

JOHNS LTD.

ANNUAL CATALOGUE

APRIL 1930



COMPLETE RADIO EQUIPMENT
ELECTRICAL APPLIANCES
BICYCLES AND ACCESSORIES
GRAMOPHONE PARTS, TOOLS, &c.

CHANCERY ST., AUCKLAND.

HIRE PURCHASE.

For the convenience of **APPROVED CLIENTS**, we offer

RADIO SETS, KIT SETS, OR APPARATUS

ON THE FOLLOWING TERMS:—

DEPOSIT—As arranged, usually 20 per cent.

INSTALLMENTS—Equal monthly.

INTEREST—Six months' terms, 5 per cent.; twelve months' terms, 7½ per cent.

Hire Purchase Clients must be over 21 years of age, or nominate a guarantor.

If other terms are desired, please write us, making known your wishes, and every endeavour will be made to meet you.

ALL HIRE PURCHASE TRANSACTIONS ARE KEPT

STRICTLY CONFIDENTIAL.

Guarantee.

We hereby Certify that our RADIO SETS are to the best of our expert knowledge, free from all defects, either of material or workmanship, when they are despatched from our factory.

We further Guarantee to replace or repair, FREE OF CHARGE, any part which may prove defective, either in material or workmanship, within the guaranteed period specified with each set, provided such defects are not caused by abuse, neglect, accident, or to alterations or repairs not executed by JOHNS LTD.

This Guarantee covers sets only, and does not include accessories, which, however, are usually guaranteed by their respective manufacturers or agents. In respect of such defects, we will always endeavour to obtain replacement, should occasion arise.

Johns Ltd.

MAIL ORDER SERVICE.

If, when ordering your RADIO REQUIREMENTS from us, you want any other goods of any description, which are procurable in Auckland, include them in your order.

We can procure these for you, giving you the benefit of our own advice in cases where necessary, and saving you the trouble and inconvenience of two separate orders to different firms.

ASK FOR OUR CATALOGUES AS UNDER:

1. WINTER SPORTS.

2. SUMMER SPORTS.

JOHNS LIMITED

DIRECTORS:

A. CLIVE JOHNS

VICTOR E. JOHNS

(Formerly in charge Physics Laboratory Workshop, Auckland University College).

(Formerly with Messrs. L. D. Nathan and Co., Ltd., Auckland).

JOHNS BUILDING, CHANCERY STREET, AUCKLAND.

(1½ minutes' walk from Queen Street, by concrete road. See Locality Chart on Back Cover.)

RETAIL RADIO LIST.

PLEASE HAND THIS LIST TO A FRIEND IF IT DOES NOT INTEREST YOU.

TERMS.

BUSINESS HOURS.

Week Days: 8.30 a.m. to 5.30 p.m.

Fridays: 8.30 a.m. to 3.30 p.m.

Saturdays: 8.30 a.m. to 12.15 p.m.

COUNTRY CUSTOMERS.

Are specially invited to visit our shop when they are in town, and to inspect any apparatus, etc., in which they are interested.

SATISFACTION.

It is our earnest endeavour that every customer should be perfectly satisfied with every transaction. If there is the slightest reason for dissatisfaction, the DIRECTORS will regard it as a personal favour if you will write them—confidentially—giving full details. It will receive prompt attention.

NEW APPARATUS.

New lines are continually being imported or made. An enquiry for any article not listed may bring you full details of the very thing you want.

ENQUIRY SERVICE.

That the RADIO business to-day demands an unusual amount of technical ability is evidenced by the numerous enquiries received daily, not only on all matters relating to Radio in particular, but to electricity in general.

This "Enquiry Service" is a very expensive one to maintain, since it demands the attention of any of the half dozen experts on our staff—sometimes when a long list of questions—often of a technical nature—different parts are referred to different experts.

We hope in the future, as we have done in the past, to continue to answer these questions fully and without discrimination between those who are our customers and others.

Your answers will be much more prompt and accurate if questions are:

1. Numbered.
2. As definite as possible.
3. Essential details are given as briefly as possible.

Remember, we appreciate your orders just as much as you may appreciate our assistance in your difficulties.

THANK YOU.

are importing some from America, but we also construct others locally, chiefly in an endeavour to secure economy of working expense, which is inclined to be completely overlooked in the imported receiver, built possibly for entirely different conditions.

Prominence has recently been given to the **UNEMPLOYMENT PROBLEM**, which all can help to solve by supporting local industry. You wish your sons and daughters to get work when they leave school. Do you assist to provide this work for them, by buying local products? If you can, you will be helping them. You should not complain if work is scarce. Think this over. We are proud of the fact that we can construct successfully—**EFFICIENTLY**—**WORKMANSHIP** **FINISH, PRICE**—with imported articles.

We can therefore confidently appeal to you to **SUPPORT YOUR FELLOW WORKERS.**

HELP US TO HELP YOU.

PAYMENT.

CASH WITH ORDER, UNLESS OTHERWISE PREVIOUSLY ARRANGED.

DEFERRED PAYMENT—See opposite page.

FREIGHT AND POSTAGE.

COMPLETE SETS.

Freight free, and safe delivery guaranteed, to nearest railway station or port.

POSTAL ORDERS.

Free on all **CASH ORDERS** of £1 or more.

EXPRESS—6d. per parcel extra.

FRAGILE—6d. per parcel extra.

FREIGHT—CASH WITH ORDER (£1 minimum).

On goods too bulky, heavy, or otherwise unsuitable for postage, half freight or railage will be allowed to any port or railway station in New Zealand.

HOW TO ORDER.

Write plainly, preferably on one side of paper only. Give full name and address with every order.

Give catalogue number, and full description—length, size, etc.

NEVER ORDER "SAME AS LAST." It will delay your order. Give full particulars with every order.

RETURNS.

NO RETURNS will be accepted after seven days. **ACCUMULATORS, VALVES, BATTERIES, CRYSTALS**, and similar articles, unless **SPECIALLY GUARANTEED**, are not returnable under any circumstances.

PROCURED GOODS NOT RETURNABLE.

VALVES.

See under **VALVES** for special conditions regarding their sale.

DEMONSTRATIONS.

We will gladly arrange a demonstration of any set or speaker at customer's convenience.

PRICE ALTERATIONS.

All prices are subject to alteration without notice.

We again take this opportunity of thanking our customers for their support in past years.

To-day, Radio has changed entirely from what it was even two years ago, but though there are, perhaps, not so many keen Radio experimenters now as formerly, there is still a very real demand for apparatus, kits, etc., not only in the Radio field, but also for electric gramophones, public address systems, etc.

For complete receivers, all are now very well cared for, though most dealers have specialised on electric sets to the total exclusion of battery sets, which still are, and must continue to be, used by a large section. We are still, as ever, catering for these requirements in the same expert manner that won us our reputation during ten years of business.

We have at last satisfied ourselves that A.C. receivers can be confidently offered to our customers. We

HAMMARLUND MEANS "PRECISION."

HAMMARLUND HI-Q 30 ELECTRIC

THE LAST WORD IN RADIO CONSTRUCTION AND DESIGN is the HAMMARLUND BAND PASS FILTER, originally invented by Hammarlund engineers.

Its object is to obtain the utmost selectivity, with no sacrifice of tone. HIBERTO, the latter has ALWAYS been sacrificed in obtaining the former. In the HI-Q 30 RADIO, when the single dial control is turned, stations are either "IN" or "OUT," the tone being always fully preserved.



30
Radio
£75
Complete
Hi-Q 30
Radio-
Gramophone
£99
Complete
Chassis
£43

* Easy Terms.

The HI-Q 30 is expensive—no naturally expects it would be. The BAND PASS FILTER must be very carefully assembled, accurately tested and matched at various stages, with closest scrutiny all the time. Mass production by unskilled labour would defeat the object of the BAND PASS. This part of the work is done in the Hammarlund factory, as an absolute guarantee of precision.

Nor does the HI-Q 30 stop there. It uses only the very best components, carefully matched. No expense is spared—no apparatus that will give improvement in working is omitted.

There is no luck about the HI-Q 30. Hammarlund chose the very best circuit yet discovered—built it with the very best Radio apparatus manufactured—built it with the same care as a laboratory product—and obtained results which were never in doubt.

A voltage regulator is fitted, which prevents damage to valves through power fluctuations.

We import the HI-Q 30 chassis, partially assembled, and finish and test it in our own factory. A JENSEN DYNAMIC—recommended by HAMMARLUND—is matched to the chassis. Gramophone PICK-UP very minute are fitted.

PAY WHAT YOU WILL, either as RADIO or COMBINATION RADIO-GRAMOPHONE, you cannot EXAL HAMMARLUND results, much less improve on them.

CABINET. We offer a selection of cabinets, both imported and locally built, thus giving you a wide choice.

VALVES. Three 224 (screen grid), two 227, two 245, one 280.

HI-Q 30 BATTERY MODEL.

Price on application, depending on accessories and equipment included. Chassis assembled, less valves, costs £35.

We will gladly quote the HI-Q 30, built into your own cabinet, or fitted in some convenient cupboard or recess in your house.

TRIUMPH S.G. ELECTRIC.

Radio design to-day tends very strongly towards making the first cost as low as possible, leaving running costs to look after themselves.

No one, we believe, has ever yet claimed that the A.C. valve, used in practically all electric Radios, is superior in operation to the ordinary battery type of valve. No one is ever likely to.

The electric valve is heated by alternating current obtained from a very cheap and simple transformer. Much more expense is involved in making the Radio operate with filament current, which is treated in the same way as the "B" supply—that is, rectified and "smoothed."

The Triumph involves no new principles—it is simply a well designed direct current Radio, using the famous band pass filter circuit and ordinary type of valves, but whereas in other Radios the "B" supply ONLY is converted before use into direct current, in the TRIUMPH, the "A" or filament current is similarly treated.

Pipe tuned circuits give utmost selectivity. The set is itself ELECTRIC—it uses no batteries at all. But owing to the simpler valves, results are appreciably better than with the so-called A.C. SET.

The TRIUMPH can be supplied in an imported cabinet (see index), or in a cabinet that is specially made for you. The speaker is a JENSEN 10-inch CONCERT DYNAMIC—on the market to-day. Westinghouse rectifiers supply the filament current.

The valves are two screened grid, detector and two audio valves, the last a power amplifier. Volume in plenty for any home—and VERY LOW RUNNING COST, due partly to less costly valves, partly to their much longer life, and partly because they are only SIX altogether.

The TRIUMPH RADIO COSTS a little more. Add up the total costs after only one year's running and you will find they are the same for the TRIUMPH as for cheaper Radios. After the first year, the TRIUMPH actually saves pounds. The economy in current is also far from negligible.



Triumph Radio
£54
Complete
Triumph
Radio-
Gramophone
£75
Complete
Battery Models
same price.
Chassis
On Application.

BUY TRIUMPH FOR ULTIMATE ECONOMY.

TRIUMPH RADIO-GRAMOPHONE.

This consists of the TRIUMPH CHASSIS, etc., as above, but mounted in a larger cabinet, which is also fitted with the best ELECTRIC MOTOR and PICK-UP OBTAINABLE. It offers all the advantages of the TRIUMPH RADIO.

TRIUMPH CHASSIS will be supplied less cabinet for fitting to your own cabinet, or in a recess in your house. In the very near future RADIO sets will thus be installed in homes, so set in ahead of the fashion.

ACE ELECTRIC—BEST VALUE FOR MONEY.

ALTONA PRINCE ELECTRIC.

THE ALTONA PRINCE is a straightforward neutrodyne design, ALL-ELECTRIC, but using only five valves (plus one rectifier).

We believe that in New Zealand most customers will be quite satisfied with the ALTONA PRINCE, which gives excellent reception on both local and distant stations, coupled with satisfactory selectivity. After all, in New Zealand there are not a very large number of stations within range, so the inclusion of two or three extra valves to obtain selectivity, is hardly essential, even in the main cities, while it must certainly be not so 30 miles from the broadcasting towns.

The usual imported seven to ten valve set, therefore, involves much higher maintenance cost, for which little return is given. You have only to compare the total cost of valves used in the Radio you buy, to obtain an accurate estimate of the yearly (or perhaps half-yearly) running cost. Total cost of valves, including rectifier, in the ALTONA PRINCE is only £5 7s.

Apart from the above consideration, the ALTONA PRINCE is locally constructed from the finest apparatus, and is fitted into a really beautiful cabinet. Repairs are very unlikely to be required, but if necessary can be promptly taken care of, at minimum expense.

CABINET.

This is the same as used with the H-R UNODIAL—See page 6

We can, nevertheless, quote the chassis only, or any other type of cabinet, either imported or locally built.
PRICE (including valves) £33 10 0

CHALLENGER ELECTRIC.

OUR ANSWER TO FOREIGN COMPETITION.

A few years ago the idea of constructing a complete ELECTRIC RADIO at this low price would have caused much ridicule.

Recently, dealers have seen and tested many cheap foreign sets, but none have been imported for sale—very few even survived the first test.

The CHALLENGER is the product of local industry, and is really a very fine and reliable set, which is sold complete with valves and N. and K. Special speaker, AND IS FULLY GUARANTEED. It uses three valves, one being a rectifier.

PRICE
£13 10s.
Complete

Easy Terms:
£1 deposit, 5s. weekly, 56 weeks

THE PRICE IS AMAZINGLY LOW, considering the quality and guarantee.

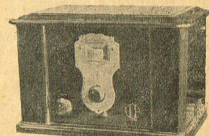
CAN YOU AFFORD NOT
TO HAVE RADIO WHEN

CHALLENGER COSTS SO LITTLE.

ACE 3 ELECTRIC.

14 REASONS FOR ACE 3 SUPREMACY.

1. Very handsome appearance, with neat wood case, well polished.
2. Three valves (all Radio—no rectifier valve).
3. Westinghouse rectifier, which unlike rectifier valves, is permanent.
4. Terminals enable it to be used as electric gramophone.
5. Locally built, for local conditions, with specially durable electrical equipment.
6. Backed by prompt factory service (experience shows that the set itself practically never gives the slightest trouble).
7. Design ensures exceptionally long valve life.
8. LOW PRICE COST.
9. LOW UPKEEP COST—should not exceed 1s. per month. We will guarantee to maintain set AND VALVES in good order for 4s. per year.
10. CURRENT CONSUMPTION, 50 to 300 hours for 6d.
11. DESIGNED BY NEW ZEALAND RADIO ENGINEERS.
12. Built by New Zealand workmen.
13. Fully guaranteed.
14. Sold on easiest of easy terms.



PRICE:
£18 18s.
Complete.
Easy Terms:
£1 deposit, 5s. weekly, 80 weeks.

Little did we think a year ago that the ACE ELECTRIC 3 would prove such a wonderful success. We set out to produce a set that would be very reliable, attractive in appearance, and capable of both in first and maintenance cost. Good tone on the local station was the first reproduction requirement, but by many owners Australian stations are regularly received. It must be remembered, however, that we do not recommend three valve electric sets for long distances, at least five and usually seven or eight valves being generally required for this purpose.

Price includes three best quality valves, and N. and K. Special (or cone) speaker.

£18/18/-
Terms from £1 deposit, 5s. weekly (80 weeks).

THE SET FOR THE MILLION.

CROSLLEY ELECTRICS.

For full particulars, send for LEAFLET. All receivers and chassis complete with valves and speakers.

CHASSIS.
Monotrad, seven-valve, screen grid £37 5 0

TABLE MODEL.
With Monotrad chassis 41 0 0

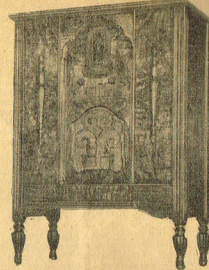
CONSOLE MODEL.
Monotrad chassis 53 0 0

ASK US ABOUT OTHER MAKES OF ELECTRICS.

ZENITH—AMERICA'S "BUICK" QUALITY RADIO.



ZENITH RADIO.



Zenith Radio

£57

Complete.

EASY TERMS:

£10 deposit.

Automatic Control

Extra.

No doubt our many customers have wondered why our firm—practically the oldest in New Zealand—has hitherto not been associated with imported A.C. RADIOS.

The reason is merely that we have hitherto been unconvinced that they represented "VALUE FOR MONEY."

It is now well known that until comparatively recently large numbers of imported A.C. SETS were quite unsatisfactory in more ways than one, but to-day the position has changed.

The A.C. SET having now proved itself, we arranged to offer our customers the finest RADIO made in America to-day. The reasons are convincingly enumerated below:

1. ZENITH RADIO is manufactured by one of the oldest Radio concerns in America, in a well-equipped factory, with 12 years' experience behind it. Production is large enough to keep costs of RELIABLE RADIO at a minimum, yet not so large that each receiver does not receive that individual attention, supervision, inspection, and test that makes one ZENITH as good as another ZENITH, and superior to the mass products of other factories. Ordinary mass production never yet resulted in uniformly high-grade apparatus.

2. ZENITH RADIO is backed by a real guarantee.

3. ZENITH CHASSIS is built on the latest principles, with infinite precision and care. The result is perfect reproduction, and unfailing regularity of reception.

4. ZENITH uses SCREEN GRID CIRCUIT—the latest development in Radio.

5. ZENITH PUSH PULL AMPLIFICATION neutralises and counter-balances all distortion, enabling the building up of pure natural tone quality.

6. ZENITH employs LINEAR POWER DETECTION, accommodating tremendous power without introducing distortion.

7. ZENITH is at once very SELECTIVE, and very SENSITIVE—distant stations, one after the other, come in strongly as you turn the dial, which is marked so you can immediately tune in any wave length.

RADIO CHASSIS.

A RADIO CHASSIS consists of the Radio section of a complete receiver, ready for inserting the valves, and connecting the speaker. If a battery chassis, of course, batteries must also be connected.



PRICES

ON

APPLICATION.

We are able to supply the CHASSIS of nearly every RADIO RECEIVER LISTED.

8. ZENITH gives, in addition to the above, absolute fidelity of reproduction—you readily imagine the singer or orchestra to be actually in your own home, performing at their very best.

9. ZENITH RADIO is the only one that can be fitted with AUTOMATIC TUNING. This feature costs more, but it enables nine selected stations to be TUNED IN INSTANTLY, merely by pressing a key like a typewriter key. ZENITH is the ONLY RADIO which offers this absolutely exclusive and unique feature.

10. Jacks for pick-ups are fitted.

WE HAVE TAKEN THREE YEARS TO SELECT ZENITH—YOU need take only THREE MINUTES.

CABINET.

Early American pattern, selected and matched Bait walnut veneers, with English satin oak top. Even without the outstanding features of the chassis already mentioned, the ZENITH would be worth the extra on account of its beautiful cabinet alone.

VALVES.

Three 224, three 227, two 245, one 250 are included.

SPEAKER.

Dynamic, of course, carefully matched in every way to suit both chassis and cabinet.

ZENITH GRAMO-RADIO on application.

RADIO CABINETS.

In the very near future, Radio will be installed in houses in special cabinets or cupboards, thus eliminating the cost of expensive cabinets, and giving greater convenience.

RADIO-GRAMOPHONES.

Any powerful Radio chassis makes a very fine gramophone, the only extras required being a motor (spring or electric) and a pick-up. These are built into the same cabinet as the Radio in expensive combinations, but give just as good results if used separately. In fact, the latter arrangement at times is very convenient—you can choose your records, place your pick-up and motor (they are quite small) on the table alongside you, and play your records without rising from your chair.

MONARCH—BIG RESULTS—LOW PRICE.

THE "MONARCH" SCREENED GRID.

In order to meet the demand for a full-size RADIO RECEIVER at a price of under £50, we have commenced negotiations in U.S.A., whereby we import the CHASSIS, DYNAMIC SPEAKER and CABINET each direct from their respective nationally known manufacturers, assembling and testing the final set in our own factory.

By these means, we are not only enabled to offer extraordinary value, but we can cater for special requirements.

MONARCH CHASSIS.

Constructed from the highest grade components, made by prominent manufacturing specialists, each an acknowledged leader in his own sphere.

The circuit employs SCREEN GRID VALVES, the very latest development of this type, which definitely makes obsolete sets not using these valves, in spite of contrary claims by many manufacturers who possibly may be unable to re-organise their works to produce the new circuit.

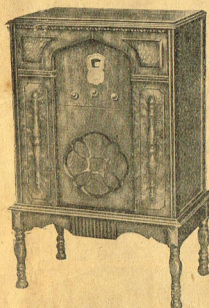
Tone quality is more than adequately provided for by push pull amplification, with powerful valves.

Terminals enable a gramophone attachment to be fitted instantly.

CHASSIS is priced separately, with valves and speaker, for those wishing to build their own cabinet.

DYNAMIC SPEAKER.

Selected to match the chassis, the MONARCH DYNAMIC SPEAKER cannot fail to please even the most critical.



Monarch Radio

£45

Monarch Radio-Gramophone

£65

EASY TERMS.

CONSOLE CABINET.

The illustration shows a typical console cabinet, but we will be able to fit the chassis into any of the several imported styles of cabinets which we stock. Alternatively, we will gladly arrange for our cabinet-maker to make a special cabinet to match your furniture, to install it in your cupboard, and to include gramophone motor, pick-up, etc.

In fact, we will be glad to have your special instructions, so that we can supply just what you desire.

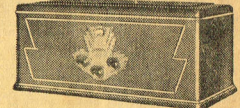
MONARCH CHASSIS.

Can be supplied complete with dynamic speaker and valves. Price on application.

COSSOR RADIOS.

COSSOR THREE VALVE ELECTRIC.

As illustrated, complete with valves. Screened grid circuit, two tone metal cabinet.



Cossor three-valve Electric ... £24 0 0

COSSOR TWO VALVE ELECTRIC.

Assembled complete, in cabinet, with dial control similar to the Cossor Three. Complete with valves. Cossor two valve Electric ... £16 16 0

EMPIRE MELODY MAKER.

This is imported as a Kitset, and correctly assembled in our own factory. All wave, 16 to 550 metres, two dial control, and three valves. Price (includes cabinet and valves).

PHILIPS RADIOS (ELECTRIC).

We stock these well-known sets, and can give customers the benefit of our expert service and guarantee. All are complete with valves, speakers being extra.

BROADCAST FOUR VALVE (2510).

Two screened grid and two ordinary type valves. Long range. Philips 2510 (with valves) ... £32 0 0

ALL WAVE FOUR (2502).

Designed for those who wish to receive both long and short waves. Philips 2502 (with valves) ... £30 0 0

Q-P.

A small two-valve set, all electric like its larger brothers. Philips Q-P (with valves) ... £16 0 0

LOFTIN WHITE AMPLIFIER.

Just before going to press, some details have become available of a new development of an idea already several years old.

The main features are—

1. Only one valve is used after the detector.
2. No transformers are used, thus reducing costs very considerably.
3. Still purer tone.

Send us your enquiries for LOFTIN WHITE AMPLIFIERS OR KITS.

WE CAN BUILD

SPECIAL RADIO RECEIVERS, ELECTRIC GRAMOPHONES, ADDRESS SYSTEMS.

TO SUIT YOUR SPECIAL REQUIREMENTS.

H-R BATTERY RADIOS ABSOLUTELY UNBEATABLE.

HAMMARLUND-ROBERTS.

The Hammarlund Roberts receiver has gained a wonderful reputation during the past few years. It is now well known throughout New Zealand as the best valve set and is almost invariably chosen better than six or seven valve sets of other makes, operating from batteries. There would be no room for a very extravagant claim, have been literally established when a test was actually made, and have been forced to admit that the HAMMARLUND-ROBERTS is truly a masterpiece.

Its marvelous results are due to the circuit design, coupled with the very high quality of components used. The special space around the coils is originally designed by HAMMARLUND—whose name is synonymous with the best in Radio in U.S.A.—to not only ensure extreme range, but also stability of operation unequalled by other regenerative sets.

While less efficient Radios have been continually redesigned, the Hammarlund alone has been practically unchanged for four years, except for improvement in appearance, and yet to-day it is still an undoubted leader in the Radio world. There appears no chance for the Hammarlund ever going out of date. This is especially the case with the battery models, which can at a later period be completely electrified without internal alteration.

It is worth while asking how many other circuits have proved so deservedly popular for such a long period. Unfortunately, Hammarlund engineers over a design which was much in advance of the times.

The H-R gained its reputation as a battery Radio, for use either on accumulators or on dry "A" batteries. Easily out-stripping its competitors in the accumulator class, it is even more in the lead for dry battery operation; in fact, it is really the only type of receiver of four or more valves which can be relied on to give satisfaction on dry batteries.

It is perfectly obvious that the successful dry battery receiver must be absolutely efficient, in order that the very utmost results can be obtained from an absolute minimum of current. Even the slightest inefficiency means wastage of expensive batteries and expensive valves. Much more advisable to pay perhaps a little more in the first place for the very best quality, than to pay a little extra maintenance, be faced with the problem of continuing to do so, or discarding your unwieldy purchase.

The actual cost of running a H-R receiver on dry batteries will be no more than where accumulators are used, charged at a service station.

Let us again emphasize that in the H-R efficiency is the keynote throughout. On the dry battery receiver the volume is only slightly less than with accumulators, the range remaining much the same.

REGENERATION.

This principle, embodied in the set, makes it capable of the extraordinary results mentioned above. We have a letter from a customer giving a list of over 70 stations, including many in U.S.A. brought in on his H-R. While this exceptional, exceedingly good performance are very common.

Regeneration is thoroughly under control, and so the set does not interfere with other receivers.

OPERATION.

The simplest instructions are sent out with each set, and anyone who can read should have no difficulty whatsoever in installing and operating the Hammarlund Roberts. Stations can be logged, and always come in on the same readings.

RANGE.

Under normal conditions, the H-R will readily bring in the usual Australian stations on the speaker, with ample volume and clarity. In many localities, where conditions are favourable, American stations are regularly received at good speaker strength. There are many larger Radios either fail entirely on distance, or bring it in with unbearable noise, the H-R is still strong, and the range is very low six or seven valve Radios will approach it for results.

On all models, the tone is really excellent, this being particularly true of the more expensive machines.

SELECTIVITY.

By a simple device, the selectivity, normally excellent, can be increased at will, to a still greater degree. With each H-R, we send out the valves which we have found by experience and test to be most suitable. For dry battery operation, invariably these are UX19's, and a meter is fitted to enable these to give maximum results, coupled with long life.

Accumulator valves are usually 221, a new Radiotron working on a six-volt accumulator (only a small one required), taking only 66 amp—less than one-quarter of the 201A. These valves can be used in older H-R Radios, now using 210A, without any alteration.

POWER VALVE.

A power valve may be used in the last stage without internal alteration.

GRAMOPHONE ADAPTOR.

Each H-R is fitted with terminals, enabling it to be used in conjunction with a PICK-UP, as an ELECTRIC GRAMOPHONE, the change over being made instantaneously.

GUARANTEE.

ONE YEAR, as per conditions inside front cover.

H-R MODELS.

This season the H-R RADIOS have been modified, chiefly by being made more compact, while the cabinets are much neater than formerly. The Radio circuit has not been changed.

The H-R CONQUEROR replaces the Junior. The UNODIAL has been retained for those who insist on a single dial control, while a FIVE VALVE SUPERB has been added, the extra valve giving PUSH PULL AMPLIFICATION, combining ample power with the finest tone possible.

The H-R RADIO-GRAMOPHONE is also included, this being, we believe, the only factory built machine of this type in New Zealand.

H-R UNODIAL.

The efficiency of a Radio is decreased by using a one dial control, but since there is an insistent demand for single control, our factory have built a UNODIAL H-R.

Only the highest grade apparatus is used in its construction, and the cabinet is of exceptionally fine finish, either mahogany or walnut.

The selected accessories are as for the Junior, but with A139 aerial and N. and K. Senior speaker.

Less accessories. With accessories.

ACCUMULATOR MODEL .. £21 0 0 £32 0 0
DRY BATTERY MODEL .. 22 10 0 31 7 0



H-R UNRIVALLED EFFICIENCY.

H-R "CONQUEROR."

On account of its low price, and the fact that its extraordinary efficiency produces results that are envied by owners of six and seven valve sets of other makes, this will be the most popular of the new H-R RADIOS.

It is particularly suitable for battery operation, and especially so where, owing to inconvenience of access, multivolt charging, dry batteries must be used. But, by the addition of an "ABC" eliminator, it becomes entirely electrically operated, retaining its wonderful range, but costing very little indeed for replacements of valves or other parts, and practically nothing for current.

The cabinet is of best imported oak, and can be supplied either dark or natural finish.

CONQUEROR ELECTRIC.

Since the CONQUEROR possesses such wonderful range, and it is natural that a four-valve RADIO, using inexpensive valves, will cost far less for upkeep than the usual seven or eight-valve set (each valve expensive) we have arranged to ELECTRICIFY the CONQUEROR. The same valves are used, with an "ABC" eliminator, the latter being also available for all previous types of H-R sets.

The prices quoted below include valves and speaker—you merely connect to your aerial, and eliminate all wires.

CONQUEROR ELECTRIC, with N. and K. .. £32 10 0
CONQUEROR ELECTRIC, with Jensen Con-
cert Dynamic speaker .. 33 19 6

H-R RADIO-GRAMOPHONE.

The H-R RADIO GRAMOPHONE combines the H-R SUPERB RADIO, with a gramophone motor and electric pick-up, so that records can be played without delay. There is no need here to emphasise the superiority of the electric gramophone over the ordinary type, and the H-R RADIO GRAMOPHONE places for the first time on the New Zealand market such an instrument capable of work on batteries.

The motor is the GARRARD, same as is used on high-class gramophones throughout the world. B.T.H., Webster, or other high-grade pick-up is fitted.

The handsome console cabinet contains the whole of the apparatus, and is extremely simple both on Radio and on records.

The price includes JENSEN CONCERT DYNAMIC SPEAKER .. PRICE, £63.

NOTE—If you can supply six-volt accumulators, we can supply "magneto" "B" batteries, and the RADIO-GRAMOPHONE, with extra accumulator, with "MAGNETO" "B" supply, "B" batteries are entirely discarded.

PRICE, extra, approx. £16.

UNIVERSAL.

ALL WAVE SCREENED 4.

Mention is made in other parts of this list of the enormous possibilities of the screened grid valve, especially in the SHORT WAVE field.

Less accessories. With accessories.

CONQUEROR, accumulator model £12 15 6 £22 19 0
CONQUEROR, dry battery model 14 9 6 21 9 6

THE DRY BATTERY MODEL includes a meter, but is otherwise identical.

H-R SUPERB.

It has hitherto been impossible for customers who have no electrical light to obtain a standard battery Radio of the power type now so common in the ELECTRIC SETS. With the sudden growth of ELECTRIC, modern improvements ceased to be applied to battery Radios, manufacturers simply scrambling over one another to produce ELECTRIC SETS.

It was to fill this breach that we arranged for the production of the H-R SUPERB. This uses the famous H-R circuit, with the best vacuum valve to secure at once ample volume and perfect tone.

With this in view, the SUPERB employs PUSH PULL AMPLIFICATION, and a JENSEN CONCERT DYNAMIC SPEAKER.

The above combination will ensure to battery owners a quality of reception that simply cannot be equalled, let alone surpassed by any Radio on the market to-day.

SELECTED ACCESSORIES.

Aerial A139, Reliance six-volt 90 amp. accumulator (working the whole set and speaker for about 70 hours on one charge), three Columbia Layerbilt "B" batteries, Columbia "C" battery, Jensen concert dynamic speaker in cabinet, Radiotron valves. (Total value, £24/6/6.)

Less accessories. With accessories.

H-R SUPERB .. £18 15 0
H-R SUPERB CONSOLE, £8/5/- extra.

The UNIVERSAL is a combined BROADCAST and SHORT WAVE SET, the change being made by a SHIELD, taken up by changing two coils.

The coils are of the highest efficiency, and the greatest care is taken, not only in the design, but also in the accurate construction of the UNIVERSAL. Full set of coils for both broadcast and short wave included.

The cabinet is of heavy aluminium, providing absolutely thorough shielding, and freedom from usual cabinet troubles. It gladly welcomes the closest inspection of the workmanship throughout.

An output filter is embodied in the set, protecting the speaker windings from undue strain and giving clearer tone.

Four volt valves are recommended, the first being a screened grid and the last a power valve.

Guaranteed one year—inside front cover.

SELECTED ACCESSORIES.

Aerial A138, four volt 30 amp. Fuller accumulator, three 45-volt Columbia "B" batteries, N. and K. Senior speaker, four valves (total value, £18/5/-).

UNIVERSAL, less accessories .. £16 10 0
UNIVERSAL, with accessories .. 23 16 0

UNIVERSAL ELECTRIC.

As above to work from A.C. .. £39 0 0



All About the All-Electric.

A handy reference book crammed with invaluable information about Electric Sets, their construction and working for the Amateur and Professional. Written in an easy-to-understand way for New Zealand listeners.

SOME OF THE ARTICLES:

Choosing an All Electric Set.
Power and A.C. Valves.
ABC Battery Eliminators.
A.C. Crystal Set Amplifier.
How to Convert Your Set.
Pick-up Adjustment.
Building the Four-valve A.C.
Browning-Drake.
A.C. Power Amplifier.
Speakers for All Electric Sets.
List of Stations (over 300).

Price 1s. 6d.

(Posted, 1/9.)

OBTAINABLE FROM ALL RADIO DEALERS AND BOOKSELLERS.

PUBLISHED BY

“THE RADIO RECORD AND ELECTRIC

The 1930 Radio Listeners' Guide

From near and far radio brings entertainment and culture into the home. Just for the touch of a switch and for the turn of a dial, the listener can have whatever he wishes, whether it be opera, jazz, lecture, or a description of a sports contest. Radio brings it all, and it rests with the listener to select from the great variety that is on the air.

Tuning through the length of the dial to discover just what suite, is a hit and miss process, so to enable the listener to tune in whatever he desires, the “Radio Record” has its being. In its columns are published week by week the forthcoming broadcasts from the main stations. It gives prominence to those broadcasts which the listener should not miss. It tells of those who are performing. It voices the compliments and complaints of those who listen, and answers the questions of those in difficulty.

The programmes of the four YA stations are published a week in advance, and the listener can choose his programme to suit his taste. He can arrange his parties well in advance by knowing exactly what will be coming over the air. But programme and programme news is not all the “Radio Record” covers. It deals with all the facts of radio, from both news and technical points of view. It gives authentic and up-to-date information about new receivers and accessories. It tests and reports on new apparatus that will be interesting for all its readers.

The women readers are well catered for, for there is a special section—the Electric Home Journal—assigned to them. Although featuring electricity in the home, this section aims to interest women generally. It has a History section, which invites contributions from readers, and there are weekly competitions for original matter, both practical and literary.

Price 2s. 6d.

(Posted, 2/9.)

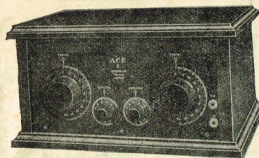
OBTAINABLE FROM ALL RADIO DEALERS AND BOOKSELLERS.

HOME JOURNAL.”

G.P.O. BOX 1032, WELLINGTON.

H-R SETS FOR ACCUMULATORS OR DRY BATTERIES.

ACE REGENERATIVE SETS.



ACE 3.

ARE YOU one of many customers who wish to get a RADIO SET, which will be a pleasure to listen to so as to ensure freedom from trouble, and yet LOW IN COST?

ACE SETS are built for this express purpose. They are not as cheap as a set can be, but they are as cheap as a GOOD SET can be.

This, of course, makes all the difference. A pound or two saved in first cost can easily be lost twice over in maintenance during the first year, even forgetting the inferior results obtained from the cheaper set.

CONSTRUCTION.

As carefully designed and built as our larger sets, and incorporating apparatus of the same quality as our H-R CONQUEROR sets. Ace sets are efficient, reliable, and as trouble free as a set of this kind can be. Special care has been taken to ensure easy operation, and very low running costs.

APPEARANCE.

The cabinet is substantially built, dark finish, while the back panel is beautifully machine engraved.

BATTERIES.

FOR ACE SETS, we recommend either dry “A” batteries, or a small accumulator. The latter can be two volt, if cost is to be a minimum. Where dry batteries are used, it is a durable, though not unobtainable, to fit a mangle, costing 30s. extra.

GUARANTEE.

ONE YEAR, as per conditions inside front cover.

SELECTED ACCESSORIES.—

Aerial A138, three No. 6 Columbia batteries, 99 volt Columbia “B” battery, Columbia “C” battery, three UX189 valves, N and K. Special speaker, Butafono phone plug. Total value, £67/-.

PRICE (Less Selected Accessories) £7 10s.

(With Selected Accessories) £13 10s.

Supplied with two volt valves and Fuller accumulator at same price.

SINGER SET.

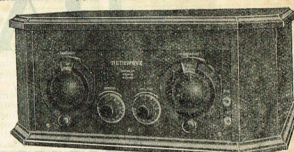
A Job line, bought in at an absurdly low price. Consists of a non-regenerative detector (using a valve) in one cabinet, and two stage amplifier in another cabinet to match. Easily wired up. Suitable for local reception, but by a slight addition can be made regenerative, with a range of the usual three valve set.

The two stage amplifier could be used with a crystal set.

SINGER SET, detector and two stage amplifier 1 10 0
Complete with all accessories, including aerial and three WX12 valves 5 0 0

MENIWAWE SHORT WAVE SET.

By using a special Hammarlund short wave condenser, the wave length of this set will go down as low as 15 metres. Unfortunately, this also means that many coils would be necessary to cover all ranges up to 600 metres, so that with the set, four coils are included, covering waves from 15 to 100 metres, approx. This feature applies to all short wave sets.



Although designed for accumulator valves, MENIWAWE SETS can also be supplied for dry cell valves.

COMPONENTS.

Very highest quality only. This is essential for good results.

RANGE.

All reasonably powered short wave stations of the world are within range, under favourable conditions.

CABINET.

Dark cabinet, with handsome mahogany panel, gold engraved.

OPERATION.

Anyone who can tune the ordinary set will find no difficulty in operating a MENIWAWE. Full instructions for installing and operating are included with every set.

GUARANTEE.

ONE YEAR, as per conditions inside front cover.

SELECTED ACCESSORIES.

Aerial A138, 6 volt 20 amp. accumulator, 99 volt Columbia “B” battery, Columbia “C” battery, three valves, N and K. Special speaker, Weston plug (total value £8/17/6).

COILS.

A FULL SET OF FOUR MENIWAWE COILS (patent applied for) included with every set.

PRICE, Less Accessories £12 10s.

With Accessories £20 9s.

MENIWAWE ALL WAVE SET.

This set is designed mainly for SHORT WAVE reception, but it will also bring in ordinary broadcasting on the speaker, provided the distance is not too great. The four coils provided enable wave lengths from about 23 to 600 metres to be tuned in, this range being suitable for all ordinary requirements.

OTHERWISE ALL FEATURES, PRICE, ACCESSORIES, ETC., ARE IDENTICAL WITH THE MENIWAWE SHORT WAVE RECEIVER AS ABOVE.

MENIWAWE SHORT WAVE ADAPTOR.

Those who already have three (or more) valve sets can readily experiment with short wave broadcasting. An ADAPTOR can be connected to their sets in a minute or two, and, if the set itself is good, results should be practically as good as with the special short wave sets.

Panel is similar to the Meniwave, with rheostat dials omitted.

Set of four Meniwave coils included, wave length approximately 15-100 metres.

PRICE, Less Cabinet £6 19 6d.

With Cabinet £8 8s.

If It's Important—It's in

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The National Radio Magazine.

The
ONLY ALL RADIO
Magazine Published
in New Zealand.

Fortnightly - - - Price Sixpence.

New Zealand Radio Handbook Annual THE RADIO 'CYCLOPÆDIA.

For Listeners, Constructors, Transmitters.

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On Sale at all News Agents and Radio Dealers throughout New Zealand.

ELECTRIC GRAMOPHONES FOR RESULTS.

WELL-MAYDE CONCERT POWER GRAMOPHONES.

(OPERATED BY BATTERIES.)

While there is already on the market ample choice in power gramophones for use on the electric supply, there is not, we believe, another machine of similar type to these, giving the full volume required for theatres, dance halls, outdoor systems, etc., and yet operated from six-volt batteries.

The difficulty has hitherto been due to the "B" supply, but now is overcome by the MAGNETO "B" (see page 213). This ingenious machine develops plenty of "B" current from two six-volt accumulators. Where these can be readily charged, the operating cost is very small, and the whole machine easily transported by car to different localities.

Since it is not dependent on outside current, it can be used anywhere, this feature rendering it especially useful for open air public addresses, announcements at sports meetings, etc.

Cabinets can be designed to suit individual needs, the one quoted being plain, but very strong, to withstand hard usage.

MICROPHONE.

Terminals are fitted so that a microphone can be used, as well as a gramophone pick-up. A simple switch changes from one to the other instantaneously. The amplifier consists of two stages, the last using two valves in PUSH PULL. The power is more than sufficient for even a large hall, for dancing, etc. The specification includes a standard double spring motor, best pick-up, magnetite "B" supply, two accumulators, Jensen dynamic speaker.

PRICE, from £55 to £75, according to power required. MICROPHONE, with battery, transformer, rheostat, etc., extra, from £5.

CRYSTAL SETS.

Crystal sets will always be popular, not only because they are very cheap, but also because the quality of reception is so perfect.

The ordinary crystal set has a range of about 10 to 20 miles from a station like Auckland, but considerably more from Wellington. Fixed detectors like the Red Diamond give good results at very short ranges, but HERTZITE crystal, better for longer distances, owing to its greater sensitivity.

The accessories required for a crystal set include merely an aerial outfit A138 (A137 would do) and one or more pairs of telephones, say, N and K.

WELL-MAYDE CRYSTAL RECEIVER.



W-M CRYSTAL SET.

A Well-Mayde product. Metal case, with a Formica top panel, and Formica tuning knob.

Can be fitted with either a Hertzite detector, or a Red Diamond permanent detector, at the same price.

WELL-MAYDE CRYSTAL SET 17 6
Complete with aerial and phones 32 6

TRANSANT CRYSTAL SET.

An English set in attractive polished case. Variable tuning ensures accurate tuning. Enclosed detector. Complete with crystal. 24 0

TRANSANT SET

..... 24 0

FORTEVOX CRYSTAL SET.

Another well-known sensitive set. Why be without Radio when a set costs only 5s. 5 0

FORTEVOX SET 19 6
Complete with phones and aerial 19 6

POWER AMPLIFIERS.

A POWER AMPLIFIER is constructed on the same lines as the last stages of amplification in a radio receiver, but attention is devoted to obtaining at the same time, magnificent volume and faithful reproduction.

To achieve this result, special apparatus is used. Operated by power from the mains, by "B" battery accumulators, magnetite "B", or even in special cases where upkeep cost matters little, dry "E" batteries.

A.C. POWER AMPLIFIERS.

These operate entirely from the mains, and are used in theatres, dance halls, pictures, restaurants, hotels, etc. They can be used with a gramophone pick-up and motor, a radio set, or with a microphone, when special announcements are to be made.

WELL-MAYDE AMPLIFIERS are locally built, most of the components being actually constructed in the factory. Special note is taken of local conditions, and all transformers, chokes, condensers, etc. are made to withstand much higher loads than they are ever likely to be called upon to do. In appearance and finish, they are unsurpassed by imported amplifiers.

WELL-MAYDE "VIM."

Two stages, with 227 (not the older 256) in first stage, and two 245, push pull, in the last stage. Rectifier valve 280. This outfit is powerful enough for even large halls, yet the high power is attained along with perfect tone quality.

The price is very low—but we can guarantee the amplifier in all ways. "Well-Mayde" trade mark does not appear on inferior products.
W-M "VIM" AMPLIFIER £18 0 0
Full set of valves 6 4 0

WELL-MAYDE "HERCULES."

Three stages, the first two each with 227 valves, and the last with two 245 in push pull. Rectifier valve, 280.

W-M "HERCULES" AMPLIFIER £24 0 0
Full set of valves 6 6 0

WELL-MAYDE "STENTOR" AMPLIFIER.

The most powerful three stage amplifier made. Each stage has two valves in push pull, the first two stages using 227, and the last stage 256. Rectifiers, two 281.

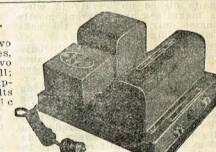
This amplifier is suitable for the largest installations, talkies, etc., will easily operate several speakers at full volume.
W-M "STENTOR" £51 0 0
Full set of valves 16 18 0

MICROPHONES.

Where necessary to use microphones in conjunction with the above, customers should advise us, as slight alterations in design are advisable, to make for greater compactness.

WEBSTER A310.

Three stages, two with 224 valves, followed by two 210 in push pull; 281 rectifier. Supplies 110-220 volts for d.y.n.a.m. speaker.



PRICE (less valves) £33 17s 6d.

WEBSTER A271.

Two stages, 226, with two 171 in push pull.
PRICE (less valves), £21 15s.

BATTERY AMPLIFIERS.

As the design of these depends so much on local facilities for charging batteries, etc. we will quote to order. Please write, giving us as full particulars of your requirements as you are able, as we are thoroughly experienced, and can meet your special needs.

IT PAYS TO BUILD OUR KITSETS.

ACE KITSETS, 1, 2 or 3 VALVE.

The Ace Kitset uses the old standard reliable circuit that has stood the test of years. It will still continue to prove popular, because of the ease of building, and the fact that a one valve set can be built the same as a two or three valve set, and then added to without waste. All the following parts are included in the ACE 3 KITSET. The instructions are very carefully drawn up, and no difficulty at all will be experienced in assembly.

Although this circuit is continually dished up in new forms, the results are essentially the same. You cannot get better results than this kitset will give, because we have carefully matched all the components for you.

Read our testimonial page for some performances of the ACE.

CABINETS Extra £15 0
VOLTMETERS Extra £2 8 6
ACCESSORIES—See under ACE SETS.

ACE 3.
1 Ace coil complete
2 Dials
3 Valve holders
4 Spark plug and condenser
5 Switch
6 Engraved terminals
7 Baseboard
8 Panel, engraved and drilled
9 Rheostat
10 Transformers
11 Instructions and diagrams.
12 Lugs, screws, tinned wire, etc.

PRICE £3 15 0

ACE 2.
Full details as above, but with only one transformer and one valve. The same set later be purchased and added when desired. The full set and baseboard are included. No parts wasted in doing this. **PRICE £3 5 0**

ACE 1.
As ACE 3, but with one rheostat, one valve and one transformer, and no other accessories. **PRICE £2 10 0**

Large power amplifier kits, either A.C. or D.C., on application.

ACE 3.

Mr. R. W. Underwood, "The Retreat," to Han—
My Ace 3 is working wonderfully well, and has brought in Japan on the speaker.

Later—
I can tell you I am more than pleased with the results that my Ace 3 is presenting. The following has certainly exceeded all expectations. The stations in a list of the stations that my Ace 3 has brought in on the loud speaker are: 2YA, 2Z, 2ZB, 2ZC, 2ZD, 2ZE, 2ZF, 2ZG, 2ZH, 2ZI, 2ZJ, 2ZK, 2ZL, 2ZM, 2ZN, 2ZO, 2ZP, 2ZQ, 2ZR, 2ZS, 2ZT, 2ZU, 2ZV, 2ZW, 2ZX, 2ZY, 2ZZ, 2AA, 2AB, 2AC, 2AD, 2AE, 2AF, 2AG, 2AH, 2AI, 2AJ, 2AK, 2AL, 2AM, 2AN, 2AO, 2AP, 2AQ, 2AR, 2AS, 2AT, 2AU, 2AV, 2AW, 2AX, 2AY, 2AZ, 2BA, 2BB, 2BC, 2BD, 2BE, 2BF, 2BG, 2BH, 2BI, 2BJ, 2BK, 2BL, 2BM, 2BN, 2BO, 2BP, 2BQ, 2BR, 2BS, 2BT, 2BU, 2BV, 2BW, 2BX, 2BY, 2BZ, 2CA, 2CB, 2CC, 2CD, 2CE, 2CF, 2CG, 2CH, 2CI, 2CJ, 2CK, 2CL, 2CM, 2CN, 2CO, 2CP, 2CQ, 2CR, 2CS, 2CT, 2CU, 2CV, 2CW, 2CX, 2CY, 2CZ, 2DA, 2DB, 2DC, 2DD, 2DE, 2DF, 2DG, 2DH, 2DI, 2DJ, 2DK, 2DL, 2DM, 2DN, 2DO, 2DP, 2DQ, 2DR, 2DS, 2DT, 2DU, 2DV, 2DW, 2DX, 2DY, 2DZ, 2EA, 2EB, 2EC, 2ED, 2EE, 2EF, 2EG, 2EH, 2EI, 2EJ, 2EK, 2EL, 2EM, 2EN, 2EO, 2EP, 2EQ, 2ER, 2ES, 2ET, 2EU, 2EV, 2EW, 2EX, 2EY, 2EZ, 2FA, 2FB, 2FC, 2FD, 2FE, 2FF, 2FG, 2FH, 2FI, 2FJ, 2FK, 2FL, 2FM, 2FN, 2FO, 2FP, 2FQ, 2FR, 2FS, 2FT, 2FU, 2FV, 2FW, 2FX, 2FY, 2FZ, 2GA, 2GB, 2GC, 2GD, 2GE, 2GF, 2GG, 2GH, 2GI, 2GJ, 2GK, 2GL, 2GM, 2GN, 2GO, 2GP, 2GQ, 2GR, 2GS, 2GT, 2GU, 2GV, 2GW, 2GX, 2GY, 2GZ, 2HA, 2HB, 2HC, 2HD, 2HE, 2HF, 2HG, 2HH, 2HI, 2HJ, 2HK, 2HL, 2HM, 2HN, 2HO, 2HP, 2HQ, 2HR, 2HS, 2HT, 2HU, 2HV, 2HW, 2HX, 2HY, 2HZ, 2IA, 2IB, 2IC, 2ID, 2IE, 2IF, 2IG, 2IH, 2II, 2IJ, 2IK, 2IL, 2IM, 2IN, 2IO, 2IP, 2IQ, 2IR, 2IS, 2IT, 2IU, 2IV, 2IW, 2IX, 2IY, 2IZ, 2JA, 2JB, 2JC, 2JD, 2JE, 2JF, 2JG, 2JH, 2JI, 2JJ, 2JK, 2JL, 2JM, 2JN, 2JO, 2JP, 2JQ, 2JR, 2JS, 2JT, 2JU, 2JV, 2JW, 2JX, 2JY, 2JZ, 2KA, 2KB, 2KC, 2KD, 2KE, 2KF, 2KG, 2KH, 2KI, 2KJ, 2KK, 2KL, 2KM, 2KN, 2KO, 2KP, 2KQ, 2KR, 2KS, 2KT, 2KU, 2KV, 2KW, 2KX, 2KY, 2KZ, 2LA, 2LB, 2LC, 2LD, 2LE, 2LF, 2LG, 2LH, 2LI, 2LJ, 2LK, 2LL, 2LM, 2LN, 2LO, 2LP, 2LQ, 2LR, 2LS, 2LT, 2LU, 2LV, 2LW, 2LX, 2LY, 2LZ, 2MA, 2MB, 2MC, 2MD, 2ME, 2MF, 2MG, 2MH, 2MI, 2MJ, 2MK, 2ML, 2MN, 2MO, 2MP, 2MQ, 2MR, 2MS, 2MT, 2MU, 2MV, 2MW, 2MX, 2MY, 2MZ, 2NA, 2NB, 2NC, 2ND, 2NE, 2NF, 2NG, 2NH, 2NI, 2NJ, 2NK, 2NL, 2NM, 2NN, 2NO, 2NP, 2NQ, 2NR, 2NS, 2NT, 2NU, 2NV, 2NW, 2NX, 2NY, 2NZ, 2OA, 2OB, 2OC, 2OD, 2OE, 2OF, 2OG, 2OH, 2OI, 2OJ, 2OK, 2OL, 2OM, 2ON, 2OO, 2OP, 2OQ, 2OR, 2OS, 2OT, 2OU, 2OV, 2OW, 2OX, 2OY, 2OZ, 2PA, 2PB, 2PC, 2PD, 2PE, 2PF, 2PG, 2PH, 2PI, 2PJ, 2PK, 2PL, 2PM, 2PN, 2PO, 2PP, 2PQ, 2PR, 2PS, 2PT, 2PU, 2PV, 2PW, 2PX, 2PY, 2PZ, 2QA, 2QB, 2QC, 2QD, 2QE, 2QF, 2QG, 2QH, 2QI, 2QJ, 2QK, 2QL, 2QM, 2QN, 2QO, 2QP, 2QQ, 2QR, 2QS, 2QT, 2QU, 2QV, 2QW, 2QX, 2QY, 2QZ, 2RA, 2RB, 2RC, 2RD, 2RE, 2RF, 2RG, 2RH, 2RI, 2RJ, 2RK, 2RL, 2RM, 2RN, 2RO, 2RP, 2RQ, 2RR, 2RS, 2RT, 2RU, 2RV, 2RW, 2RX, 2RY, 2RZ, 2SA, 2SB, 2SC, 2SD, 2SE, 2SF, 2SG, 2SH, 2SI, 2SJ, 2SK, 2SL, 2SM, 2SN, 2SO, 2SP, 2SQ, 2SR, 2SS, 2ST, 2SU, 2SV, 2SW, 2SX, 2SY, 2SZ, 2TA, 2TB, 2TC, 2TD, 2TE, 2TF, 2TG, 2TH, 2TI, 2TJ, 2TK, 2TL, 2TM, 2TN, 2TO, 2TP, 2TQ, 2TR, 2TS, 2TT, 2TU, 2TV, 2TW, 2TX, 2TY, 2TZ, 2UA, 2UB, 2UC, 2UD, 2UE, 2UF, 2UG, 2UH, 2UI, 2UJ, 2UK, 2UL, 2UM, 2UN, 2UO, 2UP, 2UQ, 2UR, 2US, 2UT, 2UU, 2UV, 2UW, 2UX, 2UY, 2UZ, 2VA, 2VB, 2VC, 2VD, 2VE, 2VF, 2VG, 2VH, 2VI, 2VJ, 2VK, 2VL, 2VM, 2VN, 2VO, 2VP, 2VQ, 2VR, 2VS, 2VT, 2VU, 2VV, 2VW, 2VX, 2VY, 2VZ, 2WA, 2WB, 2WC, 2WD, 2WE, 2WF, 2WG, 2WH, 2WI, 2WJ, 2WK, 2WL, 2WM, 2WN, 2WO, 2WP, 2WQ, 2WR, 2WS, 2WT, 2WU, 2WV, 2WW, 2WX, 2WY, 2WZ, 2XA, 2XB, 2XC, 2XD, 2XE, 2XF, 2XG, 2XH, 2XI, 2XJ, 2XK, 2XL, 2XM, 2XN, 2XO, 2XP, 2XQ, 2XR, 2XS, 2XT, 2XU, 2XV, 2XW, 2XX, 2XY, 2XZ, 2YA, 2YB, 2YC, 2YD, 2YE, 2YF, 2YG, 2YH, 2YI, 2YJ, 2YK, 2YL, 2YM, 2YN, 2YO, 2YP, 2YQ, 2YR, 2YS, 2YT, 2YU, 2YV, 2YW, 2YX, 2YY, 2YZ, 2ZA, 2ZB, 2ZC, 2ZD, 2ZE, 2ZF, 2ZG, 2ZH, 2ZI, 2ZJ, 2ZK, 2ZL, 2ZM, 2ZN, 2ZO, 2ZP, 2ZQ, 2ZR, 2ZS, 2ZT, 2ZU, 2ZV, 2ZW, 2ZX, 2ZY, 2ZZ, 2AA, 2AB, 2AC, 2AD, 2AE, 2AF, 2AG, 2AH, 2AI, 2AJ, 2AK, 2AL, 2AM, 2AN, 2AO, 2AP, 2AQ, 2AR, 2AS, 2AT, 2AU, 2AV, 2AW, 2AX, 2AY, 2AZ, 2BA, 2BB, 2BC, 2BD, 2BE, 2BF, 2BG, 2BH, 2BI, 2BJ, 2BK, 2BL, 2BM, 2BN, 2BO, 2BP, 2BQ, 2BR, 2BS, 2BT, 2BU, 2BV, 2BW, 2BX, 2BY, 2BZ, 2CA, 2CB, 2CC, 2CD, 2CE, 2CF, 2CG, 2CH, 2CI, 2CJ, 2CK, 2CL, 2CM, 2CN, 2CO, 2CP, 2CQ, 2CR, 2CS, 2CT, 2CU, 2CV, 2CW, 2CX, 2CY, 2CZ, 2DA, 2DB, 2DC, 2DD, 2DE, 2DF, 2DG, 2DH, 2DI, 2DJ, 2DK, 2DL, 2DM, 2DN, 2DO, 2DP, 2DQ, 2DR, 2DS, 2DT, 2DU, 2DV, 2DW, 2DX, 2DY, 2DZ, 2EA, 2EB, 2EC, 2ED, 2EE, 2EF, 2EG, 2EH, 2EI, 2EJ, 2EK, 2EL, 2EM, 2EN, 2EO, 2EP, 2EQ, 2ER, 2ES, 2ET, 2EU, 2EV, 2EW, 2EX, 2EY, 2EZ, 2FA, 2FB, 2FC, 2FD, 2FE, 2FF, 2FG, 2FH, 2FI, 2FJ, 2FK, 2FL, 2FM, 2FN, 2FO, 2FP, 2FQ, 2FR, 2FS, 2FT, 2FU, 2FV, 2FW, 2FX, 2FY, 2FZ, 2GA, 2GB, 2GC, 2GD, 2GE, 2GF, 2GG, 2GH, 2GI, 2GJ, 2GK, 2GL, 2GM, 2GN, 2GO, 2GP, 2GQ, 2GR, 2GS, 2GT, 2GU, 2GV, 2GW, 2GX, 2GY, 2GZ, 2HA, 2HB, 2HC, 2HD, 2HE, 2HF, 2HG, 2HH, 2HI, 2HJ, 2HK, 2HL, 2HM, 2HN, 2HO, 2HP, 2HQ, 2HR, 2HS, 2HT, 2HU, 2HV, 2HW, 2HX, 2HY, 2HZ, 2IA, 2IB, 2IC, 2ID, 2IE, 2IF, 2IG, 2IH, 2II, 2IJ, 2IK, 2IL, 2IM, 2IN, 2IO, 2IP, 2IQ, 2IR, 2IS, 2IT, 2IU, 2IV, 2IW, 2IX, 2IY, 2IZ, 2JA, 2JB, 2JC, 2JD, 2JE, 2JF, 2JG, 2JH, 2JI, 2JJ, 2JK, 2JL, 2JM, 2JN, 2JO, 2JP, 2JQ, 2JR, 2JS, 2JT, 2JU, 2JV, 2JW, 2JX, 2JY, 2JZ, 2KA, 2KB, 2KC, 2KD, 2KE, 2KF, 2KG, 2KH, 2KI, 2KJ, 2KK, 2KL, 2KM, 2KN, 2KO, 2KP, 2KQ, 2KR, 2KS, 2KT, 2KU, 2KV, 2KW, 2KX, 2KY, 2KZ, 2LA, 2LB, 2LC, 2LD, 2LE, 2LF, 2LG, 2LH, 2LI, 2LJ, 2LK, 2LM, 2LN, 2LO, 2LP, 2LQ, 2LR, 2LS, 2LT, 2LU, 2LV, 2LW, 2LX, 2LY, 2LZ, 2MA, 2MB, 2MC, 2MD, 2ME, 2MF, 2MG, 2MH, 2MI, 2MJ, 2MK, 2ML, 2MN, 2MO, 2MP, 2MQ, 2MR, 2MS, 2MT, 2MU, 2MV, 2MW, 2MX, 2MY, 2MZ, 2NA, 2NB, 2NC, 2ND, 2NE, 2NF, 2NG, 2NH, 2NI, 2NJ, 2NK, 2NL, 2NM, 2NN, 2NO, 2NP, 2NQ, 2NR, 2NS, 2NT, 2NU, 2NV, 2NW, 2NX, 2NY, 2NZ, 2OA, 2OB, 2OC, 2OD, 2OE, 2OF, 2OG, 2OH, 2OI, 2OJ, 2OK, 2OL, 2OM, 2ON, 2OO, 2OP, 2OQ, 2OR, 2OS, 2OT, 2OU, 2OV, 2OW, 2OX, 2OY, 2OZ, 2PA, 2PB, 2PC, 2PD, 2PE, 2PF, 2PG, 2PH, 2PI, 2PJ, 2PK, 2PL, 2PM, 2PN, 2PO, 2PP, 2PQ, 2PR, 2PS, 2PT, 2PU, 2PV, 2PW, 2PX, 2PY, 2PZ, 2QA, 2QB, 2QC, 2QD, 2QE, 2QF, 2QG, 2QH, 2QI, 2QJ, 2QK, 2QL, 2QM, 2QN, 2QO, 2QP, 2QQ, 2QR, 2QS, 2QT, 2QU, 2QV, 2QW, 2QX, 2QY, 2QZ, 2RA, 2RB, 2RC, 2RD, 2RE, 2RF, 2RG, 2RH, 2RI, 2RJ, 2RK, 2RL, 2RM, 2RN, 2RO, 2RP, 2RQ, 2RR, 2RS, 2RT, 2RU, 2RV, 2RW, 2RX, 2RY, 2RZ, 2SA, 2SB, 2SC, 2SD, 2SE, 2SF, 2SG, 2SH, 2SI, 2SJ, 2SK, 2SL, 2SM, 2SN, 2SO, 2SP, 2SQ, 2SR, 2SS, 2ST, 2SU, 2SV, 2SW, 2SX, 2SY, 2SZ, 2TA, 2TB, 2TC, 2TD, 2TE, 2TF, 2TG, 2TH, 2TI, 2TJ, 2TK, 2TL, 2TM, 2TN, 2TO, 2TP, 2TQ, 2TR, 2TS, 2TT, 2TU, 2TV, 2TW, 2TX, 2TY, 2TZ, 2UA, 2UB, 2UC, 2UD, 2UE, 2UF, 2UG, 2UH, 2UI, 2UJ, 2UK, 2UL, 2UM, 2UN, 2UO, 2UP, 2UQ, 2UR, 2US, 2UT, 2UU, 2UV, 2UW, 2UX, 2UY, 2UZ, 2VA, 2VB, 2VC, 2VD, 2VE, 2VF, 2VG, 2VH, 2VI, 2VJ, 2VK, 2VL, 2VM, 2VN, 2VO, 2VP, 2VQ, 2VR, 2VS, 2VT, 2VU, 2VV, 2VW, 2VX, 2VY, 2VZ, 2WA, 2WB, 2WC, 2WD, 2WE, 2WF, 2WG, 2WH, 2WI, 2WJ, 2WK, 2WL, 2WM, 2WN, 2WO, 2WP, 2WQ, 2WR, 2WS, 2WT, 2WU, 2WV, 2WW, 2WX, 2WY, 2WZ, 2XA, 2XB, 2XC, 2XD, 2XE, 2XF, 2XG, 2XH, 2XI, 2XJ, 2XK, 2XL, 2XM, 2XN, 2XO, 2XP, 2XQ, 2XR, 2XS, 2XT, 2XU, 2XV, 2XW, 2XX, 2XY, 2XZ, 2YA, 2YB, 2YC, 2YD, 2YE, 2YF, 2YG, 2YH, 2YI, 2YJ, 2YK, 2YL, 2YM, 2YN, 2YO, 2YP, 2YQ, 2YR, 2YS, 2YT, 2YU, 2YV, 2YW, 2YX, 2YY, 2YZ, 2ZA, 2ZB, 2ZC, 2ZD, 2ZE, 2ZF, 2ZG, 2ZH, 2ZI, 2ZJ, 2ZK, 2ZL, 2ZM, 2ZN, 2ZO, 2ZP, 2ZQ, 2ZR, 2ZS, 2ZT, 2ZU, 2ZV, 2ZW, 2ZX, 2ZY, 2ZZ, 2AA, 2AB, 2AC, 2AD, 2AE, 2AF, 2AG, 2AH, 2AI, 2AJ, 2AK, 2AL, 2AM, 2AN, 2AO, 2AP, 2AQ, 2AR, 2AS, 2AT, 2AU, 2AV, 2AW, 2AX, 2AY, 2AZ, 2BA, 2BB, 2BC, 2BD, 2BE, 2BF, 2BG, 2BH, 2BI, 2BJ, 2BK, 2BL, 2BM, 2BN, 2BO, 2BP, 2BQ, 2BR, 2BS, 2BT, 2BU, 2BV, 2BW, 2BX, 2BY, 2BZ, 2CA, 2CB, 2CC, 2CD, 2CE, 2CF, 2CG, 2CH, 2CI, 2CJ, 2CK, 2CL, 2CM, 2CN, 2CO, 2CP, 2CQ, 2CR, 2CS, 2CT, 2CU, 2CV, 2CW, 2CX, 2CY, 2CZ, 2DA, 2DB, 2DC, 2DD, 2DE, 2DF, 2DG, 2DH, 2DI, 2DJ, 2DK, 2DL, 2DM, 2DN, 2DO, 2DP, 2DQ, 2DR, 2DS, 2DT, 2DU, 2DV, 2DW, 2DX, 2DY, 2DZ, 2EA, 2EB, 2EC, 2ED, 2EE, 2EF, 2EG, 2EH, 2EI, 2EJ, 2EK, 2EL, 2EM, 2EN, 2EO, 2EP, 2EQ, 2ER, 2ES, 2ET, 2EU, 2EV, 2EW, 2EX, 2EY, 2EZ, 2FA, 2FB, 2FC, 2FD, 2FE, 2FF, 2FG, 2FH, 2FI, 2FJ, 2FK, 2FL, 2FM, 2FN, 2FO, 2FP, 2FQ, 2FR, 2FS, 2FT, 2FU, 2FV, 2FW, 2FX, 2FY, 2FZ, 2GA, 2GB, 2GC, 2GD, 2GE, 2GF, 2GG, 2GH, 2GI, 2GJ, 2GK, 2GL, 2GM, 2GN, 2GO, 2GP, 2GQ, 2GR, 2GS, 2GT, 2GU, 2GV, 2GW, 2GX, 2GY, 2GZ, 2HA, 2HB, 2HC, 2HD, 2HE, 2HF, 2HG, 2HH, 2HI, 2HJ, 2HK, 2HL, 2HM, 2HN, 2HO, 2HP, 2HQ, 2HR, 2HS, 2HT, 2HU, 2HV, 2HW, 2HX, 2HY, 2HZ, 2IA, 2IB, 2IC, 2ID, 2IE, 2IF, 2IG, 2IH, 2II, 2IJ, 2IK, 2IL, 2IM, 2IN, 2IO, 2IP, 2IQ, 2IR, 2IS, 2IT, 2IU, 2IV, 2IW, 2IX, 2IY, 2IZ, 2JA, 2JB, 2JC, 2JD, 2JE, 2JF, 2JG, 2JH, 2JI, 2JJ, 2JK, 2JL, 2JM, 2JN, 2JO, 2JP, 2JQ, 2JR, 2JS, 2JT, 2JU, 2JV, 2JW, 2JX, 2JY, 2JZ, 2KA, 2KB, 2KC, 2KD, 2KE, 2KF, 2KG, 2KH, 2KI, 2KJ, 2KK, 2KL, 2KM, 2KN, 2KO, 2KP, 2KQ, 2KR, 2KS, 2KT, 2KU, 2KV, 2KW, 2KX, 2KY, 2KZ, 2LA, 2LB, 2LC, 2LD, 2LE, 2LF, 2LG, 2LH, 2LI, 2LJ, 2LK, 2LM, 2LN, 2LO, 2LP, 2LQ, 2LR, 2LS, 2LT, 2LU, 2LV, 2LW, 2LX, 2LY, 2LZ, 2MA, 2MB, 2MC, 2MD, 2ME, 2MF, 2MG, 2MH, 2MI, 2MJ, 2MK, 2ML, 2MN, 2MO, 2MP, 2MQ, 2MR, 2MS, 2MT, 2MU, 2MV, 2MW, 2MX, 2MY, 2MZ, 2NA, 2NB, 2NC, 2ND, 2NE, 2NF, 2NG, 2NH, 2NI, 2NJ, 2NK, 2NL, 2NM, 2NN, 2NO, 2NP, 2NQ, 2NR, 2NS, 2NT, 2NU, 2NV, 2NW, 2NX, 2NY, 2NZ, 2OA, 2OB, 2OC, 2OD, 2OE, 2OF, 2OG, 2OH, 2OI, 2OJ, 2OK, 2OL, 2OM, 2ON, 2OO, 2OP, 2OQ, 2OR, 2OS, 2OT, 2OU, 2OV, 2OW, 2OX, 2OY, 2OZ, 2PA, 2PB, 2PC, 2PD, 2PE, 2PF, 2PG, 2PH, 2PI, 2PJ, 2PK, 2PL, 2PM, 2PN, 2PO, 2PP, 2PQ, 2PR, 2PS, 2PT, 2PU, 2PV, 2PW, 2PX, 2PY, 2PZ, 2QA, 2QB, 2QC, 2QD, 2QE, 2QF, 2QG, 2QH, 2QI, 2QJ, 2QK, 2QL, 2QM, 2QN, 2QO, 2QP, 2QQ, 2QR, 2QS, 2QT, 2QU, 2QV, 2QW, 2QX, 2QY, 2QZ, 2RA, 2RB, 2RC, 2RD, 2RE, 2RF, 2RG, 2RH, 2RI, 2RJ, 2RK, 2RL, 2RM, 2RN, 2RO, 2RP, 2RQ, 2RR, 2RS, 2RT, 2RU, 2RV, 2RW, 2RX, 2RY, 2RZ, 2SA, 2SB, 2SC, 2SD, 2SE, 2SF, 2SG, 2SH, 2SI, 2SJ, 2SK, 2SL, 2SM, 2SN, 2SO, 2SP, 2SQ, 2SR, 2SS, 2ST, 2SU, 2SV, 2SW, 2SX, 2SY, 2SZ, 2TA, 2TB, 2TC, 2TD, 2TE, 2TF, 2TG, 2TH, 2TI, 2TJ, 2TK, 2TL, 2TM, 2TN, 2TO, 2TP, 2TQ, 2TR, 2TS, 2TT, 2TU, 2TV, 2TW, 2TX, 2TY, 2TZ, 2UA, 2UB, 2UC, 2UD, 2UE, 2UF, 2UG, 2UH, 2UI, 2UJ, 2UK, 2UL, 2UM, 2UN, 2UO, 2UP, 2UQ, 2UR, 2US, 2UT, 2UU, 2UV, 2UW, 2UX, 2UY, 2UZ, 2VA, 2VB, 2VC, 2VD, 2VE, 2VF, 2VG, 2VH, 2VI, 2VJ, 2VK, 2VL, 2VM, 2VN, 2VO, 2VP, 2VQ, 2VR, 2VS, 2VT, 2VU, 2VV, 2VW, 2VX, 2VY, 2VZ, 2WA, 2WB, 2WC, 2WD, 2WE, 2WF, 2WG, 2WH, 2WI, 2WJ, 2WK, 2WL, 2WM, 2WN, 2WO, 2WP, 2WQ, 2WR, 2WS, 2WT, 2WU, 2WV, 2WW, 2WX, 2WY, 2WZ, 2XA, 2XB, 2XC, 2XD, 2XE, 2XF, 2XG, 2XH, 2XI, 2XJ, 2XK, 2XL, 2XM, 2XN, 2XO, 2XP, 2XQ, 2XR, 2XS, 2XT, 2XU, 2XV, 2XW, 2XX, 2XY, 2XZ, 2YA, 2YB, 2YC, 2YD, 2YE, 2YF, 2YG, 2YH, 2YI, 2YJ, 2YK, 2YL, 2YM, 2YN, 2YO, 2YP, 2YQ, 2YR, 2YS, 2YT, 2YU, 2YV, 2YW, 2YX, 2YY, 2YZ, 2ZA, 2ZB, 2ZC, 2ZD, 2ZE, 2ZF, 2ZG, 2ZH, 2ZI, 2ZJ, 2ZK, 2ZL, 2ZM, 2ZN, 2ZO, 2ZP, 2ZQ, 2ZR, 2ZS, 2ZT, 2ZU, 2ZV, 2ZW, 2ZX, 2ZY, 2ZZ, 2AA, 2AB, 2AC, 2AD, 2AE, 2AF, 2AG, 2AH, 2AI, 2AJ, 2AK, 2AL, 2AM, 2AN, 2AO, 2AP, 2AQ, 2AR, 2AS, 2AT, 2AU, 2AV, 2AW, 2AX, 2AY, 2AZ, 2BA, 2BB, 2BC, 2BD, 2BE, 2BF, 2BG, 2BH, 2BI, 2BJ, 2BK, 2BL, 2BM, 2BN, 2BO, 2BP, 2BQ, 2BR, 2BS, 2BT, 2BU, 2BV, 2BW, 2BX, 2BY, 2BZ, 2CA, 2CB, 2CC, 2CD, 2CE, 2CF, 2CG, 2CH, 2CI, 2CJ, 2CK, 2CL, 2CM, 2CN, 2CO, 2CP, 2CQ, 2CR, 2CS, 2CT, 2CU, 2CV, 2CW, 2CX, 2CY, 2CZ, 2DA, 2DB, 2DC, 2DD, 2DE, 2DF, 2DG, 2DH, 2DI, 2DJ, 2DK, 2DL, 2DM, 2DN, 2DO, 2DP, 2DQ, 2DR, 2DS, 2DT, 2DU, 2DV, 2DW, 2DX, 2DY, 2DZ, 2EA, 2EB, 2EC, 2ED, 2EE, 2EF, 2EG, 2EH, 2EI, 2EJ, 2EK, 2EL, 2EM, 2EN, 2EO, 2EP, 2EQ, 2ER, 2ES, 2ET, 2EU, 2EV, 2EW, 2EX, 2EY, 2EZ, 2FA, 2FB, 2FC, 2FD, 2FE, 2FF, 2FG, 2FH, 2FI, 2FJ, 2FK, 2FL, 2FM, 2FN, 2FO, 2FP, 2FQ, 2FR, 2FS, 2FT, 2FU, 2FV, 2FW, 2FX, 2FY, 2FZ, 2GA, 2GB, 2GC, 2GD, 2GE, 2GF, 2GG, 2GH, 2GI, 2GJ, 2GK, 2GL, 2GM, 2GN, 2GO, 2GP, 2GQ, 2GR, 2GS, 2GT, 2GU, 2GV, 2GW, 2GX, 2GY, 2GZ, 2HA, 2HB, 2HC, 2HD, 2HE, 2HF, 2HG, 2HH, 2HI, 2HJ, 2HK, 2HL, 2HM, 2HN, 2HO, 2HP, 2HQ, 2HR, 2HS, 2HT, 2HU, 2HV, 2HW, 2HX, 2HY, 2HZ, 2IA, 2IB, 2IC, 2ID, 2IE, 2IF, 2IG, 2IH, 2II, 2IJ, 2IK, 2IL, 2IM, 2IN, 2IO, 2IP, 2IQ, 2IR, 2IS, 2IT, 2IU, 2IV, 2IW, 2IX, 2IY, 2IZ, 2JA, 2JB, 2JC, 2JD, 2JE, 2JF, 2JG, 2JH, 2JI, 2JJ, 2JK, 2JL, 2JM, 2JN, 2JO, 2JP, 2JQ, 2JR, 2JS, 2JT, 2JU, 2JV, 2JW, 2JX, 2JY, 2JZ, 2KA, 2KB, 2KC, 2KD, 2KE, 2KF, 2KG, 2KH, 2KI, 2KJ, 2KK, 2KL, 2KM, 2KN, 2KO, 2KP, 2KQ, 2KR, 2KS, 2KT, 2KU, 2KV, 2KW, 2KX, 2KY, 2KZ, 2LA, 2LB, 2LC, 2LD, 2LE, 2LF, 2LG, 2LH, 2LI, 2LJ, 2LK, 2LM, 2LN, 2LO, 2LP, 2LQ, 2LR, 2LS, 2LT, 2LU, 2LV, 2LW, 2LX, 2LY, 2LZ, 2MA, 2MB, 2MC, 2MD, 2ME, 2MF, 2MG, 2MH, 2MI, 2MJ, 2MK, 2ML, 2MN, 2MO, 2MP, 2MQ, 2MR, 2MS, 2MT, 2MU, 2MV, 2MW, 2MX, 2MY, 2MZ, 2NA, 2NB, 2NC, 2ND, 2NE, 2NF, 2NG, 2NH, 2NI, 2NJ, 2NK, 2NL, 2NM, 2NN, 2NO, 2NP, 2NQ, 2NR, 2NS, 2NT, 2NU, 2NV, 2NW, 2NX, 2NY, 2NZ, 2OA, 2OB, 2OC, 2OD, 2OE, 2OF, 2OG, 2OH, 2OI, 2OJ, 2OK, 2OL, 2OM, 2ON, 2OO, 2OP, 2OQ, 2OR, 2OS, 2OT, 2OU, 2OV, 2OW, 2OX, 2OY, 2OZ, 2PA, 2PB, 2PC, 2PD, 2PE, 2PF, 2PG, 2PH, 2PI, 2PJ, 2PK, 2PL, 2PM, 2PN, 2PO, 2PP, 2PQ, 2PR, 2PS, 2PT, 2PU, 2PV, 2PW, 2PX, 2PY, 2PZ, 2QA, 2QB, 2QC, 2QD, 2QE, 2QF, 2QG, 2QH, 2QI, 2QJ, 2QK, 2QL, 2QM, 2QN, 2QO, 2QP, 2QQ, 2QR, 2QS, 2QT, 2QU, 2QV, 2QW, 2QX, 2QY, 2QZ, 2RA, 2RB, 2RC, 2RD, 2RE, 2RF, 2RG, 2RH, 2RI, 2RJ, 2RK, 2RL, 2RM, 2RN, 2RO, 2RP, 2RQ, 2RR, 2RS, 2RT, 2RU, 2RV, 2RW, 2RX, 2RY, 2RZ, 2SA, 2SB, 2SC, 2SD, 2SE, 2SF, 2SG, 2SH, 2SI, 2SJ, 2SK, 2SL, 2SM, 2SN, 2SO, 2SP, 2SQ, 2SR, 2SS, 2ST, 2SU, 2SV, 2SW, 2SX, 2SY, 2SZ, 2TA, 2TB, 2TC, 2TD, 2TE, 2TF, 2TG, 2TH, 2TI, 2TJ, 2TK, 2TL, 2TM, 2TN, 2TO, 2TP, 2TQ, 2TR, 2TS, 2TT, 2TU, 2TV, 2TW, 2TX, 2TY, 2TZ, 2UA, 2UB, 2UC, 2UD, 2UE, 2UF, 2UG, 2UH, 2UI, 2UJ, 2UK, 2UL, 2UM, 2UN, 2UO, 2UP, 2UQ, 2UR, 2US, 2UT, 2UU, 2UV, 2UW, 2UX, 2UY, 2UZ, 2VA, 2VB, 2VC, 2VD, 2VE, 2VF, 2VG, 2VH, 2VI, 2VJ, 2VK, 2VL, 2VM, 2VN, 2VO, 2VP, 2VQ, 2VR, 2VS, 2VT, 2VU, 2VV, 2VW, 2VX, 2VY, 2VZ, 2WA, 2WB, 2WC, 2WD, 2WE, 2WF, 2WG, 2WH, 2WI, 2WJ, 2WK, 2WL, 2WM, 2WN, 2WO, 2WP, 2WQ, 2WR, 2WS, 2WT, 2WU, 2WV, 2WW, 2WX, 2WY, 2WZ, 2XA, 2XB, 2XC, 2XD, 2XE, 2XF, 2XG, 2XH, 2XI, 2XJ, 2XK, 2XL, 2XM, 2XN, 2XO, 2XP, 2XQ, 2XR, 2XS, 2XT, 2XU, 2XV, 2XW, 2XX, 2XY, 2XZ, 2YA, 2YB, 2YC, 2YD, 2YE, 2YF, 2YG, 2YH, 2YI, 2YJ, 2YK, 2YL, 2YM, 2YN, 2YO, 2YP, 2YQ, 2YR, 2YS, 2YT, 2YU, 2YV, 2YW, 2YX, 2YY, 2YZ, 2ZA, 2ZB, 2ZC, 2ZD, 2ZE, 2ZF, 2ZG, 2ZH, 2ZI, 2ZJ, 2ZK,

A "CHARGER" SAVES MONEY AND WORRY.



(See also under "B" Batteries.)
It is impossible to judge an accumulator by its appearance, actual test by experience over at least four years being the only reliable guide. A shilling or two saved in first cost proves expensive if the accumulator lasts only six months—and a troublesome six months—whereas a reliable one would have given good service for several years.

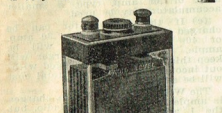
FULLERS were among the earliest in England to manufacture batteries. Quality has always been their chief aim. We have been selling Fuller accumulators of all kinds for the past nine years, and SCARCELY REMEMBER A COMPLAINT. Can you wonder that we have the greatest confidence in them?

Every detail in Sparta design has been carefully worked out. It is this attention to detail that has made possible SPARTA RELIABILITY.

SPARTA ACCUMULATORS are imported in two-volt units, larger voltages being obtained by connecting cells together. Thus a single cell can be simply replaced with a new one, should it ever become damaged.

SPARTA S.W.G.

Glass cells, in two-volt units, with liberal space round the plates for expansion, and ample ventilation at the cell. Indestructible separators. Moulded covers, with large non-corroding brass terminals. A very fine battery.



A213 SWG5, 20 amp. actual	2 volt
A130 SWG7, 30 amp. actual	15 0
A155 SWG9, 40 amp. actual	18 0
A136 SWG12, 50 amp. actual	21 0
For 4 or 6 volts, use two or three cells.	

EXIDE TWO-VOLT (GLASS).

Note.—We list D.T.G. as 10 amp. actual. Others frequently describe it as 20 amp. (ignition, or false, rating).
A145 D.T.G. 10 amp. actual 12 9
A179 D.T.G. 22 amp. actual 18 9

"A" ACCUMULATORS—See under "B" Batteries

SPARTA S.D.G. AND L.D.G.

These have thick plates, and therefore must not be charged or discharged at heavier rates than those specified. They will hold their charge much longer than ordinary accumulators, though for large outputs the latter must always be used. Glass cells, indestructible separators, and other Fuller "quality" features.

The S.D.G. is 12½ amp. actual. The usual small accumulator is only 10 amp. actual, though often listed by unreliable firms as 20 amps—a false rating that is still adopted by some manufacturers with questionable intentions!

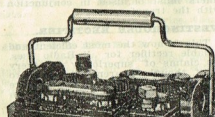
Merely fill with acid, and the accumulator is ready for work. It should be charged, however, at the very first opportunity. These accumulators are very useful for electric bells, clocks, etc., because they hold their charge for many weeks.

Maximum charge and discharge rates are 3 amp. and 1 amp. for 12½ amp. and 1 amp. and 1 amp. for the 30 amp. size.
A214 2 volt, 30 amp. actual 15 0
A197 2 volt, 12½ amp. actual 8 6

RELIANCE ACCUMULATORS.

We believe in supporting local industry, and can confidently advise you to do this. Reliance Batteries are concerned. In any case, the guarantee given protects you, since the factory is in Auckland, and not away overseas.

The RELIANCE RADIO BATTERY is a six-volt monobloc battery, in strong black case, fitted with rugged carrying handles, and designed for Radio, and is particularly suitable for use where accumulators must be sent to an ordinary garage for recharging. It is made in large capacity only.



A213 SWG5, 20 amp. actual	2 volt
A130 SWG7, 30 amp. actual	15 0
A155 SWG9, 40 amp. actual	18 0
A136 SWG12, 50 amp. actual	21 0
For 4 or 6 volts, use two or three cells.	

EXIDE TWO-VOLT (GLASS).
Note.—We list D.T.G. as 10 amp. actual. Others frequently describe it as 20 amp. (ignition, or false, rating).
A145 D.T.G. 10 amp. actual 12 9
A179 D.T.G. 22 amp. actual 18 9

CHARGING.—See Charging Table.

"A" ELIMINATOR.
See under ELIMINATORS.

CHARGERS.

WELL-MAYDE CHARGERS.

Fully guaranteed for one year.

These are manufactured in Auckland, under Patent License, incorporating the WESTINGHOUSE METAL RECTIFIER, which is British made. A full description of these famous rectifiers is given under RECTIFIERS in this Catalogue.

These rectifiers consist merely of a series of copper plates, with copper oxide between them. They never seem to wear out, so can be left working week in and week out, without stipulation as to the hours they are used during the period. In durability, therefore, they are much superior to the TUNGAR RECTIFIERS, which were so successful before the advent of the Westinghouse units.

Not only does the Westinghouse score in durability, but it is also very much more efficient than other rectifiers.

WELL-MAYDE CHARGERS may be permanently wired to your batteries, so that charging is controlled simply by the main switch. There is no need to alter a wire, thus reducing inconvenience to an absolute minimum.

Running costs are so low as to be negligible—you would not notice any difference in your electricity bill.

If you are supplied with A.C. current, you simply can connect to overlook the WELL-MAYDE CHARGER, especially as you can purchase by instalment. If desired, thus making it literally "PAY FOR IT-SLOWLY."

Besides paying for itself in a short time, your battery need never run down, nor will it stand away for a day or two at a time for recharging. The WELL-MAYDE is always ready for action. Incidentally, your battery lasts much longer if not carried about too much.

WELL-MAYDE CHARGERS are made in several patterns, all FULLY GUARANTEED. In buying one, remember that FIRST COST IS LAST COST.

In the combined "A" and "B" accumulator chargers, both batteries can be charged at the same time, if desired. In every case, the "B" charger will cost 80 to 180 volts, IN SERIES, the charging rate being up to about 50 milliamperes. This is the first charger to be offered in New Zealand that will charge such high voltages in series.

Get Your Charging Pay for Itself.

ALL WELL-MAYDE "AB" CHARGERS will charge both batteries SIMULTANEOUSLY.

(Continued next page.)

D.C. CHARGING OUTFIT.

This comprises a 1 amp carbon lamp, lamp-holder, Bayonet adaptor, and 1½ ft. twin lead. Rectifier for use.

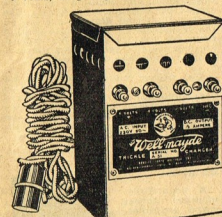
A158 13 6

D.C. CHARGERS—LARGE SIZES.

Prices on request.

"A" CHARGERS.

TYPE A.
Charges "A" batteries of 2, 4 or 6 volts, at 1 amp.



A158 2 15 0
Easy terms: 10s. cash, and five monthly payments of 10s. each.

TYPE A3.
Charges 6 volt batteries at 1 amp, and will also supply 9 volts 1 amp for dynamic speakers, or "A" film instants.
A206 2 10 0

TYPE A4.
Charges 6 volt batteries at 2 amp, and will also supply 3 volts 2 amp. for uses as for TYPE A3.
A207 5 0 0

"B" CHARGERS.

TYPE B.
Charges "B" batteries 80-180 volts, at up to 50 milliamperes.
A208 4 4 0

"AB" CHARGERS.

All "AB" chargers charge both batteries simultaneously.

TYPE AB.
Charges 6 volt batteries at 1 amp, and "B" batteries as in TYPE B.
A208 5 15 0

TYPE AB3.
Charges 6 volt batteries at 1 amp, and "B" batteries as in TYPE B.
A209 6 6 0

TYPE AB4.
Charges 6 volt batteries at 2 amp, and "B" batteries as in TYPE B.
A210 7 15 0

For 110 volt supply, 10s. extra, except TYPE A, 5s.

EASY TERMS—10s. DEPOSIT

ACE CHARGERS can be converted to one or two amp. Westinghouse units. No more bulb replacement.

The cost of conversion to a 1 amp. charger will be 10s. and for 2 or 4 amp. chargers, £3; but, when converted "B" batteries cannot be charged.

FURTHER WELL-MAYDE USES.

Types A, A3 and A4 can be used in conjunction with the coils, and, in fact, the 1-volt output of the A3 is specially designed to suit the ordinary six-volt dynamic speaker, forcing 1 amp. through the field coils, thus creating ample magnetizing force. It can then be used for charging the "A" accumulator when the Radio is not actually operating. It thus serves a triple purpose.

For the low cost of £3 10s., the TYPE A3 should fill a very definite want. Type A is frequently used also for dynamies, but should not be, unless a test made in use shows current is not more than 1 amp. Jensen speakers, for instance, use .4 amp.

ACE CHARGER, 2 AMP.

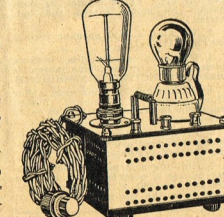
Charges six-volt "A" accumulator at 2 amps, and 90-volt "B" accumulator at 50 milliamperes simultaneously. The transformer is made of best stialloy, and the windings are carefully wound, and thoroughly impregnated with a special varnish. The transformer is practically unknown, but in any case, the transformer is fully guaranteed.

Unlike imported chargers, repairs, when required (very rarely), can be readily effected.

The rectifier is the genuine Tungar bulb. The case is of bright aluminium, and with formen top is very handsome indeed.

Price includes the RECTIFIER BULB, all that is necessary for charging "A" accumulators. For charging "B" accumulators, a lamp is required, costing 2/2 extra.

Provided A and B terminals are not connected (not connected with A and B) the charger can be permanently wired to both batteries through a simple switch. The charging can then be done without any loss of time, thus ensuring utmost simplicity.



For 110 volt mains, 5s. extra.

A100 Ace Charger, Tungar bulb 4 5 0
A161 Lamp for B Batteries 2 2 0
A161 Tungar Bulb, for Ace or Tungar chargers 2 0 0

Recticon type with bulb, similar to Tungar, but with plate connection at top instead of at side. Price, £1.

ACE CHARGER, 5 AMP.

Owing to the demand for a larger charger than the 2 amp., we can now supply the Ace charger in the 5 amp. size, arranged to charge both "A" and "B" Batteries. The larger size is useful where dealers have a number of batteries to charge for customers.

It is made with the same care, and the same guarantee as the 2 amp. Ace charger. "B" battery lamp is extra.

A190 Ace 5 amp. charger, 7 10 0
A186 Tungar bulb, 5 amp. 2 7 6
A161 Lamp for "B" batteries 2 3 0
Charger for 110 volt supply, 5s. extra.

Guarantee—

TUNGAR BULBS.

We Guarantee 2 AMP. TUNGAR bulbs sold by us for use in GENERATORS or ACE or TUNGAR CHARGERS for SIX MONTHS from date of purchase, subject to the following conditions:

1. CHARGER has been given proper use.

2. CHARGER RATE has not been altered in any way.

3. 3s. per month is paid for the use of bulb up to date of making claim for replacement. Thus, if bulb fails in three months, 9s. is paid towards cost of new bulb.

NO OTHER GUARANTEE IS GIVEN OR IMPLIED.

GARAGE CHARGERS.

WESTINGHOUSE RECTIFIERS are now available in larger sizes, and the following chargers must appeal to all garage mechanics, simply because they are a great advance on the Tungar bulb type. The advantages are:

1. Cheaper initial cost.
2. No maintenance expense, for there are no bulbs requiring replacement, and the apparatus should be everlasting.
3. Greater efficiency, so much lower expense for current, and cooler running.
4. Simpler construction.
5. No cut-outs, etc. required—if power goes off, charging ceases but resumes immediately the Power Board restores the defect.
6. Silent.

36-VOLT 5 AMP. CHARGER.

Charges 1 to 6 six-volt accumulators, at 5 amps. Fitted with ammeter.

A215 24 0 0

12-VOLT 3 AMP. CHARGER.

Charges 1 or 2 six-volt accumulators at 3 amps.

120-VOLT 15 AMP. CHARGER.

Something entirely new—a charger that will charge up to 120 volts, at 5.5 amps. Enables charges to charge high tension batteries.

Price on application.

WRITE FOR WESTINGHOUSE BOOKLET. Post free, 3d.

ALUMINIUM—BEST FOR SHIELDS.

AERIAL OUTFITS.

For convenience, the following aerial outfits are quoted complete. The aerial wire in each instance is 100 feet long. Enough is made to make the earth connection from the set should be cut off, and the remainder used for the aerial.

Neither aerial nor earth wire need be insulated, properly fitted. Enamel wire is better solely because it prevents corrosion.

AERIAL OUTFIT No. 1.

Comprises the choice of aerial materials, 100 ft. of 222 enameled wire, two Pyrex insulators, two nine-inch lead-in tubes, with nuts. Costless arrester, earth clamp. A139 19 0

AERIAL OUTFIT No. 2.

A cheaper outfit, but fulfilling insurance requirements. 100 feet 14g wire, two large porcelain insulators, nine-inch lead-in tube, Homeguard arrester, earth clamp. A138 9 0

AERIAL OUTFIT No. 3.

Although this aerial does not satisfy the insurance requirements, it is quite efficient for Radio reception. It is suitable for camping, temporary aerials, shackles, etc. 100 feet 15g wire, two porcelain insulators, porcelain lead-in tube, earth clamp. A137 4 6

AERIAL PLUGS.

A small Formica plate either black or walnut, which is screwed to the wall, and has two plated sockets (one red, one black), to which the aerial and earth wires are attached.

The aerial and earth leads to the set are connected to two plugs, also coloured, which in turn fit the sockets. The whole set can thus be readily disconnected, leaving only a neat fitting on the wall.

A204 Aerial-earth plug, complete. A136 2 0

ALUMINIUM.

ALUMINIUM is now much in demand for Radio purposes, being used for panels, shields, and even for cabinets.

Aluminium is only kept and cut at our factory, hence a few hours' delay is necessary in fitting orders, which have to be cut to size, if in town, phone your order in the morning, making sure to give correct sizes.

Thick aluminium (14g) is necessary for panels and is also by far the best for shields. Fortunately, special corner rods can be now supplied which enable heavy shields to be built up readily, the whole box being held together by eight screws. Each side is a perfectly plain flat sheet. The boxes are being sold as "WELL-MAYDE".

Prices for shields will be found under "SHIELDS."

ALUMINIUM SHEET (English).

S.W. Gauge.	Thickness	Per sq. ft.
14	.08 inch	4 6
16	.06	3 0
18	.048	3 0
20	.04	2 8
22	.028	2 0
24	.022	1 9
26	.018	1 5

ALUMINIUM PANELS.

These can be supplied either crystal enamelled or ducoed. Write for prices.

Reduced prices for quantities.

ALUMINIUM CORNER ROD.

This rod has grooves in it to take 14g aluminium sheet. The ends can be tapped for screws, which pass through the top and bottom panels, thus holding the whole assembly together.

A200 Corner rod . . . per ft. 1 0

If cut accurately to length, drilled and tapped at both ends, complete with screws, per P10CB, extra . 6d.

ALUMINIUM PARTITION ROD.

This rod has one groove only in it, and is used for putting a partition in a box. It is held in place by small screws.

A201 Partition rod . . . per ft. 6

ALUMINIUM ANGLE.

For making lighter aluminium shields, aluminium angle can be used at the corners, the panels being riveted or screwed on. We can supply suitable angle aluminium in lengths up to two feet.

3 x 3 inch per ft. 9d.
3 x 1 1/2 inch per ft. 6d.

AMPLIFIERS.

MULTI-VALVE sets always contain an AMPLIFIER, but amplifiers are used as separate units for:

1. Working a loud speaker from a crystal set. (This cannot be done except by using valves and batteries.)

2. Working a loud speaker from a single valve set.

3. Using in conjunction with a pick-up and a gramophone motor, to make an ELECTRO GRAMOPHONE.

4. With telecine apparatus. (For this purpose, a resistance coupled amplifier is generally reckoned to be the best.)

5. In conjunction with a microphone for deaf phones, and for public address systems.

6. Building a large set. Some prefer to use a complete unit like the De Jur, instead of assembling their own from the parts.

RESISTANCE COUPLED AMPLIFIER—THREE STAGE.

These can be relied on for extremely good results, and freedom from trouble. They require 135 volts "B" batteries, and cannot be used with them as with transformer amplifiers.

TRANSFORMER AMPLIFIERS—TWO STAGE.

Transformer amplifiers are by far the most common. Two stages give the same amplification as three stages of resistance coupling. The cost will depend almost entirely on the transformers used, these costing from 5/9 to 12/6 each. No expensive mounting is required—a piece of ordinary board is quite sufficient.

The prices quoted below are for the necessary apparatus mounted in the simplest manner, but always giving maximum efficiency. Suitable materials are fitted, so that the amplifier can be connected up without the slightest delay.

DE JUR.

A beautifully mounted three stage amplifier, mounted in a very compact space. It contains the necessary valve holders, transformers, and resistances, and is fitted with terminals so that it can be connected up in a few minutes. Frequently used as the amplifier of a six valve set, owing to its compactness.

R209 fl 4 0

Or with three special valves, £2

At this price, this is the cheapest amplifier ever offered.

It will be necessary to order early, as stocks of valves and amplifiers are very limited.

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MAGNETO "B" FOR REAL POWER—LOW EXPENSE.

MAGNETO "B" SUPPLY.

In England these are known as Anode converters, but we have adopted the above name as in N.Z. keeping with the terms used in N.Z. The MAGNETO "B" SUPPLY consists of a combined motor and generator, very carefully built to ensure an absolute minimum of current, since it is usually driven by an accumulator. For economy in use, a permanent magnet field is strong permanent magnet field is used—all current generated can be then put to useful work.

The machine is enclosed in a small and neat case, with precision bearings, requiring only a few drops of oil every two or three months. No other attention is necessary.

For RADIO, the MAGNETO "B" SUPPLY is mainly interesting to those who want vacuum RADIOS, those who have no electric power installed. The cost of dry "B" batteries is prohibitive, but the MAGNETO "B" provides ample power at low cost. It could, of course, be used without a filter for charging "B" accumulators.

It can be obtained to work from 110 volt direct current home lighting plants.

For ELECTRIC GRAMOPHONES, where high voltage, as well as high amperage is used, the MAGNETO "B" SUPPLY has a competitor.

For picture theatres, dance halls, public address systems, two 115-volt accumulators, which can readily be charged by any garage, will drive the MAGNETO "B", and provide 300 volts 150 mls. The MAGNETO "B" for this purpose weighs only 31 lbs., and is quite small, hence transport offers not the slightest difficulty.

Thus, powerful, easily portable amplifiers are readily possible with MAGNETO "B".

MAGNETO "B" SUPPLY is offered complete with filter system in special aluminium box, ready for use with Radio or amplifier. The machine can also be supplied without the filter system, for those who wish to build the latter, or to use the machine for some other purpose, such as for charging.

Special winding, usually 20s. extra.

B ACCUMULATORS.

It is apparent that not every accumulator manufacturer can make a reliable "B" accumulator. To this fact is due the impression in some quarters that "B" battery accumulators are not as successful as they might be.

If this is a rule, then Fuller's must be the happy exception, for we have sold hundreds, and complaints have been less than one per cent. This shows the necessity of a careful choice. Buy FULLER and forget your battery troubles.



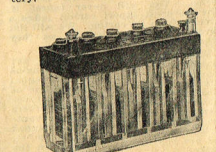
Fuller "B" batteries are now made in 10-volt monobloc units. This not only reduces considerably the size, but gives a much more substantial battery.

Two sizes are offered, but the plates in each are of the SAME QUALITY, so either can be purchased with equal confidence.

For THE FIRST TIME, the most reliable "B" accumulator can actually lower than competitors of much lower quality.

FULLER "SPARTA" MIG 10 VOLT.

3000 milliamperage. Best quality plates. Battery troubles practically unknown with this battery.



B208 10-volt unit 3 6

Nine units (90 volts) will be supplied in special wooden crate, charged ready for use when desired for £4.

FULLER "SPARTA" D.M.E.G. 10 V.

6000 milliamperage. A large "B" accumulator at small extra cost. It is suitable for powerful RADIOS, electric gramophones in districts without power supply. Size 7 x 2 5/16 x 6 1/2 in. high 12 0

B224 10 volt unit 12 0

Mr. Polson, Kiripaka, writes—

I enclose a list of stations tuned in course on Screened Grid, 8, 10, 12, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80, 85, 90, 95, 100, 105, 110, 115, 120, 125, 130, 135, 140, 145, 150, 155, 160, 165, 170, 175, 180, 185, 190, 195, 200, 205, 210, 215, 220, 225, 230, 235, 240, 245, 250, 255, 260, 265, 270, 275, 280, 285, 290, 295, 300.

COLUMBIA "C" BATTERIES.



B112 4 1/2 volt, tapped at 3 3 6

B251 9 volt (4756) 3 6

BURGESS BATTERIES, 45 VOLT.

B111 Flat (2306) 1 0

B153 Vert. (2308) 1 0

B145 Vert. (21508) Super 1 12 6

B148 4 1/2 volt (C 2340) 3 9

B149 7 1/2 volt (C 5546) 5 0



COLUMBIA No. 6.

This battery has no rival for "A" batteries of Radio sets (where accumulators cannot be used), for telephones, bells, buzzers, etc., etc.

Thousands of these batteries are used and have been selected after searching test.

These are especially useful where a broadcast and a short wave set are used, for either can be joined up to the battery connection, with and without the slightest danger of wrong connections.

C509 Multi-Plug Cable each 3 0

B113 11 volt 2 6

COLUMBIA HOT-SHOT.

Largely used for motor car and boat ignition and for Radio.

COLUMBIA HOT-SHOT BATTERY.

B184 6 volt 13 6

CHARGING "B" ACCUMULATORS.

First Extra 10 volt 10 volt

First charge, inc. acid 1 6 1 0

Recharging 6 0

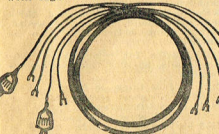
Although we do not recommend them when they cannot be recharged at home, except in special cases.

WARNING.—Beware of No. 6 at cut rates—almost invariably they have been many months in stock and already considerably run down.

WELL-MAYDE ELIMINATORS ARE SUPERB.

BATTERY CABLES—

ACE. Battery cables consist of wires of different colours, braided together to secure neatness, and to avoid troubles with straggling wires from battery to set. Can be supplied in lengths, or finished ready for use, with lugs fitted.



Cable, with Lugs and Clips.

ACE CABLES

(With Lugs, All 6ft. Long).

B176 6 wire 2 6

B178 6 wire 3 0

B213 7 wire 3 6

B214 9 wire 4 0

B215 11 wire 4 6

ACE CABLES (Cut to Length).

(With Lugs, All 6ft. Long).

B175 5 wire 20 0

B176 6 wire 24 0

B177 7 wire 28 0

B216 9 wire 32 0

ACE CABLES.

A very high grade cable for those who insist on real quality. These cables are specially treated and so rendered acid proof. They are all five feet long, and have lugs fitted.

B183 5 wire 6 0

B186 6 wire 6 0

"A" battery clips extra, per pr 1 6

MULTI-PLUG CABLES (7 Wire).

These are similar to the above, but are fitted with a plug and socket. When fitted to your Radio, all batteries can be connected or disconnected immediately.

These are especially useful where a broadcast and a short wave set are used, for either can be joined up to the battery connection, with and without the slightest danger of wrong connections.

C509 Multi-Plug Cable each 3 0

BATTERY LEAD TAGS

L shape. Z shape.

Width. Length arms. ea. ds.

B181 1/2 in. 1 in. 2d. 2 0

B183 3/4 in. 1 1/2 in. 3d. 3 0

B217 1 in. 2 in. 4d. 3 0

B184 1 1/4 in. 2 1/2 in. 5d. 3 0

These are suitable for small transmitters.

In complete sets, only: A—A+, B—B+, C—C+, D—D+, E—E+, F—F+, G—G+, H—H+, I—I+, J—J+, K—K+, L—L+, M—M+, N—N+, O—O+, P—P+, Q—Q+, R—R+, S—S+, T—T+, U—U+, V—V+, W—W+, X—X+, Y—Y+, Z—Z+.

B184 Set of eight; per set 6 6

BOOKS AND PERIODICALS.

RADIO NEWS.

Postage 2d. extra; per copy 1 6

Postage 2s. extra; per annum 12 6

Yearly subscriptions must be paid in advance.

Q.S.T. same price as Radio News.

BRACKETS.

Made of brass, finely nickel plated, and drilled to take 3/32 U.S.A. screws or 3/16 in. screws. Especially useful in all kinds of ways in Radio building, and for many other purposes.

The following describes a few of the uses:

Single bend brackets are used for mounting tubular coils vertically on the baseboard, for attaching panels to baseboard, or sub-panels to main panel, for bearings for rotors, and for many shields of aluminium.

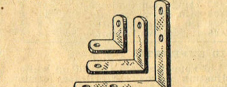
No. 145 is very suitable for making shields, as it is both long and strong.

Z brackets are used for mounting terminals and for mounting coils in a horizontal position.

Straight straps (B140) and frequent uses as they are, but they can be readily bent into brackets of various sizes.

Include a few brackets with your next order. You will soon find them more, they will be so useful.

SINGLE BEND.



Width Length arms. ea. ds.

B181 1/2 in. 1 in. 2d. 2 0

B183 3/4 in. 1 1/2 in. 3d. 3 0

B217 1 in. 2 in. 4d. 3 0

B184 1 1/4 in. 2 1/2 in. 5d. 3 0

SINGLE BEND—4 Holes.

Width. Length arms. ea. ds.

B181 1/2 in. 1 in. 2d. 2 0

B183 3/4 in. 1 1/2 in. 3d. 3 0

SINGLE BEND—Slotted Holes.

Width. Length arms. ea. ds.

B181 1/2 in. 1 in. 2d. 2 0

B183 3/4 in. 1 1/2 in. 3d. 3 0

B217 1 in. 2 in. 4d. 3 0

B184 1 1/4 in. 2 1/2 in. 5d. 3 0

Width. Length arms. ea. ds.

B181 1/2 in. 1 in. 2d. 2 0

B183 3/4 in. 1 1/2 in. 3d. 3 0

B217 1 in. 2 in. 4d. 3 0

B184 1 1/4 in. 2 1/2 in. 5d. 3 0

Width. Length arms. ea. ds.

B181 1/2 in. 1 in. 2d. 2 0

B183 3/4 in. 1 1/2 in. 3d. 3 0

B217 1 in. 2 in. 4d. 3 0

B184 1 1/4 in. 2 1/2 in. 5d. 3 0

Width. Length arms. ea. ds.

B181 1/2 in. 1 in. 2d. 2 0

B183 3/4 in. 1 1/2 in. 3d. 3 0

B217 1 in. 2 in. 4d. 3 0

B184 1 1/4 in. 2 1/2 in. 5d. 3 0

Width. Length arms. ea. ds.

B181 1/2 in. 1 in. 2d. 2 0

B183 3/4 in. 1 1/2 in. 3d. 3 0

B217 1 in. 2 in. 4d. 3 0

B184 1 1/4 in. 2 1/2 in. 5d. 3 0

Width. Length arms. ea. ds.

B181 1/2 in. 1 in. 2d. 2 0

B183 3/4 in. 1 1/2 in. 3d. 3 0

B217 1 in. 2 in. 4d. 3 0

B184 1 1/4 in. 2 1/2 in. 5d. 3 0

BRASS RODS, ETC.

BRASS RODS, ROUND.

Keep a few of these around as they are always coming in useful.

1/2 in. 3

3/16 in. 3

7/32 in. 3

1/4 in. 3

5/16 in. 3

3/8 in. 3

1/2 in. 3

5/8 in. 3

3/4 in. 3

7/8 in. 3

1 in. 3

1 1/8 in. 3

1 1/4 in. 3

1 1/2 in. 3

1 3/4 in. 3

2 in. 3

2 1/4 in. 3

2 1/2 in. 3

2 3/4 in. 3

3 in. 3

3 1/4 in. 3

3 1/2 in. 3

3 3/4 in. 3

4 in. 3

4 1/4 in. 3

4 1/2 in. 3

4 3/4 in. 3

5 in. 3

5 1/4 in. 3

5 1/2 in. 3

5 3/4 in. 3

6 in. 3

6 1/4 in. 3

6 1/2 in. 3

6 3/4 in. 3

7 in. 3

7 1/4 in. 3

7 1/2 in. 3

7 3/4 in. 3

8 in. 3

8 1/4 in. 3

8 1/2 in. 3

8 3/4 in. 3

9 in. 3

9 1/4 in. 3

9 1/2 in. 3

9 3/4 in. 3

10 in. 3

10 1/4 in. 3

10 1/2 in. 3

10 3/4 in. 3

11 in. 3

11 1/4 in. 3

11 1/2 in. 3

11 3/4 in. 3

12 in. 3

12 1/4 in. 3

12 1/2 in. 3

12 3/4 in. 3

13 in. 3

13 1/4 in. 3

13 1/2 in. 3

13 3/4 in. 3

14 in. 3

14 1/4 in. 3

14 1/2 in. 3

14 3/4 in. 3

15 in. 3

15 1/4 in. 3

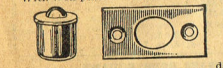
CABINET FITTINGS GIVE "DISTINCTION."

CABINET FITTINGS.

BALL CATCHES.

These small catches are used on the doors of cabinets of all kinds. They are most convenient to operate, and hold the doors quite securely enough for all ordinary purposes.

With lock plates. All nickel plated.



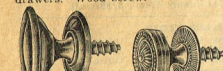
C483 1/2 in. diam.	per set	4
C484 1 1/8 in. diam.	per set	5
C485 1 in. diam.	per set	6
C486 3/4 in. diam.	per set	8

CABINET KNOBS.

Used for small cabinets of Radio sets, gramophones and similar purposes. They are supplied either nickel plated or antique finish.

PLAIN PATTERNS—PLATED.

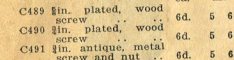
Supplied in two sizes. A solid pattern suitable for small doors or drawers. Wood screw.



C487-C488	ea.	dz.
C487 1 in. diam. top.	3d.	2 6
C488 1 in. diam. top.	3d.	2 9

FANCY PATTERN.

As the illustration shows, this is a very handsome pattern.



C489 1 in. plated, wood screw	6d.	5 6
C490 1 in. plated, wood screw	6d.	6 6
C491 1 in. antique, metal screw and nut	6d.	5 6

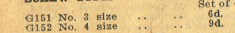
RUBBER FEET.

All smaller cabinets which are used on a table should be fitted with rubber feet. These deaden any noise, and also prevent scratching of the table top.

Rubber feet are made in three sizes. The pin type has a thin nail embedded in the rubber, and is driven into the cabinet with a hammer. The screw type is attached with a wood screw.

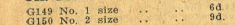
The price of these hinges is now so low that no builder need use the clumsy old-fashioned hinges.

SCREW TYPE.



G151 No. 3 size	Set of 4	1d.
G152 No. 4 size	Set of 4	1d.

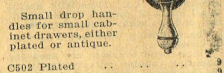
PIN TYPE.



G149 No. 1 size	Set of 4	1d.
G150 No. 2 size	Set of 4	1d.

DROP HANDLES.

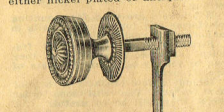
Small drop handles for small cabinet drawers, either nickel or antique.



C502 Plated	1d.	3
C503 Antique	1d.	3

CUPBOARD LOCKS.

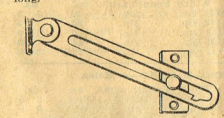
These are supplied in two sizes, either nickel plated or antique finish.



C492 1 1/2 in. diam., plated	1s.	11 0
C493 1 1/2 in. diam., antique	1s.	11 0
C494 1 in. diam., plated	9d.	8 6
C495 1 in. diam., antique	9d.	8 6

LID SUPPORTS.

Lid supports hold the lid up while adjusting valves, etc. Brass, either nickel or gold plated. Five inches long.



C487-C488	ea.	dz.
C487 1 in. diam. top.	3d.	2 6
C488 1 in. diam. top.	3d.	2 9

LID SUPPORTS—AUTOMATIC.

A heavy nickel plated lid support. Automatically locks on the lid and then releases automatically when slightly raised again. Beautiful finish.

C410 Nickel plated 1 3

C411 Gold plated 1 6

C452 Folding pattern, nickel-plated 1 0

C412 Gold plated 1 3

C413 3 inch 2 6

C414 3 inch 2 6

C415 3 inch 2 6

C416 3 inch 2 6

C417 3 inch 2 6

C418 3 inch 2 6

C419 3 inch 2 6

C420 3 inch 2 6

C421 3 inch 2 6

C422 3 inch 2 6

C423 3 inch 2 6

C424 3 inch 2 6

C425 3 inch 2 6

C426 3 inch 2 6

C427 3 inch 2 6

C428 3 inch 2 6

C429 3 inch 2 6

C430 3 inch 2 6

C431 3 inch 2 6

C432 3 inch 2 6

C433 3 inch 2 6

CELLULOID SHEET.

Transparent, white, grained or black.

Celluloid is freely used for making up-to-date coils. We carry large stocks of fresh celluloid, guaranteed to cement easily, and of suitable thickness. Transparent only. Sheets about 50 by 20 inches. Any size supplied.

For coil winding 10/1000th. thick celluloid should not be exceeded. 5/1000 being better if it can be handled.

For strips for cementing to finished coils, 50/1000 thick is recommended.

C104 10/1000 thick, sq. ft. 1 0

Full sheet, sq. ft. 10

C401 5/1000 thick, sq. ft. 8

Full sheet, sq. ft. 8

C402 5/1000 thick, sq. ft. 3 0

Full sheet, sq. ft. 3 0

We can also supply 50/1000th. thick in black, and in white ivory, at the same price as transparent. Can be used for engraved name plates.

NOTE—Many grades of celluloid, especially those used for motor windings, are very difficult to cement, and are not suitable for Radio purposes. The celluloid listed by us is guaranteed to cement readily and firmly.

See "CELLULAC" CEMENT for celluloid—under INSULATORS.

CLIPS—BATTERY

Made in two sizes, and of best material. Unlike cheap clips these never give trouble. Used for dry B batteries, and also for general test wiring work.

(CADMIUM PLATED)

C107 The popular ea. dz. gr.

size. 1 1/2 in. 6d. 5 0 48 0

(NICKEL PLATED)

C108 The popular ea. dz. gr.

size. 1 1/2 in. 6d. 5 0 48 0

C109 The popular ea. dz. gr.

size. 1 1/2 in. 6d. 5 0 48 0

C110 The popular ea. dz. gr.

size. 1 1/2 in. 6d. 5 0 48 0

C111 The popular ea. dz. gr.

size. 1 1/2 in. 6d. 5 0 48 0

C112 The popular ea. dz. gr.

size. 1 1/2 in. 6d. 5 0 48 0

C113 The popular ea. dz. gr.

size. 1 1/2 in. 6d. 5 0 48 0

C114 The popular ea. dz. gr.

size. 1 1/2 in. 6d. 5 0 48 0

C115 The popular ea. dz. gr.

size. 1 1/2 in. 6d. 5 0 48 0

C116 The popular ea. dz. gr.

size. 1 1/2 in. 6d. 5 0 48 0

C117 The popular ea. dz. gr.

size. 1 1/2 in. 6d. 5 0 48 0

C118 The popular ea. dz. gr.

size. 1 1/2 in. 6d. 5 0 48 0

C119 The popular ea. dz. gr.

size. 1 1/2 in. 6d. 5 0 48 0

C120 The popular ea. dz. gr.

size. 1 1/2 in. 6d. 5 0 48 0

C121 The popular ea. dz. gr.

size. 1 1/2 in. 6d. 5 0 48 0

C122 The popular ea. dz. gr.

size. 1 1/2 in. 6d. 5 0 48 0

C123 The popular ea. dz. gr.

size. 1 1/2 in. 6d. 5 0 48 0

C124 The popular ea. dz. gr.

size. 1 1/2 in. 6d. 5 0 48 0

C125 The popular ea. dz. gr.

size. 1 1/2 in. 6d. 5 0 48 0

C126 The popular ea. dz. gr.

size. 1 1/2 in. 6d. 5 0 48 0

WELL-MAYDE COILS FOR EFFICIENCY.

WELL-MAYDE SPACED COILS.

(New Zealand Patent No. 58840.)

The spaced turns on WELL-MAYDE COILS are firmly held together by strong, yet thin, dielectric material, selected for its great electric strength. Each turn is rigidly anchored in its correct position, thus rendering short circuit impossible.

For both sensitivity and selectivity it is essential that capacity and resistance losses be reduced to an absolute minimum. Both these features are amply demonstrated in WELL-MAYDE COILS.

Being made on accurate machines, the method of manufacture ensures that the coils are very uniform in electrical characteristics.

The finish is up to the usual WELL-MAYDE standard—a standard that is already famous throughout New Zealand.

The coils are manufactured in various diameters, at lengths of from 12 inches. Shorter lengths are then cut from these.

Standard diameters are 1 1/2, 2 1/2, and 3 inches, the spacing being 10, 20, 30, or 40 turns per inch, suitable wire being chosen in each case.

Other sizes and spacings are supplied in quantity.

WELL-MAYDE COILS must appeal to all Radio constructors, as much to the amateur as to the manufacturer.

WELL-MAYDE COILS.

"ALL WAVE."

These are the coils chosen for our famous MENWAVE SETS, fully described in an earlier part of the color column.

A full set of coils comprises the PRIMARY, mounted on a Formica base, and capable of adjustment. The base is fitted with four sockets, into which interchangeable coils can be plugged. The PRIMARY COIL, being adjustable, suits all the other coils.

The four interchangeable coils cover the wave length range from about 23-650 meters, when used with good quality apparatus, including particularly a first-class 00025 condenser. The regenerative condenser (not necessarily of best grade) should be 0001. The tickler coil is 0001. In each case, an end wound close to the secondary.

Banned plugs and sockets are used throughout, as these make smooth but perfect contact, without sticking.

The four wave length range from about 23-650 meters, when used with good quality apparatus, including particularly a first-class 00025 condenser. The regenerative condenser (not necessarily of best grade) should be 0001. The tickler coil is 0001. In each case, an end wound close to the secondary.

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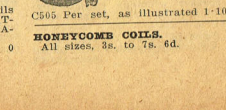
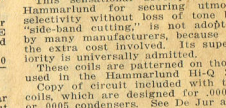
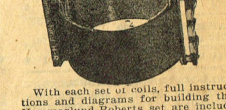
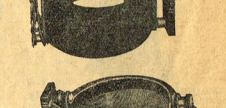
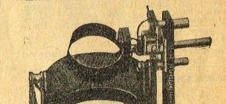
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Banned plugs and sockets are used throughout, as these make smooth but perfect contact, without sticking.

WELL-MAYDE HAMMARLUND-ROBERTS COILS.

The Hammarlund-Roberts receiver contains two coils which are the heart of this popular set. Since the set itself is fully described in this list, little more need be said here, except to point out that there are no better coils available than the WELL-MAYDE.



With each set of coils, full instructions and diagrams for building the Hammarlund-Roberts set are included. These are very simply arranged, and even if you intend rebuilding your old receiver, using the good parts from it, you should have no difficulty in following them.

C416 Set of two coils . . . 1 14 6

C417 Pointer knob to suit . . . 2 0

BAND PASS COILS (SET OF 3).

This sensational device for securing utmost selectivity without loss of tone by "side-band cutting," is not adopted by many manufacturers, because of the extra cost involved. Its superiority is universally admitted.

These coils are patterned on those used in the Hammarlund Hi-Q 29.

Two of each included with the coils, which are designed for .00025 or .0005 condensers. See De Jur and Hammarlund dual.

C418 Set of three coils . . . 1 14 6

C419 Pointer knob to suit . . . 2 0

C420 Set of three coils . . . 1 14 6

C421 Pointer knob to suit . . . 2 0

C422 Set of three coils . . . 1 14 6

C423 Pointer knob to suit . . . 2 0

C424 Set of three coils . . . 1 14 6

C425 Pointer knob to suit . . . 2 0

C426 Set of three coils . . . 1 14 6

C427 Pointer knob to suit . . . 2 0

R.F. CHOKES.

Radio frequency chokes are a necessity for short wave work, since practically every circuit employs them.

HAMMARLUND R.F. CHOKES.

The Hammarlund chokes are enclosed in beautiful bakelite cases, instructional diagrams being included. They carry 50 milliamperes, have a very low capacity, while the effective resistance is such as to eliminate resonance bands. Made in two sizes.

HAMMARLUND 85.



85 Millihenries, capacity 3 mmfda., resistance 215 ohms.
C843 Each 10 0

HAMMARLUND 250.

250 millihenries, capacity 2 mmfda., resistance 240 ohms.
C844 Each 11 6

WELL-MAYDE R.F. CHOKES.

Carefully designed and accurately constructed to suit both regenerative and screened grid sets. Very efficient. Complete with bakelite base, and plated clips.



C419 Each 1 0

DE JUE R.F. CHOKES.

This is the neatest choke we have seen. It is small, minimizing stray magnetic field, and is entirely protected from moisture by a mahogany mottled bakelite case. Bound to please.



C462 De Jue R.F. choke 6 3

ACME Z2.

Used either for impedance amplification, which is capable of readily excellent results, or for speaker output filter. The latter requires also 2 or 4 m.f. condenser, and when fitted, not only improves tone and volume, but prevents all strain on the speaker windings. Practically all modern radios include such a device.

Z223 Acme Z2 choke, 200 hz. 15 0
Condenser to suit, 4 m.f. 6 6

CHOKE COILS.

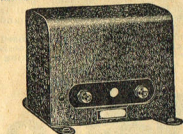
CHOKES—FILTER.

Well-Mayde chokes are ruggedly built to stand continuous full loads. The finish is the same as in Well-Mayde transformers, and you should read remarks on construction under that heading.

These chokes can be made to order in the larger sizes for power and transmitting purposes, "A" and "B" eliminators, etc.

CHOKES built to order, on receipt of:

1. Millamp or amp. to be carried.
2. Inductance in henries.
3. Purpose for which choke is required.



WELL-MAYDE CHOKES.

CHOKES H.T.

30 henry, carrying 50-100 milliamperes, for use with the H.T. rectifier, when making an eliminator. Gives output of 180 volts, the voltage drop in the choke being about 20 volts. Also suitable for eliminators using other rectifiers, such as Earthen, Radiotron.

C508 W-M HTI choke, 30 henry 35 0

WELL-MAYDE CHOKES, HT4.

For use with HT3 or HT4 rectifiers.
C548 W-M choke, HT4 30 0

WELL-MAYDE CHOKES A3.

A low resistance choke, for use with the type A3 charger (or the A3 rectifier and transformer) and an electrolytic condenser, to make an "A" eliminator, with output of 6 volts 1 amp. maximum, for the valves. Could also be used with the type A, 1 amp. charger, giving 6 volts .5 amp. for the valves.

C507 W-M choke A3 1 10 0

WELL-MAYDE CHOKES A4.

Similar to the A3, for 2 amp. output.

C550 W-M choke, A4 40 0

WELL-MAYDE DUPLEX CHOKES.

Specially made for eliminators using Raytheon and similar bulb rectifiers. For 100 millamp output maximum.

C549 W-M duplex choke 40 0

PILOT CHOKES—FILTER.

C516 30 hz., 60 m/amp. No. 377 21 0
C517 30 hz., 45 m/amp. No. 414 15 0

PILOT SHIELDED COILS.

For screened grid circuits. The coils fit UX valve holders, and are metal encased.

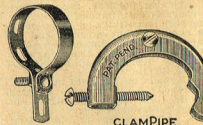
C539 Pilot S.G. coils, set of 3 49 6

CLAMPS—EARTH.

For connecting earth wires from the Radio set to water pipe.

CLAMPPIPE.

A sure and quick grip on your water pipe. Three points "dig into" the pipe to make clean contact.



C527 Clamppipe each 1 0

A lighter clamp, also adjustable.

C517 4

COILS.

ACE COIL.
The range of this coil is approximately 200-600 metres, with a .0005 condenser. It consists of a bakelized tube, wound with primary, secondary, and tickler, all correctly spaced. Brackets are fitted for base-board mounting.

The circuit employs a condenser for regeneration control, this principle being widely used. ACE SETS, as well as many New Zealand RADIO circuits, are of this type.



Full instructions for assembling the ACE KITSET included with each coil.

C534 10 0

PILOT S.W. COILS.

Bakelite coil formers, with loop handle at top and pins to fit UX valve holders. Used with .0005 condenser.

C540 S.W. coil form, not wound 6 6

C541 S.W. red, 17-20 metres . . . 9 8

C542 S.W. orange, 20-25 metres . . 9 8

C543 S.W. yellow, 48-105 metres . . 9 8

C544 S.W. green, 73-205 metres . . 9 8

C545 S.W. blue, 200-600 metres 11 0

COIL FORMS—

Some time ago the English Radio trade adopted a standard six pin mounting for tuning coils. These enable three coils to be wound on the one former, each with its individual connections.

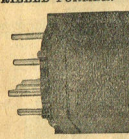
It is therefore possible when these coil holders are installed in a set, for any standard make of coil to be tried without making alterations. The advantages of such a system are obvious.

COIL FORMERS.

TUNEWELL FORMERS are moulded from bakelite, the pins being also moulded accurately in place. They are ribbed, and the amount of bakelite is the least possible consistent with strength.

It is not necessary for all the pins to be used—and in some cases two of one coil are connected together. This would leave one pin free, but this causes no inconvenience.

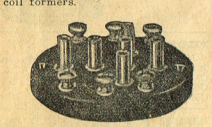
RIBBED FORMER.



Made as described above.
C499 3 3

COIL BASE.

Six pin coil bases, moulded from bakelite, to fit the TUNEWELL FORMERS, or any standard English coil former.



C561 3 0

COIL FORMS.

A bakelite tube, with thin walls, attached to a four-pin UX valve base. Can be plugged into a valve holder. Gives small size, concentrated field, readily changeable coils.

C524 each 1 6

Bakelite tube only, as above, three inches long, cut dead true each end.

C525 S.W. bakelite tube each 8 8

Six for 3 6

PILOT CENTRALINE CONDENSER.

Single hole mount, with extra fixing screw, removable spindle, for ganging. Modified S.L.F. type.

C520 .00016 10 6

C521 .00025 10 6

C522 .00035 10 6

C523 .0005 11 6

CONDENSERS.

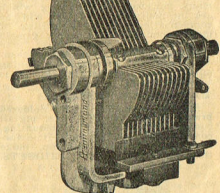
Hammarlund PRODUCTS

Hammarlund condensers, although expensive, have always proved superior to all others. They have been copied in U.S.A. and in many European countries.

Low-loss, removable shaft, right or left mounting, brass plates soldered to accurately milled supports, and capable of a 1000-volt test, one hole mounting, with extra fixing screws if required, heavy cone bearings, adjustable friction device, the Midline design, giving the advantages of all other models—withstanding, for Hammarlund never wears out.

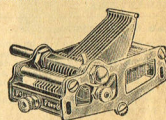
MIDLINE CONDENSERS.

C443 .00015 13 6
C346 .00025 13 6
C347 .00035 13 6
C348 .0005 13 6



DE JUE, LOW LOSS, S.L.F.

A beautiful nickel plated condenser, with end plates of brass. Pig tail connectors prevent bad connections. Low minimum capacity, hence suitable for low wave receiving sets. Body capacity effects auto-tuning. Second in quality only to the well-known Hammarlund, and better value than the usual "best" condensers obtainable elsewhere.



C443 .00015 13 6
C346 .00025 13 6
C347 .00035 13 6
C348 .0005 13 6

DE JUE DUAL.

C439 Dual, .00035 27 0
C440 Dual, .0005 27 0

DE JUE TRIPLE.

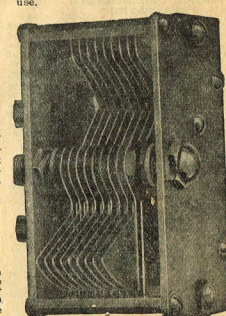
C441 Triple, .00035 36 0

LUBESEE CONDENSERS.

A soundly constructed condenser which we have sold for many years without ever having a single complaint. Efficient, neat, and unconditionally guaranteed against any defect.

LUBESEE S.L.W.

This is by far the most popular type, since it combines the best points of various styles in general use.



C348 .0005 S.L.W. 8 6
C347 .00025 S.L.W. 8 6
C346 .00015 S.L.W. 8 6

MULTIPLE BATTLESHIP OR REACTOR CONDENSERS ON APPLICATION.

Hammarlund PRODUCTS

HAMMARLUND SHORT WAVE.

This is a special condenser, with double spaced plates, securing the very low minimum capacity of only 2 mmfda. The maximum is 160 mmfda. It is ideal for short wave sets and adaptors, especially where the lowest range possible is desired. You cannot get the lowest range with ordinary type condensers.

WELL-MAYDE COILS, J. K. L. M. are specially made to match this condenser.

C242 1 5 0

GOOD CONDENSERS ENSURE SELECTIVITY.

CONDENSERS.

LUBREX S.L.F.

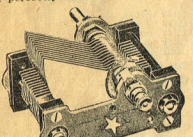
This style of condenser is a general favourite, and is constructed as carefully as the S.L.W.

C341 .00025 S.L.F.	8 6
C344 .00035 S.L.F.	8 6
C346 .0005 S.L.F.	8 6

ALL LUBREX CONDENSERS GUARANTEED.

STAR CONDENSERS.

Cheapness must never be confused with low quality—an article that will not stand up to its work is dear at any price. Star condensers are as cheap as it is possible to make a condenser which will do its work in a thorough manner. British made, and perfectly reliable.



C496 .0005	6 0
C497 .00035	6 0

STAR SHORT WAVE.

A double spaced condenser, capacity .0001, made especially for short wave sets.

C498 .0001 double spaced	6 6
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EMMCO CONDENSERS—STRAIGHT LINE.

The prominent feature of these condensers is the peculiar shape of the plates. When fully open, the average distance between the sets of main capacity is extraordinarily low.

The plates are brass, soldered into metal spindles. The shaft is removable, making ranging possible. The end plates are brass also, while the base is a bakelite moulding. The condenser can be mounted on a base-board or on a panel.



C463 .0005	12 6
C464 .00025	12 0
C465 .000125	13 0

EMMCO SHORT WAVE.

C466 .0001 double spaced	11 6
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CONDENSER SHIELDS MADE TO ORDER.

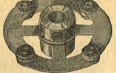
See under SHIELDS.

COUPLINGS.

Flexible couplings, for connecting condensers together when working from a single dial. Slight errors in alignment do not matter when these couplings are used. 4in. shaft.

HAMMARLUND COUPLING.

An insulated coupling that is very flexible, yet rigid. For 4-inch shafts.



C404 Each	3 0
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EMMCO COUPLING.

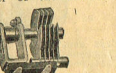
C471 Emmco	3 0
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MIDGET CONDENSERS

Midget condensers are used for many purposes, chief among which are the neutralising of sets, and the compensation for irregularities of larger condensers which are gauged together.

Some of the larger Midget condensers could be used for tuning purposes in sets where space is a consideration.

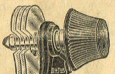
HAMMARLUND MIDGET.
For neutralising, etc. Soldered brass plates, cone bearings, pitman combined with the usual Hammarlund precision workmanship, make this the leader of the MIDGETS.



Knob included.	
C165 5 plate, 18 mmrd.	8 6
C166 9 plate, 35	9 0
C167 11 plate, 50	9 0
C168 15 plate, 65	10 0

DE JUR MIDGET.

Introduced last year, this midget condenser immediately became a real winner. The end plate is of best moulded bakelite, and the appearance of the condenser is exceptional. It is no wonder it has proved so popular.



mmrds. Mfd. Plates	
C467 25 .000025	7 4 0
C468 50 .000125	12 5 0
C469 100 .00025	25 6 0

Intermediate sizes can readily be made from the next larger size, since the extra plates can be easily removed.

PILOT MIDGET—NEUTROGRAD.

C352 5 plate	4 9
C353 7 plate	5 0
C354 13 plate	5 0
C355 23 plate	7 6

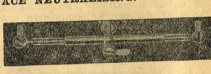
HAMMARLUND EQUALISING, BALANCING or NEUTRALISING CONDENSERS.

For neutralising circuits, or balancing or compensating condensers mounted on one shaft.



Small size, mica, dielectric, with gradual adjustment by screw. Maximum 35 mmrd. in. C329 C329 Well-Mayde, Ham'd patn. 2 0

ACE NEUTRALISING.

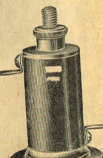


The usual type for neutralising neotrydnes. As used on ALTONA NEUTRODYNES. Formed base. C282

C282	2 6
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NEUTRA-NEUTRALISING.

English pattern, adjusting screw at top, with lock nut.



C281	3 0
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PILOT MICROGRAD.

Mica compression condenser, adjusted by screw. C536 .00005-.00005 mf. 4 9 C537 .000045-.0005 mf. 5 6 C538 .00015-.001 mf. 5 6

FIXED CONDENSERS.

DE JUR CONDENSERS.
Made of genuine moulded bakelite, compressed under enormous pressure, DE JUR CONDENSERS are absolutely impervious to moisture or other atmospheric changes, simply because the plates are enclosed in one solid block of bakelite. In addition, their accuracy makes them suitable for any Radio circuit.



C472 .00005, .0001, .0002, .00025, Each	
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C473 .001, .002	1 6
C474 .005, .005	2 3
C475 .005, .006	2 9
C476 .01	4 0

HYDRA CONDENSERS FOR GREATEST DURABILITY.

DE JUR GRID CONDENSERS.



Similar to De Jur bakelite condensers, but with grid leak clips making triple contact at each end. C477 .00025 or .0005 2 0

FIXED, BUFFALO (De Jur).

The finest material is selected for this De Jur mica condenser. Heavy phosphor bronze straps encircle the ends of the condenser, ensuring high pressure, and unchanging capacity. All tested to high voltage. Lugs swivel for convenient soldering.



C350 .001	1 6
C351 .002	1 6
C352 .005	3 9
C444 .01	3 9

BUFFALO GRID CONDENSERS.

Similar to the above, but fitted with clips as on C477. C352 .00025, with grid clips 1 6

GRAHAM-FARISH MICA (Fixed).

English made, in bakelite cases, designed to mount vertically or horizontally. High breakdown voltage ensures absolute reliability. The .00025 is supplied with American pattern grid leak clips.



Every condenser guaranteed.

C340 .00005, .0001, .0002, .00025, Each	
.0003, .0004, .0005, .0008, .001, .002	1 3
C341 .002, .004, .005, .006	2 6
C342 .008, .01	3 3

GRID CONDENSER—Usual size is .00025.

PHONE or SPEAKER CONDENSER—Usual size is .001 or .002.

SANGAMO.

Sangamo fixed mica condensers are furnished in beautifully moulded brown bakelite cases, absolutely impervious to moisture.

.001, .002, .0008	2 3
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CONDENSERS—PAPER.

Paper condensers are freely used in all modern Radios, especially those that are power operated. If one of the many used in these Radios should break down, the whole set will be thrown out of action, and, worse still, further serious damage may result.

Even in ordinary sets, the breakdown of a condenser is a fairly serious matter, as it will ruin the "B" battery or eliminator.

Paper condensers must therefore be perfectly reliable—a penny saved may be a penny spent.

"HYDRA" CONDENSERS.

HYDRA condensers are made in Europe, and are probably the best known in the world. Such is the care and accuracy used in manufacture, that a defective HYDRA is a rare curiosity. Yet, in spite of the precision of manufacture, they cost no more—generally less—than other inferior makes. The huge output of the biggest condenser factory in the world explains this.

EVERY "HYDRA" CONDENSER IS FULLY GUARANTEED.

The working voltage as well as the test voltage is given in each case. Since high voltage surges are by no means unusual, it is always advisable in choosing condensers for power work to select one with a higher test voltage than might appear necessary. This will give far more satisfaction in the end.

For D.C. work, choose a condenser of the working voltage given. For A.C. work, however, choose the next higher working voltage.

THE TEST VOLTAGES ARE GIVEN, BUT THE WORKING VOLTAGES MUST EXCEED HALF THE TEST VOLTAGES. When used as specified, ALL HYDRA CONDENSERS ARE FULLY GUARANTEED.

Group 1 is suitable for ordinary eliminators, where the D.C. voltage rarely rises above about 250 volts. For more powerful work, the other groups should be used.

HYDRA BAKELITE CONDENSERS.

These beautiful new style condensers have a bakelite case, giving them a pleasing appearance far above that of the old metal case. For use see under the 250 volt working condensers already listed.

WORKING VOLTAGE—250 D.C. TESTING VOLTAGE—500 D.C.



C478 .1 mf.	2 6
C479 .25mf.	2 9
C480 .5 mf.	3 0
C481 1 mf.	3 6
C482 2 mf.	8 0
C483 4 mf.	8 0

HYDRA CONDENSERS—Continued.



Test	GROUP 1 500 v. D.C.	GROUP 2 750 v. D.C.
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Working Test	250 v. D.C.	375 v. D.C.
1 mf.	C359 2/3	C369 3/4
.25mf.	C360 2/3	C370 3/4
.5 mf.	C361 2/3	C371 3/4
1 mf.	C362 3/4	C372 5/4
2 mf.	C363 3/4	C373 6/4
4 mf.	C365 7/6	C375 10/4

Working Test	GROUP 3 500 v. D.C.	GROUP 4 1000 v. D.C.
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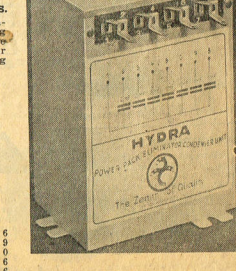
Test	1000 v. D.C.	1000 v. D.C.
1 mf.	C379 3/6	C389 7/6
.25mf.	C380 4/6	C390 9/6
.5 mf.	C381 6/6	C391 11/6
1 mf.	C382 7/6	C392 17/6
2 mf.	C383 8/6	C393 20/6
4 mf.	C385 15/6	C395 39/6

"HYDRA" ELIMINATOR BLOCKS.

The "HYDRA" condenser block contains the following condensers in one compact unit:—

- Four 1 m.f. condensers
- Two 2 m.f. condensers
- One 8 m.f. condenser.

These blocks are made especially for eliminators using Raytheon type rectifier tubes.



C339 Hydra eliminator block 1 16 0

"HYDRA" BUFFER CONDENSERS.

The Buffer Condenser is a very important part of the eliminator, because it is connected across the full voltage generated by the transformer. It must be of a high voltage type, and for this purpose we can offer the "HYDRA" unit, consisting of two 1 m.f. condensers tested at 1000 volts A.C. (equalling about 1500 volts D.C.) a unit can be absolutely relied upon.

C100 Hydra buffer condenser unit 6 0

CONDENSER—TRANSMITTING.

The ACME transmitting condenser is built to work at 750 volts. C174 2mf; each 10 6

T.G.C. CONDENSERS.

A well-known condenser in a green case. Test voltage 400, working voltage 200 volts. C513 1 mf. 2/4 C516 1 mf. 4/1 C514 2.5mf. 2/6 C517 2 mf. 4/2 C515 5 mf. 2/11 C518 4 mf. 8/3

ELECTROLYTIC CONDENSERS.

Until the advent of the Electrolytic condenser, it was practically impossible to manufacture condensers of 2000 and 4000 m.f. capacity. These condensers made the "A" eliminator possible, for large capacity condensers are essential, and the ordinary types would be far too bulky.

Suitable for any voltages up to 15. Must be connected correct way, or they will be ruined. C511 2000mf. 1 0 0 C512 4000mf. 1 15 0

MESHION CONDENSERS.

Self heating, high voltage, large capacity condensers. These are used in many leading Radios in U.S. because they allow of a much larger measure of "smoothing" in a small space.

Sample stocks of 32 and 36 mf. types are due to arrive; prices to be fixed later. Other types are made.

CRYSTALS.**RED DIAMOND (PERMANENT).**

The RED DIAMOND is made from selected materials throughout, the crystal being sensitive practically all over. It can, however, be adjusted if found necessary.

RED DIAMOND (PERMANENT).

The RED DIAMOND is made from selected materials throughout, the crystal being sensitive practically all over. It can, however, be adjusted if found necessary.

C526 Red Diamond permanent 2 6

CARBORUNDUM.

Carborundum crystal is fairly sensitive, but its chief virtue is that it requires a heavy pressure, which, of course, is not liable to "slip."

CARBORUNDUM DETECTOR

C222.

C222 Detector only 7 6

C301 Stabiliser, with detector 18 0

Z136 Battery only; each 8

HERTZITE—RUSSELL'S.

Although there are very many "brands" of crystals on the market, most of them are merely galena, either in its natural state, or treated chemically to make it more sensitive.

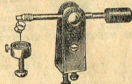
HERTZITE is a treated galena, and takes its place as the best known crystal in the world. RUSSELL'S HERTZITE is a crystal that has been consistently sold for many years, and is still the leader in England and Europe. Hundreds of thousands have been sold.



So sure are we that you cannot buy better than RUSSELL'S BLUE HERTZITE, that we readily GUARANTEE SATISFACTION. IF YOU ARE NOT SATISFIED, ASK FOR YOUR MONEY BACK. What could be fairer?

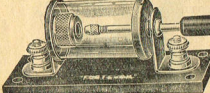
Supplied in tin boxes with cat-whisker and tweezers, which make it unnecessary to touch the crystal with the hand.

C292 HERTZITE-BLUE 1 0

CRYSTAL DETECTORS

A well made set of parts for making your own detector. Screws, crystal cup, and catwhisker included. Nickel plated. C291 White base; each 9

C303 Fortevox, bent 1 6

ACE DETECTORS.

As illustrated, this is a fully mounted, highly nickel plated detector. Glass enclosed, to prevent dust smothering the crystal. Crystal held in cup with screwed and knurled cap. Catwhisker included.

It is supplied in three styles, all glass enclosed, as follows:

C246 MOUNTED, with crystal 2 0

C182 " without crystal 3 0

C181 PARTS, on card 2

DIALS.**K-K PORT VERNIER.**

The illustration hardly does justice to this handsome dial. Ratio of vernier movement 14:1. Easily fitted, and adjustable to read right or left hand. Highly finished bakelite. Simple, yet very reliable.

The walnut dial is wonderfully beautiful, and matches Fomina walnut panel perfectly. The appearance of a set using this combination makes the average set, no matter what price or quality, look very drab in comparison.

D124 4in. black 6 6

D135 4in. walnut 6 6

D150 each 7 6

K-K JUNIOR PORT VERNIER.
A three-inch edition of the famous PORT VERNIER. Smaller in size, it is a replica in design and beauty of the larger dial, and will considerably enhance the appearance of any set where compactness is desired. It is bakelite, of course.

D136 3in. black 6 0

D137 3in. walnut 6 0

ACE VERNIER.

Artistically designed Vernier dials at a price well within the means of any set builder. It has a high ratio, which ensures easy tuning. It is made to read in either direction. The friction drive is sure. Black only. Scale 100-0-100.

D138 4in. black 6 0

D139 4in. walnut 6 0

D140 each 10 6

ARISTOCRAT.

A vernier dial that looks exactly like an ordinary dial. Vernier is not continuous, but ratio is very large, 50-1, hence where very fine tuning is essential, the Aristocrat suits admirably. Black bakelite, 4in. diameter.

D121 Each 9 0

Try one on your short wave set or adaptor.

EMMCO DRUM DIAL.

A standard bakelite dial, made in either black or mahogany. State whether wanted with dial marked 0 on left (anti) or on right (clockwise).

D127 Black bakelite; each 7 6

D128 Mahogany 7 6

D146 EMMCO VIELMO 6 0

D145 EMMCO BABY VIELMO 5 0

D147 Hammarlund single drum dial 22 6

D148 DE JUR DIAL 10 6

D149 Emmco MELLO 9 6

D140 " " Illuminated 12 6

D151 each 10 6

D152 Black bakelite; each 7 6

D128 Mahogany 7 6

D146 EMMCO VIELMO 6 0

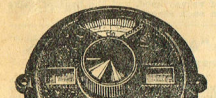
D145 EMMCO BABY VIELMO 5 0

HIGH RATIO DIALS.

For SHORT WAVE SETS, it is highly desirable to have a dial with a high ratio, as the tuning must be done very exactly. Yet it is also desirable to be able to turn the knob to the approximate position quickly. Both these features are secured in the dials offered.

PRECISE.

A small dial with worm gearing. Small knob can be instantly moved to leave the dial free to turn exactly as an ordinary dial. Ratio about 225:1.



D148 DE JUR DIAL 10 6

D149 Emmco MELLO 9 6

D140 " " Illuminated 12 6

D151 each 10 6

DUPLEX.

A large size dial, ratio about 160:1. Worm and bevel gear, instantly disconnected by tilting knob.



D147 Hammarlund single drum dial 22 6

D148 DE JUR DIAL 10 6

D149 Emmco MELLO 9 6

D140 " " Illuminated 12 6

D151 each 10 6

ARISTOCRAT.

A vernier dial that looks exactly like an ordinary dial. Vernier is not continuous, but ratio is very large, 50-1, hence where very fine tuning is essential, the Aristocrat suits admirably. Black bakelite, 4in. diameter.

D121 Each 9 0

Try one on your short wave set or adaptor.

EMMCO DRUM DIAL.

A standard bakelite dial, made in either black or mahogany. State whether wanted with dial marked 0 on left (anti) or on right (clockwise).

D127 Black bakelite; each 7 6

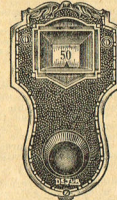
D128 Mahogany 7 6

D146 EMMCO VIELMO 6 0

D145 EMMCO BABY VIELMO 5 0

DE JUR DIAL.

This dial is illuminated, and is mounted behind the panel. The figures are very bold, while the bronze escutcheon plate is very attractive.



D148 DE JUR DIAL 10 6

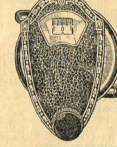
D149 Emmco MELLO 9 6

D140 " " Illuminated 12 6

D151 each 10 6

DUPLEX.

A large size dial, ratio about 160:1. Worm and bevel gear, instantly disconnected by tilting knob.



D147 Hammarlund single drum dial 22 6

D148 DE JUR DIAL 10 6

D149 Emmco MELLO 9 6

D140 " " Illuminated 12 6

D151 each 10 6

ARISTOCRAT.

A vernier dial that looks exactly like an ordinary dial. Vernier is not continuous, but ratio is very large, 50-1, hence where very fine tuning is essential, the Aristocrat suits admirably. Black bakelite, 4in. diameter.

D121 Each 9 0

Try one on your short wave set or adaptor.

EMMCO DRUM DIAL.

A standard bakelite dial, made in either black or mahogany. State whether wanted with dial marked 0 on left (anti) or on right (clockwise).

D127 Black bakelite; each 7 6

D128 Mahogany 7 6

D146 EMMCO VIELMO 6 0

D145 EMMCO BABY VIELMO 5 0

Hammarlund PRODUCTS

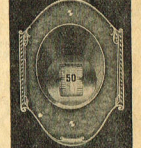
It requires only the name HAMMARLUND to stamp an article as "A1."

Hammarlund Midline condensers are now matched, and so the result is an loss of efficiency is reduced to the lowest when they are coupled or "tuned" together.

HAMMARLUND SINGLE DRUM.

An Illuminated drum dial, turned by a single knob, arranged so that the latter can be placed in any position on the panel. The scale is translucent, illuminated by a small electric light placed behind it.

The bronze escutcheon plate, embossed and oxidized, gives an air of distinction to any Radio set. The driving mechanism has absolutely no backlash, and simply cannot slip. Can be supplied with black or walnut kn.



D147 Hammarlund single drum dial 22 6

PILOT ILLUMINATED DIAL.

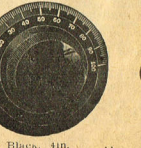
Complete with small light. D154 Pilot dial 14 3 D155 Pilot dial, less light 11 6

PILOT DRUM DIAL.

Bakelite drum, cord driven. No backlash, even with heavy condensers. D156 Pilot drum, with light 18 0 D157 Pilot drum, less light 15 6

K-K BAKELITE (ORDINARY).

The finest dials procurable. Beautifully moulded and accurately made. If you value appearance and strength you cannot afford to overlook K-K dials.



D147 Hammarlund single drum dial 22 6

D148 DE JUR DIAL 10 6

D149 Emmco MELLO 9 6

D140 " " Illuminated 12 6

D151 each 10 6

D152 Black bakelite; each 7 6

D128 Mahogany 7 6

"WELL-MAYDE" ELIMINATORS FULLY GUARANTEED.

DIALS—

MOULDING DIALS.

Although not possessing the superb beauty of K-K dials, these dials are clean and quite suitable for home constructed Radios. 1in. hole, Magnus, 2 1/2 inch . . . 6d.
Hercules, 2 1/2 inch . . . 6d.
Hercules, 2 inch rheostat . . . 6d.

PILOT LIGHT LIGHTS.

Red jewelled, without bulb, but any flashlight bulb can be used.
1 Pilot Light . . . 2 9

DIAL MARKERS.

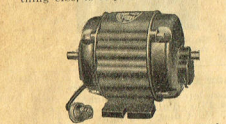
Nickel plated pointers, fitted with screw and nut.

D112 6

DYNAMOS.

This dynamo will charge a six-volt accumulator at any rate up to about 12 amps.

In milking sheds, two accumulators will enable one to be always on charge, lighting the shed when wanted, while the other is operating the Radio. Very little trouble is involved in installing, owing to different sizes included, giving the revolutions and diameter of your flywheel, and we will gladly quote for the pulley. Little, if anything else, is required except a belt.



A188 6 0 0

We can frequently quote special prices on other dynamos, six-volt and upwards, for lightning purposes, and also for charging Radio "B" batteries. Please, write, stating your requirements.

EBONITE

PANELS.

Ebonite sheet is stocked in 3/16 thickness only, and any size panel up to 24 inches square can be supplied. If value is less than 2s., a cutting charge of 1s. per panel is made. Small odd size pieces are generally available at greatly reduced prices. It should be noted that Exelon and Formica are superior to Ebonite for panels.
E124 Ebonite panel . . sq. ft. 6 6

TUBES.

Inside diameter or bore is given, the wall being 1in. thick in every case.

Bore . . 3 5/16 1 1/2 1 1/8 1 1/4 1 1/2 1 3/4 1 7/8 2 1/4
Per ft. /10 1/10 1/10 1/10 1/10 1/10 1/10 1/10 1/10

ROD.

Dia . . 3 5/16 1 1/2 1 1/8 1 1/4 1 1/2 1 3/4 1 7/8 2 1/4
Per ft. /10 1/10 1/10 1/10 1/10 1/10 1/10 1/10 1/10

Larger tubes and rods are frequently available.

The "A," "B" and "C" batteries of a Radio may be replaced by eliminators, thus enabling all current to be drawn direct from the mains, without batteries at all.

The usual A.C. Radio embodies a power pack, which "C" eliminates, but mainly on the score of extra cost, a simple transformer is used instead of an "A" eliminator.

If your Radio is now operating on batteries, and is giving good results, there is no need to discard it, for by the addition of a suitable "A" eliminator, it will continue to give excellent service, perhaps even better than many new Electric Radios do. This assumes, of course, that the eliminator chosen is really high grade.

In an eliminator, a transformer first gives a suitable A.C. current, which is passed through a rectifier to change it to direct current. Condensers and chokes then "smooth" the uneven D.C. current, and resistances control the output voltages.

Westinghouse are easily the best rectifiers that can be used in these cases. Though their first cost is higher, they are permanent and are the most common, mainly on account of lower first cost. They need periodical replacement. At present in a few cases, valves are advisable, simply because the Westinghouse rectifiers are not always obtainable in suitable sizes.

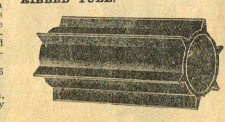
"B" eliminators first appeared on the market, to reduce the high cost of "C" batteries. These eliminators are rarely found separately, being usually combined with the "B," but since "C" batteries cost so little, and last so long, it is not always advisable to replace them with an eliminator.

"A" eliminators were not possible till a later period, because suitable condensers were not available, but the new electrolytic condensers are effectually solving this problem.

To-day, therefore, the "ABC" eliminators are perfectly reliable and wonderfully efficient.

Good battery radios can be brought quite up to date by their use, and at comparatively small expense.

RIBBED TUBE.



Ribbed tube is used for low loss coils. It is sold in six inch lengths only, the eliminator being the ribs.

E123 3in. diam. 6in. long . . 2 0
E127 1 1/2 in. diam. 6in. long . . 1 0

WELL-MAYDE ELIMINATORS.

We have already installed a large number of WELL-MAYDE ELIMINATORS, fitted with the famous Westinghouse power units, which are impregnable. Customers everywhere have expressed the greatest delight in the service obtained. Operation is so smooth as to be indistinguishable from batteries at all, and, but a very marked increase in "per" is noticeable.

In WELL-MAYDE ELIMINATORS there is nothing to wear out, so they last for years without repairs of any kind.

Special eliminators can be built to order, and quotations will be gladly given. Each should state number of valves used, and the type of valve in each stage.

"A" ELIMINATORS.

WELL-MAYDE "HALF AMP."

Maximum output 6 volts, 3 amp. Suitable for four or five 1 amp. or eight 1/2 amp. valves, including the first. Radiotron 221. Fitted with rheostat and voltmeter. Metal case in order stage voltage of valves used.
E147 8 5 0

WELL-MAYDE "ONE AMP."

Maximum output 12 volts 1 amp. Suitable for working several valves, and also for supplying a dynamo, and also for smoothing, and thus eliminating hum. Fitted with voltmeter and rheostat. Metal case in order stage voltage of valves used.
E148 9 15 0

WELL-MAYDE "TWO-AMP."

Maximum output 6 volts 2 amps. Very useful. Details as for one amp type. 12 10 0
E149

"B" ELIMINATORS.

"B" ELIMINATORS are used to replace "C" batteries on Radios where C. current is available. They are now practically free from hum, and with good power valves, they are practically the only valves necessary, as with good power valves, they can practically do nothing for current, and if fitted with WESTINGHOUSE RECTIFIERS, they should require no renewal of any sort. If they embody valves, they must be removed from time to time.

When purchasing, always get a powerful eliminator. Most of the cheap ones being asked for every day, and the biggest eliminator there is, couple of years ago, is comparatively weak to-day. This advice applies particularly where the power valves, especially gramophone pick-ups, are used, or likely to be used.

Short Wave Radios will probably not operate on eliminators, but the difficulty is surmountable by using a small 100 volt battery for the detector valve only, deriving the eliminator current from the "A" eliminator.

WELL-MAYDE ELIMINATORS, when purchased more expensive to purchase, will be cheaper in the end, because there is no bulb requiring constant renewal.

When constructing a "B" eliminator, it is always advisable if possible, to arrange it for a particular Radio, with valves selected to suit the Radio, and any variable controls be omitted; they should be omitted, because they are not needed, as the remainder of the apparatus is arranged to suit.

For this reason the WELL-MAYDE ELIMINATORS listed here are constructed to suit certain definite types of RADIOS, but we can always modify the construction to match any style of receiver. Merely tell us the number of valves you use in each stage, and their type, and we will advise the best outfit for your particular purpose.

WELL-MAYDE "B" ELIMINATORS USE WESTINGHOUSE RECTIFIERS.

WELL-MAYDE "PRINCE."

Output 180 volts 30 ma., or 150 volts 50 ma.

Suitable for following Radios:

THREE VALVE—
Ace, New Zealand Radio, Screened Grid, etc.

FOUR VALVE—
Hammarlund-Roberts, Brown-Drake, Screened Grid, etc.

FIVE VALVE—
Altona and certain Neutrodyne.

SCREENED GRID.

The recommended power valve for the last stage is 112A.
Tappings are provided for detector, R.F. and first audio, besides, of course, the full power voltage.

No bulbs to renew—long life without any maintenance expense. In handsomely finished metal case.

E145 9 0 0

WELL-MAYDE "SOVEREIGN."

Output 180 volts, 100 ma. Suitable for powerful Radios and amplifiers, using two 112A valves or one 112A in the last stage, push pull. One hundred milli is ample current for all requirements.

Tappings for detector, R.F. and first audio, and full power voltage. In handsomely finished metal case. A little higher price and well worth it.

E166 13 0 0

ACE ELIMINATOR.

Raytheon bulb type. Output is 180 volts, 60 ma., and thus suitable for the most powerful Radios. Tappings are provided for detector, R.F. and first audio, while the metal case is beautifully finished.

E173 With bulb complete . . 9 0 0

PHILIPS 3002.

Six different tapings are provided, giving a good variation of adjustment, without the necessity of variable resistors.
Complete with rectifier bulb 506.
E222 7 15 0
New bulb (506) 1 5 0

PHILIPS 3003.

As above, but with the addition of three separate values of "C" valve output, up to 40 volts.
Complete with two bulbs.
E223 10 15 0
New bulb (506) 1 5 0
New bulb (506) 5 0 0

BUY WELL-MAYDE—WESTINGHOUSE.

EMMCO "B" ELIMINATORS.

Emmco eliminators are Australian made and fully guaranteed by us on behalf of the manufacturers. They are made in several sizes to suit various sets. In choosing an eliminator, it is advisable to choose a larger size than actually required at present, since you may shortly want to operate a power amplifier, coupled to either the Radio set or to a gramophone pick-up, using a dynamic speaker. The most marvellous results can thus be obtained, but powerful apparatus is essential for this purpose.

EMMCO SUPER POWER.

(For Sets up to 10 Valves)

This eliminator will give 50 milliamps at 180/200 volts, thus giving more than ample for the largest set. It has three controls, one raising or lowering the total voltage, the other two controlling the speaker.

Full instructions for use are included, and the eliminator is supplied complete with Raytheon BH double wave rectifying valve.

E210 12 12 0

EMMCO MEDIUM "B" ELIMINATOR.

(For Sets up to 5 Valves).

This is similar to the Super Power, but with control knobs only for detector and R.F. valves. The maximum voltage is about 140. Full instructions and Raytheon BH double wave rectifying valve included.

E211 10 10 0

EMMCO MAXIMUM "B" ELIMINATOR.

(For Sets up to 7 Valves).

This is a new eliminator, designed for sets up to seven valves. The low price is accounted for by the omission of variable controls, but the provision is made for a number of tapings on a readily accessible resistance bar inside the eliminator, thus actually providing desired voltage can be obtained, by trial, while the fixed controls are more durable.

Full instructions and BH valve included.

E212 8 15 0

"ABC" ELIMINATORS.

Just as an Electric Radio uses definite types of valves in definite proportions, so it operates if these types are varied, so we prefer to build "ABC" eliminators to suit your Radio, with a set of valves which may be your own choice, but which will not afterwards be changed to another kind, unless of the same characteristics.

By adopting this policy, satisfaction is assured, and variable controls which are usually first to give trouble, are dispensed with. You never see variable "A" and "B" controls on modern Electric Radios, but they would be necessary if custom-made valves were to be made or style of valve they fancied.

If you cannot use the combination of valves which you desire, or valves similar in characteristics, we will be very glad to make an "ABC" eliminator specially for you. Our advice on the matter is always freely available.

IN ORDERING ELIMINATORS STATE—

(1) Number and type of valves.

(2) Make and type of valves.

MONARCH "ABC" ELIMINATOR.

Designed normally for our Hammarlund-Roberts sets, using three 221 Radiotron valves, and one 112A; or for the Altona Neutrodyne, using four 221 Radiotrons, and one 112A; or for any other set in which similar combination of valves can be used, such as Brown-Drake, and any five valve Neutrodyne.

Do not attempt to use the eliminator with valves whose total filament consumption is more than .5 amps.

"A" SUPPLY.

6 volts 5 amps.

"B" SUPPLY.

150 volts, 50 ma., tapped for detector, R.F. and first audio.

"C" SUPPLY.

6 and 50 volts, or to suit. Suitable for screened Grid Radios, at 140 extra filament cost. In handsome metal cabinet.

E174 Monarch "ABC" eliminator 17 10 0

PRESIDENT "ABC" ELIMINATOR.

Similar in every way to the above, but with a 50 volt 1 amp. "A" supply. This gives far more latitude of control, owing to extra filament current which is available, but if a supply is not available, it can be worked from the "A" supply, in addition to the "B" supply. It also has a dynamic speaker in, and a 5 amp. available for the valve filaments.

E175 President "ABC" eliminator 20 0 0

PHILIPS PFF.

Consists essentially of a type 3002, with a 50 volt 1 amp. transformer to supply filament current of four 3002 Philips PFF 12 0 0

E214 Philips PFF 12 0 0

ELIMINATOR KITS.

These kits can be wired together in a very short time. Assembling is no more difficult than connecting a set of batteries, in the case of the "A" eliminators, at least.

Details of outputs are the same as for the corresponding WELL-MAYDE "A" ELIMINATORS, and in ordering, please state if voltmeter is wanted, and also what voltage valves are to be used, so that the correct rheostat can be sent. The voltmeter is advisable, but in many cases the rheostats on the set itself will do.

The filament terminals of the valve holders.

With each kit, instructions are given, together with the Westinghouse booklet, "THE ALL METAL WAX, 1929," which contains much information.

"A" ELIMINATOR KITS

(METERS EXTRA).

HALF-AMP KIT (E170).

This comprises the following apparatus, together with a baseboard. It can be wired up in a few minutes, no soldering being necessary. It will supply current for up to five valves of the four-volt 1 amp. type. Thus the "A" accumulator can be entirely dispensed with.

Well-Mayde 3 amp. charger 25	1.0 0
2000 m.f. electrolytic condenser	1.0 0
Well-Mayde A3 choke	1.10 0
Rheostat, baseboard, wire	4 6
Meter extra	55 9 6

ONE-AMP KIT (E171).

As above, but supplying 6 volts at 1 amp., thus being suitable for up to 10 1-amp 6 volt valves.

Well-Mayde A3 transformer	1.10 0
Rectifier HTA	1.8 0
Two 2000m.f. condensers	2.0 0
Well-Mayde A3 choke	1.1 0
Rheostat, baseboard, wire	4 6
Meter extra	55 12 6

In this type the transformer and rectifier may be the TYPE A3 CHARGER, costing £10/0, instead of £12/18/- for the first two items above.

TWO-AMP KIT (E172).

Well-Mayde A4 transformer	2 5 0
Westinghouse A4 rectifier	2 8 0
Two 2000 m.f. condensers	2.0 0
Well-Mayde A4 choke	2.0 0
Rheostat, baseboard, etc.	7 0
Meter extra	55 0 6

METERS—Although not essential, it is advisable to fit these. A cheap one can be supplied at 8/-, and the "Preston moving coil" (recommended) at 28/6.

"B" ELIMINATOR KITS

E173 (E176).

Output 120 volts, 30 mils. Suitable for smaller Radios, but it would probably be better to choose one of the next larger kit, which is little more, but is far more powerful. Nevertheless, on Radios up to three valves, this eliminator will give ample output.

Well-Mayde transformer	1.10 0
Rectifier HTA	2.8 0
Well-Mayde choke HT4	1.10 0
2 Hydra 4 m.f. 500 volt condensers	15 0
3 Hydra 2 m.f. 500 volt condensers	12 0
Well-Mayde resistance, mounted	13 6
Baseboard, wire, terminals, etc.	3 0
	55 11 6

E174 (E177).

Output 150 volts, 50 mils. Quite a powerful eliminator, especially as it can be relied always to be working at full strength. Through the peculiar circuit used, a transformer giving only 125 volts enables a considerably higher output voltage to be adapted to this give "C" supply as well.

Well-Mayde transformer	1.10 0
Rectifier HTA	2.8 0
Well-Mayde choke HT4	1.10 0
3 Hydra 4 m.f. 500 volt condensers	12 6
2 Hydra 2 m.f. 500 volt condensers	12 0
Well-Mayde resistance, mounted	13 6
Baseboard, wire, terminals, etc.	3 0
	55 17 0

E175 (E178).

Output 180 volts, 100 mils. Very powerful, and suitable for two 171A valves in push pull in final stage. These give ample undistorted volume for any house, or for small hall.

Well-Mayde transformer	1.15 0
Rectifier HTA	4.10 0
Well-Mayde Choke HT.1	1.15 0
2 Hydra 4 m.f. 500 volt condensers	15 0
3 Hydra 2 m.f. 500 volt condensers	12 0
Well-Mayde resistance, mounted	13 6
Baseboard, wire, terminals, etc.	3 0
	55 110 3 6

PILOT POWER PACK, K111A.

Plate current for a set using up to two 171A valves. Filament output for three 6 volt 25 amp. valves, and four 227, and four 225 (if 225 not used, five 227). For 280 rectifier.

E188 Power pack K-111A . . . 8 0 0

PILOT POWER PACK, K-112A.

Plate current for up to two 245 valves, and filament supply for seven or eight 245 and 280 rectifier. E187 Power pack K-112A . . . 10 12 6

"ABC" ELIMINATOR KITS.

"ABC" ELIMINATOR KITS.

Details of circuit are hardly necessary, as they combine the apparatus used in the "A" and "B" kits, with the addition of one or two extra resistance strips for the "C" supply. It can be supplied, which can be readily followed.

E176 (E179).

Most eliminators use this type. It is a heavy duty tube, rectified output being up to 300 volts, 125 milliamperes.

Well-Mayde transformer	1.10 0
Rectifier HTA	2.8 0
Well-Mayde choke HT4	1.10 0
2 Hydra 4 m.f. 500 volt condensers	15 0
3 Hydra 2 m.f. 500 volt condensers	12 0
Well-Mayde resistance, mounted	13 6
Baseboard, wire, terminals, etc.	3 0
	55 11 6

E180 (E183).

Output 150 volts, 50 mils. Quite a powerful eliminator, especially as it can be relied always to be working at full strength. Through the peculiar circuit used, a transformer giving only 125 volts enables a considerably higher output voltage to be adapted to this give "C" supply as well.

Well-Mayde transformer	1.10 0
Rectifier HTA	2.8 0
Well-Mayde choke HT4	1.10 0
3 Hydra 4 m.f. 500 volt condensers	12 6
2 Hydra 2 m.f. 500 volt condensers	12 0
Well-Mayde resistance, mounted	13 6
Baseboard, wire, terminals, etc.	3 0
	55 17 0

Well-Mayde resistance, mounted

Baseboard, wire, terminals, etc.

55 17 0

55 17 0

55 17 0

55 17 0

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55 17 0

ERINOID.

Erinoid is a comparatively new material of peculiar interest to us in the radio industry. It is a resin product. It is made in rods, in a large variety of beautiful colours.

It is easily cut, and, when polished, it is already used very widely for electrical work (small knobs, etc.). Unexcelled for special knobs.

Send your enquiries for ERINOID sheet, and larger rods.

It can be very easily drilled.

It is unaffected by weather, ordinary chemicals and high temperatures. It is very strong indeed, does not warp or discolour with age. It looks as fresh after years of use as when new. It is not difficult to cut, and can be very easily drilled.

It can be very easily engraved.

It is unaffected by weather, ordinary chemicals and high temperatures. It is very strong indeed, does not warp or discolour with age. It looks as fresh after years of use as when new. It is not difficult to cut, and can be very easily drilled.

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FORMICA FOR BEAUTY AND INSULATION.

ENGRAVING.

Our factory has installed a TAYLOR, TAYLOR AND HOBSON ENGRAVING MACHINE, and can now cater for all requirements in MACHINE ENGRAVING.

WE CAN ENGRAVE—

SPECIAL NAMES, FIGURES, SIGNS, TRADE MARKS, ETC., ON PRACTICALLY ALL MATERIALS.

FIRST CLASS WORK ONLY.

PANELS can be beautifully engraved in white or gold lettering, and amateurs who build their own sets should invariably take advantage of the service we offer, to give their panels that professional appearance which "makes" a Radio set.

ENGRAVING MACHINE.

MACHINERY USERS, when ordering new non-metallic gears should specify FORMICA to ensure the most durable wear.

STOCKS ARE AVAILABLE in the building trades. It can be supplied in MARBLE and other finishes, proof strength, and a durability even exceeding genuine marble. It is lighter and can be used in thinner sheets.

For the panelling of entrances it is especially valuable.

For bushes for timing gears, or other turning where strength and good insulation are required, Formica serves admirably.

Price is 12/6 per pound, and a piece 6 x 2 x 1/2 inch weighs approximately one pound.

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MARBLE FORMICA.

In America, FORMICA is extensively used for many purposes in the building trades. It can be supplied in MARBLE and other finishes, proof strength, and a durability even exceeding genuine marble. It is lighter and can be used in thinner sheets.

For the panelling of entrances it is especially valuable.

For bushes for timing gears, or other turning where strength and good insulation are required, Formica serves admirably.

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HYDROMETERS.

Hydrometers are used for measuring the specific gravity of liquids, chiefly the electrolyte in an accumulator.

The ordinary float clings to the side of the tube, however, so the hydrometers listed have little glass "pimples" on the floats. This prevents sticking, and ensures an accurate reading.

For small name plates, engraving can be done to order.

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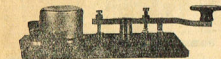
For bushes for timing gears, or other turning where strength and good insulation are required, Formica serves admirably.

GEAR FORMICA.

Metallic gears are always more or less noisy. In places where noise must be reduced to

KEYS (Telegraph).

The Ajax is a light, cheap key, which is very satisfactory for Morse Code practice. It is fully adjustable, and the bearing spindle is well fitted with polished bearings. The buzzer is the well-known Ajax.



B144 Key and buzzer	14 6
K116 Key only	10 0
K114 With brass transmitting	24 0
K141 Heavy, Brown, aeroplane	33 0

KNOBS.

ARROW KNOBS.

Highly polished bakelite, K-K brand. The arrow is deeply engraved and plainly marked.

Made in two sizes, both for 1 in. shafts, with set screws.



K129	K107
K127 1 1/2 in. diam., black; ea.	10
K128 1 1/2 in. diam., walnut; ea.	10
K119 1 1/2 in. diam., black; ea.	1 0
K126 1 1/2 in. diam., walnut; ea.	1 0

MOULDED ARROW KNOB.

The arrow is a raised moulding on this knob 1 in. shaft. Diameter 1 1/2 in. Cheap but good.

K132 Black	6
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FLEUR DE LIS KNOBS.

A new style of knob, as illustration. Made by K-K. For 1 in. shaft.

K129 Black	10
K130 Walnut	10

FOINTER KNOBS.

Made of highly polished bakelite by K-K. The marking is distinct. Shaft 1 in.

K129 Black	10
K130 Walnut	10

FOINTER KNOBS.

Made of highly polished bakelite by K-K. The marking is distinct. Shaft 1 in.

K129 Black	10
K130 Walnut	10

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K129 Black	10
K130 Walnut	10

LOUD SPEAKERS.

Three common types are met with to-day, all being so familiar as to require little description.

The DYNAMIC or MOVING COIL SPEAKER is undoubtedly the most popular, even though it is usually the most expensive.

CONDENSED SPEAKERS are now fitted with much improved mechanism, and come themselves being much more reliable than formerly. Good results are now obtainable, though these speakers will not, of course, operate on the most powerful Radios, without blasting and distortion.

HORN SPEAKERS are still the best for smaller RADIOS, because, being more sensitive, they enable the receiver to bring in more stations at better volume for speech, they usually excel all other speakers.

In general, buy a DYNAMIC SPEAKER if your set is powerful, powerful enough to carry current in the house, or can get your "A" battery charged very easily.

If your set is powerful, but batteries not readily changed, a good cone speaker may serve. But for these and smaller RADIOS, the horn speaker will probably give the best satisfaction.

N. AND K. SPECIAL.

K129	K107
K127 1 1/2 in. diam., black; ea.	10
K128 1 1/2 in. diam., walnut; ea.	10
K119 1 1/2 in. diam., black; ea.	1 0
K126 1 1/2 in. diam., walnut; ea.	1 0

MOULDED ARROW KNOB.

The arrow is a raised moulding on this knob 1 in. shaft. Diameter 1 1/2 in. Cheap but good.

K132 Black	6
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FLEUR DE LIS KNOBS.

A new style of knob, as illustration. Made by K-K. For 1 in. shaft.

K129 Black	10
K130 Walnut	10

FOINTER KNOBS.

Made of highly polished bakelite by K-K. The marking is distinct. Shaft 1 in.

K129 Black	10
K130 Walnut	10

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K130 Walnut	10

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HORN SPEAKERS.

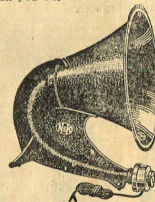
N. AND K. SENIOR.

Horn speakers supply the happy medium between good reproduction and low price, and are quoted as standard with the ordinary sets.

Our final selection of a horn speaker that will satisfy us on the score of excellent tone qualities, accuracy of construction, freedom from coil trouble so rife in speakers, and yet at a reasonable price, has fallen on the N. and K. To hear it—and to see how well finished is the speaker unit incorporated—is to be convinced of its superiority. It is equal in every way to most speakers at twice the price.

Best of all, it is sold with an absolute guarantee for one year, a guarantee given by JOHNS LTD., who will immediately replace or renew any part becoming defective through ordinary usage.

No expensive repairs—no anxiety—when you buy N. and K.



The horn of the N. and K. speakers, owing to the peculiar shape, is quite long, and it is to this approximation to an exponential horn that the speaker owes its outstanding success. The speaker is remarkably compact.

L210 N. and K. Senior	3 3 0
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THREADED.

The following knobs will fit 3/32 American screwed rods, and so are very useful for tickler and other controls.

K106	K107
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THREADED.

The following knobs will fit 3/32 American screwed rods, and so are very useful for tickler and other controls.

K106	K107
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The following knobs will fit 3/32 American screwed rods, and so are very useful for tickler and other controls.

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K106	K107
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BROWN SOVEREIGN.

The diaphragm is very light, being made of the thinnest aluminium, so that the speaker is extraordinarily sensitive. Can be thoroughly recommended to those who cannot use dynamic, and especially to those who operate battery Radios.

Beautiful as a speaker may be, however, it is by its reproductive qualities that it must be judged. The superiority of the Well-Mayde is so marked that we welcome any comparison with any other speaker in its own price class.

The Well-Mayde brings out the bass notes that other speakers (excluding dynamos) usually suppress, but without the unpleasant exaggeration which causes the higher notes to be lost. In fact, it reproduces with a delightful balance over a wide scale.

Guaranteed, of course.

Guaranteed, of course.

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Guaranteed, of course.

Guaranteed, of course.

WELL-MAYDE "SUPERB."

This speaker is locally assembled with a full knowledge of what our New Zealand customers require. Unit and chassis are the very best obtainable, while the cabinet work is of the finest. Top is flat, not curved.

Beautiful as a speaker may be, however, it is by its reproductive qualities that it must be judged. The superiority of the Well-Mayde is so marked that we welcome any comparison with any other speaker in its own price class.

The Well-Mayde brings out the bass notes that other speakers (excluding dynamos) usually suppress, but without the unpleasant exaggeration which causes the higher notes to be lost. In fact, it reproduces with a delightful balance over a wide scale.

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Guaranteed, of course.

MOVING COIL SPEAKERS.

Moving coil, or dynamic speakers, as they are usually called, were introduced many years ago, but have only come into prominence until recently, chiefly because it required the modern Radio, with its ample power, to operate them successfully.

Compared with ordinary speakers, the dynamic handles enormous volume with ease, giving no feeling of strain, and is usually more experienced with other speakers. Further, it gives the bass notes which are almost entirely lost in the ordinary speaker, and also, incidentally, in the ordinary speaker, their true value, making the tone marvellously rich.

Although used mainly with large and powerful Radios and electric gramophones, the DYNAMIC nevertheless will greatly add to the enjoyment from Radios of four valves and upwards, provided that power valves and adequate "B" current is used.

This coil moves in sympathy with the broadcast music or voice, yet with a very powerful vibration capable of producing great volume. The coil can move for 1 in. or more without touching anything, hence the coil spacing coil spacing is not a factor. This freedom of movement is the secret of the success of the speaker.

The coil is in turn attached to a cone, whose edges are held in place by rubber or thin leather. It is of course, the cone which actually imparts the vibrations to the air, and reproduces the music.

MOVING COIL SPEAKERS are very strongly built. There is no reason why they should break down, for the fine wire coils of the ordinary speakers are replaced everywhere by heavy wires.

MOVING COIL UNITS.

The working part is solid without cabinet when desired, so that the purchaser may fit it into the cabinet of his own set, or perhaps, better still, if possible, into the wall of the room. This would give the best results of all.

Otherwise the unit may be housed in a strong box, or on a large piece of wood, 3 ft. x 3 ft. at least. It is simply wood. It is necessary to make the air path from front to back of the speaker cone at least 5 or 6 feet.

The speakers are, of course, supplied complete in handsome cabinets.

N. AND K. DYNAMIC.

Apparently the only dynamic in New Zealand made to work direct on the 32-volt lighting system that are quite common. It is merely connected to a light or power point, and the music comes out. N. and K. is unsurpassed, while it possesses ample volume, even for a hall.

N. and K. Dynamic, 32-volt 6 17 N.

MAGNAVOX MOVING COIL SPEAKERS.

These speakers are supplied in two sizes, 7-inch and the new Concert 10-inch, indicated by the letter "a."

MAGNAVOX D-6.

Field coil 5.5 ohms, taking 7 amps. on 4 volt accumulator, or will work from a Well-Made 1 amp. charger.

L232 D-6 Unit 6 17 6
L276 D-6a Concert Unit 7 10 0

MAGNAVOX D-7.

Field coil 2000 ohms, for working from D.C. mains, 110 to 230 volts.

L224 D-7 Unit 6 17 6
L277 D-7a Concert Unit 7 10 0

MAGNAVOX D-9.

Field coil 7500 ohms, for working on the plate current of the amplifier.

L280 D-9 Unit 6 17 6
L278 D-9a Concert Unit 7 10 0

MAGNAVOX D-30.

Works direct from the 230 volt A.C. mains.

L226 D-30 Unit 10 0 0
L275 D-30a Concert Unit 10 12 6

JENSEN DYNAMICS do not over-emphasise the **LOW** at the expense of the **HIGH** notes.

JENSEN NU-CORE DYNAMICS.

Last season we introduced the NEWCOMB-WILEY DYNAMIC to New Zealand, orders having been placed mainly because they were then the dynamic recommended by Hammarlund. Unfortunately, the Newcomb-Wiley speaker has been discontinued. It was certainly the finest dynamic sold in this country last year.

We have again this season, however, followed the lead set by Hammarlund, and made arrangements for the agency of a DYNAMIC carrying their full and better advertisement.

IF IT'S GOOD ENOUGH FOR HAMMARLUND, IT'S GOOD ENOUGH FOR A KISS.

Consequently, we make no apology for introducing the JENSEN TO NEW ZEALANDERS.

JENSEN NU-CORE.

It is well known that special alloys are more magnetic than others. Thus STALLOY, universally used in transformer cores, has been specially made for the purpose, because a core made from it can be rendered more highly magnetic than other materials.

The special NU-CORE used in the Jensen speaker, definitely places it ahead of its competitors. You have merely to hear its performance, and compare it with other dynamics to prove it to yourself. But further proof is available—Jensen six volt speakers, **TYPE FIELD COIL**, and **TYPE 7 AMP**, or more. Economy is joined with better actual performance.

Do not think that because JENSEN DYNAMICS are cheaper than others, that their price is less in America. We willingly refer you to any American catalogue, where you will see that all well-known dynamics sell for the same prices.

But, if further proof is necessary, BUY JENSEN, and TRY IT. WE will refund your purchase price if you are not satisfied.

JENSEN MODELS.

There are of three types, the STANDARD with 7-inch cone, CONCERT with 10-inch cone, and AUDITORIUM with 12-inch cone.

Since the STANDARD 7 INCH TYPE costs the same as the 10-inch type, we are concentrating on the latter, but will always endeavour to supply the former where specially required.

JENSEN CONCERT DYNAMICS.

All JENSEN CONCERT DYNAMICS are regularly fitted with ordinary input transformers, as with other dynamics. For 5s. extra, however, we will build an amplifier to be fitted, rendering one of these units into a complete amplifier or receiver. This means that the DYNAMIC INPUT PUSH PULL with TRANSFORMER is identical with the PUSH PULL OUTPUT TRANSFORMER of an amplifier.

JENSEN D-6 CONCERT.

Field coil 15 ohms, using only 4 amp. from a six volt accumulator. Can be worked from 230 volts A.C. with 5 amp. charger.

L232 Jensen D-6 Concert Unit 17 4

JENSEN D-7 CONCERT.

Field coil 2500 ohms, for working from D.C. mains, 110 to 230 volts.

L273 Jensen D-7 Concert Unit 6 17 6

JENSEN D-9 CONCERT.

Field coil 8000 ohms, suitable for working on the plate current of the tubes, thus eliminating one of the chores.

L274 Jensen D-9 Concert Unit 6 17 6

JENSEN D-30 CONCERT.

Similar to the D-6 unit, but fitted with a PUSH PULL TRANSFORMER RECTIFIER, to operate on 230 volts A.C. The most permanent rectifier ever made.

L275 Jensen D-30 Concert Unit 10 0 0

JENSEN 12-INCH AUDITORIUM DYNAMICS invited to order. For largest halls, theatres, etc.

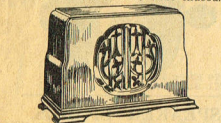
ALL DYNAMICS ON EASY TERMS.

N. AND K.—PRACTICALLY EVERLASTING.

SPEAKER CABINETS.

Fitting is free, when both cabinet and speaker unit are ordered.

Dynamic units must be used in a cabinet, or on a large baffle board, or they will sound very poor indeed.



These cabinets are specially designed to enable dynamics and cone speakers to operate at their best.

WELL-MAYDE "SOVEREIGN."

Handsomely finished and polished in our factory. Suitable for 10-inch Concert Dynamics, but could be used with cone units like the Blue Spot, Brown, etc.

L281 Sovereign cabinet 3 10 0

WELL-MAYDE "MONARCH."

A less expensive, but strongly made cabinet for dynamic and cone speakers. No special fitting is required to make this cabinet the best at the price, and it is certain to give satisfaction. For 10in. speaker.

L282 Monarch cabinet 2 12 6

WELL-MAYDE "WONDER."

A lighter cabinet, suitable for cone speakers, but not for dynamics. Nicely finished and polished. Will fit such units as Blue Spot, Brown, etc. For 10in. cone speaker.

L283 Wonder cabinet 2 5 0

MAGNAVOX CABINETS and SCREENS.

L289 Carillon 5 0 0
L284 Beverly 5 15 0
L285 Belvedere floor screen 2 17 6

BROWN DIAPHRAGMS.

These are aluminium, very light and fragile.

L115 Junior 4 0 0
L118 Other speakers 5 0 0
Fitting and adjustment extra.

LOUD SPEAKER MATS.

Sponge rubber mats, on which speaker is placed, eliminate any effect on speaker to howl, due to microphone action.

L212 3 0 0

SPEAKER UNITS.

By using a speaker unit with a horn, or with a cone, loud speaker is made. In the simplest form, a SPEAKER UNIT may be attached to an ordinary gramophone arm, thus enabling the gramophone horn to be used.

Frequently, however, it is desirable to build a speaker into the Radio cabinet, and for this purpose a unit is invariably used in conjunction with either a suitable horn or cone.

The experimenter also is usually anxious to make speaker incorporating his own ideas. The units cannot be built, but the remainder of the speaker is not difficult.

With home-made exponential horns, which are generally too bulky for sale, very fine results can be obtained with a good unit.



N. AND K. (HORN).

The N. and K. unit scarcely requires description, as it is exactly the same as used in our famous speakers. It is a precision instrument, carefully made to secure the best tone, and great durability. Fully guaranteed for one year. Actually, we have not yet had one N. and K. speaker or unit burnt out yet—truly an almost miraculous record for this country.

The attachment nipple of the N. and K. is screwed into the unit, so if any special connection is desirable, it is not difficult to make a suitable nipple. A standard size nipple is included in each unit.

L209 N. and K. unit 18 0

N. AND K. POLARISED (CONE).

This is a drive unit for a cone speaker, operating from a polarised read system. The magnet is very heavy and strong. This unit resembles somewhat the balanced armature unit, and in fact will be found perfectly satisfactory for any cone speaker. It is supplied complete with suitable cone, ready made up. It is attached with a touch of solder.

L240 N. and K. polarised unit 14 0 0

CANNON-BALL BALANCED ARMATURE (HORN).

Great volume, combined with a rich deep tone. Used for horn speakers, being particularly suitable for large exponential horns. There has been considerable demand for balanced armature unit, and this will be exacting. The requirements of the most exacting, and the most expensive horns.

L241 Cannon ball balanced armature unit 1 10 0

LISEN UNIT (Cone or Horn).

L271 Liszen unit 17 6
L272 Liszen read attachment 1 10 0

BLUE SPOT SPEAKER UNIT.

The Blue Spot unit made a New Zealand reputation in a single season, though its great popularity in England ensured that this would be so. It is constructed not only with utmost precision, but with a very fine appearance. It is adjustable.

This unit finds great favour with constructors of cone speakers, or lineal diaphragm speakers. In fact, it is almost invariably specified for this purpose by local journals.



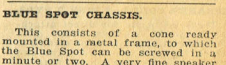
L266 Blue Spot unit (adjust.) 32 6



BLUE SPOT CHASSIS.

This consists of a cone ready mounted in a metal frame, to which the Blue Spot can be screwed in one minute or two. A very fine speaker is the result, which can be used as it is, mounted in a special cabinet, or in the Radio cone cabinet.

Remember, we buy a very fine unit in the BLUE SPOT.



L267 Blue Spot chassis 20 0

CONTINENTAL CONE UNIT.

To fill the demand for a very cheap unit, we are offering the Continental. Its value must not be gauged by its price, for it gives great results. It is supplied with a long tongue, and also with the small cone, thus enabling the home-made cone to be fitted with the utmost simplicity.

L247 Continental unit 15 0

ALL SPEAKERS REPAIRED.

N. AND K. PARBAND INDUCTOR

Recently, there was invented in U.S.A. an entirely new type of speaker, in which the armature is "rotated" between two pairs of net poles. Like the dynamic speaker, a very great movement of the armature can take place without touching the pole pieces and experts claim that this type of speaker is equal to the dynamic in results. It uses a permanent magnet, so no extra current is required to operate it. THIS IS A DECIDED ADVANTAGE.

At the moment of going to press, samples have not arrived, so we cannot speak from actual test. N. and K., however, can be relied upon to supply a very fine product. If we anticipate, the INDUCTOR SPEAKER is something especially good, supplies will be immediately cable for.

The price will include cone and chassis, ready for mounting in a cabinet, and will be about £5.

ORMOND CONE UNIT.

A British unit, adjustable, which can be bought with its own cone and chassis. Will make an excellent speaker. L289 Ormond unit only ... 18 0
L290 Ormond chassis (with cone) ... 12 0
L291 Ormond unit and chassis 30 0

LOUD SPEAKER CORDS

Speaker cords are made in pairs, braided together. The wires must be very flexible to stand constant vibration without breaking.

SPEAKER CORDS—2 PINS, 2 EYES.

These are made for direct attachment to the speaker, since most speakers have terminals or screws to which the eyes are fitted. The two pins then suit the phone plug or terminals on the set.

L234 5ft.	1 6
L234 10ft.	2 6
L250 25ft.	3 6
L251 50ft.	6 6

SPEAKER CORD CONNECTOR.

These little connectors enable two speaker cords fitted with pins to be joined together instantly. Bakelite, light, neat and strong.



L244 Connector	1 3
---------------------	-----

CONE PAPER.

In this country it is generally difficult to get suitable materials for experimenting. For this reason we have imported special sheets of paper as used by the manufacturers of cone speakers. This is the material to use either on your experimental speaker, or to renew the cone on your old speaker.

L249 11 1/2 x 35in.	2 0 10
L251 18 x 18in. approx.	1 6 10

Packing charge is made because special wood crates must be used to ensure safe delivery. Any number of sheets can be included in the one package for the charge named.

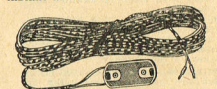
POWER UNIT (See Page 37).

L264 For exponential horns 3 10 0

SPEAKER EXTENSION CORDS—

Although four pins cords will fit direct to some speakers, they are generally used for extending the existing short speaker cords, when desired to use the speaker at some distance from the set.

On all except the six feet cord, connectors are supplied, ready for instant attachment.



T139 5ft. (no connector) ...	1 6
T248 10ft., with connector ...	3 3
T253 20ft., with connector ...	4 6
T254 25ft., with connector ...	5 6
T255 50ft., with connector ...	7 6
T256 100ft. with connector ...	12 0

Less connector, is deducted.

TAKE ADVANTAGE
OF OUR
EASY TERMS
ON
ALL APPARATUS.

Mr. Thos. Harte, Stephen's Island, writes:

I have much pleasure in advising you that the Radio parts arrived here in excellent condition, the set has been erected; and results are splendid. The instructions were most explicit, and no difficulty was experienced in assembling. Having had over twenty years' experience as a Radio operator, I extend to you my congratulations for putting on the market a set of reasonable price giving a performance equal to any results I have heard or used irrespective of cost.

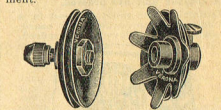
Mr. Reg. Laurence, Woodville, writes: The Trickle charger is doing good work and I can thoroughly recommend it to anyone wanting cheap charging and good results.

Mr. H. Luna, Walpawa, writes:

Now that I have had the H.R. Junior radio set in working order for a fortnight, I wish to inform you that I am very pleased with it. Until the kit arrived I had never done any radio construction work at all, but thanks to the explicit and easily followed directions sent I had no difficulty in constructing it. I have begged the following statements all on the loud speaker. I had a 25A, 22C, 22M, 22C, 22L, 22P, 21B, 2PC, 1A, 4Q, 4Q, 20C, 20B. If I had phones this list would be greatly increased. I think you will agree as per enclosed rough sketch, the set is a really splendid one. [Mr. Luna is shielded by a belt of trees 10 feet high, and his aerial is only 25 feet.]

SPEAKER CONE WASHERS.

Small coned washers, to fit speaker units to their cones. Chuck attachment.



L270 Circular pattern ...	1 6
L271 Star pattern ...	1 6

SPEAKER SPARES.

We carry spares for all speakers recommended in this list, and can quote for any repairs, in which we can claim experience extending right from 1929.

While it is not always possible to repair speakers other than those listed, it will invariably be found that, if repairs are possible, JOHNS LTD. can do them.

In purchasing all apparatus, the question of repairs should be borne in mind. It will invariably be found that, if repairs are possible, JOHNS LTD. can do them.

SPEAKER COILS.

We carry a very large range of assorted bobbin for speakers and telephones, wound ready for fitting. Send the speaker base only, if it is burnt out, and ask us to quote for fitting it with new coils, and making it as good as new again.

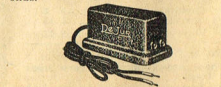
DIAPHRAGMS—See Telephones.

SPEAKER FILTERS.

WELL-MAYDE. See also output transformers.

These are becoming more and more necessary for modern Radio sets. Not only does their use improve the tone of the whole installation, but it protects the windings of the speaker from the overload strain of too much current. This prolongs their life, and prevents blasting to a substantial degree.

Capacity effects are all greatly reduced. The Well-Mayde filter is supplied with a cord to connect to the set while the speaker cord itself is connected to the filter. These connections are made in two or three seconds.



L252 Well-Mayde speaker filter ...	1 10 0
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PILOT SPEAKER FILTER.

Similar to Well-Mayde. L263 Pilot speaker filter ... 10 6

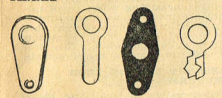
T246 De Jur output transformer ...	1 10 0
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MASTS ERECTED CORRECTLY.

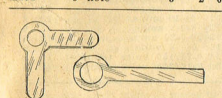
LUGS (Solder).

These lugs are nickelled or tinned to ensure easy soldering. They are used by every set builder. (See also TERMINALS.)

TINNED

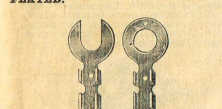


L131	L129	L167	L132	dx	gr
L131	8 hole			3	2 6
L168	10 hole, as L131			3	2 6
L170	10 hole, as L131			6	5 6
L129 No. 8 hole				3	2 6
L167 6 hole, double				3	2 6
L132 8 hole				3	2 6



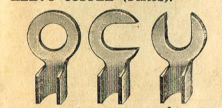
L156	L165	dx	gr
L156 No. 8 hole		6	5 6
L165		6	5 6

PLATED.



L191 Fork, 5in./32 hole	dx	gr
L192 Loop	6	5 6
L193 Fork, 3in./24	8	7 6
L194 Loop	7	0
L195 Fork, 1 1/2in./1in.	10	9 0
L196 Loop	10	9 0

HEAVY COPPER (Plated).

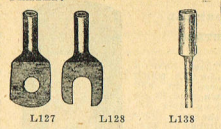


L197 Fork, 3in./1in.	dx	gr
L198 Loop	8	7 6
L199 Side Loop	8	7 6
L200 Fork, 1 1/2in./5/16	10	10 6
L201 Loop	10	10 6

MAST CLEATS.

M164 Cleats, galvanised	6	M162 Pulleys, galvanised	10
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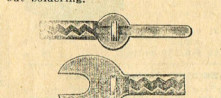
PLATED.



L127	L128	L138	dx	gr
L127	ea.	ca.	2	6
L128	ea.	ca.	2	6
L138 Phone tips	2d.	1	6	15 0

PINTERS—FORETEERS.

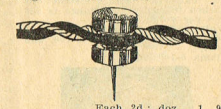
Well nicked plated lugs, with saw tooth edges. Easily fitted on braided wires with ordinary pliers. Loop makes wire connection certain without soldering.



L202 Pinters	dx	gr
L203 Forkterms	6	5 6

RADIO PINS.

These pins are invaluable for attaching flexible or single wire to the wall for speakers, etc. Inserted immediately with fingers only, yet rigid fixing. Different colours



Each 2d.; doz. 1 9

MAST CABLE.

Cable for hauling aerial into place may be rope, but this will probably rot in a year or two, and then it is necessary to lower the set to replace it. The galvanised cable listed here runs readily even over a small pulley, and will last many years. It is formed of 49 very thin steel strands, enabling it to run freely over the smallest pulley.

Although rather expensive, its advantages must be obvious to anyone. Any length can be cut to order, as it is too valuable to sell in standard lengths, with resultant waste.

W115 Steel cable, per 100ft. 12 6

GUY WIRE—See under WIRE.

PULLEYS.

M160 Strainer, galvanised	1 9
M201 Strainer, small galv.	1 0
M131 Aero 2in. ext. 15cwt.	4 0
M132 Aero 3in. ext. 45cwt.	4 0

SPEAKERS (Galvanised).

These are screwed to the outer wall, and hold a wood rod to which the cone is attached, to keep it clear of the eaves, spouting, etc.

M167 For 3in. rod	1 6
M163 For 1in. rod	1 6

MASTS AND FITTINGS

LAKE MASTS.

A complete mast at a low price. Light and easily erected. M132 26ft. ... Complete 24 0
M133 30ft. ... Complete 30 0
M154 34ft. ... Complete 37 6

GALVANISED MASTS.

HEIGHTS given are approximate, depending on the lengths of pipes available.

NOTE—These masts are supplied complete, with costly cable for hauling aerial into place, as well as the usual fittings, such as base, strong galvanised stays, mast bands, pulley, and cleat.

PRICES for single masts, not FAIRIS.
M160 30ft. high, 2 sets guys 3 5 0
M161 30ft. high, 2 sets guys 4 5 0
M162 50ft. high, 3 sets guys 6 0 0

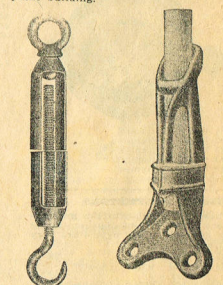
MAST BANDS—GALVANISED.

Made with three eyes, for three sizes of masts.

M180 1 1/2in. hole	1 6
M182 2in. hole	2 0
M184 2 1/2in. hole	2 6
M185 3in. hole	3 0

STRAINERS—SOCKETS (Galv.).

STRAINERS are used to adjust the tension on guy wires, one being required for each wire. The illustration shows the usual galvanised strainer, but we can also supply aero-plane strainers, machined from solid bar steel. Although not galvanised, they make very strong strainers, either for Radio work or in aeroplane building.



M100 Strainer, galvanised	1 9
M201 Strainer, small galv.	1 0
M131 Aero 2in. ext. 15cwt.	4 0
M132 Aero 3in. ext. 45cwt.	4 0

SPEAKERS (Galvanised).

These are screwed to the outer wall, and hold a wood rod to which the cone is attached, to keep it clear of the eaves, spouting, etc.

M167 For 3in. rod	1 6
M163 For 1in. rod	1 6

METERS (Electrical).

For accurate measurements, moving coil or other high-priced meters are essential. For many purposes, great consequence, moving iron meters will serve admirably.

We have in our **LABORATORY**, an extremely fine selection of our meters, including a **MICRO-AMMETER**, which measures millionths of an amp. We are ready to quote prices for testing and calibrating your instruments. Cost will depend on the accuracy which is desired.

MOVING COIL METERS.

Where accuracy in electrical measurements is desired, or where volt-meters with a small current consumption are necessary, **MOVING COIL** meters are the usual type.

Such meters must be carefully made, and until recently it has not been possible to sell them at attractive prices.

In **CRESCENT MOVING COIL METERS**, however, a high degree of accuracy is attained, together with the appearance, while the price is much lower than has previously been possible in high-class meters.

CRESCENT MILLIAMMETERS.

The body fits a 1 1/2 in. hole in the panel, and is nickel plated, and highly polished. Also fitting clips are included. The pointer has a knife edge for accurate reading. A precision instrument, comparing very favourably with the best known makes, costing far more.

M181-0.5

M181 0-5 milliamps	.. 28 6
M182 0-25 milliamps	.. 28 6
M183 0-50 milliamps	.. 28 6
M184 0-100 milliamps	.. 28 6
M185 0-200 milliamps	.. 28 6
M186 0-1.5 amps	.. 28 6

CRESCENT VOLTMETERS.

These are similar to the milliammeters. The current consumption is very low, while the meters are very accurate.

M187 0-6 volts (double range)	.. 28 6
M188 0-6/120 volts (double range)	.. 28 6
M189 0-7/150 volts (double range)	.. 28 6

FERRANT METERS.

All high-grade, moving coil instruments, of unchallenged precision. Either flush or projecting.

M220 15, 50, 150 milliamps, 1.5, 10 amps	each 1 17 6
M221 7.5, 150 volts	each 1 17 6
M222 150, 250 volts (1000 ohms per volt)	.. each 3 10 6
M223 1, 2 millamp	.. each 2 12 6
M224 Spare fuses for millamp ammeters	.. each 1 10

VERTICAL METERS.

These have a pointer which moves up and down, and an oblong hole cut in the panel. Two switches are provided, so that readings are obtained only when a switch is pressed. Thus no current passes through the meter, except when a test is being made.

M191 0-240 volts, 0-60 milliamps	.. 1 16 0
M192 0-6/120 volts	.. 1 16 0

CRESCENT MULTIMETERS.

These particularly handy meters consist of a **CRESCENT** METER, mounted in a case, and adapted to give the following readings, merely by inserting a plug in the suitable socket. It serves for measuring both "A" and "V" currents in the ordinary set, and every experimenter should have one. Nothing like it has ever been offered before, even at double the price.

In addition to measuring volts and milliamps, the meter will read ohms if used in conjunction with a suitable, battery. Full instructions attached to each. Resistance is 250 ohms per volt.

Volt readings 0-10 and 0-200.

Milliamp readings 0-10, 0-100, and 0-1000.

Ohms 0-100,000.

M193 0-50 milliamps	.. 28 6
M194 0-25 milliamps	.. 28 6
M195 0-50 milliamps	.. 28 6
M196 0-100 milliamps	.. 28 6
M197 0-200 milliamps	.. 28 6
M198 0-1.5 amps	.. 28 6

M199 0-6 volts (double range)	.. 28 6
M200 0-6/120 volts (double range)	.. 28 6
M201 0-7/150 volts (double range)	.. 28 6

BEDEE METERS (Pocket).

An inexpensive line of meters, sufficiently accurate for many testing purposes.

M198 0-50 volts	.. 3 10 0
M199 0-50 volts, 0-50 amps	.. 3 10 0

A.C. VOLTMETER—250 Volts.

An inexpensive A.C. voltmeter for checking the voltage of your mains. You will be surprised to find the variation from 210 volts, up or down. High voltage means short valve life.

M235 250 A.C. voltmeter .. 25 0 |

For the majority of ordinary purposes, moving iron meters will prove perfectly satisfactory. They are not so accurate as moving coil meters, but frequently great accuracy of measurement is by no means essential.

It should be remembered, however, that cheap voltmeters should not be used for measuring where small currents are involved, as the voltmeter may actually use more current than the normal load, giving a reading that is quite inaccurate. This does not apply to ammeter measurements.

CRESCENT MOVING IRON METERS.

Panel meters, of small size, nickel plated, and very neat.

A good range of readings is given, but we can generally supply a meter to give any reading desired.

The motor car types read both charge and discharge.

M210 0-200 milliamps	.. 12 6
M211 1, 15, 2, 5, 10, or 15 amps	.. 12 6
M212 0-6 amps	.. 12 6
M213 0-8-3 amps	.. 12 6
M214 20-20 amps	.. 12 6
M215 15 milliamps	.. 12 6
M216 0-7/150 volts (double)	15 0
M215 0-12/240 volts (double)	15 0

POCKET METERS.

CRESCENT.

The ordinary pocket type of meter is very cheaply made, but here is something much better than the ordinary, in both appearance and accuracy. Knife edge pointer. Resistance is no less than 15,000 ohms, which is several times higher than in most pocket meters.

M210 0-200 milliamps	.. 12 6
M211 1, 15, 2, 5, 10, or 15 amps	.. 12 6
M212 0-6 amps	.. 12 6
M213 0-8-3 amps	.. 12 6
M214 20-20 amps	.. 12 6
M215 15 milliamps	.. 12 6
M216 0-7/150 volts (double)	15 0
M215 0-12/240 volts (double)	15 0

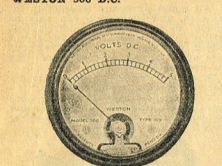
DUPLEX.

A cheap double range pocket voltmeter which will suit most users of sets who merely wish to check their "B" batteries from time to time. At this low price, everyone can well afford such a meter. Never any doubt about "B" batteries—merely test them. It takes only a few seconds.

Similar in appearance to the Crescent.

M199 0-6/120 volts	.. 3 10 0
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WESTON 506 D.C.



Made especially for Radio. Fits into a 2 1/2 hole drilled in a panel.

M112 3, 5, 7, 8, 10, 15, 50, 150 or 200 volts	2 0 0
M113 140/7, 150/7, 200/8 volts, push button	2 10 6
M114 140/7, 150/7, 200/8, 4 terminals	2 6 6
M116 1, 15, 2, 5, 10, or 15 amps	2 0 0
M117 10, 15, 25, 50, 100, 300 or 500 milliamps	2 0 0
M118 5 milliamps	2 5 6
M119 15 milliamps	2 11 6

OTHER WESTON METERS (either A.C. or D.C.) quoted on application. Also any other make of meter obtainable in New Zealand.

SET TESTERS.

With the advent of A.C. sets, which cannot be tested with ordinary meters, etc., special instruments have been devised mainly by the manufacturers of meters.

Prices of these instruments vary all the way up to about £50, so they are essentially apparatus which are not likely to be outside the possession of a dealer.

An up-to-date dealer, on the other hand, simply must have such an instrument, if he is to be able to test any radio set and locate the trouble quickly. A properly equipped dealer may check and locate his time, but if he is able to diagnose the trouble promptly, he can remedy the defect, while the repairer not properly equipped is wondering where to start.

WESTON.

This tester will not carry out as many tests, etc., as the Diagonometer, but Weston precision goes with it as far as its scope permits.

M208 Microphone, hand .. 8 10 0 |

ANNOUNCING SYSTEMS. This system combines the following features, enabling a complete RADIO-GRAMOPHONE ANNOUNCING system to be worked from a Radio receiver, either A.C. or D.C. Volume control is fitted.

It is fitted to your Radio in a moment, and when connected up, one switch enables instant change from Radio to Electric Pick-up, or to a microphone for announcing. The "mike" is the same as M208. A three-way switch controls all these operations. Invaluable for gramophone shops wishing to announce the record, and dates after playing.

Can also be used in conjunction with any amplifier, without the Radio.

M209 Announcer	.. 12 10 0
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SUPREME DIAGNOMETER.

This is the most up-to-date instrument. It actually performs no less than 42 tests, etc., while its nearest competitor is capable only of about 20.

It will even rejuvenate thoriated filament valves without removing them from the set.

Dealers should write for further information.

Price, ex stock, £45. Special price on order.

The **SUPREME** will, of course, test ordinary as well as A.C. RECEIVERS.

MICROPHONES.

AMATEURS will use these for their transmitting stations, or for amplifying speech through their Radios, and for public address systems. In shops, they can be used, as they are, for amplifying music as played by a gramophone.

All will be found very sensitive and capable of giving powerful results.

STUDIO MICROPHONE.

Two button carbon granule type stretched duraluminium diaphragm, with gold contact surfaces. Has a flat curve from 20 to 10,000 cycles, so is equal in performance to any microphone made.

M206 Microphone, studio .. 20 0 0 |

HAND MICROPHONE.

For public address work, announcing and similar purposes. Double button, reciprocating type. Switch in handle, and complete with triple cord, plug and jack. Uses push-button of microphone transformer. A very fine "mike".

M205 Microphone, hand .. 1 12 0 |

"MULTIPLE" TYPE. A very neat "mike," with separate carbon buttons, arranged in a small bakelite frame, for desk use. Clear reproduction, great sensitivity.

M217 Multiple Mike .. 5 5 0 |

M218 Transformer for above 2 0 0 |

UNIVERSAL MICROPHONES (CONDENSERS).

These expensive microphones are of the type universally used for broadcasting stations, and for making talking films, etc.

Three of the were recently supplied by us to **M.Z. Radio Films Ltd.** for use in making the first talking film in New Zealand. This is being produced at Lake Taupo, and depicts Maori life of many years ago.

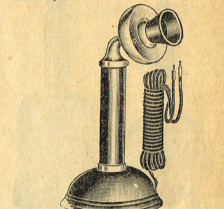
Definite price quoted on application, being approximately £60.

NAME PLATES.

We can engrave any name on Formica, celluloid, xylotone or your special order. Send for quotations.

DESK TYPE.

With stand, similar to the automatic 'phone.



M204

PONY TYPE.

For attaching to the wall, but can also be quite conveniently held in the hand.

M203

HAND TYPE.

Fitted with handle, thus very suitable for announcing while moving about.

M205

"MULTIPLE" TYPE.

A very neat "mike," with separate carbon buttons, arranged in a small bakelite frame, for desk use. Clear reproduction, great sensitivity.

M217 Multiple Mike

M218 Transformer for above

M203

M205

M206

M208

M209

M210

M211

M212

M213

M214

M215

M216

M217

M218

M219

M220

M221

M222

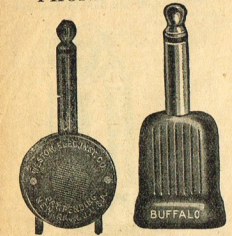
M223

M224

M225

WESTINGHOUSE RECTIFIERS FOR PERMANENCY.

PHONE PLUGS.



WESTON.

WESTON has always been considered the best plug obtainable. Its quick grip and release that never fails, and grips so that it is impossible to pull the cords out. Yet by pressing the small projections, the cords fall out readily.

P108 Weston plug 3 6
P109 Patent plug, bakelite 1 9

BUFFALO.

This small plug is astonishingly popular. It is moulded, with plated barrel. The tips are instantaneously inserted or removed. The best value ever offered in plugs.

P133 1 0

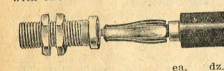
PLUGS.

See also VALVE PINS and SOCKETS, which are largely used as small plugs and sockets.

BANANA.

are very much appreciated after using other kinds of plugs. They can be supplied either red or black.

Banana plugs are so called from the resemblance of their contacts, which slide very easily into the sockets, yet perfect safety is secured at any points at least. They will be appreciated by very much after other plugs, which are either difficult to insert or make bad contact. Red or black. Sockets are brass, plated, fitted with two nuts.



P131 Plug only 2d. 2 6
P133 Socket only 3d. 2 6

BANANA COIL PLUG.

For short wave coils, a banana plug can be supplied without a coiled top, but with a screw to fix them to a coil mounting strip. These are used on MENTIVAVE SHORT WAVE COILS, and were specially made for us.

P137 Banana coil plug 3d. 2 6

WANDER PLUG—FITZ-ALL.

A new Wander plug, made of pressed metal, which is fitted with valve sockets, but will actually fit sockets much larger. It makes definite contact in every case. It is the best Wander plug we have seen. Brass, plated, with tops in six colours. You will like this Wander plug.



P138 Wander plug, Fitz-all 2d. 3 9

WANDER.

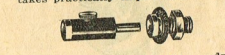
Plated, red or black tops. Easily attached to wire Split, and fits English valve sockets.



P130 Best quality 2d. 3 6
P136 Second quality 3d. 2 6

DISTINCTA.

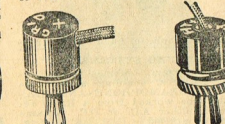
Plugs have knurled thumb screws, and are made in six colours—red, white, black, green, blue, yellow. Sockets have coloured discs to match the plugs. Brass parts plated. Used for battery connections, making mistakes practically impossible.



P132 Plug and socket 6d. 5 6

BELLING-LEE.

The Belling-Lee types have springy contact pins, while both wire and cord braiding are securely gripped, making a lasting contact with a freedom from frayed ends. State black or red.



P143 Side cord each 6d.
P144 Vertical cord each 6d.
Engraving extra.

PHONE COIL TIP.

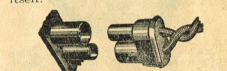
Similar to P144, but with long pin, not split, same size as phone cord tip. There is no need to disconnect your phone cords when the lugs pull off—use one of these instead.

P145 each 6

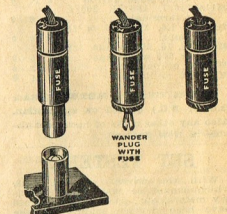
TWIN PLUG AND SOCKET.

All metal parts are completely insulated, and connections can only be made one way, ensuring correct polarity. The cords, both wire and braid, are securely gripped, without use of tools, or waste of time. Can be used for aerial masts.

Excellent for aerial earth, transformer, battery, connections, etc. Price includes the twin plug, and two parts attached to small panel shown, but not the piece of panel itself.



P146 Twin plug and socket 2 0



P145 Mono plug and socket, embodying protective fuse 1 6
P147 Mono plug and socket, similar to P145, but less fuse. Red or black 1 6
P149 Wander plug and socket 1 6
P151 Flexible wire fuse, complete 2 6
P152 Baseboard fuse and holder 2 6
P153 Spare fuses, for above 2 6

POTENTIOMETERS.

Potentiometers are really rheostats wound with fine wire, and having a high resistance, with a terminal at each end of the resistance as well as on the arm.

REX 600 OHM. A bakelite potentiometer, complete with knob. This will serve all purposes, as it will do equally well where 200 or 300 ohms are specified.



P153 Rex potentiometer 3 6
P154 Emmco, 400 ohms 4 6

WELL-MAYDE CHARGERS Under Westinghouse License.

PULLEYS.

(See under MASTS.)

ELECTRIFY YOUR RADIO.

By fitting an "A" ELIMINATOR to your RADIO, together with a "B" ELIMINATOR, you will derive the working current from the mains, dispensing with batteries. In many ways the RADIO will then be superior to the A.C. models on the market, especially on the score of expense in running, for the valves are fewer, much cheaper and have a much longer life.

WESTINGHOUSE RECTIFIERS.

(See also VALVES and TUNGAR BULBS.)

In our 1929 catalogue we expressed the opinion that WESTINGHOUSE RECTIFIERS would play a very important part in the electric Radios of the future. This prediction has been more than amply fulfilled.

The principle is known, but not explained. Electric current passes far more readily from copper oxide to pure copper, than vice versa. No one as yet seems able to explain why. A similar effect is noticed and used in other metal rectifiers, but in the latter, a chemical action goes on continuously, so that the rectifiers themselves quickly wear out. The Westinghouse effect is called electronic, not chemical, and no deterioration takes place. Thus the units are practically everlasting.

Before the Westinghouse rectifier was perfected, practically all rectifiers used in Radios were of the battery-charging or "B" eliminators, were valves. These waste considerable electricity, and have a comparatively short life. Westinghouse rectifiers waste very little, and last long, and do not need replacing.

No wonder therefore that for rectifying, Westinghouse is rapidly replacing valves, even though the former are rather more expensive.



12948 No. 6 1 12 6
12949 A3 6 1 23 6
12950 A4 6 1 8 0
12951 G.B.1 40 50 1 5 0
12952 G.B.2 120 150 1 8 0
12953 H.T.4 120 30 2 8 0
12954 H.T.1 200 100 4 10 0
12955 H.T.2 350 100 4 10 0

NOTES.

- The 6 and 9 volt rectifiers are for "A" chargers, "A" eliminators and dynamic speakers. For "A" eliminators, allow a thinby of the voltage for loss in the choke.
- G.B.1 is for "C" eliminators.
- H.T.s are for all for "B" or combined "B" and "C" eliminators.
- H.T.4 is used with a 135 volt transformer, through a peculiar circuit, the output being 150 volts.
- H.T.1 can be used direct from 230 volt A.C. mains, without a transformer, but the latter is advisable.
- Only "B" eliminators allow about 10 per cent. voltage drop in the chokes.

BRIEF SUMMARY OF WESTINGHOUSE SUPERIORITY.

- No liquids, construction being entirely metallic.
- High efficiency, so small current waste.
- Permanence.
- Maximum reliability.
- Very robust—no delicate parts to break.
- Absolute silence in operation.
- Easy to use, as transformer voltages are cut down to two volts.
- Only a simple secondary necessary for "B" eliminators.

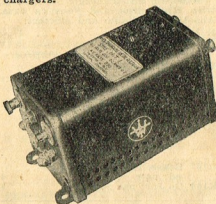
WESTINGHOUSE USES.

- Charging "A" accumulators.
- Charging "B" accumulators.
- "A" eliminators.
- "B" eliminators.
- "C" eliminators.
- Dynamic speakers.

Several of the above features may be combined in one apparatus, and other uses for the rectifiers are constantly being devised.

From the above, it can be seen that it is possible to electrify battery Radios, as well as to manufacture up-to-date electric Radios, with WESTINGHOUSE RECTIFIERS. Maximum efficiency will be assured.

See "A" and "B" eliminators and chargers.



OUTPUT VOLTS and AMPS or MILLIAMPS, are given, the transformer voltages being given under the corresponding transformers, e.g., the input voltage is designed for the A3 rectifier.

All rectifiers are in cases, EXCEPT A3 and A4.

OUTPUT.

Mfrrs.	No.	Volts.	Amps.
12948	No. 6	1	12 6
12949	A3	6	1 23 6
12950	A4	6	1 8 0
12951	G.B.1	40	50 1 5 0
12952	G.B.2	120	150 1 8 0
12953	H.T.4	120	30 2 8 0
12954	H.T.1	200	100 4 10 0
12955	H.T.2	350	100 4 10 0

Volts, m/amps.

Resistance is the "friction" of electricity, and, therefore, it is undesirable, since it means wastage. But just as friction is necessary to "brake" a vehicle, and therefore to control it, so is resistance absolutely essential to the control of electricity.

Some resistances are fixed, others variable. Resistance is measured in ohms, and in Radio the values may be from less than 1 ohm to 10 million ohms, or more.

It is called upon to do. This large variation accounts for the different names, i.e., use of a Rheostat is a variable resistor from 6 to 30 ohms. Grid leak is a fixed resistor from 1 to 10 megohms (million ohms), and so on.

This renders complete classification somewhat difficult, but information on this point is always available on enquiry.

USES—

Grid leaks, 1 to 10 megohms. Grid unpresses (for stabilising Radio circuits) 550 to 5000 ohms. Resistance coupled amplifiers, see "MATCHED RESISTORS".

Across audio transformers to improve tone—50,000 ohms to 25 megohms (250,000 ohms).

WELL-MAYDE RECTIFIERS, CHOKES AND TRANSFORMERS.

WESTINGHOUSE METAL RECTIFIERS offer great scope for the building of "A," "B," and "C" eliminators, chargers, rectifiers for dynamic speakers, and for other purposes where D.C. is essential. They can even be used to run D.C. motors, while a very recent application is the measurement of A.C. currents, with D.C. meters and metal rectifiers.

WESTINGHOUSE RECTIFIERS are not chemical—any chemical rectifier must wear out quickly, but WESTINGHOUSE RECTIFIERS do not wear out. A technical writer for

The following WELL-MAYDE transformers and chokes are manufactured in Australia, are fully guaranteed, and are supplied in metal cases, beautifully crystal enamelled. The input voltages in each case are 230 volts 50 cycle. Other voltages can be supplied, but only at an increased price.

There is a WELL-MAYDE TRANSFORMER and CHOKES for each WESTINGHOUSE RECTIFIER.

See under CHOKES and TRANSFORMERS. WRITE FOR WESTINGHOUSE BOOKLET, Post free, 3d. Contains fuller particulars, data, circuit diagrams, etc.

If you wish to discard batteries electrify your Radio with Westinghouse Metal Rectifiers.

Ask our advice.

RESISTORS.

Resistance is the "friction" of electricity, and, therefore, it is undesirable, since it means wastage. But just as friction is necessary to "brake" a vehicle, and therefore to control it, so is resistance absolutely essential to the control of electricity.

Some resistances are fixed, others variable. Resistance is measured in ohms, and in Radio the values may be from less than 1 ohm to 10 million ohms, or more. It is called upon to do. This large variation accounts for the different names, i.e., use of a Rheostat is a variable resistor from 6 to 30 ohms. Grid leak is a fixed resistor from 1 to 10 megohms (million ohms), and so on.

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Across audio transformers to improve tone—50,000 ohms to 25 megohms (250,000 ohms).

LYNCH METALLIZED FIXED RESISTORS

LYNCH FIXED RESISTORS are the "pick of the bunch." The resistance itself consists of a thin glass rod with a very thin film of metal electrically deposited on it, this accurately made unit being mounted in a glass tube hermetically sealed to moisture simply cannot get in to create noise in the set. The leak you will choose if you wish to make "absolutely sure."

DRY LYNCH RESISTOR GUARANTEED.

R101 GRID LEAKS, .25, .5, 1, 2, 3, 4, 5, 6, 8, 10 megs	2	6
R102 RESISTORS, 12,000, 25,000, 50,000, 75,000, 100,000 ohms	3	9
R127 RESISTORS, 500, 750, 1,000, 2,000, 4,000, 6,000, 8,000, 10,000	5	6

Mounts not included in prices.

RESISTORS—DE JUR.

These resistors are the result of much investigation to secure uniformity, combined with absolute freedom from temperature or moisture changes. The core is a special alloy, in the form of a colloidal film.



R163 1, 25, .5, 1, 2, 3, 4, 5, 6, 8, 10 megs	1	3
R124 25,000, 50,000, 75,000 ohms	2	6
R215 500, 750, 1,000, 1500, 2000, 3000, 5000, 10,000	3	9

GRID LEAKS—POWER.

Made in the following values, and used for power amplifiers and other purposes where the ordinary grid leak is too small. Two watt rating.



R253 1, 2, 3, 5, 10 megs and 25,000, 50,000, 75,000, 100,000	2	6
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GRAHAM-PARISH MEGITTES.

Supplied in 1, 2, 3, 4, 5 and 10 megs.
R167 Megittes, each ... 1 9

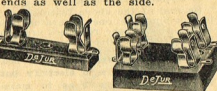
GRAHAM-PARISH STANDARD.

A good but cheap grid leak, made in England. Unit is enclosed in a bakelite tube.
R158 1, 2, 3, 4 or 5 megs ... 1 0

RESISTOR MOUNTS.

DE JUR.

These are made single and double. Base of bakelite. Clips are best phosphor bronze, nickel plated, and designed to grip the resistor at the ends as well as the side.



R161 Single mount	1	3
R162 Double mount	1	9
R164 Clips only, per pair	1	9

WELL-MAYDE MOUNTS.

Made in either single or double, with R167 clips, and Formica base. Absolutely reliable and efficient.
R161 Single mount ... 1 0
R162 Double mount ... 1 9

GRID LEAK CLIPS.



R167 Brass, best quality, plated; pair	6	
R164 De Jur; per pair	1	9

POWER RESISTORS.

POWER RESISTANCES are essential to all Radio sets which derive any current direct from the mains. Particularly are they a component of "B" ELIMINATORS for A.C. mains.

DE JUR.

DE JUR VITREOUS ENAMELLED RESISTORS are designed to satisfy fully the requirements of modern Radio apparatus. The resistance wire is the highest grade, and is wound on a porcelain refractory tube, firmly connected to lugs which cannot work loose.

Each resistance is calibrated to ensure accuracy. Then after a final test, the whole resistance is covered with a vitreous enamel and baked at a high temperature to harden the enamel.



R218 500, 750, 1,000, 1500, 2000, 2500, 3000 ohms	3	9
R219 3500, 5000, 7500, 10,000, 15,000 ohms	5	0
R220 20,000, 25,000 ohms	6	3
R221 50,000 ohms	7	6

DE JUR—20 WATTS.

R218 500, 750, 1,000, 1500, 2000, 2500, 3000 ohms	3	9
R219 3500, 5000, 7500, 10,000, 15,000 ohms	5	0
R220 20,000, 25,000 ohms	6	3
R221 50,000 ohms	7	6

DE JUR—40 WATTS.

R222 500, 750, 1,000, 1500, 2000, 2500, 3000 ohms	6	3
R223 5000, 5000, 7500, 10,000, 15,000, 20,000 ohms	7	6
R224 25,000 ohms	8	9
R225 50,000 ohms	10	0

WARD LEONARD.

Ward Leonard have been the most famous of resistor specialists in U.S.A. for very many years. Their resistors are sold under the name "VITROHM." They are made by winding a special resistance wire with practically zero temperature coefficient, on a refractory tube.

Vitrohm are not the cheapest resistors on the market, but what is more to the point, they are the BEST.

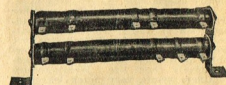
WARD LEONARD 507-6, 200 WATTS.

For intermediate voltages of 45, 67, 90, 135 and 490 in a current supply of 450 volts each. Total resistance 41,000 ohms. Maximum current 70 milliamperes.

R172 Each	4	0
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WARD LEONARD 507-70.

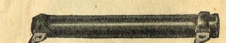
For Raytheon 350 millamp A. B. C. valve. Secures intermediate B voltages of 22, 45, 67, 135 and 180, also C negative bias of 40. Direct current of the rectifier under load should be about 220 volts.



R176 Each	4	0
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WARD LEONARD 507-94 to 67.

Type S are rated 44 watts in free air. Obtained in a wide range of values.



R177 1,500, 2,000, 2,500	6	0
R178 3,000, each	7	0
R179 4,000, each	9	6
R180 5,000, each	10	6
R181 10,000, each	13	6
R182 15,000, each	15	0
R183 25,000, each	19	6
R184 40,000, each	25	0
R185 100,000, each	31	6

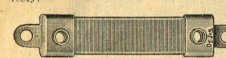
WARD LEONARD 507-47.

A kit containing eight separate resistors, 20 watts, current varying from 60 to 150 milliamperes. One each 750, 2000, 3500 ohms, two 5000 ohms, and three 1500 ohms. Total resistance 15,000 ohms.

R173 Kit	52	6
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FIXED ADJUSTABLE RESISTANCES.

It is rather difficult to find a name for these resistances. They are not variable in the sense that they have a knob attached to them for continuous changing. Actually, they are meant to be placed in the set, adjusted to suit, and then left indefinitely.



Can be supplied plain or with clamp and connector, as shown below.

The resistances serve many purposes, the main being the control of filament current for valves, rheostats being entirely discarded. The resistance is installed in the set, adjusted, and then left as long as the same valves are used.



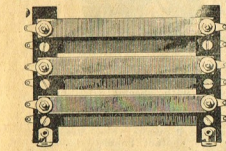
R236 2, 6, 10, 15, 30, 50 ohms	1	3
R237 100, 200 ohms	1	6
R238 400, 500, 600, 1000, 1500 ohms	1	9
R239 2000 ohms	2	6

WELL-MAYDE RESISTANCES.

We found the demand for different types of resistances so varied as to be very unsatisfactory. It was impossible to keep an adequate stock available in all lines, simply because many of them were wanted to-day, and then forgotten.

The factory therefore investigated the problem, and after much experimenting, have produced a very comprehensive range of wire wound resistors, in standard types, all of one type being wound on the same size strip, so as to be interchangeable.

The strip used is Formica, of a special grade. The wire is the best nichrome. Accurate winding machines ensure neat and close, but spaced windings. The result is a resistor that will do its work properly.



For "B" eliminators, where a number of resistances are used, a special mounting frame is supplied. This comprises two vertical strips of Formica, with plated brackets at the base for secure mounting. At intervals, tinued lugs are held in place by plated brass screws. The resistances can then be attached to the vertical strips with extra nuts, good contact being certain.

WELL-MAYDE "SOVEREIGN" RESISTANCES.

Strip is 1 inch wide, the end eyelets being spaced 4 1/2 inches apart, and suitable for 6/32 screws.
R270 1000, 2000, 3000, 5000, 7500, 10,000, 15,000, 20,000, 25,000, 30,000, 35,000, 40,000, 45,000, 50,000, 60,000, 70,000, 80,000, 90,000, 100,000 ohms 2 | 6 |

WELL-MAYDE "MONARCH" RESISTANCES.

Strip is 1 inch wide, and eyelets 4 1/2 inches apart, therefore fitting same mounting as the SOVEREIGN.
R271 1000, 2000, 3000, 5000, 7500, 10,000, 15,000, 20,000, 25,000, 30,000, 35,000, 40,000 ohms 2 | 0 |

WELL-MAYDE "PRINCE" RESISTANCES.

Strip is 1 inch wide, eyelets being 1 1/2 inches apart. For grid bias, etc.
R274 750, 1000, 1500, 2000 ohms 2 | 0 |

WELL-MAYDE RESISTANCE MOUNT.

A pair of mounting brackets, to take up to 6 Well-Mayde resistances. Nickel-plated foot brackets, with Formica strips, ready drilled and counter-sunk. Screws, nuts and washers included.

This mount, and WELL-MAYDE RESISTANCES will solve most, if not all, resistance problems for eliminator on the market.
R275 Well-Mayde mounts pair 1 6

PERMANENT WIRE RESISTANCES.

Small resistances, for small currents. Not suitable for large power packs. Complete with mounts.
R236 1000, 2000, 3000 ohms ... 6 6
R237 4000 to 40,000 ... 5 0
R238 50,000 ... 6 0
R239 100,000 ... 8 6
R240 75,000 ... 9 6
R241 100,000 ... 10 0

PILOT FIXED RESISTORS.

Wire wound, nichrome, on porcelain bases, protected by vitreous enamel.
R276 Pilot No. 960, 12,700 ohms, tapped ... 7 0
Other Pilot resistors from 450 to 10,000 ohms. Prices from 45c to 55c.

PILOT C-T RESISTANCES.

Centre tapped resistances, for filament circuits on A.C. sets; 10, 20, 50, or 75 ohms.
R277 ... each 1 6

PILOT RESISTOGRAD.

Variable resistance from 40-10,000 ohms. 20 watt size.
R279 Resistograd ... 6 0

PILOT VOLUMGRAD.

Variable resistor for volume and oscillation control. Supplied in four sizes, maximum resistance being 50,000, 100,000, 200,000, 500,000 ohms.
R280 Volumgrad ... 8 3

PILOT ADJUSTOGRAD.

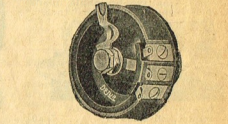
Variable resistance, 6-1000 ohms, used as oscillator suppressor in tuned "B" circuits.
R278 Adjustograd ... 3 0

RHEOSTATS.

Note.—Six ohm rheostats should generally be used for two or more valves.

DE JUR SUPPLY.

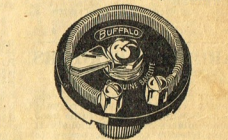
A genuine moulded bakelite rheostat, with resistance fastened in place by special brackets. Brass bushing designed to make most positive contact. Slider contact is of phosphor bronze, with velvet smooth movement. All metal parts heavily nickel plated. Supplied in 2, 6, 10, 20, 30, 50 ohms. Bakelite knob included.



R205 Each	4	6
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DE JUR BUFFALO.

A moulded bakelite rheostat, complete with bakelite knob. Suitable for all high-grade receivers. 2.21, 3.34, 4.5, 6.7, 10, 20, 30, 50 ohms.



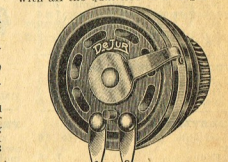
R206	each	3	0
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CONTINENTAL.

A moulded rheostat about 15 ohms, and suitable for the average neon plate with bakelite knob, on which an arrow is moulded. The cheapest rheostat on the market.
R258 15 ohm ... 1 6

DE JUR MIDGET.

A moulded bakelite base, with resistance unit fastened in place with special brackets. A small rheostat with all the qualities of a larger one.



R230 6, 10, 20, 30 or 50 ohms	2	6
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BRADLEYSTAT.

6 to 60 ohms.
R113 ... 7 6

LYNCH LEAKS ARE "SILENT."

AUTOMATIC FILAMENT RESISTORS.

Known as amperites when first marketed, these resistors automatically adjust the filament current, enabling rheostats to be dispensed with. They can be supplied for most makes of valves, either 4 or 6 volts, and in ordering it is necessary only to tell us what valve the resistance is for, and how many are to be used on the one resistor. For English and American valves.

LYNCH EQUALIZER.
The best quality obtainable, made by a firm specializing in resistors.



R234 Lynch equalizer, with mount, all sizes . . . 5 0

DE JUK THERMOSTAT.

Uses a nickel resistance element. Will withstand considerable overheat without burning out. 1255 Thermostats, with mount 4 1

AMPERITES.

Also supplied complete with a mount. 1235 Amperites . . . 4 6

VARIABLE RESISTORS (SPECIAL TYPE).

Recent improvements in the continuously variable type of resistor make it suitable for those to be used in many places where previously it was inadvisable to do so, owing to lack of durability.

MEMMCOASTS.



R237 No. 1 .25-100 ohms 7 6
No. 1A 0-2,000 ohms 7 6
No. 2 10,000-100,000 ohms 7 6
No. 3 2,500-25,000 ohms 7 6
No. 4 50,000-500,000 ohms 7 6
No. 6 .25-10 megs 7 6

MEMMCO POWERSTADS.

R238 No. 1 0-100 ohms 12 6
No. 2 0-1,000 ohms 12 6
No. 3 200-100,000 ohms 12 6

BRADLEY LEAK.

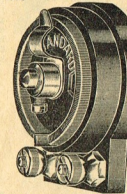
A variable grid leak, $\frac{1}{2}$ to 10 megs. 611 Each . . . 7 6

FROST HORN BALANCER.

A 20 ohm potentiometer, to centre tap filament in A.C. Radios, thus eliminating hum. 1233 . . . 7 6

ROYALTY (POTENTIOMETER).

In this the resistance element is protected by a wire winding which by its peculiar method of fitting, merely acts as a set of switch studs, thus protecting the element from wear. In appearance, it is exactly like a rheostat, and can be used either rheostat or potentiometer fashion.



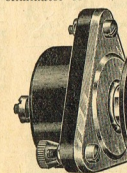
Note.—All ROYALTY RESISTANCES are fitted with THREE TERMINALS.

The lowest resistance possible should not be reckoned as less than about 10 per cent. of the figures given.

Range	Current	Ohms	Milliamps	S. d.
R198 F	2,000	25.0	6	6
R202 K	5,000	20.0	6	6
R199 G	10,000	16.5	6	6
R200 H	25,000	10.5	6	6
P251 C	50,000	7.5	6	6
R255 B	100,000	5.0	6	6
R201 J	200,000	4.0	6	6
R203 L	500,000	2.5	6	6
R196 D	700,000	2.0	6	6
R256 A	7 megs.	2	6	6

ROYALTY HEAVY DUTY.

A 10 watt variable resistance similar to the Clarostat. Range from 5000 to 10 megs, over several turns of the knob. Powerful enough for eliminator control.



R257 10 6

FROST, WITH D.C. SWITCH.

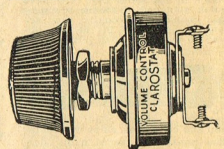
This variable resistance has a switch incorporated with it, for filament operation. As the resistance is turned on, the filaments are automatically lighted, volume control being then secured by further movement of the knob. 2000, 50,000, 200,000, or 500,000 ohms. 1236

R246 11 6

CLAROSTATS.

Clarostats are continuously variable resistances made in U.S.A.

STANDARD—20 WATTS.



R163 0-5 megs. 12 6
1500 ohms infinity . . . 12 6

POWER—40 WATTS.

R239 200-100,000 ohms . . . 19 6

SUPER-POWER—60 WATTS.

R240 200-100,000 ohms . . . 42 0

VOLUME CONTROL.

A small clarostat specially made for the control of volume (from pick-up), plate voltage, regeneration, or stabilization. Not meant for use in power circuits. Range 10-500,000 ohms.

R241 Volume control clarostat 8 6

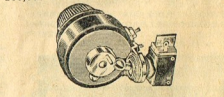
VOLUME CONTROL—TABLE TYPE CLAROSTAT.

This is No. R241 mounted in a container, and fitted with long cords and connector, so that the set can be controlled from some distance. Range 10-500,000 ohms.

R242 Table volume control . . . 13 6

FROST, WITH A.C. SWITCH.

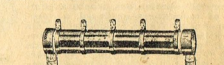
As R246, but with an A.C. snap switch, for 230 volts. Very substantial switches are necessary for this purpose, and the Frost will give every satisfaction. 2000, 25,000, 200,000 or 500,000 ohms.



R247 15 0

ACB RESISTANCES—50 watt.

Wound with special wire on a smooth porcelain tube, about 7 inch long and 1 1/2 inch diameter. Rated mounting clips secure the resistance to baseboard, while there are five adjustable contact bands. A very fine resistance.



R281 Ace 10,000 ohms . . . 9 0
200,000 10 6
R283 Ace 20,000 ohms . . . 12 0

SCREWS, NUTS, WASHERS.

Without question, our range of these is the largest in the country. In fact, it is equally beyond dispute that our range of RADIO APPARATUS is not only the largest, but EASILY SO.

U.S.A. SCREWS AND NUTS.

For ordinary purposes, U.S.A. screws are recommended, because a range of only four sizes will cover practically every requirement in Radio. In fact, the two sizes (6/32 and 8/32) would almost do so.

All U.S.A. screws and nuts are brass, nickel plated, and the nuts are guaranteed to fit the screws properly. The nuts are hexagon, double chamfered, to give nearest appearance.

The first number in the U.S.A. sizes denotes the gauge thickness of the screw, and the approximate equivalent in inches is given alongside. The second number (32 or 36) denotes the threads per inch.

Either ROUND HEAD (R/H) or COUNTERSUNK (C/S) screws can be supplied at the same price. Nuts are extra in every case.



Length. 2/56 (1/12in) 3/48 (1/10in)
1/2 or 3/32 3d. 2/6 4d. 3/—
NUTS 4d. 3/— 4d. 3/—

4/36 (3/32in) 6/32 (1/16in)
1/2 3d. 2/6 3d. 2/9
1/4 4d. 3/— 4d. 3/6
1/2 1in. 7d. 6/6 8d. 7/6
1 1/2 11d. 11/— 12d. 11/—
NUTS 4d. 3/6 4d. 3/6

3/32 (5/32in) 10/32 (3/16in)
1/2 4d. 3/9 6d. 5/6
1/4 6d. 5/6 7d. 6/—
1 1/2 7d. 6/6 8d. 7/—
2 1/2 15d. 13/6 18d. 15/—
NUTS 5d. 4/6 6d. 5/6

CAP NUTS, 6/32, 8/32, 10/32.

Cap nuts fit over the ends of screws, entirely concealing the threaded portion. By using cap nuts, an extraordinary neat appearance is given to the work. Brass, nickel plated.



ea. dz.
S142 All sizes same price 2d. 1/6
English 2 or 4 B.A. same price.

B.A. SCREWS AND NUTS.

B.A. is the standard for all British electrical apparatus. Sizes 1 to 6 B.A. are listed, but other sizes from 0-10 are sometimes available.

The SCREWS are brass, nickel plated, either round head or countersunk.

The hexagon nuts are also brass, nickel plated.

Length. 1 B.A. 2 B.A.
1/2 6d. 5/6 4d. 3/6
1/4 3d. 7/— 3d. 4/6
1in. 9d. 8/— 6d. 5/6
NUTS 6d. 5/6 4d. 3/6

3 B.A. 4 B.A.
1/2 4d. 3/— 3d. 2/6
1/4 3d. 7/— 3d. 4/6
1in. 5d. 4/6 4d. 3/6
NUTS 4d. 3/— 4d. 3/—

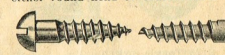
5 B.A. 6 B.A.

1/2 3d. 2/6 3d. 2/3
1/4 3d. 2/6 3d. 2/6
1in. 4d. 3/— 3d. 2/3
NUTS 3d. 2/6 3d. 2/6

U.S.A. sizes, 6/32, 8/32, 10/32, 1/2, 3/4, 1, 1 1/2, 2, 3, 4, 5, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100.

WOOD SCREWS.

Stocked in brass, nickel plated, either round head or countersunk.



The gauge sizes are given, the smaller the number, the thinner the screw.

The gauge size given first is the usual, but owing to the demand for thinner screws, an alternative thinner screw is offered.

Length. Gauges dz. gr.
1in. 3. 1. 3d. 5/8
1/2 4. 2. 4d. 3/6
3/4 5. 3. 5d. 4/6
1in. 6. 4. 6d. 5/6
1 1/2 7. 5. 7d. 6/6
2 8. 6. 8d. 7/6
3 9. 7. 9d. 8/6
4 10. 8. 10d. 9/6

ENURED NUTS.

Brass, nickel plated.



ea. dz.
S170 Any size . . . 2d. 1 9

WING NUTS, 4/32, 6/32, 8/32, 10/32.

There is no need to suggest uses for wing nuts. Stocked in four sizes, to fit U.S.A. screws. Brass, nickel plated.

ea. dz.
S147 Any size . . . 2d. 1 9

WASHERS.



These washers are BRASS, cleanly cut, and nickel plated. The data given are—O.D. (outside diameter), I.D. (diameter of hole) U.S.A. screw that the washer will fit.

O.D. I.D. Screws dz. gr.
1/2 1in. 10/16 4/32 3d. 1/6
3/4 1 1/16 1/2 4/32 3d. 1/6
S145 9/32in. 1/2 4/32 3d. 1/6
S147 1in. 1/2 4/32 3d. 1/6
S148 1 1/16 1/2 4/32 3d. 1/6
S149 7/16 1/2 4/32 3d. 1/6
S150 7/16 1/2 4/32 3d. 1/6
S151 1in. 1/2 4/32 3d. 1/6
S152 1 1/16 1/2 4/32 3d. 1/6

SPRING WASHERS.

Spring washers consisting of a couple of turns of flat phosphor bronze strip. Nickel plated. Two sizes, 5/32, and 3/16in.

dz. gr.
S180 6d. 5/—

SHAKEPROOF LOCK WASHERS.

It has been left to the SHAKEPROOF LOCK WASHER COMPANY to devise a simple washer which has the following advantages:—

1. They do not angle, causing delay and inconvenience in separating them when they are wanted.
2. They grip at a number of points, thus making a perfect lock.
3. They are not cut radially, thus they cannot spread out or slip out of place.
4. They are comparatively thin.

The illustration shows exactly how these washers are made—high grade steel, with the TWISTED TEETH THAT LOCK.

TRY SHAKEPROOF WASHERS on the number plates and fittings of your CAR or MOTOR CYCLE. This will prove their utmost reliability. You will then not hesitate to adopt them wherever you use washers.



The Radio sizes (4/32 to 10/32) are given in parenthesis alongside the corresponding bolt and screw size. All sizes have a larger bore than the actual bolt, to ensure easy fitting.

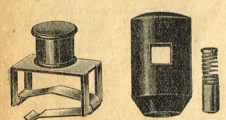
INTERNAL OR EXTERNAL TEETH, SAME PRICE.

Bolt thickness. per dz. per gr.
1/10 (4/32) . . . 3d. 2/—
5/32 (8/32) . . . 3d. 2/—
3/16 (10/32) . . . 3d. 2/—
1/2 3d. 2/—
5/16 . . . 3d. 2/9
3/4 . . . 3d. 2/9
7/16 . . . 3d. 2/9
1 1/2 . . . 3d. 2/9
2 . . . 3d. 2/9
3 . . . 3d. 2/9
4 . . . 3d. 2/9
5 . . . 3d. 2/9
6 . . . 3d. 2/9
7 . . . 3d. 2/9
8 . . . 3d. 2/9
9 . . . 3d. 2/9
10 . . . 3d. 2/9
11 . . . 3d. 2/9
12 . . . 3d. 2/9
13 . . . 3d. 2/9
14 . . . 3d. 2/9
15 . . . 3d. 2/9
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91 . . . 3d. 2/9
92 . . . 3d. 2/9
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94 . . . 3d. 2/9
95 . . . 3d. 2/9
96 . . . 3d. 2/9
97 . . . 3d. 2/9
98 . . . 3d. 2/9
99 . . . 3d. 2/9
100 . . . 3d. 2/9

SPECIAL PRICES TO GARAGES, ELECTRICIANS AND ENGINEERS.

SLIDERS.

Sliders are made to fit in. square brass rod. Rods can be purchased either in plain brass or ready drilled and plated.



S104 Plated, coloured knob ... 4d.
S102 Black, with spring plunger ... 4d.

SLIDER ROD-PLATED.

These are in. square, to fit above sliders 6in. long. Plated and drilled ready for use.

For plain brass rod, see under BRASS.

SPECIAL QUOTATIONS FOR SCREWS AND NUTS IN QUANTITIES.

SOLDER AND FLUX.

RESIN-FOR SOLDER.

A high-grade solder, made in England, and used locally by responsible authorities. Better than all others. S187 1lb. (approx. 35ft.) ... 1 6
S188 5ft. length ... 1 6

(See under Tools.)

SHIELDS.

Most modern Radio sets are shielded by enclosing all or part of the apparatus in aluminium boxes. These are most effective when they are made of thick aluminium, but, nevertheless, the lighter shields are very effective indeed.

In co-ordination with New Zealand Radio and the Radio Record, we intend to manufacture shields in standard sizes, and to keep the cost down, these journals will adhere to standard sizes as far as possible. Special sizes can always be made to order, but are naturally rather more costly.

WELL-MAYDE SHIELD.

Made from 14 g. aluminium (about 1/16th in. thick), with special grooved corner rods. Rightly installed, they with eight sets, and entirely collapsible. Supplied unassembled, they can be assembled in a few minutes. Size, 9 x 6 x 5 inches. The shield for the expert.

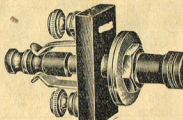
ACE SHIELD.

A lighter shield, designed for easy assembly and efficient working. Size 9 x 6 x 5 in. S183 ... 9 0

SWITCHES.

WELL-MAYDE 'A' BATTERY.

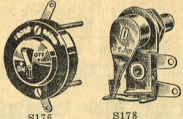
A simple, efficient and durable switch, mounted on Porcelain base, all brass parts being nickel plated. The springs are hard and springy, making the switch very free from trouble. Working parts can be inspected a decided advantage. Single hole mounting.



S184 Well-Mayde switch ... 1 6

TOGGLE SWITCH.

In this a small lever is moved up and down. Bakelite frame. "On" and "Off" words moulded in.



S176 Toggle switch ... 1 6

DE JUE.

Different from the usual push-pull switch, in that it is very small and neat. Contacts are self-cleaning. Complete with handsome bakelite knob.

S173 Each ... 2 0

RADIO POWER SWITCH.

For the new A.C. sets, switches must be entirely different from the older push pull type. Tumbler switches could be used, but are much too clumsy. This switch can be mounted on a panel, has a quick make and break, and is very suitable for A.C. sets, electric gramophones, etc. Plate, engraved on-off, included.



S181 ... 2 6

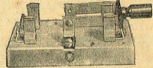
LEADERS IN RADIO

Since 1920.

PORCELAIN BASE.

Useful for aerial-earth switches, for launches and other low voltage circuits. Plated.

S111 Single pole, double throw, each ... 1 6



S112 Double pole, double throw, each ... 2 6

Aerial switch, with spark gap, similar to S111 ... 1 6

SWITCHES, MINIATURE-PARTS.

These switches are very useful for Radio and other purposes where a small switch is required. Two grades are supplied, both being plated. A template for easy marking of the panel is included with each.



S114 S.P. D.T. A quality; ea ... 1 6

S115 S.P. D.T. B quality; ea ... 2 0

S116 D.P. D.T. A quality; ea ... 1 0

S117 D.P. D.T. B quality; ea ... 1 0

SWITCH ARMS-Plated.



S122 ... 1 6

S123-179 (bearing) ... 1 6

Taper knob, with plated adjustable blade to 1 1/2 inch. Brass bearing. S122 Each ... 1 0

S123 Each ... 1 0

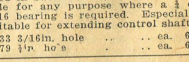
BEARINGS.

Brass bearings, nickel plated, as used in switch arms, but also available for any purpose where a 1/16 bearing is required. Especially suitable for extending control shafts.

S123 1/16in. hole ... ea. 6d.

S124 1/8 in. hole ... ea. 6d.

SWITCH POINTS AND STOPS.



S125 SWITCH POINTS 1 0 11 0

S126 SWITCH STOPS 1 0 11 0

These are used in conjunction with switch arms for tuning coils, variable battery voltages, variable resistances and similar apparatus. Both are nickel plated on brass, with plated brass nuts. The points are in. diameter, 1/8 in. deep.

S125 SWITCH POINTS 1 0 11 0

S126 SWITCH STOPS 1 0 11 0

DEWAR SWITCHES.

All Dewar switches have three positions, and they combine in a very small space the necessary means of obtaining complicated switching that otherwise would require very bulky and clumsy switches. They are very neat, and work extremely smoothly.

The smallest type can be used for switching from Radio to electric gramophone working, and for operating two tick-urvy gramophone fitted with two turntables.

A trial will convince you that the N. and K. has no equal—they are in a class by themselves. Experts are agreed on this.

So confident are we of N. and K. quality, that not only do we give our own personal guarantee with every pair for twelve months, but if you find they are not as represented, DO NOT HESITATE TO RETURN THEM—your purchase price will be refunded in full.

S169 24 contacts ... 12 0
S182 12 contacts ... 10 6
S186 6 contacts ... 9 0

TELEPHONES.

Telephones find many uses other than the usual one with crystal sets. For long distance and short wave work, they are almost essential.

Those who are, unfortunately, deaf can almost hear quite well through a pair of phones connected to the Radio. We can always arrange in such cases, that others in the house can use the speaker at the same time.

Further, we can supply apparatus which enables deaf persons to take part in the ordinary conversation in a room. The cost is really very small for the benefits obtained.

In times of sickness, telephones can be connected from any room to the Radio by a long cord. Many hours are thus made infinitely more pleasant.

We could offer cheaper phones—but we could not guarantee them. Quality comes first with us.

The N. and K. has a wonderful "phone at the price. They are every bit as reliable as the Senior, in fact, they carry exactly the same guarantee.

We carry a very large stock of "phone coils of various sizes, but if we cannot repair your phones with these, we can usually return the old "phone. This is worth while only with good quality phones, however.

Only very rarely can we fit ear-cups, except to phones which we ourselves have supplied.

WARNING.

When buying phones, make sure that you can obtain spare parts, such as earcups and diaphragms. Actually, such parts can be obtained for very few phones and speakers.

JOHN LTD. CARRY SPARE PARTS FOR EVERY PHONE LISTED.

N. AND K. SENIOR.

The outward finish of N. and K. phones is very attractive indeed, the nickel plating being absolutely superb. But not until the smoothly polished earcup is removed does it become clear that the apparatus inside is made with the precision of a watch because very evident.

A trial will convince you that the N. and K. has no equal—they are in a class by themselves. Experts are agreed on this.

So confident are we of N. and K. quality, that not only do we give our own personal guarantee with every pair for twelve months, but if you find they are not as represented, DO NOT HESITATE TO RETURN THEM—your purchase price will be refunded in full.

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S186 6 contacts ... 9 0

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S182 12 contacts ... 10 6
S186 6 contacts ... 9 0

S169 24 contacts ... 12 0
S182 12 contacts ... 10 6
S186 6 contacts ... 9 0

BROWN FEATHERWEIGHT.

The well-known English light-weight phones, made by the most famous English maker. Aluminium headbands.

T122 FEATHERWEIGHT ... 15 0
T172 Earcup ... 2 6
T176 Diaphragm ... 1 0

T173 C.A.s (fitting 2s. extra), per earpiece ... 6 0

PHONE COILS.

Flexible "phone coils can be supplied with pins on all ends, or with two pins and four lugs, the latter being usual.

T123 All pins ... 2 0
T129 Four loops, two pins ... 2 0

TELEPHONE COILS.

Please read the comments on SPEAKER COILS, because they apply in exactly the same way to telephones. If your "phones are burnt out, we are nearly certain to be able to fit new coils at a low price.

PHONE CUSHIONS.

Sponge rubber cushions fit over the earcups of your phones, and make them feel very pleasant and comfortable. They also exclude external noises, making weak signals much more plain.

S169 24 contacts ... 12 0
S182 12 contacts ... 10 6
S186 6 contacts ... 9 0

S169 24 contacts ... 12 0
S182 12 contacts ... 10 6
S186 6 contacts ... 9 0

S169 24 contacts ... 12 0
S182 12 contacts ... 10 6
S186 6 contacts ... 9 0

S169 24 contacts ... 12 0
S182 12 contacts ... 10 6
S186 6 contacts ... 9 0

S169 24 contacts ... 12 0
S182 12 contacts ... 10 6
S186 6 contacts ... 9 0

S169 24 contacts ... 12 0
S182 12 contacts ... 10 6
S186 6 contacts ... 9 0

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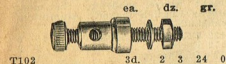
S169 24 contacts ... 12 0
S182 12 contacts ... 10 6
S186 6 contacts ... 9 0

S169 24 contacts ... 12 0
S182 12 contacts ... 10 6
S186 6 contacts ... 9 0

S169 24 contacts ... 12 0
S182 12 contacts ... 10 6
S186 6 contacts ... 9 0

TERMINALS AND STRIPS ENGRAVED TO ORDER.

TERMINALS—PLATED



T102 3d. 2 3 24 0



T103 Wood screw 3d. 2 3 24 0



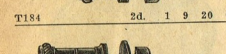
T119 Double 6d. 5 6 60 0



T104 3d. 3 0 33 0

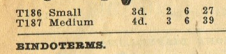


T184 2d. 1 9 20 0



T186 Small 3d. 2 6 27 0

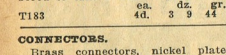
T187 Medium 4d. 3 6 39 0



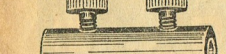
T188 2d. 1 9 20 0



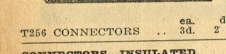
T183 4d. 3 9 44 0



T184 2d. 1 9 20 0

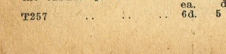


T185 2d. 1 9 20 0



T186 Small 3d. 2 6 27 0

T187 Medium 4d. 3 6 39 0



T188 2d. 1 9 20 0



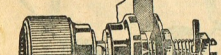
In the past, a number of Belling-Lee Type B terminals that proved defective were inadvertently sold. If any customer received these, he can have them replaced with new terminals on sending the old ones back to us.

No trouble will be experienced with the new terminals, all defects having now been removed, and the terminal made practically perfect.

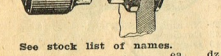
See stock list of names.

TYPE B—ENGRAVED.

These terminals are of substantial size, and being of finely moulded bakelite, have a superb appearance. The engraved top does not rotate, so that once the terminals are fixed, the readings always line up. 8 inch diameter, height 1 inch above panel. End is slotted to grip wire firmly without soldering. Non-removable top.



T189 2d. 1 9 20 0



T190 2d. 1 9 20 0

T191 2d. 1 9 20 0

T192 2d. 1 9 20 0

T193 2d. 1 9 20 0

T194 2d. 1 9 20 0

T195 2d. 1 9 20 0

T196 2d. 1 9 20 0

T197 2d. 1 9 20 0

T198 2d. 1 9 20 0

T199 2d. 1 9 20 0

T200 2d. 1 9 20 0

T201 2d. 1 9 20 0

T202 2d. 1 9 20 0

T203 2d. 1 9 20 0

T204 2d. 1 9 20 0

T205 2d. 1 9 20 0

T206 2d. 1 9 20 0

T207 2d. 1 9 20 0

T208 2d. 1 9 20 0

T209 2d. 1 9 20 0

T210 2d. 1 9 20 0

T211 2d. 1 9 20 0

T212 2d. 1 9 20 0

T213 2d. 1 9 20 0

T214 2d. 1 9 20 0

T215 2d. 1 9 20 0

T216 2d. 1 9 20 0

T217 2d. 1 9 20 0

T218 2d. 1 9 20 0

T219 2d. 1 9 20 0

T220 2d. 1 9 20 0

T221 2d. 1 9 20 0

T222 2d. 1 9 20 0

T223 2d. 1 9 20 0

T224 2d. 1 9 20 0

ENGRAVED TERMINALS.

There is no doubt that terminals, suitably engraved or named, not only add considerably to the appearance of a home-built Radio set, but also make it far easier to connect up the set correctly, especially if it is ever disconnected some time after construction.

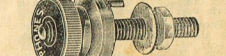
The extra cost of these terminals is very small indeed, while a large variety of names is available. These are in the common terms in use in New Zealand, not the little-known English terms. In special cases, too, we can engrave the terminals with any name to suit. This is a service few firms can offer.

As an alternative to engraved terminals, we can engrave terminal strips as used, and are described later.

STOCK LIST TERMINAL NAMES.
AERIAL PHONES
B BATT. B BATT. + DEF.
C BATT. + B BATT. + R.F.
O BATT. + B BATT. + A.P.
C BATT. + B BATT. + F.W.R.
C BATT. + F.W.R.

PLATED.

Brass plated terminals, with names engraved on red and black insets. Two sizes with all names as per special list.



T206 Medium 4d. 5 9 66 0

T207 Small 4d. 5 9 66 0

T208 Small 4d. 5 9 66 0

T209 Small 4d. 5 9 66 0

T210 Small 4d. 5 9 66 0

T211 Small 4d. 5 9 66 0

T212 Small 4d. 5 9 66 0

T213 Small 4d. 5 9 66 0

T214 Small 4d. 5 9 66 0

T215 Small 4d. 5 9 66 0

T216 Small 4d. 5 9 66 0

T217 Small 4d. 5 9 66 0

T218 Small 4d. 5 9 66 0

T219 Small 4d. 5 9 66 0

T220 Small 4d. 5 9 66 0

T221 Small 4d. 5 9 66 0

T222 Small 4d. 5 9 66 0

T223 Small 4d. 5 9 66 0

T224 Small 4d. 5 9 66 0

T225 Small 4d. 5 9 66 0

T226 Small 4d. 5 9 66 0

T227 Small 4d. 5 9 66 0

T228 Small 4d. 5 9 66 0

T229 Small 4d. 5 9 66 0

T230 Small 4d. 5 9 66 0

T231 Small 4d. 5 9 66 0

T232 Small 4d. 5 9 66 0

T233 Small 4d. 5 9 66 0

T234 Small 4d. 5 9 66 0

T235 Small 4d. 5 9 66 0

T236 Small 4d. 5 9 66 0

T237 Small 4d. 5 9 66 0

T238 Small 4d. 5 9 66 0

T239 Small 4d. 5 9 66 0

T240 Small 4d. 5 9 66 0

T241 Small 4d. 5 9 66 0

T242 Small 4d. 5 9 66 0

T243 Small 4d. 5 9 66 0

T244 Small 4d. 5 9 66 0

T245 Small 4d. 5 9 66 0

T246 Small 4d. 5 9 66 0

T247 Small 4d. 5 9 66 0

T248 Small 4d. 5 9 66 0

T249 Small 4d. 5 9 66 0

T250 Small 4d. 5 9 66 0

T251 Small 4d. 5 9 66 0

T252 Small 4d. 5 9 66 0

T253 Small 4d. 5 9 66 0

T254 Small 4d. 5 9 66 0

T255 Small 4d. 5 9 66 0

T256 Small 4d. 5 9 66 0

T257 Small 4d. 5 9 66 0

T258 Small 4d. 5 9 66 0

T259 Small 4d. 5 9 66 0

T260 Small 4d. 5 9 66 0

T261 Small 4d. 5 9 66 0

T262 Small 4d. 5 9 66 0

T263 Small 4d. 5 9 66 0

T264 Small 4d. 5 9 66 0

T265 Small 4d. 5 9 66 0

T266 Small 4d. 5 9 66 0

T267 Small 4d. 5 9 66 0

T268 Small 4d. 5 9 66 0

T269 Small 4d. 5 9 66 0

T270 Small 4d. 5 9 66 0

T271 Small 4d. 5 9 66 0

T272 Small 4d. 5 9 66 0

T273 Small 4d. 5 9 66 0

T274 Small 4d. 5 9 66 0

T275 Small 4d. 5 9 66 0

T276 Small 4d. 5 9 66 0

T277 Small 4d. 5 9 66 0

T278 Small 4d. 5 9 66 0

T279 Small 4d. 5 9 66 0

T280 Small 4d. 5 9 66 0

T281 Small 4d. 5 9 66 0

T282 Small 4d. 5 9 66 0

T283 Small 4d. 5 9 66 0

T284 Small 4d. 5 9 66 0

T285 Small 4d. 5 9 66 0

T286 Small 4d. 5 9 66 0

T287 Small 4d. 5 9 66 0

T288 Small 4d. 5 9 66 0

T289 Small 4d. 5 9 66 0

T290 Small 4d. 5 9 66 0

T291 Small 4d. 5 9 66 0

T292 Small 4d. 5 9 66 0

T293 Small 4d. 5 9 66 0

T294 Small 4d. 5 9 66 0

T295 Small 4d. 5 9 66 0

T296 Small 4d. 5 9 66 0

T297 Small 4d. 5 9 66 0

T298 Small 4d. 5 9 66 0

T299 Small 4d. 5 9 66 0

T300 Small 4d. 5 9 66 0

T301 Small 4d. 5 9 66 0

T302 Small 4d. 5 9 66 0

T303 Small 4d. 5 9 66 0

T304 Small 4d. 5 9 66 0

T305 Small 4d. 5 9 66 0

T306 Small 4d. 5 9 66 0

T307 Small 4d. 5 9 66 0

T308 Small 4d. 5 9 66 0

T309 Small 4d. 5 9 66 0

T310 Small 4d. 5 9 66 0

T311 Small 4d. 5 9 66 0

T312 Small 4d. 5 9 66 0

T313 Small 4d. 5 9 66 0

T314 Small 4d. 5 9 66 0

T315 Small 4d. 5 9 66 0

T316 Small 4d. 5 9 66 0

T317 Small 4d. 5 9 66 0

T318 Small 4d. 5 9 66 0

T319 Small 4d. 5 9 66 0

T320 Small 4d. 5 9 66 0

T321 Small 4d. 5 9 66 0

T322 Small 4d. 5 9 66 0

T323 Small 4d. 5 9 66 0

T324 Small 4d. 5 9 66 0

T325 Small 4d. 5 9 66 0

T326 Small 4d. 5 9 66 0

T327 Small 4d. 5 9 66 0

T328 Small 4d. 5 9 66 0

T329 Small 4d. 5 9 66 0

T330 Small 4d. 5 9 66 0

T331 Small 4d. 5 9 66 0

T332 Small 4d. 5 9 66 0

T333 Small 4d. 5 9 66 0

T334 Small 4d. 5 9 66 0

T335 Small 4d. 5 9 66 0

T336 Small 4d. 5 9 66 0

T337 Small 4d. 5 9 66 0

T338 Small 4d. 5 9 66 0

T339 Small 4d. 5 9 66 0

T340 Small 4d. 5 9 66 0

T341 Small 4d. 5 9 66 0

T342 Small 4d. 5 9 66 0

T343 Small 4d. 5 9 66 0

T344 Small 4d. 5 9 66 0

T345 Small 4d. 5 9 66 0

T346 Small 4d. 5 9 66 0

T347 Small 4d. 5 9 66 0

T348 Small 4d. 5 9 66 0

VALVES.

THE FILAMENT of every VALVE is tested before despatch or sale, and no claims for valves returned with defective filaments CAN BE ENTERTAINED.

UNDER NO CIRCUMSTANCES are valves sent out on trial or approval. We cannot offer subsequent customers second hand valves. We supply only RELIABLE BRANDS, and American valves are not made with English bases.

VALVE BASES.

The American bases—UX for ordinary and UY for A.C. valves—are by far the most common in New Zealand, and should always be adopted. English and Continental valves are made with UX bases, but American valves are not made with English bases.

ALWAYS STATE UX OR ENGLISH BASE in ordering—otherwise UX BASE WILL BE SENT.

CURRENT CONSUMPTION.

This is important to those who use dry batteries, especially "B" batteries. Many valves with small "A" consumption far exceed that made up in "B," which is really much more expensive. Our advice is always available on the choice of valves.

"A" BATTERY.

Six volt is usual in this country, and should be adopted where possible, where accumulators are used. For dry battery, the UX159 valve, in our opinion, is the only valve possible for economy.

The third column in the valve table gives the voltage of the battery to be used—usually, rather higher than the actual voltage of the valve.

PURPOSE.

The following explains the second column abbreviations: D, detector; R, Radio amplifier; A, audio amplifier; C, resistance coupled amplifier; S.G., screened grid; Pen., Pentode; P, super power amplifier.

WHEN IN DOUBT, CONSULT US ABOUT VALVES.

A.C. VALVES.

These have filaments heated, directly or indirectly, by low voltage A.C. through a simple transformer. Valves of this kind must not be interchanged—when replacement is made, great care must be taken to see that a valve identical in characteristics with the old one is fitted. Otherwise the new and the old valves may all be damaged.

A.C. valves seem to be continually changing both in design and price, but as with all apparatus, we make any reduction at the earliest possible moment.

SCREENED GRID VALVES.

Screened grid valves have amplifying possibilities up to over 500 times, but unfortunately, no satisfactory circuit has yet been devised that enables amplifying above about 20 times. It is a valve with enormous possibilities, but at present, except for short wave work, it cannot perhaps be said to be definitely more satisfactory, taken all round, than ordinary battery valves.

When used, it must be in a specially designed circuit, with every stage carefully shielded.

Details are given in table below.

PENTODE.

This has three grids, and is used as a last stage audio. Properly installed, it makes a one stage amplifier better by 20 or 30 per cent. in New Zealand, where one stage amplifiers are not very common, the Pentode valve has enjoyed little popularity, because its extra cost is almost equal to another stage, which gives much better results.

Details are given in table below.

POWER VALVES.

Ample volume with pure tone can be obtained only by the use of power valves, requiring high "B" and "C" voltages, and a speaking coil. For theatre and hall use, only those valves on opposite page marked with the "BLACK" ⬛ should be used. The UX245 is very popular because of its very great power on only 250 volts "B."

RECTIFIERS.

These are used for "B" eliminators, or power packs, etc., although Westinghouse rectifiers are preferable. For the maximum output volts and milliamperes are given. Equivalent Philips in brackets.

UX388 F 300v. 125mA (1560) 25 0
UX281 H 450v. 125mA (1682) 50 0
Raytheon, F 300v. 125 mA 25

RADIOTRON A.C. VALVES.

Philips equivalent are given in brackets.
UX226 (P109) Amplifier 14 0
UX224 (P209) Screened grid 22 0
UX227 (P209) Screened grid 29 6
UX245 Super power amplifier 25 0
UX250 P Super power amplifier 75 0

PHILIPS 4-volt, A.C.

E408 E409 E424 E450 E435 C443 30 0
E415, 37/6 E445, 32/6, E443 40 0

MULLARD A.C.

B406 P Acc. 4 15 30 30-45 45-150 6 4,200 13 6
B405 P Acc. 4 15 30 30-45 45-150 9 2,500 15 0
B409 P Acc. 4 15 30 30-45 45-150 9 4,500 15 0

B403 AP Acc. 4 15 30 30-45 45-150 15-24 2,100 15 0
A415 D Acc. 4 15 30 30-45 45-150 15 7,500 13 6

A409 DAR Acc. 4 15 30 30-45 45-150 15-24 9 7,500 13 6
B405 DAR Acc. 6 15 30 30-45 45-150 45-15 6 2,800 13 6

A630 DRC Acc. 6 15 30 30-45 45-150 15-24 30 35,000 13 6
C602 P Acc. 6 15 30 30-45 45-150 15-24 23 1,500 15 0
A615 D Acc. 6 15 30 30-45 45-150 15 6,250 13 6

RADIOTRON UX221.

A new Radiotron valve, taking only .05 amp. at 6 volts, and designed to replace 20A in any circuit without reneutralising. This valve is so important, that we are giving it speciality here, as well as in the table.

So far, we have sold a good quantity, with extremely good results. Replace your 20A with it, and cut "A" battery charging to less than a quarter.

DEH210 DRC Acc. 2 10 6 40-80 120-150 0-13 35 50,000 13 6
HL210 DAC Acc. 2 10 6 50-90 70-150 13-24 20 23,000 13 6
DEH210 DAR Acc. 2 10 6 40-80 70-150 3-7 11 12,000 13 6
DEH210 A Acc. 2 10 6 40-80 70-150 11-10 13 4,000 13 6
DEH210 P Acc. 2 10 6 40-80 70-150 12-24 4 2,500 20 0

DEH410 DRC Acc. 4 10 6 40-80 70-150 0-13 40 60,000 13 6
DEH410 DAR Acc. 4 10 6 40-80 70-150 11-14 15 8,500 13 6
DEH410 P Acc. 4 10 6 40-80 70-150 11-10 13 4,000 13 6
P425 P Acc. 4 10 6 40-80 70-150 73-163 4.5 2,300 20 0

DEH610 DRC Acc. 6 10 10 40-80 70-150 0-13 40 60,000 13 6
EL610 DAR Acc. 6 10 10 40-80 70-150 0-13 30 30,000 13 6
DEH610 DAR Acc. 6 10 10 40-80 70-150 11-14 15 7,500 13 6
DEH610 P Acc. 6 10 10 40-80 70-150 41-9 8 2,500 13 6

P625 P Acc. 6 25 6 100-250 6-24 6 2,400 20 0
P65A P Acc. 6 25 6 100-180 133-30 3.7 1,600 20 0
LS6 P Acc. 6 15 8 100-150 2-40 5 6,000 35 0
LS6A P Acc. 6 15 8 100-150 30-130 2.5 2,700 35 0
LS6A P Acc. 6 15 6 300-400 50-125 2.5 1,400 40 0

PM15F DR Acc. 2 1 6 35-100 50-125 1-3 18 25,500 13 6
PM15F DAR Acc. 2 1 6 30-100 50-125 2-9 11 12,000 13 6
PM1A C Acc. 2 1 6 75-125 1-2 36 51,900 13 6
PM2 A Acc. 2 1 6 75-125 4-12 7.5 4,400 12 6
PM2S P Acc. 2 3 6 75-150 3-18 5.4 2,600 15 0
PM2 P Acc. 2 25 6 30-100 50-125 2-6 13.5 10,700 13 6

PM3 DAR Dry 4 0 6 20 30-100 75-125 2-6 14 15,000 13 6
PM3A C Acc. 4 0 6 20 30-100 75-125 1-2 30 30,000 13 6
PM4 A Acc. 4 1 6 75-125 4-12 8 4,450 13 6
PM5A P Acc. 4 25 6 30-100 50-125 2-6 13.5 10,700 13 6
PM5A P Acc. 4 25 6 30-100 50-125 2-6 13.5 10,700 13 6

PM5X DR Acc. 6 0 6 30-100 50-125 2-6 17.5 14,700 13 6
PM5B C Acc. 6 0 6 30-100 50-125 1-2 40 55,000 13 6
PM5B C Acc. 6 0 6 30-100 50-125 3-9 2,550 13 6
PM5D D Acc. 6 1 10 30-100 50-125 2-6 18 9,000 13 6
PM5S P Acc. 6 25 10 75-150 5-20 4.25 2,100 15 0

VALVE TABLE.

IMPORTANT—STATE ENGLISH OR U.X. BASE IN ORDERING.

Type.	Purpose.	A BATTERY			B BATTERY			C Batt. Factor	Impedance	Price
		Kind	Volt	Amps	Rheo Ohms	Detector Volts	Amplifier Volts			

RADIOTRON VALVES—U.X. BASE ONLY. (CUNNINGHAM ARE IDENTICAL).											
WX-12	AD	Dry	1.5	.25	6	22	90-135	4.5-10.5	6.6	15,500	12 6
										15,500	12 0

UX-199	DAR	Dry	4.5	.06	30	22-45	90	4.5	6.6	15,500	13 0
UX-120	P	Dry	4.5	.12	30		135	22.5	3.3	6,300	15 0
UX-200A	D	Acc.	6	.25	6	45			20	30,000	25 0

UX-171A	P	Acc./A.C.	6	.25	6		90-180	16.5-40.5	3	2,500	18 0
UX-245	P	A.C./Acc.	5.5	1.25	2		130-250	18-35	3	1,500	28 6
UX-210	P	A.C./Acc.	5.5	1.25	2		250-450	18-35	8	6,000	50 0
UX-250	P	A.C./Acc.	7.5	1.25			250-450	45-84	8.8	2,900	75 0

UX236	AR	A.C.	1.5	105		45-90	90-180	6-133	3.2	9,400	14 0
UY227	D	A.C.	2.5	1.75					8	10,000	22 0

PHILIPS VALVES—U.X. OR ENGLISH BASE.

B406	DA	Acc.	4	15	30	30-45	45-150	6	4,200	13 6
B405	P	Acc.	4	15	30	30-45	45-150	9	2,500	15 0
B409	P	Acc.	4	15	30	30-45	45-150	9	4,500	15 0

B403	AP	Acc.	4	.15	30	30-45	50-120	15-24	2	2,100	15 0
A415	D	Acc.	4	.08	30	20-45	50-150	15	7,500	13 6	

A409	DAR	Acc.	4	.06	30	10-45	60-120	1-5.9	9	7,500	13 6
B405	DAR	Acc.	6	.1	30	20-45	60-150	1-5.9	3	6,000	13 6
B605	DA	Acc.	6	.1	30	20-45	60-150	4.5-18	6	2,800	13 6

B605	DA	Acc.	6.	.1	30	20-45	50-150	4.5-18	5.	2,500	13 6
A630	DRC	Acc.	6.	.06	30	50-150	50-150		30.	35,000	13 6
C602	P	Acc.	6.	.3	20	50-150	50-150	-27	3.3	1,500	15 0

OSRAM OR MARCONI (both are identical) U.X. or English Base.

DEH210	DRC	Acc.	2	10	6	40-80	120-150	0-13	35	50,000	13 6
HL210	DAC	Acc.	2	10	6	50-90	70-150	13-24	20	23,000	13 6
DEH210	DAR	Acc.	2	10	6	40-80	70-150	3-7	11	12,000	13 6
DEH210	A	Acc.	2	10	6	40-80	70-150	11-10	13	4,000	13 6
DEH210	P	Acc.	2	10	6	40-80	70-150	12-24	4	2,500	20 0

DEH410	DRC	Acc.	4	10	6	40-80	70-150	0-13	40	60,000	13 6
DEH410	DAR	Acc.	4	10	6	40-80	70-150	11-14	15	8,500	13 6
DEH410	P	Acc.	4	10	6	40-80	70-150	11-10	13	4,000	13 6
P425	P	Acc.	4	10	6	40-80	70-150	73-163	4.5	2,300	20 0

DEH610	DRC	Acc.	6	10	10	40-80	70-150	0-13	40	60,000	13 6
EL610	DAR	Acc.	6	10	10	40-80	70-150	0-13	30	30,000	13 6
DEH610	DAR	Acc.	6	10	10	40-80	70-150	11-14	15	7,500	13 6
DEH610	P	Acc.	6	10	10	40-80	70-150	41-9	8	2,500	13 6

P625	P	Acc.	6	25	6	100-250	6-24	6	2,400	20 0
P65A	P	Acc.	6	25	6	100-180	133-30	3.7	1,600	20 0
LS6	P	Acc.	6	15	8	100-150	2-40	5	6,000	35 0
LS6A	P	Acc.	6	15	8	100-150	30-130	2.5	2,700	35 0
LS6A	P	Acc.	6	15	6	300-400	50-125	2.5	1,400	40 0

MULLARD VALVES—U.X. AND ENGLISH BASE.

PM1HF	DR	Acc.	2	1	6	35-100	50-125	1-9	18.	22,500	13 6
PM1LF	DAR	Acc.	2	1	6	30-100	50-125	2-5	11.	12,000	13 6
PM1A	C	Acc.	2	1	6	75-125	1-2	36	51,000	13 6	

PM3A	C	Acc.	2	1	6	20-30	75-125	1-2	30	30,000	13 6
PM2	A	Acc.	2	15	6	75-125	4-12	7.5	4,400	13 6	
PM252	P	Acc.	2	3	6	75-150	3-15	5.4	2,600	15 6	
PM2D	D	Acc.	2	25	6	30-100	50-125	2-6	13.5	10,700	13 6

PM3	DAR	Dry	4.	.06	30	30-100	50-125	2-6	14.	13,000	13
PM3A	C	Dry	4.	.06	30		75-125	1-2	38.	55,000	13

PM255	P	Acc.	6	25	10	75-150	5-20	4.25	2,100	15 0
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PM255	P	Acc.	6	25	10	75-150	5-20	4.25	2,100	15 0
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PM255	P	Acc.	6	25	10	75-150	5-20	4.25	2,100	15 0
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PM255	P	Acc.
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NEW LINES CONSTANTLY ARRIVING.

INSTRUMENT WIRES.

DOUBLE COTTON.

S.W.G.	Yds. Turns	per lb. per in.	1lb.	1lb.
14	17	10	1/2	3/2
16	28	15	1/2	2/3
18	46	17	2/3	1/2
20	78	22	1/2	4/3
22	128	26	1/2	4/6
24	202	30	2/3	5/6
26	293	36	2/3	6/6
28	422	39	3/4	7/6
30	670	44	3/4	9/6
32	721	50	3/4	10/6
34	940	54	3/4	11/6
36	1272	63	4/6	14/6

DOUBLE SILK—GREEN.

S.W.G.	Yds. Turns	per lb. per in.	1lb.	1lb.
16	29	14	1/3	3/6
18	48	19	2/3	3/3
20	84	25	4/3	3/6
22	138	32	6/3	4/3
24	222	39	5/6	5/6
26	329	47	1/2	11/6
28	474	56	4/3	13/6
30	670	65	5/6	16/6
32	886	76	5/6	18/6
34	1200	85	6/3	21/6
36	1602	102	13/6	25/6
38	2690	121	10/6	27/6
40	4000	142	15/6	23/6
42	5491	168	18/6	44/6
44	8102	192	5/6	40/6

ENAMELLED.

S.W.G.	Yds. Turns	per in.	1lb.	1lb.
16	15	1/2	1/3	3/6
18	26	1/2	2/3	3/6
20	46	1/2	2/3	3/6
22	85	1/2	2/3	3/6
24	142	1/2	2/3	3/6
26	242	1/2	2/3	3/6
28	422	1/2	2/3	3/6
30	670	1/2	2/3	3/6
32	886	1/2	2/3	3/6
34	1200	1/2	2/3	3/6
36	1602	1/2	2/3	3/6
38	2690	1/2	2/3	3/6
40	4000	1/2	2/3	3/6
42	5491	1/2	2/3	3/6
44	8102	1/2	2/3	3/6

RADIO CABLES.

For many Radio purposes, the power cables are used, but frequently much thinner insulation and wire is all that is necessary.

RAYON RADIO WIRE.



RAYON flex is composed of ten thin strands of wire, insulated with rubber, and then covered with a pretty silky braiding. It is made in several colours.

It makes an excellent wire for frame aerials, and for battery cables especially, though in Radio it finds a large number of other uses.

It is imported in long lengths, and can be supplied in short lengths if necessary. Any length cut.

W129 per yd. 3d. If more than 20yds. per yd. 2d.

WIRE TABLES.

B. AND S.

S.W.G. DATA.

Diam (in)	Gauge	Diam (in)	Gauge
19	10185	23	10185
18	10801	22	10801
17	11528	21	11528
16	12362	20	12362
15	13312	19	13312
14	14388	18	14388
13	15592	17	15592
12	16936	16	16936
11	18420	15	18420
10	20044	14	20044
9	21808	13	21808
8	23712	12	23712
7	25756	11	25756
6	27940	10	27940
5	30264	9	30264
4	32728	8	32728
3	35332	7	35332
2	38076	6	38076
1	40960	5	40960
0	43984	4	43984
-1	47148	3	47148
-2	50452	2	50452
-3	53896	1	53896
-4	57480	0	57480
-5	61204	-1	61204
-6	65068	-2	65068
-7	69072	-3	69072
-8	73216	-4	73216
-9	77500	-5	77500
-10	81924	-6	81924
-11	86488	-7	86488
-12	91192	-8	91192
-13	96036	-9	96036
-14	101020	-10	101020
-15	106144	-11	106144
-16	111408	-12	111408
-17	116812	-13	116812
-18	122356	-14	122356
-19	128040	-15	128040
-20	133864	-16	133864
-21	139828	-17	139828
-22	145932	-18	145932
-23	152176	-19	152176
-24	158560	-20	158560
-25	165084	-21	165084
-26	171748	-22	171748
-27	178552	-23	178552
-28	185496	-24	185496
-29	192580	-25	192580
-30	199804	-26	199804
-31	207168	-27	207168
-32	214672	-28	214672
-33	222316	-29	222316
-34	230096	-30	230096
-35	238012	-31	238012
-36	246064	-32	246064
-37	254252	-33	254252
-38	262576	-34	262576
-39	271036	-35	271036
-40	279632	-36	279632
-41	288364	-37	288364
-42	297232	-38	297232
-43	306236	-39	306236
-44	315376	-40	315376
-45	324652	-41	324652
-46	334064	-42	334064
-47	343612	-43	343612
-48	353296	-44	353296
-49	363116	-45	363116
-50	373072	-46	373072
-51	383164	-47	383164
-52	393392	-48	393392
-53	403756	-49	403756
-54	414256	-50	414256
-55	424892	-51	424892
-56	435664	-52	435664
-57	446572	-53	446572
-58	457616	-54	457616
-59	468796	-55	468796
-60	479112	-56	479112
-61	489564	-57	489564
-62	500152	-58	500152
-63	510876	-59	510876
-64	521736	-60	521736
-65	532732	-61	532732
-66	543864	-62	543864
-67	555132	-63	555132
-68	566536	-64	566536
-69	578076	-65	578076
-70	589752	-66	589752
-71	601564	-67	601564
-72	613512	-68	613512
-73	625596	-69	625596
-74	637816	-70	637816
-75	650172	-71	650172
-76	662664	-72	662664
-77	675292	-73	675292
-78	688056	-74	688056
-79	700956	-75	700956
-80	713992	-76	713992
-81	727164	-77	727164
-82	740472	-78	740472
-83	753916	-79	753916
-84	767496	-80	767496
-85	781212	-81	781212
-86	795064	-82	795064
-87	809052	-83	809052
-88	823176	-84	823176
-89	837436	-85	837436
-90	851832	-86	851832
-91	866364	-87	866364
-92	881032	-88	881032
-93	895836	-89	895836
-94	910776	-90	910776
-95	925852	-91	925852
-96	940964	-92	940964
-97	956212	-93	956212
-98	971596	-94	971596
-99	987116	-95	987116
-100	1002772	-96	1002772

S.W.G.

S.W.G.

Lbs. per 1000yds.	1000yds.	per sq. in.
14.8	1.868	1.887
15.8	2.051	2.058
16.8	2.242	2.242
17.8	2.442	2.442
18.8	2.652	2.652
19.8	2.872	2.872
20.8	3.102	3.102
21.8	3.342	3.342
22.8	3.592	3.592
23.8	3.852	3.852
24.8	4.122	4.122
25.8	4.402	4.402
26.8	4.692	4.692
27.8	4.992	4.992
28.8	5.302	5.302
29.8	5.622	5.622
30.8	5.952	5.952
31.8	6.292	6.292
32.8	6.642	6.642
33.8	7.002	7.002
34.8	7.372	7.372
35.8	7.752	7.752
36.8	8.142	8.142
37.8	8.542	8.542
38.8	8.952	8.952
39.8	9.372	9.372
40.8	9.802	9.802
41.8	10.242	10.242
42.8	10.692	10.692
43.8	11.152	11.152
44.8	11.622	11.622
45.8	12.102	12.102
46.8	12.592	12.592
47.8	13.092	13.092
48.8	13.602	13.602
49.8	14.122	14.122
50.8	14.652	14.652
51.8	15.192	15.192
52.8	15.742	15.742
53.8	16.302	16.302
54.8	16.872	16.872
55.8	17.452	17.452
56.8	18.042	18.042
57.8	18.642	18.642
58.8	19.252	19.252
59.8	19.872	19.872
60.8	20.502	20.502
61.8	21.142	21.142
62.8	21.792	21.792
63.8	22.452	22.452
64.8	23.122	23.122
65.8	23.802	23.802
66.8	24.492	24.492
67.8	25.192	25.192
68.8	25.902	25.902
69.8	26.622	26.622
70.8	27.352	27.352
71.8	28.092	28.092
72.8	28.842	28.842
73.8	29.602	29.602
74.8	30.372	30.372
75.8	31.152	31.152
76.8	31.942	31.942
77.8	32.742	32.742
78.8	33.552	33.552
79.8	34.372	34.372
80.8	35.202	35.202
81.8	36.042	36.042
82.8	36.892	36.892
83.8	37.752	37.752
84.8	38.622	38.622
85.8	39.502	39.502
86.8	40.392	40.392
87.8	41.292	41.292
88.8	42.202	42.202
89.8	43.122	43.122
90.8	44.052	44.052
91.8	44.992	44.992
92.8	45.942	45.942
93.8	46.902	46.902
94.8	47.872	47.872
95.8	48.852	48.852
96.8	49.842	49.842
97.8	50.842	50.842
98.8	51.852	51.852
99.8	52.872	52.872
100.8	53.902	53.902

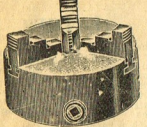
NICHROME WIRE (Bare).

Gauge	Lbs. per 1000ft.	Resist. per 100ft.	AMPS	Price per lb.
14	4.2	4.2	4.4	16 6
15	4.2	4.2	4.4	16 6
16	4.2	4.2	4.4	16 6
17	4.2	4.2	4.4	16 6
18	4.2	4.2	4.4	16 6
19	4.2	4.2	4.4	16 6
20	4.2	4.2	4.4	16 6
21	4.2	4.2	4.4	16 6
22	4.2	4.2	4.4	16 6
23	4.2	4.2	4.4	16 6
24	4.2	4.2	4.4	16 6
25	4.2	4.2	4.4	16 6
26	4.2	4.2	4.4	16 6
27	4.2	4.2	4.4	16 6
28	4.2	4.2	4.4	16 6
29	4.2	4.2	4.4	16 6
30	4.2	4.2	4.4	16 6
31	4.2	4.2	4.4	16 6
32	4.2	4.2	4.4	16 6
33	4.2	4.2	4.4	16 6
34	4.2	4.2	4.4	16 6
35	4.2	4.2	4.4	16 6
36	4.2	4.2	4.4	16 6</

DEVELOP YOUR ENGINEERING TENDENCIES.

CHUCKS.

CHUCKS—CUSHMAN PATTERNS.



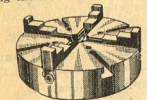
Three jaw chucks, supplied with two sets of jaws, are key. Self-centering.

Back plate castings are included. In the rough, since chucks must always be fitted to the lathes on which they are used. We believe we are the only firm who include these castings in the price of the chuck.

X258 3 1/2 in. diam. 2 0 0
X259 4 5/16 in. diam. 2 10 0
X260 5 1/8 in. diam. 3 0 0
X261 6 1/4 in. diam. 3 15 0
Extra keys in stock.
Back plate castings included.

INDEPENDENT.

The jaws, of which there are four, can be moved one at a time. Jaws are reversible. Back plate casting included.



X269 4 1/2 in. diam. 3 10 0
X270 5 in. diam. 4 10 0
X271 5 1/2 in. diam. 5 10 0

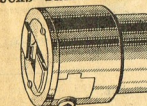
DRILL CHUCKS—Three Jaws.

These chucks will hold round drills from 1/4 in. down to the smallest size. The 1/4 in. parallel shank will fit the ordinary drill, while the No. 1 Morse taper shank will fit lathe head stocks, and some smaller drilling machines.



X292 Parallel shank, 1/4 in. 5 0 0
X225 No. 1 Morse shank 6 0 0

CHUCKS—DRILL.



Two jaws, operated by key. Strong design. The body is made of steel, and the two jaws are very strong. The key ensures a rigid grip. Suitable for drilling machines and lathes.

X282 6 1/2 in., each 9 15 0
X283 8 1/2 in., each 1 0 0

CHUCKS—DRILL.

This chuck will save its cost in a very short time, where drills have to be frequently changed. The locking mechanism runs on ball-bearings, and so a firm grip can be obtained by hand pressure alone—no need to look for the key at each change. When the drill is adjusted, the grip. Yet the chucks will readily unscrew when desired.

X264 4 9/16 in. drills 1 16 0

SPILT CUTTER PINS.

Well known for all classes of machinery. Best English quality.

T279 Gross box, assorted 1 3

COUNTERS.

Revolution counters are used wherever a tally of the number of revolutions (or to and fro movements) must be kept. Printing machines, cycles, winding machines, admission gauges, engines, etc.

HAND COUNTER.

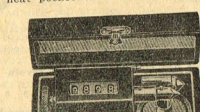
Counts to 1000. Adds one each time small lever is pressed. No larger than a medium sized watch. Nickel plated.



T280 Hand counter 13 6

POCKET TYPE.

Counts revolutions to 10,000. Two spindles, with rubber and metal pointers. Instantaneous zero set. In neat pocket case.



T281 Black 15 0
T282 Nickel, with point and rubber wheel 18 6

PROGRESS.

A larger counter, to 100,000. Instantaneous zero set. Can be used right or left hand.

T283 Black, with set key 32 6

GIANT V.

Figures 5/16 in. high, counting to 100,000. Can count backwards.

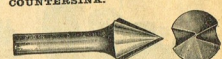
T284 14 6

GIANT V.

As Giant V, but counts one way only, to 1,000,000.

T285 60 0

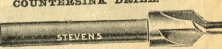
COUNTERSINK.



Cuts metal, formica, ebonite, etc. Short round shank, small enough to fit hand drill.

X105 2 0

COUNTERSINK DRILL.



5/32 drill, for 6/32 and 3/32 U.S.A. screws. Bore holes, and counter-shanks for the screw head, rapidly and accurately in one operation.

X106 1 6

COUNTERSINKS.

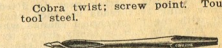
Rose head, for metal or hard wood.



X224 Price 9

GIMLET BITS.

Cobra twist; screw point. Tough tool steel.



X220 1 in. 6d 6d
X221 3/16 in. 6d 6d
X222 1/2 in. 6d 6d

X223 With handle 6d
X224 With handle 6d

X225 With handle 6d

X226 With handle 6d

X227 With handle 6d

X228 With handle 6d

X229 With handle 6d

X230 With handle 6d

X231 With handle 6d

X232 With handle 6d

X233 With handle 6d

X234 With handle 6d

X235 With handle 6d

X236 With handle 6d

X237 With handle 6d

X238 With handle 6d

X239 With handle 6d

X240 With handle 6d

X241 With handle 6d

X242 With handle 6d

X243 With handle 6d

X244 With handle 6d

X245 With handle 6d

X246 With handle 6d

X247 With handle 6d

X248 With handle 6d

X249 With handle 6d

X250 With handle 6d

X251 With handle 6d

X252 With handle 6d

X253 With handle 6d

X254 With handle 6d

X255 With handle 6d

X256 With handle 6d

X257 With handle 6d

X258 With handle 6d

X259 With handle 6d

X260 With handle 6d

X261 With handle 6d

X262 With handle 6d

X263 With handle 6d

X264 With handle 6d

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X387 With handle 6d

X388 With handle 6d

X389 With handle 6d

X390 With handle 6d

X391 With handle 6d

X392 With handle 6d

X393 With handle 6d

X394 With handle 6d

X39

VALVES.—GOOD VALVES are Best in the End.

ELECTRIC FITTINGS.

ACCUMULATORS—MOTOR CAR.

Six volt.
Reliance accumulators are locally made from the purest materials and are fully guaranteed. The following sizes are the commonest used, but others can be supplied promptly when desired.

30 AMP. SPECIAL.

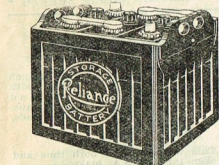
A good accumulator, at a very competitive price. Suitable for replacements. Fits same cars as A218 below.

A217 30 amp. special . . . 3 15 0

92 AMP.

As used on the majority of cars. Well constructed, and very reliable. Note the size is just a little larger than usually quoted at the price.

For Buick 4, Chevrolet, Kurbly, Brasque, Essex, Ford, Whippet, etc.



A218 92 amp. 5 0 0

110 AMP.

For larger cars, and general heavy duty.
For Buick Master 6, Chandler, Chrysler, Dodge 6, Graham-Paige, Hudson, Nash, Oakland, Oldsmobile, Pontiac, Plymouth, Studebaker, Reo, A219 110 amp. 5 17 6

Write for full price list, or name your car, and we will quote you, if not mentioned in above list.

ADAPTORS—BAYONET.

Bayonet adaptors are universally used in order to work apparatus from the lamp holder. Both adaptors listed are moulded, and the wires can be very readily connected, since the metal parts cannot turn.



E130 Each 1
E110 "MAGNET" BAKELITE adaptor 1 0

ADAPTORS—MAGNET BAKELITE.

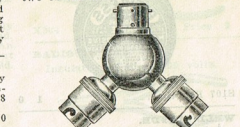
Fitted with a switch, enabling the light to be turned on or off, but enabling an iron or other light to be left on.



112 Bakelite; each 8 0
215 Bakelite, push switch 6 6

ADAPTORS—DOUBLE.

Enabling two lamps or other apparatus to be used from the one holder. Every home wants one or two of these.



E111 Brass, hollow screw . . . each 4 6

ADAPTORS.



This adaptor fits into the ordinary bayonet holder, and a screw lamp connection (U.S.A. Standard) can then be used. It fills a very pressing need, as it enables all American apparatus to be connected to our bayonet lamp holders.

A211 5 0

A212 Fits U.S.A. holder, enabling bayonet lamp to be used 5 0

ADAPTOR—EDISON SCREW.

This double fitting is used in conjunction with American (Edison) screw lamp holders. Price includes the two pieces as illustrated.

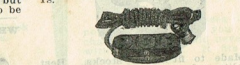


E190 Plug only, bakelite 1 0
E191 Plug only, rubber 1 9
E192 Screw part only 6

TRIPLE OUTLET.

Consists of E190 plug and adaptor, a length of twin flex and a beautifully finished bakelite moulding, fitted with three sockets to suit a plug as in E190. Two screw holes enable it to be screwed to the wall or table. Its insulation is perfect, or table. It has no metal parts exposed, and it enables, say, a reading lamp, Radio and fan to be operated at the same time.

The adaptor can be changed for a bayonet adaptor in a few moments the plug then being used for the outlet. Extra outlet plugs, see E190, 18.



This is the neatest thing we have seen for a long time, and we shall be surprised if it does not sell in hundreds, owing to its exceptional convenience.
E180 Triple outlet 9 0
E190 or E191 Plug to fit, each 1 0

ADAPTOR—DOUBLE EDISON.

This is made of porcelain, fitting only the Edison screw lamp holders. E191 Each 2 0

ADAPTOR, TRIPLE.

Triple adaptor, bakelite, fitting the plug that usually accompanies American apparatus. Enables three connections to be used instead of only one. Fits E192 or E190.

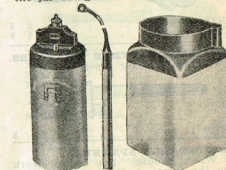


E179 Triple adaptor 2 0

E190 or E191 Plug to fit, each 1 0

LECLANCHÉ BATTERIES.

The universal favourite for ringing bells, working telephones and other jobs where intermittent current is required. Uses sal ammoniac solution, 2oz. to the pint of water, the jar being filled two-thirds.

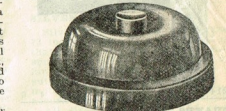


B218 Complete 3 6
B219 Porous pot only 1 9
B220 Zinc rod only 1 8
B221 Glass jar only 1 6
B222 Sal-ammoniac 1b. 1 6

BELL PUSHES.

MOULDED.

Wood pushes are now superseded by bakelite, which is not only far more satisfactory, but is also cheap.



E150 1 6

PEAR PUSHES.

Used where the bell wires hang from the ceiling, or where the push must be moved about, as in a sick room. Bakelite moulding.



E160 1 9
Rosette to match 1 0

BELLS AND BUZZERS.

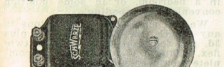
These electric bells will be found quite reliable. They are easily installed, requiring only two or three No. 6 dry batteries to operate them, and a bell push.

Where a quieter signal is desired, buzzers are installed, these being similar to the bells, but without the gong.

Where alternating current is available, bells may be operated from the mains through a transformer costing only a few shillings. This eliminates all battery troubles, and guarantees the most efficient working.

IRON BELLS.

Schwarze iron bells are not affected by weather changes. The gongs are musical, and the viewings are nearly concealed from view. Long service assured.



E146 Gong, 2 1/2 in. 3 9
E147 Gong, 2 in. 4 6



E148 Tea gong, 2 1/2 in. 5 3

WOOD BELLS.

G.R.C. magnet, wood base, 2 1/2 in. gong.



E161 Ordinary quality 4 9

BUZZERS.



E149 Buzzer, similar to E146 3 6

CONNECTORS—PORCELAIN.

Brass connectors, held in porcelain



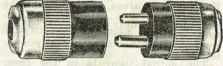
E194 Screw fuse each 6

FOR FUSES FOR RADIO USE.
See Edison screw miniature bulb holders, which are used with a flash-light bulb as a fuse, and also under C425 for Belling-Lee Radio fuses.

C412 One way ea. 2s.
C413 Two way 3d. 2 9
C425 Three way 3d. 3 6

CONNECTORS.

Small two pin connectors, for loud speaker extensions, etc. Can be connected only one way.



E155 Each 2 0

ALOCKS.

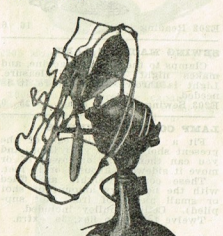
Polished wood blocks are used for mounting switches, etc.



E114 Round, 3 1/2 in.; each . . . 6
E115 Rectang., 6 x 3 1 0
E116 Rectang., 9 x 3 1 6

ELECTRIC FANS.

As sold by the B.G.E. who make the MAGNET ELECTRIC APPARATUS. 230 volt, either D.C. or A.C. Ten inch fan.

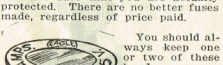


E209 Electric fan 2 17 6

E210 Electric fan, oscillating 4 5 0

FUSES.

Screw fuses, as used in all American electric stoves, etc. All tested, to make sure that you are actually protected. There are no better fuses made, regardless of price paid.



You should always keep one or two of these handy.
Stocked in 5, 10, 15, 20, 25 and 30 amps. State which required in ordering.

E194 Screw fuse each 6

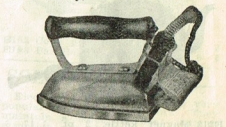
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C412 One way ea. 2s.
C413 Two way 3d. 2 9
C425 Three way 3d. 3 6

ELECTRIC IRONS—230 VOLT.

The EAGLE IRON is sold with a definite guarantee of service. It is a well-finished, nickel plated iron, complete with best connector, asbestos covered cord, and plug.

The heating element—the life of the iron—is wound on best mica, with asbestos wire, and it will last for years. Spare elements are always carried in stock, ready for instant replacement, should such ever be necessary.



E185 Eagle iron 27 0

EAGLE HOUSEHOLD IRON.

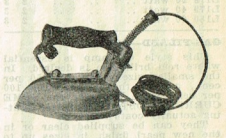
A full weight, perfectly reliable iron, complete with connector, cord, and plug. Nickel plated. Uses the durable standard Eagle element. Guaranteed.

E196 Eagle household iron . . . 2 0

Write for prices of 32 or 110 volt irons or elements.

"MAGNET" IRON.

Balanced weight, comfortable grip. 6lbs. Element guaranteed for three years. With connector and cord.



E1807 Magnet iron 1 5 6

PLUGS—BAKELITE.

Plugs suitable for irons, toasters, radiators, etc. Bakelite, with strong phosphor bronze clips, with spring tongues, ensuring contact even if the clips should break with heat. Special lock nuts, which do not work loose.

E188 Bakelite plug 2 6

PLUGS—ARMORED.

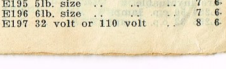
Similar to the bakelite plug, but with a plated steel cover, making it practically unbreakable.

E189 Armored plug 2 6

IRON ELEMENTS—230 VOLTS.

Best mica, wound with highest grade nichrome wire. Fits most electric irons on the market. A small extra charge is made for fitting to your iron.

E195 5lb. size 7 6
E196 6lb. size 7 6
E197 32 volt or 110 volt . . . 8 6



K-N IRONS—BRITISH MADE.

MAGNET ELECTRIC KETTLES.

A beautifully nickel plated kettle, made in two sizes. Fitted with safety fuses, preventing damage to elements if kettle boils dry. Guaranteed.



E212 Magnet kettle, 2 pt. 1 17 6
E208 Magnet kettle, 3 pt. 2 12 6

LAMPS—OSRAM 230 Volt.

Electric lighting now extends to all quarters of the globe, and it is safe to say that OSRAM lamps are known wherever electric current is available. British made, of uniform excellence.

METAL FILAMENT.

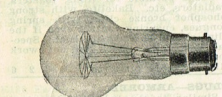
Very durable, giving approximately one candle power per watt.

L178 20 watt	2 3
L179 40 watt	2 3
L180 60 watt	2 3

GAS-FILLED—OSRAM.

This style of lamp is essential where real brilliance is desired. In the smaller sizes they give 50 per cent., and in the larger sizes 100 per cent. more light for the SAME CURRENT COST. Thus better lighting actually costs less.

They can be supplied clear or in the new pearl finish, in sizes up to 100 watt. Larger sizes are clear only. The 150 watt is the largest lamp that can be supplied for the ordinary bayonet holder.



	Watts.	Approx.	C.P.	Each
L217	40	60	3 0	
L218	60	90	3 8	
L219	75	100	4 0	
L218	100	150	6 0	
L219	150	200	8 0	
L220	200	400	10 0	
L221	300	600	14 0	
L222	500	1000	20 0	

CARBON LAMPS, 230 volt.

Used in places where severe shocks may be encountered, they are not efficient for lighting. As resistances for charging from D.C. mains they are invaluable.

L244 50 c.p. lamp	4 6
L256 32 c.p. lamp	2 9

OSGLIM LAMPS.

Useful for night lights, where little illumination is required, but far more useful to the experimenter, since they are a form of neon tube. For testing valves, lamps, flashlight bulbs, condensers, coils, circuits, an OSGLIM is simply invaluable. Made to fit ordinary bayonet holder. Current consumption is practically negligible.

The actual light is in the form of a letter or number, any of which can usually be supplied. 230 volts.

L216 OSGLIM LAMP	5 0
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READING LAMPS.

Flexible arm, with heavy metal base. The lamp can be "bent" to any position. Ideal for table use, bedroom lamp, etc. Lamp included.



E202 Reading lamp 16 6

SEWING MACHINE LAMP.

Clamps to the sewing machine, and makes night sewing a pleasure. Light is thrown right where it is needed.

E203 Sewing machine lamp	25 0
--------------------------	------

LAMP COUNTER-WEIGHTS.

Fit a long wire instead of the present short one to your lamp, and you can then raise or lower it, or move it sideways about 8 or 10 feet. These counter-weights are filled with the necessary amount of shot or small pieces of iron (not supplied). Cutting pulley included. Twelve feet twin flex, 3s. extra.



E181 Counter-weight 5 0

MOTOR CAR LAMPS, Westinghouse.

Very best quality motor car lamps. In ordering, please state: (1) voltage, (2) candle power, (3) single or double contact.

Voltage is now 6-8 for most cars, three or six candle power lamps being used for dash and tail, while larger sizes are used for head lamps. If in doubt what lamp to order, please state make and model of car.

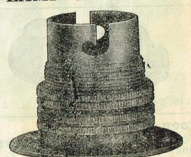
3 or 6 candle power	1 2
15, 21, 32, 50 candle power	2 1
21/21 or 32/32 twin filament	3 3
21/2 or 6, 32/2 or 6 ditto	2 8

LAMP EXTENSIONS.

There are times when everyone wants an extension cord, so that an electric lamp can be used in some special place. It may be near a sewing machine, or near the mirror in a bedroom, or in some position convenient for reading.

We can supply such extensions in any length, the cost being 2s. plus 3d. per foot for every foot of twin flex. Thus a 12-foot extension complete would cost 6s.

LAMP HOLDERS.



BAYONET—BATTEN.

E140 Oxidized finish	1 6
E138 Magnet bakelite	1 6
E133 Miniature	1 3

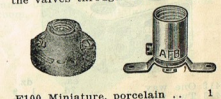
EDISON SCREW—BATTEN.



E103 Porcelain	1 3
E136 With switch	2 6

EDISON SCREW—MINIATURE.

Made to fit ordinary flashlight bulbs. Fitted in the negative "B" lead of a Radio set, they prevent damage to the valves through a short circuit.



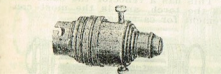
P190 Miniature, porcelain	1 0
P192 Miniature, brass	9

OUR KITSETS FOR EASY ASSEMBLY.

BAYONET—CORD GRIP.



E191 Oxidized finish	1 3
E139 Magnet bakelite	1 3
E159 Miniature	1 3



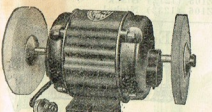
E192 With switch	5 0
E134 With switch, cheaper	3 0

EDISON SCREW—CORD GRIP.



E194	1 6
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MOTORS (Electric). (1 H.P.)



For amateur use this 1 h.p. motor will serve most purposes. It will turn a small engineer's lathe, or a drilling machine, by removing the polishing pot, and fixing a pulley in its place.

It is normally built as a grinder and polisher, being supplied with a six inch carburendum type wheel, and a six inch cotton polishing belt. It can be used on any lighting circuit, if desired.

M106 230 volt 50 cycle A.C. single phase	6 0 0
M107 230 volt D.C.	7 0 0

CENTURY.

1/2 h.p. for 230 volts 50 cycles A.C. only. Very powerful and smooth running. Get this motor to drive your small machinery, for it costs practically nothing to run.

M202 Century 1/2 h.p.	5 5 0
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MARATHON.

A rather cheaper but perfectly reliable 1/2 h.p. motor, for 230 volts 50 cycles A.C. only. Pulley is fitted.

M236 Marathon 1/2 h.p.	4 15 0
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ASK FOR QUOTATIONS FOR LARGER MOTORS.

SEWING MACHINE MOTORS.

Attach one of these to your sewing machine, and avoid the trouble of pedalling. Speed under full control, merely by foot pressure. Complete with control.

E213 Sewing machine motor	6 0 0
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MAGNET RADIATOR.

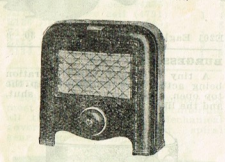
Polished copper reflector, which can be adjusted to any angle. Connector and cord included. The heating element is constructed so that the coils of nichrome wire do not loosen on the porcelain and touch, thus causing instant blow out. 750 watts.



E205 Magnet radiator 1 7 6

MAGNET ELECTRIC FIRE.

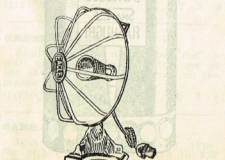
1000 watts, therefore capable of warming a room. Uses two elements, one of which can be turned out.



E206 Magnet electric fire 2 12 6

RADIATORS.

Twelve inch copper bowl, polished and lacquered. Heavy iron base to give ample stability. Adjustable pivot, to enable heat to be focussed to any angle. Bronze finish.

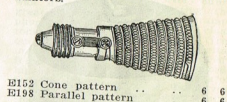


E200 Eagle radiator 27 0

RADIATOR ELEMENTS.

The elements listed here are wound with nichrome, and are equally as good as any other, regardless of price. There is only one grade of nichrome.

Cone porcelain, wound with nichrome, to suit 230 volt radiators. Will fit 600 watt size. Plus most radiators.

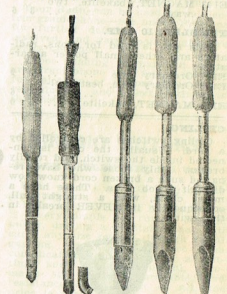


E152 Cone pattern 6 6

E158 Parallel pattern 6 6

SOLDERING IRONS.

Electric soldering irons are very popular for all kinds of work. They maintain a soldering heat without attention, are always ready for use, and quickly save their cost. Tinning is not burnt off as it is with other soldering irons.



E154 E155 E156 E157 E158

COMMERCIAL, 230 Volt.

Weight 8oz., 70 watts. Copper bit is 1/2 in. diameter. Fitted with 5ft. twin flex and adaptor.

E154	12 6
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DE LUXE, 230 Volt.

Weight 12oz., 70 watts. Two copper bits, 1/2 in. diameter. Fitted with 5ft. twin flex and adaptor.

E155	16 6
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UNIVERSAL, 230 Volt.

Weight 11lb., 150 watts. Heavy copper bit; 5ft. twin flex, with adaptor.

E156	22 6
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MEDIUM, 230 Volt.

Weight 11lb., 200 watts. Heavy copper bit; 5ft. twin rubber covered flex, with adaptor.

E157	32 6
------	------

HEAVY, 230 Volt.

Weight 21lb., 300 watts; 1/2 in. copper bit; 5ft. twin flex, rubber covered, with adaptor.

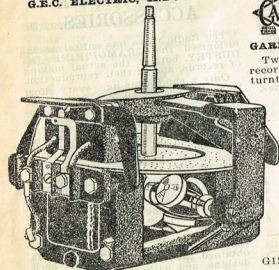
E158	42 0
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K-N ELECTRIC SOLDERING IRONS ARE FULLY GUARANTEED.

Globe Monarch motor	..	8	0	0
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ALTONA NEEDLES—PURER TONE, LESS WEAR.

G.E.C. ELECTRIC INDUCTION.



A very fine American motor, with no moving contacts, consequently no noise. For A.C. current only. Will run without attention until the bearings wear out.

G165 G.E.C. induction motor \$ 10 0

GARRARD SPRING (British Made).

On Garrard motors, the gears are accurately cut, to ensure smooth and silent running, as well as long life. Their general excellence is known in every country, and "GARRARD MOTOR" is the hall-mark of the good gramophone.

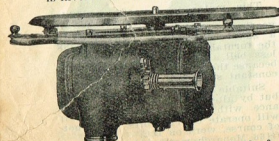
All are complete with turntable, brake, speed indicator, winding handle, escutcheon plate, screws and washers.

The springs are contained in a separate unit, which can be detached in a few seconds, without dismantling the remainder of the motor. This makes the fitting of new springs a much easier job.

GARRARD SUPER.

Without question the finest motor made to-day. All working parts are solidly and completely enclosed in a heavy iron case, not only preventing accidental damage, but excluding every trace of dust. To ensure perfect lubrication, a patent oil pump feeds lubrication, with a minimum of attention. Turntable 12in. plush covered.

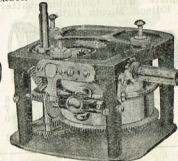
It will play three 12in. records with one winding, having two long and strong springs is incorporated. A control plate is incorporated, with starter and speed indicator already fitted in place. No difficulty is involved in fitting to cabinet.



G120 GARRARD SUPER .. 7 10 0

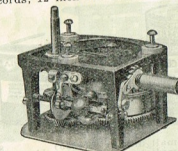


GARRARD 10A.
Two-spring, playing three 12 inch records. Very powerful; 12 inch turntable.



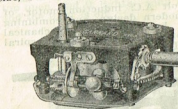
G121 GARRARD 10A .. 3 15 0

GARRARD 11B.
Two-spring, playing two 12 inch records; 12 inch turntable.



G122 .. 2 17 6

GARRARD 12.
Single spring, playing two 10 inch records; 10 inch turntable. Small size, suitable for portable machines.



G123 .. 1 17 6

MONARCH GRAM. MOTORS.

These are Swiss make, and are of marvelous quality, when the low price is considered. Certainly, no one need hesitate about purchasing one of these motors on the score of expense. We import them direct, and intend to carry spare parts.

Each is complete with winding handle, fast screws, rubber washers, regulator, brake and turntable. The number of records played at one winding is given.

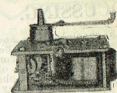
MONARCH "SIMPLEX."

Single spring, with 8 1/2-inch turntable. Plays 12-inch record. Design similar to Champion.

G159 Simplex .. 25 0

MONARCH "CHAMPION."

Single spring, with 10-inch turntable. Plays 12-inch record. Worm governor, special regulator.



G160 Champion .. 33 9

MONARCH "CHIEF."

Double spring, with 12-inch turntable. Plays two 12-inch records. Worm governor, patent regulator. Design similar to Champion.

G161 Chief .. 39 0

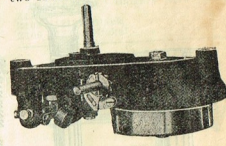
MONARCH "LEADER."

Single spring, with 12-inch turntable. Plays 12-inch record. Worm governor, all enclosed gearing. A fine motor.

G162 Leader .. 45 0

MONARCH "SUPERIOR."

A very high grade motor, similar in construction to the LEADER, but with double spring motor, playing two 12-inch records.



G163 Superior .. 63 0

GRAMOPHONE PICK-UPS.

Electrical gramophone pick-ups are used with a steel needle much as an ordinary reproducer. Instead, however, of creating sound waves, they generate electric alternations, which may then be greatly magnified in an amplifier, and finally turned again into sound waves by a good speaker.

Excellent results can be obtained with any good Radio, provided it has power valves, and a good "p" amplifier. For really powerful electric pick-up work, all that is required is a first-class pick-up, motor, good amplifier and a dynamic speaker. Pick-ups are usually fitted with volume controls, enabling any volume from a mere whisper to full band strength to be obtained at will.

PHILIPS.

Usually sold less tone arm and volume control.

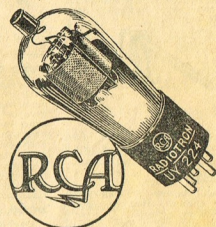
G173 Philips pick-up .. 3 5 0

G174 With tone arm, and volume control .. 3 17 6

World's Most Sensitive Valve— RADIOTRON

The first test of the quality of a Radio Set is the Valves. All makers of quality sets choose RCA Radiotrons because of their quality and dependability.

The latest member of the Radiotron family is RCA 221. Sensitive as a Detector, Powerful as an Amplifier, and rugged in construction, this new Radiotron will please the most exacting amateur by its stable and efficient behaviour, plus its long life performance.



For Better
Radio Reception

RCA RADIOTRON.

Amalgamated Wireless
(Australasia) Ltd.

Es!!!

FIG. 8/6/24

SEE DEPOSIT.

Y.

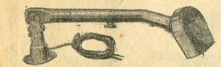
B.T.H. PICK-UPS—SWEETEST TONE.

B.T.H.

The best British pick-up on the market, and one which others have tried for the most faithful reproduction of the original. Volume is only a little less than with other pick-ups, but this is far more than compensated by the wonderful tone, especially for use in the home and smaller halls, etc.

It is fitted with a very fine gold finished tone arm, with special offset end, making it "track" better the record than other pick-ups. This prevents undue record wear.

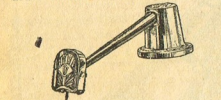
Separate volume control is included.



G170 B.T.H. pick-up .. 4 10 0

WEBSTER.

A well-known and very powerful American pick-up, usually chosen where full volume is desired. Model 2A has tone arm, incorporating a volume control, while Model 2B is without tone arm, but with separate volume control.



G168 Webster Model 2A .. 55 0 0
G169 Webster Model 2B .. 4 0 0

EDISON BELL.

Another well-known British pick-up, which, though cheaper, gives very satisfactory results. Complete with volume control. This means we will refund if you are not more than satisfied.

G138 Edison Bell pick-up .. 2 0 0

VOLUME CONTROLS.

These are connected between the pick-up and the Radio or amplifier, giving full control over the volume from a whisper to the fullest power possible—merely by turning a knob.

For illustrations, see ROYALTY RESISTANCES and CLAROSTATS.

v. a. c.

ROYALTY VOLUME CONTROL.

with 50,000 ohm L. Royalty, resistance is involved, 500 ohms. by volume control 6 6

CLAROSTAT VOLUME CONTROL.

up to 500,000 ohms. for fitting into a cabinet, case, for table use, for controlling radio set, from a disc-

control clarostat 8 6

able type .. 13 6

G120 GARR

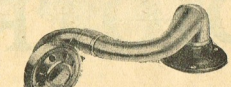
REPRODUCERS.

We now have a very large sample range of TONE ARMS and REPRODUCERS. You can modernise your present machine, and make a wonderful improvement in it by replacing your present reproducer, and also perhaps the tone arm, by a modern type.

Write for details. We will make arrangements for you to try the above, returning same if our claims are not justified.

DURO REPRODUCERS AND TONE ARMS.

Duro reproducers are very popular in U.S.A., and are fitted to many expensive and well-advertised machines. Strongly constructed, with due care to the production of really fine



tonal results, and smoothly nickel plated.

DURO QUALITONE, MATCHED.

A reproducer that is generally sold with its own matched tone arm, thus assuring the best results. It will give better results than your present reproducer, however, even on your own tone arm. A trial will be gladly arranged.

G125 Reproducer and tone arm .. 2 2 0
G126 Reproducer only .. 1 2 6
G127 Tone arm only .. 1 2 6

DURO SIMPLEX.

Develops a remarkably clear and melodious tone. Can be supplied either alone or with tone arm. Very suitable for portable machines. Beautifully nickel plated.

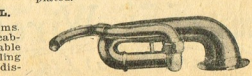
G128 Reproducer and tone arm .. 1 2 6
G129 Reproducer only .. 12 0
G130 Tone arm only .. 12 0

NOVATONE TONE ARM.

This is something very special, and will make a vast improvement in any gramophone fitted with the style tone arm. Its novel construction enables it to act like the exponential horn, a well known and successful in horn.

Arrange for a trial—you will not be asked to keep it, unless you are quite sure that you want it.

English made—ball bearing—nickel plated.



G164 Novatone tone arm .. 1 15 0

GRAMOTROPE.

This converts your Radio into an electric gramophone, so that you can either enjoy Radio concerts, or play your favourite records at will. It consists of a cabinet fitted with a suitable gramophone motor and pick-up. It is simply connected to your Radio by a speaker cord.

You can select the records, and put them alongside you on the table, together with the GRAMOTROPE, and then play them at your leisure, without getting up from your chair.

Even when you have a large combined outfit, you will at times appreciate the great convenience of being able to avoid the constant getting up and down to go to it, when records are to be changed.

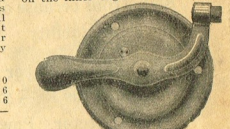
MODEL A. Fitted with G.E.C. induction motor, B.T.H. pick-up and volume control, and 20 feet speaker cord. G170 Model A Gramotrope 16 0 0

MODEL B. Fitted with Garrard Super spring motor, otherwise same as Model A. G171 Model B Gramotrope 14 10 0

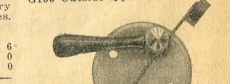
MODEL C. Fitted with Garrard 11A motor, and good quality pick-up. G172 Model C Gramotrope 8 0 0
Double turntables quoted on request.

FITTINGS.

These serve to stop the motor when the record is played. They are all designed to press on the turntable, some on the outer, and some on the inner edge. Nickel plated.



G153 Outside type .. ea. 1 0



G154 Outside type, best .. ea. 2 6

G155 Inside type .. ea. 1 6

NEEDLE CUPS.

G133 Nickel plated, with covers 1 0



G144 Set of two, one with cover through a small hole in which used can be dropped. No mistake in using needles twice over. 2 0

G144 Per set .. 2 0

G144 Set of two, one with cover through a small hole in which used can be dropped. No mistake in using needles twice over. 2 0

G144 Per set .. 2 0

ACE CYCLES. BEST BRITISH.

"ALTONA" NEEDLES.

ALTONA NEEDLES are made by a first-class Sheffield steel firm, who also make needles for many of the prominent gramophone firms, who sell them under their own name, of course, at a much higher price.

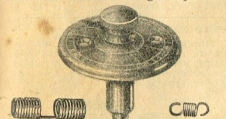
ALTONA NEEDLES ARE THE BEST QUALITY IT IS POSSIBLE TO OBTAIN, so that you can use them with every confidence.

Per box Five of 250 boxes.
G134 Soft .. 1 0 4 9
G135 Loud .. 1 0 4 9
G136 GOLDEN, box 100 1 3 6 0

GOLDEN TONE needles play eight or ten records without requiring to be changed.

SPEED REGULATORS.

Consists of a nickel plated disc engraved with numbers to denote revolutions per minute. A knurled nut and pointer regulate the speed, by adjusting the brake arm under the motor board of the gramophone.



G158. G145. G157
G146 Speed regulator .. ea. 2 6

SPRINGS.

G157 Brake springs .. each 3d.
G158 Check springs (replacing winding ratchet) .. each 6d.

TONE ARMS.

Although most pick-ups will fit the average tone arm, many like to fit a special tone arm on their gramophone for the pick-up. A tone arm is necessary, of course, for those who purchase a gramophone without their electric gramophone.

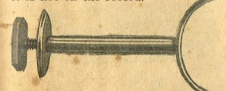
Not suitable for ordinary gramophones.

G141 TONE ARM, plain .. 6 6

G142 TONE ARM, hinged .. 7 6

TONE ARM SUPPORTS.

Small plated arms, which screw to cabinet lid alongside the turntable, and shaped at the top to support tone arm when it is not on the record.



G143 With nut .. ea. 1 6

GRAMOPHONE REPAIRS, MAIN-SPRINGS, etc. quoted on application. See CATALOGUE FITTINGS for other accessories.

THE 'ACE' BICYCLE

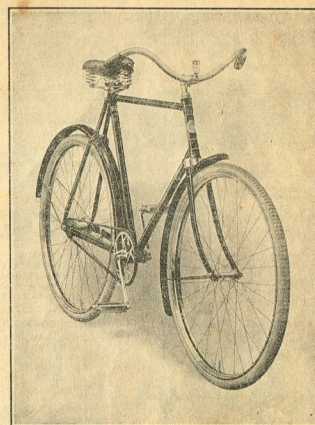
£8:12:6 CASH.

Lady's 7/6 extra.

Speedy!
Reliable!
Rustless!

EASY TERMS.

3/6 Weekly



Delivered Free to any Port or Railway Station.

SPECIFICATION.

FRAME.

To ensure ample strength, only the best WELDED STEEL TUBE is used, with machined lugs. All parts are assembled with the utmost precision before brazing, so that true and easy running is guaranteed.

BEARINGS.

Ball bearings are fitted throughout, accurate to one thousandth of an inch, while the cones and cups are hardened and ground with equal precision.

WHEELS.

Best chromium plated rims, non-rusting spokes. Built true and remains so. Radial coaster rear hub, combining a never failing powerful brake with a perfect free wheel.

HANDLEBAR.

Upturned, adjustable as standard, but other types can be fitted to order.

CHAINWHEEL AND CRANKS.

Best English, the chain wheel being flanged and attached to the specially toughened cranks with the standard five screws.

PEDALS.

Rat-trap or rubber.

SADDLE.

Brooks Legion, or three-coil saddle of exceptional comfort.

CHAIN.

Brampton roller.

TYRES.

English best Dunlop roadster covers, and Dunlop tubes. Fully guaranteed. The longest wearing tyre that can be purchased.

FINISH.

Best stove enamel, with gold lines.

ACCESSORIES.

Bell, tool bag and tools, pump and chain, rear reflector and oil can.

Chromium-Plated—Non-Rusting.
Frame Guaranteed 50 Years!!!

EASY TERMS:

Deposit	Weekly	Payments.	Total Price
3/6	60	3/6	£10/13/6
£4/-	30	3/6	10/13/6
£4/-	30	3/6	3/12/-

NOTE THE CONSIDERABLE SAVING by paying a LARGER DEPOSIT.

Payments may be made WEEKLY or MONTHLY.

ACE CYCLOMETERS COUNT YOUR MILES.

CYCLE ACCESSORIES.

NOTE—Only the main items are listed here. Write us for any cycle accessory, and it will be promptly supplied.



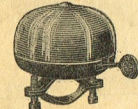
BALLS—HOFFMANN.

Guaranteed true to a 10 000th part of an inch.

	dz.	gr.
Y100 1/8-inch	28	1 3
Y101 1/6-inch	30	2 0
Y102 1/4-inch	40	3 0

BELLS.

Lucas excel in bells as well as in lamps for cycles. The Lucas brand is your guarantee of a really reliable article.



	Diam.	Each
Y103 Lucas No. 236	2 3/16	1 6
Y104 Lucas No. 236	2 1/16	2 0
Y105 Lucas No. 256	2 5/16	3 0
Y106 Rouser (not Lucas)	2	1 0

BRACKET AXLES.

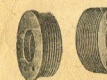
Made by Brampton, carefully hardened, and accurately ground.

BRACKET CUPS.

Also made by Brampton, the cottered type for use with cotter pins.



and the cotterless type with left and right threads, the latter used with a lock nut on the left side of the cycle.



Y111 Bracket cup, cottered	1	0
Y112 Bracket cup, cotterless, right	1	0
Y113 Bracket cup, cotterless, left	1	0
Y114 Bracket lock ring for Y113	1	0
Y115 Bracket cotters, complete	3	0

CARRIERS—REAR.

Both are complete with straps. The Hercules is a very strong carrier, suitable for heavy parcels, while the Sturdi is quite rigid, and perfectly safe for light parcels such as an overcoat.

Y116 Hercules carrier	3	9
Y117 Sturdi carrier	2	9

CHAINS—Roller.

Brampton chains are very strong and smooth running. See if you can see between your chain wheel and chain. If so renew your chain, which has stretched, and will quickly wear out the wheels.



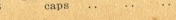
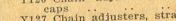
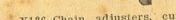
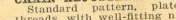
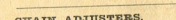
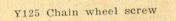
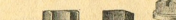
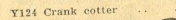
Y118 Brampton 1 x 4 or 3/16	4	6
Y119 Brampton military, extra strong	7	6
Y120 Renold chain	2	0

CHAIN WHEELS, CRANKS, ETC.

These are the best quality, the chain wheel being flanged to secure enormous strength, and the cranks being specially toughened. Complete set includes two cranks, and chain wheel.

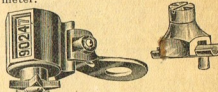


Y121 Complete set	10	6
Y122 Right crank	5	6
Y123 Left crank	4	0



CYCLOMETERS.

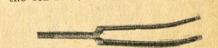
Complete with striker, for 28 inch wheels only. These are soundly constructed, and read to 10,000 miles. Why not know how far your cycle—every motor car carries a speedometer.



Y108 Ace cyclometer	6	0
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FORKS.

Standard sizes, enamelled and plated, ready for fitting. Send measurement of fork stem, or, better still, the old fork, as pattern.



Y128 Fork, front	12	6
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HEAD FITTINGS.

Brampton quality, well nickel-plated. Two patterns the head clip fitting stems that are slotted, while the screwed race is used for expander type stems.



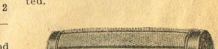
Y129 Head clip and bolt	2	9
Y130 Head lock ring	1	0



Y131 Head bolt and nut, as illustration	6	6
Y132 Head bolt and nut, plain	6	6
Y133 Head race, black	6	6
Y134 Head crown race, plated	1	0
Y135 Head screw race, plated	1	0

HANDLE GRIPS.

Celluloid is the usual pattern, the Blumel grip being especially durable. For comfort, some prefer the rubber grip. All are very easily fitted.



Y136 Celluloid	pair	1 0
Y139 Celluloid, Blumel	pair	1 0

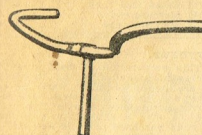


Y126 Chain adjusters, curved	8	0
Y127 Chain adjusters, straight caps	8	0
Y140 Rubber	pair	2 0

ELECTRIC CYCLE LAMPS—ALWAYS READY.

HANDLEBARS—CANADIAN.

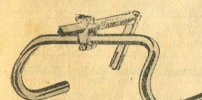
The Canadian handle-bar is the most popular shape, and it can be used down or up, since it has a reversible clip. Well plated, and fitted with grips.



Y136 Canadian handlebar	10	6
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HANDLEBARS—MAJOR TAYLOR.

Fitted with outrigger, giving forward as well as up and down adjustment. The pattern usually seen on racing machines, complete with grips and thoroughly nickel plated.

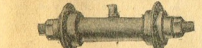


Y137 Major Taylor handlebar	18	0
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HUBS—ORDINARY.

Hubs fitted to your wheel, new spokes, Ss. extra.

Brampton hubs are perfectly reliable, and reasonably priced.



Y144 Brampton front hub	3	9
Y145 Front spindle	6	6
Y173 Front cone	6	6
Y174 Front nut	3	0
Y175 Brampton rear hub	7	0



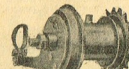
Y176 Rear spindle	6	6
Y177 Rear cone	6	6
Y178 Rear nut	3	0



Y179 Rear sprocket, 12-18 teeth	1	9
Y180 Rear sprocket, 20-22 teeth	2	6
Y181 Rear lock nuts	2	6

HUBS—RADIE.

The Radie coaster hub combining free wheel and back pedal brake, is easily the best on the market. Many have attempted to imitate the Radie, but it has readily maintained its supremacy for over 30 years. Not only is it the most reliable, but its brake is very certain and strong in action. Your life literally depends on your brake, so if you value the former, you cannot afford to be without an Radie.



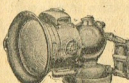
Y141 Radie coaster hub	27	6
Y142 Radie coaster hub, fitted with new spokes	33	6
Y143 Radie coaster hub, complete new wheel, plated	39	6

RADIE PARTS.

Y108 Ace cyclometer	6	0
Y146 Friction Plate	62R	4 6
Y147 Bronze brake ring	63R	3 0
Y148 Brake cone and lever	64R	3 0
Y149 Brake spring lever	65R	1 6
Y150 Clutch nut, toothed	66R	2 6
Y151 Right cup, toothed	67R	2 6
Y152 Driving nut	68R	3 6
Y153 Sprocket, 12-18 teeth	69R	3 0
Y154 Sprocket (not Radie)	70R	2 0
Y155 Left cup	70R	2 0
Y156 Brake clips, comp.	71R	1 3
Y157 Lock nuts	72R	1 3
Y158 Retainers & balls, lg.	73R	1 0
Y159 Retainers & balls, sm	74R	1 0
Y160 Clutch spring	75R	1 4
Y161 Adjusting cone	76R	1 6
Y162 Clutch spring screw	77R	3 0
Y163 Split collar, narrow	78R	3 0
Y164 Split collar, wide	79R	3 0
Y165 Packing piece, B.S.A.	80R	6 6
Y166 Spindle collar	81R	3 0
Y167 Packing piece, std.	82R	6 6
Y168 Chain stay clip screw	83R	2 6
Y169 Chain stay clip screw	84R	2 6
Y170 Spindle nut	85R	3 0
Y171 Lubricator	86R	6 6
Y172 Spindle only	87R	1 6

LAMPS—ACETYLENE.

These give a very fine light, which is essential for safe riding on country roads.



Y182 Panther	10	0
Y183 Revenge	17	6
Y184 Acetylene burner	1	0
Y185 Burner cleaners	6	6

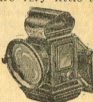
LAMPS—ELECTRIC.

These are driven from the front wheel, generating their own electricity. No batteries to replace.

Y190 P. and H.	30	0
Y191 Balaco	30	0
Y192 Bulbs for above	1	6

LAMPS—OIL.

These are cheap, and sufficiently powerful for use on good roads. They require very little attention.



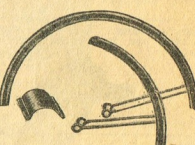
Y186 Demon pattern	3	6
Y187 Lumo	6	0
Y188 Wicks	1	1
Y189 Oil per tin	1	0

LAMP BRACKETS.

Y183 Head, ordinary pattern	9	0
Y194 Fork	9	0
Y195 Outrigger, for Major Taylor	1	6

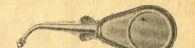
MUDGUARDS.

Made from heavy steel, stove enamelled, strong stays.



Y196 Defiance	3	6
Y197 Protector, extra wide	4	6
Y198 Screws for front guard	2	0

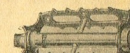
OIL CANS.



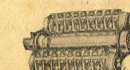
Y199 Plated, with screw cap	9	0
Y200 Plated, best quality	1	0
Y201 Oil, best cycle quality, tin	1	0

FEDALS.

Good quality, strong and durable.



Y202 Brampton rat-trap	pair	4 9
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Y203 Brampton rubber	pair	5 6
Y204 Coltonia, rat-trap	pair	4 0
Y205 Pedal rubbers, set of	4	2 3

EXELON TYRES TRAVEL FURTHER.

PUMPS.

Both styles are strong, and capable of standing up under hard usage. Connections and washers are best quality.

Y206 Nickel plated, 15 x 2	2 9
Y207 Celluloid	3 6

Y208 Pump connections, best	9
Y209 Pump washers genuine leather	2



Y210 Pump clips, black, light pair	6
Y211 Pump clips, plated, heavy pair	1 6

REFLECTORS.
Rear, red light. Necessary for safety.



Y212 Rear reflector	1 6
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RIMS.
Supplied plated or enamelled, drilled 32 holes for front, and 40 for rear wheels. Plated rims are lined in colour.

Y213 Front rim, 25 x 1 1/2, plated	8 9
Y214 Rear rim, 25 x 1 1/2, plated	8 9
Y215 Enamelled rim, 25 x 1 1/2	7 6
Y217 Rim tapes	4

SADDLES.



Y218 Brooks B18	13 3
Y219 B18 pattern	9 0
Y220 Three spring pattern	9 0

SPANNERS—See also TOOLS.
Y221 B.S.A. spanners, block .. 1 6
Y222 B.S.A. spanners, cones .. 1 6

SPOKES (State Wheel Size).	
Y223 Spokes and nipples, rustless	1 0

TOE CLIPS.	
Skeeta metal toe clips, easily attached.	1 6
Y109 Skeeta toe clips	1 6

TOOL BAGS.	
Y224 Leather, 6in.	2 6
Y225 Leather, 12in. strong	3 9

TROUSER BANDS.	
Y226 Plated bands	pr. 6

EXELON TYRES.

Size 28 x 1 1/2 wired only.
EXELON TYRES are specially made for use in one of the largest and best equipped tyre factories in the world.
Every tyre is fully guaranteed against defects, either in material or workmanship, and as we promptly settle all claims ourselves, no time and annoyance is incurred through referring the matter to some representative or other third party.



At the same time, claims are so rarely made, that we can afford to treat them in a generous manner.

SPECIAL OFFER.

On each FULL SET of EXELON CYCLOMETERS (two covers, two CYCLOMETER, value 6/-).
With a full set of EXELON "GREY" tyres and tubes, the CYCLOMETER may be obtained for 2/6.
ORDER NOW. This offer is available for a limited time only.

EXELON CRYSTAL.

Rubber of an amber colour, frequently referred to as crude rubber, has become prominent recently. Tennis shoes with crude soles practically never wear out.

EXELON CRYSTAL TYRES give like service on your cycle. They are extremely hard wearing, and though they cost more in the first place, they are actually cheaper in the end.

The fabric is extra strong and flexible, making the tyre very comfortable and fast. One side is corrugated, for driving electric generators.

Prices are much below any other type of the same quality.

EXELON TYRES are of the finest rubber. TRY ONE—it will stretch to several times its normal length, without suffering in any way. Cheap rubber will not stand this test.

GUARANTEED 9 MONTHS.

Y231 Exelon "Crystal" cover	12 6
Y234 Exelon "Crystal" tube	5 0
Y244 Two covers, two tubes	23 0

EXELON GREY.
EXELON GREY and tube, but very good value indeed. There is no need to risk using old tyres when new ones that are quite reliable cost so little.

Guaranteed 9 Months.	
Y235 Exelon Grey cover	7 0
Y236 Exelon Grey tube	3 0
Y237 Two covers two tubes	19 0

SOLUTION.	
Y237 Dunlop	4
Y238 Dunlop	6
Y239 Dunlop, in tins	1 3

TYRE LEVERS.	
Y240 Set of three	5

VALVE TUBING.	
Y231 Special grade rubber, yd.	8

DUNLOP TYRES.

Y110 Roadster cover, cord	12 6
Y239 Tube	5 6
Y240 Bates Red cover	10 0
Y241 Bates Red tube	4 0
Y242 Mercuro cover	5 9
Y243 Mercuro tube	3 0

PUNCTURE.

This preparation is used in your cycle tubes, and has the property of sealing up ordinary small punctures and leaks. Customers have reported great success with Puncture, and we offer it subject to a refund of your purchase price if not satisfied. Try it on some tube that factory. It is troublesome—the risk is ours.
Y232 Puncture (for one tube) 1 6

BENZINE ENGINES.

An American manufacturer is now making a range of very small and portable benzine motors, from about 1 h.p. upwards. Total weight is quite small, and already the motors are being largely used in U.S.A. for driving dynamos, lathes, woodworking and washing machines, etc.

SIZES FROM HALF HORSE POWER.

They could also be used for small pumps, spraying machines, driving lawn rollers and countless other purposes.

We can frequently supply suitable dynamos for coupling to these engines, and with the addition of an accumulator, they would provide a very compact, easy portable outfit for lighting houses, beach cottages, etc., and for charging batteries, either in the garage, or at home, for Radio.

Small stocks are actually now on order, so if you are interested, send in your enquiry immediately. The half horse power type should cost about £12-15.

ROTARY CONVERTERS.

In those towns where direct current (D.C.) is supplied, the Rotary converter is one method available for changing the current into A.C., as used on the majority of Radios and electric gramophones.

The Janette has now been on the market for some years, with extremely satisfactory results. It is made in a large variety of sizes, but the two chief are given below, while others will be quoted on application. Thirty-two volt machines are made for Dekon plants.

They can be supplied either with filters, which must be used if RADIOS are to be operated, or without filters, since these are unnecessary for purely gramophone amplifier work.

300 WATT.	
220 volt D.C. to 220 volt 50-60 cycle A.C.	£23 10 0
With filter	£21 10 0
Less filter	

Other types and sizes on application.

COLUMBIA Layerbilt RADIO BATTERIES

100% Construction

COLUMBIA Layerbilt WORKMANSHIP BATTERIES are made of Flat Cells, pressed tightly together, every bit of space being used. This construction gives 30% more capacity and proportionately longer life.



100% Reception

CLARITY, VOLUME, and DISTANCE

Sales in New Zealand of Columbia Batteries during 1929 were twice the combined sales of all other makes.

INSIST ON GETTING THE PROVED BATTERY



RADIO BATTERIES.

OBTAINABLE FROM ALL FIRST CLASS DEALERS.

