

Canadian

**RADIO
DATA
BOOK**



1943 - 44

Price
One Dollar

ANNUAL EDITION OF RADIO and ELECTRICAL SALES

Published by

WRIGLEY PUBLICATIONS LIMITED

46 BLOOR STREET WEST • TORONTO • CANADA

*Postmaster: Return Postage
Guaranteed by Publisher.*

Listen Every **WEDNESDAY**

1943 AUTUMN 1943						
SUN	MON	TUE	WED	THUR	FRI	SAT
"YESTERDAY - TODAY - TOMORROW"						

A Lively, Liltng Variety Show

Make a date every Wednesday evening to tune in "Yesterday—Today—and Tomorrow" . . . radio's own radio show! This program brings to the public the thrilling story of radio in war and peace. It gives them a glimpse into how radio equipment made in Canada helps invasions, and how it serves in every branch of the service. It tells of radio's contribution to educa-

tion, and how lives are saved with electronics. It is spiced throughout with lively, liltng music from great radio programs of the past and present. It's an all-entertainment broadcast!

Boost the "Yesterday—Today—and Tomorrow" musical variety show in your community and it will help build goodwill for you!

EVERY WEDNESDAY OVER A NATION-WIDE NETWORK

9 - 9:30 p.m., A.D.S.T.

7 - 7:30 p.m., C.D.S.T.

8 - 8:30 p.m., E.D.S.T.

9:30 - 10:00 p.m., M.D.S.T.

8:30 - 9:00 p.m., P.D.S.T.

SPONSORED BY RADIO MANUFACTURERS ASSOCIATION OF CANADA

*Until
the
Trade
Winds
Blow Free
Again... --*



Will Continue to Produce:

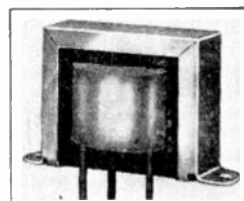
- AIRCRAFT WINGS, FINS AND STABILIZERS • AIRCRAFT RADIO DEVICES • MILITARY AND NAVAL RADIO REQUIREMENTS • RADIO HEAD PHONES • SHELL AND BOMB PARTS

Be Prepared To "Go Places" With Phonola After The War!

DOMINION ELECTROHOME INDUSTRIES LIMITED
KITCHENER, ONTARIO

NOTE: Phonola service and replacement parts are available in adequate quantities — write directly to the factory.

- in prewar THE OUTSTANDING
MANUFACTURER OF QUALITY PRODUCTS.



- at war C.T.C. PLANT CONVERTED TO
PRODUCTION OF PARTS FOR OUR "ARMED FORCES".



- in post - war NEW DESIGNS, NEW INNOVATIONS
THAT AGAIN WILL BE EXCLUSIVELY C.T.C.

*Radio Servicemen Now More Than Ever Before Must Use Radio
Parts Of Dependable Manufacture And Proven Performance*

Canadian Transformer Company

12 CEDAR STREET E. WATERLOO, ONT.

Power & Input Transformers Solenoids

Chokes & Output Transformers Battery Boosters

Our biggest customer today

He is in the uniform of the Canadian army, or navy, or airforce. For sometime now he has been taking the entire output of the expanded Marconi plant. That he is putting it to good use is shown in the news from the battlefronts. The success of the navy and airforce against the U-Boats has been made possible by radio. The successful coordination of land, air and sea operations in Sicily was made possible by radio.

Your biggest customer tomorrow

This man knows how well Marconi radio equipment performs under tough conditions. When the war is over he and comrades will come back. Many of them to set up new homes. Then he will be *your* biggest customer for the greatly improved home receivers now shaping up in the design and engineering departments. The fastest way we know of making him your biggest customer is to continue giving him the entire output of our factory till Victory is ours.

"Tube-itis" Advertising Continues to sell Marconi RVC Radiotrons

There is radio repair and tube replacement business in your neighborhood. Keep the Marconi displays on show to identify yourself with the Tube-itis advertising campaign.

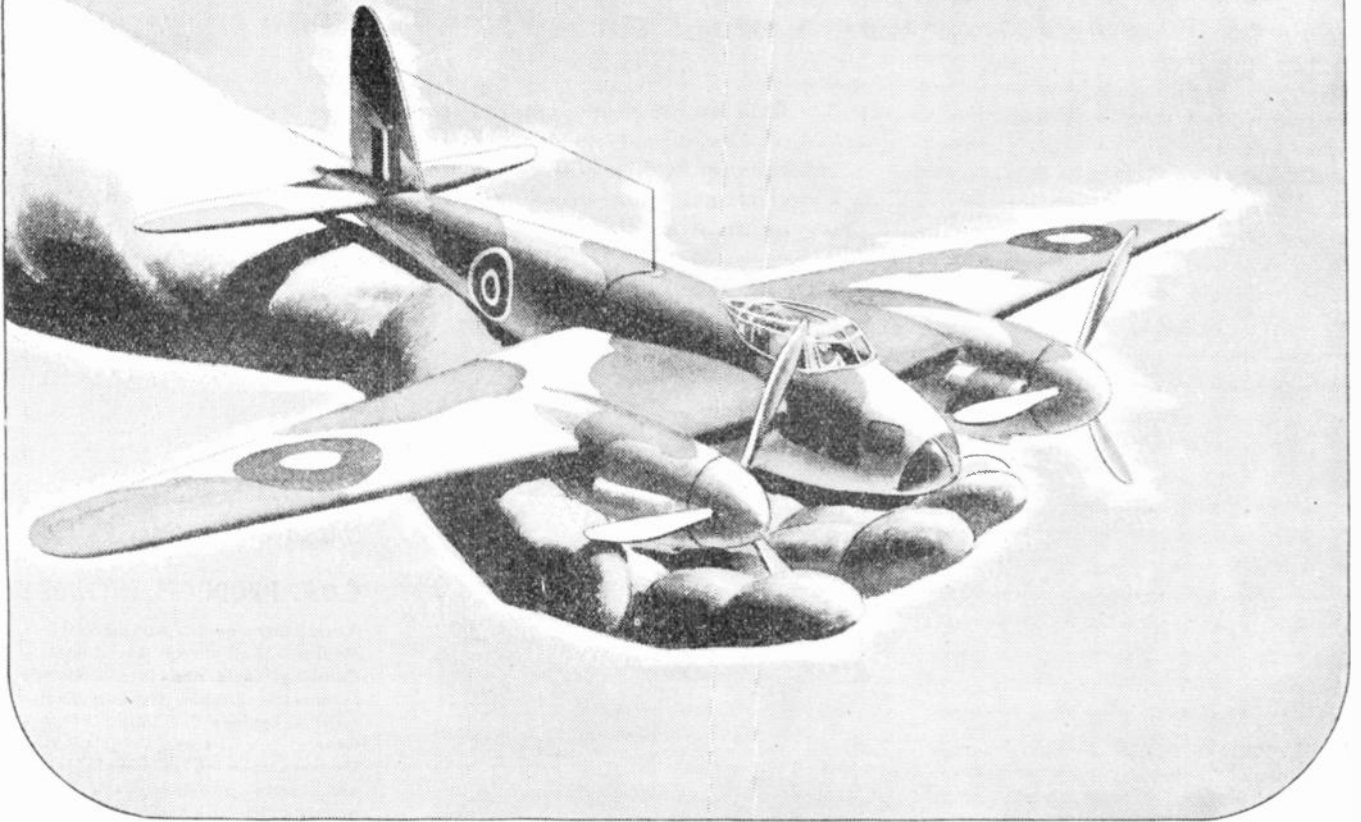
CANADIAN MARCONI COMPANY

Established 1903

MARCONI BUILDING - MONTREAL

Vancouver - Winnipeg - Toronto - Halifax - St. John's, Nfld.

Look at a Bomber~



de Havilland Mosquito.

you see Northern Electric at WAR

No, we don't build bombers . . . our job is to give speech, sight and hearing to those argosies of victory — those D-for-Donalds, C-for-Charlies and their gallant crews who are making aerial history. And into this work go sensational developments in electronic equipment fashioned and perfected to guide our airmen (many of them our fellow workers) to any target . . . through any weather . . . and to bring them safely home again. The men and women of Northern Electric . . . the hands that man the machines . . . are working at high speed, accurately, in a full-time effort to produce the world's best equipment for the world's best fliers. Only when peace comes will the hands of Northern Electric return to their regular activity of manufacturing wires and cables, telephones, radio receivers for civilian use . . . all the products of a national electrical service.



INFORMATION

"Our war production job is by no means confined to bombers alone. Vital equipment for all the Services — Navy, Army, Air Force — is our full-time schedule".

40-31-SC

Northern Electric

AND ITS EMPLOYEES

IN WAR AND IN PEACE—A NATIONAL ELECTRICAL SERVICE

We're One Team with One Task...

- VICTORY.

HERE AT
CANADIAN GENERAL ELECTRIC



● From the oldest veteran to the youngest recruit, the workers of Canadian General Electric realize the responsibility which rests upon their shoulders. They are building huge and intricate electrical units—to generate and distribute power and apply it in the war plants. They are making precise and complicated military equipment—aircraft instruments, gun mountings, marine engines and searchlights.

They are helping supply the "Power to Win" so that they, and all of us may the sooner pick up the peacetime task of making better things for a better Canada.

C.G.E. PRODUCTS INCLUDE:

Aircraft Instruments • Anti-aircraft Gun Mounts • Anti-aircraft Searchlights • Carbonyl Tools and Dies • Electric Furnaces • Electric Welding Equipment • Engines for Cargo Boats • Generators • Wire and Cable • Wiring Devices • Lightning Equipment • Motors and Control • Capacitors • Panelboards • Plastics • Radio Equipment • Secret War Devices • Transformers • Special Lamps for Navy, Army and Air Force.

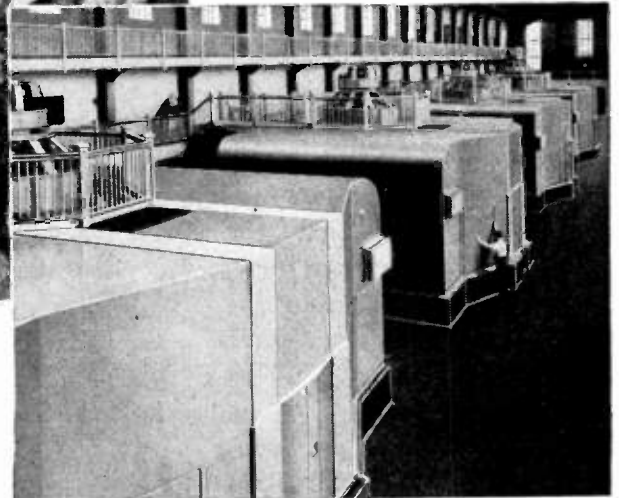


JACK TILLEY AND ADAM RANKIN at work upon the massive castings for turbines which will soon be helping to generate the electric power needed to meet the ever-mounting requirements of Canadian war industry.



POWER TO WIN! Electric power for Canada's busy war factories is developed in ever-increasing volume by the mighty hydraulic turbines and generators produced in the foundries and workshops of Canadian General Electric.

EW-843



CANADIAN GENERAL ELECTRIC CO. LIMITED

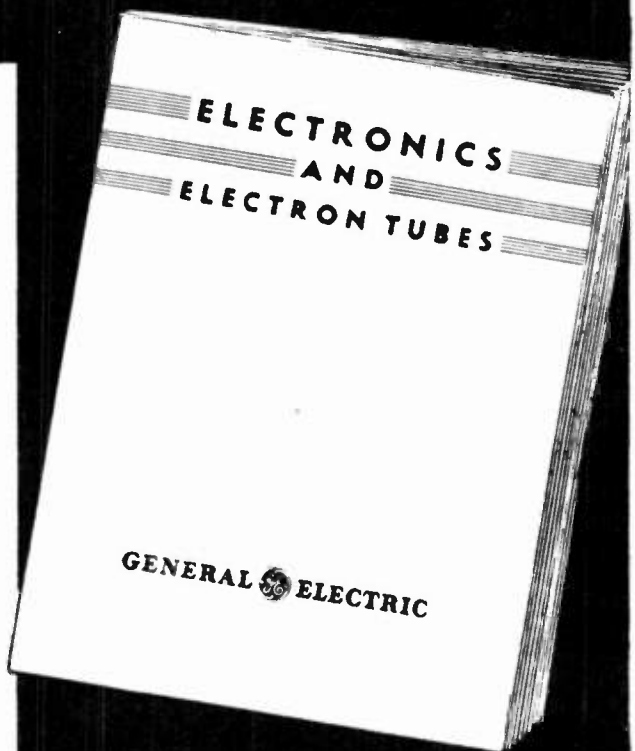
Sydney • Halifax • St John • Quebec • Sherbrooke • Montreal • Ottawa • Toronto • New Liskeard • Hamilton • Sudbury • London
Windsor • Fort William • Winnipeg • Regina • Saskatoon • Lethbridge • Edmonton • Calgary • Trail • Kelowna • Vancouver • Victoria

ELECTRONICS

Your Future Business

Electronics! Today on duty in a host of secret war devices . . . Tomorrow destined to be the foundation of a great new peacetime industry.

Already alert radio service men are preparing to become the electronic maintenance men in their communities. To help you gear your knowledge to the electronic future, we present "Electronics and Electron Tubes"—an authoritative guide to electronic theory and practice. More than 50,000 words in length, the book is replete with illustrations, curves, tables and experiments. Get in on the ground floor of electronics! Send for your copy—today!



SEND COUPON NOW

To Canadian General Electric Co. Limited
Attention: W. J. Watterson.
212 King St. West, Toronto.

Please send me a copy of "Electronics and Electron Tubes".

Name

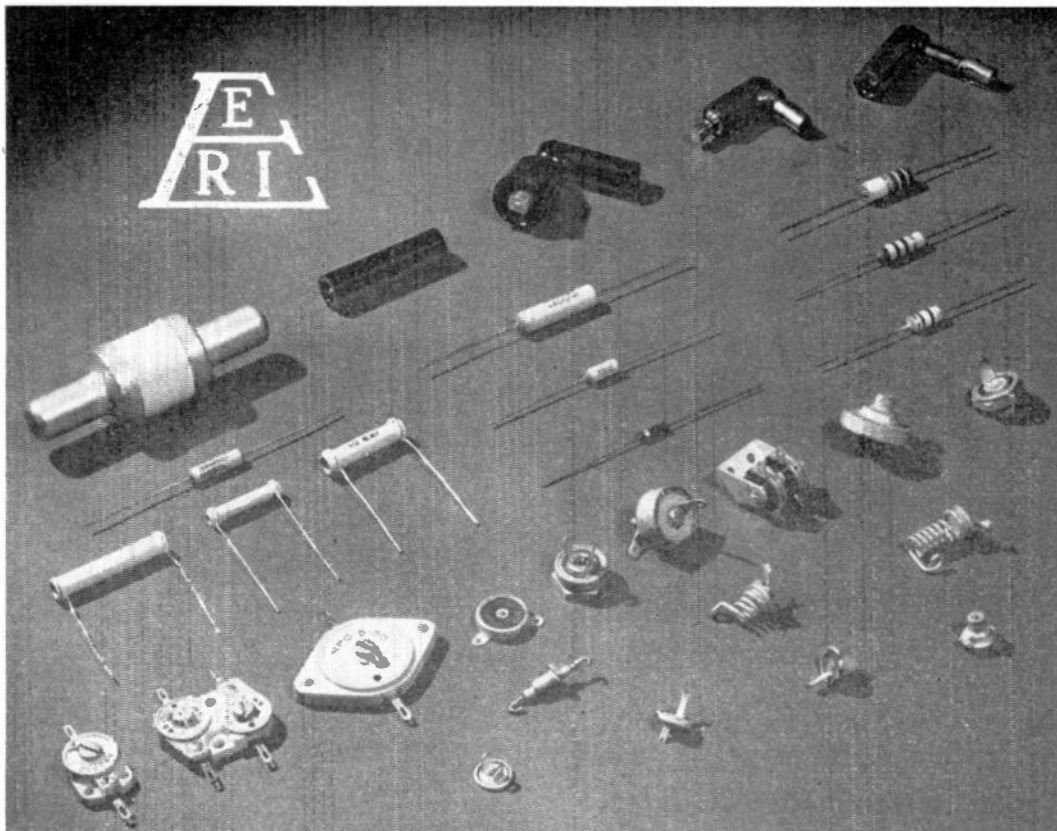
Address

NW-243X



CANADIAN GENERAL ELECTRIC CO. LIMITED

Sydney • Halifax • St John • Quebec • Sherbrooke • Montreal • Ottawa • Toronto • New Liskeard • Hamilton • Sudbury • London
Windsor • Fort William • Winnipeg • Regina • Saskatoon • Lethbridge • Edmonton • Calgary • Trail • Kelowna • Vancouver • Victoria



The science of Electronics forges ahead with Accurate, Dependable Components ...

The tremendous progress in the electronic arts, to which Erie has made many contributions, probably surpasses the development in any other scientific field during any equal period of time.

This rapid progress of electronic communications and controls is not the result of any single research activity, but rather the fruits of continued, persevering thought and labor in the development and production of the many components incorporated in the various electronic mechanisms.

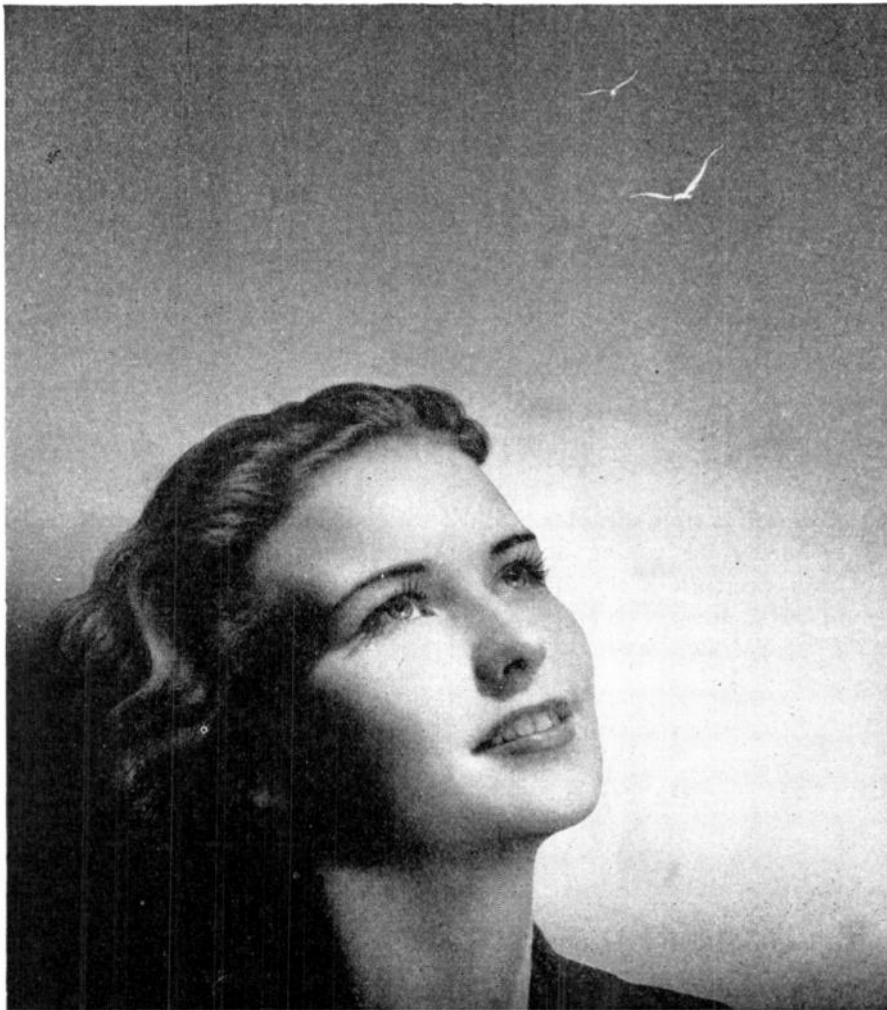
Erie Resistor's part in this research and development is an important one. The Erie products, illustrated above, show how much Erie has contributed to the progress of the electronics industry by making available a wide variety of dependable components.

- 1 **ERIE RESISTORS**—Made in ½ and 1 watt insulated, 2 and 4 watt non-insulated styles in resistance values from a few ohms to 100 megohms.
- 2 **ERIE SUPPRESSORS**—Efficiently eliminate ignition interference in radio receivers. Type L-4 for spark plugs and S-5 for distributors.
- 3 **ERIE CERAMICONS**—Tubular, silver-ceramic capacitors, available in 10 standard temperature coefficients from +100 (P100) to -750 (N750) parts/million /°C (P/M/°C). 1100MMF maximum capacity in N750.
- 4 **ERIE CERAMICON TRIMMERS**—Adjustable ceramic condensers, made in one double and three single styles. Temperature coefficients, zero, -300, and -500 parts/million/°C (±100 P.M/°C). Capacity ranges between 1.5 to 7 MMF in NPO, and 10 to 110 MMF in N500 are available.
- 5 **ERIE DISC CERAMICONS**—Type 1770, rated 500 volts D. C., maximum capacity 850 MMF in NPO, 4,000 MMF in N750 temperature coefficient; Type 170, rated 1,000 volts D. C., maximum capacity 1,000 MMF in NPO and 4,000 MMF in N750 corresponding capacities at 1,500 volts, D. C., 375 MMF and 1,500 MMF. Available in 10 standard temperature coefficients. Very compact and excellent for u.h.f. applications.
- 6 **HIGH DIELECTRIC CERAMIC CONDENSERS**—Present units use K1200 dielectric. Maximum available capacitors 5,600 MMF in insulated style and 16,000 MMF non-insulated. Now available in production quantities.
- 7 **ERIE BUTTON MICAS**—Compact silver mica condensers available in a variety of mounting and terminal designs. High resonant frequency makes them ideal for u.h.f. applications. Maximum capacities: Type 370, 500 MMF; Type 470, 1,000 MMF; Type 4700, 3,000 MMF.

Also shown above are two types of combination choke & condenser assemblies.

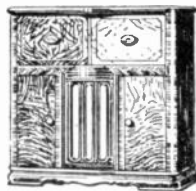
Engineers who are interested in any of the above components may obtain detailed information upon request.

ERIE RESISTOR OF CANADA LIMITED
Factories in: Erie, Pa. London, England Toronto, Canada



When the air is clear again

It will be a great day when Victory is won . . . when the boys march home to peace and security . . . "when the air is clear again." Yes, and it will be a great day, too, when peacetime production hits its stride again . . . when markets widen, demands strengthen and great new de-



*In Radio and Telephones
there is nothing finer than a*

velopments, services and products arise to fill the needs of a people liberated from the sacrifice and burden of war.

When that great day comes you will find Stromberg-Carlson

Radio again in the forefront of design and achievement . . . again representative of "the finest in radio."

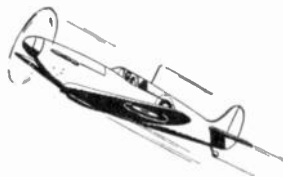
STROMBERG-CARLSON

Stromberg-Carlson Telephone Mfg. Company of Canada Limited, Toronto

Busier Than A Bee



A bee flies an estimated 43,776 miles in gathering a pound of honey, yet under the British Commonwealth Air Training Plan our pilots fly an average of more than 2,000,000 miles a day!



**Your VICTORY BOND Purchases
give them Wings and Speed Victory!**



Incidentally, we are fully and busily engaged on vital war work, manufacturing **AMPLIFIERS, MOBILE SYSTEMS and VIBRA-PACKS—also TELESCOPIC ANTENNAS, SECTIONAL AERIALS and MICROPHONES.**



A. CROSS & CO., LIMITED

**45-49 Elm St.
TORONTO**

**995 St. James St. W.
MONTREAL**



"There's no substitute for that material sir!"



The "material"
we mean is ...
EXPERIENCE

"Experience" is one simple word that stands for a great variety of assets.

Experience is the result of years of careful painstaking labour over a particular technical task or craft.

Experience brings the slow, steady, development of a dependable ever-growing skill and technical excellence in performing an exacting job.

Believe us, please, when we say there's absolutely NO substitute for such skill and technique—especially in the field of radio.

The high quality and painstaking exactness demanded of us by war contracts have had a definite part in developing that kind of skill, the kind that means familiarity with the mastery of a tough job.

We're proud to say that we now have a good many Grade AA craftsmen and technicians whom the years have ripened in their work and made masters of their craft.

These men have the "know-how" that's needed to bring you all the finer products you'll want to handle for your customers in the better, more comfortable world of to-morrow.

★ *It all adds up to* ADDISON

ADDISON INDUSTRIES LTD.

187 - 209 GEARY AVENUE TORONTO



PREST-O-LITE BATTERIES
1360 Dufferin St., Toronto

RESERVE STRENGTH

Reserve strength often determines the tide of battle. And the reserve strength built right in PREST-O-LITE radio batteries makes all the difference in the world to battery-set performance.

This is particularly true in Winter time when the average radio "works" far longer hours than at any other season.

Start your customers off right by selling them PREST-O-LITE radio batteries. Their longer life and greater reserve strength means more satisfaction and better profits for you.

Prest-O-Lite

RADIO BATTERIES

SRP

TRANSFORMERS



When the armed services and leading manufacturers use Standard Transformers in their radio equipment—they know by experience that they can depend on efficient performance—when Standard Transformers are reordered for replacements they also know they will give satisfactory service. Whether for new radio equipment or replacement specify and get Standard Transformers.

Write for information

STANDARD RADIO PRODUCTS

MANUFACTURERS OF
COILS AND RADIO TRANSFORMERS

KITCHENER

CANADA

FORESIGHT!

Backed by years of experience and research, RCA Victor Company Limited is constantly in the vanguard of radio and communication-equipment production. Uniquely prepared, RCA Victor was ready, at the outbreak of war, to begin its great expansion plans to answer immediately Canada's call for important war weapons.

Today, production at the RCA Victor plant must focus on Canada's wartime needs; but RCA Victor remembers *You* and *Your Civilian Customers* — and the importance of those customers in the post-war period. And so RCA Victor is kept constantly in the public mind, with its "Voice of Victor" radio programme, top-ranking Canadian musical show carried on the complete C.B.C. network . . . and with its regular coast-to-coast newspaper advertising for Victor Records.

With an eye to the present, RCA Victor looks to the future, thus ensuring that after the war, RCA will again be the accepted leader of the radio and record world, in development, quality and prestige.



RCA VICTOR COMPANY LIMITED

Halifax Montreal Ottawa Toronto Winnipeg Calgary Vancouver



LOOKING TOWARDS THE WORLD OF TOMORROW

AN INSPIRING CHALLENGE to the imagination is this ever-expanding science of electronics.

From the laboratories of Rogers Radio Tubes Limited in Toronto, Canada, in 1924, came the first A. C. Tube for domestic radios.

War-time censorship postpones the announcement of our new developments in radio tube design. Meanwhile, Rogers Radio Tubes are today wholly devoted to serving the armed forces of the United Nations.

ROGERS

POWER TUBES

ROGERS RADIO TUBES LIMITED • TORONTO, CANADA

*An Open Letter to Our
Radio Dealers and Jobbers --*

**ROGERS MAJESTIC
LIMITED**

Manufacturers & Distributors of Radio Sets • Tubes • Radio Apparatus • Electrical Appliances

Head Office, 622 Fleet St. W.
TORONTO, CANADA

Gentlemen:-

Now that Italy has capitulated, and in view of the general conditions of the war, it would seem wise to focus our attention even more sharply on our post war set-up. Many of our dealers have not been frankly and completely informed regarding our post war policies, and as a consequence, have become justifiably concerned about their future and our distribution picture. Just so there will not be any misunderstanding regarding Rogers Majestic's position, here are a few important facts which you will want to keep in mind.

Will Rogers and DeForest radio sets be sold after the war? The answer is definitely, yes. Just as soon as our facilities permit.

Plans relating to both engineering and production are already under way. From a study of these plans I am confident that Rogers Majestic will be a very strong factor for both the early and later markets in the radio and electronic field.

You will not be used as a guinea pig in launching an untried and unproven line of products. We intend to build our reputation on quality and outstanding merchandise.

Great strength has been added to the Rogers Majestic organization during these war years to enable us to be a leading post-war producer as well as one of the leading producers of vital war equipment. Men of the highest reputation have been engaged to operate and direct the engineering, production, and sales staffs. We have increased our floor space since the war started from 80,000 square feet to 170,000 square feet.

Many new products that we will offer to the public cannot at present be revealed. Our designing activities are being directed by an outstanding engineer, and we plan on a program which will be mutually for the benefit of all concerned, modern and aggressive.

War production naturally ties us down in our factory tasks and we regret that we cannot get around to see you at the present time, but I want to let you know that we are thinking about our dealers and jobbers, and that we are ready and will be ready to serve you in the post-war era.

With the above remarks, I ask your continued patience and support. Please feel free to write me any time regarding any phase of our business.

Yours sincerely,



H. P. Mackechnie, President,
Rogers Majestic Limited.

HPM-FM

CONTINENTAL CARBON OF CANADA LIMITED

Manufacturers of

CONTINENTAL CERTIFIED CONDENSERS



**SUPPRESSORS
RESISTORS
FILTERS**

54 SUMACH STREET - TORONTO, CANADA





A Year Ago he was a civilian . . .

Today he bombs vital centres of Nazi Germany. Throughout his training period . . . right down to the final words of command which come to him over his target . . . one factor has played a vital role—*Radio Electronics!*

Radio helps train men who fly planes. Radio guides the planes through hundreds of miles of fog and darkness to their destination and here again radio keeps planes in contact with each other in the combat zones.

In the early stages of this tremendous development Stewart-Warner's research staff and Precision Engineers realized that the right method of wireless communication for proper aerial navigation must be taught in simple fashion. That is why Stewart-Warner not only builds equipment for the Navy, Army and Air Force, but designed and built class-room equipment for student pilot training.

Stewart-Warner Engineers are working in all fields of modern radio and electronics. When peace returns Stewart-Warner will help to usher in a new world . . . in communications . . . in the home . . . business . . . transportation by land, sea and air . . . in entertainment. Stewart-Warner will again be foremost in the field with the new discoveries and new services that will make modern living.



STEWART-WARNER
RADIO ELECTRONICS



Stewart-Warner Radio and Electronics, Alemite Lubrication Systems, Bassick Casters, South Wind Heaters, Tecalemit Oil Filters, Fittings, etc.

Made in Canada

STEWART-WARNER-ALEMITE CORPORATION OF CANADA, LIMITED
BELLEVILLE, ONTARIO

Canadian **RADIO DATA BOOK**

Annual Edition of
RADIO & ELECTRICAL SALES

WRIGLEY PUBLICATIONS LIMITED
46 BLOOR STREET WEST, TORONTO

Weston Wrigley,
President

G. B. Wrigley,
Editor & Manager

Henry McCordle, Technical Editor

Established 1923

October, 1943



THIS is essentially a wartime issue of *Canadian Radio Data Book* and many new features have been incorporated which will cause it to be preserved by most readers as a reference book.

Radio has become a vital war weapon and, as such, care must be taken that no information of value to our enemies regarding radio location or other communications equipment be published. As a result articles for publication in the *Data Book* have been submitted to the censors and passed by them.

These restrictions on publicity also apply to advertising as will be seen by regulation No. 25 B dated at Ottawa, July 30, 1943, as follows:

Subject: Radiolocation

"While certain limited disclosures have been made in Great Britain, Canada, and the United States on the subject of radiolocation or radar, there is still much which the enemy does not know of developments by the Allied nations in this and similar fields. To insure against furnishing the enemy with any further information or any clue to such information, the Censors of Publications request that all references in advertising or news stories to radar, radio-location, RDF, or other electronic devices for military purposes be submitted to them before publication. This request is being made in conjunction with British and American Censorship authorities." Signed by F. Charpentier, and W. Eggleston, Chief Censors of Publications.

Radio manufacturers, through

The PUBLISHERS' PAGE

From Manufacturers

the Radio Manufacturers Association and individually, and radio engineers also have done an exceptionally valuable and patriotic job in both the quality and quantity of their production for the war effort and this issue endeavours to place "on the record" a measure of their war services.

* * *

Statistics of pre-war production and sales are also recorded with part of the curtain lifted to show the greatly broadened post-war possibilities for the radio trade. Developments in broadcasting, sound and test equipment, new Government Regulations and priority restrictions, Servicemen's Activities and Directories of Government Officials and trade organizations are also included, the new "Made in Canada Radio Manufacturers' Directory" being the most comprehensive ever compiled and showing the rapid growth of the radio manufacturing industry in Canada.

* * *

The expansion in the variety of radio parts and accessories now produced in this country is reflected in the increased size of the *Data Book* and the increase in the number of advertisers by over seventy-five per cent.

* * *

The use made of the publication and the value placed on it as a reference book by all branches of the trade is indicated by the following extracts from some of the letters received by the editor.

"The *Data Book* has become a valuable reference book for the radio trade by faithfully recording important milestones in radio progress. The inclusion of a considerable amount of service material in the present edition is particularly timely."—Chas. O. Baldwin, Manager, parts and service division, Philco Corp. of Canada, Toronto.

"Your selection of editorial matter is timely and will be well received."—G. A. Harris, Manager, Appliance Division, Canadian General Electric Co., Toronto.

"The production and editorials are very good. We are especially pleased with our advertisement."—B. W. McKee, Stewart-Warner-Alemite Corp., Belleville, Ontario.

"The advertisements in the *Data Book* should be a big help to the war effort."—P. H. Kirby, Burgess Battery Co., Niagara Falls, Ont.

"Your latest *Canadian Radio Data Book* contains much valuable data information."—W. E. Schwartz, Canadian Westinghouse Co., Ltd., Calgary, Alta.

Radio Engineers

"By all means keep up the publication of the *Radio Data Book*."—R. A. Glaser, Radio Engineer, Na. Research Council, Ottawa.

"The editorial matter in the *Data Book* is quite good and should be of assistance to dealers and servicemen."—G. J. Irwin, Chief Engineer, Philco Corp. of Canada, Toronto.

(Continued on page 24)

PLANNING AFTER

Rtdio Communications and Television will step industry forward—

Manufacturers Oualook Very Bright

First of all, there is the reestablishment of millions of men—and the radio industry must absorb its share. There is the reestablishment of all the broken lines of communication which must take place before raw materials can flow once more—and the radio industry will *not* be the first to be considered when this is being done. Then there is the little item of competition, not competition within the industry, *competition between industries*, competition in the race for raw materials and competition for the customer's dollar. There is, of course, the larger headache, competition between countries but let's ignore that.

This question of how the customer will spend his dollar is an interesting one. It will be divided, as always, between TAXES, Essentials, and luxuries. We fall in the latter category—how far we fall depends upon how well we plan. We can take it for granted, how-



The Control Tower, the nerve centre of every airport.

A GREAT deal has been written of late on the war's most secret weapon, "Radio Communications." Very little that has been written is of any great value to the enemy of course, and the only reason that permission is granted for as much as has been said is because some of the equipment has been captured and the enemy now has an inferior but reasonable facsimile.

The extent to which we have improved upon our earlier models, which performed such miracles during the Battle of Britain, is still a very closely guarded secret. Enough has been disclosed, however, to give a fair idea of what has been accomplished.

What this will mean, after the war is over, is fairly easy to see in a general way. Television and reception of audio signals uncluttered by parasitic noises will be commonplace. The principles on which they are based are now in use, and the same engineering ability that made them so efficient in war will not take very long to apply them in peace. Nor will the cost be so great. The war has taught us that to get mass production of anything, all that need be done is break the project into small enough pieces so that more unskilled help can be used. It is one of the wonders of this war that ways have been discovered of breaking down even the

most complicated devices.

Well—there it is. After the war we will have beautiful radio reception and excellent television. We shall be able to make them at reasonable cost, and in large quantities. Best of all we shall have a virgin market. It all sounds very nice and easy. But is it?

It will *not* be easy. In the post-war readjustment period it will be found that the radio industry will have its trials and tribulations just the same as any other industry.



A corner of the radio room of a navy ship.

FOR RADIO THE WAR

Dealers and Servicemen will be Important Factors.

By HENRY McCARDLE

ever, that Plastics, Airplanes and Automobiles will give us a good run for the luxury fraction of the customer's dollar. There are smart men in them thar' outfits who are already planning plenty for after the war.

Anyone who imagines that these problems can be solved *after* they arrive is indulging in a dangerous pipe dream. The old saw—"In times of peace, prepare for war" is just as wise in reverse. Wiser perhaps, because the difficulties of war are met with patriotic fervour whereas the difficulties of peace only meet with indifference. In planning *now* to meet the problems of peace we may help bring about an orderly transition from war activities to peaceful progress. If the memory of the aftermath of the last war, with its bitterly exploded idealism, means anything at all, it should mean that we will not permit the victory won by our soldiers to be defeated by our lack

In an airplane the operator has everything within handy reach.

of foresight, or worse—our selfishness, at home.

How can we plan for after the war? Merely by taking what we know, adding what we anticipate, subtracting what we fear and allowing a percentage for error. We know we have a wonderful product, one that should be in every home and we know that we will have difficulty obtaining raw material, that we will get only a fraction of the customer's dollar. These are gen-

eralities. But because their effect will be general, only co-operative planning within the industry can hope to solve them. No single individual or organization can solve them for their own exclusive salvation. It must be a co-operative effort. Co-operation was necessary in war, it will be just as necessary in peace. Material allocation will certainly continue. Distribution will be controlled after the war.

The problem of distribution will probably be quite complicated. From time to time we have heard it said that the middle man should be eliminated. From factory to customer just isn't feasible in the radio industry. As a matter of fact it doesn't appear feasible in any industry in a country so vast as ours. Industries that have tried it have usually ended up by establishing "branches" in different parts of the country and branches are in effect the same as distributors and dealers. In the radio industry, however, it doesn't appear even reasonable. Service must always be a localized activity. The replacement of a tube or a part, the work of adjusting sets must always be done by a local service business. It is therefore natural that the outlet for the product should be through the same channel. There would be no economy in any other system. Therefore, the dealer will



Signalman transmitting a message from an army truck.



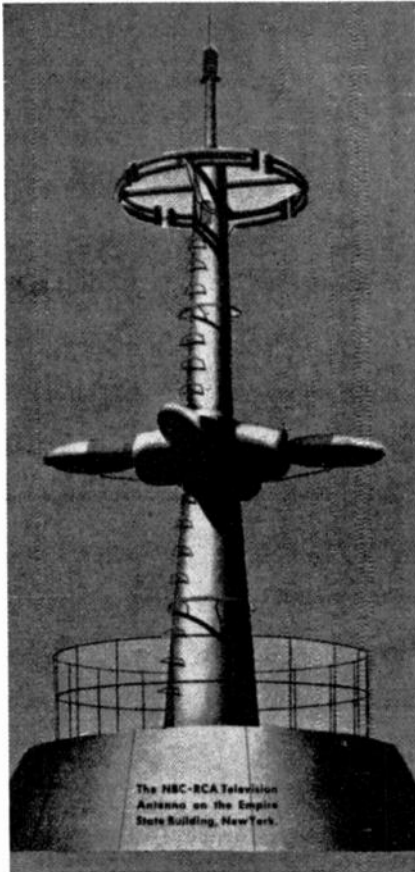
Signal Section wireless truck equipped with field transmitter.



Interesting set of electrical nerves operated by a lineman in khaki.

remain. But it is definite that he will be more carefully chosen. He will probably have to show that he is equipped and staffed to handle the delicate service problems that will present themselves. The coming domestic instrument will be no gadget. Hit and miss methods are more likely to lead to destruction than to a lucky cure for trouble. Skill and knowledge will be essential.

Right here is where some very useful planning can be done now that will be for the general good. At the present moment there are thousands of men in the armed forces who have been trained to operate and service radar equipment. These men are naturals for the work ahead. Many of them will be absorbed by the industry for the production of the many different industrial and domestic devices that will be required. Many will return to their own localities to become the skilled servicemen of the future. But how many will the industry absorb and how fast will they be taken up? The industry will lose less time if it has a prepared plan to present to the Government than it will if it leaves



the planning until after the problem presents itself.

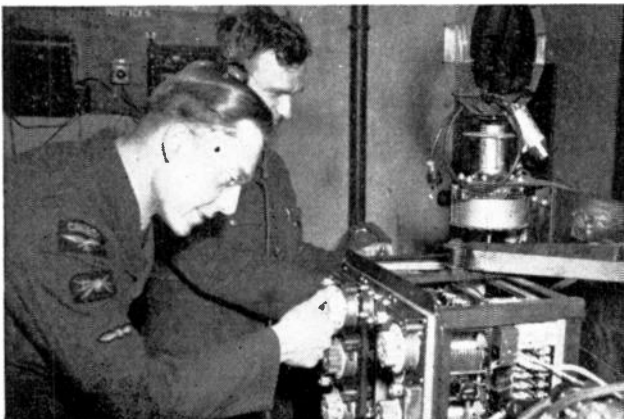
Plan now, so that the period of transition will be orderly and short. Let our part in the peace to come be an intelligent one.

YESTERDAY, TO-DAY AND TO-MORROW

The Radio Manufacturers Association of Canada is sponsoring another series of broadcasts entitled "Yesterday, To-day and Tomorrow," a musical variety show each Wednesday evening beginning Sept. 29, 1943. The programme will be from 8 to 8:30 p.m. in both Eastern and Western Canada.

In addition to a programme of lively music the story of radio's early developments, its war services and its possibilities in the future will be outlined in an informative manner helpful to all branches of the industry.

Dealers and servicemen should promote the broadcasts in their localities in every possible manner in order to get the benefit of the publicity of this popular programme both to-day and to-morrow when post-war activity begins.



Illustrating sturdy construction of aircraft equipment.



Checking the mount mechanism at Research Enterprises.

RADIO'S PART IN CANADA'S WAR EFFORT

Canadian Radio Manufacturers and Research Engineers Produce Vital Equipment for all Branches of the Armed Forces serving in all parts of the world.

By HENRY McCARDLE

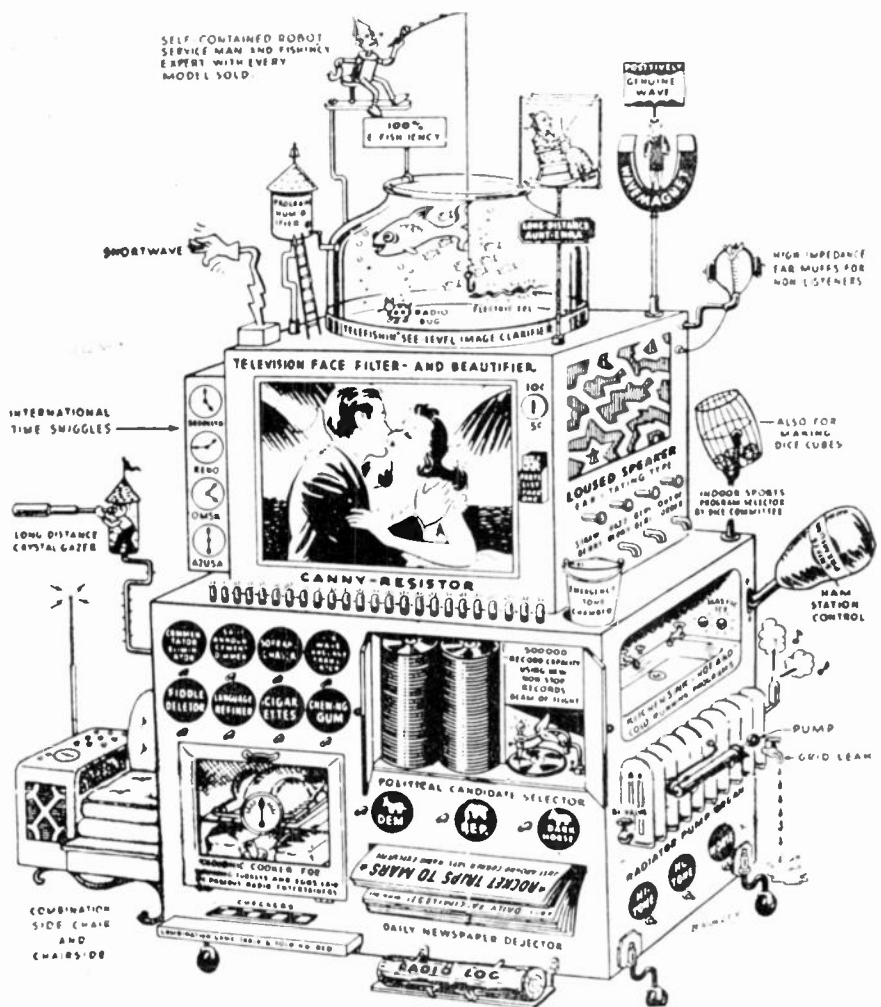
A FEW of the Canadian radio industry's contributions to the war effort are shown in the accompanying official photographs supplied to Canadian Radio Data Book. It will be realized, of course, that nothing can be shown that would be of the slightest value to the enemy. The real wonders, therefore, must wait until the end of the war. These photographs, however, will indicate the nature and shape of things to come.

It is fairly well known, now, that the control tower at any airport is like a technician's dream come true. Nearly every known form of communication is used by aircraft. There is wireless communication between plane and ground, intercommunication within the plane, public address systems on the ground, direction finding, and blind landing equipment. Telephones, telegraph and even the lowly megaphone is brought into play. To withstand the rigours of flying, the sudden changes in temperature, pressure, and humidity, and to withstand vibration and shock, the equipment must be of the highest quality. Its ease of operation plus its dependability and accuracy are its outstanding features. Fundamentally simple and stripped of everything that might be labelled "gadget," aircraft equipment may well be considered the ultimate in design and construction.

In the army portability is an essential. From the smallest walkie-talkie to the largest pieces of equipment, it must be put together in such a way that it can move with the troops without impeding their progress. So we find that it may be broken down into small enough units to be portable, or else it is built into mobile carriers. New problems had to be solved with this type of equipment. It is more susceptible to abuse than either aircraft or naval equipment. Constantly on the move and subjected to the hazards of the roughest kind of transportation and handling, it called for considerable ingenuity in design.

The same solid quality is to be observed in naval equipment. Here, however, weight is not a consideration, nor is large dimensions undesirable. The shock of gun fire is tremendous and the punishment inflicted by pounding waves is al-

most beyond credibility. The equipment is also expected to last much longer. It is, therefore, built upon a larger foundation, more after the fashion of broadcast stations.



Zenith Radio's Post-War Combination Set

This Rube Goldbergian cartoon is Zenith Radio Corp.'s satire on post-war television promises. It was sent to thousands of Zenith dealers as a warning not to "kid the public into believing that it is going to have a combination radio-phonograph-F.M.-facsimile set for \$14.92, with 40% off for cash." Zenith named the contraption the Great Christopher Model. One Zenith dealer in Wisconsin missed the point, sent in his check for the new instrument. General Motors' Dr. Charles Kettering received a copy of the cartoon and remarked: "We have the same people designing automobiles."

THE PUBLISHERS' PAGE

(Continued from page 19)

"We will be glad to arrange to have the 1943 *Data Books* mailed to our members; our mailing list containing some 210 names. We are sure our members will appreciate receiving a copy and thank you for your kindness."—J. T. Pfeifer, Secretary Toronto Section, I.R.E.

Arrangements have also been made to supply 250 copies of the 1943 *Data Book* for distribution to the members of the Montreal section of the I.R.E.—Editor.

Jobbers and Dealers

"The *Data Book* will be of definite value to all in the radio trade."—H. McMahon, Taylor & Pearson, Ltd., Edmonton, Alta.

"The concise and important material in the *Data Book* will be of inestimable value to us."—Brydon Electric Sales & Service, Collingwood, Ont.

"We find a number of articles that are both interesting and instructive."—I. S. Isaacs, Hartney Company, Limited, Montreal.

"Your 1942 *Data Book* will be as useful to us as the 1941 edition."—Radiotek Radio & Electrical Service, Innisfail, Alta.
Service Men

Service and Dealers Associations across Canada have favoured the publishers by sending revised lists of dealers and servicemen in their districts to help in making it possible for the publishers to make an accurate distribution of the 1943 *Data Book* for which the editor expresses his thanks.

George V. Wade, secretary Associated Radio Technicians of Alberta, Edmonton, when sending a revised list of Alberta dealers and servicemen recently, said: "We have used our past copies of *Canadian Radio Data Book* quite often and have found it a valuable publication."

"In your *Data Book* published October 1941, you showed several black and white plates, one entitled 'Why Radios Break Down' and another 'Little Radios and Big Radios, Why They Cost the Same to Repair.' We were wondering if it would be possible to obtain plates of these pictures so that they could be used for advertising purposes. Would you please advise us by return mail."—Keplers Radio Service, Calgary.

Walter A. Rush, Controller of Radio, Department of Transport, Ottawa, writes the *Data Book* as follows:

"The radio licensing regulations issued under the Radio Act, which have been in effect for some twenty years insofar as Private Receiving sets are concerned, and which affect all such sets were not mentioned in the 1942 *Radio Data Book*.

"I would also call your attention to the Warning Notice which is required to be affixed to every receiving set before it leaves the factory. This, I think, is a matter of great importance to manufacturers and dealers.

"An article in your 1942 edition, which I think is open to criticism is entitled 'How Hartney's Service Department handle radio repairs.' The article reprints the contents of a circular which is enclosed in all deliveries from the Hartney's Stores in Montreal. One or two paragraphs of this circular are somewhat misleading, for example, listeners are advised that more than 90% of all noise is due to either atmospheric conditions or local noise in the listener's immediate locality. It is stated that the radio set cannot be blamed for this, especially if the noise appears only on one or two stations and the local radio inspector's assistance is to be solicited.

"I may say that this has not been the experience of my Division, and the fact that noise appears at one particular part of the dial is no guarantee that the noise is due to outside interference, which, incidentally, is, in our experience, much lower than the 90% to which the circular refers.

"The following paragraph in the circular is entirely erroneous:—If two stations come in together or overlap, or a second station can be heard in the background, this is not the fault of the radio, but exists in almost every locality since our Government has changed over the wave frequencies. Unfortunately, a service call cannot alter this situation.

"Apart from the fact that the overwhelming consensus of opinion among listeners and responsible radio authorities alike throughout the Dominion has been that the changes effected under the Havana Broadcasting Agreement of 1937, have been tremendously beneficial in the mitigation of inter-

station interference, it is wholly incorrect to state that overlapping of stations or the appearance of a second station in the background is due to improper assignment of frequencies.

"In a great many cases this condition is caused by sets developing a misalignment of circuits or by lack of selectivity in even new sets which are cheap or poorly designed."

DEATH TAKES R.M.A. PAST PRESIDENT

The Canadian radio trade has suffered the loss of one of its ablest men in the death by drowning on August 3 of E. C. Grimley, president of the RCA Victor Company Ltd., Montreal, and past president of the Radio Manufacturers Association of Canada.

After a practical and educational training in both engineering and business and two years service in the U. S. Navy in 1917-9, Mr. Grimley joined the RCA Victor Company in the United States in 1919 filling such positions with them as Comptroller, treasurer, and Manager of their International Division.



The late E. C. GRIMLEY
President RMA of Canada 1941-42-43.

In 1935 Mr. Grimley was appointed President of RCA Victor Company, Ltd., at Montreal, and was the dominant factor in the tremendous expansion of the Canadian business and its Manufacturing capacity. Sensing the danger of war and the need for radio Communication equipment Mr. Grimley commenced the construction of new buildings before the war broke out in 1939.

Being a real Captain of Industry Mr. Grimley organized and trained his executives to carry on without him and followed the same far seeing plan in establishing cost of living bonus and insurance plans for his factory employees in advance of government legislation.

The radio trade generally, and the RCA Victor organization in particular, suffer a great loss in the passing of Mr. Grimley at the early age of 52 years.

QUALITY WILL RULE AFTER WAR

By CHARLES L. GOLENPAUL, *Aerovox Corporation*

WHO knows? Such must be our official answer to any request for predictions regarding postwar planning. To be really specific on the subject we would in turn have to secure answers to many questions we might pose, such as: How long will the war last? How complete our victory? How long and how thoroughly must we feed and rehabilitate other nations? With what are they going to reimburse us for our tremendous outlays in the postwar period? How much money will John Q. Public have left to spend after paying those postwar taxes? What is to be the American living standard? And so on and so on. These are all *variables* in the situation. And nothing more than a wild guess is possible in the face of so many unknown and unpredictable quantities.

Having set up this pitch-black smokescreen behind which we can safely hide our official selves, we can perhaps hazard a few guesses as to postwar parts jobbing. But remember, they are just guesses, nothing more, nothing less.

Parts Trade Will Increase

First and foremost, parts jobbing will continue as a business. Those who will have struggled through the war period will be up front when peace returns. Others who suspended operations will find it no easy matter to get back in again, for much has been learned and accomplished by those who have stuck by their guns.

The parts trade will be on a far greater scale than ever before. This is a safe guess. There will be many more radio sets in use to be serviced. In addition, there will be commercialized television at last. Furthermore, home recording will be commonplace. Also sound home movies. There may be other elaborations, as well, of radio home entertainment. On top of all that, there are bound to be numerous electronic devices in the household of tomorrow, all requiring servicing and replacements, thereby raising the grand total of the parts jobbing trade.

Second and of even greater significance, there will be an industrial field to be served by the parts

jobber. Call it electronics if you wish. That is to say, there will be many, many applications of radio technique to non-radio purposes. Photoelectric devices, automatic testers and counters, high-frequency heating devices, conductivity checkers for industrial solutions—these, and scores of other tube-using devices, will be commonplace in postwar industry and business. The usual plant electrician and engineer will be very keen about electronics. Much of the equipment will be bought complete. Much more will be built by the handy electrician or engineer. Either way, the parts jobber is in for a lot more business—if he prepares himself for it!

Already there are many electronic instruments, devices and machines in use. Many are military secrets. Others may be trade secrets. They require tubes, parts, replacements. The radio parts jobber is the logical local source of supply and servicing. Here and there, enterprising parts jobbers

are getting set for this electronic business. They are building up the necessary technical personnel, or, at least preparing to employ some of those radar boys who'll be demobilized with the signing of the peace. It is our guess that this industrial business eventually will be the dog that wags the radio tail.

Will Prices Be higher?

Still another guess is a step-up in radio quality and price levels. Before the war we were still on the toboggan — cheaper and still cheaper, while quality was something else. Today most radio parts plants are concentrating on quality. Beautiful components are being made in tremendous quantities, to meet the demands of our armed forces. Extreme reliability is imperative. Those military assemblies must be absolutely dependable. Our plants have learned to make top-notch components as a matter of everyday routine. Much labor-saving equipment has been installed under wartime urge and financing. There is bound to be a carry-over to peace times, so far as quality is concerned. And perhaps a rising price scale will accompany this movement.

WE SHOULD PLAN NOW FOR PEACETIME

By HENRY McCARDLE

HISTORY proves that war's aftermath can be just as calamitous as war itself. If we are to avoid the hardship and poverty that usually follows, the end of *this* war must find us prepared to deal with the tremendous problems that lie ahead. It is just as disastrous to be unprepared for peace as for war.

At the present moment,—with the end of the war not yet arrived, when every effort must still be brought to bear on war activities—no fewer than eight separate post-war planning committees have been appointed by the Dominion Government. Similar bodies have been set up in the United States and Great Britain and probably every other country in the world. It is comforting to the student of history to know that measures are being taken to avoid the usual catastrophe.

Government action *now* is a tremendous step in the right direction, but, of course, it is not enough. At the present time we all are doing

what we are allowed or told to do. Industry is supported by fixed prices, subsidies or some other arrangement. Tremendous expansion has taken place—warranted by war but not warranted for peace. The capacity of the facilities brought into being by war's need is infinitely greater than peace will require. So, when the war comes to an end, what is going to happen?

If the wheels of industry are not to stop we must aid the Government by preparing ourselves for the inevitable changes. This preparation must not detract from the intensity of the war effort. Therefore it can consist only of thought and discussion—planning. It will consist of a recognition that in the peace to come the world will be entirely different to anything we have ever known and an attempt to anticipate how we will fit in.

Those of us who survive the buffeting of the torrents of bloodshed during the war period must strive to avoid the quicksands of power politics at the peace conference.

TEST EQUIPMENT IMPROVEMENTS FORECAST

By HENRY McCARDLE

THERE is little use in thinking of buying any new test equipment these days. The requirements of the armed forces have loaded down the entire production capacity for a long time to come. Yet there is no harm in taking full advantage of the advances made during the war. War needs have disclosed the weaknesses of pre-war commercial design and construction and many of the improvements will be carried over into peace activities.

Very early in the war it was discovered that much of our equipment was too fancy. We had combination units that would do everything but put out the cat and wind the clock at bed time. The theory was that with a minimum of equipment a serviceman would be able to do any job that came along. Nice theory, but the forces soon discovered that if one common part ceased to function they were left without any tools at all. So simple instruments with few functions became the rule.

If the construction demanded by war needs is carried over into peace time, then users of test equipment need have no fear about its ruggedness. Fewer sky hooks are used, components are stronger and more conservatively rated, there are no long unsupported leads, grounding and shielding have been improved, lugs are used as terminals for wire and not supports for components, and in many other apparently small ways, construction may be truly termed "battleship."

The basic service instruments after the war will be:

1. Multirange Meter
2. Dynamic Tube Tester
3. Signal Generator
4. Output Meter

1. The multirange meter should provide AC and DC voltage and DC current readings and have an ohmmeter scale. It will be necessary to read as high as 4,000 to 5,000 volts. It is unlikely that there will be any great need to measure DC current in excess of 500 MA. The ohmmeter scale should read up to 20 meg. at least. Accuracy on voltage and current readings should never be worse than 4% and resistance measurements should be within 10%. To accomplish this

the meter must have an accuracy of 2% or better.

2. A dynamic tube tester will be essential. The type of tube that will be used will demand a dynamic test. In the lower frequency bands, cathode emission could be accepted 95% of the time as a reliable indicator of the condition of the tube. At the higher frequencies, however, such a test is no indication at all. Slight changes in electrode capacity, input and output resistance which would not affect the emission to any appreciable extent might make the tube utterly useless as an R.F. oscillator or amplifier. At the present time, even a dynamic test is not infallible for some tube types, but these problem children will also be brought under control before long. The history of the trade is just a long life of triumphs over problems.

3. The signal generator of the future must have a range well up

into the U.H.F. bands. Its frequency calibration must be of a very high order and it must have a calibrated attenuator. This is a device that *must* be right if chaos in the field is to be avoided. Two servicemen in the same district working to different standards in this respect could cause real havoc in the community. To obtain and maintain the necessary sensitivity and selectivity, alignment must be perfect. The work of adjusting and aligning the set of the future will be an art and the tools must be well nigh perfect.

4. The same remarks apply to the output meter. While used more often as an optimum indicator, its function in the future will be to determine that the servicing performed has returned the set to its original standard of performance when it rolled off the production line. It will be necessary therefore to use an indicator the error of which is known.

RADIO NOW IN SIXTH PLACE IN CANADA'S WAR PRODUCTION

THE tremendous development of the radio communications industry in Canada during the war is shown in the following extract from an article in the Financial Post on August 28:

"Now ranking in sixth place among major Munitions & Supply programmes in Canada, production of signalling apparatus for Army, Air Force and Navy ranks is one of our greatest achievements. Out of the need to meet war's exacting standards may easily come a peacetime radio, or telephone, that is far better than any now in ordinary use. This year between \$250 millions and \$300 millions of communications equipment will roll from Canadian factories with radio playing the major role, but the whole programme involving about 100 different types of equipment. It ranges from radios to cable layers, and includes thousands of miles of electrical cable, signal lamps, telephones and switchboards. Each month about \$20 millions of this equipment is produced in Canadian factories.

The whole programme is co-ordinated by the Signals Production Branch. Bulk of the output comes from the Canadian radio industry, which has expanded its volume by 1,600% since the outbreak of war; from Electrical equipment manufacturers, from Research Enterprises Ltd., a government-owned company established to develop and to manufacture secret equipment and now having a monthly output value of \$5 million.

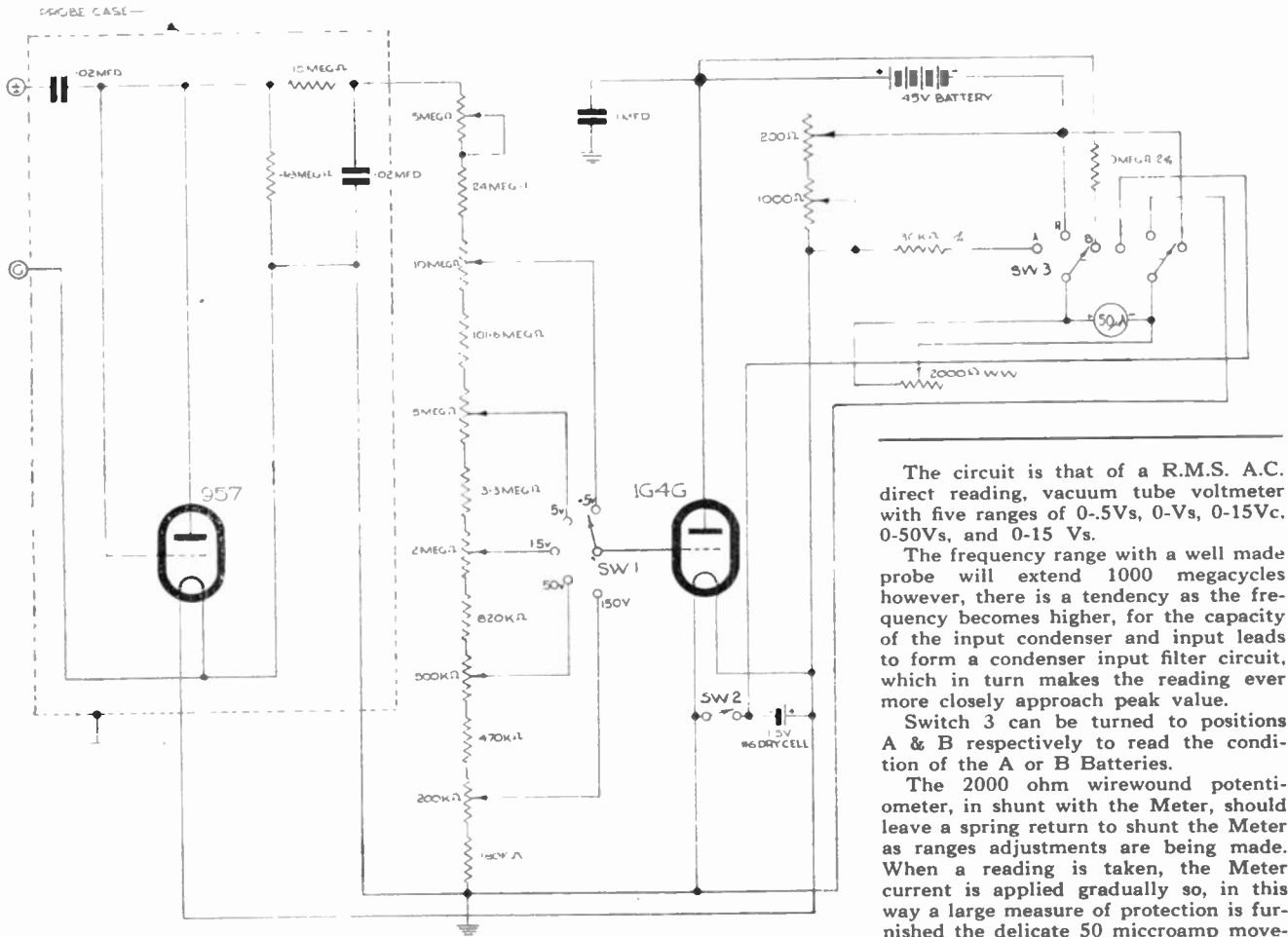
Success of the programme is largely

dependent upon hundreds of small supply plants in Canada and the United States which furnish small parts for assembly in the larger factories. Scores of these plants have been converted from non-essential production just as the radio industry itself has been converted 100% from civilian radio output to war productions.

Biggest single feature of the programme from the volume standpoint are the general purpose vehicle wireless sets used to equip tanks and armoured fighting vehicles of the Allies. British designs provided the basic start, were re-engineered in Canada, and the sets are now being made in three large Canadian plants at a rate of several thousands monthly.

Such sets must withstand temperature variations from 50 deg. below zero to 150 deg. above. They must operate under varying power conditions, withstand the jolting and pounding, serve for communication between members of the tank crew, for short range communication with other units in the field and for long range communication with headquarters. In particular they must combine compactness with simplicity of operation. Similar standards must be carried over into the manufacture of aircraft communications equipment while marine equipment must be specially designed to withstand corrosion and humidity and to prevent radiation which might betray the location of the ship".

PORTABLE HIGH FREQUENCY VACUUM TUBE VOLTMETER



The circuit is that of a R.M.S. A.C. direct reading, vacuum tube voltmeter with five ranges of 0-.5Vs, 0-Vs, 0-15Vc, 0-50Vs, and 0-15 Vs.

The frequency range with a well made probe will extend 1000 megacycles however, there is a tendency as the frequency becomes higher, for the capacity of the input condenser and input leads to form a condenser input filter circuit, which in turn makes the reading ever more closely approach peak value.

Switch 3 can be turned to positions A & B respectively to read the condition of the A or B Batteries.

The 2000 ohm wirewound potentiometer, in shunt with the Meter, should leave a spring return to shunt the Meter as ranges adjustments are being made. When a reading is taken, the Meter current is applied gradually so, in this way a large measure of protection is furnished the delicate 50 microamp movement. The 200 ohm potentiometer is used for zero setting when the probe terminals are short-circuited. This must be done when switching from one range to another.

Although a sensitivity shunt is not shown in the circuit, one is necessary across the Meter. With the 5 Meg. potentiometer at the D.C. input to the voltage divider, at mid rotation, the lowest range (0-.5Vs) should be adjusted to read .5Vs at the right hand end of the .5 Volt scale, by setting this shunt across the Meter. This setting should not be disturbed unless, in replacing the Tubes the Meter will not re-calibrate properly. The balance of the calibration methods have been covered thoroughly many times before, but this can easily be accomplished since there is a full scale adjustment on each range. The lowest range is crowded at the left hand end due to lack of linearity caused by contact potential of the 957 diode but as the reading exceeds one volt the scales become extremely small non-inductive ceramic coated resistors should be used in the probe along with high grade small mica condensers and the wiring and associated capacity kept as small as possible.

The stability is assured through the use of Batteries and low- μ Tubes, leaving the final performance almost entirely dependent on the perfection of calibration and the condition of the batteries which can be read at the turn of a knob.

WHAT IS RADAR?

TELESCOPE the phrase "radio detection and ranging" into "radar"—and you have a word that, until recently, was taboo even to mention. It's the American name for one of the few basically new weapons of this war explains Popular Science for August.

Through fog, storm, or darkness, radar spots enemy planes and surface ships for defense and attack. One of the marvels made possible by the electron tube, it emits radio waves of ultrahigh frequency. Reflected from a hostile craft, these waves bounce back to the radar station. Although they travel at the speed of light, 186,000 miles a second, the extremely short time between their start and return can be measured accurately. This interval reveals the distance of approaching air raiders, or the range of a naval target. Radar instruments are compact enough to be installed in airplanes, as well as on land and board ships.

The British declare that their similar instrument which they call the "radio locator", helped save England during the aerial blitz of 1940-41. It warned of distant air raiders in time for defending planes and anti-aircraft guns to give

them a hot reception. Losses of German planes became so heavy that wholesale bombing had to be called off.

At sea, radar may prove the weapon needed to end the U-boat menace. A submarine cannot travel submerged for long, but must surface to recharge its batteries. Preferably it does so at night, when darkness protects it from observation. But the magic "eye" of the radar easily spots it. Equipped with this apparatus, a convoy escort ship can pump shells into a sub before it has a chance to dive. This offsets the increased strength of modern submarine hulls, which are said to withstand the underwater explosion of a depth charge at a fraction of the distance that formerly disabled or destroyed them.

A superdreadnought equipped with radar, as United Nations ships are, can locate an unseen enemy battleship and drop a broadside upon it. Radar operates to a distance as great as the range of the biggest guns. The deadly accuracy with which they are aimed with the aid of data provided by radar might supplement, if not actually replace, the use of spotting planes.

CANADIAN RADIO TRADE STATISTICS

RADIO set manufacture has given way to war production and at the beginning of 1943 the inventory of unsold new sets totalled only about 13,000, as compared with 492,655 manufactured in Canada and 36,062 imported into Canada in 1940. Radio dealers and servicemen do not need to be told that there is a war on. The figures talk for themselves.

But Canadian radio manufacturers are more than doing their part in war production as well as in preparing for greater expansion in radio manufacture for civilian use after the war ends. President E. C. Grimley, at the recent convention of the Radio Manufacturers Ass'n. of Canada told of the remarkable expansion of the privately owned radio industries in Canada with a total production of \$15,000,000 before the war rose to \$35,000,000 in 1941 to over \$100,000,000 in 1942 and estimated production of possibly \$250,000,000 in 1943.

Production of radio sets for civilian sale in 1942 was allowed under Government permit to enable manufacturers to use up certain parts and materials in stock and this having been completed no new sets are likely to be available until the end of the war is definitely in sight.

With the sale of new sets out the re-sale of second hand models and the servicing of old sets is keeping continuing dealers and servicemen busy, with increasing difficulties due to shortages of parts and tubes for replacement.

The Dominion Bureau of Statistics, whose official figures are quoted (except where otherwise mentioned in the following tables) discontinued their quarterly bulletins covering radio production with their December 1942 issue and the Radio Manufacturers Ass'n of Canada ended this branch of their activities with their October, 1942, bulletin. The figures given, probably the most complete ever compiled by a Canadian publication, will, therefore, be of value for record and comparison in after the war activities.

Trends in Radio Sets

During the past twenty years radio manufacturing in Canada has passed through many changes. In addition to the developments due to the introduction of electric mod-

els and changes in circuits, etc., there have been changes due to increasing demand and quantity production. The development of automobile, portable and phono-combinations has also widened manufacturing activities.

In 1930, for example, the average cost of production of sets was about \$113 for the 170,000 sets produced. In 1935 the average was reduced to \$49 on a production of 191,293 sets. In 1940 production increased to 492,655 sets and the average sale price dropped to only \$24 each. And in 1942 with production down to 176,287 sets the average cost per set rose to about \$37 each.

The high dollar cost era, with limited production of large console models gave place to the high unit period with tremendous production of low cost mantel sets, followed by the upward unit cost and low production during the war. This will probably be followed with a further upward trend when new and better types of television sets become the vogue in the after the war period.

Figures Show U.S. Trend

In a table included in this article figures are given showing the volume and variety of radio equipment produced in the United States in 1942, the first year that country was in the war. The table is interesting in showing the drop in production from the previous year and

the beginning of the production of television and frequency modulation equipment in volume. In spite of severe restrictions on the establishment of new broadcasting stations serving the owners for F.M. and television sets it can be taken for granted that these new fields will be swiftly developed as soon as war restrictions are lifted.

Percentage of Dead Sets

More evidence that the number of "dead" receivers is not yet a serious factor in radio, is supplied by a prominent Pennsylvania radio distributor. This jobber was anxious to investigate reports that thousands of receivers were "dying" daily because of shortages in tubes, parts, and batteries. Accordingly he called a representative number of his repairman customers together and asked them to make a careful estimate of the number of out-of-repair radios in their areas.

When the figures were totalled, it was found that less than 2 per cent of the sets in the whole area were inoperative. These receivers could not be fixed because the servicemen did not have the proper replacement parts, mostly the "hot" tube numbers.

The distributor points out also that these results do not mean that 2 per cent of the homes in the area are without radios; it must be assumed that a number of the inoperative radios were second and third sets.

UNITED STATES RADIO MANUFACTURERS 1942 SALES

(Unit figures from RCA License Report)

	Units	%	Retail Value
Table sets	1,736,608	40.32	\$40,000,000
Console sets	271,740	6.31	22,000,000
Portable sets (battery and/or AC-DC)	573,025	13.30	19,000,000
Automobile sets	341,424	7.93	12,000,000
Farm battery sets (table or console)	269,510	6.26	8,000,000
Frequency-modulation adapters	7,678	.18	400,000
Electric phonographs (including wireless record players)	120,649	2.80	3,600,000
Table combination sets	379,514	8.81	20,000,000
Console combination sets	388,183	8.55	60,000,000
Radio, phonograph and recorder	40,805	.95	8,000,000
Television (with sound or phonograph)	778	.02	160,000
Television (without sound)	175	.....	20,000
Apparatus without cabinets	195,996	4.55	7,000,000
Separate remote or time-controlled devices	899	.02	25,000
1942 Total	4,306,984	100.00	\$200,205,000
1941 Total	13,668,515		\$520,000,000

Canadian Radio Market

Population	11,518,684	1941 Census
Householders	2,668,710	"
Rural	1,152,220	"
Urban	1,516,420	"
Wired Homes	1,800,000	estimated
Radio Families	Population	
Maritimes	270,325	1,130,410
Quebec	752,733	3,331,882
Ontario	988,675	3,787,655
Manitoba	154,977	729,744
Sask.	171,677	895,922
Alberta	166,872	796,169
B.C.	229,794	817,861

* 2,735,053 11,489,643

Elliott Haynes Radio Survey	Radio Sets in Use	Sales in 1942
Maritimes	240,000	17,679
Quebec	650,000	38,797
Ontario	1,150,000	94,076
Manitoba	290,000	20,175
Sask.	310,000	7,527
Alta.	315,000	11,769
B.C.	320,000	18,540

3,275,000 209,163
Radio Data Book Estimate D.B. of S. Figures

Set Licenses Issued

Official figures supplied Canadian Radio Data Book by Walter W. Rush, Controller of Radio, Department of Transport, Ottawa, indicate a substantial increase in the sale of radio licenses in Canada during the past year as follows:

Prince Edward Island	1941-2	1942-3
	8,962	8,516
Nova Scotia	71,776	81,524
New Brunswick	48,728	52,743
Quebec	400,902	436,288
Ontario	604,981	637,116
Manitoba	104,384	108,435
Sask.	122,304	127,529
Alberta	124,489	126,525
B.C.	138,191	149,481
Yukon & N.W.T.	772	721

1,623,489 1,728,880

Under present regulations only one license is required no matter how many sets are used in the listener's homes. As hundreds of thousands of homes have two or more sets and Elliott-Haynes survey shows 2,735,053 radio families the Radio Data Book estimate of 3,275,000 sets in use in Canada can be considered conservative.

The life of a radio set is estimated at an average of ten years and the Bureau of Statistics shows 2,651,838 sets sold in Canada during the ten years ending December 1942, not including several hundred thousand sets imported, during that period.

CANADIAN RADIO SET PRODUCTION

Year	Sets Produced	Factory Sales Value
1929	150,050	\$15,604,145
1930	170,082	19,196,936
1931	291,711	18,555,710
1932	121,468	6,808,877
1933	112,273	4,401,313
1934	188,710	8,196,248
1935	191,293	9,493,399
1936	255,896	11,388,173
1937	289,247	11,696,717
1938	242,721	8,808,981
1939	348,507	8,678,130
1940	492,655	11,694,048
1941	354,449	11,368,521
1942	176,287	6,682,010

MANUFACTURERS SET SALES

Year	Units
1934	167,177
1935	190,289
1936	247,920
1937	265,855
1938	251,259
1939	370,568
1940	438,976
1941	399,556
1942	209,163

LIST VALUE OF SALES

Year	Value
1940	\$23,551,572
1941	23,283,944
1942	14,404,236

AUTO SET SALES

Year	Units
1939	21,652
1940	28,561
1941	30,211
1942	6,933
Motor cars in use, about	1,200,000
Equipped with radio	250,000
SET MANUFACTURERS INVENTORIES	
Dec. 31, 1940	95,930
" " 1941	54,108
" " 1942	13,685

TUBE PRODUCTION AND IMPORTS

Year	Canadian	Imports
1940	\$1,813,841	\$494,698
1941	1,272,785	801,578
* 1942	1,090,600	1,108,917

* 9 months to October, 1942

TYPES AND VALUE OF SETS SOLD DURING 1942

Electric Standard	Units	List Value
Consoles	1,654	\$ 81,280
Table	70,437	2,034,490
Short Wave		
Console	31,822	4,523,358
Table	42,439	2,848,764
Battery Standard		
Console	295	24,159
Table	26,968	887,555
Short Wave		
Console	2,070	204,402
Table	8,654	475,901
Portable	675	23,075
Battery and Electric	3,279	186,332
Phono. Comb.	13,919	2,647,783
Automobile	6,933	467,137
	209,163	14,404,236

RADIO SETS IMPORTED

Year	Sets	Value
1939	59,089	\$1,017,673
1940	36,062	680,632
1941	4,022	140,428
1942	2,652	118,863

PRICE RANGE OF SETS SOLD

Units	1941	1942
Under \$20	26,705	9,018
\$20 — \$30	109,005	41,312
\$30 — \$40	69,282	38,757
\$40 — \$50	49,730	12,418
\$50 — \$60	26,728	18,874
\$60 — \$70	23,539	9,298
\$70 — \$80	19,265	6,767
\$80 — \$90	11,025	6,549
\$90 — \$100	15,830	10,945
\$100 — \$115	6,648	2,947
\$115 — \$130	9,766	2,828
\$130 — \$150	10,967	10,727
\$150 — \$175	8,793	4,056
Above \$175	12,940	14,287

* TOTAL 400,223 188,873
* R.M.A. of Canada figures

ELECTRICAL FARM HOMES IN CANADA

1941 Census	Electric Lighting %	Radio %
Prince Edward Island	5.5	53.
Nova Scotia	26.2	58.7
New Brunswick	18.6	48.6
Quebec	23.6	36.4
ONTARIO	37.3	66.3
Manitoba	7.3	66.8
Saskatchewan	4.8	71.5
Alberta	5.5	72.9
British Columbia	36.	69.3

ELECTRICAL APPLIANCES IN ONTARIO HOMES

Appliances	No. in Use in Ontario	Saturation per cent
Air Heaters	62,383	11.1
Clocks	224,118	39.9
Coffee Makers	48,267	8.6
Fans	63,204	11.3
Roasters	7,137	1.3
Furnace Blowers	48,791	8.7
Grates	50,619	9.0
Grills—Sandwich	95,082	16.9
Hair Curlers	25,224	4.5
Hair Dryers	4,998	0.9
Hot Plates	54,148	9.7
Humidifiers	10,202	1.8
Irons	561,912	100.1
Ironing Machines	19,685	3.5
Kettles	7,199	1.3
Mixers	33,374	5.9
Oil Burners	13,547	2.4
Percolators	47,960	8.5
Radios	577,309	102.8
Razors	43,127	7.7
Ranges	166,498	29.7
Rangettes	37,112	6.6
Refrigerators	218,922	39.0
Sun Lamps	12,563	2.2
Toasters	439,971	78.4
Vac.—Floor Model	213,032	37.9
Vac.—Hand Model	57,035	10.2
Waffle Irons	31,568	5.6
Warming Pads	90,105	16.1
Washers	359,428	64.0
Water Heaters—		
Metered	74,695	13.3
Flat Rate	75,241	13.4
No. of Consumers	561,382	

—Courtesy Hydro News

Radio Manufacturing Association Activities

AT the annual meeting of the Radio Manufacturers Association of Canada held at Toronto, May 27, 1943, the retiring president in reviewing the situation regarding radio manufacturing, said:

"During this past year the few odds and ends of stocks of material of radio sets in our factories were assembled, finished and disposed of. We completed converting our industries over to war production, and I believe we have responded well and, on the whole, made a good job of this transition. This year has witnessed our really hitting our stride in war production.

"Prior to this transition, the volume of the radio industry (sets, tubes, parts, communication equipment and all associated with it) reached a high of about \$35 million in 1940. It has now grown so that at the time of this report we are producing at a rate over \$100 million a year, and this of course includes only privately owned radio industries. So we have grown up.

"Now, I have no corresponding figures to this volume, but I am sure that the number of employees in the radio industry has increased several times, and that plants and facilities have been substantially expanded.

Radio—a War Weapon

"We all know that radio is a necessary weapon on land, in the air and at sea. It must perform with more precision and dependency



L. A. YOUNG (Stewart Warner)
President RMA 1943-4.

and of course must take a terrific amount of hard use, and therefore be made a whole lot more sturdy than the peacetime parlor set. Not only has our industry produced these complete communication systems, but our tube manufacturers are making new types of special purpose tubes; our parts manufacturers have opened up new and enlarged factory facilities and increased their manufacturing considerably in Canada. We have become more of a self sufficient manufacturing industry than ever before.

"Many of our members have not confined themselves to the manufacture of radio communication equipment. Of course, our electrical manufacturers engaged in the general electrical field have a variance of important products. Then, many of the other manufacturers are producing instruments, components and accessories needed not only in the radio industry but in the motor and aviation industries.

"I think that the radio industry has arrived and is in the process of being recognized as one of the most important production factors that Canada has in this war.

"In the intensity of this battle of production there has been more co-operation and co-ordination among us because of our association in this organization than is generally realized. I believe real efforts have been made by the prime contractors to sub-contract throughout the industry, and good results have been obtained. Where efforts have not been successful, it has been because the individual contractor did not have the facilities or available capacity to do the job, but by no means because the radio manufacturers among themselves did not attempt to co-operate.

"In my annual report to you last year, I called attention to the fact that we had built some friendly relations with the Government and public but that there was still too much unfriendliness towards the radio industry and we must take steps to correct it. In other words, we must organize our public relations and carry on the necessary work to build goodwill. I am happy to report today that a good start and even some good results

have been made during the year. A Public Relations Committee was formed shortly after the annual meeting. You are all familiar with its personalities through the regular meetings held throughout the year. They have already accomplished some worth while things.

RMA Broadcasts

"They organized and put on a radio program which was broadcast from coast to coast on Sunday afternoons, called "Yesterday, Today and Tomorrow." As the title indicates, it told the public about the contribution of radio in the past, in the present and particularly the contribution in the war effort, and also gave some intimation of what might be ahead. The series of thirteen weeks has just been completed, and the plans are to discontinue until Fall. This effort needs your continued enthusiastic support.

"The Committee has done other things not quite as costly but nevertheless very important. For example, through persistent effort have convinced the Canadian Government that communication equipment should be given an important position when releasing information about Canada's war effort. So, today, communication equipment has received this recognition by the Government. I understand that in official sources in Ottawa it has been placed fourth



REG. N. BROPHY (Marconi)
Vice-President RMA, 1943-4

on the list of important war equipment, ships at present being first.

"In January, 1943, the control of the radio industry was transferred



W. W. RICHARDSON
Secretary, Radio Manufacturers
Association of Canada.

to the Wartime Prices & Trade Board, under the administration of Mr. Arthur Brown, an old associate and former President of this Association. I believe we are fortunate in being under the control of a man experienced in the radio industry.

Also, as your President, I have requested that we be permitted to follow and sit in on the post-war planning of the RMA in the United States.

Bright Outlook Ahead

"We in the radio industry are indeed fortunate. We have little to fear in the post-war because our past experience and recent experiences can be put right to work in our particular art and science. With the accumulated demand for our home sets, with the improvements and refinements in the art of broadcasting and receiving, we should enjoy a number of post-war years of good volume in supplying that demand. Research in the general field of electronics, and wartime developments, are going to add to radio, heretofore confined more or less to the service of hearing, the sense of seeing, because the instruments of war have developed a sense of direction as well as detection. One of the products of the art of seeing is Television, completely graduated from the development stage and with fairly long runs of actual broadcasting and receiving tests in the field. The

realms of high frequency applications are many. We might combine one group of them into radio-thermics, or the science of radio generated heat. The application of passing these tiny radio waves through objects, whether they be wood, metal, fabric, has wide scope, particularly in industrial processes.

"Very few of us have been or are financially interested in the broadcasting branch of radio. However, we should not forget that the interests of this activity are bound up very closely with our own. Trends in the system of broadcasting, quality of programs and broadcasting service, should have your serious interest. Accordingly, I recommend that we establish some relations or liaison with the Canadian Association of Broadcasters. I know that recent efforts in this direction in connection with our own broadcast program did not meet with success, nevertheless I believe that they will soon recognize that they have many interests in common with we manufacturers. The immediate post-war period will see important allotments of frequencies, power and other rights that must be obtained from the Government. The Government's policy on these matters will have an influence on the whole nature of our industry. If we do not merge or combine Broadcasting with Manufacturing we can at least set up a liaison between them."

Report of the Service Committee was made by George H. Baldwin (Westinghouse), the Parts and Accessories Committee by J. R. Longstaffe in the absence through illness of Chairman R. Randell, and the Engineering Committee by F. A. Barrow in the absence of Gordon Irwin.

Tribute was paid the secretary, W. W. Richardson for valuable services and the retiring president E. C. Grimley was presented with an engraved cigarette case as a reminder of his two years service as president. Officers elected for the coming year were: President, L. A. Young (Stewart-Warner-Alemite), Belleville; vice-president, R. M. Brophy (Canadian Marconi), Montreal

Parts and Accessories Division: Chairman, R. Randall (Radio Condenser Co.) Toronto; vice chairman, R. H. White, (White Radio) Hamilton; and director, W. H. Furneaux, (Aerovox) Hamilton.

Engineering division, Chairman, G. J. Irwin (Philco) Toronto.

Service Division, chairman, G. H. Baldwin (Westinghouse) Hamilton.



R. RANDALL
Chairman Parts and Accessories
Division RMA of Canada.
Vice-President RMA, 1943-44

SALVAGE OF RADIO PARTS

THE Service Committee of the Radio Manufacturers Association of Canada have issued a bulletin calling upon servicemen and others to help the national salvage effort by: (1) the collection of defective parts and the return through the local salvage committees and parts manufacturers for the salvaging of raw materials; and (2) the repairing of minor defects rather than the replacing of the part.

A. L. Hames, Toronto, as chairman of the Service Committee, writes:

Power Transformers

The parts manufacturers report there is no worthwhile salvage value to them in defective transformers and recommend they be turned over to local salvage committees rather than returned at the time of purchase of new ones. The cost of transportation in most cases would outweigh the recovery value of the transformer if returned to the parts manufacturers. Every effort should be made to repair transformers rather than replacing.

Repair Speaker Assemblies

Every effort should be made to repair speaker assemblies rather than replacing. However, those speakers which cannot be repaired can be turned over to your local salvage committee. There are, no doubt, cases where speaker ter-

minal leads are open at the outer end of the field winding. These can quite often be easily repaired by folding back the insulation and resoldering the lead. However, the repair becomes difficult if the break is in the internal winding.

This is a specialized job and we understand that some of the jobbers, particularly in the more populated areas, have, or are setting up, facilities to repair speakers and transformers. Dealers and jobbers lacking such facilities would be well advised to check with their jobber to see what kind of service is available.

Volume and Tone Control

Through the efforts of the Service Committee the volume and tone control parts manufacturers are making certain tests on defective controls with a view to their salvage and repair, and we hope to provide the trade with worth-while information thereon in the near future. For the present it is suggested that all volume and tone controls be accumulated.

Condensers

The parts manufacturer reports that the cost of reclaiming paper tubular condensers is prohibitive. However, these condensers contain metal foil and should be accumulated and turned over to the local salvage committee. The aluminum cans on electrolytic condensers can be reused. To minimize transportation charges, it is suggested that they be given to your local salvage committee.

Inasmuch as the greater portion of radio component parts contain metal, the attention of the trade is drawn to W.P.T.B. orders No. M.C. 10, which states in effect that no one is allowed to burn or throw away any product which contains metal.

SOLDER AND IRONS

C. S. Steele, chairman of the RMA sub committee on supplies, writes:

In a recent statement issued by the Metals Controller, he stated that the only tin Canada will have for the duration is the stock pile now on hand. Accordingly steps have been taken not only to eliminate non-essential civilian require-

ments, but also to reduce tin content wherever possible in specifications for war supplies.

Consequently, purchases of the tin solder are on a quota basis and this type should only be used for special purposes. Any quantities over and above quotas must have the permission of the Controller.

At the present time there are substitutes available that in many respects are entirely suitable for certain types of work.

For instance, manufacturers are now producing solders with silver, cadmium, bismuth and lower percentages of tinned solders. However, these types are not expected to do the fine class of work of the previous types containing higher percentage of tin. In the majority of cases, they will give satisfactory service.

Most of these solders have been in production for only a few months and many cases have been found where they were preferred to the regular tin-lead solders. As time goes on and these substitutes are used more frequently, it is the general opinion that prejudices may be overcome by (1) a little adjustment in iron heating capacities. (2) use of fluxes. (3) some changes in the general soldering practice.

As in most cases, one type may be better suited to the particular job in question and some experimenting will be necessary in arriving at the correct combinations to do a satisfactory job. Manufacturers offer free industrial advice service for any particular problem and will extend the benefit of long experience in this type of work.

Under conditions as they exist to-day, it is extremely difficult to obtain the raw materials used in the production of soldering irons. Owing to the increased demand on available supplies by war industries, the Government found it necessary to curtail the use of copper, heater wire and other materials used in the production of this equipment.

TRANSFORMER TROUBLES

B. Hofstetter, chairman of the Service sub committee on transformers, writes:

In some cases audio and power transformers have been found

dead, due to one of the windings opening up in the transformer. One of the common reasons for this trouble is that moisture gets in at the soldered joints on the outside winding or terminal connections, causing a corrosion on the soldered connection which eventually eats away the wire. To repair this type of open coil it is only necessary to remove the paper insulation around the outside of the coil until the terminal strip is reached. In cases of output transformers, it is necessary to remove first the laminations, and then the secondary winding, or voice coil winding, in order to reach the primary terminals of the transformer for repairing. It is impractical to repair internal shorts in the primary windings of 110V power transformer or the secondary windings of input transformers, (that is, opens that occur inside the transformer). The best solution for this is, of course, to remove the defective coil and have a new coil wound to fit the iron being used.

CAUTION: When lacing the iron back into the repaired transformer or the new coil, it is very important that you pay particular attention to lacing the lamination straight in the coil, otherwise damage may result due to cutting of the first few layers of primary.

Transformers that have been found completely burnt out or cooked, can be partly salvaged by using the old iron and replacing a new coil only. In cases where the iron is not too badly covered with the tar and wax from the burnt out coil, it is advisable to clean off thoroughly with benzine or thinner before relacing.

The salvage value of copper in transformers is very high due to the remelting of copper. It is practical for all servicemen and service departments to save all the burnt out and discarded transformers, especially the copper, they possibly can in order to conserve the use of this essential metal and thus continue the servicing and replacing of transformer coils in the radio business.

BUSINESS CHANGE AT WINNIPEG

C. F. Down, president C. F. Down Co. Winnipeg, Vancouver and representing several prominent U. S. radio manufacturers in Western Canada, died January 19, 1943. The business is being carried on by C. M. Robinson, under the name of the C. F. Down Company. Mr. Robinson was associated with Mr. Down in the business for the past 19 years.

The table below will give some idea of the melting points and approximate strengths of various types of solder.

	Silver	Cadmium	Bismuth	Tin 50/50
Melting point	585°F.	400°F.	400°F.	358°F.
Liquid point	585	445	445	414
Extra hot iron required	Yes	No	No	No
Strong flux preferred	Yes	No	No	No
Strength (general)	90%	85%	85%	100%

New Regulations Re Radio and Appliances

Radio Administration Transferred to Wartime Prices and Trade Board

EFFECTIVE March 1, 1943, Order No. A611, was issued by A. L. Brown, Administrator of Electrical Equipment and Supplies, Respecting Radios, Radio-Phonograph Combinations, Phonographs and Replacement parts for Radios.

WHEREAS pursuant to regulations established by Order in Council P.C. 6391, dated August 19, 1941, as amended, and with the approval of the Minister of Munitions and Supply and of the Chairman of the Wartime Industries Control Board, the Controller of Supplies made Orders numbers C.S. 17, C.S. 17-A, C.S. 17-B, and C.S. 26-B, to curtail the manufacture of radios, radio-phonograph combinations, and phonographs, and Order number C.S. 17-C respecting radio replacement parts;

AND WHEREAS by Order in Council P.C. 504, dated January 23, 1943, it was provided that the jurisdiction of the Controller of Supplies with respect to the goods referred to in the said Orders be terminated and that the said Orders of the Controller of Supplies be deemed to be Orders made by this Board;

AND WHEREAS by Order in Council P.C. 8528, dated November 1, 1941, this Board, with respect to the said goods, including radios, radio-phonograph combinations, phonographs, and replacement parts for radios, has jurisdiction as to their production and otherwise and has deemed it expedient to consolidate and amplify the provisions of the said Orders and for that purpose has revoked the said Orders and directed that this Order be substituted therefor;

THEREFORE pursuant to authority conferred by the Wartime Prices and Trade Board it is hereby ordered on behalf of the Board,

1. For the purposes of this Order:
 - (a) "radio" means a radio receiving set and includes a radio-phonograph combination;
 - (b) "phonographs" include electrical phonographs, spring power phonographs, phonograph turntables, automatic record changers, and coin operated phonographs.
2. (1) No person shall, unless he has obtained the written permission of the Administrator of

Electrical Equipment and Supplies, manufacture or assemble a radio, except to the Order of

- (a) the Department of Munitions and Supply;
- (b) the Department of National Defence (Naval Services);
- (c) the Department of National Defence (Army);
or

(d) the Department of National Defence (Air Services).

3. No person shall, unless he has obtained the written permission of the said Administrator, manufacture or assemble phonographs.
4. Nothing in this Order shall apply to the manufacture of parts for the repair and maintenance of radios and phonographs.

PRICES SET FOR USED RADIOS

Effective June 19, 1943, Order No. A-761 by S. Godfrey, Administrator of Used Goods, respecting Used Domestic Radios reads as follows:

Pursuant to authority conferred by the Wartime Prices and Trade Board, it is hereby ordered on behalf of such Board as follows:—

1. For the purposes of this Order,

- (a) "radio" means a domestic radio receiver of one or other of the following kinds types or models: (i) "mantel radio" being one designed and built for use on a mantel, table or stand; (ii) "console radio" being one designed and built to stand directly on the floor or to be contained in a cabinet which stands on the floor; (iii) "combination radio" being one which is a combination unit of radio receiver and of a turntable for the playing of phonograph records contained in a single cabinet, but a radio with merely an attachment for the playing of phonograph records is not to be deemed to be a combination radio;
- (b) "rebuilt radio" means a used radio in which all worn, defective, broken and missing parts, attachments and connections have been reworked, repaired and replaced, where necessary, and as so rebuilt is capable of performance substantially equivalent to that of the same radio when new;
- (c) "used radio" means a radio that has been in use or ac-

quired for use for a period of six months or more since the time it was first sold when new.

2. (1) The maximum price, f.o.b. his nearest shipping point or delivered at any place within his customary free delivery area, at which a dealer in used radios may sell or offer to sell

- (a) a rebuilt radio of a kind, type or model named or described in Schedule "A" hereto; or
- (b) a used radio of a kind, type or model named or described in the said Schedule "A" which although not a rebuilt radio is in as good condition as a rebuilt radio and is capable of performance substantially equivalent to that of the same radio when new

shall be the price or as determined by the percentage of price, as the case may be, set forth in the said Schedule "A" for that rebuilt radio or used radio.

(2) On every sale by a dealer of a rebuilt radio or used radio referred to in this Section there is hereby imposed as a term or condition of the sale an implied warranty by the dealer as a part of the consideration on the transaction, as set forth in Schedule "B" hereto.

3. The maximum price, f.o.b. his shipping point or delivered at any place within his customary free delivery area at which a dealer in used radios may sell or offer to sell a used radio, other than one to which Section 2 is applicable, shall be fifty per centum (50%) of the

maximum price at which a dealer may sell a rebuilt radio of the same kind, type or model.

4. (1) On and at the time of every sale by a dealer of a rebuilt or used radio he shall issue a sales invoice or receipt in duplicate whereon there shall be accurately set forth the name and complete address of the dealer, the name and complete address of the buyer, a detailed description of the radio sold according to its kind, type or model and whether it is a rebuilt radio, the serial number, if any, of the radio and the actual selling price.

(2) One copy of the said invoice or receipt shall be furnished to the buyer at or prior to the time of delivery of the radio sold and the remaining copy shall be retained and kept by the dealer at his place of business for a period of twelve months after the date of sale and the copy so retained shall be available at all times for inspection by any authorized representative of the Board.

6. The maximum price at which a dealer in radios or radio tubes may sell a used radio tube shall be twenty-five per centum (25%) of the highest lawful price at which such tube, new, is selling at retail in the locality in which the used tube is sold.

7. The provisions of this Order shall be subject to such written exemption as the Administrator of Used Goods may grant, upon application to him, in individual cases of undue hardship or other special circumstances.

USED REFRIGERATOR PRICES

Effective May 12, 1943, order A712 regulates the sale of rebuilt and used refrigerators. A rebuilt refrigerator is one in which defective parts have been replaced and performance considered as good as new. A used machine is one which has been in use for one month or more. A rebuilt machine sold by a dealer on a 90 days free guarantee can be charged at a price 25% higher than if no guarantee is given.

USED WASHING MACHINES

Effective June 14, 1943, the Wartime Prices and Trade Board have issued an order setting prices ranging from \$9 to \$95, depending upon type and age, for rebuilt electric washing machines sold for domestic use. The order provides that the price may in no case be more than 90 per cent of the original retail selling price.

The destruction of used electric washing machines, except for the construction or rebuilding of other machines, is prohibited. Dealers must provide a 30-day guarantee on washers selling for \$50 or less and a 90-day guarantee on machines selling for more than \$50.

WIRING AND SIGNALLING DEVICES

Effective March 29, 1943, order A665 replaced Order A241 of the Wartime Prices and Trade Board. The new order sets out a schedule which must be followed in the manufacture of all wiring and signalling devices.

Schedule "A" To Administrator's Order No. A-671

No. A-761

Price Schedule for Used Electric Radios

Mantel radio previous to 1934 (Standard Wave) ..	\$29.00
Console radio previous to 1934 (Standard Wave) ..	29.00
Mantel radio, 1934 to 1937 (Standard Wave) (Note: Police bands not considered as short wave)	
5 tubes ..	25.00
6 to 7 tubes ..	30.00
8 tubes and up ..	35.00
Console radio, 1934 to 1937 (Standard Wave)	
5 tubes ..	35.00
6 to 7 tubes ..	40.00
8 tubes and up ..	45.00
Mantel radio, 1934 to 1937 (Long and Short Wave)	
5 tubes ..	30.00
6 to 7 tubes ..	35.00
8 tubes and up ..	40.00
Console radio, 1934 to 1937 (Long and Short Wave, without push button tuning)	
5 tubes ..	45.00
6 to 7 tubes ..	55.00
8 tubes and up ..	65.00
Mantel radio, 1938 to 1939 (Long & Short Wave)	
A.C. & D.C. sets ..	17.50
A.C. Midgits with transformers ..	22.50
	<i>Without</i> <i>With</i>
	<i>push-buttons</i> <i>push-buttons</i>
5 tubes ..	\$35.00 .. \$40.00
6 to 7 tubes ..	40.00 .. 45.00
8 tubes and up ..	45.00 .. 50.00
Console radio, 1938 to 1939 (Long & Short Wave)	
5 tubes ..	54.00 .. 59.00
6 to 7 tubes ..	64.00 .. 69.00
8 tubes and up ..	79.00 .. 89.00
Mantel radio, 1940, 1941, and 1942 (Standard, Long & Short Wave)	
With a list price below \$30.00 ..	90%)
" " " " from \$30-45 ..	85%) of original
" " " " " \$46-70 ..	80%) list price
" " " " " \$71 and up ..	75%)

Console radio, 1940, 1941 and 1942 (Standard, Long & Short Wave)	
With a list price below \$100 ..	80%)
" " " " from \$101-\$160 ..	75%) of original
" " " " " \$161 and up ..	70%) list price
Combination radio, up to and including 1933 ..	\$60.00
Combination radio, 1934 to 1937	
Original list price up to \$300 ..	125.00
" " " " from \$301 and up—not to exceed 50% of original list price.	
Combination radio, 1938 to 1939	
Not to exceed 60% of original list price.	
Combination radio, 1940, 1941 and 1942	
With list price up to \$100 ..	90%)
" " " " from \$101 to \$175 ..	85%) of original
" " " " " \$176 and up ..	75%) list price

Schedule "B" To Administrator's Order No. A-671

No. A-761

Implied Warranty applying to Rebuilt Radios and Used Radios referred to in Section 2 of this Order (See subsection 2 of Section 2)

Implied warranty that:

- (a) the radio is capable of performance substantially equivalent to that of the same radio when new;
- (b) forthwith upon demand and at his own cost and expense the dealer will repair the radio and replace all worn, defective, broken and missing parts, attachments and connections as may be necessary to its due performance, except repairs and replacements occasioned by improper use or from want of proper care on the part of the buyer;
- (c) the warranty shall be effective from the date of delivery of the radio to the buyer
 - (i) if the maximum selling price be \$50.00 or less, for the period of thirty days; or
 - (ii) if the maximum selling price be more than \$50.00, for the period of ninety days; and
- (d) the warranty shall be binding on the dealer, his heirs, executors and administrators or successors and shall enure to the benefit of the buyer, his heirs, executors, administrators or successors and assigns.
- (e) any action on or arising out of the warranty by or on behalf of the buyer, or his heirs, executors, administrators, successors or assigns, shall be commenced within six months after the time when the cause of action arose.

PRIORITIES ON RADIO IMPORTS

Written specially for "Canadian Radio Data Book"

by Les. W. Holbrook

ON August 3, 1943, Charles E. Wilson, Executive Vice-President of Washington's War Production Board stated "We still have production problems in radio"; that statement prompts us to emphasize, at the outset, that no procedures set up for priority assistance on radio parts can guarantee delivery. Radio repair parts continue in short supply and there is no assurance that parts will be available for all domestic uses. However, the domestic radio is considered important in war-time and it seems obvious that every effort will continue to be made to supply parts for its operation. An indication of this was a recent announcement that the Radio and Radar Division of the U.S. War Production Board were attempting to conserve a certain portion (between 12% and 15%) of the radio tube production for civilian receiving sets.

For the past year, Canadian distributors of radio parts of United States origin have been able to use the United States distributor's application for preference ratings. As of July 1st, under the Modified Controlled Materials Plan as adopted for Canada, a purely Canadian form (PB-1010) was introduced for this purpose.

Canadian distributors of radio parts manufactured in the United States should make application for U.S. priority assistance on form PB-1010. This form, together with instructions for completing same, are available from your nearest Regional Priorities Office (See list of Offices attached.)

Commercial Consumption

Under date of October 5, 1942, United States Preference Rating Order P-133 was issued by the War Production Board and this order was used by Canadian radio communications and broadcasting stations to obtain their maintenance, repairs and operating supplies.

The adoption of the Controlled Materials Plan in the United States also necessitated changes here and, under date of June 1, 1943, Order P-133 was revoked.

Procedures now to be used when ordering such maintenance, repairs and operating supplies (MRO) are covered by Priorities Officer's Or-

ders P.O. 4 and P.O. 5 (copies obtainable from Regional Priorities Offices).

A study of these orders will show that "radio communications" and "radio broadcasting" are both listed on Schedule 4 of the orders. Briefly this allows Canadian radio stations, etc., to place "PCS-22" on orders for MRO when they are buying from Canadian sources and to extend an AA-2 rating when ordering such MRO directly from the United States. Copies of these orders should be studied so that users

Forecasting Radio Prices After War

Advertising Age, a leading U.S. business paper recently said:

"There are manufacturers who think frequency modulation is so superior that the people will be satisfied with nothing less. But frequency modulation sets require more man-hours and materials. The lowest retail price of a complete frequency modulation set in 1942 was approximately \$60, or almost double the average price paid for radio sets. So if everybody demanded FM sets, and their price did not drop sharply, and if the public had \$880,000,000 to spend for home radios and radio phonographs, only a pitiful 15,000,000 could be bought."

Something's wrong with somebody's reasoning there. It's bogged down to the hubcaps in a brand of pre-war thinking, a pre-war concept of electronics, and an assumption that pre-war manufacturing methods used in FM will also be post-war methods. True enough, the construction of an FM receiver in 1941 *did* take more man-hours than the building of an AM set. True enough—because manufacturing and market demand were on a far smaller scale—models with FM cost about twice the average AM price, which was pretty badly dragged through the back part of the cellar by mass production of "midget" sets that sold for \$9.98.

But as low as *Advertising Age* seems to be basing its statements on the theory that post-war FM sets will be manufactured by the same methods, under the same limitations, as in 1941, it overlooks

are completely familiar with details.

Regional Priorities Offices
Vancouver—1130 Marine Building—E. A. Leslie.
Edmonton—c/o North West Purchasing Limited, 109th St. & Jasper Ave., G. P. Morison.
Winnipeg—209 Power Building—E. N. Dack.
Windsor—1009 Canada Bldg.—H. W. Ford.
Hamilton—Terminal Bldg.—G. W. Rymal.
Toronto—11 Jordan St.—A. R. Whitten.
Montreal—1155 Bishop St.—W. D. Lachapelle.
Halifax—302 Bank of Nova Scotia Bldg.—H. E. Silver.

the inevitable advent of new vacuum tubes able to do the same work that it once took several to perform. It ignores improved and simplified circuit designs. It shuns the industrial truism that mass production sends costs down, cuts the man-hours involved, almost always leads in time to a better product for less money.

We have no figures on it—although there must be some—showing to what extent the cost of building a pre-war FM receiver was increased by the unavoidable use of standard parts, tubes and other integral gadgets. In most cases, this meant putting more material and man-hours into an FM chassis than would be necessary if all the parts had been designed expressly for FM.

Advertising Age also seems to overlook that even those sets selling for \$60 were a *combination* job—really two sets in one. They received both FM and AM. The "average-priced" (in the U.S.) AM set—for about \$30—therefore cost only half as much but delivered a good deal less than half the performance, according to FM advocates.

One of the finest radio engineers once sagely avowed no one could build a super-heterodyne receiver (the AM type now in general use) for less than \$100. When we start evaluating possible post-war developments by the industrial and economic yardsticks that held true in pre-war days, we're just wasting our time. Events have a nasty way of shaming even the most omniscient forecaster.

... AFTER



The Gun barrels and Bombsights represented in the picture are only two of many items of war production manufactured in Westinghouse Plants in Hamilton, Canada.



Together with their sons and brothers in the *Fighting Forces, Westinghouse men and women at home, by producing weapons and munitions are waging relentless war upon the enemies of human liberty.

This inspiring task will be carried on, backed by all Westinghouse resources, until Victory is won.

**47 Westinghouse women and 1051 Westinghouse men on Active Service.*

FREEDOM OF WORSHIP
FREEDOM OF SPEECH
FREEDOM FROM WANT
FREEDOM FROM FEAR
★ FREEDOM OF OPPORTUNITY

ELECTRICITY...THE KEY

VICTORY

A Greater Future Lies Ahead!

Unquestionably electricity will be the greatest single factor in the post-war world. Canada will emerge from this war with some 10,000,000 electrical horsepower, of which about 2,000,000 H.P. has been created since the war began.

With a tremendously expanded industrial capacity and hundreds of thousands of families clamouring for the better things of life, electricity will play an immense part in the resumption of Canada's progress.

By widespread publicity Westinghouse is stressing the importance of the part Electricity plays both in war and in peace—

and especially its role in building the kind of world which everybody looks forward to.

To this end emphasis is given to "Freedom of Opportunity"—the freedom which gives all other freedoms their highest meaning.

That is the message that Westinghouse is telling, on behalf of the electrical industry . . . seeking to outline the broad pattern of our post-war Canada . . . and to inspire every Canadian with the enthusiasm, determination and fortitude that will make the vision a reality.

To those post-war days, then, look forward as partners with our valiant Fighting Men. This is their Land.

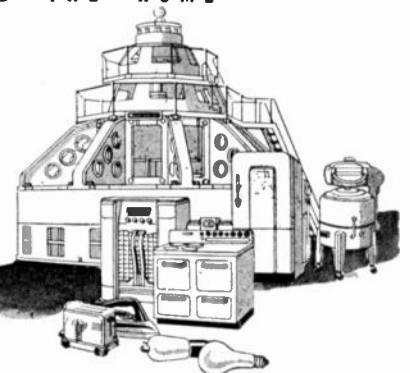
Westinghouse

ELECTRICAL PRODUCTS FOR INDUSTRY AND THE HOME

CANADIAN WESTINGHOUSE COMPANY LIMITED

HEAD OFFICE AND PLANTS: HAMILTON, CANADA

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TO CANADA'S ★ FIFTH FREEDOM

CANADIAN and U. S. BROADCASTING STATIONS

Arranged by Provinces

—NOVA SCOTIA—

Call Letter	Location	Frequency	Power Watts
CJFX	Antigonish	580	1000
CHNS	Halifax	960	1000
CJCB	Sydney	1270	1000
CKIC	Wolfville	1010	50
CJLS	Yarmouth	1340	100

—NEW BRUNSWICK—

Call Letter	Location	Frequency	Power Watts
CKNB	Campbellton	950	1000
CFNB	Fredericton	550	1000
CKCW	Moncton	1400	250
CBA	Sackville	1070	50000
CHSJ	Saint John	1150	1000

—PRINCE EDWARD ISLAND—

Call Letter	Location	Frequency	Power Watts
CFCY	Charlottetown	630	1000
CHGS	Summerside	1480	100

—QUEBEC—

Call Letter	Location	Frequency	Power Watts
CHAD	Amos	1340	250
CBJ	Chicoutimi	1580	1000
CKCH	Hull	1240	250
CBF	Montreal	690	50000
CBM	"	940	5000
CKAC	"	730	5000
CFCF	"	600	500
CHLP	"	1490	250
CHNC	New Carlisle	610	1000
CBV	Quebec City	980	1000
CKCV	"	1340	100
CHRC	"	800	1000
CJBR	Rimouski	900	1000
CKRN	Rouyn	1400	250
CHGB	St. Ann Pocatiere	1230	250
CHLT	Sherbrooke	1240	250
CHLN	Three Rivers	1450	100
CHVD	Val d'Or	1230	100

—ONTARIO—

Call Letter	Location	Frequency	Power Watts
CKPC	Brantford	1380	100
CFLC	Brockville	1450	100
CFCO	Chatham	630	100
CKMO	Cobalt	1240	50
CKPR	Fort William	580	1000
CHML	Hamilton	900	1000
CKOC	"	1150	1000
CKCA	Kenora	1450	250
CFRC	Kingston	1490	100
CKWS	"	960	1000
CJKL	Kirkland Lake	560	1000
CKCR	Kitchener	1490	250
CFPL	London	1570	1000
CFCH	North Bay	600	100
CBO	Ottawa	910	1000
CKCO	"	1310	1000
CFOS	Owen Sound	1400	250
CHPS	Parry Sound	1450	250
CHOV	Pembroke	1340	250
CKEX	Peterboro	1430	1000
CKTB	St. Catharines	1550	1000
CJIC	S. Ste Marie	1490	250
CJCS	Stratford	1240	50
CKSO	Sudbury	790	1000
CKGB	Timmins	1470	1000
CKCL	Toronto	580	1000
CFRB	"	860	10000
CBL	"	740	50000
CBY	"	1010	1000
CKLW	Windsor	800	5000
CKNX	Wingham	920	1000

—MANITOBA—

Call Letter	Location	Frequency	Power Watts
CKX	Brandon	1150	1000
CFAR	Flin Flon	1400	1000
CJRC	Winnipeg	630	1000
CKY	"	990	15000

—SASKATCHEWAN—

Call Letter	Location	Frequency	Power Watts
CHAB	Moose Jaw	800	1000
CKBI	Prince Albert	900	1000
CKCK	Regina	620	1000
CJRM	Regina	980	1000
CFQC	Saskatoon	600	1000
CBK	Watrous	540	50000
CJGX	Yorkton	1460	1000

Call Letter Location Frequency Power Watts

—ALBERTA—

Call Letter	Location	Frequency	Power Watts
CFAC	Calgary	960	1000
CFCN	"	1010	10000
CJCJ	"	1230	100
CKUA	Edmonton	580	1000
CJCA	"	930	1000
CFRN	"	1260	1000
CFGP	Grand Prairie	1340	250
CJOC	Lethbridge	1060	1000

—BRITISH COLUMBIA—

Call Letter	Location	Frequency	Power Watts
CHWK	Chilliwack	1340	100
CFJC	Kamloops	910	1000
CKOV	Kelowna	630	1000
CKLN	Nelson	1240	250
CFPR	Prince Rupert	1240	50
CJAT	Trail	610	1000
CJOR	Vancouver	600	1000
CKMO	"	1410	100
CKWX	"	980	1000
CBR	"	1130	5000
CJVI	Victoria	1480	500

Short Wave Stations

Station	Location	Frequency in Kilocycles	Power Watts
CBFW	Montreal (CBC)	6090	7500
CBFX	Montreal (CBC)	9630	7500
CBFY	Montreal (CBC)	11705	7500
CBFZ	Montreal (CBC)	15190	7500
CFCX	Montreal (Marconi)	6005	75
CFRX	Toronto (Rogers)	6070	1000
CHNX	Halifax, N.S.	6130	500
CJCX	Sydney, N.S.	6010	1000
CJRO	Winnipeg	6150	2000
CJRX	Winnipeg	11720	2000
CFVP	Calgary	6030	100
CKFX	Vancouver	6080	10
CBRX	Vancouver	6160	150

NEWFOUNDLAND STATIONS

Call Letter	Location	Frequency	Power Watts
VOWN	Corner Brook	850	100
VOCM	St. John's	1000	100
VONF	St. John's	640	1000

Canadian FM Stations

Experimental Stations Authorized to Transmit by F.M. in the Ultra High Frequency Broadcasting Band in Canada

Station	Owner	Location	Frequency (Kc/s)	Power (watts)
VE9CM	Marconi	(Montreal)	25	43700
(on behalf of C.B.C.) 2000				
VE9AE	Stromberg-Carlson	(Toronto)	25	43000
VE9AK	Rogers	(Toronto)	25	43400

Hours Sets Are Used Most

City	Daytime (9 a.m. - 6 p.m.)		Evening (6 p.m. - 10 p.m.)	Average
	Daytime	Evening		
Halifax	25.3	28.7	26.3	
Sydney	26.8	38.3	30.3	
Saint John	36.8	40.9	38.1	
Quebec	38.4	46.1	39.7	
Montreal—Fr.	28.1	41.1	32.1	
Montreal—Eng.	19.2	28.4	22.0	
Ottawa	48.1	53.7	49.8	
Kingston	36.8	50.4	41.0	
Toronto	17.9	32.8	22.5	
Hamilton	22.0	31.2	24.8	
London	21.7	35.6	26.0	
Windsor	24.5	41.7	29.8	
North Bay	27.8	34.5	29.9	
Kirkland Lake	41.3	50.4	44.1	
Timmins	36.7	44.5	39.1	
Winnipeg	25.8	39.6	30.0	
Regina	34.5	42.5	37.0	
Saskatoon	26.2	42.4	31.2	
Calgary	25.1	37.5	28.9	
Edmonton	26.2	35.7	29.1	
Vancouver	17.8	26.1	20.4	

—Elliott-Haynes Surveys

Arranged by Frequencies

CANADIAN

Frequency	Location	Network
540	CBK Watrous, Sask.	CBC
550	CFNB Fredericton, N.B.	CBC
560	CJKL Kirkland Lake, Ont.	CBC
580	CKCL Toronto	CBC & Mutual
580	CKPR Fort William, Ont.	CBC
580	CKUA Edmonton, Alta.	
600	CFCF Montreal	Blue
600	CFCH North Bay, Ont.	CBC
600	CFQC Saskatoon	CBC
600	CJOR Vancouver	
610	CJAT Trail, B.C.	CBC
610	CHNC New Carlisle, Que.	
620	CKCK Regina, Sask.	
630	CFCO Chatham, Ont.	
630	CFCY Charlottetown	CBC
630	CKOV Kelowna, B.C.	CBC
630	CKRC Winnipeg	
690	CBF Montreal	CBC
730	CKAC Montreal	Columbia
740	CBL Toronto	CBC
790	CKSO Sudbury, Ont.	CBC
800	CHAB Moose Jaw	CBC
800	CKLW Windsor, Ont.	Mutual
800	CHRC Quebec City	
860	CFRB Toronto	Columbia
900	CKBI Prince Albert, Sask.	CBC
900	CJBR Rimouski, P.Q.	CBC
900	CHML Hamilton, Ont.	CBC
910	CBO Ottawa	CBC
910	CFJC Kamloops, B.C.	CBC
920	CKNX Wingham, Ont.	
930	CJCA Edmonton	CBC
940	CBM Montreal	CBC
950	CKNB Campbellton, N.B.	
960	CFAC Calgary, Alta.	CBC
960	CHNS Halifax, N.S.	CBC
960	CKWS Kingston, Ont.	
980	CBV Quebec	CBC
980	CKRM Regina, Sask.	CBC
980	CKWX Vancouver, B.C.	
990	CKY Winnipeg	CBC
1010	CFCN Calgary, Alta.	
1010	CBY Toronto	CBC
1060	CJOC Lethbridge, Alta.	
1070	CBA Sackville, N.B.	CBC
1130	CBR Vancouver	CBC
1150	CKOC Hamilton, Ont.	CBC
1150	CKX Brandon, Man.	CBC
1150	CHSJ St. John, N.B.	CBC
1230	CKVD Val d'Or, P.Q.	
1230	CJCJ Calgary, Alta.	
1230	CHGB Ste Anne Pocatiere	
1240	CFPR Prince Rupert, B.C.	
1240	CHLT Sherbrooke, P.Q.	
1240	CJCS Stratford, Ont.	
1240	CKCH Hull, P.Q.	
1240	CKLN Nelson, B.C.	
1240	CKMC Cobalt, Ont.	
1260	CFRN Edmonton, Alta.	
1270	CJCB Sydney, N.S.	CBC
1310	CKCO Ottawa	
1340	CJLS Yarmouth, N.S.	
1340	CFGP Grand Prairie, Alta.	
1340	CKCV Quebec, Que.	
1340	CHWK Chilliwack, B.C.	
1340	CHOV Pembroke, Ont.	
1380	CKPC Brantford, Ont.	
1400	CFAR Flin Flon, Man.	
1400	CKCW Moncton, N.B.	CBC
1400	CKRN Rouyn, P.Q.	
1400	CFOS Owen Sound, Ont.	
1410	CKMO Vancouver, B.C.	
1430	CHEX Peterboro, Ont.	
1450	CHLN Three Rivers, P.Q.	
1450	CFLC Brockville, Ont.	
1460	CJRL Kenora, Ont.	
1460	CHPS Parry Sound, Ont.	

Frequency	Network
1460 CJGX	Yorkton, Sask.
1470 CKGB	Timmins, Ont.
1480 CHGS	Summerside, P.E.I.
1480 CJVI	Victoria, B.C.
1490 CJIC	Sault Ste. Marie, Ont.
1490 CFRC	Kingston, Ont. CBC
1490 CKCR	Kitchener, Ont.
1490 CHLP	Montreal, Que.
1550 CKTB	St. Catharines, Ont. CBC
1570 CI'PL	London, Ont.
1580 CBJ	Chicoutimi, P.Q. CBC

United States

550 KFYP	Bismark, N.D.	Red
550 WGR	Buffalo, N.Y.	Mutual
570 KVI	Tacoma, Wash.	Columbia
590 KHQ	Spokane, Wash.	Red
610 KFAR	Fairbanks, Alaska	
620 KGW	Portland, Ore.	Red
640 KFI	Los Angeles	Red
650 WSM	Nashville, Tenn.	Mutual
660 WEAJ	New York City	Red
670 WMAQ	Chicago, Ill.	Red
680 KPO	San Francisco	Red
700 WLW	Cincinnati, Ohio	Red
710 KIRO	Seattle, Wash.	Columbia
710 WOR	New York	Mutual
720 WGN	Chicago, Ill.	Mutual
750 WSB	Atlanta, Ga.	Red
760 WJR	Detroit, Mich.	Columbia
770 WJZ	New York City	Blue
780 WBBM	Chicago, Ill.	Columbia
810 KGO	San Francisco	Blue
810 WGY	Schenectady, N.Y.	Red
820 WFAA	Dallas, Tex.	
830 WCCO	Minneapolis	Columbia
840 WHAS	Louisville, Ky.	Columbia
850 KOA	Denver, Colo.	Red
880 WABC	New York	Columbia
890 WENR	Chicago, Ill.	Blue
890 WLS	Chicago	
920 KFPY	Spokane, Wash.	Columbia
930 WBEN	Buffalo, N.Y.	Red
950 KOMO	Seattle, Wash.	Red
950 WWJ	Detroit, Mich.	
970 KOIN	Portland, Ore.	Columbia
970 WDAY	Fargo, N.D.	Red
970 WHA	Madison, Wis.	Red
1000 KJR	Seattle, Wash.	Blue
1000 WCFL	Chicago, Ill.	Red
1020 KDKA	Pittsburgh, Pa.	Red
1030 WBZ	Boston, Mass.	Blue
1040 WHO	Des Moines, Iowa	Red
1050 WHN	New York	
1060 KYW	Philadelphia	Red
1070 KNX	Hollywood, Calif.	Colum.
1080 WTIC	Hartford, Conn.	Red
1100 WTAM	Cleveland, Ohio	Red
1120 KMOX	St. Louis, Mo.	Columbia
1140 KSOO	Sioux Falls, S.D.	
1160 KSL	Salt Lake City	Columbia
1170 KVOO	Tulsa, Okla.	
1180 WHAM	Rochester, N.Y.	Blue
1190 WOWO	Fort Wayne, Ind.	Blue
1200 WOAI	San Antonio, Texas	
1210 WCAU	Philadelphia	Columbia
1250 KTW	Seattle, Wash.	
1290 KGVO	Missoula, Mont.	Columbia
1290 WHLD	Niagara Falls, N.Y.	
1300 KOL	Seattle, Wash.	Mutual
1360 KMO	Tacoma, Wash.	Mutual
1370 KGIR	Butte, Mont.	
1390 WFBL	Syracuse, N.Y.	Columbia
1420 WHK	Cleveland, Ohio	Blue
1430 WIRE	Indianapolis, Ind.	Mutual
1480 WGAR	Cleveland, Ohio	Columbia
1500 KSTP	St. Paul, Minn.	
1500 WJSV	Washington, D.C.	Colum.
1510 KGA	Spokane, Wash.	Blue
1520 WKBW	Buffalo, N.Y.	Columbia
1530 WCKY	Cincinnati	
1530 KFBK	Sacramento, Calif.	Red
1540 KXEL	Waterloo, Iowa	

F.M. DEVELOPMENTS IN THE U.S.

Special Dispatch from Washington, D.C.

THE practical history of FM as a broadcast service dates from March, 1940, when the U.S. Federal Communications Commission viewed its qualifications thoroughly and then, two months later, announced the establishment of a special FM broadcast band running from 43 to 50 megacycles in the ultra-high frequency part of the radio spectrum. This band is divided into 40 channels and, at the time, most people felt confident it would be ample to accommodate all the expansion FM might undergo for a long, long while.

Subsequent events brought some doubts. In New York City, for example, only 11 channels are available for the type of station (class B) designated to serve cities. By the end of 1941, all but two of these channels had been assigned, with 10 applicants still vying for a chance to get FM stations on the air. Similar problems of congestion were also developing in New England, and seemed to be in sight for Chicago, Philadelphia and Los Angeles.

The unfrilled fact that a sizable majority of all groups which had FM applications pending at the start of the war recently asked for official reinstatement of these applications is, of course, significant. Add to them the many new people who are certain to enter FM broadcasting at the first post-war chance they get, and further crowding of FM channels seems inevitable.

Two suggestions have been made. One is to extend the present FM broadcast band (43 to 50 mc.) beyond its 40 channels. The other is to move the whole business from where it is now to a higher spot in the radio frequency spectrum—probably above 100 megacycles.

Both are a great deal easier to talk about than to do. There's a mounting clamor for use of the ultra-high frequencies—a region of radio that was so unwanted a few years ago that you could almost shoot antelopes down there. Today, many police installations operate on ultra-high frequencies. The air lines have an eye on them for communication and aerial traffic control purposes. A growing amount of point-to-point relay work uses them. Peacetime applications of radar will need space in the upper reaches of the ultra-high spectrum. Television also must have suitable channels.

If FM moves above 100 megacycles, it should eliminate occasional cases of long-range reception where—under freak conditions—faraway FM stations may be able to interfere with local outlets. On the other hand, manufacturing suitable receivers on a large scale would be a more critical process and (for a time, at least) more expensive.

Lastly, the factor that makes us apprehensive is the obvious effect any removal of the present FM band would have on some half million FM sets now owned by listeners in the United States. If the channels between 43 and 50 megacycles were extended in either direction, alterations might well be made on the receiving range of existing sets. But if FM broadcasting were bodily transported to a new homestead south of 100 megacycles, those receivers would become worthless for FM reception.

The whole subject calls for a lot more scrutiny and no little study. We're not advocating anything one way or the other right now, you understand. It just seems pretty plain that when FM begins to take a really deep breath after this war, it's likely to bust off a few vest buttons unless more room is found somewhere.

UNITED STATES FM STATIONS

About 60 FM stations are operating (or have applications pending for licenses) in the United States. Experimental stations are being operated by the National Broadcasting Co. (New York), General Electric, (New Scotland, N.Y.), Westinghouse (Springfield, Mass.), Edwin H. Armstrong (Alpine, N.J.) and eight others.

Commercial stations totalling 45 are being operated over 20 of these being in New York and Pennsylvania; six in New England, thirteen in Ohio, Michigan, Indiana, Illinois and Wisconsin, and half a dozen in Southern or Western States. Included in these are General Electric (Schenectady), Stromberg Carlson (Rochester), Westinghouse (Boston, Philadelphia, Pittsburgh and Fort Wayne), Zenith Radio (Chicago), Columbia Broadcasting (New York and Chicago) and the City of New York Municipal Station.

C.B.C. EXTENDING THEIR ACTIVITIES

FOURTEEN radio range and communication stations have been built since the outbreak of the war, seven radio stations are nearing completion, and plans have been made for construction of 16 additional stations in 1943, Munitions Minister Howe told the House of Commons recently.

Tightened control of licenses for private commercial broadcasting stations is provided in an amendment to radio regulations published in the Canada Gazette. The regulations now are extended to prevent control of a group of private stations by any one individual or interest. The amendment is in line with a recommendation made last year by the House of Commons radio committee.

The new regulations provide that "except with the permission of the minister, given upon the recommendation of the Canadian Broadcasting Corp., no person shall be licensed to operate more than one station and no license shall be issued to a company owned or controlled by a company holding a license."

The issue of a license is also made conditional on the licensee being the owner of the station and upon the ownership not being transferred directly or indirectly without the permission of the minister.

The station must be actually operated by the licensee, or by bona fide employees, although this condition may be rescinded by the minister acting on the recommendation of the C.B.C.

The regulations are also extended to enable the minister to require returns, to be made by the licensee, of the revenues, profits and expenditures of the station and any other information to ensure that the station is operated in the national interest and for the benefit of the community in which it is located.

Changes Forecasted

Great changes in the transmission of radio broadcasts may be expected after the war, Dr. Augustin Frigon, assistant general manager of the Canadian Broadcasting Corporation, said in evidence before the House of Commons Radio Committee.

Discoveries and developments made during the war would then come into general use and an international conference would be necessary to allot wavelengths and

take up matters of interference across international borders, Dr. Frigon said.

An important factor would be developments in "frequency modulation," which would not interfere with stations on the standard band. It is not affected by static.

The signals in "F.M." carry only to the horizon and therefore cover a radius of not more than 70 miles, dependent on the height of aerial. The method would make possible the granting large numbers of licenses for community broadcasts which would not interfere with existing stations on the standard wave band.

CBC Revenues

A report from the Transport Department, read to the committee, said 1,728,880 receiving set licenses were issued in the fiscal year ended last March 31, and the gross revenue was \$4,187,667. After deducting commissions and cost of administration, the CBC received \$3,667,340, or \$215,158 more than

in the year before when the number of licenses was 105,391 less.

The CBC also received \$34,350 in fees from private commercial broadcasting stations, bringing the corporation's total from licenses to \$3,701,690.

The average commission on sale of receiving-set licenses was 17.18 cents, compared with 17.22 cents the year before.

Administration costs were up \$25,861 due to higher salaries and additional staff to take care of the increased number of licenses issued.

New Short Wave Station

Dr. Frigon said the CBC was doing its best to keep the total cost of the new short wave radio station at Sackville within the \$800,000 estimate, but it was difficult because of the higher costs of materials in wartime.

The number of broadcasting stations licensed this year in Canada is: CBC, 27 (including five short-wave licenses and 12 repeater licenses); university (educational) stations licenses at a fee of \$50, two; and privately owned commercial stations, 85 (including eight short-wave licenses).

INDEPENDENT BROADCASTERS BRIEF

A delegation representing the Canadian Association of Broadcasters appeared before the Radio Committee of the House of Commons before it adjourned on July 24.

Joseph Sedgwick, K.C., presented a brief to the committee in which he asked that private broadcasting be allowed to compete with the Canadian Broadcasting Corporation on a "reasonable basis." The brief read:

1. That individual stations be encouraged to improve their facilities, increase their power and operate multiple station hook-ups.

2. That private broadcasting stations be given the opportunity of participating in the development and use of all new phases of broadcasting.

3. That private broadcasters be assured continuance of their licenses so long as operation of their stations was in accordance with public interest and convenience.

Mr. Sedgwick said that private broadcasters were disturbed by the weakening of the security of the private stations engendered by last year's report which supported general nationalization of radio in Can-

ada, a feeling born not only of what was said, but of some things which were hinted at.

If the committee proposed total nationalization of radio, he said, it should say so flatly. If it did not want this, radio should be freed of the constant threat of nationalization, which certainly did not create an atmosphere of encouragement to private stations in expanding their service to the public.

Nationalized radio in Europe, he pointed out, was used largely for propaganda purposes. He referred to the situation in England, and explained that the BBC did not have a monopoly before the war, and could not have fully satisfied the wants of the British listeners, because a number of continental commercial stations broadcast exclusively to England, and that often these stations had a larger audience than the BBC. He also expressed the view that commercial broadcasting would be permitted in England after the war.

Quoting the results of a survey made on behalf of the Broadcasters' association, Sedgwick revealed that when questioned as to the type of radio control the public wanted,

16% favored complete government ownership; 32% were in favor of some government and some private stations; and those favoring all private stations comprised 20%. 12.9% wanted private stations under government supervision and 18% would express no view.

Urges CBC to Act Fairly

Dr. J. J. McCann, chairman of the Parliamentary Committee on Radio Broadcasting tabled the report of the committee on July 22 recommending that the Canadian Broadcasting Corporation should make use of channels granted to Canada under the Havana agreement, if necessary increasing the power of all Canadian stations to the limit of the international treaty, and so ensure their being retained for Canada—and that the CBC perform its function of regulating the private stations with fairness.”

Referring in its report to its favorable comment on “the existing good relations between the corporation and the privately owned stations,” the committee also went on record with the statement that the private stations function usefully.

Commenting upon the C.B.C. monopoly control of radio in Canada the *Canadian Broadcaster* undoubtedly expresses the viewpoint of the majority of radio trade in Canada when it says:

“Radio’s control by the CBC, as a government commission, could be of benefit to the country, just like the Railway Commission, or, in the United States, the Federal Communications Commission. It is for such purposes that government commissions are usually appointed. But as for these Commissions starting in business in opposition to and partially capitalized by the private organizations they are appointed to regulate, even an apathetic public should shiver in its shoes, for under such a state of affairs, democracy becomes a myth and freedom of speech a fading memory.”

Committee Needs Re-Organizing

The *Toronto Globe and Mail* also makes a timely comment as follows:

It was recognized by the committee that the CBC Board of Governors needed strengthening. One paragraph in the report reads: “Your committee recommends that the Government progressively strengthen the board by appointing persons selected because of outstanding ability and genuine interest.”

“Opposition Leader Gordon Graydon, said that the board should resign en bloc and a new board be appointed, composed of capable men and women who are non-partisan.

“None of these Parliamentary committees seems to deal in a direct and forthright manner with the essential weakness of the whole CBC structure. The CBC collects license fees from every owner of a radio set. It has a monopoly of lines for network purposes; it has the authority to restrict the power of any private station and increase the power of its own stations. It is in commercial competition with the private stations, and these are allowed to operate only under license of the CBC.

“It is as though the Canadian National Railways had the right to fix limits on the number of locomotives possessed by the C.P.R., exercise control of all junction and intersection points, and make everybody in the country buy a ticket for a fixed mileage, whether he ever travelled on the C.N.R. or not. It is not surprising that the relations between the CBC and the private stations are amiable. The day-to-day existence of every private station in Canada depends upon its preserving cordial relations with a power which could throttle it at will.”

Canadian Radio Data Book endorses these criticisms and suggests the appointment of some practical radio men of the type of Radio Administrator A. L. Brown, Montreal, or R. A. Hackbusch, Toronto, or Reg. N. Brophy, (Marconi Co.) Montreal, formerly one of the managers of the National Broadcasting Company at New York.

Without question there should be radio trade representation on the Board of Governors of the C.B.C. Who would be more intelligent representatives of the “listeners” than those who know radio equipment and are financially interested in giving progressive service to the end of increasing the listening audience of set owners across Canada.

CATHODE RAY TUBE HELPS ADJUSTMENTS

A cathode-ray tube has been incorporated into multitube communicating receiver to give a visual checkup on the characteristics of incoming signals. Placed above the receiver proper, the cathode-ray tube can be switched on any time the operator desires. The image obtained is dependent on the kilocycle width of the intermediate-frequency stages. It enables the operator to adjust the receiver for the best possible reception at all times.

MOST POPULAR PROGRAMS

English—Evening

Charlie McCarthy
Jack Benny
Fibber McGee & Molly
Lux Radio Theatre
Aldrich Family
Nazi Eyes on Canada
Treasure Trail
Kraft Music Hall
All Star Varieties
NHL Hockey Broadcasts
Fred Allen
Inner Sanctum Mysteries
Silver Theatre
Vox Pop
Amos 'n' Andy

English—Daytime

They Tell Me
The Happy Gang
Big Sister
Road of Life
Dr. Susan
Refreshment Time
Pepper Young's Family
Mary Marlin
Lucy Linton
Soldier's Wife
Ma Perkins
Right to Happiness
The Bartons
Vic and Sade
Life Can Be Beautiful

French—Evening

Les Varieties, 1943
Ceux qu'on Aime
Le Ralliement du Rire
Le Cafe Concert
Le Course au Tresor
Notre Canada
Radio Theatre Lux
Nazaire et Barnabe
La Vie Commence Demain
Lionel Parent Chant
Ti-pit et Fifine
Le Theatre de Chez-Nous
Ovila Legare
Pension Velder
Les Amours de Ti-Jos

French—Daytime

Jeunesse Doree
Quelles Nouvelles
La Rue Principale
Les Joyeux Troubadours
Grande Soeur
Joson et Josette
Madeleine et Pierre
C'est la Vie
Vie de Famille
Tante Lucie
Le Vieux Maitre d'Ecole
Histoires d'Amour
Pierre et Pierrette
La Mine d'Or
Le Courier du Jour

—Elliott Haynes Surveys

TELEVISION DEVELOPMENTS DURING WAR

S. L. Solon in Radio and Television Weekly (London, Eng.)

THE application of television to warfare has interested experimenters for a number of years. Reconnaissance by the use of television to send back instantly the results of the survey made by observers in aircraft or scout cars would give a commander definite advantage over an enemy using slower methods of transmitting information.

Methods to use television for the steering of mechanized equipment and aircraft were fully designed before the war. There is an apparatus which enables the navigator to receive the televised picture of a compass scale on which his bearings are clearly marked. This is an improvement over the older DF system which requires the navigator to know Morse in order to interpret the signals flashed from the beacon station.

Developments in Canada

In cases of poor visibility television may be used to project a picture of the landing field on the dashboard of the plane with a moving spot of light to represent the aircraft's own position in relation to the field. By watching the moving light on the fluorescent screen the pilot can follow his course of flight into the airdrome.

The development of facsimile transmission by wireless also has important military application. The Royal Canadian Corps of Signals has been testing machines for the transmission of printed matter since the war.

It is possible by means of this equipment to send maps, messages, documents in identical reproduction to distant receiving stations. Both transmitting and sending sets, plus the power unit, can be transported in a small lorry.

The fact that television signals did not follow the curvature of the earth, but moved in a straight line into space, limited the effective range to about 30 miles.

In February, 1940, David Sarnoff, president of the Radio Corporation of America, announced that the problem of distance television had at last been solved. By the erection of mechanical relay stations 30 miles apart the original signals sent out on a frequency of

45,250 kilocycles could be converted to 500,000 kilocycles until the distant broadcasting station was reached, when they could be reconverted to the lower frequency.

The result is that television today may have the same limitless audience as sound broadcasting. How soon this "missing link of television"—as Mr. Sarnoff described it—will be generally adapted for military purposes such as training, information in the field, etc., is any layman's guess.

J. L. Baird's outstanding work in color television has introduced another important element for future military radio. Color transmission of battle scenes by wireless may one day constitute the primary source of information for the commander in directing his forces.

Such are the dramatic potentialities of wireless warfare in outline. However, there are many applications of radio to the war effort which, though less sensational, are of high importance. New inventions and new techniques are coming from the laboratories constantly.

The war has accelerated the development of directional broadcasting to reduce wasted radiation to a minimum. By the use of carefully calculated directional aerial systems the transmission of energy can be directed according to the needs of the area served by the broadcasting station.

The aerial system of the Midland Regional Transmitter, for example, serving the Midland counties from Gloucestershire to Nottinghamshire, was designed so that the energy would be concentrated in the northeast direction.

Weather Forecasting

The story of how radio has been used to further weather forecasting is one of the most fascinating chapters of the war.

In stormy weather a young meteorologist released a large pear-shaped silk balloon from the upper deck. Several minutes later with the balloon miles away the automatic short-wave apparatus began to send signals back to the receiving apparatus aboard ship. It told the full details of barometric pressures and temperature as it ascended miles into the stratosphere.

These reports recorded automatically on charts in the receiving apparatus were radioed to the meteorological station in Long Island, where a composite picture of Atlantic weather conditions was obtained.

This new method, now generally utilized, has placed long-range weather forecasting on a completely scientific basis. Its importance for long-distance flights cannot be exaggerated. It is the silent service of the air, working day and night on the high seas, in calm and storm, which makes modern air traffic possible.

In America RCA engineers have developed a new method of sounding ARP and emergency warnings over the wireless. By equipping each receiving set with a special fixed-tune three-valve receiver, which is kept switched on, the entire population could be called to attention in a few seconds.

Signal Operates Bell

The announcer simply plugs into the microphone circuit an oscillator unit which modulates the carrier wave to an agreed frequency, which is picked up by the receiver. The signal can be used to operate an electric bell or switch on a light calling the householder to the wireless to listen to the announcement. The special receiver can operate from batteries so that if the power mains are cut off it will not prevent the emergency signal from being received.

Radio altimeters to tell the height of a craft above a reflecting surface by transmitting radio energy of varying wavelength, and heterodyning the wave returned after reflection with the wave then being radiated, have been greatly improved. New inventions make it possible to do away with the undesired harmonic frequencies which interfere with its operation. High-speed wireless for sending thousands of words in a few minutes is perfectly feasible. The messages are simply sent at top speed through the transmitter and then picked up by the receiving station recorder operating at the same speed. The records can then be run through a reproducer at normal speed for transcription.

RECOMMENDED SERVICE CHARGES

RECOMMENDED AND

Canadian RADIO


COMPILED BY

DATA BOOK

The following suggested standard of radio service charges cover time, labour and testing only. Materials are extra, cost of which can be secured from your own suppliers' catalogue.

AERIALS:		CONDENSERS OR RESISTORS:		RESISTORS:	
Built-in Loop, (replace or repair)	3.00	(Replacement, wiring repairs)		Voltage Divider, replace	2.50
Standard & All-Wave (install, per hr.)	2.00	Audio amplifier	2.50	SOCKETS:	
ALIGNING TUNED CIRCUITS:		Automatic Frequency Control System	3.00	Replace	3.00
(Including Dial Calibration)		Automatic Volume Control System	2.75	Repair Contacts	2.00
Automatic Frequency Control	1.75	Detector Circuit (First)	2.50	Tube replace	1.00
Frequency Modulation System	3.00	Detector Circuit (Second)	2.75	SPEAKERS:	
Intermediate Frequency Stages .....	.50	Discriminator Circuit	3.00	Cone recentering	1.00
Intermediate Frequency Stages		Intermediate Frequency Amplifier	2.00	Cone replacement	2.00
High Fidelity	1.50	Limiter Circuit	2.00	Field Coil Assembly replace	3.00
Standard Broadcast Band	1.00	Oscillator Circuit	2.25	SWITCHES:	
Short Wave Band (each)	1.00	Power Supply Circuit	2.00	Off-On, replace	1.50
Wireless Remote Control Amplifier	2.50	Radio Frequency Amplifier	2.50	Push Button, clean & lubricate	2.00
AUTOMATIC TUNING:		Volume Expansion Amplifier	3.00	Push Button, replace	2.75
Push Button type, adjust & lubricate	1.50	Wireless Remote Control Amplifier	3.50	Radio-Phono., replace	1.75
Motor operated type	2.00	DIALS:		Wave Band (Single Section) clean and	
AUTOMOBILE RADIOS:		Dial Drive (cable or cord) replace	1.75	lubricate	2.00
Bench Test .....	.75	Dial Drive Mechanism, replace or		Wave Band (Single Section) replace	2.75
Installations—Radio	Min. 4.50	repair	1.50	Wave Band (Multiple Section) clean &	
—Aerial	Min. 1.00	Dial Lamp, replace .....	.50	lubricate	2.50
Remove & Replace	1.00	Dial Pointer, replace .....	.50	Wave Band (Multiple Section) replace	4.00
BATTERIES:		Dial Scale, replace	1.00	TONE CONTROLS:	
Replace. (Portables) .....	.50	LABOUR:		Replace	2.25
Replace. (Home)	1.00	In Shop	per hour 1.25	TRANSFORMERS:	
CHOKES:		Outside Shop	per hour 1.50	Discriminator Transformer, replace	3.50
Filter Choke, replace	2.25	MINIMUM SERVICE CHARGE:	1.00	I. F. Transformer, replace	2.50
COILS:		MINIMUM BENCH TEST:	.75	Power Transformer, replace	3.50
Oscillator Coil, replace	2.75	PICKUP AND DELIVERY:		Radio Frequency Transformer, replace	3.00
CONDENSERS:		5 mile radius	1.00	Wireless Remote Control Transformer,	
By-Pass condenser, replace	2.25	Over 5 miles, add per mile .....	.10	replace	4.00
Compensator condenser, replace	3.00	RECORD PLAYERS:		Wireless Remote Control Stepper,	
Coupling condenser, adjust	2.25	Automatic Record Changers, clean,		replace	4.50
Main Filter condenser, replace	2.50	adjust & lubricate	3.50	VIBRATORS:	
Tuning Gang condenser, adjust	2.50	Phonograph Motor, clean & lubricate	2.75	Replace	1.50
Tuning Gang condenser, replace	3.50	Phonograph Motor, replace	2.00	VOLUME CONTROLS:	
		Phonograph Motor Pickup, replace or		Replace	2.25
		adjust	1.75		

The above prices are based on charges used by responsible radio service engineers across Canada. Intermittent trouble requiring additional testing must be charged on a time and material basis.

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MUNITIONS MADE TO MUSIC

MUSIC tends to reduce fatigue and consequently to increase muscular endurance. That fact was pointed out by the Journal of the Canadian Medical Association long before war broke out. And in keeping with that belief, the Canadian General Electric Company installed music as a working feature in its plant in 1926 and now has 1600 employees working to music in its Toronto plants. Request boxes are scattered through the factories and employees have the choice of several hundred records to choose their selections from.

Approximately 200 Canadian plants now have music while their employees work and over 3000 United States plants have similar installations. In "Help Wanted" advertising in to-day's newspapers factories announce that music is available in working hours and this has helped to obtain hundreds of employees.

"The music is supplied either by plants having their own play-back equipment, or over special balanced telephone lines by the Associated Broadcasting Company who are the Canadian representatives of "Music By Muzak." In Montreal the Muzak Service is being supplied to some forty-five Companies including: Defence Industries, Robert Mitchell, Fairchild Aircraft, Belding-Corticelli, and in Toronto to some thirty plants including: Research Enterprises, Dominion Bridge, Ontario Silknit.

The Muzak Service is being extended to Hamilton and the Niagara Peninsula through the use of a special broadcast telephone line, connected with these points. The scientific programming feature of Muzak involves twelve minutes of music each half hour with a different type of rhythm for each hour of each work shift.

Canadian Westinghouse Limited, Hamilton, report that they have worked to music for many years, but not to records. Broadcast music is used entirely and "our belief is that the music is appreciated by our employees," the management declares.

In Montreal, RCA Victor Company Limited, with their long musical history, naturally use music at work to aid their production of wartime radio communications equipment. RCA Victor have a full-time director of plant broadcasting, giving newscasts and factory news in

French and English, as well as playing the music programmes planned by RCA Victor's psychologist, Dan Halpin, for Victor's industrial music library. RCA Victor have loud speakers installed at crisscross intervals throughout the plant, for better reception free from echoes, and also a volume control is available at Victor for each individual speaker.

At the John Inglis Company Limited, Toronto, largest small arms plant in the British Empire, from 12,000 to 15,000 workers work to music every day, mostly on machine guns. About 90 loud speakers service the Colt plant and music is on the point of being installed in the machine shop, where engines and boilers for the 10,000-ton cargo vessels are taking shape. The noise level is high, but the music is selected to be heard over the scream of the lathes and the chatter of the machines without effort and without seeming to contribute to the din. Inglis had the advantage of having a sound system already installed for paging purposes, before the music was added. This, however, had to be perfected by adding many dozens of new speakers at strategic intervals that the music might be heard at the proper volume level over each machine. Now, paging may

be done audibly without interrupting the music.

Music is still in the experimental stage at Inglis, but has been used daily since October, and in planned programme form on all shifts throughout the Colt plant since the middle of February. The belief of the management is that the music has added to the safety of the workers, especially on the night shifts, and that it cuts down gossip and arguments at work and gives the workers something besides lunch to look forward to—a particularly valuable feature to workers on inspection and tedious tasks.

Helps Reduce Absenteeism

Canadian General Electric, where music has been used the longest, have an absentee rate of only 3 per cent.

The John Inglis Company report that the absentee rate has decreased slightly in the last six months, since music was first introduced experimentally.

Small Electric Motors, in Toronto, have a relatively low rate of absenteeism, too.

And in Montreal, RCA Victor Company, Limited, are proud of their rate of absenteeism which remains below average for a plant of its size.

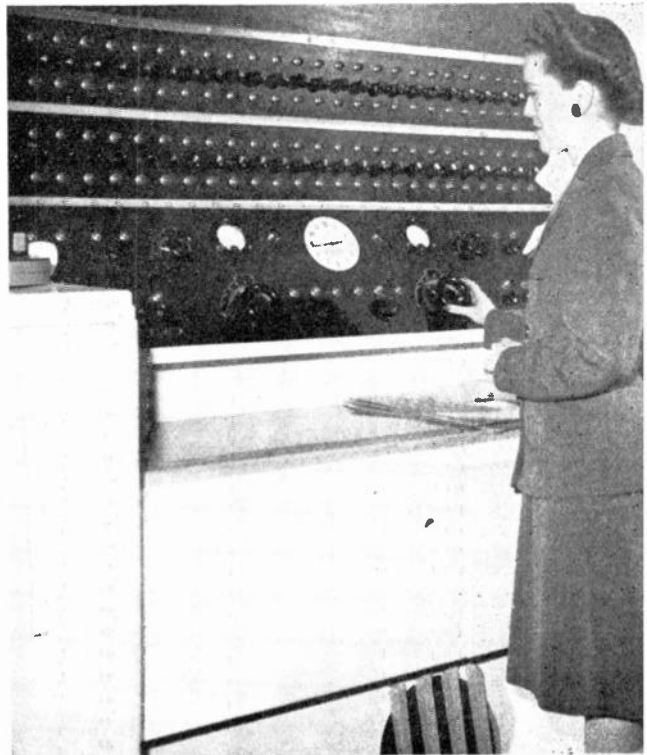
*Illustration
Courtesy
"Industrial
Canada."*



Shop talk, new style, is going on now in the plant of RCA Victor Company Limited, where, instead of gossip the workers on wartime radio communications instruments get to hear the real news concerning those around them—who's promoted, who's a papa, who has a birthday! They also hear newscasts from the war fronts, in English and French. And, of course, recorded music at planned intervals.



Illustrating "Muzak Music" studios of Associated Broadcasting Co. Ltd., Montreal (left) and Toronto (right).



Prof. Harold Burris-Meyer of Stevens Institute of Technology, Hoboken, N.J., reports that music cuts late-rates down from 33 per cent to less than 3. One production manager I talked to, who has twelve hundred workers working daily to music, said: "It has saved us thousands and thousands of hours! You've no idea how much time it saves! We don't think the music does speed up production, but it makes so much difference in the absentees and lates!"

Four plants of Defence Industries, Limited, Montreal; Dominion Industries; Robert Mitchell; Fairchild Aircraft; and Belding-Corticelli, are other Montreal factories wired for music and working to rhythm.

In Montreal about 45 war industries use music, and most of these use it on day shifts as well as night. Most of this music is what is known as "piped" from the Associated Broadcasting studio who specialize in giving music to industry. Every half-hour, selections are played and each of the firms on the wire receive exactly the same music.

MUSIC WHILE YOU WORK

Robert Dufault Reg'd., Montreal, sound engineer for Associated Broadcasting Company Ltd., Canadian distributors of Muzak Music. They have built transmitting equipment used in Montreal to relay programmes to war industries,

using music to boost employee morale. Consists of two large broadcast type 16" turntables, of two special Weston Electric pick ups, 2 pre-amplifiers and 2 "Master" Northern Electric amplifiers. Panel with a switching arrangement to feed different programmes to war industries at the same time. Two D.B. meters are installed to check or verify the level going into the telephone lines. A large number of telephone lines are connected to said board to feed 60 users of Muzak programmes.

Installation in war plants are equipped to provide music to one or several shops and in addition, the system may be used to sound a siren, deliver an important address or make announcements. They are also used to announce starting work, lunch, rest periods and stopping time. Robert Dufault Reg'd., have the facilities for building any type of sound equipment for all purposes either in industry, institutions, public address, colleges, schools, churches, or for Provincial, municipal and federal police.

BUTLER ENGINEERS "ASSOCIATED" SYSTEMS

ONE of the pioneer Canadian companies to use Sound equipment in their factories is the Canadian General Electric Company who in 1927 installed a

system in their Toronto plants consisting of several of their latest radio receivers with a series of loud speakers in various locations where employees could hear music or other programmes over the air.

This equipment was serviced by the R. A. Butler Sound and Service Company, Toronto who in 1936 replaced the older system with a more modern one consisting of six 50 watt amplifiers and two microphones, one at each switchboard. A C.G.E. receiver and an automatic record player provides the music but by pressing a foot control switch the music can be cut off and announcements made or executives paged over the system. Once a week the system is also used for fire drill by the employees. The Radio Valve Company, in the same building, are so connected they can use the same equipment either independently or as part of the C.G.E. System.

Mr. Butler is chief engineer for Ontario for the Associated Broadcasting Company, Toronto and Montreal and has designed and installed all of the "Associated" equipment in Ontario including the head office system illustrated on this page which will take care of 9999 lines for each single amplifier used. Through a special highly complicated network, additional 9999 lines can be added for each extra amplifier.

BUSINESS PLANNING IS NECESSARY

ROGERS-MAJESTIC APPOINTMENTS

ANY survey of radio men today will show that none are happy, very few are taking any positive corrective action, most are using temporary tricks and expedients to keep going on a day to day basis, just to delay the day of reckoning.

While it is true that we, as individuals, can no longer precisely control our destinies, it is also true that we can influence them to a large degree, if we plan, and act.

Radio men have been notorious for their lack of planning, for their blind drifting in the swift currents of new business riding the flood tide of popular acceptance.

Never was it more true than it is today, that you must "run your business, or your business will run you."

Your plans must consider four vitally important factors.

1. The fast changing living, working and buying habits of a determined people.

2. The vast, and fast increasing number of our loved ones on the fighting fronts of the world.

3. The inevitable effects of the war, and of governmental wartime restrictions, on business, through control of industrial production and a wartime economy.

4. The reaction which will follow the cessation of war.

Thousands of small businesses will close their doors. Tens of thousands will not. Whether yours is the former, or the latter, will depend upon your vision, your planning, your action.

In all your calculations, bear in mind:

1. More and more young men are going to war.

2. More and more women are going to work.

3. Fewer people can seek rest and pleasure in travel.

4. More must find entertainment near, or in, their homes.

5. Shopping will be less frequent, more concentrated.

6. Taxes, direct and indirect, will be an increasing factor in the buying habits and buying power, of most people.

7. A tremendous "luxury demand" is being built up, for future release, but current attention is focused on necessities, food, clothing, home.

If you have what the public want, when and where they want it, at a price they can afford to pay, they will buy. That's business—your business and every business.

U.S. TELEVISION STATIONS

Twelve commercial television stations are operating or have pending commercial applications in the United States. Included in these are National Broadcasting Co. and Columbia (both at New York), Philco (Philadelphia), General Electric (Schenectady), Zenith (Chicago), and Allan B. Dumont Laboratories (New York).

Thirty-two experimental television stations are also operating, National Broadcasting and Columbia are operating two each, Philco five, RCA Victor two, General Electric two, Crosley and Zenith one each, and Allan B. Dumont Laboratories four.

DRY CELL BATTERIES

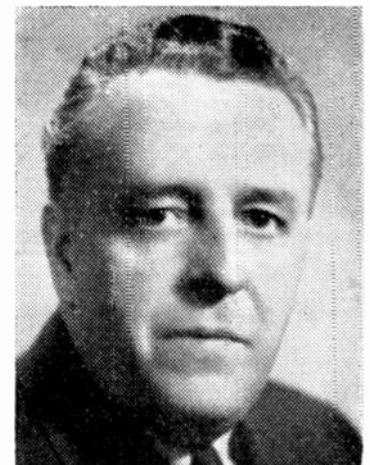
Effective April 3, 1943, order A-678 of the Wartime Prices and Trade Board establishes a schedule governing the manufacture of Dry Cell Batteries including Radio A and B batteries, radio A-B packs, and radio C batteries.



H. L. P. MACKECHNIE
President and General Manager.



S. G. WATERS
Eastern Sales Manager.



W. T. BURNHAM
Western Sales Manager.

RADIO ADVERTISING LEADS NEWSPAPERS AND MAGAZINES

Some interesting figures show the relative national revenues of the "Big Three" advertising media in the States, newspapers, magazines and radio, over the past fifteen years.

Figures and percentages are shown for the "normal" year 1927, the "depression" year, 1933, and the latest year 1942.

Year	Total Revenue	Newspapers	Magazines	Radio
1927	\$412,000,000	54.6%	44.2%	1.2%
1933	299,000,000	48.6%	32.2%	19.2%
1942	551,000,000	25.9%	31.3%	42.8%

WE SALUTE CANADIAN RADIO ENGINEERS

A GREAT deal has been said about the great part that Canada is playing in the war, but very little has been said about the men behind the scenes who are responsible for the magnitude of the effort. Nowhere is this so true as in the field of technical equipment—particularly electronic equipment. The secrecy surrounding this activity has been extended to include even the scientists and engineers who have brought these devices to such a high degree of efficiency.

Now that the existence of Radar and allied devices have been publicly acknowledged, it is time that some of the men responsible for the development and production of these marvels be given a little credit. It will come as a shock to many that, in the main, these men have a thankless task. It is a life of struggle to achieve a certain excellence of performance that involves innumerable experiments and tests. This goes on day after day. Many of the experiments lead nowhere—but yet even this negative knowledge is valuable and must be recorded and considered. Some experiments add but a fraction of a

per cent to the performance—but all these fractions added together may constitute a tremendous advance. Only a very few result in a soul-satisfying abundance of achievement—and these seldom happen twice to the same individual.

To perform this sort of work, we have to have a special kind of man—a man who can turn his entire concentration upon a problem and work through to a solution irrespective of the reward for his labour. He has to be able to undertake the drudgery of detail without rancour and yet be big enough to command a larger project without fear. That Canada has its full share of such men is evidenced by her contribution to the war activities of the United Nations.

It would be impossible to do honour here to all of those whose work establishes them as worthy contributors to the general effort. All we can do is follow the fortunes of those who have been connected with our industry for a long time. The story of their accomplishments, however, must wait until the war is over.

the Marconi Beam Wireless transmitting station at Drummondville, Que. When that work was completed he was transferred to the Canadian Marconi Company's factory in Montreal as a Development Engineer and at the beginning of the present year was appointed Engineer-in-charge of Development.

WALTER E. DAVISON

Joining Canadian General Electric Company in 1915, Mr. Davison organized the Radio Valve Company in 1921. In addition to being Managing Director of the Radio Valve Company, Mr. Davison is Manager of the Tube Division of Research Enterprises, Limited.

Mr. Davison has been active in the Radio Manufacturers Association for many years, having served as chairman of the Parts and Accessories Division. Many of the new radio tubes which have played such an important part in war communications have been developed under Mr. Davison's direction.

RALPH A. HACKBUSCH

When Research Enterprises Limited was organized as a Government owned industry in 1940 to undertake research and manufacture of radio, optical glass, and other war equipment, Ralph A. Hackbusch, Vice-president and General Manager for Stromberg-Carlson Company of Canada, Toronto, was placed in charge of the Radio Division as Vice-president in-charge-of-radio. With thousands of employees and with one of the largest engineering staff of any Canadian radio industry the position was one of great responsibility.

Mr. Hackbusch served on the engineering staff of the Canadian Westinghouse Company, was Associate Radio Engineer for Kolster Radio, and joined Stromberg-Carlson in 1930 as Radio Engineer-in-charge. A few years later he was elevated to the position of Chief Engineer, later to the position of Chief Engineer-and-factory-manager, and in 1939 was elected a director and named Vice-President and General Manager.

F. A. BARROW

Twenty-eight years service with Canadian Marconi Company. He was first engaged on installation of wireless equipment on ships and later at wireless stations in Labrador, along the East Coast and the Great Lakes. Mr. Barrow then spent two and a half years in the development of the trans-atlantic wireless station at Louisburg, N.S. In 1923, he was transferred to the Engineering Development Department in the Marconi factory in Montreal where he did development work on commercial apparatus; with the establishment of broadcasting he carried on development work on broadcast receivers. In 1940, he was placed in charge of Receiver development. At the beginning of this year, Mr. Barrow was placed in charge of the development and manufacture of quartz crystals and is now Manager of the Company's Technical Resources Division.

J. A. BECKINGHAM

Director of the Signals Production Branch Department of Munitions and Supplies, Ottawa, served as factory manager of Canadian Marconi Company, Montreal, from 1924 to 1942 when he was called to Ottawa where his leadership and planning ability have proved of great value to the war effort. In particular, his work toward planned production have had a widespread effect on the Communications industry.

L. T. BIRD

An air force pilot in the last war, Mr. Bird after demobilization attended London University where he earned his degree of Bachelor of Science in Electrical Engineering, in 1922. He then joined the Marconi Wireless Telegraph Company doing development work in connection with broadcasting stations. Mr. Bird worked on the installation of



F. A. BARROW



J. A. BECKINGHAM



L. T. BIRD.



E. A. LAPORT

In 1926 he was elected an Associate of the Institute of Radio Engineers in 1930, transferred to the Member Grade and in 1937 was elected a Fellow. Only two other Canadians hold this coveted honour. His recent nomination as Vice-President of the Institute is a further tribute to his tireless efforts to further the art of radio and telecommunications. He has served as Chairman of the Toronto Section and was a member of the Board of Directors (1938), Admissions and Public Relations (1940) of I.R.E.

For eight years he acted as Chairman and Director of the Engineering Division of the Radio Manufacturers Association of Canada, as well as serving on the Board of Directors for many years.

Ralph Hackbusch has been a guest member of the American R.M.A. General Standards Committee for many years. He has been a member of the Main Committee of the Canadian Engineering Standards Committee, the Joint Co-ordination Committee of E.E.I., N.E.M.A., R.M.A., and guest member A.S.A. Committee on Radio Electrical Co-ordination.

He is a registered Professional Engineer 1936 (Electrical) and a Fellow of the Radio Club of America.

Ralph Hackbusch has faithfully served the radio industry and Canada for many years and Canada's War Effort in the



I. M. LESLIE

tremendous task of organizing and bringing into production one of the most important units in the production of vital specialized electronic devices on the North American Continent. Feeling that his major usefulness to Research Enterprises Ltd., had been fulfilled and he recently resigned to resume his peacetime activities.

GORDON J. IRWIN

Chief Engineer of Philco Corporation of Canada Mr. Irwin has been with Philco in Canada for nearly twelve years. He has been chairman of the Engineering Committee of the Radio Manufacturers Association for the past two years and is a member of the Institute of Radio Engineers and the Registered Professional Engineers.

During the war Mr. Irwin has also served as consulting engineer for Radio Production Alliance, a group of Manufacturers including Addison Industries, Toronto; Dominion Electrohome Industries, Kitchener; Philco Corporation, Toronto; Stewart-Warner-Alemite, Belleville; Sparton of Canada, London; and Stromberg-Carlson, Toronto; who have jointly undertaken important contracts for vital war equipment.



R. LETTO

EDMUND A. LAPORT

Edmund A. Laport was a commercial radio operator at KDKF, New York City, in 1921, and a receiver service engineer for the Westinghouse Electric & Manufacturing Company in 1922. In 1923, he was a laboratory assistant in the Radio Engineering Department of the General Electric Company, working on transmitter development.

From 1924 to 1932 Mr. Laport was a transmitter engineer with Westinghouse and installed three high frequency communication stations for the Chinese Ministry of Communications, Peking, China, in 1928, and two 50-kilowatt broadcast stations at Rome and Milan, Italy, 1929-1930 and 1932. He also installed several broadcast stations from 1 to 50-kilowatts in the United States and Canada. During 1933 and 1934 he was a consulting engineer. From 1934 to 1936 he was employed as a transmission engineer for Wired Radio, Inc., working on variable and suppressed-carrier, asymmetric-side-band transmission development.

Since 1936 he has been a section engineer, working in high-power transmitters with the RCA Manufacturing Company at Camden, New Jersey. Mr. Laport was transferred to Montreal in December, 1938, as Manager of the Engineering & Development Engineering Products Division of the RCA Victor Company Limited.



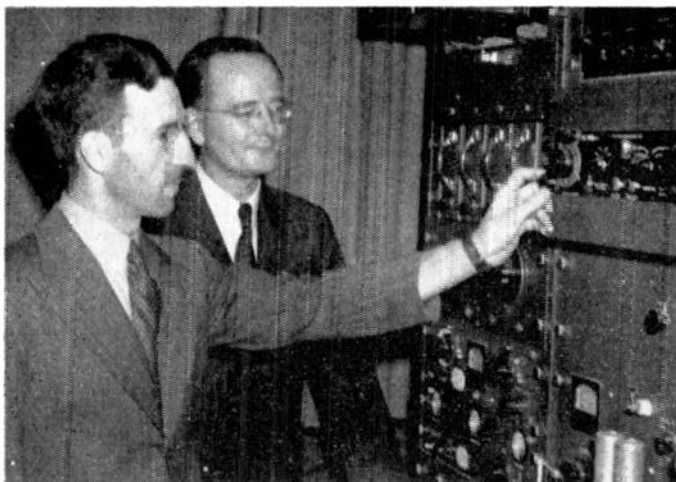
WALTER E. DAVISON



RALPH A. HACKBUSCH



GORDON J. IRWIN



J. C. R.
Punchard
and
R. F.
Lambton



R. LETTS

Thirty-three years service with Canadian Marconi Company. He was a radio amateur from 1903 to 1910 when he joined the Marconi as a radio telegraphist. In 1914, he was appointed Assistant Superintendent of the Company's Newfoundland Division and four years later became Superintendent of the Maritime Division, until 1920. For the next twenty years he was Development Engineer, when he became Engineer-in-charge of Transmitter Development and held that position from 1939 to the beginning of this year, when he became Manager of Engineering Services.

HENRY McCARDLE

Recently appointed Assistant to the Director of the Signals Production Branch, Department of Munitions and Supplies, Ottawa, Mr. McCardle spent more than two years in charge of the Radio Inspection and Test Department of Research Enterprises, Limited.

Locating in Toronto in 1925 he conducted a laboratory for experimental purposes and specialized on service work. In 1925 he became technical editor of Radio and Electrical Sales and still continues to contribute to Canadian Radio Data Book.

In 1930 with R. A. Hackbusch as chairman, he established the Radio Service Examining Board, holding technical classes with the object of establishing a standard of efficiency for radio servicemen and providing certificates to qualified students.

F. S. MacKAY

F. S. MacKay, Radio Engineer, Canadian Westinghouse Company, on loan to Research Enterprises, is a graduate in Electrical Engineering of Dalhousie University. He has also done post graduate work at McGill University.

Mr. MacKay joined Westinghouse in 1934 and after having worked in the Radio Department for six years was promoted to the position of Supervising Engineer in the Radio Department.

Mr. MacKay is well known in radio engineering circles, both in Canada and the United States. He has several developments in the radio field to his

Mr. Laport has been a member of the Institute of Radio Engineers since 1927. He is also the author of many technical papers in the radio engineering field, and has ten patents on radio circuits and devices.

LAMBTON AND PUNCHARD

R. F. Lambton (right) and J. C. R. Punchard (left) two of the engineers of Special Products Division of Northern Electric in Montreal who have much to do with the design and development of communication equipment for the Armed Forces of Canada and the Allied Nations are here seen together observing the operations of a corptal guiding equipment.

Mr. Lambton has been associated with the Radio Broadcast field since 1931, and with Northern Electric since 1935. Since the outbreak of the War he has specialized in Tank Communication Equipment and Airborne Radio Receiver Equipment. Went Overseas in 1940 to assist in the accumulation of information for the Canadian Manufacture of Radio Equipment for the Armies of the United Nations, and overcame innumerable problems to see an important, large-scale job through an exacting, mass-production schedule. Member of the Institute of Radio Engineers.

J. C. R. Punchard was well known in

the early days of amateur radio as the operator of VE3CJ in Toronto and VE2KK Montreal. Spent the summers of his University years with the Ontario Forestry Branch, operating and maintaining radio communication equipment. Joined the Northern Electric Company in 1935 and assisted in engineering the first two 50 kilowatt broadcast transmitters installed in Canada. Is now Radio Transmitter Development Engineer in the Special Products Division of the Company, specializing in Airborne Radio Transmitter Equipment and High Power Ground Station Equipment. He is Secretary of the Montreal Branch of the Institute of Radio Engineers.

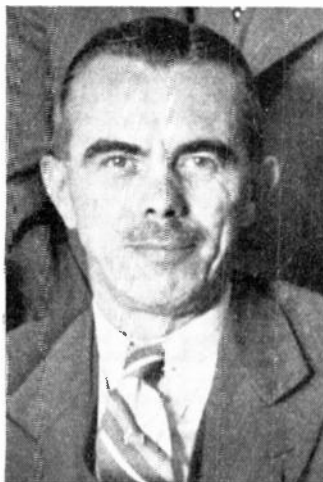
I. M. LESLIE

Director of Communications for Addison Industries Limited, Mr. Leslie has had a long and practical experience in the design and production of radio equipment.

Mr. Leslie was production engineer for Fada Radio from 1925-1934 and chief engineer for Mohawk Radio from 1934 to 1940. His present work covers the design and engineering of Government Communication Equipment, practically all his engineering capacity with Addison Industries being on the No. 58 Wireless Set.



F. S. MACKAY



HENRY McCARDLE



ALLAN B. OXLEY

credit. His work with Research Enterprises has given him scope for his talent, and the thoroughness with which he tackles engineering problems augurs well for the immediate projects in which he is at present engaged.

H. W. PARKER

After graduating from the New York City College in 1919, Mr. Parker joined the research laboratory of the General Electric Company at Schenectady, N.Y. in 1923 and after six years there



H. W. PARKER

came to Canada in 1929 to join Roger Radio Tubes, Ltd., with whom he is now Chief Engineer and vice president.

Instrumental in perfection of Ragers Radio Tubes and research Mr. Parker is now devoting his entire effort to war type tubes. He has been nicknamed the "Radio Tube Bug" of the Radio Tube Industry.

ALLAN B. OXLEY

The Chief Engineer of R.C.A. is Allan B. Oxley, 41 years of age, and has had over 25 years of professional service in scientific industry and research.

From 1918 to 1922 he served as apprentice to William Haines, and Mechanician to Sir Oliver Lodge, Cheltenham College, Cheltenham, England, engaged in scientific and mechanical instrument making, radio coherers, and motion picture apparatus. From 1922 to 1924 he was Master Instrument maker with the Consolidated Optical Company, Toronto, making surveyors transits, theodolites, microscopes, compasses, polariscopes and research optical instruments.

From 1924 to 1926 he was instrument maker to the Department of Physiology, University of Toronto, and afterwards appointed as assistant to Sir Fredrick Banting and Dr. Best under Prof. McLeod, making special research apparatus, research in timing devices. During 1926 he was instrument maker to Prof. McLennan in the Department of Physics. At this time he was chemical balance maker and calibrator for the entire university, specializing in spectroscopic analysis, and took Post Graduate studies under Prof. McLennan on



F. H. R. POUNSETT

F. H. R. POUNSETT

For the past three years, on loan from Stewart-Warner-Alemite Corporation of Canada, Ltd., has been chief engineer in the radio division of Research Enterprises, Limited. Graduating from Toronto University in 1928 with the degree of B.A.Sc. Mr. Pounsett spent six years on the engineering staff of Deforest-Crosley and from 1934 to 1940 he was radio engineer for Stewart-Warner. He is a member of the I. R. E. the Association of Professional Engineers and has served on the Engineering Committee of the Radio Manufacturers Association.

atomic orbits and quantum theory.

From 1926 to 1927 he was in business under the firm name of Oxley & Meredith Co. Ltd., Toronto, manufacturing special apparatus, developing inventions, precise radio measuring equipment (mostly for Government contracts), and a full line of radio receiver kits of all circuits bearing the trade name of "Oxmer".

From 1927 to 1929 he was Manager and Engineer for the Canadian branch of King Radio Corp. From 1929 to 1931 he was Chief Engineer for Williams Piano Company, Oshawa, successors to King Radio Corp'n.

In 1931 he was appointed Chief Engineer for Philco Radio and Television Corporation at their Canadian Factory. In 1933 he was appointed Chief Engineer for the Philco Radio at London, England. Here he designed a new factory for chassis parts and radio tube manufacture; organized large research laboratories and design facilities; was in sole charge of engineering and production. After the new factory was operating he returned to Philadelphia for research work.

In 1933 he was appointed quality control engineer for the RCA Victor Co. Ltd., and later joined its engineering staff to generally assist and design in the preparation of the product for facilitating high speed production. Here he set up a complete system of statistics and graphs to show quality of chassis and tube performance. He designed and built "dead sound room" for acoustical measurements and was engaged in addition in speaker and acoustical design. In October 1940 Mr. Oxley was appointed Chief Engineer, in which position he is presently engaged.

Since the war started, the Receiver Engineering Department under his guidance has concentrated 100% on problems of research and design in connection with the engineering of Government requirements for special equipment for planes, tanks, and battle-

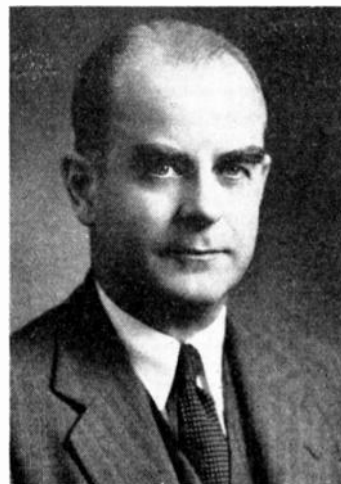
ships, including some of the highly secret devices which have contributed so greatly to Canada's war effort.

Mr. Oxley's Engineering Section at RCA Victor alone employs over 100 highly trained Engineers, Designers, Draughtsmen, Model Makers, Laboratory technicians, and other personnel.

L. M. PRICE

With Radio Valve Company as engineer since 1924, Mr. Price is now chief engineer of Radio Valve Company and chief engineer of the Tube Division of Research Enterprises, Limited.

Mr. Price is a member of the Institute of Radio Engineers and a former chairman of the Toronto section. He is at present chairman of the Special Tube Committee of the Canadian Tube Manu-



L. M. PRICE

facturers and a member of the Inter-service Technical Valve Committee, working with the various branches of the Canadian Armed Forces.

PERMITS NECESSARY FOR NEW BUSINESSES

Effective June 14, 1943, Wartime Prices and Trade Board order No. 284 requires a permit from anyone establishing or taking over a business, adding new classes of merchandise or service to an existing business, extending premises or moving to another locality, combining two or more businesses into one. The purpose of the order is to maintain stability of existing business. Order No. 184, dated Sept. 8, 1942, covering the same subject, has been revoked.

RADAR'S PEACETIME USES

The billions of dollars expended upon radar for war are bound to have tremendous influence on future designs of all ultra-shortwave transmitters, tubes, antennas and cathode-ray television technique. But radar itself may have direct post-war uses such as:

- Safeguarding Ships* in fog, against collisions, icebergs;
- Protecting Planes* against mountain-top crashes;
- Measuring Flying Height* above ground;
- Detecting Planes* approaching in fog;
- Patrolling Harbors* against smugglers;
- Surveying* through underbrush and obstacles;
- Measuring Height* of ionosphere layers;
- Measuring Distance* of nearby astronomical objects.

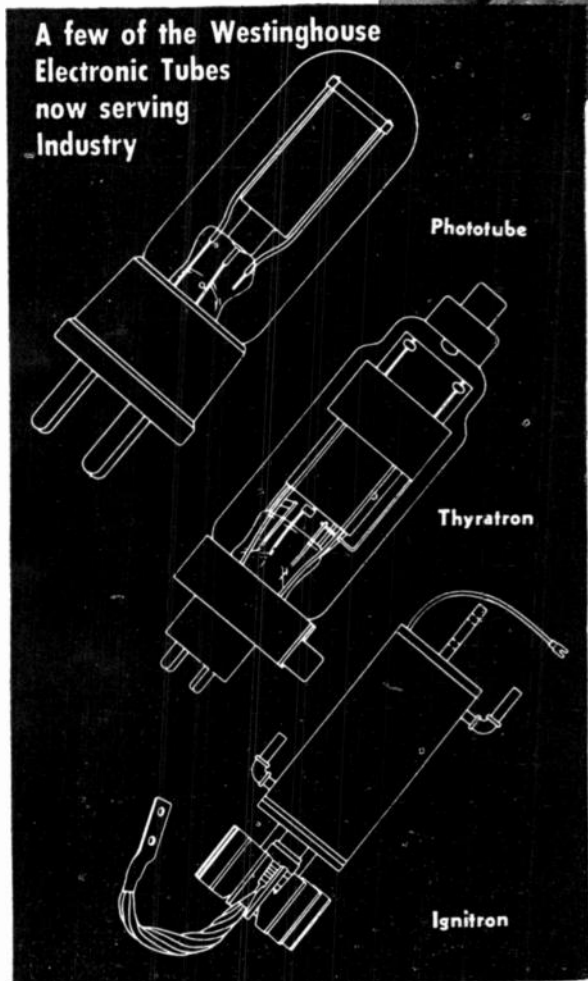
Essentially
ELECTRONICS
is the
VACUUM TUBE



... the same type
of Vacuum Tube as

Westinghouse
GENUINE RADIOTRONS

STANDARD OF THE INDUSTRY



Fundamentally a vacuum tube is a device for putting electrons to work. Today Westinghouse Electronic tubes are hard at work in industry doing such jobs as detecting vibrations in rotors, heat treating and welding and dust precipitation. You'll also find them widely used by the armed forces, enabling men to "see" in darkness, land planes at "ceiling zero", keeping ships safe in fog-bound harbours, detecting enemy planes at great distances and many other uses.

Westinghouse Electronic tubes are going to play a big part in your post-war life and business. You can depend on Westinghouse leadership to pioneer the new peacetime uses of electronic tubes.

Westinghouse

CANADIAN WESTINGHOUSE COMPANY LIMITED, HAMILTON, ONTARIO
SALES ENGINEERING OFFICES -- *VANCOUVER, TRAIL, *CALGARY, EDMONTON, *REGINA, SASKATOON,
*WINNIPEG, FORT WILLIAM, *TORONTO, *SWASTIKA, LONDON, *MONTREAL, OTTAWA, QUEBEC, HALIFAX
SERVICE AND REPAIR SHOPS AT POINTS MARKED*

CIRCUIT CALCULATOR FOR SERVICEMEN

Circuit	Z	$1/Z$	$|Z|$	ϕ
	R	$1/R$	R	0
	$R + j\omega L$	$\frac{R - j\omega L}{R^2 + \omega^2 L^2}$	$\sqrt{R^2 + \omega^2 L^2}$	$\arctan \frac{\omega L}{R}$
	$R - j/\omega C$	$j\omega C$	$1/\omega C$	$-\pi/2$
	$R + j[\omega L - (1/\omega C)]$	$\frac{R - j[\omega L - (1/\omega C)]}{R^2 + [\omega L - (1/\omega C)]^2}$	$\sqrt{R^2 + [\omega L - (1/\omega C)]^2}$	$\arctan \frac{\omega L - (1/\omega C)}{R}$
	$R - (j/\omega C)$	$\frac{R + (j/\omega C)}{R^2 + (1/\omega^2 C^2)}$	$\frac{1}{\omega C} \sqrt{1 + \omega^2 C^2 R^2}$	$-\arctan (1/\omega CR)$
	$\frac{R(1 - j\omega CR)}{1 + \omega^2 C^2 R^2}$	$(1/R) + j\omega C$	$\frac{R}{\sqrt{1 + \omega^2 C^2 R^2}}$	$-\arctan \omega CR$
	$R_2 \frac{[R(R+R_2) + \omega^2 L^2] + j\omega LR_2}{(R+R_2)^2 + \omega^2 L^2}$	$\frac{[R(R+R_2) + \omega^2 L^2] - j\omega LR_2}{R_2(R^2 + \omega^2 L^2)}$	$R_2 \frac{\sqrt{R^2 + \omega^2 L^2}}{\sqrt{(R+R_2)^2 + \omega^2 L^2}}$	$\arctan \frac{\omega L R_2}{R(R+R_2) + \omega^2 L^2}$
	$\frac{R + j\omega L(1 - \omega^2 CL) - CR^2}{(1 - \omega^2 CL)^2 + \omega^2 C^2 R^2}$	$\frac{R - j\omega L(1 - \omega^2 CL) - CR^2}{R^2 + \omega^2 L^2}$	$\frac{\sqrt{R^2 + \omega^2 L^2}}{\sqrt{(1 - \omega^2 CL)^2 + \omega^2 C^2 R^2}}$	$\frac{L(1 - \omega^2 CL) - CR^2}{R}$

These convenient formulas for common circuit combinations will save time in figuring part values for set conversions, etc. The first column is a group of typical part combinations. Note that the inductance L also includes a series resistance R. In the second column the formula for Z , the complex impedance, is given for each circuit. The third column is $1/Z$ or the complex admittance. The fourth column $|Z|$ is the formula for the numerical value of the impedance. The last column gives the phase angle of the current with respect to the voltage. Arctan is to be interpreted as "the angle whose tangent is." The symbol w is $2\pi f$.

Courtesy RADIO Retailing TODAY.

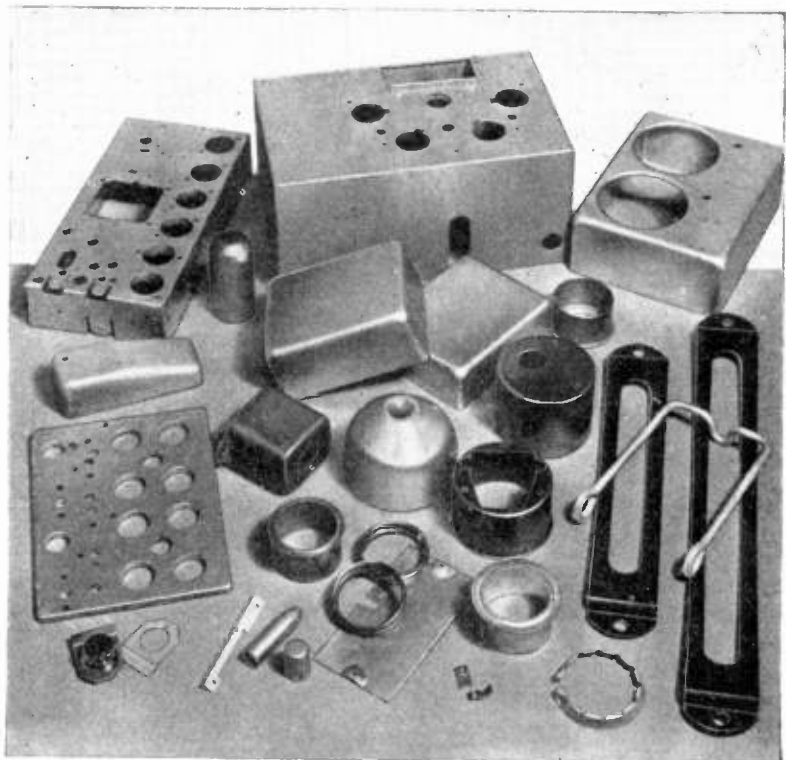
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33 Jobbers —

ready to serve your wartime requirements

J. Lorne MacLaren, Limited,
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Western Agencies Limited,
VANCOUVER, B.C.
Radio Sales Service Limited,
VANCOUVER, B.C.

H. R. Carson Limited,
LETHBRIDGE, Alta.

Radio Supply Co. Ltd.,
EDMONTON, Alta.

Taylor & Pearson Limited,
EDMONTON, Alta.

Taylor, Pearson & Carson
Limited,
CALGARY, Alta.

Jas. Smalley Jr.,
CALGARY, Alta.

Radio Supply & Service Co.,
REGINA, Sask.

Electrical Supplies Limited,
WINNIPEG, MAN.

Sparling Sales Limited,
WINNIPEG, MAN.

Alpha Aracon Radio Co.
Limited,
TORONTO, Ont.

Canadian Tire Corporation
Limited,
TORONTO, Ont.

Canadian Electrical Supply
Co. Limited,
TORONTO, Ont.

Radio Trade Supply Co.
Limited,
TORONTO, Ont.

Toronto Radio & Sports
Limited,
TORONTO, Ont.

Wholesale Radio Co.
Limited,
TORONTO, Ont.

Canadian Radio Products,
GUELPH, Ont.

The Crawford Radio,
HAMILTON, Ont.

East Hamilton Radio
Exchange,
HAMILTON, Ont.

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Hunter & Son Limited,
ST. CATHARINES, Ont.

Keyes Supply Co. Limited,
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Canadian Electrical Supply
Co. Limited,
MONTREAL, Que.

Payette & Co., Limited,
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New Brunswick Radio Co.,
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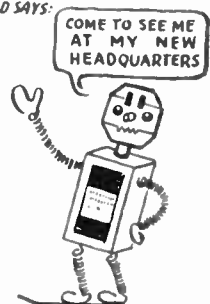
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HAMILTON, ONTARIO

HI-FARAD SAYS:



BOOKS FOR SERVICEMEN

A TREND noted by radio parts distributors is the increasing demand for technical radio books which stress servicing methods, radio circuit diagrams and set case histories.

That such demands should be natural at this time is probably due to a number of factors, among which is the serious scarcity of experienced radio servicemen. This in turn forces dealers to hire green help who in turn need such books. In many cases dealers themselves, trying to service sets, seek help in how-to-do-it books. Radio vocational school graduates full of theory but lacking practical servicing background are also buying servicing books. In some cases the Jobber himself, who has added a servicing department, becomes his own good book customer. All these add up to the same thing, however—a search for quick servicing information and a substitute for practical working knowledge, by newcomers into radio servicing.

It is fortunate indeed, that the radio industry has a number of excellent sources for radio books and technical literature which are of direct interest to the radio servicing neophyte.

In this connection, there are comprehensive books which provide the following types of servicing information: 1) Collection of circuit diagrams of radio receivers by manufacture, including complete data on alignment, IF peak frequencies, operating voltages and parts lists; 2) A book which contains a collection of radio trouble-shooting case histories most frequently experienced by servicemen and takes up the trouble, points out the cause and recommends its proper correction, all in a simple, direct manner that saves many hours of labor for newcomers to radio servicing and, 3) A general book on modern radio servicing technique.

Books Specialize On Servicing

Although these provide quick help in many cases, the basic approach to correct servicing, however, must be obtained through a thorough knowledge of radio and electrical fundamentals. Only in this way may circuit characteristics and peculiarities impress themselves on the radio serviceman. Salesmen have found newcomers who think all volume control circuits are the same, who regard polarity of electrolytic condensers as something not to be taken too seriously and who are quick to replace a defective rectifier tube without first trying to determine if a defective filter section caused the tube to "go".

Such a lack of knowledge on the part of his service customers often reacts to the detriment of the Jobber. For example, this may lead to an excessive number of returned "defective" parts for replacement. Obviously, with tubes so scarce, every jobber who might be inclined to be liberal in his replacement policy, would be unable to continue such a policy at this time. Thus it is better to cure the trouble at its source.

Aside from this, however, the serviceman who builds his fund of radio technical knowledge, eventually takes a greater interest in his work and becomes a better serviceman.

Among such important books is one

devoted to the superhet circuit. Not to be overlooked is the fact that of the more than 60 million radio sets in use in the United States and Canada today, practically 85 to 90 per cent of them use the superhet circuit. Obviously, a bedrock knowledge of the circuit is vital; also how its fundamental parts operate, such as the RF amplifier, the oscillator, the mixer, the IF stages and the second detector. All these must be known if the serviceman is to recognize trouble when he faces it in the superheterodyne circuit.

Not only is a knowledge of circuits important, but also an understanding of the use of meters and servicing instruments is necessary. For today, with test equipment at a premium, every possible use to which limited equipment may be put must be sought out. Here, again, many servicemen are unaware of the fullest possibilities offered by basic meters and equipment—subjects covered by other books available to the radio dealers and servicemen.

Radio Troubleshooter's Handbook

The tremendous popularity of the Ghirardi Radio Troubleshooter's Handbook has made it necessary to bring out a revised and enlarged 744-page edition. It is a veritable mine of profitable information helpful in all phases of radio service work and designed to enable both new and experienced technicians to troubleshoot and repair all types of radio receivers faster and for greater profit under present "wartime" emergency servicing conditions.

Featured among its 744 manual-sized (8½"x11") pages now are 404 pages of trouble "Case Histories" giving all the common troubles and their remedies for over 4,820 receiver and automatic record changer models—the largest authoritative "Case History" compilation ever published; a complete tabulation of I-F peaks and alignment data for partially every known superhet receiver; the most complete tube characteristics and basing data chart ever published anywhere—17 pages long and giving complete information on the characteristics, operating voltages, classification, interchangeability and socket connections of 1042 receiving tube types.

In addition to this helpful information there are 133 additional pages containing 52 more specially prepared reference graphs, charts, tables and other compilations presenting vitally needed information on a wide variety of important subjects such as receiving tube types recommended for substitution, special purpose tubes, tube testing, receiver modernization, i-f transformer troubles, servicing and replacement, ballast resistors, dial lamps, coil winding, grid bias resistors, condenser replacement, transformers, all RMA and manufacturer's colour codes for resistors, condensers, transformers, etc., parallel and series network calculations, logarithmic computations, decibels, volume and tone controls, filters, conversion factors, "time constants", reactance, electrical and radio servicing formulae, drills

screws and taps, trade directories of all manufacturers related in any way to the radio industry, and many others.

An important innovation in this new Handbook that both new and experienced service men will appreciate is the fact that every chart and data table is preceded by a clear, detailed explanation of its contents, together with instructions and actual examples for its use. This entirely eliminates material that is "dead" to the owner because he does not understand the data as it is arranged, or does not know how to apply it to his needs. All data is cross-indexed. The price is \$5 in the U.S.A. Copies may be obtained from your regular jobber or direct from Radio & Technical Publishing Co., 45 Astor Place, New York City.

Rider's Manuals

Rider's Manuals are used by radio maintenance men throughout the world. They make it easy to locate troubles in defective radio receivers for they contain complete and authoritative maintenance data on practically every make and model radio receiver manufactured. They are the only source where necessary information can be found in one place: complete data on alignment, I-F peaks, operating voltages, parts lists and values, voltage ratings of condensers, wattage ratings of resistors, coil resistance data, gain data and all other material essential for speedy and accurate trouble shooting.

There are thirteen volumes. Volumes I to V, abridged (2,000 pages, \$12.50) covers sets most widely distributed between 1929 and 1932. The other volumes each cover sets manufactured during periods of approximately one year. Volumes III, IV, V and VI are priced at \$8.25 each. Volumes VII to XIII, each containing over 1600 pages, are priced at \$11.00 each. Volume XIII covers sets manufactured as late as March 1942, the time when United States domestic radio set manufacturing was cut because of the war.

Altogether, the complete set of XIII Rider Manuals offers the radio maintenance man more than 18,000 pages of authentic servicing information. They are available from Radio Jobbers. Information available from the publisher, John F. Rider Publisher, Inc., 404 Fourth Ave., New York City.

Modern Radio Servicing

This book by Alfred A. Ghirardi, in its 1300 pages contains a complete course on the most up-to-date methods of radio servicing—the construction and operation of all kinds of latest radio test equipment; servicing and repair of all forms of receivers (auto-radio, all-wave, high fidelity, etc.); locating and eliminating noise and interference; special servicing problems; construction, operation and use of new Cathode Ray Oscillographs for aligning superhets, (the first textbook to have this); thorough explanation of AVC and QAVC circuits and their troubles; tested advertising and merchandising tips to help you get more service jobs and make more money out of them; etc.

It is written in clear, simple style illustrated with 706 diagrams, photographs, charts, etc. A typical Ghirardi book which is a worthy companion to his famous "Radio Physics Course." The price is \$4.00 from Radio and Technical Publishing Co., 45 Acton Place, New York, N.Y.

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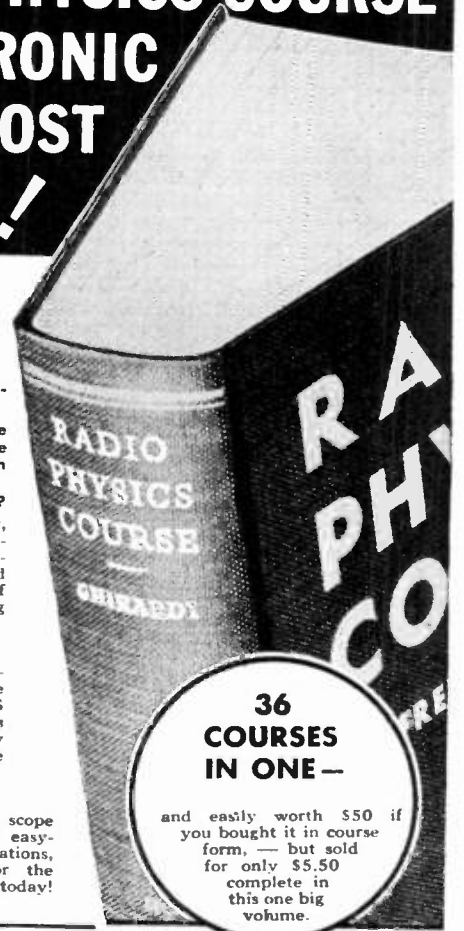
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Procedure to establish a radio industry technical planning organization, for post-war radio services and products, has been completed by committees of the Institute of Radio Engineers and the Radio Manufacturers Association of the U. S. with the RMA of Canada co-operating.

The R. T. P. B. will be a technical advisory body to formulate recommendations to the Federal Communications Commission and other Government, also industry, agencies on the technical future of radio developments, including spectrum utilization and systems standardization for many public services, such as television and frequency modulation. The R.T.P.B. will develop studies, investigations, recommendations, and standards as are required, submitting them to the F.C.C. and other agencies having final authority.

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The second revised edition of Radio Physics Course by Alfred A. Ghirardi gives a remarkably clear, complete and easily understood course in radio, sound, and electricity, a book that leading radio schools throughout the world have chosen as the most thorough, most instructive, and most interesting radio book ever written,—they use it as their basic text in their own radio courses. Explains in easy-to-understand language all of the essential facts about both electricity and radio from simple fundamentals to the most intricate applications.

The book has 972 pages, 508 illustrations, 856 self-review questions, and contains 36 valuable chapters on Sound, Electricity, Electrical Circuits, Alternating Currents, Batteries, Test Instruments, Condensers, Coils, Filters, Vacuum Tubes, Amplifiers, Loud Speakers, Battery Radios, Modern Superheterodyne Receivers, Auto Radio, Aircraft Radio, Phonograph Radio, Public Address System, Photo-electric Cells, Talks, Television, Short Wave Radio, etc., etc. Handy appendixes explain radio symbols, show wire tables, radio formulae, etc. The book is published by the Radio and Technical Publishing Co., 45 Arter Place, New York City, the price being \$4.00.

NEW RADIO HANDBOOK

ALLIED'S RADIO DATA HANDBOOK. Edited by Lieut. Nelson M. Cooke, United States Navy, U. S. Naval Research Laboratory, Washington, D.C. Published by ALLIED RADIO CORPORATION, Chicago. Forty-eight pages, six by nine inches. Price, 25c postpaid. This is a comprehensive, condensed handbook of formulas, charts and data most commonly used in the field of radio and electronics.

Formulas are given for Decibels, Resistance, Capacitance, Inductance, Reactance, Resonance, Frequency, "Q" Factor, Impedance, Conductance, Susceptance, Admittance, Transients, Peak Average and R.M.S. Voltage and Current Values, Meter Shunts and Multipliers, Vacuum Tube Constants, etc. The Data section contains such subjects as Radio Color Codes, Inter-changeable Tubes, Pilot Lamps, Plug-in Ballast Resistors, Coil Winding, and others.

INTER-SERVICE PREFERRED LIST OF VACUUM TUBES

A new list of preferred general-purpose tubes selected jointly by the Signal Corps and the Bureau of Ships was issued in the United States 1943. The purpose of this list is to effect an eventual reduction in the variety of tubes used in Service equipment. Unclassified tubes to be used in all future designs of new equipments for these branches of the Service must be chosen from this list, unless specific approval of other tubes is first obtained from the Service concerned.

A new Canadian Preferred list of Vacuum Tubes passed by the Canadian Inter-Service Technical Valve Committee, has also been issued dated June 2, 1943, for Canadian Service requirements and is separate from the commercial list contained in radio tube manufacturers catalogues.

The Canadian preferred list contains 45 types of receiving tubes and 21 types of transmitting tubes.

The preferred list is only of use to those making equipment for war services and copies of the list are obtainable by them from any of the tube manufacturers.

SUGGESTED TUBE SUBSTITUTIONS

In the 1942 edition of "Canadian Radio Data Book" a list of "Discontinued Tubes and their Substitutes" was published. It was pointed out that war conditions had made it necessary to reduce the number of tube types produced and our list showed about 300 types manufacture of which had been discontinued and indicated about 70 substitutions for the cancelled types.

Supplementing this the four Canadian tube manufacturers have issued booklets listing all types of tubes showing direct and possible substitutions with explanatory notes indicating suggestions for the use of the substitutes as shown on the page reproduced herewith from the Canadian General Electric booklet. In the Canadian Westinghouse booklet

an asterisk is also included to show tubes that are banned and in the Canadian Marconi publication an extra column is added indicating tubes that are not now available. Rogers Radio Tubes, Ltd., have also issued a similar book for their customers.

Dealers and servicemen who have not one of these booklets on file for reference should write the manufacturers of the lines they carry for a copy together with a table of tube characteristics.

As explained by the tube manufacturers "the list has been designed to give broad suggestions on alternate tube types. Its usefulness lies in substituting for tube types which have become difficult to get.

"Obviously, a list such as this could not be too specific, without taking into consideration characteristics of the set under repair. Before actually selecting a substitute tube, the characteristics of the original tube, and of the proposed substitute, should be studied, together with the circuit in which it is used."

SUTTON HORSLEY MAKING RADIO TEST EQUIPMENT

Sutton-Horsley Limited, who moved from Toronto to 30 Commercial street, Leaside, Ont., early in 1943 have been taken over by the Dominion Government and are now being operated as a Government war industry with R. J. Pinchin as president.

In addition to the airplane equipment formerly manufactured Sutton Horsley, Limited, are now making a wide line of radio test equipment including tube testers, ammeters, volt meters, etc.

With facilities for a very large production the company should, in peacetime, become one of the largest manufacturers of radio test equipment on the continent.

RADIO PARTS DIRECTORY

Give priority in your buying of radio parts and accessories to the Made in Canada items listed on pages 66 and 68 of this edition.

RECENT R.C.A. VICTOR APPOINTMENTS



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Vice-president, RCA Victor Co.*



*F. W. Redcliffe, Toronto
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Public Relations, RCA Victor Co.*

Canadian Radio Data Book, 1943



H. S. PUTNAM
Manager of Publicity and Supervisor of Personnel for Canadian Marconi Company, Montreal.

ELECTRICAL APPLIANCE DEALERS' CONVENTION

Electrical Appliance retailers will hold a Wartime Conference at the Royal York Hotel, Toronto, on October 25 and 26 in affiliation with the Retail Merchants Association. Officers of the New Electrical Appliance Dealers Association of Ontario include: President Fred R. Cavers, Cavers Brothers, St. Catharines. Directors: C. Hill, Chas. Ogilvy Ltd., Ottawa; T. Gibson, Danforth Radio Co., Toronto; R. G. McCormick, G. W. Robinson Co. Ltd., Hamilton; L. L. Hartman, Mills and Hadwin Ltd., Toronto; John Meagher, Meagher's Electrical Appliances, Oshawa; Wilf. Hodgins, Geo. A. Young & Co., London.

BATTERY MANUFACTURERS ORGANIZE

The Association of Canadian Storage Battery Manufacturers has been organized with the following officers:

President, J. E. Ells, Exide Batteries of Canada Ltd., Toronto; Secretary, J. S. Cohen, Monarch Battery Mfg. Co. Ltd., Kingston; Directors, W. W. Taylor, Prest-O-Lite Storage Battery Co. Ltd., Toronto; H. G. Mills, Willard Storage Battery Co. of Canada, Ltd., Toronto; C. H. Hargreaves, Hart Battery Co. Ltd., St. Johns Que., and R. Range, Globe-Lite Batteries, Ltd., Winnipeg Man.

ERIE RESISTOR MOVES

Eric Resistor of Canada, Ltd., formerly located in the Terminal Building, Toronto, have moved to 128 Peter Street, Toronto, to obtain larger Manufacturing space.

SNYDER AERIALS IN CANADA

A. Cross & Co. Ltd., 25 Elm Street, Toronto are now manufacturing Snyder Aerials in Canada. Present production is for war demands.

TO MANUFACTURE CONVERTORS

Electronic Laboratories, Inc., Indianapolis, Indiana, have established a Canadian branch known as Electronic Laboratories of Canada, Ltd., at 80 King Street West where they will manufacture convertors for war needs and later other electronic products for the radio industry.

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SERVICEMEN REPORT SHORTAGE IN TUBES AND PARTS

Working Together At London

H. Sugden, secretary London Radio Servicemen's Association, London, Ont., writes:

"Canadian Radio Data Book suggested service charges conform very closely to our basic charges adopted by the Association.

"The parts situation is not very good at present, especially on tubes, but this appears to be general all over the country. The boys here have all been exceptionally busy this summer and we put this down to the fact that there are less people going away for long vacations.

"The association has had a large drop in membership, but the ones that are left all work together. Enclosed is a complete list of Radio Servicemen in London and District."

Reports Data Book Helpful

Robert Lawson, Secretary Radio Technicians Association, Wallaceburg, Ont. writes:

"With regard to the servicing situation we find conditions here reasonably satisfactory, and are getting most parts with little trouble. The tube situation is, however, becoming quite acute, and tubes for AC-DC midget radios are practically off the market. We are, nevertheless, managing to keep most radios in an operating condition by changing the circuits where possible, to use what tubes may be available.

"I am also including a list of dealers and servicemen in this section. We will be looking forward to receiving the 1943 edition of the Canadian Radio Data Book, which all servicemen in this district find most interesting and helpful."

Why Tubes Have Been Short

Contacted by *Canadian Radio Data Book* tube manufacturers state that many types of tubes have been short during the past season because of the uncertain and fluctuating requirements from government sources.

This situation is being cleared up, however, and it is assured that production for civilian use will be more regular during the coming fall and winter. —Editor.

St. Thomas Servicemen Charge for Testing Tubes

The St. Thomas Servicemen's Association have adopted a plan whereby one group pick up and deliver in the mornings while another group do the same in the afternoons no radio being picked up and delivered the same day.

They make a charge of 5 cents for testing tubes, and save all dud glass tubes for salvage. They have agreed not to exchange any parts, one serviceman turning over to another work if he happens to be out of stock, or cannot hold customer until he receives the same.

SUBSCRIBE NOW

Don't miss any copies of CANADIAN RADIO DATA BOOK. Only \$1.00 yearly. See order form on page 68.

Canadian Radio Data Book, 1943

WRITING to Canadian Radio Data Book, J. R. Baird, secretary Associated Radio Technicians of British Columbia, Vancouver B.C. says "Complying with your request we are enclosing a copy of our mailing list covering both the Vancouver and Victoria sections. Also a list of our executive for this year.

"This association has always maintained a list of prices to be charged for radio service work. In our case we call it a "Suggested Price List" and is only intended as a guide. In checking it with your "Suggested Service Charges" we think the two lists compare very well, although on the whole ours would seem to be a little higher. For your convenience we are sending a copy of our list. You will notice that we make allowance for a complete check-up regardless of parts required. We believe that this method makes it easier to compute estimates before doing any work.

Shortages in Parts

"The parts situation here is only fair, Transformers, speakers, high wattage resistors, controls and coils of all types are hard to get. The supply of special parts is very low. In many cases where the part cannot be repaired the serviceman must take what he can get and make the part over to fit the job. The tube situation is very bad, while the supply of certain types is very good it is impossible to buy most popular types. Here are a few of the ones which are not available—24, 27, 35, 41, 42, 45, 47, 1A7GT, 1C6, 1N5G, 1H5G, 1C5G, 1T4GT, 6K7, 6Q7, 6N7, 6F6, 6L6, 5W4, 6SQ7, 6SA7, 12SA7, 12A8GT, also several of the 25 volt and 117 volt types. Several of the special Rogers types are not to be had. We believe the manufacturers could keep us in supply on these popular types if they concentrated production on them instead of on some of the ones for which there is not much demand. This could be done without entailing more material or production hours. It is not a case of more tubes, but one of fewer of some and more of other types.

"There is, in all other industries a definite shortage of servicemen. All shops here are from one to two weeks behind in their work. Other than the inconvenience to customers this does not constitute a problem. Most servicemen are having to put in longer hours in order to keep ahead of their work.

"In view of the fact that officials look upon radio as a vital means of keeping the public informed on present problems we believe that the Government should put radio on a priority basis as was done in the United States. In this respect any representations that you can make to the proper authorities on behalf of the radio industry would be very much appreciated."

Shortages At Victoria, B.C.

G. M. Warnock, secretary ART of B.C. writes:

"Our method of computing Radio Service charges differs somewhat from your "Labour plus material" rate but would probably average about the same. We certainly try to be consistent with our customers and in most cases a quotation is made to the radio owner after a preliminary examination of his receiver. This seems to avoid arguments and promotes a better understanding. If no repair work results from a QUOTE then a \$1. minimum charge is made to cover the time involved.

"A good deal of common sense is required in these trying days because of the ancient vintage of many radios coming in for repair that ordinarily would have been scrapped by this time.

"Incidentally, we try to avoid the terms "TIME" or "LABOUR" in reference to Radio Service and instead refer to it as TECHNICAL SERVICES. This was agreed upon some years ago as part of our campaign to raise the status of the Radio Technician.

"In reference to the parts situation here; We are chiefly concerned with tube shortages, all 12 volt, 35 volt and some old types such as 27, 24A and 47 have us badly tied up.

"Power and output transformers, wire wound resistors, switches wire and small hardware parts are very scarce but it's remarkable what can be done with substitutes and some ingenuity."

A Valuable Publication

George V. Wade, secretary ART of Edmonton, Alberta, writes:

"We have used our past copies of Canadian Radio Data Book quite often and have found it to be valuable publication for radio shop owners and radio servicemen. Various Radio Servicemen's Association items, radio models data and standard radio service charge pages are referred to quite often.

Just lately The Associated Radio Technicians of Alberta have not held meetings due to many members being engaged in Military activities but the Association has been of considerable help to its members in the past especially in the stabilizing of service charges, assisting one another in technical data and service hints.

"We enclose a list of radio dealers and servicemen as requested and thank you for past copies of your valuable book."

Conditions Good At Sherbrooke

S. M. Cross, secretary Sherbrooke Radio Servicemen's Association, Sherbrooke, Que., writes:

"The local situation is very good at present, most parts outside of tubes seem available. Most of the above members are getting along with some help as before the war and are consequently working harder but making far more profit than previously."

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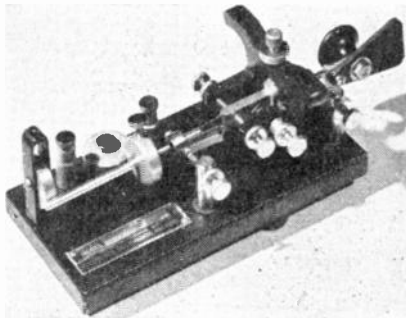
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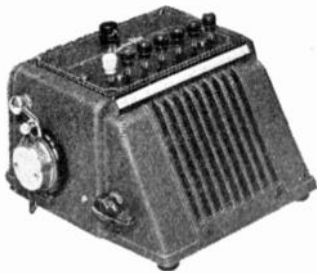
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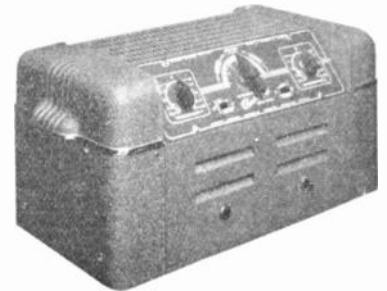
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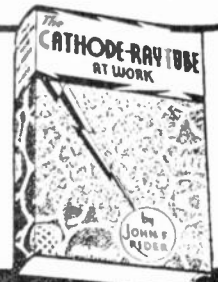
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