ELECTRONICS *and* COMMUNICATIONS

DESIGN—MANUFACTURE—ENGINEERING—DISTRIBUTION—APPLICATION

New Ideas for Modern Management

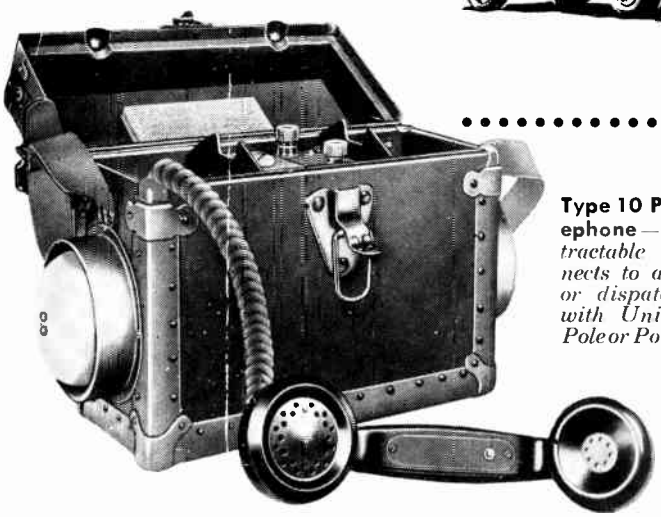
- **Canada Claims North American First In Two-Media Microwave.**
- **New Radar Offers Boon To Inshore Loggers And Fishermen.**
- **Canadian Industry Learns Know-How Through Naval Radar Contracts.**
- **New Plastics Offer Electronic Industry Greater Flexibility.**
- **Canadian Designed Motor Offers Challenge To Competition.**

Commodore H. N. Lay, Assistant Chief Naval Staff (Warfare), Commodore W. L. M. Brown, Assistant Chief Naval Staff (Air) and Commodore (L) W. H. G. Rogers, Electrical Engineer-in-Chief, examine the Plan Position Radar Indicator of Canada's newest and most powerful detection weapon built by R.C.A.

May-June, 1954 ★ $5.00 a year
An AGE Publication, Toronto, Canada

Distribution Of This Issue Over 11,000 Copies

keep your maintenance crews rolling . . .



Type 10 Portable Telephone—*with new retractable cord. Connects to any message or dispatcher circuit with Universal Line Pole or Pole Jack Box.*

Universal Line Pole—*Connects easily to any pair of wires up to 33 inches apart. Comes in 3 foot, quick-assembly sections. Extends to 12 feet, or longer if specified. Canvas carrying bag is optional.*

Protected Pole Jack Box—*Mounts on poles for easy portable telephone use. Protects user from possible high potentials. Cast iron box is weatherproof and bulletproof. A husky mounting bracket secures box to pole. Jack is shielded from weather by a drop skirt beneath the box.*

Automatic Electric

PORTABLE TELEPHONES

keep maintenance crews in touch

You can keep constant control over your maintenance crews when Automatic Electric Portable Telephones are a standard part of their equipment.

Direct communication with every crew—every vehicle—helps foreman finish jobs faster . . . saves man-hours. Service can be restored as soon as work is complete. And of prime importance, portable telephone communication "time-tables" tight working schedules—helps prevent accidents.

Modernize your maintenance vehicles and line crews with rugged, compact, easy-to-carry Automatic Electric Type 10 Portable Telephones. Full details are given in Circular 1697-A—available on request.

T-5437

AUTOMATIC ELECTRIC

(CANADA) 1953 LIMITED

Distributor in Canada

AUTOMATIC ELECTRIC SALES (CANADA) LIMITED

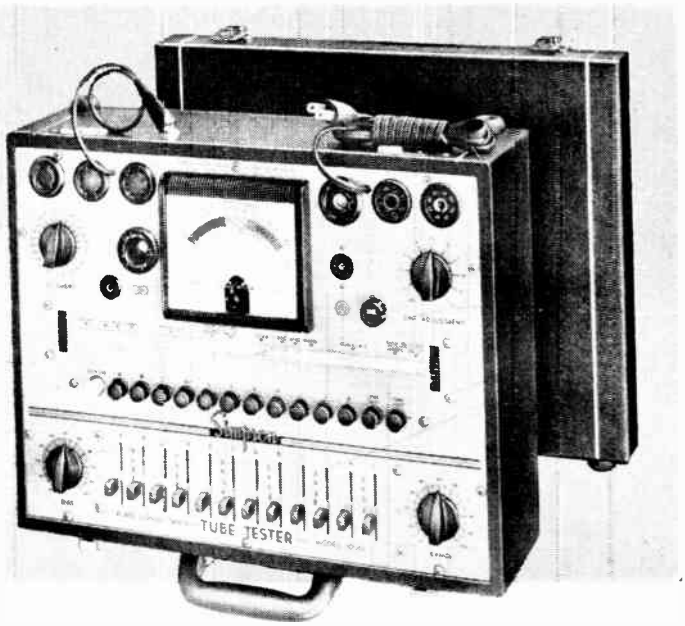
Head Office: 185 Bartley Drive, Toronto 16

MONTREAL • OTTAWA • BROCKVILLE • HAMILTON • WINNIPEG • REGINA • EDMONTON • VANCOUVER

For further data on advertised products use page 62.

Faster tube testing!

Now! fast testing in plate conductance with convenient ohms readings for leakage and shorts.



Simpson MODEL 1000

SEE IT AT YOUR LOCAL JOBBER

- tests any tube — including 9 pin miniatures and subminiatures—for plate conductance. Dial shows percentage of rated plate conductance for more positive, accurate results.
- tests are made under conditions simulating actual use in radio, TV, hearing aids and other electronic circuits.
- gives you reliable short tests because the Simpson 1000 quickly and conveniently shows you the exact ohms values for inter-element leakage and tube shorts.
- Simpson's roll chart service makes a new roll chart available each year and complimentary roll chart supplements are provided at regular intervals.
- and—the Simpson 1000 is as handsome as it is useful. Front panel is finished in non-glare grey hammerloid. Rich burgundy carrying case looks like expensive luggage. Comes complete with Operator's Manual.

BACH-SIMPSON LIMITED

1255 BRYDGES ST. - LONDON, ONT.

IN U.S.A. SIMPSON ELECTRIC COMPANY 5200 W. KINZIE ST. CHICAGO 44, ILL.

For further data on advertised products use page 62.

The Editor's Space

The Kenora *Ontario Miner and News* reports that "an electronic system has been perfected that takes the guess work out of finding airplanes that crash in desolate country or into the ocean. By radio the system pinpoints the spot at which a plane crashes and permits rescue teams to fly directly to the scene of the crash without searching for the missing craft".

May we ask why someone hasn't informed the airline operators and private flyers of this device?

* * *

Talked with Ronald M. Robinson, General Manager of C.G.E.'s recently formed Electronics Division in his office at 212 King Street awhile back and learned some mighty interesting facts about the Canadian electronics industry. Mr. Robinson's off-the-cuff discourse on the subject of electronics in Canada marked him in our opinion as not only fully informed on the industry as it stands today but two or three jumps ahead of the situation. Was also impressed by the mural design of decoration on the east wall of Mr. Robinson's office.

* * *

A new law in the States of New York makes it a misdemeanor to refuse to give up a party telephone line needed for an emergency. We're not sure whether such a law exists in Canada but if it doesn't it may be a good thing for the authorities to consider it!

* * *

Learned in an interview with R. M. Brophy, Deputy Minister of Defense Production in Ottawa of recent date that one of the greatest difficulties facing his department is the task of obtaining skilled personnel for the engineering divisions of the department. In this respect, Mr. Brophy, as deputy head of a government department requiring a large number of engineers is confronted with the same dilemma that faces industry generally. Despite the lack of skilled engineers Mr. Brophy gave us a run-down account of the department's accomplishments since its inception some three years ago, an account which is little less than spectacular and one which stands to Canada's credit.

* * *

While in Ottawa also had a chat with A. B. Hunt, now head of the Electronics Division of the Department of Defense Production. Mr. Hunt, now well ensconsed in his new position tells us that this month will see the termination of his term as President of the Radio Electronic Television Manufacturers Association. In our opinion Mr. Hunt, you can look back on a job well done as President of the RETMA.

* * *

There's really not much new in the world after all we're beginning to believe. A recent issue of the York Report tells us that: "For 50 years the battle of the St. Lawrence Seaway has been raging. Presidents since Harding have urged the project. In 1920, Du Pont, Alcoa and General Electric offered 1.3 billion dollars to build the project giving navigational improvements to Canada and the United States in return for 5 million horsepower latent between Montreal and Ogdensburg."

* * *

A revolutionary new system in the art of mail sorting is being developed by Canadian Post Office engineers in Ottawa. Mr. David Adamson, public relations head of the Post Office Department in Ottawa recently afforded us the opportunity of seeing engineers at work on an electronic mail sorting machine that will revolutionize and speed up the business of getting the mail out. The project headed by Dr. M. M. Levy has attracted the attention of interested parties in the United States and Europe. Our thanks to A. C. Taller, chief technician on the project for his time in conducting us on a tour of the laboratories where the project is being developed.

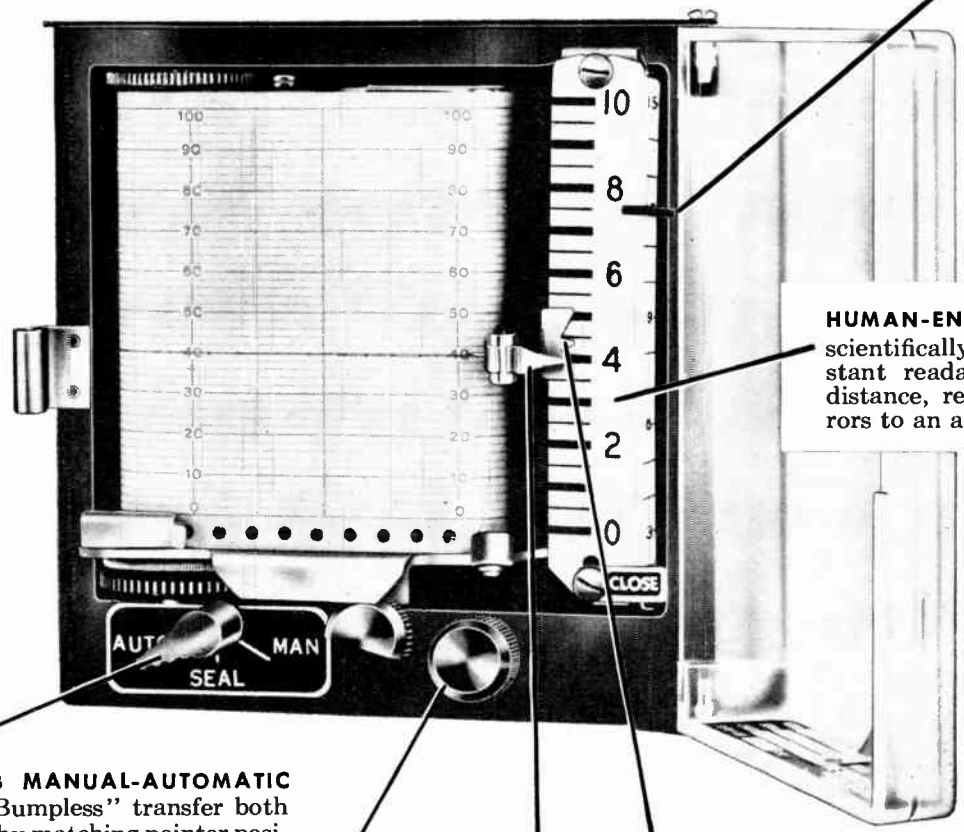
(Turn to page 54)

For further data on advertised products use page 62.

NEW BRISTOL'S METAGRAPHIC* RECORDERS

with CONTINUOUS VALVE-POSITION INDICATION

* Separate from set-point indication data on control valve position and level of process operation
* Gives continuous data on control valve position and level of process operation
* No switching to get reading



HUMAN-ENGINEERED SCALE, scientifically designed for instant readability even at a distance, reduces reading errors to an absolute minimum.

SINGLE-KNOB MANUAL-AUTOMATIC TRANSFER. "Bumpless" transfer both ways, simply by matching pointer positioners—no need to read actual scale values—minimizes reading errors—speeds operation.

CONTINUOUS SET-POINT INDICATION. Shape and color of set-point target make it easy to see at a glance when process is on or off the control point. Rapid scan deviation indicator.

SET-POINT REGULATOR. High-precision, two-stage, no-drift regulator—high capacity (3 scfm) output for fast manual control in emergencies.

CONTROL VARIABLE RECORDED AND INDICATED. High-visibility pointer (fluorescent paint) for accurate reading at a distance.

* Bristol *Metagraphic* Pneumatic Transmission Instruments measure, indicate, record, and control pressure, temperature, vacuum, flow, differential pressure and liquid level. Write for bulletin.

The BRISTOL Company of Canada Limited

BRISTOL'S

TORONTO • MONTREAL • HAMILTON • VANCOUVER

HALIFAX
A. R. WILLIAMS MACHINERY CO. LTD.

WINNIPEG
FILER-SMITH MACHINERY CO. LTD.

EDMONTON-CALGARY
GORMAN'S LTD.

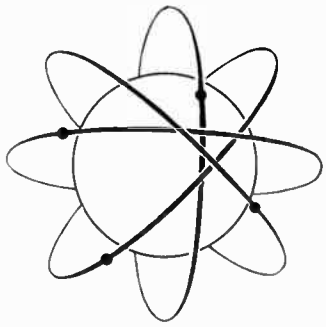
MEASUREMENT OF INDUSTRIAL PROGRESS

For further data on advertised products use page 62.

U.K. NEWS

Edgar Lee, Managing Director of Belling and Lee Company, London, England, has reported that his company will send top-flight directors to Canada at an early date to make a survey of the Canadian electronics market. Belling and Lee, the largest manufacturers of television antennas in Britain are also one of the world's largest radio and electronics components manufacturers . . . . **Reproducers and Amplifiers of Wolverhampton, England,** had their Mr. H. C. Willson make a tour of the Canadian electronics industry during the month of May . . . . **Dubilier Condenser Company** have added a large addition to their plant at North Acton, England to facilitate the handling of Canadian exports. A spokesman for the company reports that "every attention is being given to Canadian orders. Orders for the Canadian market must be given special treatment. The Canadians are harder to please than Americans and there is no use accepting business in Canada unless you are prepared to give them exactly what they want on the day they require it" . . . . **W. Edwards and Company, (London) Limited** manufacturers of high vacuum equipment have just established a completely new plant at the new town of Crawley in Sussex. The move was in conformance with the British Government's scheme to move industry from London . . . . **The United Kingdom Delegation** to the 5th Session of I.C.A.O. held in Montreal recently submitted details of two long-range radio aids to navigation proposed by the Decca Navigator Company Limited. It was recommended that I.C.A.O. should encourage member States to continue the development and evaluation of these aids, named Dectra and Delrac, together with the NAVAGLOBE/NAVARHO system proposed by the United States . . . . **The British Radio Components Show** held recently in London, England, showed many of the new developments of the industry. Noticed at the exhibition was an increase in the range of cathode ray tubes which has been extended to include 21" types with wide angle deflection so that the depth of the cabinet is kept to a minimum. One manufacturer exhibited an experimental tube having a deflection angle of 90 degrees. Another company is producing a new form of picture tube which is a wide angle electrostatically focused type which eliminates the need for external coils or magnets . . . . **Also the range of transistors** which will undoubtedly replace valves in some circuit applications, is steadily increasing and these are at present of particular interest in miniaturized equipments and deaf aids. One germanium junction power rectifier is claimed to have an efficiency of 99 per cent.

MAY - JUNE, 1954



ELECTRONICS AND COMMUNICATIONS

Vol. 2 No. 3

FEATURES

DEPARTMENTS

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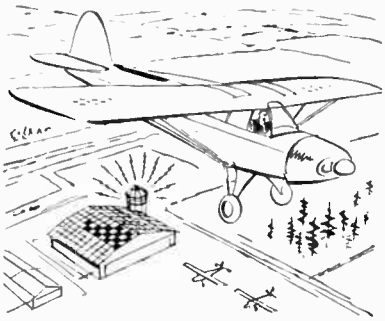
PRINTED IN CANADA

Co-ordinate your operations with G-E 2 WAY RADIO

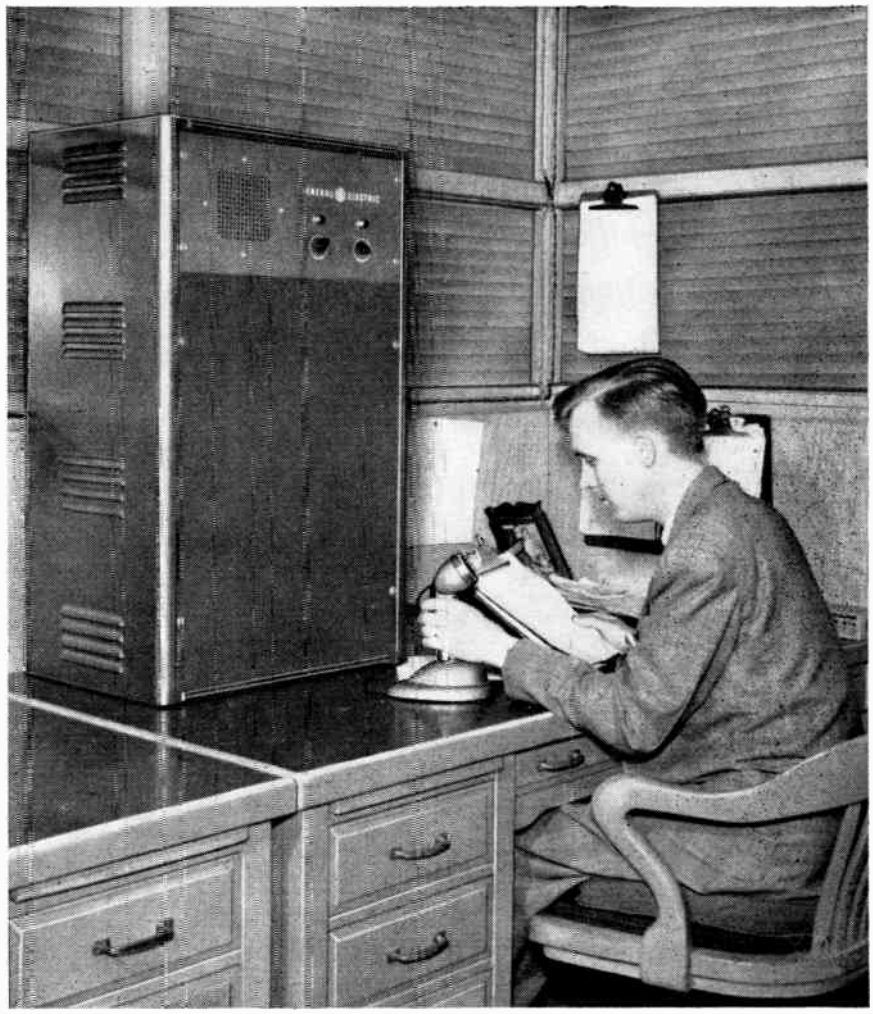
2-Way Radio used in police cruisers is a vital factor in highway or metropolitan police operations.



Small aircraft, equipped with 2-Way Radio, are in direct, instant touch with control towers.

Public Utilities, with widespread mobile units, rely on 2-Way Radio for instant communications.

G-E 2-Way Radio speeds operations and increases efficiency in many industrial applications.



In widespread lumber and pulp operations, often as much as 100 miles in the bush, two-way radio is playing a major role. Accidents and costly operation stoppages — that once were fatal or took days or weeks to rectify—are now overcome with radio in a matter of a few hours.

Every branch of Canadian industry with widespread operations will find G-E 2-Way Radio the fastest, most economical way to co-ordinate their efforts.

This highly-efficient, moderately-priced radio equipment will provide substantial savings in money and time, speed work and increase efficiency.

To learn how G-E 2-Way Radio can help you — contact your nearest C-G-E office, or write to: Mobile Radio Sales, Electronic Equipment Department, Canadian General Electric Co. Ltd., 830 Lansdowne Ave., Toronto, Canada.

731W-254

CANADIAN GENERAL ELECTRIC COMPANY LIMITED

For further data on advertised products use page 62.

business briefs & TRENDS

★ **ROSS D. SIRAGUSA, PRESIDENT** of the Admiral Corporation predicts that the United States television industry will sell between 5,500,000 and 6,000,000 TV receivers in 1954.

★ **VISITORS TO THE UNITED STATES** complain of the lack of color TV sets on display in the stores. The largest collection of color TV sets ever shown to the buying public was recently staged as the feature of the Sixth Annual Music and Television Festival held at Macy's world famous department store in New York.

★ **MORE THAN 4,000 AMERICAN BUSINESS firms now use private wire telegraph systems. These private wire networks use 1,360,000 miles of telegraph circuits.**

★ **C.G.E.'S PRESIDENT, H. M. TURNER, in presenting the annual report of the company said: "The most significant single factor emerging from last year's operations related to the concerted drive by foreign manufacturers for increased participation in the Canadian market . . . ."**

★ **DR. C. B. JOLLIFFE, VICE-PRESIDENT and Technical Director of the Radio Corporation of America told the American Society of Professional Engineers in Detroit that the business office of the future will not use electronic devices only for the handling of statistical, accounting and book-keeping chores but for radiotelephone, facsimile and television communication between divisions in a plant and between headquarters and branch offices.**

★ **APPROVAL HAS BEEN GIVEN BY THE HOUSE OF COMMONS authorizing the Eastern Telephone and Telegraph Company to increase its capital to carry out its part in the building of the $35,000,000 trans-atlantic telephone cable from Nova Scotia to Scotland. Plans for the transoceanic cable call for its completion by 1956.**

★ **A SURVEY BY THE CANADIAN ADMIRAL** Corporation points up the fact that there are 77,000 television sets in the Windsor viewing area. This compares with an estimated 42,500 home phones in the same area and — if it means anything — 76,000 bath tubs.

★ **MONTREAL TELEGRAPH COMPANY** stockholders have voted in favor of the sale of the company to the Canadian National Railways for $3,000,000. The sale price worked out at $60 a share on the 50,000 outstanding shares.

★ **HEAVY INVESTMENT IN PLANT MODERNIZATION and expansion of manufacturing and marketing facilities is Canadian industry's answer to the current heavy tax load and increasing competition from abroad according to one prominent Canadian industrial leader.**

★ **IN A NINE MONTH PERIOD DURING 1953** the International Business Machines realized a net profit of $24,092,078. In the same period for 1953 Remington Rand's net profit amounted to $5,325,769.

★ **THE RUSSIAN ELECTRONICS INDUSTRY** has been told that it has to manufacture 2.8 million radio sets and 325,000 TV sets in 1954.

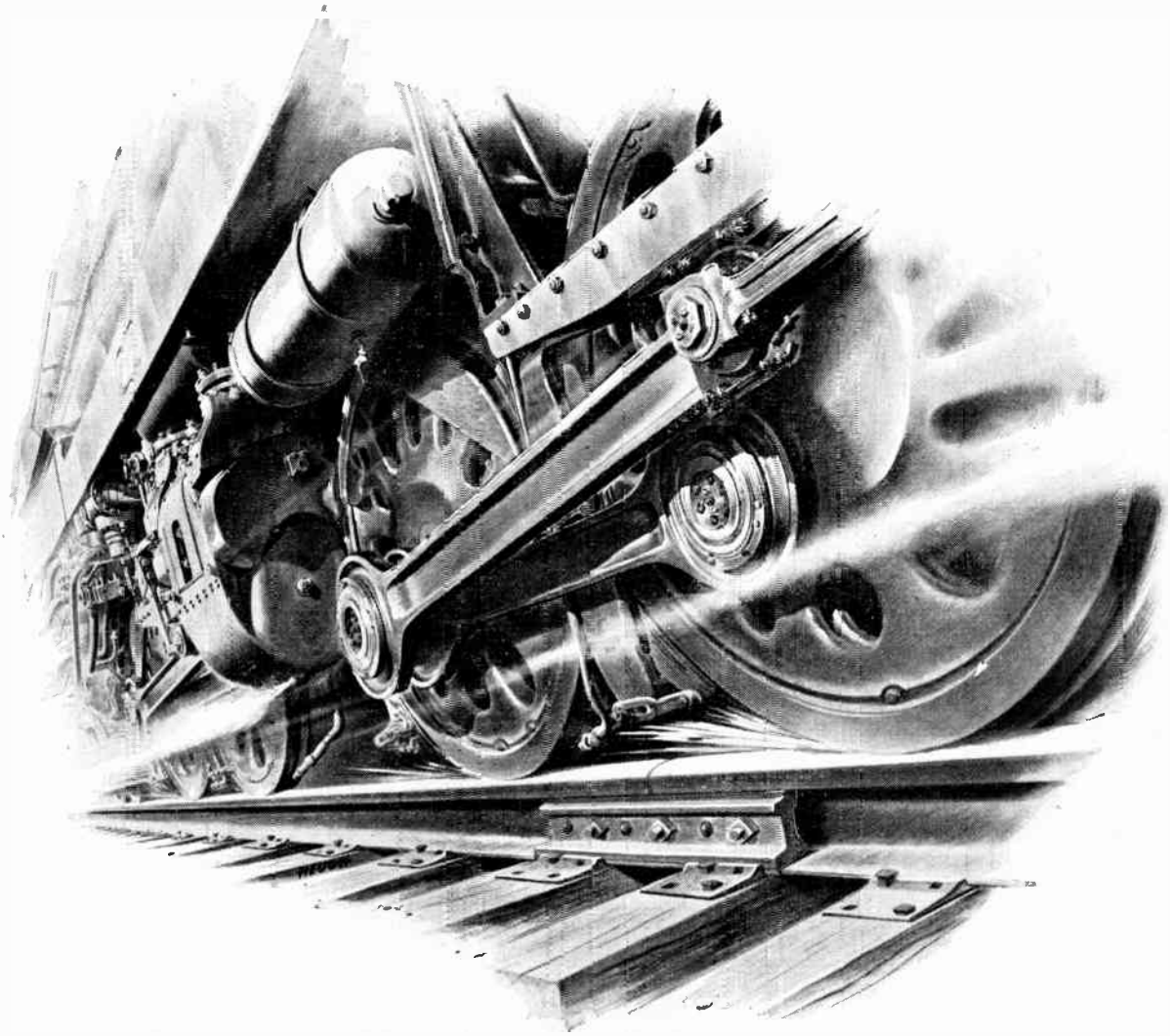
★ **THE PRICE OF R.C.A. COLOR TV TUBES** to set manufacturers in the United States has been quoted at $175.

★ **IT HAS RECENTLY BEEN REVEALED that orders awarded to overseas manufacturers for electrical equipment has meant a loss of 1,400,000 man hours of employment to Canadian workers.**

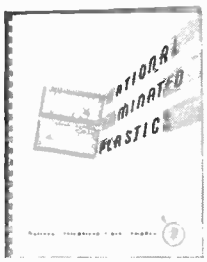
★ **THE REVIEW OF FOREIGN TRADE** published by the Department of Trade and Commerce says: "Canada is one of the few countries in the world today which has almost no significant barriers to imports aside from tariffs and the Canadian tariff has been considerably reduced since the war."

★ **ANOTHER FORECAST OF THE SALE of television sets in Canada for 1954 comes from Vincent Barreca, president of Canadian Admiral Corporation who has estimated that more than 500,000 television receivers will be sold in Canada this year. This is a 40 per cent increase over the number of sets sold in Canada in 1953.**

(Turn to page 31)



There's Safety in Numbers



Want the facts and specifications on weights, tolerances, forms and grades available? Or dielectric strengths, colors, suggested applications, machining and forming techniques? Here's the whole story in one thumb-tabbed package. It's a catalog you can't afford to be without. Write for your copy to either of the addresses listed, attention Dept. Y-AD5

Also makers of Phenolite Laminated Plastic, Vul-Cot Waste Baskets, Peerless Insulation, and Materials Handling Equipment

Railroads can't afford to gamble with safety. That's why it is standard railroad practice to use but one material in the insulation of the rail-joints . . . the literally thousands of them . . . on which depends the operation of electric signal and safety systems.

That material is *Vulcanized Fibre!* No other material has the ability to withstand, year after year, the exposure and pounding impact of such punishing service conditions.

Vulcanized Fibre is really tough . . . long lasting . . . dependable. It has a unique combination of electrical, mechanical, and physical properties . . . and can be worked and machined like metal. It weighs only half as much as aluminum . . . and is relatively low in cost.

So, if you would like to make a product, or a part, better . . . lighter . . . or at lower cost . . . National Vulcanized Fibre might be your answer. Just get in touch with us. A National sales engineer will be glad to help.

Nothing takes the place of Vulcanized Fibre

NATIONAL

FIBRE COMPANY OF CANADA, LTD.

ATLANTIC & HANNA AVES., TORONTO • 1411 CRESCENT ST., MONTREAL

For further data on advertised products use page 62.

10 SOLID REASONS why the NEW Canadian-built MARCONI DT 45 2-WAY RADIO will be profitable for you!

Whatever your type of vehicle . . . wherever you operate . . . in any kind of weather . . . the new Marconi DT 45 will give you more of everything desirable in 2-way radio performance than has ever been available before.

HERE'S WHY!

- No more chop, flutter or fade . . . dependable, constant reception.
- Greater range than any other 2-Way mobile radio equipment now in use.
- Less signal noise . . . crackling and splutter are gone.
- New-type vibrator has ten times more life.
- Simplicity of construction and quality of components ensure less servicing.
- Greater selectivity — finer tuning.
- Individual driver tone adjustment.
- Canadian designed and built for top performance under Canada's variable weather conditions.
- Two-channel convertibility.
- Priced competitively with other equipment in the field.

Write for detailed specifications.

Commercial Products Division
CANADIAN MARCONI COMPANY
Established 1902

2442 Trenton Avenue, Montreal 16, P.Q.

VANCOUVER • WINNIPEG • TORONTO
MONTREAL • HALIFAX • ST. JOHN'S

Marconi

the greatest name in Radio and Television

For further data on advertised products use page 62.

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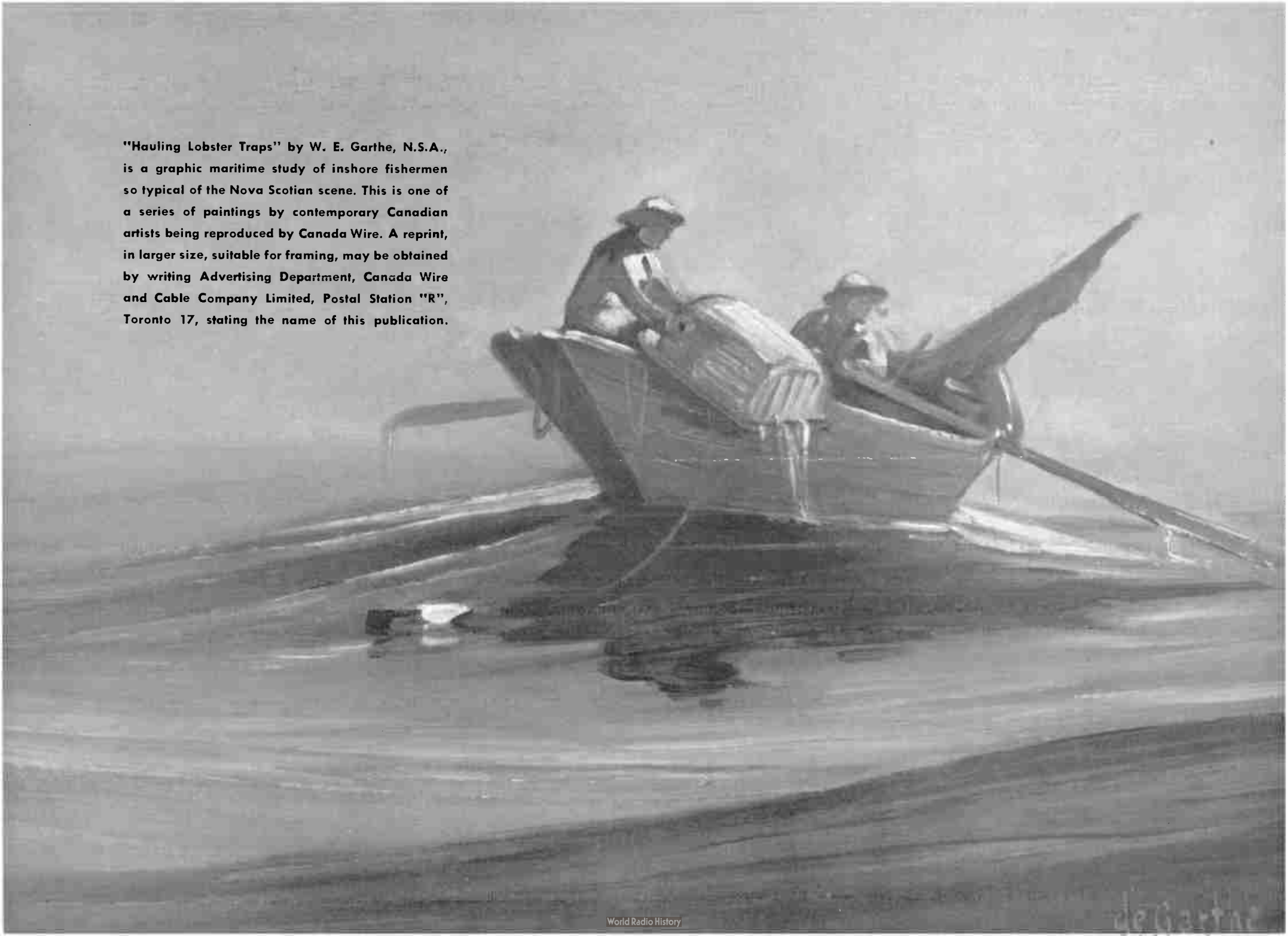


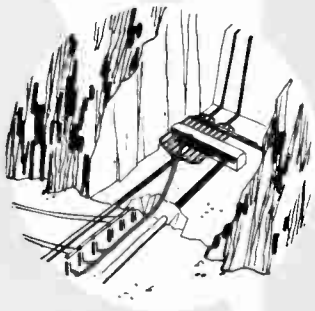
"Hauling Lobster Traps" by W. E. Garthe, N.S.A., is a graphic maritime study of inshore fishermen so typical of the Nova Scotian scene. This is one of a series of paintings by contemporary Canadian artists being reproduced by Canada Wire. A reprint, in larger size, suitable for framing, may be obtained by writing Advertising Department, Canada Wire and Cable Company Limited, Postal Station "R", Toronto 17, stating the name of this publication.

If you needed a starting point, you might say it all began at Craigellachie, B.C. on November 7th, 1885. In this tiny village the hammer blows that drove home the last spike of the Canadian Pacific Railway resounded around the world to announce the "coming of age" for Canadian engineers. Since that time, there have been many notable "Canadian" engineering achievements. The ingenuity that resulted in the telephone and the incandescent light has been a rich inheritance upon which to build. Shipsaw compares on all counts with any power project in the world. The Orenda jet engine and the CF 100 that it powers have blazed a trail across the pages of world aviation history. And now we talk of whole new towns to be planned on the new banks of a St. Lawrence that will be most unfamiliar to the ghost of Champlain —a St. Lawrence that will open the Canadian interior to the traders of the world and supply Canadian industry with the power to produce the needs of the world.

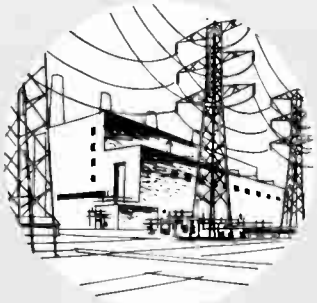
Canadian Engineers have been "Major League" for 69 years

CANADA WIRE ENGINEERS HAVE BEEN SETTING THE PACE

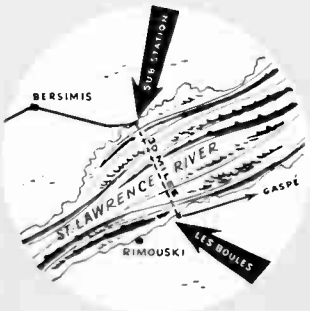
The complex projects of Canadian engineering development become simpler with the assistance of specialists at Canada Wire who have solved countless problems in high voltage power transmission and the development of every type of electrical conductor.



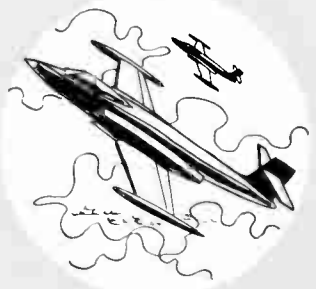
When a cable was needed to transmit the output of two 106,000 h.p. generators from the transformers in the heart of a mountain 2,000 feet through a cable tunnel to the high-voltage switchyard at Alcan's Kemano River basin, Canada Wire engineers produced one. This cable is single conductor 301 kv. All-Aluminum oil-filled cable; hollow core conductor, low-viscosity, oil-impregnated paper, seamless Aluminum Sheath. This is the first 301 kv. cable system designed in the British Commonwealth.



When the new Richard L. Hearn Steam Generating Station, first of its type in Canada, was completed at Toronto, Canada Wire engineers produced two high voltage underground cable circuits 120 and 161 kv. to deliver 60-cycle power underground to the Leaside-Thorncliffe Transformer Station. The hollow conductors used facilitated both the charging of the system and the maintaining of the insulation under nitrogen gas pressure.



When the St. Lawrence stood as a barrier to power transmission (a distance of 32 miles underwater) from Bersimis on the north shore of the river to the great new copper mining area in the Gaspé, Canada Wire engineers became pioneers both in design of the submarine cable, its manufacture, the unique "flaking down" and wharf handling procedures and the underwater installation. This is the largest high-voltage submarine cable system in the world.



The modern jet aircraft requires over 12 miles of wire. High tension cables for engine and ignition systems, low tension cables, conductors carrying current to fire rocket charges, and steel wire control cables all provide the muscles and the nerves for Canada's aircraft. Canada Wire is engineering and producing these essentials which are fulfilling the "rigid performance specifications" necessary to meet the demand for greater speed, greater safety and manoeuvrability.

REG'D. TRADE MARK

CANADA WIRE AND CABLE COMPANY LIMITED

Factories: Toronto, Montreal, Smiths Falls, Vancouver
Sales Offices From Coast to Coast

CANADA WIRE ENGINEERS HAVE THE "KNOW HOW" FOR CANADIAN CONDITIONS

54-21

E&C EDITORIAL

Radio Versus Television - - - -

Despite the fact that statistics show the sales of radios to be holding strong in the face of competition from TV let's not kid ourselves that the advent of television is not going to be temporarily detrimental to the radio broadcasting industry. It's going to hurt but there's no reason to believe that radio can't take the shock and in the long run come up better for the ordeal.

For some years radio has had the airwaves to itself in the entertainment and commercial fields and despite the fact that the calibre of Canadian broadcasting has been generally good there are portions of it that could have been improved. With no pressing competition from TV however, the processes of improvement, where it is deemed such could have been applied, have been slow. Now the situation has changed. It's now a battle between TV and radio and the fight is being waged in thousands of living rooms across Canada, where the radio set, in more cases than it is pleasant to realize from the radio broadcaster's point of view, has been relegated to a shelf in the kitchen where it is used to tune in on the early morning news and weather forecasts and used as a stand-by medium of entertainment until the first TV telecasts are put on the air.

Bien c'est la guerre, as the French say. But it should not be a case of "may the best man win". There's room for both if they're good but — they'll stand or fall on their merits — so they've got to be good! The public is a cruel and ruthless judge and as we see it the radio broadcasting industry is now on trial in most homes with TV.

Are We Too Reticent - - - - ?

There's been a good deal of talk in recent years on the subject of a stronger more distinctive Canadian identity and culture. Included in such has been a fair amount of chatter to the effect that Canadians are beginning to detach themselves from those American influences which for years past have tended to cast their identity in a semi-American mold. Such may be the case in some fields of endeavor but there's little to indicate that the professions seem very concerned about lending their effort to the development of a more prominent Canadian identity when the opportunity affords itself. That such seems to be the case is indeed a pity because there is no field of Canadian endeavor that could contribute as greatly to a Canadian identity as our professions, particularly our engineering professions.

In our opinion there is no need to plan a Canadian culture or identity as some authorities seem to think. We already have one. One that's been developed over the past three hundred years. It's staring us in the face and the greatest obstacle to its becoming recognized as such is our inherent reluctance to talk about ourselves.

The achievements of our professional men, for instance, are second to none. Nowhere, not even in the United States which is so prominently known for such engineering works as Boulder Dam, Oak Ridge and the Tennessee Valley Project can Canadian engineering achievements be over shadowed. Canada's Kitimat, Chalk River, the Seven Islands Development and the proposed St. Lawrence Seaway are projects well worth talking about. In the field of research too there have been accomplishments which, if afforded more publicity, would have added stature to our Canadian identity. But we're a reticent, unobtrusive people either too shy and modest to shout our achievements to the world or too hide-bound by outdated professional ethics calling for reserve and stodgy decorum to brag within reason of our accomplishments.

At the recent I.R.E. Annual Convention in New York City, the world's largest gathering of electronic engineers, no less than six hundred technical papers were presented. Out of this total there was one Canadian presentation, a paper prepared by James Wait and W. A. Pope of the Defense Research Board's Radio Physics Laboratory. Among the hundreds of exhibits in this electronic fashion parade there was also only one from Canada, that of P.S.C. Applied Research Limited. To these evangelists we extend our congratulations for their missionary work in raising the voice and prominence of Canada at the Institute of Radio Engineers convention.

True, we do a considerable amount of talking among ourselves, but this is of little use in getting ourselves known abroad and whether we like to admit it or not culture and identity are fundamentally commodities for export, used to raise our national stock in the eyes of other people. So let's shout a little oftener and a little louder about our accomplishments, particularly on occasions when the people of other countries can hear us.

● *Right:* First step in the signals' journey from the studios is by video cable to Bell's work center two-thirds of a mile away.

● *Left:* David C. Kerr, Bell foreman, is seen with the equipment used to test and control quality of the microwave signal.

Two Media Microwave - - - -

Canadian TV Station Employs Unique Transmission Link

HAMILTON'S new television station, CHCH-TV, is believed to be the first in North America to use two media — microwave radio and video cable — to provide a permanent link between its studios and transmitting tower.

Made necessary by the unusual topography of the Hamilton area, the novel connecting facilities are provided and maintained by the Bell Telephone Company of Canada. The studios are located on Jackson Street in downtown Hamilton and the 500-foot tower is seven miles away, atop the Hamilton Mountain near Stoney Creek.

First step in the television signals' journey from the studios to the tower is via special video cable in underground conduit to the Bell's work center on Bay Street North, more than two-thirds of a mile away.

Equipment at the work center amplifies the signals, after which they enter the microwave radio system. A microwave transmitter on top of the two-storey building beams the signals 6⅓ miles to a 70-foot tower on top of the mountain. From the receiving microwave equipment there the signals pass by video cable to the nearby CHCH-TV transmitting equipment and tower.

Mountain Obstacle

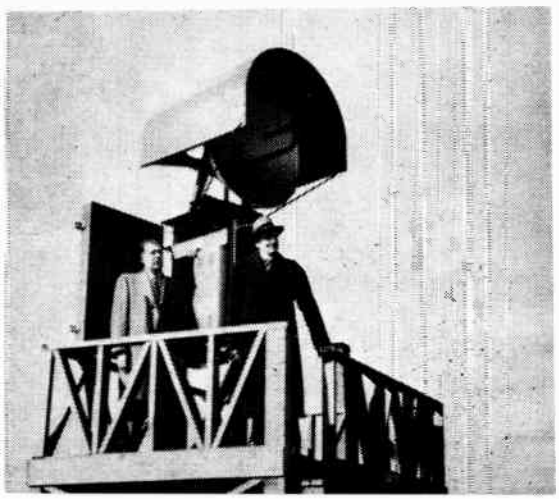
Microwaves, which are super-high-frequency radio waves, require a clear-line-of-sight for efficient transmission. For this reason, direct microwave connection between the studio and the mountain tower was impossible — a projection of the mountain got in the way of the signals. Thus the two-step transmission method became the most feasible means of completing the connection.

Control of the quality of the signals transmitted over the microwave system is maintained by monitoring equipment located in the Bell's work center, and an alarm circuit in the microwave equipment gives immediate warning should the signal begin to deteriorate. Direct communication with the Bell's monitoring room is available to station personnel in the studios and the transmitter control building on the mountain over a special four-way telephone circuit.

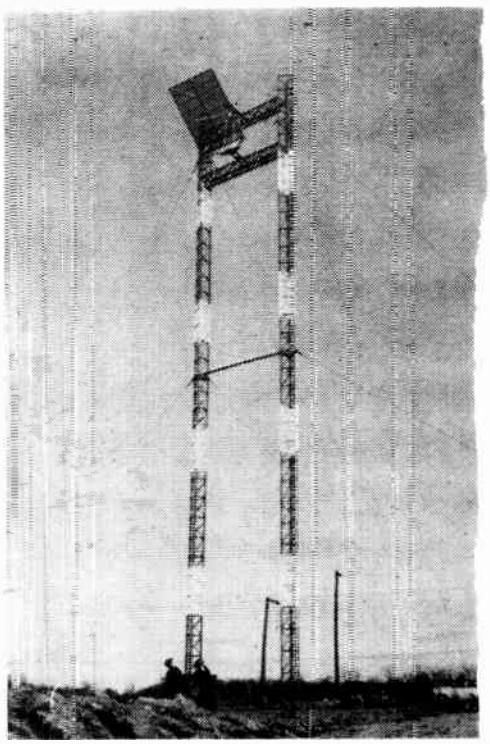
A feature of the microwave installation is that the signals do not proceed direct from antenna to antenna as they usually do. Instead, the Bell's two-legged tower on the mountain has a large aluminum-grid reflector mounted on top of it. The angle of this reflector is such that the microwaves are beamed directly downwards into the antenna immediately below the tower.

Another Bell installation, combining microwave and cable transmission, was also provided co-incident with the opening of CHCH-TV. This installation permits the televising of events taking place at Hamilton's rink, the Forum. Portable microwave equipment beams the signals from the roof of the Forum to the roof of the Royal Connaught Hotel, a distance of just over one mile. From there the signals go to the studio by means of 4,400 feet of video cable in underground conduit.

● This microwave antenna is situated on top of the penthouse on the roof of the Bell's work center. The microwave signals are carried from the equipment room below by means of a metal wave guide which terminates in the antenna.



● Some 50 feet away from the CHCH-TV transmitting tower is this two-legged tower. The reflector mounted at the top reflects the microwave signals arriving from the transmitter in downtown Hamilton downwards into the antenna on the ground.



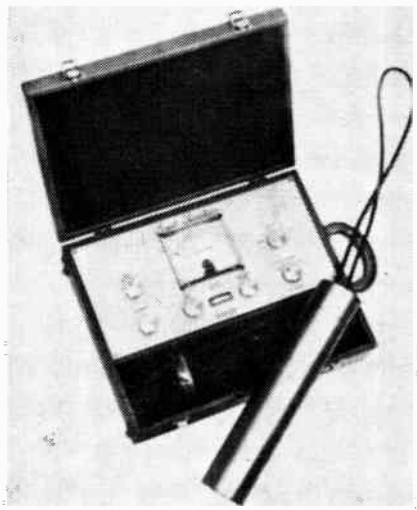
Looking For An Oil Well—?

Here's How!

IN this "Atomic Age" any new atomic development is news and the latest device to come out of the laboratories will be of particular interest to the oil industry. The new gadget promises to eliminate the tedious and costly chore of drilling oil wells that never produce anything more than increased figures on the debit side of the ledger.

Science has now produced a "scintillator" which its manufacturers claim will define the limits of an oil field and thereby obviate the necessity of drilling those many dry holes which in the past have been necessary to determine whether or not there is a presence of oil. The instruments usefullness is not limited to the detection of oil-fields. It will also locate uranium deposits, according to its makers, and it has many uses in the laboratory. It can be operated from an aircraft or a moving vehicle. The entire instrument is contained in a small case which weighs 24 lbs. It employs a 2¼" diameter Thallium activated Sodium Iodide Crystal as its detecting element and incorporates a scaling circuit as well as a ratemeter. Its ranges are .01, .025, .05, .1, .25 and 1 MR/HR. It has a counting rate of 500,000 counts per minute in a one MR/HR field of radiation.

The manufacturers of this instrument call it the "Royal Scintillator" another of the "Atomic Age" instruments that is taking the pick and shovel donkey work out of unearthing the world's mineral treasures.



● The Royal Scintillator.

New Equipment Offers - - -

Prize Package For Coastal Shipping

THE PERIL of collision in fog or darkness — major hazard to small vessels threading their way through crowded harbours or along rocky coasts—has now been reduced through the magic of a new electronic device.

"Big Ship" radar, with its rotating antenna and all-seeing eye is no longer confined to Navy ships and other large, ocean-going vessels but is now available for use on tugs, workboats, yachts, motor launches, small fishing vessels, and similar craft of the type which are operated by the thousand on Canada's east and west coast and inland waterways.

The new type radar set has all of the essential features of its bigger brothers and the captain of a small craft can now guide his vessel through a crowded harbour in thickest fog or darkest night, without fear of colliding with other vessels or objects.

Simple But Reliable

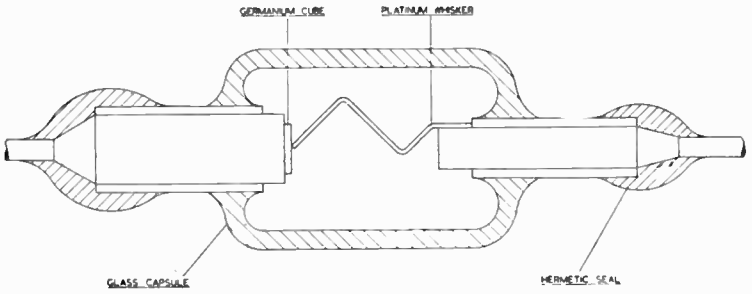
Working on the standard radar principle, the new type radar known as Model 1500 sends out a radio signal like the rays of a searchlight. When these rays strike an object, they rebound like echoes, but with the speed of light. The radar picks up these "echoes" of its own signals, and translates the time interval between the signal and its echo into distance. The direction and distance of objects are indicated on a picture scope, similar to a television screen.

The radar is a pulse radar with a 10-inch scope. It has selective ranges of one, two, four, eight, and sixteen miles. There are two units, consisting of the antenna-transmitter, which is mounted on the mast, and the indicator-receiver unit, which can be mounted on the bulkhead, overhead, or placed on a table or shelf. There is a bearing cursor and a "reflection plotter" included, by means of which the operator can keep a constant check on the ranges, bearings, and courses of other vessels, to avoid collisions; or keep similar track of fixed objects like buoys, shore points, and lightships for navigational purposes.

Because of the simplicity, reliability, and relatively low cost of the new device, the manufacturers of this small ship radar expect it to find widespread use on ferries, tugs, small steamers, excursion and pleasure boats, and other such vessels.

● REFLECTION PLOTTER is part of the new Model 1500 "Mariners Pathfinder" radar for small vessels.

● TEST METER is an integral part of the new Model 1500 "Mariners Pathfinder" radar for small vessels.



GERMANIUM RECTIFIER

Fig. 1

Component Manufacturing Technique

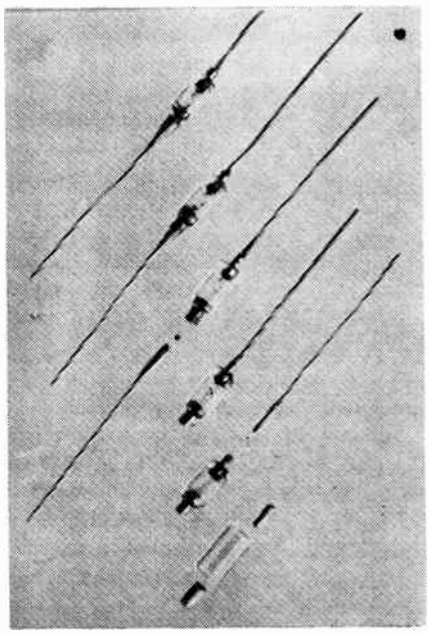
Manufacturing and Testing Germanium Rectifiers

General Electric Co. Ltd., England

RECTIFIERS based on the properties of the non-linear conduction between a metal and a semi-conductor were widely used in the early days of radio. Whilst being quite efficient they were very unreliable electrically and unstable mechanically, and were soon superseded by the thermionic diode.

Later, more robust and stable rectifiers were introduced for power and audio-frequency applications, the main materials used being copper-oxide and selenium. However, the high self-capacitance, due to the large area of contact between the metal and semi-conductor, made this type of rectifier unsuitable for use at high frequencies.

With the introduction of radar during the war, which called for detectors at frequencies of thousands of megacycles per second, a rectifier was needed with even lower self capacitance and high conductance than the thermionic diode. This requirement led to the development of the modern version of the silicon rectifier, in which a point-contact was used as in the early days, but the device was made much more stable by improved technique. Its inability to withstand large transient surges and its low voltage-handling capacity were the main limitations of the silicon crystal. Although silicon is still used universally at centimetre wave lengths, germanium is now generally used in point-contact rectifiers designed for operation at wavelengths of one metre or more.



● Fig. 2—Various stages in the production of a G.E.C. germanium rectifier.

Germanium diodes, in many instances, have ousted the thermionic diode, over which they have several advantages:

1. High forward conductance.
2. Low self-capacitance.
3. Small size and robustness.
4. Absence of heater supply and hence freedom from troubles due to R.F. feedback and hum.

The main disadvantage of the germanium diode compared with the thermionic diode is its finite back resistance. This, however, can be overcome in most cases by the correct choice of circuit and by taking into consideration the individual characteristics of each type of rectifier.

Germanium diodes manufactured by the G.E.C. can be divided into two fundamental types:

1. High back voltage.
2. High forward conductance.

The high-back-voltage types incorporate very pure germanium and are graded:

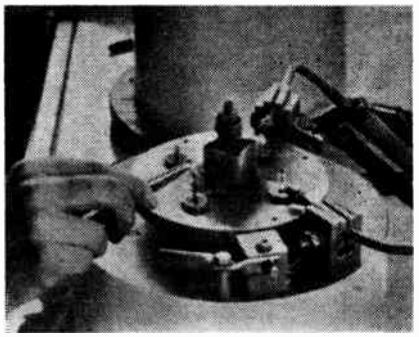
(a) for turnover voltage (i.e. voltage at which the reverse dynamic impedance is zero) which governs the magnitude of the peak inverse voltage that can be applied and

(b) for the reverse resistance which governs the impedance of the circuit in which the rectifiers will operate satisfactorily. The mean forward current measured at +1 volt is approximately 8mA.

● Fig. 1—Cross section of a G.E.C. germanium rectifier.

In the high forward conductance types the germanium is deliberately poisoned by the addition of a carefully controlled amount of antimony. These rectifiers are sub-divided into two main categories:

1. Diodes which have a low self-capacitance. These have been designed for use as mixers and low-level detectors in the H.F. and V.H.F. band. The mean forward current at +0.5 volt is 8mA.
2. Diodes which have a self-capacitance of the order of 30 pF but in which the forward resistance is very low. These are restricted in use to application at low frequencies (i.e. as modulators in telephone circuits,



● Fig. 3—Fusing the glass capsule of the G.E.C. germanium diode to the alloy tube.

meter rectifiers, and any application needing very high forward conductance at low voltage levels). The mean forward current at +0.3 volt is approximately 8mA.

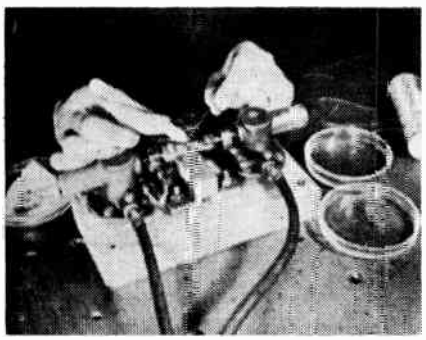
Germanium

The bulk of the germanium now used for the manufacture of rectifiers in England, is extracted from the flue dust obtained by burning certain types

● Fig. 4—The platinum whisker wire is crimped to the required length and form in this press.

of coal. The method of extraction, developed jointly by the General Electric Co. Ltd. of England, and Johnson Matthey, Ltd., yields from ½-1 per cent germanium oxide from the dust. The oxide is reduced to germanium metal

powder by heating in an atmosphere of hydrogen. The powder is then melted in an inert atmosphere to form germanium ingots. These operations have

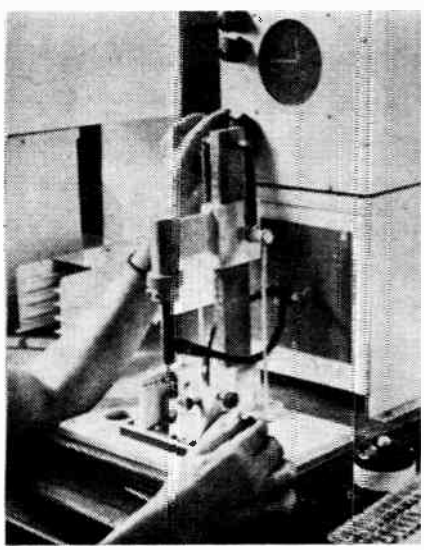


● Fig. 5 — The germanium cube is mounted on the stub with a high melting point solder.

to be controlled very carefully if germanium of the purity required for rectifiers is to be obtained. The germanium, however, must include a small amount of arsenic or antimony, the optimum value being of the order of 1 part in 10,000,000. If the amount is appreciably less than this, the rectifiers have very high forward resistance. On the other hand a larger proportion of arsenic or antimony reduces the turnover voltage. Uniformity of characteristics thus requires accurate control of the very low impurity content. The only method of attaining this, is first to reduce the impurity to a level well below that finally required, and then to add controlled amounts. New techniques have been developed to attain pure germanium, and the material now used in production is probably in a form more pure than that of any other material.

Construction and Manufacture

The construction of the G.E.C. rectifier is shown in fig. 1 and the various components in fig. 2. The body of the rectifier consists of a glass envelope fused to two tubes of different diameters in an alloy of nickel and iron. The tubes and the special glass have been selected to give good sealing. That is, the thermal expansion of the metal and glass must be such as to give a strain-free



● Fig. 6—The method used for mating crystal and whisker in a G.E.C. germanium diode.

seal in order to withstand the severe conditions to which the rectifiers will subsequently be subjected. The glass capsule is formed on a semi-automatic machine by fusing the two ends of the rotating glass and alloy tubes by means of an oxy-coal gas flame (see fig. 3). The table on which four sets of parts are mounted is rotated when the glass-to-metal seal is complete. Considerable experience is required in order to determine the exact amount of heat required; too much will cause the glass to collapse and too little will not produce a good seal. A successful seal depends on the oxide formation between the alloy tubes and the glass. This oxide must be removed from the exposed parts of the tube so that a satisfactory weld can be made to it in a subsequent operation. The capsule is therefore chemically etched to remove the oxide. An annealing process is then carried out on the capsule in order to remove any strains in the body of the glass.

The whisker and germanium are both mounted on nickel rods or stubs which have been swaged to form the connecting wires.

The whisker wire, which is of a springy platinum alloy 0.004 in. in

● Fig. 7—Oxide formed on a G.E.C. germanium diode during the welding process is removed on a rotating scratch brush.

diameter, is welded to the whisker stub and crimped to the required length and form (see fig. 4). It is important that the platinum wire is cut in such a way that a sharp point is presented to the germanium. The whisker stub is then welded into the smaller of the two alloy tubes. If the glass-to-metal seal is not to be damaged during this welding operation, the weld must be carried out in a very short time; special welders have been developed which perform the operation in one hundredth of a second.

Assembly

The germanium which, as mentioned earlier, is prepared in ingot form, is cut into 0.03 in. cubes. The wastage in the operation is quite considerable, despite the use of the thinnest of cutting wheels. Because of the high price of germanium all the sludge from this operation is re-claimed for further processing. The germanium cube is mounted to the stub with a high melt-

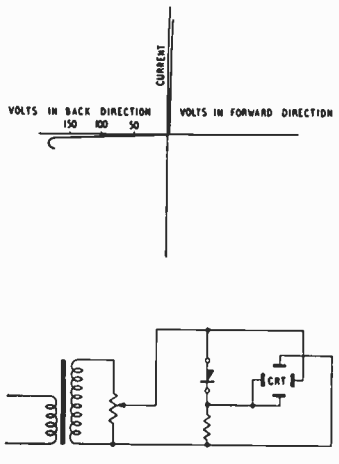


Fig. 8

● Fig. 8—Testing circuit for a G.E.C. germanium diode with, above, typical trace obtained.

ing point solder (fig. 5) and the surface is ground and polished to form the rectification area. This area is then etched to form a suitable surface for the whisker contact.

The glass capsule with the whisker mounted in it and the crystal soldered to its stub are now ready for assembly. The next operation, which is the most critical, is the mating of the crystal and the whisker. The equipment used is shown in fig. 6. The crystal is advanced by the use of a micrometer adjustment until it makes contact with the whisker; it is then further advanced to obtain the correct contact pressure. An A.C. voltage is applied between the crystal and the whisker and the static characteristic is displayed on a cathode ray oscilloscope. If this characteristic is considered satisfactory a forming current is passed through the rectifier, and the crystal stub is welded into its sleeve.

The characteristic of a germanium rectifier is sensitive to the presence of water vapor, which makes it necessary for the capsule to be hermetically sealed. This is carried out by soft soldering the two ends. However, before this can be accomplished the oxide formed during the welding process has to be removed, by means of a rotating scratch brush as shown in fig. 7. To ensure that the contact is not moved by vibration. the face of the germanium is coated with a plastics cement immediately be-

● Fig. 9—Grading G.E.C. germanium rectifiers.

fore assembly. This cement is subsequently polymerised by heating so that the whisker is held firmly on the face of germanium.

Finally the lead-out wires are tinned

(Turn to page 60)

Electronics For Defense - - - -

Canadian Equipment Meets Stringent Tests!

SINCE the war, Canada's naval service has become an important part of the nation's defence force and to step up its defence efficiency, the Navy recently purchased from RCA Victor Company, Ltd., Montreal, the largest and most powerful air search radar equipment ever produced in Canada.

Listed as the AN/SPS-12, the new equipment was recently demonstrated to top Navy officers, and Department of Defence Production officials. Two Sea Fury fighter aircraft served as aerial targets for the test demonstration and were picked up on the radar screen as they approached Montreal. Simultaneously, the movements of the 90-foot antenna mounted on top of one of the RCA Victor buildings were shown on a television screen so that naval officers, and production officials had a complete picture of the equipmen in action throughout the test.

Set up in an enclosed section of the company's engineering products departments, the equipment was operated by a naval operator under conditions simulating those which would be found on shipboard. The demonstration was completely successful with the results exceeding the expectations of naval officers.

Canadian Production Assured

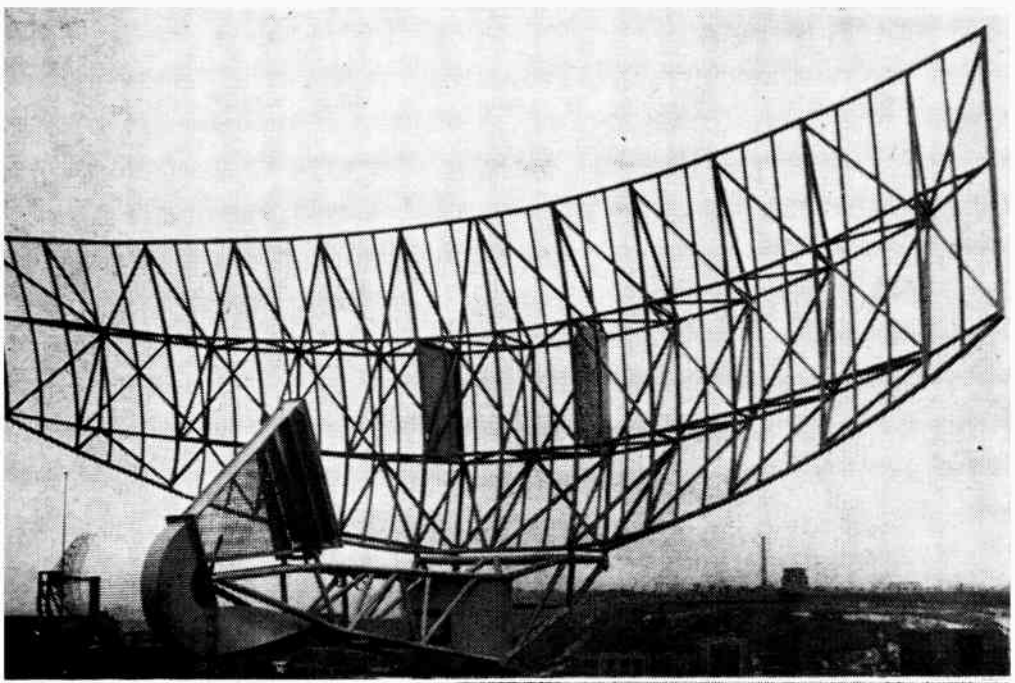
Designed to detect enemy aircraft at long ranges, the new radar equipment is the largest and most powerful ever produced in Canada and will greatly strengthen the defence effectiveness of Canada's Atlantic and Pacific fleets. Sets will be installed in destroyer escorts and in the aircraft carrier now being built for the Royal Canadian Navy.

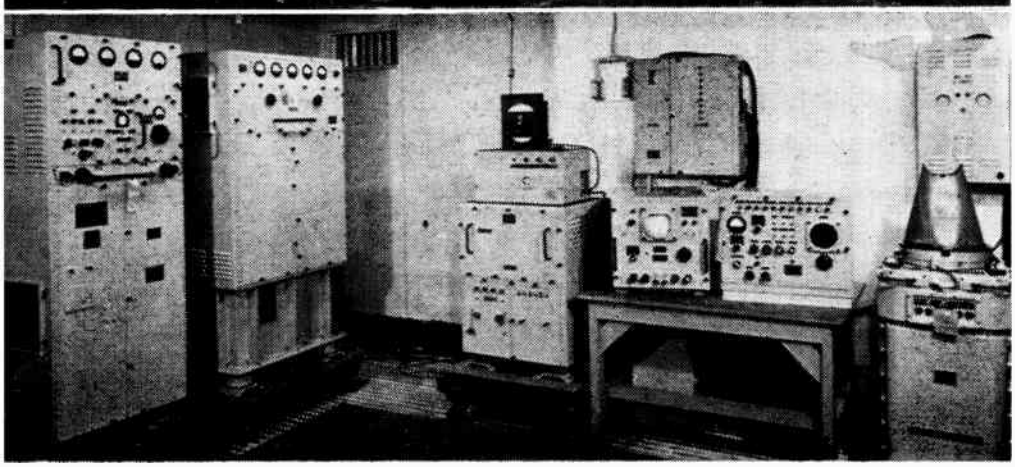
● Commodores H. N. Lay and W. H. G. Rogers inspect the equipment.

Weighing upwards of two tons, the complete equipment includes a stainless steel antenna which will be mounted high on the warships' superstructures, a transmitter, a modulator and several smaller parts. The antenna rotates continuously, sweeping the sky with a radio beam shaped like a fan on edge. The bearing and distance of an aircraft more than 100 miles distant are revealed at the instant it intercepts the radio beam. This information is then displayed instantaneously on the television-like screen of the plan position indicator unit.

The equipment's output is several hundred thousand watts and this can be increased to several million watts, making it the most powerful naval aircraft search radar in the world.

Commenting on the success of the demonstration, Commodore Lay emphasized that it could be of tremendous value to Canada in an emergency. He pointed out that the equipment was being manufactured in Canada so that the navy could be assured of production in that country and not be dependent upon United States sources. The builders, he said, were to be congratulated for the efficiency with which it had produced the first set to be delivered and for the manner in which the demonstration had been so successfully staged. When installed on Canadian ships the new equipment will be among the most powerful in use on any naval ships in the world.





● *Top* picture shows the 19 foot antenna of the new navy radar sets. *Bottom:* The Plan Position Indicators of the system.

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SPECIFICATIONS

FREQUENCY RANGE: 500 KC to 250 MC in eight ranges.

FREQUENCY ACCURACY: ±1%.

RESISTANCE RANGE (Rp): 15 to 100,000 ohms.

RESISTANCE ACCURACY (Rp): $\pm \left\{ 2 + \frac{Fmc}{200} + \frac{Rp}{5000} + \frac{Q}{20} \right\}\% \pm 0.2$ ohms.

CAPACITANCE RANGE (Cp): −100 mmf to +20 mmf.

CAPACITANCE ACCURACY (Cp): $\pm \left\{ 0.5 + 0.0002\ F^2\ mc \right\}\% \pm 0.15$ mmf.

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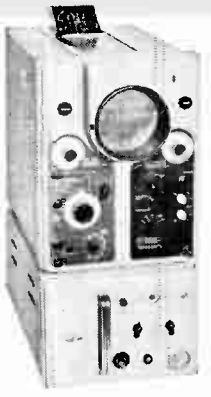

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For further data on advertised products use page 62.

Economics ÷ Engineering = Good Business

Canadian Engineering Skill Challenges Competition

IT is estimated that between 15 and 20 per cent of the Canadian market for electric motors has been captured by English manufacturers. This knowledge, combined with the fact that engineers have been aware for nearly fifteen years that some reduction in motor frame sizes could and should be achieved, has prompted Canadian General Electric engineers to produce the first polyphase induction motor to be built to the new revised standards of the Canadian Electrical Manufacturers Association. The resultant motor is a product which represents the first major development in the 1 to 75 H.P. class of motors to be introduced into Canada in more than 20 years. By virtue of its low cost, a 25 to 30 per cent reduction in frame size and almost 25 per cent lighter in weight than previous machines of the same horsepower, the new product is Canada's challenge to motor competition from abroad.

The startling size and weight reduction of the new motor has been achieved by the use of new materials and techniques which hitherto could not be used to full advantage in motor construction. Only by a complete redesign which is represented by the new machine could complete advantage be taken of modern core steels, insulating materials and manufacturing techniques which have been developed over the past twenty years.

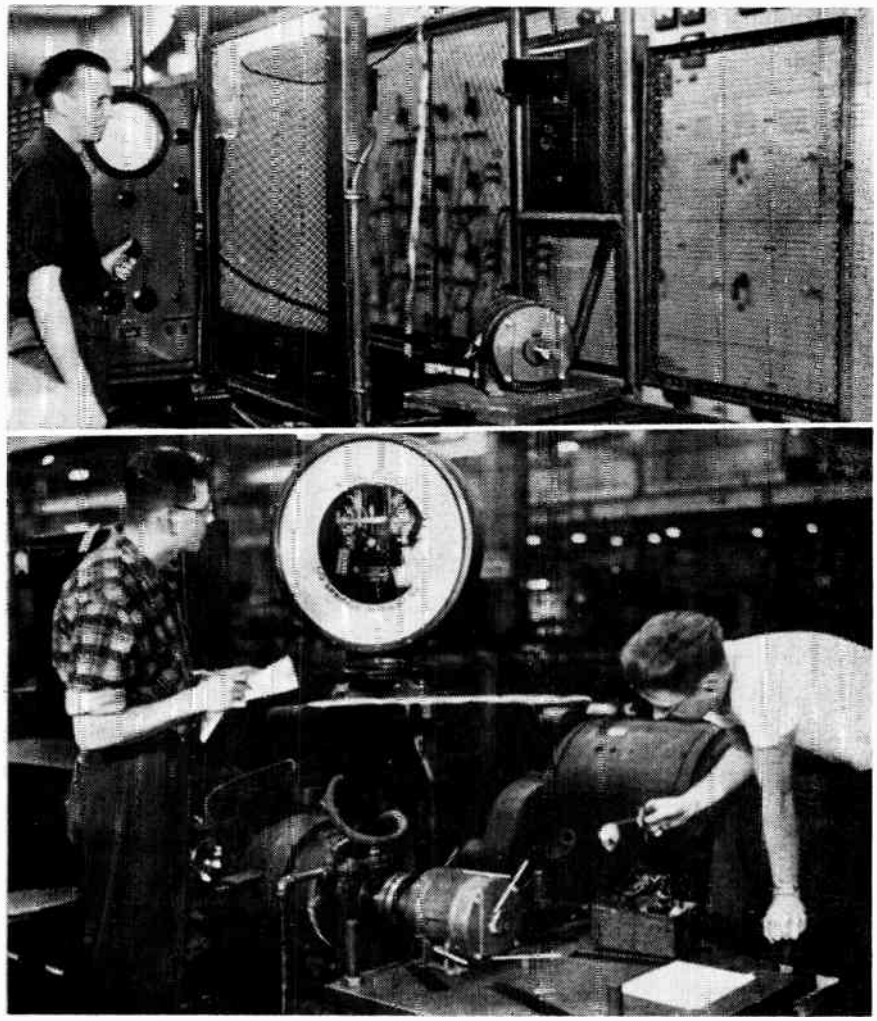
More Power For Less Cost

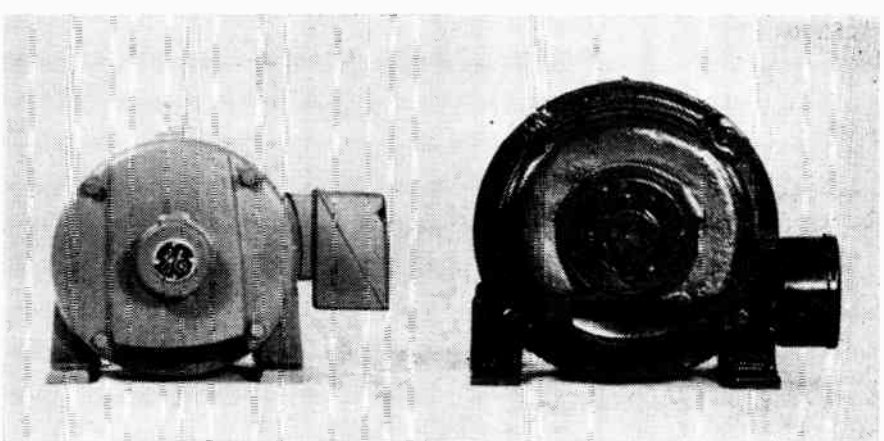
This revolutionary new type motor takes advantage of three things which have became available to engineers during the past few years, these are vastly improved materials, streamlining of mechanical design and great strides in the art of electrical design itself. The backbone of the motor insulation system, for instance, is a new polyester film. Considerably thinner than any previously used material, it is both physically and dielectrically many times stronger.

The new insulation is formex wire treated with Glypsil which is the well tried Glyptal varnish with Silicone added for better moisture protection.

This latest development in the design and construction of electric motors will enable the consumer to get more power for his dollar, or equal power at less cost.

Remarking on the competition that has eaten into the Canadian market for electric motors, R. M. Allemang, Manager of Marketing of the Motor and Control Department of C.G.E. expressed the views of his company with respect to tariffs as a means of protecting Canadian industry thusly: "We at C.G.E. are not sold on the idea that higher tariffs on these motors is the solution and prefer to combat foreign competition with a better product. We think this motor is the solution to the problem."



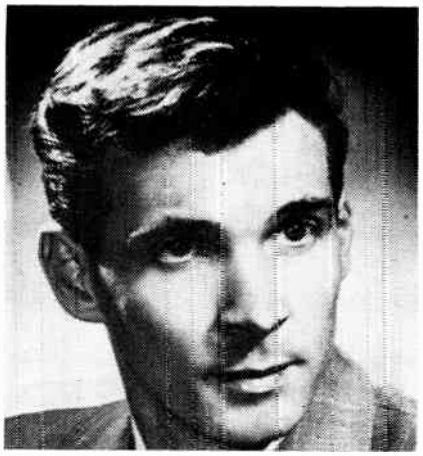


● *Top:* New CEMA motor being given surge test and Hipot at Peterborough works. *Center:* The new motor on dynamometer test stand undergoing full load heat run. *Bottom:* End view comparison of new CEMA standard motor with former motor. Pictured a two horsepower drip-proof motor of the new design on the left and a two horsepower motor of the former design on the right.

NEWS

Key Appointments By Rogers Majestic Electronics Ltd.

GEORGE W. CROSSMAN



GORDON H. DICKSON

Alan M. Crawford, Manager, Equipment Division, Rogers Majestic Electronics Limited, has announced the following appointments: George W. Crossan, Product Manager, Communications Department; Gordon H. Dickson, National Service Manager, Equipment Division.

Mr. Crossan, who will fill the newly created post of Communications Product Manager, was formerly Sales Manager of Bach Simpson Ltd., London, Ont. He is a member of the Institute of Radio Engineers.

Prior to his appointment as National Service Manager, Equipment Division, Mr. Dickson was Regional Service Manager with the Canadian Westinghouse Company.

Both men bring to their new posts a wealth of experience and knowledge in the electronics field which will bring additional strength to the expanding organization.

Cables, Conduits And Fittings Limited Plan $2 Million Plant

V. R. Longtin, President of Conduits and Fittings Limited, St. Johns, Quebec, has reported that his firm is planning the construction of a 60 to 80 thousand square foot addition to their plant facilities. The addition planned as a one-storey structure will cost in the neighborhood of two million dollars, including the cost of equipment.

The plant will be built on a 40-acre tract of land that has already been purchased and it is expected that construction will begin this fall with completion of the plant sometime in 1955.

At the present time the firm employs some three hundred workers and it is expected that this number will be increased by between 150 and 200 employees during the first year or two of operation of the new plant.

Cables, Conduits and Fittings manufacture high tension cables and were the leaders in the development of oil-filled high-voltage cables.

Marconi Research Manager To Ottawa To Direct Design Of Communications System

Mr. D. F. Wright, Manager of the Canadian Marconi Company's Research Department, has been seconded to Ottawa at the urgent request of the RCAF it was announced by Mr. H. A. Rice, Manager of Commercial Products Division here today. Mr. Wright has been asked to head up a group of engineers in connection with the design of a communication system of far reaching importance in the defense of our country. He will stay in Ottawa for an indefinite period.

Mr. L. T. Bird, at present heading the Engineering Department will, in addition to his present duties, take over the administration of the Research, Consulting and Microwave Departments. The combined organization under his charge will be known as the Research & Development Department.

Adams Engineering Limited To Represent Daven Company Of New Jersey

Adams Engineering Limited of Montreal and Toronto have been appointed representatives in eastern Canada for the Davens Company of Newark, New Jersey. The appointment was made known in a recent announcement by the Davens Company.

W. Edwards and Co. (London) Establish Canadian Branch

The formation of a new branch company by W. Edwards and Company, (London) Limited, Crawley, Sussex, England, in Canada has been announced. The branch company to be known as W. Edwards and Company, (Canada) Limited will have offices on Jutland Road, Toronto.

Mr. F. J. Pearce, who is a director of the new company is presently visiting the parent company in England.

Walter A. Cole To Manage Canadian General Electric's Micro-Wave Sales

To co-ordinate Canadian General Electric Company's sales in the expanding telecommunication's market, Walter A. Cole has been appointed Manager, Microwave Sales in the company's Electronic Equipment Department.

Mr. Cole is responsible for the sale of microwave radio systems, telephone and telegraph wire line and radio carrier multiplex equipment and associated products and services, including supervisory control telemetering and teletype equipment.

WALTER A. COLE

Mr. Cole was graduated from U. of T. in 1943 with the degree of B.A.Sc. in Engineering Physics. He is a senior member of the Institute of Radio Engineers and a member of the Association of Professional Engineers of the Province of Ontario.

Radio-Television Manufacturers Elect C. A. Pollock President

C. A. Pollock, President of Dominion Electrohome Industries Ltd., Kitchener, Ontario was elected President of the Radio-Television Manufacturers Association of Canada at the twenty-fifth annual meeting of the Association held in Niagara Falls June 10th and 11th.

Mr. Pollock has been actively associated with the Canadian radio and television industry since 1928 and has held the position of Vice-President of RTMA for the past two years after many years' service as a Director of the Association.

Co-relating his interests in the manufacture of radio and television, Mr. Pollock started the first exclusively FM station in Canada in 1949. Due to the lack of public interest in this method of sound broadcasting, the station was closed a few years ago. However, this contact with the business of broadcasting has recently resulted in his association with Central Ontario Television Limited. He is President of this Company, which operates CKCO-TV in Kitchener-Waterloo and serves Central-Western Ontario.

Ralph E. Hendershot Appointed Westinghouse Sales Manager

The appointment of Ralph E. Hendershot to the position of Sales Manager of the Lamp and Tube Division of the Canadian Westinghouse Company has been announced. Mr. Hendershot's former position with the company was Manager of manufacturing services in the company's Electronics Division. Mr. Hendershot has been with Westinghouse for 19 years being employed for the greater part of this time in the lamp and tube operations of the firm.

Subsidiary Company Formed By Beaconing Optical & Precision Materials Company Limited

J. A. Benard, Managing Director of Beaconing Optical and Precision Materials Company Limited, Montreal, has reported the formation of a subsidiary company, General Precision Industries Limited. The new company will handle Metrix test instruments.

The Metrix line which includes a wide range of accurate equipment used in the electronics and electrical fields, is made in France and enjoys a large market in many European countries. It is now being introduced into Canada where General Precision Industries will be the distributor and service organization. Mr. A. F. Wells has been appointed Sales Manager of the new company.

Tillsonburg To Get Electronics Branch Plant

The R. D. Fleck and Company of Toronto have leased 8,000 square feet of floor space from the Beaver Foundry in Tillsonburg which will be remodelled to carry out the processing of wired assemblies for the electronics and appliance industries.

This move on the part of the R. D. Fleck Company will bring a new industry to Tillsonburg which in the initial stages of operation will employ 10 to 15 workers. It is anticipated that operations of the new branch plant will commence around July 1st.

R. G. Griffith Appointed Chief Engineer Canadian Overseas Telecommunications

Douglas F. Bowie, President and General Manager of the Canadian Overseas Telecommunication Corp., has announced the appointment of R. G. Griffith, as Chief Engineer of the Corporation.

Mr. Griffith goes to the government owned system with a wealth of experience in the communications field gained from many years' association with the cable and wireless communication industry. In addition Mr. Griffith has a broad reputation in the sphere of design engineering and development in communications.

A. R. (Al) Jacques Joins Sales Staff Of D. Eldon McLennan

The appointment of Mr. A. R. (Al) Jacques to the sales staff of D. Eldon McLennan, manufacturers' representative of Vancouver, Canada, has been announced. Mr. Jacques possesses a wide experience in the radio field and served as signals officer in the R.C.A.F. with the rank of Flight Lieutenant during the war.

A. R. (Al) JACQUES

For the past eight years he has been associated with Taylor and Pearson (BC) Limited as Manager of the Electronics Division.

A. B. Hunt Reports To R.T.M.A. 25th Annual Meeting

In reviewing the work of the Board of Directors of the Radio Television Manufacturers Association of Canada for the past year, A. B. Hunt, retiring President of the Association told the Silver Anniversary Annual Meeting of the Association held at the Sheraton-Brock Hotel, Niagara Falls, last June 10th and 11th, that the year under report had been a particularly good one for the industry. In the twelve months ending April 30th, 1954, the members of the Receiver Division reported sales of 408,531 television receivers having a list value of over $158,000,000, an increase of 84 per cent over the 222,000 television receivers that were sold in the previous Association year. Despite the continuing rise in television sales, radio receivers continued to move at a healthy rate and although the 552,000 reported in the Association year just ended was down 10 per cent from the previous year it is still about 20 per cent higher than the year 1952-53 and is about double what was considered a good year pre-war.

A. B. HUNT

When the value of the defence orders and the sales and service of the many other electronic products handled by member companies, are added up the overall Canadian electronic industry is in the one half billion dollar per year class and the future looks extremely bright.

Membership in the Association continues to increase, Mr. Hunt said, and with the new companies that we have welcomed during the year and at this meeting, we now have a grand total of ninety-six made up of sixty-four in the Parts Division, twenty-one in the Receiver Division and eleven in the Technical Products Division.

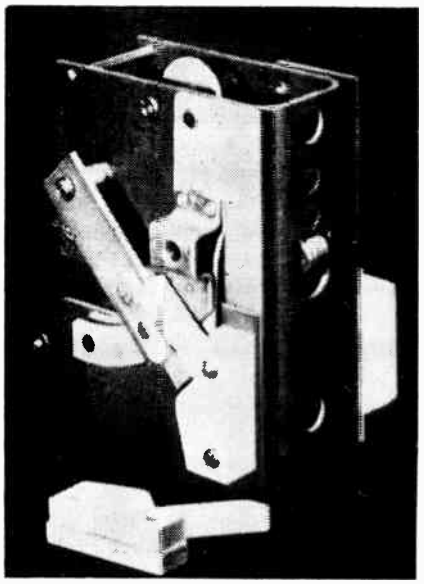
The principal change in the operations of the Association in the past year, Mr. Hunt said, has been in the increased emphasis that has been placed on work of the Divisions that has become necessary with the growth of the Association and the fairly recent addition of a Technical Products Division.

(Turn to page 28)

New Materials - - -

Electronic Industry Spurs Development Of New Plastics

A NEW paper-base electrical grade plastic, bonded with a polyester-modified melamine resin, has been developed to eliminate the difficult machining properties frequently encountered with the present series of melamine plastics.



● A typical end use for Phenolite Y-2401. Parts (like those in foreground) serve as limit stops for spring-loaded contact arm on this circuit breaker assembly.

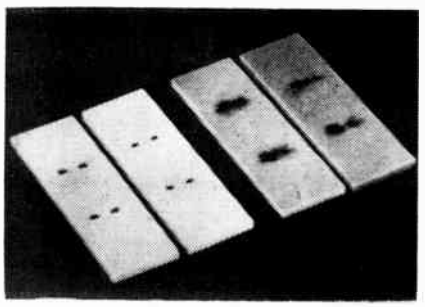
The new high pressure laminate is said to possess excellent dielectric strength, low dissipation factor and good moisture resistance. In its arc resistance, the new plastic, designated Phenolite Grade Y-2401, lies approximately midway between paper-base phenolic (NEMA Grade XXX) and paper-base melamine (NEMA Grade XX-M). Chief advantages to the electrical industry are that, compared with the electrical grades of the phenolics (such as Grade XXX), the new material has much superior arc resistance, dielectric strength, dissipation factor and moisture resistance. In addition, it is just as easy to machine as the paper-base phenolics.

Easily Worked

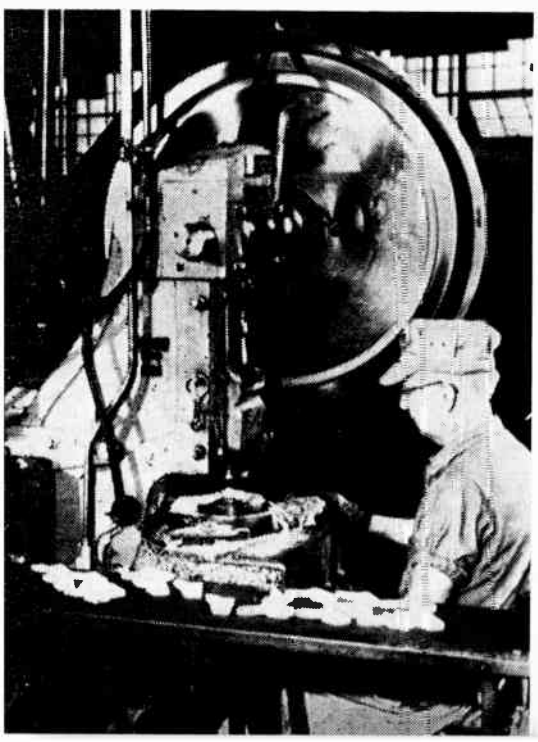
The melamine-polyester can be punched in thicknesses up to $\frac{1}{8}$ in., in contrast with a maximum of $\frac{1}{32}$ in. possible for comparable melamines used in electrical applications. In addition, sections up to $\frac{3}{8}$ in. can be shaped by shaving dies. Unlike the comparable melamine, it can be drilled, sawed, turned and milled using standard tools, rather than carboloy-tipped tools. In addition, because Grade Y-2401 is not brittle, it can be rough-blanked much closer to its final form, and therefore both requires less machining and reduces waste of stock.

Designed Applications

The melamine-polyester plastic is intended for such electrical applications as transformers, television and radar insulation, circuit breakers, switch bases and supports for sliding contacts — in fact, wherever good electrical and arc resisting properties are required. In the past, because of machining problems, it was sometimes necessary to fabricate these components from phenolic laminates in preference to the melamines. Now, such parts can be made from the modified melamine, but owing to superior arc resistance of the new material, the parts can be reduced in size while providing the same electrical properties.



● Set of samples of the new Phenolite, at left, is comparatively unaffected by the same arc test that burned completely across the two samples of NEMA Grade XX, at right.



● The new materials are easily machined and can be drilled, sawed and turned.

Calling all airports

Meet MIKE

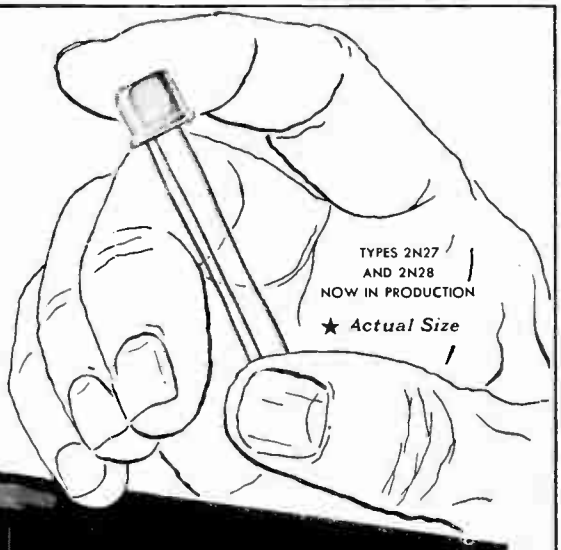
TINY transistors, the magic little devices destined to free many electronic applications from the limitations of the vacuum tube, have been applied successfully to the problem of developing a microphone to improve the quality of radio voice communication between pilots and airport control towers. In addition to increasing message intelligibility in vital operations such as stacking planes in "instrument weather", this new transistor microphone clarifies announcements to travellers in airport terminals and to passengers aboard the plane.

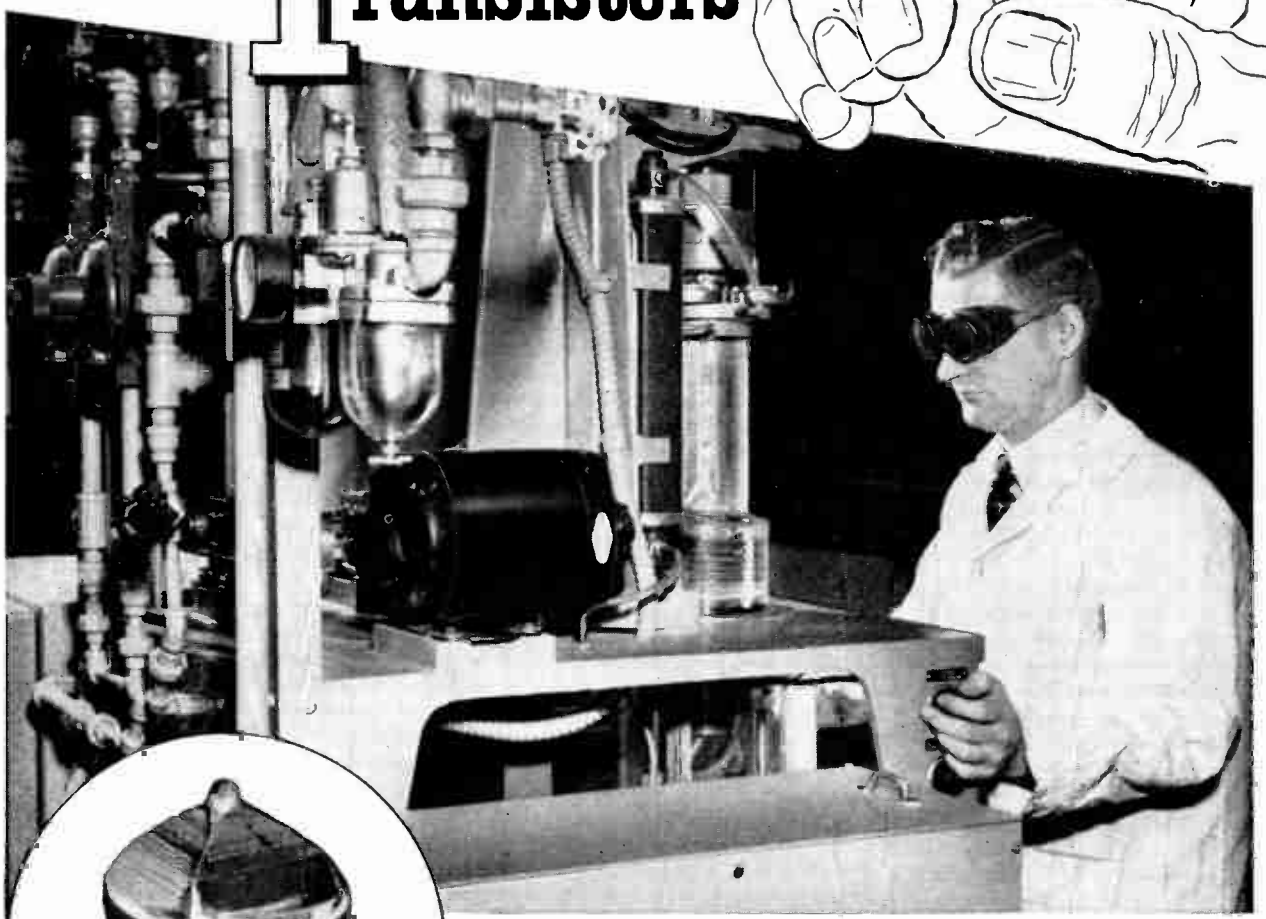
● It's Transistorized!

The range of sound transmitted by the carbon microphones commonly used in an aircraft is comparable to a telephone and covers little more than an octave in the musical scale. In a quiet home environment this is sufficient for the communication of information, but the high harmonics of the voice which give it characteristic clarity and timbre are missing. Such deficiencies are tolerated on a telephone, but in an environment where the talkers are immersed in noise fed into microphones by aircraft motors and in control towers which simultaneously monitor messages coming in from pilots over as many as fifteen different frequencies, the range of the present microphone is inadequate and makes communication with the pilot difficult under certain circumstances.

The new microphone with built-in transistor amplifier suppresses extraneous noises and more than triples the range to include voice frequencies from the lower part of the sixth through the ninth octave. This eliminates confusion in understanding letters like "b" and "v" so that it is no longer necessary to repeat messages and go through the routine "B" as in boy, V as in Victor" which is frequently impossible in an emergency.

Junction Transistors





Skill is required to operate complicated equipment installed in our Montreal Plant to produce grown NPN crystals for Junction Transistors.

"Single crystal" of pure germanium grown in our plant for use in Junction Transistors.

Based on Fundamental research in semi-conductors, Northern Electric now offers "Home Grown" NPN Junction Transistors.

- ★ *Manufactured To Close Tolerances*
- ★ *Alpha Closely Approaching Unity*
- ★ *Instantaneous Operation*
- ★ *Long Life*
- ★ *Hermetically Sealed*
- ★ *Withstand Mechanical Shock*
- ★ *Non-microphonic*
- ★ *Light Weight*
- ★ *Small Size*

Grown Junction Transistors have Superior characteristics especially for low power operation and compare favourably in respect to "Noise" with the best vacuum tubes. They are ideal for low level Transmission Amplifiers.

Northern Electric

COMPANY LIMITED

44 BRANCHES THROUGHOUT CANADA

2054-1

For further data on advertised products use page 62.

NEWS

(*Continued from page 25*)

L. J. Dennett Named General Manager Of Decca Radar (Canada) Limited

Decca Radar (Canada) Limited, the recently formed Canadian Branch of Decca Radar Limited, England, has as its General Manager Mr. L. J. Dennett. The announcement was made recently in "The Scanner" the house journal of Decca Radar Limited, England.

L. J. DENNETT

Mr. Dennett is a Canadian who served throughout the war with the Royal Canadian Air Force. For most of this time he was attached to No. 60 Group R.A.F. This Group was the Radar Group of the Royal Air Force, and in it Mr. Dennett obtained a wide experience of radar systems, rising to the rank of Squadron Leader.

After the war he joined the Decca Navigator Company and subsequently, on its formation, Decca Radar Limited. Since 1946 he has been responsible for building up the world-wide service organization which has played so vital a part in establishing both Deca Navigator and Decca Radar.

Sylvania Training Technicians For New Dunnville Plant

The Sylvania Company of Canada presently building a new plant in Dunnville for the production of television receivers have, in advance of completion of the plant, set up a production line in the town's arena. Forward thinking on the part of company officials has also resulted in the establishment of a 14-week training course in basic electronics which is being held at the Dunnville High School.

The course is being conducted by two specialists of the firms Buffalo technical staff, Dominic Spicola and Melbourne Smith. Fifty-five men are enrolled in the class the purpose of which is to train technicians in the technique of trouble shooting and testing.

The course, which will cover a period of 14 weeks consists of three, three-hour classes a week. The first seven weeks of the course will be devoted to theory and successful trainees will be given practical instruction on bench work at class rooms which will be incorporated in the firm's Dunnville offices.

The two instructors of the course will be assisted by R. R. Forbes, Plant Manager; R. Traquair, Plant Superintendent and O. J. Hayles, Plant Engineer. The course of training is considered to be the equivalent of similar courses given in accredited high schools.

Construction Started On New Cannon Electric Plant

Work has already started on the construction of new offices and factory building for Cannon Electric Canada Limited, well known manufacturers of all types of electrical connectors. The site chosen is 160 Bartley Drive, Toronto 16, and plans for the single floor building incorporating 20,000 square feet of work space were drawn up by J. B. Parkin and Associates. Although no definite completion date has been announced, it is anticipated that the new Cannon plant will be in full production sometime in September of this year.

Chase & Sons, Inc. Name Canadian Representative

Chase & Sons, Inc., Randolph, Massachusetts, have named Canadian Johns-Manville Co., Ltd., 199 Bay Street, Toronto 1, Ontario, as exclusive Canadian representatives for Glasterra, Chasbestos and other Chase electrical insulating materials.

J. E. Partridge Appointed Plant Superintendent Of Amphenol Of Canada Limited

J. E. Partridge has been appointed Plant Superintendent of Amphenol Canada Limited. In announcing the appointment, Mr. J. R. Longstaffe, President, indicates that Mr. Partridge's initial program will be to set up the Canadian manufacturing plant, working in close liaison with American Phenolic Corpn., Chicago.

J. E. PARTRIDGE

Mr. Partridge has had 15 years' electrical and supervisory experience and for the past four years was Shop Foreman of the Ontario Hydro Conversion Plant at Islington. From 1945 to 1949 he was General Manager of A. Cross & Co., responsible for the electrical shop, personnel, office records, and shop expansion.

McCurdy Radio Appoints N. J. Pappas and Gordon B. Thompson

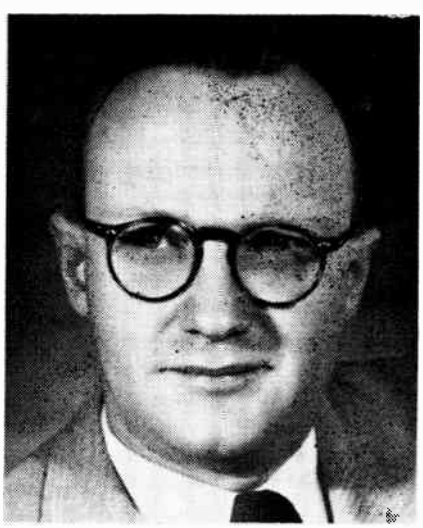
Two recent appointments to the Engineering staff of McCurdy Radio Industries Limited has been announced by George McCurdy. They are N. J. Pappas who has been named Chief Engineer and oGrdon B. Thompson will take over the position of Assistant Chief Engineer.

Prior to joining McCurdy Industries Limited, Mr. Pappas was for nine years with the Canadian Broadcasting Corporation, Montreal. Eight years of Mr. Pappas' employment with the C.B.C. was in the engineering design branch. Mr. Pappas is a graduate in mathematics and physics from the Sir George Williams College, Montreal.

Gordon B. Thompson comes to McCurdy Radio Industries Limited from the Northern Electric Company Limited where he was employed for seven years on development engineering of audio equipment for broadcasting stations. Mr. Thompson is a graduate in engineering physics from the University of Toronto. As Assistant Chief Engineer he will be in charge of broadcast systems design for McCurdy Industries. Mr. Pappas' appointment as Chief Engineer will place him in charge of systems and equipment design, and complete installation of broadcast and television stations.

Concurrent with the announcement of the appointment of N. J. Pappas and Gordon B. Thompson to the engineering staff of the company Mr. George McCurdy also announces the change of address of the company from 74 York Street to 22 Front Street, Toronto.

N. J. PAPPAS



GORDON B. THOMPSON

Cover miles in Seconds with Marconi

(CANADIAN DESIGNED) 2-WAY RADIO COMMUNICATIONS EQUIPMENT

Whatever your type of operation, Marconi Radio Communications Equipment puts you on the job though you may be miles away . . . with a flick of a switch you are kept up-to-date on the progress of your operation . . . information received and instructions are delivered in seconds . . . operations become more efficient and economical.

And because all Marconi Mobile Radio equipment is designed in Canada, it is specially suitable for Canadian requirements.

Marconi provides FM and AM Radio Communications Equipment for all types of industry and business, and has at your disposal competent communication specialists to help you plan your Communication system. They will gladly advise which type of equipment will best serve your particular needs.

Marconi has a complete line of Canadian designed Radio Communications equipment for immediate delivery. Marconi equipment has been specially engineered to provide continuous 24-hour operation. Another Marconi first. For further information call or write: Commercial Radio Communications Dept.

CANADIAN Marconi COMPANY

MONTREAL 16

Sales Offices:

VANCOUVER · CALGARY · WINNIPEG · TORONTO · HALIFAX · ST. JOHN'S

CANADA'S LARGEST ELECTRONIC SPECIALISTS

MARCONI originated in Canada 24-hour continuous duty equipment operation for 2-Way Radio. Another first for Marconi !

For further data on advertised products use page 62.

NEW PRODUCTS

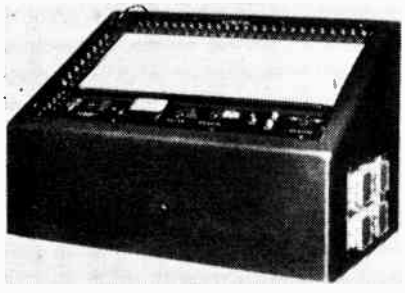
New Product specifications published in Electronics and Communications have been briefed for your convenience. If you require further information on any of the items published you may readily obtain such by using our Readers' Service, Page 62. Just mark the products you are interested in on the coupon on page 62 and the information will be in your hands within a few days.

• *Electrical Circuit Analyzer For Complex Circuit Testing*

Item 512

A new Universal Automatic Electrical Circuit Analyzer for testing any complex aircraft cabling system or control panel assembly, at speeds up to 200 circuits in 20 seconds, has been placed on the market.

Production has now started on this versatile machine, designed to test automatically



for line and insulation resistance simultaneously up to 200 Megohms featuring 28 and 500 volt D.C. test ranges, engineered with many outstanding features, emphasizing simplicity and speed of operation and unmatched flexibility.

Two hundred separate test positions are provided with separate facilities for operating external devices such as relays, at any test position.

Multiplier sections can be added, bringing the standard 200 circuit analyzer up to a 600 or 1200 circuit capacity.

Visible matrix type reference charts pinpoint circuit errors; fault pattern appears readily to indicate interacting circuitry. No time is wasted searching through instruction books.

• *A.R.C. No. 16706 Course Indicator*

Item 513

Starting in July, 1954, deliveries of A.R.C.'s Type 15D VOR Receiver may be had with the Cross-Pointer Meter and Course Selector combined in one instrument, the A.R.C. No. 16706.

This cuts in half the number of holes required on the instrument panel and makes dual VOR Receiver installations more practical. All other units of the equipment remain unaltered.

• *Coaxial Transmission Line And Waveguide Catalog*

Item 514

For use in Microwave, VHF, UHF Communications and Television, a complete new line of Co-axial Transmission Line and Waveguide is now available.

Supplied in accordance with Military specifications and RTMA standards, Air Dielectric, Teflon insulated Co-axial Line together with associated fittings is available for high power applications at frequencies up to 3000 megacycles. Six sizes of Co-axial Line and Waveguide, together with Couplings, Hangers, etc. are described in this new publication.

• *Type 303 Continuously Variable Time Delay Passive Network*

Item 515

A revolutionary new device for time delay matching or phase measurement of TV systems.

Resolution time less than 5 x 10-10 seconds, passing signals of any waveform. No time jitter.

Type 303 is very suitable for use as a time delay matching device in television systems, variable time delay for pulses, or precision

measurement of small time intervals. Both the bandwidth and the transient response are excellent. The rise time is less than 7 per cent of the time delay at any point and the amount of overshoot is less than 2 per cent. This instrument consists of an input amplifier, an output amplifier, and a continuously variable delay line of which the time delay may be adjusted continuously by the front panel dial. Ten different types of continuously variable delay lines are available with the shortest one being 0 to 0.05 microsecond and the longest one being 0 to 0.8 microsecond. The input impedance is 1 megohm shunted with 20 uuf. The output impedance is 1000 ohms shunted with 15 uuf. Both the input and output impedance can be made lower by shunting the terminals with proper resistors. Both amplifier stages have 15 megacycles bandwidth and 10 volts peak to peak maximum signal leved. Accuracy can be maintained within 1 per cent after calibration.

• *Infrasonic Voltmeter*

Item 516

The Model 316 Voltmeter has been developed primarily for the measurement and monitoring of small potentials in ultra-low frequency systems such as servomechanisms and geophysical equipment. A range of 20 millivolts to 200 volts peak-to-peak is directly read in four decade steps with an accuracy of 3 per cent throughout the spectrum of 0.05 cps to 30KC. Measurements are also possible between 0.01 cps and 0.05 cps when corrections are applied.

Pointer flutter is negligible down to 0.05 cps while discharge of the storage circuits for a rapid sequence of readings may be effected by a reset device.

The voltmeter features high input impedance, freedom from line disturbances, logarithmic voltage scale, and excellent long-term stability.

• *Subminiature Ceramic Capacitors*

Item 517

A new subminiature ceramic capacitor claimed to represent today's ultimate in capacitors, where minimum size is a paramount requirement has been announced. Mucon capacitors are used extensively in military equipment such as the handie-talkie, walkie-talkie and air-borne equipment, as well as commercial equipment such as hearing aids, TV tuners, etc.

Specifications on the reverse side describe properties of Mucon High Temperature capacitors, which are constructed of ceramic elements embodying the latest improvements in materials for use at temperatures up to 150° C.

• *Time-Temperature Program Controllers*

Item 518

An Electronic Dynamaster Recording Potentiometer is now available in the form of Time-Temperature Program Controllers.

These new program controllers regulate temperature according to a predetermined schedule of changing values. Any desired program, such as a heating, soaking, and cooling cycle can be accurately maintained. The desired schedule of temperatures is prescribed by the contour of a transparent plastic cam. The same controller can be used to maintain any number of different temperature programs, since cams of different contour are easily cut and interchanged. The instruments employ an electronic control system with proportional input action optionally available.

Complete specifications are given in a twelve-page Bulletin No. P1255, available from the makers.

(Turn to page 33)

TRENDS *(Continued from page 9)*

★ **A RECENT ISSUE OF THE YORK REPORT points out the swing to automation by the automobile industry. With the increased use of automation for industrial process control there will be born a new and demanding market for the producers of industrial electronic equipment.**

★ **FOR THE FIRST TIME IN CANADIAN HISTORY the facsimile method of telegraph operation has been installed to speed up service. The system went into operation recently following a ceremony in Montreal.**

★ **SUBMARINE CABLES LIMITED HAVE RECEIVED** an initial order from the British Post Office for the manufacture of about 90 per cent of the first of two transatlantic telephone cables to be run between Oban and Newfoundland. This portion of the new transatlantic cable will cost approximately $5,600,000.

★ **THE CANADIAN DEPARTMENT OF TRANSPORT have chosen VHF AM two-way radio telephone equipment of PYE manufacture for installation on airports throughout Canada.**

★ **CONSTRUCTION OF A 1200-MILE RADIO RELAY** network extending from Toronto to Winnipeg has been commenced by the Bell Telephone Co., of Canada. Forty-five radio relay towers will make up the network. They will be spaced at 25-mile intervals. The system will be used primarily to handle telephone traffic but will also be available for television transmissions.

★ **DURING 1953 — 437 LEADING AGENCIES in the United States and Canada placed 506,777 pages of advertising in business publications, over 36,000 more pages than were placed in 1952. Ranking 9th among all agencies for volume placed, was the Canadian agency Cockfield Brown and Company Limited. Seventeenth in this regard among all agencies was the MacLaren Advertising Agency Company Limited of Toronto, Canada. Other Canadian agencies whose business paper schedules exceeded the general average and also topped their own 1952 billings were Heggie Advertising Company Limited and the Walsh Advertising Company.**

★ **ACCORDING TO AUTHORITATIVE SOURCES the saturation point of TV sales in the Toronto, Montreal and Windsor areas stands at about 35 per cent.**

★ **PRODUCERS' SALES OF TELEVISION** sets continue to rise, and in February exceeded the sales of radios for the first time. TV set sales in February rose to 38,029 from 25,973 a year earlier, but radio sales were cut to 33,828 units from 47,696. TV receiver sales were higher in all areas, with the bulk of the sales in Ontario and Quebec. Ontario's sales were up to 18,348 units from 17,152, Quebec to 14,696 from 7,524, British Columbia to 3,923 from 1,288 Atlantic Provinces to 802 from 6 and the Prairie Provinces to 260 from 3. Largest reduction in radio sales occurred in Ontario where the number fell to 11,896 from 25,067; Quebec's sales were down to 6,948 from 8,535. Sales in other areas were higher, rising in the Atlantic Provinces to 3,605 from 3,242, Manitoba to 2,346 from 2,329, Saskatchewan to 2,147 from 2,071, Alberta to 3,740 from 3,371, and British Columbia to 3,146 from 3,081.

★ **SUSTAINED DEMAND DURING THE FIRST** quarter of 1954 for both local and long-distance telephone service was reported by the Bell Telephone Co. of Canada in its first quarterly review mailed to its 116,000 shareholders. President Thomas W. Eadie reported that growth in telephones was 37,500, not including 10,500 added by merger of a former subsidiary. The increase in long distance messages was nearly 8 per cent over the same period of 1953. Mr. Eadie pointed out that while operating revenues were considerably higher than a year ago, operating expenses also rose substantially and fixed charges have increased.

For further data on advertised products use page 62.

WESTINGHOUSE *now presents*

The *Continental* Type 315 5000 WATT AM TRANSMITTER

1. Unexcelled performance — very low intermodulation distortion.
2. Built-in corrective network for matching transmitter to highly selective loads often presented by directional antenna arrays.
3. Simplicity of installation. Self contained — no enclosure required — interconnecting cables furnished.
4. Automatic, electronically controlled, line voltage regulator.
5. New type, high speed, plate circuit breaker.
6. Two complete — new type — crystal oscillators.
7. Electronically controlled time delay.
8. Electronic type of arc-back indication and protection.
9. Vacuum capacitors — fixed and variable — in power amplifier circuit.
10. DC control system — eliminates buzzing and vibration of relays and contactors.
11. Built-in oscillograph for tuning and neutralizing.
12. Transview styled cabinet — permits observation of all functional equipment while in operation.
13. Matching type cabinets for phasing equipment available.
14. Increase to 10 KW output possible with no change in cabinet or floor space.

THE TYPE 315 5KW AM TRANSMITTER REPRESENTS a deluxe design of the high efficiency power amplifier type of circuitry, in which no features that would improve performance, reliability and ease of installation are omitted. It is especially suited to the requirements of present day regional stations utilizing directional antenna systems. Because of its inherent stability, the high efficiency power amplifier lends itself ideally to this application, and in the Type 315 it is further improved and particularly adapted to this requirement, by the addition of extra equipment for matching the transmitter output to the highly selective load circuit often presented by these directional arrays.

If you are planning a new station or thinking of replacing obsolete equipment — call in one of our engineers. He will tell you about our complete range of broadcast equipment.

YOU CAN BE SURE... IF IT'S Westinghouse

CANADIAN WESTINGHOUSE CO. LTD. / SALES AND SERVICE IN ALL PRINCIPAL CITIES • Electronics Division HAMILTON

For further data on advertised products use page 62.

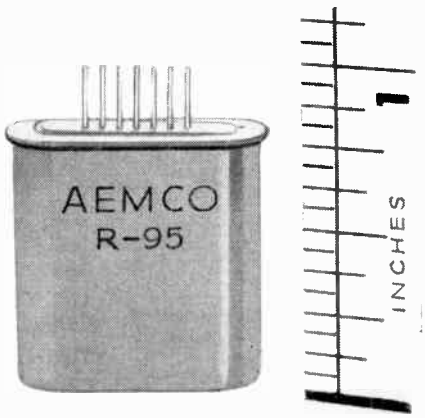
NEW PRODUCTS

(Continued from page 30)

● *Sub Sub-Miniature Relay*

Item 519

The illustrated article is the sub sub-Miniature relay developed after a number of years of engineering research to fulfill a great demand. General electrical characteristics are: Double pole, double throw contacts—capacity 1 Amp. — 28 volts — coil 900 Ohms — No. 44 Teflon Wire — Temp. 125 degrees Cent. Shock test



in excess of 150 G's without contact bounce or flutter. Table space ¾" wide, ⅛" thick, ¾" high. (Standard crystal case).

It is hoped in the near future coil resistance may be increased to 2,000 to 3,000 Ohms for use in plate circuits.

● *High Temperature Capacitors*

Item 520

A new development in high-temperature capacitors has been announced. This most recent addition to metallized paper capacitors has been given the trade-marked name of HY-MET, and features the use of a newly-developed, solid thermosetting impregnant which completely eliminates all possibilities of impregnant leakage, a serious problem in capacitor operation.

HY-METs are designed for exceptionally dependable operation over the wide temperature range of −50° to + 125°C. This outstanding performance has been achieved without sacrificing subminiaturization or any of the other outstanding characteristics for which metallized paper capacitors are well-known. HY-METs offer high insulation resistance, longer life, lower power factor and exceptional stability under extreme environmental conditions.

● *Handy Tool Catalog*

Item 521

A new catalog of handy tools for servicemen has been prepared and is being distributed to servicemen throughout the country by a well known electronics manufacturer.

The catalog describes both tools which have already become standard aids to the serviceman and newly-developed tools, such as CBS-Hytron's Twin Pin Straightener . . . for both 7-pin and 9-pin miniatures.

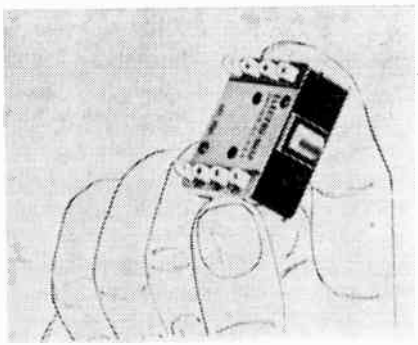
Most of the tools, such as the CBS-Hytron Soldering Aid, Tube Lifter, Probing Tweezers, and Miniature Tube Puller were developed as a result of prize-winning suggestions made by servicemen, themselves, in an idea contest sponsored by CBS-Hytron.

Other tools described in the catalog include 7-pin and 9-pin miniature and octal Test Adapters, a wax-tipped Pick-Up Stick, individual 7-pin and 9-pin Pin Straighteners, and the well known CBS-Hytron Tube Tapper, which can also be used as a pencil or eraser.

● *Double-Pole Precision Switch*

Item 522

One of Sir Isaac Newton's discoveries has been used by enigneers for the solution to instantaneous switching in a newly-developed double-pole precision switch. Operation of the two poles of the switch is based on Newton's reaction principle. When one pole starts to snap over, the resulting reaction force is used to simultaneously snap over the second pole.



The new switch has been developed as an inexpensive answer to switching circuits having two different currents, phases or voltages, but which must be switched at the same time. Because the new double-pole switch can simultaneously break or reverse current flow through two windings of a three-phase motor, it can be used as an inexpensive start-and-stop or limit switch on three-phase machinery This is but one of many applications where the switch can be used to replace expensive relays or to combine several switching operations into one action. The only double-pole switch to have eight terminals, it can operate as many as four separate circuits at one snap.

(Turn to page 24)

For further data on advertised products use page 62.

NEW PRODUCTS

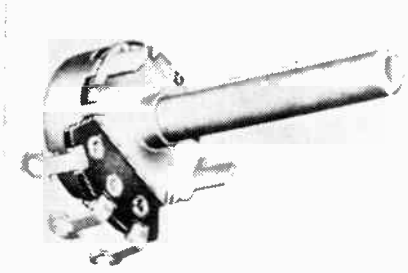
(Continued from page 33)

• *Tab-Mounted Variable Resistor, .894" Diameter*

Item 523

A miniature, low cost "bushingless" control for tab-mounting in television receivers, printed circuits, etc., has been announced. Measuring only .894 inches in diameter, the new controls dissipate a full .5-watt and can be supplied with any of nine different line switches.

Known as LR5 Variable Resistors, the units are mounted by two tabs extending from the front covers in much the same way as many can-type electrolytic capacitors. The tabs are inserted in rectangular slots of the mounting plate so that twisting the extended tab portions securely fastens the control. This construction eliminates the usual threaded brass bushing, lockwasher, and mounting nut. To preserve shaft alignment with negligible side motion, the front mounting plate has an extruded portion which serves as a bushing. The shaft itself may be furnished with a knurl, a slot, or both.



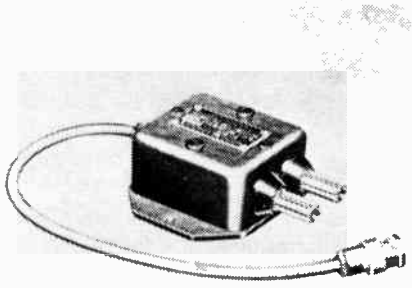
These low cost controls find greatest use as rear-of-chassis and concealed front panel controls in television receivers, pre-set gain controls for multiple input pre-amplifiers, and in other circuits requiring only occasional adjustment.

• *Coupling Unit*

Item 524

A manufacturer announces a new Coupling Unit, Type 564-A, which will permit the coupling of an external oscillator into the new Type 260-A Q Meter for Q measurements in the audio and supersonic frequency ranges.

The new Coupling Unit is housed in a gray



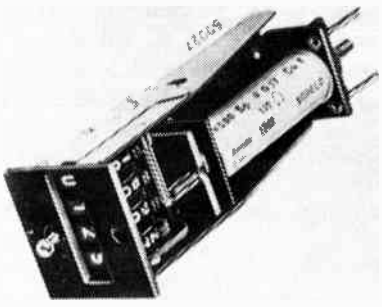
hammertone case 1¼" x 2½" x 3¾" and provides binding posts for connection of the external oscillator and a coaxial cable with BNC connector for convenient connection to the Q Meter. Physical mounting is by means of a drilled mounting flange which is provided.

Electrical specifications are as follows: Input Impedance — 500 ohms (when output is connected to Q Meter Type 260-A); Output Impedance — 0.3 ohms (provided by voltage injection circuit of Q Meter Type 260-A); Frequency Range — 1 KC to 50 KC; Input Voltage Requirements — variable up to 22 volts.

• *Miniature Impulse Counter*

Item 525

Miniature Impulse Counters TCeZ4E with instantaneous manual zero reset, panel type, owe their growing popularity not only to their miniature size (1.3386" x 1.2205" x 4.6850") but also to their low consumption (1.4 . . 2.5W) which facilitates their actuation by electronic tubes, and to their insensitivity to voltage variations within ± 15 per cent. Originally they were available for 4 V (12 ohms, 333 mA), 6 V (20 ohms, 300 mA), 12 V (100 ohms, 120mA), 24 V (350 ohms, 68.5 mA), 36 V (700 ohms, 51.5 mA), 48 V (1000 ohms, 48 mA), 60 V (1500 ohms, 40 mA), and special types 120 V (5800 ohms, 21 mA), and 160 V (10000 ohms, 16 mA), or the former in series with 8000 ohms 16 mA, the latter in series with 12000 ohms, 10 mA, for impulse frequencies up to 10 imp/sec. (impulse min. 40 ms, interval min. 50 ms). By somewhat increasing their consumption to about 6 W they have now become available for frequencies up to 25 imp/sec. (impulse min. 20 ms, interval min. 20 ms): 4 V (2.7 ohms, 1480 mA), 6 V (6 ohms, 1000 mA), 12 V (20 ohms, 600 mA), 24 V (100 ohms, 240 mA), 36 V (200 ohms, 180 mA), 48 V (350 ohms, 137 mA), 60 V (600 ohms, 100 mA), 120 V (2400 ohms, 50 mA). Their great success, especially in the USA, has led to the development of a five-digit model TCeZ5E by increasing the width of the front panel from 1.3386" to 1.6536". Both types have become available with optional electrical (0.4 sec.) zero reset (models



TCeF4E and TCeF5E) instead of the manual zero reset, by increasing the height, and may be supplied with armature contact or with secondary contact.

Lack Of Canada's Voice At Convention Regretted

By HAROLD S. MODLEY-JONES

AN examination of the record of Canadian Scientists and Electronic Engineers at the Annual Conventions of Radio Engineers held in New York each year, points out the lack of Canadian participation in this event. At the meeting held in March 1954 some 41,000 persons attended the technical sessions and associated radio show. These technical sessions are without doubt the largest sessions of their kind held annually throughout the world. During the past three years there have been some 680 speakers at these sessions. An examination of the programs shows that less than 10 Canadians prepared and delivered technical papers or acted as chairmen of the sessions. It is at these Conventions that Canadian engineers could bring to the world the fruits of their research and development, instead of sitting back in the shadows of engineers from other countries. It has been said that to listen to the ideas and ideals of creative minds can benefit all. This is true, but surely Canadians could express some of their ideas and ideals that others might benefit from their experiences.

It is suggested, then, that Canadian Sections of the I.R.E. undertake to present at the next annual convention in March 1955 a series of symposiums with personnel composed entirely of Canadian Engineers. There are seven Canadian Sections of the I.R.E., four in Ontario and one each in Quebec, Manitoba and British Columbia. Five of these Sections are within easy reach of New York, and many of the members of these Sections attend the annual conventions regularly. In addition there are many members who, because of their locale, are associated with Sections in the United States.

If one symposium could be given daily for four days of the convention, it should be possible to present one by the combined London-Hamilton Sections and one each by the Sections from Toronto, Ottawa and Montreal. The Sections from the western part of Canada have not been included in the above suggestion due to the long distance of travel which restricts the number of western engineers attending. Considering the wide field of electronic research in Canada and the abilities of Canadian scientists and engineers, subject matter should present no difficulty.

Planning Needed

If such a proposal is ever to become a reality, the close co-operation of Canadian Sections of the I.R.E., the Regional Director of the I.R.E., the Technical Program Committee and the Executive of the I.R.E. will be necessary. It is believed that such co-operation would be forthcoming, and that Canadian sessions would assist the I.R.E. in spotlighting future conventions.

There are two schools of thought

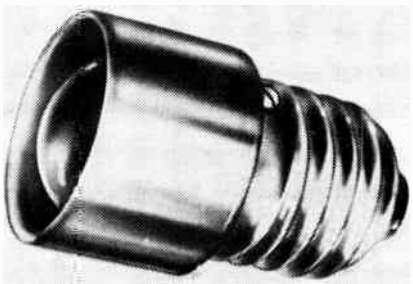
(Turn to page 68)

• *New Supersensitive CdS Crystal Photo Cell*

Item 526

Dr. B. Lange, Berlin, announces a new line of supersensitive CdS Resistance Cells for Switches, Counters and for Radiation measurements in the visible, infrared, ultraviolet and X-Ray frequency bands.

Those crystal cells are characterized by their extreme sensitivity, small measurements, insignificant dark current and low inertia. In relay operation response periods of 1/100 sec. are obtained. At light frequencies of 1000 cps 30-50 per cent of the photo current are still relayed. The dark resistance of the cells exceeds 100 Megohms and an illumination of 100 Lux (9.29 ft. cdles.) reduces that resistance to 1/100 and less.



The cells are available as Standard Photocells and as Activated Photocells: The former have at an illumination of 1000 Lux (92.9 ft. cdles.) a resistance of approx. 0.2-2 Megohms and a photocurrent of approximately 50-500 uA at 100 V Cell voltage; the photocurrent of the activated cells is approximately the decuple and attains 5-50 uA at 10 Lux (0.929 ft. cdles) already. In the lower range the photo current increases in linear ratio, and under high illumination it attains a limit value. The spectral sensitivity of the Standard Photocells reaches from about 400-600 mu with maximum sensitivity in the Green band at about 510 mu. The spectral sensitivity of the Activated Photocells has a considerably wider range, and cells with high UV, IR or X-Ray sensitivity may be supplied. Standard Photocells are used for the actuation of Relays and Electronic Tubes, while Activated Photocells are preferable for Measuring purposes and for faint illumination. They have also a better stability. The Cells will operate on D.C. or A.C., the rated maximum voltage being 100 V, the rated maximum load 1 mA.

The base of the cell is supplied with lamp thread E 10 (miniature), E 14 (Candelabra), E 27 (medium) or with four plugs. The latter has the advantage of positive orientation of the crystal and better insulation. It may be supplied with lense or diaphragm.

• *Model-A Circuit Matcher*

Item 527

The "Circuit Matcher" bridge compares production assemblies with a prototype "standard" in terms of per cent deviation. Subassemblies, etc., may be compared by plugging into corresponding tube sockets, plugs, jacks, cable connectors, etc. Special test cables with naval end plugs and mating adapters to the usual tube sockets are provided. Others available on special order. An unskilled operator may systematically perform the tests and rapidly record the errors for a technician to analyze and correct. Pushbutton selection is provided for a group of 9 test points. Connectors over 9 points may be checked by using multiple adapters. Separate AC and DC bridge operation isolates reactive and resistive errors with an accuracy of ± 1% over a wide impedance range. Circuit deviations up to ± 22% can be read directly. A built-in ohmmeter provides direct point to point resistance measurement in either "standard" or test unit. Instrument is complete with bridge supplies and balance indicators. Conservatively designed and ruggedly built with the best materials.

(Turn to page 41)

Canadian Luncheon - - - -

Electronic Sales Reps Warned Of Carpet Baggers' Invasion

ADDRESSING more than 120 members of the Canadian Electronic Sales Representatives at their annual luncheon held in the Conrad Hilton Hotel, Chicago, Harry A. Ehle, Vice-President of the International Resistance Company of Philadelphia and President of the Electronics Parts Show uttered a word of warning to the Canadian electronics sales industry. Mr. Ehle said that the American industry was beginning to give itself transfusions intimating that competition was at an all-time high since the war and that business showed signs of tightening up. As a result, Canadians could expect an invasion of "Carpet baggers" from south of the border. Canada, said Mr. Ehle, had built up a fine electronics industry which in his opinion will be invaded by competition from the United States. He advised Canadians not to be frightened by this competition, which he said would be rugged, but to absorb it.

● *Left to right:* Canadian Luncheon speakers: P. J. Heenan, H. A. Ehle, guest luncheon speaker and Ralph Hackbusch.

Competition, said Mr. Ehle, was a good thing. It resulted in better management, better engineering and better all 'round service. Mr. Ehle said that he hoped that Americans would understand us but doubted whether they would. Canadians therefore, would have to adopt themselves to the American way of doing business and initiate any adjustments necessary to meet the American technique of competition. Mr. Ehle saw this competition rising to the point where it would not only make a concerted bid for our business but would also bid to take from our business personnel of managerial and technical skill in the industry.

Guts Of The Industry

In tracing the recent history of the electronics sales industry in the United States, Mr. Ehle said that certain antagonisms had developed, apparently in the managerial categories, which could only be remedied by bringing in a second generation of managers. Such a step was necessary in Mr. Ehle's opinion if industry was to progress.

One of the great faults of the American industry, Mr. Ehle intimated, was the reluctance of old-time managers to give up their positions with the result that "normal attritions and heart attacks" were reducing their numbers leaving their positions vacant, a situation arising from their failure to train younger men in their skills. For this reason "the basic guts of the industry could fall apart" Mr. Ehle said. In the light of this American situation Mr. Ehle advised Canadians to mend their fences by bringing young men into the industry. It was, said Mr. Ehle, the responsibility of the manufacturer to pass on his skills. In closing Mr. Ehle passed on the warning that the basic mistake of industry was a lack of protection against itself.

● Members of the Canadian Electronic Sales Representatives Association and officials of American principals represented by them who attended the Canadian Room, Conrad Hilton Hotel, Chicago, held during the 1954 Electronics Parts Show last May 17th to 20th, are shown in the accompanying photographs. They are S. Cline and Jack Cartwright, Aerovox (Canada) Limited; H. G. Weir, Radio Trade Supply, Toronto; J. R. Dunn and V. B. Dowdell, Canadian General Electric, Toronto; H. Reiche, Department of National Defense, Ottawa; J. Key, Aerovox (Canada) Limited, Hamilton; W. A. Wilson, Northland Radio Supply; N. M. Best, Antiference Canada; George Belanger, Crobel Ltd., Que.; C. G. Ruth, Canadian Algar, London, Ontario; J. H. Pickett, Aerovox, New Bedford, Mass.; I. M. Leslie, Crosley Radio and Television, Toronto; Charles W. Pointon, Charles W. Pointon, Toronto; C. M. Wescott, Delhi Metal Products, Delhi, Ont.; S. Schacter, Aero Gasket Industries Limited, Toronto; M. Bobkin, Atlas Radio Company, Toronto; K. J. Davis, J. R. Longstaffe Company, Toronto; D. Kay, Addison Industries, Toronto; Milt Stark, Stark Electronics, Ajax; W. Furneaux, Aerovox, New Bedford, Mass.; W. Stephens, Astral Electric Company Limited, Toronto; A. F. Askew, J. R. Longstaffe Company, Toronto; H. R. Gray, Astral Electric, Toronto; Sol S. Budd, M. J. S. Electronic Sales, Toronto; Jack Aaron, Radio Center,

Montreal; Claude Simmonds, Claude Simmonds and Sons, Toronto; S. G. Smallwood, S. G. Smallwood Limited, Kitchener; Charles L. Thompson, Charles L. Thompson Limited, Vancouver; W. J. Doig, Northern Electric Company Ltd., Belleville; Alfred Williams, Custom Sound and Vision, Toronto; P. J. Heenan, P. J. Heenan Limited, Toronto; R. C. Kahnert, R. C. Kahnert Sales, Toronto; C. T. Adams, Poole Electronic Supply Limited, Windsor; Douglas J. Ward, Walter H. Belcher and George J. Dickson, Bowman-Anthony Limited, Windsor; W. F. Choat, Canadian Westinghouse Supply Co., Limited, Toronto; Arthur Usheroff, E. T. R. Supply, Montreal; H. W. McFadden, Canadian Industrial Consultant Ltd., Toronto; J. R. Longstaffe, J. R. Longstaffe Co., Toronto; N. Jack, Excel Distributing, Montreal; Al Manis, Manis Radio & Electric, Montreal; S. Sakaloff, Commercial Radio, Montreal; W. M. Smith, Fisher Radio Company, London, Bud Boss, Frank Gerry and Company, London, Ontario; David J. Gerry, Frank Gerry and Company, London; J. S. Morris, Atlas Wholesale Radio, Montreal; Leo J. Doucette, Radiovision Sales, Calgary; Leo Rosenberg, Lee Bern and Company, Winnipeg; Dave Elliott, Charles L. Thompson; B. A. Rosenberg, Radio Supply Company, Edmonton; E. G. Hill, Antiference (Canada) Limited, Toronto; C. J. Benninger, Fisher Radio Company, London; F. J. Fisher, Fisher Radio Company, London, F. W. Bardgett, Hallicrafters, Toronto; N. Coxall, Phillips Industries, Leaside, Toronto; W. K. Anderson, Anderson Sound Equipment, Hamilton; John Thomas, Lawrence Baker Company Limited, St. Thomas; C. M. Peterson, C. M. Peterson Company, London; W. Cohen, Montreal; A. Ainley, Rogers Majestic Electronics, Toronto; R. S. Williams, Rogers Majestic Electronics, Toronto; Lloyd Harris, T. S. Farley Ltd., Hamilton; John H. Williams, C. M. Peterson Company, London; H. E. Buchanan, Canadian Marconi Company, Toronto; Frank H. Gordon, Electrohome Sales, Kitchener; Howard Peterson, C. M. Peterson Limited, London; D. B. Black, J. R. Tilton Limited, Toronto; John R. Tilton, J. R. Tilton Limited, Toronto; Len Davidge, Hackbusch Electronics, Toronto, and E. S. Gould, E. S. Gould Sales Company, Montreal.

'54 Electronics Parts Show — — — — — —

Highlights Color TV Components And Hi-Fi Equipment

Ten thousand distributors, suppliers and sales representatives of the electronic parts industry saw the products that will go into next year's television, radio and allied products, at the Conrad Hilton Hotel during the three days of the Electronics Parts Show last May 17 to 20th.

Jobbers and suppliers from every State and thirty-one foreign countries visited the more than three hundred exhibits and display rooms. With the largest advance registration in the Show's seventeen year history, the Board of Directors, consisting of representatives of the industry's five trade associations voted this year to do away with all educational conferences and seminars at the Show, to concentrate exclusively on displays and individual appointments between distributors and manufacturers.

The Show, which is restricted to distributors and their suppliers, featured an unusually large number of new products, particularly in the color television components, equipment and high fidelity sound reproduction fields. Displayed in Exhibition Hall and on the fifth and sixth floors of the Conrad Hilton were several thousand types of speakers, amplifiers, tuners, recorders, antennas, cabinets, components, test equipment and other products which distributors throughout the world will be selling for original installations and replacement and for servicing.

The Show is sponsored jointly each year by the Radio-Electronics-Television Manufacturers Ass'n.; The National Electronic Distributors Ass'n.; the Association of Electronic Parts and Equipment Mfgrs.; the Sales Managers Club Eastern Group and the West Coast Electronic Manufacturers Ass'n.

● The 1954-55 executive of the Canadian Electronic Sales Representatives are shown above, left to right: C. G. Pointon, Vice-Chairman; Fred Harris, Chairman; and C. L. Thompson, Vice-Chairman, (Western). A. T. R. Armstrong, not shown in photo was elected Treasurer.

NEWS

(Continued from page 28)

Stuart Cline Appointed To Aerovox Sales Staff

J. Cartwright, Sales Manager, Aerovox Canada Limited, has announced the appointment of Stuart Cline to the Aerovox sales staff. Mr. Cline has been working in the sales department of

STUART CLINE

Aerovox for the past four years, and has just completed the course in radio and TV broadcasting at the Ryerson Institute of Technology in Toronto. In his new position he will be calling on radio parts jobbers, set manufacturers and industrial accounts.

Douglas M. Gow Joins Leonard Electric Limited

Leonard May, President of Leonard Electric Limited has announced the appointment of Douglas M. Gow as Office Manager of the firm.

Mr. Gow has had extensive experience in the electrical industry having been associated with W. R. Key Limited and Canadian Acme Screw and Gear Limited and in addition possesses a wide practieal knowledge of the electrical industry. Mr. Gow served four years with the Royal Canadian Engineers during the last war.

Flamboro Instrument Company Announces New Service Facilities

Herbert W. Bennett, President of the Flamboro Instrument Company, Dundas, Ontario, has announced the establishment of plant facilities to fill the need of manufacturers and research establishments requiring production facilities of the highest quality but whose demands do not warrant the setting up of a special production line with its attendant expense of low volume production runs.

Flamboro Instrument Company has been in operation for about two years during which period the firm has devoted considerable time to development projects.

Emerson Radio Of Canada Limited Formed

The formation of a new company to manufacture and sell television and radio receivers in Canada was announced recently. The new company will be known as Emerson Radio of Canada Limited.

R. K. GRANT

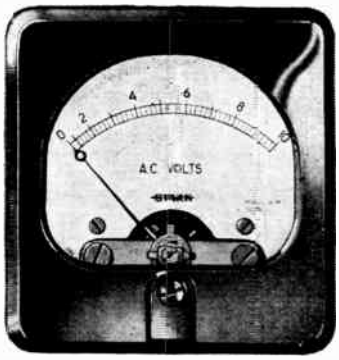
S. J. SINCLAIR

Mr. S. J. Sinclair will be President, with Mr. Rupert K. Grant, Sales Manager. Head office will be in Montreal, at 74 Trenton Avenue, Town of Mount Royal.

Emerson Radio of Canada Limited will sell its line of television and radio receivers through distributors from coast to coast. Manufacturing operations are already underway and models will shortly be available on the market.

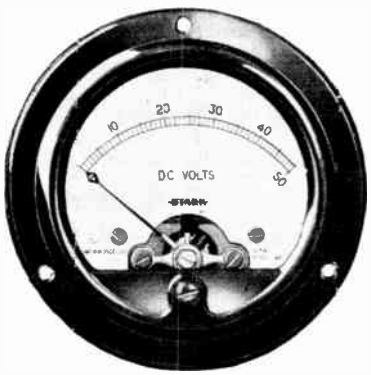
(Turn to page 42)

For further data on advertised products use page 62.



MODEL 704. AC volts, amperes, milliamperes. Moulded bakelite 3" rectangular case. (Also available in 3½" round case.) Flush mounting, spade or lance type pointer. Scale length 2.03".

MODEL 604R. DC volts, amperes, milliamperes, microamperes. Moulded bakelite 3½" round case, flush mounting, spade or lance type pointer. Scale length 2.4". Also available in 2½" round case—Model 605R.



MODEL 804. DC volts, amperes, milliamperes, microamperes. Moulded bakelite 4" rectangular case, flush mounting, spade or lance type pointer. Scale length 3.7". Also available in 3" rectangular case — Model 604. NOTE: High overload R.F. Meters also available with internal thermocouple in all case sizes.

HERMETICALLY SEALED METERS

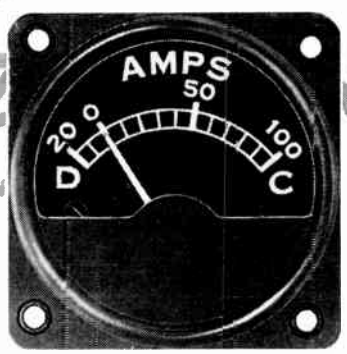
Approved MIL-M-6A Stark Hermetically Sealed Meters. Available as voltmeters, ammeters, milliameters, microammeters and wattmeters — for precision registration under severe conditions.

FOR

indicating instruments

see STARK

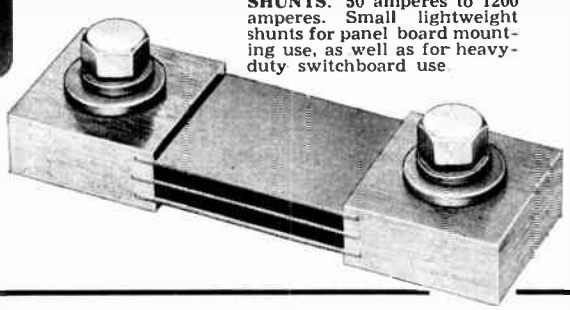
• More than 20 years of experience in design, manufacture and assembly backs every Stark Indicating Instrument. Each meter is built to rigid specifications and, in every step of manufacture they are carefully examined and checked against standard cell potentiometers. Before you buy an indicating instrument — get in touch with Stark. Our engineering department is at your disposal to assist and advise you.



MODEL 605A

DC Aircraft Indicating Ammeters, Voltmeters, etc. Manufactured in accordance with applicable aircraft specifications — ammeters supplied with self-contained or external shunts. Scale length 1.9".

SHUNTS. 50 amperes to 1200 amperes. Small lightweight shunts for panel board mounting use, as well as for heavy-duty switchboard use.



MODEL 46-250. 250 degree DC Movement available in all standard microampere, milliampere and voltmeter ranges. A most practical instrument where long scale length is important.

STARK ELECTRONIC INSTRUMENTS LIMITED

5309-R

Head Office and Factories:
Ajax, Ontario.
Foreign Division:
276 West 43rd St.,
New York 36, N.Y., U.S.A.
Sales Office:
2028 Avenue Road, Toronto.
Cables: Starkex, New York.

For further data on advertised products use page 62.

RIPLEY RIVET GUN

SETS OVER 30 A MINUTE

SIMPLIFIES DESIGN — SPEEDS PRODUCTION

Close Hole Tolerances for inserting.
Explosive rivets not required.

FOR MASS PRODUCTION

Tips of Nichrome Steel.

AN EASY ONE-MAN JOB

No hammer or bucking bar required — light, easy to use under all conditions.

Sets Explosive rivets in less than two seconds.

S.P. MIRACLE EYE
Ripley Sunswitch

For automatic unattended control of your lighting. Applications for street and highway, signs, railroad, construction, radio and TV, airport, floodlights, factory—from 500-6,000 watts.

ELECTRONIC LIGHT WATCHMAN

Turns lights on at dusk — off at dawn, automatically — for entrances, over safes, garages, yards, show windows and the home.

L-R BLOWERS
Weighs only 2½ ozs.

The midget with the hurricane force. For cooling aircraft and electronic equipment—all places where size and weight must be considered.

ALL LEADERS IN THEIR LINE!

DOUBLE-DUTY
60 SERIES

- Electronic Switches
- Timers and Relays
- Photo-Electric Controls
- Liquid Level Controls
- Electronic Counters
- Safety Controls
- Burglar Alarm Systems
- Smoke Controls
- Registration Controls
- Web Alignment Controls

RIPLEY COMPANY, INC., MIDDLETOWN, CONNECTICUT

Canadian Organization

JOHN HERRING and COMPANY LTD.

3468 DUNDAS STREET WEST TEL.: MU. 9824 TORONTO, ONTARIO

For further data on advertised products use page 62.

NEW PRODUCTS

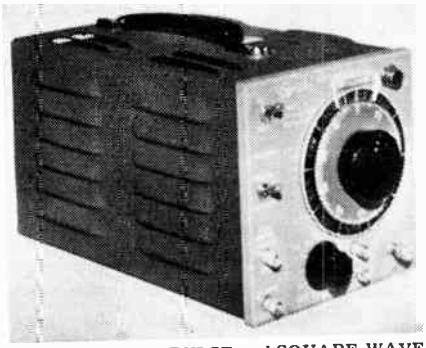
(Continued from page 35)

● *Model G-1 Pulse And Square Wave Oscillator*

Item 528

A Model G-1 PULSE and SQUARE WAVE OSCILLATOR is a source of pulses and square waves with accurate, continuously variable repetition rates variable from 1 pulse per second to 100,000 pulses per second in five decade ranges. These repetition rates may be controlled by the main dial or by an external control voltage to an accuracy of 1 per cent.

Three outputs are available. Positive and negative pulses of .2 microsecond width and 30 volts amplitude are simultaneously available, together with a square wave of 75 volts amplitude.



The Model G-1 PULSE and SQUARE WAVE OSCILLATOR can be used as a variable frequency master timing oscillator in laboratory experiments; for the determination of operating rate limits of equipment under test; and, as a frequency modulated oscillator in data transmission systems.

This instrument is 7½" x 7½" x 13" overall. It weighs 15 pounds.

● *Transistor Manual* *Item 529*

Filling a definite need is a down-to-earth, comprehensive, 8-page transistor manual published by a well-known firm of manufacturers.

Profusely illustrated, the Transistor Manual is in three parts: 1 — Theory. 2 — Data. 3 — Application. Contained are nine different basic transistor applications. Both point-contact and junction transistor operation are explained by vacuum-tube analogy. Also clearly described are conduction by "holes," and P-N-P and N-P-N transistors.

Pointing out that the transistor, although one of the newest electronic devices, is actually a descendant of the crystal detector of early radio, the manual states that the transistor is capable of performing many of the functions of the vacuum tube, in addition to opening new fields of application that were not possible, or even conceivable, with the vacuum tube.

Although the device is still in the early stages of development, sufficient progress has been made to foresee the tremendous advantages of transistorized circuits, the manual declares, with exceptionally small power consumption being especially advantageous. Reduction of equipment size, elimination of filament-power requirements, instantaneous operation, and exceptionally long life are other advantages cited.

Looking ahead, the manual states that the transistor will supplement the vacuum tube, whose usage will continue to increase. Problems to be overcome before the transistor can find universal application are described as are drawbacks which have been eliminated by engineers.

Included in the manual's application section, which constitutes an introduction to transistor circuitry, are hearing-aid and radio-receiving circuits which employ transistors, and a circuit for use in switching applications.

All in all, the Transistor Manual is an easy-to-take introduction to the way transistors work, their characteristics, and methods of application.

● *Hard Glass Reliable Beam Power Amplifier Tube*

Item 530

A new beam power amplifier, 6094, has been added to the line of reliable tubes. Incorporating features that promote long life, the tube will assure long, dependable service and uniform operating characteristics under severe operating conditions. This tube is designed to replace the 6AQ5/6005 and other such tube types.

Each 6094 is run-in tested and aged under

vibration with all operating voltages applied for forty-five hours. This run-in serves to reduce early failures in actual operation. This tube is designed for use in equipment in which high ambient temperatures and high levels of vibration, shock and other accelera-

(Turn to page 44)

For further data on advertised products use page 62.

● The new premises of Amphenol Canada Limited situated at 300 Campbell Avenue, Toronto, will provide 30,000 square feet of floor space for manufacturing and office facilities.

J. R. Longstaffe To Head Amphenol Canada Limited

For many years one of the best known trade names in United States in the field of electrical-electronic components, Amphenol now returns to Canada as Amphenol Canada Limited, with a manufacturing plant and offices in Toronto, Ontario.

This undertaking is to be a Canadian operation with its manpower, management, and engineering being reinforced and aided by the United States company to whatever extent may be necessary at the outset and these only as long as conditions demand.

The new company is chartered as Amphenol Canada Limited, under the presidency of J. R. Longstaffe of Toronto. The Directorate consists of: J. R. Longstaffe, W. J. Bushnell, J. T. Band, A. J. Schmitt, A. Trevor Jones, the latter two representing United States interests.

To house Amphenol Canada Limited operations, 30,000 sq. ft. of modern manufacturing and office facilities have been acquired at 300 Campbell Ave., Toronto, Ontario. Sales offices are to be maintained in leading cities from coast to coast.

Teletronics Laboratory Names C.D.C. As Canadian Agent

R. S. Marston, President of Teletronics Laboratory Incorporated, Westbury, Long Island, has announced the appointment of Computing Devices of Canada Limited, Ottawa, Ontario, as their Canadian agents.

Announcement has also been made that William Herrmann has been named to the position of Product Sales Manager of Teletronics Laboratory, designers and manufacturers of electronic test equipment.

Dr. D. W. R. McKinley Appointed Assistant Director at N.R.C.

Dr. D. W. R. McKinley who ranked as one of the leading radar experts during World War II and whose work with the National Research Council of Canada on radar research helped to place advanced designs of equipment at the service of the allies has been appointed Assistant Director of the Radio and Electrical Engineering Division of the National Research Council.

(Turn to page 44)

For further data on advertised products use page 62.

For further data on advertised products use page 62.

NEW PRODUCTS

(Continued from page 41)

tions are encountered. A hard glass (nonex) bulb and stem with tungsten pins are used. This, along with careful exhaust to a very low vacuum, permits operation of the 6094 at bulb temperatures up to 300°C in contrast for an average of 175°C for soft glass bulbs. Ceramic spacers, instead of micas, are used for element separation. This eliminates the common problem of mica deterioration and consequent loss of emission and, in addition, reduces damage caused by fatigue failure of parts. These tubes have a cathode type structure with extruded ceramic heater insulator and a coil type heater, permitting operation at high heater-cathode voltages. This construction, along with the ruggedized mount structure, virtually eliminates heater failures, shorts and other adverse effects of shock and vibration. The tube has a 9-pin miniature button base and can operate at altitudes up to 80,000 ft.

The 6094 is especially designed for aircraft, industrial, military and other applications where severe environmental conditions are encountered.

• *New Teflon Catalog Available*

Item 531

The latest technical data on "Teflon"* for the chemical, electrical and electronic industries is now available in an 8-page catalog. Applications and possibilities for the material are described in detail along with the outstanding properties and characteristics of "Teflon". The booklet is illustrated with a complete set of tables, charts and sketches. A special summary deals with design considerations in using "Teflon" while extra help is offered through a technical service section on the cover. The booklet catalogs the POLYPENCO "Teflon" products in the forms of rod, tubing, slab and tape with specifications on size, shape and tolerance.

• *Engineers Handbook Of Special Grade Laminates*

Item 532

Data sheets on special grades of laminates of especial use to the electronics and communications industries and a new handbook on phenolite plastics is now ready for mailing to engineers, designers and purchasing agents by a nationally known manufacturer of these materials. Also available to the trades is the latest data sheet on copper clad phenolic for printed circuit work.

• *Electromagnetic Relays (P.O. 3000 & 600)*

Item 533

Electromagnetic relays built to the following specifications are now available: coil windings up to 80,000 ohms, contact capacity up to 8 amps., insulation up to 5K.v., and finishes ranging from ordinary to inter services tropical and jungle finish. Standard relays can be supplied to operate from .75 milliamps, and special relays from about 30 microamps (suitable for P.E. cell operation). The latter are master relays which will operate slaves.

If speed of operation is your problem we can supply a range of relays from balanced reed at 1000 c/s to slugged relays at 400 m/s.

Although P.O. relays are not for pure AC operation modified relays can be supplied to operate directly from the mains with a current consumption of 25 m/a.

P. O. Key Switches can also be supplied to specification.

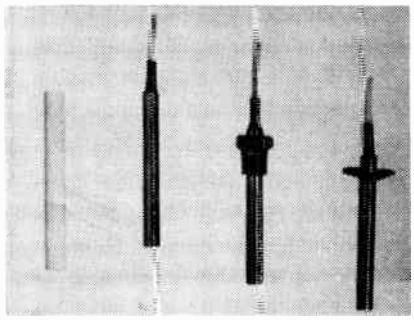
• *Two-Wire Midget Thermostat*

Item 534

A new series of precision midget thermostats — no larger than a pencil stub and weighing little more than a 25-cent piece — has been developed. These heat controls, called the midget Thermoswitch, are ¼-in. in diameter and approximately 2⅜-in. long.

Because of its unusually small size and double-lead design, the midget thermostat may be used (with suitable relay circuit) as a precision temperature controller in any heated device, such as a platen, where installation space is closely limited. It may also be used as an overheat detector in high-rpm machine bearings, ovens, oil pumps, heater ducts, in fact wherever overheating might endanger a process or mechanism.

The performance of the thermostat represents a substantial achievement in the design of miniature temperature controls. Although the volume of its shell is only one-twelfth that of standard Fenwall Thermoswitch units, the midget unit retains such operating characteristics as built-in temperature anticipation, fast reaction time, short heat transfer path, wide operating range and uniform sensitivity.



The thermostat is unusually stable under shock and continuous vibration. Under continued 10 G vibrations exerted along each of three mutually perpendicular planes, the unit will maintain its present actuation temperature to approximately 5 degrees F.

The midget Thermoswitch unit is factory set to actuate at any selected temperature in the range of -65 to + 450 F. Depending on the set point, the unit will have an accuracy of 1 to 5 degrees F. It is designed for 1 amp service at 115 volts A.C. or 32 volts D.C.

(Turn to page 46)

For further data on advertised products use page 62.

● The 1954-55 RTMA Transformer Sub-Committee: C. A. Norris, H. D. Idler, G. L. Sloper, H. Stewart, G. Irwin, J. G. Hutchinson, R. W. Little, A. K. Bernard, B. Underwood and W. Block.

List Of Standard Letter Symbols For Acoustics Now Completed

Signal and communications engineers, theater operators, radio and television technicians and manufacturers, and other persons engaged in work involving acoustical measurements now have available an American Standard on Letter Symbols for Acoustics.

The new standard lists more than one hundred symbols for terms used in acoustics measurement. It is published by The American Society of Mechanical Engineers under the procedures of American Standards Association.

Preparation of the standard was begun in 1949 by a group under the Chairmanship of Harry F. Olson, RCA Laboratories, Princeton, N.J. The group operates under the Sectional Committee on Letter Symbols, Chairman of which is H. J. Turner, Associate Professor of electrical engineering at Yale University.

Copies of the new standard, which has been assigned the designation ASA Y10.11-1953, may be obtained at $1.00 from Order Dept., ASME, 29 W. 39th St., New York 18, N.Y. Discounts are available for quantity orders.

R.T.M.A. Transformer Sub-Committee Meet In Dundas

More than one hundred engineers representing the Canadian electrical manufacturing industry were guests of the Transformer Sub-Committee, Parts and Accessory Division, Engineering Committee, Radio Television Manufacturers Association of Canada at a meeting held in the Collins Hotel, Dundas, Ontario, May 26th last.

Following the formal meeting of the committee invited guests were conducted on a tour of the plant of El-Met-Parts Limited, manufacturers of transformer laminations after which the more than one hundred visiting engineers were guests of the Transformer Sub-Committee at a reception and dinner.

Guest speaker was Mr. William Jones, of the Armco Steel Corporation, Middletown, Ohio, who spoke on the subject of "Transformer Core Steels".

Members of the Transformer Sub-Committee and their firms who were hosts to the gathering are as follows: G. Irwin, Chairman, Elora Industries Limited; H. Stewart, Allanson Armature Mfg., Co.; J. G. Hutchinson, Audio Transformer Co.; A. K. Bernard, Canadian Westinghouse Company; G. A. Norris, Copper Wire Products Limited; W. Bloch, El-Met-Parts Limited; E. A. Pollard, Federal Wire and Cable Company Limited; H. D. Iler, Hammond Mfg., Co.; R. Hastings, R.C.A. Victor Company Limited; and R. W. Little and Bruce Underwood, Standard Television Products Limited.

(Turn to page 48)

● Host and Guest Speaker at recent RTMA meeting in Dundas are left to right, A. L. Stopps and William Jones.

For further data on advertised products use page 62.

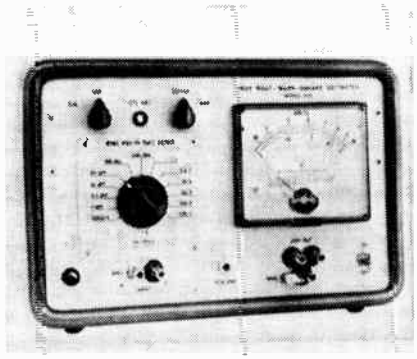
NEW PRODUCTS

(Continued from page 44)

● *True RMS Voltmeter*

Item 535

The Model 320 is the first commercially available voltmeter of the ultra-sensitive type to measure true root-mean-square values of highly complex wave forms in addition to sinusoidal waves. It operates over a range of 100 microvolts to 320 volts and in a band of 5 cps to 500 kc. Accuracy is better than 3 per cent between 15 cps and 150 kc for any reading regardless of scale position.



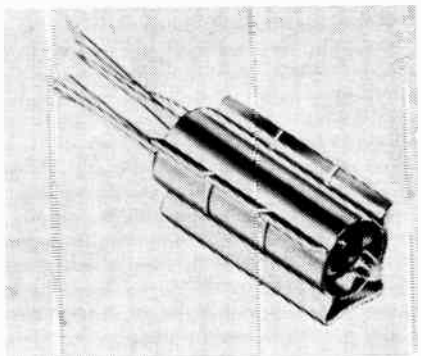
Other features include 10 megohm input impedance, provision for simultaneously observing the voltage reading and monitoring the amplified signal with phones or C.R.O., and a built-in calibrator unit for correcting the effects of advanced aging of tubes. Accessories are available for extending voltage range to 20 microvolts and 10 kilovolts and for measuring rms currents from 0.1 microampere to 10 amperes.

● *Subminiature Tube Holder*

Item 536

New light-weight SUBMINIATURE TUBE HOLDER made of Cadmium Plated Spring steel with silver plated Brass Tube Shield provides space-saving, economical and convenient methods for firm holding in fixed positions in relation to a mounting surface.

Sub-miniature tubes, held in place by the holders, withstand high shock and vibration encountered in Mobile Electronics such as Guided Missiles.



Their compact design facilitates neatness and more reliable electronic packaging. Electronic equipment using this construction technique has withstood tests of 10 to 500 cps from 5 to 20 g for 8 hours without resonance.

● *Paper-Dielectric Capacitors Catalog*

Item 537

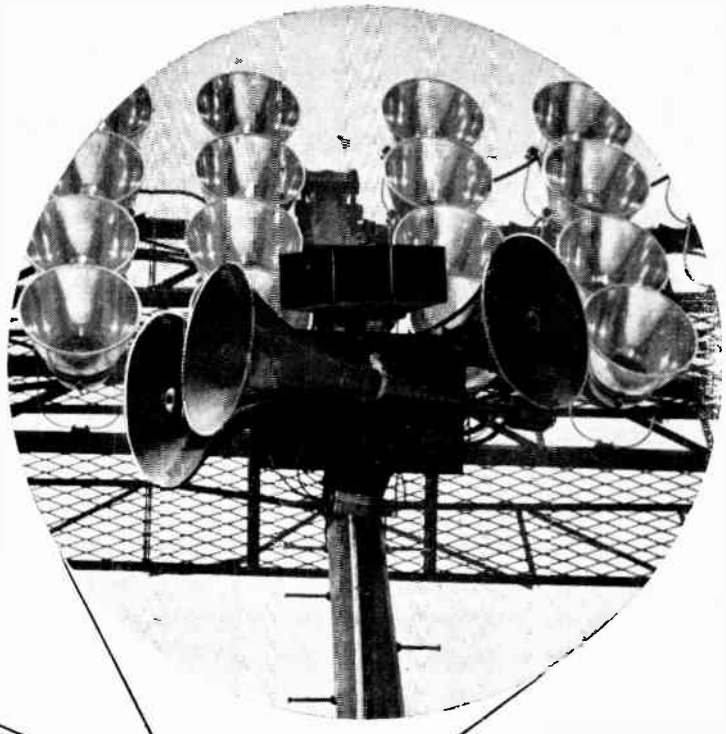
A new publication describing the latest MIL-C-25A Capacitors is now available and includes high temperature operation characteristics called for in latest military specifications.

Catalog contains complete listing of all ratings, dimensions, etc. which apply and is now available to industry.

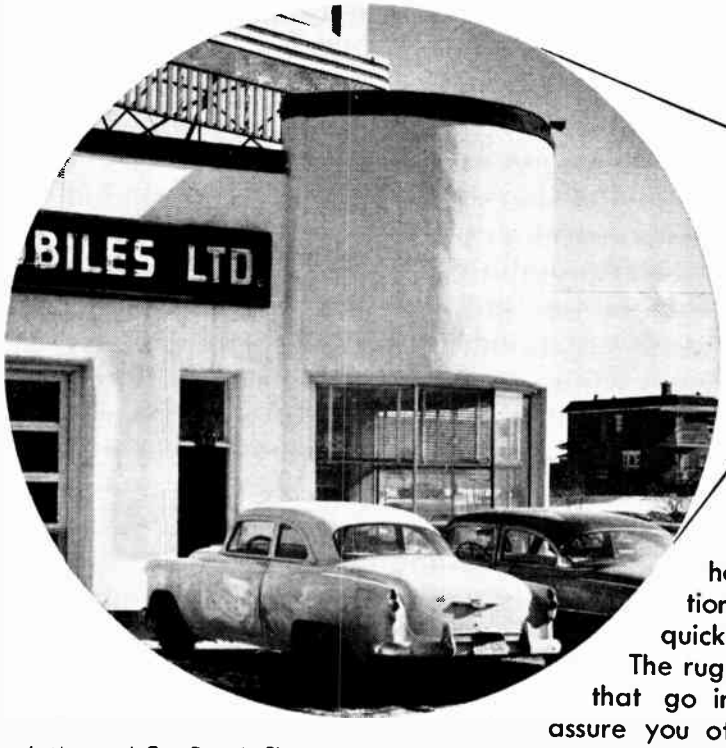
(Turn to page 61)

For further data on advertised products use page 62.

Operations large and small use Marconi Public Address Systems



New Winnipeg Stadium and Ball Park are equipped with a Marconi Public Address System.



A Montreal Car Repair Shop uses a Marconi PA System for keeping in touch with employees; issuing instructions, etc.

A MARCONI Public Address and Paging System in your operation will increase its over all efficiency . . . man-hours become more productive . . . instructions and information can be delivered quickly . . . eliminating many unnecessary steps. The rugged construction and highly technical skill that go into the production of this equipment assure you of long, dependable service . . . minimum repairs . . . lower maintenance costs.

As part of MARCONI's service to you, trained specialists will analyze your operation and recommend the type and size of equipment best for your particular needs . . . to make your operation more efficient and economical.

Whatever the purpose of your operation . . . whatever its size, a MARCONI Public Address and Paging System will meet your particular requirements.

For further information write to:
Sound, Signalling and Intercom Department

CANADIAN Marconi COMPANY
MONTREAL 16

CANADA'S LARGEST ELECTRONIC SPECIALISTS

For further data on advertised products use page 62.

NEWS

(Continued from page 45)

Ricardo Muniz Heads Up New Canadian Westinghouse Radio Television Division

Ricardo Muniz, one of North America's outstanding electronics authorities, has been appointed to head up manufacturing operations for the Canadian Westinghouse Company's Television-Radio Division which was recently moved from Hamilton to Brantford, Ontario.

R. MUNIZ

As Manager of television and radio operations for Westinghouse, he is engaged in getting full scale receiver production under way at the new Brantford location. At the same time Mr. Muniz will begin a broad research and development program which it is predicted will result in outstanding advances for Canadian television.

How To Succeed In Antenna Manufacturing

Tore Lundahl, Sales Manager of Technical Appliance Corporation, Sherburne, N.Y., manufacturers of Taco high-gain television and radio antennas whose company is represented in Canada by Hackbusch Electronics Limited of Toronto claims that the service technician is the fellow to please if success in antenna manufacturing is to be achieved.

Says Mr. Lundahl: "Twenty-three years of antenna manufacturing has taught us that the service technician is the fellow we have to please. We must provide him with the product that will perform up to specifications and at the same time incorporate the dependability upon which he can stake his reputation."

Decca Radar on S.S. "Cayuga"

The twin-screw passenger steamship "Cayuga", owned by the Cayuga Steamship Company Limited of Toronto, will operate the new Toronto-Niagara Steamship Service.

This vessel, licensed to carry 1850 passengers, is the latest addition to the increasing number of Canadian vessels now fitted with radar.

Navigation of the S.S. "Cayuga" is normally carried out from an open bridge and a Decca Waterproof Display has been installed. This display unit, initially designed for use by the Royal Navy, is particularly suited for the operating conditions encountered on ships with open bridges.

For further data on advertised products use page 62.

L. S. Payne Associate Of Guglielmo Marconi Retires

The retirement of L. S. Payne, Chief Engineer of the Canadian Overseas Telecommunications Corp., and Technical Adviser to the Canadian Marconi Company brings to a close an active 42-year career in the electronics industry. Mr. Payne was associated with the Canadian Marconi Company since 1913 and is one of the few engineers remaining who had worked with Guglielmo Marconi.

Mr. Payne served as Chief Communications Engineer and Manager of the Patents Division of Canadian Marconi since 1939 and since 1950 was Chief Engineer of the Canadian Overseas Telecommunications Corp., at which time this firm was established to manage the overseas circuits of the Canadian Marconi Company.

Mr. Payne is a Fellow of the Institute of Radio Engineers and an Associate Member of Institute of Electrical Engineers.

Utility Commission Engineers To Meet June 15-17 In Ottawa

The 32nd annual conference of utility commission engineers is to be held June 15-17 in Ottawa, at the invitation of the National Bureau of Standards and the Canadian Board of Transport Commissioners.

TV Service Meetings Held Throughout West

Town meetings for television technicians were held throughout Western Canada to provide television service technicians with the latest information on receiver circuitry and service techniques.

The meetings, sponsored by the Radio-Television Manufacturers Association of Canada, in co-operation with the National Advisory Council of Town Meetings, set distributors and parts jobbers, dealers, technicians and trade papers were strictly educational and non-commercial, designed to give technicians the best possible instruction on TV receiver servicing, concentrated over a three-day (and evening) period. Instruction was designed to complement individual manufacturer and distributor training programs.

Dates and places where meetings were held are as follows: *Winnipeg*, Manitoba Technical Institute, May 18, 19 and 20; *Regina*, Regina College, May 25, 26 and 27; *Calgary*, Provincial Institute of Technology and Art, June 1, 2 and 3; *Vancouver*, Physics Building, University of British Columbia, June 8, 9 and 10.

G. B. Elliott, Chairman of the R.T.M.A. Service Committee is the co-ordinator of the Western Town Meetings. Mr. Elliott is also Chairman of the National Advisory Council.

C.G.E. Appoints Malcolm Murray To Western P.R. Post

M. Malcolm Murray has been appointed public relations representative for Canadian General Electric Company in Alberta, Saskatchewan, Manitoba and the Lakehead area.

M. M. MURRAY

Born in Winnipeg, Mr. Murray is well-known for his activities in business and community organizations in that city. He is responsible for co-ordination of the company's film and speaker program in the region and for relations with educational institutions and with the press, radio and television. He has his headquarters in the company's Mid-West District Office at 945 St. James Street in Winnipeg.

(Turn to page 50)

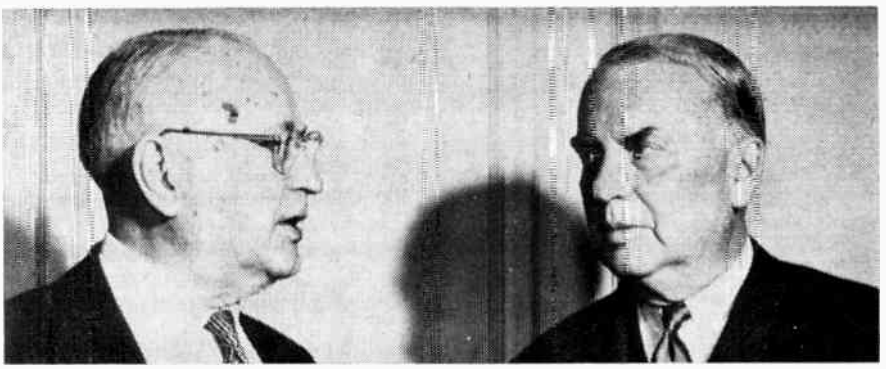
For further data on advertised products use page 62.

NEWS

(Continued from page 49)

Arthur E. Wilson Completes 63 Years In Electrical Industry

After 63 years in the electrical industry, Arthur E. Wilson, recently became a member in the 25-year club of Smith & Stone Limited and associated companies Fiberglas Canada Ltd. and Duplate Canada Limited. Col. W. E. Phillips, President of the three companies, welcomed Wilson into the club with the comment that it was like giving him "a certificate to a nursery". Ontario Sales Manager of Smith & Stone until two years ago, Wilson is now Vice-President, public relations.



● Arthur E. Wilson being received into the 25-year club of Smith and Stone Limited by President W. E. Phillips. Mr. Wilson has served a total of 63 years in the electrical industry.

D. M. Stephens New President Of E.I.C.

Donald McGregor Stephens, M.E.I.C. of Winnipeg, Manitoba, took over the duties of President of the Engineering Institute of Canada at the annual general and professional meeting of the Institute held in Quebec City last May 12-13 and 14.

Mr. Stephens is Chairman and General Manager of the Manitoba Hydro-Electric Board and President and General Manager of the Winnipeg Electric Company. Mr. Stephens succeeds Ross L. Dobbin of Peterborough as President of the Engineering Institute of Canada.

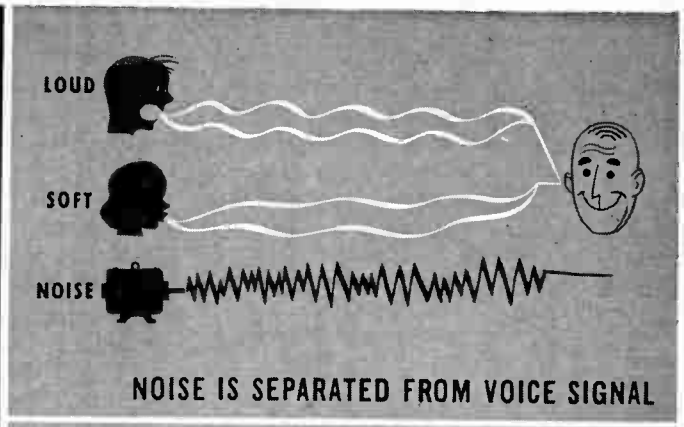
(Turn to page 52)

For further data on advertised products use page 62.

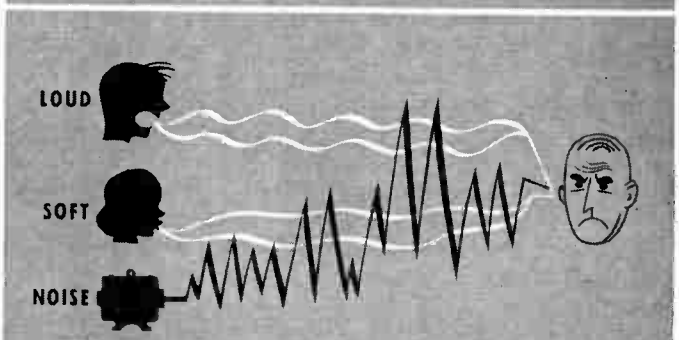
RADIO CIRCUITS can sound like this

...instead of this

with the addition of Lenkurt



NOISE IS SEPARATED FROM VOICE SIGNAL

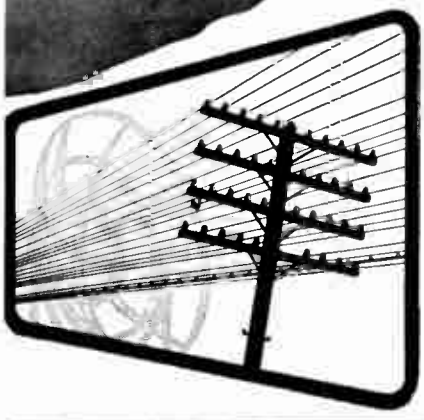


NOISE INTERFERES WITH VOICE RECEPTION

Type 5090A COMPANDOR UNIT

Some of the economies which may be achieved by LENKURT COMPANDOR application to point-to-point radio systems include:

- Fewer repeater stations on long systems
- Smaller antennas and tower structures for short links
- Extensions of present systems by being able to add more tandem systems
- Reduced and simplified maintenance because of relaxed alignment limits



LENKURT COMPANDORS MAY ALSO BE USED TO HELP REDUCE NOISE AND CROSSTALK ON OPEN WIRE LINES

C-5448

AUTOMATIC ELECTRIC

(CANADA) 1953 LIMITED

Distributor in Canada

AUTOMATIC ELECTRIC SALES (CANADA) LIMITED

Head Office: 185 Bartley Drive, Toronto 16

MONTREAL • OTTAWA • BROCKVILLE • HAMILTON • WINNIPEG • REGINA • EDMONTON • VANCOUVER

For further data on advertised products use page 62.

CANADIAN I.R.E. SECTION NEWS

Hamilton Section I.R.E. Wind Up Season's Activities

Mr. H. E. Rice, Manager, Radio and TV Division, Canadian Westinghouse Company, Hamilton, was the guest speaker at the season's final meeting of the Hamilton Section of the Institute of Radio Engineers held in Robert's Restaurant, Hamilton, last May 10th.

More than 40 members and guests attended the meeting and heard Mr. Rice speak on the subject of "The Engineer's Place in Management".

The Executive Committee of the Hamilton Section I.R.E. for the 1954-55 season announced at the meeting is made up of the following members: G. M. Cox, Chairman; G. F. Beaumont, Vice-Chairman; A. L. Fromanger, Secretary-Treasurer; J. W. Lucyk, Past Chairman; W. A. Cheek, Meetings and Papers; E. Ruse, Section Editor; C. J. Smith, Publicity; and C. F. Cantlon, Membership.

Distribution of door prizes and consolation prizes to all present marked the close of the meeting.

Ottawa Section I.R.E. Addressed By B. G. Ballard

Mr. B. G. Ballard, Director of the National Research Council's Division of Radio and Electrical Engineering who was recently named Vice-President (Scientific) of the N.R.C. addressed a recent meeting of the Ottawa Section of Institute of Radio Engineers. Mr. Ballard spoke on "The Canadian Standards Association and the Electronics Industry".

Transfers, Elections And Admissions Of Canadian Members Of The I.R.E.

Transfers and admissions of Canadian members of the Institute of Radio engineers approved to be effective as of April 1st, have been reported as follows: Transferred to Senior Member, A. Ainley, 987 Wilfred Street, Toronto. Transferred to Member: D. T. Couzens, R.C.A.F., No. 8 Temporary Building, Ottawa. Admitted as Member: P. U. Aasgaard, 1360 Quimet Street, Ville St. Laurent; M. W. Fletcher, 490 Ontario Street, Toronto; C. G. Helwig, 803 Lakeside Park, Toronto; L. Lavoie, Riviere du-Loup; A. A. Lochanko, 60 Ellis Park Road, Toronto; B. I. McCaffrey, St. Catherines, Ontario; T. A. Stewart, Montreal. Elected to Associate grade: Y. P. Chew, 361 King Street East, Toronto; B. W. Langton, 48 Sheridan Street, Brantford; F. M. Mosher, 140 Glen Albert Drive, Toronto; D. F. Page, Center Street, Forbes Post Office, Ottawa; R. G. Pearce, 589 Rhodes Ave., Toronto; R. E. Penton, 2096 Claremont Ave., Montreal; E. F. Pryzdial, 780 Palmerston Ave., Toronto; and C. Western, 152 Main Street, Toronto.

Toronto Section I.R.E. Inspects TTC Communications System

The Toronto Section, Institute of Radio Engineers, held its final meeting for the 1953-54 season on April 26th in the Hillcrest Administration Building of the Toronto Transit Commission. Mr. J. Y. Doran, Electrical Engineer in charge of power requirements for the new subway, gave a short preliminary talk outlining the communications and control systems in general. Following this, the 100 members and guests were divided into three groups for a conducted tour of the building. Of particular interest were the radio system for communication with emergency trucks, the system for remote control of all metropolitan sub-stations and the layout of the new subway control and signal system.

The meeting was preceded by the usual informal dinner at Hart House.

IRE SECTIONS PLEASE NOTE

The news editors of Electronics and Communications are anxious to cover as fully as possible the activities of the Canadian Sections of the Institute of Radio Engineers. With this in view we extend a sincere invitation to the publicity committees of the various sections to send us news releases of their meetings, results of executive elections, new members and any other material which it is considered would be of interest to institute members generally.

As far as we know Electronics and Communications is being mailed regularly to every Canadian member of the I.R.E. all of whom are interested in the activities of the different sections. Can we count on you to supply us with the information to keep the membership of your institute informed of its overall activities.

Sincerely,
The Editors,
Electronics and Communications.

General Instrument Corp. Acquires Kitchener Electronics Firm

General Instrument Corp., of Elizabeth, N.J., has recently acquired the Watt Electronic Products Limited of Kitchener, Ontario, which, it has been announced, will be expanded into a major Canadian manufacturer of television, radio and electronic parts according to Monte Cohen, President of the U.S. company.

H. T. WATT

Hugh T. Watt, head of the Kitchener firm, who is a direct descendant of James Watt, inventor of the steam engine, will remain in charge of operations.

Acquisition of the Kitchener firm will enable General Instruments to manufacture equipment in Canada which was formerly imported from the United States. It is intended to gradually increase production in Canada until such items as deflection circuit components, automobile radio tuning devices, television tuners, converters, transformer windings and ultimately transformers themselves are coming off the production lines.

As a manufacturer of television, radio and electronic components, General Instruments is one of the leading American manufacturers with plants in New Jersey, Chicopee, Mass., Joliet, Ill., and Danielson, Conn.

Admiral Training Technicians To Service Color TV

A color television training school was held recently for 30 Admiral field engineers and distributor service engineers from Canada and the U.S. The company held its first color TV school early in December and it will be a continuing feature of Admiral's educational program during the development and growth of color TV.

Students are taught the theory and fundamentals of color television, also how to install and service the new receivers. Eight days of the month-long course are devoted to lectures, with practical work on color sets for the remainder of the time.

(Turn to page 58)

For further data on advertised products use page 62.

THE EDITOR'S SPACE

(Continued from page 5)

* * *

According to a release which has come across our desk we are informed that engineers and scientists are prepared to go on record to the effect that no problem is impossible. A one-hour plane to London! A sure cure for cancer! A flying saucer! Want any of these things? They're all possible, now apparently, not in years hence, but now! Their solution lies in man-power, time and dollars and the sooner they're wanted the more dollars it will require.

Wonder if some of Finance Minister Abbott's $350,000,000 surplus could be devoted to the solution of continued high taxation?

* * *

Murray Binions of the Collins Radio Company of Canada Limited whom we had the pleasure of meeting in the company's new offices on Sparks Street in Ottawa not long ago tells us that his company is scheduled to install a VOR navigation transmitting system at one of the hard-to-approach air bases on the west coast. The system will be the first of its type to be installed at an air base in Canada.

* * *

Thirteen miles from the center of Ottawa on the shores of the Ottawa River is the new Telecommunications Establishment of the Defense Research Board. Primarily employed on the solution of radar and communications problems for the Canadian armed forces the new laboratories are nevertheless employed on fundamental research much of which will eventually be of great benefit to the commercial field. Heading the laboratory is Frank T. Davies whom we had the pleasure of interviewing recently in the new laboratories.

* * *

Talked with George McCurdy of McCurdy Radio Industries in his office at 74 ork Street a couple of weeks back. By the time this appears in print Mr. McCurdy will be well settled in his new office located at 22 Front Street. The reason for the move Mr. McCurdy says: "more room." At the new address the engineering department will occupy a space of 3,000 square feet with 9,000 square feet being devoted to manufacturing facilities. While on tour of the McCurdy plant was impressed with the intricasy of some of the custom engineered projects in hand by the company.

* * *

We take this opportunity of wishing Bon Voyage to Dr. T. W. Strakie of the Communications Branch of the Defense Research Board who tells us that he is leaving for a two year stint in England.

* * *

N. J. Pappas and Gordon B. Thompson recently appointed to the engineering staff of McCurdy Industries Limited dropped in to see us recently. Trust that the product of our photographic department which "mugged" you two gents will meet with your approval. For results turn to the News section of this issue.

* * *

Was amazed at the agility of Mr. M. Stark of Stark Electronics scrambling around the window sills on the 17th floor of the Conrad Hilton Hotel in Chicago from which vantage point he was determined to capture the view of Grant Park and Lake Michigan on 3D color film. The episode took place during the recent Electronic Parts Show held in Chicago.

* * *

Speaking of Chicago our thanks to Messrs. Lou and Frank Harris of Atlas Radio Corporation Limited for the kind invitation to their buffet supper held in the Conrad Hilton Hotel during the course of the Electronics Parts Show. Will long remember your hopitality.

* * *

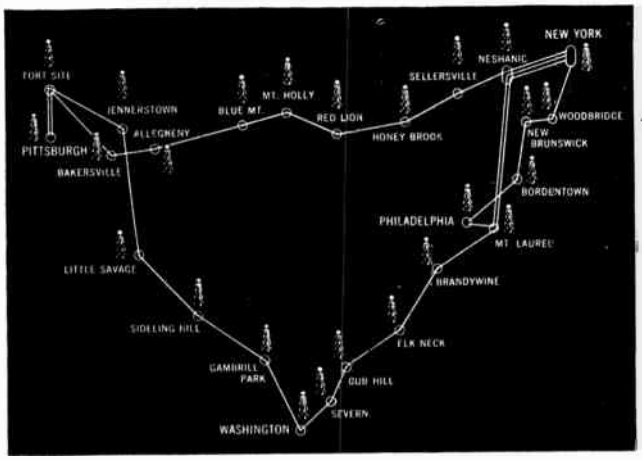
Am more than thrilled to know that Bill Choat of the Westinghouse Supply Company makes a point of carrying a copy of ELECTRONICS AND COMMUNICATIONS around in his brief case.

(Turn to page 63)

For further data on advertised products use page 62.

IN ITS 21 TOWER MICROWAVE SYSTEM

Western Union uses Sperry Klystrons

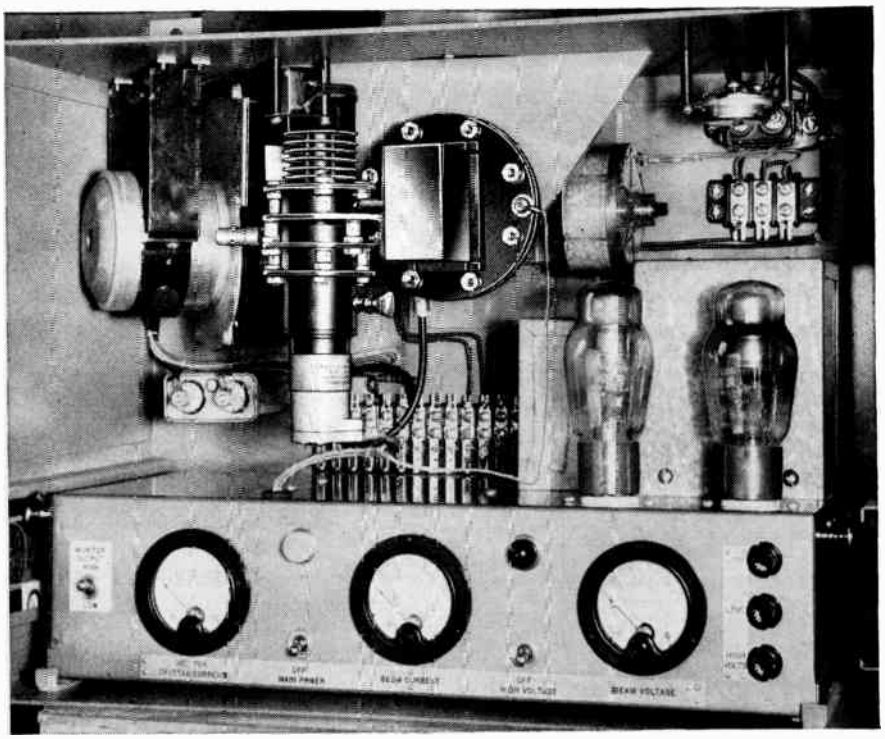


"Dependability has been excellent," writes H. P. Corwith, Vice President, Development and Research. "Average tube life has been more than 15 months, and some tubes have been in continuous service for almost 3 years."

Installed in 1948, the Western Union microwave system between New York, Philadelphia, Washington and Pittsburgh, consists of 21 towers, varying in height from 60 to 120 feet, and spaced up to 55 miles apart. The system handles hundreds of telegraph circuits—including important government and leased private wire systems as well as circuits for regular message traffic.

■ Through the use of Sperry SAC-41 Klystrons providing power output of 10 watts, Western Union has effectively reduced circuit outages due to fading, and provided dependable service under all conditions. Furthermore, as Mr. Corwith points out above, the average life of Sperry SAC-41 Klystrons has been 15 months—and some tubes have served continuously for almost 3 years.

■ Since 1938, when Sperry sponsored the development of the Klystron, this Company has extended its application to tubes for low, medium and high power applications—and in a frequency range from 750 to 40,000 megacycles. The research, development and specialized production facilities of Sperry in Klystrons — and in accompanying Microline* equipment—are at your disposal to help in solving your problem.

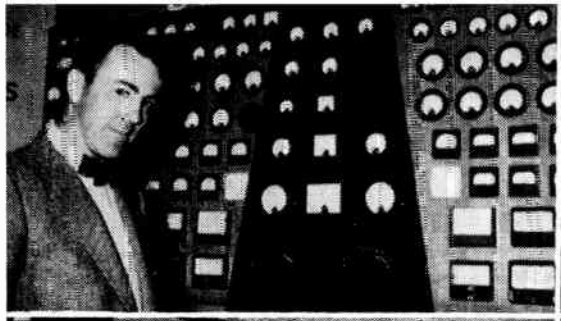


*T.M. REG. U.S. PAT. OFF.

SPERRY GYROSCOPE COMPANY OF CANADA LTD.

P. O. BOX 6121 • MONTREAL, QUEBEC • SPERRY GYROSCOPE OTTAWA LTD., OTTAWA, ONT.

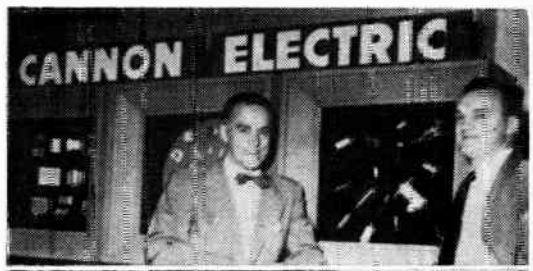
For further data on advertised products use page 62.

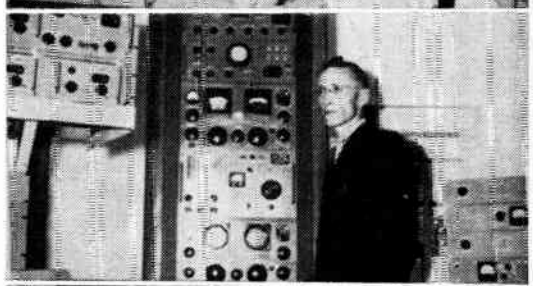


Canadian Electronic Manufacturers Well Represented At C.I.T.F.

The Canadian International Trade Fair, spring-time meeting place for businessmen from the far corners of the world, wound up its seventh edition recently. For the seventh consecutive year the enterprise has proven of inestimable value to world trading and a particular booster for the products of Canadian industry. Exhibits at the C.I.T.F. ranged from the present day versions of the ancient potters art to the ultra modern devices of the 20th century and the growing importance of Canada as a manufacturer of electronic equipment was evident in the representative exhibits of this industry. The accompanying photographs show the exhibits of Canadian electronic manufacturers in attendance at the Canadian International Trade Fair. Shown in the accompanying photographs are the exhibits of the following firms with company officials in attendance: Bach-Simpson Limited, Industrial Electronics, Standard Telephone and Cable Limited of London, England, The National Fibre Company of Canada, Cannon Electric, Canadian Electronic Materiel, Trans-Canada Sound Services and Stark Electronic Instruments.

Company officials in attendance at the booths and officials of British and American principals represented by the Canadian companies are: R. D. Hickock, Hickok Electrical Instrument Co., Cleveland; M. J. Stark, Stark Electronic Instruments, Ajax; H. A. Leah, Bach-Simpson Limited; J. Vrooman, T. M. C. Canada Limited, Ottawa; Mr. McCauley, Trans Canada Sound Services, Sherbrooke; E. C. Kent, Dawe Instrument Ltd., England; S. A. Ribb; Frank Hancock and John Murphy, Cannon Electric; A. S. Mackie, Industrial Electronics, Toronto; W. J. Doddridge, D. Bailey and Max Stettelen, Standard Telephone and Cable Limited, Lindon, England and H. A. Frankel and N. E. Jepson, National Fibre Company of Canada.





For further data on advertised products use page 62.

U.S. REPORT

The textile slump in New England has been offset by the booming growth of the electronics industry in this part of the United States. Hundreds of electronics firms have settled in this area in the last few years. There are 44 in Lawrence, Mass., alone. Vacant textile mills have been taken over and 85,000 new jobs have been created by the mushrooming electronics industry, almost 60 per cent more than were laid off due to the textile slump . . . . Included in the U.S. Army estimates for the fiscal year 1954-55 is a request for $355,000,000 for research and development. A large part of this amount will be devoted to the fields of electronics and communications as the armed forces continue to place emphasis on guided missiles and similar projects . . . . Members of the American Gas Association were addressed by Douglas M. Edmonds of the Bell Telephone Company of Canada in Montreal recently. Mr. Edmonds pointed out the benefits to be derived by the telemetering services of the telephone companies as a means of communication by which thermometers, pressure gauges and similar devices employed by pipelines could be read . . . . Radio Electronics Television Manufacturers Association of the United States reports that factory production of both radio and television receivers in the first quarter of this year was roughly the same for the same period of 1952. In 1952 there were more than 6,000,000 TV sets and roughly 11,000,000 radio sets produced. During the quarter in question there were 1,447,000 TV receivers and 2,581,000 radios manufactured . . . . Though most facts concerning the chain of Arctic radar stations is classified it has been announced in New York that if the system were put on an operational basis it would afford "four to six hours" warning of impending attack. Vernon B. Bagnall, Western Electric's Project Manager of the job made the statement . . . . General Teleradio Inc., have been granted a special 90-day authority to test their phonevision system over its New York City station WOR-TV. The system operates in conjunction with a subscription television apparatus produced by Zenith Radio Corporation . . . . Six Sheraton Hotels in New York, Boston, Washington, Baltimore, Detroit and Chicago were recently linked together by coaxial cable and microwave radio relay facilities to inaugurate the first closed hotel television network. The hour long program telecast over the circuit was viewed by more than 5,000 persons in the six hotels . . . .

For further data on advertised products use page 62.

● PSC Applied Research exhibit at Kingsbridge Armory, New York.

PSC Applied Research Limited Exhibit Automatic Deicing Control System At I.R.E. Show

The world's first automatic deicing control system the product of a Canadian firm, PSC Applied Research Limited of Toronto, was shown at the I.R.E. Show in Kingsbridge Armory, New York, during the recent I.R.E. Annual Convention. The system is now in production by the Canadian firm which is under license to the National Research Council of Canada who designed the basic system. Goodyear Tire and Rubber Company, Special Products Division, Akron, Ohio, has been appointed exclusive distributor for the equipment in the United States.

International Testing Methods For AM Radios Released By Geneva Office of I.E.C.

International methods for testing the overall performance of A.M. radios have been issued by the International Electrotechnical Commission from its central office in Geneva. The data may be used by manufacturers, testing organizations, college laboratories and similar groups.

The proposed methods of testing in the international recommendation are for such properties as sensitivity, interference, frequency response characteristics, distortion, stability and various miscellaneous properties, such as: radiation, tuning, and power and current consumption.

H. O. Merriman, M.B.E., Telecommunications Expert Retires From Service

H. O. Merriman, M.B.E., B.A.Sc., E.E., P.Eng., co-inventor of the first electrical gramophone pick-up device was retired recently as Engineer in Charge of the Inductive Interference Section of the Department of Transport's Telecommunications Division after more than 35 years in the government service.

Mr. Merriman was in charge of the first investigation into radio interference carried out by the National Research Council and the Department of Transport which led to the establishment of the Interference Section of the Department in the 1920's.

H. O. MERRIMAN

During World War II, Mr. Merriman assisted the armed services in the development of radio suppressors for vehicles, aircraft and ships for which services he was awarded the M.B.E. Since the war, he has been responsible to a large measure for drafting of specifications for interference suppressors applicable to various types of electrical equipment and devices for the Canadian Standards Association.

(Turn to page 68)

For further data on advertised products use page 62.

Government Controlled Radio Needs Watching!

Norman McHardy, Vice-President of Age Publications, publishers of ELECTRONICS AND COMMUNICATIONS, *in a recent address to the London Chamber of Commerce, when discussing the freedom of speech and the freedom of the press had the following to say concerning government control of radio broadcasting in Canada.*

". . . . There is however a very special reason in Canada why we should be concerned about freedom of the printed press — about having widely read influential periodicals and newspapers available to large sections of the public.

"Radio broadcasting in Canada is government controlled and subsidized. Many thoughtful people in Canada think there are regulations around this control that are open to wide interpretations. Those interpretations could be such that freedom of speech on the air could be greatly curtailed.

"Fortunately there has, as yet, been little cause for complaint in this regard and whenever any cause did exist, our newspapers and periodicals have been quick to raise a voice of protest and are keeping an ever watchful eye for any indication of it. But, it is an historical fact that, in Great Britain, because of government control of radio, Winston Churchill was denied broadcasting privileges at the time of Munich in 1938.

"But despite conditions as they now exist and have existed in the past in Canada, who knows what would happen should we have an administration in power at Ottawa whose views with regard to what is freedom of speech could not be relied upon. It is not beyond possibility then, that radio, another great medium for shaping and moulding public opinion and behavior, might not be left equally available to those who do not hew close to the party line and those who do.

"Under such circumstances a strong, widely read printed press would be the chief bulwark available to us to preserve our liberties, ideals and institutions."

● "Gentlemen, our computer has broken down. Does anyone do subtraction?"

For further data on advertised products use page 62.

GERMANIUM RECTIFIERS

(Continued from page 19)

to facilitate the soldering of the rectifier in service, and the body is cleaned to remove any grease or flux.

Grading and Testing

The rectifiers are first segregated for turnover voltage by the use of the circuit shown in fig. 8 which displays on a cathode ray tube the characteristic curve of the rectifier under test.

The diodes are then graded according to their reverse and forward resistances at various voltages by passing a fixed current through the crystal in the forward (easy flow) direction and measuring the voltage drop. *This* method is employed in preference to measuring the current at a fixed voltage owing to difficulties in obtaining current meters whose resistance is low compared with that of the rectifiers. The reverse resistance is measured by applying a fixed voltage in the "no-flow" direction and measuring the current passing through the rectifier. Diodes intended for use at high frequencies e.g. television sound and video detectors are given a rectification efficiency test at 45Mc/s, since D.C. measurements do not always predict accurately the behavior at high frequencies.

Typical grades, supplied for example to the Services, are shown in table A. The type of grader used is shown in fig. 9.

High Conductance Types

Such rectifiers have been designed for use in applications where the applied voltage is low, so that the forward and reverse currents are measured at lower voltages than for high reverse voltage types. In the forward direction the voltage for a current of 5 mA is measured, and in one type, primarily intended for use in telephone modulators, the rectifiers are graded to have a very small voltage variation.

Table B indicates the type of characteristic obtained from these high-conductance rectifiers:

To ensure that the rectifiers are suitable for operation under severe climatic conditions all rectifiers are placed in a humidity cabinet for a period of seven days. The temperature inside this cabinet varies cyclically from 35°C to 50°C and the relative humidity rises from 50 per cent to 99 per cent which represents more severe conditions than are likely to be experienced in the tropics. Quality checks and life tests are carried out on a percentage of the rectifiers produced (from day to day) by laboratory personnel, thus ensuring the high standard of reliability expected.

Typical tests are:

1. Stability with time.
2. Stability after overload.
3. Stability after temperature changes and humidity cycling.
4. Life tests, in which hundreds of rectifiers are continuously operated under typical circuit conditions. These tests take a period of years to complete.

TABLE A

Type	Turn over voltage	Current at +1 volt	Current at −10 volts	Current at −50 volts
CV 448	100 min	3 mA min	—	100 uA max
CV 425	80 min	4 mA min	—	1000 uA max
CV 442	30 min	3 mA min	1000 uA max	

TABLE B

Type	Voltage to produce a current-of-5 mA	Current at −1 volt	Self Capacitance
GEX 66	0.5 max	50 uA approx	1 pF
GEX 64/3	0.30 max 0.285 min	160 uA approx	May be as high as 30 pF

For further data on advertised products use page 62.

NEW PRODUCTS

(Continued from page 46)

• *Miniature Permanent-Magnet Motor*

Item 538

Rated at 1/400 horsepower with operating rotor speed of 10,500 rpm, the new Dalmotor Type PM-47 miniature permanent-magnet motor is suggested for application to small fans, blowers, and other similar lightweight-load applications. Designed for continuous duty, this motor draws 0.18 amp at 27 volts d-c, and has a total weight of 5 ounces.

Dimensions are 1 13/16 inches long by 1⅛ inches diameter and the ⅛-inch diameter shaft has an extension length of 1⅛ inches. However, other lengths and special arrangements including splines, keyways, gears, etc. can be provided where required. Electrical connections (integral-lead type illustrated) can be provided in a number of arrangements to suit application requirements.

• *DC And AC Precision Calibrator*

Item 539

The Model 420 Calibrator is a triple-purpose instrument combining highly stable DC and AC voltage sources and having an output range of zero to 10 volts for three selectable outputs; DC, RMS and PEAK-TO-PEAK of a 1000 cps sine wave. A decade control provides steps of 1000 millivolts to which is added the setting of a 10-turn potentiometer.

Dividing factors up to 1000 are obtained with a four position push-button switch. This control combination has a setting resolution of 0.01 per cent for outputs above 10 millivolts and of 1 microvolt below 10 millivolts. Long-term accuracy is 0.5 per cent, and short-term stability is better than 0.05 per cent per hour, while distortion and hum on AC is less than 0.5 per cent. Internal impedances on AC are exceptionally low thus minimizing loading errors.

• *Variable Composition Resistor*

Item 540

A 2-watt Variable Composition Resistor, manufactured to JAN-R-94, Type RV-4, specifications, on which interim approval from the Electronics Standards Sub-Committee, Department of National Defense has been obtained is now available on the market.

The Precision Model "VJ" is the result of many months of exhaustive research and life tests, and offers many advantageous features, such as low humidity drift, high di-electric strength, and low noise level. It is also dust-proof.

(Turn to page 64)

For further data on advertised products use page 62.

READERS' SERVICE PAGE

We realize that our readers are busy people and may not always have time to write letters of enquiry to manufacturers regarding advertised products that are of interest to them. Therefore, to save you the time of writing a letter, we offer you the use of this Readers' Service Page. It is designed for your convenience in obtaining free and without obligation detailed information on any advertiser's product or New Product appearing in this issue of *Electronics and Communications*. Check as many New Products or Advertisements as you like on the attached coupons and send to *Electronics and Communications*, 31 Willcocks Street, Toronto 5, Ontario. We will see that detailed information concerning your enquiries is in your hands within a few days.

Check Here For Additional Information On Advertisements And New Products

Check Advertiser's Name For Further Information

	ADVERTISER	Page
☐	A.D.S. relays	64
☐	Aerovox motor starting capacitors	70
☐	Airmec ionisation tester	5
☐	Automatic Electric portable telephones	2
☐	Bach Simpson tube testing equipment	4
☐	Bakelite copper clad laminates	66
☐	Bendix aircraft inverters	46
☐	Bendix electrical connectors	45
☐	Bendix electron tubes	57
☐	Boonton R.F. bridge	21
☐	Bristol metagraphic recorder	6
☐	British General Electric manual	31
☐	British General Electric uniselectors	68
☐	Burgess batteries	35
☐	Burndy nylon cable hangers	64
☐	Canada Wire & Cable Co., wires and cables	13-14
☐	Canadian Aviation electronic & nucleonic instruments	22
☐	Canadian General Electric two-way radio	8
☐	Canadian Marconi generators	43
☐	Canadian Marconi public address systems	47
☐	Canadian Marconi tubes and components	3
☐	Canadian Marconi two-way radio	11; 29
☐	Canadian Marconi "Humdinger" wire-bound controls	35
☐	Canadian Stackpole fixed and variable resistors	73
☐	Canadian Westinghouse 5000 Watt A.M. transmitter	32
☐	Cannon battery plugs	67
☐	Centralab miniature switches	61
☐	Computing Devices Electronic equipment	50
☐	Consolidated Electronic thermal time delay relay	58
☐	Dalohm deposited carbon resistors	53
☐	Davohm resistors	49
☐	Edwards vacuum tubes	60
☐	Eitel-McCullough Eimac Klystrons	42
☐	Electro Sonic El Menco capacitors	42
☐	Essico soldering irons	56
☐	Herring relays	40
☐	Kester solder	53
☐	Lenkurt compandor unit	51
☐	Lenkurt toroidal coils	63
☐	Measurements Engineering aluminum, brass & steel fabrication	52
☐	Motorola permakay filter	72
☐	Motorola two-way radio	48
☐	Mueller Electric clips	50
☐	McCurdy audio equipment	49
☐	National vulcanized fibre	10
☐	Northern Electric junction transistors	27
☐	Osborne communications protection	38
☐	P.S.C. photographic equip.	44
☐	Phillips magnet wire	69
☐	Pye V.H.F. transmitter	59
☐	Radio College of Canada technicians required	58
☐	Radionic Research tubes	63
☐	Robinson shock absorbers	74
☐	Sperry klystrons	55
☐	Stark Electronic indicating instruments	39
☐	Stoddart turret attenuator	65
☐	Stromberg-Carlson sound equipment	54
☐	Sylvania electronic tubes	33
☐	Telephone Mfg. telecommunication equipment	41
☐	Tri-O-Matic record changers	43
☐	U.S. Engineering terminal boards	42

Check New Product Items For More Information

☐ 512	☐ 517	☐ 522	☐ 527	☐ 532	☐ 537	☐ 542
☐ 513	☐ 518	☐ 523	☐ 528	☐ 533	☐ 538	☐ 543
☐ 514	☐ 519	☐ 524	☐ 529	☐ 534	☐ 539	☐ 544
☐ 515	☐ 520	☐ 525	☐ 530	☐ 535	☐ 540	☐ 545
☐ 516	☐ 521	☐ 526	☐ 531	☐ 536	☐ 541	☐ 546

COMPANY NAME .....

YOUR NAME .....

YOUR POSITION .....

STREET ADDRESS .....

CITY OR TOWN ..... PROV. .....

MAY - JUNE, 1954

● "SMILE, BECAUSE CANADA IS GOING PLACES." That's what it says on the card that pretty Miss Helen Salter, Age Publications editorial staff member handed out to 28,000 visitors to the Canadian International Trade Fair from Age Publications' booth. "Most of them," says Helen, "took the advice."

THE EDITOR'S SPACE — *(Continued from page 57)*

Although it sounds like a boiler factory attempting to fill a back-log of over-due orders the plant of El-Met-Parts Limited in Dundas, Ontario, is a far cry from such in appearance. Had the privilege of visiting this plant as a guest of A. L. Stopps, President of the company and the Transformer Sub-Committee of R.T.M.A. awhile back and could not help but be impressed with the startling cleanliness and orderliness of the establishment.

* * *

Apropo the visit to the plant of El-Met-Parts Limited, the turkey dinner which followed the tour and which was tendered by the Transformer Sub-Committee of the R.T.M.A. to the more than one hundred engineers who visited the plant was reminiscent of a Christmas dinner in more than one respect, at least as far as members of the press was concerned. This by virtue of the fact that there were two helpings served at the press table.

* * *

Messrs. Jack Willis, Peter Tuck and R. M. Allemang, staff members of Canadian General Electric's Motor and Control Department really had something to talk about at their recent press preview of a revolutionary new type induction motor developed at the company's Peterborough Works. Designed to meet European and American competition the new machine is low cost, smaller in size and lighter in weight than any other comparable machine and in our opinion is an achievement of note for Canadian engineering. Congratulations to Peter Tuck Development Engineer at the company's Peterborough Works, who, we understand, was largely responsible for the development of the motor.

For further data on advertised products use page 62.

NEW PRODUCTS

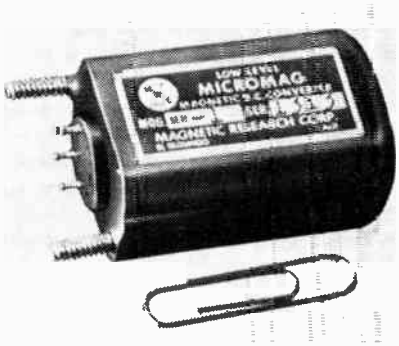
(Continued from page 61)

• *Magnetic Low Level DC Converter*

Item 541

Expansion of the Micromag line to include a standard line of new static magnetic low level DC converters has been announced.

The magnetic DC converters produce phase reversing AC outputs sinusoidal voltage in response to a polarity reversing DC input voltage. Utilizing no vacuum tubes or no moving parts these converters are rugged and reliable, and exhibit a very constant conversion gain over a wide ambient temperature range.



These converters find wide application in computers as summing amplifiers and as null detectors in self balancing potentiometer circuits. They are used in many other applications in the control and measurements field where conversion of low level DC signals from sensing elements, such as strain gauges, thermocouples, photocells, etc. is required. The magnetic converter can be used in place of the mechanical chopper in numerous applications.

The Micromag converter line consists of two basic types as follows:

Type Mf — Produces an AC output voltage which is the second harmonic of the excitation tion voltage. Models are available with 60 or 400 cycle excitation frequency. No bias is required for operation of these converters.

Type Mh — Produces an AC output voltage which is the second harmonic of the excitation voltage. These converters may be operated at any excitation frequency in the range of 60 to 10,000 cps. These units are basically drift free and are recommended for all applications where very low level DC signal current must be sensed. Model MH-1 has been especially designed for thermocouple applications. It has an input resistance of 10 ohms and a DC signal sensitivity of 10 microvolts. Model MH-3 has been designed for applications in electronic equipment. It has an input resistance of 2000 ohms and a DC signal sensitivity of less than 0.1 microamperes.

• *Sub-Miniature Electrolytic Condensers*

Item 542

The recent introduction of transistors has created fresh impetus to the design of ancillary components of comparably small dimensions. For this purpose we have produced a range of Sub-Miniature Electrolytic Condensers, which we believe to be the smallest of their type ever made. These diminutive condensers are equally suitable for use in miniature walkie-talkie equipment, hearing aids, and similar assemblies where every component is scaled down to the absolute minimum physical size.

A feature of their construction is the plug-pin (⅛" long), which forms one of the terminations, thus enabling them to be inserted quickly and easily. On the other hand, these condensers can be supplied with tinned copper wire terminations, 1½" long, both ends, if required.

The temperature range is —30° C. to + 60° C., and the tolerance of capacity—25% to + 50%.

• *Standard Piezo Type 41 Crystal Oven*

Item 543

The availability of a new quartz crystal oven has recently been announced.

The unit has a standard metal base and will accommodate either one HC-6/U Type crystal unit or one HC-13/U Type crystal unit. It can also be furnished with multiple cavaties where desired. It will maintain the crystal temperature (+ 75°C. or + 85°C.) to within ± .03°C. at room temperature and to within 1.0°C. over a range of — 40°C. to + 75°C. ambient. The warm up time for stable operation at — 40°C. ambient is less than nine (9) minutes.

The oven is 4" high, 1⅞" wide and 1⅞" deep. It can be produced to operate on 115 V, 6 V, 12 V or 24 V, AC or DC and is designed to meet all military specifications. The oven can be modified to meet any other specifications, either military or commercial, the makers claim.

• *Oscillograph Probes*

Item 544

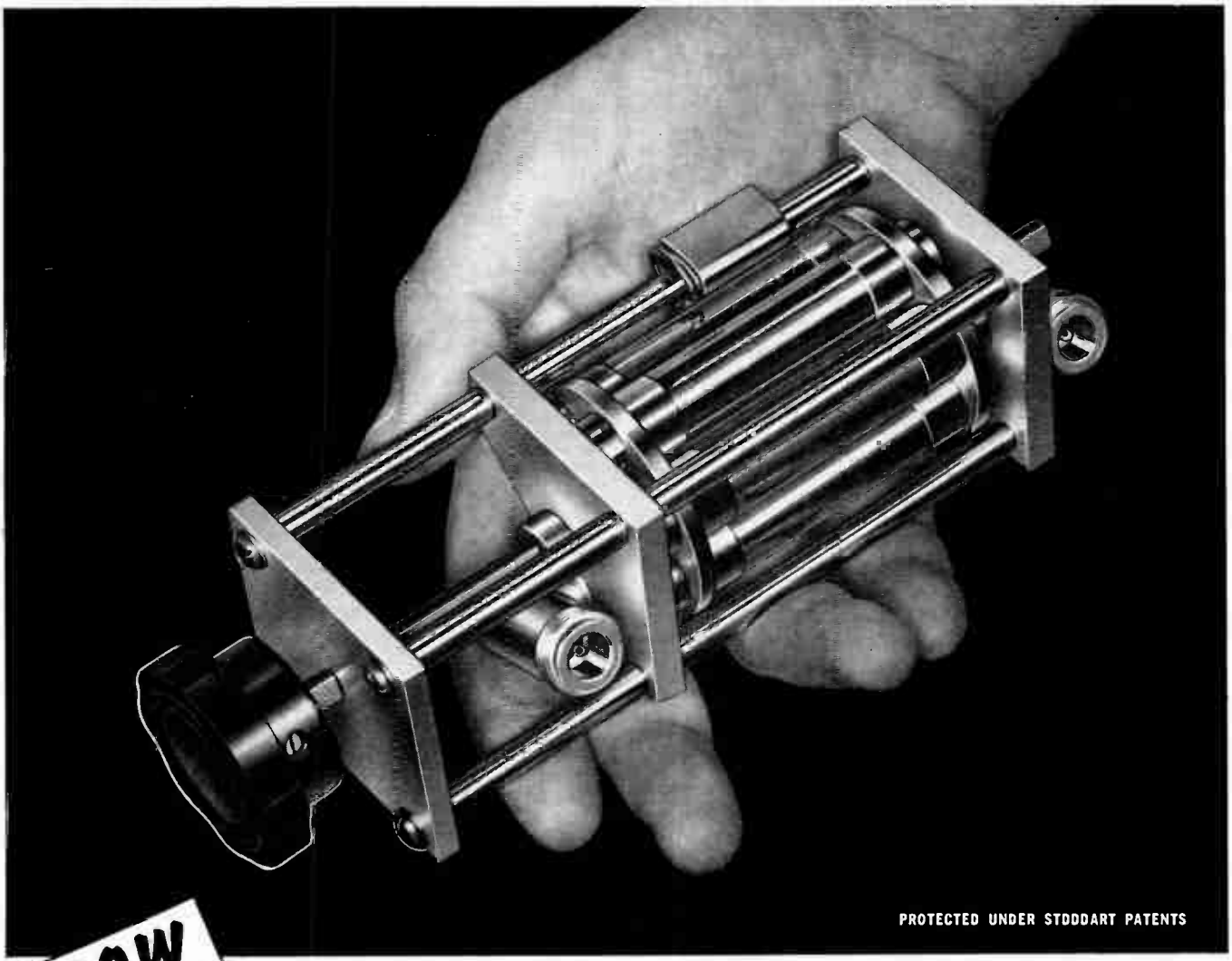
Signal Tracing Probe BZ-1. The Scala BZ-1 can be used to locate dead I.F. stages, mark ratio detector curve, calibrate marker generator, adjust video amplifiers, check output of a sweep generator, view response of single I.F. stage, trace buzz pulse in sound I.F. strip.

Low Capacity Probe BZ-2. The Scala BZ-2 makes it possible to trace video, sync or sweep waveforms through high impedance circuits without phase shift or causing waveform distortion due to circuit loading. Cuts the effective input capacitance of scope and test lead by a factor of 10. Gives an attenuation of 10 to 1.

100:1 Voltage Divider Probe BZ-3. The Scala BZ-3 is very useful in trouble-shooting horizontal sweep circuits. It may be applied

(Turn to page 67

For further data on advertised products use page 62.



NOW

Precision Attenuation to 3000 mc!

▶ TURRET ATTENUATOR featuring "PULL-TURN-PUSH" action . . .

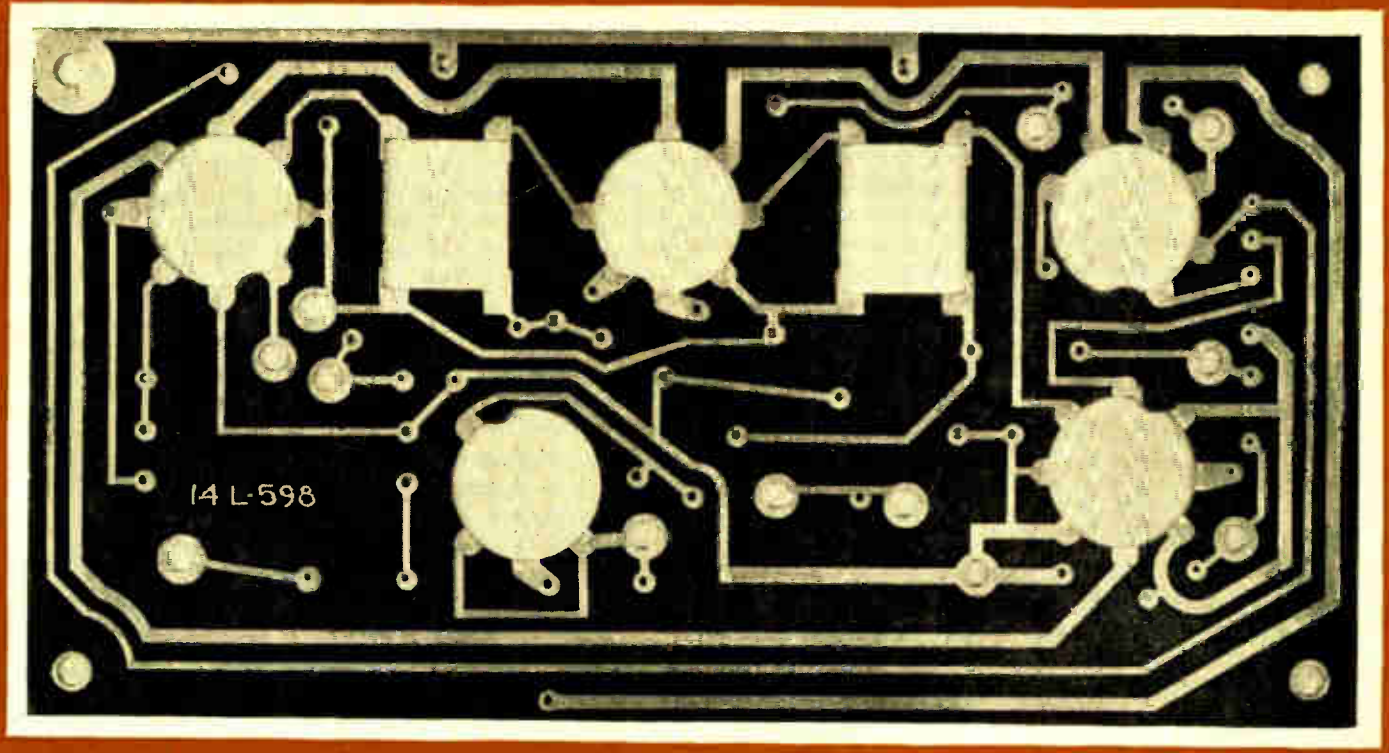
FREQUENCY RANGE: dc to 3000 mc.
CHARACTERISTIC IMPEDANCE: 50 ohms
CONNECTORS: Type "N" Coaxial female fittings each end
AVAILABLE ATTENUATION: Any value from .1 db to 60 db
VSWR: <1.2, dc to 3000 mc., for all values from 10 to 60 db
<1.5, dc to 3000 mc., for values from .1 to 9 db
ACCURACY: ± 0.5 db
POWER RATING: One watt sine wave power dissipation

Send for free bulletin entitled "Measurement of RF Attenuation"

•

Inquiries invited concerning pads or turrets with different connector styles

STODDART AIRCRAFT RADIO CO., INC.
6644-D SANTA MONICA BLVD., HOLLYWOOD 38, CALIFORNIA
HOllywood 4-9294



PRINTED CIRCUITS

with BAKELITE

TRADE-MARK

Circuit above printed by Canadian Name Plate Co. for Canadian Westinghouse Company Limited.

copper clad

LAMINATES

Today manufacturers of Radio, TV and Electronic equipment are investigating the possibilities of Printed Circuitry. Recent developments in this field have proved that production of radio chassis can be increased greatly at a reduced cost, as well as eliminating the chance of human error.

At the base of every good Printed Circuit is a BAKELITE copper clad Laminate.

BAKELITE is selected because of its excellent dielectric strength—it has extreme resistance to cold flow, heat or temperature distortion. BAKELITE Laminates have good punching qualities, as well as resistance to most acid actions.

Write or 'phone for further information.

BAKELITE COMPANY

Division of Union Carbide Canada Limited UCC

BELLEVILLE — ONTARIO

1 University Ave., Toronto 1

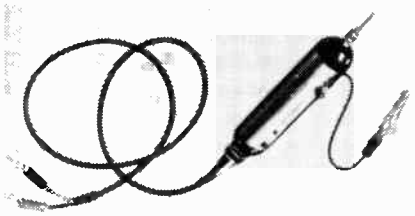
1191 University St., Montreal 2

- PHENOLIC MOULDING MATERIALS
- IMPREGNATES
- RESINS AND VARNISHES
- INDUSTRIAL LAMINATED SHEET
- TUBE AND FABRICATED PARTS
- POLYETHYLENE
- POLYSTYRENE
- POLYESTERS

NEW PRODUCTS

(Continued from page 64)

directly to plate of horizontal output tube or at the plate of the damper tube to check the operation waveforms and to measure their peak to peak voltages without impairing the wave shape or incurring danger to the oscillograph. Input vacuum capacitor less than 2 mmf. Useful to 10,000 peak to peak volts.



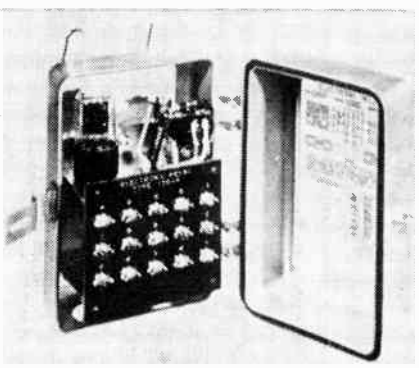
Voltage Doubler Probe BZ-4. The Scala BZ-4 provides virtually double the deflection on a scope screen provided by conventional half-wave probes. Offers a high degree of 60-cycle hum rejection. Contains dual demodulator of low-capacitance, high-impedance design, selected for balance and sensitivity, useful to 150 M.C.
tondCcalaiidemsensi

Scala BZ-123. Consists of Scala BZ-1, BZ-2, and BZ-3 probes complete with one coaxial cable, instructions and removable Klipzon tip which can be fastened to any Scala probe to make a firm connection to test point.

• *Level Control Photoswitch Type 13DJ3*

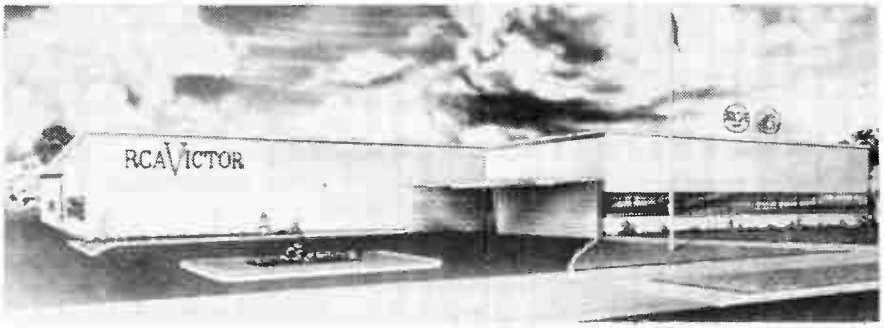
Item 545

The introduction of a Level Control Type 13DJ3 has been announced. Incorporating the latest techniques of electronic design, Level Control Type 13DJ3 controls the level of all electrically conductive liquids. The control consists of an electron tube amplifier and relay combination which operates from minute currents in the probe circuit. Except for annual replacement of a long-life electron tube, it is completely maintenance-free as there are no floats or stuffing boxes to wear or fail in operation. Contact with the liquid is made only by corrosion-resistant stainless steel probe rods. Accuracy is independent of temperature and pressure. A single control, through flexible terminal panel connections, provides for operation as either a pump-up or pump-down control, or a high or low level safeguard with fail-safe action for all five types of operation. The control is universal for either 115 or 230 volts 50/60 cycle supply.



Positive control of all electrically conductive liquids results from the extremely wide resistivity range — zero to 20 megohms per centimeter cube — over which the probe circuit operates. Positive control is assured by proper selection upon installation of the six resistors provided for ready attachment to the conveniently located terminal panel.

For further data on advertised products use page 62.



● New RCA Victor Record Plant in Smiths Falls, Ontario, to which all record manufacturing operations of the company have now been transferred.

Britain's National Radio Show To Be Held Aug. 25 - Sept. 4

British exports of television cameras, studio equipment and outside broadcast units are becoming significant and the most complete demonstration of them yet arranged will take place in the National Radio Show, Earls Court, London, from August 25th to September 4th, with a special pre-view for overseas visitors on August 24th.

An arena for demonstration by the B.B.C. of outside television broadcasts is a new feature of the Show. There will also be two fully-equipped television studios within the Exhibition, one of them also being used for sound programs, with their complete control equipment and the latest film scanner.

CANADIAN PARTICIPATION

(Continued from page 34)

in the minds of executives of large companies with respect to the future of the electronic engineer. The Vice-President-Engineering of a large aviation company recently said "Management generally has found engineers hard to deal with — they make poor supervisors, etc" while other executives are said to be grooming engineers to take charge of management.

Someone wrote these words (I wish I had) — "If management is to receive full benefit of the engineer's skill and knowledge it is necessary that he be articulate to a very high degree. The ability to speak concisely and forcefully is a 'must' for the engineer, particularly in view of the fast tempo of modern research."

The ability of the engineer to prepare and successfully deliver technical papers tends to make him a leader in his field.

Will the Canadian electronic engineers accept these responsibilities? Will they groom themselves to advance to those positions in management? Time alone will tell, but by taking a part in bringing the story of Canadian developments and research to the world they benefit themselves, their employers and Canada.

RCA Smiths Falls Record Plant Now In Full Production

Completion of the transfer of phonograph record production from Montreal to their new Record Plant in Smiths Falls, Ontario, has been announced by the RCA Victor Company, Ltd. The new 50,000 sq. ft. plant, providing the finest of working conditions for a staff of 125, is now in full production on all speeds and sizes of records carrying the world-famous RCA Victor label. The label goes back to the days when Caruso first put his voice on wax in 1903, said Mr. L. I. DelMotte, Manager of the Smiths Falls Plant, but the technical advances have been tremendous in recent years. Mr. DelMotte further stated that we are able to record sound over the entire audible range of the human ear — from about 30 to 18,000 cycles per second — with a fidelity that would have astounded the great Caruso.

For further data on advertised products use page 62.

soft...easily formed Phillips

ENAMELLED AND FORMEL

MAGNET WIRE

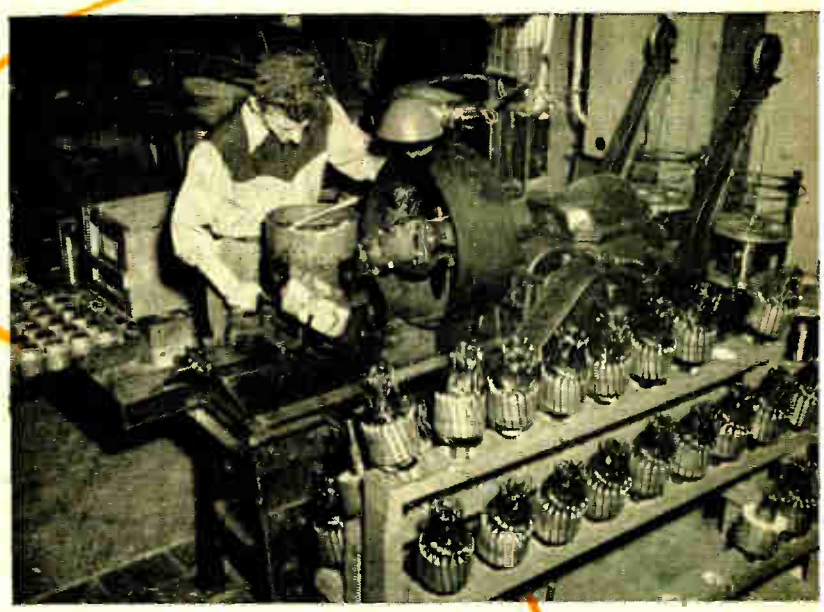
means increased productive capacity for you!

When you buy Phillips Magnet Wire you know you are getting the finest quality . . . because Phillips Magnet Wire is the product of the most modern methods of drawing and annealing. It is made of the finest materials . . . and manufactured by the latest methods. Then, too, there is constant inspection during its manufacture to insure uniform dimensions and correct softness. So that the Phillips Magnet Wire you buy is a perfectly finished product . . . that bends with ease, without cracking or flaking.

Phillips Magnet Wire, with its high ductility, is the result of many years of manufacturing and development. It can be supplied to standard or special specifications.

Let us know your magnet wire needs. We'll be glad to fill your order promptly! Stocks are maintained at distributing centres all across Canada.

Winding relay coils with Phillips Enamel Magnet Wire.



Winding motor armature with Phillips Formel Magnet Wire.

Phillips Electrical Company (1953) Limited

WIRES & CABLES

THE CANADIAN AFFILIATE OF THE B.I.C.C. GROUP

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BOOK REVIEW

RADIO AND TELEVISION SERVICING LIBRARY, shows you how to carry out virtually every TV-radio installation, service or repair job; operate field testing equipment, understand problems of TV broadcasting, FM-AM transmission et cetera. You can establish yourself solidly in the widening electronics field, get a specialists rating right off — or even branch out into your own business.

The men who wrote the 4-volume library of Radio and Television Servicing are among the outstanding radio and TV instructors in America. They are practical shirt sleeved technicians. They know what information you want, and have set it down clearly in over two thousand pages of step-by-step instruction, and over fourteen hundred how-to-do-it illustrations. Review questions and answers "cinch" everything you learn while at-a-glance "trouble-shooting" charts show how to diagnose instantly any radio or TV breakdown — how to repair it expertly and quickly.

RADIO AND TELEVISION SERVICING LIBRARY, published by McGraw-Hill in 4 volumes contains 2311 pages, 1467 illustrations.

"ELECTRONICS" by Thomas Benjamin Brown. This book is the result of over 30 years of study and teaching in the field of electronics and looks primarily to the whys behind electronics. It has been designed to help the reader to a sound grasp of the fundamental principles and concepts. Emphasis is placed on the physical analysis of electron tubes and circuits, rather than on a detailed study of many types.

The book makes liberal use of graphical methods, including: graphical analysis of negative-feedback circuits to show reduction distortion, cathode-follower circuits a,nd multi-stage amplifiers. Original graphical analysis, such as that for the Eccles-Jordon (flip-flop) circuits, are provided.

Special consideration is given to non-linear functions performed by electronic circuits. The modulation processes, which include detection and frequency conversion, are systematically treated so as to highlight common relationships. Of particular interest is the chapter devoted to UHF electronics, which covers special tubes, such as klystrons, magnetrons, and travelling-wave tubes.

"ELECTRONICS" is published by John Wiley & Son Inc., 440 Fourth Ave., New York; contains 545 pages; hard cover bound. Price $7.50.

ANDREW ANTENNAS is the title of a new catalog recently published by the Andrew Corporation of Chicago. Termed on the inside cover as Catalog AQ January, 1954 the publication contains a wealth of information on the following subjects: semi-flexible coaxial cables, rigid transmission lines, gassing equipment, FM and TV broadcast antennas, communications antennas, microwave antennas, antenna tuning equipment, instruments and components, and tower lighting equipment.

The Andrew Antenna Corp., Ltd., Canadian location is P.O. Box 971, Whitby, Ontario.

"INTRODUCTION TO COLOR T.V." by M. Kaufman and H. Thomas. The color television receiver circuits dealt with in this book will be subject to changes in the future, but the basic principles of the NTSC system are well crystallized. Simplifications in circuitry are inevitable, but these need not necessarily reflect changes in basic principles, hence the fundamentals as set forth herein are detined to have long life.

The color television system is accorded detailed attention, with the emphasis on the receiver. It was felt that this choice suited the needs of most who might be readers of this book — service technicians, students, and engineers who are not familiar with color television processes. The minimization of mathematics is deliberate.

"Introduction to Color T.V." is published by John F. Rider, 480 Canal Street, New York. Contains 140 pages; paper binding. Price $2.10.

"TV MANUFACTURERS' RECEIVER TROUBLE CURES", edited by Milton S. Snitzer, is the fifth in a series of volumes which deals with specific TV receiver troubles and their cures. These trouble cures are the TV manufacturers' own answers to some of the problems that may arise in their particular receivers.

After a certain model or chassis has been in the field for awhile, certain troubles may occur which are peculiar to that receiver. In an effort to maintain his own good reputation, the manufacturer is interested in keeping his receiver in tip-top working order. Therefore, his service or engineering department evolves a cure for the particular trouble. Such are described in this book.

"TV Manufacturers' Receiver Trouble Cures" is published by John F. Rider Inc., 480 Canal St., New York; contains 120 pages, paper bound; Price $1.80.

"RIDER'S SPECIALIZED HOME AND PORTABLE RADIO MANUAL". The Specialized Series of Rider Radio Manuals are planned to satisfy several particular requirements. Many service organizations have need for authentic, factory-prepared (and therefore dependable), service information on particular brands of radio receivers. The Specialized Series aims to satisfy this need.

Volume 8, the eighth of the Specialized Series of Radio Manuals, contains servicing information on home and portable radio receivers produced over the period, and by the manufacturers shown on the cover. Subsequent volumes in this Series will embrace the remainder of the radio receiver manufacturers and their products produced during 1951 through 1953.

"Rider's Specialized Home and Portable Radio Manual" is published by John F. Rider, 480 Canal Street, New York; paper binding; Price $1.65.

"TV TROUBLESHOOTING AND REPAIR GUIDEBOOK" by Robert G. Middleton. Readers of Volume 1 of "TV Troubleshooting and Repair Guidebook" have had an opportunity to become familiar, at least to a certain extent, with a wide range of recognized troubleshooting procedures. The experience thus gained answers some of the questions of the practicing technician, but it leaves unanswered other questions. Discussions with readers have indicated that information is desired concerning troubleshooting and repair of front ends, picture i-f amplifiers, video amplifiers, sound i-f amplifiers and detectors, and audio amplifiers. Accordingly, these matters received considerable attention in this, Volume 2.

"TV Troubleshooting and Repair Guidebook" Volume 2, is published by John F. Rider, Inc., 480 Canal Street, New York; contains 160 pages, paper bound; Price $3.30.

"COIL WINDING" is the title of a new 125 page technical book by William Querfurth. The book describes coil winding machinery and winding procedures. 80 illustrations and numerous tables help to make the book a valuable primer to a person entering the coil winding business.

Value to established coil winding firms is substantial. Detailed description of many processes and naming of all machine parts aid in the standardization of nomenclature in the industry. Instructions are given on how to setup and align winding machines of various types, how to lay out a bench to best advantage for coil winding, how to make an arbor, a chuck, a collet, how to design cams, how to align wire guides, how to select and adjust various wire tension devices. The book can be obtained from **Geo. Stevens Mfg. Co., Inc., Pulaski Rd., at Peterson, Chicago 30, Ill. Price $6.50.**

For further data on advertised products use page 62.

Power Gain of 1000 at UHF

EIMAC 3K50,000LF
Length 49 inches
Weight 48 pounds

Eimac 3K50,000L Klystrons in typical CW operation give 10KW power output with only 10 watts drive

High power, high efficiency, ultra-high frequency Eimac type 3K50,000L klystrons, widely heralded for UHF-TV, are proving outstanding for CW. Typical CW operation of these versatile klystrons shows 40% efficiency while delivering 10 kw output with only 10 watts drive—a power gain of 30 db., or 1000 times. Furthermore service at frequencies above and below the UHF-TV band is being obtained through flexibility provided by the externally tuned cavities of Eimac klystrons.

● *For information about Eimac type 3K50,000L klystrons contact our Application Engineering department.*

TYPICAL OPERATION
3K50,000L Klystrons

	CW	TV
D-C Beam Current	1.65	2.15 amps
D-C Beam Voltage	15	17.2 kv
Driving Power	10	55* watts
Power Output	10	12* kw
Efficiency	40%	32%*

*Peak synchronizing level (80% of saturation power)

3K50,000L KLYSTRONS
FOR UHF-TV

TYPE	FREQUENCIES
3K50,000LA	470-580 mc
3K50,000LF	580-720 mc
3K50,000LK	720-890 mc

Eimac

EITEL - McCULLOUGH, INC. ● **San Bruno, California**

Export Agents: Frazar and Hansen, 301 Clay St., San Francisco, Calif.

For further data on advertised products use page 62.

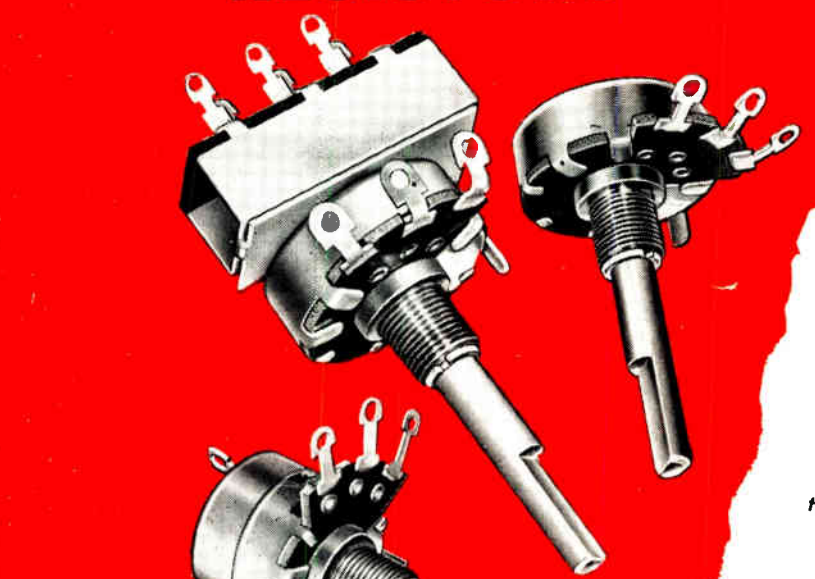
ADVERTISERS' INDEX

For further data on advertised products use page 62.

A GOOD NAME TO REMEMBER
WHEN YOU NEED DEPENDABLE
COMPONENTS... *faster!*

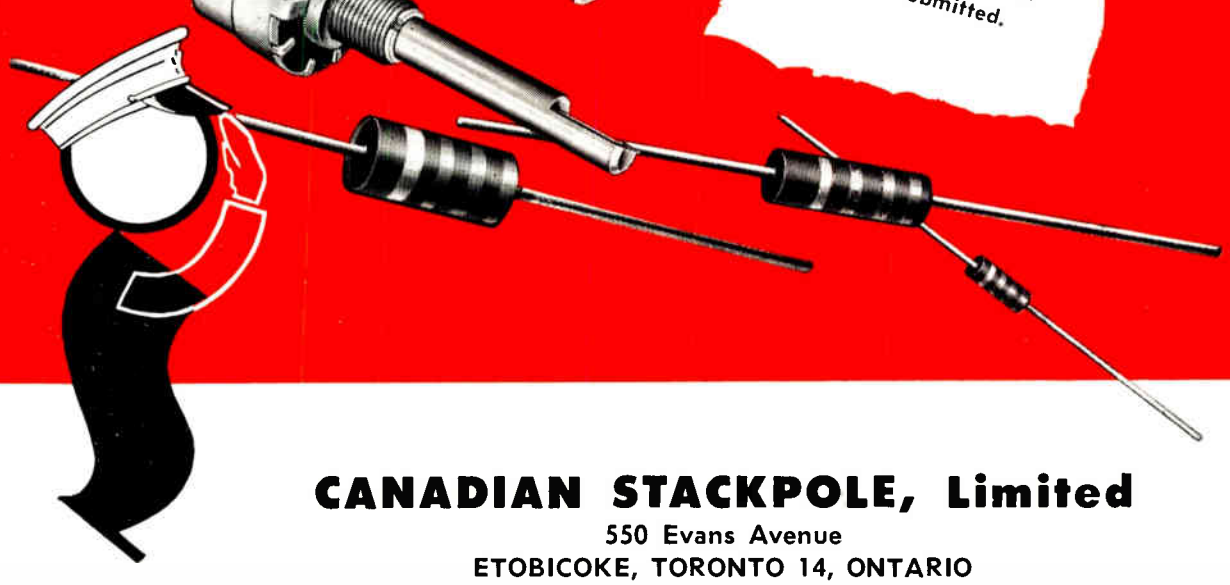
STACKPOLE

FIXED and VARIABLE RESISTORS



From radio to television to industrial or exacting military uses, Stackpole resistors spell dependable, trouble-free service. Standard types cover practically every requirement. Each unit is backed with full quality control extending from raw materials to electrical and mechanical tests of the finished product.

SAMPLES to your specifications gladly submitted.

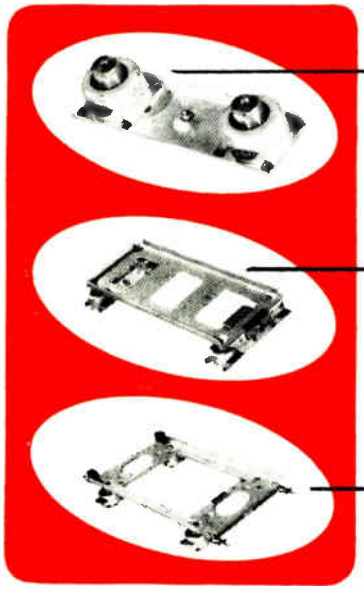


CANADIAN STACKPOLE, Limited
550 Evans Avenue
ETOBICOKE, TORONTO 14, ONTARIO

ROBINSON MET-L-FLEX all-metal mounts for vibration isolation and shock protection

FOR AIRBORNE ELECTRONIC EQUIPMENTS, INSTRUMENTS AND CONTROLS

SERIES 878 TWIN UNIT MOUNT ASSEMBLY



The assembly consists of two Series 7001 MET-L-FLEX Unit Mounts on a flanged tie-plate for attachment to your own tray or mounting base. S-1 and S-2 standard bases incorporate this assembly. Special widths and load ratings available. See Dwg. 878 B for details.

Robinson Model Number	Load Rating Lbs. Each End
878-1	½ to 1
878-2	¾ to 1¾
878-3	1½ to 3
878-4	2½ to 5½
878-5	5 to 10

SERIES 892 UNIT MOUNTING BASE

Designed and manufactured in conformance with JAN-C-172A and included specifications. "Proof Tested" Construction. Uses two Series 878 MET-L-FLEX Twin Unit Mounts and Bonding Jumpers. See Dwg. 892 B for details.

Robinson Model No.	Standard Designation	Load Range in Pounds	Weight in Lbs.
892-1	MT-S-1	6-12	1.25
892-2	MT-S-2	10-22	1.35

SERIES 831 UNIT MOUNTING BASE

Designed and manufactured in conformance with JAN-C-172A and included specifications. "Proof Tested" Construction. Employs four Series 7002 MET-L-FLEX Unit Mounts and Bonding Jumpers. See Dwg. 831 B for details.

Robinson Model No.	Standard Designation	Load Range in Pounds	Wgt. in Pounds
831-1	MT-A1-B	10-24	2.40
831-2	MT-A1-C	10-24	2.45
831-3	MT-A1-D	10-24	2.50
831-4		18-40	
831-5	MT-B1-B	10-24	2.60
831-6		18-40	
831-7	MT-B1-2-C	10-24	2.65
831-8		18-40	
831-9	MT-B1-2-D1	22-50	2.70
831-13	MT-B1-2-D2	40-80	2.70
831-14	MT-C1-2-C	40-80	2.80
831-15	MT-C1-2-D	40-80	2.85

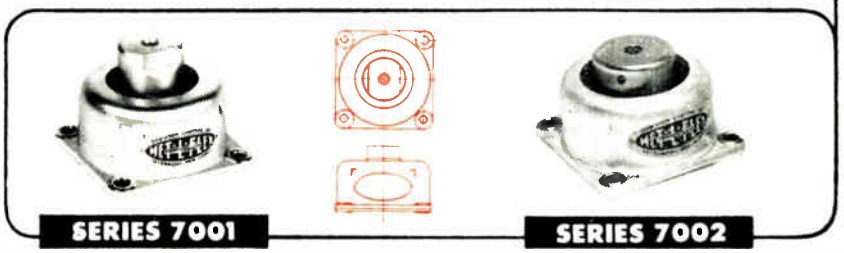
Robinson MET-L-FLEX Engineered Mounting Systems, Mounting Bases, and Unit Mounts . . . by Robinson Aviation Inc. . . . are compact, rugged and effective at *all altitudes*. The basic unit mount is an all-metal resilient element made of stainless steel which has . . .

- High damping stability at all altitudes.
- Non-linear deflection characteristics — maximum vibration absorption.
- Sea level performance at any altitude — unaffected by oils, hydraulic fluids, temperature, vibration or moisture.
- Extremely long life.
- Negligible drift rate and wide temperature range — 90 to +175C.

Robinson mounts are designed and built for the operating life of the aircraft. They lack the inherent weaknesses of mountings incorporating organic or plastic materials. Anti-vibration mounts are available in a wide range of sizes, permitting replacement of existing mounts in most cases.

Write for bulletin on vibration isolation mounts to: 200 Laurentien Blvd., Montreal

Mounting Bases to meet your exact dimensional and load requirements are available on special order.



SERIES 7001 **SERIES 7002**

Model Number	Application Range in Lbs.
7001-H	½ to 1
7001-J	¾ to 1¾
7001-K	1½ to 3
7001-L	2½ to 5½
7001-M	5 to 10

Model Number	Application Range in Lbs.
7002-G	1½ to 2¾
7002-H	2½ to 6
7002-J	4½ to 10
7002-K	5½ to 12½
7002-L	10 to 20
7002-U	15 to 30
7002-M	18 to 40
7002-P	35 to 50
7002-R	45 to 75

MET-L-FLEX is the copyrighted designation for the all-metal resilient cushions developed and pioneered by Robinson.

Canadian Distributor

AVIATION ELECTRIC LIMITED

MONTREAL VANCOUVER

SALES • SERVICE • OVERHAUL • MANUFACTURE OF AIRCRAFT INSTRUMENTS & ACCESSORIES