and light in weight make ideal elements for 10 metre rotary beam antennas, in addition to being suitable for auto, caravan and home use. Complete in canvas bag.—Cat. No. AX1080, Cadmium plated **14/-** Price
Ditto, but copper.—Cat. AX1623 **18/6** ea.

Sizzling War Surplus Bargain



3 Link Plastic Chain INSULATORS

as used in Army Radio Aerials. Very effective insulators. Put one chain on each end of your aerial. Worth 2/6 each but because they are surplus war stocks, to be sold for a song. Length of 3 links, 9 inches. Weight 3 ozs. only. **ONLY 5** D. each
Cat. No. AA601

VALUES IN SURPLUS WAR STOCKS

I.F. TRANSFORMERS



Each Transformer tested under rigid army supervision. The finest money can buy, and only half the price of ordinary I.F.S. 465 k.c. Iron Core.
 Cat. No. AX1006—No. 1 I.F. **7/11** each
 Cat. No. AX1007—No. 2 I.F. **7/11** each

WAR SURPLUS BARGAINS!

TRANSMITTER EXCITER UNIT

Comprises 3-gang Tuning Condenser and Dial, together with Oscillator and Buffer Coils, R.F. Chokes, 2-gang Wave Change Switch and associated Resistors and Condensers. Ruggedly constructed Unit—cadmium plated. Both coils are completely shielded and provided with switchings to cover from 1.9 to 8 Mc. Unit uses two 6U7G Valves—one as an electron coupled oscillator and one as a single ended buffer. These tubes are not included in the price.
 Cat. No. AX1009 .. **18/-** each

Similar unit to above, but less dials, R.F. choke, wave-change switch and trimmers.
 Cat. No. AX1190 .. **15/-** each

COIL MOUNTING BASES



Seven-hole oblong bases of hi-test ceramic insulating material. 4 1/2 in. x 1 1/2 in. 5-16 in. thick. Invaluable for mounting coils and components where high insulation is desirable.
 Cat. No. AX1503— **6D.** each
 5-32 in. diameter holes

MEG POTENTIOMETERS

Carbon. Pots. as used in ZC1 Transceivers.
 Cat. No. AX1041 .. **3/-** each

SCREWS AND NUTS

Fine Screws with nuts. Iron. Counter sunk head, 5/8 in. long x 3/48. Cat. No. AX 1212 **6D.**
 Chrome head 7/8 in. long x 3/48. Cat. No. AX1213 **4/6** Gross

COILS FOR T1803 R.A.F. TRANSMITTERS

Master Oscillator Coils

These coils are constructed of 12g. silver plated copper wire 2 1/2 in. in diameter, rigidly mounted on four "Kermit" supports. The coil is mounted in a complete unit and the inductance is continuously variable from 2 1/2 to 12 turns by sliding contact. The dial indicates the number of complete turns in use, and also the portions of the last turn to one degree. The coupling coil is fitted with two tapings, and is fully adjustable from maximum to minimum coupling with a dial indicator showing the degree of coupling. Plugs 1/4 in. diameter are fitted on the base of the assembly for plug-in purposes, if required. Two small fixed capacitors are mounted on the unit—one air dielectric, and one mica, both of at least 1500 volt working.

Amplifier Coils

Similar in construction to the Master Oscillator coils described above with the exception that there is no coupling coil and no mica capacitor. The diameter of the winding is 3 in. and the inductance of the coil is continuously variable from 0-12 tapings.

Both coils described above are supplied complete in a wooden box measuring 9 in. high, 6 in. x 6 in. with hinged lid.
 Cat. No.

AX1288—Amplifier Coil	Range A	15,000-10,000 K.C.	3/11
AX1289—Amplifier Coil	Range B	10,000-6,000 K.C.	3/11
AX1293—Amplifier Coil	Range C1	3,000-15,000 K.C.	3/11
AX1294—Master Oscillator	Range C1	3,000-15,000 K.C.	8/6
AX1296—Master Oscillator	Range D	500-136 K.C.	8/6

COILS

Coils for 1084 Army Transmitters:—

Cat. No.	Range	Kc.'s
AX1512—A	20,000-14,300	
AX1513—B	14,300-10,700	
AX1514—C	10,700-6,000	
AX1515—D	6,000-4,285	
AX1516—E	4,285-2,500	
AX1517—F	2,500-1,600	
AX1518—G	1,600-1,000	
AX1519—H	1,000-600	
AX1520—J	600-350	
AX1521—K	350-200	
AX1522—L	200-120	
AX1523—	180	
AX1524—	40	

ALL
2/- EACH
 TO CLEAR

Wood Boxes to hold one of any of above Coils.

Cat. No. AX1525	16 Coils in case for Type 1083. Army receiver.	1/6 each
Cat. No. AX1528	Individual Coils for X1083 Transceiver.	12/- set
Cat. No. AX1526	Individual Coils for X1083 Transceiver.	1/- each

SOCKET PLATES

Each contain 2 octal wafer sockets, 2 mica condensers and a resistor
 Cat. No. AX1096 .. **1/9** each

WAR SURPLUS BARGAINS!

Coils, removed from NEW ZC1 Army Transceivers. In perfect working order. Never used.

Short Wave Receiving Coils—Aerial

Wound on 3/4 in. diam. former. 465 k.c. Iron Core. Fitted on to mounting terminal base. Lug connections. Shielded in can. Dimensions: 3 in. high x 1 1/2 in. x 1 1/2 in., 4 to 8 M.C. **9D.** each
 Cat. No. AX1003 ..

Oscillator Coils

Similar description to above mounted in can 2 in. high x 1 1/2 in. x 1 1/2 in. Air Core. **1/6** each
 Cat. No. AX1005 ..

R.F. Interstage Coils

Similar details to above Aerial coils.
 Cat. No. AX1004 .. **1/6** each

B.F.O. Coils

For use with 465 I.F. Transformers and complete with .001 and .005 mfd. 5 per cent. Tolerance Mica Condensers. Shielded in can. Dimensions: 2 in. high x 1 1/2 in. x 1 1/2 in. **1/6** each
 Cat. No. AX1002 ..

P.A. Tank Coils

Unshielded Coils covering approximately 2 to 4 megs. (Low frequency) 40 Turns of 26 S.W.G. Enamelled Copper Wire Wound on 1 in. former. **6D.** each
 Cat. No. AX1034 ..

Ditto. High Frequency. Covering approximately 4 to 8 megs. 18 Turns of 22 S.W.G. C. and E. Copper Wire. **6D.** each
 Cat. No. AX1035 ..

Driver Tuning Coils

Driver Tuning Coils. Constitute 103 turns of 7/46 S.W.G. Litz wire dual-lateral wound on 1 in. former and tapped at 30 turns from start of winding. Mounted in metal can 3 in. x 1 1/2 in. x 1 1/2 in. **2/6** each
 Cat. No. AX1087 ..

Aerial Loading Coils

Wound on 4 1/2 in. long x 2 in. diameter ribbed ebonite former. **1/6** each
 Cat. No. AX1092 ..

Aerial Tuning Coils

Two windings on 5 1/2 in. long x 2 in. diameter former. First winding constitutes 60 Turns 26 S.W.G. Tinned Copper wire tapped every 6 turns. Second winding is 10 turns same wire tapped every turn. Spacing between two windings = 1 in. **1/-** each
 Cat. No. AX1249 ..

Master Oscillator Coils

Coverage 2.2 to 6.5 megs. Windings incorporate .00005 mfd. mica condenser and a 50,000 ohm. resistor. Mounted in can 3 in. x 1 1/2 in. x 1 1/2 in. **1/-** each
 Cat. No. AX1176 ..

AERIAL TUNING UNITS

Tank Coil — Tuning Unit: Tank coil consisting of 75 turns double spaced tinned copper wire, 22 gauge; wound on a heavy former 2 in. diameter and tapped by means of two single bank 11-position rotary selector switches. Coil and Switches mounted by means of 2 heavy bakelite end pieces, fitting on a cadmium-plated metal bracket. **6/11**
 Cat. No. AX1024 ..



WAR BARGAINS!

CONDENSERS

The following Condensers have been removed from brand new ZCI Transceivers—

- Cat. No. AX1025—10 x 10 mfd. Electrolytics **4/-**
- Cat. No. AX1026—10 x 10 mfd. Insulated **4/-**

Tubular Condensers

AX1027—.02 mfd. 400 volt Tubular Condensers **6D.** each or **5/-** doz.

- AX1028—.1 mfd. 400 volt Tubular Condensers **9D.** each
- AX1029—.25 mfd. 400 volt Tubular Condensers **1/3** each
- AX1030—.25 mfd. 25 volt Electrolytic Condensers **1/6** each

Padders and Trimmers

- 465 K.C. Single Hole mounting type Padders, 1in. square. **2/-** each
- Cat. No. AX1031
- Double Trimmers: Philips make. Low-loss air spaced type, with mounting piece 2in. x 1in. **2/-** each
- Cat. No. AX1032
- Aerial Trimmer Condensers: An air-spaced midjet variable condenser with a capacity of 25 mmfd. **3/-** each
- Cat. No. AX1033

Ganged Condensers

Standard 3-gang Condensers, as used in ZCI Transceivers, 1in. shaft, complete with mounting brackets and connections. Brand new. Capacity .000385 **9/6** each

3 Gang Variable Condensers. Some of the plates have been removed giving them the approximate capacity of .00018 mfd. per section. Grid clip and leads attached to the second and third sections. Complete with mounting brackets. **2/11**

Plessey Split Stator Condensers

- 2 GANG: 2 identical sections with 2 sets of stators and corresponding rotors in each; larger capacity set in each section has a max. of 195 mmfd., min. 9. Smaller capacity in each section max. 135 mmfd., min. 7.5. **3/11**
- Cat. No. AC926
- 3 GANG: 2 sets of stators and rotors in each section. Middle and rear sections identical. Larger capacity set max. 258 mmfd., min 10. Smaller set max. 40 mmfd., min. 6. Front section: Larger capacity set 275, min. 10. Smaller capacity set max. 100, min. 7.5. **3/11**
- Cat. No. AC927

EBONITE ROD

Cat. No.	Length	Diam.	Ebonite Rod.	per ft.
AX1432	12in.			12/6
AX1431	1in.			10/6
AX147	1in.			4/3
AX1435	2in.			3/-
AX1434	3in.			2/8
AX148	3in.			2/3
AX1433	3in.			1/9
AX149	1in.			1/3

EBONITE TUBING

Cat. No.	Outside Diam.	Hole (in.)	Price (ft.)
AX1443	1	1/8	3/9
AX1446	1	1/4	1/3
AX1447	3/16	1/16	11d.
AX1448	3/16	1/32	11d.
AX1449	.090	.037	4d.

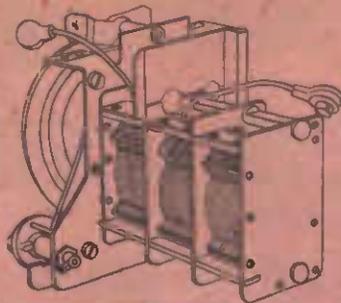
METAL CASED CONDENSERS

2M.F.D. 200-volt Metal Cased Condensers. Cat. No. AX1598 **1/6** each

INSULATED SHAFTS

Round Ebonite Rod for shaft extensions, etc., 1in. diam. x 2 1/2in. long. Cat. No. AX1150 **6D.** each

RECEIVER GANG & DIAL UNIT



Three-gang Tuning Condenser (192.5 MMFD MAX.) and Dial. Dial has verner drive with two "click stop" positions. Hand grip 2 1/2in. Knob. Suitable dial for any type of short wave receiver and lower power transmitter. Cat. No. AX1008 **7/6**

BAKELITE ELECTROLYTIC PLATES

Plastic moulded plates oval in shape. Mounting 1 1/2in. apart. Centre hole 3/4in. diameter, used for insulating upright mounting electrolytic condensers from chassis. Cat. No. AX1300 **2D.** each or **1/6** dozen

CONDENSER MOUNTING RUBBERS

Small Condenser Mounting Rubbers 1/2in. deep, diameter 3/4in. with 1/4in. hole through the centre. For cushioning variable condensers from Chassis. Cat. No. AX1363 **2D.** each or **1/6** dozen

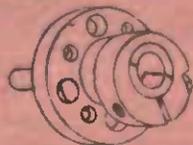
BLOCK CONDENSERS

Metal cased block type Condenser 2 mfd. 200v. Working. Width 1 1/2in., depth 1in., height 2 1/2in. Cat. No. AX1308 **1/-** each

4 mfd. 200v. Working. Width 1 1/2in., depth 1in., height 2 in. Cat. No. AX1309 **1/6** each

CONDENSER SHAFT REDUCERS

Cast metal Condenser Shaft Reducers. Bush takes a 1/4in. shaft and terminates with 1/4in. shaft. Bush is fitted with tightening screw for good junction. Overall length 2in., diameter 1 1/2in. Cat. No. AX1118 **GOOD BUY!** **9D.** each



VARIABLE CONDENSERS

- Small Type Air Spaced Variable Condensers, 1in. shaft, 160MMFD. Cat. No. AX1559 **4/6** each
- Enil. 3500-volt 150MMFD. Transmitting Condensers. Cat. No. AX1609 **27/6** each
- National 1500P.V. 100MMFD. Transmitting Condensers—Cat. No. AX1611 **15/-** each
- T.M.S. 1000P.V. 250MMFD. Transmitting Condensers—Cat. No. AX1612 **12/6** each
- Enil. 1500V. 200MMFD. Transmitting Condensers—Cat. No. AX1615 **20/-** each

DIAL PARTS

- Dial Drums, 6in. diam., for 3-8in. shaft. Cat. No. AX1618 **1/-** each
- Ditto, 5 5/8in. diam. Cat. No. AX1610 **1/-** each
- Chrome Escutcheons, for dials, overall size of window 5/8in. x 5/16in. Cat. No. AX1616 **4/6** each
- National Dials, slow motion type. Cat. No. AX1572 **20/-** each

HARDWARE

RUBBER FERULE



Rubber Ferule as illustrated. Useful as protection for wires passing through wts, chassis, etc., 1 1/2in. long x 1/2in., maximum diameter, 3/16in. hole. Cat. No. AX1204. **1D.** each; **9D.** dozen

CONDENSER RESISTOR LOOMS

As used in ZCI Transceivers. Each loom contains 4, 25-volt 25 m.f.d. Condensers and 8 assorted resistors and a moulded bakelite mounting board, measuring 4 1/2 x 2 1/2. Cat. No. AX1098 **6/9** each

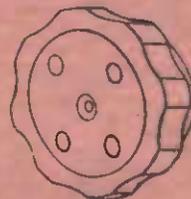
WAR SPECIAL! TUNING DIALS



As used in ZCI Transceivers. Suitable for receivers or transmitters. Can be set for two preset frequencies, with flick tuning mechanism. Cat. No. AX1090/4 **1/6**

As above but Mark 2 Exciter Unit Dials. Cat. No. AX1253 **1/6** each

SURPLUS INSTRUMENT KNOBS



Black Handrip Bakelite Instrument Knobs as used with Army Equipment during war-time. Has 1in. brass insert in centre but has no grub screw. 4 other brass inserts 1in. tipped with thread also on rear of knob to allow for firm attachment to metal or plastic disc.

BULK BUYING ENABLES US TO PASS THESE ON TO YOU AT
Cat. No. AX1107— **6D.** each or **5/6** doz.

PAPER TUBING

1/2in. Outside Diameter, 2ft. lengths. Cat. No. AX1207 **2/-** piece

MEISSNER TRIMMERS

High-quality trimmer. Type 50, mounted on high dielectric porcelain base and completely shielded in brass can. Capacity 25MMFD. Dimensions: 1 1/2in. high by 1/2in. diameter. Normally worth 4/6 each, but because they are war surplus at 9d. each. Cat. No. AC865 **9D.** each



HEAVY DUTY INSULATED TERMINALS

These Terminals were used for Aerial connections on Transceivers and are an extremely robust and well-insulated job. Overall dimensions of terminal assembly 2 1/2 in. high, 2 in. diameter bakelite top. Heavy rubber insulating washers over steel stem.



Cat. No. AX1050—
1/3
Similar to above but small size (1 1/2 in. x 2 in. and not insulated).
Cat. No. AX1050A **1/4**

ALL-METAL TERMINALS

Non-insulated all-metal oxidized Radio Terminals. Threaded headpiece & washer screwing down on to base washer makes for sure connection. 4BA x 1/2 in. stem allows ample room for attaching insulating washers if terminal is required to be insulated.



Cat. No. AX1051 **6D. each**

HEAVY METAL TERMINALS

Heavy metal terminals nickel plated. Knurled nut screws down over wire giving a firm connection. Insulating washers, 3/32 in. hole; plate with nut and solder lug. 1/2 in. diameter; overall length 1 1/2 in.

9D. each

Cat. No. AX1315

DOUBLE TERMINALS

8BA Beas Double Terminals. Centre stem is 1 1/2 in. in length and has on it three knurled nuts spaced with spiral washers and a set of nuts and washers for attaching to chassis. Ideal for crystal sets and small sets in general.

6D. each

Cat. No. AX1402
Cat. No. AX1401—Ditto but much longer size. Threaded stem is 3 in. in length x 2BA. Three heavy knurled nuts (same principle as above) and mounting nuts.

1/4 each

PLASTIC TERMINAL TOPS

Black Plastic Tops 2 in. diameter as used on ZC1 terminals. Brass inset with 1/2 in. thread. Apart from their use with terminal assemblies these knobs will serve many other purposes such as feet for kettles, chassis stands, etc., etc.

Cat. No. AX1154 **4D. each or 3/4 doz.**

BATTERY TERMINAL KNOBS

Black plastic knobs 1 in. diameter with knurled edge. These knobs do not use a grub screw but are threaded inside the 5/16 in. hole. Take a 1 in. shaft comfortably. You can find many uses for these knobs at such a gift price!

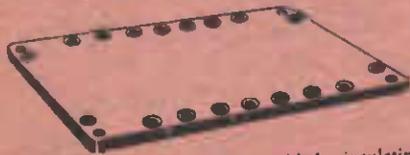
Cat. No. AX1100 **2D. each or 1/6 D. doz.**

PLASTIC KNOBS

Black plastic knobs 2 in. diameter. Small brass insert to take 1/2 in. rod. Fitted with grub screw.

Cat. No. AX1143 **6D. each**

TERMINAL BOARDS



Terminal Boards of moulded insulating material provided with holes for mounting resistors, condensers, etc. Size, 4 1/2 in. x 2 1/2 in. x 3/16 in. thick.

Cat. No. AX1089 **9D. each**

BRASS SADDLES

Brass saddles for saddling wiring or conduit together. 2 in. in width x 1/2 in. deep mounting flanges at either end.

Cat. No. AX1414 **3D. each**

WANDER PLUGS

A heavy duty plug with a Plastic Top and a 3/16 in. Metal Split Pin. Split pin could be spread out to fit sockets slightly larger.



Cat. No. AX1184

6D. each

WAR BARGAINS!

SMALL CROWN EYELETS



Approximately 1 in. in diameter with 1/2 in centre hole. Protruding spikes around edge of eyelet fold over and make a firm sure connection.

Cat. No. AX1387 **9D. dozen or 7/6 gross**

RING LUGS

8BA Cable Lugs Nickel Plated. Crimping edge to take connecting wire.

Cat. No. AX1388 **6D. dozen or 4/6 gross**

CABLE ENDS—CLAW TYPE



Brass claw type cable ends. Length 1 1/2 in. Round eyelet is 1/2 in diameter with a 1/2 in. hole in centre and has a crimped fold-over edge. Groove for cord 3/16 in.

Cat. No. AX1394 **2D. each or 1/6 dozen**

Cat. No. AX1395—With 1/2 in. diameter eyelet and 1/2 in. hole in centre.

2D. each or 1/6 dozen

CABLE ENDS—HOOK TYPE



Cadmium-plated Cable Ends. Have hook end for fitting around terminal and teeth for crimping over and holding cable. Overall length 2 in.

For Cable up to **2D. each**

Cat. No. Hook slot (diam.) **2D. each**

AX1393—3/16 in. (2BA) 2MM. **1/9**

AX1396—3/16 in. (2BA) 7MM. **dozen**

AX1397—3/16 in. (2BA) 5MM. **dozen**

AX1398—5/32 in. (4BA) 5MM. **dozen**

CABLE LUGS 5m.m.

Nickel Plated Cable Lugs. 1 in. in length, width of flange 5/16 in., 3/16 in. hole to take cord. Will fit terminals up to 3/16 in. diameter.

Cat. No. AX1399 **2D. each or 1/6 dozen**

BONDING CLIPS

Circular metal band 3/16 in. in width x 1/2 in. diameter. Fitted with nut and bolt for tightening. Similar in appearance to hose pipe clip.

Cat. No. AX1408 **6D. each or 5/4 dozen**

OVAL BONDING CLIPS

Similar to clip described above except oval in shape, length 1/2 in., width 1/2 in.

Cat. No. AX1409 **6D. each**

NUTS AND BOLTS General Assortment

Here a list of a few types of which limited stocks only are available: **dozen**

Cat. No. AX1162—6/32 in. Cadmium plated bolts. Mixture of lengths varying between 5d.

1/2 in. and 1 in. **5d.**

AX1169—10/32 in. Cadmium plated **3d.**

Hex. Nuts **3d.**

AX1171—1/2 in. Whitworth Hex. Nuts both brass and Cadmium plated **4d.**

AT451—3/16 in. Brass Nuts **2D. doz.**

3/16 in. Spring Washers (steel) **2D. doz.**

Cat. No. AX1238 **3D. doz.**

6BA Fan Type Locking Washers (steel)—Cat. No. AX1218 **3D. doz.**

LEATHEROID WASHERS

Insulating leatheroid washers. Size: Outside diam., 9/16 in.; hole 3/16 in.; 1/16 in. thick.

Cat. No. AS309 **6D. dozen**

GALVANISED SADDLES

1 in. Galvanised Half-saddles. Half-circular with mounting flange to enable them to be screwed to a well for holding cable or conduit. Will take up to 1 in. diameter.

Cat. No. AX1111 **6D. doz.**

PORCELAIN WASHERS

Porcelain insulating washers. Small size. Width 1 in. with a 1/16 in. hole through centre. A good insulating washer for slipping over fine wires.

Cat. No. AX1206 **2D. dozen**

TERMINAL BUSHINGS

Fibre bushings as originally used on ZC1 Terminals. Solid fibre insulated washers with unlimited uses to the Radio Hobbyist. Diameter 1 in. reducing in two steps to 1/2 in. Will take 1/2 in. bolt.

Cat. No. AX1192 **2D. each or 1/6 dozen**

CUP WASHERS

Cadmium Plated Cup Washers. 1 in. across base, 1 in. deep with a 3/16 in. hole. A general purpose washer with many uses.

Cat. No. AX1232/3 **1D. each or 6D. dozen**

RUBBER WASHERS

Rubber washers 1 in. diameter, with a 1/2 in. hole, giving a band of 1/2 in. Good and strong yet flexible.

Cat. No. AX1179 **1D. each or 6D. dozen**

COILED SPRINGS

Coiled springs 2 in. in length; diameter 1 in. Used as Dial Springs with Army Transceivers. Would make a good come-back spring for small doors and many other general uses.

Cat. No. AX1205 **6D. each**

FLICK TUNING CAMS

Constitutes an oxidised metal finger knob attached to metal spindle 1 1/2 in. in length by 1/2 in. diameter. We must admit that the uses for these must be limited. If you have a use for them, the cost is only—

Cat. No. AX1106 **2D. each or 1/6 D. doz.**

WASHERS

Lock Washers. 3/64 x 1-32 in. x 5G.

Cat. No. AX1229 **1D. doz.**

GRID CLIPS

Small Grid Clips for G.T. or Metal Valves mounted on Bakelite plate 1 1/2 in. x 1 in.

GREAT VALUE! **1D. each**

Cat. No. AX1203—

RUBBER COVERED GRID CLIPS

Screen Grid Clips to fit Octal based, glass or metal Valves. Rubber protecting cap moulded over clip. 6 in. length of pushback wire attached.—Cat. No. AX1043 **3D. each**

BRASS TERMINAL



Consists of two round knurled nuts, screwed on to 1 in. 3 B.A. screw. Useful and cheap terminal.

Cat. No. AT61 **3D. each**

ANOTHER BIG SPECIAL

1/2 in. Wood Screws
1/2 in. x 8 gauge Wood Screws. Buy purchase from War Surplus Store enables us to sell at this unbeatable price.

Cat. No. AT556 **11D. doz.**

HEAVY TERMINAL LUGS



Heavy Lugs—Brass, for connections to batteries or terminals where heavy duty. Will take up to 1 in. diameter.

Cat. No. AX1201 **6D. doz.**

VALUES IN SURPLUS WAR STOCKS

THREADED METAL SPACERS

As above but centre hole is threaded.

Cat. No.	Length (in.)	Diameter (in.)	Size of Hole (in.)	Price
AX1241	1 4	1/4	1/8	1d. each.
AX1110	3/4	1/4	1/8	1d. each.
AX1596	3 3/4	3/8	3/16	6d. each or 5/3d. dozen

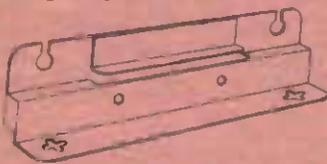
METAL SCREWS

2in. x 1in. Bright Cadmium Plated Screws. Whitworth 1in. thread. Flat head not slotted. Used as the centre bolt in the large ZCI terminals. **2D.** each or **1/6** dozen
 Cat. No. AX1149
 Ditto. 1 1/2in. x 1in. Whitworth 1in. thread. Flat head. **1D.** each or **9D.** dozen
 Cat. No. AX1114

SMALL SPINDLES

Better described as a small pulley. 2in. outside diameter with a 3/16in. centre, fastened to a metal spindle 1 1/2in. x 1/4in. This would have many uses for motor driven models. **3D.** each
 Cat. No. AX1135

MOUNTING BRACKETS



Heavy metal mounting brackets suitable for shelves, etc., length 8in., depth 2in., width of turnover 1 1/2in. Two mounting holes on each flange as illustrated. **3D.** each
 Cat. No. AX1091

CHASSIS HARDWARE

MOUNTING PILLARS

Heavy mounting pillars that have a variety of uses. Length overall 5in. Body 4 1/2in. long, diameter 3/8in. solid. 3/16in. diameter threaded ends protrude 1/2in. **4D.** each or **3/6** dozen
 Cat. No. AX1139

SPACING BAR

Metal Spacing Bar 4 1/2in. x 1/2in. Internally threaded at either end with 1/8in. hole. **2D.** each
 Cat. No. AX1116

CHASSIS SCREWS

Cadmium plated Chassis Retaining Screws. These screws measure 8 1/2in. in length and are 1/2in. in diameter. The stem is tapped for approximately 1/2in. from one end with a slotted head on the other. **3D.** each or **2/6** dozen
 Cat. No. AX1108

BEARINGS

Bearings complete with nut. Shaft 1 1/2in. x 1/2in. diameter and tapped approx. 1in. from end with a 1in. thread. Supplied complete with nut. **3D.** each
 Cat. No. AX1159

PANEL BEARINGS

Constitute threaded bush 1in. in length and 1/2in. diameter. Fitted with nut. **6D.** each
 Cat. No. AX1136

SMALL HOLLOW SOCKETS

Metal sockets 1/2in. long, 1/2in. diameter with outside thread and nut. 3/16in. hollow centre. Cadmium plated. **2D.** each or **1/6** dozen
 Cat. No. AX1134

SPRING WASHERS

1/8in. Spring Locking washers, steel Cadmium plated—Cat. AX1573 **3D.** dozen; **2/8** gross

KNURLED NUTS

1/2in. diameter Nickel Plated Knurled Nuts, with 3/16in. threaded hole. Knurled edge for neat grip. **1D.** each or **9D.** dozen
 Cat. No. AX1306

LID HOOKS

Lid Hook assemblies removed from remote control units. A small cadmium plated clip. Ideal for cupboard doors. **3D.** each
 Cat. No. AX1305

RIVETS

.14in. x .267in., Stimpson No. 78 brass eyelet. **4D.** doz.
 Cat. No. AX1217
 3-32in. x 3-32in. brass hollow; zinc plated. **2D.** doz.
 Cat. No. AX1215

SPECIAL CHASSIS AND PANEL

Cadmium Plated Radio Chassis, taken from dismantled Army ZCI Transceivers. Dimensions 20in. x 8 1/2in. x 3in. deep; 22 Valve and Coil holes drilled. Space for Tuning Gang and Coil Assembly. Ideal chassis for a communications or a similar receiver. **6/3** each
 Cat. No. AX1058

WING NUTS AND PILLAR

1/2in. x 2 1/2in. long Pillars with threaded wing nut pinned on. **3D.** each
 Cat. No. AX1511

VALVE SHIELDS

Cadmium plated Valve Shields for glass Octal based Tubes, 4 1/2in. x 1 1/2in. x 1 1/2in. Complete with flush mounting base. **1/-** complete
 Cat. No. AX1052

Similar Shield to above but made from heavy metal and reinforced. **1/3** complete
 Cat. No. AX1054



SMALL VALVE SHIELDS

Small cadmium plated Valve Shields measuring 3in. high and 1 1/2in. square. Ideal for G.T. Tubes. Supplied complete with mounting base. **6D.** each
 Cat. No. AX1102

INSULATION TERMINAL STRIPS

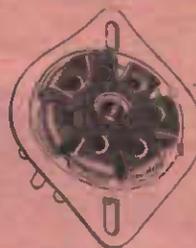
Strips of Insulation material (Black Panica) for mounting terminals or other insulating purposes. Size 8 1/2in. x 2in. x 1/16in. **9D.** each
 Cat. No. AX1592

HEAVY BANANA PLUGS AND SOCKETS



Heavy Duty Type for heavy currents. Diam. of socket hole 3/8in. Supplied complete, with mounting nuts. **1/-** each
 Cat. No. AX1557—Sockets
1/- each
 Cat. No. AX1558—Plugs

7-PIN SPEAKER PLUGS



"AMPHENOL"
 American made 7-pin Speaker Plugs complete with detachable mounting flange measuring 1 1/2in. between mounting holes.

Cat. No. AX1362

1/- each

OCTAL WAFER VALVE SOCKETS

Eby Wafer Octal Valve Sockets to take all the modern types of tubes with the octal base. These sockets have the mounting holes spaced 1/2in. further apart than the standard type but otherwise are exactly the same as the standard wafer socket selling at 8d.

GREAT BARGAIN!

Cat. No. AS630—
4 1/2D. each or **3/9** doz.

AMPHENOL OCTAL VALVE SOCKETS

These Sockets are the ring mounting variety and are new with the exception of being soldered. **4D.** each
 Cat. No. AX1048

SHIELDED OCTAL SOCKETS



Constitute a standard Octal speaker plug mounted in a shell. A good recessed socket for wires carrying dangerous voltages. Impossible to touch male prongs. Overall diameter 1 1/2in.

Neat and compact. For below surface mounting on all types of Radio apparatus including P.A. amplifiers, transmitters, electronic instruments, etc. **1/6** each
 Cat. No. AX1230

ENGLISH 5-PIN PLUGS

English 5-pin Chassis Mounting Plugs 5 prongs mounted on bakelite wafer base 1 1/2in. x 1 1/2in. with mounting holes at every corner. **9D.** each
 Cat. No. AX1356

ENGLISH 5-PIN SOCKETS

Wafer socket to take plug described below. Wafer socket 1 1/2in. x 1 1/2in. **9D.** each
 Cat. No. AX1357

ENGLISH 5-PIN CORD TYPE PLUGS

English 5-pin Plugs. Heavy bakelite two-piece plug—cord grip—fits into socket listed above (Cat. No. AX1357). **1/-** each
 Cat. No. AX1358

Five-pin sockets for fitting into cord to take above plugs. **9D.** each
 Cat. No. AX1359

SMALL SELF-TAPPING SCREWS

No. 2 x 3/16in. long—Cat. No. AX1565
4D. dozen; **3/4** gross

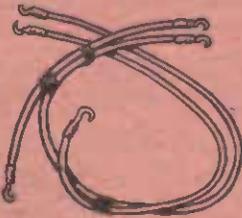
MICROPHONE CORDS

Surplus from Army Microphones. 6ft. in length; 3 wires terminating in neatly formed rings at each end. Each lead is individually coloured. Cotton braiding overall. Many other purposes can be found for these high quality 3 wire cords. Would cost twice the price to manufacture. **1/-** each
Cat. No. AX1236

SHORT LENGTH WIRES

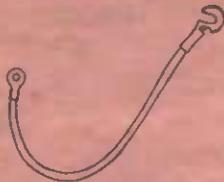
Four single lengths of rubber or braided cord twisted together. Each piece 2ft. 6in. in length. General purpose connecting wire. Because these are in cut lengths it reduces their value—so out they go. **4 D. Set**
Cat. No. AX1181

POWER LEADS



Comprises 3 pieces of Single, Heavy Core Rubber Flex in lengths of 3½ft., 5½ft., and 1½ft. The 4 ends finish off with heavy spade lugs. **1/-** set
Cat. No. AX1037

RUBBER COVERED LEADS



Stranded flexible copper wire heavily insulated with rubber (like cabtyre) with eyelet type lug (3in. diameter) on one end and heavy spade lug on the other.

- Cat. No. AX1351—6in. lead .. **5 D.** each
- Cat. No. AX1074—12in. lead .. **4 D.** each
- Cat. No. AX1352—16in. lead .. **8 D.** each

RESISTANCE WIRE

To be sold for a fraction of its original cost. For elements, resistances, etc., etc. Sold in reel lots only.

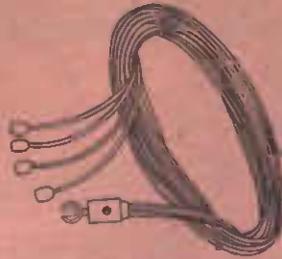
- Cromaloy IV, 40 B & S. gauge, 190 ohms per yard, 8 to 10oz. reels. **2/-** oz.
Cat. No. AX1237
- Cromaloy IV, 42 B. & S. gauge, 269.7 ohms per yard, 8 to 14oz. reels. **2/6** oz.
Cat. No. AX1257
- Cromaloy IV, 46 B. & S. gauge, 650 ohms per yard, 4oz. reels. **2/9** oz.
Cat. No. AX1258

PRICES ARE SUBJECT TO ALTERATION

All Prices in this book must be regarded as an indication only—all orders will be executed at ruling prices.

THE ELECTRIC LAMP HOUSE LIMITED,
11 MANNERS STREET,
WELLINGTON, C.1.

COUNTERPOISE LEADS



This counterpoise is made up of four 12ft. lengths of rubber-covered flex terminating in a spade lug type junction box. **2/11** set
Cat. No. AX1072

TINNED COPPER WIRE

- 50ft. Coils 23 S.W.G. Bare Copper wire for set wiring, etc. **1/-** coil
Cat. No. AX1105
- 25ft. Coils 18 S.W.G. Tinned Copper Wire. **1/-** coil
Cat. No. AX1101

SHIELDED POWER FLEX

Stranded insulated Flexible 3-core Cable, covered overall with woven metal braid.

- Cat. No. AX1462—23/0076 .. **2/-** yard
- Cat. No. AX1463—40/0076 .. **2/6** yard
- Cat. No. AX1464—14/0076 .. **2/-** yard

7/044 T.R.S. CABLE

Small quantity only available—Cabtyre T.R.S. 7/044 while stocks last.

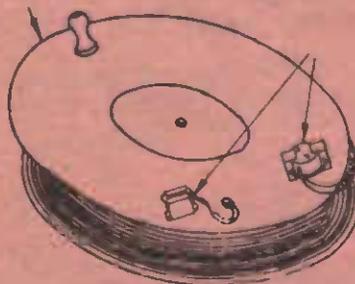
- Cat. No. AX1457—
ONLY 8 D. yard; **50/-** 100 yards

1/20 V.I.R. CABLE

20 S.W.G. Copper Wire, V.I.R. insulated. Excellent for connections, bell work, etc., etc.

- Cat. No. AX1504—
1 D. foot or **1/6** for 20 feet

FIELD CABLE



Metal Reels containing approx. 100 yds. Twin Twisted Yellow and Black stranded (6 Iron 1 Copper) flexible Cable. Insulated with plastic P.V.C. Excellent for telephones, bells, etc. etc.
Cat. No. AX1189 .. **19/9**

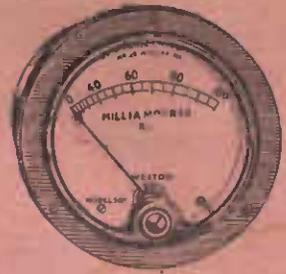
ZC1 INSTRUCTION BOOKS

A 58-page Booklet of working instructions for the ZC1 Mk. II Transceivers. **1/6** each
Cat. No. AX1062

LAMPHOUSE GUARANTEE

Any goods that prove in any way unsuitable may be returned undamaged within seven days from receipt and your money will be refunded in full.

METER SPECIAL!



"Western" 0-100 M.A. 2½in. round R.F. thermo-coupled milliammeter. Flush mounting —plastic case.

GREAT VALUE!
Cat. No. AM23 .. **29/11** each

"Ferranti" 0-100 M.A., D.C., 2½in. round meter with luminous dial. **35/11** each
Cat. No. AM22

BARGAIN METERS

0-100 M.A. Moving Coil Milliammeters. These meters have been removed from brand new ZC1 Transceivers and except for a few scratches are brand new. **18/-** each
Cat. No. AX1014

METER BARGAIN

War Surplus! Ferranti 0/500 micro-amps, 2½in. moving coil meters. **24/11** each
Cat. No. AM24

"SIMPSON" 0-15 volts, 3in. A.C. Square meters. Cat. No. AM55 .. **55/-** each

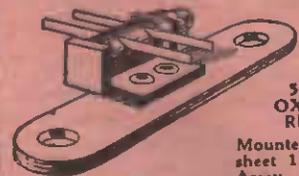
Same as above with Illuminated Dial. Cat. No. AM56 .. **67/6** each

"BURLINGTON" 0.25 volts A.C. 3in. Square Meter—Cat. No. AM58 .. **47/6**

"G.E." 0-1500 volts D.C. Voltmeter. Flush Mounting with External Multiplier. Cat. No. AM59 .. **95/-**

METER VALUES THAT ARE HARD TO BEAT!
Prices as Low and Even Lower Than Peo-War-

METER RECTIFIERS

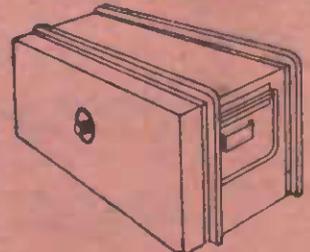


SMA COPPER OXIDE METER RECTIFIERS.

Mounted on plastic sheet 1½in. x ½in. Ex Army stocks, at a fraction of their true value.

Cat. No. AM45 .. **8/6** each

METAL TOOL BOXES



This box is actually the Cabinet in which the ZC1 set is housed. Waterproof, moisture proof, etc. Inside measurements are 20½in. x 11in. x 8½in. Made of steel, crackle finished in green and featuring a rubber flange on which the lid is fitted by pressure thumb screws. Canvas cover fits over lid. Carrying handles at either end.—Cat. No. AX1078 .. **28/6** each

WAR SURPLUS BARGAINS!

PRESS BUTTONS

Ex Air Force aircraft. Strong push button mounted in plastic casing 2in. x 1 1/2in. x 1 1/2in. The button is recessed into the mounting. Ideal as cord grip bell push, or press-to-light switch. Cat. No. AX1406 .. **1/-** each

ON-OFF PLATES

Small nickelled plates for slipping over the threaded bush of a toggle switch. Marked ON-OFF. Gives a neat finish to flush mounting toggle switches. **3** D. each
Cat. No. AX1210 .. **3** D. each

Spare Round Knurled Fixing Nuts for toggle switches.—Cat. No. AX 1211 .. **2** D. each

These Switches have been removed from ZC1 Army Transceivers. All are brand new, although some have solder marks.

FLUSH MOUNTING SWITCHES

10 amp. 240 volt Flush Mounting Switches. Can be used for ordinary house lighting circuit or for any other purpose where an on-off switch is required. **2/-** each
Cat. No. AX1019 .. **2/-** each

PUSH-TO-TALK SWITCHES

D.P.D.T. Push Switch. Excellent for a meter push switch or for inter-communication work. Depth 3in., width 2in. **2/-** each
Cat. No. AX1021 .. **2/-** each

S.P.S.T. TOGGLE SWITCHES

Standard type S.P.S.T. 230 volt, 3 amp. Toggle Switch. **2/-** each
Cat. No. AX1020 .. **2/-** each

WAVE CHANGE SWITCHES

3-Bank, 2-Position, 9-Pole Wave Change Switches, as used in Transceivers for ZC1 Receiver/Band/C.W. Switch **4/6** each
Cat. No. AX1016 .. **4/6** each

2-Bank, 3-Position, 4-Pole Wave Change Switches as used for normal/set/remote Switch. Cat. No. AX1017 **3/6** each

3-Bank, 3-Position, 6-Pole Wave Change Switches. Cat. No. AX1018 **4/9** each

HIGH QUALITY LEVER SWITCHES

D.P.D.T. Lever Switches with low loss trilateral mounting. Spring relay contacts give positive connection. Ideal for intercom. or radio/gram switching. Flush mounting. Overall measurements: length, 3in.; depth, 1 1/2in.; width, 3in. Superbly constructed switch. Cat. No. AX1313—

OUR PRICE **4/6**

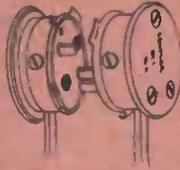
4-Pole Double Throw Lever Switch similar in construction to above. Can be described as a double set of D.P.D.T. switches. Centre position of lever is "off," "up" position closes first circuit; "down" position closes second circuit. There's many uses for a high quality switch such as this. Overall Measurements: Length, 3in.; depth 1 1/2in.; width, 3in. Cat. No. AX1314—

OUR PRICE **5/9**

2-VOLT BULBS

2-Volt 1.5 Watt M.E.S. (Torch Size) Bulbs. British make **6** D. each
Cat. No. AX143 .. **6** D. each

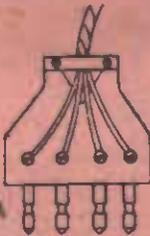
SURPLUS CORD CONNECTORS



A 2 piece 2-wire connector to serve a variety of uses. Heavy plastic moulded bodies plug into each other forming a strong coupling and giving a sure contact. Two ringclips enable both halves to be firmly locked together. Excellent as a lead coupler for caravans, extension speakers and

extensions of all description. **1/-** set
Cat. No. AX1083 .. **1/-** set

2-4 PRONG PLUGS



Heavy Bakelite Plugs. 4 prongs approx. 3.16in. diameter, with screw terminals. Recessed for cord entry with detachable moulded piece to clamp on to cord making a sure and safe connection.

WORTH TWICE THE PRICE TO MANUFACTURE!

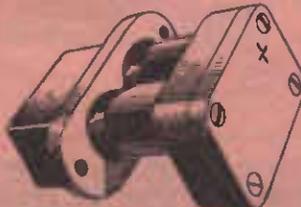
Cat. No. AX1185— **1/-** each

Cat. No. AX1301—2 Prong Plug. Similar to above illustration but with only 2 outside prongs. **9** D. each

GREAT BARGAINS FROM WAR SURPLUS!



CHASSIS PLUG AND SOCKET



Exceptionally heavy Power Plug and Socket. Plug is chassis mounting; socket can be attached to cord. **REALLY A BARGAIN AT 3/6** set
Cat. No. AX1060 .. **3/6** set

SURPLUS WAR STOCKS

Jacks

Single Key Jacks (S.C.), Single-pole double-contact insulated jack mounted on 2in. x 3in., bakelite panel

Cat. No. AX1038— **1/-** each

Double Phone Jacks (D.C.) mounted on 2 1/2in. x 2in. panel. Cat. No. AX1039—

1/- each

Line-Microphone Jacks. A double outlet 3-contact insulated Jack. **1/6** each
Cat. No. AX1040 .. **1/6** each



RESISTORS

Carbon Resistors

Cat. No. AX1373—1.75 megohm **3** D each
1 watt Carbon Resistors .. **3** D each

Cat. No. AX1239—Ceramic 2,800 ohm 1 watt Resistors **2** D. each

3 Watt Resistors

1 Meg. 3 watt Resistors. Length 2 1/2in., 8in. diameter. **9** D. each
Cat. No. AX1367 .. **9** D. each

HEAVY-DUTY RESISTORS

One hundred watt, 1700 ohm Wire-wound Resistors **4/-** each
Cat. No. AX1506 .. **4/-** each

Same as above but 3000 ohm **4/-** each
Cat. No. AX1507 .. **4/-** each

DIMMER SWITCHES

30-ohm Variable Resistance, turning approximately 90 degrees. Switch is mounted in plastic cast 2in. diameter with control knob on top. Cat. No. AX1425 .. **2/9** each

HEAVY DUTY RESISTORS (Wirewound)

1500 ohm 1RC/adjustohm, 200 watt.—Cat. No. AX1607 .. **19/6** ea.

2000 ohm 1RC/adjustohm, 200 watt.—Cat. No. TX1608 .. **19/6** ea.

2000 ohm Mallory, 100 watts. Cat. No. AX1602 .. **15/-** ea.

2500 ohm 1RE/adjustohm, 100 watt.—Cat. No. AX1605 .. **14/6** ea.

4000 ohm Mallory, 100 watt. Cat. No. 1601 .. **19/6** ea.

4500 ohm 1RC/adjustohm, 100 watt.—Cat. No. AX1613 .. **19/6** ea.

5000 ohm 1RC/adjustohm, 50 watt.—Cat. No. AX1603 .. **5/6** ea.

10,000 ohm 1RC/adjustohm, 50 watt.—Cat. No. AX1614 .. **7/6** ea.

10,000 ohm 1RC/adjustohm, 115 watt.—Cat. No. AX1606 .. **19/6** ea.

2 BANK WAVE CHANGE SWITCHES

Each bank single pole, with three positions, with shorting bar lin. shaft **3/11** each
Cat. No. AX112 .. **3/11** each

WATT HOUR METERS



Used, but in good order. These Meters can be used for check meters, in flats, or on installations where there is only a small load. Several leading brands available. 230v., 50 cycle, 5 amp.—Cat. No. AX139 **19/6** each

Ditto for 110 volts (meters contain 2 magnets, counter coils and sundries, and are cheap at the price for these parts **5/-**
Cat. No. AX165 .. **5/-** each

CHOKES REMOVED FROM ZC1 TRANSCEIVERS

2.5 Henry 80 MA Filter Chokes
Mounted in metal containers 2in. high x 3in. between mounting holes. Lug type connection.—Cat. No. AX1010 .. **17/6**

Modulation Chokes

Small Heavy Duty Modulation Chokes. Similar dimensions and descriptions to above. Suitable for plate circuits of 6V6GT or similar valve. Cat. No. AX1011 .. **5/11** each

Parasitic Chokes

The ideal Unit for preventing parasites in low and medium power transmitters, 3 1/2in. x 1in. Catalogue No. AX1047 .. **1/-** each

Vibrator Chokes

Low tension Hash Chokes for use with Vibrator Packs and Motor Car Sets, etc. Size: 1 1/2in long, 3/4in. diameter. Wax coating.—Cat. No. AX1141 .. **2/3** each

Cat. No. AX1155—High Tension R.F. **1/9** each

2.5 MA Chokes

ZC1. 2.5 MA HT Chokes, with connecting leads cut rather short. Removed from New ZC1 Receivers. Cat. No. AX1624 **1/3**

Low Tension R.F. Chokes

Good Hash Choke as used in ZC1 Unit. 1 1/2in. long wound on 3/4in. bakelite former. Cat. No. AX1200 .. **6D.** each

650 Micro Henry Choke

Cylindrical 1 1/2in. long x 1in. with solder lug mounting. Might be used as a crystal set coil or for line filter work. Cat. No. AX1246 .. **9D.** each

CHOKES

Removed from telephone sets 6 Henry 210 ohms metal cased Cat. No. AX1593 .. **7/6** each
1.7 Henry 210 ohms (tapped) Cat. No. AX1594 .. **7/6** each

12 VOLT 6-PIN VIBRATORS

12 volt 6-pin Vibrators. All brand new but slightly soiled with storage. May be necessary to adjust points before using. **GRAND BUY!** Cat. No. AB67 .. **9/11** each



MICROPHONE TRANSFORMERS

For use with Dynamic type Microphones. Size 1 1/2in. x 1 1/2in. x 2in. high. Cat. No. AX1013 .. **14/6**
For use with ZC1 carbon type microphones.—Cat. No. AX1316 .. **12/6**

HEADPHONE TRANSFORMERS

For matching Dynamic Headphones. Size 1in. x 1 1/2in. x 2in. high. Cat. No. AX1012 .. **14/6**

CERAMIC FORMERS

Ceramic Formers with wire ends for winding chokes, resistors, etc. Cat. No. AX1202 .. **6D.** each

MULLARD VALVES

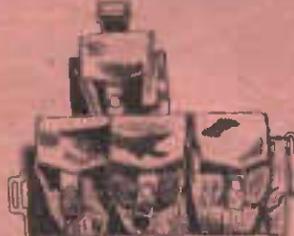
Cat. No. AX1554 Mullard Type, 164V— **2/6** each
Cat. No. AX1555 Mullard Type, 4VA— **2/6** each

PARACHUTE CLIPS



Hand spring release, locking clip, made of heavy brass and plated. Spring clips makes easy connection and release. Flat end will take up to 1 1/2 belt or strap, etc. Hundreds of uses around farms and on boats, etc. Length approx. 4in.—Cat. No. AX1625 **3/6**

CARTRIDGE BELTS



Made of heavy canvas. They contain four pockets, 3 1/2in. deep, with flaps kept in place by heavy brass domes. Farmers, carpenters, and the odd job man will find many uses for these. Size 12in. x 4in. **1/-** each
Cat. No. AX1626 .. **1/-** each

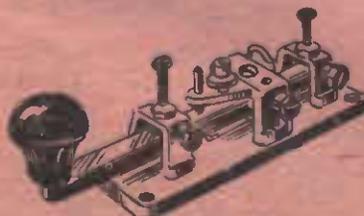
SPARE TRANSFORMERS ZC1 Vibrator Transformers

Power Transformers from ZC1 Tranceivers. Input 12 volts. Two Output windings, 180/0/180 volts and 300/0/300 volts. "Hams" have many uses for these useful transformers. Cat. No. AX1088 .. **16/6** each



WAR SURPLUS BARGAINS!

ARMY MORSE KEYS



This key is very compactly constructed on a bakelite base measuring 3 1/2in. x 1 1/2in. Very efficient for sending Morse at a high speed, and is complete with fine adjusting screw. As used by the Army and other services.

WORTH 30/- BUT NOW
Cat. No. AX1075A— **5/11**



The last of surplus war stocks. The following types are available at big reductions on list prices. All brand new.

- | | |
|--|--------------|
| | EACH |
| 1K5G—2volt R.F. Amplifier Pentode Octal Base .. | 2/6 |
| 1L5G—2-volt Power Amplifier Pentode Octal Base .. | 7/11 |
| 1LD5—1.4-volt Diode Pentode Octal Base .. | 7/11 |
| 3D6/1299—1.4-volt U.H.F. Tet. rode Octal Base .. | 5/- |
| 1LN5—1.4-volt R.F. Amplifier Pentode Octal Base .. | 12/11 |
| 6X5GT—6.3 volt Full-wave Rectifier, Octal Base .. | 7/11 |
| 6Q7GT—6.3 volt Duplex Diode H-MU Triode, Octal Base .. | 8/11 |
| 6U7G—6.3 volt Triple Grid super Control Amplifier, Octal Base .. | 7/11 |
| 807—6.3 volt Transmitting Beam Power Amplifier, 5-pin Base .. | 11/6 |
| 9A—Acorn Base .. | 2/11 |
| 92A—6.3 volt Detector Amplifier Penutode, Acorn Base .. | 2/11 |
| 93A—6.3 volt Detector, Amplifier, Oscillator, Acorn Base .. | 2/11 |
| 94A—1.25 volt Pentode Detector Amplifier, Acorn Base .. | 2/11 |
| 95A—6.3 volt U.H.F. Diode, Acorn Base .. | 2/11 |

REMOTE CONTROL UNIT SPARES

- | | |
|---|-------------|
| Metal case for Remote Control Units. Cat. No. AX1304 .. | 4/11 |
| Single jacks for Remote Control Unit. Cat. No. AX1310 .. | 6D. |
| Double jacks for Remote Control Units. Cat. No. AX1311 .. | 6D. |
| Chokes, Line Suppression for Remote Control units. Cat. No. AX1307 .. | 1/6 |

FUSES—HOLDERS, etc.

- FUSE HOLDERS**
- Plastic mounting piece 1 1/2in. x 1 1/2in. x 1/16in. thick with two clips mounted to take tubular fuse. Overall distance between clips is 1 1/2in. which allows them to take the standard size fuses. **6D.** each
Cat. No. AX1113 .. **6D.** each

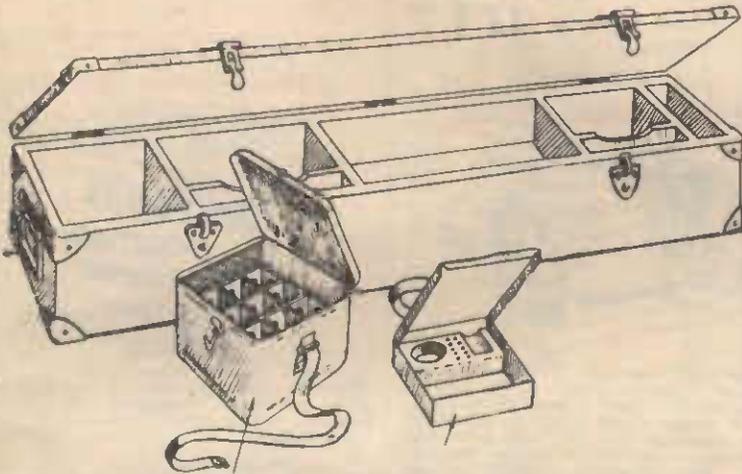
PLASTIC MOULDED BASE

Plastic moulded morse key bases as used with the Army Morse Key. Measuring 3 1/2in. x 1 1/2in. x 3/16in. thick. 3/4in. holes drilled at each corner. Make good mounting strips for different small components.
Cat. No. AX1312 **6D.** each or **4/6D.** doz.



BARGAINS OF THE YEAR!

TOOL BOXES



AX1084

AX1066

WOODEN TOOL BOXES

Exceptionally strong wooden boxes, suitable for tools, etc. Partitions can be easily removed if not required. Patent heavy clamp fasteners. Carrying handles, and metal corner pieces. Size 42in. x 8in. x 7in. Only **15/11** each. Cat. No. AX1077

SPARE VALVE BOXES

A heavy gauge Steel Box measuring 6 1/2 in. x 6 1/2 in. x 6 in., divided into 9 compartments each measuring 1 1/2 in. square. Each compartment rubber-cushioned. Complete with carrying handle and vibration-proof-catch. Cat. No. AX1084 **8/6** each

SPARE PARTS BOXES

A small metal box measuring 6in. x 6in. x 1 1/2 in. Suitable for many purposes in the home workshop. Cat. No. AX1066 **3/-** each

MONEY BACK GUARANTEE

Any goods which prove in any way unsuitable may be returned within 7 days from receipt and your money will be Refunded in Full!

REMOTE CONTROL UNITS

TWO-WAY INTER-COMMUNICATION SETS

This unit consists of Morse Key, Buzzer and associated Terminals and switches in heavy gauge steel case. Measurements: 9in. x 5 1/2 in. x 5in. This unit makes an ideal Portable Telephone which could be used for a number of purposes, e.g., between houses, workshops and office, sick room and kitchen, and similar purposes.



Each unit is provided with 2 Headphone Jacks which enables two persons to listen at the one time. Accessories required would be:— Carbon Microphone, Dynamic Headphones and reel of coupling wire, all of which are listed under War Surplus.

Cat. No. AX1061— **30/-** each

Cat. No. AX1061A— as above but used **19/11**

BIG VALUE IN ! HEADPHONES !

ARMY DYNAMIC PHONES



This dynamic Headset is the last word in phones. In reality 2 miniature loud speakers, 80 ohms. Necessitates the use of a matching transformer to use with ordinary radio or small receivers. Would make a good quality Dynamic Microphone, giving fairly flat response, for the amateur. Pre-amp would be required for this purpose. Supplied complete with flexible cord. Cat. No. AX1065 **9/11** pair

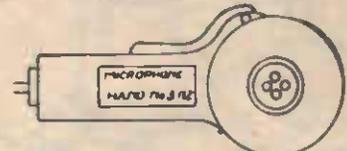
Suitable matching Output Transformer.

Cat. No. AX1012 **14/6**

HEADPHONE CUSHIONS

Sponge Rubber Cushions for AX1065 Headphones. Can also be used on other phones with an approx. 3in. diam. earpiece. **1/-** pr. Cat. No. AC205

ARMY "MIKES."



A solidly constructed Hand Type Microphone, featuring a press switch mounted in the handle. Complete with 6ft. flex. Unit is enclosed in a heavy bakelite case. This Microphone is suitable for telephone amateur radio work and any similar purpose requiring a sturdy "mike."

Cat. No. AX1063 **15/-** each

Suitable Microphone Transformers. **12/6**

Cat. No. AX1316

DYNAMIC HAND MICROPHONES

Similar in physical construction and appearance to the above (No. AX1063). Has lower output than the Carbon type and therefore requires the use of the Microphone Input Transformer listed below. This "Mike" gives better response than the Carbon type. **19/6**

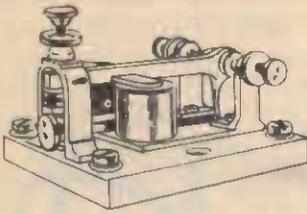
Microphone Transformers
for use with above. **14/6** each
Cat. No. AX1013

BUZZERS

Buzzers as used in the Remote Control Units of ZC1 Transceivers. A solidly constructed high-frequency buzzer suitable for Morse Code practice, etc. Operates from 4 1/2 volts and has an adjusting knob to vary the pitch.

Cat. No. AX1303 **5/-**

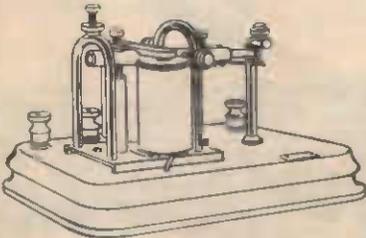
SOUNDERS



Telegraph-type Sounders mounted on wood base. Heavy brass terminals and fittings, 4 1/2 in. x 4 1/2 in. x 4 in. high. Used.
Cat. No. AX1500 .. 7/6 each

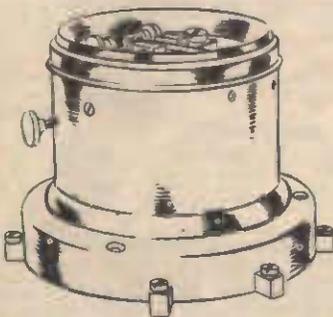
As above but slightly damaged.
Cat. No. AX1500A .. 4/6 each

TELEGRAPH TRANSMITTERS



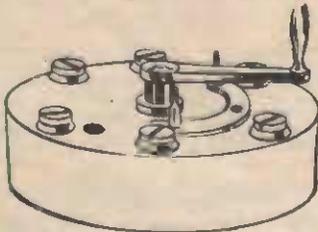
Western-Electric quad-type telegraph transmitters, 8 in. x 4 1/2 in. x 4 1/2 in. high. Used.
Cat. No. AX1493 .. 10/- each

TELEGRAPH RELAYS



Telegraph Relays mounted on wood base. Brass case glass cover, heavy construction, 5 1/2 in. diameter, 4 in. high.
Cat. No. AX1505 .. 10/- each

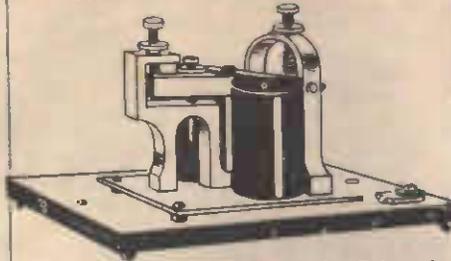
LEVER SWITCHES



Telegraph-type Lever Switches mounted on round wood base of 4 in. diameter, solid brass fittings. Single pole change-over (2 circuit) type. Used.
Cat. No. AX1498 .. 2/- each

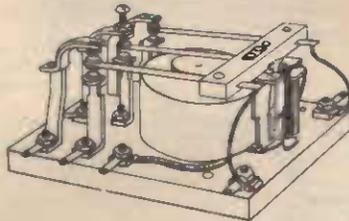
Similar to above but 3 circuit, 2-way. Used.
Cat. No. AX1499 .. 2/- each

TELEGRAPH SOUNDERS



Western-Electric type 3C, 140 ohm Telegraph Sounders. Size 5 1/2 in. x 3 in. x 4 in. high. Brand new.
Cat. No. AX1494 .. 17/6 each

**ZC1 Relays
3 P.D.T. AERIAL RELAYS**



A sturdily constructed relay which was designed for antenna change-over when using break-in operation on ZC1 Mark 2 Army Transceivers. Similar in constructional details to Key Relay, with the exception that two extra poles have been included. Operation is positive and contacts are easily adjustable. Suitable for any purposes requiring three circuits to be thrown in two positions. 12-volt operation at .1 amp. Measures 3 1/2 in. x 3 in. x 1 1/2 in.
Cat. No. AX1023 .. 14/6

S.P.D.T. KEY RELAYS

This unit is designed for operation from 12 volts and draws approx. .08 amp. Relay will operate from voltages as low as 8 volts providing spring tension is decreased. Cadmium plated parts are mounted on bakelite plate, measuring 3 1/2 in. x 1 1/2 in. x 2 in. overall. A very efficient relay which is suitable for many purposes including arial changeover for transmitters, remote control of transmitters, or receivers, etc.
Cat. No. AX1022 .. 12/6



PLASTIC WATCH CASES

Plastic Watch Cases, 2 in. diameter, 1 in. rim round top case, holds watch in position and allows 1 1/2 in. opening for watch face.

Cat. No. AX1036—Case only) 1/3 each

**The Light with Many Uses
THE "ANDY" LIGHT**



This Unit consists of a insulated socket and plug collar, 3 in. flexible Swan Neck and Torch Bulb type Lampholder.
Cat. No. AX1042 .. 2/11

6D. 6-VOLT LAMPS 6D.

Six-volt 17 c.p. Lamp, standard bayonet base. These were originally motor-car lamps, but bases were converted during the war to standard size. Because they look a little rough we offer them at 6d. each. Ideal for camp, caravans, etc., etc.—Cat. No. AL489 .. 6D. each

CANVAS HOLD-ALLS

Originally used as carrying caps on ZC1 Aerials. Canvas Bag 5 1/2 in. deep x 2 1/2 in. diameter with carrying laces eyeleted in. Would serve as a nail holder or screw holder for carpenters, etc.
Cat. No. AX1247 6D. each or 6 for 2/6

**BIG REDUCTION!
Firmo-Plastic Solution**



A general purpose solution used for bonding rubber to metal, or rubber to wood, concrete, slate, etc. Used extensively for cementing linoleum, rubber window trimming in automobiles, flooring, etc.

PACKED IN 1 PINT TINS

Because the tins still have Army labels on them and the extra cost of re-canning would add to the price we are selling at well below the normal price (2/9).

ANOTHER GENUINE BARGAIN!

Cat. No. AX:254 .. 1/6 tin

HAMMERS



Engineer's type Hammers. 3 1/2 in. x 1 in. Head. Handle 13 in.
Cat. No. AX1071 .. 2/6 each

9-VOLT LAMPS

9-volt, 16 C.P., double-contact motor-car lamps.
Cat. No. AX134 .. 3D. each

THROAT MICROPHONES



A bulk purchase of THROAT MICROPHONES as used by the Armed Services. Simply fasten around the throat, or attach to instrument, as case may be, and with the aid of a special Matching Transformer allows you to broadcast through your own radio. Ideal for playing stringed instruments through a radio. English manufacture.

Outfit comprises of two small magnetic units held on either side of throat by an adjustable band. Useful where high noise level precludes use of an ordinary mike (e.g., they are used in tanks and police cars). Could be adapted as contact mike for musical instruments.—Cat. No. AM180 .. 15/-
Suitable Transformers for use with above.—Cat. No. AT725 .. 7/6



THE "LAMPHOUSE" carries a full range of all types of valves. Numerous brands are usually available but owing to Import Restrictions we cannot guarantee being able to supply a specific brand. Always state your first and second preference when ordering. Do not hesitate to write us for any special types not listed—we will probably be able to quote.

Prices Subject to Alteration.

Type.	Price.	Type.	Price.	Type.	Price.	Type.	Price.	Type.	Price.
01A	9/6	3Q5GT	14/1	6G8G	14/3	6X4	11/6	25L6G	10/-
0A3/VR75	16/3	3S4	11/4	6H6	10/-	6X5	12/5	25L6GT	13/9
0A4G	23/9	3V4	18/-	6H6G	8/6	6X5G	10/6	25Y5	19/6
0C3/VR105	19/10	5R4GY	25/9	6H6GT	9/6	6X5GT	10/6	25Z5	9/8
0D3/VR150	19/7	5T4	16/2	6J5	9/10	6Y6G	13/6	25Z8	11/11
0Z4	13/3	5U4G/U52	9/7	6J5G	8/3	6Z7G	13/6	25Z6G	9/8
0Z4G	12/8	5V4G	14/6	6J5GT	9/6	6ZY5G	14/4	25Z6GT	10/7
1A4P	17/-	5W4	10/3	6J6	18/5	7A4	15/6	26	7/-
1A5G	14/2	5W4GT	10/-	6J7	11/9	7A5	17/-	27	9/-
1A5GT	14/2	5X4G	9/1	6J7G	13/-	7A6	14/-	30	11/6
1A6	13/2	5Y3GT	7/4	6J7G/1620	13/11	7A7	14/-	31	8/6
1A7G	14/3	5Y4G	7/3	6J7GT	10/10	7A8	17/-	35A5	15/6
1A7GT	15/-	5Z3	13/-	6J8GA	20/6	7A8	13/-	35L6GT	12/6
1B4P	18/-	5Z4	14/0	6K5GT	10/3	7B4	14/-	35Z3	14/10
1B5/255	12/7	6A3	16/8	6K6G	9/4	7B6	15/6	35Z4GT	10/5
1C4	17/6	6A4	11/6	6K6GT	10/6	7B7	14/-	35Z5GT	10/7
1C5G	13/11	6A6	12/11	6K7	11/7	7B8	17/-	36	10/1
1C5GT	15/-	6A7	15/-	6K7G	10/2	7C5	13/-	37	11/9
1C6	18/10	6A8	13/6	6K7GT	9/11	7C6	14/-	38	10/2
1C7G	18/6	6A8G	11/7	6K8	13/6	7C7	15/6	39/44	10/4
1D4	16/9	6A8GT	11/1	6K8G	14/4	7F8	—	41	9/9
1D5GP	15/3	6AB5/6N5	13/6	6K8GT	13/6	7H7	23/-	42	11/3
1D7G	13/1	6AB7/1853	19/2	6L5G	9/6	7J7	23/-	43	11/5
1D8GT	20/10	6AC5G	18/-	6L6	19/-	7Q7	10/6	45	10/3
1E5GP	12/6	6AC7/1852	20/-	6L8G	16/4	7Y4	15/6	45Z5GT	10/6
1E7GV	18/6	6AF6G	11/4	6L7	13/7	10	25/11	46	11/9
1F5G	14/6	6AG7	18/-	6L7G	13/-	11AV	9/6	47	10/10
1F7GV	14/4	6AK5	37/6	6N6G	18/-	12A6	20/-	48	21/-
1G4GT	13/2	6AK6	17/-	6N7	13/6	12A6GT	10/9	50	20/9
1G5G	11/6	6AL5	22/3	6N7G	11/6	12A7	16/9	50L6GT	12/3
1G6GT	13/3	6AQ5	13/9	6N7GT	13/1	12A8GT	10/10	50Y6GT	9/6
1H4G	10/4	6AQ6	15/5	6Q7	12/4	12B8GT	13/9	53	17/3
1H5G	13/5	6AR7GT	16/9	6Q7G*	10/-	12C8	14/1	55	9/6
1H5GT	14/1	6AT6	10/11	6R7	12/9	12F5GT	10/3	56	7/6
1H6G	10/-	6AU6	12/6	6R7G	10/4	12J5GT	9/9	57	10/11
1J6G	14/2	6AV6	9/9	6R7GT	10/-	12J7GT	11/6	58	10/11
1K4	10/3	6B4G	19/8	6S7	12/-	12K7GT	10/7	59	14/11
1K5G	6/3	6B5	17/6	6S7G	11/10	12K8	17/-	70L7GT	22/3
1K6	19/-	6B6G	11/6	6SA7	10/7	12Q7GT	11/6	71A	9/8
1K7G	18/7	6B7	14/6	6SA7GT	12/-	12SA7	11/3	75	10/9
1L4	9/6	6B7S	14/6	6SB7	15/11	12SA7GT	12/6	76	7/3
1L5G	16/7	6B8	17/6	6SC7	12/6	12SC7	11/8	77	9/11
1L6	22/3	6B8G	14/3	6SF5	11/9	12SF5	9/6	78	10/3
1LD5	19/6	6BA6	13/7	6SF7	15/3	12SJ7	10/7	79	11/2
1LH4	27/-	6BE6	12/9	6SG7	11/9	12SK7	10/6	80	9/10
1LNS	19/3	6C4	15/9	6SH7	13/6	12SN7GT	15/6	81	18/8
1M5G	17/3	6C5	10/8	6SJ7	10/10	12SQ7	10/6	82	12/-
1N5G	12/6	6C5G	10/-	6SJ7GT	16/-	12SR7	13/6	83	11/7
1N5GT	14/-	6C6	10/-	6SK7	10/7	12Z3	11/10	83V	16/3
1P5GT	15/4	6C6G	11/6	6SK7GT	14/11	15	16/4	84/6Z4	11/7
1Q5GT	18/1	6C8G	19/9	6SL7GT	14/3	19	10/3	85	9/6
1R5	13/11	6D6	14/3	6SN7GT	15/6	24A	13/8	89	9/11
1S4	13/11	6D8G	12/7	6SQ7	11/8	25A6	13/10	112A	9/6
1S5	11/-	6E5	12/10	6SQ7GT	11/6	25A6GT	10/9	117Z3	19/3
1T4	11/-	6F5	11/7	6SS7	9/6	25A7G	13/6	117Z6GT	18/3
1T5GT	16/-	6F5G	9/4	6T7G	12/1	25A7GT	12/6	117L7GT	30/-
1U5	15/6	6F6G	9/6	6U5 6G5	12/7	25B6G	12/6	117N7GT	19/4
1V	8/5	6F6GT	9/-	6U7G	9/10	25L5	12/6		
2A3	16/1	6F8G	11/2	6V6	14/9				
2A5	9/11	6F8	11/8	6V6G	10/11				
2A6	11/3	6F8GT	9/-	6V6GT	13/10				
2A7	12/8	6F9G	21/6	6W7G	12/6				
2B7	19/-	6F9GT	12/11	6Q7GT*	10/7				
2E5	12/-	6G6G	13/11						
3Q4	13/3								

Transmitting and Special Types
(PRICES ON APPLICATION)

MULLARD VALVES

Type.	Base.	Price.	Type.	Base.	Price.	Type.	Base.	Price.	Type.	Base.	Price.
ABC1	P	14/6	CY1	P	10/9	DL91	B7G	13/6	EBC33	K	12/-
AC044	A	17/9	CY31	K	10/9	DL92	B7G	10/6	EBC41	B8A	13/3
AF3	P	18/3	DAC32	K	12/3	DW2	A	10/3	EBF2	P	14/9
AK2	P	17/9	DAF91	B7G	9/9	DL95	B7G	13/6	EBF32	K	14/6
AL3/AL4	P	16/-	DF33	K	14/-	DW4/350	A	10/3	EBL1	P	16/6
AZ1	P	9/3	DF91	B7G	10/9	EAC91	B7G	20/9	EBL31	K	14/9
AZ31	K	8/-	DK32	K	14/6	EAF41	B8A	13/3	EC31	K	11/6
AZ41	B8A	9/3	DK40	B8A	16/-	EAF42	B8A	13/3	EC52	B9G	11/6
CB1	P	14/6	DK91	B7G	11/6	EB34	K	10/3	EC91	K	23/-
CCH35	K	15/9	DL21	K	14/-	EB4	P	10/6	ECC31	K	16/-
CL2	P	15/3	DL33	K	14/-	EB41	B8A	17/9	ECC32	K	14/9
CL4	P	15/3	DL35	K	14/6	EB91	B7G	13/6	ECC33	K	19/6
CL33	K	13/6	DL36	K	15/3	EBC3	P	14/6	ECC34	K	14/9

Continued overleaf

MULLARD VALVES—Continued

Type.	Base.	Price.	Type.	Base.	Price.	Type.	Base.	Price.	Type.	Base.	Price.
ECC35	K	18/3	EL35	K	20/-	PEN36C	M	15/3	UCH42	B8A	15/3
ECC40	B8A	19/6	EL37	K	23/9	PEN4DD	M	17/-	UF1	B8A	13/3
ECC81	B9A	—	EL41	B8A	13/6	PEN40DD	M	17/9	UL41	B8A	13/6
ECC91	B7G	19/6	EL42	B8A	15/9	PEN4VA	M	15/3	UY41	B8A	10/3
ECH2	P	14/9	EL91	B7G	17/6	PEN428	M	15/3	UR1C	O	10/9
ECH3	P	17/-	EM1	P	12/9	PL81	B9A	—	VP13C	M	15/9
ECH35	K	14/9	EM34	K	12/9	PL82	B9A	—	VP2	M	16/-
ECH41	B8A	14/-	EM4	P	13/6	PL83	B9A	—	VP2B	M	18/6
ECH42	B8A	14/9	EN31	K	25/6	PM1HF	A	11/9	VP4	M/O	19/-
ECL80	B9A	—	EQ80	B9A	—	PM12M	A	15/3	VP4B	M/O	19/-
EF36	K	13/6	EY51	—	PM2A	A	10/3	VP4B	M	15/3	
EF37A	K	15/6	EY91	B7G	17/6	PM2B	M	14/6	2D4A	O	10/6
EF39	K	12/-	EZ35	K	11/-	PM2HL	A	10/3	2D4B	M	10/6
EF40	B8A	20/-	EZ40	B8A	12/-	PM22A	O	12/9	2D21	B7G	25/3
EF41	B8A	12/3	EZ41	B8A	11/-	PM24A	O	14/9	354V	O	11/6
EF42	B8A	17/3	FC13C	M	17/9	PM24M	O	16/-	1267	K	25/-
EF50	B9G	10/3	FC2	M	19/-	PY80	B9A	—	7475	4 pin	20/9
EF54	B9G	16/3	FC2A	M	19/-	QV04-7	B9G	31/-	85A1	B8C	23/9
EF6	P	13/6	FC4	M	17/9	QV05-25	O	34/6			
EF9	P	12/-	FW4/500	A	11/6	SP13C	M	21/-			
EF80	B9A	—	IW4/350	A	11/-	SP2	M	16/-			
EF91	B7G	23/6	IW4/500	A	11/-	SP4	O/M	18/6			
EF92	B7G	21/-	KBC1	P	17/6	TDD13C	M	16/-			
EFF81	B9G	60/-	KBC32	K	12/9	TDD2A	O	14/6			
EK2	P	15/9	KF3	P	16/6	TDD4	M	15/3			
EK3	P	15/9	KF35	K	13/6	TH21C	M	30/3			
EK32	K	17/9	KK2	P	17/9	TH30C	M	22/9			
EL2	P	18/3	KK32	K	17/-	TH4B	M	22/-			
EL3	P	17/-	KL35	K	13/6	UAF42	B8A	13/3			
EL32	K	15/9	KL4	P	15/9	UBC41	B8A	12/9			
EL33	K	14/-	PENA4	M	12/9	UCH41	B8A	14/-			

DEFINITION OF BASES
 A = 4-pin English
 K = Octal
 M = 7-pin English
 O = 5-pin English
 P = Side Contact
 B7G = 7-pin Amer. miniature
 B8A = 8-pin Rimlock
 B9G = 9-pin

PHILIPS VALVES

(NOTE: Where type numbers are bracketed the types are direct equivalents or substitutes.)

On some of the special types prices are not available at present. These may be had on application.

A425—4-pin American	11/9
A609—4-pin American	9/0
A615—4-pin American	9/0
A642—4-pin American	13/9
AB2—Small side contact "P"	12/9
ABC1—Side contact 8-pin "P"	14/6
AF2(VP4A)—5-pin Eng. substitute	17/0
AF3—Side contact 8-pin "P"	18/3
AK2—Side contact 8-pin "P"	17/9
AL3 (AL4)—Side contact 8-pin "P"	16/6
AX50—4-pin English substitute	27/0
AZ1—Side contact 8-pin "P"	9/3
AZ3(AZ4)—Side contact 8-pin "P"	14/9
AZ31—American octal	8/0
AZ41—Rimlock B8A	9/3
AZ50—4-pin English	30/-
B405—4-pin American	10/9
B406—4-pin American	10/9
B442—4-pin American	13/6
B605—4-pin American	10/9
C1C—4-pin English	17/3
C8—Side contact 8-pin "P"	17/3
C10—Side contact 8-pin "P"	16/6
C12—Side contact 8-pin "P"	22/3
C443—5-pin English	15/3
CBL1—Side contact 8-pin "P"	14/6
CBL31—American octal	17/-
CC1—Side contact 8-pin "P"	12/3
CCH35—American octal	15/9
CL2(CL4)—Side contact 8-pin "P"	15/3
CL33—American octal	13/6
CY2—Side contact 8-pin "P"	16/6
CY31—American octal	10/9
DA90	13/6
DAC21—American octal	14/0
DAC32(1H5)—American octal	12/3
DAF91(1S5)—B7G American min.	9/9
DCC90(3A5)	16/6
DDR100—American octal	—
DF21—American octal	14/0
DF33(1N5)—American octal	14/0
DF65	14/0
DF70	11/6
DF91(1T4)—B7G American min.	10/9
DF92(1L4)—B7G American min.	12/9
DK21—American octal	16/-
DK32(1A7)—American octal	14/6
DK40—Rimlock B8A	16/0
DK91(1R5)—B7G American min.	11/6
DL21—American octal	14/0
DL33(3Q5)—American octal	14/0
DL35(1C5)—American octal	14/6
DL36(1Q5)—American octal	15/3
DL41—Rimlock B8A	14/6
DL65	14/9
DL71	11/6
DL72	11/6

DL91(1S4)—B7G American min.	13/6
DL92(3S4)—B7G American min.	10/6
DL93(3A4)—B7G American min.	12/9
DL94(3V4)—B7G American min.	10/6
DL95(3Q4)—B7G American min.	13/6
DL121—American octal	23/6
E424—5-pin English substitute	16/6
E452T(SF4)—5-pin Eng. substitute	18/6
E463(Pen4VA)—7-pin English substitute	14/6
E499(4657)—5-pin Eng. substitute	19/6
EA40—Rimlock B8A	30/-
EA50—Wire-in	13/3
EAC91—B7G American miniature	20/9
EAF41—Rimlock B8A	13/3
EAF42—Rimlock B8A	13/3
EB4—8-pin side contact "P"	10/6
EB34(6H6)—American octal	10/3
EB40—Rimlock B8A	50/0
EB41—Rimlock B8A	17/9
EB91(6AL5)—B7G American min.	13/6
EBC3—Side contact 8-pin "P"	14/6
EBC33(6Q7)—American octal	12/0
EBC41—Rimlock B8A	13/3
EBF2—Side contact 8-pin "P"	14/9
EBF32(6B8)—American octal	14/6
EBF35—American octal	24/0
EBL1—Side contact 8-pin "P"	16/6
EBL21—American octal	18/6
EBL31—American octal	14/9
EC31—American octal	11/6
EC50—Side contact 8-pin "P"	40/0
EC82—9-pin B9G	11/6
EC53—9-pin B9G	17/6
EC54—9-pin B9G	12/9
EC80(6Q4)—9-pin American noval	56/0
EC91—B7G American miniature	23/0
ECC31—American octal	16/0
ECC32—American octal	14/9
ECC33(6SN7)—American octal	19/6
ECC34—American octal	14/9
ECC35(6SL7)—American octal	18/3
ECC40—Rimlock B8A	19/6
ECC91(6J6)—B7G American min.	19/6
ECH3—Side contact 8-pin "P"	17/0
ECH21(7S7)—American octal	14/9
ECH35(6K8)—American octal	14/9
ECH41—Rimlock B8A	14/-
ECH42—Rimlock B8A	14/9
ECP1—Side contact 8-pin "P"	69/6
EP6—Side contact 8-pin "P"	13/6
EP9—Side contact 8-pin "P"	12/0
EF22(7B7)—American octal	13/6
EF37(6J7)—American octal	13/6
EF37A(6J7)	15/6
EF39(6K7)—American octal	12/6
EF40—Rimlock B8A	20/0
EF41—Rimlock B8A	12/3
EF42—Rimlock B8A	17/3
EF50—9-pin B9G	10/3
EF54—9-pin B9G	16/3
EF55—9-pin B9G	16/3
EF91—7-pin B7G American min.	23/6
EF92—7-pin B7G American min.	21/0
EF93(6BA6)	12/0

EFF51—9-pin B9G	60/0
EK2—Side contact 8-pin "P"	15/9
EK32(6A8)—American octal	17/9
EL2—Side contact 8-pin "P"	17/3
EL3—Side contact 8-pin "P"	18/0
EL31	27/6
EL32—American octal	15/9
EL33(6V6)—American octal	14/0
EL34(6L6)—	28/0
EL35—American octal	20/0
EL37—American octal	23/9
EL38—American octal	23/9
EL41—Rimlock B8A	13/6
EL42—Rimlock B8A	15/9
EL51—Side contact 8-pin	106/9
EL60—9-pin B9G	56/0
EL91—7-pin B7G American min.	17/6
EM1—Side contact 8-pin "P"	12/9
EM4—Side contact 8-pin "P"	13/6
EM34—American octal	12/9
EN31—American octal	25/6
EW80—9-pin B9G	56/6
EY51—Wire-in	26/6
EY91—7-pin B7G American min.	17/6
EZ2—Side contact 8-pin "P"	9/3
EZ3—Side contact 8-pin "P"	9/3
EZ22—American octal	13/3
EZ35(6X5)—American octal	11/0
EZ40—Rimlock B8A	12/0
EZ41—Rimlock B8A	11/0
GZ32(5V4)—American octal	11/6
FW4-800—4-pin English	13/6
HVR2—4-pin English	26/6
KBC1—Side contact 8-pin "P"	17/6
KBC32—American octal	12/9
KF3—Side contact 8-pin "P"	18/6
KF35—American octal	13/6
KK2—Side contact 8-pin "P"	17/9
KK32(1C7)—American octal	17/0
KL4—Side contact 8-pin "P"	15/9
KL35(1F5)—American octal	13/6
KLL32—American octal	19/0
LSD2—Edison screw	—
LSD3—4-pin American	—
LSD3A—	—
LSD4—	—
LSD7—4-pin American	—
LSD8—	—
ME1400	30/0
U30	16/6
UAF41—Rimlock B8A	13/3
UAF42—Rimlock B8A	13/3
UBC41	12/9
UBL21—American octal	20/9
UCH21—American octal	19/6
UCH41—Rimlock B8A	14/0
UCH42—Rimlock B8A	15/3
UF21—American octal	16/0
UF41—Rimlock B8A	13/3
UF42	21/0
UL41—Rimlock B8A	13/6
UM4—American octal	15/9
UY1(N)—American octal	11/6
UY21—	11/0

PHILIPS VALVES—Continued

UY41—Rimlock B8A	10/3	20CV—P.E. cell (Vac.) Amer. loctal	—	150C1	28/9
1561—4-pin English	14/9	58CG	—	150C1K	28/9
1805(506)—4-pin English	11/0	58CV	—	DB4-2	—
1875—Side contact 8-pin "P"	53/0	90AV—P.E. cell (Vac) Am. Min B7G	—	DB7-2—Cathode ray tube	—
1876—Side contact 8-pin "P"	27/6	90CG—P.E. cell (Gas), Am. Min B7G	—	DB7-5	—
1877—4-pin English	26/6	90CV—P.E. cell (Vac) Am. Min B7G	—	DB9-3—Cathode ray tube	—
1904—4-pin English	16/9	4060—3-pin "H"	—	DC4-2—Cathode ray tube	—
1909—3-pin "H"	19/0	4065(ME.1401)	—	DC7-1—Cathode ray tube	—
1914—Edison screw	16/0	4066(ME1402)	—	DC7-2—Cathode ray tube	—
1927	40/0	4613(E406)—4-pin English	38/0	DC7-3	—
1928	16/9	4624(E707)—4-pin special	79/0	DC7-5	—
1941—Edison screw	14/6	4654—Side contact 8-pin "P"	24/3	DC9-3—Cathode ray tube	—
1945	16/5	4657—5-pin English	22/6	DC9-3	—
3510—P.E. cell (Vac) 4-pin English	—	4673—Side contact 8-pin "P"	18/3	DC10-6	—
3512—P.E. cell (Vac) 4-pin English	—	4682(AL2)—Side contact 8-pin "P"	23/9	DN7-2—Cathode ray tube	—
3530*—P.E. cell (Gas) 2-pin Special	—	4689—Side contact 8-pin "P"	29/6	DN9-3—Cathode ray tube	—
3533—P.E. cell (Gas) 4-pin English	—	4690—Side contact 8-pin "P"	43/3	DN9-5—Cathode ray tube	—
3534*—P.E. cell (Gas) 4-pin Amer.	—	4699—Side contact 8-pin "P"	24/9	DN10-6	—
3538*—P.E. cell (Gas) 2-pin Special	—	4687—Stabilizer neon	12/9	DR10-6	—
3541*—P.E. cell (Gas) 4-pin English	—	4687-K	12/9	THE—Vacuum thermocouple	—
3541*P.E. cell (Gas) 4-pin English	—	7475—Stabilizer neon	20/9	TH2—Vacuum thermocouple	—
3543—P.E. cell (Gas) wire-in	—	85A1—Stabilizer neon	23/9	TH3—Vacuum thermocouple	—
3546—P.E. cell (Gas)	—	100E1—Stabilizer neon	104/0	TH4—Vacuum thermocouple	—
* Also available without base.	—	13201—Stabilizer neon	45/6	TH5—Vacuum thermocouple	—
20AV—P.E. cell (Vac) Amer. loctal	—	150A1—Stabilizer neon	28/9	4383—Rare gas fuse	—
20CG—P.E. cell (Gas) Amer. loctal	—				

Substitute Type.	Philips Type.	Base Description.	Price.	Substitute Type.	Philips Type.	Base Description.	Price.
			s. d.				s. d.
DW2	506	4 Pin English	10 3	TDD2A	KBC1	5 Pin English	14 6
DW3	1561	4 Pin English	13 6	TDD4	ABC1	7 pin English	15 3
FC2A	KK2	7 Pin English	19 0	TDD13C	CBC1		16 0
FC4	AK2	7 Pin English	17 9	UR3C	CY2	7 Pin English	17 0
FC13	CK1		17 9	VP2B	KF3	7 Pin English	18 6
PEN4A	AL4	7 Pin English	12 9	VP4	E47	7 Pin English	19 0
PEN4VA	E463	7 Pin English	15 3	VP4A	AF2	7 Pin English	19 0
PEN4DD	ABL1	7 Pin English	17 0	VP4B	AF6	7 Pin English	15 3
PM2B	KDD1	7 Pin English	14 6	VP13A	CF2	Side Contact 8 Pin "P"	15 9
PM2HL	KC3	4 Pin English	10 3	2D4A	AB1	4 Pin English	10 6
PM22A	KL4	5 Pin English	12 9	354V	E424	5 Pin English	11 6
PM24M	E443H	5 Pin English	16 0	6X5P	2Z2/2Z3	Side Contact 8 Pin "P"	9 3
SP4	E442, etc.	5/7 Pin English	18 6	904V	E438	5 Pin English	12 3

Coming!

The drills and accessories listed below will not be available until late in 1951. We will gladly record your requirements and advise you when our shipment arrives.

'WOLF' CUB ELECTRIC DRILLS

"WOLF" CUB ELECTRIC DRILL



The ideal Electric Drill for the home workshop. Drilling capacity (mild steel), 1/4 inch; (wood) 3/8 inch. Watts 210, Speed 2400, R.P.M. speed loaded

1330 R.P.M. Length overall 7 1/2 in. Nett weight 3lb. Accessories will be available for sanding, polishing etc. (See listings below.)

Approx. Price
Cat. No. AU400 .. **£5/10/-**
Delivery expected about end 1951.

"WOLF" BENCH CLAMP



This Clamp holds the "Wolf" Cub Drill so that it can be used for polishing, grinding etc.

Cat. No. AU401—**18/6**

Arbour Assm. for attaching grinding wheels, etc., to drill.

Cat. No. AU406—**5/-**
Approx. Price

"WOLF" DRILL STAND

Doubles the usefulness of your "Wolf" drill. For all work calling for a delicate touch and for general vertical drilling. The Cub fitted to this stand fills the bill. Lever design ensures a firm, smooth feed. Depth of feed 2in. Max. distance from chuck to drilling table 6in. Distance from pillar to twist drill centre 2 1/2 in. Diam. of drilling table 4in. Overall height 18in. Nett weight 5 1/2 lb.

Cat. No. AU407—**55/6**



"WOLF" DRILL ACCESSORIES

- Cat. No. AU402—3in. GRINDING WHEELS .. **6/3** each
- Cat. No. AU403—POLISHING MOPS .. **5/-** each
- Cat. No. AU404—3in. WIRE BRUSHES .. **3/3** each
- Cat. No. AU405—SET OF FOUR TWIST DRILLS .. **14/-** each



Rola

THE WORLD'S FINEST
SOUND REPRODUCERS

Permanent Magnet Speakers



BEHIND EVERY GOOD RADIO...
THERE IS A **Rola!**

FIND SPEAKERS THAT MAKE YOUR
RADIO... A BETTER RADIO

Anisotropic Alnico magnets have so greatly improved the performance of the Rola permanent magnet speakers as to make this type far more efficient than the electro-dynamic types with the result that the latter are rapidly becoming obsolete. We do however get a few occasionally, so if you especially want an Electro-dynamic speaker let us have your order and we will do our best to execute it for you.

Our Cat. No.	Rola No.	Overall Diam. (in.)	Voice Coil Diam. (in.)	Voice Coil Impedance (ohms)	Power Handling Capacity (watts)	Weight with Transformer lb. oz.	Price
AS962	12U	12 1/16	1 1/2	8.4	15	12	13 15 0
AS963	G12	12 1/16	1 1/2	15	15	11	8 8 0
AS964	12-0	12 1/16	1 1/2	2.3	7	5	5 3 0
AS965	12-M	12 1/16	1	2.3	7	3 12	3 15 0
AS966	10-42	10 1/16	1	2.3	7	5	4 7 1
AS967	10-M	10 1/16	1	2.3	7	3 12	2 19 0
AS968	8-M	8 1/16	1	2.3	7	2 13	3 1 0
AS969	8K	8 1/16	1	2.3	5 1/2	2 11	2 15 0
AS970	8H	8 1/16	1	3.7	4	1 14	2 10 0
AS971	6K	6 9/16	1/2	3.7	5	2 6	2 11 0
AS972	6J	6 9/16	1/2	3.7	4 1/2	2 2	2 11 6
AS973	6H	6 9/16	1/2	3.7	4	1 12	2 7 3
AS974	5H	5	1/2	3.7	3 1/2	1 10	2 0 6
AS975	5C	5	1/2	3.7	2 1/2	1	1 17 0
AS978	3C	3 9/16	1/4	3.7	1/2	1/2	2 2 0

PHILIPS "TICONAL" P.M. SPEAKERS



5 1/2 in. SPEAKER: Excellent small Speaker. Voice coil impedance, 5 ohms at 1000 cycles per second. Baffle aperture, 4 1/2 in. Without Output Transformer—Cat. No. AS937 .. **19/6**

6 1/2 in. SPEAKER: A medium sensitivity light weight Speaker with good rigidity. Voice Coil impedance, 5 ohms at 1000 cycles per second. Baffle aperture 6 in. Without Output Transformer. Cat. No. AS938 .. **23/3** each

8 1/2 in. SPEAKER: A high quality 8 1/2 in. standard Speaker of recognised quality. Already used in many commercial made receivers. Voice Coil impedance, 5 ohms at 1000 cycles per second. Baffle aperture 7 1/2 in. Without Output Transformer.—Cat. No. AS939 .. **27/6** each

Suitable Transformers

A suitable Transformer for use with any of the above "Philips" Speakers would be the "Minor" 3-watt Universal Output Transformer. Cat. No. AT603 .. **16/-**

Or 5000 ohm. Speaker Transformer Output.—Cat. No. AT716 .. **11/6**

ENSIGN EXTENSION SPEAKER



Fitted in attractive cabinet, as illustrated, 8 1/2 in. high, 11 in. wide, and 5 1/2 in. deep. Supplied complete with volume control and transformer. 8 in. Rola speaker unit ensures faithful reproduction—Cat. No. AS995 **£4/19/6**

IMPORTANT

ALL PRICES IN THIS CATALOGUE ARE SUBJECT TO ALTERATION WITHOUT NOTICE

"ENSIGN" SPEAKER EXTENSION ADAPTORS



Extension Speaker Adaptors. The problem of fitting an extension speaker to your electric set has been solved! All you do is remove the output valve, plug in the adaptor, then put back the valve on top of the adaptor. The adaptor can also be used as a tone improver.

Can be used in conjunction with all P.M. speakers which have output transformers fitted.

Cat. No. AS680—4-pin ..	7/6 each
Cat. No. AS681—5-pin ..	7/6 each
Cat. No. AS682—6-pin ..	7/6 each
Cat. No. AS683—Octal ..	8/6 each

EXTENSION SPEAKER



Mullard Extension Speaker in moulded plastic case. 8 in. in diameter, equipped with 5 in. P.M. speaker complete with volume control. Colours: brown, cream, pastel green, light mottled red, dark mottled red. Cat. No. AS998 .. **64/6**

LAMPHOUSE GUARANTEE

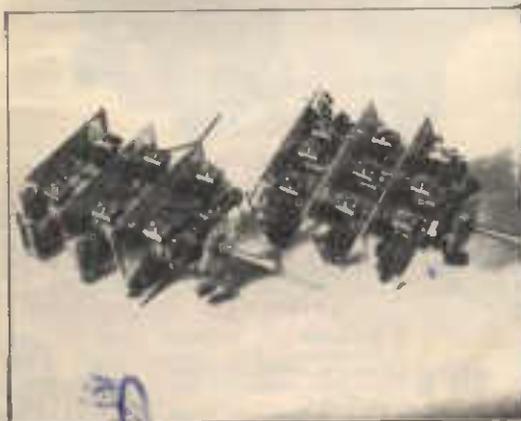
Any goods that prove in any way unsuitable may be returned undamaged within seven days from receipt and your money will be refunded in full.



All ENSIGN Coils are designed by experts and are accurately tested and matched. ENSIGN Coils are designed for use with tuning condensers (measured without trimmers) of maximum capacity 440 to 480 mmfd. and minimum capacity 9 to 15 mmfd. and especially for the Plessey types "K" and "E", tuning condensers for which our dial scales are calibrated.

All coils other than those specified are wound on 3/4 in. ext. dia. former and all broadcast coils are wound with seven or ten strand Litz secondaries and high impedance primaries. Broadcast Band Coverage, 535 to 1700 k.c.

"ENSIGN" TUNING UNITS



Completely wired and assembled unit for use in 5-valve receivers. Consists of aerial and oscillator sections and has a coverage on short wave from 19/50 metres and broadcast 540 to 1600 k.c. for use with Plessey Type K. 1842-11. Condenser and 6K8 Converter Tube. Price includes all coils, wave change switch already assembled, padders, bypass condensers, and trimmers. Air tested and aligned. Full instructions. Cat. No. AC350 **£4'3/11**

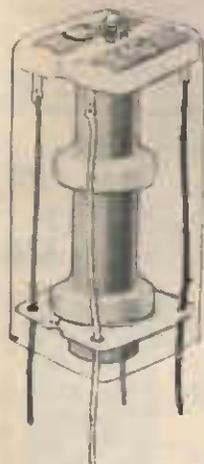
DIAL WAVE UNIT

Dual Wave, assembled similar to the above, but containing Aerial R.F. and Oscillator Sections. Cat. No. AC351 **£6'2/8**

TRIPLE WAVE UNIT

Similar to above, containing Aerial, R.F. and Oscillator sections. Cat. No. AC352 **£6'13/9**

"ENSIGN" INTERMEDIATE FREQUENCY TRANSFORMERS



have been carefully designed by experts to give maximum results. Types suitable for midget, commercial or high fidelity receivers are available. These factors allow the experimenter and home constructor more scope than before when designing a receiver.

Cat. No. AC340—Iron Core, Litz wound in 1 1/2 in. square by 3 1/2 in. high can, 465 k.c. **15/6** each

Cat. No. AC341—Air Core Ditto **14/6**

COILS FOR KITS

Cat. No. AC533—Coils for Easy-Built Three **4/9** ea.

MIDGET I.F. TRANSFORMERS



Measuring only 2 in. high x 1 1/2 in. diameter, the "Ensign" Midget I.F. is ideal for the miniature portable receiver. Permeability tuned. Wound on Polystyrene Former; 2 pyc; 465 k.c. Noise to signal ration excellent. Aluminium can. Cat. No. AC524 **13/6** each

T.R.F. COILS

These Coils have been developed for constructors wanting low-priced yet well-made T.R.F. Coils. Wound with enamelled wire on bakelite former 1 1/2 in. diam.

Cat. No. AC530—Aerial **3/9**

AC531—R.F. **3/9**

AC532—R.F. With Reaction. **4/3**



AIR CORE TYPE

Air Core Litz Wound, mounted in 1 1/2 in. square by 1 1/2 in. cans. Broadcast.

Cat. No. AC303—Aerial **8/11**
Cat. No. AC304—R.F. **8/11**
Cat. No. AC306—Oscillator, 465 K.C. **8/11**



IRON CORE TYPE

Iron Core Adjustable Permeability Litz Wound in 1 1/2 in. square by 1 1/2 in. cans. Broadcast.

Cat. No. AC301—Aerial **11/6**
Cat. Nn. AC302—R.F. **11/6**

Suitable Oscillator Coils for above (air core).
Cat. No. AC306—465 K.C. **8/11**

UNSHIELDED TYPE

Air Core Litz Wound Broadcast 1/2 in. Former.

Cat. No. AC311—Aerial **5/10**
Cat. No. AC312—R.F. **5/10**
Cat. No. AC313—Oscillator, 465 k.c. **5/10**

"ENSIGN" SHORT WAVE COILS

Unshielded, wound on 1/2 in. Formers, 19/50 Metres.

Cat. No. AC320—Aerial **5/6** ea.
Cat. No. AC321—R.F. **5/6** ea.
Cat. No. AC322—465 K.C. Oscillator **5/6** ea.

"ENSIGN" PORTABLE COIL KIT

Special Coil Kit for portable sets. Consists of "Ensign" Loop Aerial, 8 in. x 8 in. (matched to standard "Ensign" coils and fitted with primary windings for use with outdoor aerial when required); "Ensign" Oscillator Coil; 2 "Ensign" I.F. Transformers and Padder.

Cat. No. AC449 **£2'7/-** ea.
Aerial only, Cat. No. AA300 **9/6**

"ENSIGN" UNIVERSAL REPLACEMENT COILS

Universal replacement coils adjustable in inductance to suit gang condenser capacities from 360 to 480 mmfd. Will replace existing coil. Unshielded.

Cat. No. AC330—Aerial Type **7/11**
Cat. No. AC331—R.F. Type **7/11**
Cat. No. AC332—Oscillator Type **7/9**

FULL DETAILS WITH EACH COIL.

"ECONOMY" I.F. BOBBINS



Cat. No. AC527—465 K.C. Air Core **4/6**

HIKER'S ONE COILS

Ready wound coils for the famous Hiker's One sets. Wound on Coil Former 1 1/2 in. diam. x 3 1/2 in. Cat. No. AC535 **3/9** each

ENSIGN COILS Colour Code

AERIAL & R.F.		
Grid	Green
Plate or Aerial	Yellow
Earth or B +	Red
Earth or A.V.C.	Black
OSCILLATOR		
Grid	Green
Plate	Yellow
B +	Red
Padder	Black
INTERMEDIATE FREQUENCY TRANSFORMERS		
Plate	Blue
B +	Red
Grid or Diode Plate	Green
A.V.C. or Diode Load	Black

TUBULAR CONDENSERS



Non-inductive Condensers with wire ends.
350 VOLTS (WORKING).

Cat. No.		each
AC674—.1 mfd.		9d.
AC676—.25 mfd.		9d.
500/600 VOLT WORKING		
AC700—.0001	1/-	
AC701—.0002	1/-	
AC702—.00025	1/-	
AC703—.0003	1/-	
AC704—.0005	1/-	
AC705—.001	1/-	
AC706—.002	1/-	
AC707—.003	1/-	
AC709—.005	1/-	
AC710—.006	1/-	
AC711—.01	1/2	
AC712—.02	1/2	
AC712A—.03	1/3	
AC713—.05	1/3	
AC714—.1	1/9	
AC715—.25	1/9	
AC716—.5	1/9	

MICA FIXED CONDENSERS

Cat. No.		each
AC750—.00005	1/-	
AC751—.0001	1/-	
AC753—.00025	1/-	
AC755—.0005	1/3	
AC756—.001	1/3	
AC757—.002	1/3	
AC758—.003	1/9	
AC759—.004	1/9	
AC760—.005	2/6	
AC766—.01	2/6	
AC767—.02	3/-	

ELECTROLYTIC CONDENSERS



ELECTROLYTIC CONDENSERS IN ROUND CARDBOARD CONTAINERS.

Tubular Type—Dry.

Cat. No.		each
AC600—8 mfd.	3/8	
AC614—16 mfd.	3/11	
AC625—25 mfd., 25 volt	2/6	
AC619—10 mfd., 40 volt	2/3	
AC640—12 v. 500 mfd.	7/6	
AC635—50 mfd., 350 volt	8/6	

DRY ELECTROLYTIC CONDENSERS IN METAL CASES.

AC613—16 mfd. Upright Mounting	6/11
AC620—10 x 10 mfd. "	7/6

WET ELECTROLYTICS IN METAL CASES.

AC602—8 mfd. 500 volt	9/6
AC615—16 mfd. 450 volt	9/6

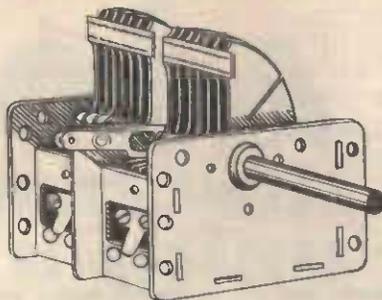
HIGH VOLTAGE CONDENSERS LOW PRICED

Cat. No.		each
AC653—.001 mfd., 1800 volts test, mica	2/6	
AC652—.002 " 1800 " " "	2/6	
AC651—.005 " 1800 " " "	2/6	
AC655—.001 " 2500 " " "	2/9	

Another Condenser Bargain CERAMIC FIXED CONDENSERS

Cat. No. AC660—5 pfd
Cat. No. AC662—15 pfd **5^D** each

GANGED CONDENSERS



British-made reliable Condensers will match up with Ensign Coil Kits. 1/2 in. shafts, anti-clockwise rotation. Capacity .00042.

Cat. No. AC922—2-gang	13/-
Cat. No. AC923—3-gang	18/6

SPECIAL PURCHASE 2 Gang Condensers

A large quantity of two gang variable condensers, new, but bearing solder marks. Capacity .000385 mfd.; complete with mounting brackets, etc. 1/2 in. shaft. Bulk buying enables us to pass these on at **7/11** each
Cat. No. AX111

" ENSIGN " MIDGET CONDENSERS

Ideal Gang Condensers for miniature portables, etc. Overall dimensions only, Height 1 1/2 in., Width 1 1/2 in., Depth 1 1/2 in.: 1 gang section 1/2 in. Capacity, .000365 max., 14 p.f.d. min. Ceramic insulation. Nickel silver contacts.



Cat. No. AC924—2 gang	18/6
Cat. No. AC925—3 gang	23/-

MIDGET VARIABLE CONDENSERS

Very compact Condensers for constructing small receivers, wave traps, and other apparatus. Solid dielectric type. 1/2 in. diam. shaft. Overall dimensions, 1 1/2 in. x 1 1/2 in. x 1/2 in. thick. Shaft assembly 1/2 in. long.



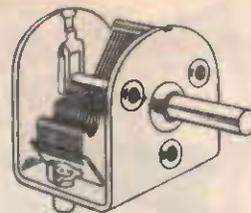
AC918, .0003—	5/3
Cat. No. AC919—.0005	5/3
Cat. No. AC917—.0001	5/3 each

GENERATOR CONDENSERS



Special Condensers for noise suppression on motor car radio installations, etc. .25mfd. Metal case **3/6** each
Cat. No. AC658

TUNING CONDENSERS



Single gang for crystal sets, Hiker's One, wave-traps, small valve sets, etc., etc. Small size make them ideal for portables, etc. Panel mounting. Size 1 1/2 in. x 1 1/2 in. x 1 1/2 in. high; shaft 3/16 in. long.

Cat. No. AC905—.0003	6/3
Cat. No. AC906—.0005	6/3

MIDGET CONDENSERS, R.C.S.

Midget Condensers with high voltage troilitul insulation end pieces, single bearing type.



Cat. No.	Max. Cap.	Min.Cap.	Plates.	Price
AC809	Mmfd.10	Mmfd.3	2	5/6
AC810	Mmfd.25	Mmfd.3.5	4	5/4
AC811	Mmfd.50	Mmfd.4	7	6/3
AC812	Mmfd.100	Mmfd.6	14	7/9

TRIMMING CONDENSER

Air-spaced Trimming Condenser, 1/2 in. shaft; capacity 35MMFD. Knob is not supplied with condenser.



Cat. No. AC807	3/9 each
Ditto, .0001 MFD	
Cat. No. AC808	4/9 each

INTERFERENCE SUPPRESSION CONDENSERS

Specially constructed Condensers to alleviate radio interference set up by electrical units such as motors, etc. Fits direct to the motor or other such unit.

Cat. No. AC595—Tubular Pack. .1 mfd. + .1mfd. + .01 mfd. 250 volt A.C.	5/6
Cat. No. AC596—Oblong Metal Can. 1 1/2 in. x 1 1/2 in. with mounting bracket. .01 mfd. + .01 mfd. + .02 mfd. 250 volt A.C.	5/6

PADDERS AND TRIMMERS

Single bank Trimming Condensers, capacity 30 mmfd.

Ceramic Insulation. Cat. No. AC875 **1/-** each

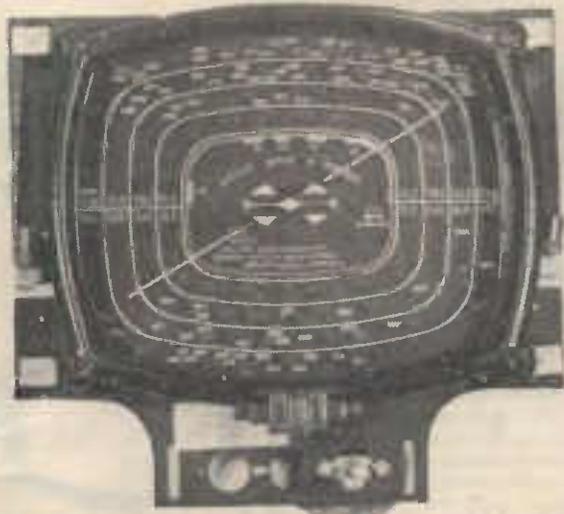
Single Hole MOUNTING PADDERS, 600 mmfd. Troilitul mounting. **2/6** each

Cat. No. AC880 **2/6** each
Cat. No. AC879—Ditto 1600 mmfd. **2/-** each



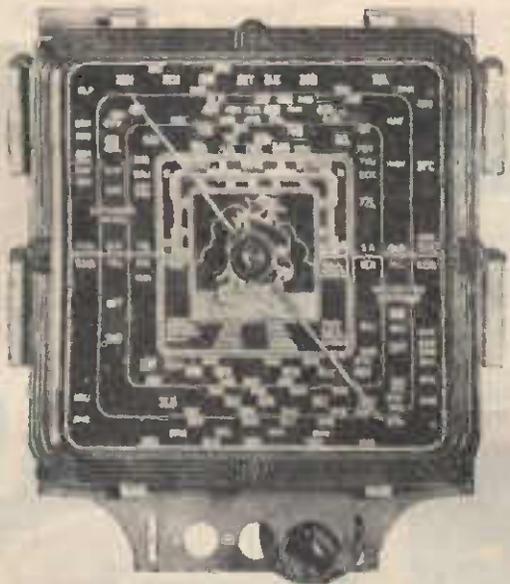
DIALS

These high quality Dials are designed by Australia's Leading Dial Manufacturers for those who want a first-class article at a reasonable price. All are calibrated for New Zealand, Australian and Shortwave Stations and matched to the Plessey type "K" 3-gang condenser (440 mmfd.) Dial Shaft, 3/8in.



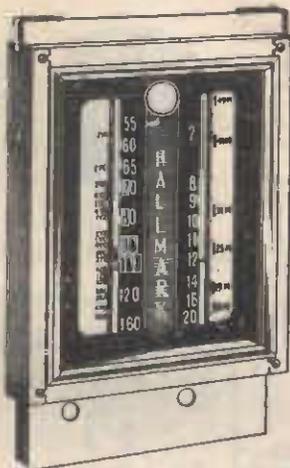
A popular size for 5 or 6 valves. Attractive colour toning. Glass scale is mounted against a black background. Station markings are in Green and Orange with Ivory trimmings. Fancy brown mottled Escutcheons, two Dial Lightholders for edge lighting. Maximum measurements for Visual Dial face. Length, 8in.; Depth, 6 1/2in. Overall dimensions of frame: Length, 10in.; Depth, 9 1/2in. **50/-**
Cat. No. AD120—NEW LOW PRICE

A DE LUXE SPECIAL FOR A CONSOLE CABINET



ITS SIZE WOULD MAKE IT AN ADMIRABLE DESIGN FOR THE LARGER CLASS OF RADIO
Visual Dial face measures 8in. x 8in. Overall dimensions are: Length, 10 1/2in.; Depth, 11 1/2in. Colour scheme is as follows: Background—Black, Station markings—Green, Orange, and Ivory. Trimmings in Orange and Ivory. Grooved brown mottled bakelite Escutcheon. Space for Four Dial Lights. **55/-**
Cat. No. AD121—NEW LOW PRICE

"HALLMARK" 3-COLOUR DIALS



THREE COLOURS—Yellow, Green, White.

DUAL WAVE — VERTICAL MOUNTING.

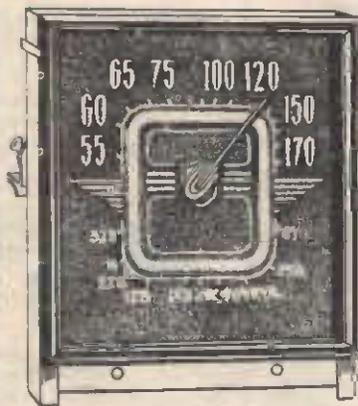
Dimensions—
Overall 10 1/2in. x 6 1/2in.
Face 7 1/2in. x 5 1/2in.
Escutcheon Inside 6 8in. x 4 8in.

Spin Drive. Details given with each Dial simplify mounting. The whole job is Cadmium plated and is really a finished article.

This is the same Dial as is used on the popular "EASY BUILT 5" RECEIVER. **42/6**
Cat. No. AD102

THEY'RE REAL VALUE AT THE PRICE!

THE "SKY-KING" BROADCAST DIAL



A Really First-class Broadcast Dial, ideal for the smaller class of set, such as a Portable or Small Electric or Battery Radio. Logged in Kilocycles between 550 and 1700. Station markings also given. Tracks with a 420/480 gang 3in. shaft; anti-clockwise rotation. Size: 4in. x 4in.

COLOURING: Brown background, White figures, Red station markings, Gold trimmings, Escutcheon in Brown. Two Dial Light Holders for Flood Lighting.

AN ATTRACTIVE AND WELL DESIGNED DIAL.

Cat. No. AD115 **24/6**

"HI-Q" SLIDE RULE DIALS



DUAL WAVE

A handsome and Well-constructed Horizontal Slide-rule Dual-wave Dial, finished in crackle black and Cadmium plate. The Dial is fitted with FLY-WHEEL type SPIN TUNING and is edge lit. Approximate outside dimensions 11in. x 6in. The Dial Glass is printed in two colours and calibrated to match the Plessey type 1842/11 Condensers (440 to 480 MMFD.).

Cat. No. AD106 **58/9**

TRIPLE WAVE

Similar description to above but fitted with Triple-wave Scale. Dial Glass is printed in three colours.

Cat. No. AD107 **58/9**

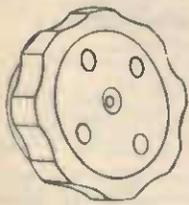
BROADCAST

A Small Dial of similar design and construction to the Dual Wave type described above but not incorporating SPIN TUNING. Outside measurements: 6 1/2 x 5in. The Dial Glass is single colour. Calibrated to match the Plessey type 9372/L27 Condenser.

Cat. No. AD105 **47/2**

DIAL KNOBS AND ACCESSORIES

SURPLUS INSTRUMENT KNOBS



Black Handgrip Bakelite Instrument Knobs as used with Army Equipment during war-time. Has 1/2 in. brass insert in centre but has no grub screw. 4 other brass inserts 1/4 in. tapped with thread also on rear of knob to allow for firm attachment to a metal or plastic disc.

BULK BUYING ENABLES US TO PASS THESE ON TO YOU AT

Cat. No. AX1107—6D. each, or 5/6 doz.

BAKELITE POINTER KNOBS

Ideal knobs for test equipment, all types of transceivers, and electrical and radio test equipment. Hole for 1/2 in. diam. shafts. Black finish with engraved white line through centre of pointer.



Cat. No. AD68—2 1/2 in. ... 1/9 each

Cat. No. AD67—1 1/2 in. ... 1/1 each

INSTRUMENT KNOB



Black Moulded Instrument Knob, fits 1/2 in. shaft. Metal inset. (Knobs are slightly damaged.) Fixed by grub screw. Diam. 2 in.

Cat. No. AD40 ... 2/9 each

Knob similar to above but without flange. Cat. No. AD41 ... 2/6 each

WHITE PLASTIC RADIO KNOBS

Moulded Ivory Plastic Knobs. Knurled edge for easy grip, 1/2 in. diameter. Fits 1/2 in. shaft.

Cat. No. AD75 ... 9D. each



DIAL KNOBS



Attractive Knob, with finger grip, 1 3/16 in. diam., for standard 1/2 in. shaft. Walnut—Cat. No. AD87 ... 10D.

White—Cat. No. AD88 ... 1/1 each



Octagonal Knob of good design, 1 1/2 in. diam., for 1/2 in. shaft. Walnut—Cat. No. AD85 ... 10D. each

White—Cat. No. AD86 ... 1/1 each



DIAL PLATE

Indicator Plates, engraved from 0 to 10 degrees. Diameter 1 1/2 in., hole 1/2 in. Cat. No. AD30 ... 2/3

(Suitable Pointer Knobs are—Cat. No. AD67—1/1 each.)

OBLONG INDICATOR PLATES

Metal indicator Plates marked 0—10 with 20 divisions. Size 1 1/2 in. x 2 1/2 in. Background black with all markings in white.

Cat. No. AD33—2/3 each.

(Suitable Pointer Knobs are—Cat. No. AD67 1/1 each.)



KNOB FELTS

Felt Circles, for fitting between control knobs and cabinet of Radio Sets. Outside diameter 1/2 in. with 1/4 in. hole.

Cat. No. AD25 ... 1D. each

"MARQUIS" MAGIC EYE ESCUTCHEON



Moulded in brown plastic. Neat design. Fit into 1 1/2 in. diam. hole. Give that finished look to your set.

Cat. No. AS507—9D. each

MAGIC EYE ESCUTCHEONS



Moulded in beautifully finished plastic it will finish off any radio cabinet. Made for use with "Magic Eye" Tuning Indicator. Size overall 4 1/2 in. x 1 1/2 in.

Cat. No. AS506 ... 9D. each

RADIO DIAL PLATE



Dial plate as used on some "Easy-Built" kits. Size, 4 in. x 2 1/2 in. Finish black and silver.

Cat. No. AD35 ... 6/6 each



PILOT LIGHT BRACKET

Red ruby jewel. Two lugs insulated, from bracket. Jewel fits into 7/16 in. panel hole.

Cat. No. AD500—3/6 each

RUBY WINDOW BRACKET FITTING

An inexpensive accessory, comprising nickel-plated bezel with ruby lens and bulb-holder. Fixed by 3 screws provided. Takes all M.E.S. bulbs. Cat. No. AD501 5/6 each



DIAL ESCUTCHEONS

Prices slashed as an Anniversary special

Oval shape. Black plastic.

Outside measurements 8 1/2 in. x 7 1/2 in.

Inside measurements 6 1/2 in. x 5 1/2 in.

Cat. No. AD200 ... NOW 11 1/2 D. each

Glasses for above. Cat. No. AD201 1/1 each



OCTAGONAL ESCUTCHEONS

Square Brown Bakelite type, with Octagonal opening. Overall dimensions: 4 1/2 in. x 4 1/2 in. Opening is 3 1/2 in.

Cat. No. AD218 ... 11 1/2 D. each

SPARE DIAL SCALES

Spare Glass Faces for Dials.

"SKY-KING" BROADCAST ANTI-CLOCK-WISE. Facing Glass, 550 kc. on left-hand side.

Cat. No. AD116 ... 6/1 each

RADIO PANEL LAMPS

AL300—6 volt, with S/C large bayonet base for Columbus and similar sets ... 1/6 each

RADIO PANEL LAMPS. Tubular Type, screw base.

Cat. No. AL119—2 volt, .05 amp. (special low consumption for battery set) ... 1/3 each

Cat. No. AL120—2.5 volt 1/3 each

Cat. No. AL121—3.8 volt 1/3 each

Cat. No. AL122—6 volt 1/3 each

Cat. No. AL123—6 volt, with small bayonet base ... 1/3 each

Cat. No. AL126—19 volt tubular, with screw base ... 1/6 each

Cat. No. AL118—2 volt Battery Set type with small bayonet base 1/3 each

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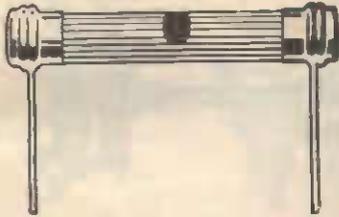
Cat. No. AL118—2 volt Battery Set type with small bayonet base 1/3 each



DIAL CORD

Glazed Cord, suitable for dial restringing. Cat. No. AD26 ... 2D. yard

COLOUR CODED RESISTORS



Conservatively rated at 1 watt. They will stand up to 50 per cent. overload without injury. Colour coded to the R.M.A. standard. They are accurate to within 5 per cent. of stated values, which remain constant whether in use or in stock. Perfectly noiseless and completely free from hand capacity effects. All one watt size.

1-WATT RESISTORS

Cat. No.	Ohms.
AR210—	100
AR211—	200
AR212—	250
AR213—	300
AR214—	400
AR215—	500
AR216—	750
AR182—	1,000
AR183—	2,000
AR184—	3,000
AR185—	4,000
AR186—	5,000
AR187—	7,500
AR188—	10,000
AR189—	15,000
AR190—	20,000
AR191—	25,000
AR192—	30,000
AR193—	50,000
AR194—	75,000
AR195—	100,000
AR196—	150,000
AR197—	200,000
AR198—	250,000
AR199—	300,000
AR200—	500,000
AR201—	1 megohm
AR202—	2 megohm
AR203—	3 megohm
AR204—	4 megohm
AR205—	5 megohm
AR206—	6 megohm
AR207—	7 megohm
AR208—	8 megohm
AR209—	10 megohm

ALL
6D. each

1/2-WATT RESISTORS

AR310—	50
AR319—	750
AR325—	1,000
AR335—	5,000
AR339—	10,000
AR341—	15,000
AR343—	20,000
AR345—	25,000
AR349—	50,000
AR351—	100,000
AR359—	200,000
AR361—	250,000
AR363—	300,000
AR365—	500,000
AR367—	1 megohm
AR369—	2 megohm
AR371—	3 megohm
AR381—	5 megohm
AR389—	10 megohm

4D. each

Special!

Because we are overstocked with the following 1/2 watt resistors we have chopped the price almost in half to reduce our stock. Get your order away now!

Cat. No.	ohms watts
AR312—	200 1/2
AR317—	600 1/2
AR327—	2,000 1/2
AR329—	3,000 1/2
AR355—	150,000 1/2

2D. each

2-WATT RESISTORS

Cat. No.		
AR100—	20 ohm wire wound (centre tap)	3/6
AR101—	50 ohm wire wound (centre tap)	3/6
AR102—	100 ohm wire wound (centre tap)	3/6
AR110—	20 ohm wire wound	1/2
AR114—	200 ohm wire wound	1/2
AR118—	5,000 ohm wire wound	1/6
AR125—	10,000 ohm wire wound	1/6
AR130—	20 ohm carbon	9d.
AR135—	5,000 ohm carbon	9d.

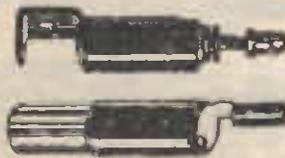
5-WATT RESISTORS

Cat. No.		
AR250—	20 ohm wire wound	2/-
AR255—	1500 ohm wire wound	2/3
AR259—	5000 ohm wire wound	2/3

10-WATT RESISTORS

Cat. No.		
AR268—	400 ohm wire wound	3/4
AR269—	500 ohm wire wound	3/4
AR270—	750 ohm wire wound	3/4
AR281—	5,000 ohm 8/10 watts wire wound	3/6
AR285—	10,000 ohm wire wound	3/6

MOTOR RADIO SUPPRESSORS



Spark Plug Type (top illustration). A sturdy unit which meets the most exacting demands for spark plug suppression.

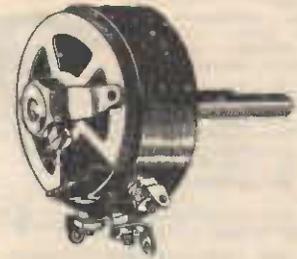
Cat. No. AR229	1/8
Distributor Type—Cat. No. AR228	1/8

The above suppressors will not affect power or petrol consumption of your engine.

RESISTANCE WIRE

Resistance wires and Ribbons are available in small reels for making special resistances, etc. Refer to page 37.

R.C.S. RHEOSTATS



R.C.S. Rheostats, made from moulded bakelite with brass spindles, 1/2 in. diam. shaft. Nickel-silver contacting ring ensures smooth action.

Cat. No. AR507—	6 ohm .25 amp.	5/9 ea.
Cat. No. AR508—	10 ohm .25 amp.	5/9 ea.
Cat. No. AR509—	20 ohm .25 amp.	5/9 ea.
Cat. No. AR510—	30 ohm .25 amp.	5/9 ea.

POTENTIOMETERS

CARBON POTENTIOMETERS

Carbon type employs a full wiping contact between the movable contact member and the hard smooth composition resistance element.



Cat. No.	Ohms
AP110—	1,000
AP111—	2,000
AP112—	2,500
AP115—	5,000
AP117—	10,000
AP118—	15,000
AP120—	25,000
AP122—	50,000
AP125—	100,000
AP126—	250,000
AP128—	500,000
AP130—	1 megohm
AP132—	2 megohm

ALL
4/- EACH

POTENTIOMETERS with Switch



Cat. No. AP145—
500,000 ohm with
S.P.S.T. Switch.

5/9

Cat. No. AP146—
500,000 ohm with
D.P.S.T. Switch.

6/6

R.C.S. WIRE-WOUND POTENTIOMETERS

Made from moulded bakelite with brass spindles. Nickel-silver contacting ring ensures smooth action, 1/2 in. diameter shaft.

Cat. No. AP29—	200 ohm, 50 M.A.	5/6
Cat. No. AP30—	400 ohm, 50 M.A.	6/9
Cat. No. AP31—	1,000 ohm, 35 M.A.	6/9
Cat. No. AP32—	2,500 ohm, 30 M.A.	6/9
Cat. No. AP33—	5,000 ohm, 30 M.A.	6/9
Cat. No. AP34—	10,000 ohm	6/9
Cat. No. AP37—	25,000 ohm	8/11
Cat. No. AP40—	50,000 ohm	10/2

R.C.S. WIREWOUND RESISTORS



AR5—	100-ohm, 100 MA
AR7—	200 " 100 "
AR8—	250 " 100 "
AR9—	300 " 100 "
AR11—	400 " 100 "
AR13—	450 " 100 "
AR14—	500 " 100 "
AR15—	750 " 100 "
AR16—	1000 " 100 "
AR18—	1500 " 100 "
AR19—	2000 " 50 "
AR23—	5000 " 50 "

each
1/-

R.C.S. VOLTAGE DIVIDERS



These are wound on tubing 1/2 in. in diameter, and the highest grade nichrome wire is used in their winding. The current capacity is 50 M/A. The contact clips are of a special flat type, which, while making perfect contact, do not damage the wire. The total length of the Divider is 4 1/2 in., and has two clips.

Cat. No. AR82—	15,000 ohms	5/10
Cat. No. AR83—	25,000 ohms	5/10

WAFER SOCKETS

Ruggedly constructed. Certain connection with three points contacting each of the valve pins. Standard mounting centres.



- Cat. No. AS631—4-pin
 - Cat. No. AS632—5-pin
 - Cat. No. AS633—6-pin
 - Cat. No. AS634—7-pin
 - Cat. No. AS635—8-pin
 - Cat. No. AS636—Loctal
- (Octal) ALL 7D. EACH 1/-

- Cat. No. AS637—Sockets for Midget Valves (1S4 series) .. 1/9 each
- Cat. No. AS603—Sockets for acorn type valves, Ceramic 3/-
- English 5-pin Special Wafer Sockets (for PM22A Valves). Cat. No. AS602 .. 3/9
- Cat. No. AS648—5 pin Valve Sockets for English type valves, Ceramic .. 3/9

AMPHENOL VALVE SOCKETS



Amphenol Valve Sockets, complete with metal mounting plates

- Cat. No. AS614—4-pin .. ALL
- Cat. No. AS615—5-pin .. 10D.
- Cat. No. AS616—6-pin .. 10D.
- Cat. No. AS617—7-pin .. 10D.
- Cat. No. AS618—7-pin Large .. EACH
- Cat. No. AS619—8-pin .. 8D.
- Cat. No. AS619A—8-pin Clip Mounting Type, without Flange .. 8D.

MOUNTING FLANGES FOR AMPHENOL VALVE SOCKETS

Metal Mounting plate similar to that illustrated on Amphenol socket above. Converts ring mounting socket to flange type.

- Cat. No. AS612 .. 2D. each

BASEBOARD MOUNTING VALVE SOCKETS



Amphenol Sockets mounted on raised metal shield to enable the sockets to be screwed on wooden baseboards, etc.

- Cat. No. AS620—4-pin .. 2/3 each
- Cat. No. AS621—5-pin .. 2/3 each
- Cat. No. AS624—8-pin Octal .. 2/3 each

"STEATITE SOCKETS"



Made from entirely new dielectric, ultra low loss. Phosphor bronze silver-plated contacts. Steatite Sockets are particularly recommended for high frequency work and where high temperatures are encountered. Ideal for Transmitters and Amplifiers and other apparatus in excess of 20 watts.

- Cat. No. AS641—4-pin
 - Cat. No. AS642—5-pin
 - Cat. No. AS643—6-pin
 - Cat. No. AS644—7-pin
 - Cat. No. AS645—8-pin
- ALL 5/- EACH

SIDE-CONTACT CHASSIS VALVE-HOLDERS

"P" Base Moulded Bakelite Chassis Valve Holders for the side-contact valves. Fitted with eight leaf contacts and integral solder tags.—Cat. No. AS601 .. 1/7

RIMLOCK SOCKETS

Philips Rimlock type valve sockets.—Cat. No. AS600 .. 1/5 each

MINIATURE SWITCHES

Here's a handy little switch, suitable for radio and motor-car work. Positive action. Nicely finished (nickel plated). British made.



- Cat. No. AG118 1/10

RADIO TOGGLE SWITCHES

British, quick make-and-break Toggle Switches. Rating 230 v., 3 amp.



- Cat. No. AS441—S.P. On-off 2/6 each
- Cat. No. AS442—D.P. On-off 4/- each
- Cat. No. AS443—S.P. Change-over 3/3 ea.
- Cat. No. AS444—D.P. Change-over 4/- ea.

NAME PLATES FOR TOGGLE SWITCHES



On-off Plates to fit standard toggle switch. Cat. No. AX1210 .. 3D. each

ROTARY RADIO SWITCHES



Rated 230 volt, 2 amp. These are the rotating type of switches and are supplied with 1/2 in. shaft, so that a knob can be fitted to match the other controls on the set. One hole fixing. Switch mounted in hermetically sealed cases, perfectly reliable contact, durable construction.

- Cat. No. AS445—S.P., on-off 4/3 each

METER PUSH SWITCH



Designed for one-hole fixing to panels between 1/16 in. and 7/32 in. thick. With highly polished nickel-plated bush-nose and coloured insulated plunger. Silver-contacts make sure of trouble-free contact. With terminal screws, one pole live to bush. Rating: 1 amp. at 10 volts or 100 m.a. at 100 volts.

- Cat. No. AS482 .. 2/9 each

KNIFE SWITCHES



- Single Pole Double Throw Aerial-Earth Switches. Bakelite base. British.
- Cat. No. AS490 .. 1/6

WAVE-CHANGE SWITCHES



Switches suitable for band changing, and for use with test equipment, etc. Best imported manufacture. Made from laminated bakelite. All 1/2 in. diam. shaft. Phosphor bronze points for sure contact.

- 10 position, Single Bank Switch; 2 1/2 in. shaft.—Cat. No. AS450 .. 4/- each
- Single Bank, 3-pole, 2-position Switches. Cat. No. AS454 .. 4/- each
- Single Bank, 2-Pole, 2-position Switches. Cat. No. AS455 .. 4/- each
- Single Bank, 2-Pole, 3-Position Switches. Cat. No. AS456 .. 4/- each

"PLUG-IN" COIL FORMERS



Coil Formers for winding short-wave plug-in coils. Eight-ribbed bakelite. Well made. 1 1/2 in. diameter.

- Cat. No. AF55—4-pin Plug-in-Former 2/9 ea.
- Cat. No. AF56—5-pin Plug-in Former 2/9 ea.
- Cat. No. AF57—6-pin Plug-in Former 2/9 ea.

"COIL FORMER"



This Former Tube for coil winding has very high insulating properties, the surface being made of pure bakelite.

- AF78—1/2 in. dia., 6 in. lengths .. Each 1/9
- AF80—1 in. dia., 6 in. lengths .. 3/1
- AF81—1 1/2 in. dia., 6 in. lengths .. 3/6
- AF81A—1 1/2 in. dia., 3 in. lengths .. 2/6
- AF83—1 1/2 in. dia. 6 in. lengths (valve base size) .. 4/-
- AF86—2 in. dia., 6 in. lengths .. 4/1
- AF87—2 1/2 in. dia., 6 in. lengths .. 4/7
- AF88—3 in. dia., 5 in. lengths .. 4/-
- AF90—2 1/2 in. dia., 3 in. lengths .. 2/2
- AF91—3 in. dia., 3 1/2 in. lengths .. 2/7

BULK PURCHASE!

BAKELITE COIL BASES



Used for finishing Coil Windings and for connecting to the wiring of the Set. Provided with 4 lug Terminals mounted on bakelite strip. Mounting holes 1 1/2 in. apart. Bulk purchase enables to sell these at a fraction of their true cost!

- Cat. No. AC529— 2D. each 1/3 doz.

PLUGS—JACKS

SPEAKER PLUGS

For use with Speakers, Battery Cables, etc.

Moulded Type



- Cat. No. AP240—4-pin .. 1/- each
- Cat. No. AP242—5-pin .. 1/- each
- Cat. No. AP246—7-pin .. 1/- each
- Cat. No. AP248—8-pin .. 1/- each
- Cat. No. AP244—6-pin .. 1/- each

BIG REDUCTION! PHONE PLUGS



A Jack Plug with strong brass contacts, Heavy black bakelite moulding.
Cat. No. AP269 .. 2/3

JACKS



Bulgin S.C. Jacks—
Cat. No. AJ22 .. 1/11 each



Bulgin Single Closed Circuit Jacks.
Cat. No. AJ23—
2/8 each

TWIN TIP JACK UNITS

A strong spring firmly makes contact to any tip inserted within its grip. Mounted on bakelite strip. Metal parts are nickelplated. Jacks fit any standard 'phone tip.



Cat. No. AJ8 .. 8D. each

SPEAKER CORD TIPS



Nickel-plated tips for speaker and 'phone cords. Cat. No. AT28 .. 2D. each

DE-LUXE CORD TIPS

A nickel plated, stepped phone or speaker tip. Finished article.
Cat. No. AT26 .. 6D. each

SOLDERING ACCESSORIES

"SOLON" ELECTRIC SOLDERING IRONS



Improved Bit.—Oval shaped tinned copper bit allows work to be done in a narrow space. It is designed to provide the maximum amount of heat at the working end with a minimum of heat loss due to radiation, as the heating element is totally enclosed in the bit.

Constant Heat.—Four minutes to heat up and the "Empire" Model SOLON is ready for continuous use if required.

Flexible Lead.—Six feet of Tough Rubber-Sheathed 3-core Flex.

Cat. No. AS375—Solon Domestic or Radio Soldering Iron .. 28/1

- Cat. No. AS395—Spare Bit for Standard "Solon" Iron .. 5/7 each
- Cat. No. AS394—Spare Elements for "Solon" Soldering Irons .. 7/4 each
- Cat. No. AS376—"Solon" Pencil Bit Soldering Iron. This Iron has a Pencil Tip for fine work and general Radio Soldering. .. 30/2
- Cat. No. AS393—Spare Bit for "Solon" Pencil Bit Iron .. 1/7 each
- Cat. No. AS377—"Solon" Heavy Duty Soldering Iron. This is the 1lb. Iron for all heavy work. .. 54/9

FOR THE HANDYMAN!

"SPEEDEE" ELECTRIC SOLDERING IRONS



Consumes 100 watts—no more than a small light bulb. Indispensable to the handy man in workshop or home.

Cat. No. AS406 .. 16/7 each

SPARE ELEMENTS FOR ABOVE—

Cat. No. AS407 .. 6/- pair

SPARE COPPER BITS—

Cat. No. AS408 .. 3/- each

"SPEEDEE" HEAVY DUTY IRONS

Designed for commercial use requiring a heavy iron for long periods. Watts, 180.

Weight, 3 1/2 lb. Cat. No. AS396 .. 45/6 each

Spare Elements for above. Cat. No. AS397 .. 19/- each

ALUMINIUM SOLDER

For repairs in aluminium ware and die cast metals. No soldering iron or flux necessary. Recommended for aluminium saucepans, kettles. Full instructions supplied with each stick.

Cat. No. AS420—Small stick, 3in. x 1/8 .. 1/8

Spare Elements for Rawl Plug Soldering Irons.

Cat. No. AS392 .. 8/6 each

"ERSIN" MULTICORE SOLDER

The New English Solder



"ERSIN" Multicore Solder is recommended for the home constructor. It looks like wire and is filled with a resin preparation which eliminates the necessity for using flux or spirits of salts, etc.

Instructions for Using:

1. The joints to be soldered should be thoroughly cleaned and free from acid or grease. On plated parts (nickel or chromium) the "plate" should be filed away where the joint is to be made.
2. Heat the soldering iron just enough to melt the solder. "Tin" the copper bit by first filing lightly and then rubbing with the cored solder until coated.
3. Heat again for working, but not to red heat.
4. Apply the bit and the cored solder to the work, rubbing the bit well down to transmit the heat. It is important that the bit, cored solder and joint should come into contact simultaneously.

Cat. No. AS411—Small Reel 10D. reel measuring approx. 27in. .. 10D.

Cat. No. AS412—Large Packet 6/- pkt. (12oz.) .. 6/-

SOLDERING PASTE

Super Soldering Paste. An ideal paste for use instead of flux or resin. Can be used on all metals except aluminium.

Cat. No. AS423—2oz. tins .. 1/5

SOLDER STICKS

Full size sticks of 34/66 Solder. Each stick weighs about 1 1/2 lb..

Cat. No. AS418 .. 2/6 stick

STRIP SOLDER

Small strips of 45/55 top grade Solder. Each strip measures approx. 27in. long 1/4in. wide.

Cat. No. AS416 .. 7d. strip

POWER TRANSFORMERS



WELL MADE, FIRST GRADE TRANSFORMERS. 230 VOLT PRIMARY WINDINGS. FLAT MOUNTING.

Secondary Windings:

280/280 volts, 60 M.A.; 6.3 volt, 2 amp; 5 volt, 2 amp.—Cat. No. AT649 .. **40/-**

350/350 volts, 60 M.A.; 5 volt, 2 amp; 6.3 volt, 2 amp.—Cat. No. AT650 .. **42/6**

385/385 volts, 80 M.A.; 5 volt, 2 amp; 6.3 volt, 3 amp.—Cat. No. AT651 .. **50/-**

385/385 volts, 100 M.A.; 5 volt, 2 amp; 6.3 volt, 4 amp.—Cat. No. AT652 .. **61/-**

400/400 volts, 150 M.A.; 5 volt, 3 amp; 6.3 volt, 4 amp.—Cat. No. AT654 .. **98/6**

350/350 volt, 60 M.A.; 5 volt, 2 amp; 2.5 volt, 5 amp.—Cat. No. AT656 .. **47/-**

385/385 volt, 80 M.A.; 5 volt, 2 amp; 2.5 volt, 8 amp.—Cat. No. AT657 .. **55/-**

385/385 volt, 100 M.A.; 5 volt, 2 amp; 2.5 volt, 10 amp.—Cat. No. AT658 .. **67/-**

UPRIGHT MOUNTING.

Similar Transformers to the above but constructed for vertical mounting.

60 M.A., 6.3 volts. Cat. No. AT550A .. **42/6**

80 M.A., 6.3 volts. Cat. No. AT651A .. **50/-**

100 M.A., 6.3 volts. Cat. No. AT652A .. **61/-**

125 M.A., 6.3 volts. Cat. No. AT653A .. **76/-**

Special 150 M.A. Transformers

6.3 volt, 150 M.A. Upright Mounting Power Transformers. Suitable for use with receivers and amplifiers requiring 2 separate 6.3 v. windings. 5 volt, 3 amp. Rectifier winding. Mounted in crackle finished case. Wire lead connections. Cat. No. AT655 .. **£5/17/-**

FILAMENT TRANSFORMERS

Cat. No. AT632—6.3 volts 2 amp. **28/-**

"BEACON" AUDIO TRANSFORMER

Vacuum Sealed Inter-stage Audio Transformer. Wound on first grade core using best quality copper wire flexible leads to ensure higher efficiency. Ratio 3 to 1. Size, 2 1/2 in. high, 3 in. wide and 2 in. deep.

Cat. No. AT610— **22/-** each



230/110v. TRANSFORMERS



Stepdown from 230 to 110 volts. Rating 60-80 watts. **48/6**
Cat. No. AT622 ..
Larger or special stepdown transformers can be made to order.

"BEACON" ELECTRIC SHAVER TRANSFORMERS

Stepdown from 230 to 110 volts at 15 watts. Specially constructed for use with 110 volt Electric Shavers. Dimensions: Length 2 1/2 in., Height, 2 in., weight 1 lb. 3 oz. Cat. No. AT621 .. **30/9** each

"BEACON" VIBRATOR POWER TRANSFORMERS

Manufactured from the first grade material. 150 volt, 25 M.A.—6 volt. Cat. No. AT625 .. **20/-**

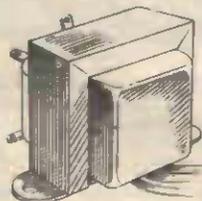
240/6 VOLT TRANSFORMERS

This reducer supplies 6 volts 5 amps. from the 240-volt light or power. A 2-pin plug outlet is provided. Cat. No. AT623 .. **45/-**

TRANSFORMERS FOR VALVE TESTERS

In response to many enquiries we have now available a special transformer for valve testers, experimenters, etc. It has a 230-volt primary and secondary windings of 2 amps., as follows—1.5 volts, 2 volts, 2.5 volts, 4 volts, 5 volts, 6.3 volts, 7.5 volts, 12.5 volts, 25 volts and 30 volts. Cat. No. AT616 .. **55/-**

"BEACON" UNIVERSAL OUTPUT TRANSFORMER



These Transformers have been designed to meet the needs of engineers, experimenters, and servicemen, for a single unit so constructed as to provide the correct impedance matching between various types of Audio Output Tubes in a single Push-Pull, Parallel, or Class F Circuit, and any Dynamic Speaker. Full instructions are given with each Transformer.

Cat. No. AT603—3 watt .. **16/-** each
Cat. No. AT602—6 watt .. **20/6** each
Cat. No. AT601—10 watt .. **28/-** each
Cat. No. AT604—20 watt .. **66/-** each

"ENSIGN" SPEAKER TRANSFORMERS

Made from the best stallo steel and wire and under strict supervision these transformers are ideal for replacement, etc.

Single Pentode 7000 ohms. **13/6**
Cat. No. AT 714 ..
Cat. No. AT716—5000 ohm .. **11/6**

"ENSIGN" SPEAKER TRANSFORMER COILS

Will fit practically all types of Speaker Transformers, thus doing away with the necessity of replacing the complete transformer. **7/9**
Cat. No. AT730—Single Pentode

H.F. CHOKES



Honeycomb wound H.F. Chokes. 10M.H. Cat. No. AC140— **2/9** each



H.F. CHOKES. 2.5 M.H. Pye Wound (4. pye) Chokes, wound on Isolantite Former. We have overbought this line and are therefore prepared to sell them at a greatly reduced price. Cat. No. AC138 .. **2/3**

Similar to above but with connecting leads cut rather short. Removed from New ZC1 Receivers. Cat. No. AX1047A .. **1/3**

L.F. CHOKES

30 hy. 50 M.A. Filter Chokes. Cat. No. AC141 .. **13/-**
12 hy. 100 M.A. ditto. Cat. No. AC142 .. **£1/8/9**
12 hy. 150 M.A. ditto. Cat. No. AC143 .. **£2/1/-**

MAGIC EYE ASSEMBLY



For 6-prong Tubes. An easy method of adapting a Magic Eye or Electron Ray Tube to any standard radio receiver having a.v.c., or any Frequency Modulated receiver. Also used extensively for installing Magic Eyes as indicators in test instruments such as signal tracers, condenser testers, etc.

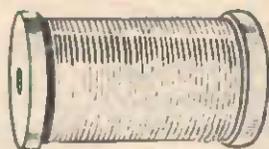
The metal encased socket is completely wired with a 5-wire colour-coded cable 22in. in length. The necessary 1-megohm target-to-plate resistor is concealed and protected by the socket's metal shell.

Complete set of parts, without valve. Cat. No. AS500 .. **10/6**

LAMPHOUSE GUARANTEE

Any goods that prove in any way unsuitable may be returned undamaged within seven days from receipt and your money will be refunded in full.

INSTRUMENT WIRES



Only the Best British Wire Stocked.

PRICES PER REEL.

The following prices are estimates only. The prices of copper and other raw materials are fluctuating, and each shipment varies in price. All orders executed at ruling prices at time of supply.

ENAMELLED WIRE.

1lb. Reels.			1lb. Reels		
Cat. No.	Gauge	Price	Cat. No.	Gauge	Price
AW400	16	2/6	AW480	16	10/-
AW402	18	2/6	AW482	18	10/3
AW404	20	2/6	AW484	20	10/6
AW406	22	2/8	AW486	22	10/9
AW408	24	2/10	AW488	24	11/3
AW410	26	2/11	AW490	26	11/9
AW412	28	3/2	AW492	28	12/-
AW414	30	3/4	AW494	30	13/-
AW416	32	3/4	AW496	32	13/6
AW418	34	3/7	AW498	34	14/6
AW420	36	3/9	AW500	36	15/9
AW422	38	4/-	AW502	38	16/6
AW424	40	4/8	AW504	40	—

D.C.C. WIRE

1lb. Reels.			1lb. Reels.		
Cat. No.	Gauge	Price	Cat. No.	Gauge	Price
AW432	16	3/6	AW510	16	10/-
AW434	18	3/9	AW512	18	11/-
AW436	20	4/3	AW514	20	12/-
AW438	22	5/6	AW516	22	14/-
AW440	24	5/6	AW518	24	16/-
AW442	26	6/9	AW520	26	—
AW444	28	7/6	AW522	28	—
AW446	30	8/9	AW524	30	—
AW448	32	9/3	AW526	32	—
AW450	34	9/6	AW528	34	—
AW452	36	10/-	AW530	36	—



ENSIGN PUSH BACK WIRE

Best quality solid push back wire in assorted colours. 10ft. coils. Cat. No. AW157 **1/3** coil
Stranded push back wire in assorted colours. 10ft. coils. Cat. No. AW156 **1/3** coil
(Any length of push back wire can be supplied at the rate of 1/3 for 10 feet.)

Motor Car Cables. See Page 39.

Special Purchase

WIRES SUITABLE FOR SPEAKER EXTENSIONS, TALK BACK SYSTEMS, BELL INSTALLATIONS AND SIMILAR PURPOSES.

2 Wire Rubber-Covered Flexible Wire, covered overall with a waterproof braid. Cat. No. AW87 **4** D. Yard

METALLIC SHIELDED WIRE

Metal shielded wire. Suitable for grid leads, input leads on Amplifiers, Microphones, Electric St-instruments, etc. Cat. No. AW158 **5** D. per ft.

SHIELDED POWER FLEX

Stranded insulated Flexible 3core Cable, covered overall with woven metal braid. Cat. No. AX1462—23/0076 **2/-** yard
Cat. No. AX1463—40/0076 **2/6** yard
Cat. No. AX1464—14/0076 **2/-** yard

PLASTIC TRU-RIP FLEX

Twin Plastic Flex, laid flat, clear, white or brown: 2 Wire—**9** D. yard
Cat. No. AW272
2 Wire and Earth—**1/5** yard
Cat. No. AW271

MICROPHONE CABLE

Insulated and shielded Microphone Cable for connecting Pickups, Microphones, Speakers, etc. Cat. No. AW160—Single **8** D. ft.
Cat. No. AW162—Twin **11** D. ft.

230 Volt Power Flex. Refer Page 37.

PLASTIC CONNECTING WIRE

10/010 P.V.C. Insulated Flex, suitable for battery connections, indoor aerials and for any other purpose requiring a light, thin, stranded insulated flexible wire. Assorted Colours. Cat. No. AW159—10ft. Coil **1/3** coil

Any length can be supplied at a rate of 1/3 for every 10ft.

SPECIAL!

27 S.W.G. Cotton Covered Insulated Copper Wire, 100ft. reels. Cat. No. AW351 **1/-** each

WAR PURCHASE

American V.I.R. Wiring Cables, 17 A.W.G. (equiv. our 1/044, Red or Black Single V.I.R. Cable—Cat. No. AW57 **3** D. yard, **16/8** 500ft. Coil
7/0245 A.W.G. (equiv. our 3/036), ditto **4** D. yard, **25/-** 500ft. Coil
Cat. No. AW58
6 A.W.G. (equiv. our 7/064), ditto—Cat. No. AW59 **1/6** yard

MULTI-WIRE SPEAKER CABLE



5-wire Speaker Cable, insulated with P.V.C. in distinctive colours and bound over all in cotton braid. Cat. No. AW101 **6** D. ft.

8-wire Ditto cotton braided over rubber insulated wires. Special bulk purchase enables us to sell at **9** D. ft.
Cat. No. AW102

SPEAKER FLEX.

Thin Twin Transmission Cable, for extension Speakers, Speaker Systems or for double doublet and similar Aerial Systems. Standard Flexible 2-Core Wire, rubber-covered and covered over all in a Waterproof Braid. Flexible and long-lasting. Cat. No. AW87 **4** D. per yard

SPEAKER SILK

Special Fabric for putting in front of Speakers in cabinets, etc. Cat. No. AS900—12in. x 12in. **2/-** each
Cat. No. AS902—18in. x 18in. **2/10** each

HANDY WIRE

Reels of 24 S.W.G., double-cotton covered Copper Wire. Approximately 60ft. For winding coils, temporary aerials, bell connections, and a dozen and one handy uses around the home. Cat. No. AW348 **1/9** each

SPAGHETTI INSULATING TUBING

Cat. No.	Size	Length	Price
AS0	1/4 mil.	1 yd.	3d.
AS1	1 mil.	1 yd.	4 1/2d.
AS2	2 mil.	1 yd.	5d.
AS3	3 mil.	1 yd.	5d.
AS4	4 mil.	1 yd.	6d.
AS5	5 mil.	1 yd.	7d.
AS6	6 mil.	1 yd.	8d.
AS7	8 mil.	1 yd.	1/-
AS8	10 mil.	1 yd.	1/-

SHIELDED BRAID

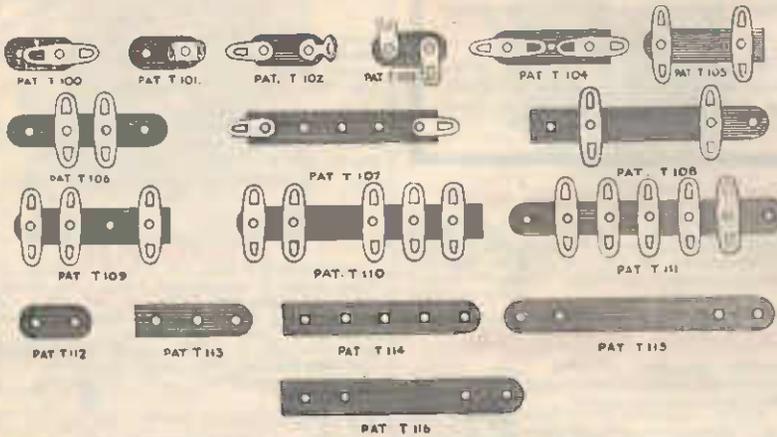
Metal Screening Tubing, for slipping over insulated wires, etc., for shielding. In many modern A.C. circuits it is essential to screen grid and plate leads to prevent pick-up on these leads. Flexible. Cat. No. AW163—1in. **1/1** yd.

Cat. No. AW164—3/16in. **9** D. yd.



GREAT VALUE!

TERMINAL STRIPS FOR EVERY PURPOSE!



A complete range constituting 16 different patterns.

BAKELITE STRIP. 3/8 in. wide.

Cat. No.				Cat. No.			
AT100	—1 lug	Straight	1d. each	AT109	—3 lug	R/angles	3d. each
AT101	—1 lug	R/angle	1d. "	AT110	—3 lug	R/angles	6d. "
AT102	—2 lug	1 R/angle 1 Straight	2d. "	AT111	—3 lug	R/angles	6d. "
AT103	—2 lug	R/angles	2d. "	AT112	—2 Hole	Blanks	} 6d. doz.
AT104	—2 lug	Straight	2d. "	AT113	—3	" "	
AT105	—2 lug	R/angles	2d. "	AT114	—5	" "	
AT106	—2 lug	R/angles	2d. "	AT115	—4	" "	
AT107	—2 lug	Straight	2d. "	AT116	—4	" "	
AT108	—2 lug	R/angles	2d. "				

ASSORTED PACKET

Another Anniversary Bargain!

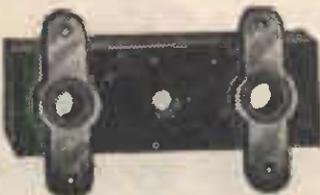
We offer a packet of 40 assorted strips of all types listed above at the Special Price of **5/-** pkt.
Cat. No. AT120

TERMINAL STRIPS

Bakelite Terminal Strips, fitted with double ended lugs. Ideal for the neat assembling of small components, such as resistors and condensers. Lugs eyeleted on to strip.

- Cat. No. AT135—24 lug Strip **2/6** each
- Cat. No. AT136—12 lug Strip **1/5** each
- Cat. No. AT137—6 lug Strip **9D.** each

ANCHORING STRIPS



Used for supporting condensers, resistors, etc., above earth or chassis. Fixed by bolt through centre hole. **4D.** each
Cat. No. AT134

TERMINAL STRIPS



Terminal Screws mounted on insulated strip.
Cat. No. AT127 **7D.** each

FAHNSTOCK CLIPS



Spring Brass.
5/16in. x 1in.
Cat. No. AT41 **2D.** ea.

TIP JACKS AND PLUGS



Amphenol Single Tip Jacks; a useful all bakelite plug and chassis mounting socket. Socket can be attached to panel or chassis by means of a gripping ring provided. Plug fits snugly into tight-fitting jaws in socket. Socket can be used separately to take phone or speaker
Cat. No. AJ25 **1/3** pair

IMPORTANT!

Owing to existing conditions prices in this book are given as a guide only. All orders will be executed at the rate ruling at the date of supply.

N.P. TERMINALS



4 B.A. nickel-plated terminals with hole. Complete with nut. Cat. No. AT55 **5D.** each

SMALL INSULATED TERMINALS, 4BA.



The illustration is approximately full size. These terminals fill the want of many who seek a small, inexpensive type. The heads are removable and have inserts. In two colours, red and black.

Cat. No. AT70 **11D.** each

INSULATED BAKELITE TERMINALS



Insulated type supplied in either red or black. Spring grip makes easy connection or disconnection. Designed so that when fitted they are insulated from metal chassis. Finished job.
Cat. No. AT65 **8D.** each

BRASS TERMINALS



Brass Binding Posts complete with three nuts and two washers. Length of threaded stem 2in. Thread 4BA. Excellent heavy Duty Terminal.
Cat. No. AT60 **6D.** each

ALL-METAL TERMINALS

Non-insulated all-metal oxidised Radio Terminals. Threaded headpiece and washer screwing down on to base washer makes for sure connection. 4BA x 3/8in. stem allows ample room for attaching insulated washers if terminal is required to be insulated.
Cat. No. AX1051 **6D.** each



WAR SURPLUS SPECIAL! Heavy Duty Insulated Terminals

These Terminals were used for Aerial connections on Transceivers and are an extremely robust and well-insulated job. Overall dimensions of terminal assembly 2 1/2in. high, 1/2in. diameter bakelite top. Heavy rubber insulating washers over steel stem.
Cat. No. AX1050



1/3
Similar to above but small size (1 1/2in. x 3/8in.) and not insulated.
Cat. No. AX1050A **1/-**

LUGS

CONNECTORS

CLIPS

SOLDERING LUGS.

4 B.A. Double Ended Soldering Lugs (tinned).
Cat. No. AT7 **3D.** doz.



PEAR-SHAPED LUGS

Small, 3/16 in. long, 5/32 in. hole.

Cat. No. AT2 **3D.** doz.



Large, 1/4 in. long, 5/32 in. hole.

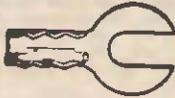
Cat. No. AT3 **3D.** doz.

DROP-SHAPED LUGS

2 in. long, 7/32 in. hole.
Cat. No. AT4 **3D.** doz.



Large N.P. Terminal Spade Lugs.
Cat. No. AT5—
3D. each



Small N.P. Terminal Spade Lugs.

Cat. No. AT17—
1D. each, **11D.** doz.

Ring Type Small N.P. Lugs. Cat. No. AT18—
1D. each, **9D.** doz.



RIVET LUGS

AT42

AT37

Double-ended solder lugs with centre hollow rivet. 13-16 in. long, 1/16 in. rivet.
Cat. No. AT37 **3D.** doz.



Solder lugs with hollow rivet one end. 7-16 in. long, 3-16 in. rivet.
Cat. No. AT38 **3D.** doz.



Same as above, but 9-16 in. long, 1/16 in. rivet.
Cat. No. AT39 **3D.** doz.

Angle Coil-mounting lugs, 1/2 in. x 1/2 in.
Cat. No. AT42 **3D.** ea.

SOLDERING LUG ASSORTMENT



A miscellaneous selection of 100 Assorted Solder Lugs.
Cat. No. AT1 **1/9** Packet

SPADE ANCHOR LUGS



Steel cadmium plated for mounting coils, condensers, shield cans, etc., 6/32 thread. Hole in flat portion fits 9/64 in. diameter eyelets and 6/32 screws.
Cat. No. AT40 **2D.** each

INSULATED SPADE TERMINALS



Insulated Spade Terminals are useful for easy connection of wires under terminals, etc. Colours: Red and Black.
Cat. No. AT15 **4D.** each

R.C.S. TERMINAL BOARDS

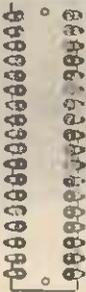
BAKELITE TERMINAL BOARDS.

for neat assembling of Resistors and Condensers. Lugs are eye-letted on to the bakelite. Mounting holes provided.

23 LUG STRIP.

Neatness is a big factor in any job!

Cat. No. AT145 **4/-**



BANANA PLUGS AND SOCKETS



Banana Plugs and Sockets have all sorts of uses, such as for aerial and earth connections, coil tapping, battery connections, etc. Red and Black. Insulated.

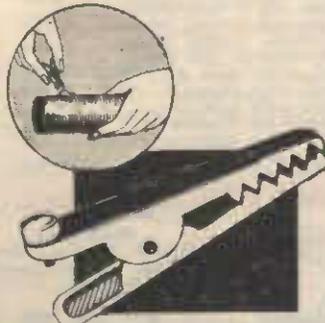
Cat. No. AT23—Banana Plugs only **6D.** each

Cat. No. AT24—Sockets for above **6D.** each

All Metal Banana Plugs.
Cat. No. AT25 **4D.** each

All Metal Banana Plug Sockets.
Cat. No. AT27 **6D.** each

ALLIGATOR CLIPS



Here's a Handy Clip for coil and battery connections. The strong spring ensures a good connection.
Cat. No. AC19 **6D.** each

INSULATED CROCODILE CLIPS



Insulated Crocodile Clip. Useful for servicemen, experimenters, etc., when dealing with high voltages. Wire passes through insulator to grip sleeve and screw. Nickel-plated. Red and black insulated.
Cat. No. AC18 **1/-** each

UNIVERSAL BATTERY CLIPS



British made, these Clips have good strong springs that make a sure contact.

Cat. No. AC120—5 amp. (Pee Wee) **8d.** each

Cat. No. AC121—10/25 amps. **1/-** each

Cat. No. AC122—50 amp. **1/1** each

CLIPS, SCREEN GRID

For attaching of screen grid

Cat. No. AC23 **1/-** each



Cat. No. AC24—Screen Grid Caps for Metal valves **1D.**

Grid clips for 807 Valves **1/9** each
Cat. No. AC25—

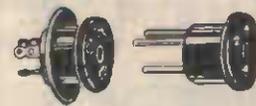
CONNECTORS—SINGLE



Small Brass Connector
Sire 1/2 in. x 1/2 in.

Cat. No. AC194—
3D. each

CHASSIS PLUGS AND SOCKETS



Miniature 3-pin type. Socket mounts on to chassis. Extremely useful unit for connecting external units such as microphones, pickups, etc.

Cat. No. AP290 **1/8** pair

DIAL LIGHT HOLDERS



With clip style bracket, made to clip over condenser, etc. To take screw globe.
Cat. No. AD504—
9D. each

As above, but without clip—AD506 **9D.** each

DIAL LAMP HOLDERS, similar to above, but to take miniature bayonet type Dial Lamps. With clip.

Cat. No. AD505 **1/-** each

MINIATURE SCREW HOLDERS

Bakelite Lampholders, miniature screw thread which takes torch and similar lamps.

Cat. No. AS223—
9D. each



CORD GRIP DIAL LAMP HOLDERS

Take the standard screw base panel lamp. Cord mounting with no fastening bracket. Apart from their use as dial lampholders they can also be used with decoration strings, etc.

Cat. No. AD509 **9D.** each

CONDENSER COUPLINGS

1in. Bakelite and Metal Flexible Condenser Couplings for ganging two variable condensers. Flexible brass connector on bakelite mount.

Cat. No. AC901—
2/3 each



SHAFT CONNECTORS

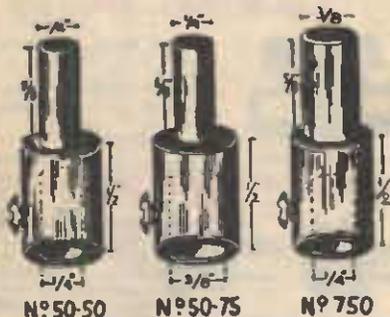
Solid Brass Shaft Connector, with two set screws each end for joining 2 1/2in. shafts.

Cat. No. AC902 **8D.** each

Nº250

THE BEST COSTS LESS AT THE LAMPHOUSE!

SHAFT ADAPTORS



For Condenser or Volume control shafts, etc.
1/2in. to 1in. shaft extender (50-50)—
Cat. No. AS134 1/6 each
1/2in. to 1in. shaft reducers (50-75)—
Cat. No. AS135 1/6 each
1/2in. to 3/4in. shaft reducers (750)—
Cat. No. AS133 1/6 each
1/2in. Diam. Ebonite Rod for insulated condenser shaft; 6in. lengths—Cat. No. AS151 8d. each

"GOAT" VALVE SHIELDS

Form fitting Valve Shields, complete with split ring and base mounting clips.

Cat. No. AS20—
1/3 complete

Metal Shields for G.T. Type Valves.
Cat. No. AS21 **9D.** each

RUBBER GROMMETS

Made of good quality black vulcanised rubber. For fitting in holes in chassis, etc., to insulate and protect cables. To fit 1/2in. holes. Inside diameter 1/2in.
Cat. No. AS244 **3D.** each

Fit 3-16in. diam. hole. Inside diam. 1/2in.
Cat. No. AS243 **3D.** each

Fit 1/2in. diam. hole. Inside diam. 1/2in.
Cat. No. AS245 **3D.** each

WOOD SCREWS



Counter-sunk heads. Gimlet points. All sizes can be supplied. The following are in most popular demand:

Cat. No.	Size	Dozen
AT550	1/2in. x 1	3d.
AT552	1/2in. x 2	3d.
AT554	1/2in. x 3	3d.
AT558	1/2in. x 3	3d.
AT560	1/2in. x 6	4d.
AT562	1/2in. x 4	4d.
AT564	1/2in. x 6	4d.
AT566	1/2in. x 8	5d.
AT568	1 in. x 4	5d.
AT570	1 in. x 6	5d.
AT572	1 in. x 8	6d.
AT574	1 1/2in. x 8	6d.
AT576	1 1/2in. x 10	7d.
AT578	1 1/2in. x 6	7d.
AT580	1 1/2in. x 9	8d.
AT588	2 in. x 11	8d.

HANDYMANS



WOOD SCREWS

An assortment of 50 wood screws, various sizes. All with countersunk heads. All popular types. Don't be "caught out"! Keep a jar of these screws always on your work bench.

Cat. No. AT590 **1/9** jar

SELF-TAPPING SCREWS



For mounting components on radio chassis, etc. 1/2in. long. No. 6 Gauge.

Cat. No. AT400 **5D.** per dozen
4/9 per gross

SCREWS AND NUTS

Best English quality. All Brass.

Cat. No.	Description	Dozen
AT428	1/2in. x 6BA Screws and Nuts	9 1/2d.
AT430	1/2in. x 6BA Ditto	10 1/2d.
AT424	1/2in. x 4BA Ditto	1/1
AT426	1/2in. x 4BA Ditto	1/1
AT421	1/2in. x 2BA Ditto	1/7
AT423	1/2in. x 2BA Ditto	1/6
AT433	6BA Brass Hex. Nuts	5 1/2d.
AT432	4BA Ditto	6d.
AT431	2BA Ditto	8 1/2d.
AT436	6BA Washers	4d.
AT435	4BA Washers	4 1/2d.
AT434	2BA Washers	6d.

THICK RUBBER WASHERS



Dimensions: Diameter 1 1/2in.; diameter of hole, 1in.; thickness 1/2in.

Cat. No. AS250—
1D. each; **9D.** dozen

PORCELAIN INSULATING WASHERS



High Insulating Properties. Size: Overall Diam., 1/2in. Diam. of hole 1/4in. Thickness, 3-32in.

Cat. No. AS320—
6D. dozen

DOME NUTS

Give that finished look to a job.
Cat. No. AT417—
6BA Dome Nuts **1D.** each
Cat. No. AT419—
4BA Dome nuts **1D.** each
Cat. No. AT418—
2BA Dome nuts **2D.** each

FIBRE INSULATING WASHERS

Insulating Washers for insulating potentiometers and other components from metal panels, etc. 1/2in. diam. x 1/2in. diam. hole x 1-16in. thick.

Cat. No. AS302 **1/3** doz.
Ditto, 1/2in. x 1/2in. x 1/16in.
Cat. No. AS305—
Fibre **1/3** doz.



BAKELITE WASHERS

Insulating Washers stamped from 1-16in. Bakelite Sheet.

Cat. No. AS229—1/2in. diam. x 1/2in. diam. hole **3D.** doz.
Cat. No. AS308—1/2in. diam. x 1/2in. diam. hole **3D.** doz.

FLAT GLASS PLATES

Nickel plated 1/2in. Glass Plates. Designed for attaching to the back of pictures, mirrors, etc., but also serving dozens of uses to the radio man. Bracket may be bent in centre giving a heavy coil mounting base. Length 1 1/2in. Width 1in.



Cat. No. AT30 **3D.** each

RIGHT ANGLE BRACKETS



Height 1in., turned over base 1/2in. Width 1/2in. Copper plated. Two holes drilled as illustrated. Real Value.

Cat. No. AT33—**1D.** each

SPRINGS

Spiral Springs, 1/2in. x 1/2in.—
Cat. No. AS85 **3D.** each

CHASSIS

Metal chassis are available for the following Kits. Details as to whether battery or A.C. powered and chassis dimensions are given below.

Cat. No.	Description	Price
AC1100	6in x 6in x 2 1/2in. Hikers Two Valve (Battery)	9/-
AC1115	9 1/2in. x 4 1/2in. x 2 1/2in. Versatile-Radiotron Amplifier 3 Valve (A.C.)	9/-
AC1120	10in. x 9in. with Bracket Simplex Valve Tester Panel	15/-
AC1125	12in. x 5 1/2in. x 2 1/2in. Defiant 5 Valve (Battery)	14/6
AC1127	10 1/2in. x 8 1/2in. x 2 1/2in. Sky-Hawk 4 Valve (A.C.)	10/9
AC1131	13 1/2in. x 6in. x 2 1/2in. Bell Tone Amplifier (A.C.)	14/6
AC1134	11 1/2in. x 4 1/2in. x 2 1/2in. Easy Built 4 Valve Clipper (Battery)	10/9
AC1135	9in. x 6in. 1 1/2in. Easy Built Three	12/6
AC1136	15 1/2in. x 6 1/2in. x 1 1/2in. Easy Built (new) Five	14/6
AC1137	9 1/2in. x 6in. x 1 1/2in. Airline 4	14/6

MAIL ALL ORDERS TO . . .

THE ELECTRIC LAMPHOUSE LIMITED.

11 Manners Street, Wellington, C.1.

ENSIGN RADIOS



7 TUBE DUAL WAVE A.C. SET, IN MANTEL CABINET—ENTIRELY NEW DESIGN

2 Bands, 8in. Speaker, 3 Gang Condenser, Super Sensitive Circuit, R.F. Stage (increases sensitivity and eliminates background hiss and noise). Continuously variable Tone Control. Latest type Loctal Tubes, Magic Eye, Spin Drive Tuning, Clear full vision dial.
Cat. No. AR732A

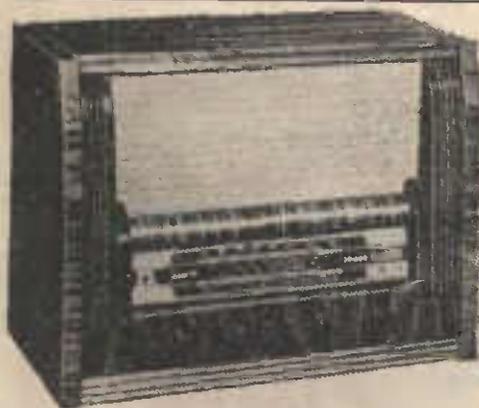
£42/10/-



7 Tube Dual Wave Table Model A.C. Set with Radio Gramophone

Attractive Cabinet incorporating same chassis as AR732A model at left, plus latest type Motor, Turntable and Pick-up.—Cat. No. AR752

£58/10/-



6 Tube Dual Wave Mantel Model

Well constructed cabinet of new and pleasing design. Size 23½in. high, 17½in. wide, 8½in. deep. Six latest type tubes, including Magic Eye. Easily read glass slide-rule dial. Special 9in. x 6in. Rola Elliptical Speaker. Continuously variable tone control with power switch.

Cat. No. AR743A—

£35/17/6



Exciting New Portable THE PACEMAKER-LEADER

Operates from either self-contained battery (only one battery ER753), while at picnics, trips, outings, etc., or from A.C. power mains while at home. The ideal all-purpose set; 5 valves. Size 12in. x 9in. x 5in. Weight 15lbs. Finished in attractive polished plastic with contrasting colour knobs and handle, chrome trim.

Cat. No. AR745—

£39/12/6



6 Tube Broadcast A.C. Model

9in. x 6in. Special Elliptical P.M. Speaker. Heavy Negative Feedback to improve Tonal quality. Rubber Insulated 3-gang Condenser. Tuned R.F. Stage. Variable Tone Control. High Signal to Noise Ratio, 4 to 1. 6 Latest Type Miniature Tubes. Full-size attractive Streamlined Cabinet. Dimensions: 17½in. Wide, 13in. High, 8½in. Deep. Splendid overall performance. Easily-read Glass Dial. Bass and Treble Equalization in Output Stage.

Cat. No. AR734A **£31/17/6**



ENSIGN RADIOS



8 Valve All-Wave A.C. Mantel

Entirely New Design. 3 Bands, complete coverage 550 kc/s. to 1600 kc/s., 3.15 to 8 mc. s. and 7.5 to 22 mc/s. Range includes the important 13-metre band, large photo-process dial having exposed length of 16 inches. Band and Tone Range Indicators. New 5-position Tone Circuit provided with provision for normal "top cut," bass boost, bass and treble boost and bass and treble cut. Heavy Negative Feed-back, Wide Range I.F. Transformers, 7 Loctal Valves, 1 Standard Magic Eye, 8in. P.M. Loudspeaker, Gramophone Pick-up Receptacle and Change-over Switch.

Cat. No. AR748 **£56/7/6**



8 Valve All-Wave A.C. Console

Similar to mantel model, but has 12in. Operadio P.M. Speaker.

Cat. No. AR749 **£70/10/-**

10 Valve All-Wave A.C. Mantel

General Specification as above, but incorporating a Push-pull Output Stage with 10 watt undistorted capacity and Over-sized Power Transformer, 9 Loctal Valves, 1 Standard Magic Eye, 8in. P.M. Loudspeaker with Superior Quality Output Transformer.

Cat. No. AR750 **£59/10/-**

10 Valve All-Wave A.C. Console

General Specification as above, but incorporating a Push-pull Output Stage with 10 watt undistorted capacity and Over-sized Power Transformer, 9 Loctal Valves, 1 Standard Magic Eye, 12in. P.M. Operadio Loudspeaker with Superior Quality Output Transformer, provision for Extension Speaker and Radio Gram Pick-up.

Cat. No. AR751 **£76/2/6**

" ENSIGN PACEMAKER "

POWERFUL QUALITY, PERFORMANCE, and REPRODUCTION throughout New Zealand Broadcast Band.

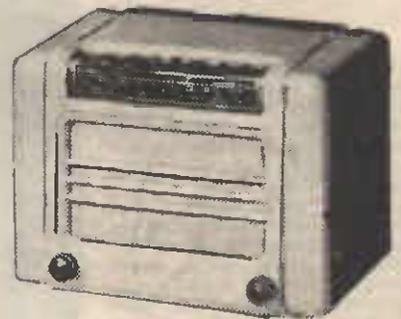
MODERN DESIGN—Incorporating Latest Features and Improvements in Radio Design. Latest Loctal Tubes. Uses full Automatic Volume Control preventing fading, thus keeping volume uniform on all stations.

Definitely Unequaled By Any Other Radio in its Class!

BEAUTIFUL POLISHED PLASTIC CABINET in Mottled Brown, Green, Red, or Ivory. Dimensions: Height, 7in.; Length, 9½in.; Breadth, 6½in. 5 tubes.

QUALITY CONSTRUCTION—Using only the finest standard components throughout. SUPERB TONE with a fine fidelity 5in. P.M. Speaker.

REASONABLE LOW PRICE Cat. No. AR729 .. **£18/18/6**



Mullard



enjoyable listening
wherever you go

Size 8½ x 4½ x 2½. Weight including batteries only 3½ lbs. and carried as easily as a folding camera. Switches "on" automatically when lid opens and "off" when closed. Unbreakable plastic case with carrying handle. Splendid tone, ample volume.



17 GUINEAS

complete with Batteries

Cat. No. AR760

Spare Batteries and Valves readily available

A Portable For Any Occasion

"Motorola"



6 VALVE CAR RADIO



We are again able to offer the well-known "MOTOROLA" Car Radio. A powerful 6 valve Auto Radio with speaker enclosed with set. Remote control unit has bracket attached for easy attachment to dashboard. Measures 5½in. in length, 1½in. deep. Attractively designed and giving an excellent performance the "MOTOROLA" is "tops" in Car Radios available today.

Metal cabinet housing set measures: Length, 9½in.; height, 6½in.; width, 5in., and is attractively finished with ivory plastic front.

Cat. No. AR780 .. **£37/10/-**

AS ABOVE, BUT FOR 12 VOLT.
Cat. No. AR782 .. **£37/10/-**

ENSIGN 7-TUBE DE LUXE AUTO RADIO

FOR 6 VOLT OR 12 VOLT OPERATION

Fits any car. Circuit includes A.V.C. Tone Control, Bias Boost, Audio Circuit for sparkling tonal quality, R.F. Stage eliminates background noise and increases sensitivity.

Three-gang rubber-mounted condenser. Circuit remarkable for its tuning sensitivity and selectivity; powerful and dependable anywhere you drive. Coloured panel lamps are used to minimise glare. Uses seven latest type miniature tubes. Slide Rule Dial—easy to read, easy to tune—inclined to provide full vision and complete safety while driving.



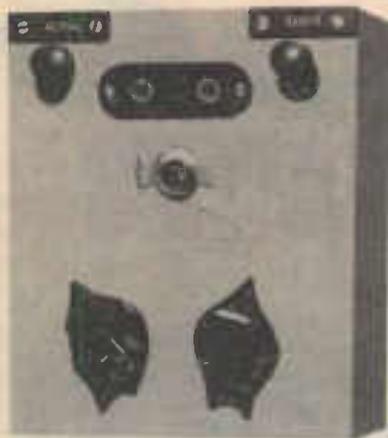
Cat. No. AR785—6 Volt Model

£39/18/6

Cat. No. AR786—12 Volt Model

£39/18/6

★ ★ LAMPHOUSE KITSETS ★ ★



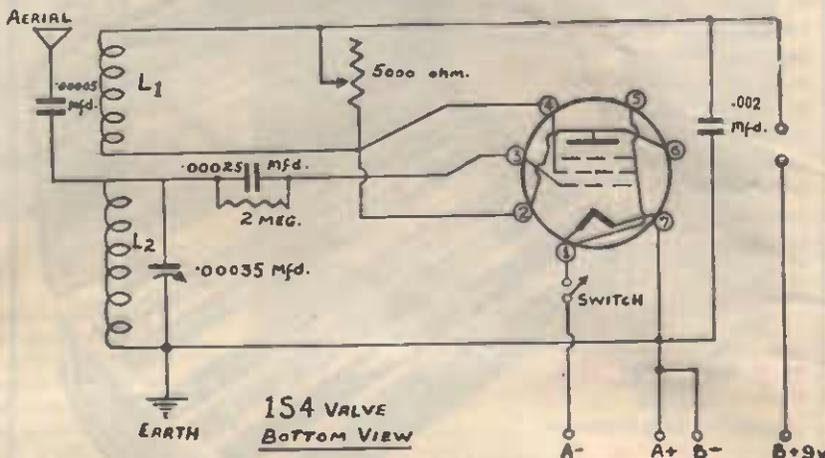
“THE POPULAR ONE”

Once again we bring before you THE “POPULAR ONE,” the neat and compact little receiver that has proved so popular in recent years. It's the LITTLE chap with the BIG heart!

A Simple Circuit — Brilliant Performance

We constructed the trial set in a small wooden cabinet 5½ in. x 4½ in. x 2½ in. deep, and would suggest that you do likewise. A cabinet any smaller than this would tend to cram the components and probably impair the performance.

It's easy to build and gives exceptionally good results. Uses a miniature tube. It's small, and may in fact be carried in the average size coat pocket.



PARTS LIST

- 1 Midget valve socket. 1S4 valve.
- 1 .00035 mica spaced condenser.
- 2 Small pointer knobs.
- 1 Twin tip Jack.
- 1 2 meg. ½ watt resistor.
- 1 5000 ohm. volume control.
- 1 Switch.
- 1 only .00025 mica condenser.
- 1 .00005 mica condenser.
- 1 .002 condenser.
- 1 Midget R.F. coil. 2 Fahstock elips.
- 6 Bijou cells. 3ft. Pushback wire.
- 1 1½ v. unit cell, 8 Nuts and Bolts.

Complete KIT OF PARTS
as above.

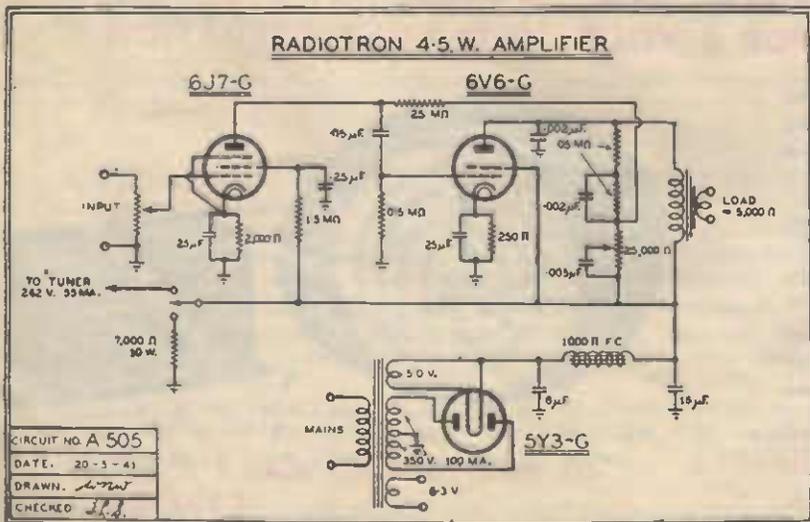
Cat. No. AK2005 (Head-phones extra) **45/-**

SUITABLE HEADPHONES
Cat. No. AC245— **25/- pair**
("Brown's")

"Build Your Own" KITS

The 'RADIOTRON' AMPLIFIER

A simple yet effective circuit of a small 4½ watt Amplifier, ideal for use with a Radio Tuner or an ordinary Gramophone Pick-up. Neat, compact, sensitive; uses all the modern octal based tubes. Gives reproduction that will please the most critical ear.



PARTS LIST

- ✓ 1 Chassis.
- ✓ 1 each 6J7G, 6V6G, 5Y3G Valves.
- ✓ 3 Valve Sockets. ✓ 1 Speaker Socket.
- ✓ 1 6.3 volt 60 MA Power Transformer.
- ✓ 1 8 mfd. Electrolytic Condenser.
- ✓ 1 16 mfd. Electrolytic Condenser.
- ✓ 2 25 mfd. 25 volt Electrolytic Condensers.
- ✓ 1 ½ yards Power Flex.
- ✓ 8 1-watt Resistors.
- ✓ 1 7500 ohm. 10 watt Resistor.
- ✓ 1 .005 mfd. Tubular Condenser.
- ✓ 2 .002 mfd. Tubular Condensers.
- ✓ 1 .05 mfd. Tubular Condenser.
- ✓ 1 .25 mfd. Tubular Condenser.
- ✓ 1 .5 mfd. Tubular Condenser.
- ✓ 1 Switch.
- ✓ each 25,000, 500,000 ohm Potentiometers.
- ✓ 2 Indicator Plates.

SUNDRIES, including:
Hook-up Wire, Shielded Grid Wire, Nuts and Bolts, Solder Lugs, Clip, Goat Shield.

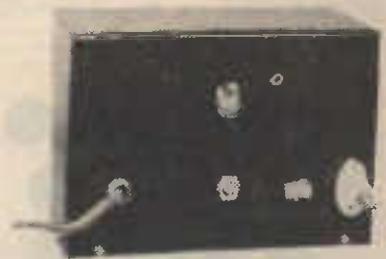
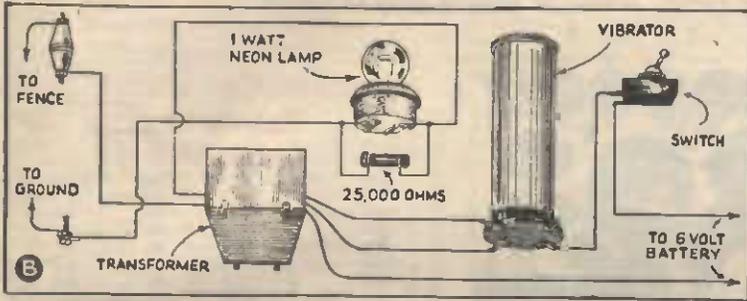
COMPLETE "LAMPHOUSE" KIT.
Cat. No. AK2044 **£6/9/6**

CIRCUIT NO. A 505
DATE: 20-5-43
DRAWN: [Signature]
CHECKED: [Signature]

★ ★ LAMPHOUSE KITSETS ★ ★

“OXFORD” ELECTRIC FENCE KIT

A simply designed ELECTRIC FENCE UNIT, easy to construct and worth its weight in gold to the farmer. It has been proved that a single wire charged with electricity is more effective in keeping livestock in selected fields and keeping intruders out, than the old-fashioned barbed wire fence or board fence, and with this thought in mind and in response to numerous requests, we present the “OXFORD FENCE KIT,” as previously mentioned, a simply designed and constructed unit.



Complete KIT OF PARTS
 (Including Cabinet)
 Cat No AK2042 **£3/19/6**

HERE is a simple amplifier capable of delivering 9.5 watts undistorted output. It is easy to build, has no hum, and is inexpensive. It is dynamically coupled, which accounts for its distortionless reproduction, giving as it does a truly “bell-like” tone. Frequency response is flat from 40 to 9000 cycles. The R.M.A. definition of a high-fidelity receiver is “one which has an audio reproduction range from 50 to 7,500 cycles with a harmonic distortion not to exceed 5 per cent.” The range of the average console radio is from 100 to 4,000 cycles. We give you these figures by way of comparison. Another point is that from low volume up to full output the same high quality is obtained—no falling off in bass response at low volume. The 6AC5G tubes are designed to operate with dynamic coupling from the driver cathodes—the 6F8G is an ideal tube for this purpose. The cathodes of this tube automatically supply the correct bias for the 6AC5G's. Dynamic coupling is the only possible method employable in television, where distortionless amplification over a wide frequency range is necessary. The coupling between the 6N7G and 6F8G is also unusual, and phase inversion is obtained without the necessity of having both input leads above earth. It is similar to a method used in “talkie” equipment.

The “BELLTONE” Dynamic AMPLIFIER

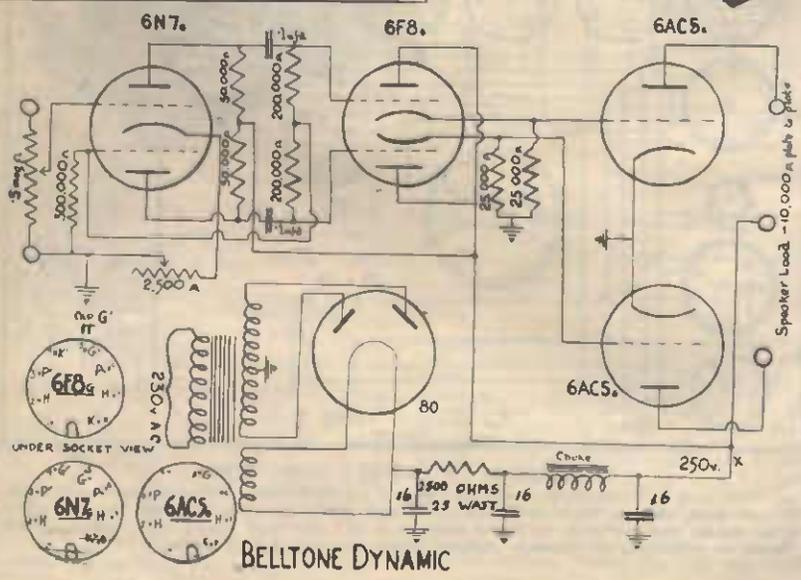
**Low Cost!
 Outstanding
 Performance!**

**Still
 Modern**

**Still
 Popular
 !!!**



**A POPULAR
 PRE-WAR AMPLIFIER**



Complete KIT OF PARTS
 Cat. No. AK2061— **£12/10/-**

SUITABLE SPEAKERS—

Cat. No. AS964 “Rola”
 12-0 P.M. Speaker .. **£5/3/-**

Cat. No. AS963 “Rola”
 G12 P.M. Speaker .. **£8/8/-**

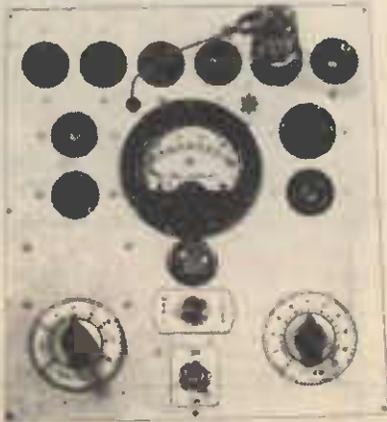
The Circuit design incorporates an E.M. Speaker. Only P.M. types are now being manufactured and to use these a 25 watt Resistor is included in the Kit of Parts to replace the speaker field. For details of connecting, see article on page 128 (Fig. 1).

The "Simplex" Universal Valve Tester

By GORDON W. READ.

A simple circuit of a Valve Tester that has proven exceptionally popular since we first produced it some time ago.

In the designing of this versatile valve tester we have kept in mind that the circuit must be simple and inexpensive, yet capable of testing all the many types of valves on the New Zealand market. In the latter respect we are in an unfortunate position, as we have to deal with the standard American types, including Octal, Loctal, and miniature, the Philips range, also the Mullard and the standard English types. In this tester a total of eleven sockets is used to make it truly universal.



THE circuit is of standard design in that it tests valves on the principle of emission or electron activity of the Cathode. Each valve is tested as a rectifier with 30 volts on the plate, and the load potentiometer is adjusted to a standard setting for that particular valve, and the electron flow is recorded directly on the meter. After a valve has been in use for a considerable length of time the active emitting salts on the cathode become exhausted and the efficiency of the valve and associated apparatus begins to fall. It is this fall of efficiency that causes the meter to read either good or bad when a constant plate voltage and load are applied by the tester. Incorporated in the instrument is an extremely sensitive neon test for leakage between filament and cathode. We cannot stress too strongly the need for a



leakage test on tubes used in modern receivers using AVC, QAVC, and other complex circuits, as the slightest leakage between the filament and cathode can cause hum noise, fading and either intermittent or permanent distortion. Note that this test is made on a hot cathode as many intermittent shorts are caused by thermal expansion and a cold check is of very little use.

The actual construction of the tester is not difficult, but be sure to use high quality components as any equipment is only as reliable as its component parts. The transformer is designed and specially wound for this instrument. The 1000-ohm potentiometer must be wire wound for accurate calibration and the contact shoe must ride directly on the resistance element for accurate resetting of the calibration points.

The meter is a standard 3in. round type of 100 ohms. Internal resistance. Should a meter of a lower resistance be used additional resist-

"SIMPLEX" UNIVERSAL VALVE TESTER

SUGGESTED CHART

Type	Volts	Load	Type	Volts	Load
O1A	5	8	25L6	25	1
1A4	2	6	27	2.5	4
1A6	2	11	30	2	7
1B4	2	6	32	2	6
1B5	2	20	37	6.3	3
1C4	2	4	39	6.3	5
1D4	2	4	41	6.3	4
1F4	2	4	42	6.3	2
1K4	2	4	43	25	1.5
1K6	2	5	45	2.5	4
2A3	2.5	2	46	2.5	4
2A5	2.5	3	47	2.5	6
2A6	2.5	2	49	2	7
2A7	2.5	3	50	7.5	6
5Z3	5	2	55	2.5	3
6A7	6.3	2	56	2.5	3
6A8	6.3	3	57	2.5	2
6B5	6.3	4	58	2.5	2
6B7	6.3	3	75	6.3	2
6C5	6.3	3	76	6.3	3
6C6	6.3	3	77	6.3	2
6D6	6.3	3	78	6.3	2
6F6	6.3	3	80	5	4
6F7	6.3	3	81	7.5	18
6H6	6.3	3	85	6.3	3
6J7	6.3	2	KBC1	2	7
6K7	6.3	3	KC3	2	2
6L6	6.3	2	AK2	4	2
6L7	6.3	20	AF3	4	2
6N7	6.3	1.5	AB2	4	2
6Q7	6.3	2	EBC3	6.3	2
6V6G	6.3	1.5	1561	4	3
6X5	6.3	1	EBL1	6.3	1
10	7.5	5	B240	2	2
19	2	2	AZ1	4	3
24A	2.5	5	506	4	3
25A6	25	3			

THE "SIMPLEX" UNIVERSAL VALVE TESTER

PARTS LIST

- 1 Panel
- 1 each 4, 5, 6, 7, Loctal, Midgat Valve Sockets
- 2 Octal Valve Sockets
- 1 each Philips (P), Squash 7-pin, 5-pin Valve Sockets
- 1 0-1 MA Meter
- 1 1000 ohm. W/W Potentiometer
- 1 1/2 watt Neon Indicator
- 1 Holder for same
- 1 Special Transformer
- 1 10-position Switch
- 2 .01 Condensers
- 1 D.P.D.T. Toggle Switch
- 1 S.P.S.T. Toggle Switch
- 2 Pointer Knobs
- 2 Resistors
- 1 yard 3-core Flex
- 1 Clio
- 1 yard Spaghetli Tubing

SUNDRIES:—Including Nuts and Bolts. Hook-up Wire, Connecting Wire, Grommets, Indicator Markings, etc.

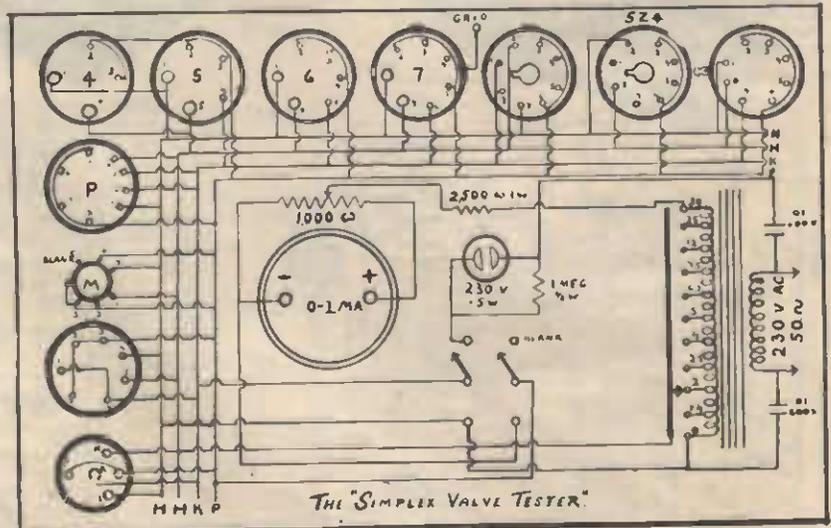
A KIT OF PARTS

Supplied by

THE LAMPHOUSE

Cat. No. AK2032

Costs only
£8/15/-



RE ERROR IN "P" SOCKET CONNECTIONS:

An error occurs in the diagram, Pins 2 and 3 are both shown connected to the common cathode lead, whereas Pin 2 should go to common left-hand heater lead and Pin 3 to right-hand heater lead. Pin 4 is shown connected to right-hand heater lead, whereas this should be connected to common cathode lead. Pin 1 is left as it is.

ance should be added to bring it up to 100 ohms. The meter as supplied with the kit of parts is 85 ohms internal resistance and a suitable 15 ohm resistor is supplied. A word of caution. Don't try to measure the resistance of a meter on the low ohms range of a multimeter, as the current through the meter can be as high as 100 M.A. with disastrous results to the meter under test.

The internal resistance of the meter is usually printed on the meter face. The filament selector switch must be of the non-shorting type otherwise a short would develop across the secondary as the switch arm is moved from one

point to the next. All the other parts are standard and need no special mention.

The actual testing of valves is very simple. All that is required is to place the valve in the right socket, and the correct load and filament voltage are applied as indicated on the chart. The short-circuit switch is moved to the short position and the power is turned on. Should the neon indicator show no leakage the switch is moved to the merit position and the meter reading noted. The meter scale should be graduated 0-100. From 0-50 is in the replace region, 50-60 doubtful, 60-100 good. To calibrate the instrument on types of valves

not shown on the chart, proceed as follows: - Select the correct filament voltage and set the load potentiometer at zero. Allow sufficient time for the valve to reach a stable operating temperature and then slowly rotate the load pot, until the meter reads full scale.

The following rectifier valves are tested in the socket marked 5Z4, 5U4G, 5V4G, 5W4, 5Y3G, 5Z4, and 5T1. This is because their filament terminals are Nos. 2 and 8 instead of Nos. 2 and 7 as is usual among the Octal range.

This concludes the description of a very simple yet versatile valve-tester that will fill the needs of all experimenters and servicemen.

"OXFORD" CRYSTAL SET

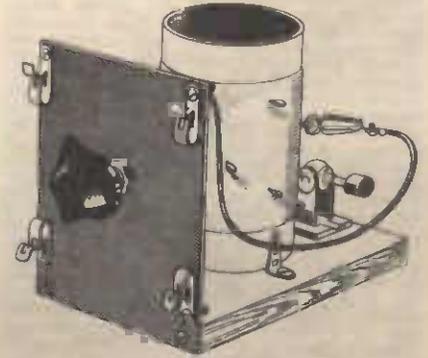
Though progress is being made rapidly in the radio world there will always be a place for the Crystal Set, that reliable and compact little receiver that works "for a song."

The "OXFORD" CRYSTAL SET illustrated may be constructed with ease by any schoolboy.

Though there may be one or two multi-valve receivers in the household, the crystal set is still practicable, for while mother and father may not wish to listen to the "big" radio, junior can always dash away and listen to his serials on the headphones without disturbing other members of the family.

However, this set is not recommended for use further than 30 to 40 miles away from a

strong station. There have been instances where crystal sets have brought in stations up to 200 miles away and sometimes even overseas, but this must be considered an exception to, and not the general rule.

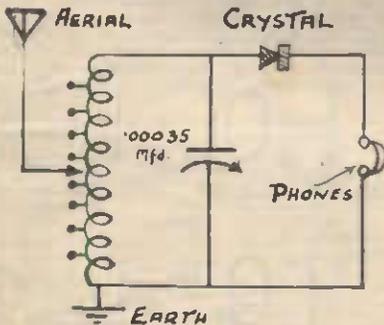


"OXFORD" CRYSTAL SET PARTS

- One Crystal Detector
- One Variable Condenser, .00035 mfd. or .0005 mfd.
- One 3 1/2 in. x 2 in. or 3 1/2 in. x 2 1/2 in. Coil Former
- Two Coil Feet
- One oz. 24 gauge D.C.C. Wire
- One Baseboard
- One Panel
- One Knob
- Four Fahstock Clips
- One Bulldog Clip
- Screws, Solder Lugs, Nuts and Bolts, etc.

COMPLETE KIT OF PARTS
(WITHOUT HEADPHONES)
Cat. No. AK2006 ... **17/11**

Full Constructional Details Supplied With Each Kitset

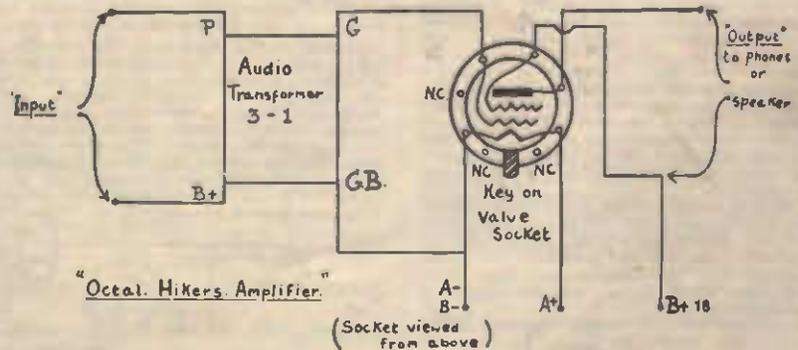


THE "OCTAL HIKER'S" AMPLIFIER

The **OCTAL HIKERS**
ONE VALVE
AMPLIFIER



1.C5C. or 1Q5C.



PARTS LIST

- 1 DL35-6 or 1Q5GT Valve
- 1 Octal Baseboard Socket
- 1 Audio Transformer
- 7 Fahstock Clips
- 1 Baseboard.
- 12 Wood Screws
- 1 9-volt C Battery.
- Hook-up Wire
- Solder Lugs

Complete KIT OF PARTS
as above.

Cat. No. AK2010 ... **47/6**
Cat. No. AK2010A—KIT AS ABOVE,
with 2 9-volt Batteries, **59/6**
1 No. 6 Cell

Above is the circuit of an excellent Single Valve Amplifier using an Octal Type Tube. This amplifier may be used in conjunction with any of the Hiker's Series Sets, or for amplifying a crystal set or other small receivers. The input to the amplifier is simply connected to the headphone terminals of the Hiker's or crystal set, etc. A 3 : 1 audio transformer is shown in the diagram, but a 3 1/2 : 1 or 5 : 1 Transformer would do equally as well.

To obtain satisfactory results it is recommended that 18 volts be used on the plate of the valve, although the amplifier may work on a lower voltage. Using the 22 1/2 volt tapping

of a 15 volt B battery would be quite satisfactory.

One 9 volt C Battery is included in the Kit of Parts. This, together with the 9 volt Battery already in use with the "Hikers" gives the required 18 volts. The 1 1/2 volt supply from the "Hikers" One is utilised with the Amplifier.

When adding to a crystal set where no batteries are employed the Kit should be purchased with a full set of batteries.

The ideal Amplifier to hook on to your "Hiker's One" to operate a Speaker

PICKUP INPUT CIRCUITS

Compensating for 78 and 33 1/3 r.p.m. Recording Characteristics

An Abridged Article from "Wireless World"

MUCH disappointment can be avoided by a simple understanding of the principles underlying the design and selection of input arrangements for standard 78 r.p.m. and 33 1/3 r.p.m. long-playing records. An exhaustive treatment is not intended, but it is hoped that this article will help the beginner to avoid the commoner pitfalls.

Most pick-ups fall into two main types—crystal (or piezoelectric) and magnetic—the latter covering ribbon and moving coil, as well as moving-iron armature and "variable reluctance" types. Crystal pick-ups are always of high-impedance; they are thus suitable for more or less direct connection to a grid circuit. Magnetic pick-ups are sometimes wound with a large number of turns of wire to generate the relatively large voltage required for the grid circuit; this can introduce electrical resonance (of self capacity and inductance of coil) unless great care is taken in the design. For high-fidelity pick-ups it is normally more convenient to use fewer turns (only one in the ribbon) these produce very small e.m.f.'s but are capable of delivering a much larger current. Since it is voltage and not current that matters at the grid circuit a suitable step-up transformer is normally used. The following remarks apply either to high fidelity impedance magnetic types or to the secondary side of a transformer when low impedance types are used.

Hum: Causes and Cure.—There are two main sources of hum—by induction from an alternating magnetic field such as from the mains transformer or gramophone motor, and by electrostatic induction from wiring and components usually connected to the mains or other high voltage a.c. sources.

Magnetic hum introduced into the leads and wiring represents only a very small e.m.f., since only one complete turn is involved. This can be troublesome when a step-up transformer follows the lead in question, how troublesome depends on the transformer turns ratio and the e.m.f. generated by the pick-up.

The best treatment is to twist tightly these low-impedance leads all the way from the pick-up coil itself right up to the transformer input terminals. For the secondary connections, ordinary screened leads are sufficient, but it is advisable to keep all these leads as far from stray magnetic fields (including heater wiring) as possible. The transformer hum problem is dealt with later. On the high-impedance side the magnetic and crystal types experience mainly hum from electrostatic induction. The cure is simple—just plain good screening everywhere, and this precludes mains switches on volume controls, unless they are well shielded.

Rumble. This consists usually of vibrations originating from the motor, with the main components between about 5 to 30 c/s. Magnetic pick-ups are seldom troubled with rumble since their output is proportional to velocity which falls with frequency for a given amplitude—hence very little output occurs at these low frequencies.

Crystal pick-ups, on the other hand, usually show up the motor deficiencies on this score, since the output voltage is proportional to amplitude. In a recent design (Acos GP20) a velocity type characteristic has been introduced below about 30 c/s and the trouble is considerably reduced.

Where necessary, a simple high-pass filter, such as that shown in Fig. 4, gives useful rumble attenuation without spoiling the bass response. This attenuates at 12 db/octave and gives a more rapid rate of fall at small values of attenuation than the more usual circuit, having equal capacities and equal resistances. Using the circuit shown, values of

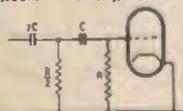


Fig. 4.—Simple "rumble" filter.

$C = 0.01 \mu F$ and $R = 0.5 M\Omega$ have proved satisfactory.

Simple Pick-up Measurements. Very little apparatus is necessary to carry out useful checks on frequency characteristics. A standard frequency record, preferably the type with bands of fixed frequency ranging from, say, 30 c/s up to 14,000 c/s or more, a fixed resistor of 5 to 10-watt rating equal to the nominal speaker load, an a.c. voltmeter (rectifier type) of range 0 to 5 V or 0 to 10 V.

Most modern amplifiers employ sufficient feedback to be virtually flat over the audio range, so, with a resistive load in place of the speaker and the voltmeter across that, they make a very nice valve voltmeter, provided the volume control is not disturbed after the initial setting.

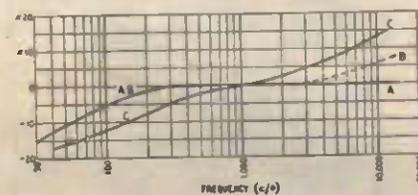


Fig. 6.—Principal commercial recording characteristics plotted on the basis of equal velocity at 1,000 c/s. A, standard 78 r.p.m.; B, Decca FFRR, 78 r.p.m.; C, Decca long playing.

A response curve can then be obtained quite easily by converting voltage ratios to the voltage, at say, 1,000 c/s into decibels by the usual formula: Decibels = $20 \times \log$ ratio, or by referring to decibel tables or abacs if these are available.

Be careful not to overload the amplifier when taking these readings. Knowing the maximum power output of the amplifier and remembering that $Watts = V^2/R$ calculate the highest reading V you can allow to be seen on the voltmeter.

In the absence of an LP test record, the circuit can be checked satisfactorily using a 78-r.p.m. standard frequency record, run at 78 r.p.m. and using the correct stylus. To the readings obtained, when converted to decibels, add the bass-cut figures quoted on the record, then the final curve should look like the inverse of curve C in Fig. 6 if equalization is correct. This method is quite accurate except for the top resonance, if any.

Controls for a Pick-up.—Two controls are really sufficient—a top attenuator, preferably switched in 4 or 5 stages, to cover age, origin, and condition of 78-r.p.m. records, and a changeover switch to effect the major 78—LP change. A three-position switch is useful, in the form 78—LP—Radio. The more ambitious might like to expand it to: 78 NORMAL—78 FFRR—LP—Radio, but the extra top of the Decca FFRR can be dealt with quite adequately by the normal top control.

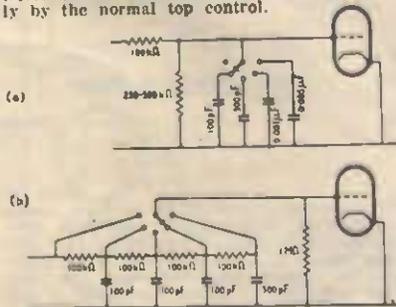


Fig. 5.—Top boost controls (a) with variable cut-off frequency, (b) with variable attenuation slope.

Two top cut circuits are shown, Fig. 5(a) is the conventional one with 6 db/octave attenuation, starting higher or lower in the scale according to the capacity chosen. With the values given attenuation starts, according to the switch position, at frequencies in the neighbourhood of 10, 6 and 3 kc/s and for really bad records at about 3000 c/s. Fig. 5(b) varies the slope from 5 to 20 db/octave, with a little variation of the starting point, which is in the region of 1,000-2,000 c/s.

A 78/LP change-over is suggested, rather than using the top and bass controls; this enables the changeover to be made with a single operation. Further, exact equalization of LP recordings is not possible with simple cut/boost controls, and it is in any case desirable that the whole of the variable top and bass control range should be available for special conditions.

78 r.p.m.—(I) The recording characteristic.—Fig. 6 shows (A and B) the two recording characteristics produced in this country in terms of velocity against frequency.

R ₁	R ₂	R ₃	C
100kΩ	10kΩ	≥ 500kΩ	0.05μF
200kΩ	20kΩ	≥ 1MΩ	0.05μF

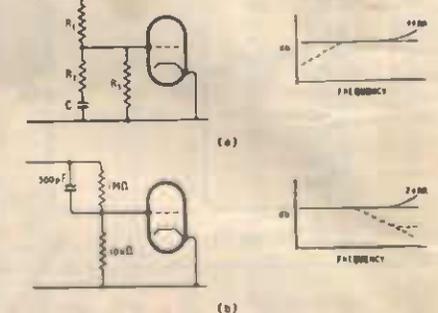


Fig. 7.—Simple compensating circuits for 78-r.p.m. recordings (a) magnetic (velocity) pickups, (b) crystal (amplitude) pickups. The dotted curves indicate voltage output before correction.

(II) Correction Circuits.—The magnetic types require a bass-lifting circuit of the type shown in Fig. 7(a). In reality it "attenuates-everything-but-the-bass," a matter of 10 times for both sets of values given, so that adequate gain must be available in the amplifier.

The circuit of Fig. 7(b) for the crystal type is similar in this respect. With the older crystal types it must be used with discretion, though, on account of the rather large high-note resonance. An elaboration of this circuit which was recommended for use with the Acos GP12 is shown in Fig. 8. This pick-up followed closely the theoretical amplitude operation of piezo crystals.

With the later types of crystal pickup, such as the Acos GP20, the high-frequency response does not follow this law, but has an internally compensated response which approximates to a velocity law at high frequencies when terminated by a resistance load. For those who would like to improve the response a circuit is shown in Fig. 9.

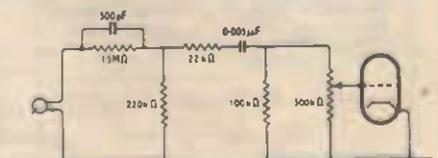
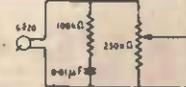


Fig. 8.—Correction circuit for the Acos GP12 pickup on 78 r.p.m. records.

Fig. 9.—Correction circuit for Acos GP20 pickup on 78 r.p.m. recordings.



None of these circuits include a top correction for the difference between standard and FRR characteristics, but this will be covered by the suggested top control.

A complete circuit for a magnetic pick-up is shown in Fig. 10.

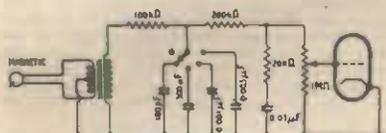


Fig. 10.—Complete compensating circuit (78 r.p.m.) for magnetic (velocity) pickups.

Long Playing (33 1/3 R.P.M.)—The successful adaption of standard pick-up for microgroove recording is dependent on the recognition of several factors.

If the pick-up will not track standard 78 R.P.M. test recordings satisfactorily at 14 grams or less, it is improbable that the same pick-up (with a correct radius stylus, of course) will track long-playing records at 7 grams. The tracking problem is not only important at the low frequencies, but also at the extreme high frequencies, where the velocity of the microgroove recording approaches that of the standard record, although the tracking weight of the pickup is considerably less

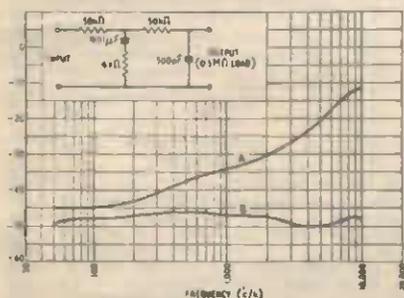


Fig. 12.—Output of high-impedance Decca Model D2 (3-pin type) moving-iron pickup on 33 1/3 r.p.m. test record; A, without correction; B, with equalizer circuit shown inset.

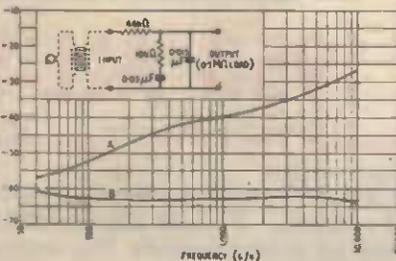


Fig. 13.—Low-impedance Leak moving-coil pickup and transformer on 33 1/3 r.p.m. test record; A, without correction; B, with equalizer circuit.

and mechanical impedance of the armature is rising rapidly.

Assuming, however, that the pick-up is satisfactory in this respect, there is no reason why it should not give satisfactory results on microgrooves, providing it is correctly equalized. It should be noted that the effective resonance frequency of the armature system is usually decreased by about half an octave on microgroove compared with standard records, so that if any resonance is at all apparent in the upper register on standard records it will, in general, be more prominent and at a lower frequency on microgrooves.

Frequency Correction.—As examples, two high-fidelity magnetic pick-ups and a similar type crystal pick-up are presented herewith. The open-circuit response characteristic of the Decca Model D2, 3-pin type, magnetic pick-up is given in Fig. 12(A). It will be seen that this response, in the mid and lower registers, approximates to the recording characteristic, Fig. 6(C), but in the higher frequencies rises rather more steeply because of the lowered re-

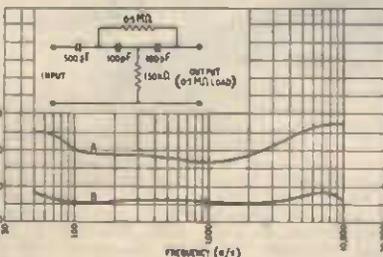


Fig. 14.—Cosmocord GP20 crystal pickup on 33 1/3 r.p.m. test record; A, without correction; B, with "bridged T" equalizer circuit.

sonant frequency of the armature system. The electrical network, shown inset, corrects the response of the pick-up and gives the overall response shown in curve B. Although this final response is not in the "straight line from d.c. to infinity" beloved by the pedants, it is well within ± 2 db. The components in question were radio-tolerance units. It may be pointed out that the 500 pF terminating condenser and the 4,000-ohm resistance may have to be varied with individual pick-ups to get a satisfactory balance between the middle and upper frequencies. This equalizer has been successfully used with a variety of pickups of up to 5,000 ohms impedance (connected direct or taken on the secondary of the coupling transformer) which normally require a load resistance of quarter to half megohm.

The best of the moving-coil pick-ups show a resonance of at least 20 kc/s on standard 78-r.p.m. records and even when played on microgroove records the resonance is seldom lower than 15 or 16 kc/s and the pick-up response is very nearly that of the record. With care the low-frequency resonance can be below 30 c/s and the low-frequency response will also be very nearly that of the recording characteristic. The Leak moving-coil pick-up and its transformer are shown as being representative of this type of instrument. The open-circuit response is given in Fig. 13(A); when connected with the appropriate equalizer network the response shown at B is obtained. The high frequency "roll-off" is controlled by the 0.015- μ F condenser; decreasing it to 0.01 μ F. will increase the 10-ke/s response by about 4db. This condenser can be adjusted to meet individual requirements. If the low-frequency end is considered excessive a condenser can be inserted between the transformer secondary and the 44,000 Ω resistor. A value of 0.25 μ F will give a reduction of about 6 db at 50 c/s. The "roll-off" at low frequency can be adjusted to suit conditions by varying the value of this condenser, lower values increasing the attenuation.

The case of the crystal pick-up is shown in Fig. 14, the unequaled response being shown at A and the equalized at B. It will be seen that a modified "bridged T" network is used, and, within reason, the equalizing is independent of the pickup impedance. In all cases the terminating resistance should be 0.5 M Ω . If the input impedance of the amplifier is other than this value, a simple potential-divider matching arrangement should be used.

It may be found, especially with cheaper type turn-tables or units that have been modified from 78 r.p.m., that motor rumble is excessive. Should this be the case, the high-pass filter unit described earlier may be used successfully, but should be connected between the equalizing unit and its load resistance.

FACTS, FIGURES, AND TABLES

Useful Conversion Table

Multiply	by	to obtain
Diam. of circle	3.1416	Circumference
Metres	1.0933	Yards
Metres	3.28	Feet
Sq. Metres	1.196	Sq. Yards
Sq. Metres	10.764	Sq. Feet
Cu. Metres	1.308	Cu. Yards
Cu. Metres	35.315	Cu. Feet
Inches	2.54	Centimetres
Sq. Inches	6.45	Sq. Centimetres
Cu. Inches	16.39	Cu. Centimetres
Feet	.3048	Metres
Yards	.9144	Metres
Miles	1.609	Kilometres
Knots	1.152	Miles per hour
Kilogrammes	2.204	Pounds
Grains	.065	Grammes
Pints	.568	Litres
Ounces	28.35	Grammes
Pounds	453.6	Grammes
Litres	1.76	Pints
U.S. Gallons	.8333	Imperial Gallons

COPPER CONTENT

Copper is used in more well-known alloys than any other metal. A few of these are:—

- Brass = 60% copper and 40% zinc.
 - Bronze = 66% copper and 34% tin.
 - Aluminium Bronze = 90% copper and 10% aluminium.
 - Manganese Bronze = 70% copper and 30% manganese.
 - Phosphor Bronze = 80% copper, 10% tin, 9% antimony, and 1% phosphorus.
 - Silicon Bronze = 95% copper and 5% silicon.
 - Gunmetal = 90% copper and 10% tin.
 - Manganin = 82% copper, 15% manganese and 3% nickel.
- These alloys are not always produced in exactly the proportions shown above, variations often being required for special industrial uses.

ELECTRIC SUPPLY

Those who are interested in checking up the amount of mains current consumed by their receivers, transmitter, etc., will find this table useful. The first column shows the watts consumed, the second the current, and the remaining two, units against time.

At 230v. Watts.	Unit Amp.	per Hour.	El. Supply Hours per Unit.
40	.173	.04	25
50	.213	.05	20
60	.26	.06	16.6
70	.30	.07	14.3
80	.34	.08	12.5
90	.39	.09	11.1
100	.43	.1	10
120	.52	.12	8.3
140	.61	.14	7.1
160	.7	.16	6.3
180	.78	.18	5.5
200	.87	.2	5.0

THE "RADEL" 1950 ALL-WAVE SEVEN

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HERE is a seven-valve all-wave receiver with push-pull triode output stage, without negative feedback. The set has excellent quality of reproduction, and an output of approximately five watts, which is ample for the average home set. Provision for using a pick-up to make the set into a radio-gram combination is easily made, and the audio gain is ample for most modern pick-ups. The cost is not exorbitant.

INTRODUCTION.

IN designing we decided that one feature that was quite indispensable was the use of the latest valve types wherever possible; there are two main reasons for this, firstly, that the more recently-developed valves will undoubtedly give higher performance than the older types, and secondly that as a set can be expected to have a life of several years if well constructed, with parts of good quality, the more modern valve types will enable valve replacement to be made more easily in the future, when types that are old now can be expected to have become obsolete and difficult to obtain even for replacement purposes.

Accordingly, the line-up of this set comprises (1) a 6BA6 miniature R.F. pentode as R.F. amplifier, (2) an X61M as oscillator-mixer; (3) a 6AR7-GT as I.F. amplifier and detector, A.V.C. rectifier; (4) A 6SN7-GT as audio voltage amplifier and phase inverter; (5) two 6T6's as push-pull output stage, and (6) a 5Y3 as power rectifier.

These are all very modern valves, as far as this part of the world is concerned. However, we have not departed from our principle of trying to use only those components that are readily available, because all these valves are being manufactured in Australia, from where all our American type valves come from now that no direct imports come from dollar sources.

IDEAS BEHIND THE DESIGN OF THIS SET.

When a new set is presented by us there are always a few main ideas round which the design centres, and we have always made it a practice to describe these in some detail, so that the reader may get an accurate idea of just what sort of set he is getting. The ideas of some of the older radio magazines seemed to be

directed rather to convince the reader, simply by reiteration, that each set presented was the best ever seen with four, five, or however many valves it used. This approach is palpably nonsense, and some magazines even today seem to employ it with more or less success. That sort of thing may be well enough for the enthusiastic but not very knowledgeable reader, but today most constructors know that there is no such thing as a "best" seven-valve

set, and that a design containing a given number of valves may be excellent for some special purpose, and almost useless for another. In describing a set which we ourselves have designed, we believe that not only the specially good features, if any, should be stressed in the article, but also that its limitations should be pointed out, so that every reader may weigh up the whole thing and decide for himself whether or not the set suits the purpose he has in mind.

Accordingly, here is a list of features belonging to the "1950 All-wave Seven."

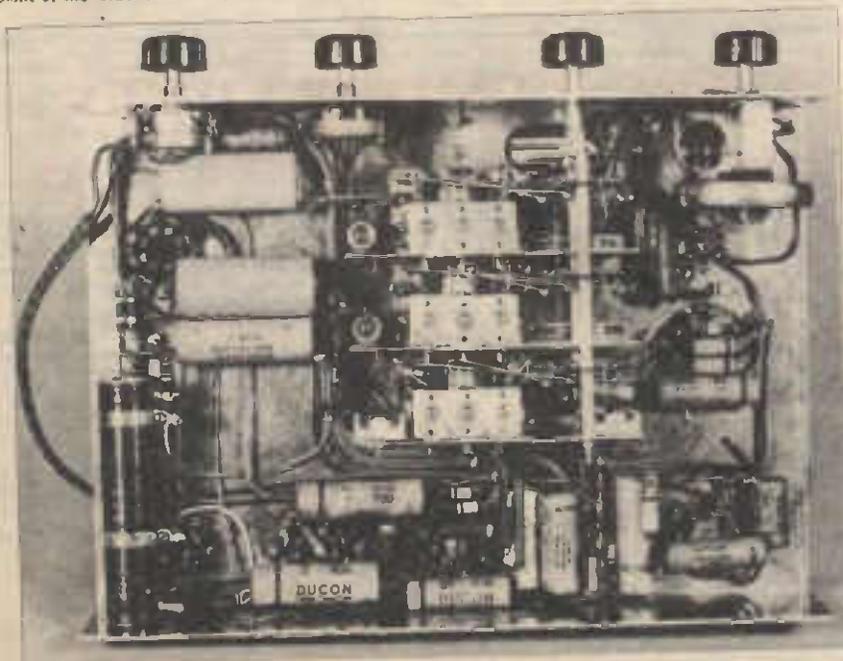
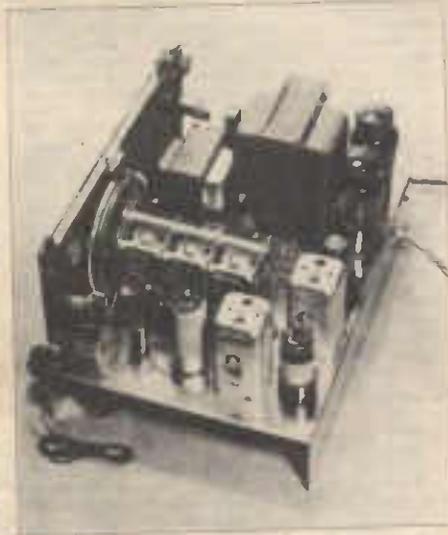
- (1) Good audio quality, without the use of negative feedback.
- (2) No special arrangements for improving the audio frequency response for radio reception compared with the average receiver, i.e., no variable selectivity circuits, or specially difficult features in the R.F. or I.F. parts.
- (3) All-wave coverage, without band-spread, from broadcast to 20 mc/sec., in three bands.
- (4) High sensitivity and good short-wave performance through the use of modern high-gain R.F. amplifier and oscillator-mixer valves.
- (5) Low cost for the number of valves, owing to a type of circuit which eliminates several small components without sacrificing efficiency or stability.
- (6) Somewhat higher audio power output than the average set with single ended output, but less than that of many sets with high-powered push-pull output stages. This also helps considerably in keeping costs down.
- (7) Ease of construction, with straight-forward, easily-made chassis.

It will be noticed that some of these features appear to be negative in character; for instance, it is stated that there is no variable selectivity incorporated, nor any negative feedback. Taken together, these two boil down to the fact that while the set has been designed for better than average quality, it does not fall within the so-called "high-fidelity" class. In consequence, it is essentially simple, and therefore easy to construct, while the cost is only slightly in excess of that of a 6-valve set with only ordinary audio quality and power output. Also there are no difficult adjustments to make that really need a laboratory's facilities, either in the audio or the R.F. end. The receiver is therefore, just what it claims to be, namely a better-than-average performer, especially suited to construction by the amateur.

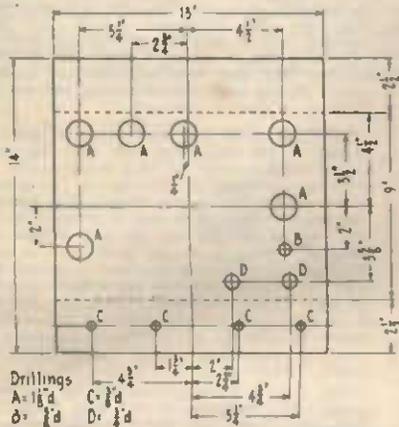
THE CIRCUIT ARRANGEMENT.

As can be seen from the circuit, a commercial three-band coil unit is used. These units can be obtained from more than one maker, and as well as saving the constructor much work, give the completed set a performance that he would find difficult, if not impossible, to achieve if he attempted to build a coil unit himself. The dial is one sold by the maker of the coil unit, and designed to track with it, assuming that the recommended kind of gang condenser is used. It should be pointed out that it is quite possible to build the set using a unit other than the one built into the prototype, and that if this is done, just as good performance should be obtained, it may be necessary, though, to modify slightly the chassis lay-out, especially so far as the mounting of the I.F. amplifier and oscillator-mixer valves, and the dial are concerned. Apart from this, no changes should be needed in the circuit if a different make of unit is used.

Although many manufacturers are in the habit of designing their circuits in such a way as to eliminate cathode resistors and bypass condensers wherever possible, this is not often seen in circuits intended for home-construction. The reason is possibly to be found in the fact that the use of a back-biasing arrangement for the whole set is apt to introduce hum in the hands of inexperienced builders. Nevertheless,



there is one great advantage of back-biasing, in that all cathodes of valves supplied with grid voltage in this way can be directly earthed to the chassis. This improves R.F. stability and eliminates two components for every valve so treated. In this case three of the valves are back-biased, so that three cathode resistors and their bypass condensers do not have to be used. The audio stages, however, use cathode biasing in the ordinary way. But since the output stage is push-pull, no bypass condenser need be used there, and only the voltage ampli-



her stage has a cathode bypass condenser. The objections to back-biasing apply with most force to audio stages, which are prone to pick up hum in this way, so that leaving only the R.F. part of the set with back bias leaves very little chance of trouble from this cause. To obtain approximately 2v. a resistor of R13, of 25 ohms, is placed in series with the power transformer centre-tap, which is thus grounded through the resistor instead of directly. The whole H.T. current of the set therefore flows through the 25-ohm resistor, making the ungrounded 2 volts negative with respect to chassis. In order to decrease the hum voltage across the back-bias resistor, the first smoothing condenser is connected not to earth, but to the transformer centre-tap. The grid

returns of V1, V2, and V3 are then connected together and taken to R13. If the connection is traced through the set from the upper end of R13, it can be seen to go not only to the grid circuits of V1, V2, and V3, but also to the lower end of R9, which is the load resistor for the A.V.C. diode. There is therefore a negative potential of 2 volts placed on the plate of this diode. This gives a 2-volt delay to the A.V.C., preventing this from coming into action until the aerial signal is strong enough to produce an I.F. signal of 2 volts peak at the plate of the I.F. amplifier. On very weak signals, therefore, the A.V.C. does not work, and the full sensitivity is realized. Where a cathode resistor is used for the valve containing the A.V.C. diode, the usual way of providing delay voltage is simply to allow the cathode to be positive with respect to the diode plate by earthing the load resistor.

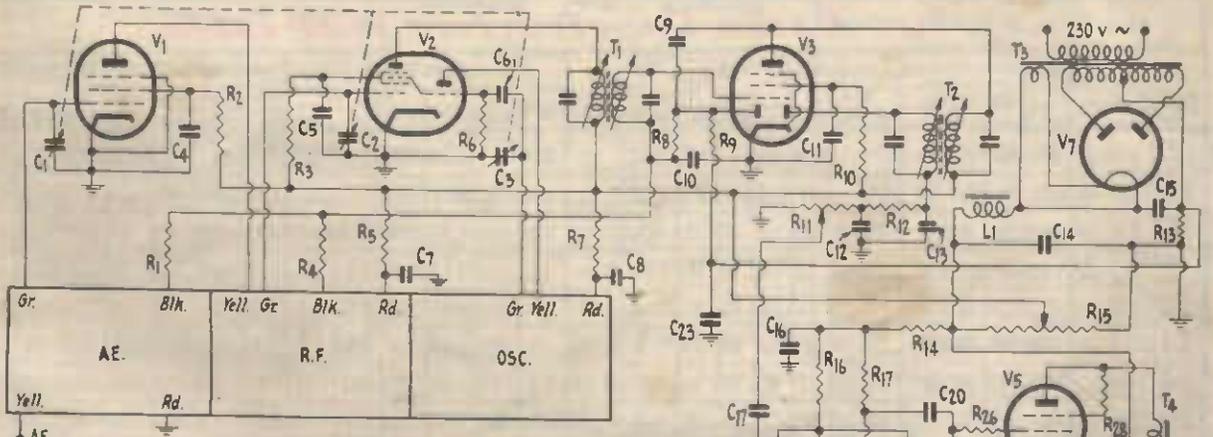
In the wiring to the coil unit, shown simply as a block on the circuit diagram, the black leads in the aerial and R.F. compartments carry the A.V.C. voltage to the R.F. stage and mixer respectively, R1 and R4 are decoupling resistors, which in a full circuit diagram have bypass condensers connected to earth from the coil unit. These are not shown, because they are included in the coil unit. However, in the red leads, which take the H.T. Voltage into the R.F. and oscillator compartments, no provision by bypass condensers is made, so that C7 and C8 are shown on the circuit.

When we examine the circuit of V3, we can see that it appears rather crowded. This part of the drawing could have been spaced out somewhat, but this was not done, advisedly, so as to emphasize one important point. It is the need for short wiring in the circuit of the A.V.C. rectifier. This is something that is very often not realised, with the result that long leads are made carrying the full voltage output of the I.F. amplifier, and simply asking for the set to oscillate. The general principle of keeping R.F. and I.F. leads short applies with greatest force to those leads carrying the greatest voltage. In an R.F. stage, the signal voltage can be reckoned in small fractions of a volt, but not so in the I.F. amplifier, where even 50 volts of signal is not out of the way under some circumstances. If then a long lead is run round the set, carrying an I.F. voltage of this magnitude, it is a bit hard to expect it not to radiate to other parts of the set, where it will most probably cause

oscillation. Often the valve line-up does make it difficult to preserve short leads in the A.V.C. rectifier circuit, but here there is no difficulty. The blocking condenser, C9, can be mounted with only about 1/4 in. of lead right across the socket of the 6AR7. The load resistor R9 can be attached to its 'high' end directly on to the diode contact lug, and the other end anchored to an insulated solder lug mounted nearby especially for the purpose. Then, right at this lug, should be mounted C23, after which no I.F. voltage will be present on the lead which goes to C15, and this may wander as far as we like round the chassis without causing any trouble. The same thing applies to the lead from the A.V.C. diode's plate to the A.V.C. filter resistor R8. This is where many people slip up. It is most important in any set to make this lead as short as possible. If R8 and C10 are mounted as close up to the diode as possible, then the A.V.C. line leaving C10 will have no I.F. voltage, but only the D.C. control voltage on it, and it also can be run as far as we please without causing instability. The object lesson in drawing the V3 circuit very compactly is now obvious and should need no further labouring!

Similar considerations apply to the diode detector, where high I.F. voltages also occur. Here, the important thing is to keep the I.F. filter consisting of R12, C12, and C13, as close as possible to where the lead from the second I.F. transformer comes through the chassis. At the left-hand end of R12 there should be a high audio voltage, but very little I.F. voltage, so that the lead connecting R12 to R13 should not be a source of I.F. instability. However, where as here, the diode load resistor R13 is used also as the volume control, and must therefore be on the front of the chassis, some way from R12, it is usual as a safety measure to shield the lead and this should always be done.

The audio section of the receiver is quite conventional and does not need much comment. The first half of V1, the 6SN7, is used as a voltage amplifier, with a gain of approximately fourteen times. Then comes the phase inverter, of the reliable and well-balanced split-load variety, which in turn feeds the grids of the push-pull stage. The use of KT61's triode connected, gives an amplifier with a power output of 5 to 6 watts, with the usual good triode quality, but in this case with very high sensitivity. Only about 9 volts peak is required to fully swing each valve, which is a far cry from the old 45 or 2A3, which needed



COMPONENT LIST.

- V1, 6BA6.
- V2, X81M.
- V3, 6AR7-GT.
- V4, 6SN7-GT.
- V5, V6, KT61.
- V7, 5Y3.
- R1, R4, R10, R16, 100k.
- R2, R6, R12, R17, R20, 50k.
- R3, 15k.
- R5, R24, 2k.
- R7, 35k.
- R8, R9, 1 meg.
- R11, R18, 500k. 10t.
- R13, 25 ohms.
- R14, 30k.
- R15, 25k. voltage divider, with one tap.
- R19, 1k.
- R22, R24, R25, 250k.
- R23, R26, 10k.
- R27, 150 ohms.
- R28, R29, 100 ohms.
- C1, C2, C3, 420 $\mu\mu\text{f}$. max. cap. 3-gang.
- C4, C5, C7, C8, C17, C21, C23, 0.05 μf .
- C6, C9, C12, C13 50 $\mu\mu\text{f}$. mica.
- C10, C11, C20, C22, 0.1 μf .
- C14, C15, 16 μf . 450v. electro.
- C16, 8 μf . 150v. electro.
- C18, 100 $\mu\mu\text{f}$. (or larger, see text).

- C19, 25 μf . 25v. electro.
- T1, T2, I.F. transformers.
- T3, 100 ma. power transformer.
- T4, output transformer, 6000 ohms, p.-p. to v.c.
- L1, 100 ma. smoothing choke.

Important Note.—A 100,000-ohm resistor, not shown, should be connected between the screen of V2 and chassis.

over 40 volts of undistorted output from the preceding stage before the full output could be realized. Thus, with only one very low-gain voltage amplifier stage, and a phase inverter which provides a slight loss in each side rather than any gain, the whole audio section can be fully loaded by rather less than a volt R.M.S. of audio signal from the detector. Since this will provide about 20 volts or so on strong local signals, this means that the volume control will be advanced only very slightly for most listening purposes, and still not very far even for full output from the amplifier. This has a beneficial effect on the detector diode, as it reduces considerably the shunting effect of the grid resistor R18, which is tapped across only a very small portion of the load resistor R11. Detector distortion, which can often be very violent, is thus reduced to a minimum.

Particular note should be taken of the grid and screen stopper resistors, in the output tubes. The older types of output valve did not need these, but modern high-Gm valves should always have them included, for without them, the audio amplifier may sometimes burst into most unaccountable oscillation at the most unlikely frequencies—often above 30 kc/sec.

CONSTRUCTION.

The photograph and the working drawing for the chassis give a good idea of the lay-out of the main parts. The coil unit is not mounted centrally on the chassis, but to the right a little, as can be seen in the underneath photograph. The gang condenser is placed almost over the centre of the coil unit, and a little towards the right. Then, in a row from front to back, to the right of the gang are the 6BA6, the X61M, the first I.F. transformer, and the 6AR7. The latter is in the corner of the chassis. The circuit then progresses along the back of the chassis, with the second I.F. transformer, the 6SN7, and the 6X4. In front of these are the power transformer, the smoothing choke, and the rectifier tube. The latter is partly hidden in the plate lead, but can just be seen between the transformer and the choke.

A slide-rule type of dial is used, with the spinner right at the right-hand end of the chassis. The two large holes in the front of the chassis are for the string to pass through on its way to and from the spinner shaft.

KITSET

**FULL KIT OF PARTS FOR
"RADEL 1950 ALL-
WAVE SEVEN"**

Including Matched Coil Unit,
Dial and Condenser, same as
used in actual prototype. Ex-
cluding Speaker and Cabinet.

Cat. No. AK2070—

£24/10/-

SPEAKERS—See Page 62.

CABINETS—See Page 46.

The underneath view shows how comparatively free from small parts is the "front end" of the set. The only part of the set where it may be found a little difficult to fit in the condensers and resistors is in the vicinity of the 6SN7. The volume control potentiometer is on the extreme left of the chassis, and its shielded leads can be seen skirting the coil unit and going to the second I.F. transformer. In wiring this part of the circuit it is important to see that the I.F. filter is placed as close as possible to the I.F. transformer. The shielded leads to the volume control do not then have so much shielding to do, since practically all of the I.F. voltage is removed by the filter before the shielded lead is reached. The shield braid should be well earthed, preferably to several points on the chassis. In our case, an aluminium chassis was used, so the earthing points had to be solder lugs tightly clamped between the chassis and the mounting

nuts of Valve-sockets, etc. The earthed end of the volume control potentiometer should be earthed to the end of the shield braid, and the case of the potentiometer should also be connected to the same point. This makes the cover of the pot, an effective shield for the "works" inside, and as well as helping to by-pass any residual R.F., it also aids in keeping any hum from getting into the volume control by capacitive coupling (as sometimes happens). The voltage divider can be seen at the left of the under-chassis view. These somewhat old-fashioned components seem to have re-appeared on the market after a long absence, and they are extremely useful, and much cheaper than a pair of conventional high-voltage wire-wound resistors would be. It will be noticed that two tapings can be made by means of the sliding connections, but only one of them is used in this set.

There is little else one can say about the wiring of the set, since this must follow the logical arrangement of the main parts. Nor is there anything at all out of the ordinary in the circuit or its adjustment that needs explanation. The alignment is straight-forward, and can be carried out by any of the stock methods, using a signal generator, a multivibrator, or both. It has just occurred to us that the multivibrator as an alignment tool is far too much neglected, especially by those of us who cannot afford a signal generator; an article on the use of this extremely cheap and versatile instrument would certainly not go amiss.

The I.F. transformers shown in the photograph are condenser-tuned ones, with fixed iron-dust slugs, but there is no reason why permeability-tuned transformers should not be used if desired.

While there is certainly nothing startling, or even new about the design of this set, its excellent performance, which it derives from the use of some of the most modern valves currently available, should appeal especially to those builders who are also DX enthusiasts, while the simple but effective push-pull output system should find many "buyers" among those whose cry is for better audio quality than the average set will give. We suggest that a good 12in. speaker would be a very good investment for this set, and would really give some idea of the excellent quality of which it is capable.

The Radio Constructor's Wire Table

No.	Diam. Mils.		Cross-sectional Area		Turns to Inch			Ohms per 1000 ft.		Pounds per 1000 ft.			Amperes carried				Watts carried at 230 volts (Enclosed)		No.					
	B & S	SWG	Sq. Inch		B & S			SWG		B & S			SWG			Open Leads	Used Coils			B & S	SWG			
			B & S	SWG	En	dsc	dcc	En	dsc	dcc	En	dsc	dcc	En	dsc		dcc	B & S				SWG	B & S	SWG
12	81	104	005129	008495	121	109	96	88	1'62	201	204	330	357	200	337	65	1065	1500	1900	12				
14	64	80	003225	005127	151	13	126	105	2'58	126	129	200	203	129	200	41	65	950	1500	14				
16	51	64	002028	003217	189	183	167	14	13	409	2491	79	80	8'21	1240	12'8	13'0	8'0	12'9	26	41	600	950	14
18	40	48	001276	001810	23	22	20	19	19	651	446	49	502	524	697	7'3	74	5'1	6'1	1'6	20	370	460	16
20	32	36	0008023	001018	29	28	24	26	25	10'4	7'87	3'1	3'17	3'37	392	4'13	4'2	3'2	4'1	1'0	13	230	300	19
22	253	28	0005046	0006158	37	34	30	32	30	16'5	13'013	1'9	2'01	2'17	237	262	27	2'0	30	640	800	147	180	21
24	201	22	0003173	0003801	46	41	35	40	38	26'2	21'08	1'2	1'27	1'40	1465	1'65	1'72	1'25	20	400	400	100	100	23
26	159	18	0001996	0002545	58	50	41	50	47	41'6	31'49	785	810	914	9806	1'08	1'13	800	12	250	320	58	75	25
28	126	148	0001255	0001720	73	61	48	61	56	66'2	46'56	494	514	608	663	703	788	500	700	160	200	37	45	27
30	100	124	0000789	0001208	91	72	55	71	66	105	66'36	311	333	400	465	527	57	310	480	100	130	23	30	28
32	80	108	0000496	0000916	115	84	62	88	75	167	8746	196	217	270	353	375	415	200	365	63	100	145	23	30
34	63	92	0000312	0000665	145	99	70	98	85	266	120'5	123	141	193	2562	297	362	125	265	40	80	92	185	31
36	50	76	0000156	0000454	180	114	77	122	102	423	176'6	078	092	136	1748	218	264	63	183	25	50	58	115	33
38	40	60	0000123	0000283	227	128	83	143	120	673	2834	049	062	105	1089	124		50	113	16	32	37	7	34
40	31	48	0000078	0000181	286	145	90	180		1070	443	031	043	084	0697	083		31	72	10	20	23	45	37
42	22	40	0000038	0000127	384			220		2100	638							0484	061		15	51	5	14
44	20	32	0000031	0000081	415			270		2480	996							0310	041		12	32	4	9

FACTS, FIGURES, AND TABLES

USEFUL FORMULAE, ETC.

In presenting these useful formulae for use in various calculations it was thought that it would be helpful to express them directly in terms of the practical units or sub-units that they are to be worked in, rather than in the conventional symbols. For the sake of simplicity various rearrangements of well-known formulae are also given.

CONCERNING OHMS LAW FOR D.C.

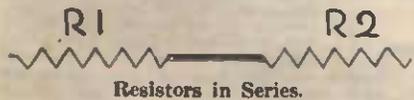
- (1) Amperes = $\frac{\text{Volts}}{\text{Ohms}}$
- (2) Milliamps = $\frac{\text{Volts} \times 1,000}{\text{Ohms}}$
- (3) Ohms = $\frac{\text{Volts}}{\text{Amperes}}$
- (4) Ohms = $\frac{\text{Volts} \times 1,000}{\text{Milliamperes}}$
- (5) Volts = $\frac{\text{Amperes} \times \text{Ohms}}{\text{Milliamperes} \times \text{Ohms}}$
- (6) Volts = $\frac{\text{Amperes} \times \text{Ohms}}{1,000}$

CONCERNING RESISTANCES, ENERGY, DISSIPATION, D.C.

- (7) Amperes = $\sqrt{\frac{\text{Watts}}{\text{Ohms}}}$
- (8) Milliamps. = $1,000 \times \sqrt{\frac{\text{Watts}}{\text{Ohms}}}$
- (9) Watts = $\text{Amperes}^2 \times \text{Ohms}$
- (10) Watts = $\frac{\text{Milliamps.}^2}{1,000,000} \times \text{Ohms}$
- (11) Watts = $\text{Volts} \times \text{Amps.}$
- (12) Watts = $\frac{\text{Volts} \times \text{Milliamps.}}{1,000}$

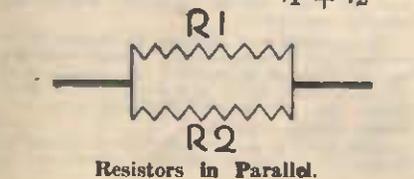
CONCERNING RESISTANCES.

- (13) Connected in series:—
Total Resistance = $r_1 + r_2 + r_3$



- (14) Connected in parallel:—
Total resistance = $\frac{1}{\frac{1}{r_1} + \frac{1}{r_2} + \frac{1}{r_3}}$ etc.

or
for two values only,
(15) Total Resistance = $\frac{r_1 \times r_2}{r_1 + r_2}$



Example 1.—A 1,000 ohm resistor is connected in series with a 2,000 ohm resistor. What is the total resistance?
Resistors in series = $R + R$, then the total resistance is 3,000 ohms.

Example 2.—A 1,000 ohm resistor is connected in parallel with a 2,000 ohm resistor. What is the resultant resistance?

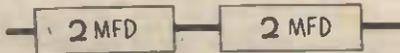
$$\text{Resistance in parallel} = \frac{R \times R}{R + R}$$

$$= \frac{1,000 \times 2,000}{1,000 + 2,000}$$

Therefore the total resistance is 666.666 ohms.

CONCERNING CONDENSERS.

- (16) Connected in series as formula (14) or (15).

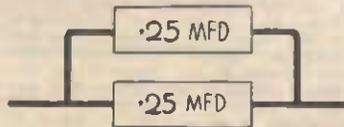


CONDENSERS IN SERIES.

Example: Two condensers are connected in series, having a capacity of 2 mf and 4mf respectively. What is the total capacity?

$$\frac{2 \times 4}{2 + 4} = \frac{8}{6} = 1.333 \text{ m.f.}$$

- (17) Connected in Parallel, as formula (13).



Condensers in Parallel.

Example.—A .5 mfd is required, but only Two .25 mfd are on hand. Then, by connecting them in parallel, the resultant capacity is .5 mfd.

$$.25 + .25 = .5$$

By the same method as set out above, the capacity of Variable Condensers can be increased or decreased, by connecting fixed condensers in parallel or series.

- (18) Apparent Resistance ("Reactance") of a condenser to A.C. of given frequency:—

$$\text{Ohms} = \frac{1,000,000}{6.28 \times \text{frequency} \times \text{microfarads}}$$

RELATION OF WAVELENGTH AND FREQUENCY.

- (19) Metres = $\frac{300,000,000}{\text{Cycles per second}}$
- (20) Cycles per second = $\frac{300,000,000}{\text{metres}}$

RESISTANCE OF METER SHUNTS

- (21) Ohms of Shunt = $\frac{\text{Ohms of Meter}}{N - 1}$

Where N = No. of times full scale current is to be increased.

SOME VALVE FACTS.

The amplification of a valve is:

$$\frac{\text{Impedance} \times \text{Mutual Conductance}}{1,000}$$

The mutual conductance of a valve is:

$$\frac{\text{Amplification Factor}}{\text{Impedance}} \times 1,000$$

The impedance of a valve is:

$$\frac{\text{Amplification Factor}}{\text{Mutual Conductance}} \times 1,000$$

The correct ratio of output transformer to match speaker and output valve is:

$$\sqrt{\frac{\text{Optimum Valve Load}}{\text{Loudspeaker Impedance}}}$$

READY REFERENCE TABLE.

$$E = (I \times R), (W \div I), (KW \times 1000 \div I), (\sqrt{R \times W}), (MA \times R \div 1000).$$

$$E^2 = (W \times R).$$

$$I = (E \div R), (W \div E), (KW \times 1000 \div E), (\sqrt{W \times R}).$$

$$I^2 = (W \div R), (KW \div 1000 \times E).$$

$$R = (E \div I), (E^2 \div W), (W \div I^2), (1000 \times E \div MA), (1,000,000 \times W \div MA^2).$$

$$MA = (1000 \times E \div R), (1000 \times W \div E), (\sqrt{W \div R \times 1000}).$$

$$MV = (I \times R \div 1000), (W \div I \div 1000), (W \div MA \div 1000).$$

$$W(DC) = (E \times I), (HP \times 746), (E^2 \div R), (E \times MA \div 1000), (MA^2 \times R \div 1,000,000), I^2 \times R, (1/746 \text{ H.P.}), (\text{JOULES} \times \text{SECS}).$$

$$W(AC) = (E \times I \times \text{Power Factor}).$$

$$W.Hrs. = (E \times I \times \text{Hrs.}), (W \times \text{Hrs.}).$$

$$KW = (E \times I \div 1000), (HP \times 0.746), (W \div 1000).$$

$$KW.Hrs. = (E \times I \times \text{Hrs.} \div 1000), (W \times \text{Hrs.} \div 1000).$$

$$\text{Amp.Hrs.} = (I \times \text{Hrs.}), (E \div R \times \text{Hrs.}), (W \div E \times \text{Hrs.}), (KW \times 1000 \times E \times \text{Hrs.}), (\sqrt{W \div R \times \text{Hrs.}}).$$

$$\text{COULOMB (Q)} = (I \times \text{Seconds}).$$

$$\text{Joule (J)} = (E \times I \times \text{Seconds}), (W \times \text{Seconds}), (I^2 \times R \times \text{Seconds}).$$

$$\text{H.P.} = (W \div 746), (KW \div 0.746), (E \times I \div 746), (KW \times 1.341), (W \times 0.0013), (746W).$$

$$\text{EFFIC.} = (HP \times 746 \div E \times I), (HP \times 146 \div W), (\text{Brake HP} \div \text{Elect.H.P.}).$$

$$\text{INPUT} = (\text{Output} \div \text{Effic.}), (\text{Output} \times \text{Losses}).$$

DIGEST OF METER ARTICLES

WE PRESENT HEREWITH A SELECTED DIGEST OF ARTICLES DEALING WITH METERS.

WHAT EVERY SERVICEMAN SHOULD KNOW

THE three most important tools of the radio serviceman's kit are the Voltmeter, the Milliammeter, and the Ohm-meter. With these three instruments, it is possible to trace practically every fault which is likely to occur in a receiver. Other instruments, such as Signal Generators, Output Meters, and Oscillographs, are extremely valuable, and, in some cases, essential for fault tracing and for maintenance, but the Big Three of the service field are the Voltmeter, Milliammeter, and Ohm-meter.

Fundamentals

In order that we shall fully understand the operation of these instruments it is essential that we go right back to electrical fundamentals. The first principle to be remembered is that "When an electric current flows through a conductor it produces a magnetic force or 'field' around the conductor. The strength of the magnetic field produced is proportional to the length of the conductor and the amount of current flowing along it."

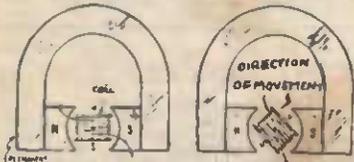


Fig. 1.—These diagrams illustrate the design of a moving coil meter, and show the direction in which the coil moves when a current passes through it.

In a straight piece of wire the magnetic field is quite weak at any point, but if the wire is bent into the form of a loop the same amount of magnetic force will be generated in a much smaller area than exists around the wire in its straight form.

If a number of turns of wire are wound solenoid fashion and closely together—as in an ordinary tuning coil—the magnetic forces surrounding each turn of wire unite to form a magnetic field around and through the entire coil, which then really becomes a magnet.

The North magnetic pole of this coil is the end of the coil from which the magnetic lines of force leave, and the South magnetic pole is the end at which they enter. If we place an iron core within this coil a much more effective path is provided for the magnetic lines of force.

The result is that a given current will produce more magnetic lines of force through an iron-cored coil than through an air-cored one. An iron-cored coil of this type is known as an electro-magnet. The magnetic strength of this depends upon the amount of current flowing through the coil, the number of turns of wire

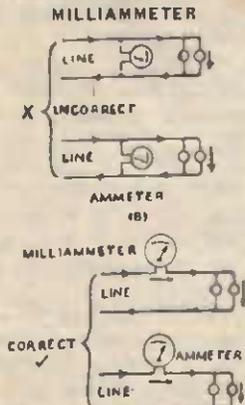


Fig. 2 (top).—The wrong, and (below) the correct way of connecting milliammeters and ammeters into circuit.

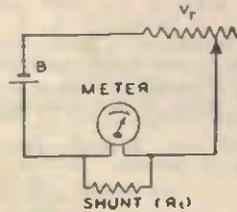


Fig. 4.—How shunts can be calibrated when the meter resistance is unknown.

employed on the coil, and the shape, size, and material from which the core is made.

Instrument Application

The application of this magnetic principle to electric measuring instruments depends upon the mounting of the current-carrying coil on pivots and its placing between the poles of a strong permanent magnet.

The North pole of the coil then will be attracted by the South pole of the permanent magnet and repelled by the North pole of this magnet. This will cause the coil to rotate or deflect in the direction shown in Fig. 1.

Where the permanent magnet is of fixed magnetic strength the force tending to deflect the coil will depend upon the strength of the current flowing through it. Thus, if suitable means are provided for indicating the exact amount of the coil's deflection, it can be used to measure the strength of electric current.

In most modern direct current meters the design is such that the pivoted coil, to which is attached an indicating pointer, is mounted on jeweled bearings between the poles of a fairly powerful permanent magnet.

In order that the coil will not swing to its fullest arc when any current flows through its windings, tension springs operating in opposite directions are mounted at the top and bottom bearings, and attached to the coil in such a manner that when the mechanical energy stored in the springs is equal to the magnetic energy generated by the passage of the current through the coil winding the coil will stop rotating.

The springs also serve the purpose of returning the coil to a definite zero position when the current is switched off.

Current Operated Device

It should be realized at this juncture that in speaking of the meter movement we have

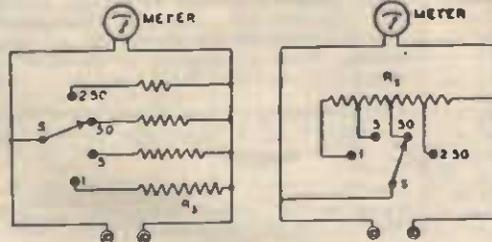


Fig. 5a and Fig. 5b.—Two methods of making multi-current range meters. The method shown in the left-hand diagram is to be preferred.

always talked of current and not of voltage. This is because all meters of this type operate on the Milliammeter, or current, principle. The greater the current we pass through the coil the greater the magnetic force we apply. The amount of current which can flow through the coil will depend by Ohm's Law, on the potential of the applied voltage and the resistance of the coil winding.

This brings us to the question of meter sensitivity. Meter sensitivity is determined by the strength of the current necessary to swing the coil and its attached pointer to the fullest arc. With microammeters and milliammeters, this is expressed directly as the number of microamperes or milliamperes necessary to obtain

full scale deflection. Thus, an 0.1 milliammeter is one requiring a current of 1 milli-ampere for full scale reading.

Voltmeters are usually rated in terms of Ohms-Per-Volt. The sensitivity of a meter depends upon the strength of the permanent magnet, the number of turns of wire on the coil, and the smallness of the air gap between the coil and the permanent magnet poles. The lightness of the coil and its freedom from frictional effects in its bearings also contribute to the meter's sensitivity. The more sensitive the meter the higher its cost because of the extremely delicate manufacturing processes which must be followed.

For a long time the standard of sensitivity in ordinary instruments was 1 m.a., but today it is possible to obtain meters which require only 50 micro-amperes of current for full scale deflection.

Now these extremely sensitive instruments must be fitted with coils wound with wire finer than the human hair in order that they shall be light in weight and free from inertia. If this were not so considerable current would be required to move the coil and so the sensitivity would be lost. Naturally, this very fine wire cannot carry a heavy current.

When we want to measure small currents, up to the maximum for which the micro-ammeter or milliammeter is designed, we connect the meter in series with the circuit, as shown in Fig. 2. In such a case the full current flowing in the circuit will flow through the meter. If this current is too high for the instrument the latter's coil will be damaged.

Current Shunts

There are many occasions, however, where it is desired to read currents ranging from 10 to 250 m.a. with a meter designed for a maximum reading of 50 micro-amperes or 1 milli-ampere. It would be both costly and wasteful to have special meters for each of the current ranges desired.

To overcome this difficulty we use what are known as Current Shunts, and connect these in parallel with the low range current reading meter. The principle of these Shunts is that they consist of a low resistance winding through which the greater proportion of the circuit current can flow.

It is a fundamental electrical rule that where two resistances of different values are connected in parallel and a current is caused to flow through both, the amount of current flowing through each of the resistances will be in exact proportion to the arithmetical relationship existing between the two resistances.

For example, if we have an 0.1 milliammeter, having a moving coil resistance of 25 ohms and connect in parallel with this coil another resistance of 25 ohms, then the passage of a 1 milliampere current will produce only half scale deflection of the meter. This is because a 1 m.a. current flowing through the circuit will be divided between the two resistances.

As the meter depends for its indicating qualities upon the amount of current flowing through its coil, then the fact that only half the current passes through the coil, the other half being "shunted" through the parallel wire will reduce the magnetic force of the coil by half, and permit the meter to deflect only to half scale.

Conversely, it can be seen that to obtain full scale deflection under the conditions we have just set out, a current of 2 m.a. must be flowing through the circuit. In this case 1 m.a. of current will flow through the meter coil, and the other will be "shunted" through the parallel resistance.

By applying this principle it is possible to measure currents up in any strength with low current types of instrument. The resistance of the shunt coils is low, and must never be much higher than the resistance of the meter coil.

Shunt Design Formula

Milliammeters and ammeters must always be connected in series with the circuit to be

measured. Providing sufficient current is available in the circuit the connection of milliammeters and ammeters across, or in parallel with, the circuit will result in the burning out of the moving coil and shunt.

The range of any direct current ammeter or milliammeter can be increased by connecting additional shunt coils across its terminals.

The value of these should be calculated from the formula

$$R_s = \frac{R_m}{n - 1}$$

Where:
 R_m is the meter resistance.
 n is the desired multiplying ratio.
 R_s is the shunt resistance in ohms.

As an example, assume we have an 0-1 milliammeter having a moving coil resistance of 27 ohms.

It is desired to construct a shunt which will permit us to measure a current of 100 milliamperes. The multiplication ratio therefore is 100. From our formula we find the calculation to work out 100 minus 1, or 99, divided into 27. The shunt then must have a resistance of .2727 ohms.

Direct Calibration

If no accurate information on the internal resistance of the meter is available then a set-up such as that shown in Fig 4 should be arranged.

Assume that it is desired to extend the range of an 0-1 m.a. meter to 10 m.a. full scale. Resistance, VR, should be a 200 ohm. variable resistor capable of carrying the 10 m.a. test current. The battery, B, may be a 1½-volt dry cell. Connect the meter, the battery and VR in series, first making sure that the arm of VR is set so that maximum resistance is in circuit. Gradually adjust VR until the meter reads exactly 1 m.a.

Now connect the shunt across its terminals and adjust the resistance of this until the meter reads exactly .1 milliamperes. When this condition has been reached the shunt is of correct value to provide the desired current multiplication of 10.

The best materials for meter shunts are Manganin and German Silver wires because these are less subject than most other metals to resistance changes due to heat. The shunts should be of sufficient dimensions to carry the current without heating, and for this reason sheet metal is to be preferred to wire.

In Fig. 5 we have shown two methods of fitting a meter with a number of shunts, so that several current ranges may be covered. In Fig 5A are shown four separate shunts, each or any of which may be switched in to give the desired current range. A simpler arrangement is shown in Fig. 5B, where a tapped shunt, or a number of shunts connected in series, is used. The arrangement of Fig. 5A is to be preferred. The errors are confined to each individual shunt and are not cumulative as in the case with the tapped shunt arrangement.

It should be stressed at this point that for current readings, particularly if these are in the 500 milliamperes to 2 ampere range, the selector switch should be of high quality construction and possess contacts which make definite low resistance electrical connection. It is possible to dispense with the switch altogether and to bring one side of each shunt out to a terminal. Here again good electrical contact is essential.

Precautions Necessary

We would stress the importance of putting first-class work into the construction of meter shunts. Remember, if the shunt open-circuits whilst the meter is connected to a high cur-

rent circuit the meter's moving coil will almost certainly burn out, due to the passage of the complete current through its winding.

Never attempt to change shunts whilst the current is still flowing in the circuit. Switch off the unit under test before attempting to alter the current range of the meter by switching or otherwise changing the shunts. Finally, remember, in current as in other radio measurements always start off at the highest range of the meter.

Even though you know there is only a 1 m.a. current flowing in the circuit, set your m.a. meter at the 250 m.a. range for your first check. You can always change to a lower range later, but if you've miscalculated it's not much use attempting to change a burnt out meter to a higher range.

Smashing Offer!!

See Outside Back Cover
of this Annual for
Details of

FREE METER

FAULTY SUPPLY METER

I recently came across a rather peculiar fault which I think might be of interest to your readers.

The receiver under examination was particularly noisy during the daytime, but immediately any lights were switched on it worked perfectly. Examination of the receiver proved that the trouble was external.

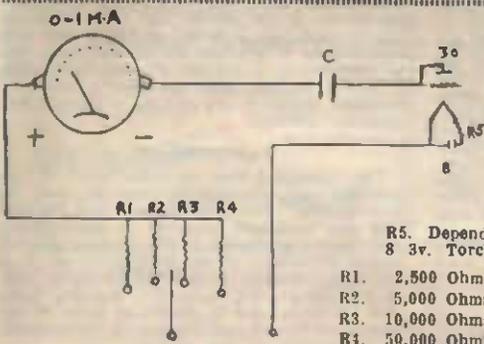
The receiver consumed approximately 50 w., and it appeared that whenever an external load of over this wattage was switched into the circuit (in any part of the house) all crackles stopped.

I first of all examined the house wiring and could find no fault there. Secondly, the electricity meter was tested, and I found that on giving this a slight tap the noise in the receiver disappeared for about three minutes and then returned again. The meter was then removed and examined. The report was that the rotor was hitting the pole pieces while on low load. A new meter completely cured the trouble.

OUTPUT METER

Here is a good circuit of an output meter using a type of 30 tube as rectifier. (Illustrated at left.)

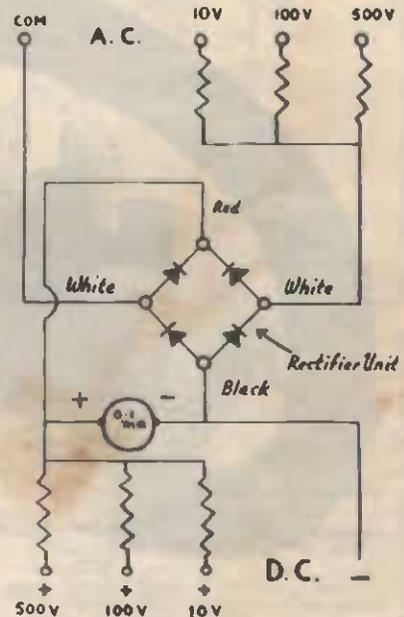
By fitting a switch to short out C, this outfit may be used to read A.C. volts. Readings on D.C. volts scale must be multiplied by 2.2 to get correct readings as the tube is working as a half-wave rectifier.



- R5. Depends upon all current of tube used.
 8 3v. Torch Battery. C. 2 M.F.D. Tubular
- | | | | | |
|-----|--------------|---|-------|-----------------------------|
| R1. | 2,500 Ohms. | — | 2.5v. | These Resistors may be |
| R2. | 5,000 Ohms. | — | 5v. | altered to suit own needs, |
| R3. | 10,000 Ohms. | — | 10v. | and are calculated upon the |
| R4. | 50,000 Ohms. | — | 50v. | basis of 1,000 Ohms. P.V. |

**Of Interest to
SERVICEMEN AND
EXPERIMENTERS !**

Owners of 0—1 moving coil M.A. meters can increase their usefulness by incorporating a Westinghouse dry rectifier, which, together with the correct multiplier resistors, will enable them to measure A.C. voltages (see illustration). The rectifier is of the bridge type and is provided with leads for connecting.



The meter becomes a milliammeter of approximately 11 per cent. higher range—i.e., full scale consumption will be 11 per cent. higher than for D.C. readings. The diagram shows an A.C.-D.C. voltmeter made from a D.C. meter.

Care must be taken not to apply a load to the rectifier unless it is connected to the meter.

MODIFYING A METER

The following question and answer appeared in "Practical and Amateur Wireless":

"Is it possible to alter the range of a 0-6 volts voltmeter to 0-150 volts and higher ranges? If so, what is the best method?"

If it is considered that the meter actually registers the current flowing through it, it will at once be appreciated that it may be modified in the manner you suggest. If the meter is joined across a 6-volt cell a current dependent upon the total resistance of the meter will flow, and in your case this will be of such a value that the scale (full scale deflection) will be 6 volts maximum. If now you placed the meter across a 12-volt cell the winding would perhaps be burnt out owing to the greater current which would flow, and, accordingly, to prevent this it would only be necessary to include a further resistance in series with the meter. If this resistance has the same value as the meter resistance (and a 12-volt cell is still used) the current passing through the two resistances would be identical and would be such that 6 volts would be dropped across both meter and resistance, consequently the meter would still register 6 volts. This means that the scale would be doubled when a resistance equivalent to the meter is included in series, and therefore on similar lines the scale could be trebled and so on. The value of the series resistance would have to be chosen according to the resistance of the meter, but by trial and error methods you may find suitable resistances to give any desired higher voltage range, when a known voltage source is used for calibration.

Building the "WILLIAMSON" AMPLIFIER

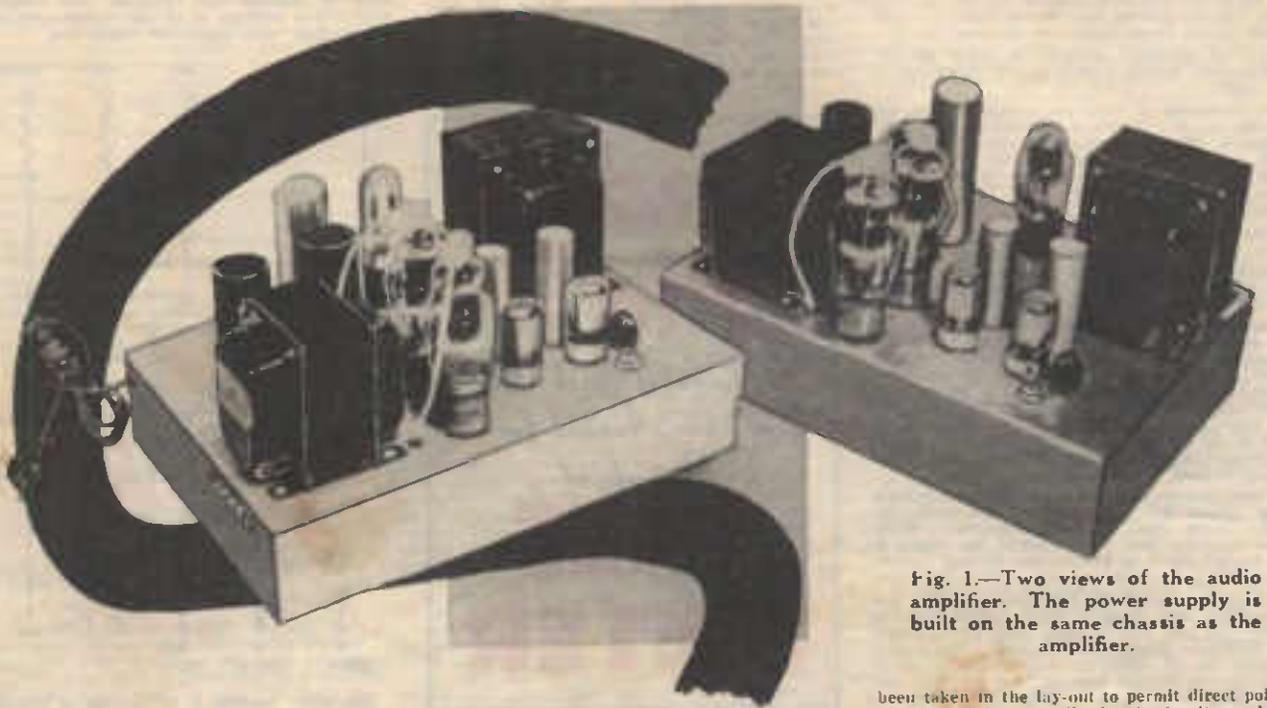


Fig. 1.—Two views of the audio amplifier. The power supply is built on the same chassis as the amplifier.

High quality performance is obtained from this American version of a British design.

THE Williamson Amplifier Circuit, originated in England by D. T. N. Williamson, has attracted world-wide attention from high fidelity enthusiasts because of the almost perfect quality of the reproduced output. There are many features in the amplifier that make it an attractive construction project for the builder. The circuit is simple, free from critical adjustments, and may be built economically of top quality parts at a cost of less than \$25. Within its power rating of 10 watts at less than 1% intermodulation distortion, the amplifier proves to be ideal for home and small auditorium installations.

The performance of the amplifier, based on listening tests, can best be described as containing the elusive "presence effect," a quality inherent in low distortion equipment with the flat frequency response and low phase shift that enables speech and musical transients to be correctly reproduced. The bass response is solid and free from harmonic distortion. Highs are clean and crisp with none of the shrillness so often experienced with other amplifiers.

Since a number of the components specified in the original amplifier are of English manufacture, considerable effort was made to choose substitute parts that would permit the same high degree of performance attributed to its prototype.

The circuit diagram of the amplifier is shown in Fig. 2. The circuit contains four resistance-coupled stages and is operated with 20 decibels of voltage feedback taken from the secondary of the output transformer and carried around the complete amplifier. Medium mu triode tubes are used throughout and are biased to operate with minimum distortion. A noteworthy feature of the amplifier lies in the selection of the type of output tube. This is

a power tetrode which is connected in the circuit to function as a medium mu power triode. The driving voltage required is much smaller than that taken by the more conventional 2A3 or 6B4 type of output tube, and the driver operates with considerably lower distortion.

The first two stages of the amplifier are somewhat unusual. The first stage which is a voltage amplifier, is directly coupled to the second, cathodyne inverter. This method of coupling is made possible by the high operating potential on the inverter cathode. The two stages are self-balancing and bias themselves to a low distortion operating point.

The heart of the amplifier is the output transformer. This device must provide response that extends well beyond the limits of the audio band in order to limit phase shift to the requisite degree in the feedback circuit. It is the degree of success with which this is achieved that makes for fidelity in musical transient reproduction.

The output tubes are the type 807, the characteristics of which are similar to the KT-66 British type used in the original. The plate resistance, however, is about 20% greater for the 807, and this requires a corresponding increase in the plate-to-plate match of the output transformer in order to obtain the same low figures of distortion in the output. The plate-to-plate impedance of the transformer is, therefore, 10,000 ohms specified for the original. Another excellent output tube which may be used is the Western Electric type 350A. This tube has greater power capabilities than the 807 and will provide up to 25% more output.

CONSTRUCTION.

The amplifier is constructed on a single 10 x 14 x 3-inch chassis. Considerable care has

been taken in the lay-out to permit direct point-to-point wiring in all signal circuits and to avoid extraneous couplings which may introduce instability into the feed-back loop. In the construction of the amplifier a ground bus is not used since no improvement will be effected through its use provided several precautions are observed. Ground returns should be made closely adjacent to the stage affected. This may be easily done by using sockets with ground lugs projecting from the mounting ring. The filaments are wired by running a separate two conductor pair to each stage. When wired in this manner only one pair of leads carrying the stage current enters into proximity with the stage, and the hum field is reduced. The filament lines do not necessarily have to be twisted. It is desirable that they be cables or bused compactly together. The filament wiring is grounded at one point only; at the first stage, as indicated.

After the amplifier is wired and checked, it may be turned on and connected to a speaker load. If any motor-boating is experienced the two plate leads connected to the output transformer should be interchanged. The plate currents may then be balanced after which no further adjustments will be required. The amplifier will be driven to full output by about two volts R.M.S. Although a volume control has been included on the amplifier chassis to permit setting the level when the unit is used with a variety of inputs, for most installations it will not be required, and may be replaced by a resistor of equivalent value. A power take-off plug has been provided to facilitate external control from a separate pre-amplifier chassis.

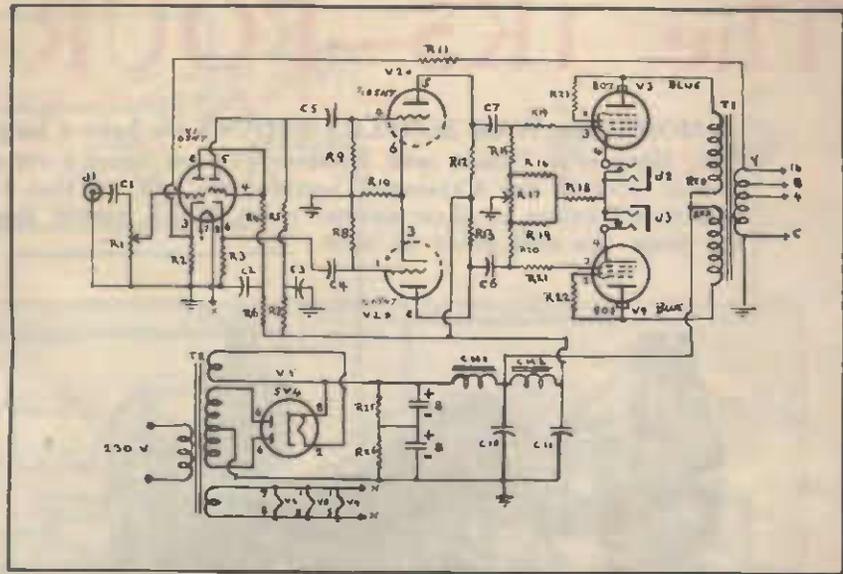
PERFORMANCE.

The distortion-free characteristics of the amplifier are immediately apparent upon the first playing. The lack of false bass response and bass transient hangover is also striking, and can be attributed to the exceptionally low output impedance of the amplifier which is in the neighborhood of three-tenths of an ohm, on the sixteen ohm tap. The damping factor seen by the speaker is, therefore, about 48, and results in a real improvement in the transient characteristics of the speaker.

The curves taken of intermodulation, shown in Fig. 4, reveal the low distortion content of the output. It is clearly seen that the 10 watt rating of the amplifier is a conservative one, since for any condition of measurement the intermodulation is less than 1%. It might also be mentioned that these curves were taken at a lower-than-normal plate supply voltage of 400 volts on the 807 output tubes. For the normal plate supply voltage of 425 volts, about 15% more output or 11.5 watts can be expected for the same amount of intermodulation distortion.

The excellent transient characteristics of the amplifier can be deduced from the frequency response curve shown in Fig. 5. The response is shown for a 100 milliwatt output level and under the conditions both with and without feedback. The influence of the output transformer can easily be judged from these curves. Without feedback the response is down 3 DB. at 55KC. and at 12 C.P.S. It should be noted that this response is that of the complete amplifier and includes the normal roll-off in gain of the individual stages as caused by the tube input capacities and the effect of the stage coupling condensers. With feedback the curve is flat to 75 k.c. and lacks the usual resonant rise associated with feedback amplifiers at the high frequency end of the band; a condition that causes ringing and a dissipation of power at unwanted frequencies. The response at maximum output power taken with distortion limited to 2% is also noteworthy and indicates the undistorted response to be down only 3 DB. at 8 C.P.S. and at 50 KC.

It is the excellence of these results and the uniformity with which they may be achieved that is largely responsible for the growing popularity of the Williamson amplifier.



PARTS LIST

- R1—1 Meg. Volume Control.
- R2—500 ohm 1/2 watt Resistor.
- R3, R5—20,000 ohm 1 watt Resistors (matched pair).
- R4—50,000 ohms 1 watt Resistor.
- R6—30,000 ohms, 1 watt Resistor.
- R7—25,000 ohms 1 watt Resistor.
- R8, R9, R25, R26—500,000 ohms, 1/2 watt Resistors.
- R10—500 ohms 1/2 watt Resistor.
- R11—5000 ohms 1/2 watt Resistor.
- R12, R13—50,000 ohms 1 watt Resistors (matched pair).
- R14, R21—1000 ohms 1/2 watt Resistors.
- R15, R20—100,000 ohms 1/2 watt Resistors.
- R16, R19, R22, R23—100 ohms, 1/2 watt Resistors.
- R17—200 ohm Wire-wound Potentiometer.
- R18—250 ohm 10 watt Resistor.
- C1, C4, C5—.05 mfd. 600-volt Tubular Condensers.
- C2, C3—10 x 10 mfd. 450-volt Electrolytics.
- C6, C7—.25 mfd. 600-volt Tubular Condensers.
- C9, C9A—8 mfd. 450-volt Electrolytics.
- C10, C11—16 mfd. 450-volt Electrolytics.
- T1—Beacon Universal Output Transformer. Super Silcore type, 48-S-16, 10,000 ohms. plate to plate to 4, 8, 16 ohms.
- T2—Power Transformer, 125ma., 400v.-0-400v.; 6.3v. at 4 amps.; 5 volts at 3 amps.
- CH1—Choke 12 Henry—150 ma.
- CH2—Choke 4 Henry—50 ma.
- J1—Open Circuit Jack.
- V1, V2—6SN7GT Valves.
- V3, V4—807 Valves.
- V5—5V4 Valves.

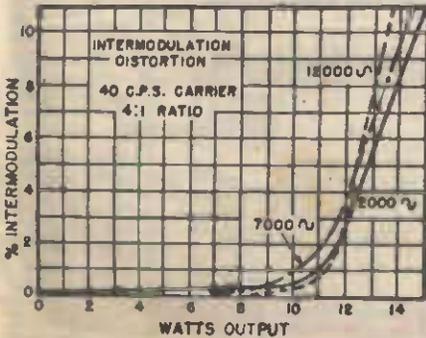
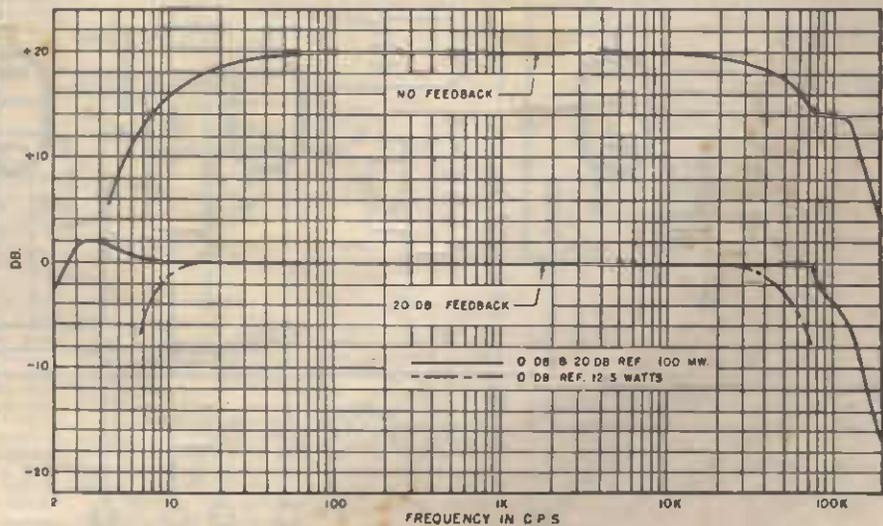


Fig. 4. Intermodulation distortion.

Fig. 5. Frequency response characteristics of the audio amplifier.



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SPEAKERS:

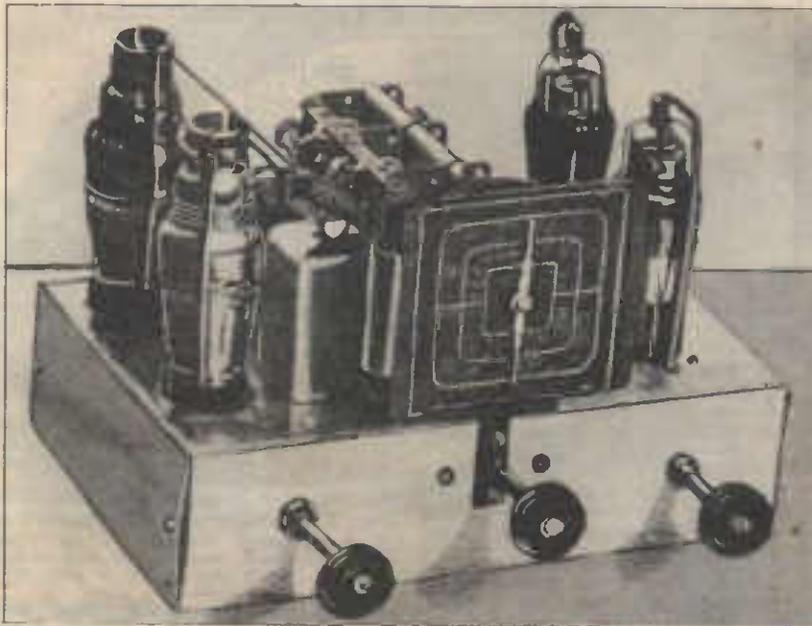
Refer Page 62.

LOOK FOR OUR WAR SURPLUS BARGAINS!

The 1K5---FOUR Receiver

Reprinted from "Radio and Hobbies," Australia.

AMONG our WAR SURPLUS STOCKS we have a large quantity of 1K5G Valves. Here is a "Radio and Hobbies" circuit using a complete line up of these tubes. If you refer to our Catalogue Section you will see that type 1K5G Valves are being sold at a fraction of their normal price, which makes this circuit a very interesting one from the cost point of view.



THE 1K5-G is an Australian designed RF pentode, which has proved its reliability in Army field sets. It has a husky 120-mill-amp filament, specially supported to prevent sagging and microphony troubles. It makes an excellent general-purpose triode, where such is required, and can be regarded as the battery equivalent of the popular 6J7-G mains valve.

Knowing that so many of these valves are available, it is natural to consider ways and means of putting them to service. Here is an example of their use—a four-valve regenerative TRF receiver, which puts up a surprising performance.

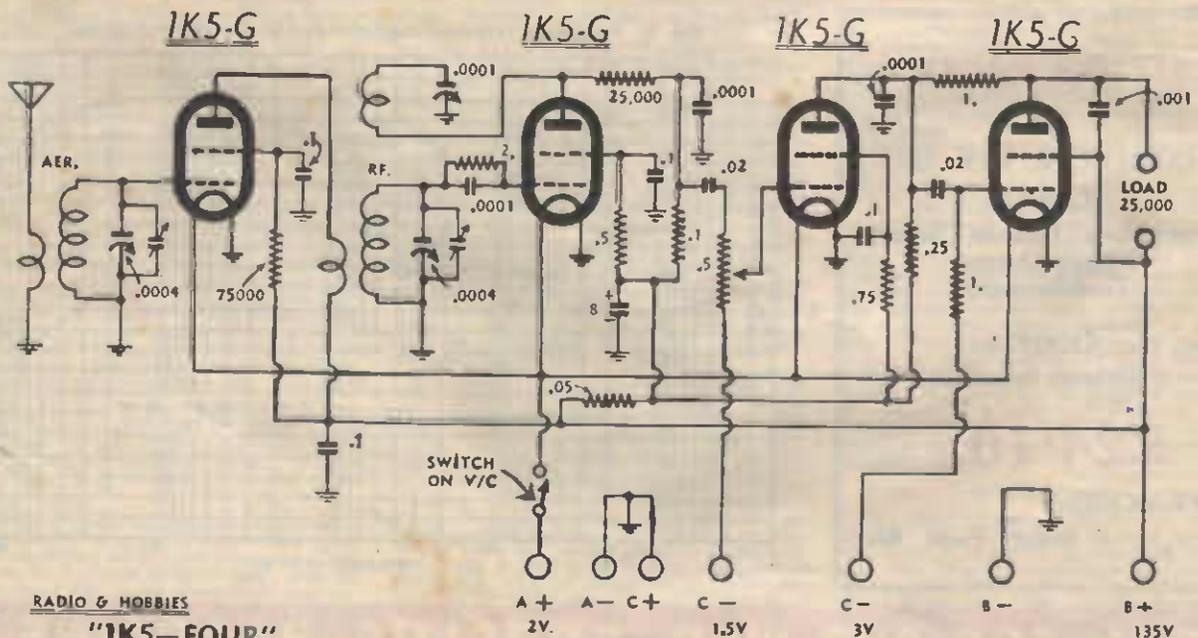
One does tend, in these modern times, to develop a superhet complex and, indeed, our first impulse was to try and evolve a superhet circuit using 1K5-G valves in all stages, including the converter and output positions. While such a scheme would doubtless be feasible, one could expect problems in employing a standard-type oscillator coil, and in achieving some measure of modernity in the circuit arrangement.

Then we recalled the constant requests for a simple TRF receiver, and the dozens of enthusiastic reports about sets of this nature. Our mind was made up. This set would be a TRF job with one RF stage, regenerative detector and a high gain audio system.

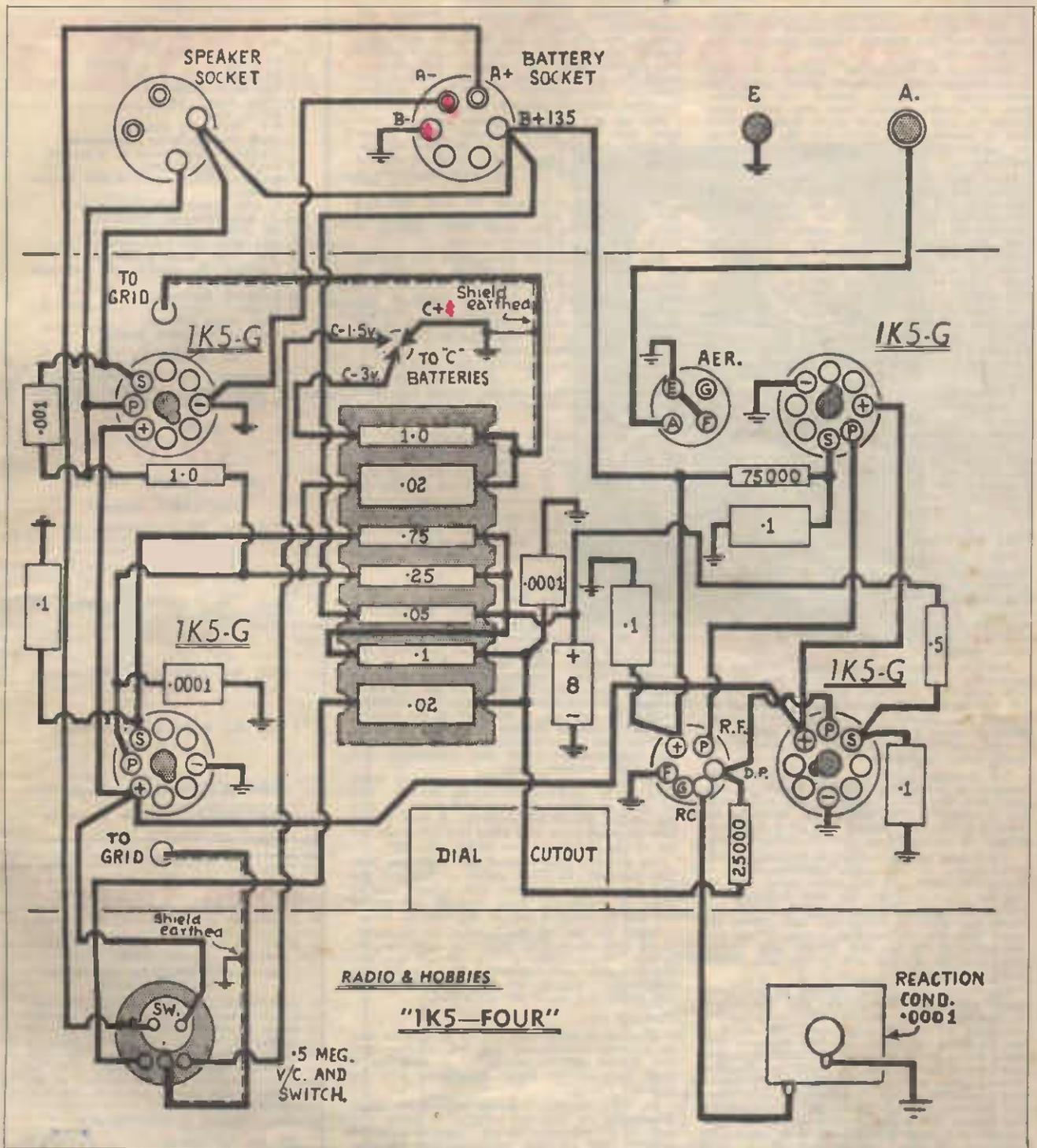
Once having made this decision, the rest was only a matter of circuit detail. A suitable chassis was designed for the job, a circuit drawn up and amended as experiment proved necessary, and the "1K5-FOUR" became a reality.

The set impressed us with its possibilities immediately it was put on test. The reaction and volume controls have to be handled carefully for optimum results—as with any regenerative set—but there was evidence of plenty of gain. Connected to a short aerial within

THE CIRCUIT DIAGRAM OF THE 1K5-FOUR



RADIO & HOBBIES
"1K5-FOUR"



our steel-framed building, it tuned in all local stations, which augured well for its performance under normal receiving conditions.

Selectivity was surprisingly good and power output impressive, considering it does not use a regular power output valve. Now for a run through the schematic circuit.

The aerial feeds into a standard commercial aerial coil, which is tuned by one section of a two-gang condenser. Signals from this tuned circuit are fed to the grid of a 1K5-G serving as an RF amplifier stage. The valve operates with zero grid bias, full high tension on the plate, and a screen voltage of about 67 volts, obtained through a series dropping resistor.

GAIN CONTROL

We had planned originally to provide gain control for this stage, but a practical test

showed that smoother control over the receiver gain could be obtained more simply in the audio amplifier. Only under exceptional circumstances is the RF stage likely to deliver enough signal to the detector to overload the latter seriously.

The plate of the RF amplifier valve is fed through the primary winding of an RF coil with reaction. Make sure that you get one with a reaction winding, not just a plain RF coil. It should also be of the same brand as the aerial coil, so that the two will match up as far as inductance is concerned.

The grid winding of this coil is tuned by the second section of the two-gang tuning condenser, thus achieving single-dial control. Trimmer condensers must be wired across each of the tuned circuits and, if not built on to the tuning gang, they must be purchased separately and soldered across the appropriate

coil pins or in parallel with each section of the condenser.

In the original set, the trimmers were attached to the gang condenser. The lug connecting to the outer plate and the adjusting screw is soldered to the frame of the gang at a convenient point, and the other lug soldered to the stator plate connection.

The oscillator grid condenser and resistor are also mounted above the chassis, being strung directly between the appropriate tuning gang section and the top cap of the 1K5-G detector.

We thought a good deal about the circuit for the detector. It could have been connected as a triode, tying the screen directly to the plate pin and omitting the screen feed resistor and bypass. We also considered using screen grid reaction and potentiometer control. Both schemes are excellent, but the potentiometer

control generally necessitates an extra section on the "off-on" switch to remove the bleed current from the battery supply when the set is not in use.

Ultimately we elected to operate the valve as a pentode for maximum gain, using the conventional condenser control for reaction. This, of course, means that the audio gain overall is very high and more than ordinary care is necessary to filter out the RF from the audio amplifier to prevent trouble with howling.

After some experiment we found that better results were obtained, especially at the lower frequency end of the band, by replacing the conventional RF choke in the detector plate circuit with a 25,000 ohm resistor. There is room for experiment here. You can try the resistor alone, or a resistor and choke in series, or a good multi-section choke alone. Quite a lot will depend on the type of tuning coil used.

In some cases it may be desirable to bypass the plate of the detector direct to chassis with a 50 or 100 mmfd. condenser—a good scheme provided it does not put the detector out of oscillation at the low frequency end of the band.

Another factor which can complicate matters is the natural resonance of the high impedance primary fitted to most modern coils. If the primary happens to resonate in the band, it may completely upset the reaction circuit and control at the low frequency end of the tuning range. If you suspect this trouble, try bypassing the RF plate to B-plus with a 50 mmfd. condenser or, more simply, try shielding the plate lead of the RF amplifier valve.

GRID RESISTOR

The oscillator grid resistor is shown as 2.0 megohms, which is a good all-round value, but experiment with individual sets may indicate slightly improved results with higher or lower values. Likewise the series screen resistor may be increased from 0.5 megohm to 1.0 megohm, or more if the reaction is too fierce in its operation.

Don't be discouraged by thought of these experiments. Nine chances out of ten, the set will work like a charm exactly as shown in the circuit, but the amendments mentioned represent the normal bit of "plus and minus" when it comes to getting the very best out of a regenerative detector. And the best is certainly worth trying for.

The detector plate and screen resistors return to a decoupling network which is common with the plate supply of the audio voltage amplifier. This decoupling network, involving a .05 meg. resistor and an 8 mfd. condenser, is necessary to prevent motor-boating.

A 0.5 meg volume control is included in the grid circuit of the audio amplifier stage to permit adjustment of the audio gain. The set can be operated under the best conditions of selectivity by keeping the reaction control just below the point of oscillation, and setting the audio gain for the required output. Note that the leads to the hot end of the gain control and from the moving arm to the grid should both be shielded.

The plate and screen circuits of the audio stage are quite conventional and the output is coupled to the grid of the fourth 1K5-G, operating as an output pentode. The valve is not intended primarily for this class of service, but a check on its characteristics showed that useful power output could be expected with a plate and screen voltage of 135 volts and operating into a 25,000 ohm load. When the receiver was ultimately put into operation the output into a 6in. to 10in. loudspeaker exceeded our expectations and was ample for ordinary listening requirements in a quiet room.

GRID BIAS

A grid bias of about -3.0 volts is necessary for the valve under these conditions and it was provided, at the outset, by means of a back-bias network. In view of the fact that only three volts is necessary, we decided to clip two torch cells to the chassis which provided bias for both stages.

The 1.0 meg. resistor connecting between the plates of the last two valves provides a measure of negative feed-back which helps the 1K5-G output valve to do a better job.

If adequate power output is required for loudspeaker reception, it is desirable to operate the set from the full 135 volts high tension supply. The current drain is moderate—approximately 10 milliamps—so that it would be quite feasible to use small 45-volt batteries. Alternatively, two 67.5-volt portable batteries would do the job.

The set will certainly operate on lower voltages, but with much reduced audio power. With an operating voltage of 90 volts or less, the bias on the output valve could be reduced to -1.5 volts and on the preceding valve to zero.

As a matter of interest we tried operating the set from a 1.5 volt filament supply, and with fair success. The chief effect appears to be a reduction in power output.

The A and B-battery connections are brought out through a plug and socket for ease of connection. Anything from four to seven pins will do, provided the two are wired to correspond. The bias batteries were attached directly to the chassis but they could be installed separately and connected to the receiver through the battery plug.

The chassis designed for the receiver was 10in. x 6½in. x 2½in. The tuning dial and gang mount centrally on the chassis and there is enough space elsewhere to accommodate up to four valves.

The aerial and earth terminals mount on the rear edge, the aerial lead going straight to the aerial coil. The RF amplifier valve mounts alongside the aerial coil, its plate lead running forward to the plate lug on the RF coil.

The components in the plate circuit of the detector range along the front edge of the chassis, coupling to the audio volume control and thence up to the grid of the 1K5-G audio amplifier.

No difficulty should be encountered in assembling and wiring this set since the position of most components and leads is indicated clearly in the underneath wiring diagram. Begin by mounting the valve sockets, taking care to see that they are turned to ensure the shortest possible plate leads. Then add the filament wiring, running the positive lead through the "off-on" switch to the appropriate pin on the battery socket. The "off-on" switch, by the way, is built on to the rear of the audio volume control.

After that it is merely a matter of adding the various other leads and components and finally the resistor panel.

As mentioned previously, a couple of leads have to be installed above the chassis. One of these goes from the rear stator to the grid cap of the 1K5-G RF amplifier. A lead should also be taken from this point down through the top of the aerial coil can to the grid lug.

The detector grid resistor and condenser connect between the front stator section and the grid cap of the detector, with a lead passing from the condenser down through the top of the can to the grid lug on the detector coil.

When the job of construction is completed, check over everything carefully, then connect to the "A" battery. Switch on and see that the filaments light normally. Then plug in the loudspeaker, connect the "B" batteries, aerial and earth, and see if the set works.

TUNING IN

If all is in order you should be able to tune in stations immediately and the reaction control should operate smoothly. A tendency to howl may require some experiment with the detector circuit.

To peak up the trimmer condensers, begin by setting the detector trimmer to about one-half its normal capacitance. Tune in a station around 1400 kc and, while rocking the dial slightly, adjust the RF trimmer until you get maximum signal strength. It is wise to keep the detector just below the point of oscillation, while this adjustment is being made.

If you are using a calibrated dial, tune into a station near 2VA and, by loosening the grub screws or the pointer screw, set the pointer so that it indicates accurately the station to which the set is tuned.

Now reset the receiver so that it is tuned to a station about 1300 or 1400 kc and, by adjusting the detector trimmer, bring the station to its calibrated position on the dial. The RF trimmer will then have to be screwed in or out to peak the circuit again.

PARTS LIST

- 1 Chassis.
- 4 1K5-G Valves.
- 1 Two-Gang Condenser.
- 1 "Sky King" Dial.
- 1 Aerial Coil.
- 1 R.F. Coil with reaction.
- 1 .0001 mfd. Reaction Condenser.
- 1 500,000 Volume Control w/switch.
- 4 Octal Valve Sockets.
- 1 each 6-pin and 4-pin Valve Sockets.
- 1 8 mfd. Electrolytic Condenser.
- 4 .1 mfd. Tubular Condenser.
- 2 .02 mfd. Tubular Condensers.
- 1 .001 mfd. Mica Condensers.
- 3 .0001 mfd. Mica Condensers.
- 2 Trimmer Condensers (for variable Condenser).
- 10 Assorted Resistors.
- 3 Knobs.
- 2 Goat Valve Shields.
- 1 Resistor Mounting Board.

SUNDRIES:

- 2 Terminals, with insulating washers;
- 4 Grid Clips, 6-pin Plug, Hook-up Wire, Spaghetti, Nuts and Bolts, etc.

CAT. No. AK2071

£6/10/-

(KIT AS LISTED ABOVE).

BATTERIES (Extra).

- 3 Cat. No. AB237—Eveready 762 45-volt Batteries.

23/1 each

- OR
- 2 Cat. No. AB250—Eveready 467 67½-volt Batteries.

21/- each

- 1 Cat. No. AA20—2-volt Accumulator.

50/3

- 2 Cat. No. AC200—Eveready 950—

11½^D. each

SPEAKERS—Refer Page 62

CABINETS—Refer Page 46

Valve Special!

WAR SURPLUS TYPE 3D6/1299 VALVES—BRAND NEW!

An excellent Valve for our famous "HIKER ONE."

CHARACTERISTICS: U.H.F. Tetrode. Local Base. 1-4 or 2.8-volt Filament. Main Characteristics and Voltages are similar to 1Q5GT. Specially designed as a Class C R.F. Amplifier for frequencies up to 200 Mc/Sec. As an Audio-Amplifier the 3D6 is one of the highest rated power valves in the 1.4-volt filament series.

BASE CONNECTIONS:

- Pin No. 1—Filament.
- Pin No. 2—Plate.
- Pin No. 3—Screen-grid.
- Pin No. 4—N.C.
- Pin No. 5—N.C.
- Pin No. 6—Control Grid.
- Pin No. 7—Filament Centre-tap.
- Pin No. 8—Filament.



5/-

EACH

A FRACTION OF THEIR TRUE COST!

LAMPHOUSE" RADIO BOOKLETS ARE INTERESTING AND INSTRUCTIVE
CIRCUIT BOOK 2/6 — INSTRUCTION COURSE 2/6 — DATA BOOK 3/6

"11 RANGE UNIVERSAL TESTER"

PARTS LIST

- 1—0-500 Microamp Meter (with Special Universal Scale Reading).
 - 1—0-500 Microamp Meter (with Special Scale Reading)
 - 1—12 Contact 2 Bank Meter Switch.
 - 1—9in. x 7in. Bakelite Panel.
 - 1—Wooden Cabinet.
 - 4—Shunts.
 - 2—Pointer Knobs.
 - 6—Resistors.
 - 1—2500 ohm. Volume Control.
 - 4—Banana Sockets.
 - 1—D.P.D.T. Toggle Switch.
 - 1—Set Indicator Markings for Panel.
 - 1—4½-volt Battery.
- SUNDRIES: Solder Lugs, Nuts and Bolts, Connecting Wire, etc.

Cat. No. AK2973

£6/7/6



THIS multimeter kit consists of a circuit built around two 0-500 micro ammeters, one being calibrated to read milliamps and volts and the other to read ohms. As these meters have a sensitivity of 2000 ohms. per volt it will be seen that this multimeter is capable of giving quite accurate readings in any work it is liable to be put to by radio men. The following ranges are available:—

D.C. Milliamps.	D.C. Volts	Ohms.
0 - 1 M.A.	0 - 10v.	0 - 1000 Ohms.
0 - 10 M.A.	0 - 50v.	0 - 1 Megohm.
0 - 100 M.A.	0 - 100v.	
0 - 200 M.A.	0 - 250v.	
	0 - 500v.	

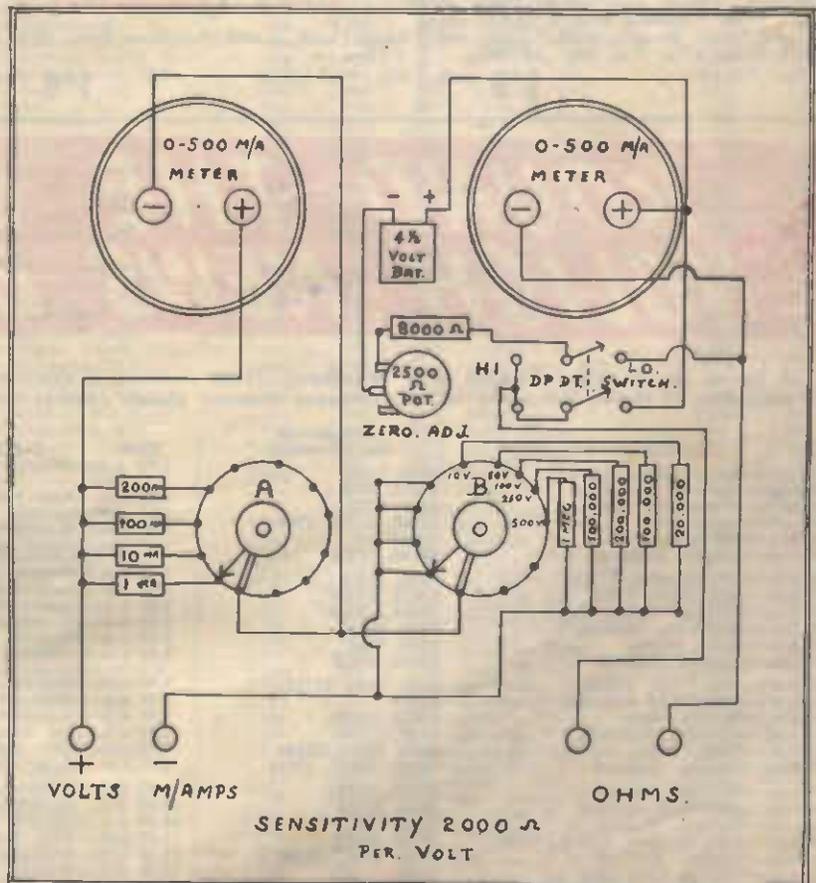
The appropriate millamp or voltage scale is obtained by means of a rotary switch and the two ohms. readings by means of a D.P.D.T. toggle switch. We feel that these ranges cover values most useful for radio enthusiasts. Although it would have been possible to use one meter we felt that this would tend to crowd the scale unduly and make the quick check on readings more difficult. Normally, the increased cost of an additional meter of the type used would rule out the idea, but we are in the happy position to be able to supply the two meters at a price less than that usually paid for one. It is only after you have used this meter that you will realize just what a difference the use of twin meters can make.

We would strongly advise constructors to obtain our kit in its entirety, as it is absolutely essential that accurate shunts and multipliers are used if the results you obtain are going to match up with our original test meter. A glance at the circuit diagram will show the simplicity of the whole job. The switches, test prod sockets, meters, etc., all mount on a 9in. x 7in. bakelite panel, the whole being fitted into a special case provided. A small carrying handle could be fitted if desired.

The switches "A" and "B" which appear to be separate in the diagram actually are part of one switch which is a twelve position 2 bank meter switch, the switch for the high and low Ohms. scale being a normal double-hole double throw switch.

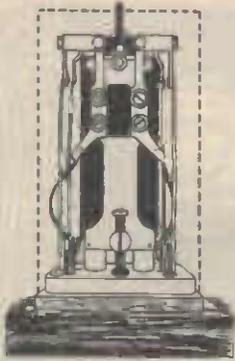
There is little more to add as the wiring is simplicity itself, as a glance at the diagram will show. Care should be taken to see that all soldered connections are firmly made as a poor joint could create enough resistance to impair the accuracy of the readings without actually making the meter inoperative.

Finally, we would say that when you have completed this meter you will have an instrument which, in accuracy and scope, is far better than many in use by qualified radio men today, and you will have obtained it at a cost well below the equivalent factory made job plus the additional satisfaction of having constructed the whole thing yourself.



Surplus Telegraph Equipment

TELEGRAPH RELAY



Mounted on wood base, 2 1/2 in. x 1 1/2 in., and enclosed in metal case. Overall height 4 in. Will operate on 50/100 volts. Two windings each 90 ohms, can be used individually, in series, or in parallel. Two sets of space, tongue, and mark contacts. Can be used as a sounder for Morse keying.

Cat. No. AX183 .. 13/6 each

TELEPHONE TYPE JACK



Useful Jack. Panel mounting by means of two bolt holes. Pushing plug in makes one circuit and breaks another circuit. Takes our Standard Phone Plug (Cat. No. AP298).

Cat. No. AX180 .. 1/9 each

Here's 6 Telegraph Lines which experimenters and others will be able to find many uses for. Most of the parts are used, but in good condition.

ELECTRO MAGNETIC COUNTERS



Taken from telephone equipment, these Counters are of the 4-wheel type, and will operate from the self-contained electro-magnet which could be powered by an ordinary 45-volt radio B battery. (Operational range 40/150 volts D.C.) By arranging a contact on a machine counter could be put to many industrial uses. Counter could also be used manually by disconnecting the electro magnetic coil. Size 3 in. x 1 1/2 in. x 1 in. Illustration shows unit with metal cover removed.

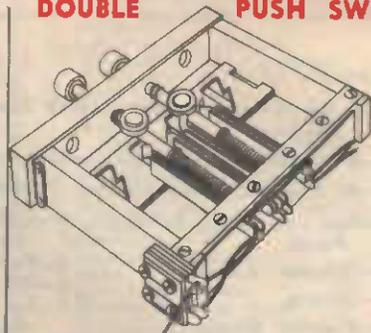
Cat. No. AX184— 7/6 each

BLOCK CONDENSERS

Metal Cased, 2 mfd. Telephone Type, 4 1/2 x 1 x 1 1/2.

Cat. No. AX182 .. 1/6 each

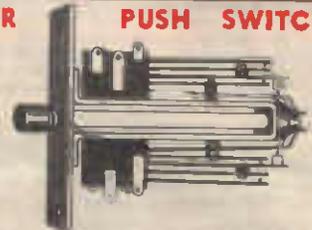
DOUBLE PUSH SWITCH



Another Useful Switch for testing equipment, etc. Pushing one button makes and breaks several different circuits, while pushing other button another set of circuits is made and broken. At the same time both buttons make and break two separate circuits. Could be used for testing and protection of meters in instrument circuits, etc.

Cat. No. AX181 .. 5/6 each

METER PUSH SWITCH



This Switch will find many uses in connection with testing and test meters. Pushing button makes and breaks a number of circuits. 10 lever type. Panel mounting by means of two bolt holes in front plate.

Cat. No. AX185 .. 2/6 each

ROUND THE CLOCK ENGLISH NEWS BROADCAST

A list of the principal English news broadcasts, from stations in every continent. Seasonal conditions will affect the reception of these, but many of the stronger stations should provide reliable signals throughout the year.

Time.	Location	Frequencies (in kilocycles)	Time.	Location	Frequencies (in kilocycles)
Midnight	Los Angeles, U.S.A.	9670, 11860	7.00 a.m.	Jakarta, Java	7220, 11785, 15150 (new frequency)
Midnight	Karachi, Pakistan	11570, 7660	7.00 a.m.	New York, U.S.A.	9690, 12095, 15210
Midnight	Pyeongyang, Korea	4480, 2560	7.30 a.m.	Warsaw, Poland	6215
12.30 a.m.	Delhi, India	15160, 11830, 9590	7.30 a.m.	Moscow, U.S.S.R.	11630, 11720, 15160
12.30 a.m.	Helsinki, Finland	15195	7.45 a.m.	Sofia, Bulgaria	7660
1.00 a.m.	London, England	15140, 17715	7.45 a.m.	Prague, Czechoslovakia	9550
1.00 a.m.	Los Angeles, U.S.A.	9670, 11860	8.00 a.m.	London, England	9510, 11750
1.15 a.m.	New York, U.S.A.	15350, 17800	8.00 a.m.	Bucharest, Roumania	6220, 9254, 11910
1.30 a.m.	Peking, North China	10280, 15060	8.00 a.m.	Teheran, Iran	15100
2.00 a.m.	Singapore, Malaya	4825, 7200	8.15 a.m.	Madrid, Spain	9368
2.00 a.m.	Seoul, Korea	2510, 7930	8.15 a.m.	Teheran, Albania	7850
2.00 a.m.	London, England	15140, 17715	8.30 a.m.	Moscow, U.S.S.R.	11630, 11720, 15160
2.00 a.m.	New York, U.S.A.	6120, 9650, 11730	8.30 a.m.	Melbourne, Australia	9650, 11850
2.30 a.m.	Melbourne, Australia	11810	9.00 a.m.	Budapest, Hungary	9830, 11910
3.00 a.m.	Jakarta, Java	11770, 15150	9.00 a.m.	Tel Aviv, Israel	9000
3.15 a.m.	Karachi, Pakistan	9845, 11570	9.30 a.m.	New York, U.S.A.	9690, 12095, 17780
3.30 a.m.	Delhi, India	9590, 11830, 15160	9.45 a.m.	Sofia, Bulgaria	7660
4.00 a.m.	London, England	15180, 17715, 17810	10.00 a.m.	Montreal, Canada	11720, 15320
5.00 a.m.	Montreal, Canada	15320, 17820	10.45 a.m.	Melbourne, Australia	11850, 15320
5.30 a.m.	Hilversum, Holland	6590, 11730	11.00 a.m.	London, England	11800, 15280
5.30 a.m.	Warsaw, Poland	6215	11.00 a.m.	New York, U.S.A.	15250, 21740
5.40 a.m.	Lake Success, U.S.A. (UN)	15130, 21610	11.10 a.m.	Budapest, Hungary	9830, 11910
6.00 a.m.	London, England	9510, 11750, 15180	11.10 a.m.	Madrid, Spain	9368
6.15 a.m.	Vatican City, Italy	9660	12.06 p.m.	Lake Success, U.S.A. (UN)	9670, 15210
6.40 a.m.	Rome, Italy	8010	12.30 p.m.	Delhi, India	15180
6.45 a.m.	Montreal, Canada	15320, 17820			

Time	Location	Frequencies (In kilocycles)
1.00 p.m.	London, England	9510, 9825, 11750, 11800
1.00 p.m.	New York, U.S.A.	15210, 17780, 17800
1.30 p.m.	Berne, Switzerland	9690, 11720, 11960, 15230
1.50 p.m.	New York U.S.A.	9645, 15330
2.00 p.m.	Copenhagen, Denmark	9520
2.00 p.m.	Hilversum, Holland	9590, 11730
2.00 p.m.	Prague, Czechoslovakia	11840, 15320
2.00 p.m.	Moscow, U.S.S.R.	9690, 11720, 11960, 15230
2.00 p.m.	Rome, Italy	9575, 9630, 15310
2.30 p.m.	Karachi, Pakistan	9645, 15330
2.30 p.m.	Rio de Janeiro, Brazil	11720
3.00 p.m.	Moscow, U.S.S.R.	9690, 11720, 11960, 15160
3.00 p.m.	Helsinki, Finland	9555, 15195
3.00 p.m.	Melbourne, Australia	15200, 17840
3.00 p.m.	Berne, Switzerland	11865, 15305
3.30 p.m.	Prague, Czechoslovakia	11840, 15320
3.50 p.m.	Moscow, U.S.S.R.	11720, 11960, 15160
3.50 p.m.	Montreal, Canada (U.N.)	8630, 11720 (new freq.)
4.00 p.m.	London, England	9510, 9825, 11750, 15110
4.00 p.m.	Budapest, Hungary	9830, 11910
4.00 p.m.	Buenos Aires, Argentina	9450
4.35 p.m.	Buenos Aires, Argentina	9690
5.00 p.m.	Moscow, U.S.S.R.	11630, 15160, 15410
5.10 p.m.	Brazzaville, F.E. Africa	9440, 11970
5.15 p.m.	Melbourne, Australia	15200, 17840, 21540
5.55 p.m.	Buenos Aires, Argentina	9450
6.00 p.m.	London, England	9690, 9825, 11800, 11820
6.00 p.m.	Los Angeles, U.S.A.	11730, 15160, 15105

Time	Location	Frequencies (In kilocycles)
6.15 p.m.	Moscow, U.S.S.R.	11630, 15160, 15410
7.00 p.m.	Los Angeles, U.S.A.	11730, 11860,
7.00 p.m.	London, England	6110, 9510, 11750 (new frequency)
7.15 p.m.	Berne, Switzerland	11705, 11865, 15305
7.30 p.m.	Melbourne, Australia	11760
8.00 p.m.	Wellington, N.Z.	11780, 15280 (new freq.)
8.00 p.m.	Lake Success, N.Y., (UN)	9650, 15130, 15250
8.00 p.m.	Delhi, India	21510
8.15 p.m.	Rome, Italy	15120, 17765
8.45 p.m.	Montreal, Canada	9630, 11720 (Sun., Wed. only)
9.00 p.m.	Los Angeles, Calif., U.S.A.	9670, 11860
9.00 p.m.	Sydney, Australia	6090
9.00 p.m.	Tokio, Japan	6175, 4860
9.00 p.m.	Melbourne, Australia	11760, 11850, 15200
9.30 p.m.	Peking, China	10260, 11680, 15060
10.00 p.m.	Hilversum, Holland	15220, 17770, 21480
10.00 p.m.	Saigon, Vietnam	11830
10.00 p.m.	Bangkok, Thailand	6010, 11960
10.15 p.m.	Manilla, Philippines	9690
10.30 p.m.	Taipei, Taiwan	7150
10.45 p.m.	Saigon, Vietnam	11830
11.00 p.m.	Rome, Italy	15120, 17765, 21570
11.00 p.m.	London, England	15140, 17810, 21470
11.00 p.m.	Jakarta, Java	15150
11.30 p.m.	Singapore, Malaya	7200, 7250
11.55 p.m.	Jakarta, Java	15150

AUSTRALASIAN BROADCAST LOG

Compiled by Arthur T. Cushen, 212 Earn Street, Invercargill. (* Proposed stations and power increases.)

Call	Location	Kilo-cycles	Power Watts.	Call	Location	Kilo-cycles	Power Watts.	Call	Location	Kilo-cycles	Power Watts.
4QL	Longreach, Q.	530	200	40B	Melbourne, Vic.	930	400	2NC	Newcastle, N.S.W.	1,230	2,000
2CR	Cunnamack, N.S.W.	550	10,000	40Z	Maiba, Q.	910	2,000	3TB	Sale, Victoria	1,240	1,000
6WA	Minding, W.A.	560	10,000	2XL	Coona, N.S.W.	920	500	6IX	Perth, W.A.	1,240	500
2LA	Wellington, N.Z.	570	60,000	4VL	Charleville, Q.	920	500	1VD	Auckland, N.Z.	1,250	750
3WV	Horsham, Vic.	580	10,000	*6NA	Narrogin, W.A.	920	2,000	9PA	Port Moresby, N.G.	1,250	500
40B	Brisbane, Q.	590	2,000	3UZ	Melbourne, Vic.	930	600	3SR	Shepparton, Victoria	1,260	2,000
7ZL	Hobart, Tas.	600	2,000	2JV	Suva, Fiji	930	400	2SM	Sydney, N.S.W.	1,270	1,000
2EC	Sydney, N.S.W.	610	10,000	2ZA	Palmerston North, N.Z.	940	2,000	3AW	Melbourne, Vic.	1,280	600
3AB	Melbourne, Vict.	620	10,000	4RK	Rockhampton, Q.	940	2,000	4RK	Brisbane, Q.	1,290	750
40N	Townsville, Q.	630	7,000	7ZR	Hobart, Tas.	940	500	2TM	Tamworth, N.S.W.	1,300	2,000
5CK	Crystal Brook, S.A.	640	7,500	2UE	Sydney, N.S.W.	950	1,000	1XH	Hamilton, N.Z.	1,310	2,000
2NE	Manila, N.S.W.	650	10,000	3UC	Christchurch, N.Z.	960	10,000	5AD	Adelaide, S.A.	1,310	500
2YC	Wellington, N.Z.	660	60,000	3BO	Bendigo, Vic.	960	500	3BA	Ballarat, Vic.	1,320	500
2BH	Broken Hill, N.S.W.	660	200	4AY	Ayr, Q.	960	500	6KY	Perth, W.A.	1,320	500
2CO	Corowa, N.S.W.	670	7,500	1XX	Whangarei, N.Z.	970	2,000	3SH	Swan Hill, Vic.	1,330	200
2HR	Lochnagar, N.S.W.	680	300	5DN	Adelaide, S.A.	970	500	4BU	Bundaberg, Q.	1,330	500
4AT	Atherton, Q.	680	500	2ZB	Wellington, N.Z.	980	10,000	2XX	Neelson, N.Z.	1,340	2,000
7QT	Queensdown, Tas.	680	300	2LE	Kempsey, N.S.W.	980	300	2LY	Young, N.S.W.	1,340	300
3YA	Christchurch, N.Z.	690	10,000	6AM	Northam, W.A.	980	2,000	6TZ	Darlingup, W.A.	1,340	2,000
4RQ	Brisbane, Q.	690	1,000	2GZ	Orange, N.S.W.	990	2,000	3GL	Geelong, Vic.	1,350	1,000
6WP	Perth, W.A.	690	5,000	3HA	Hamilton, Vic.	1,000	1,000	4GY	Gympie, Q.	1,350	200
2NR	Grafton, N.S.W.	700	7,000	2XC	Gisborne, N.Z.	1,010	2,000	3MA	Mildura, Vic.	1,360	200
7NT	Kelso, Tas.	710	7,000	4CA	Cairns, Q.	1,010	300	2XP	New Plymouth, N.Z.	1,370	2,000
4VZ	Invercargill, N.Z.	720	5,000	4MB	Maryborough, Q.	1,010	300	2MO	Cunneled, N.S.W.	1,370	100
2TR	Taree, N.S.W.	720	200	7EN	Launceston, Tas.	1,010	500	5BE	Mt. Gambler, S.A.	1,370	200
6CF	Kalgoorlie, W.A.	720	2,000	2KY	Sydney, N.S.W.	1,020	1,000	6GE	Geraldton, W.A.	1,370	500
5CL	Adelaide, S.A.	730	5,000	3DB	Melbourne, Vic.	1,030	600	2GN	Goulburn, N.S.W.	1,370	200
2BL	Sydney, N.S.W.	740	10,000	4ZB	Dunedin, N.Z.	1,040	10,000	4MK	Mackay, Q.	1,380	100
4QS	Dalby, Q.	750	10,000	5PT	Crystal Brook, S.A.	1,040	2,000	4RH	Brisbane, Q.	1,390	1,000
1XA	Auckland	760	10,000	2CA	Canberra, F.T.	1,050	2,000	2TL	Wellington, N.Z.	1,400	250
2NB	Broken Hill, N.S.W.	760	2,000	4SB	Kingaroy, Q.	1,060	2,000	2PK	Parkes, N.S.W.	1,400	200
3LO	Melbourne, Vic.	770	10,000	1ZB	Auckland, N.Z.	1,070	10,000	5AU	Port Augusta, S.A.	1,400	200
1YA	Dunedin, N.Z.	780	10,000	2RG	Griffith, N.S.W.	1,070	200	2KO	Newcastle, N.S.W.	1,410	500
2KA	Katoomba, N.S.W.	780	1,000	6WB	Katanning, W.A.	1,070	2,000	4AT	Apla, Samoa	1,420	2,000
4TO	Townsville, Q.	780	200	2LT	Lithgow, N.S.W.	1,080	100	3XY	Melbourne, Vic.	1,420	600
4QR	Brisbane, Q.	790	3,500	4RO	Rockhampton, Q.	1,090	200	4XD	Dunedin, N.Z.	1,430	100
*6	Moora, W.A.	790	—	7HT	Hobart, Tas.	1,090	500	2WL	Wollongong, N.S.W.	1,430	500
1YZ	Rotorua, N.Z.	800	10,000	3LK	Lubeck, Vic.	1,090	2,000	6CT	Collie, W.A.	1,440	500
*2	Bega, N.S.W.	800	—	3ZB	Christchurch, N.Z.	1,100	10,000	2QN	Deniliquin, N.S.W.	1,440	200
6WN	Perth, W.A.	800	1,000	3LD	Longreach, Q.	1,100	1,000	4IP	Inswich, Q.	1,440	200
*2	Glen Innes, N.S.W.	810	—	6MD	Merredith, W.A.	1,100	500	2MG	Mudgee, N.S.W.	1,450	100
2DU	Dubbo, N.S.W.	810	200	7LA	Launceston, Tas.	1,100	500	7DY	Derby, Tas.	1,450	200
7BU	Burnie, Tas.	810	200	2UV	Sydney, N.S.W.	1,110	1,000	2CK	Cessnock, N.S.W.	1,460	300
6GN	Geraldton, W.A.	820	1,000	4BC	Brisbane, Q.	1,120	1,000	7MU	Murray Heights, S.A.	1,460	200
2NA	Newcastle, N.S.W.	820	2,000	2IB	Wellington, N.Z.	1,130	200	3CV	Rendig, Vic.	1,470	500
*3	Klamath, N.S.W.	820	—	2XJ	Armidale, N.S.W.	1,130	200	2MY	Murrumbidgee, N.S.W.	1,470	200
5RM	Renmark, S.A.	830	2,000	3CS	Colac, Vic.	1,130	200	2AB	Abury, N.S.W.	1,480	200
*2	Kempsey, N.S.W.	840	10,000	61M	Perth, W.A.	1,130	500	2BE	Bega, N.S.W.	1,490	200
3GI	Sale, Vict.	840	7,000	2HD	Newcastle, N.S.W.	1,140	500	4ZR	Roma, Q.	1,490	200
2CY	Canberra, F. T.	850	10,000	2WG	Wagga, N.S.W.	1,150	2,000	2BS	Bathurst, N.S.W.	1,500	200
2NY	Napier, N.Z.	860	5,000	3XC	Timaru, N.Z.	1,160	2,000	3AK	Melbourne, Vic.	1,500	200
4CR	Toowoomba, Q.	860	500	*4Q	Mackay, Q.	1,160	2,000	5DR	Darwin, N.T.	1,500	500
7RO	Hobart, Tas.	860	500	*5	Mt. Gambler, S.A.	1,160	—	*2	Narooma, N.S.W.	1,520	—
2GR	Sydney, N.S.W.	870	1,000	2NZ	Inverell, N.S.W.	1,170	2,000	5AL	Alice Springs, S.A.	1,530	30
1XX	Auckland, N.Z.	880	*10,000	3XM	Gisborne, N.Z.	1,180	100	*2	Tenterfield, N.S.W.	1,530	—
3UL	Warragul, Vic.	880	200	3YM	Melbourne, Vict.	1,180	600	*2	Bendigo, Vic.	1,530	—
4WK	Warrick, Q.	880	100	2CH	Sydney, N.S.W.	1,190	750	*5LN	Port Lincoln, S.A.	1,530	200
6PR	Perth, W.A.	880	500	2XK	Wanganui, N.Z.	1,200	2,000	*6M	Gympie, Q.	1,540	200
4QY	Cairns, Q.	890	2,000	5EX	Adelaide, S.A.	1,200	500	*7	Queensdown, Tas.	1,540	—
5AN	Adelaide, S.A.	890	2,000	2GF	Grafton, N.S.W.	1,210	200	*2	Armidale, N.S.W.	1,550	—
3YC	Dunedin, N.Z.	900	*10,000	3YB	Warrambool, Vic.	1,210	200	*2	Canberra, F. T.	1,560	—
2CB	Lisnoire, N.S.W.	900	1,000	6KG	Kalgoorlie, W.A.	1,210	500	2LG	Lithgow, N.S.W.	1,570	200
7AD	Devonport, Tas.	900	300	4AK	Oakey, Q.	1,220	2,000				

SHORT WAVE STATIONS OF THE WORLD

The leading short-wave stations of the World appear in this log, covering stations from 4500 to 18000 kilocycles. Times are listed in NZST which is 12 hours ahead of GMT. News broadcasts are listed in English, while location is that of the studio, to which reports can be addressed. When no schedule is given station is under construction or is used only seasonally.

Compiled by Arthur T. Cushen, 212 Earn Street, Invercargill, Short Wave Editor of "New Zealand DX Times" the official organ of the New Zealand Radio DX League. Enquiries concerning unlisted stations,

addresses, and fuller details to the above address will be answered promptly.

ABBREVIATIONS: BBC'S Pacific Service (6.00-7.45 p.m. daily), G.O.S. General Overseas Service, 24 hours a day. European Service. English periods are 5.15-5.30 p.m., 6.0-6.15 p.m., 6.45-7 p.m., 7.45-8.00 p.m., 11.15-11.45 p.m., 6.00-6.30 a.m., 8.30-8.45 a.m., 9.15-10.00 a.m. A.F.R.S. Armed Forces Radio Service, San Francisco and New York. U.N., United Nations. Lake Success, N.Y., U.S.A. V.O.A., Voice of America, New York 19, N.Y., U.S.A.

Call and Location.	Freq. Kilo-cycles.	Power in Watts.	Schedule, Slogan, English News, Periods, etc.	Call and Location.	Freq. Kilo-cycles.	Power in Watts.	Schedule, Slogan, English News, Periods, etc.
Pyeongyong, Korea	4490	—	English midnight	YDB2—Jakarta, Java	4910	300	10.30 a.m.-1.30 p.m., 3.30-6.30 p.m., 9 p.m.-3.30 a.m.
HC2AK—Guayaquil, Ecuador	4650	1,000	"Radio Ecuador," 11 a.m.-4.30 p.m.	ZOY—Accra, Gold Coast	4915	5,000	3.45-0.34 a.m., News 4.30, 6 a.m.
HC2ET—Guayaquil, Ecuador	4720	300	"Radio El Telegrafo," 10.30 a.m.-4.30 p.m.	VLM—Brisbane, Aust	4917	10,000	8.00 a.m.-1.30 a.m.
YVMA—Maracaibo, Ven.	4705	300	"Ecos del Zulia," 11 a.m.-2.30 p.m.	VUN2—Madras, India	4920	10,000	Midnight-5.00 a.m.
YVKV—La Guaira, Ven.	4760	1,000	"Emisora Vargas," 11 a.m.-2.30 p.m.	YVKR—Caracas, Ven.	4920	5,000	"Radio Caracas," 11 p.m.-5 a.m., 9 a.m.-3.30 p.m.
HJGB—Bucaramanga, Colombia	4775	1,500	"Radio Santander," 11 a.m.-2.45 p.m.	HJAE—Cartagena, Colombia	4965	750	"Radio Colonial," 11 p.m.-6 a.m., noon-3 p.m.
YLVA—Valencia, Ven.	4780	300	"La Voz de Carabobo," 9.30 a.m.-2.30 p.m.	CR7BV—Lourenco Marques, Mozambique	4930	7,500	3.00-9.00 a.m. (English).
Radio Malaya, Singapore	4780	10,000	12.15-3.30 a.m., "Radio Malaya"	Karachi, Pakistan	4935	7,500	
HJAB—Barranquilla, Colombia	4785	1,000	"La Voz de Barranquilla."	YVMQ—Barquisimeto, Ven.	4940	4,000	11.30 p.m.-3.30 p.m.
YVQC—Cuidad, Bolivia, Ven.	4790	1,000	"Ecis del Orinoco," 10.30 a.m.-2.30 p.m.	JKM—Tokio, Japan	4940	5,000	7.55 p.m.-2.00 a.m.
Peshawar, Pakistan	4790	7,500		HJCW—Bogota, Colombia	4945	1,000	"Emisora Sur America," 11.45 p.m.-4.15 p.m.
HJDX—Medellin, Colombia	4705	750	"Ecos de la Montana," 10.30 a.m.-2.30 p.m.	HJCQ—Bogota, Colombia	4955	1,000	"Radiodifusora Nacional," 10 a.m.-4 p.m.
YVME—Maracaibo, Ven.	4800	2,000	"Ondas del Lago," 10.30 a.m.-2.30 p.m.	VUD2—Delhi, India	4960	10,000	1.15-5.30 a.m.
ZYF8—Manaos Brazil	4800	5,000	"Radio Difusoras Amazonas," 10 p.m.	HC5BC—Riobamba, Ecuador	4960	—	"Ondas del Chimboraz," 2-4 p.m.
HJDX—Medellin, Colombia	4795	750	"Emisora Cultural," 10 a.m.-3 p.m.	F.B.S., Malta	4960	—	Sign off 9.00 a.m.
YVMG—Maracaibo, Ven.	4810	400	"Radio Popular," 11.30 a.m.-3.30 p.m.	HJAE—Cartagena, Colombia	4965	750	"Laboratorles Fuentes," noon-3.30 p.m.
HJBB—Cucuta, Colombia	4815	750	"La Voz de Cucuta," "La Voz del Norte."	HJAG—Barranquilla, Colombia	4975	450	"Emisora Atlantica," noon-4.15 p.m.
Lahore, Pakistan	4818	7,500		DYB2—Bacolod City, Philippines	4980	1,000	Sign off 3.00 a.m.
CR7BV—Lourenco Marques, Mozambique	4820	7,500	4.00-9.00 a.m.	HCQRX—Quito, Ecuador	4985	250	11.45 p.m.-1.45 p.m.
Singapore, Malaya	4825	10,000	10.30 p.m.-3.30 a.m.	YVMO—Barquisimeto, Ven.	4990	850	"Radio Quito," 9.30 a.m.-2.30 p.m.
HJED—Call, Colombia	4825	1,000	"La Voz del Valle," noon-3.32 p.m.	MSF—Rugby, England	5000	10,000	"Radio Occidental," Frequency Check
HJKE—Bogota, Colombia	4835	5,000	Noon-2.30 p.m., "Radio Continental."	WVY—Washington, D.C.	5000	10,000	Frequency check station.
VUC2—Calcutta, India	4840	10,000	1.00-5.30 a.m.	YDQ2—Macassar, Celebes	5030	500	10.00 a.m., 3.00-6.30 p.m., 9.00 p.m.-3.00 a.m.
YVOI—Valera, Ven.	4840	300	"Radio Valera," 11 a.m.-2.40 p.m.	YVKM—Caracas, Ven.	5030	1,000	"Radio Continental."
ZYU8—Terestina, Brazil	4845	500	Sign on 8.30 a.m.	VJF—Djogjakarta, Java	5060	1,000	Heard midnight
CSX2—Ponta Delgada, Azores	4845	1,000	9.00-11.00 a.m., "Emisora Regional."	PZX—Paramaribo, Surinam	5750	750	11 a.m.-1.45 p.m.
YDP—Medan, Sumatra	4845	500	9.30 p.m.-2.35 a.m., "Radio Sumatra."	CE3AA—Santiago, Chile	5805	500	"Radio Soc. Nacional de Agricultura," Opens 11.30 p.m.
HJGF—Bucaramanga, Colombia	4845	1,000	"Radio Bucaramanga," 1-3 p.m.	OAX1B—Piura, Peru	5840	500	11.00 a.m.-4.30 p.m., "Radio Piura."
VQG1—Nairobi, Kenya	4855	1,500	10-11 p.m., 3-7 a.m.	CP15—La Paz, Bolivia	5855	300	Noon-5.00 p.m., "Radio el Condor."
JKL—Tokio, Japan	4840	5,000	ARFN. 9.00 p.m.-2.05 a.m.	TIGPH—San Jose, Costa Rica	5870	—	"Alma Tica," noon-4 p.m.
VUD3—Delhi, India	4860	5,000		HRN—Tegucigalpa, Honduras	5875	750	"La Voz de Honduras," 1-3 a.m., 11 a.m.-4 p.m.
HJEX—Call, Colombia	4865	2,500	"Radio Pacifico," noon-3 p.m.	ZRK—Capetown, South Africa	5875	5,000	4.45-6.30 p.m., 4-9.05 a.m., 9 p.m.-3.5 a.m.
YDD2—Batavia, Java	4865	300	10.30 a.m.-12.30 p.m., 4.30-7.15, 9.30 p.m.-4 a.m.	*CP15—La Paz, Bolivia	5880	1,000	"Radio El Condor."
—Peltermaritzburg, St. Af.	4875	1,000	4.45-6.30 p.m., 8.15-12.10 a.m., 2-9.05 a.m.	OAX4Z—Lima, Peru	5895	14,000	"Radio Nac. de Peru," 11 a.m.-4.30 p.m.
HJFH—Armenia, Colombia	4875	3,000	"La Voz de Armenia," 10.45 p.m.-3 p.m.	ZNB—Mafeking, Bechuanaland	5900	200	11 p.m.-1 a.m., 5-7.30 a.m.
VUB2—Bombay, India	4880	10,000	2.00-5.30 a.m.	OAX4V—Lima, Peru	5905	500	"Radio America," 1 a.m.-6 p.m.
HJDP—Medellin, Colombia	4885	2,500	"Emisora Claridad 11 a.m.-3 p.m.	OAX4S—Lima, Peru	5960	1,000	12.30 a.m.-3 p.m.
Johannesburg, South Africa	4895	5,000	3.50-9.05 a.m.	HJCF—Botota, Colombia	5965	750	11.40 a.m.-4.00 p.m.
VLX—Perth, W. Aust.	4897	10,000	10.15 p.m.-3.30 a.m.	HVJ—Vatican City, Vatican	5970	25,000	News for Britain, 7.15 a.m.
Colombo, Ceylon	4900	7,500	5.00-8.30 p.m., 9.50 p.m.-4.45 a.m.	Rome, Italy	5975	—	Italy's 3rd Programme.
JKI—Tokio, Japan	4910	5,000	8.55-10.15 a.m., 7.55 p.m.-2.00 a.m.	OAX4P—Huancayo, Peru	5980	250	"Radio Huancayo."
Multan, Pakistan	4910	7,500					

Call and Location.	Freq. Kilo-cycles.	Power in Watts.	Schedule, Slogan, English News, Periods, etc.	Call and Location.	Freq. Kilo-cycles.	Power in Watts.	Schedule, Slogan, English News, Periods, etc.
ZFY—Georgetown, B. Guina	5980	1,000		CFHX—Toronto, Canada	6070	1,000	10.55 p.m.-1.45 p.m.
CBNX—St. Johns, Newfoundland, Canada	5985	300	1.30-5.00 a.m., 9.30 a.m.-2.00 p.m.	GtR—London, England	6070	50,000	
H14T—Ciudad Trujillo, D.R.	5985	500	Midnight-5.00 p.m. "La Voz de Dominicana."	*CXAS—Montevideo, Uruguay	6078	1,000	"Radio Ariel." Opens 10 p.m.
OAX4Q—Lima, Peru	5990	1,000	12.30 a.m.-5 p.m. "Radio Victoria"	CKFX—Vancouver, Canada	6080	10	2.30 a.m.-8 p.m.
HJIB—Quito, Ecuador	5995	1,000	Eng. 2-5.30 p.m.	Munich Germany	6080	85,000	4.00-10.00 a.m., "Voice of America."
Andorra, Andorra	5997	20,000	"Radio Andorra." 10 p.m.-10.30 a.m.	Munich, Germany	6080	75,000	4.00 a.m.-8.00 a.m.
PR13—Belo Horizonte, Brazil	6000	5,000	"Radio Inconfidencia."	Rome, Italy	6085	10,000	
YBW—Santa Ana, El Salvador	6000	1,000	12.30-4.00 p.m., "Radio del Pueblo."	ZYK2—Recife, Brazil	6085	15,000	11 p.m.-2.00 p.m.
HNYM—Port-au-Prince, Haiti	6000	—	5.00-7.00 a.m., 11.30 a.m.-2.00 p.m.	Radio Luxembourg, Luxembourg	6090	6,000	4.00-11.00 a.m.
DZH4—Manila, Philippines	6000	—	10.30 p.m.-4.00 a.m. "The Voice of Manila."	YL12—Sydney, N.S.W.	6090	2,000	8.45-10.30 a.m., 8.30 p.m.-1.30 a.m.
OAX2A—Trujillo, Peru	6000	250	11.30 a.m.-4.30 p.m., "Radio Trujillo."	Tabriz, Azerbaijan, Iran	6090	—	2-6.45 a.m.
Damascus, Syria	6000	500	5-6 p.m., midnight-1 a.m., 4-9 a.m.	CRFW—Montreal, Canada	6090	7,500	12.30 a.m.-4.30 p.m.
HJKB—Bogota, Colombia	6000	—	2.00-4.00 p.m., "Emisora Nuevo Mundo."	*GWM—London, England	6090	50,000	
VE9AI—Edmonton, Canada	6005	200	2-6.5 p.m.; News, 5 p.m.	ZYB7—Sao Paulo, Brazil	6095	5,000	"Radiodifusor Sao Paulo." to 3 p.m.
CFCX—Montreal, Canada	6005	75	Midnight-5.00 p.m.	Munich-2, Germany	6095	75,000	7.30-10.00 a.m.
HP5K—Colon, Panama	6005	250	"La Voz de la Victor," 12.5 a.m.-4 p.m.	Munich-2, Germany	6100	75,000	10.15 a.m.-7.15 p.m.
Rabat, Morocco	6005	2,500	7.00-8.45 p.m., midnight-11.30 a.m.	DYH3—Cebu, Philippines	6100	250	9.00 p.m.-4.05 a.m.
Dornbirn, Austria	6005	200	5-7.35 p.m., 4-11 a.m., "Radio Vorarlberg."	TGOA—Guatemala City, Guata.	6102	—	"La Voz de la America" to 6 p.m.
CJCK—Sydney, N.S., Canada	6010	1,000	11.55 p.m.-4 p.m.	BCOF—Radio, Kure, Japan	6105	1,000	8.00-1.30 a.m.
CE601—Antofagasta, Chile	6010	5,000	"La Voz del Norte," 2-4 p.m.	ZYN6—Fortaleza, Brazil	6105	5,000	"Voice of B.C.O.F." "Ceara Radio Club," 8.30 a.m.-2 p.m.
YUD9—Delhi, India	6010	7,500	2.45-4.00, 4.10-6.30 a.m.	HJFK—Perelra, Colombia	6105	2,500	"La Voz Amiga," 9 a.m.-5.30 p.m.
OLR2A—Prague, Czechoslovakia	6010	30,000		DZ13—Manila, Philippines	6110	5,000	9.00-5.00 p.m.
GRB—London, England	6010	50,000	European Service.	*CP2—La Paz, Bolivia	6110	5,000	"Radio Nac. de Bolivia."
Rome, Italy	6010	50,000	Eng. 7.15-8.00 a.m.	GSL—London, England	6110	50,000	GOS 4.00-6.15 p.m.
PRAS—Recife, Brazil	6012	5,000	"Radio Club Pernambuco."	Berlin, Germany	6115	—	4-9.15, 11 p.m.-noon.
FHS—Malta, G.C.	6015	7,500	B.B.C. news 6 p.m. sign off 5 p.m.	H11Z—Ciudad Trujillo, D.R.	6115	400	10.30 p.m.-4.00 p.m.
YSC—San Salvador	6015	—	9.15 a.m.-2.07 a.m.	Forces Station, McKinnon Road, Kenya	6115	—	9.30-11.30 p.m., 3-7a.m.
JKK—Tokio, Japan	6015	5,000	"Radio MH," to 6 p.m. and later.	OIX1—Helsinki, Finland	6118	15,000	5-7 p.m., 8-midnight, 3.30-8.45 a.m.
KE01—Mexico City, Mexico	6016	1,000	"La Voz de Colombia," 12-1 a.m., to 4 p.m. English.	Manila 3—Philippines	6120	50,000	9.00 p.m.-3.45 a.m.
HJCK—Bogota, Colombia	6018	750		KCBR-2, Los Angeles, U.S.A.	6120	50,000	5.30-7.30 p.m. (AFRS)
HS8PD—Bangkok, Siam	6020	2,500		*HP5H—Panama City, Panama	6122	600	"La Voz del Pueblo," 11 p.m.-4.45 p.m.
Brazzaville, French Eq. Africa	6024	1,500	4.00-9.30 a.m.	H11G—Ciudad Trujillo, Dom. Rep.	6125	150	"Radio la Opinion," 1-9 p.m.
XEUW—Vera Cruz, Mexico	6020	250	Midnight-5.45 p.m.	GWA—London, England	6125	50,000	European Service.
Kuala Lumpur, Malaya	6025	7,500	12.45-3.30 a.m. In English.	CHNX—Halifax, Canada	6130	500	11 p.m.-3.15 p.m.
PGD—Bilversum, Holland	6025	5,000	Good signal, 8 a.m.	HC2FB—Guayaquil, Ecuador	6130	250	"Radio Nacional Condor" 5 p.m.
HROW—Tegucigalpa, Honduras	6025	3,000	midnight-4.55 p.m.	COCD—Havana, Cuba	6130	1,000	"La Voz del Aire," 2 a.m.-5 p.m.
CFVI—Calgary, Canada	6030	100	12.30 a.m.-7.00 p.m.	KEUZ—Mexico City, Mexico	6130	1,000	8 a.m.-5.20 p.m.
NEKW—Morelia, Mexico	6030	500	"El Eco de Michoacan" to 4 p.m.	YLX2—Perth, Western Aust.	6130	10,000	10.30 p.m.-4.00 a.m.
Radio Stuttgart, Germany	6030	10,000	5.00-9.45 p.m., 2.55-10.00 a.m.	ZJM4—Limassol, Cyprus	6135	7,500	3.55 p.m.-8.35 p.m. 3.45-8.15 a.m.
HP5B—Panama City, Panama	6030	150	"Radio Miramar," 11 a.m.-4 p.m.	"Voice of Free Europe," Munich, Germany	6135	—	5.00-10.00 a.m.
DZH6—Manila, Philippines	6030	300	11 a.m.-1 p.m., 4-6 p.m., 8 p.m.-3.15 a.m.	F.B.S., Malta	6140	—	9.00-4.00 a.m.
Monte Carlo, Monaco	6035	25,000	6-8 p.m., 6-10.15 a.m., "Radio Monte Carlo."	DYH2—Cebu, Philippines	6140	1,000	"La Voz de Antioquia," 9 a.m.-3.30 p.m.
Rangoon, Burma	6035	1,500	English 2.15-3.15 a.m.	HJDE—Medellin, Colombia	6145	5,000	8.00-10.15 a.m., 8.45 p.m.-2.00 a.m.
Radio Noumea, New Caledonia	6035	500	7.00-10.30 p.m.	YLR3—Melbourne, Aust.	6150	2,000	8.00-10.15 a.m., 8.45 p.m.-2.00 a.m.
OAX6R—Arequipa, Peru	6035	100	"Radio Landa" closes 5.00 p.m.	GRW—London, England	6150	50,000	European and Latin-American service.
GWS—London, England	6035	50,000	European Service.	WEIN1—Vienna, Austria	6155	300	4.45 p.m.-12.05 p.m.
CXA30—Montevideo, Uruguay	6035	800	"Radio Nacional," 10 a.m.-3 p.m.	CE615—Santiago, Chile	6155	3,000	"La Co-operative Vitalita," 4 p.m.
CORF—Havana, Cuba	6040	1,000	"Radio Libertad," 1 a.m.-4 p.m.	KGEI-2, San Francisco, U.S.A.	6155	50,000	5.30-8.45 p.m. (AFRS)
HO50—Panama City, Panama	6040	—	Sign off 5.00 p.m.	CR2WD—Lisbon, Portugal	6155	300	7.30 a.m.-noon.
Sao Paulo, Brazil	6040	—	Testing 5 p.m.	HJKJ—Bogota, Colombia	6160	—	11.50 p.m.-4.00 p.m.
GSY—London, England	6040	100,000	"Voice of America" 7.30-10.30 a.m.	CBRX—Vancouver, Canada	6160	150	Relays CBR to 7 p.m., news 6.55 p.m.
XETW—Tampico, Mexico	6045	100	"La Voz de Tampico," 4.45 a.m.-4.45 p.m., 9.00 p.m.-3.00 a.m.	Saigon	6160	—	9.00 p.m.-3.30 a.m.
VDV—Jakarta, Java	6045	100,000		Radio France-Asie, Saigon	6165	12,000	9.00 p.m.-3.30 a.m.
Radio Batavia, Java	6045	100,000		HER3—Berne, Switzerland	6165	25,000	5.20-6.40 p.m., 5-10.15 a.m.
GSA—London, England	6050	50,000	European Service.	*GWK—London, England	6165	50,000	
*OAX6A—Arequipa, Peru	6050	250	"Radio Arequipa."	HHCM—Port-au-Prince, Haiti	6167	100	"N.B.C." 10 p.m.-1.30 a.m., 10 a.m.-2 p.m.
HJEX—Cali, Colombia	6055	2,500	11.30 p.m.-3.30 p.m.	CXA21—Montevideo, Uruguay	6170	100	"Radio Felix," 11 a.m.-2 p.m.
DYH4—Dumaguete City, Philippines	6055	300	10.00 p.m.-2.00 a.m.	GSZ—London, England	6170	100,000	
VQ7LO—Nairobi, Kenya	6060	1,500	12.30-1.30 a.m., Wed., Fri. only.	YDA2—Rangoeng, Java	6170	250	11.30 a.m.-1 p.m., 4.30-7.15, 10 p.m.-3.30 a.m.
CKRZ—Montreal, Canada	6060	50,000		XEXA—Mexico City, Mexico	6175	1,000	"Radio Gobernacion," 1 a.m.-6 p.m.
Tangiers 1—North Africa	6060	50,000		DUH2—Manila, Philippines	6170	400	9 a.m.-4.00 a.m.
HORT—Balboa, Panama	6060	—	Closes 4.15 p.m. "Radio Balboa."	VUV2—Hyderabad, India	6170	—	12.30-5.30 a.m.
GSX—London, England	6060	100,000	European Service.	ZJM5—Limassol, Cyprus	6175	7,500	3.55-6.35 p.m., 3.45-8.15 a.m.
Radio Pakistan, Karachi, Pakistan	6062	250		HOB—Panama City, Panama	6175	—	11.30 p.m.-5.00 p.m.
"Radio Tannarive," Madagascar	6065	—	In French to 6.25 a.m.	BFBS, Singapore, Malaya	6175	7,500	9.15 p.m.-4.30 a.m.
HC2FQ—Guayaquil, Ecuador	6065	500	"Radio Continental," 10 a.m.-4 p.m.	LRN—Mendoza, Argentina	6180	10,000	"Radio Aconagua," 10.30 p.m.-4 p.m.
SRO—Stockholm, Sweden	6065	12,000	6.40-8.10 p.m.	GRO—London, England	6180	50,000	6.30-11.15 a.m., 6-8.15 p.m.
				XECC—Puebla, Mexico	6185	50	"Impulsoras del Progreso" 2.5 p.m.
				HCUHQ—Ibarra, Ecuador	6187	250	"Radio Equinoccial," 3.50-6.15 a.m.
				VUD7—Delhi, India	6190	100,000	3.50-6.15 a.m.
				Hanoi, Indo-China	6190	1,000	9.00 p.m.-1.30 a.m. "Radio France."

Call and Location.	Freq. Kilo-cycles.	Power in Watts.	Schedule, Slogan, English News, Periods, etc.	Call and Location.	Freq. Kilo-cycles.	Power in Watts.	Schedule, Slogan, English News, Periods, etc.
Frankfurt, Germany	6190	1,000	4.00-7.45 p.m., 2.00-10.00 a.m.	GRK—London, England	7185	50,000	European Service.
GRN—London, England ..	6195	50,000	G.O.S. 5.30 p.m.	Commercial Service Radio, Ceylon, Colombo	7195	7,500	11.30 p.m.-4.30 a.m.
HJCT—Bogota, Colombia ..	6198	10,000	"Radiodifusora Nacional," 3.30 p.m.	Tangier-1, North Africa ..	7200	50,000	U.N. broadcast, 4-6 p.m.
Paris, France	6200	50,000	5.00-5.15 p.m., 11.15 p.m.-2.30 a.m.	GWZ—London, England ..	7200	100,000	6.00-9.30 a.m. "Voice of America."
HC1AC—Quito, Ecuador ..	6210	250	11.30 p.m.-5.00 p.m.	GWL—London, England ..	7205	50,000	North American service, 1.15-2 p.m.
WARSAW 3, Warsaw, Poland ..	6215	7,500	English 7.30-7.50 a.m.	H18Z—Santiago de los Caballero ..	7212	300	To 4 p.m. Sundays.
Rome, Italy	6220	—	Third programme.	Tangiers 1—North Africa ..	7215	50,000	1.00-2.00 a.m.
CE622—Santiago, Chile ..	6220	5,000	Opens 11.30 p.m., closes 4.10 p.m. in English.	VUC3—Calcutta, India ..	7210	250	7.00 p.m.-9.30 p.m., 1.15-4.30 a.m.
TGJA—Guatemala City, Guat.	6230	1,000	1.00 a.m.-2.30 p.m.	Forces Broadcasting Service, Cyprus ..	7220	—	3.00 p.m.-8.00 a.m.
HRD2—La Ceiba, Honduras ..	6235	200	"La Voz de Atlantida," to 3 p.m.	VUB3—Bombay, India ..	7240	250	2.00-3.30 p.m., 2.00 a.m. 5.30 a.m.
Budapest, Hungary	6247	—	English news 10.00 a.m.	GSW—London, England ..	7230	50,000	Pacific Service.
CE625—Santiago, Chile ..	6250	5,000	"Soc. de Nacional Agricultura."	VUB2—Bombay, India ..	7240	10,000	English news, 12.30 a.m.
YSUA—Cincuenta, El Salvador	6250	—	Signs 5 p.m.	Vienna, Austria	7240	400	5-7 p.m., 11 p.m.-11.05 a.m.
TGRA—Guatemala City, Guat.	6255	—	"La Voz de Guardia Civil"; noon-3 p.m.	VUD10—Delhi, India ..	7240	20,000	7.00-8.00 a.m.
YSH—San Salvador, El. Salv.	6270	1,000	"La Voz de El Salvador," Fair, 6.30 p.m.	*GWI—London, England ..	7250	50,000	
Greek Forces, Athens ..	6330	900	"Radio Nac. de Paraguay," to 4 p.m.	Munich 4—Germany ..	7250	75,000	3.45-10.45 a.m.
ZPA1—Asuncion, Paraguay ..	6276	2,500	Closes 4 p.m. "Emissora Colombia."	JKF—Tokio, Japan ..	7257	5,000	8.25 a.m.-2.00 a.m.
BJWO—Bogota, Colombia ..	6270	—	5-7 p.m., 4-8 a.m.	GSU—London, England ..	7260	50,000	4.45-7.15 p.m.; 11 p.m.-10 a.m.
OTM1—Leopoldville, Bel. Congo	6282	—	"Radio International"	VUM3—Madras, India ..	7260	250	7.00-9.30 p.m., 10.30 p.m.-11.30 p.m., mid-night-5.00 a.m.
TGTQ—Guatemala City ..	6285	—	11.00 a.m.-5.00 p.m.	VUM2—Madras, India ..	7260	10,000	1.30-3.30 p.m., Mid-3.30 a.m.
OAX4L—Lima, Peru	6315	500	Opens 11.57 p.m.	OZU—Copenhagen, Denmark ..	7260	6,000	5.15-10.30 a.m.
YNAS—Managua, Nicaragua ..	6305	100	English sign off 4.55 p.m.	VUD5—Delhi, India ..	7270	100,000	11 p.m.-midnight, 4.15-5.15 a.m.
OAX4M—Miraflores, Lima, Peru	6310	—	4 p.m.-10 a.m.; "Sued-westfunk."	VUD6—Delhi, India ..	7275	7,500	2.45-4.00 a.m., 4.10-6.30 a.m.
Baden-Baden, Germany ..	6321	1,000	11 p.m.-5 p.m.	VLT5—Port Moresby, New Guinea ..	7280	2,000	8.45-10.45 a.m., 8.15 p.m.-12.45 a.m.
COCW—Havana, Cuba ..	6325	1,000	"Radio Continental," 11 a.m.-5 p.m.	GWN—London, England ..	7280	50,000	European service, 5-8.15 p.m., 11 p.m.-2 a.m.
OAX6E—Arequipa, Peru ..	6333	3,000	"Radio Mundial."	KJK—Tokio, Japan	7285	5,000	9.25-11 a.m., 7.55 p.m.-2.00 a.m.
HE12—Berne, Switzerland ..	6345	25,000	8.30 a.m.-noon.	TAS—Ankara, Turkey ..	7285	100,000	Eng. 9.00-9.45 a.m. 4.30-5 a.m. daily.
COKQ—Santiago, Cuba ..	6345	—	11 a.m.-3 p.m.	ZQP—Lusaka, Sth. Rhodesia ..	7285	—	10.30 p.m.-midnight.
OAX4H—Lima, Peru	6368	1,000	6-8 a.m., 1-4 p.m.	VUD3—Delhi, India ..	7290	10,000	2.30-4.30 p.m., 11.30 p.m.-1.00 a.m.
CS2MA—Lisbon, Portugal ..	6370	10,000	"Radio Lima," closes 4.40 p.m.	VUD2—Delhi, India ..	7290	10,000	2.00-3.15 p.m.
EHCM—Port-au-Prince, Haiti	6400	1,000	"RHC—Cadena Azul," midnight-6.02 p.m.	Moscow	7290	—	4.00 p.m.-10.05 a.m.
TGQA—Quezaltenango, Guatam.	6405	300	"La Voz de Guatemala."	Hamburg, Germany	7295	25,000	"Nordwest sender," Eng. 4.30 a.m., signs 9.30 a.m.
OAX4G—Lima, Peru	6410	300	5.30-6.30 p.m., 5-6 a.m.	Athens, Greece	7300	7,000	4.00-4.45 p.m.
COH1—Santa Clara, Cuba ..	6450	300	"Radio Morse," 12.3 a.m.-5 p.m.	F08AA—Papeete, Tahiti ..	7300	800	Signs 6 a.m.
TGWB—Guatemala, Guatemala	6460	1,000	10.00 a.m.-4.30 p.m.	ZOY—Accra, Gold Coast ..	7300	5,000	"La Voz de Democracia," noon-4 p.m.
Jannina, Greece	6580	60	4.30-6.30 p.m., 5.00-9.00 a.m.	YSO—San Salvador, El Sal.	7312	1,000	G.O.S., 4-7.30 p.m.
TG2—Guatemala City, Guatam.	6620	300	French-English 6.30-6.50 a.m.	GRJ—London, England ..	7320	50,000	Chinese programmes, 11 p.m.
OAX1A—Chiclayo, Peru ..	6710	150	"La Voz de Nicaragua," 10 a.m.-5 p.m.	BCFF—Taipei, Taiwan ..	7340	—	English, 6.30-7.30, 8.30-9.30 a.m.
Greek Army Radio, Larissa ..	6745	500	"Radio Municipal," 10.20 a.m.-2 p.m.	Radio Moscow, U.S.S.R. ..	7340	50,000	11 a.m.-4.45 p.m. "Radio Cent."
UN—Geneva, Switzerland ..	6675	7,500	5.00-6.15 p.m., 2.30-5.30 a.m.	HC2DC—Guayaquil, Ecuador	7350	250	9.00 p.m.-3.00 a.m.
YNPS—Managua, Nicaragua ..	6765	800	"La Voz de la America Central."	YDP2—Medan, Sumatra ..	7360	300	"La Voz de Occidente."
CP49—La Paz, Bolivia ..	6770	500	"Radio Manta"; 1-4 p.m.	TGDA—Quezaltenango, Guat.	7460	—	"La Voz de la Sultana," 10 a.m.-3 p.m.
Radio Kol-Israel, Palestine ..	6835	—	Neon-3 p.m.	YNLAT—Granada, Nicaragua	7615	300	Eng. 8.45-9.45 a.m.
YNOW—Managua, Nicaragua ..	6850	1,000	"La Voz de Victoria," 6 a.m.-4 p.m.	Sofia, Bulgaria	7660	5,000	Used irregularly.
HC4EB—Manta, Ecuador ..	6870	375	10.00-10.45 a.m., 4.00-4.45 p.m.	ZM2AP—Apia, Samoa ..	7700	2,000	7.10 a.m. English 8.15 a.m.
TGLB—Mazatenango, Guata.	6905	—	"La Voz de Boaco," 11 a.m.-3 p.m.	ZAA—Tirana, Albania ..	7850	3,000	5-9 a.m.
YNQW—Managua, Nicaragua ..	6917	—	"Radio Panamerica," 11 a.m.-3.20 p.m.	SUX—Cairo, Egypt	7860	10,000	"Radio Ecuador Amazonico," 11.30 p.m.
F08AA—Papeete, Tahiti ..	6980	800	"Radio Sport," 6 a.m.-3 p.m.	HC1CG—Quito, Ecuador ..	7875	200	9.30-11.00 a.m.
YNBO—Boaco, Nicaragua ..	6985	30	"Radio National," 7-10 a.m.	HLKA—Seoul, Korea ..	7935	5,000	"Radio Falange,"
YNBH—Managua, Nicaragua ..	7008	500	"Radio Mediterraneo," 6 a.m.-4 p.m.	EAJ31—Alicante, Spain ..	7950	1,200	8000 375
YNWW—Granada, Nicaragua ..	7020	—	"Radiodifusora Iman," noon-4.15 p.m.	JJOY—Athens, Greece ..	8000	2,000	Saturdays 6.30-7.30 a.m.
EAJ9—Malaga, Spain	7020	1,000	Closes 7.30 a.m. All Arabic.	JJY—Kemigawa, Japan ..	8000	2,000	Frequency Measurement.
Valencia, Spain	7037	300	Neon-1 p.m., midnight-3.30 a.m.	FXE—Beirut, Syria	8035	3,000	5-6.15 p.m., 10.15 p.m.-1.10 a.m., 3.30-9 a.m.
YSL—San Salvador, El Sal. ..	7040	100	"Radio Somali," 2.30-3.30 a.m.	CNR—Rabat, Morocco ..	8035	12,000	"Radio Maroc."
HC2CM—Guayaquil, Ecuador ..	7055	250	Eastern service 6.30-8.30 a.m.	YNC3—Pontianak, Borneo, N.E.I. ..	8090	150	10.45 p.m.-1.30 a.m.
GRS—London, England ..	7075	50,000	"La Voz de Manabi," 11.45 p.m.-3.30 p.m.	YNXW—Managua, Nicaragua	8195	—	"Radio America," noon-4 p.m.
Y15KG—Baghdad, Iraq ..	7090	50,000	"La Voz del Tropico," noon-3.15 p.m.	CR6RG—Dundo, Angola ..	8240	300	6.30-7.30 a.m.; Sundays, 11 p.m.-midnight.
Radio Bangkok, Slam ..	7105	800	European Service.	VED—Edmonton, Alberta ..	8265	5,000	2.00 a.m.-7.00 p.m., relays CBX.
GRM—London, England ..	7120	50,000	English, 11.30 p.m.	COJK—Camaguey, Cuba ..	8656	1,000	1-5.30 p.m.
Hargelsha, Br. Somaliland ..	7125	1,000	"Radio Commercial," 11.45 p.m.-4 p.m.	COCO—Havana, Cuba ..	8700	2,000	"Radio America," mid-night-4.30 p.m.
G—London, England	7135	100,000					
HC4FA—Portoviejo, Ecuador	7140	100					
YNFP—Managua, Nicaragua ..	7140	100					
GRT—London, England ..	7150	50,000					
Taipei, Taiwan	7150	—					
HC1BF—Quito, Ecuador ..	7160	500					

Call and Location.	Freq. Kilo-cycles.	Power in Watts.	Schedule, Slogan, English News, Periods, etc.
COCQ—Havana, Cuba	8825	5,000	10.30 p.m.-5.15 p.m.
COCK—Santiago, Cuba	8955	500	"Cadena Oriental de Radio," 11 p.m.-5 p.m.
BCAF—Taipai, Taiwan	8990	—	English 11.00-11.45 p.m.
Tel Aviv Israel	9000	7,500	"Radio Kol-Israel," English.
Tel Aviv	9000	—	Eng. 9.00-9.30 a.m. (new schedule)
COB2—Havana, Cuba	9026	250	"Radio Salas."
FZP8—Papeete, Tahiti	9053	24,000	—
CNR3—Rabat, Morocco	9095	25,000	5-8 p.m., 6-10 a.m.
CR6RB—Luanda, Angola	9165	—	—
Radio Congo, Leopoldville, B. Congo	9210	250	5.00-6.30 a.m.
CR8AA—Macao, Portug. China	9235	500	11 p.m.-2.20 a.m.
COBQ—Havana, Cuba	9235	—	"La Voz de Cuba," 1-5 p.m. and later.
Bucharest	9250	—	Eng. news 8 a.m. (new schedule)
YSF—Salvador, El Salvador	9250	400	"Radio Vanguardia," 6.0 a.m., noon-4 p.m.
COCX—Havana, Cuba	9270	1,000	"Casa Levin," midnight-4 p.m.
Radio Rodina, Sofia, Bulgaria	9315	5,000	—
OAX4J—Lima, Peru	9330	1,000	"Radio International," 11 a.m.-5 p.m.
COBC—Havana, Cuba	9362	1,000	"Radio Progreso," midnight-4 p.m.
Madrid, Spain	9368	—	Eng. 8.15-8.45 a.m. 11.15-11.45 a.m.
OTM2—Leopoldville, Belgium Congo	9380	50,000	3.45-9 a.m., 5-7 p.m.
GRI—London, England	9410	50,000	Latin American service, 11 a.m.-3.30 p.m.
CP21—Suere, Bolivia	9430	270	"Radio La Pata," 2-4.45 a.m., 8-10 a.m.
COCH—Havana, Cuba	9440	1,000	11 p.m.-5 p.m. "Union Radio."
Brazzaville, Fr. Eq. Africa	9440	50,000	4 a.m.-1 p.m., News 6.45, 8.45 a.m.
OAX4W—Lima, Peru	9440	1,500	"Radio America."
LRA—Buenos Aires, Argentina	9450	25,000	Eng. 3.00-6.00 p.m.
TAP—Ankara, Turkey	9465	25,000	News 7.45 a.m., Eng. programme 9-9.45 a.m.
CR6RA—Luanda, Angola	9470	250	7-8.30 a.m.
CP38—La Paz, Bolivia	9480	250	"Radio Nat. de Bolivia."
*GWF—London, England	9490	50,000	—
XEWW—Mexico City, Mexico	9500	10,000	"La Voz de America Latina," 12.30 a.m.-6.45 p.m.
VL13—Sydney, N.S.W.	9500	2,000	10.45 a.m.-8.15 p.m.
OIX2—Helsinki, Finland	9500	15,000	—
DZH3—Manila, Philippines	9500	—	9.30 a.m.-4 a.m.
OLR3B—Prague, Czechoslovakia	9504	35,000	English 8.30 a.m.
HOLA—Colon, Panama	9505	—	Closes 3 p.m.
JBD—Tokyo, Japan	9505	7,500	7.55 p.m.-2.00 a.m.
*YUC—Belgrade, Yugoslavia	9507	10,000	—
GSB—London, England	9510	50,000	5.45-10.45 a.m., 11 a.m.-8 p.m.
KRCA1—Los Angeles, Calif.	9515	50,000	9.00 p.m.-2.15 a.m.
ZBW3—Hongkong, China	9515	5,000	4.30-6 p.m., 10.30 p.m.-3 a.m. B.B.C. new 11 p.m.-1 a.m.
Commercial 1 Service, Radio; Ceylon, Colombo	9520	7,500	1.30-7.30 p.m.
VL11—Port Moresby New Guinea	9520	2,000	2.09-4.00, 6.00-8.00 p.m.
Paris, France	9520	100,000	4.15-7 p.m., 7.15-9 p.m.
OZF—Copenhagen, Denmark	9520	100,000	—
H12L—Ciudad Trujillo, D.R.	9525	500	"La Voz de Tropico."
GWJ—London, England	9525	50,000	European Service.
VUC3—Calcutta, India	9530	250	1.30-3.30 p.m., 11 p.m.-1 a.m.
WGEO1—Schenectady, U.S.A.	9530	100,000	11.00 a.m.-3.00 p.m.
SBI1—Stockholm, Sweden	9535	12,000	6.30-10 a.m.
HERJ—Berne, Switzerland	9535	100,000	1.30-3 p.m., 5.20-6.40 p.m., 8-10.15 a.m.
Munich, Germany	9540	85,000	4.00-10.00 a.m., "Voice of America."
Paris, France	9540	100,000	1.55-3.45 p.m., 5-5.45 a.m.
LKJ—Oslo, Norway	9540	5,000	7-7.15 p.m., 10.45-12.30 a.m., 4-10 a.m.
VERA1—Edmonton, Canada	9540	—	—
VLR—Melbourne, Aust.	9540	2,000	10.30 a.m.-7.15 p.m.
XEFT—Vera Cruz, Mexico	9540	250	"La Voz de Vera Cruz," 6 p.m. and later.
ZL2—Wellington, N.Z.	9540	10,000	—
DZI-2—Manilla, P.I.s.	9550	500	9.00-3.00 a.m.
YDQ—Macassar, Celebes	9550	10,000	10 a.m.-noon, 3.00-6.30 p.m., 9 p.m.-3 a.m.
*OLR3A—Prague, Czechoslovakia	9550	30,000	News 7.45 a.m.
*GWB—London, England	9550	50,000	European service.
ZYK3—Recife, Brazil	9565	—	11 p.m.-1.00 a.m., 7.00 a.m.-2.00 p.m.
VUB3—Bombay, India	9550	250	11.30 p.m.-1.45 a.m.

Call and Location.	Freq. Kilo-cycles.	Power in Watts.	Schedule, Slogan, English News, Periods, etc.
Paris, France	9558	100,000	5.15-9.15 p.m., 10-11.30 p.m., 10.30-11.15 a.m.
XETT—Mexico City, Mexico	9558	500	Midnight-6.45 p.m.
JBD2—Tokyo, Japan	9560	7,500	7.55 p.m.-2.00 a.m.
VUD7—Delhi, India	9565	100,000	3.15-4.10 p.m.
KWID1—San Francisco, U.S.A.	9570	50,000	midnight-2.15 a.m.
WRUL4—Boston, U.S.A.	9570	50,000	noon-1.00 p.m.
GSC—London, England	9580	50,000	Eastern Broadcasts 4.30 p.m.
GWX—London, England	9570	100,000	—
Rome, Italy	9575	50,000	English 2.00 p.m.
VLH3—Melbourne, Aust.	9580	10,000	8.28 p.m.-2.00 a.m.
VLB9—Melbourne, Aust.	9580	100,000	4.30-5.15 a.m.
CE960—Santiago, Chile	9585	1,000	Noon-5.00 p.m. "Radio la Americana."
PCJ—Hilversum, Holland	9590	60,000	7-8 a.m.
VUD4—Delhi, India	9590	10,000	News 1 a.m.
VUM2—Madras, India	9590	10,000	7-9.30 p.m., 10.30-11.30 p.m.
VUD3—Delhi, India	9590	5,000	4.30-5.30 a.m.
VUM3—Madras, India	9590	250	1.30-3.30 p.m.
GRY—London, England	9600	50,000	African Service, news 8.45 a.m.; 6 p.m.
XEYU—Mexico City, Panama	9605	250	"Radio Univ. Nacional," 2-5 p.m.
HP5J—Panama City, Panama	9605	380	"La Voz de Panama," 10 a.m.-3.30 p.m.
Athens, Greece	9605	7,500	English news 7.30 a.m.
JKL2—Tokyo, Japan (AFRS)	9606	5,000	9.15 a.m.-8.45 p.m.
Radio Goa, Portuguese China	9610	500	1.30 p.m.-5.30 a.m.
LLG—Oslo, Norway	9610	100,000	6.25-7.30 p.m., 4.00-9.00 a.m.
ZYCB—Rio de Janeiro, Brazil	9610	25,000	8.00 a.m.-3.00 p.m.
VLW5—Perth, Western Aust.	9610	2,000	10.30 p.m.-4.00 a.m.
VLX3—Perth, West Aust.	9610	10,000	2.30-10.00 p.m.
CHLS—Montreal, Canada	9610	50,000	—
DZCA—Salzburg, Austria	9615	300	Opens 5.00 p.m.
NERQ—Mexico City, Mexico	9615	500	"Radio Continental," heard 6 p.m.
VLB9—Melbourne, Aust.	9615	100,000	3.00-3.45 a.m.
VP1RD—Port of Spain, Trinidad	9620	500	10.00 p.m.-1.00 a.m., 8.00 a.m.-3.00 p.m., Local News 10 p.m., B.B.C. relay 11 p.m.
VUD7—Delhi, India	9620	100,000	7.00-8.00 a.m.
DUH4—Manila, Philippines	9620	400	News 10 p.m. "The People's Station."
Paris, France	9620	100,000	5.15-7 p.m., 7.15-9 a.m.
ZLS—Wellington, N.Z.	9620	7,500	—
Radio Addis Ababa, Ethiopia	9620	1,000	1.45-4.10 a.m., English 3.15-4 a.m.
CXA6—Montevideo, Uruguay	9623	3,000	Good 10.30 p.m.
Radio France Asia, Saigon	9624	25,000	8.30 a.m.-2 p.m.
GW0—London, England	9625	50,000	—
XEHT—Mexico City, Mexico	9625	10,000	Eng. news 3.45 p.m., sign off 6 p.m.
VUD2—Delhi, India	9630	10,000	7.00-9.00 p.m.
CBFX—Montreal, Canada	9630	7,500	Sign off 5.00 p.m.
CR10—Sackville, N.B., Canada	9630	50,000	—
CKLO—Montreal, Canada	9630	50,000	8.40-9.50 p.m. Sun., Wed. for N.Z.
Rome, Italy	9630	50,000	Eng. 2.00 p.m.
CXA8—Colon, Uruguay	9640	3,000	4-6 a.m., 9 a.m.-2 p.m. (see 11840).
DZH2—Manila, Philippines	9640	1,000	9.00 a.m.-4.00 a.m.
*CHMD—Sackville, N.B., Canada	9640	50,000	—
*COX—Havana, Cuba	9640	5,000	—
GVZ—London, England	9640	50,000	Signs 4 p.m.
HVJ—Vatican City, Europe	9645	25,000	4.00-4.30 a.m.
TIFC—San Jose, Costa Rica	9645	300	9.00 a.m.-5.00 p.m. (Missionary)
VLB2—Melbourne, Aust.	9650	100,000	8.00-9.30 a.m.
KRCA2—Los Angeles, U.S.A.	9650	50,000	7.15-8.45 p.m., 9.00 p.m.-2.15 a.m.
KRCA-3—Los Angeles, U.S.A.	9650	100,000	AFRS programmes.
TGNA—Guatemala City	9660	—	Eng. 2.00-2.15 p.m.
HED6—Schwarzenburg, Switzerland	9655	100,000	—
WEIN3—Vienna, Austria	9664	250	4.45 p.m.-12.05 p.m.
LIX—Buenos Aires, Argentina	9660	7,500	"Radio el Mundo."
VLQ3—Brisbane, Aust.	9660	10,000	8 a.m.-2 a.m.
GWP—London, England	9660	50,000	—
HVJ—Vatican City, Vatican	9660	25,000	News 6.15 a.m.
Radio Moscow, U.S.S.R.	9660	50,000	English, 6.30-7.30, 8.30-9.30 a.m.
HHBM—Port-au-Prince, Haiti	9660	1,000	"Nac. Broadcasting Co.," 10 p.m.-1.30 a.m.
JKI2—Tokyo, Japan	9655	5,000	10.25 a.m.-7.45 p.m.
KGEU1—San Francisco, U.S.A.	9670	50,000	—
Radio Vietnam, Saigon	9670	—	English 10.30 p.m.

Call and Location.	Freq. Kilo-cycles.	Power in Watts.	Schedule, Slogan, English News, Periods, etc.	Call and Location.	Freq. Kilo-cycles.	Power in Watts.	Schedule, Slogan, English News, Periods, etc.
GWT—London, England	9675	50,000	European Service, 7 p.m. 11 p.m.-4.30 a.m., 8.30-10.15 a.m., 4.30-4.45 p.m.	KGEI—San Francisco, U.S.A.	11730	50,000	9.00 p.m.-3.15 a.m. V.O.A.
Moscow, U.S.S.R.	9680	50,000	English news 7.15 p.m.	Talpeh—Taiwan	11735	—	English news 11.30 p.m.
VUD9—Delhi, India	9680	7,500	12.00-12.50 a.m.	*LKQ—Oslo, Norway	11735	5,000	"R.H.C. Cadona Azul,"
XEQQ—Mexico City, Mexico	9680	1,000	"Radio Panamericana," midnight-5.45 p.m.	COCY—Havana, Cuba	11740	1,000	11 p.m.-6 p.m.
EQC—Teheran, Iran	9680	14,000	"Radio Teheran," 5-7.30 a.m., news, 6.30 a.m. 8.00-9.00 a.m.	CEI174—Santiago, Chile	11740	—	Midnight-4 p.m. "Nuevo Mundo."
Tangiers 1—North Africa	9680	50,000	3.00-3.30 p.m.	Radio Pakistan, Lahore	11745	7,500	News midnight, 2.45-4.30 a.m.
VUD3—Delhi, India	9680	5,000	10 p.m., 2 a.m., 3-5 a.m.	GSD—London, England	11750	50,000	5.15 a.m.-3.45 p.m.
VUD6—Delhi, India	9680	10,000	"Radio del Estado."	VLG10—Melbourne, Victoria	11760	10,000	8.55-11.50 p.m.
LRA1—Buenos Aires, Argentina	9683	7,000	Pacific Service.	CKRA—Sackville, N.B., Canada	11760	50,000	
GRX—London, England	9690	50,000	English news 4.45 p.m.	VLB3—Melbourne, Aust.	11760	100,000	
LRA—Buenos Aires, Argentina	9690	100,000	10.30 p.m.-4.30 a.m.	VLG3—Melbourne, Aust.	11760	50,000	
Singapore, Malaya	9690	7,500	9.00 a.m.-5.00 a.m. (next day).	VLA8—Melbourne, Aust.	11760	100,000	
DYH5—Manila, Philippines	9690	250	9.45-11.00 a.m.	VUD11—Delhi, India	11760	20,000	7.00-8.00 a.m.
JKM2—Tokio, Japan	9695	5,000	"Voice of America" relays.	ZVB8—Sao Paulo, Brazil	11765	5,000	"Radiodifusora Sao Paulo," 1 a.m.-2.35 p.m.
GWY—London, England	9700	100,000	7.45 p.m.-2.15 a.m.	GVU—London, England	11770	50,000	European service.
KCBK2—Los Angeles, U.S.A.	9700	50,000	noon-3.00 p.m.	WRCA2—New York, U.S.A.	11770	50,000	8.15-10.15 a.m.
WLW08—Cincinnati, U.S.A.	9705	1,500	"Radio Martinique."	HP5G—Panama City, Panama	11780	600	5 a.m.-5 p.m.
Fort-de-France, Martinique	9705	1,500	"Radio Golcochea," 11 a.m.-3 p.m.	*XENN—Mexico City, Mexico	11780	500	"Radiomundial."
OAX4K—Lima, Peru	9712	250	10.30-3.30 a.m.	OIX3—Helsinki, Finland	11780	15,000	4.45 p.m.-12.5 p.m.
Radio Malaya, Singapore	9710	7,500	"Radio Nacional."	WEIN4—Vienna, Austria	11785	200	5-8.30 a.m.
PRL7—Rio de Janeiro, Brazil	9720	50,000	Noon-1.00 p.m. "Emissora Nacional."	YDF2—Jakarta, Java	11785	100,000	Eng. 7.00-8.00 a.m.
—Lisbon, Portugal	9727	10,000	11 p.m.-4 p.m., opens and signs in English. Missionary Opens 10 p.m.	VUD5—Delhi, India	11790	100,000	7.00-8.00 a.m.
CE970—Valparaiso, Chile	9728	1,000	3 p.m.-11 a.m.	GWV—London, England	11790	100,000	
DZH7—Manila, Philippines	9730	1,000	Midnight-5.00 p.m.	ZL3—Wellington, N.Z.	11780	7,500	6.00-8.45 a.m., 7.00-11.30 a.m.
Leipzig, Germany	9730	12,000	English to 4 p.m.	Radio France—Asie, Saigon	11785	12,000	English 1.00-3.15 a.m.
H12T—Ciudad Trujillo, D.R.	9740	7,500	4.15-4.45 p.m., 4.30-6.00 a.m.	Honolulu 1—Hawaii	11790	100,000	9 p.m.-2.15 a.m.
OTC2—Leopoldville, B. Congo	9745	50,000	Spanish to 5.15 p.m.	Tangiers 2—North Africa	11790	50,000	8.00-10.15 a.m.
CR7BE—Lourence Marques, Mos.	9755	10,000	6.00-8.00 p.m., 8.00-10.15 a.m.	WRUL1—Boston, U.S.A.	11790	50,000	12.30-3.00 p.m.
Khartoum, Sudan	9750	400	North American and Pacific Services.	Radio Batavia, Java	11795	100,000	
TGWA—Guatemala City, Guatemala	9780	10,000	English, 10 a.m. 11.10 a.m., 4 p.m.	JKL1—Tokio, Japan	11800	5,000	AFRS to 8.00 p.m.
Monte Carlo, Monaco	9785	25,000	"Radio Cadena Suaritos," 7.15-8.30 p.m. to N.Z. Missionary to 2 p.m.	KCBF—San Francisco, Calif.	11810	50,000	9 p.m.-3 a.m.
HS8PD—Bangkok, Siam	9790	2,500	3-3.15 a.m.	COBH—Havana, Cuba	11800	1,000	"Radio Cadena, Havana" to 5 p.m.
GRH—London, England	9825	50,000	English, 11.30 a.m.-5 p.m.	GWH—London, England	11800	50,000	
Budapest, Hungary	9830	100,000	Frequency check station. Freq. check	Rome, Italy	11810	10,000	9.00-9.20 a.m. News 10.20 p.m.
COBL—Havana, Cuba	9833	1,000	English news, 1.30 a.m. 2-2.15 a.m., 4-5.48 a.m. 4.30-5.30 p.m., 8.30-10 p.m.	VLG7—Melbourne, Aust.	11810	50,000	Midnight-1.45 a.m.
4VEH—Cap. Haiti, Haiti	9890	700	5.30-8.30 a.m. "Emissora Nacional."	HEU5—Berne, Switzerland	11815	100,000	7.15-8.45 p.m.
GRU—London, England	9915	50,000	English, 6.30-7.30 a.m. 5-7.15 a.m., 7.30-9 a.m. Closes 4 p.m. "Radio Nacional."	GSN—London, England	11820	50,000	Pacific service.
XDY—Mexico City, Mexico	9924	8,000	Fridays, 8.30-8.45 a.m. "Radio Teatre Estrella," to 4 p.m.	XEBR—Hermosillo, Mexico	11820	150	"Radiodifusora de Sonora," 2 a.m.-6 p.m.
HCBJ—Quito, Ecuador	9960	1,000	"Radio Buñes."	WGEO2—Scanectady, U.S.A.	11830	100,000	8.15-10.30 a.m.
WWV—Washington, D.C., U.S.	10000	10,000	North American service.	VLW3—Perth, Aust.	11830	2,000	3.30-10.15 p.m.
MSF—Rugby, England	10000	10,000	7-1.45 a.m.	VUD6—Delhi, India	11830	10,000	3.30-10 p.m.
SUV—Cairo, Egypt	10055	10,000	9 p.m.-midnight.	VUD8—Delhi, India	11830	7,500	Midnight-2.15 a.m.
Pelipng, North China	10260	—	7.00-8.00 a.m.	CXA19—Montevideo, Uruguay	11835	1,500	"Radio El Espectador," 11 p.m.-3 p.m.
ZIK2—Belize, Br. Honduras	10600	200	8.30-10.15 a.m.	Radio France—Asie, Saigon	11835	12,000	English 9.15-10.15 p.m.
Tananarive, Madagascar	10625	—	noon-3.00 p.m.	Aigers, Algeria, North Africa	11835	12,000	5.25-8 p.m., 5-11 a.m.
SDB2—Stockholm, Sweden	10780	10,000	3.55-6.30 p.m., 10.30 p.m.-3.00 a.m.	DUH5—Manila, Philippines	11840	400	News 10.00 p.m.
Ponta Delgada, Azores	11090	1,000	To N.Z. Sun. 8.45-10.30 p.m.	*GWQ—London, England	11840	50,000	
CS2MK—Lisbon, Portugal	11040	10,000	2.00-3.15 p.m. (Eng.) Eng. 2.30-2.45 p.m.	Paris, France	11840	100,000	7.15-9.30 a.m., 4-4.45 p.m.
Radio Moscow, U.S.S.R.	11630	50,000	"Radio Teatre Estrella," to 4 p.m.	*CXAS—Colonia, Uruguay	11840	3,000	News 3.30 p.m., 12.30 a.m.
GRG—London, England	11680	50,000	"Radio Buñes."	Prague, Czechoslovakia	11840	35,000	6.25-7.30 p.m., 4.00-10.00 a.m.
HUCT—Bogota, Colombia	11680	—	North American service.	LLK—Oslo, Norway	11850	100,000	7.00-8.15 p.m., 8.30 p.m.-2.00 a.m.
BCAF—Talpe, Formosa	11680	3,500	7-1.45 a.m.	VLB4—Melbourne, Aust.	11850	100,000	7.20-9 p.m., 12.30-5.30 a.m.
HVJ—Vatican City, Vatican	11688	25,000	9 p.m.-midnight.	VUD4—Delhi, India	11850	20,000	
HP5A—Panama City, Panama	11695	1,000	7.00-8.00 a.m.	DZH8—Manila, Philippines	11855	1,000	
Paris, France	11700	100,000	8.30-10.15 a.m.	CEI185—Santiago, Chile	11860	3,500	"Radio El Mercurio," midnight-3.30 p.m.
GWV—London, England	11700	50,000	noon-3.00 p.m.	KWID2—San Francisco, U.S.A.	11860	50,000	1.15 p.m.-2.15 a.m.
SBP—Stockholm, Sweden	11705	12,000	3.55-6.30 p.m., 10.30 p.m.-3.00 a.m.	GSE—London, England	11860	50,000	European service; also 11 a.m.-2.30 p.m., Spanish.
VLG3—Melbourne, Aust.	11710	10,000	To N.Z. Sun. 8.45-10.30 p.m.	ZPA3—Asuncion, Paraguay	11863	1,000	"Radio Telesco," 9.55 a.m.-2.05 p.m.
VUD5—Delhi, India	11710	100,000	2.00-3.15 p.m. (Eng.) Eng. 2.30-2.45 p.m.	HER5—Berne, Switzerland	11865	100,000	10.30-11.15 a.m., 7.15-8.45 p.m., 1.30-3 p.m.
WLW07—Cincinnati, U.S.A.	11710	75,000	"Radio Buñes."	VUD9—Delhi, India	11870	7,500	9.30-2.30 a.m.
WLW08—Cincinnati, U.S.A.	11710	75,000	North American service.	Munich 1—Germany	11870	50,000	6.00-10.30 a.m.
HEI5—Berne, Switzerland	11715	25,000	7-1.45 a.m.	VLH4—Melbourne, Aust.	11880	10,000	8-10.15 a.m., 6.30-8.30 p.m.
ZJM7—Limassol, Cyprus	11720	7,500	9 p.m.-midnight.	LRS—Buenos Aires, Argentina	11880	10,000	Eng. to 6.00 p.m.
CHOL—Montreal, Canada	11720	50,000	7.00-8.00 a.m.	Singapore, Malaya	11880	7,500	BFEB8, 9.15 p.m.-4.30 a.m.
Moscow, U.S.S.R.	11720	50,000	8.30-10.15 a.m.	XEHH—Mexico City, Mexico	11880	250	2 a.m.-5 p.m.
PRL8—Rio de Janeiro, Brazil	11720	50,000	noon-3.00 p.m.	LBR—Rocario, Argentina	11880	10,000	9 p.m.-2 p.m.
*GVY—London, England	11730	50,000	3.55-6.30 p.m., 10.30 p.m.-3.00 a.m.	VLA8—Melbourne, Aust.	11880	100,000	4.30-5.15 a.m.
*EQE—Teheran, Iran	11730	14,000	To N.Z. Sun. 8.45-10.30 p.m.	VUD11—Delhi, India	11890	20,000	1.30-3.00 p.m.
PHI—Hilversum, Holland	11730	20,000	2.00-3.15 p.m. (Eng.) Eng. 2.30-2.45 p.m.	Paris, France	11885	25,000	5-5.45 p.m., 6.30, 6.45 p.m.
			"Radio Teheran," 7-8 a.m.	GWV—London, England	11890	100,000	9.00 p.m.-3.45 a.m.
			"Radio Teheran," 7-8 a.m.	Manila 1—Philippines	11890	50,000	

Call and Location.	Freq. Kilo-cycles.	Power in Watts.	Schedule, Slogan, English News, Periods, etc.	Call and Location.	Freq. Kilo-cycles.	Power in Watts.	Schedule, Slogan, English News, Periods, etc.
Dakar, Senegal, Africa ..	11895	12,000	7.00-7.30 p.m., 6.00-11.00 a.m.	GWU—London, England ..	15210	100,000	7.30-8.00 a.m.
CE1190—Santiago, Chile ..	11900	1,000	11 p.m.-4 p.m.	Tangiers 1—North Africa ..	15210	50,000	5.15-9.30 a.m.
KEX—Mexico City, Mexico ..	11900	—	Heard 4 p.m.	WRCA5—New York, U.S.A. ..	15210	50,000	noon-3.00 p.m.
CXA10—Montevideo, Uruguay ..	11900	10,000	"Radio Electrica," 8.30 a.m.-2.15 p.m.	WBOS—Boston, Mass., U.S.A. ..	15210	50,000	4.10 a.m., 1-3 p.m.
KWID1—San Francisco, U.S.A. ..	119000	50,000	5.30-11.30 p.m.	VLG11—Melbourne, Aust. ..	15210	10,000	2.00-4.15 p.m.
QVX—London, England ..	11930	50,000	News, 10 p.m.	VLG11—Melbourne, Aust. ..	15220	50,000	8.00-9.45 a.m.
GVY—London, England ..	11955	50,000	8 a.m.-3.15 p.m.	PC12—Hilversum, Holland ..	15220	40,000	10-11 p.m. to N.Z.
Bucharcest, Roumania ..	11900	60	English 8 a.m.	ZL10—Wellington, N.Z. ..	15220	7,500	9.00 a.m.-6.45 p.m.
Rome, Italy ..	11900	50,000	—	JRD3—Tokio, Japan ..	15225	7,500	10.50 a.m.-7.45 p.m.
ZPA5—Encarnacion, Paraguay ..	11955	2,500	"Radio Encarnacion," 11 p.m.-2 p.m.	JBD4—Tokio, Japan ..	15235	7,500	11.15 a.m.-8.15 p.m.
Commercial Service, Radio, Ceylon ..	11975	7,500	11.30 p.m.-4.30 a.m.	YLS5—Melbourne, Aust. ..	15230	10,000	9.45-11.15 a.m.
Radio Moscow, U.S.S.R. ..	11980	50,000	English, 1.30-3.15 p.m.	YLS5—Melbourne, Aust. ..	15230	100,000	English, 1.30-3.15 p.m.
Brazzaville, French Eq. Africa ..	11870	50,000	5-7.30 p.m., 4 a.m.-1 p.m.	Rafco Moscow, U.S.S.R. ..	15230	50,000	Noon-1 p.m.
CE1180—Santiago, Chile ..	12000	1,000	"Radio Soc. Nac. de Agricultura," 11 p.m.-4 p.m.	*OLR5A—Prague, Czechoslovakia ..	15230	30,000	4.30-7.30 a.m.
Damascus, Syria ..	12000	500	5.00-6.00 p.m., 4.00-8.45 a.m.	WLW05—Cincinnati, U.S.A. ..	15240	85,000	4-4.45 p.m.
GRV—London, England ..	12040	50,000	10 a.m.-3.30 p.m. in Spanish.	Paris, France ..	15240	100,000	10.30 a.m.-8 p.m., 3-4, 4.35-5.40 p.m.
Budapest, Hungry ..	11910	100,000	Eng. 9 a.m., 11.10 a.m., 4 p.m.	VLG6—Melbourne, Aust. ..	15240	10,000	5.30-8.00 p.m.
EZES—Papeete, Tahiti ..	12080	800	4.15-5.00 p.m.	KRCA3—Los Angeles, U.S.A. ..	15250	50,000	7.15-8.00 p.m.
GRF—London, England ..	12090	50,000	GOS 7.00-10.00 p.m.	Manila 2—Philippines ..	15250	50,000	9.00 a.m.-6.45 p.m.
HI3X—Ciudad Trujillo, D.R. ..	12110	250	"Radiodifusora Oficiales 4 a.m.-2.40 p.m.	GSI—London, England ..	15260	50,000	—
TFJ—Reykjavik, Iceland ..	12235	7,000	2-2.30 a.m., Mondays English to 5 p.m.	WABC2—New York, U.S.A. ..	15270	50,000	10.40 a.m.-3.00 p.m.
HCJB—Quito, Ecuador ..	12455	10,000	1 a.m.-11.30 a.m.	Radio Pakistan, Dacca, Pak. ..	15275	7,500	V.O.A., 7.45 p.m.-3.15 a.m.
CS2W1—Paredo, Portugal ..	12400	300	"Sudan Broadcasting Service," 4-6 a.m.	Munich-1—Munich, Germany ..	15280	85,000	6.00 a.m.-10.30 p.m.
OMDURI—Sudan ..	13200	—	"Radio Africa," 7.00-9.55 a.m.	ZL4—Wellington, N.Z. ..	15280	7,500	3.30 p.m.-midnight.
EA9AA—Tangiers, Africa ..	14278	1,000	Frequency checks. Eng. 1.30 a.m.	VUD3—Delhi, India ..	15290	5,000	4.10-6.30 a.m.
WVY—Washington, D.C., U.S. ..	15000	1,000	Eng. 3.15 a.m.	VUD10—Delhi, India ..	15290	20,000	—
Peiping, China ..	15060	—	2.30-5.00 a.m.	LRA—Buenos Aires, Argentina ..	15290	25,000	Spanish to 6 p.m.
Addis Ababa, Ethiopia ..	15060	1,000	G.O.S. 6.00-8.00 p.m.	GWR—London, England ..	15300	50,000	9.15 p.m.-4.30 a.m.
Forrest Side, Mauritius ..	15060	1,500	—	Singapore, Malaya ..	15300	7,500	8.00-9.30 a.m.
GWC—London, England ..	15070	50,000	"Radio Central America," 6.00-8.00 p.m.	WRUL3—Boston, U.S.A. ..	15310	50,000	1.15-7.30 p.m.
CKLX—Montreal, Canada ..	15090	50,000	"Radio Teheran," English news, 11.30.	KCBR3—Los Angeles, U.S.A. ..	15310	50,000	—
HOXA—Panama City, Panama ..	15100	7,500	6.00-8.00 p.m.	GSP—London, England ..	15310	50,000	1.30-3 p.m.
EPB—Teheran, Iran ..	15100	14,000	Special Pacific broadcast to 5 p.m.	HEB9—Berne, Switzerland ..	15315	100,000	Eng. 2.00-3.45 p.m.
GWG—London, England ..	15110	50,000	10.00 p.m.-4.15 a.m.	Prague, Czechoslovakia ..	15320	40,000	4.45 p.m.-5.40 p.m.
HCJB—Quito, Ecuador ..	15110	1,000	5.30-7.45 p.m.	VLAS—Shepparton, Victoria ..	15320	100,000	4.30-11.30 a.m.
Colombo, Ceylon ..	15120	100,000	—	CKCS—Montreal, Canada ..	15320	50,000	4.45-5.45 p.m., 8.30-11.30 p.m.
KGE11—San Francisco, Calif. ..	15105	100,000	—	VLC4—Melbourne, Aust. ..	15320	50,000	1.30-3 p.m.
HED7—Schwarzenburg, Switzerland ..	15120	100,000	—	HE17—Berne, Switzerland ..	15320	25,000	1.30-3 p.m.
Commercial Service, Radio, Ceylon ..	15120	100,000	—	Radio Pakistan, Dacca ..	15330	7,500	English news, midnight.
Rome—Italy ..	15120	50,000	—	Honolulu 1—Hawaii ..	15330	50,000	9.00 p.m.-2.15 a.m.
KRCA1—Los Angeles, U.S.A. ..	15130	50,000	—	VGE01—Schenectady, U.S.A. ..	15330	100,000	4.00-10.30 a.m.
KCBR1—Los Angeles, U.S.A. ..	15130	50,000	—	Radio Pakistan ..	15330	—	Eng. 2 p.m., 7.30 p.m., midnight.
GSP—London, England ..	15140	50,000	—	Munich-2—Munich, Germany ..	15340	85,000	V.O.A., 7.45 p.m.-2.15 a.m.
ZYK2—Recife, Brazil ..	15145	—	—	Athens, Greece ..	15345	7,500	3.00-9.30 a.m., 10.30 a.m.-11.00 a.m.
Munich 11, Germany ..	15150	75,000	—	WRUL1—Boston, U.S.A. ..	15350	50,000	5.30-10.15 a.m.
YDC—Batavia, Java ..	15150	3,000	—	VUD8—Delhi, India ..	15350	7,500	2-6.30 p.m., 8.30 p.m.-1.30 a.m.
SBT—Stockholm, Sweden ..	15155	12,000	—	Paris, France ..	15350	25,000	Midnight-2 a.m.
OZH—Copenhagen, Denmark ..	15165	50,000	—	FHE—Dakar, Senegal ..	15392	12,000	7-8.30 a.m. In French.
VLG7—Melbourne, Aust. ..	15160	10,000	—	PZX5—Paramaribo, Surinam ..	15405	750	10-11.30 p.m.
ZYB9—Sao Paulo, Brazil ..	15160	5,000	—	Radio Moscow, U.S.S.R. ..	15420	50,000	English, 1.30-3.15 p.m.
VUD7—Delhi, India ..	15160	100,000	—	GWE—London, England ..	15435	50,000	5-6.30 p.m., 9.45-12.45 a.m.
Lisbon, Portugal ..	15160	10,000	—	Brazzaville, French Eq. Africa ..	15595	50,000	7.20-7.50 a.m.
KEWW—Mexico City, Mexico ..	15160	10,000	—	HEK5—Berne, Switzerland ..	15875	25,000	1.40-2.15 a.m.
ZYN7—Fortaleza, Brazil ..	15165	5,000	—	HEVJ—Vatican City, Vatican ..	17445	25,000	5-6.30 p.m., 9.45-12.45 a.m.
VLB11—Melbourne, Aust. ..	15160	100,000	—	Brazzaville, French Eq. Africa ..	17527	50,000	—
LKV—Oslo, Norway ..	15170	10,000	—	GVP—London, England ..	17700	50,000	11 p.m.-2 a.m.
*TGWA—Guatemala City, Guat. ..	15170	10,000	—	GRA—London, England ..	17715	50,000	GOS 8.00-10.00 p.m.
GSO—London, England ..	15180	50,000	—	GVQ—London, England ..	17730	50,000	7.00-7.40 p.m.
VUD5—Delhi, India ..	15190	100,000	—	VUD3—Delhi, India ..	17760	5,000	7.15-8.45 p.m. (UN.)
VUD5—Delhi, India ..	15190	100,000	—	Manila 1—Philippines ..	17760	50,000	4.30-9.45 a.m., 10 p.m.-2.30 a.m.
CKCX—Montreal, Canada ..	15190	50,000	—	OTC4—Leopoldville, Bel. Congo ..	17770	50,000	—
OIX4—Helsinki, Finland ..	15195	100,000	—	PHI—Hilversum, Holland ..	17760	5,000	—
TAQ—Ankara, Turkey ..	15195	25,000	—	Rome, Italy ..	17765	50,000	1.15-7.30 p.m.
VLB6—Melbourne, Aust. ..	15200	100,000	—	KCBR3—Los Angeles, U.S.A. ..	17770	50,000	4.00-10.30 a.m.
YLC—Melbourne, Aust. ..	15200	50,000	—	WRCA5—New York, U.S.A. ..	17780	50,000	8-8.30 p.m., Monday.
VLG6—Melbourne, Aust. ..	15200	100,000	—	HER7—Berne, Switzerland ..	17784	25,000	Eastern Service.
XECC—Mexico City, Mexico ..	15205	500	—	GSG—London, England ..	17790	50,000	7.15-8.45 p.m. (UN.)
DZH8—Manila, Philippines ..	15300	3,000	—	Honolulu 1—Hawaii ..	17800	50,000	Heard 2 p.m.
			—	Rome, Italy ..	17800	50,000	Music 9 p.m.
			—	OIX5—Helsinki, Finland ..	17800	100,000	5.30-9 p.m., 10 p.m.-1 a.m.
			—	GSV—London, England ..	17810	50,000	2.15-8.45 a.m.
			—	CKNC—Montreal, Canada ..	17820	50,000	3.20-10.30 p.m., 10.40 p.m.-1 a.m.
			—	VUD10—Delhi, India ..	17830	5,000	—
			—	TAV—Ankara, Turkey ..	17840	100,000	Opens 10.15 p.m.
			—	VLC9—Melbourne, Aust. ..	17840	50,000	2.00-4.00 p.m., 4.30-5.40 p.m.
			—	Paris, France ..	17850	25,000	2.30-3.30 a.m.
			—	GRP—London, England ..	17870	50,000	3.30 a.m.-5 a.m.
			—	WRCA5—New York, U.S.A. ..	17830	50,000	4.00-10.15 a.m.
			—	HCJB—Quito, Ecuador ..	17890	10,000	5.00-8.45 a.m. to Europe.
			—	GRQ—London, England ..	18025	50,000	—
			—	GVO—London, England ..	18080	50,000	—

Handy Hints and Kinks

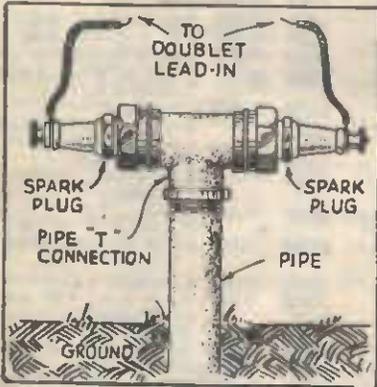
SUBSTITUTION GADGET



A quick and easy way of testing various radio components is shown below. Solder a Fahnestock clip on each end of a piece of twisted light cord. Cut one of the wires shorter than the other so that the clips cannot touch. Tin the opposite ends to serve as test prods. Resistors, condensers, coil, etc. are fastened to the clips.

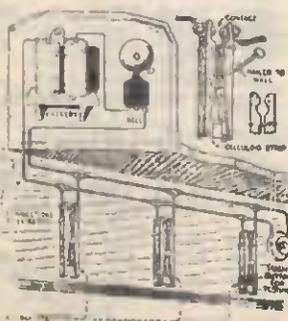
If you have test prods, double clips may be fastened to a 1 x 2-inch piece of bakelite, plastic or Masonite. The upper clips are used to connect to the spare parts, the lower ones connect to the test prods.

DOUBLET LIGHTNING ARRESTOR



Many "fans" have attempted to construct their own "doublet" antenna lightning arrestors and have not been successful. Therefore I am passing along my idea, which has worked out very nicely. It consists of two discarded spark-plugs, which should be thoroughly cleaned, eliminating all traces of carbon and corrosion. These are then placed into the two ends of a "T" connection, which in turn is screwed into the ground pipe. In my particular case a ground pipe 3ft. long proved to be sufficient. However, the length of this pipe will depend upon the type of earth it is embedded in, and in some cases a pipe as long as 10 feet may be required.

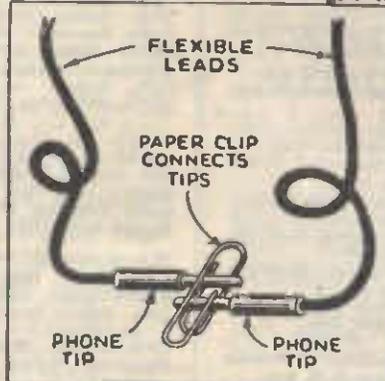
LOW COST FIRE-ALARM



Although the cost of this Fire-Alarm system is negligible, it insures adequate protection.

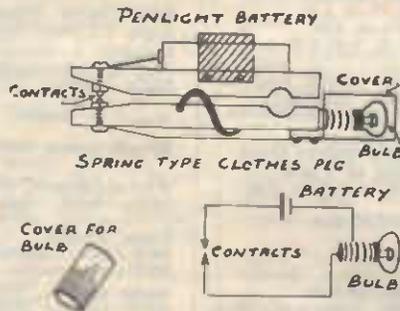
JIFFY CONNECTOR

It seems that there are no end of uses for the "old faithful" paper clip. I found that it serves excellently as a connector where tem-



porary test connections are to be made. While the drawing shows two phone tips held together with a paper clip, almost any connection may be made in a similar manner. Flexible wires, of course, as well as solid wires, may be joined together without the trouble of twisting them.

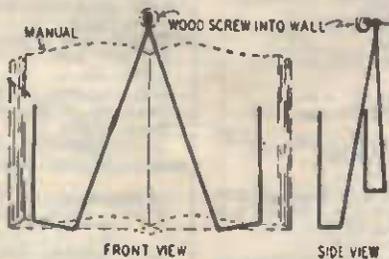
HANDY PIN-POINT SIGNALLING LAMP



KEEPING SOLDER OFF CHASSIS

To prevent solder from sticking to a chassis while making a joint on a tubsocket lug, rub the chassis with the end of a small candle. Any solder that falls will not stick to the waxed metal.

BOOK HOLDER



Books that are in use while a set is being serviced can be kept clean and out of the way by holding them to the back of the bench with a wire holder made from a wire coat hanger.

The hanger is cut in the centre of the horizontal wire, and the hook is removed.

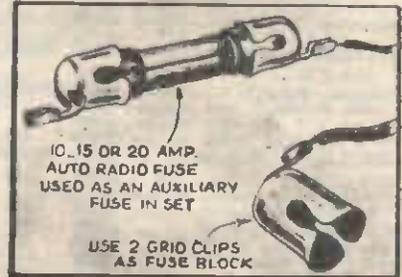
WIRE STRIPPER

A metal photo clip makes a good wire stripper for hookup wire. Merely put the wire between the jaws of the clip, squeeze them together, and pull the wire out fully stripped.

This clip is also very handy for holding ends of wire together for soldering.

NOVEL FUSE CLIPS

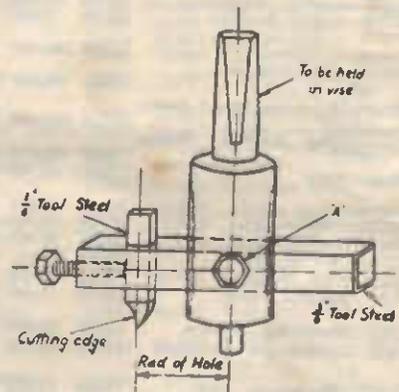
It is sometimes desirable, in a radio set or especially in measuring instruments, to use fuses of the cartridge type to protect the



apparatus from damage due to short circuit, overload or other causes.

In some cases there is not sufficient space for the usual fuse mounting. It will be found that the grid clips, sold for use on metal tubes, will fit perfectly on the caps of these small cartridge fuses and take practically no space.

SOCKET HOLES

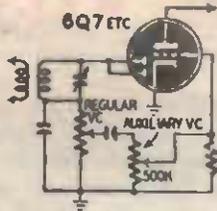


Ever spent hours cutting socket holes in chassis then filing them out to perfect (?) shape? Aluminum wasn't too bad, but steel always did present a problem. While factories use presses, these are not available to the radio service technician, who in the past has had to laboriously drill the holes out, or ruin a washer cutter on each hole. The socket hole cutter shown in the diagram can be used on steel chassis, because it uses a cutter similar to that used in a lathe. Dimensions are given so that radio service technicians can get one made up for themselves, but in the meantime, any live toolmaker who sees this drawing would be well advised to check the good market that awaits it.

REMOVING CONTROL KNOBS

When a control knob is hard to remove from its shaft, don't pry it off with a screwdriver, as this is likely to ruin the cabinet and break the edge of the knob. Wind a piece of heavy cord or thin rope once around the shaft in back of the knob, then pull the ends of the cord outward. The knob will come off without damage.

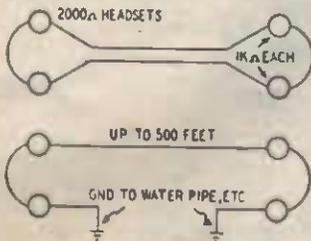
PRESET VOLUME



A preset volume control can be a blessing where loud radios are annoying. Children can be prevented from upsetting mother's nerves by running the volume up on the more blood-curdling programs.

The auxiliary control, wired as shown, is placed in any convenient position away from prying fingers. It may be screwdriver-set. Sets using variable bias as a volume control may be preset with a variable 3,000-ohm resistor placed in series with the regular control.

SOUND-POWERED TELEPHONE

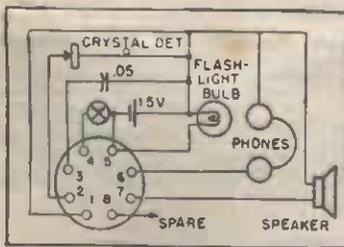


The sound-powered telephones used by the Armed Forces during the war were specially made to be very efficient but anyone can rig up a sound-powered telephone system with two pairs of ordinary, good-quality, high-impedance headsets. Results are excellent up to 500 feet.

Each set of phones should have at least 2,000 ohms impedance. Simply connect them together, either with two-conductor cable or by using a single conductor plus a good ground on each end. If one set of phones is spoken into, the sound will be heard in the other pair.

HANDY TESTER

This tester is made of parts assembled on a bakelite panel, the numbered ends of each part being connected to the prongs of an octal socket.



To make external connection, a phone tip end of the reed is inserted into the socket. The other end has a test prod.

USES

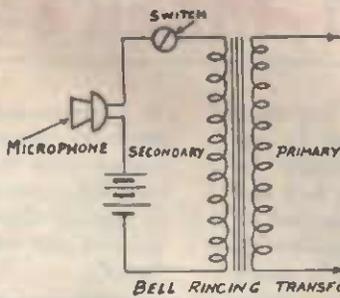
- 1 and 6. Test A.F. stages.
- 2 and 6. Test R.F. stages.
- 4 and 6. Test resistors.
- 4 and 5. Test condensers or wire connections.
- 4 and 1. Test dial bulbs.
- 1 and 7. Use of test speaker.
- 1 and 5. Test filament wiring. First remove all tubes, then contact test prods to filament prongs of each tube. If bulb lights normally tubes may be inserted.

I have found this instrument very useful in making quiet tests. A great advantage is that there are no expensive meters to damage or burn out.

HEADPHONE REPAIR

When headphones become defective, almost always one of the coils is found to be open. This coil can be shorted out, allowing the current to pass through the other coil. The phones are less sensitive, but still usable till replacements can be obtained.

SUBSTITUTE MIKE TRANSFORMER



A bell ringing transformer can be pressed into service as a microphone transformer. The primary (240 volt winding) is connected to the amplifier, the secondary 16 or 8 volt winding) to the microphone.

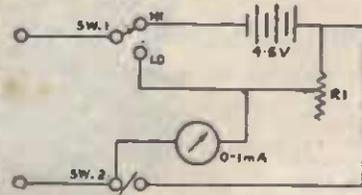
DENTAL MIRROR AID

Many points in the crowded space under the chassis of small sets are hard to examine. I use a dental mirror to get into these places. To insulate the handle of the mirror, a coating of tape is wrapped around it.

USEFUL OHMMETER

The circuit of a double-purpose ohmmeter reproduced below will interest radio technicians who have need of a simple ohmmeter that is capable of measuring both high and low resistors.

A 1.5 volt battery is used to operate the meter, and R1, a 500 ohms wire-wound variable resistor is the zero setting control in both cases. It will of course be necessary to cali-



brate the meter by using resistors of known value, but if a good quality meter is used, it will be possible to obtain ready calibrated scales for the high range.

The low range can be read to within 0.5 ohm with reasonable accuracy, and is therefore useful for testing coils and other low resistance components. Switches S1 and S2 comprise a single switch movement, such as a Vaxley. With Sw. 1 in the upper position, and Sw. 2 open, the meter will read high ohms. "Australasian Radio World."

MAKING METER SHUNTS

Although it is an easy matter to compute the value of meter shunts for the purpose of increasing the range as an Ammeter or MA meter, it is not so easy to make the shunt to the required value. A simple method which requires no preliminary calculation and which does not require the measurement of the finished shunt, is to place another meter in series with that to be shunted. Current is supplied from a battery and regulated by a series resistor in order to prevent overload of the meters. The shunt across the meter on which the range is to be altered should have a very low resistance to start with. The value of this resistance is gradually increased until both meters read the same value. Though this method is not highly accurate, it is quick, simple and close enough for service applications and it avoids the necessity of measuring or calculating the internal resistance of the meter. When making up the shunt, and changing its value, be sure to disconnect the battery, as with no shunt in place the meter will be damaged.

CLEANING CONDENSER PLATES

Condenser plates of the present-day radio are so closely spaced that we can no longer use the old stand-by (a pipe cleaner) for cleaning them.

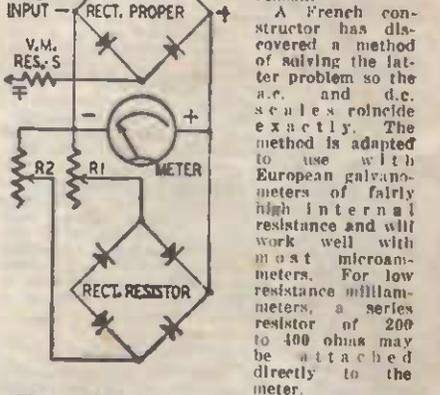
Wash between the plates with white gasoline, using a soft-bristled brush. A good absorbent photographic blotting paper, cut into strips about 1/2 inch wide, is then passed between each pair of condenser plates. This absorbs the unevaporated gasoline along with any dirt which may be present.

USING UNIVERSAL SCALE D/C METERS ON A/C—COMPENSATOR FOR A.C. METERS

The most common equipment for measuring weak alternating currents and voltages such as those produced in the audio section of a radio is the so-called rectifier-type meter. It is composed of a meter rectifier of the copperoxide or the newer high-frequency selenium type, and a microammeter or milliammeter. The greater number of measurements are of voltage, therefore a series resistor or resistors are necessary part of the apparatus.

Many instruments use the same D'Arsonval milliammeter or microammeter in conjunction with a number of series resistors and shunts to make a large number of different measurements. It is generally impossible to make the same scale read direct and alternating volts, as the rectifier-type meter measures the average current through the meter, and what is required is the effective current, which is slightly over 10 per cent higher. Thus d.c. readings on a rectifier-type a.c. meter are about 10 per cent too high, as the meter is calibrated to compensate for the rectified a.c. Conversely, if a meter is calibrated to read correct on d.c., its a.c. measurements will be too low.

This difficulty can be avoided at the expense of adding complication to the meter, by using a separate set of series resistors for a.c. voltage measurements. Their values are approximately 90 per cent of those for the corresponding d.c. ranges. Another difficulty still exists—the resistance of the converter is greater for low current intensities than for high. Some meters use special scale for a.c. for this reason.



The method is one of compensation. A second rectifier is used as a variable resistor bridged across the meter, as shown in the figure. A pair of resistors (R1, R2) which are variable from zero to approximately 10 times the internal resistance of the meter serve to adjust the unit. For greater ease of adjustment, the rectifier-resistor should be identical in type with the rectifier proper.

At low current intensities, the resistance of the rectifier cells is very high—running up to as much as 25,000 ohms for .01 milliamperes and 4,000 ohms for 0.1 ampere in one rectifier measured. The effect of the shunted rectifier on the meter is therefore negligible.

As the current increases, the internal resistance of the rectifier cells decreases, increasing the effect on the meter reading. It is thus possible to compensate rigorously for the non-linearity of the rectifiers, obtaining a linear scale.

ODD SIZE RESISTORS

When I cannot obtain an odd-size value of resistor, I make one as follows: Roughen the surface of a small strip of 1/32-inch sheet metal and paint a line with India Ink down the length of each side. Wrap two turns of No. 21 wire around each end of the strip and hold them in place with a conducting cement to assure a good connection. (This cement is made of powdered graphite mixed with coil dope to form a medium paste.) After the cement dries, coat the entire unit with thinned coil dope.

One resistor made in this way measured 47 megohms. Other values can be obtained by varying the amount of ink used or the size of the mica strip.

THE "IMPROVED HIKER'S ONE" KITSET

THIS set has stood the test of time and there are now thousands of Hikers Sets in use throughout the Dominion. Practically the only failures have been entirely due to bad and untidy workmanship. When making your set be neat, particularly with the coil and soldering. Attention to these points and success will be yours.

In country districts (away from powerful local stations) reception of all the main New Zealand stations and many Australians can be had in the evenings; whilst your nearest YA station will come in during daylight even in summer, and all this without the need of a large and expensive "B" Battery.

Still Tops the Poll as the most popular Kitset in New Zealand!

A ONE-VALVE BATTERY RADIO THAT REALLY "PULLS" THE STATIONS.

It's Easy to Construct — Cheap to Buy — and Economical to Run!

The ideal little Radio for a "boy's" room.

The Hiker's One Set, which we described in our 1937 Annual, proved to be one of the most popular of our Kit Sets. Hundreds of these little "Battery Misers" are in use every day all over New Zealand, in cities and bush countries and in backblocks where power is not available, and the average battery receiver expensive to run.

It was originally described to run off torch cells, and the components used were such as to cut down the weight as much as possible. The set was then used by hikers, trampers, and others, who have carried their Hiker's One from one end of New Zealand to the other.

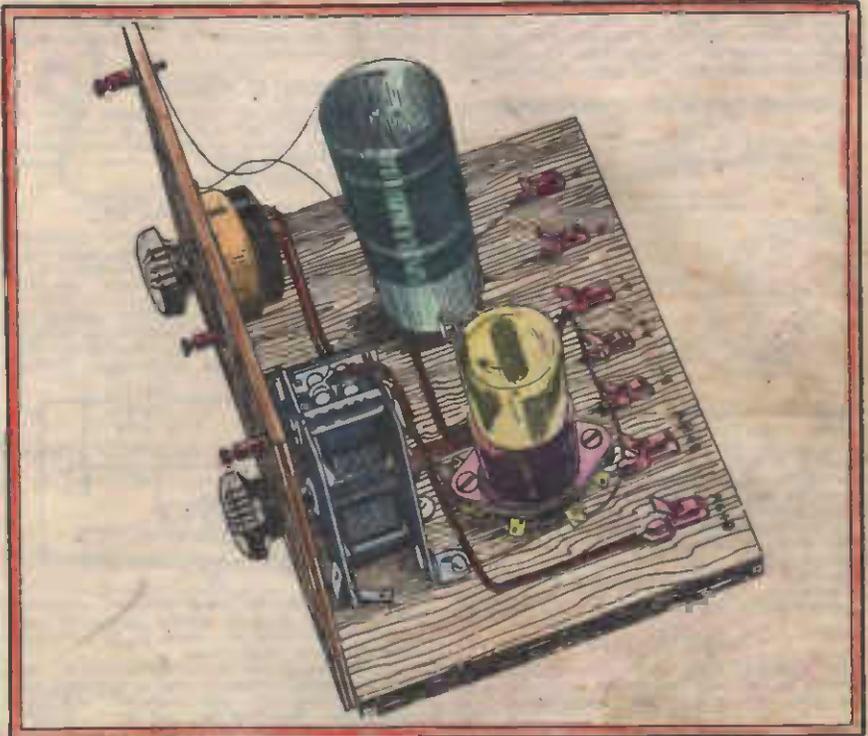
We recommend using the batteries listed for more satisfactory operation and life-lasting economy. In country districts (away from powerful "local" stations) reception of all the main New Zealand stations and many Australian can be had in the evening, whilst your nearest YA station will come in during daylight even in summer; and all this without the need of a large and expensive B battery.

CONSTRUCTIONAL DETAILS

First, screw the panel to the baseboard. Then slide the condenser up to the panel and mark the position for the hole to take the shaft. Now mark another hole on the opposite side of the panel in the same relative position for the potentiometer. Make both of these holes large enough to take the threaded bush on the condenser and the potentiometer. You can now mount these two, fastening them to the panel by means of the mounting nuts provided. Now mount the two terminals for the phones, making sure that the one nearest the tuning condenser does not touch the tuning condenser frame. This finishes the panel.

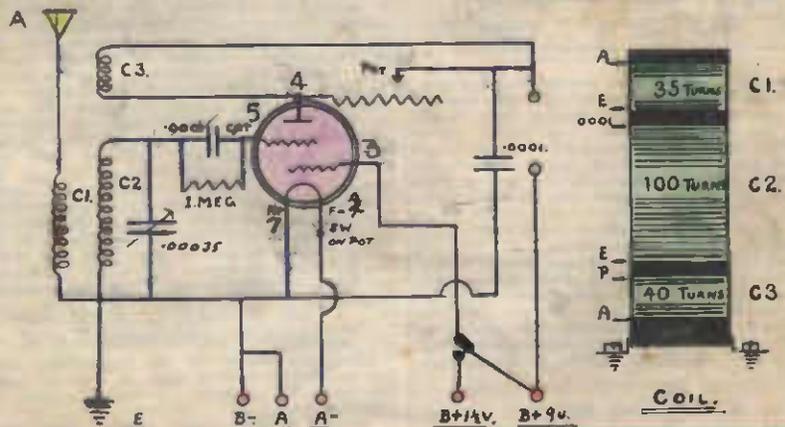
Next, drill seven holes through the baseboard and mount the Fahnestock clips. Looking at the back of the set, mark these clips from left to right as follows:— B+9V B+11V B- A+, A-, E, A. Screw down the valve socket behind the condenser.

Now the coil. It is essential that a neat job be made of this, otherwise tuning will be erratic and oscillation awkward to avoid. All three windings must be in the same direction and spaced 1/4 in. apart. Make a small hole 1/4 in. away from one end of the former and pass the wire through this twice, looping it the last time and leaving about 6 in. to connect up to the A terminal afterwards, finishing the end off by passing the wire through two small holes in the former spaced about 1/4 in. apart and leaving about 6 in. of wire for connecting up. 1/4 in. below this winding make two more small holes and commence the next winding of 100 turns.



finishing off the same as the first winding. The third winding is put on the same way 1/4 in. below the second winding and has 40 turns. You should now have about 1/4 in. former left below this winding to which the coil feet are attached. Do not mount the coil yet, but commence the wiring. All joints should be soldered—and not liquid solder or splirts of flux—use resin core solder for a good electrical joint and make sure that parts to be soldered

are clean, preferably sand papered clean. The following is a complete wiring list: All wires should be laid flat on the baseboard and be as short as possible. Neatness here will count a lot. Wire from the A- clip to one side of the switch on the potentiometer. Wire from the other side of the switch on potentiometer to E- on valve socket. Wire from centre contact on potentiometer to nearest phone terminal. Wire from the top of the third



THE BEST COSTS LESS AT THE "LAMPHOUSE" NEW ZEALAND'S LEADING RADIO & ELECTRICAL HOUSE

53
F-108
F-7
96
10

winding on coil, to centre contact of the potentiometer.

One side of .0001 mica condenser to frame of tuning condenser (the coil should now be mounted) and the other side also to the centre contact of potentiometer. Wire other phone terminal to clip marked B+3V. Wire B on valve socket to terminal marked B+1V. Wire from tuning condenser frame to P clip on valve socket and on to clip marked B on to A and thence on to E. The bottom of both the first and second coils are now also wired to E. Bottom of third coil to P connection on valve socket. Wire from left lug on potentiometer also to P on valve socket. Note that right lug on potentiometer is not used. Top of first coil to clip marked A. Top of second coil to fixed plate terminal on tuning condenser. Place resistor and remaining .0001 condenser side by side, and twist together the pin-tails of these and run the soldering iron along them. Connect one side of this combination to G connection on valve socket. Connect other side to fixed plate terminal on tuning condenser.

The wiring is now finished, all but the checking. It is important to check the wiring, as a mistake might mean burning out the valve. Put the knobs on the two shafts protruding from the front of the panel, and connect the phones to the phone terminals. Now connect the aerial (which must be a good one) and the earth (which also must be good) to the clips marked A and E respectively.

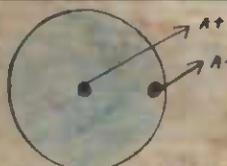
BATTERY CONNECTIONS

Clip A goes to side terminal on No. 6 Cell. Clip A+ goes to the centre terminal on No. 6 Cell.

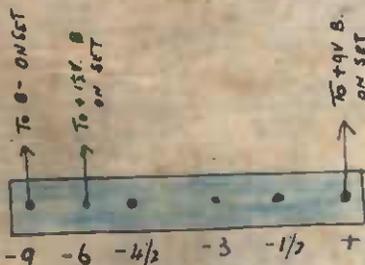
Clip B goes to the 0 volt socket on the C Battery.

Clip B+1V goes to the 6 volt socket on the C Battery.

Clip B+3V goes to the + socket on the C Battery.



No. 6 1.5 volt BATTERY
WIRES go TO A+ + A - ON SET



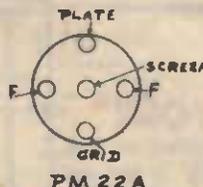
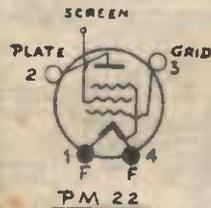
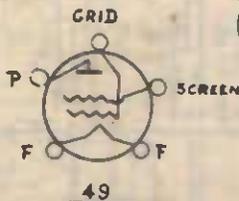
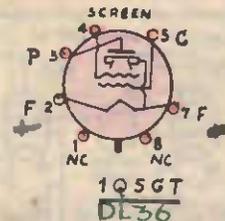
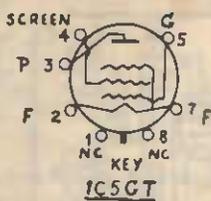
9 volt BATTERY.
Diagram showing Battery Connections to Hiker's One

The last three connections may seem wrong, but you must remember a C battery is usually used for giving negative bias to valves, and consequently, marked with one + socket and tapped sockets. Actually the -9 socket gives us -0V; the -7 1/2 V socket gives us +1V and the +0V socket gives us +3V. In operation it might be found necessary to increase B+1V to 3V or 4V to obtain satisfactory oscillation. If this is so, move the connection from -7 1/2 V to -6 or -4 1/2 sockets.

OPERATION

Turn the volume control clockwise to the point just before the set goes into oscillation. Should you advance this control too far, a

ORDER YOUR KIT NOW



UNDER SOCKET VIEW.

NC shown on 1Q5GT and 1C5GT Valves = No Connection

RANGIPO, National Park.
"I have to acknowledge receipt of the Hiker's One Radio Set recently sent to me, and desire to thank you for the prompt manner of delivery. Your official receipt with 9d. In stamps is also to hand. The set has been giving excellent results, considering the distance I am from main stations, the best reception being received from Auckland and 3ZB Christchurch.—(Sgd.) D.B.L.

NELSON.

"I am getting wonderful results from the improved Hiker's One. I have logged 18 different stations so far, and I am very pleased with it."—(Sgd.) P.H.

NELSON.

"Incidentally, the Hiker's One which I purchased from you in January for a friend is now going great guns, and he is well satisfied with it."—K.M.

whistle will be heard in the phones, which indicates the set is oscillating. To operate a set in this condition not only causes interference in near-by receiving sets, but is also an offence against the broadcasting regulations.

In conclusion, may we wish you 365 days and nights of good reception with your "Hiker's One."

"My Hikers One is going wonderfully and I have never seen such a wonderful little set before. I have had the following stations on my Radio:—

Invercargill, one or two Dunedin stations, Christchurch, Greynouth, Napier, Rotorua, one or two Auckland stations and for that matter one or two Wellington stations, too, and two could send me the details of the "Octal" Hikers Two."—G.S.Mc., Invercargill.

Parts List

- 2 .0001 mfd. Mica Condensers
- 1 1 meg. Resistor
- 1 Variable Single Gang Condenser .00035 or .0005 mfd.
- 1 500,000 Potentiometer with Switch
- 9 Fahnestock Clips or Terminals
- 1 Valve, 49, 1Q5GT, 1C5GT
- 1 Valve Socket
- 1 1 1/2 in. x 3/4 in. Coil Former
- 1oz. 32 gauge Enamelled Wire
- 2 Coil Feet
- 14 Wood Screws
- 2 Nuts and Bolts
- 1 Coil Pushback Wire
- 1 Baseboard
- 1 Panel
- 2 Knobs
- 1 1 1/2 v. Dry Cell
- 1 9v. C. Battery

COMPLETE KIT OF PARTS WITH OCTAL TUBE AND BATTERIES—
Cat. No. AK2004 **£2/5/-**

Would you kindly forward me your latest Annual. Incidentally, the Hikers One which I built up is going perfectly. I have received the following stations:—

1YA, 1ZB, 2ZB, 3ZB, 4ZB, 1YZ, 2YZ, 3YZ, 4YZ, 1XH, 2YC, 2ZA, 2XN, 2YZ, 3VA, 4VA, 1YD, 2XP, 1AB, 2WL, 2NW, 2JV, 2NA, 2HD, and several other Australian stations.—Mr. A. F., Upper Moutere, Nelson.

The other week I made a Hikers One from spare parts using a 1Q5GT Valve. I received the following stations:—

1YZ, 2YA, 1YA, 4YZ, 3YA, 2YZ, 4YA, 2XD, 2YC, 1YC, 2XN, 3YZ, 2YD, 4XD, 1ZB, 4YC, 3YC, 1YD, 2ZA, 3ZB (N.Z. Stations), 2FC, 2LF, 2KC, 3AV, 4QB, 72L (Australian).—W.P., Nelson.

I wish to inform you that for the last two years I have been using one of your excellent "Hikers One" and am sending you a list of stations I have received during that time. They are as follows:—

1ZB, 2ZB, 1YA, 2YA, 3YA, 4YA, 1YC, 2YC, 1YD, 1XH, 2YZ, 3SR, 2FC, 2BH.

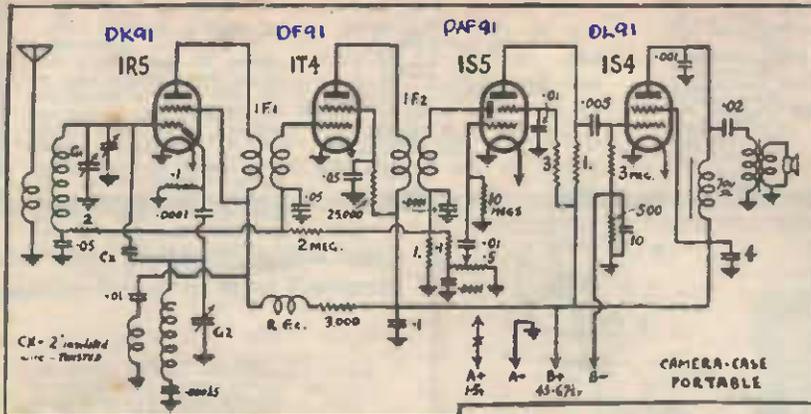
I have just completed building the Octal Hikers Two as described and can use it as a portable using a Loop Antenna and I have heard Auckland and Christchurch on a speaker in daylight using the set as a portable.

In conclusion I wish to thank you for your prompt attention to my mail orders over the past year.—R.G., Wellington.

I am so pleased with its performance that I am going to build a Hikers Two.—Mr. B. T. L. J., North Auckland.

LAMPHOUSE" RADIO BOOKLETS ARE INTERESTING AND INSTRUCTIVE
CIRCUIT BOOK 2/6 — INSTRUCTION COURSE 2/6 — DATA BOOK 3/6

SEVEN GOOD CIRCUITS

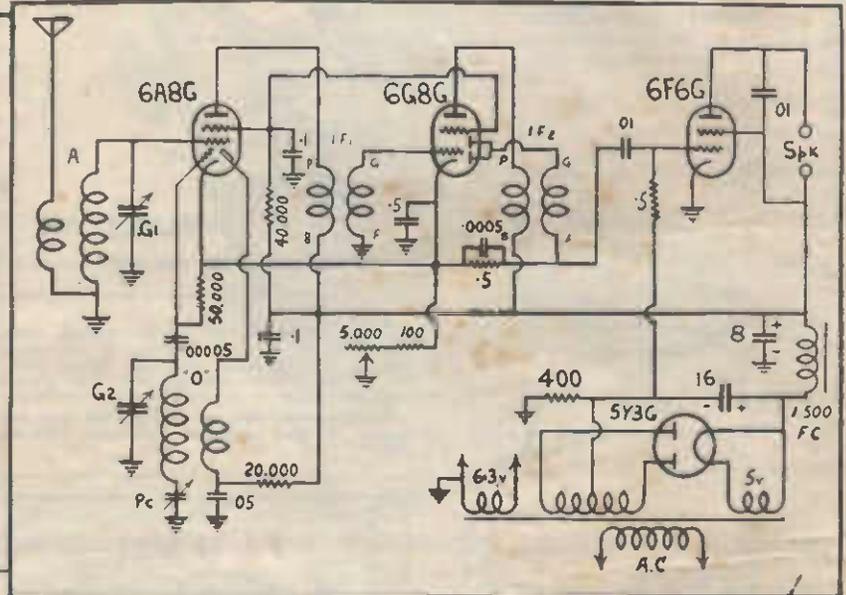


"CAMERA-CASE" PORTABLE

This is a good little circuit taken from the "Australasian Radio World" of a midget Portable. The valves used are the 1.4 volt miniature types which though small in physical size give excellent results.

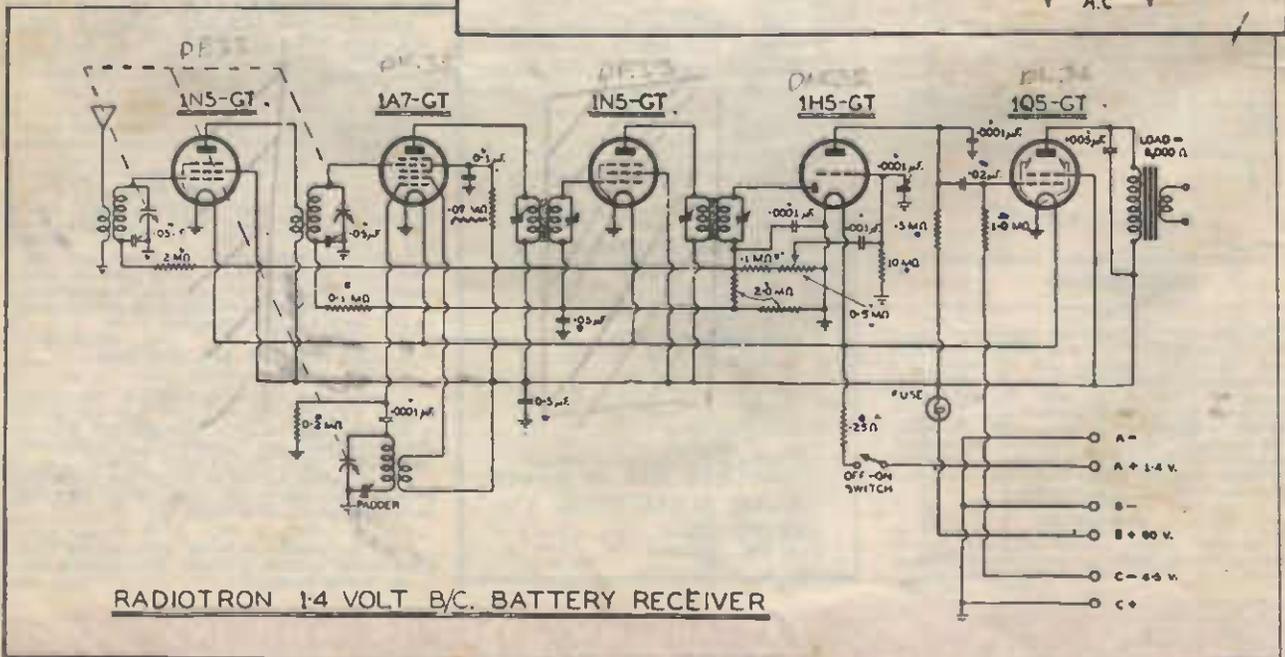
"RADIO WORLD FOUR"

A four valve Electric Receiver of conventional design. The wiring is straight forward and the circuit is devoid of "frills". Would make up into a nice bedroom receiver or local broadcast set.

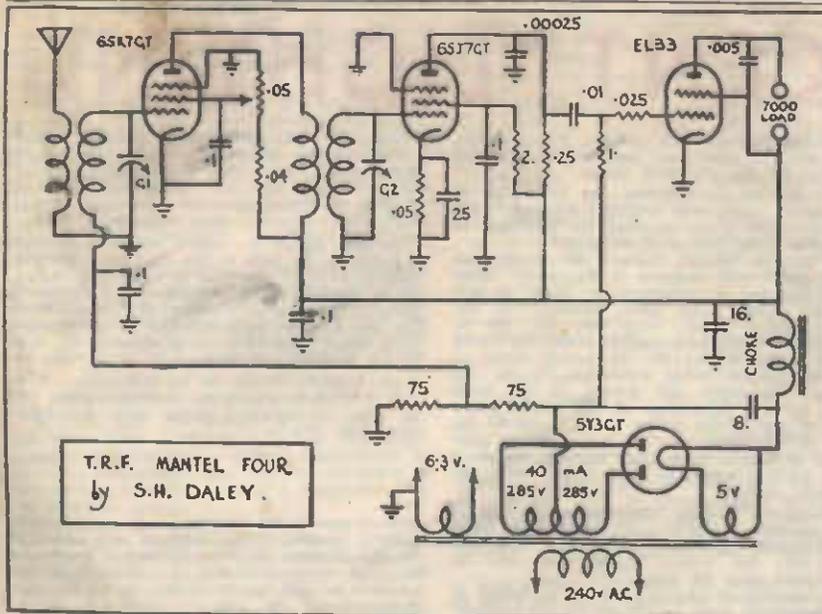


"RADIOTRON" Battery 5

5 Octal 1.4 volt tubes giving maximum output. Could be used as a Portable or as a permanent radio for localities where the power is not connected.



RADIOTRON 1.4 VOLT B/C. BATTERY RECEIVER



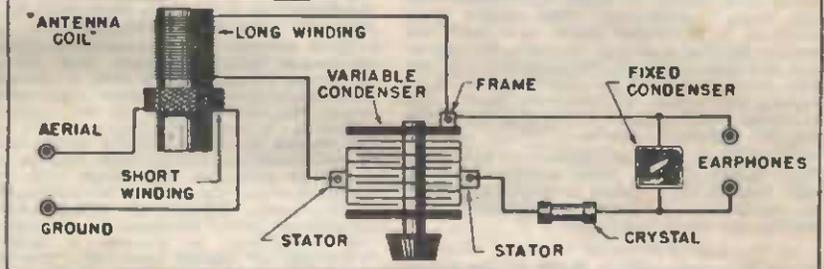
T.R.F. MANTEL FOUR
by S.H. DALEY.

"T.R.F. MANTEL 4"

A 4 valve A.C. Model also featured in "Australian Radio World" magazine. Incorporates a Philips EL33 as output tube, the other three tubes being American types. Another good local receiver.

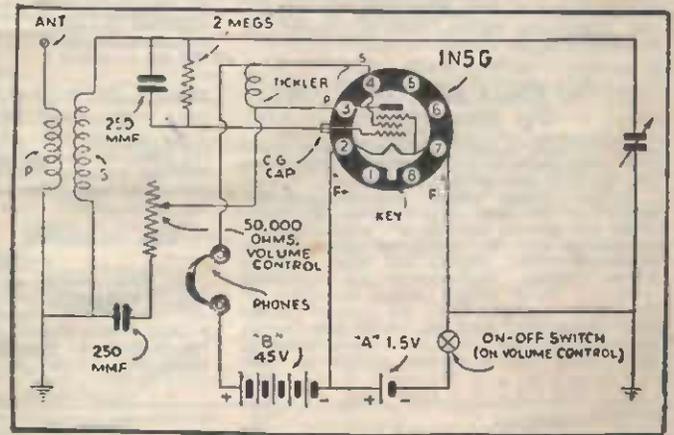
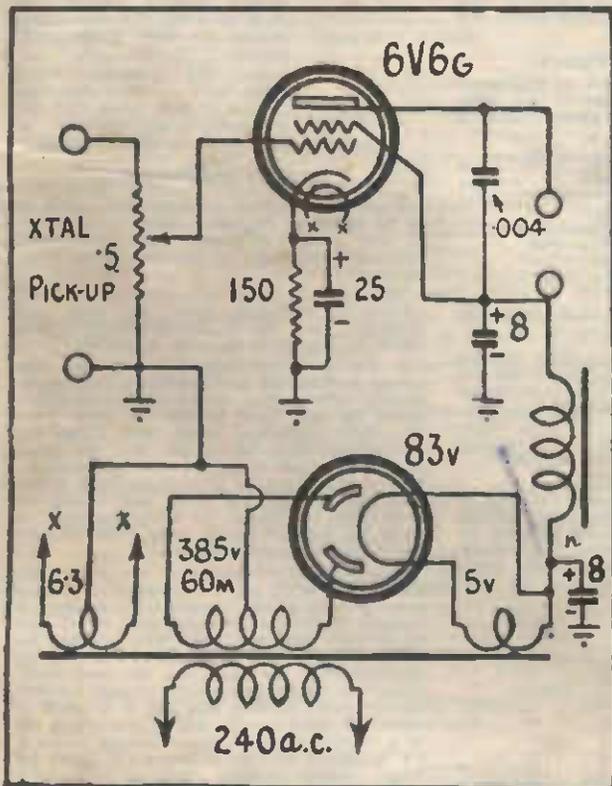
SUPER CRYSTAL SET

An American super Crystal Set circuit using the latest Germanium Crystal (Type 1N34 or equivalent). Other types of Crystals can also be use in the circuit but naturally will not give the performance of the 1N34. The illustration shows the neatness of the receiver mounted on a perspex base.



"RAHOB SINGLE"

One valvers are still just as popular as ever with the constructors. The "RAHOB SINGLE" is a proven circuit capable of giving excellent performance with the minimum of battery drain. The schematic diagram is clearly drawn and should not present any difficulties to constructors who have previously built Crystal Sets or the like.



SINGLE VALVE GRAM. AMPLIFIER

mpact Amplifier with low output for reproducing recordings. The volume would be room strength level and the circuit is the height of simplicity. Originally published by "Radio and Hobbies".

FLUORESCENT LIGHTING

IN the ten short years since fluorescent lighting made its public debut, this new form of illumination has so thoroughly demonstrated its value and effectiveness that it now demands thoughtful consideration for all lighting installations in stores, offices, schools, and factories. For home lighting, too, it has become an increasingly important factor because of the pleasant, efficient, and decorative illumination it provides. One basic reason for this increasing acceptance is a greater interest in and a demand for better seeing conditions in all fields of human endeavour, a demand which, incidentally, has resulted in a steady increase in the use of incandescent lighting as well. The use of fluorescent lighting, however, shows a much greater proportional increase, featuring a rise in lamp sales in the U.S.A. from 200,000 units in 1938 to 76,500,000 units in 1947.

Behind the phenomenal growth in the acceptance of fluorescent lighting is the fact that for many purposes it provides a better and more natural type of illumination. There also is a very real economic factor, because, generally speaking, fluorescent lighting can produce more foot-candles of illumination with the same power consumption or equal illumination with less power consumption. The colours made available by fluorescent lamps have made this type of lighting especially desirable for decorative or special-purpose illumination. In the field of merchandising this has proved to be an impetus to sales of consumer goods and, naturally, merchants have been demanding this effective adjunct to display.

Because of the heavy demand of fluorescent units for commercial users, straight after the war manufacturers found it almost impossible to concentrate on producing something more finished for home lighting.

In the past few years, however, manufacturers have been able to make up the leeway and now with improved designs and construction and also a greater appreciation of its value by the general public, fluorescent units are becoming more and more popular in the home. This is borne out by the fact that today fluorescent lighting is used in more than 15 per cent. of American homes. It must be pointed out, though, that such use is as a supplement to incandescent lighting.

In the opinion of home lighting experts fluorescent lamps have brought an entirely new concept of illumination. Increased acceptance in the future for fluorescent lighting in homes will be facilitated, without doubt, and manufacturers are endeavouring to improve the appearance, styling, and performance of fluorescent lamps for the home.

SAVING POWER WITH FLUORESCENT LIGHTING.

MEMORIES of power cuts over past years make it natural to be apprehensive about the effects of electricity restrictions this winter. Domestic users account for a large percentage of the total lighting load. To them, under the general heading of "non-industrial" consumers, may be added the great number of shops, offices, schools, and other premises whose lighting requirements are somewhat similar. These people know something of fluorescent lighting, but the present power shortage—coupled with the recent introduction of new fluorescent lamps particularly suited to their needs—has made the subject of more

immediate interest than before. The new 2ft. 20W and 40W sizes have been joined still more recently by the 3ft. 30W lamps.

In terms of light alone, the advantage of fluorescent lamps over tungsten filament lamps of comparable power consumption is shown in the table at the bottom of the page:—

To take a typical example of an average living room with tungsten or fluorescent lighting, a common arrangement of three 60-watt tungsten lamps gives 1,850 lumens. If the user replaced them with two 2ft. 40 w. fluorescent lamps (operated in series) he would obtain 2,320 lumens for an actual input of 100 w. (20 w. being accounted for by the choke). He might well decide, on the other hand, to take advantage of the higher efficiency of one of the longer lamps, such as the 4ft., 40 w., when, for 52 actual watts consumed he would have 1,720 lumens, compared with 1,850 lumens for 180 watts with the tungsten lamps.

Taking the average time the lamps burn at the customary figure of 1,500 hours in the year, the tungsten lamp user would consume 270 units, but the owner of the 4ft. 40 w. fluorescent only 78 units.

The balance is weighted further in favour of the fluorescent lamp by its longer life—several times that of a tungsten lamp—and the consequently lower replacement costs.

It is natural for the intending owner of fluorescent lighting to ask how soon his saving on electricity bills will counterbalance the higher costs of fluorescent lamps and fittings. So much depends on the nature and extent of the installation that a specific answer can hardly be given, but a useful general basis for comparisons has been evolved in the shape of costs per lumen-hour. A typical calculation on these lines shows that even after allowing £12 for the fittings and gear to run an 80 w. fluorescent fitting, the cost per lumen-hour is actually a little less (.000146d. as against .000158d.) than for a 200 w. gas-filled installation against which no fittings are charged, and which furnishes only an average of 2,880 lumens throughout life compared with 3,040 lumens.

FLUORESCENT CHEMICALS.

To obtain the various colours in fluorescent lighting, several chemical powders are used.

The phosphor used to give these colours is listed below:—

Phosphor.	General Colour.
Calcium Tungstate	Blue
Magnesium Tungstate	Blue-white
Zinc Silicate	Green
Zinc Beryllium	Yellow-white
Cadmium Silicate	Yellow-pink
Cadmium Borate	Pink
360 BL phosphor	Blue Ultra

EFFECT OF FLUORESCENT LIGHTING ON ROOM COLOURING.

We show on the next page a table showing the effect on various room tonings of the two different coloured fluorescent tubes now in use—daylight and white—and the ordinary tungsten lamp.

HOW TO DECIDE ON FLUORESCENT LIGHTING.

We have worked out a simple equation so that a prospective user of fluorescent lighting can work out the number of tubes required for a room, office, factory, or wherever this lighting is desired. The following formula determines the number of foot candles in com-

parison with the size of tube and the size of the room in which the tubes are to be installed:—

$$\text{Foot Candles} = \frac{\text{Lumens} \times .5}{\text{Area of room} \times 1.43}$$

Lumens equals the output of the tube (this is taken to be 3040 in the case of a 5ft. 80w. tube or 1720 for the case of a 4ft. 40w. tube). .5 is taken as the co-efficient of utilisation factor. This varies considerably from .39 to .70, but we have determined .5 as the average. Area equals area of room in square feet. 1.43 is the depreciation factor.

An example would be as follows:—
If a 5ft tube was to be used in a room 10ft X 10ft, the equation would work out something like this:—

$$\text{Foot Candles} = \frac{3040 \times .5}{100 \times 1.43}$$

This would be equivalent to approximately 10.5ft. candles. The technical committee of the Illuminating Engineering Society has issued a small table indicating the number of foot candles for the various classes of work. Recommended

Foot Candles.	Class of Task.
3	Casual observation where no specific work is performed.
4-5	Work of simple character not involving close attention to fine detail.
7-8	Less exacting visual tasks such as general office, large assembly work and class rooms.
10	Visual tasks such as reading, writing, detailed office work and sewing of light goods, retail shops.
15	Prolonged critical visual tasks such as proof reading, type setting, drawing, reading, fine machine work, fine assembling, sewing on dark goods, large stores.
20-25	Severe and prolonged visual tasks such as fine engraving, sewing of dark goods and discrimination or inspection of fine details of light contrast.

EFFECT UPON HEALTH.

From time to time questions are raised as to the effects of fluorescent lamps upon health. It may safely be stated that the modern fluorescent lamp has no harmful effects whatsoever.

Two possible causes of trouble are harmful ultra-violet radiation from the lamp and poisoning from the fluorescent powders with which the inside of the tube is coated.

It has been conclusively proved that the energy radiated by a fluorescent lamp has no harmful effects either to the eyes or the skin. While the arc itself is rich in short wave ultra-violet radiation, which can cause eye trouble and blistering of the skin, the glass tube absorbs this completely and none escapes. The small amount of ultra-violet light which does pass through the glass, and which can cause some fluorescence of active materials, is all in the near UV region (long wave) and has absolutely no harmful effects.

A number of complaints of eye trouble resulting from work under fluorescent lamps have been investigated by competent authorities in England, and in no recorded case has it been found that the light itself has damaged the eye. In almost every instance it has been the application of the lamp, not the lamp itself, which has caused the trouble. Lamps mounted too low down so that they are in the field of view will cause trouble due to glare, and this is a fruitful cause of dissatisfaction. Again, an insufficient number of lamps may cause eye strain, merely because there is not enough light for the work. A recorded instance of eye trouble due to fluorescent lamps in a printing works was cured not by removing the lamps but by doubling the number installed.

When it is considered that there are millions of people working continually under millions

Tungsten.		Fluorescent.		
Watts.	Lumens.	Rating.	Actual watts*	Lumens.
15	107	—	—	—
25	195	—	—	—
40	312	—	—	—
60	550	One 3ft. 30W.	42	1260
75	740	Two 2ft. 20W.†	52	1240
100	1094	One 4ft. 40	52	1720
150	1855	Two 2ft. 40 †	100	2320
200	2572	One 5ft. 80	100	3040

* Includes power loss in choke.

† Lamps in series.

of fluorescent lamps it will be obvious that if any harmful radiations were present the complaints would be more widespread than they are.

Publicity has been given to the possibility of poisoning from the powder coating inside the tube. It must be admitted that the earlier fluorescent lamps used as an active agent a beryllium compound with some toxic effects. However, during the last two or three years the principal lamp manufacturers have used an entirely different and non-toxic compound, which is, incidentally, considerably more efficient.

The modern fluorescent lamp can therefore be handled with complete confidence, but when handling broken lamps known to be more than two years old it is wise to exercise caution, so that the powder is not inhaled into the lungs or allowed to enter cuts or abrasions of the skin.

SERVICING FLUORESCENT UNITS.

Ballast, tube and starter switch—these are the three units requiring service in fluorescent lighting installations. Since the ballast is more or less trouble-free, common servicing is simply a matter of replacing a burnt-out tube or defective starter.

The tube: Both ends of the tube are alike. The electrode or filament furnishes a terminal for the arc and originally is covered with an electron-emissive material. This is dissipated during the life of the lamp and is deposited inside the tube, causing the familiar end blackening, which is a fair index of the "life expectancy" of the lamp. Early end blackening indicates faulty starting.

Lamp blinking: Near the end of life, the electron-emissive deposit on tube filaments is exhausted, the filaments are no longer self-sustaining and a cycle of blinking continues until either lamp or starter ceases to function. To prevent blinking, auxiliary equipment was added to the glow switch, making a double switch, the second turning off the first when the fixture is not functioning properly.

Radio interference: Direct radiation from the tube is eliminated easily by simply moving the

Colours of Paints Tested.	Daylight F.	White F.	Filament (100 w.)
Cascade blue	Bluish green (preferred)	Greyish green	Yellowish faded blue
Palmetto green	Fresh blue green (preferred)	Yellowish grey	Yellowish pale green
Peach	Good—slightly Good slightly pink	Normal—slightly cold	Normal—same as white
Blossom pink	Purplish pink	Yellowish	Yellowish
Maize tan	Greyish—cold	Yellowish	Strongly yellow
Sun tone	Faded grey	Slightly greenish	Cream—good
Deep cream	Bluish—excellent	Intensified—good	Yellowish—fair
Governor's red	Slightly bluish—good	Yellowish—good	Yellowish—good
Deep blue	Vivid—good	Richer—good	Greyed
Dusky rose	Bluish	Yellowish	Yellowish
Deep yellow	Greyish—unattractive	Vivid	Reddish

lamp or radio. Line feed-back can be cut to a very low level by connecting a small condenser across the line. Special condensers are made for this purpose. Ground the free end of each condenser to some part of the fixture.

Ballast hum: Correction for ballast hum often is made by simply tightening loose screws holding the ballast. A rubber shim under the ballast will give a more positive reduction of noise. For complete elimination of noise, the ballast can be moved any reasonable distance from the lamp without affecting its performance. As a general rule, keep ballast within 50ft. of lamp, avoid damp locations and air temperatures of 120 deg. F. and above.

Stroboscopic effect: This should not be confused with an actual flicker or blink. Stroboscopic effect shows itself on moving machinery, where, when the moving part and the lamp cycle happen to be timed just right, rotating parts may appear to stand still or to rotate

backwards. The highest correction is obtained by using two lamps arranged so that one is "off" while the other is "on." However, a two-lamp fixture is not insurance against stroboscopic effect. Many two-lamp fixtures are two single lamps, each with separate ballast. Current surge of each lamp is the same. Stroboscopic correction is made only with a two-lamp high power-factor ballast.

HOW DOES LIGHTING AFFECT PRODUCTION?

Light and lighting are just as intimately and complexly associated with the quality and quantity of useful work done as vision and seeing are. Some effects are obvious but most of them are subtly accumulative over long periods for the benefit or to the detriment of everyone concerned. It is axiomatic that if light and vision are co-operating to make seeing efficient and easy, users of eyesight will be best served and they in turn will serve best.

WHAT IS GLARE AND WHY DOES IT AFFECT SEEING?

Glare is a rather indefinite term which must eventually be divided into various components. It is applied to light or brightness which decreases visibility and ease of seeing. Seeing is an activity of the entire human being and, therefore, glare is distracting in various ways. It not only decreases the sensitivity of the visual sense but also causes muscular, neural and mental strain. A bridge must carry its own weight and still be able to carry an additional useful load. The inevitable useless weight should be minimized and unnecessary useless load, after due esthetic considerations, should be eliminated. So it is with lighting and seeing conditions. Unpreventable glare should be minimized and preventable glare should be eliminated.

FLUORESCENT LIGHTING IN THE FUTURE.

In conclusion, the temptation to consider the future development and influence of fluorescent lighting can hardly be resisted; the possible tube developments and the range of applications are so considerable that he would be an unusual engineer or designer who did not at some time turn his thoughts to what may come. The day should not be far distant when lighting in your home, built-in fluorescent lighting, can be "tailor made."

FLUORESCENT-LAMP, TROUBLE-SHOOTING CHART

FAULT.	POSSIBLE CAUSE	REMEDY.
Lamp Blinks (This fault should be corrected at once to avoid undue wear on lamp and starter)	End of Life (Normal life is 2500 hours) Defective Starter Loose Contacts With New Lamp: May be caused by Defective Lamp With Plug-in Fixtures: Loose Connection at Plug	Install New Lamp Test with New Starter Check Contacts at Lamp Ends Check with a Lamp Known to be Satisfactory Check Plug. Try New Plug-in Test from Different Outlet.
Poor or Slow Start	Usually Defective Starter Cold Weather (Fluorescent lamps are unsatisfactory below 50deg. F.)	Replace Starter. Shield Lamp
No Start	Lamp or Starter or Circuit Defective	Check Lamp, Starter, and Circuit in order named.
Ends of Lamp Remain Lighted	Defective Starter	Replace Starter
Ballast Hum	Normal. Most Pronounced in Cheap Single-lamp Ballast	Insulate with Rubber Base. Tighten Screws. Be sure Ballast has some means of Ventilation
Radio Interference	Direct Radiation from Lamp or Line Feedback	Move Radio away from Lamp. Connect condenser across power line.
Stroboscopic Effect	Normal to some Extent with all Single-lamp Ballasts Most Pronounced with Blue and Daylight Lamps.	Replace Fixture with Two-lamp Unit, using Two-lamp Ballast Change to White Lamps
Flicker or Swirl	Normal, especially when Lamp is first used, but may occur at any time.	Switch Lamp on or off a Few Times or let it alone and it will clear up itself.
Decrease in Light Output	Light Output during first 100 hours is above normal Cold Weather. A Light Loss of about 1% per degree below 65 degrees F.	Lamps are Rated at 100-hour Value (about 10% above normal) Enclose or Protect Lamp
End Blackening	Normal Near End of Life. Caused by Burning of Coating on Filament.	If Occurring Early in Life. Careful Check of Entire Fixture should be made

FLUORESCENT LIGHTING FIXTURES Advertised on Page 24

HEALTH FROM YOUR HOTPOINT!

INFRA-RED THERAPY

(Copyright—All rights reserved.)

BEFORE PURCHASING AN INFRA RED OUTFIT WE STRONGLY ADVISE YOU TO CONSULT YOUR DOCTOR

After many years' experience with Infra Red Lamps we are able to give a short account of the use and benefits which can be derived from this health-giving Home Treatment, and our experience is amply supported by the many letters of appreciation received from sufferers who have had great relief from pain after using the Infra Red treatment.

This article does not suggest that home treatment by Infra Red Therapy can or should take the place of your Physician.

Always consult your Doctor, as he will know how beneficial Infra Red Treatment is, and so will be able to supervise the treatment and instruct you in the correct use of your Lamp for your particular complaint. The value of

series of energy rays is known as the Spectrum. A small part of the Spectrum is visible—ordinary light—and is known as the visible spectrum. This means that a certain range of energy wavelengths stimulates the eye and we are conscious of "light."

Now let us start at light—visible wave-lengths. As we pass to shorter and shorter wave-lengths we enter the realm of Ultra Violet Light, invisible to the human eye and very irritating to the human skin if the exposure is prolonged. Still shorter wave-lengths are known as X-rays, which are used for deep photography. Beyond these the wave-lengths are infinitely small and are now being investigated by Physicists.

INFRA-RED LAMP

Advertised on
Page 7

The circulation of the blood is concerned with several vital functions. Among these are the supplying of food and oxygen to the tissues for the purpose of maintenance and repair. Removal of waste, including the products of tissue activity and tissue injury and protection against bacterial invasion. It follows then that the better the blood supply is to any part of the body the greater are the possibilities of tissue health. For example, a deep-seated bruise requires two things—a plentiful supply of repair materials and a rapid removal of the damaged tissue. Both depend upon a healthy blood supply to the affected part. Inflammation is the natural reaction of the system in an attempt to bring this about. It is well-known that the application of heat assists and increases the circulation and the Infra Red Lamp is a convenient and efficient means of heat therapy.

Properly used it is a useful adjunct to medical treatment prescribed by your Doctor.

Local application is easily and accurately controlled so that there is no danger of burns or accidents; and the relief from pain and the general assistance in restoring and maintaining health is beneficial to both body and mind. You will thus see that Infra Red Treatment is but the application of natural Health principles.

INSTRUCTIONS FOR USING YOUR INFRA RED LAMP

Connect to your wall plug and your Lamp is ready for use in 10 minutes. The Lamp is equally suitable for use by patients themselves or by an assistant. After the first treatment the patient can tell whether the treatment is going to be successful. If this is so it can be considered highly possible that the Lamp will assist considerably in a complete cure even though the ailment is deep-seated and of long standing.

The Lamp should be placed or held about 10 in. to 12 in. from the part being treated, or as close as can comfortably be borne. You should aim at treating about 10 square inches of the body surface. While Infra Red Rays are quite harmless and can be applied in longer periods, it is advisable to restrict treatments at first to twenty minutes, twice daily. You can lengthen the time of application according to the benefits and effects obtained.

The penetrating power of Infra Red Rays is such that deep-seated muscular complaints and congestions can be easily and conveniently treated. We cannot emphasise too strongly however, the necessity for regular treatment at regular intervals so as to gain the maximum benefit. Endeavour to maintain this regularity, arranging a time at your own convenience so as to undergo treatment at the same time each day for several days without interruption or variation.



these rays is well known by all medical practitioners and most hospitals are now equipped with some form of Infra Red apparatus.

Very many common complaints are due firstly to the neglect of the simple rules of health—good plain food, fresh air and exercise, abundant sleep—and secondly to over-indulgences, especially overeating; unless the primary cause is removed and bad health habits are corrected a permanent cure cannot be effected in spite of Infra Red treatment or anything else.

On the other hand, observance of these simple rules and regular Infra Red treatment to relieve pain and congestion, will quickly restore to you that healthy joy of living so often denied in others.

WHAT ARE INFRA RED RAYS?

Energy is often transmitted by means of rays of a particular wave-length, and the whole

If we go back to visible light and increase the wave-length we come to Infra Red Rays, the subject of this article. These energy waves are also invisible. Infra Red gradually merges into the various types of Wireless Waves, which, of course, have still greater wave-lengths, so we see that Infra Red Rays are a form of Energy emanations which have great penetrating power insofar as the human tissues are concerned much more penetrating than Ultra Violet Rays lying on the other side of the visible Spectrum. In this penetrating power of Infra Red Rays lies the secret of its health-giving properties.

Here we have the means of applying heat to energy tissues, whether superficial or deep, with no danger of burning, providing instructions are followed. But before this aspect can be discussed a few facts regarding the circulation must be mentioned.

ALWAYS

**ASK YOUR
DOCTOR**

FIRST!

"EASY BUILT" OCTAL HIKERS TWO

THIS latest addition to our "Easy-Built" family is the ever-popular "Hiker's Two". A two-valve set which has been in great demand in the past, we now present it again but this time with a more complete write up. This set will easily drive a speaker on the more powerful stations and of course headphones may be used if desired.

The chassis measures 6in. x 4in. and is 1in. deep. The front panel measures 6in. x 4 1/2in. Holes are ready cut for the mounting of sockets, controls, etc. The wiring is not at all difficult and is commenced only after all of the various components are bolted down in their respective places on the chassis. A look at the top view diagram will indicate the placing of the various parts.

A point worth mentioning here is to see that the earthing lugs on the chassis are scraped clean before attempting any soldering work. You will notice we have prepared a detailed list of parts giving complete wiring information for each part.

Let us assume you are about to commence wiring having mounted the various parts. There is no hard and fast rule but a good idea is to earth those lugs which require earthing first. Lug 2 of socket "A", lug 2 of socket "B" and lug 3 of the coil socket all need earthing and should be earthed to the

We will say no more on the actual wiring as a study of the list and diagrams we have prepared should give you all the information you want. Good soldered joints, short leads, and neat appearance are things to aim at. When taking the battery leads out through the chassis, stick to a system. Use the hole nearest the side of the chassis for A—, the next one A+, then B—, next B+15, and finally B+18. Be sure not to make them too short. Also twist the A— and A+ leads together and this will prevent any confusion with the "B" leads.

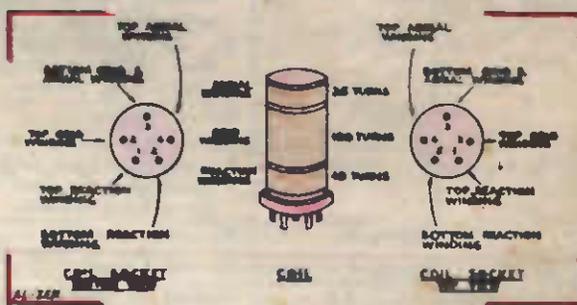
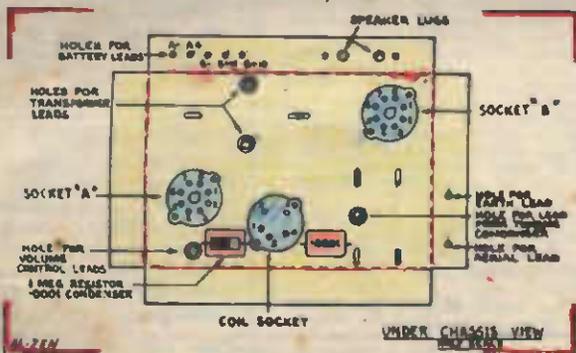
WINDING THE COIL

Let us now proceed to the only thing which may be considered a bit tricky—winding the coil. This consists of three windings of 32-gauge enamel wire all on the one former. Neatness is essential if erratic operation is to be avoided.

Make a small hole at the top of the former above the appropriate pin, which is number 4, feed wire through the hole and down the inside of the former, bring it out at the gap between the former and the base, thread the wire through one of the holes at the bottom of the former several times and be sure to leave



coil which will cover the usual short-wave band can be made up using 26-gauge enamel wire. Aerial winding: 4 turns; grid winding: 20 turns; reaction winding: 15 turns. Half a turn either way makes a big difference with



nearest lug on the chassis. Keep your leads short and close to the chassis.

Before proceeding, tick these connections off on your list. Carry on now as you wish taking care to check each connection against your list. For instance, lug 3 of the coil socket has about a foot of wire soldered to it which is fed through the hole in the side of the chassis. The aerial is connected to this lead. Tick this off against your list and when the list is completely ticked off you can be sure you have wired your set correctly. You can easily cross-check each connection. Take lug 5 of the coil socket—this goes to lug 3 of valve socket "A" and if we look at the list again we see that lug 3 of valve socket "A" goes to lug 5 of the coil socket so we get a double check

enough to solder on to the appropriate pin. Then commence to wind closely and neatly 35 turns. When this is done make a small hole directly above pin number 3 and feed the wire through, making sure you leave enough to lead down to the pin. This completes your aerial winding, which should be quite tight. Your grid and reaction windings are done in the same way leaving 1in. between each winding and taking the leads down the inside of the former to their correct pins. Scrape the enamel off the ends of the wire before winding round the pins and soldering. The application of coil "dope" helps to keep the windings in place. An important point—see that all the windings are put on in the same direction. You may wish to listen in on short-wave. Well, there is room for experiment here. A

short-wave coils and an interesting time can be had making up a few different coils. Local and overseas "hams" and many other stations can be heard in this way.

A final word—don't rush the job. Take it easy. Check and recheck your every connection and you will not be disappointed. After a little practice with the controls you will be amazed at what you can get on this little set.

(Wiring Chart Overleaf)

PARTS LIST

- 1 Chassis.
 - 2 1Q5GT Valves. 1C5GT-015-DA
 - 2 Valve Sockets.
 - 1 500,000 ohm Potentiometer with Switch
 - 1 .00025 mfd. Condenser.
 - 2 .0001 mfd. Condensers.
 - 1 1meg. Resistor.
 - 1 5-pin Coil Former.
 - 1 2oz. Reel Winding Wire.
 - 1 1 1/2-volt Cell.
 - 2 9-volt C Batteries.
 - 1 yard Battery Cable.
 - 2 Pointer Knobs.
 - 1 3-1 Audio Transformer.
- Extras: Including Hook-up Wire, Nuts and Bolts, Strips, etc.

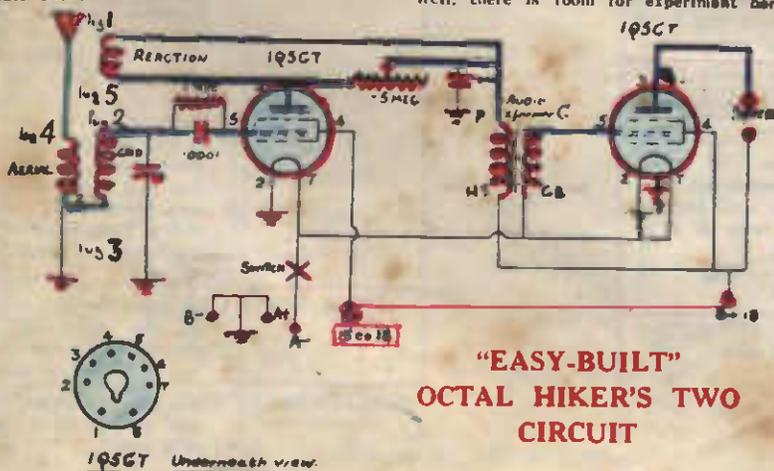
Cat. No. AK281

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Suitable Speaker

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Refr. Sla. P.M.

£1'9'9

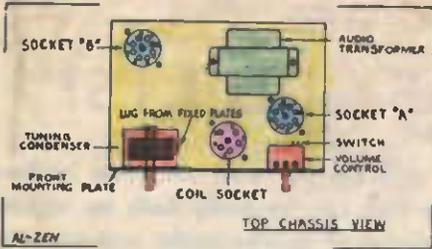


"EASY-BUILT" OCTAL HIKER'S TWO CIRCUIT

"HIKER'S TWO" CONNECTIONS TO BE MADE

COIL Under Chassis View	LUG 1 <i>top C₂</i>	To centre lug of volume control. To one end of .0001 condenser. To blue lead of audio transformer.	1 MEG. RESISTOR and .0001 CONDENSER	These will be considered as a single unit as they are placed together and have their ends twisted and soldered. One pair of ends go to lug 5 of socket "A". The other pair go to lug 2 of the coil socket.
	LUG 2 <i>top C₂</i>	To fixed plates of tuning condenser. To one end of the .0001 condenser and 1 meg. resistor which are twisted together.		
	LUG 3 <i>bot 1+2</i>	Earthed to chassis.		
	LUG 4 <i>top C₁</i>	To length of wire which is used for aerial connection.		
	LUG 5 <i>bot C₂</i>	To lug 3 of valve socket "A".		
VALVE SOCKET "A" Under Chassis View DL33	LUG 1	No connection.	BATTERY LEADS	These are fed through the five small holes at the back of chassis. B+18 LEAD Connects up to the same lug on the speaker terminal strip as that to which lug 4 of socket "B" is connected. B+15 LEAD Connects to lug 4 of socket "A". B- LEAD Is earthed to chassis. A+ LEAD Is earthed to chassis. A- LEAD Connects to one lug of switch attached to back of volume control. There is a hole directly below the control through which to feed the lead.
	LUG 2 <i>F+</i>	Earthed to chassis.		
	LUG 3 <i>P</i>	To lug 5 of coil socket. Left-hand lug of volume control.		
	LUG 4 <i>9</i>	Has length of wire soldered to it which goes to B+15.		
	LUG 5 <i>G</i>	To the twisted ends of the .0001 condenser and 1 meg. resistor.		
	LUG 6	No connection.		
	LUG 7 <i>F-</i>	To lug 8 of socket "B". To one lug of the switch attached to the back of the volume control.		
	LUG 8	No connection.		
VALVE SOCKET "B" Under Chassis View DL36	LUG 1	No connection.	BATTERIES	You will receive three batteries with your kit. The large round one being the "A" battery and the two flat batteries when joined together the "B" battery. The centre connection on the round cell is A+, the outside connection is A-. The B battery is made up by connecting a short wire between -9 on one battery and + on the other battery. This now leaves a + terminal free which becomes B+18 and a free -9 terminal which becomes B-. B+15 is the second terminal away from B+18. It has -3 marked on it but don't worry about that. Ignore all other markings on the batteries.
	LUG 2 <i>F+</i>	Earthed to chassis.		
	LUG 3 <i>P</i>	To one lug on speaker terminal strip.		
	LUG 4 <i>S</i>	To other lug on speaker terminal strip and red lead of audio transformer.		
	LUG 5 <i>G</i>	To green lead of audio transformer.		
	LUG 6	No connection.		
	LUG 7 <i>8</i> <i>F-</i>	To lug 7 of socket "A" and other green or black lead of audio transformer.		
LUG 8 <i>7F+</i>	Earthed.			
TUNING CONDENSER		Bolted to chassis. Fixed plates to lug 2 of coil socket.		
VOLUME CONTROL	LEFT LUG	To lug 3 of socket "A".		
	CENTRE LUG	To lug 1 of coil socket.		
	RIGHT LUG	No connection.		
SWITCH ON BACK OF VOLUME CONTROL		One lug has lead going down through the hole in chassis and out of the A- hole at back of chassis. Other lug to lug 7 of socket "A".		
AUDIO TRANSFORMER <i>P</i> <i>B+ HT</i> <i>G</i> <i>C-G B</i>	BLUE LEAD	To lug 1 of coil socket.	AERIAL LEAD	This feeds through a hole in the side of the chassis and connects to lug 4 of coil socket.
	RED LEAD	To lug 4 of socket "B".		
	GREEN LEAD	To lug 5 of socket "B".		
	BLACK or other GREEN LEAD	To lug 7 of socket "B".	EARTH LEAD	

Here's What Constructors Say:



I have built a Hikers Two recently and have been able to get the following stations:— 2YA, 2YC, 3YA, 1YA, 1YZ, 2YZ, 1YC, 2ZB, 1ZB in the daytime and 2YA, 2YC, 3YA, 1YA, 4YA, and 2XP at night. The aerial is only 20 feet above the ground and as we are in a hollow, the aerial is below street level to the east, and just above the sand hills to the west. —S.H., New Plymouth.

The "Hikers Two" I purchased a while ago has been operating very well. I have logged nearly all N.Z. stations from Auckland down to Dunedin besides several stations of more

powerful variety in Australia.—W. J. Mc., Ohaupo.

Recently I bought a "Hikers Two" Kitset from you. Using 'phones I receive 1YA and 1ZB very clearly and quite loud during the daytime.

2YA and 2YH are loud enough to understand speech. At night, besides those mentioned which have to have volume reduced, I receive 2YA, 2ZB, 3YA, 3ZB, 2ZJ, and have received ZJU Suva and 2NC Australia (Newcastle).

I have been using the set at Hicks Bay, 11 miles by road from Gisborne.—L.T., Gisborne.

POINTS ABOUT AERIALS:

No matter what make of set, or how powerful your set is, you are not getting the best out of it unless you have a good aerial and earth system.

Your first consideration must be height—always remember that this is a lot more important than length—the higher the better. Trees, high buildings, etc., make suitable objects to attach your Aerial to, but failing these you should obtain a mast (about 30ft.).

Our next requirement will be aerial wire. Copper wire is the best, and 7-strand wire is usually used. Enamelled copper wire will repay you in the long run, although it costs more to start with, the enamel covering stops erosion and is also an insulation. Aerial wire is sold in 100ft coils, and that length is sufficient for aerials, lead-in, earth wires. Don't make the mistake of having your Aerial too long, up to 100 feet is ample.

The Aerial has now to be insulated. Two or three egg or plastic insulators should be placed on each end.

It is advisable to attach one end (or both) of the Aerial to a halyard rope run through a galvanised pulley. This allows the Aerial to be lowered for examination.

The lead-in should be taken from the end nearest to the house, and if the Aerial is not level the end nearer the house should be the lower. Make the lead-in as short as possible, and use a lead-in tube where it enters the house. A lightning arrester should be placed on the outside of the house close to the lead-in tube.

Never cut the Aerial wire except as a last resource, as soldered joints unless done by an expert are never satisfactory, and sooner or later will cause artificial static. It is usually possible to use one length of wire for the complete Aerial and lead-in.

Make sure that the lead-in does not touch any spouting, chimneys, or other objects; there are plenty of insulating gadgets available at little cost that will enable you to get past all kinds of obstructions.

The earth wire is connected to a waterpipe by means of an earth clip. Keep the earth wire short as possible, and rather than running the wire all around the house before coming to a pipe it is much better to obtain an earth tube. This is driven into the ground as near to the set as possible, and if in a dry situation it is a decided advantage to wet the soil now and again with a bucket or two of water. There is usually a terminal provided on the earth tube for attaching the wire.

One difficulty which often confronts an amateur is what length of earth lead he can use with efficiency, the choice often lying between a good contact with a longer lead and a bad contact with a much shorter lead. The general advice is to keep the earth lead short. Often this misleads the amateur into abandoning his pet earth, because to get to it a long lead would be essential. The longer lead need not have a high resistance if a reasonably heavy gauge of wire is used. Never use anything under 7/22 gauge. A long lead is only really bad when you use too small a gauge of wire.

When making an earth connection to a brass tap, remember that this may be heavily lacquered and the connection would be poor. Some sandpaper and elbow grease will fix it.

You should not share either your Aerial or your Earth with your neighbour, as you will run the risk of interference between the two sets.

When handling a new coil of aerial wire you must be careful not to kink it.

When atmospheric discharges are distressingly bad, the position can sometimes be relieved by connecting a 100,000 ohm resistance directly across the aerial and the earth terminals of your set.

Should you use a wooden mast that goes right into the ground, have a look beneath the surface of the soil and make sure that the bottom of the pole is not rotten.

For preference take the lead in from one end of the Aerial; if you have to take it from the centre, make sure that it is the true centre.

PERMANENT MAGNET SPEAKERS ARE HERE TO STAY!

COMMENTS FROM THE MAKERS OF "ROLA" SPEAKERS.

THE following is an extract from an overseas magazine, where the question of advantages of P.M. speakers over E.M. types was discussed fully.

It is a simple matter to replace the field of an electro dynamic speaker with a choke providing the smoothing of the choke is of the same order as the field replaced. To install a choke of two-thirds the smoothing ability of the field is to ask for trouble and bother.

Filtering is only one aspect of the whole question of the use of permanent magnet speakers in A.C. receivers. Here are some of the advantages:—

1. The absence of distortion in receivers using permanent magnet speakers due to hum neutralisation. Hum is only neutralised when the cone and voice coil are at rest. Any displacement either way upsets this balance and hum results, this hum being amplitude modulated by the force moving the voice coil to and fro.
2. Lower heat dissipation in the receiver. This is of very great importance in small receivers.
3. Greater power handling capacity because the voice coil is operating in a lower ambient temperature.
4. More efficient chokes can be constructed of laminated cores with optimum airgaps. The same value and inductance as given by the field coil can be obtained from properly designed chokes having much lower D.C. losses.
5. The voltage drop across a properly designed choke is considerably less than across the field coil resulting in general economy of receiver design, better regulation and lower voltage electrolytic condensers.
6. Simplicity of inventory of factories and servicemen. When electro dynamic speakers were used, a multitude of field coils was in use with the result that no serviceman could carry an adequate replacement stock. The result of this was either delay in servicing a set or substitution of an integral part of the circuit. This could quite readily result in altered performance of the receiver. In a modern set, all this is eliminated and the serviceman need carry only the minimum of replacement speakers.

The art of the use of permanent magnet speakers in A.C. receivers is only in its infancy. Let us therefore not condemn it until the full facts regarding its use are brought to light. Permanent magnet speakers in A.C. sets have come to stay.

—(Australasian Radio World, April, 1948.)

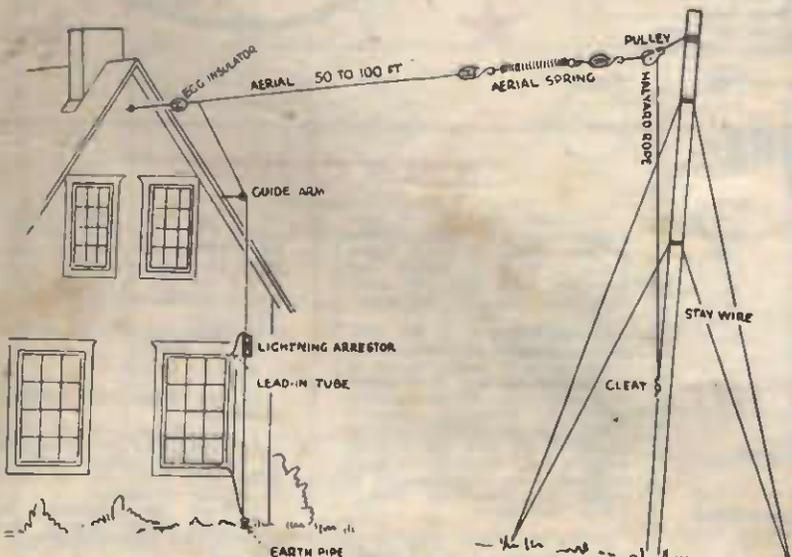


ILLUSTRATION OF A GOOD AERIAL INSTALLATION.



What are "EASY-BUILTS?"

"Easy-Built" Kits are just what the name implies; radio kitsets that can be easily built by anyone with a knowledge of how to solder and who can count up to 30.

Instead of constructing the set by following a schematic circuit of radio symbols, all items and connections are numbered, and it's just a matter of soldering one to seven—four to eighteen and so on.

SOUND SIMPLE? IT IS SIMPLE!

Any boy from 9 to 90 can make a Radio under the "Easy-Built" system.

A GREAT PERFORMER!

PARTS LIST

"Easy-Built" Electric 3

- | | |
|---|---|
| 1 Chassis | 1 .004 mfd. Mica Condenser |
| 1 "Easy-Built" Coil | 1 .0001 mfd. Mica Condenser |
| 1 0.0005 mfd. Air Spaced Condenser | 1 .00025 mfd. Mica Condenser |
| 1 60 M.A. 6.3v. Power Transformer | 1 .25 mfd. Tubular Condenser |
| 1 Filter Choke | 1 .01 mfd. Tubular Condenser |
| 2 16 mfd. Electrolytics | 5 Assorted Resistors |
| 1 10 mfd. Electrolytic | 1 Special Dial Plate |
| 1 each Type 6X5GT, 6U7G, 6V6GT Valves | 2 Pointer Knobs |
| 3 Octal Valve Sockets for above Valves | 2 yards Power Flex |
| 1 500,000 ohm Potentiometer | 1 coil Hook-up Wire |
| 1 5in. P.M. Speaker with separate Transformer | Sundries: Nuts and Bolts, Solder Lugs, Grid Clips |



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A FEW OPINIONS!

"I would also like to congratulate on your great success of your "1949 Bedroom Radio A.C.3." Since I bought and assembled it I have had great reception."—Mr. G., Tauranga.

The performance of the little set has exceeded all expectations. Tone is good and volume is really remarkable; I have plenty in reserve even on our weakest local. My aerial is a battery clip on to the electric conduit piping in the roof and a small capacity fixed condenser in series attached at the aerial terminal by means of fahstock clips.—J.F.C., Devonport.

I have the "Easy Built" 3 set going now. Even though I haven't

got a very good aerial I am getting 2YA, 1YA, 4YA and 2ZB quite well in the daytime. At night 2XN comes in very loud and I can get 8 stations loud enough to hear in the room quite well.

Thanking you for your service.
—A.J.T., Nelson.

Re the "Easy Built Bedroom 3 Kitset."

I have found this set most serviceable and I have been able to pull in Auckland stations, 12B, 1YC, 1YD, and all come in at good strength.

I found the construction of this very simple and a very good idea for construction.—C.G., Otahuhu.

THE "EASY BUILT BEDROOM THREE"

THIS year we present a new arrival in our family of "Easybuilt" receivers. After a great deal of thought and burning of the midnight oil we decided to produce a receiver which we felt would have even greater appeal than our two previous efforts. This receiver is a simple A/C set which is designed to bring in the local stations at good speaker strength which is all we intend to claim for it, although in localities away from powerful stations reasonable distance reception may be expected.

A point well worth stressing here is the importance of aerial length with a set of this type. You will be well repaid if you spend a little time trying the effect of various aerial lengths on the receiver. As too long an aerial may cause an annoying "cross talk" effect between the locals and too short of course will prevent the reception of the weaker stations at full volume.

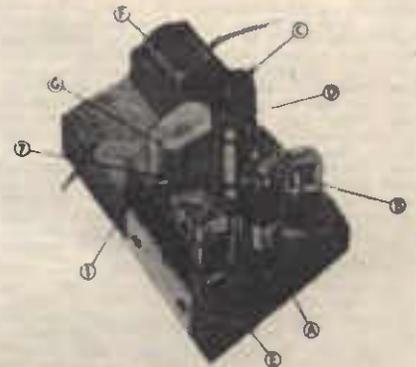
A glance at the circuit will show a receiver which is in essence similar in design to sets which have given outstanding results since the early days of radio. This then is our modern version of an old friend and we feel sure you will give him the welcome he deserves. The low cost and modest size of this receiver make it the answer to the "second set" problem for although we do not claim it will perform up to "superhet" standards it will definitely give satisfactory listening on any of the local stations. The simplicity of construction and the fact that there are no trimmers and padder condensers to be lined up as in a superheterodyne receiver, makes this receiver an ideal one for the beginner in set construction to make a start with. Without further ado we will now get weaving on the actual business of having this fine little set transformed from a magazine article into a working model.

First check off the parts against the list. Having done this the next thing is to mount the various parts. Now if you will look through this article you will notice that not only have we provided the conventional circuit diagram but also for the benefit of the less experienced we have also included our "Easybuilt" method. By using this method the new chum can check and cross check his every connection against the list and be sure his wiring up is O.K.

Now you will see list one sets out the various components that mount by means of nuts and bolts. That is the tuning condenser, valve sockets, volume control, etc. The small components which are the condensers and resistors all of which are soldered to the various points are set out in list number 2. So if you are not too good on circuit diagrams you can wire the set entirely from these lists. As you come to each component check it off the list and when the wiring is complete you can easily check up by seeing that the lists are completely ticked off.

Take a look at diagram "B." This gives you the actual placement of parts. Now the first thing to do is to mount the valve sockets, etc. When mounting the valve sockets A, B, and C, see that the key or notched hole points in the same direction as indicated in the diagram also place a solder lug under the securing nuts of each. One lug should go under the front nut of "A," another under the nut nearest the chassis edge in the case of "B" and the nut nearest the front of the chassis with "C." The rest of the parts may now be bolted down. That is the power transformer "F," power choke "G," tuning condenser "E," volume control "I," and under the chassis the speaker transformer "H." Do not mount the coil "D" yet as it may be knocked about when the chassis is turned over. Let us proceed now with the job of soldering up the valve sockets and various components. So make sure your soldered joints are good as a badly soldered connection can cause a lot of trouble in the way of noisy operation or poor reception.

HAVING got your iron heated and the various parts close handy, cut about 4in. off your coil of hook-up wire and strip off the insulation. Now solder one end to one of the 6.3v. lugs of power transformer "F" then lead the wire across to the C.T. lug and solder to this point then lead the wire on to the lug under the nut securing socket "C" and solder securely. Take care this bare wire contacts no other points than those mentioned. Check these connections off your list. Cut a 3 1/2in. length of hook-up wire now and solder one end to the other 6.3v. lug of transformer "F." Now cut a 4 1/2in. length of hook-up wire and solder one end together with the free end of the previous length on to pin No. 7 of socket "C." Lead



TOP OF CHASSIS (DIAGRAM A)

the 4 1/2in. length over to pin No. 7 of socket "B" and solder it on to this pin together with another 2in. length of wire, the free end this time connecting to pin No. 7 of socket "A."

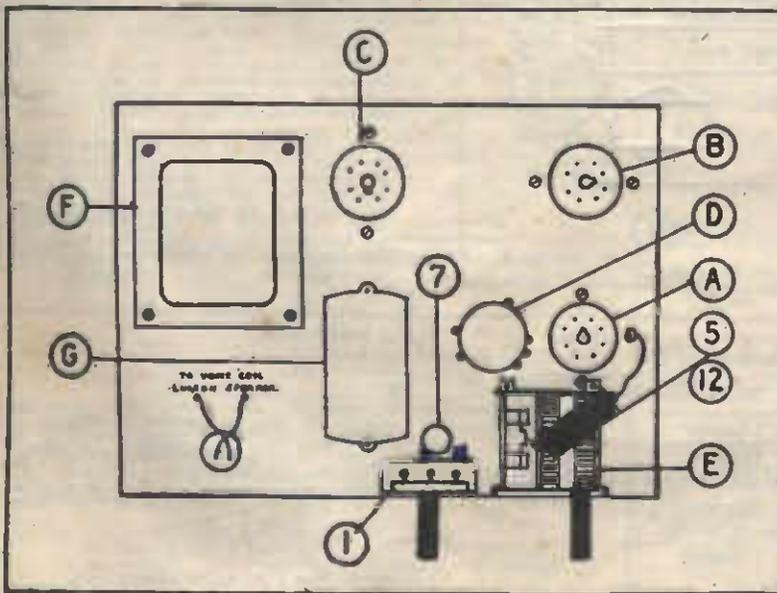
Run a short length of bare wire to Pins No. 1 and 2 of socket "C" and earth to the lug under the nut securing the socket. Do the same with Pins No. 1 and 2 of socket "B." Now with socket "A" a bare length of wire soldered to Pins 2, 1, 8, and 6 and earthed to the lug under the nut securing the socket. This completes all the earthing of the various sockets. Check all these connections off your list.

Solder a short length of wire to one of the 280v. lugs on transformer "F" and solder the other end on to Pin No. 3 of "C." Now another length on to the other 280v. lug, the free end this time solders on to Pin No. 5 of "C." Check this off. Still on socket "C" solder one end of a 8in. length of wire on to Pin No. 8 and the other end on to the nearest lug of filter choke "G."

Look now at No. 9 on your list which is a 300 ohm. resistor. Actually you will receive two 600 ohm. resistors which are twisted together to make 300 ohms. Now No. 3 is a 10 mfd. condenser and this also has its ends twisted together with the 300 ohm. unit. Run a little solder along the twisted ends to make a good joint. The positive end of this unit is now soldered to pin No. 8 of "B." The negative end is earthed by soldering it to Pin No. 1 of "C."

Let us get the other two electrolytics wired up now. That is 1 and 2 on the list. Twist the two negative leads together and earth by soldering on to the earthed 6.3v. lug on transformer "F." The positive ends now. One to each lug of filter choke "G." Cut a 5in. length of wire now and solder one end on to pin No. 4 of socket "B." Now pick up 10 the 50,000 ohm. resistor and 13 the .25 meg. resistor, solder one end of these together with the free end of the 5in. length of wire and one of the covered leads of speaker transformer "H" on to "G" the filter choke, use the lug nearest the front of the chassis. Twist the free end of 13 with one end of 8 the .01 condenser and one end of 6 the .00025 condenser and solder on to pin No. 3 of socket "A." Earth the free end of 6.

Now the free end of 8 is soldered together with one end of 11 the 500,000 ohm resistor on to pin No. 5 of socket "B," solder the free end of 11 on to pin No. 2 of socket "C" which is or should be earthed. Have a glance at diagram "C" once in a while as this will help you in placing the various parts all of which have been arranged with an eye to easy wiring. Speaker transformer "H" has a covered lead lying round loose so let us get rid of it by soldering a length of wire on to it and run this over to pin No. 3 of socket "B." Before soldering, however, slip a length of spaghetti



TOP OF CHASSIS VIEW (DIAGRAM B).

over the end and slide it down over the soldered joint of the wire, this will eliminate any chance of shorting on to the chassis. You may now solder on to pin No. 3 of socket "B" and while you are about it solder one end of 4 the .004 mica condenser on to this pin also. Earth the other end of 4 to the chassis.

This does not complete the under chassis wiring but let us have a look at the top section for a change. Stand 7 the .25 condenser on its end poking the bottom pigtail through the hole provided in the chassis. The top pigtail is soldered together with 2 1/2 in. of hook-up wire on to the centre lug of "I" the 5 meg. volume control. Don't worry about a few stray ends just now; we will catch up all in good time.

Take 5 the .0001 condenser and 12 the 2 meg. resistor and twist together, solder one set of ends on to the fixed plates of tuning condenser "E." Now plug the 6U7G into its socket and gauge the length of wire needed to come from the other twisted ends of 5 and 12 to reach the grid cap. Remove the valve, solder the necessary length on to the twisted ends and finish the job off by soldering the grid clip on to the other end of the wire. Look at the volume control again, solder about 5 in. of wire on to the left hand lug and thread the free end through the hole in the chassis. Another lead is soldered on to the right hand lug and also threaded through the chassis. To be clear on which is right hand and left hand lug these are the lugs which are on the right and left when you look at the back of the volume control and the lugs point upwards.

Turn the chassis over again now and complete one or two of the odd bits of wiring. The free end of 7 the .25 condenser and the lead from the left hand lug of "I" the volume control may be twisted together and earthed to a convenient solder lug. This leaves the lead from the right hand lug of "I" which connects to the free end of 10 the 50,000 ohm. resistor, the lead from this resistor should be cut short so that the bare wire will not touch the chassis.

Have a look now at speaker transformer "H" and we find a couple of enamelled leads going

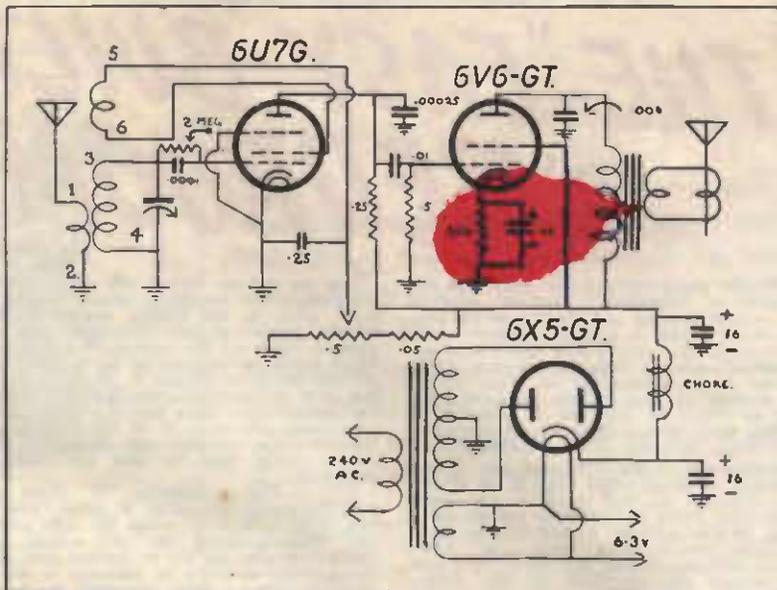
nowhere in particular. Solder a 3 in. length of hook-up wire on to each of these, slip a length of spaghetti over the joint of each lead and push the two leads through the hole provided in the chassis, these two leads later solder on to the two lugs mounted on the speaker.

Turn the chassis right side up again and position the coil "D" and bolt down in place. Look at the top of the coil and you will see it has six lugs all of which are numbered.

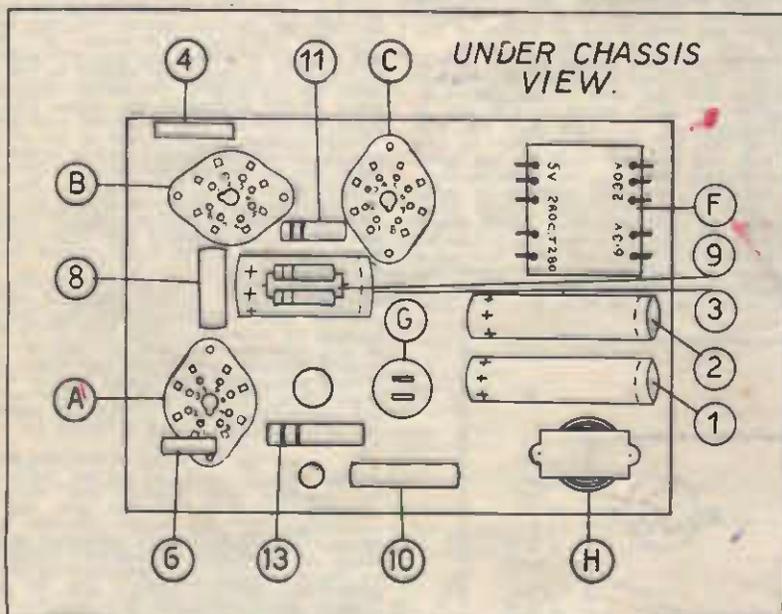
Now number one is the aerial lug so solder about 15 in. of wire on to this lug lead it down through the hole in the chassis. At the rear of the chassis is another hole but before pushing the wire through tie a knot in it so that any strain is taken up by the knot against the chassis and not by the lug. Now lugs No. 2 and 4 are earthed so connect these two lugs together and earth to a suitable point on the chassis. Solder now a short lead between lug No. 3 and the fixed plates of tuning condenser "E." Lug No. 5 now is connected to the centre lug of "I" the volume control. All that is left now is lug No. 6. A lead is soldered on to this lug and fed down through the hole in the chassis and is soldered on to pin No. 4 of "A." Solder a suitable length of wire on to one of the earthing lugs and feed through the same hole as the aerial wire. Wire up the power flex on to the 230v. lugs on the power transformer, solder your speaker on to the two leads projecting through the top of the chassis and your wiring is complete.

Satisfy yourself your connections are correct and then fit the valves into their respective sockets and fit the grid lead on to the 6U7G. Now plug the set in and keep a wary eye on the tubes especially the 6X5GT, if there is no sign of trouble attach the aerial and earth, advance the volume control a little and turn the condenser knob. You should now be able to tune in a station or two. Should you set up a loud squeal back the control off until the station can be tuned in clearly. A little practice will enable you to tune in quite distant stations at good volume. All that remains now is to fit this grand little receiver into the cabinet which we have specially designed for you.

We would like to state here that should you have any difficulty whatever in getting this set to operate do not hesitate to call on our technical staff for assistance. They are only too happy to set the new chum on the right track if they can. In conclusion let us say we feel confident the set will prove a great success and will reward the builder with many hours of happy listening.



CIRCUIT DIAGRAM.



(DIAGRAM C.)

CONNECTIONS TO BE MADE

6U7G SOCKET	A	6V6GT SOCKET	B
	Pin No. 1 Earthed to Chassis.		Pin No. 1 Earthed to Chassis.
	Pin No. 2 Earthed to Chassis.		Pin No. 2 Earthed to Chassis.
	Pin No. 3 To one end of 6, 8, and 13.		Pin No. 3 To 4 & one lead of "H."
	Pin No. 4 To Lug No. 6 of "D."		Pin No. 4 To lug of "G" nearest front of Chassis.
	Pin No. 5 Earthed to Chassis.		Pin No. 5 To 8 and 11.
	Pin No. 6 No connection.		Pin No. 6 No connection.
	Pin No. 7 Filament connection (See text).		Pin No. 7 Filament Con. (See text).
	Pin No. 8 Earthed to Chassis.		Pin No. 8 To Positive end (+) of 3 and to 9.

SMALL COMPONENT CONNECTIONS TO BE MADE

6X5GT SOCKET	C	Pin No. 1 Earthed to Chassis.
		Pin No. 2 Earthed to Chassis.
		Pin No. 3 To one 280v. lug of "F."
		Pin No. 4 No connection.
		Pin No. 5 To other 280v. lug of "F."
		Pin No. 6 No connection.
		Pin No. 7 To one 6.3v. lug on "F."
		Pin No. 8 To lug of "G" nearest back of chassis.
R.F. COIL WITH REACTION	D	1 Lug 1 To aerial.
		2 Lug 2 Earthed to Chassis.
		3 Lug 3 To fixed plates of tuning condenser "E."
		2 Lug 4 Earthed to Chassis.
		4 Lug 5 To centre lug of vol. control "I."
		5 Lug 6 To pin No. 4 of "A." 44"
TUNING CONDENSER	E	Fixed plates to No. 3 lug of coil "D" and one end of 5 and 12.
POWER TRANSFORMER	F	230V. LUGS WIRED TO POWER FLEX
		6.3v. lugs: One lug is earthed to chassis and also used as earthing point for 1 and 2. The other 6.3v. lug is connected to Pin No. 7 of "A," "B," and "C."
		280v. C.T. The 280v. lugs wire up to pins No. 3 and 5 of "C." The C.T. lug is earthed. Do not use the 5v. lugs.
FILTER CHOKE	G	Lug nearest front of Chassis has the following connections made to it. One end of 10 and 13, also one covered lead of "H," positive end of 1 and Pin No. 4 of "B."
		Other lug connects to Pin No. 8 of "C" and positive (+) end of 2. 46"
SPEAKER TRANSFORMER	H	One covered lead to front lug of "G," other covered lead to Pin No. 3 of "B."
		Enamelled leads feed through Chassis and connect to two voice coil lugs on side of speaker frame.
.5 MEG. VOLUME CONTROL	I	Left hand lug earthed to Chassis.
		Centre lug to one end of 7, also to lug No. 5 on coil "D."
		Right hand lug to one end of 10.

16 Mfd Electrolytic	1	✓ (+) Positive end to one lug of "G."
		✓ (-) Negative end earthed to Chassis.
16 Mfd Electrolytic	2	✓ (+) Positive end to other lug of "G."
		✓ (-) Negative end earthed to Chassis.
10 Mfd Electrolytic	3	✓ (+) Positive end to Pin No. 8 of "B."
		✓ (-) Negative end to Pin No. 1 of "C" which is earthed to Chassis.
.004 Mica condenser	4	One end to Pin No. 3 of "B."
		Other end earthed to Chassis.
.0001 Mica condenser	5	One end to fixed plates of tuning condenser.
		Other end to grid cap on 6U7G valve.
.00025 Mica condenser	6	One end to Pin No. 3 of "A."
		Other end earthed to Chassis.
.25 Tubular condenser	7	One end to centre lug of vol. control "I."
		Other end earthed to Chassis.
.01 Tubular condenser	8	One end to Pin No. 3 of "A."
		Other end to Pin No. 5 of "B."
300 Ohm Resistor (See Text)	9	✓ One end to Pin No. 8 of "B."
		✓ Other end to Pin No. 1 of "C" which is earthed to Chassis.
50,000 Ohm Resistor	10	One end to lug of "G" nearest front of Chassis.
		Other end to right hand lug of vol. control "I."
500,000 Ohm Resistor	11	One end to Pin No. 5 of "B."
		Other end to Pin No. 2 of "C" which is earthed to Chassis.
2 Megohm Resistor	12	One end to grid cap of 6U7G valve.
		Other end to fixed plates of tuning condenser.
.25 Meg Resistor	13	One end to Pin No. 3 of "A."
		Other end to lug of "G" nearest front of Chassis.

ANOTHER EASY BUILT RECEIVER PRODUCED ONLY BY "LAMPHOUSE"

NEW "EASY BUILT" SUPER FIVE

WE present here a brand-new version of our "Easy-Built 5." A study of the schematic diagram "A" will no doubt be of interest to our more experienced builders. The use of the ECH21 converter tube will probably be met with a nod of approval and we can assure you that it has a great bearing on the outstanding performance of this excellent receiver.

However, as far as this article is concerned, the man who wants to build a set and merely wants to know how to put it together is our main concern. Let us then assure anyone who is considering building this receiver that this is a high-class job which will out perform many 5 valvers on the market today.

You will notice we have prepared two lists: One with the various parts listed alphabetically, A, B, and so on—the other numerically, 1, 2, etc. The first list refers to the larger components, coils, tuning condenser, valve sockets, etc., and the second list to the various trimmers, resistors, and fixed condensers. There are various diagrams also to enable you to get a good idea of the placement of the parts—this will be of great value to the beginner as the wiring is enormously simplified if the components are properly placed.

Having checked off all the parts, the next thing is to get cracking on the actual assembly. Mount the sockets first. Note that "A" is the odd local socket. With your kit you will receive some solder lugs. These are mounted at suitable points under the chassis to enable the easy earthing of any components which require to be earthed to the chassis. These are secured by a nut and bolt or by placing under the nut which secures the valve sockets in place.

When mounting the sockets see that the notched hole or key-way points in the direction indicated in the diagram. Local socket "A" (the ECH21 socket) has its key-way pointing to the edge of the chassis, also a solder lug is placed under the securing nut nearest this key-way. Socket "B," the 6U7G socket, is mounted with its key-way pointing to the rear of the chassis. An earthing lug is also placed under the nut nearest this key-way. This valve needs shielding, so mount the shield base when attaching socket. Be sure to bolt down firmly. Now, socket "C," the 6Q7GT socket, with its key-way pointing to the chassis front, also has a lug attached to this point. Socket "D," the 6V6GT socket has the key-way pointing to the rear and a lug at this point. Finally we come to the 6X5GT socket, socket "E." This mounts with the key-way pointing away from the chassis edge and has a solder lug under the nut nearest the key-way.

Now with all the sockets mounted, fit the two I.F. transformers "I" and "J" in place, also the power transformer "K," and under the chassis the filter choke "L." Place a solder lug under each mounting nut. Twenty-eight and 29, the tone and volume controls,

may also be fitted. A study of the given chassis and under chassis diagrams will indicate the positioning of these parts. Do not attempt to mount the sub chassis and condenser gang yet as this will have to be wired up first before attaching to the main chassis. Just leave that on one side for the time being. Having got your valves and dial removed from the scene of operations, turn the chassis over. Before going any further, remember this—poorly soldered joints are the cause of more disappointment in a set's performance than all other constructional faults put together. Erratic performance can often be put down to bad connections.

so please be careful with your soldering. Keep your iron properly tinned and use your solder sparingly. A great blob of solder does not necessarily mean a good joint. Do not try to solder dirty leads or lugs—scrape them clean first. When you are dealing with several leads, twist together first and then solder.

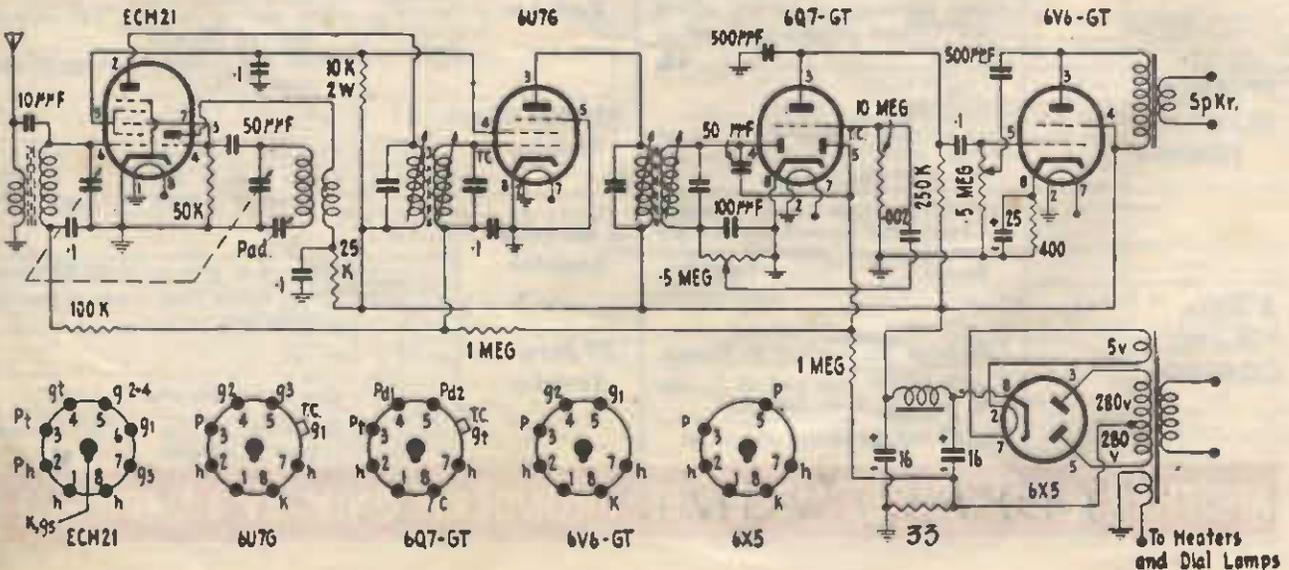
Take a look at under chassis diagram "C." This gives you the approximate placing of the various small parts. We have shown no wiring as it was felt that the number of leads going apparently in all directions at once would confuse, rather than help, the beginner. Instead we use our lists. Look at "A" on our list of connections to be made. Now "A" is the ECH21 socket and suppose we take pin No. 3 we will see that this connects to the yellow lug on "H," the oscillator coil, and if we refer to "H" on the list, you will see that the yellow lug goes to pin No. 3 of "A." This enables you to cross-check any connection you make. The idea now is that as you make the various connections you tick them off the list. When you have ticked off all of the connections you can be sure that the wiring up is complete. By this means you can keep an eye on the correctness of your wiring.

The heaters of the valves are generally the first things to wire up, so let us get on with that particular job. First, earth one of the 6.3 lugs on "K," the power transformer, to the nearest solder lug. Now solder a length of hook-up wire to pin No. 8 of socket "A" and then lead it along the chassis to pin No. 7 of



socket "B," cut off. Now solder the two ends to the No. 7 pin. Continue the lead now along to pin No. 7 of socket "D," cut off, but don't solder as there are other connections to be made to this pin yet. Solder now a lead to the remaining 6.3 lug on the transformer "K" and run this along also to pin No. 7 of socket "D," cut off, and now with the lead from socket "B" and the end from the coil of hook-up wire twist and solder the three ends to the No. 7 pin of "D" socket. Lead the coil of hook-up wire now to pin No. 7 of socket "C" and cut off. Solder this and another length of about 10in. to this pin and push the free end of the 10in. length through the hole in the chassis directly below 29, the volume control. This lead will be used later for wiring up the dial lights. You have now wired up one side of your heaters. Check and make sure your wiring corresponds with the list connections. Tick them off as you go.

Now back to socket "A." The centre lug and the No. 1 lug are joined together and earthed to the solder lug, which is, we hope, secured under the nut which holds the socket in place. Tick this off. Now to socket "B." This socket has three lugs earthed, 2, 5, and 8, so solder a short lead on 2, and one on 5, and then solder the two ends to pin No. 8 and earth this pin to the nearest solder lug. Tick this little lot off. Socket "C" has pins No. 1, 2, and 8 earthed. Link these three together with a short length of bare wire and earth to the nearest lug. Now with socket "D," earth



pin No. 2 only. Have a look now at socket "E" which is the 6X5GT socket. We can put a little work in here. Pin No. 2—solder one end of hook-up wire on to this and lead over to one 5v. lug of transformer, "K." Cut off and solder this end to the lug. Now with pin No. 7 repeat the process and finish up on the other 5v. lug of "K." Take pin No. 3 now, solder a lead on and solder other end to one 280v. lug of "K." A lead now to pin No. 5 and the other end solders to the other 280v. lug.

Have a look now at the small sub chassis. This mounts above the main chassis and on it is mounted the tuning condenser "F" and beneath this little chassis is mounted the two coils and various other odds and ends. Sup-

when securing in place, put a solder lug under each securing nut. Take the green lead of the aerial coil "G" and solder onto pin No. 6 of "A," the ECH21 socket. Solder the lead from 18, the 100,000 ohm resistor onto the grid return lug of "I," the first I.F. transformer. Do not have any of these leads longer than necessary. The green lead from oscillator coil "H" connects to one end of 5, the .00005 condenser, the other end of 5 going to pin No. 4 of "A," the ECH21 socket. Cut the condenser leads short so as not to contact any other parts. Now solder the yellow lead from the oscillator coil "H" onto pin No. 3 of "A" and the red lead from "H" onto one end of 20, the 25,000 ohm resistor, also to the insu-

solder a lead from there to the B+ lug of "J," the 2nd I.F. tranny, also to this B+ lug of "J." Solder the free end of 21, also one end of 22, the 250,000 ohm resistor and a 4j.in. lead.

Now to socket "D," the 6V6GT socket. Onto pin No. 4 solder the following: The other end of the 4j.in. lead, the positive (+) end of 16, the 16 mfd. condenser, and one lead of "L," the filter choke. Earth the negative (-) end of 16. To pin No. 8 of socket "D," the 6X3GT socket solder the positive (+) end of 17 the other 16 mfd. condenser and the other lead of "L," the filter choke. To pin No. 2 of socket "D" solder one end of 27 the 400 ohm resistor. This pin should be earthed. To the No. 8 pin, solder the free end of 27, plus the positive (+) end of 15 the 25 mfd. condenser. Earth the negative (-) end of 15 to the nearest solder lug.

Take a look now at 28, the tone control. The right-hand lug (that is the lug on the right when you look at the back of the control and the lugs point upwards) is earthed to the chassis. From your shielded lead, cut two lengths about 13in. each. See that the shielded braid is pushed back far enough to prevent it shorting onto the wire. Now solder one end of each of these two leads onto the centre and left-hand lugs. Run these two leads along the front of the chassis and then at right angles across the chassis to socket "D." The lead from the left-hand lug going to pin No. 5 and the lead from the centre lug to pin No. 6. It is advisable to solder these two shielded leads together at two or three points along the way. Also near the front of the chassis you should have a couple of solder lugs under the nuts which secure the sub chassis. Earth the braid to these two lugs.

Now 29—the volume control. Earth the left-hand lug to the nearest solder lug. Now solder one end of your shielded wire onto the right-hand lug, lead across the chassis to the diode return lug of "I," the 2nd I.F. transformer and solder on together with one end of 9, the .0001 mica condenser. Earth the other end of 9, also the braid to the solder lug under the nut which secures the rear section of the sub chassis. Solder a lead between the plate lug of 2nd I.F. tranny "J" and pin No. 3 of 6U7G socket "B." Now still on "J," solder a lead onto the diode lug and solder the other end onto pin No. 4 of "C," the 6Q7GT socket, together with one end of 10, the .00005 mica condenser. Now onto pin No. 5 of "D" solder one end of 13, the .1 paper condenser, the other end solders with 11 the .0005 mica condenser and the free end of 22, the 250,000 ohm resistor onto pin No. 3 of socket "C." Earth the other end of 11. Do not have these leads longer than necessary. Nip off any leads which are too long. Still with socket "C," connect the following onto pin No. 5: One end of 23 and 24, the 1 meg. resistors, also the free end of 10. Now pin No. 6. Cut about 7in. of shielded wire and solder one end, together with an end of 12, the .002 condenser, and 25, the 10 meg. resistor, onto this pin. See that the braid does not short onto any of the wiring. Push this lead up through the hole provided in the chassis. Later on a grid clip is soldered to this end to go onto the top of the 8Q7GT valve. Solder the other end of 12 onto the centre lug of 29, the volume control. Earth the free end of 25.

pose we get this sub chassis wired up now and mounted in place. A glance at diagram "D" will indicate the positioning of the various parts. The coils "G" and "H" are attached to the chassis by a small bolt.

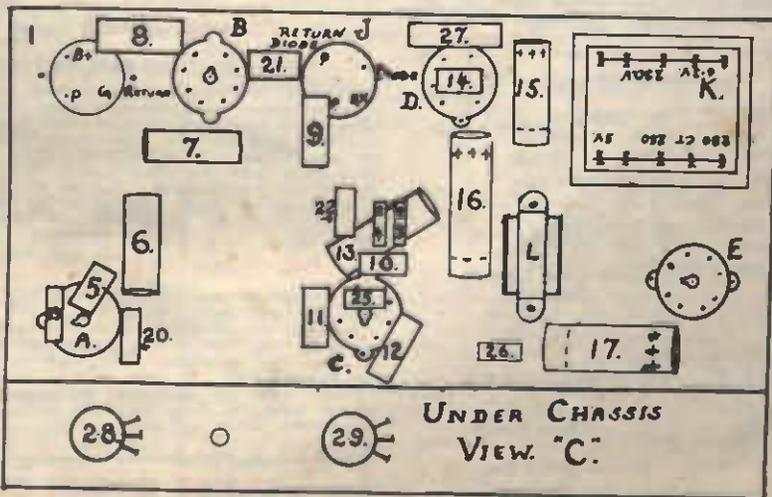
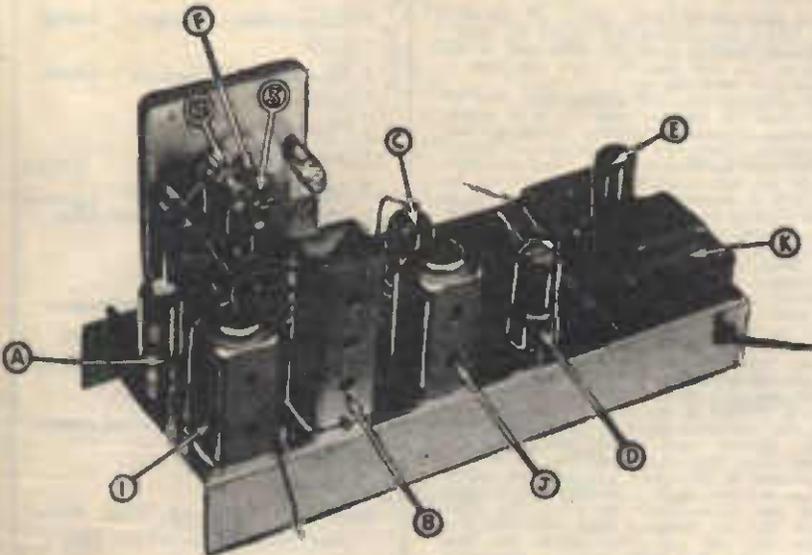
Now first of all secure the tuning condenser "F" in place, securing a couple of solder lugs down at the same time, and then the two coils, "G" and "H," should be mounted. Now, with the aerial coil "G," you will find a tiny condenser. Solder this across the yellow and green lugs. Solder about 2ft. of pushback wire to the yellow lug—this will be used as your aerial lead. Now on each of the bottom lugs of the two-gang condenser "F," solder two leads of sufficient length to feed through the respective holes and connect to the two coils. The lead from the front section going to green lug of the aerial coil "G," and the lead from the rear section going to the green lug of oscillator coil "H." Now from these lugs we have to take other leads which feed through the main chassis and connect up underneath there. A good idea is to use leads having the same colour as the lug to which each is to be soldered. That is, green lead to green lug, yellow lead to yellow lug, and then there will be no mistake. Let us get cracking.

To the green lug of aerial coil "G," solder about 4in. of green hook-up wire. Earth the red lug to nearest solder lug. Now to the black lug. Solder the insulated end of 4, the .1 condenser, also one end of 18, the 100,000 ohm resistor. Now earth the other end of 4. Solder about 8in. of wire to the free end of 18. Turn to the oscillator coil, "H" now. Solder about 4in. of green lead to the green lug. Now about 6in. of red lead to the red lug, also the same length of yellow lead to the yellow lug. Have a look at 1, the padder condenser, that is the one with the porcelain base. Attach this so that the adjusting screw may be seen through the small hole in the top of the sub chassis. Earth one lug and take a short lead to the black lug of "H," the oscillator coil from the other lug.

Let us now mount the sub chassis in place, making sure to push the loose leads through the holes in the top of the main chassis and

lated lug of 6, the .1 condenser, the other end of 20 being connected to the B+ lug of "I," the first I.F. transformer. Do not earth 6 yet!

Now solder a short lead from pin No. 4 to pin No. 7 of "A," also solder one end of 19, the 50,000 ohm resistor to pin No. 7. Earth the other end of 19. No. 2 pin of "A" now, a lead from there to the plate lug of "I," the first I.F. transformer. A lead now from pin No. 5 of "A" to pin No. 4 of "B," the 6U7G socket. Before attaching, however, to this No. 4 pin of "B," connect also the lug on the insulated end of 7 the .1 condenser and one end of 21 the 10,000 ohm, 2-watt resistor. Now take the free ends of 6 and 7, the .1 condensers, and earth onto a solder lug. Now back to the B+ lug of "I," the 1st I.F. tranny,



Have a look at 26 which is a 33 ohm resistor. As we do not possess such a value, we have substituted two resistors, one 100 ohm, and the other of 50 ohm. These are placed side by side and the ends are twisted together, thus making a single unit. Now solder one end of this unit together with one end of your hook-up wire onto the negative (-) lead of 17. Be sure you cut the resistor and condenser leads as short as possible. Earth the free end of 26, the 33 ohm unit. Now lead the hook-up wire which has one end attached to the negative lead of 17, over to the C.T. lug of "K," the power transformer. Cut off and solder the two ends onto this lug. Now lead the hook-up wire along the chassis, keeping it as flat as possible and take it over to 23. Cut the pigtail of 23 as short as possible, leaving only enough to solder the lead to. Now with 24, the other 1 meg. resistor, also cut the pigtail short and solder one end of your hook-up wire to it and lead the wire across to the grid return lug of "L," the 1st I.F. transformer. Now before soldering to this lug, also attach the insulated end of 8, the .1 condenser. Earth the other end of this condenser. Now across pin No. 3 of "D," and pin No. 6 of "B" solder 14, the .0005 mica condenser.

Now wire up your power flex to the 230v. lugs on the transformer "K." Be sure to use a rubber grommet in the hole where the flex comes through the rear of the chassis. This should complete the under chassis wiring.

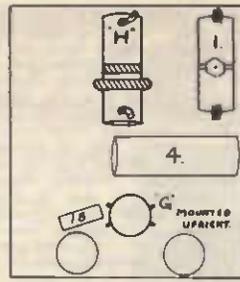
Fit the dial now. This needs little explanation. You will see the tuning shaft is fitted to the hole between the volume control and and tone control, and a cord feeds up from here to the dial drum which mounts onto the tuning condenser shaft.

We come now to the wiring of the dial lights. Having got your dial completely set up, solder the end of the hook-up wire which is poking up from the chassis onto one lug of the holders, then continue a lead across the back of the dial to one lug on the other holder. The other lug on each should be bent back and soldered to the holder clip. Screw the lights in and fit the holders in place.

You still have a shielded lead doing nothing in particular, so plug the 6Q7GT valve into its socket which is "C." Estimate the length of lead required to go to the top cap of this valve, see that the braid will not foul the wire and solder on the grid clip. Do not solder when the clip is on the valve.

Solder about 18in. of black lead onto a suitable solder lug and lead to the rear of the chassis. This will be used as the earth lead the best plan now is to thoroughly check all your wiring and see that there is no faulty wiring, unintentional hobs of solder causing shorts, etc. All being O.K., wire up your speaker. Now these leads go through the hole in the chassis near the power transformer. This should have a grommet placed in it. One lead goes to pin No. 3 of "D," and the other lead to pin No. 4 of "D." It is also a good idea to take a lead from the frame of the speaker and earth it onto one of the solder lugs under the chassis. These three leads can all feed through the one hole.

Now fit the various valves into their sockets, placing the shield on the 6U7G valve and attach the grid leads. Connect up the aerial and earth. Give the set a trial run now and watch the 6X5GT valve in particular for any excessive heating inside the tube. Should it



MOUNTING OF PARTS ON SUB CHASSIS "D"

tend to glow red all over, switch off immediately. Check your wiring and rectify the fault. If you have made a good job, there will be no trouble of this sort and the valve will have a dull red glow near the top.

Now assuming you are getting some sort of results from the set, the next job is to adjust the various trimmer and padder condensers for best results. This is a most important operation and must be done carefully. Bull-at-a-gate methods are out. All adjustments should be made with a non-metal instrument, such as a broken knitting needle filed to fit the adjusting screws. First of all, screw in 1, the padder condenser tightly and then slacken off about one turn. Then tighten up the screws of 2 and 3, the trimmer condensers on top of the tuning condenser, and slacken off two or three turns. Now tune in a station at the high-frequency end of the dial. That is, the end where the tuning condenser plates are almost fully unmeshed. Keep the volume well down, either with a small temporary aerial, or by using the volume control. Now adjust the trimmer on the front section of the gang for best volume, using the volume control if it becomes too strong. Should you require to screw the trimmer right out, you must then screw the rear trimmer in about one turn and then adjust the first trimmer again. On the other hand, if you find it necessary to screw the front trimmer right in, then you must screw the rear trimmer out one turn and adjust the first trimmer again for best results. Rock the tuning knob slowly back and forth while making these adjustments. Now tune in a station round about 1YA or 2YA and adjust 1, the padder condenser for best results, rocking the knob slowly back and forth at the same time. This is all we can advise in the way of adjustment. The two I.F. transformers have two adjusting screws also, but it is very easy to break these if the utmost care is not exercised. Should you decide to try any adjustment, do not turn them more than a 1/4-turn either way. If at all possible, get the whole job aligned by a qualified serviceman.

All that is required now is the fitting into the cabinet and your job is completed and a fine set you will have, the outstanding performance of which is contributed to in no small measure by the ECH21 converter tube. We can assure you, you will be delighted with the result of your few hours labour spent in its construction.

Handy Hints

SPEAKER CONE REPAIRS

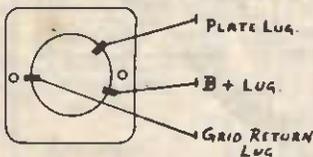
To repair a tear in a speaker cone, apply a small amount of household cement to the edges of the tear, bring the torn edges together carefully, then apply a cigarette paper over the tear on the back of the cone. When the cement has dried, the paper may be torn off, thus leaving a neat repair. Because this adds a minimum of extra material to the cone, the fidelity of the speaker is not affected appreciably.

TIGHTENING GRILL CLOTH

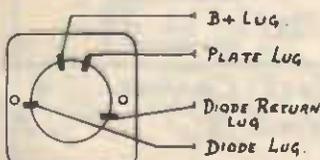
A number of receivers that come into the shop for repair have sagging grill cloths. A simple way to tighten them is to sprinkle or spray them lightly with water, and then let them dry overnight. The cloth shrinks and becomes taut.

Since water is distinctly unhealthy for speaker cones, it is a good idea to remove the speaker before sprinkling.

I.F. TRANSFORMER CONNECTIONS.



1st I.F. Grid Lead From Top of Can.



2nd I.F. J.

PARTS LIST

- 1 Chassis.
- 1 each ECH21, 6U7G, 6Q7GT, 6V6GT, 6X5GT, Valves.
- 4 Octal Valve Sockets.
- 1 Octal Valve Socket.
- 1 2-gang Variable Condenser.
- 2 Trimmers.
- 1 Padder.
- 1 Unshielded "Ensign" Aerial Coil.
- 1 Unshielded "Ensign" Oscillator Coil.
- 1 "Sky-King" Dial
- 11 Assorted Resistors.
- 2 16 mfd Electrolytics.
- 1 25 mfd 25-volt Electrolytic.
- 5 .1 mfd. Condensers.
- 1 .002 mfd Condenser.
- 2 .0005 mfd Mica Condensers.
- 1 .0001 mfd Mica Condenser.
- 2 .00005 mfd. Mica Condensers.
- 2 1/2-meg. Potentiometers.
- 1 280/280 6.3-volt Transformer.
- 1 Filter Choke.
- 3 Knobs.
- Sundries: Hook-up Wire, Bolts and Nuts Lugs, Clips, etc.

KITSET AS ABOVE

Cat. AK2065 **£9/5/-**
11' 10'

Kitset with "Rola" 8in. 8K Speaker

Cat No. AK2065A **£11/7/6**

Kitset with Speaker and Veneered Cabinet

Cat. No. AK2065B **£14/17/6**

"EASY BUILT FIVE"

I received from you about this time last year, the kit-set for the "easy built five." It took next to no time to construct it and it has been working well ever since.

The instructions in the Annual were very simple and easy to follow. I can get 32 stations in the evening, and half as many in the day time. I wish to state that I am very pleased with it.—A.W., Christchurch.

WIRING CHARTS GIVEN ON NEXT TWO PAGES

CONNECTIONS TO BE MADE

ECH21 Socket	A Centre lug to pin 1 of "A" and earthed. Pin 1—To centre lug and earthed. Pin 2—To plate pin on first I.F. trany "J". Pin 3—To yellow lug on oscillator coil "H". Pin 4—To one end of .00005 condenser "5", also to pin 7 of "A". Pin 5—To pin 4 of "B". Pin 6—To green lug on aerial coil "G". Pin 7—To pin 4 of "A", also to one end of 19. Pin 8—To pin 7 of "B".	6X5GT Socket	E Pin 1—No connection. Pin 2—To one 5v. lug on "K". Pin 3—To one 280v. lug on "K". Pin 4—No connection. Pin 5—To other 280v. lug on "K". Pin 6—No connection. Pin 7—To other 5v. lug on "K". Pin 8—To positive (+) end of 17 also one lead of "L".
6U7G Socket	B Pin 1—No connection. Pin 2—Earthed to chassis with pins 5 and 8. Pin 3—To plate pin on 2nd I.F. trany "J". Pin 4—To pin 5 of "A", also to one end of 7 and 21. Pin 5—Earthed to chassis with pins 2 and 8. Pin 6—No connection. Pin 7—To pin 8 of "A" and pin 7 "D". Pin 8—Earthed to chassis with pins 2 and 5.	2-Gang Condenser	F Lead taken from bottom lug of fixed plates of section nearest dial, to the green lug of "G". Lead taken from bottom lug of fixed plates of rear section, to the green lug of "H".
6Q7GT Socket	C Pin 1—Earthed to chassis with pins 2 and 8. Pin 2—Earthed to chassis with pins 1 and 8. Pin 3—To one end of 11, 13 and 22. Pin 4—To one end of 10, and diode pin on 2nd I.F. Trany "J". Pin 5—To one end 23 and 24 and other end of 10. Pin 6—Used as junction for one end of 12 and 25, also shielded lead which goes up through chassis to cap of valve. Pin 7—To pin 7 of "D", also to dial light holders. Pin 8—Earthed to chassis with pins 1 and 2.	Aerial Coil	G The small condenser supplied is soldered between the green and yellow lugs. Lead taken from yellow lug and used as aerial connection. Red lug earthed to chassis. Green lug—A lead to pin 6 of "A", also to fixed plates of front section of "F". Black lug to one end of 4 and 18.
6V6GT Socket	D Pin 1—No connection. Pin 2—Earthed to chassis. Pin 3—To one end of 14, also to one speaker lead. Pin 4—To other speaker lead, also one lead of "L" positive (+) end of 16 and B+ lug on 2nd I.F. trany "J". Pin 5—To one end of 13, also through shielded lead to left-hand lug of tone control 28. Pin 6—To one end of 14 also through shielded lead to centre lug of tone control 28. Pin 7—To pin 7 of "B" and "C", also to 6.3v. lug of "K". Pin 8—To positive (+) end of 15, also one end of 27.	Oscillator Coil	H Yellow lug—A lead to pin 3 of "A". Red lug—A lead to one end of 6 and 20. Green lug to fixed plates of rear section of "F", also lead to one end of 5. Black lug to one lug of 1.
		1st I.F. Transformer	I Green (grid) lead from top, fits on to cap of 6U7G valve. B+ lug has lead to B+ lug of "J", also to 20. Plate lug to pin 2 of "A". Grid return lug to one end of 8, 18 and 24.
		2nd I.F. Transformer	J B+ lug has lead from B+ lug of "I", one end of 21 and 22, also lead from pin 4 of "D", all soldered to it. Plate lug to pin 3 of "B". Diode lug to one end of 10 and pin 4 of "C". Diode return lug to one end of 9, also through shielded lead to right-hand lug of 29.
		Power Transformer	K 230v. lugs to power flex. 6.3v. lugs—one lug is earthed to chassis, the other lug has a lead going to pin 7 of "D" from which a lead goes to pin 7 of "C" and up through chassis to connect to dial light holders. Also from pin 7 of "D" a lead to pin 7 of "B", continuing onto pin 8 of "A". 5v. lugs—one lug to pin 2 of "E", the other lug to pin 7 of "E". 280v. lug to pin 3 of "E", other 280v. lug to pin 5 of "E". C.T. lug to negative (-) end of 17 and one end of 23 and 26.
		Filter Choke	L One lead to pin 8 of "E". Other lead to pin 4 of "D".

CONDENSER, RESISTOR CONNECTIONS

Padder Condenser	No. 1	One lug to black lug of "H". Other lug earthed to chassis.	16 mfd. Electrolytic	No. 16	Positive (+) end to pin 4 of "D". Negative (-) end earthed to chassis.
Trimmer Condenser	2 3	These condensers are connected to main tuning condenser. Solder to main condenser in the position indicated in diagram "A", that is, the large lug of 2 is soldered to the front metal plate of the tuning condenser and the large lug of 3 is soldered to the back metal plate. A small lead is then taken from each spare lug, the lead from 2 going to the top lug of fixed plates of front section of "F". The lead from 3 going to the top lug of fixed plates of rear section of "F".	16 mfd. Electrolytic	17	Positive (+) end to pin 8 of "E". Negative (-) end to one end of 23 and 26 and C.T. lug of "K".
.1 Tubular Metal Condenser	4	Insulated lug to black lug of "G". Lug on metal case earthed to chassis.	100,000 ohm Resistor	18	One end to black lug of "G". Other end a lead through chassis to grid return lug of "I".
.00005 Mica Condenser	5	One end to pin 4 of "A". Other end to green lug of "H".	50,000 ohm Resistor	19	One end to pin 7 of "A". Other end earthed to chassis.
.1 Tubular Metal Condenser	6	Insulated lug to one end of 20, also lead through chassis to red lug of "H". Lug on metal case earthed to chassis.	25,000 ohm Resistor	20	One end to insulated lug of 6, also lead through chassis to red lug of "H". Other end to B+ lug of "I".
.1 Tubular Metal Condenser	7	Insulated lug to pin 4 of "B". Lug on metal case earthed to chassis.	10,000 ohm 2-watt Resistor	21	One end to pin 4 of "B". Other end to B+ lug of "J".
.1 Tubular Metal Condenser	8	Insulated lug to grid return lug of "I". Lug on metal case earthed to chassis.	250,000 ohm Resistor	22	One end to B+ lug of "J". Other end to pin 3 of "C".
.0001 Mica Condenser	9	One end to diode return lug of "J". Other end earthed to chassis.	1 meg. Resistor	23	One end to pin 5 of "C". Other end to C.T. lug of "K", one end of 26 and negative (-) end of 17.
.00005 Mica Condenser	10	One end to pin 4 of "C". Other end to pin 5 of "C".	1 meg. Resistor	24	One end to pin 5 of "C". Other end to grid return lug of "I".
.0005 Mica Condenser	11	One end to pin 3 of "C". Other end earthed to chassis.	10 meg. Resistor	25	One end to pin 6 of "C". Other end earthed to chassis.
.002 Tubular Condenser	12	One end to pin 6 of "C". Other end to centre lug of 29.	33 ohm Resistor	26	This is made up of 2 resistors of 100 ohms and 50 ohms each. These are placed together and the ends twisted together and soldered. This can now be regarded as one resistor of 33 ohms. One end to C.T. lug of "K", Negative (-) end of 17. Other end earthed to chassis.
.1 Tubular Condenser	13	One end to pin 3 of "C". Other end to pin 5 of "D".	400 ohm Resistor	27	One end to pin 8 of "D". Other end earthed to chassis.
.0005 Mica Condenser	14	One end to pin 3 of "D". Other end to pin 6 of "D".	.5 meg. Tone Control	28	Left-hand lug through shielded lead to pin 5 of "D". Centre lug through shielded lead to pin 6 of "D". Right-hand lug earthed to chassis.
25 mfd. Electrolytic	15	Positive (+) end to pin 8 of "D". Negative (-) end earthed to chassis.	.5 meg. Volume Control	29	Left-hand lug earthed to chassis. Centre lug to one end of 12. Right-hand lug through shielded lead to diode return lug of "J".

The "Easy Built" Clipper Portable

An ideal circuit for those wishing to build a portable set to take with them on their vacation as well as for use at weekend outings, tennis parties, tramping, motoring trips, etc. Four modern 1.4 volt valves give maximum operating efficiency as well as being a great little economiser as far as the battery drain is concerned.

As portables go you may think that the chassis we use (11in. x 4 1/2in.) is a little larger than necessary. We fully realize the tendency these days is to get a portable as small and as compact as possible, but we felt very reluctant to sacrifice the performance of this radio by cutting down its size.

By using midget I.F. transformers, a midget variable condenser and numerous other midget parts the set could have been reduced in physical dimensions, but from our experience we find that midget components of this nature do not give the performance of their larger counterparts.

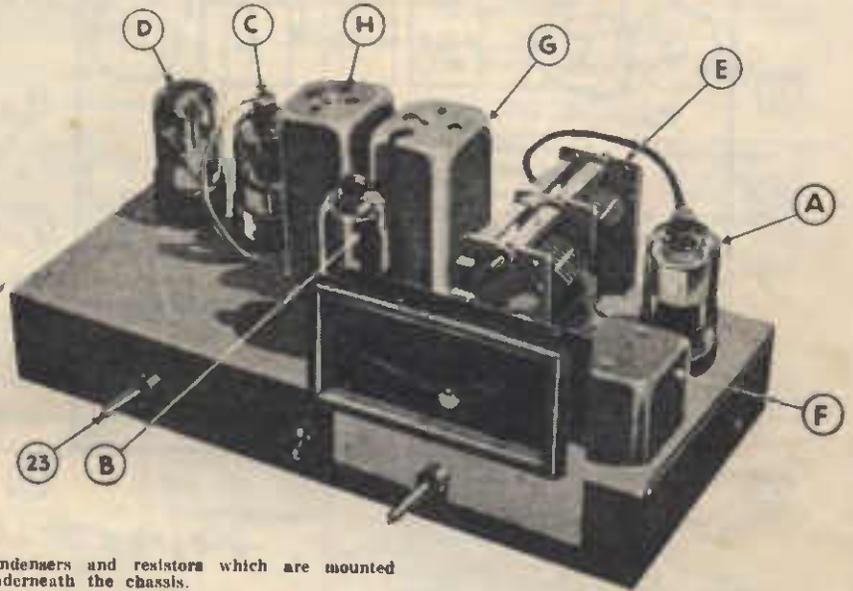
Also, the smaller the set the more difficult is the wiring for an inexperienced constructor, and as the "Easy-Built" range of kits is designed for simple construction we are sure you will agree that a slightly larger set giving a 100 per cent. performance is better than a midget set that is not quite as good as it could be.

We can heartily recommend our "Easy-Built" Clipper 4 portable as a first-class proven set that can be constructed with ease by even a novice with very limited radio construction experience.

The system we use is the same as we have used with great success in other "Easy-Built's", so if you can use a soldering iron, and are capable of following simple point to point connections even though your knowledge of radio theory may be nil you can build this receiver. This we say without fear of contradiction.

Do you know a resistor? Can you distinguish it from a valve socket? Can you count up to 23? You can! Good! You can build this grand little set.

Have a look at the various diagrams. "A" is the circuit diagram; "B" shows the position of the parts above the chassis, and "C" shows the placement of parts underneath the chassis. We have also prepared two lists. The first lists alphabetically the valve sockets and various parts that are mounted to the chassis by means of nuts and bolts. The second list numbers the



condensers and resistors which are mounted underneath the chassis.

CONSTRUCTIONAL DETAILS

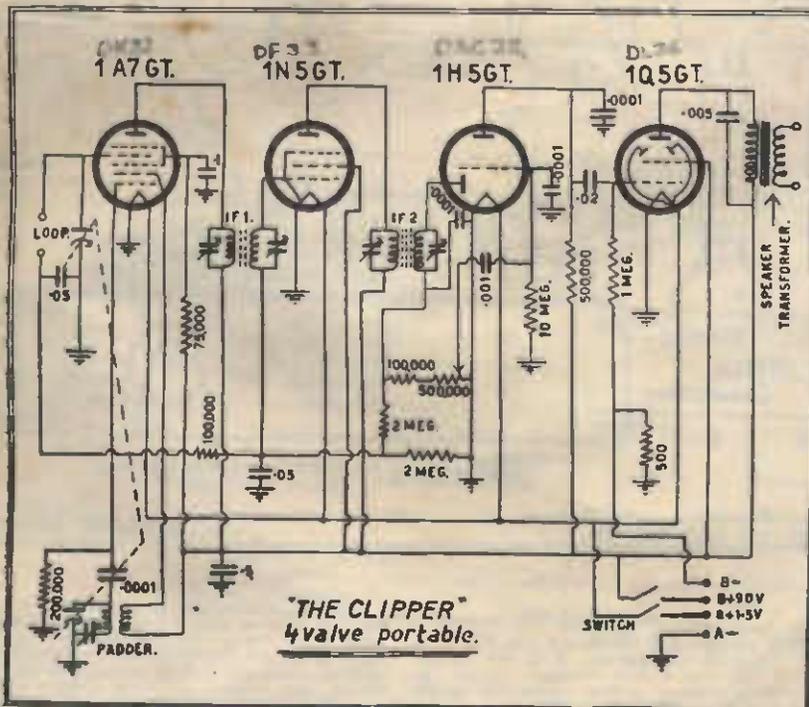
Mount the four valve sockets and make sure the "key," or notch, points the same way as shown in the diagram. On each of the bolts that go through socket "A" place a solder lug before putting on the nuts.

Socket "B" has one lug placed on bolt nearest front of chassis. Sockets "C" and "D"

have a lug also on bolt nearest front of chassis. These lugs are used as earthing points for the various small parts, so make sure the bolts are contacting the metal of the chassis and not just resting on the paint. Now before mounting the tuning condenser (E) solder a length of push back wire on to the bottom lugs coming from the fixed plates of each section of the gang. Both of these lengths should be about 1/2in. long. Thread these wires through their respective holes in the chassis and bolt the condenser in place. Also to the top lug of the rear section of the condenser gang solder a 5in. length of wire the other end of which has a grid clip soldered to it which goes on to the cap of the 1A7 GT valve. But don't worry about that yet. Mount now the rest of the parts. The oscillator coil (F) mounts on the front right hand corner and the two I.F. transformers (G and H) mount side by side. The transformer with the lead coming out the top of the can is known as the first I.F. (G) and mounts next to the condenser gang and before bolting in place put a solder lug under the rear nut. When fitting the second I.F. transformer (H) put an additional nut on the mounting lug nearest the front of the chassis, place the one lug anchoring strip provided over this and secure it by means of a third nut. This strip is used later as a junction for the black lead of "E" which is the second I.F. transformer and also 6 which is a .0001 condenser 16 and 17 100,000 ohm and 2 megohm resistors respectively. Mount now the twin terminal strip which mounts at the rear of the chassis and almost directly below socket "A". Next mount the switch and volume control (23) but do not tighten up the nuts as you will want to solder leads on to the various contacts and may need to turn them to get at the lugs. Try the dial in place, now make sure it will turn smoothly, then remove it and replace later when all the wiring is done.

Now for some work under the chassis. First solder one end of your hook-up wire on to the appropriate lug on the switch (see diagram of switch connections) and allow enough wire to reach pin No. 2 of socket "B" and cut off.

Cut an 8in. length of wire now and solder one end together with the lead from the switch on to pin No. 2 of socket "B". A 3in. length of wire now and solder it with the free end of the 8in. length on to pin No. 2 of socket "D".



HOLE FOR SPEAKER.
AND BATTERY CABLES.

TWIN TERMINAL STRIP
FOR CONNECTING LOOP
AERIAL.

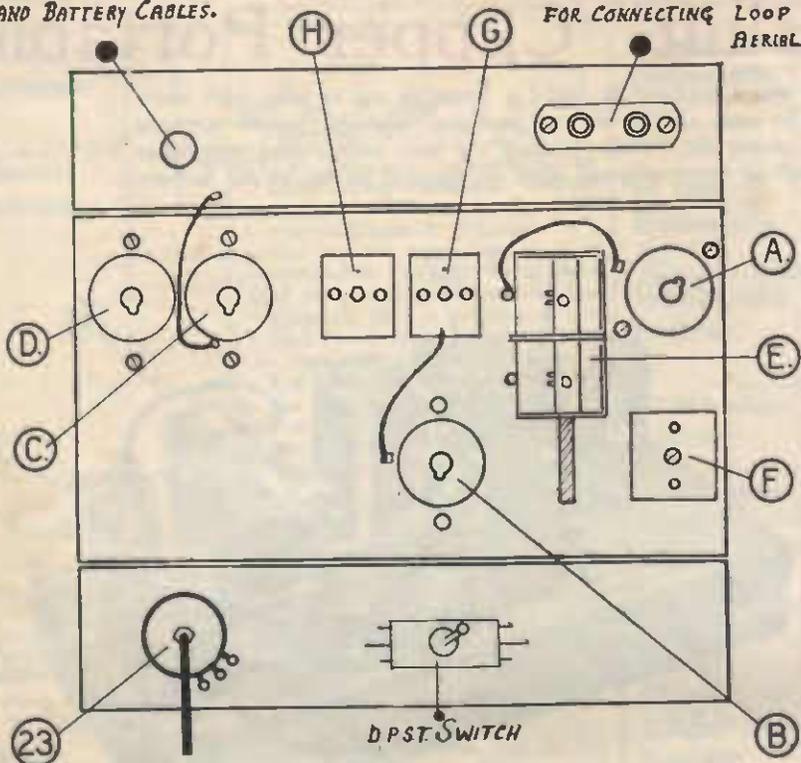


Diagram "B"

Another 8in. length is cut now and soldered on to pin No. 2 of socket "C" with the spare end of the 3in. length. We may should have only one tree end left which is soldered on to pin No. 2 of socket "A". Now earth pin No. 7 of each of these sockets on to their respective solder lugs by means of short lengths of wire. Keep all of these leads flat on the chassis. Now by referring to the various lists we feel sure you will have no trouble in wiring up the rest of the set. Wire up the leads from your tuning condenser and the I.F. transformers and then work round to the various small parts. By ticking off the individual connections on the lists as you go along you can be sure all the necessary joints have been made.

When all your wiring is done recheck against the list again. Wire up your speaker now to pins Nos. 3 and 4 of socket "D". Your battery cable also, the A+ and B- leads going to the switch (see diagram). The A- lead is earthed to a suitable lug and the B- lead goes on to pin No. 6 of "D". Your loop aerial leads go on to the two terminals at the back of the chassis. Having made sure your A and B batteries are connected correctly the time has arrived to try the set out. Let us stress, however, the importance of checking on your battery connections, as many a set of valves has been ruined by the over-confident hooking up of batteries without a proper check of connections. With all the valves in their correct sockets and grid leads in place tune in a station in the vicinity of 1300 Kcs. and adjust the trimmers on the condenser gang for best results. Now, at the other end of the dial tune in a station and adjust the padding condenser for maximum signal. This is rather a rough and ready method and we strongly advise having the set aligned by a qualified serviceman. Remember your loop is highly directional and must be pointed toward the incoming signal for best results. Should any of the details be not quite clear to you our technical staff will willingly endeavour to clear up the joints in question for you.

**ALL LAMPHOUSE KITSETS ARE
BASED ON PROVEN CIRCUITS**

**THE "EASY BUILT
CLIPPER" PARTS LIST**

- 1 Chassis.
- 1 2-gang Variable Condenser.
- 2 "Ensign" 465 K.C. I.F. Transformers.
- 1 "Ensign" Oscillator Coil (Shielded).
- 1 "Ensign" Loop Aerial.
- 1 5in. Speaker.
- 1 1A7GT Valve.
- 1 1N5GT Valve.
- 1 1H5GT Valve.
- 1 1Q5GT Valve.
- 4 Valve Sockets.
- 1 Dial.
- 1 500,000 ohm Volume Control with D.P.S.T. Switch.
- 10 Resistors.
- 4 .0001 mfd. Mica Condensers.
- 1 .001 mfd. Tubular Condenser.
- 1 .005 mfd. Tubular Condenser.
- 1 .02 mfd. Tubular Condenser.
- 2 .05 mfd. Tubular Condensers.
- 1 .1 mfd. Tubular Condenser.
- 1 8 mfd. Electrolytic Condenser.
- 2ft. Battery Cable.
- 2 pkts. Hook-up Wire.
- 18 Nuts and Bolts.
- 1 Terminal Strip.
- 18 Solder Lugs.
- 2 Knobs.
- 3 Grid Clips.
- 1 Grommet.
- 1 Padder Condenser.

Complete Kit of Parts as
above—

Cat. No. AK2040 **£10/7/6**

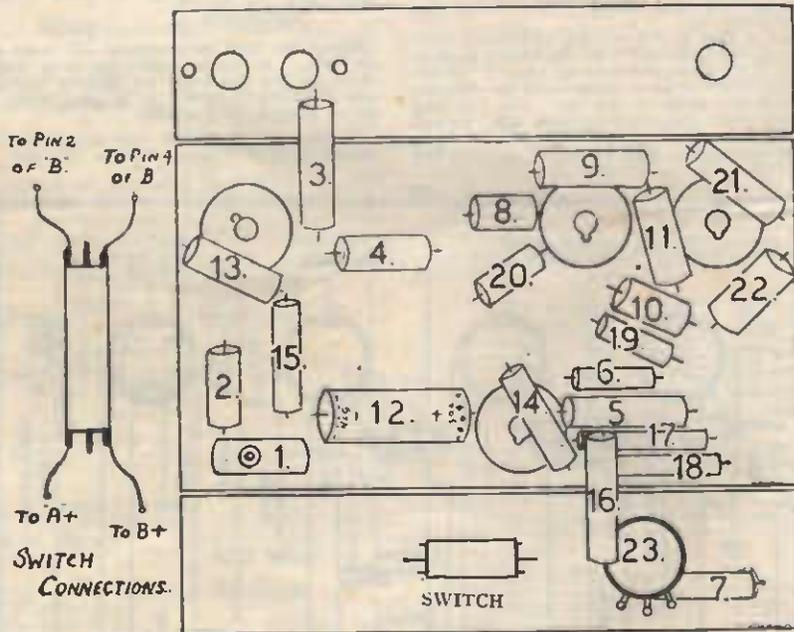
Batteries.

- 2 45-volt Portable Batteries.
- 1 1½-volt "A" Battery.

£12/12/6

Complete Kit WITH
BATTERIES—

Cat. No. AK2040A



- UNDER CHASSIS VIEW. -

- Diagram "C".

Handy Hints

COIL WINDING TIP

It is usually hard to thread the end of a thin wire through the pin of a coil former. But if the wire is first threaded through the eye of an ordinary sewing needle, the needle then can be used to pass the wire through the hole in the pin.

NOVEL PANEL FINISH

A novel crackle finish for radio panels and cabinets may be made by painting the surface with a slow-drying enamel. When the surface is partially dry, apply a coat of quick-drying enamel. The top coat of enamel will tend to shrink and wrinkle the more pliable bottom coat and produce a realistic wrinkle-finish surface.

CONNECTIONS TO BE MADE

1A7GT Socket	"A"	Pin 1—No connection.	1Q5GT Socket	"D"	Pin 1—Earthed and used as earthing lug for 10, 19 and 22.
		Pin 2—Filament Pin (see Text).			Pin 2—Filament pin (see Text).
		Pin 3—To yellow lead of "G".			Pin 3—To 11 and one lead of speaker transformer.
		Pin 4—To 4 and 15.			Pin 4—To Pin 4 of "B", 11, and other lead of speaker transformer.
		Pin 5—To 2 and 13.			Pin 5—To 9 and 21.
		Pin 6—To yellow lug of "F."			Pin 6—To 21 and 22, also B— lead of battery cable.
		Pin 7—Filament pin earthed to chassis			Pin 7—Filament pin earthed to chassis.
		Pin 8—No connection.			Pin 8—No connection.
1N5GT Socket	"B"	Pin 1—No connection.	2 Gang Condenser	"E"	Lead from top lug on fixed plates of rear section goes to cap of 1A7GT valve. Lead from bottom lug of same section goes to left hand lug of the twin terminal strip. Lead from bottom lug of front section goes to green lug of "F."
		Pin 2—Filament pin (see Text).			
		Pin 3—To yellow lead of "H".			
		Pin 4—To positive end of 12 red lug of "F", Pin 4 of "D" and 20 red leads of "G" and "H."			
		Pin 5—To right hand lug on twin terminal strip.			
		Pin 6—Used as junction for 5, 14, 17, 18 and black lug of "G."			
		Pin 7—Filament pin earthed to chassis.			
		Pin 8—No connection.			
1H5GT Socket	"C"	Pin 1—No connection.	Oscillator Coil	"F"	Green lug to 2 and bottom lug of front section of "E."
		Pin 2—Filament pin (see Text).			Black lug to fixed plates of 1.
		Pin 3—To 8, 9 and 20.			Yellow lug to pin No. 6 of "A."
		Pin 4—No connection.			Red lug to pin No. 4 of "B."
		Pin 5—To green lead of "H."			
		Pin 6—No connection.			
		Pin 7—Filament pin earthed to chassis.			
		Pin 8—Used as junction for lead from grid cap of 1H5GT, also 7, 10, and 19.			
			1st I.F. Transformer	"G"	Green lead from top of can goes to cap of 1N5GT valve.
					Black lead to Pin No. 6 of "B."
					Yellow lead to Pin No. 3 of "A."
					Red lead to Pin No. 4 of "B."
			2nd I.F. Transformer	"H"	Green lead to Pin No. 5 of "C."
					Black lead to 6, 16 and 17.
					Yellow lead to Pin No. 3 of "B."
					Red lead to Pin No. 4 of "B."

SMALL COMPONENT CONNECTIONS TO BE MADE

Condensers	No.		Condensers	No.	
Padder	1	Fixed Plates to black lug of "F". Moving plates earthed.	.0001 Mica	6	To black lead of "H". Earthed to chassis.
.0001 Mica	2	To Pin No. 5 of "A". To green lug of "F".	.001 Tubular	7	To Pin No. 8 of "C". To centre lug of 23.
.05 Tubular	3	Right hand lug of twin terminal strip. Earthed to chassis.	.0001 Mica	8	To Pin No. 3 of "C". Earthed to chassis.
.1 Tubular	4	To Pin No. 4 of "A". Earthed to chassis.	.02 Tubular	9	To Pin No. 3 of "C". To Pin No. 5 of "D".
.05 Tubular	5	To Pin No. 6 of "B". Earthed to chassis.	.0001 Mica	10	To Pin No. 8 of "C". Earthed to chassis.

Condensers		No.	Resistors		No.
.005 Tubular	11	To Pin No. 3 of "D".	2 megohm	18	To Pin No. 6 of "B".
		To Pin No. 4 of "D".			Earthed to chassis.
8 mfd Electrolytic	12	Positive (+) end to Pin 4 of "B".	10 megohm	19	To Pin No. 8 of "C".
		Negative (-) end earthed to chassis.			Earthed to chassis.
Resistors			500,000 ohm		
200,000 ohm	13	To Pin No. 5 of "A".	1 megohm	21	To Pin No. 4 of "B".
		Earthed to chassis.			To Pin No. 3 of "C".
100,000 ohm	14	To Pin. No. 6 of "B".	500 ohm	22	To Pin No. 5 of "D".
		To Pin No. 5 of "B".			To Pin No. 6 of "D".
75,000 ohm	15	To Pin No. 4 of "A".	.5 megohm	23	To Pin No. 6 of "D".
		To red lug of "F".			Earthed to chassis.
100,000 ohm	16	To black lead of "H".	Vol. Control		Right hand lug to 16.
		To right hand lug of 23.			Centre lug to 7.
2 megohm	17	To black lead of "H".			Left hand lug earthed to chassis.
		To Pin No. 6 of "B".			

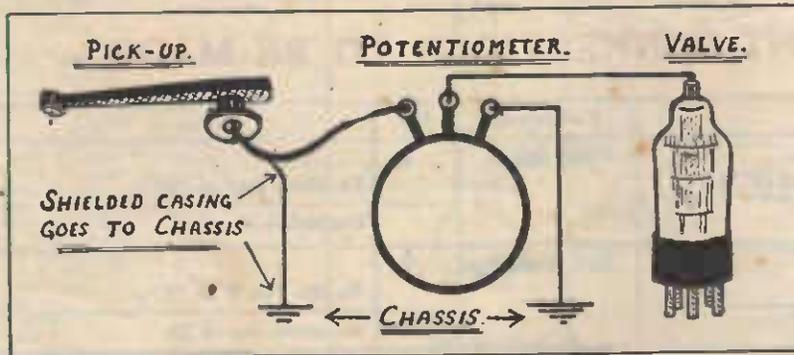
A FEW OF THE MANY COMPLIMENTS

The "Clipper Portable which arrived recently opened up to my entire satisfaction. This Circuit is indeed a winner and results I have obtained leave nothing to be desired.

Thanking you for your prompt service and attention. I am, yours faithfully, J.J., Tongaporutu.
"I have the "Clipper" Portable going perfectly now and I am very pleased with it." F.J.G., Blenheim.

USEFUL INFORMATION

CONNECTING A PICK-UP TO YOUR RADIO



The above simple illustration and instructions show how easy it is to fit a Pick-up to your radio. The valve to which the connection is made in the set is the Detector tube. On most sets this tube is a shielded one usually enclosed in a valve can with a grid clip on top and is situated in the majority of cases next to the two valves without grid clips.

The following is a list of the most commonly used Detector tubes: Type 24A, 57, 55, 6C6, 6B7, 2B7, 75, 6Q7, 6B8, 6J7. The grid clip

of this tube to which a wire is already connected is removed and in its place the lead from the centre lug of the volume control is fitted, preferably by means of a detachable grid clip.

One of the outside lugs of the volume control goes to earth while the other goes to the Pick-up Lead. The shielded casing of the Pick-up Lead or the second wire as the case may be goes to earth.

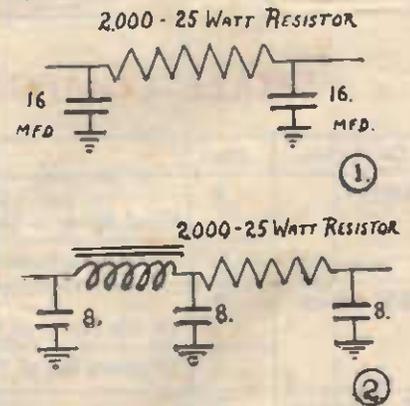
Earth refers to the metal chassis of the radio.

Converting Circuits to Use P.M. Speakers

It is really not a difficult task to convert a Radio Circuit incorporating an Electro-magnetic Speaker to use a Permanent Magnet type.

Manufacturers are now concentrating mainly on the Permanent Magnet type of speaker using the latest "Alnico" Anisotropic Magnet, and the day is not far away when the good old E.M.'s will be just a pleasant memory.

Below we give two Circuits showing the simplicity of the interchangeability of these two types.



The Field winding of the standard E.M. Speaker is replaced by a Heavy-duty Resistor. A 2,000 ohm 25-watt type is suitable for the majority.

Figure 1 shows the alteration using 2-16 mfd. Electrolytic Condensers for filtering.

In case of hum where this filtering proves insufficient, Circuit 2 should be used. This incorporates a Filter Choke as well as the resistance.

8 mfd. Electrolytics are of a large enough capacity in this set-up.

"C.M." WATER PUTTY



Ready for use, simply by mixing with water. Dries rock hard without shrinking. Easy to apply, and can be used on wood, plaster stone, and similar material. Can be coloured or varnished.

Cat. No. AU163 (8 oz.) .. **1/6** per tin

Cat. No. AU165—Large size (16 oz.) .. **2/4** per tin

LAMPHOUSE GUARANTEE

Any goods that prove in any way unsuitable may be returned undamaged within seven days from receipt and your money will be refunded in full.

"QUICKMEND"

IS THE NEW SCIENTIFIC LIQUID MENDER



Specially prepared for mending Aluminium, Brass, Silver, Copper, White Metal, Iron, Pewter, Guttering, Enamel, Petrol Tanks, Carburetors, Water Tanks. Requires no HEAT, no SOLDERING IRON, no FLUX. Is not soluble in Spirits or Acids; withstands the action of hot or cold water.

Full instructions with each bottle.

Cat. No. AU167 .. Costs Only **1/7** Bottle

FREIGHT

We pay Freight on all retail orders over £1 value. Please include sufficient cash for postage on small orders.

PLASTIC WOOD



The perfect moulding material. A plastic material which is easily worked. A high-class filler for all types of jobs. Used by Carpenters, Joiners, Painters, Mechanics, Farmers and Householders. Hardens very rapidly, and, like wood, can be cut, sawn, planed, filed, nailed or screwed. It can be varnished, stained, painted or polished. Grease-proof, water-proof, and weather-proof.

Cat. No. AU168—1oz. Tube .. **1/7**

LIQUID CASEIN GLUE— "ATAGLU"

Waterproof. A high-class, ready to use, casein liquid glue. "Ataglu" eliminates loss of time preparing hot glues. Does not stain. Gives a better spread than ordinary cold glues.

Cat. No. AU157 .. **1/10 1/2**

"NEW GRIP" MENDS ANYTHING!



"NEW GRIP"—The Universal Cellulose Cement, mends anything: Slate, Glass, Paper, Ivory, Wood, Crockery, Canvas, etc. Recommended for Model Aeroplane building.

NEW PRICE!

Cat. No. AU156 .. **1/6**

LAMPHOUSE RADIO BOOKS

"The Lamphouse" RADIO CIRCUIT BOOK

An 80-page booklet containing nearly 200 different Circuits, Circuits of all types, from Crystal Sets to a 26 Valve De Luxe Receiver. Amplifiers, power packs, electric fence units, testing equipment, short-wave converters, wave traps, oscillators, aerial systems—in short, a Circuit to meet every requirement. Schematic diagrams only are given and not constructional details. No claim is made that this book contains any new Circuits all having previously been published in Lamphouse Annuals or Radiograms.

Enthusiasts, whether beginners or experienced servicemen, will find this book invaluable as a reference medium. Your Radio Library will not be complete without a copy.

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