

# New Points For Listeners and Dealers-- By "Meter"

The aim of this section is to give listeners information of new and interesting devices and sets on the local market. It is free of advertising intent or influence and to the best of our ability will convey only absolutely reliable statements. Names, prices and sources of supply are mentioned for the benefit of readers and to save individual inquiry.

**T**HE name of the Radio Corporation of America has always been associated with the highest standards in radio wares, and this tradition holds good in respect to the company's 100-A loudspeaker, which I have subjected to a fortnight's testing. This loudspeaker has proved itself in every way a monarch among its competitors in the astonishing faithfulness of its reproduction on all audible tones, and in its sensitivity. With its instrumental and vocal music is a new delight. The bass notes are superbly rich and clear, and the treble leave nothing to be desired. Under the terrific strain of band music broadcast from 2YA, Wellington, I found it impossible to make the loudspeaker "chatter," although the music was passed through six valves at relatively close range to the big station. The 100-A R.C.A. loudspeaker is of the mantel-piece clock design, housed in a metal container. It embodies a new type of corrugated cone, which is completely weather-proof. Its pole pieces and armature are extra heavy, permitting great volume without saturation. A large-size permanent magnet of special alloy steel gives greater sensitivity and volume throughout the whole musical scale. It is claimed that this magnetic strength will not decline with age, resulting in decreased sensitivity, as is the case with some loudspeakers. An electrical filter is also provided, which removes distortion produced by high-frequency harmonics and summation tones. The metal case acts as a baffle-plate, and preserves the deep, full tones, while a light felt lining destroys obnoxious resonant effects and insures uniform response throughout its frequency range. This speaker is retailed at £12 10s. It was through the courtesy of the National Electrical and Engineering Co., Ltd., 42 Customhouse Quay, Wellington, that I have been able to test the R.C.A. 100-A loudspeaker.

## COMMERCIAL CONDENSERS.

IN many instances the size of variable condensers is given in microfarads, and in still more cases it is given in number of plates. The number of plates is no gauge to the exact capacity of the condenser, as the size of plates differs with different makes as well as the spacing between plates. As a rule, however, the requirements for variable condensers are not exacting as to size, the size specified being the maximum capacity when the plates are all in. In general the relation between number of plates and capacity is as follows:

Number of plates.	Capacity of Microfarads.
11	0.00025
23	0.0005
43	0.001
65	0.0015

The mere fact that a condenser has metal end plates does not mean that it is a better condenser or a "low loss" condenser. There are just as many poor condensers with metal end plates as with insulation end plates. There are just as good or better condensers with insulation end plates as with metal end plates. The name of the manufacturer is your best guarantee.

The plates should be thick and stiff, preferably of aluminium or brass, equally spaced, and the frame construction rugged. A vernier dial such as "velvet grip" or "easy tune" is better than a separate vernier plate, as a rule. Usually small plates mean a better made condenser. A pig tail connection is not necessarily better than sliding contact, but do not oil the bearings on a condenser which has no pig tail.

With so many good condensers to choose from you should pay more at-

tention to mechanical construction and strength, especially in the bearings where slackness soon develops.

## CORRECT RHEOSTATS.

THE problem of determining the correct resistance of rheostats often confronts a buyer who likes to design and build his own equipment. The proper resistance to use depends on the voltage of the "A" battery and the normal current that the valve operates on most satisfactorily.

For WD-11 and WD-12 tubes on 1½ volts a 6-ohm rheostat is satisfactory. For single C-301-a or UX-201-a tubes or any ½ ampere tubes on 6 volts a 30-ohm rheostat is proper.

For two C-301-a or UX-201-a tubes in parallel a 20-ohm rheostat will suffice. For four of these tubes in parallel a 6-ohm rheostat will be sufficient.

For UX-199 or C-299 tubes on ½ volts use a 30-ohm rheostat.

For UX-112 and UX-171 tubes use a 15-ohm rheostat on 6 volts.

For UX-112-a and UX-171-a tubes use a 30-ohm rheostat. These are the new quarter-ampere valves.

RADIO service men should interest their clients in the protection of their loudspeaker. Due to the increased clarity of signals, as well as to the additional power which may be obtained, many owners of receiving sets are incorporating power valves in sets which were not originally built to accommodate them. It has been the sad experience of many of these fans to find out that after a short period the loudspeaker would go on a "strike" due to the windings of the electro-magnet coils burning out.

This condition arises from the fact that the additional current necessary to operate these power valves is really more than the windings of the speaker can stand, with the result that a powerful surge induced by a loud burst of music will cause the fine wires to fuse.

Damage to the loudspeaker can be prevented in a very simple manner by the use of an output circuit, one type of which is described herewith. It is not necessary to place this apparatus in the cabinet, as it may easily be mounted right on the base of the loudspeaker.

The apparatus necessary is a choke coil and two 1mf. fixed condensers. These are connected in the following manner: First, they are mounted, with the two condensers in parallel. From one side of the output going to the speaker, connect a wire to one side of this condenser bank. From the other side of this condenser bank a wire goes direct to one side of the choke coil, and continues from there to one terminal of the set output.

From the other output terminal of the set connect a wire to the other side of this choke coil and to terminal for the output to the loudspeaker.

## "NEW" CIRCUITS.

THE home constructor is confronted with "new" circuits in nearly every radio magazine, and he is often tempted to tear down his set and test the latest circuit, only to find it is no better than the last. An American radio writer says:—

"When a radio wave coming through the air at the rate of 186,000 miles per second comes in contact with the wire of an aerial it sets up in that wire a current which, after a great deal of amplification, emerges as sound energy from the loudspeaker. Whether this sound is a faithful reproduction of what took place in the broadcast studio is merely a matter of engineering, and as we generally assume that there is no distortion between the studio and the receiving aerial, the main troubles are encountered most often in the receiving sets themselves.

"As has been intimated, the problem of distortion is one that has been engaging the attention of engineers ever since the start of broadcasting. Sets of all types, circuits, number of valves, etc., have been tried with the idea in mind that distortion was to be reduced to a minimum or eliminated entirely. New circuits were brought out, which upon inspection proved to be nothing more than old hook-ups dressed up in new clothes, and many of these newcomers were little better than their forerunners.

"So many of these so-called 'new' circuits have been foisted upon the radio public that every time something really worth while is put on the market the thinking portion of the radio enthusiasts look at it askance. It is seldom that anything radically new is presented to the radio constructor as something that is actually new in every sense of the word."

## TO FIT A VOLTMETER.

RADIO traders who build high-class sets should equip them with the best voltmeters. They add greatly to the finish of a set.

A voltmeter is a very handy instrument to have on the panel of a set using five or more valves, for with it you can tell the condition of both A and B batteries at any time.

Some set builders have not fitted a voltmeter on account of the apparent difficulty of cutting the large hole necessary to take the instrument. If this has proved a difficulty to you, the following instructions will show you how to make any size of hole in the panel.

Mark off panel with a pair of dividers the exact size of the hole desired, then mark out a second circle ½ inch inside. Now mark off the inside circle in ¼-inch sections all round, then take a Bradawl or the point of a sharp file and spot each hole.

The next operation is to drill a hole at each ¼-inch mark with a ¼-inch drill. We take a ¼-inch drill, and drill into each of the ¼-inch holes. If you have marked off your ¼-inch sections correctly, you will find that when you have finished with the ¼-inch drill that the piece of panel in the centre will fall out.

Finish off the hole with a half-round file.

## THE VALUE OF SOLDERING.

THE radio service man, professional and amateur builder, should solder connections in a set wherever possible.

One cannot receive unless the energy is transmitted through proper contact from metal to metal.

An invisible coating or film of air surrounds every metal, no matter how tight it may be pressed against another metal. Or worse, this film of air coats the metal with an invisible oxide. All oxides are notoriously bad conductors of current. In fact, nearly all oxides are insulators. So proper contact must be assured if the tiny surges of current are to be led from one part of a set to another.

With poor contact a surge of current cannot build up so as to produce oscillation. One must remember that a complete oscillation is a cycle of current running 0 degrees minimum to then to 180 degrees, where a reversal 90 degrees, the maximum in strength, of polarity occurs, and on to a similar change with opposite polarity. Now, poor contact is had, the current cannot build up from 0 degrees to 90 degrees, consequently no current will flow and no signals will be heard.

So the wise radio builder will see that good contact is made and kept by soldering every place in his set where current flows from one metal part to another. The soldering must be properly done, the joint first cleaned by scraping and sand-papering, then the parts cleaned, using a small amount of non-corrosive rosin flux, and finally the parts soldered together, using just enough solder to make a good electrical connection which has mechanical strength.

Every joint should be mechanically strong, as well as electrically conductive. If one inserts his hand into the

set for any reason, and brushes against the wire, the joint, if not mechanically strong, may break.

## GOOD EARTH ESSENTIAL.

SERVICE men who received complaints about poor reception should never fail to examine their clients' earth connections. It generally requires a few months to educate the average radio novice on the necessity for providing an efficient earth connection. The directions given in the radio books, magazines, etc., read "attach the ground wire to a water pipe, hot-water radiator, etc." In the hurry to get the set into operation the new enthusiast makes a very quick job of the earth connection, then wonders why his set will not operate properly. The ground wire does not have to be covered with insulation, although it would be better if it were, but it should be made of a fairly heavy gauge pure copper wire of about 12 or 14 gauge. Secure an earth as near your set as possible, as the shorter the distance from set to the earth the better will be your results.

A cold water pipe makes the best place to connect the earth wire. First scrape or file about 1 inch: round the pipe, then with a piece of sandpaper brighten the copper wire. Wrap from 10 to 15 turns of the wire round the scraped part of the pipe, pulling it up tight with a pair of pliers.

The wire should be soldered to the pipe, and then wrap the joint with black friction tape or adhesive plaster. This will keep out the air, and prevent the bright part of the pipe and wire from oxidising and so reducing the efficiency of the earth in a short time.

## WEIGHT OF COPPER WIRE.

THE following table showing the number of feet per pound of copper wire, should prove handy to dealers:—

WIRE TABLE OF FEET PER POUND.	
B & S Single Double	Single Double
gauge cotton cotton	silk Enamel
20 311 298 319 312 323	
21 309 370 403 389 404	
22 488 461 503 493 509	
23 612 584 636 631 642	
24 762 746 800 779 810	
25 957 903 1,006 966 1,019	
26 1,192 1,118 1,265 1,202 1,286	
27 1,488 1,422 1,590 1,543 1,620	
28 1,852 1,759 1,972 1,917 2,042	
29 2,375 2,207 2,470 2,406 2,570	
30 2,960 2,534 3,145 2,939 3,240	
31 3,604 2,768 3,493 3,283 4,082	
32 4,375 3,737 4,490 4,654 5,132	
33 5,390 4,679 5,610 5,869 6,445	
34 6,500 5,168 6,240 6,511 7,093	
35 7,800 6,737 8,000 8,334 9,017	
36 9,380 7,877 9,400 9,809 10,513	
37 11,860 9,309 10,800 11,266 12,110	
38 14,350 10,636 12,200 12,722 13,710	
39 17,130 12,507 14,300 14,916 16,010	
40 21,590 15,222 17,700 18,433 19,710	

## LOFTY STATION TOWERS

### DANGER TO AVIATORS.

To eliminate a serious hazard to aviation which is developing rapidly in commercial centres, the United States Federal Radio Commission state they may find it necessary to order owners of broadcasting stations to mark their towers in order to increase the visibility to flyers.

Aeronautical experts of the United States Army, Navy, and Commerce Departments have approved methods of marking air navigation obstruction such

as radio masts, transmission towers, and flag poles in the immediate vicinity of an airport, intermediate landing field or civil airway.

Three methods of painting are recommended: For the maximum desired visibility, towers less than 250 feet in height should be painted alternate bands of white and chrome yellow separated by black bands one-half the width of the white and chrome yellow bands.

As an alternative, the towers could be painted with bands of chrome yellow and black. As another alternative, the towers could be painted with bands of black and white or black and aluminium. From sunset to sunrise, the towers should be marked with red lights, making 80 to 120 flashes a minute. In order to afford adequate protection to aircraft the experts recommend that lights of higher candle power be used on major obstructions in the vicinity of landing fields.

Additional fixed red lights using 50-watt lamps are suggested for radio towers, one being placed at two-thirds of the height and one at one-third of the height of the tower. These lights would be arranged so as to be visible from any angle of approach.

## CLEAN YOUR SET

### EXIT DIRT AND DUST.

A clean radio set is most important if best results are required, and now that many listeners are cleaning their sets, the correct method of cleaning should be fully understood by every amateur. Outside of the regular testing of batteries, valves, aerials, and earth, dust and corrosion must be carefully removed.

The first thing that the serious broadcast listener should do is to dismantle his aerial system, wash the insulators in carbon tetrachloride or some other agent, which will remove the heavy accumulation of dirt and dust. Then examine the aerial itself. Is the lead-in joint tight and making good connection? Has natural oxidation made a poor connection? Wouldn't it be worth while to put up a new wire and attach a new lead-in? Wouldn't it be worth while to change the direction in order that some of those long-distance stations be received? Whilst these matters seldom occur to the average radio set owner, nevertheless they are very important.

### Use the Vacuum Cleaner.

Then on the set itself. Take it out of the cabinet, and if a vacuum cleaner is handy, use the long hose attachment and carefully clean every last trace of dirt and dust from the set. Use a pipe cleaner folded double and clean the plates of the condensers thoroughly, and see that the socket connections are bright and shiny, and that the movable connections are all solid, and will last.

Thoroughly clean the set from aerial to earth, cleaning all connections, brushing out dirt from the corners, cleaning off all surfaces where connections are made, testing all valves, and in short, giving your set a house cleaning. You will find out that much better results will be obtained from a set if it is given these periodical cleanings than if it is just dusted off from the inside with little or no attention paid to the inside.

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2C08 (10 AMP) POWER	15/6		
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2C28 (10 AMP) AUDIO	13/6	2C28 (10 AMP) AUDIO	13/6
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