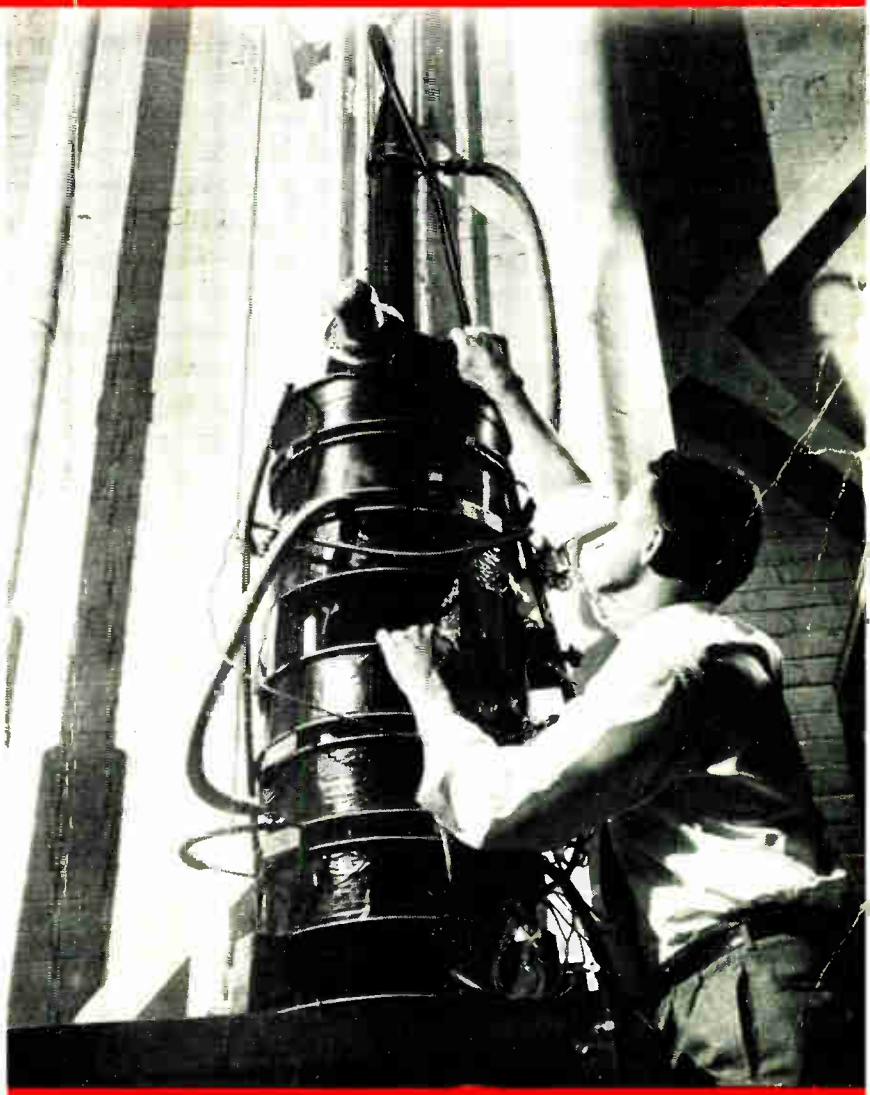
ELECTRONICS *and* COMMUNICATIONS

DESIGN—MANUFACTURE—ENGINEERING—DISTRIBUTION—APPLICATION

New Ideas For Modern Management

- **Electronic Assembly Techniques To Speed Industrial Production.**
- **Canadian Devised System Simplifies Exploration Surveys.**
- **The Role Of Relays In The Electronic Age.**
- **Connectors For The Electronic Industry — Some New Ideas.**
- **Package Sorting For The Warehouse Industry.**
- **Versatile Airborne Radar Promise To Safer Flying.**



First photo of 4,000,000-watt klystron designed to power an advanced Air Force radar. The eight foot giant, prototype for a series of the military's most powerful microwave tubes, is shown being installed.

Nov. - Dec. 1954 ★ $5.00 a year
An AGE Publication, Toronto, Canada

Distribution Of This Issue
Over 10,000 Copies

For Hams, Ships, Police Radio, etc.

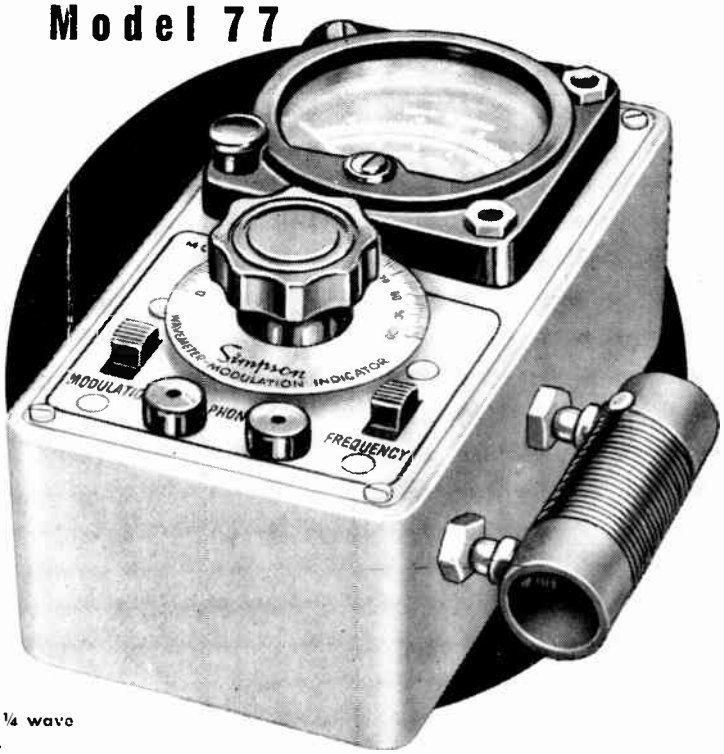
Simpson

WAVEMETER and MODULATION INDICATOR

Model 77

The New Wavemeter Features

1. Continuous coverage 1-63 mc and (140-170 mcs)
2. More effiicient circuit
3. Improved Stability, new air spaced trimmer
4. Increased sensitivity
5. Improved accuracy, sharper tuning
6. Reliable bandspread calibration
7. Stable pre-grooved coils
8. Extremely loose coupling — no danger
9. Pre-calibrated coils for 160 and 6 meters available
10. Pre-calibrated adjustable ¼ wave antenna for 140-170 mcs



Use it for S.W.R. measurements, field strength measurements, T.V., harmonics and special signal detection, plus a multitude of other applications.

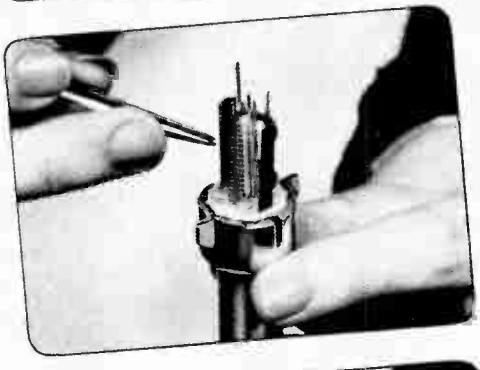
typically Simpson-made.. small, versatile, sturdy

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 64.



patiently perfected . . .

Everyone engaged in the making of Marconi tubes keeps one important fact in mind—*each* tube is a piece of equipment on which someone's listening pleasure, convenience or even life is going to depend. So every single Marconi RVC tube is made with as much care as if it had been specially ordered for a particularly important application.

YOUR customers' satisfaction is the dividend Marconi earns by setting higher standards for the industry.

MARCONI RADIOTRONS

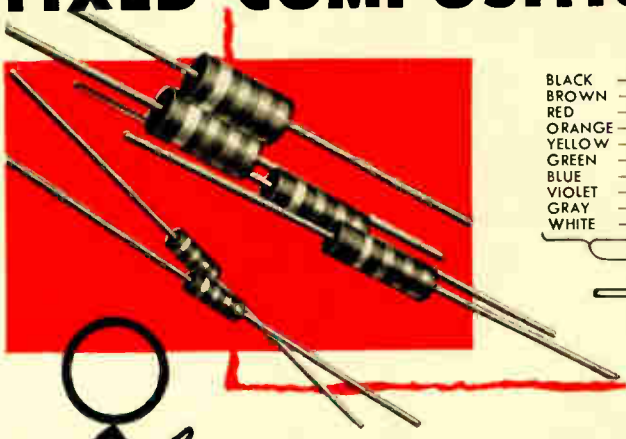
Canada's finest radio and television tubes

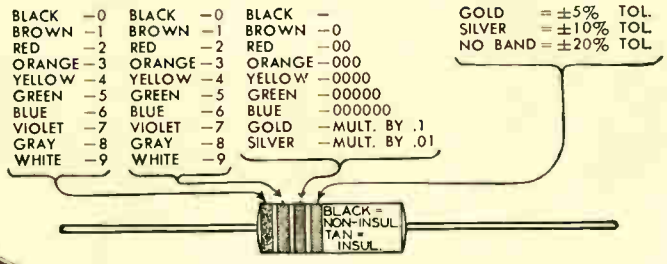
CANADIAN MARCONI COMPANY

VANCOUVER, WINNIPEG, TORONTO, MONTREAL, HALIFAX, ST. JOHN'S, NFLD.

STACKPOLE

FIXED COMPOSITION RESISTORS





These standard resistance ratings have been carefully selected to cover every circuit requirement while avoiding costly and unnecessary overlapping of values. All Stackpole ½-, 1-, and 2-watt resistors are regularly supplied in each of the ranges and tolerances indicated. Through this standardization you are assured of maximum quality and faster deliveries plus easier stocking of resistors for you.

CANADIAN STACKPOLE LIMITED
550 Evans Avenue, Toronto 14, Ontario

These 269 RETMA Values Meet Every Modern Circuit Need!

±20%	±10%	±5%
10	10	10
		11
	12	12
		13
15	15	15
		16
	18	18
		20
22	22	22
		24
	27	27
		30
33	33	33
		36
	39	39
		43
47	47	47
		51
	56	56
		62
68	68	68
		75
	82	82
		91
100	100	100
		110
	120	120
		130
150	150	150
		160
	180	180
		200
220	220	220
		240
	270	270
		300
330	330	330
		360

±20%	±10%	±5%
	390	390
		430
470	470	470
		510
	560	560
		620
680	680	680
		750
	820	820
		910
1000	1000	1000
		1100
	1200	1200
		1300
1500	1500	1500
		1600
	1800	1800
		2000
2200	2200	2200
		2400
	2700	2700
		3000
3300	3300	3300
		3600
	3900	3900
		4300
4700	4700	4700
		5100
	5600	5600
		6200
6800	6800	6800
		7500
	8200	8200
		9100
10000	10000	10000
		11000
	12000	12000
		13000

±20%	±10%	±5%
15000	15000	15000
		16000
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±20%	±10%	±5%
	560000	560000
		620000
680000	680000	680000
		750000
	820000	820000
		910000
1.0 Meg	1.0 Meg	1.0 Meg
		1.1 Meg
	1.2 Meg	1.2 Meg
		1.3 Meg
1.5 Meg	1.5 Meg	1.5 Meg
		1.6 Meg
	1.8 Meg	1.8 Meg
		2.0 Meg
2.2 Meg	2.2 Meg	2.2 Meg
		2.4 Meg
	2.7 Meg	2.7 Meg
		3.0 Meg
3.3 Meg	3.3 Meg	3.3 Meg
		3.6 Meg
	3.9 Meg	3.9 Meg
		4.3 Meg
4.7 Meg	4.7 Meg	4.7 Meg
		5.1 Meg
	5.6 Meg	5.6 Meg
		6.2 Meg
6.8 Meg	6.8 Meg	6.8 Meg
		7.5 Meg
	8.2 Meg	8.2 Meg
		9.1 Meg
10.0 Meg	10.0 Meg	10.0 Meg
		11.0 Meg
	12.0 Meg	12.0 Meg
		13.0 Meg
15.0 Meg	15.0 Meg	15.0 Meg
		16.0 Meg
	18.0 Meg	18.0 Meg
		20.0 Meg
22.0 Meg	22.0 Meg	22.0 Meg

For further data on advertised products use page 64.

The Editor's Space

Ivor Nixon, Manager of the Telecommunications Division of Pye Canada Limited informs us that his company's new offices at 60 Front Street in Toronto will be fitted with a closed circuit television installation. According to Mr. Nixon, businessmen who may have given some thought to the possibility of using this type of apparatus in their offices or factories but who are not quite sure of its effectiveness or application, will be welcome to visit the Pye office installation and acquaint themselves with the workings and functions of closed circuit television equipment.

* * * *

Was privileged to witness a film entitled "Team Work in Action", a dramatic 33 minute picture which documents the compensation and rehabilitation services available to approximately 1,350,000 persons covered by the Workmen's Compensation Act of Ontario. The film has been produced as part of the Board's program of informing employers, workmen, labor organizations, doctors and community groups regarding the advantages of workmen's compensation and the manner in which the various services and facilities can best be utilized. Was privileged to meet E. E. Sparrow, Chairman of the Board on the above occasion to whom I extend thanks for answering my many questions.

* * * *

According to figures released by the Dominion Bureau of Statistics the average annual snatch of doctors in Canada is approximately $9,000.00. It's my opinion that the tabulating machinery of the D.B.S. in Ottawa has broken down or the average Canadian doctor can't add very well!

* * * *

The legal validity of electronic devices for apprehending traffic offenders and speeders has been developed into courtroom pantomimes on several recent occasions. Being inanimate contrivances, electronic traffic traps cannot be questioned in the witness box. This, of course, would be ultra vires and all that sort of thing but it's a sure bet if they had the ability to feel and express themselves their testimony for prosecution would be as water-tight as the legal argument against them is unsound and reactionary.

* * * *

Canadian Inventive and Scientific Associates Limited is the name of a new organization which has been established to assist inventors in the appraisal of their ideas, process patents and finally, the marketing of their inventions. To this organization we extend our best wishes for success. Reference to this organization may result in the saving of many hundreds of dollars on the part of well-meaning inventors who otherwise without council, may spend their hard-earned money on protecting useless ideas with costly patents. It is significant that in some European countries government patent offices will not accept an application for patent protection on a device unless such merits it. It is our understanding that the Canadian patent office will process all applications for patents irrespective of their value — for the required fee of course.

(Turn to page 48)

For further data on advertised products use page 64.

Dear People - - -

In the publishing business "people" are the most critical ingredient of all. First of all, there are the "people" who produce the magazine — the writers, photographers, editors, the advertising salesmen, the production staff, the stenographers, et al — that's us.

Then there are the "people" who use and read the magazine. Our readers are our severest critics and our best friends. We love 'em!

Then of course, there are the "people" who are our advertisers. They are the people who make our magazine possible.

Put it all together, and it spells P-E-O-P-L-E, the one thing we cannot do without.

So we say, to all you kind people — thanks for your patronage and courtesies during '54. It's been wonderful working for you. We'll try even harder in '55 to serve your best interests. In the meantime, may you have a Joyous Christmas and a Happy, Prosperous New Year!

The Staff of
AGE PUBLICATIONS LIMITED.

publishers of

Restaurants & Institutions • Heating, Plumbing and Air Conditioning AGE
Electronics & Communications • Oil & Gas Heat • Hotel & Tavern

LONDON REPORT

A summary of developments in the British Electronic industry.

New electronic aids to air navigation, many of which were shown at the S.B.A.C. exhibition at the Royal Aircraft Establishment at Farnborough, are providing safer flying conditions for both civil and military aircraft in many parts of the world.

The British radio industry has produced a wide and varied range of electronic equipment for air-borne and ground installations. These range from miniaturized beacon and communication rescue equipment to large airfield search radar installations.

Sir Miles Thomas, Chairman of B.O.A.C., when opening this year's Radio Show at Earls Court, London, hinted that before long new British airliners would be equipped with a radar search device for locating the dangerous cumulo-nimbus cloud formations.

The radio industry anticipated this requirement several years ago and in 1949 E. K. Cole, of Southend-on-Sea, produced a collision warning radar which indicates the presence of other aircraft.

The latest Ekco airborne search radar equipment, as installed in the Bristol Britannia and other aircraft, is mainly designed to give the pilot warning of dangerous cloud formations, but the radar beam which scans a section of space ahead of the aircraft will also give responses from other aircraft, mountain peaks and high obstructions.

As permanent features of the landscape are also painted on the Display screen by the scanning beam, this equipment can be of advantage to a pilot making approach to an airfield which is not equipped with full navigational aid installations.

Life-Saving At Sea

In recent years more attention has been focussed upon methods for locating military aircrew who have had to abandon their aircraft and bale out over the sea. Gone are the days when an airman afloat in his Mae West or a rubber dinghy had to rely for rescue upon a chance sighting by passing ships or aircraft.

Radio's first use was for life-saving at sea; it is still a major use. Taking full advantage of modern miniaturised valves, components and batteries, radio equipment has been developed which greatly increases the airman's chance of survival and rescue.

The latest is "TALBE" — a talk and listen beacon equipment made by Burndept of Erith, Kent, which has just been approved for adoption by the Fleet Air Arm. An important feature of TALBE is that no special equipment is required by the search aircraft for it operates with the standard VHF communication and homing apparatus fitted in civil and Service aircraft.

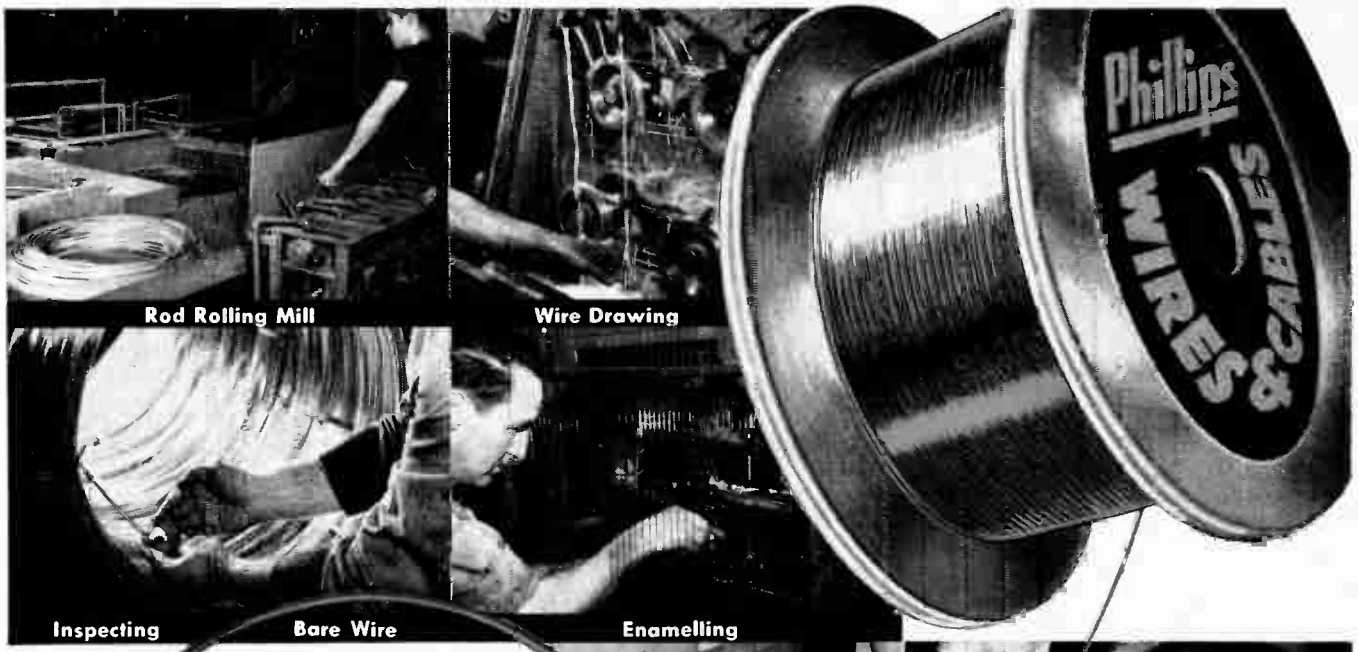
A specially designed belt to be worn by each member of the aircrew contains a super light-weight and miniature VHF beacon and R/T transmitter. As soon as the airman has baled out and is floating in the sea he raises the aerial and switches on his TALBE device.

The beacon equipment then radiates a continuous distress signal which can be recognised and received at distances up to 60 nautical miles by any aircraft flying at 5,000 feet or higher. This greatly increases his chances of survival for it means that the distress signals are receivable by all such aircraft within an area of 11,000 square miles.

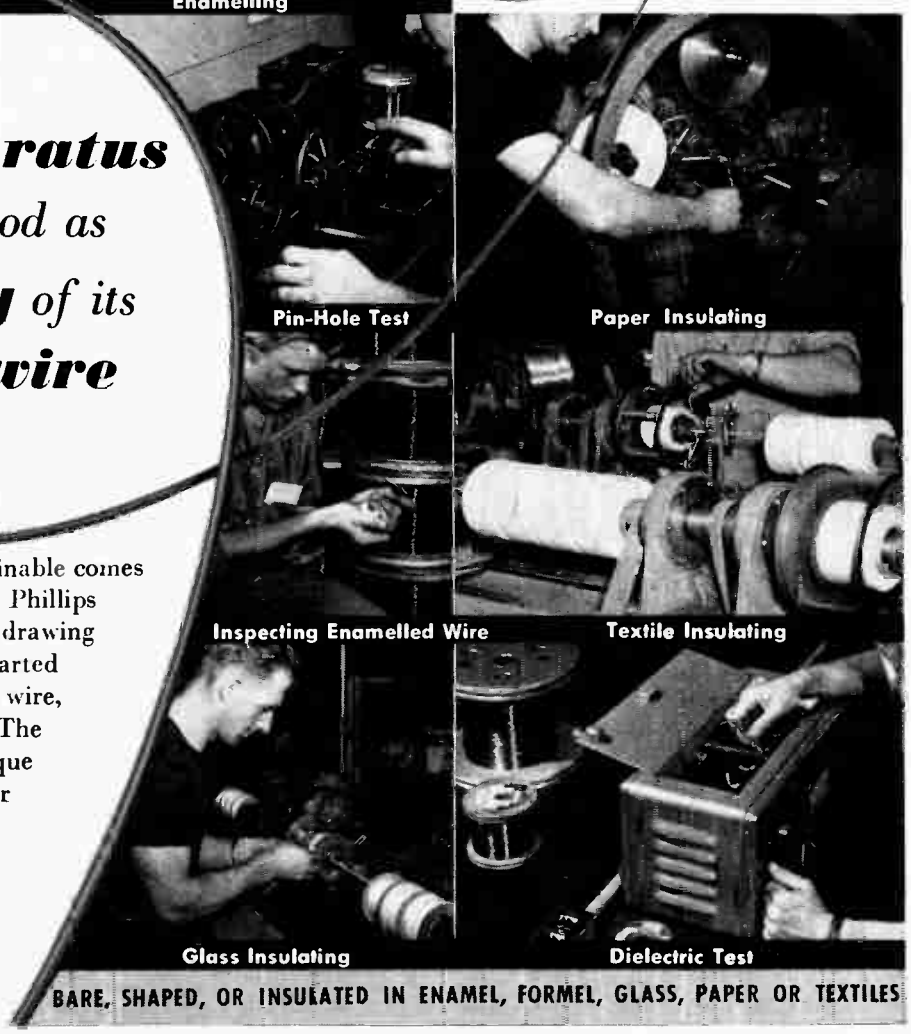
When one of the rescue aircraft is within about 20 miles of the airman he can switch to R/T and talk with

(Turn to page 62)

For further data on advertised products use page 64.



your apparatus
is only as good as
the ***quality*** *of its*
magnet wire



Some of the finest Magnet Wire obtainable comes from the 99.9% pure copper rolled in Phillips rod mill. Throughout the rolling and drawing operation a high surface finish is imparted to the wire that is invaluable in bare wire, and essential for all insulated types. The annealing process used renders a unique softness to the copper that is ideal for easy winding. When insulated, the dielectric is applied in a smooth impervious layer that is Phillips guarantee of complete reliability.

Whether you need bare, shaped or insulated Magnet Wire, your best bet is Phillips.

BARE, SHAPED, OR INSULATED IN ENAMEL, FORMEL, GLASS, PAPER OR TEXTILES

Phillips
ELECTRICAL COMPANY (1953) LIMITED
WIRES & CABLES
THE CANADIAN AFFILIATE OF THE B.I.C.C. GROUP

26 Hollinger Road, Toronto 16

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

5460

For further data on advertised products use page 64.

About This Issue

It's Time We Made Up Our Minds, our lead story which appears on page 14 of this issue deals with the little known but magnificent part played by the Manufacturers' Communications Network set up to aid in salvage and rescue operations during Hurricane Hazel which devastated sections of Toronto on October 15. The loss of life and property caused by the hurricane serves as a grim warning what may be expected in the case of another such emergency, be it natural or otherwise, and the dire need for a civil defense organization to cope with it.

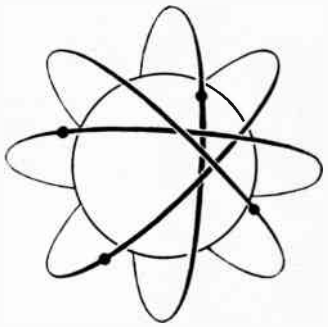
Electronics which have assisted immeasureably in increasing the efficiency of many types of industry is also being employed to increase the efficiency of the electronic industry itself. A new assembly technique which is being developed by the United Shoe Machinery Corporation of Boston, Mass., promises something of a revolution in the matter of assembly methods for such items as television receivers and radios. The story of the new technique is told on page 16 of this issue.

There's a mighty lot of ground to be covered in Canada before the location of her rich lodes of minerals can be located and no one knows this better than Canadians themselves. It is perhaps natural then that a team of Canadian scientists have developed a method of covering this ground in less time and at the same time determining where our minerals are hidden. The story of this Canadian achievement is on page 17.

Electrical connectors haven't changed much in 25 years, but if they are to be made to fit into the miniaturized assemblies that are now possible they will have to undergo considerable face-lifting. Some ideas along these lines are discussed in Dr. Leslie Hill's article which appears on page 20.

Size and weight have limited to a considerable extent the range, power and versatility of radar equipment which can be carried aboard aircraft. Now however, a new type radar unit, small, powerful and versatile in its function has been satisfactorily tested and which will increase the safety margin of flying large aircraft to an astounding degree. A description of the unit is on page 52.

NOV.-DEC. 1954



ELECTRONICS AND COMMUNICATIONS

Vol. 2 No. 6

FEATURES

DEPARTMENTS

Electronics and Communications is published bi-monthly by AGE PUBLICATIONS LIMITED, publishers of *Oil and Gas Heat, Heating, Plumbing and Air Conditioning Age, Hotel and Tavern,* and *Restaurants and Institutions.*

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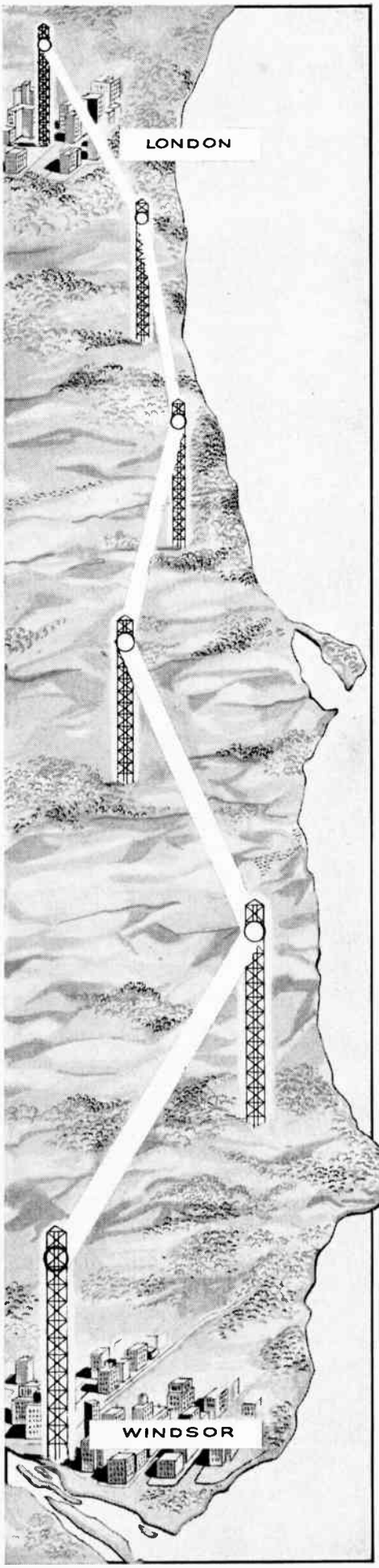


Another Link in Canada's TV Chain...

CANADIAN GENERAL ELECTRIC TO SUPPLY MICROWAVE EQUIPMENT TO THE CANADIAN NATIONAL AND CANADIAN PACIFIC RAILROADS

CANADIAN GENERAL ELECTRIC is now installing G.E.C. microwave equipment for the two major Canadian railway companies to extend the CBC Trans-Canada TV network from London to Windsor. Providing two reversible TV channels, the system will carry compatible colour programs with minor modifications. Supervisory control facilities allow the direction of transmission of each TV channel to be instantaneously reversed from a single control point.

In initiating this service, which will bring network TV programs to thousands of Western Ontario homes, C.G.E. is providing a complete "package" installation including site selection, microwave equipment, and towers. The Apparatus Division of C.G.E., joined forces with the Electronics Division to provide motors and generators for the diesel-electric emergency power supplies which are required at the four repeater stations and at the terminals — thus ensuring TV viewers of virtually uninterrupted service.

This is another example of C.G.E.'s leadership in the provision of complete engineering services and communications facilities to meet the requirements of Canadian industry, Government services and the public.

GENERAL ELECTRIC MICROWAVE

Electronic Equipment Department
CANADIAN GENERAL ELECTRIC COMPANY LIMITED
830 Lansdowne Ave., Toronto 4, Ontario

For further data on advertised products use page 64.

business briefs & trends

★ The twenty-three Canadian companies engaged in the manufacture of television sets will produce about 575,000 sets this year according to the Radio Television Manufacturers Association and the month of November last was expected to mark the completion of the one millionth television receiver to be manufactured in Canada.

* * *

★ Roughly 25,000 Canadians are now employed in the Canadian electronics industry and it is expected that this figure will be increased as domestic production of electronic equipment is broadened out to include components and assemblies not yet produced in the country.

* * *

★ Long distance telephone communications facilities between Kamloops and Vancouver have been greatly augmented by the opening of several radio telephone circuits between Kamloops and the coast. The new circuits almost double the number of circuits previously operating and will provide speedier telephone communication between the two cities, according to an announcement by B.C. Telephone Company officials in Vancouver.

* * *

★ The significance of the Canadian electronics industry to the commercial communications industry and to national defense was emphasized by the 45 representatives of the Canadian electronics industry attending the first annual general meeting of the Technical Products Division of the Radio Television Manufacturers' Association of Canada. Department of Defense Production negotiations, research and development in industry patents, specifications and other aspects of doing business with the armed services highlighted the first day's program of the meeting.

* * *

★ A report of findings by the RTMA Industrial Relations Committee concerning the shortage of skilled personnel in the electronics industry which was compiled at the request of the Department of Citizenship and Immigration shows a dirth of skilled help in the following categories: (1) Experienced electronic engineers, electronic physicists or engineering physicists with a specialized knowledge in communications and/or microwave electronics. (2) Electrical engineers or engineering physicists without specific experience. (3) Technicians with a broad background of experience in television or in related fields of communications.

* * *

★ A film depicting the potentialities of the Canadian electronic industry is planned by the Parts and Accessory Division of the RTMA that will show the design and development personnel of the Armed Services and other government agencies the scope of Canada's electronic industry for the design and production of military and commercial electronic equipment. The film is planned to be one of about 25 minutes' duration and will be in technicolor.

* * *

★ 345,327 television receivers were sold during the first nine months of 1954 at an average suggested list price of $349, including taxes. For the same period of 1953, 199,376 television receivers were sold at an average suggested list price of $411, including taxes. In September of this year, 82,424 television receivers were sold, a monthly record. In September 1953, 42,640 television receivers were sold. Radio receiver sales, reported by RTMA member companies, for the first nine months of 1954 show a reduction from last year's figures for the same period. In the first nine months of 1954, 284,663 radio receivers were sold: 412,330 were sold in the first nine months of 1953.

* * *

★ The Wilmot Castle Company of Rochester, N.Y. has been appointed by the General Electric Company as their supply house and distributor for the company's line of closed circuit television equipment.

* * *

★ A new type of supervisory control equipment claimed to be capable of use with any type of communications equipment and able to carry audio signals including microwave and VHF as well as power line carrier and wire lines has been developed by Motorola's Communications and Electronics Division. By using twelve different tones of the apparatus it is claimed that up to 90 individual points can be controlled.

* * *

★ The Rural Electrification Administration of the United States is carrying out an experiment to reduce operating difficulties and costs on rural telephone lines. The experiment will consist of insulating one of a pair of wires to prevent contact between the bare wires, a simple modification, but one that is expected to improve efficiency.

* * *

★ Experimentation with the wave guide technique of radio transmission has reached the point in Britain where one prominent university professor — Harold Barlow of University College, London — has been quoted as stating that one telephone company hopes to link distant cities by wave guides "within five years". According to reports, "Several telephone and cable manufacturers (in London) are convinced that a new 'guided' wireless wave form called HO_1 will supplement, and may eventually supplant, almost all methods of telecommunication, including Television and telephone coaxial cables and microwave transmission towers now in use in Britain and elsewhere".

* * *

★ Formation of an Electronics Division by Seneca Falls Machine Company was announced recently by Edwin R. Smith, President of the machine tool manufacturing concern. Pointing out that his company has for some time been experimenting with electronics and has made considerable progress, Mr. Smith said that it would seem the time has now arrived, "when any machine tool builder who intends to be in a competitive position in the future should devote some of his time, energy and money to the development and application of electronics".

* * *

★ According to John M. Hay, Assistant Vice-President of the Bell Telephone Company of Canada the prime objective of research in the telephone industry is: To provide a means of communication that will enable the person with the weakest voice to speak to and be understood by the person with the poorest hearing — whether the distance separating them be measured in feet or thousands of miles. A means of communication that is rapid, reliable and reasonably priced.

* * *

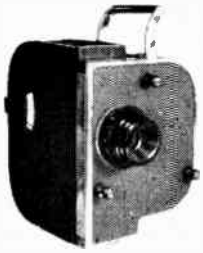
★ Dr. W. B. Lewis, Vice-President for Research and Development, Atomic Energy of Canada Limited predicts that atomic power will be available for commercial purposes at a cost comparing favorably with other sources of power within 10 years and maybe sooner.

(Turn to page 48)

Geophysical Exploration Equipment

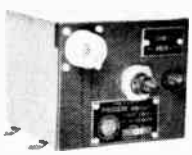
Microwave Siting Equipment

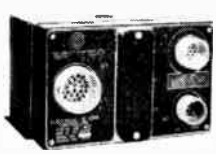
Computers



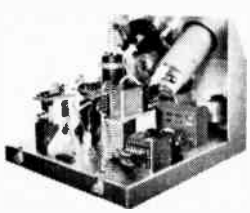
Photographic Equipment

A PROGRESSIVE CANADIAN ENGINEERING AND PRODUCTION FIRM OFFERS





De-Icing Detection and Control



Test Equipment

Radar

Armament Intervalometer

OPPORTUNITIES FOR SENIOR ENGINEERS and Technicians

The steady expansion of PSC Applied Research Limited has created permanent positions for senior engineers experienced in electro-mechanical, electronic, servo-controlled and computing instrumentation, in the following grades:

Project Managers
Development Engineers
Product Design Engineers
Technical Writers

SALARIES OPEN — EQUAL TO OR BETTER THAN THE ASSOCIATIONS OF PROFESSIONAL ENGINEERS' SCHEDULE

If you are interested in more information, write detailing education, qualifications and experience. All enquiries will be treated in strictest confidence.

Senior Technicians: Opportunities also for senior technicians experienced in instrumentation.

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Electronics and Communications

EDITORIAL

Vol. 2 November - December, 1954 No. 6

An Engineer's Education

Judging from the spate of material being written on the subject there seems to be a growing concern as to what the education of an engineer should consist of. Greater part of the expressed opinion seems to favor bolstering the young engineer's training with more cultural learning, a study of the humanities and the social sciences.

Present-day university courses for engineers are being indirectly and mildly criticised for neglecting "to round out" the engineer's education with this type of book-learning and it has been hinted that some colleges are becoming nothing more than trade schools, as a result of confining their engineering courses strictly to the subject of engineering. Well, this form of training for an engineer sounds logical to us. This is not to say, however, that an engineer should be content to remain a mortar-board mechanic all his life, but it is considered that if a young man has exhibited the ability and intelligence to graduate from one of our present-day courses in engineering, then it follows that he has the inherent ability to acquire a knowledge of the humanities and social sciences on his own hook, after graduation.

Whether or not this acquisition is gained following graduation is entirely up to the individual, and it would seem logical to assume that the pursuit of such knowledge by a graduate would accurately indicate his type as the calibre to fill those higher posts of managership for which present courses of study in engineering are being criticised as inadequate.

To clutter up engineering courses with further extraneous studies, with the uncertain knowledge of how many graduates would put it to future use or who, indeed, may possess the initiative or ambition to utilize it through a lack of aspiration, would only prolong our engineering courses in the long run and delay the graduation of engineers at a time when industry has an immediate need for them.

Surely, if an engineer in possession of the knowledge and training gained through our current style engineering courses aspires to those higher planes of managership in his profession, the normal social contacts of his everyday life will dictate the pre-requisites of his goal and he will seek such out in the normal pursuit of his professional objective on his own volition.

A fallacy too often catered to in this day and age of higher education is the belief that learning and knowledge, unless it is wrapped up in a college degree, is not quite good enough to receive our seal of approval.

Nero Fiddled Too!

Irrespective of the contentious question as to who should foot the bill for Toronto's civil defense requirements, it would seem that the city's administrators should at least be sufficiently intelligent to react normally to the primitive urge for survival, proceed with the installation of whatever equipment is necessary, and thereby prove their concern for the public. The decision of who should pay, and how much, is surely the second point of importance to be settled in the myopic deadlock which now exists between federal and city officials.

Since dollars and cents however, rather than the protection of the public, seems to be of greater concern and importance to the authorities, in the matter of Toronto's civil defense, it is conceivable that more positive thinking in the matter of organizing to the best of our ability against any future emergency, may be forthcoming from other sources.

The opinion that such assistance may be available is prompted by the readiness with which public spirited concerns lent their personnel and equipment when Hurricane Hazel devastated sections of Toronto on October 15th.

When this disaster struck, vital power and communications facilities were disrupted and where such services did withstand the onslaught their limited capacity and inflexibility rendered them incapable of the diverse communications needs created by the emergency. It has been truthfully said that adequate communications is the primary requisite of any civil defense organization and Hurricane Hazel proved this point. If the great need for communications facilities had not been recognized in the early hours of the storm by five of the leading manufacturers of communications equipment in the Toronto area, it is conceivable that a much greater loss of life would have resulted. Personnel and equipment loaned by The Canadian General Electric Company Limited, The Canadian Marconi Company, Rogers Majestic Electronics Limited, Pye Canada Limited and the Canadian Westinghouse Company provided orderliness and efficiency to salvage and rescue operations that would otherwise have been impaired by duplicated effort, confusion, doubt and despair.

The services rendered by these companies indicates that there may well be a further willingness to plan some interim organization to meet the need of communication facilities in time of emergency. Though equipment and personnel were made readily available and served magnificently in the recent disaster, a prearranged plan of operation would greatly increase the efficiency of any similar public service in a future catastrophe.

It is now reasonable to assume, that should another disaster strike Toronto before the authorities have settled their differences and established a civil defense organization, that communications equipment would again be forthcoming from those companies whose service filled so great a need during Hurricane Hazel. It is hoped that another such misfortune is not in store for us, but an organized plan of action for the part that voluntary communications facilities could fulfill in such an event is certainly something that is worthwhile considering. Having planned thus far in the matter of emergency communications it is left to us to sit back and trust that both Ottawa and Toronto finish fiddling before they get burned.

Improvisation or - - -

It's Time We Made Up Our Minds - - - - - !

When "Hurricane Hazel" hit Toronto and the southern part of Ontario on Friday, October 15 last it proved that the need for an adequate civil defense organization is as necessary to combat the fury of natural disaster as it is to contend with and oppose the consequence of man-made war. Equipment, organization and trained personnel, to supplement the normal fire and police services must surely now, as a result of the damage caused by the storm, be recognized as a logical necessity to cope with the result of natural disasters.

The loud and consistent argument put forward to disparage the establishment of such an organization is based on the premise that hurricanes don't strike every day and the expenditure of money for equipment and the training of personnel is not warranted. On its face value this argument is difficult to oppose but the argument is suspect of a designed evasion of a problem that must be tackled sooner or later.

ONE of the greatest needs in time of emergency is the need of communications without which all measures to stem the wasteful loss of life and property result in nothing less than disorganized effort, confusion, duplication and doubt.

When the full impact of "Hurricane Hazel" struck home there is little room to doubt that anyone in authority would not have appreciated the assistance that could have been afforded by an organization trained in a manner that would have permitted it to face the situation square-on and fight it with the efficiency born of organization and planning. As it was established police and fire communications systems lent all available help but the need for fire and police communications systems is increased in such an emergency and cannot be expected to be extended to cover the additional load of duty which such emergencies give rise to.

Wire communications in such an event are highly susceptible to damage and vital communication lines were washed out and disrupted by power failure in the early hours of the recent storm. The gap left by this failure and the need for additional communication equipment was recognized almost simultaneously by nearly half a dozen of the leading manufacturers of communication equipment in the Toronto area including Rogers Majestic Electronics, Canadian General Electric Company Limited, Pye Canada Limited, the Canadian Marconi Company and the Canadian Westinghouse Company. Within twelve hours of the disaster these companies had more than sixty thousand dollars worth of communications equipment in operation manned by trained technicians from their respective companies and in spite of the attendant confusion of the incident managed to establish an organized communications system to serve the needs of the occasion.

The need for the equipment supplied by these companies was emphasized by the fact that the naval detachment working out of H.M.C.S. York were communicating by means of semaphore, a noble effort indeed on the part of naval personnel, but surely an archaic and doubtful method to rely on in the face of disaster conditions.

The area of operations covered by what has become known as the Manufacturers' Network extended from Woodbridge in the north-west and south to Etobicoke and covered Weston, Thistletown and the hard hit localities in between these points. Red

● *Top:* Rogers Majestic Electronics equipment at Woodbridge. *Second from top:* General Electric Pakfone operating in the Humber Bridge area. *Second from bottom:* Portable "Handie Talkie" being used by naval officer to guide out stretcher case. *Bottom:* Red Cross Headquarters, terminal for communications to Etobicoke, Woodbridge and Bradford.

Cross Headquarters in Toronto was put in direct communication with the outlying stricken areas through the services of the Manufacturers' Network and the facilities of the Rogers Majestic Electronics transmitter situated at their Leaside works and by a station established at Castlefield by the Canadian General Electric Company.

Chronologically, the operation of the Manufacturers' Network which assisted in the areas laid waste by Hurricane Hazel as follows:

Canadian General Electric Company Limited

At two o'clock Saturday afternoon Canadian General Electric personnel dispatched a mobile radio into the Woodbridge area and by four o'clock had established a transmitting station at Castlefield. By five o'clock this company had established communications with Red Cross headquarters in Toronto and by seven o'clock on the same evening Rogers Majestic Electronics had consolidated a contact in Woodbridge, a station which was operated by personnel from both the Canadian General Electric Company and Rogers Majestic Electronics. By this time a Canadian General Electric mobile set was operating out of the Pine Grove area and by early Sunday morning the C.G.E. transmitter at Castlefield was being jointly operated by personnel from their own company, Rogers Majestic Electronic and the Canadian Marconi Company. Sunday also saw the dispatch of a mobile unit to the Bradford area which was operated by relay through the repeater station at Aurora and by eight o'clock Sunday morning C.G.E. had opened up another mobile station in Thistletown. Early Sunday afternoon the hard-hit Scarlett Road area was provided with another C.G.E. mobile unit and trained company personnel with walkie-talkie handsets were assisting in search and rescue operations along the Humber River.

Pye Canada Limited

The contribution of Pye Canada Limited in establishing much needed communications during the disaster commenced at 10 o'clock Saturday morning when their offer of assistance was extended to Etobicoke authorities. By Saturday afternoon Pye equipment was being used to assist officials of the Etobicoke health and water works departments. Public address systems were installed to warn residents of the polution of water and the availability of typhoid innoculations. By seven-thirty on Saturday evening the area of Pye coverage was extended to Thistletown to which community a jeep-mounted mobile unit had been dispatched. Another contribution of Pye in this locality was the provision of public address equipment to aid the Red Cross in the supply of food, clothing and emergency equipment.

In view of the valuable service rendered by Pye equipment in the above areas it is significant to note that authorities expressed doubt as to whether or not there was a need for communications equipment.

The Canadian Marconi Company

Marconi equipment was pressed into service early Saturday morning on the west side of the Humber River reporting bridge wash-outs on the Queen Elizabeth Highway. At four-thirty Saturday afternoon local communications in the form of mobile units were sent by Marconi to the Woodbridge area and on Sunday equipment was dispatched to the vicinity of Bradford. Marconi equipment and personnel served from Monday through to Thursday working in co-operation with personnel from Rogers Majestic Electronics and the Canadian General Electric Company Limited. Two base stations, one in the Bayview district and the other at Etobicoke were comprised of Marconi equipment in addition to which two of their Portaphone units rendered valuable assistance in the Humber valley.

Rogers Majestic Electronics

Early recognition of the need of assistance brought Rogers Majestic Electronics equipment and personnel into the fight by ten o'clock on Saturday morning and following consultation with Toronto and Etobicoke police two technicians commenced operation of the company's Leaside transmitter, one of the two base stations through which all intelligence from the outlying areas was received and re-transmitted to Red Cross headquarters. At the same time five of the company's technicians were sent to the Woodbridge area with portable units.

By one o'clock on Saturday afternoon Rogers Majestic Electronics personnel had set up a control point in the Woodbridge fire hall and a short time later a relay station was established at the intersection of Highway No. 7 and Highway No. 400 for the purpose of relaying local information to Red Cross headquarters in Toronto. Another Rogers Majestic Electronics mobile unit arrived at Pine Grove at five o'clock on Saturday afternoon and by seven in the evening direct communication from this locality with Red Cross headquarters in Toronto had been accomplished in addition to which equipment and personnel which had been sent to Weston and Etobicoke were serving the needs of police in these two communities.

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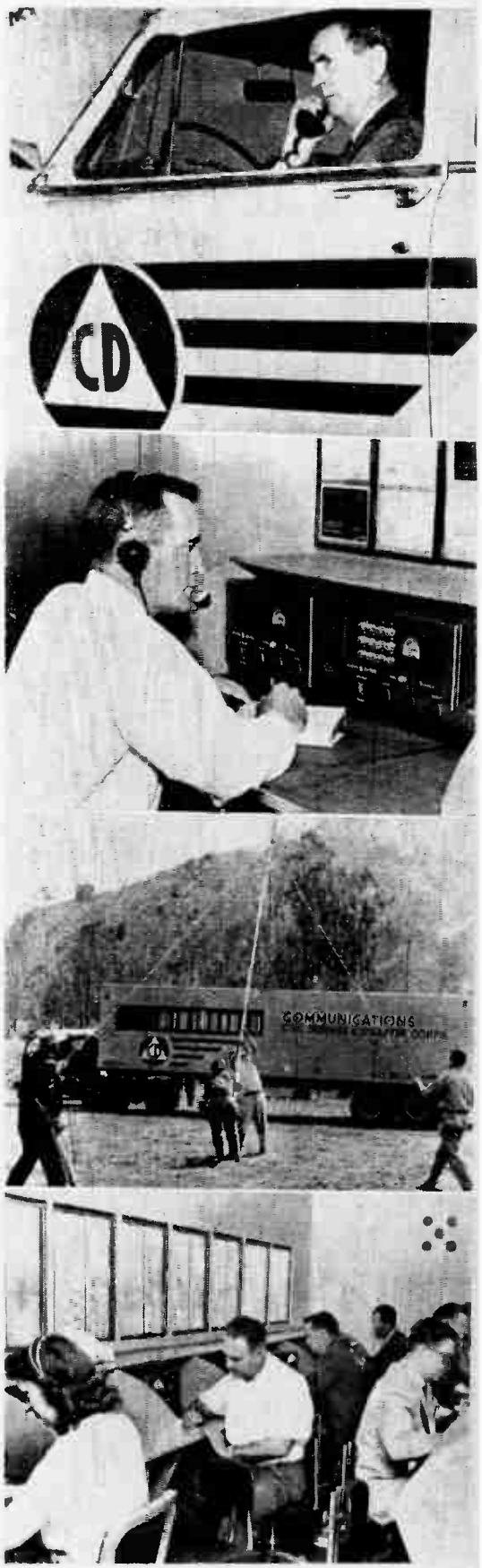


● *Top:* Los Angeles' radio equipped car for civil defense. *Second from top:* Inside of Communications trailer. *Second from bottom:* Outside view of civil defense trailer. *Bottom:* Interior view of truck trailer Communications center, showing control station manned.

Manufacturing - - -

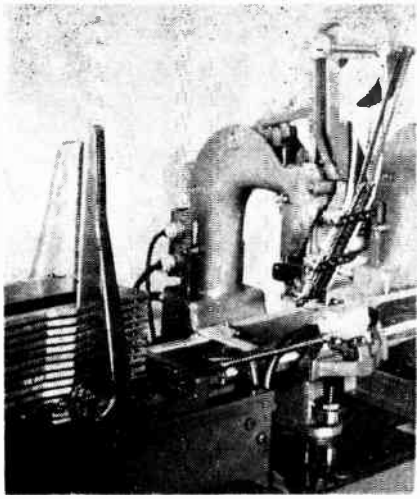
Electronic Assembly Technique Increases Industrial Output

AUTOMATIC assembly of electronic equipment may be the outcome of a machine development which has recently been demonstrated by the United Shoe Machinery Corporation of Boston.

About two-hundred representatives of firms manufacturing electronic equipment and components have shown interest in the equipment and visited the Beverly, Massachusetts, laboratories of the USMC's Research Division to witness operation of the experimental conveyor-type machine which automatically inserts resistors, capacitors, jumper wires, and eyelet-type terminals in printed circuit wiring boards. Operating at the rate of 9600 boards in an 8-hour day, the experimental automatic assembly machine is readily adjustable to provide for changes in circuitry and components. It is mechanically straightforward and rugged equipment, designed to handle standard electronic components with simplicity of change-over and maintenance.

In its present state of development, printed wiring boards up to 5" x 8" are loaded by hand onto pallets or frames by which they are conveyed to each of the several inserting stations. At each of these stations, a pallet is stopped and one component automatically inserted in any desired location on the board. As it now stands the experimental machine will insert only resistors, tubular and disc ceramic capacitors, jumper wires, and eyelets. However, if the concept of automatic assembly in the electronic field as shown in the experimental machine meets the requirements of the industry, it is expected that the now incomplete development will be carried further.

The complete system for automatic assembly of electronic equipment as the machine's designers now see it will include means for automatic placement of PW boards in the pallets, additional inserting heads for tube sockets, coils, and other components, as well as stations for dip soldering, testing, and pallet unloading, together with provision for automatic return of pallets to the loading station.



● Inserting head on experimental conveyor automatically cuts and forms component leads and inserts them through pre-punched holes.

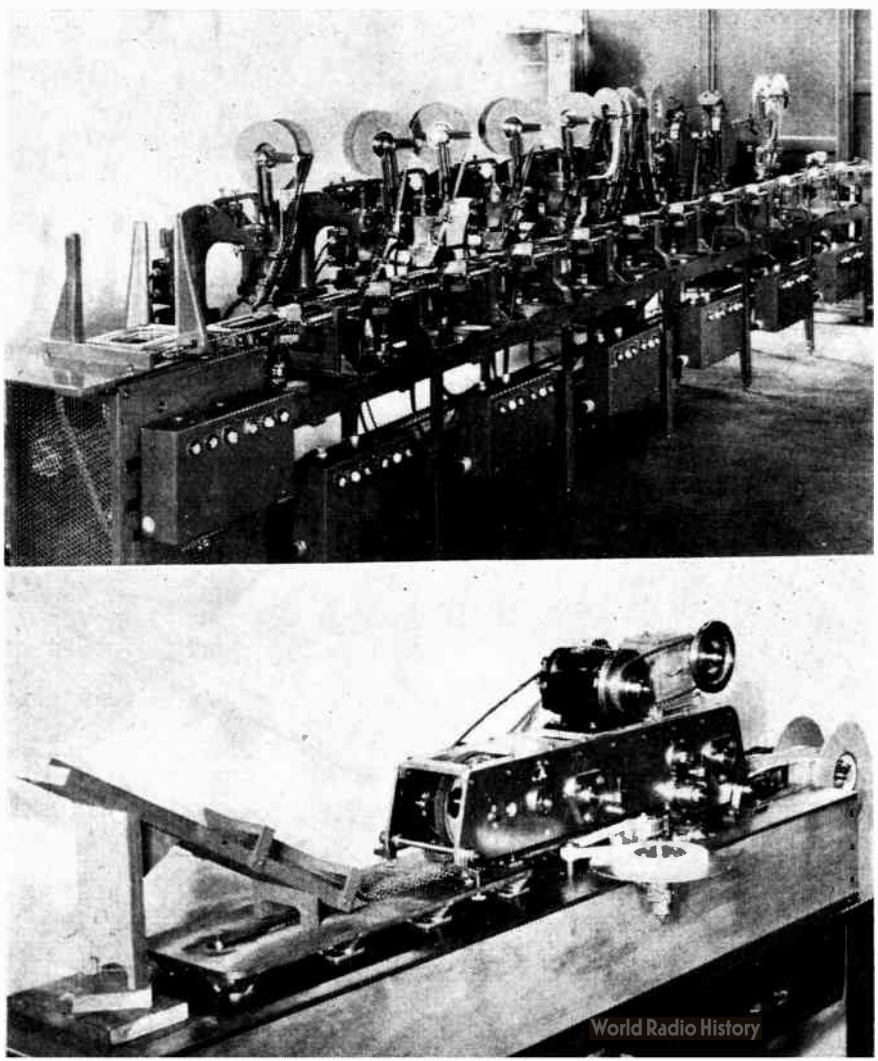
An important part of the experimental system is the "belting" of pigtail components in order to secure the best "feeding" conditions. One machine has already been built for belting resistors, the basic design of which may be readily extended to other axial lead components. In this equipment resistors are fed automatically through lead straightening and taping stations.

Safeguards Product Uniformity

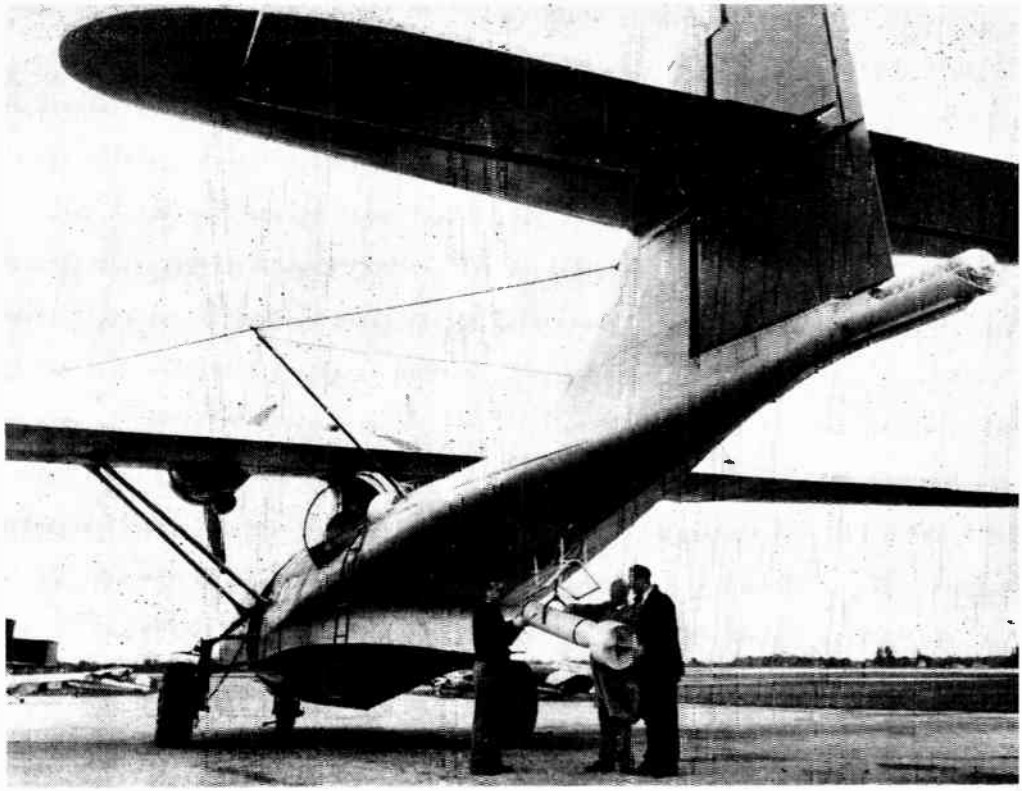
At the conveyor, belted components are fed from reels into the inserting heads which automatically cut and form the wire leads and insert them through the pre-punched holes in the printed wiring boards. At the same station the lead ends protruding through the board are automatically clinched to hold each component in place until the board is dip soldered. To avoid damage to the bodies of components they are handled by their leads throughout the belting, inserting and clinching operations.

To insure uniformity in the completed product, engineers have built several safeguards into their experimental machine. Included are provisions to stop the machine when a station is empty, when a component is missing or not correctly inserted, or when an inserting head does not complete its cycle.

Designers of the machine plan to continue with a program of field testing and evaluating the versatility of the machines which have been constructed. It is expected that the first experimental conveyor will be operating on production assemblies by late in 1954.



● *Top:* Straightening and Taping stations of assembly technique. *Bottom:* Experimental system for automatic assembly.



● View of the world's first "flying geophysical laboratory," developed by Aeromagnetic Surveys Limited of Toronto.

Exploration - - -

Canadian Achievement Cuts Cost And Speeds Up Surveys!

INSTALLATION of the three major types of airborne geophysical equipment in one aircraft has been achieved by a Canadian theam of air-surveyors and electronics specialists.

The world's first "flying geophysical laboratory" — a Canso amphibian plane incorporating an airborne magmetometer, scintillation counter and electromagnetic detector.

The three electronic systems have been widely used in recent years for airborne surveys but until now technical difficulties prohibited installation of all three into a single aircraft. The three systems with their applications are:

—The Airborne Magnetometer, which records variations in the earth's magnetic field, thus aiding geologists in the search for iron, oil, asbestos, titanium and nickel.

—The Scintillation Counter, an airborne instrument that gives clues to the presence of uranium in the earth.

—The Electromagnetic Detector, or EM, which can directly locate "sulphide bodies" that may contain copper, lead, zinc or nickel.

Co-operative research, development and testing by companies associated with The Photographic Survey Corp. Ltd. of Toronto resulted in creation of the "flying lab". Instruments were designed and built by PSC Applied Research Limited for Aeromagnetic Surveys Limited who will supervise survey use of the aircraft; while the aircraft's operators, Kenting Aviation Ltd., and PSC's aircraft servicing company, Field Aviation Ltd., contributed to necessary aircraft modification.

Lower Cost Surveys

Creation of the new flying laboratory will provide integrated and comprehensive geophysical surveys at considerably lower cost than the previous method of obtaining the three types of survey independently, said D. N. Kendall, Vice-President of Aeromagnetic Surveys Ltd. In addition all three types of data will be more conveniently comparable having been procured on the same flight lines. Until its transformation into a flying laboratory, Kenting's Canso had been flying magnetometer and scintillation counter surveys for Aeromagnetic Surveys Ltd., in all parts of the world, using a fixed - position magnetometer mounted in the tail. During the past six months PSC Applied Research engineers equipped the big flying boat with an EM system specially developed for this installation.

In developing the flying laboratory, major problem was to design an electromagnetic detector that could be used with a metal-skinned aircraft, only type big enough to get the half-ton of equipment for all three systems airborne. Researchers solved the problem by mounting a specially-designed compensating device outside the plane.

EM requires a transmitting coil energized with an alternating electric current to surround it with an electromagnetic field. This field induces electric currents in any conductor within reasonable range (e.g., a sulphide body, building, ship, water, moist overburden, etc.), thereby surrounding the conductor with a secondary electromagnetic field differing from the first in amplitude (strength) and

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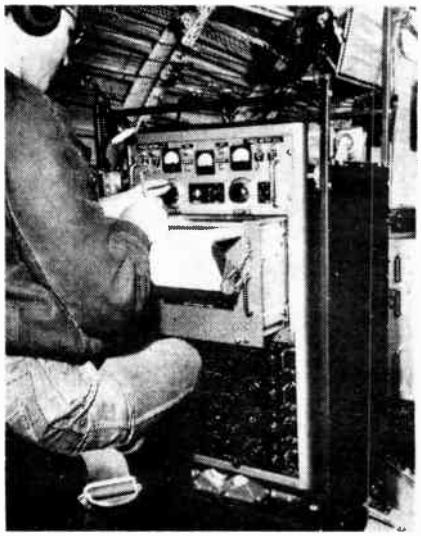

● *Left:* Amplifying and recording equipment measures the difference between two electromagnetic fields.

● *Right:* An operator checks airborne magnetometer data in Aeromagnetic Surveys Limited's "flying geophysical laboratory".

● The Bristol Britannia, turbo-prop liner depends on relays in servo mechanisms and other electronic equipment.

Relays - - -

Outmoded Relics Or Handmaid Of The Electronic Age...?

By PETER A. DWIGHT

IN this modern age there has been a spectacular trend towards the use of electronics in every field of engineering, from the simpler remote control switching circuits to the highly complex servo-systems of industrial process control. To a large extent, this popularity can be attributed to the recent developments and successful miniaturization of the thermionic valve and to the many new forms of cold-cathode valve, thyratron and transistor which have permitted more simple and reliable units at lower cost. But there is now a real danger that the attraction of pure electronics will blind the circuit designer to the many advantages which can still be gained from the integral use of relay switches in his equipment.

Relays are not outmoded relics of an earlier age! They are valuable components which can simplify and improve basic valve circuits, and their more recent versions will facilitate the design of extremely reliable equipment for use even under the severe conditions of modern high speed flight.

Many types of non-polarized relay have been designed and their performance in modern telephone systems is a tribute to their high standard. Some are small and possess excellent operating characteristics, but it must be borne in mind that they have certain limitations which restrict their use. For instance, they cannot differentiate between energizing currents of opposite polarity without the addition of an interposed rectifier; a "neutral", or two-position system will necessitate the use of two relays and two rectifiers; and there must be a reasonable safety margin available on the operating currents. It is obvious that higher grade relays are required before any weight can be added to the argument in favor of their use, and it is here that the polarized relay scores.

The polarized relay, by virtue of its design, will respond to energizing currents of opposite polarity, and the polarizing forces which are provided by its permanent magnets permit greatly increased contact pressure in the absence of an energizing signal, higher sensitivities and faster operation. It is therefore possible for the relay to respond to short duration impulses or to "follow" medium frequency alternating current inputs, and so provide a continuously operating symmetrical change - over switch between two independent sources.

It is often stated that recent developments in thermionic valves have made it possible to design switching systems without the use of relays, but the complete exclusion of relays can sometimes lead to complicated, expensive and unsatisfactory results. Whilst a two-stage triggered multi-vibrator valve circuit can be designed to simulate the function of an "each-side-stable" polarized relay, it is necessary to provide continuous regulated cathode heater and anode H.T. supplies, resulting in increased bulk and added cost. The use of the "cold cathode" type of valve does not greatly simplify the design, since negative H.T. supplies are then required to "cut-off" each valve. The relay gives a useful improvement to the basic valve circuit and should be considered as a complementary component rather than as a complete replacement.

Despite the apparent advantage of the polarized relay in the above type of circuit, there is still often a preference for valve switching because of the lower supervision and maintenance costs. The principal argument against relays is the necessity for regular contact inspection, but providing the contacts are adequately protected by limiting resistors or spark quenches, the possibility of failure is rare. It is worth

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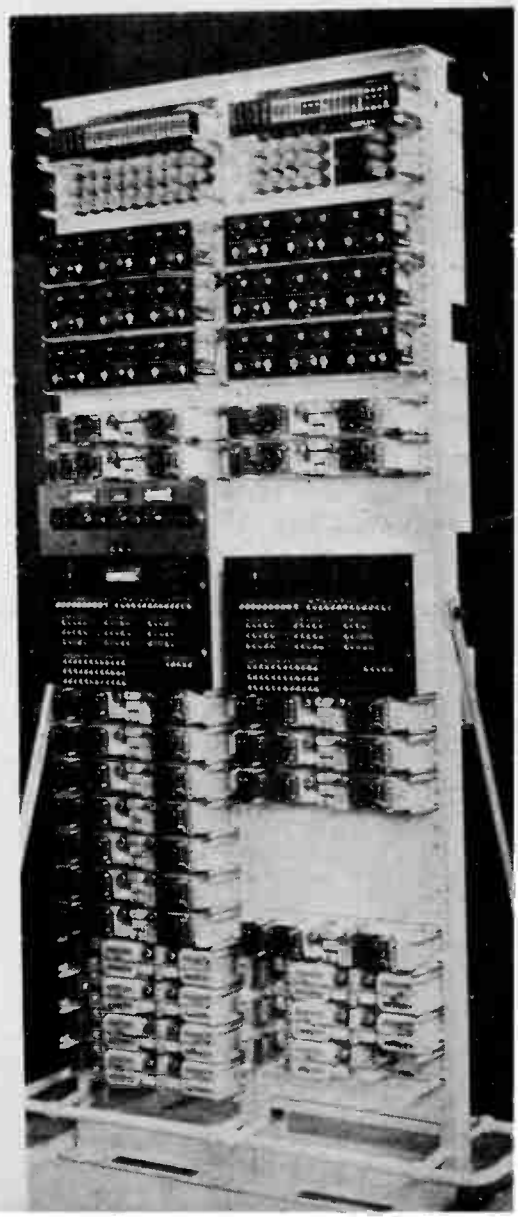


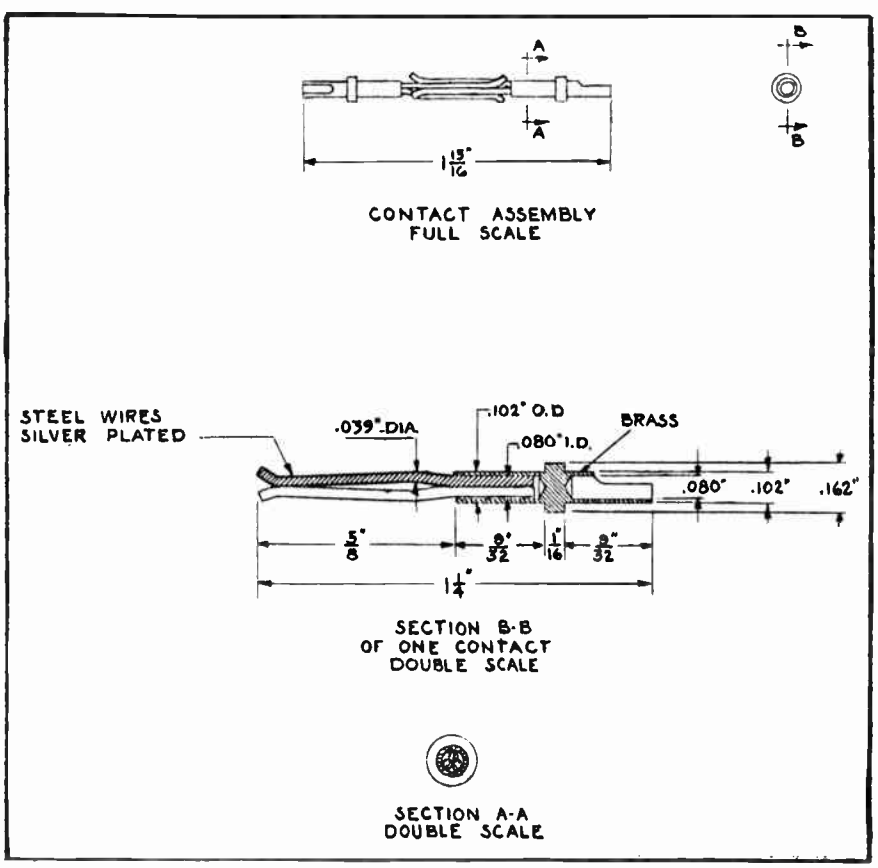
● 18 channel VF telegraph terminal equipment for the Canadian National Railways at Campbellton, New Brunswick. Polarized relays are visible at the right hand end of Panels 6, 7, 11 to 13 in the right-hand rack.

Connectors For The Electronic Industry

By LESLIE L. HILL, Ph.D.
Contributing Editor, Electronics & Communications

Connectors — like men's clothing — have changed little in design in the last quarter century and leave much to be desired in design to meet the requirements of present day miniaturization trends.

CONNECTORS today are a major source of failure in both electrical and electronic equipment. The present connector in its actual shape is really more or less an adaptation of a design at least twenty to twenty-five years old. Generally speaking, for medium power circuits, the design might be quite satisfactory, but to talk primarily of the outward appearance and the always more exacting necessity of limited space and minimum weight, present day connectors are quite often far too bulky and too large in size. It seems nonsensical to fit connectors into electronic equipment, which in itself is much lighter than the connector which should constitute an infinitesimal part of the equipment. Furthermore, it is a commonplace problem to fit a connector of two inches in diameter into a component of only a few cubic inches in volume. Long, overhanging connectors are generally fitted, and their vibrations will, in the long run, break even the best of seals. Maintenance requires that conductors attached to a connector should be replaceable, but difficulties have been encountered—additionals and "fixes" have been applied until the assembly time for the connector becomes almost prohibitive. A deleterious effect is created through reduced atmospheric pressure at high altitudes where the pressure at the time of sealing should be maintained.



Before offering any suggestion for the possible improvement of connectors, and particularly the urgent need for a general design of connector to standardize the "general purpose," the "moisture proof," the "pressurized," the "hermetically sealed" and, if possible, also the "Quick disconnect," it may be helpful to summarize some of the most discussed deficiencies of present-day designs.

Deficiencies

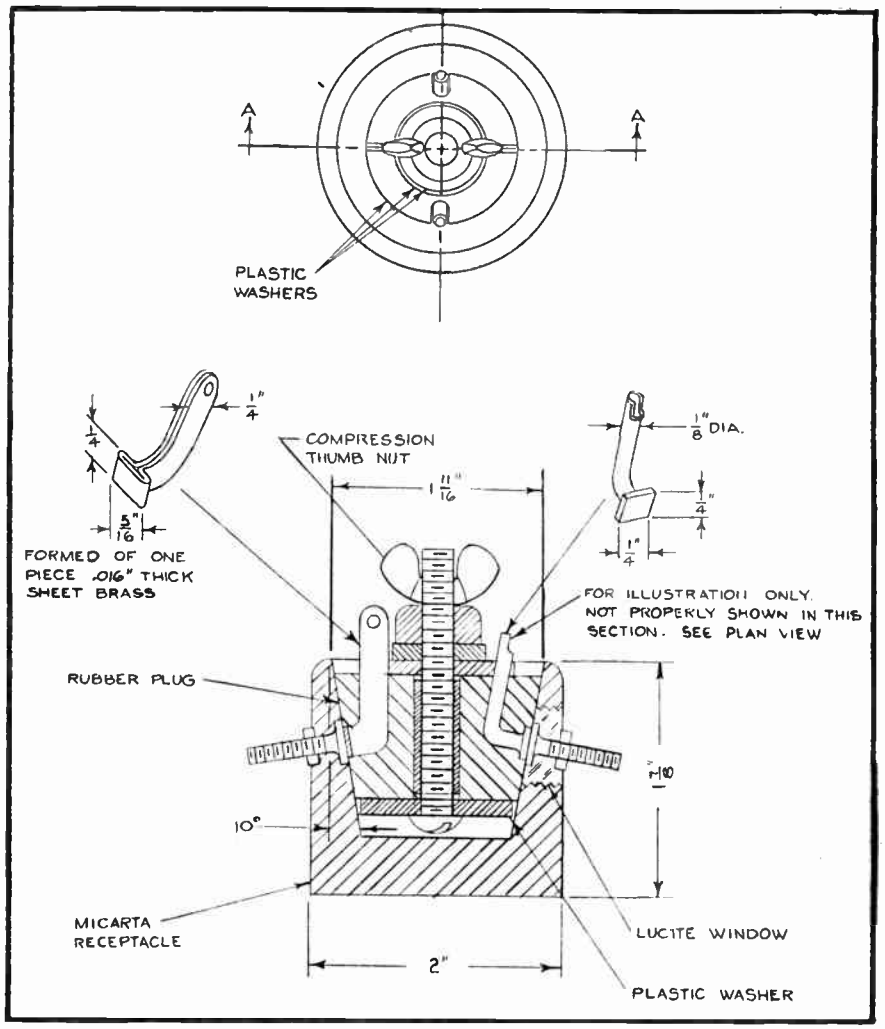
Some of these deficiencies result in the following conditions: wire breaking at solder pots; moisture entering insert material and causing low-leakage resistance; connectors of such a size that much valuable space is lost; weight of connectors being such that satisfactory vibration isolation of delicate equipment is impaired; pins and inserts either pushing back or pulling out in the resilient inserts connectors; connectors which cannot be used in areas of high ambient temperature due to soldered connections; coupling rings which have to be secured by safety wire and therefore difficult to operate; socket contacts which are split and tend to spread to such an extent after mating that contact is lost or becomes intermittent; connectors which, when used on some sealed relays double the size and weight of the relay; and the coupling and uncoupling of present-day connectors in arctic regions which is extremely difficult and a definite deterrent to quick maintenance, etc., etc.

Connector contacts are subdivided in "slide" or "pin and socket" contacts, and so-called "butt" contacts. During the last twenty years or so the *"pin and socket"* contact has been quite fully explored by connector manufacturers such as Amphenol, Cannon, Bendix and Winchester. Therefore, there is little to add or contribute to their achievements. The small paper-clip model (three wire contact), may, however, be mentioned because of its miniature size:

With regard to the *"butt"* contact, however, there is a large field for new ideas and radical developments.

Every effort has been made to use the butt-type connector in place of multi-contact connectors for low current, and has led to the development of a new principle. This principle uses an equal distribution of pressure in an

← ● Paper Clip Contact



● General Concept of Rubber Connector.

elastic body in all directions, when the body is compressed only in one direction. All previous investigations on butt-contacts show that it is impossible to obtain reliable contacts of this type with almost negligible resistance, especially if the pressure applied is high enough, and if precious metals, such as silver and/or gold are used on the contacting surfaces. The advantages of such pressure contacts lies in their high current capacity, the low voltage drop and the relatively small force necessary for mating and un-mating, (essential for a quick disconnect). These and other advantages over the old-fashioned "pin-and-socket" contacts led to the new construction, where pressure contacts are considered exclusively.

New Principle

This principle is based on the mechanical transfer of pressure within an elastic material, in which the contacts are embedded. In this way the contacts are pressed against each other and at the same time separated and isolated in an airtight condition from the neighboring contact, leakproof and moisture-proof. Both connector halves become in this way absolutely shock-proof, since they are exposed to the same pressure. Once the pressure ceases, they may be instantaneously separated. This fact facilitates the construction of a quick disconnect, showing clearly at a considerable distance, whether the connector is locked or open, therefore making safety wiring unnecessary. This type of construction makes any check of the contacts, when dismated, very simple. They can be easily cleaned and are protected against damage. The male part may be simply manufactured in one piece together with the wire, economizing in the build-up and eliminating soldering. In emergency cases, if repairs appear necessary in field service, soldering can also be applied.

The rubber connector would serve all applications required for general purpose, pressurized, hermetically sealed, and quick disconnect connectors, etc., but is not fireproof. For fireproof requirements the conventional type can be redesigned with ceramic inserts.

In order to apply this principle, the metallic contacts are fixed on the surface of the elastic body and pressed against fixed counter-contacts through compressing forces (deformation). In this case, a constructive improvement is achieved, as, e.g., excellent isolation and no leakage, moisture protection and pressurization, and at the same time standardizing four different types of connector groups.

(Turn to page 24)

Another Time Saver!

As many as ten synchronized sweeps can be thrown at one time on the screen of a single-gun oscilloscope with the aid of a new electronic device which has recently been made public. The compact unit is called a multiplexer.

Basically, the multiplexer is an ultra high-speed electronic switch built around the Burroughs beam switching tube. The new device combines as many as ten input wave forms in a single, sequenced wave train, and then electronically chops the train into ten separate sweeps that are positioned vertically down the face of a single-gun scope.

The multiplexer can throw separate sweeps on to the face of an oscilloscope in this fashion at the rate of 500,000 a second.

The multiplexer is seen as a boon to scientists and engineers who want to view and compare as many as ten related, repetitive phenomenon all at one time. Using nothing more than a standard laboratory oscilloscope, the multiplexer does a job that ordinarily would require many oscilloscopes or additional complex circuits.

Varied Applications

Possible uses for the multiplexer are seen (1) in strain gage analysis to study stresses throughout a body, (2) in TV receiver design to study simultaneously the performance of video, audio and related channels, and (3) in medical electronics to study the response under stimulation of various organs of the human body.

The information input section of the multiplexer will accept from two to ten different wave forms or pulse patterns. Each is fed to the grid of a separate triode amplifier. The plates or outputs of all ten tubes, which are normally not conducting, are tied together across a common load resistor.

A separate external input, a synchronizing signal from the subject under study, is fed to a Schmitt trigger input stage in the multiplexer. This circuit causes a beam switching tube to trigger the triode amplifiers one by one.

The resulting output across the common load resistor is a single wave train containing in sequence all the input wave forms to be observed. Each discrete wave form in the train, however, is at a different direct current level. At a result, when fed to the vertical deflection plates of single-gun scope, each wave form is spaced separately down the face of the scope.

NEWS

E. G. Bradner Named Sales Manager Of Stop Nut Division

Mr. George A. Tinnerman, President of Dominion Fasteners Limited, has announced the appointment of Mr. E. G. Bradner as Sales Manager for the newly formed Stop Nut Division of the Company. Mr. Bradner is well known in eastern Canada, having served since 1948 as Sales Engineer, with headquarters in Montreal, for the line of Tinnerman Speed Nuts. In his new position, Mr. Bradner will be located at the Toronto office of Dominion Fasteners, 77 York Street.

E. G. BRADNER

Superior Electric Company Announce Canadian Office

The Superior Electric Company of Bristol, Connecticut, have announced the opening of a Canadian sales office at 453A Eglinton Ave. West, Toronto. Mr. Jan J. Munk, previously associated with the former Quebec and Eastern Ontario representative of the company is in charge of the company's new Canadian outlet.

S. F. Love Addresses Toronto Section Institute Radio Engineers

S. F. Love, Tube Application Engineer, Radio Valve Company, Toronto, delivered a paper on Tube Application in TV Deflection Circuits before the Toronto Section of the Institute of Radio Engineers on November 15th. Mr. Love discussed the tube types commonly used in vertical and horizontal deflection circuits, the factors governing good design and described how frequent breakdowns were often eliminated by relatively small changes in potential. He also described and demonstrated two methods for measuring plate dissipation in vertical and horizontal output tubes.

Decca Radar (Canada) Limited Move To New Offices And Factory

Decca Radar (Canada) Limited, formerly of 1175 Bay Street, Toronto 5, have now moved to new offices and factory at 272 Dalesford Road, Toronto 14.

This move is necessitated by the considerable expansion of this Company's activities in the sale and service of a wide range of radar equipments and in the promotion of the Decca Navigator System in Canada.

New Directors Appointed By Dominion Fasteners Limited

Following a recent shareholders meeting, Mr. George A. Tinnerman, President, Dominion Fasteners Limited, exclusive Canadian manufacturer and licensee of Tinnerman Speed Nuts, announces the appointment of Mr. W. F. Beattie, Mr. L. Wills, and Mr. George A. Tinnerman III, as directors of the Company. In recent years Mr. Beattie has been Vice-President and General Manager, and Mr. Wills his assistant. In addition to his appointment as a director, Mr. Wills has also been named Secretary-Treasurer. Mr. Tinnerman III joined the Company recently after several years of product development work with Tinnerman Products Inc. of Cleveland.

L. WILLS G. A. TINNERMAN W. F. BEATTIE

Domac Technical Sales To Interpret Government Regulations For Industry

The establishment of Domac Technical Sales Limited with offices at 1950 Bank Street, Ottawa has been announced. In addition to the firm's affiliation with Northern Radio Company Incorporated of New York, Domac Technical Sales Limited offer an advisory service to the electronics industry with respect to the interpretation of government regulations and orders.

Mr. W. Dover, president of Domac Technical Sales Limited was previously Deputy Director of the Communications Division of the Electronics Branch, Department of Defense Production. Mr. Jack Macmillan, partner in the Domac enterprise being formerly associated with the same department in the capacity of Chief of Communications Production.

Total service of both Mr. Macmillan and Mr. Dover in government service at Ottawa covers some thirteen years during which they were employed in key positions with the Department of Munitions and Supply, United Kingdom Ministry of Supply, Department of National Defense and the Department of Defense Production.

J. R. Longstaffe Co. Ltd. To Manufacture Airtron Products

J. R. Longstaffe Co. Ltd., announce their appointment as Sales Representatives of Airtron Incorporated of Linden, N.J. Included in this agreement is the license to manufacture Airtron products as the need in Canadian Industry becomes apparent.

Airtron are considered one of the leading United States manufacturers and developers of Micro-wave systems. Their design and production engineers are thoroughly trained and backed by modern plant facilities and personnel who know the importance of contributing components. This engineering knowledge and production skill has been made available to the staff of J. R. Longstaffe Co. Ltd.

In making this announcement, Mr. J. R. Longstaffe, President of J. R. Longstaffe Co. Ltd., has indicated that he feels the licensing to not only sell but manufacture Airtron products will be a tremendous asset to Canadian Industry.

Cannon Electric Canada Limited Occupy New Premises

Cannon Electric Canada Limited have announced the completion of the move to their new premises at 160 Bartley Drive, Toronto 16. The new factory of Cannon Electric Canada Limited is situated in the rapidly expanding industrial area of east Toronto.

Dr. O. Solandt Opens New Marconi Laboratory

Speaking to an audience of distinguished scientists and electronic engineers at the official opening of the Canadian Marconi Company's new research laboratories on November 24th, 1954, Dr. Owen Solandt, Chairman of the Defense Research Board, stressed the importance to Canadian industry, and Canadian defense, of facilities like the Canadian Marconi Company Laboratories. He complimented the Company on having had the faith and foresight to establish research laboratories of its own to make substantial contributions towards the ingenuity, design and development, which will help to keep Canadian industry in the forefront and maintain scientific initiative in the free world. Following Dr. Solandt's opening speech, the guests were conducted through the laboratories and given the opportunity of seeing many demonstrations, one of which was a revolutionary highly sensitive photoconductive cell.

A considerable advance on earlier models, this photocell will make cheaper and more reliable electronic devices possible, and is already being used commercially to adjust picture brightness in TV sets.

Considerable interest was shown in a device which will make atoms in a material ring like a bell and an electronic "tape measure" under development which will accurately measure distances up to thirty miles. This tape measure is light enough to be carried by two men over rugged country.

Interest was also shown in a demonstration showing some ceramic crystals being "grown" which will "remember" electrical voltages for many months, and which will also amplify electronic signals.

The curtain was lifted on many new and interesting developments by Canadian Marconi Company in radio, nuclear instrumentation, and medical electronics.

Dominion Fasteners To Represent Simmonds Fibre Elastic Stop Nuts

Mr. George A. Tinnerman, President, Dominion Fasteners Limited, has announced the appointment of his company as exclusive distributors for Canada for Simmonds Fibre Elastic Stop Nuts. Simmonds Aerocessories Limited of England are the manufacturers. To provide maximum fastening service to Canadian industry, the Stop Nut Division of Dominion Fasteners Limited will carry in stock in Hamilton a complete assortment of Stop Nuts for standard, American national and Unified series of screw sizes. Plans are being formulated for the appointment of stocking agents in principal cities throughout the country.

● Mr. H. A. Rice, Manager, Commercial Products Division, Canadian Marconi Company Limited is shown presenting mementos of the opening of his company's new research laboratories in Montreal to Mr. S. M. Finlayson, President, Dr. O. Solandt, Chairman of the Defense Research Board; and Mr. J. J. Kingan, General Manager.

Rogers Majestic Electronics Limited Exhibit New Electronic Equipment

Eighty new electronic devices, ranging from a peanut-sized crystal detector which can end signal failure in television sets to a 66-pound, water cooled, vacuum tube which will sharply reduce the costs of high-power, radio broadcasting were unveiled recently by Rogers Majestic Electronics Limited.

The three-day exhibit was designed to acquaint equipment designers, broadcasting engineers and other electronic specialists with recent advances in vacuum tubes and such related products as diodes, transistors, tetrodes and thyratrons. It featured tubes which will flip a switch 1200 times a second, control the speed of red-hot ingots moving through steel rolling mills, and guide airplanes flying through fog and darkness.

Most of the new products featured in the exhibit incorporated advances which make possible more dependable electronic equipment for use in communications, factories, offices, laboratories and hospitals. The mass production of one of them — a twin-type tube known as a tetrode — involves the use of powdered glass which looks like sugar and is molded and baked like a cake.

Vancouver Section I.R.E. Hears C. N. Hoyler Discuss Color Television

The October 27th, meeting of the Vancouver Section of the Institute of Radio Engineers was addressed by Mr. Cyril N. Hoyler, Manager of Technical Relations for the David Sarnof Research Centre of Princeton, N.J. Mr. Hoyler gave a demonstration and discussion on the principles and latest developments of color television. Several hundred people attended the meeting in Room 200 of the Physics Building at the University of British Columbia, including members of the Institute of Radio Engineers, American Institute of Electrical Engineers and members of the joint student body of both professional bodies.

Mr. Hoyler was interviewed by the CBC Television station in Vancouver.

In addition to a descriptive and active demonstration of color television, Mr. Hoyler discussed at length, some of the new developments stemming from years of research in the David Sarnof Research Centre, including progress on transistors.

C. W. Hale Elected Canadian Director of PR Society

Clifford W. Hale, Manager of public relations for Canadian Westinghouse Company, Limited, Hamilton, Ontario, was elected by the board of directors of the Public Relations Society of America to a three-year term as a director representing the Society's Canadian District, according to an announcement by Robert L. Bliss, national Executive Vice-President. The directors' meeting was held at the Hotel Roosevelt, New York City, preceding the Society's three-day 7th annual national PR conference.

Andrew International Corp. Announces Canadian Sales Facilities

Effective November 1, 1954, all orders originating in Canada for Andrew products should be addressed to the Andrew Antenna Corporation Limited, P.O. Box 971, Whitby, Ont.

This change is designed to relieve customers of the burden of custom clearances and other delays and inconveniences. Sales by Andrew Antenna Corporation, Ltd. will be f.o.b. Whitby, Ontario, Canada, are net to the user, and include duty and federal sales tax. The terms offered the trade will be the usual current ones.

(Turn to page 26)

CONNECTORS

(Continued from page 21)

The following possibilities were considered:

1. Manufacture of the plug of elastic material or of plastics; the receptacle of metal lined with elastic material or plastics.
2. Both plug and receptacle may be made of elastic material under certain precautions.

The pressure will be exercised:

1. From inside (axial by concentrical screw from inside; radial by expansion from inside, or with cavities by liquid or gas).
2. From outside (axial; radial or peripherical by side screw).
3. Rotary pressure all around the connector.

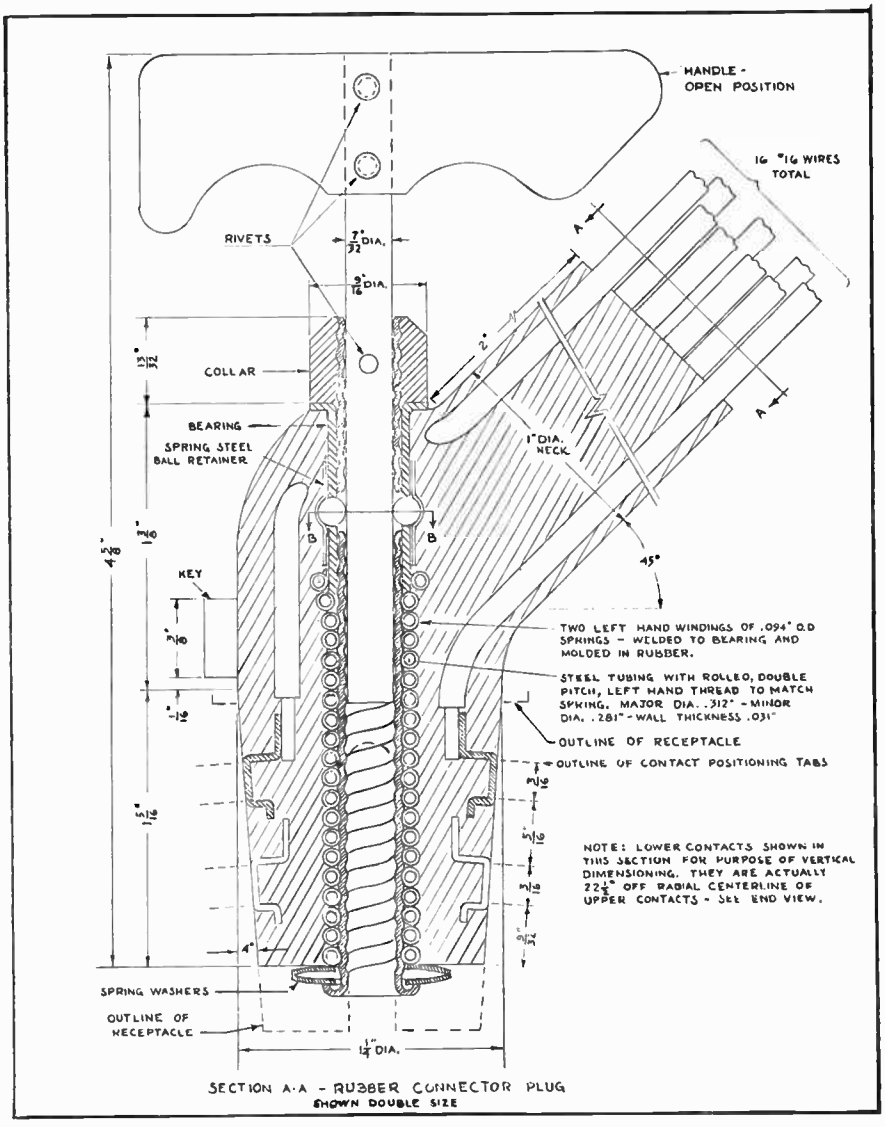
Sometimes it will appear beneficial to interchange male and female part of the connector as a protection against outside damage.

It is suggested to grind-in the completed contact and then to silverplate or goldplate the whole, not only the tips.

The insert material of either the plug or the receptacle must be an elastomer. The other insert may also be an elastomer, but it is preferable for the development of maximum contact pressure, that it is a non-elastic insulator.

It is desirable that the general connector design be adaptable to soldered, welded or lug connection to cable and also that the connector's elastomer might be integrally molded to the cable for continuous, tape-free insulation.

The possible sources of energy for a pressure device are manual effort, hydraulic or pneumatic circuits, electrical motor, or magnets. Of course, the use of manual energy is a design requirement, but consideration of the hydraulic and pneumatic sources is interesting and may have value.



● **General Purpose Rubber Connector.**

Since a multiplication of effort is necessary, a manual device might employ a screw, gear, cam or lever. The use of cam arrangements is the solution. Employment of hydraulic or pneumatic pressure is definitely dependent on introduction of an electric circuit control requirement for the connector, i.e., the connector being used as a means of remote or automatic connect and disconnect of electrical circuits.

The general purpose connector shown incorporates a particular solution to the problem, which seems to satisfy all requirements.

The pressure device, a cam type, is located on the axis of the plug. The cam surface shaped like a double pitch round thread is formed on a steel tube. The tube is riveted to the connector handle, and when the handle is in the open position, the cam surface of the tube mates perfectly with a similar surface in the rubber. In the particular illustration, the cam surface of the rubber is strengthened by molding into it two helical springs wound to match the steel tubing. When the handle is turned, either clockwise or counterclockwise, one-quarter turn to the closed position, there cannot be a screw action, for the axial position of tube and the rubber is fixed at both ends; at one by the collar and at the other by a heavy spring washer. Instead there is a cam action on the spring reinforced rubber; the rubber being expanded radially for the full length of its contact with the steel tube. When the radial expansion is restricted by the receptacle, the necessary contact pressure is, of course, developed.

The handle is locked by a ball bearing detent. The rubber confines the balls to the holes in the tube and in order to ride over the tube to another position when the handle is turned, the balls must force the rubber out. A spring retainer is placed over the balls to simplify the force required. It is expected that this positioning of the handle will be sufficiently secure against vibration that no safety wiring is necessary. Direct impact on the handle might open the connector, of course, but even this could be precluded by making the handle removable. The handle might even be key fitted to the connector so that only authorized people could service equipment. The tube of the plug slips over a guide pin in the receptacle, centering the plug in the receptacle and preventing accidental cross connection of circuits when plugging or unplugging the connector. Two polarity keys molded into the rubber plug, and mating polarity slots in the receptacle complete the orientation of plug and receptacle.

The method of connection to cable is not definitely delineated, since any method could be used; integral molding of cable and connector, solder pot, screw lug or welding.

The main purpose of this study is to open the way to new thinking along non-conventional lines, completely bypassing the old everyday designs made more and more obsolete by the necessities of the electronic industry.

The newest achievements in electronics make it emphatic to abandon the old everyday pattern of conventional ways and means. There are still a good many very complicated problems to be solved to further improve the functioning of connectors and to satisfy the ever-increasing and exacting demands on industry.

For The Lumber Industry

It's no longer necessary for forest rangers to maintain long and tiring vigil atop watch towers. This duty can now be performed by a rotating camera which picks up the first signs of a fire and beams the information to forest rangers at a distant central location. The watch is constant and unceasing and capable of detecting forest fires before they have a chance to get properly started.

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 64. Just mark the products you are interested in on the coupon on page 64 and the information will be in your hands within a few days.

• *New Sensitive High-Frequency Detector*

Item 580

A new sensitive detector for signals in the frequency range from 25 to 5000 megacycles is now available by using this new Type 1216-A Unit I-F Amplifier with a Type 874-MR Mixer Rectifier and a suitable Unit Oscillator. The signal to be detected is heterodyned in the crystal mixer with a signal from a local oscillator to give a 30-Mc difference frequency which is fed to the I-F Amplifier. The small size and light weight of the 30-Mc amplifier combine with the broad bandwidth good selectivity (0.7 Mc and 3 db down and 9.5 Mc at 60 db down), and excellent shielding to make the instrument much more useful for detector work than the usual communications receiver. Two separate internal power supplies are used, one for operating a Unit Oscillator.

A gain of 100 db makes possible a sensitivity of about two microvolts of 30-Mc input for a meter deflection of 1 per cent over the residual noise. For use with null-type measuring devices an automatic volume control position is available on the panel switch. With this avc the meter remains on scale over a wide range of input signal levels with no reduction in maximum sensitivity.

The well-shielded amplifier also has a built-in precision attenuator. This attenuator can be used with the calibrated panel meter to measure relative signal levels as well as insertion-loss and attenuation characteristics of filters, cables and attenuators over the VHF and UHF bands.

• *Loudspeaker Support Stand*

Item 581

A manufacturer of public address loudspeakers, microphone stands and accessories, has just re-designed their Model SS-2 Loudspeaker Support Stand to accommodate the U-brackets of all makes and types of loudspeaker projectors. The new type "quick and easy off" top bracket adaptor also permits the attachment or removal of a projector without need of unscrewing the top adaptor or using any tools.

The same "easy off" fittings are now supplied with the new HM-2 Twin Speaker Adaptor which, if used with the SS-2, permits the mounting of three speaker projectors on a single support stand.

Because of its wide surface spread, the base stability of the SS-2 is quite adequate for the support of a cluster of speakers even under adverse wind conditions. The three cadmium-plated steel, rubber-tipped folding legs automatically level on uneven ground or turf; and the "double lock" vertical adjustment provides extra safety against accidental release.

Model SS-2 supports several hundred pounds.

• *Continuous Standardization Available On Dynamaster*

Item 582

An electronic dynamaster potentiometer is now available with continuous standardization. The dynamaster, available in round and strip-chart models with intermittent automatic or push-button manual standardization is now offered with a constant voltage source which continuously standardizes the instrument and eliminates dry cells. The continuous standardizing device employs a voltage regulator, but retains the standard cell for assuring accuracy. The method consists of regulating the output of a dry-disk rectifier to reasonable limits, and floating a standard cell across the load to reduce further the deviations of load value from the required value.

NO-BATT continuous standardization (the name for the new device) eliminates conventional standardizing mechanisms, and their intermittent interruptions of control.

• *Snap-Tite Model-2 Control*

Item 583

A new "Snap-Tite" Model 2 Control completely eliminates all mounting hardware, twisting of tabs, and mounting tools. The control is simply pushed into the mounting hole where it snaps securely in place. Six spring clips grip the panel tightly. Since both hands are left free to insert controls, two can be snapped in place at one time, cutting assembly time up to 73 per cent.

"Snap-Tite" controls are primarily designed for fine-adjustment applications in TV and electronic equipment, the units having a short knurled and slotted shaft for fingertip or screwdriver adjustment. The shaft is molded of high impact blue color plastic for best electrical insulation and mechanical strength, and extends ½" from the face of the mounting panel. Immediate change over can be made from current production controls with no panel retooling as the new units will accommodate any standard chassis punched for bushing or twist-tab mounted controls, and are available in any standard resistance and taper.

• *Delay Lines For Color Television*

Item 584

A new series of Epoxy resin impregnated miniature delay lines to meet the requirements of color television manufacturers are now available.

Model GTV. 6-2.5K provides a .6 microsecond delay with an impedance of 2500 ohms. Length: 1¾". Model GTV. 8-4.1K provides a .8 microsecond delay with an impedance of 4100 ohms. Length: 2⅛". Both units are ½" diameter, and have flexible axial leads. Other delays and impedances are available to meet special requirements.

• *Toroidol Inductors*

Item 585

Two types of precision-wound toroidal inductors are now listed by a large manufacturer. Both types are available in six different sizes with various Q's and inductance ranges.

One coil type is wound on Carbonyl Iron cores for high frequency applications with inductance values from .15 millihenries to 1.0 henries. The other is wound on Molybdenum-Permalloy cores for low frequency applications with inductance values from 2.0 millihenries to 9.0 henries.

Q curves, dimensions, and other data fully describing each type of coil are included in the new bulletin. All coils are specially wound to within one per cent of specified inductance value.

Copies of descriptive Bulletin TL-P4 are available on request.

• *Ceramic-Type Power And Transmitting Capacitors*

Item 586

Transmitting or industrial high power, high current capacitors of unique design, utilizing ceramic dielectric and designated as Series HP units, are now available from a leading manufacturer.

Radically different, these capacitors serve functions heretofore limited to mica types. They are based on ceramic developments by French engineers and scientists of the C.S.F. organization, and provide complete independence from imported mica or other strategic materials. Series HP capacitors are particularly suitable for transmitting as well as industrial-electronics applications. Thousands of these units have been in use for years in Europe and even under the gruelling climatic conditions found in Indo-China.

In both disc ("double-saucer") and cylindrical ("tubular") ceramic dielectric bodies, HP units are great space and weight-savers with reductions from 50 per cent to 90 per cent less than corresponding mica units. The unique contours of the ceramic dielectric, together with metallized surfaces serving as capacitor plates, provide anti-corona design and high flashover voltages. The heavy connections through large silver-plated surface areas provide for high currents.

Other outstanding features are ease of mounting; ease of connecting in series or parallel; very low inductance connections; exceptional immunity to humidity, heat, cold, atmospheric pressure; wide range of designs, sizes, capacitance values and operating voltages.

• *Communications Booklet*

Item 587

Recent developments in radio communication design and engineering now involve more specialization than ever before. This is placing a greater responsibility on the manufacturer to see that the user gets maximum efficiency on installations.

With this in mind a useful booklet entitled "Communication Systems Planning" describing the publishers systems planning service and how it is equipped to plan, design, integrate and put into operation any type of installation in mobile or fixed station radio communications is now available on request.

All the factors entering into the planning of a system tailored to special operational requirements and the selection of the right equipment are outlined. The company's Systems Planning Service also provides for both present and future developments and all installations are designed with that object in view.

(Turn to page 27)

NEWS

(Continued from page 23)

MJS Announces New Appointment

Sol S. Budd, Sales Manager of MJS Electronic Sales Limited announces the appointment of Stan A. Rybb as Sales Engineer for the Instrument Division of MJS Electronic Sales Limited. Mr. Rybb will head the sales introduction for the line of Laboratory and Field Test Instruments manufactured by Dawe Instruments Ltd. (England). Mr. Rybb comes to MJS Electronic Sales Ltd. by way of a B.Sc. (Eng.) degree from London University and a long association with Dawe Instruments in England.

SOL BUDD

STAN. A. RYBB

He has had wide experience in the development and production of instruments for communications, industrial and photographic applications. During World War Two, Mr. Rybb served as officer in the Telecommunications Branch of the Allied Armed Forces. He has since lectured before the Institute of Electronics, Birmingham, England. Mr. Rybb's knowledge and assistance are being made available to government departments and to our armed forces.

Honeywell Electronics Control Operations Augmented By Recent Acquisition Of Heiland Research

The recent purchase of assets and business of Heiland Research Corporation of Denver by Minneapolis-Honeywell Regulator Co. Ltd. brings Honeywell a complementary instrument division and allows the company to enter the photographic field. In addition to its photographic line, Heiland manufactures precision instruments for scientific and industrial uses.

In commenting on the transaction, W. H. Evans, Vice-President and General Manager of Minneapolis-Honeywell Regulator Co., Ltd., Leaside, Ontario, said: "Heiland is an ideal choice for two reasons. One is that its instrument division fits in perfectly with our own manufacturing and sales experience in the electronic controls field. The other is the opportunity to enter the photographic field with what is one of the most respected names in the industry, and with the greatest potential for rapid and solid growth."

Adams Engineering To Represent General Instrument Corporation

General Instrument Corporation, major manufacturer of television, radio and electronic components, with Canadian plant at Kitchener, Ontario, has created a new Canadian sales set-up to provide improved service for its customers in the Dominion, Edwin A. Freed, General Sales Manager, has announced.

The Company has made arrangements with Adams Engineering Limited, 1500 Catherine Street West, Montreal, Quebec, to represent all product lines of General Instrument Corporation and its Canadian and United States divisions in the territory east of Ontario Highway No. 41, from Pembroke to Kingston. Clyde B. Adams will personally handle this territory.

H. T. Watt, Vice-President of General Instument — F. W. Sickles of Canada, Ltd., and President of its Watt Electronics Products subsidiary, will be responsible for all General Instrument product lines west of this boundary, with the exception of solenoids and other electrical coils made by Watts Electronics. These latter products will be handled by F. W. Deacon of 65 Bloor Street West, Toronto, Ont., an associate of Mr. Adams.

Canadian Educators Experiment With Television As Teaching Aid

An experiment to determine the value of television in the teaching profession was put into effect in 82 public junior and high schools from coast to coast in Canada on November 2nd. Plans for the experiment were worked out by the Canadian Broadcasting Corporation and the National Advisory Council on School Broadcasting and equipment for the experiment was loaned by the Radio-Television Manufacturers Association. Equipment provided by the Association consisted of 21-inch table models which were installed and services free on a completely non-commercial basis.

The experiment is the first of its kind planned for school use in Canada.

Westinghouse Appointed Distributor For Presto Equipment

The Canadian Westinghouse Company and Instantaneous Recording Services, the Canadian distributors of Presto Recording products, have signed an agreement appointing Westinghouse as the exclusive sub-distributor for Presto equipment. The arrangement adds another important line to the present range of broadcasting and entertainment equipment handled by the company.

CGE ADMINISTRATIVE SERVICE GROUP REORGANIZED

V. B. Dowdell, Manager-Electronic Tube Marketing, Canadian General Electric Co. Ltd., has announced that his organization has recently been expanded to improve further its service to customers by the addition of an Administrative Service group.

The group will act as the point of customer contact for information on delivery promises, shipping dates and changes to scheduled requirements, on orders for Electronic Tubes and Devices placed with the company.

John H. Martin has been appointed Manager - Marketing Administrative Service. He was formerly Manager-Replacement Sales and returns to the tube business after two years with other departments of the company.

Associated with him will be E. F. (Ed) Gowing, who is well known in the tube business and who will specialize in handling customer inquiries.

J. H. MARTIN

E. F. GOWLING

NEW PRODUCTS

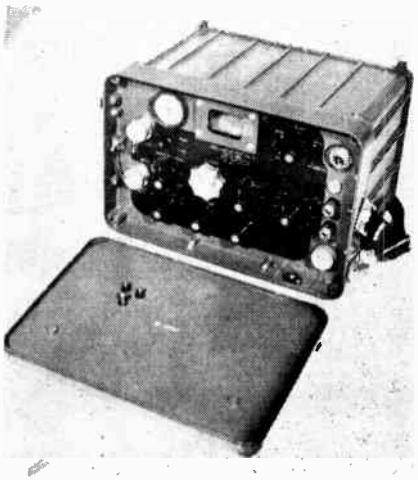
(Continued from page 25)

● *Test Oscillator No. 2 Type 872*

Item 588

The test oscillator No. 2 type 872 has been developed and manufactured for the Ministry of Supply in conjunction with the Signals Research and Development Establishment. It is a transportable, hermetically-sealed signal generator of very small size and extreme robustness. It is designed for use under field conditions in any climate, but is equally suitable for employment in the laboratory and workshop. It may be operated either from A.C. mains supplies or a 12-volt battery.

Controllable signals are produced by the instrument in two frequency bands over the complete range 20 M/cs-80 Mc/s. The tuning dial, which is fitted with an illuminated cursor, is driven by a slow motion drive giving a reduction ratio of about 100:1 with negligible backlash. The smoothness and accuracy of the frequency control thus obtained is such that the instrument may be employed for testing receivers incorporating crystal filters.



The output signal may be either amplitude or frequency modulated by an internal source of 1 kc/s, and spurious frequency and amplitude modulation under these two conditions respectively is exceptionally low. The output may be reduced by two precision step attenuators to a level of 1 microvolt from a 75-ohm impedance or 0.1 microvolt from a 7.5 ohm impedance. The external field is so low that the smallest signal outputs are usable.

The mains lead, battery lead, signal probe and spare fuses are stowed in a detachable lid which protects all the controls when the instrument is being transported. The unit chassis are hinged to give complete accessibility to every component. In spite of its compactness, therefore, the instrument is extremely easy to service.

● *General Parts Catalog*

Item 589

A leading Canadian parts jobber, has recently announced their new 1954-55 general parts catalog. Containing 284 pages, 8½" x 11", plus an 8 page index, it is believed to be the largest catalog of its type ever published in Canada. In a complete and up to date listing, the company has included its entire line of television components, radio parts, industrial devices, high fidelity and public address equipment, test instruments, ham gear, tools, electrical accessories, appliances, and radios.

Items have been arranged in logical sequence, and special attention has been paid to complete cross-indexing, no less than four separate indexes being provided. The main indexes are unusual in that they are bound into the centre of the book, and are printed on green stock for easy location. A copy is available on request.

● *Electrical Circuit Analyzer For Complex Circuit Testing*

Item 590

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.

Simplicity in operation enables the operator to rotate test selection switch to the desired test voltage position and the test proceeds automatically.

American manufacturers of large type airplanes have made exhaustive tests and discovered unbelievable savings were possible with the DIT-MCO Electrical Circuit Analyzer. One operation indicated a $15,000 annual saving utilizing the analyzer only four hours per day; another showed $4.000 yearly utilizing the analyzer for 30 minutes daily. In still another instance, a normal two to four hour test time was reduced to as little as five to ten minutes.

● *Model ES-180 Wide Band Electronic Switch*

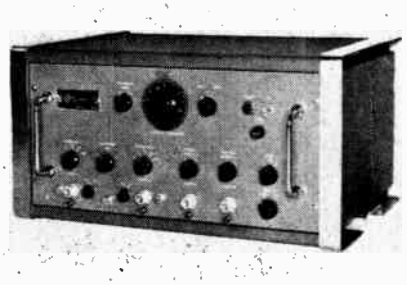
Item 591

This new wide band electronic switch is now available on the market. The switch provides DC to 15 MC dual trace oscilloscope presentations, and may be used with almost switched at sweep-end, at rates up to 100 K.C.

A movable horizontal index makes rapid and accurate amplitude and time measurements, without parallax error. A control dial, calibrated in volts and per cent, is used to position the horizontal trace and a connector is provided for introducing time marker signals from an external source.

Typical applications for which a simultaneous viewing and comparison of two inputs may be made are: overshoot, rise time and duration measurements; accurate shape time and amplitude comparisons; simultaneous display of related waveforms; and simultaneous display of non-synchronous signals.

Amplifier rise time is .023 microseconds. Input impedance is one megohm. And load impedance is 93 ohms. Unity gain, feedback, regulated power supplies are provided for maximum linearity and stability.



Because of the high stability of the two amplifier channels and their practically identical characteristics, it is possible to compare two signals in time with an accuracy of one milli-microsecond. Each channel has its own attenuator for input signals and a DC output control. Either input may be selected separately or alternate sweep presentation employed. The switch responds to waveforms of either polarity.

● *Communications Receiver*

Item 592

A completely new professional and amateur communications receiver incorporating such advance features as a continuously calibrated bandspread and a novel sectionalized construction has been introduced to the market.

The receivers precision differential tuning system, a marriage between mechanical and electrical bandspread makes it possible to read the exact frequency to which the receiver is sent anywhere from 550 kilocycles to 35.5 megacycles. The rotary turret construction for selecting anyone of the six bands of the type found in the Super-Pro 600 receiver permits extremely short leads between the circuits and tubes and makes possible the separate removal of individual circuit sections.

The set is double conversion from 2.2 to 35.5 megacycles it's top four bands for high image rejection. High stability is achieved because front-end selectivity is obtained with the modern single tube, triple-tuned RF section. Besides the normal BFO level an extra high level BFO has been incorporated for single side-band reception.

● *Model 460, Volt-Ohm Milliammeter*

Item 593

Approved by the Armed Forces and used by them extensively under the most exacting conditions and climatic changes, the Model 460 is said to be the finest V.O.M. ever designed. It has a sensitivity of 20,000 Ohms per volt.

Utility in handling is improved considerably in the Model 460. It is virtually impossible for the user to be handicapped by the lack of test leads, since the mere picking up of the unit by the handle "telegraphs" to the technician that he has or hasn't the test leads.

Chassis construction carefully and scientifically designed with every component accessible for test and replacement. No complicated moldings or catacombs to discourage and prevent a temporary or permanent repair in order to keep the unit in use. Despite the simplicity of construction the Model 460 is even more rugged than any previously constructed V.O.M. . . . hence the reason for its wide acceptance by the Armed Services.

The Model 460 is completely portable, measuring only 9" x 6" x 3½" and features a 5" plastic, shatterproof, front meter.

● *Crown Crimp Eyelets*

Item 594

A large manufacturer announces the addition of a new Crown Crimp eyelet to their line of solderless wire terminations. The eyelet features fast application, greater reliability and easier handling. The eyelets are supplied in strip form on reels for use with AMP automatic machines and can be applied at speeds upwards of 2000 per hour.

The crimped eyelets have even distribution of wire strands around the eyelet and afford ample tensile without solder. The use of the Crown Crimp eyelets save wire because of shorter strip lengths required.

(Turn to page 30)

RELAYS

(Continued from page 18)

noting that the high efficiency of modern automatic telephone systems is made possible by the use of large numbers of relays, and telephone call between two automatic exchanges may involve the perfect functioning of as many as 1000 contacts.

It is true that with low switching loads the advantage gained by employing relays is slight, but where high loadings must be handled the relay is undoubtedly superior. This is well illustrated by the overland telegraph systems in which fairly large line currents are commonly encountered.

Improved Waveforms

In valve amplifiers, the output waveforms are usually of the same shape as the input wave-forms but in several impulsing applications an ill-shaped output wave can result in incorrect operation of subsequent apparatus. If however, the valve amplifier feeds through a polarized relay there is a resultant improved square pulse shape from the relay contacts. Further, the relay itself will act as a high-gain amplifier so that the preceding valve stages can be correspondingly reduced. Even where proportional amplification is required, the polarized relay can still make a valuable contribution in overcoming the instability of such valve amplifiers.

Proportional amplifiers are generally used in control and recording devices in which only a very low level, direct voltage is obtained from the initiating source, but considerable trouble is often caused by the high random drift of "zero point" common to most directly-coupled amplifiers. This trouble has in the past, prevented the use of a straightforward electronic circuit in high-grade equipment, but there are now a number of ways of overcoming the difficulty; one of the more satisfactory methods is to use a fast-operating polarized relay to convert the input D.C. signal to a square-wave alternating voltage which may then be amplified simply in a valve circuit. If the A.C. amplifier is tuned to the modulating frequency it is possible to keep the "noise" voltages to approximately one microvolt.

Alternatively, the small signal voltage can be fed to a straightforward D.C. valve amplifier, whilst a fraction of the voltage is taken to an A.C. amplifier employing an "each-side-stable" polarized relay. One side-contact of the relay is used alternatively to "earth" and "free" this input voltage, thereby converting it to a square wave 9.C., whilst the other side contact restores the amplified A.C. output to D.C. This output is then fed back to he conrol grid of the original D.C. amplifier, in a sense tending to eliminate any drift voltage.

A justifiable prejudice exists against the use of "contact modulators" due to the trouble caused by the generation of thermal voltages, but there are various forms of polarized relay at present on the market, in which this failing is virtually eliminated.

The polarized relay is produced in many forms, each with its own particular advantage, but all incorporate the same fundamental design. By employing an efficient magnetic circuit in which the main polarizing fluxes do not pass through the coil core it has been possible to restrict the cross-section of this core to carry only the signal flux, thereby giving a low mean diameter for the coil winding and a resultant high electro-magnetic efficiency. Compliant contact mountings are fitted to eliminate contact "chatter" and high frequency bounce, and to provide a slight rubbing action which ensures a clean contact. The side contacts, rather than the moving armature contact, are made compliant so that although the nominal contact gap is small, the actual gap is greater because of the partial collapse of the side-contact mountings after contact has been made; the small gap enables high operating speeds and an increased sensitivity to be obtained.

Miniature Size Relays

One criticism levelled against polarized relays in general is their comparatively large size, but there are now miniature versions of the relay in which all the important features are combined in an overall volume of approximately 50 cu. cms.

There are relays which will operate in considerably less than 0.5 milliseconds and respond to frequencies approaching 1000 c/s with no evidence of contact bounce and with almost perfect symmetry; some versions will operate on 0.05 milliwatts even under severe vibration and acceleration, and some with lower sensitivities will remain in close adjustment for considerable periods without attention.

The high-grade polarized relay is widely used in the voice frequency and D.C. impulsing circuits common to telephone and telegraph systems, for the transmission of low level dialling signals and code messages, where it responds to weak incoming impulses of poor quality and varying strength to produce a greatly amplified perfect square wave signal at the contacts for re-transmission, or for the operation of electronic apparatus. The improved performance resulting from the use of the polarized relay permits fully automatic working over distances of 100 miles of underground trunk cable without intermediate repeating, or allows the direct operation of groups of teleprinters.

The high sensitivity and positive action of the polarized relay has facilitated the design of fire protection equipment using a beam of light to illuminate a photo-electric cell, the output of which passes either directly, or through one valve stage, to the relay coil. If any smoke should arise from, say, the cargo-hold of a ship, the beam of light would be partially obscured and the voltage output from the photo-electric cell would drop, so causing the relay to operate the alarm system.

The good overall performance of the better type of polarized relay has resulted in an exceedingly wide range of applications covering practically every aspect of engineering. This diversity of use embraces equipment employed in telephony and telegraphy, mobile artillery and road vehicles and there is in fact, unlimited scope. Electronics has opened up a vast new field of engineering in which the polarized relay can play a useful role, and it is hoped that this article will at least have dispelled the feeling that electro-magnetic devices are things of the past, unworthy of consideration in a modern world.

For further data on advertised products use page 64.

NEWS

(Continued from page 26)

J. R. McGovern Appointed Sola Eastern Canada District Sales Engineer

Sola Electric Co., Chicago, announces the appointment of J. R. (Dick) McGovern as District Sales Engineer in Manitoba, New Brunswick, Nova Scotia, Ontario, Prince Edward Island and Quebec for the company's complete line of specialty transformers.

J. R. McGOVERN

Since his graduation from McGill University, where he received his degree in electrical engineering, McGovern has been associated with the specialty transformer field in Canada. His experience qualifies him to undertake aplication work in the fields of static-magnetic voltage stabilizers, constant wattage fluorescent lighting ballasts and mercury vapor lamp transformers.

Mr. McGovern will work out of the Sola office at 617 Runnymede Road, Toronto 9, Ontario.

Dr. J. T. Henderson Re-elected Regional Director I.R.E.

Dr. John T. Henderson, Principal Research Officer at the National Research Laboratories in Ottawa has been re-elected as Regional Director of the Institute of Radio Engineers, for 1955.

John D. Ryder, Dean of the School of Engineering, Michigan State College, was elected President of the Institute of Radio Engineers for 1955.

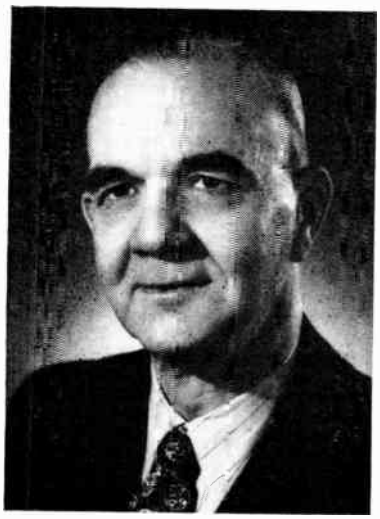
Dominion Fasteners Names Frank Lewis Sales Engineer For Quebec And Maritime Provinces

Mr. W. F. Beattie, Vice-President and General Manager of Dominion Fasteners Limited, exclusive Canadian manufacturer and licensee of the famous line of Tinnerman Speed Nuts, recently announced the appointment of Mr. Frank Lewis as Sales Engineer for Quebec and the Maritime provinces. With headquarters in Montreal, Mr. Lewis brings to his new position several years' experience in the aircraft, radio and electronics industries.

FRANK LEWIS

Phillips Electrical Company (1953) Limited Appointments

J. R. PHILIPS



A. LAUDER

Following the appointment of Mr. T. Lindsay as Executive Vice-President, the Board of Directors of Phillips Electrical Company (1953) Limited announce the following changes in organization: Mr. J. R. Philips, a member of the Board and Vice-President (Operations), has been appointed to the new position of Vice-President (Finance). Mr. A. Lauder, presently Works Manager, is appointed Vice-President (Production and Engineering).

Mr. Philips is a Chartered Accountant, and has served in a number of senior positions with the Company since joining them in 1940. Mr. Lauder has been with the Company since 1913, and has been a senior plant officer since 1922. He is a well-known and respected figure in the wire and cable business in Canada, the United States and England.

(Turn to page 32)

For further data on advertised products use page 64.

NEW PRODUCTS

(Continued from page 27)

• *Capacitor Tanks*

Item 595

C-L-M capacitor tanks are now being aluminum metalized to defer corrosion indefinitely. The new finishing process consists of cleaning and roughening mild steel tanks, applying aluminum spray, following with a chromate primer, and ending with a dark alkyd resin enamel. The dark finish coat expedites heat radiation and keeps capacitor packs at low operating temperatures.

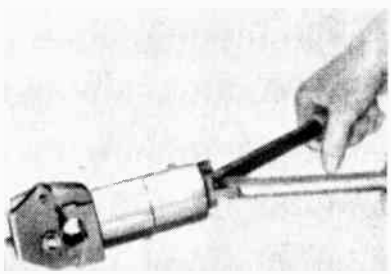
The makers state that tanks of Elemex capacitors have always had excellent protection against corrosion, even under severe field conditions. Aluminum spray in the new metallizing process is added assurance of corrosion-free service, even if the paint is scratched down to the metal.

• *Lightweight Hydraulic Hand Tool*

Item 596

A new, lightweight hydraulic hand tool for users of solderless terminals on wire sizes 8 through 2 has been announced.

The tool weighs only 5 lbs. but produces crimping force of 1,200 lbs. A special double lever action produces this force with 50 per cent less pumping effort than on conventional hand hydraulic tools. A sudden decrease in pressure indicates to the operator that a crimp is complete.

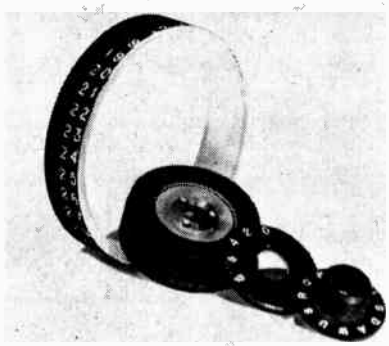


The tool is available in two styles which correspond to certain types of application. One style has rotating nests in its head which can be used on uninsulated copper wire, either solid of stranded. The other style has removable inserts and is used with insulated stranded copper wire or uninsulated stranded aluminum wire.

• *Control Panels-Dials-Knobs*

Item 597

Laminated panels, knobs, switches, flat dials and even drum dials have the required letters or figures processed into the background so they appear dead white against the non-reflecting black background. In the dark, small red-filtered lamps which are inserted in the inside lamination of clear plastic, illuminate the figures with a red light which the eye does not retain when in motion.



All dials and panels are laminated of methyl methacrylate and vinyl films which meet the standards of Specification MIL-P-7788. They will withstand all standard humidity and salt-spray testing; and no change is noted in the overall efficiency of the materials when tested at temperatures varying between — 65°C. and + 85°C.

This new method of making control panels, dials, knobs, etc., lends itself readily to quantity production and competitive costs. For application other than military use, other colors have also been developed.

A booklet with complete information is available.

• *Brochure On New Air Data Computer*

Item 598

A large manufacturer of controls, components and computers, has compiled an 8-page technical brochure on its "Master Air Data Computer". The Brochure points out that the "Master Air Data Computer" provides a single co-ordinated source of information eliminating much duplication. Schematic diagrams show how the plug-in type computer permits calculation of complex functions with a minimum of equipment.

• *New Telemetering Bulletin*

Item 599

A new expanded bulletin illustrating and describing the publishers complete line of metameter telemeters and accessories is now available.

In addition to telemetering over telephone circuits, carrier current and private wires, the bulletin features microwave telemetering, telemetering with selective calling and time multiplexing telemetering.

Specific information and application illustrations are given on how metameter telemetering may be applied to the measurement and transmission of pressure, flow, liquid and water level, mechanical motion, electrical units and totalized power load. Each category is treated separately.

Copies of the 44 page bulletin, illustrated by almost 100 photos and line drawings is available on request.

• *Dynamotor*

Item 600

A Chicago firm has developed what is believed to be the smallest, most rugged dynamotor. The dynamotor, developed for the U.S. Army, is for use where space and weight are at a premium.

The dynamotor measures $3\frac{5}{8}$ inches in length and $1\frac{1}{4}$ inches in diameter, about the size of a roll of quarters.

The miniature dynamotor's ruggedness was tested by firing it from a 57 mm. rifle. It withstood force of 10,000 G's (10,000 times the pull of gravity). The makers compared this to dropping the dynamotor from a building 107 times the height of the Empire State Building. The dynamotor continues to operate during a 10,000 rpm spin.

The dynamotor has an input of 6 volts at 1.5 amperes, an output of 150 volts at 25 milliamperes, 42 per cent efficiency, and weighs one pound.

(Turn to page 34)

For further data on advertised products use page 64.

Excerpts from - - -

C.G.E. President H. M. Turner's 1954 Survey

In 1954, for the first time in 15 years, the output of Canada's electrical manufacturing industry will fall below the level attained in the previous year. In some measure this is the result of a general levelling off in an economy which will show a decline in gross national product for the first time in the post-war years. The electrical industry, however, is beset by problems which compound the issue, and for which there are no sudden and dramatic solutions. . . .

. . . To keep pace with Canada's expected growth, the electrical industry has set itself the goal of producing as much equipment in the next ten years as it has since its inception. In order to attain this objective, every effort is being exerted to meet and overcome advantages now held by foreign competitors.

Competition from abroad has been particularly evident over the past year in the field of electrical capital goods known as "apparatus". Orders for such custom-built heavy electrical equipment as water-wheel generators and power transformers are subject to intense competition from abroad. A substantial percentage of all available business in these lines in the past year has been placed in Western European countries.

The severity of this present competition appears to stem from the fact that this equipment has a high labor content. With present Canadian wages being roughly three times those paid in Europe, factory costs on Canadian-made equipment are substantially greater than those of European competitors. Then too, the present premium on the Canadian dollar lowers the cost of imported goods, thus lowering the competitive prices of foreign equipment. . . . . . In general, Canadian purchasers of electrical equipment — in their own interests and in the interest of the Canadian economy as a whole — would prefer to place their business in Canada. To this end, Canadian manufacturers are closely scrutinizing their own opeartions, and the operations of their competitors abroad, with a view to determining how the existing price differential can be narrowed. The problem must be resolved if the electrical industry — now one of Canada's largest —is to remain as a prime supplier of goods for peacetime expansion, as well as a basic contributor to the nation's defence. . . .

. . . Well over a million television receivers are now in operation in Canada, of which about half were sold this year. The television segment of the industry foresees no slackening of demand in the near future, and estimates sales at upwards of 600,000 units in 1955. Twenty-four transmitting stations will be in operation at year-end, and industry estimates indicate that at least twelve new TV outlets will go into operation next year. Intensive development work to reduce the number of circuits in color television receivers — and thus lower their cost to the consumer — is currently under way. However, the sale of these receivers is not expected to form any significant part of the television market in Canada until 1956 at the earliest.

Developments in the field of electronics — and their application in communications, defence and industry — are proceeding at a pace governed only by the availability of specialists trained in the electronic art. Increasing applications for electronic equipment are being found daily in the field of nuclear energy, in defence work for aircraft and guided missiles, and in the greater use of automation in industry. . . .

For further data on advertised products use page 64.

NEWS

(Continued from page 29)

Newfoundland T.V. Station Authorized By Transport Department

Honorable George C. Marler, Minister of Transport, has announced that authority has been granted by Governor in Council for the establishment and operation of a television broadcasting station by the Newfoundland Broadcasting Company Limited, present operators of AM radio broadcasting station CJON at St. John's, Newfoundland. The new television station will operate on Channel 2. Shareholders of the Newfoundland Broadcasting Company Limited include C. W. Stirling and D. Jamieson, radio executives.

Granting authority to the St. John's Newfoundland, station will bring to a total of 29 the number of authorized television broadcasting stations in Canada, of these, six formerly authorized Canadian Broadcasting Corporation and 12 privately owned stations are now in operation.

F. H. Slaymaker Addresses Toronto Section I.R.E. On Hi-Fidelity

F. H. Slaymaker, Chief Engineer, Sound Equipment Division, of the Stromberg Carlson Company, Rochester, N.Y., was the guest speaker at the October 25th meeting of the Toronto Section of the Institute of Radio Engineers. The subject of Mr. Slaymaker's talk was recent Developments In High Quality Sound Reproduction.

The speaker began with a discussion of the frequency range required for the exact reproduction of various musical instruments and proceeded to demonstrate the effects that were obtained when this frequency range was restricted to various degrees. The subject of transients, their nature and how they were affected by resonance in the reproductive system was also discussed. Loudspeakers and speaker enclosures were also thoroughly dealt with. Both disc and tape recordings of various types were demonstrated.

F. P. Wilson Appointed President of Bakelite Company

F. Perry Wilson has been appointed President of Bakelite Company, division of Union Carbide Canada Limited, it was announced recently by Ewart Greig, President Union Carbide Canada Limited.

Mr. Wilson was graduated in 1936 from North Carolina State College with a degree in Chemical Engineering. He joined the Bakelite organization in 1941 and was made Sales

F. P. WILSON

Manager in 1950. In 1953 he was appointed Vice-President in charge of Sales.

A member of the Society of Plastic Engineers, Mr. Wilson is also a member of the Society of the Plastic Industries. He will continue to make his headquarters at the General Offices and Plant at Belleville, Ontario.

For further data on advertised products use page 64.

Plans For Vancouver Office Warehouse Announced By Canadian General Electric

Plans for a new office and warehouse building on Broadway Avenue East, at Nootka St., in suburban Vancouver, are announced by the Canadian General Electric Company Limited. The building will be erected on a 7-acre site purchased by the Company in 1953.

To contain 81,000 square feet of floor space, the structure is scheduled to be completed early next year. The company's Wholesale Division together with the Electronics and Industrial Products Divisions will occupy the new premises.

The building will contain a service shop, a combination auditorium and display room, and completely equipped employees' cafeteria. Enclosed loading docks at truck deck level will speed receiving and shipping on the warehouse floor. Rail facilities will be provided by a siding from the Great Northern Railway. Customer conveniences will include counter service and a full stock of renewal parts. Spacious customer and employee parking areas will be provided.

Atlas Radio Corporation Named Canadian Reps.

International Rectifier Corporation of El Segundo, California, have announced the appointment of the Atlas Radio Corporation Limited, 560 King Street, West, Toronto 2B, Canada, as their exclusive sales representative throughout Canada. Representing Atlas Radio in sales and customer relations for all International Rectifier Corporation products are: Mr. D. Lou Harris, President, General Manager; Mr. Fred Harris, Sales Manager; Mr. Fred Sargeant, Industrial Sales; Mr. Seymour Janikun, Industrial Sales; Mr. Manny Bobkin, Distributor Sales.

Service and information is also available from Mr. J. R. Bass, Distributor and Industrial Sales, 505 McIntyre Block, Winnipeg; and Mr. Jack Collins, Distributor Sales, 4560 Prince of Wales Avenue, Montreal.

Westinghouse Reorganizes Lamp Tube Division

The Canadian Westinghouse Company has reorganized the firm's Lamp-Tube Division, which formerly operated as a single unit.

Two separate divisions have now been established under General Manager L. A. McCalpin. H. E. Rice, formerly manager of the company's Television-Radio Division at Brantford, Ontario, has returned to Hamilton to manage the newly-created Tube Division. He is succeeded by Ricardo Muniz who formerly held the post of operations manager at the television facilities at Brantford.

Northland Radio Supply Move To Sudbury, Ontario

Northland Radio Supply announce that they have moved their office and warehouse from Kirkland Lake to 400 Bessie Ave., Sudbury, Ontario. Northland Radio has served northern Ontario as a distributor of radio, television and electronic parts and components for over 10 years.

Company officials anticipate that the new location will improve deliveries and service to all Northland Radio customers in both northern Ontario and Quebec, and will also enable them to expand their stock and facilities.

CKX-TV Brandon Gets New Transmitter

Canadian General Electric Company have signed a contract with television station CKX-TV, Channel 5, Brandon, Manitoba, for a 5-kilowatt transmitter and studio equipment.

The transmitting system has been designed to enable the station to increase its effective radiated power to 100 kilowatts when warrante dby the market development.

It is calculated that the present power of close to 20-kw ERP, will result in the station covering a radius of approximately 60 miles.

(Turn to page 36)

For further data on advertised products use page 64.

NEW PRODUCTS

(Continued from page 30)

• *DC Millivolt Meters And DC-Amplifiers For Aviation Research*

Item 601

A new series of Electronic DC Millivolt Meters covering a voltage range of 100 uV to I KV, at 6 megohms input impedance on the low ranges and 60 megohms on all ranges above 1 V full scale have been developed for aviation research. They contain an accurately tuned 120 ops DC Modulator which is driven from its own highly stable 60 ops R/C-tuned oscillator.

The new DC Millivolt Meters are available as portable models and in rackmounted form, also with or without facilities for operation as highly stable DC amplifiers. In the latter case they have a gain of 1500 and a DC drift of less than 50 uV referred to the input circuit over long periods of time. They may be used over a wide power supply frequency range extending from 40 cps. to 500 cps., and are recommended for all applications in which the standard American Domestic and Industrial Power Supply of 117 V, 59-61 cps. is not available.

• *Versatile Transistor*

Item 602

An illustrated folder showing how power transistors can be of value in designing and redesigning equipment is now available from a large instrument manufacturer.

Since their inception a few years ago, transistors have captured the imagination of product designers and inventors. They can be used in compact, rugged control units unobtainable with conventional electronic circuitry.

In 1951 the Company's research division was assigned the task of evaluating the usefulness of transistors in relation to their products. As a result of this study, a special power transistor was developed. Because of its relatively high power output, it has been found ideally suited for an ever-increasing range of applications.

This power transistor directly drives a servo motor, directly operates a speaker — as used in dictating devices and other compact business machines — public address systems and high fidelity radio. It also directly handles numerous electrical switching operations and has made possible the operation of a unique transistorized aircraft fuel gauge.

The power transistor features exceptionally compact design for its relatively high capacity. Its small size ($\frac{1}{2}$ x $\frac{1}{2}$ in. diam. — exclusive of leads and mounting stud) affords considerable opportunity for product re-design and miniaturization.

Specially designed for electronic control applications, these transistors are available for experiment or production in any quantity required by prospective users.

• *New Cable Clip*

Item 603

A new C.S.A. approved Staple for non-metallic cable has been developed. Designed and manufactured in Canada to meet the requirements of the Canadian Electrical Code, the galvanized Staple, designated as Catalog No. 99, can be used on all popular sizes of non-metallic sheathed cable: 14-2, 12-2, 14-3, 12-3 or cables having equivalent outside diameter.

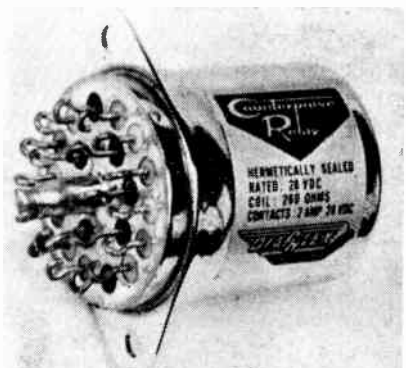
According to the makers, the outstanding design feature of the Catalog No. 99 are "ears" which protrude from each leg to prevent overdriving and subsequent damage to cable sheath. Also inside surfaces are rounded to prevent damage to cable. A few simple hammer blows drives the sharp pointed Staple into place, securely and positively supporting the cable.

• *Precision Counterpoise Relay*

Item 604

According to the manufacturer the unique design, micro-precision construction, and extreme care in the assembly by watchmakers and skilled instrument mechanics offer a new relay concept in delicate, dependable performance, immunity to vibration and shock, and long service life.

The counterpoise advancement incorporates the principle of the fulcrum and lever. When two balanced weights act in the same direction and at equal and opposite distances from the fulcrum, no motion can take place. This is the case when the relay is subjected to either shock or vibration. However when the coil is energized and de-energized, a force couple is produced giving the lever a smooth, rocking motion which is transmitted to the relay contacts. Therefore, the entire relay mechanism is responsive to electrical energy only.



The unique construction of the spring and header assembly, actuator and the entire magnetic circuit uses no solder, brazing, flux, resin, or riveting; no clinching, roll-over, screws, threaded parts, fasteners, lock washers, or safety wiring; no pile up insulators, phenolic or melamine insulation, or staking lacquer. The major portion of the assembly work is done with magnifying glasses; spacing measurements and parts relationships are controlled by micrometer measurements. Also the coil space to volume ratio in the Counterpoise Relay is increased to 80 per cent. The larger number of turns provided, together with the mid-coil location of the actuator anvil provides an unusually high magnetic force with accompanying increased gram pressure and spring travel. This relay design employs an outer annealed Armco case as the magnetic return circuit providing an ample loss-free closed iron field.

For further data on advertised products use page 64.

• *Sweeping-Image Recorder*

Item 605

Details of a new research camera system using synchronized-streak techniques to produce a writing speed of 5.46 millimeters per microsecond and a sweep duration of 44 microseconds, are given in a new folder, Form 168-754. Including a number of typical illustrations of research pictures taken with the camera, the folder illustrates the equipment and devotes space to the discussion of the kind of explosive, flash-tube, shock-wave and spark-discharge phenomena suitable for study with the instrument. Other sections discuss optics, interpretation of the images, means and capabilities of the synchronization equipment. A data tabulation gives extensive engineering details not only on the camera but the remote control unit as well.

• *Television Laboratory Oscilloscope*

Item 606

The oscilloscope type 404 is an exceptionally high-grain, wide-band oscilloscope created especially for designing and servicing television receivers. It accurately displays any TV pulse, waveshape of signal on a large 7-inch screen. The Type 404 incorporates many important features usually found only in more expensive oscilloscopes, and is recommended for servicemen, laboratories, schools and industry.

Other features include an internal hard-tube multi-vibrator sweep circuit; linear sweeps from 10 cycles to 50 kc.; rapid return trace; control for synchronizing to either positive OR negative signals; wide-range phasing control; and an internal 60-cycle sine wave sweep which eliminates one set of leads during alignment operations. Vertical and horizontal polarity reversing switches to provide orientation of pattern to suit viewer. High acceleration voltage assures a bright trace and balanced and non-astigmatic deflection is assured by push-pull deflection amplifiers.

Flexibility is provided by switches for direct connection to deflection plates; rear panel connection for intensity (Z-axis) modulation; useful for calibration and Z-axis blanking. Cathode-ray tube protected by plastic shield and exclusive impact-resistant rubber mount. Has low-parallax cross-lined screen. Scope supplied with Type 7VP1A (green trace) tube or can use standard 7" TV picture tube Type 7JP4 (white trace).

• *High Temperature Switch*

Item 607

A new precision switch for high-temperature applications is announced.

Because of its small size the new switch, designated IHTI, is ideal for high-temperature aircraft applications. Its capacity for switching a substantial electrical load in a temperature range of minus 50 degrees to 1,000 degrees F. makes it equally well suited for high-temperature industrial applications, such as those found in vulcanizing plants and other industries which require high-temperature components.

Laboratory tests at 700 degrees F. show life in excess of 25,000 operations at a resistive load of 5 amperes 28 volts d-c. At 1,000 degrees F. the new switch has surpassed 9,000 operations carrying a resistive load of 2 amperes 28 volts d-c.

The switch is designed for panel mounting. Two thin hexagonal nuts and two lock nuts on the threaded bushing permit adjustment of the operating point without removing the switch from its mounting.

Chraracteristics of the IHTI:

Operating Force	10 to 20 oz.
Pretravel	.065 in. max.
Differential Travel	.010 in. max.
Overtravel	.125 in. max.

• *New pH Instrumentation Systems*

Item 608

Complete systems for pH recording and control, which incorporate for the first time the new Beckman Model W. amplifier, have just been announced.

These pH instrument systems include a Bristol Electronic Dynamaster Potentiometer recorder or controller, a Beckman Model W Amplifier, electrode assemblies in either flow or immersion types, and a variety of final control elements for the addition of gaseous, liquid, solid, or slurried reagents.

A new bulletin Q1304 gives full engineering specifications and illustrations of each component of the systems, and shows methods of installing pH instruments in a number of different applications. It also contains photos of installations in various fields of manufacture. The 38 page, two-color bulletin is available on request.

(Turn to page 45)

For further data on advertised products use page 64.

NEWS

(Continued from page 33)

Bogue Electric Plant Under Construction

One of Canada's newest industrial plants, that of Bogue Electric of Canada, Ltd., will employ some 200 Canadians in the manufacture of high frequency generators, magnetic amplifiers, electronic equipment and numerous other products when the plant begins operations, Grant A. Taylor, company representative, has disclosed.

Erection of steel on the plant site at Gloucester Township, near Ottawa, has already begun. It will contain 75,000 sq. ft. of floor space. Plant investment is estimated at $2 million.

Key Canadian personnel are at present receiving training at the company's main plant at Paterson, N.J.

The Canadian plant became a necessity when the rapid growth and tremendous industrial expansion of this country was realized, Dr. Schinman declared.

The decision was strengthened by the fact that the demand for special electrical equipment for both military and civilian application have been increasing so fast that it was no longer possible to supply increasing Canadian needs in the United States.

Helipot Corporation Open New Canadian Plant

More than 300 persons prominent in government, finance and the electronics industry attended an open house at the new Canadian plant of Helipot Corporation on Thursday, December 9.

The new plant, located at No. 3 Six Points Road, Toronto, Ontario, is the latest development in the expansion program of Helipot Corporation, manufacturer of precision potentiometers and other components used in electronic and electro-mechanical systems. A division of Beckman Instruments, Inc., Helipot has four plants in the United States: at South Pasadena, Pasadena and San Gabriel, California, and Mountainside, New Jersey.

F. A. Sweet Named General Manager Of Canadian Standards Association

Dean R. E. Jamieson, President Canadian Standards Association announces the appointment of Fred A. Sweet, P.Eng. as General Manager, to succeed the late Colonel W. R. McCaffrey.

Mr. Sweet, who has been Chief Technical Officer of the Association for the past fourteen years, is a graduate in civil engineering of the University of Toronto, and a member of the Association of Professional Engineers of Ontario and the Engineering Institute of Canada.

J. Ross Kehoe Appointed Marconi Staff Assistant

Announcement has been made by S. J. Sinclair, Manager of the Broadcast and Television Receiver Division of the Canadian Marconi Company, of the appointment of J. Ross Kehoe to the position of staff assistant to Mr. Sinclair.

J. R. KEHOE

A native of Sault Ste. Marie, Ont., Mr. Kehoe graduated from the University of Western Ontario with a B.A. degree (business administration). He has been actively engaged in an executive capacity in Sales and Merchandising since that time. His headquarters will be at the Canadian Marconi Company's Head Office in Montreal.

For further data on advertised products use page 64.

New Firm to Specialize As Broadcast Consultants

Department of Transport approval has recently been granted to Broadcast and Communications Consultants Limited, 22 Front Street West, Toronto, to engage in a consulting capacity to the broadcasting, television and telecommunications industry.

The new firm, headed up by W. H. (Bill) Holroyd, General Manager and G. R. Mather, P. Eng., Chief Engineer, has been established to fill the need of independent consulting services for the Canadian radio, television and telecommunications industries. Out of

W. H. HOLROYD

G. R. MATHER

the twelve previously established Canadian radio consultation agencies, which includes the consultation services of several manufacturers, there is only one agency specializing in the field of radio broadcast consultants.

Although Broadcast and Communications Consultants Limited are at present specializing in the broadcast field it is anticipated that their services will be broadened in the future to cover the general telecommunications field, according to Mr. Holroyd. Projects presently in hand by the firm includes investigations for a new AM station, television station power increases and industrial television applications.

Broad Engineering Experience

Mr. Mather was born in Bulyea, Saskatchewan in 1923 and graduated from the University of Alberta in 1946 with a B.Sc. in electrical engineering. Prior to associating with Broadcasting and Communications Consultants Limited he was employed by the Federal Department of Mines and Resources and the Department of Transport in Ottawa. During his tenure of employment with the Federal Government Mr. Mather served as Broadcast Engineering Specialist with the Department of Transport and was a Canadian representative at the International High Frequency Broadcasting Conference at Mexico City, Canadian representative at NARB Montreal and Washington, Chairman of the NARBEC Engineering Committee and took an active part in negotiations with the American Federal Communications Commission concerning the technical considerations of the Canadian television assignment plan.

Marketing Specialist

Mr. Holroyd was born in Sheffield, England in 1900 and came to Canada in 1945 following seven years service with the R.A.F. as signals radar officer. From 1945 to 1954 he was employed by the Canadian General Electric Company Limited serving as the company's Maritime Representative in Halifax, later serving in Winnipeg as the company's western representative from the Great Lakes to the Pacific Coast. His last association with the General Electric Company was as Manager of Sales and Planning for Broadcast and Mobile Communications Equipment. His headquarters in this capacity was at the company's Royce Works in Toronto.

Self-Serve Merchandising Enters Canadian Electronic Parts Business

The new Frank Gerry & Company Appliance Distributing Centre recently opened in London, Ontario, introduces many new features in Factory-Distributor-Dealer co-operation.

Of a great interest to the trade is the Self-Serve Parts Operation, the first of its kind in Canada. This layout was designed and installed by the E. J. Wright Utilities of Strathroy, Ontario

(Turn to page 40)

For further data on advertised products use page 64.

For further data on advertised products use page 64.

For further data on advertised products use page 64.

● Plans for this new office and warehouse building on Broadway Avenue East, at Nootka St., in suburban Vancouver have been announced by the Canadian General Electric Company Limited. The building will be erected on a 7-acre site purchased by the Company in 1953.

Regina Telephone Exchange Modernized

Early in 1955, the first phase of a new composite Telephone Installation program, involving the largest project of its kind in Western Canada, will be cut into service with the opening of the New Main Telephone Exchange in Regina Saskatchewan.

The job will comprise a new main dial exchange, initially accommodating 21,000 terminals; a new power plant arranged for supply at 24, 48 and 130 Volts; a new 60 position (3 CL) toll switchboard; new carrier terminals; new test board equipment; additional voice frequency carrier telegraph and a 2000 line extension to the existing Regina North Exchange.

E. A. Freed To Supervise Canada-U.S. Sales

Appointment of E. A. Freed as General Sales Manager of General Instrument Corp. was announced recently by Monte Cohen, President of the Company. In his new capacity, Mr. Freed will be in charge of sales of all products made by General Instrument and its manufacturing subsidiaries, including its F. W. Sickles and Elizabeth Divisions, both here and in the United States.

E. A. FREED

Canadian Westinghouse Announces New Employee Pension Plan

A new pension plan based on years of service of employees was brought into effect by the Canadian Westinghouse Company Limited on October 1st.

The new pension scheme scraps the old plan which Westinghouse initiated in 1919 and marks the fourth major change in employee relations to be announced by the Mr. H. H. Rogge, President, in the past year.

Designed to meet the demands of today's increased cost of living the new pension plan affords increased monthly payments, larger death benefit payments and arrangement for optional retirement age and a wider choice of retirement income payments for employee's widows.

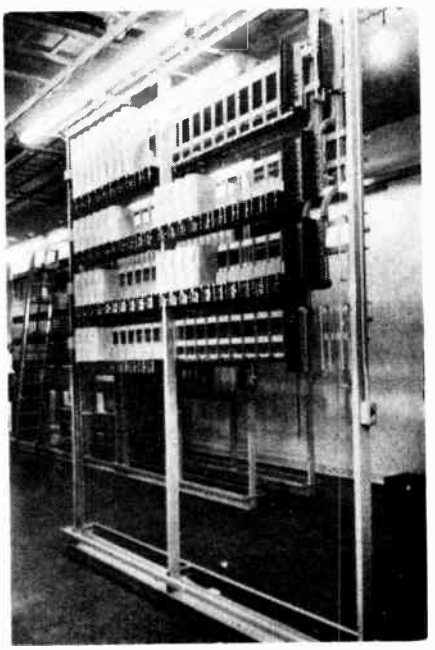
For further data on advertised products use page 64.

City of Prince Rupert New Automatic Telephone System

On Sunday, September 19th, the new municipal automatic telephone system of the City of Prince Rupert, B.C., was cut into service, to replace the manually operated system that had served the city for 44 years.

The entire system was completely re-designed for automatic operation and the equipment was supplied by Automatic Electric Sales (Canada) Ltd. and their associate organization, Canadian (B.C.) Telephones & Supplies Limited, were responsible for the installation.

The new Strowger Automatic system provides initially for 1600 lines with 4300 terminals on a terminal-per-station basis. Up to 4-party lines with full selective ringing are available, using 16⅔, 33⅓, 50 and 66⅔ — cycle harmonic ringing, the same as for the previous manual system. The switching equipment includes 200 — line line finders, 10/10 local selectors and individual 100-line connectors, mounted on high type frames. The toll switchboard has three positions equipped to provide toll and magneto line termination, recording trunk service, radio lines service and ship-to-shore radio service. For the last mentioned service, the operators use dials to select the various radio frequencies employed.



● View of section of automatic switching equipment.

Power is furnished by a 500 ampere-hour capacity storage battery, charged by constant voltage rectifiers, with a 20 kw. gasoline engine driven generator for emergency service.

The new equipment is housed in a single-storey concrete building with basement, centrally located to provide this growing community with the most modern telephone service.

New C.S.A. Laboratories Equipped With Latest Aids

The new modern Canadian Standards Association Laboratories located on Rexdale Boulevard in the Township of Etobicoke was officially opened recently by Dean R. E. Jamieson, CSA President and Dean of Engineering McGill University.

The CSA is responsible for the testing and approving of electrical and oil burning equipment of all kinds, against fire and shock hazards for the protection of the Canadian public.

The Laboratories, which consists of a single-storey laboratory and office building of 50,000 square feet is of modern construction, with emphasis on well lighted working conditions, by extensive use of glass partitions and the latest in lighting fixtures.

The method of distributing power in a great variety of combinations of voltages and frequencies, to the various laboratories and test locations, is probably unique in Canada.

To provide for future expansion, the Association purchased ten acres in all and the new building is specifically designed for extending its scope, as well as for growth of existing testing programs. It is likely that the laboratories will be asked to provide a certification service on other products besides electrical and oil-burning equipment.

Canadian General Electric To Supply Equipment For London-Windsor TV Link

A complete television microwave relay system will soon be installed to carry television programs between London and Windsor, Ontario. The system will forge another link in the CBC Trans-Canada television network enabling additional thousands of television set owners to see and hear network programs.

Electronic equipment for the new television link is being supplied to the Canadian National and Canadian Pacific Railways by Canadian General Electric Company.

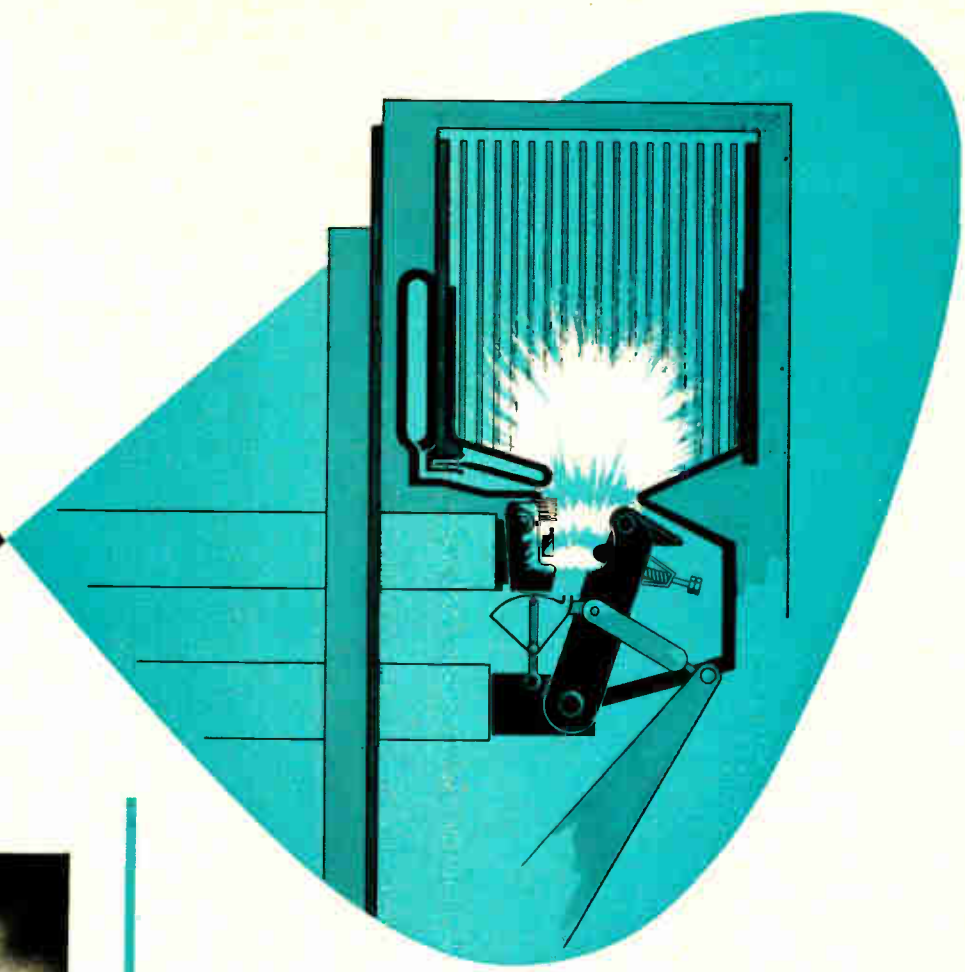
Consisting of two reversible television channels which allow programs to be transmitted in either direction, the system will utilize two terminal stations and four repeaters. A feature of this equipment is a supervisory control system which allows the direction of transmission to be reversed at all stations from a single control point. Standby electric power will be provided by diesel electric sets to ensure continuous service with no interruption of transmission.

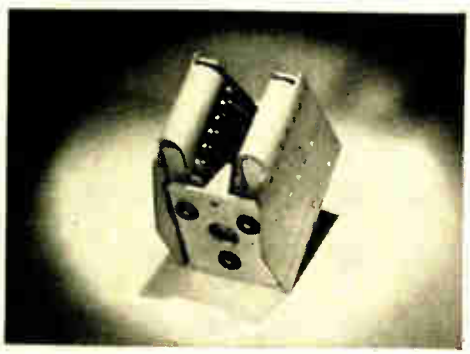
Facilities are available for adding equipment which will carry 240 simultaneous telephone conversations as well as the television programs.

For further data on advertised products use page 64.

things happen fast when

THE CURRENT SHOOTS THE CHUTE!





National Vulcanized Fibre barriers in the circuit breaker arc chute illustrated above really "torture" the arc—distort, elongate and tame it—so that no damage is done. Such severe service calls for excellent electrical properties and arc resistance. And, because it is a tough, strong material, vulcanized fibre also gets the nod for mechanical applications in the "breaker"—as bushings, pins, sleeves, washers, connector bars, etc. Maybe these applications will give you a clue as to how this material can help you. If you'll give us an idea of your intended end-use, we'll send appropriate technical and descriptive literature. Write to either of the addresses listed, attention Dept. AD-11.

Also manufacturers of Phenolite Laminated Plastic, Vul-Cot Waste Baskets, Peerless Insulation, Materials Handling Equipment, and Textile Bobbins.

In a circuit breaker when current overload occurs, the contacts open . . . a violent arc jumps across the gap . . . then is drawn upward through the breaker's "safety valves"—the arc chutes. In a split second, intense heat and dangerous gases are dissipated . . . the arc is quenched without harm to life or equipment.

National Vulcanized Fibre plays a vital and reliable role in this drama of industrial safety. It is utilized widely as a basic material in the sides and plates of arc chutes. Its inherent properties enable it to stand up under the rigorous punishment dealt by electrical energy "on the loose," and to help curb it effectively! These properties also make National Vulcanized Fibre the ideal material for dozens of other applications in power switching equipment and in thousands of uses within the broad electrical field. High dielectric and mechanical strength—excellent machinability—splendid formability—lightness of weight—great resistance to heat, shock and abrasion . . . name what you want in characteristics and capacity, and National Vulcanized Fibre is likely to have it, and more!

The chances are strong that there are many uses in your own business for versatile, economical National Vulcanized Fibre. Why not let us help you to find out?

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 64.

OUR MINDS

(Continued from page 15)

Westinghouse

Another vital link in the communications system that served the ravaged areas was that established by the amateur radio club of the Canadian Westinghouse Company Limited working in co-operation with the Amateur Radio Emergency Corps. Out of an approximate 100 radio hams working in the Toronto area no less than 82 of their number operating from 28 mobile units, four portables and two walkie-talkies, assisted in the Thistletown, Woodbridge and Bradford areas providing service for the Salvation Army and the Red Cross. Their activity started as early as nine o-clock Saturday morning when they set up communications between Malton Airport and the city covering a communication gap created by the destruction of line communications.

Police Communications

Throughout the week-end of "Hurricane Hazel" police communications systems of the Toronto police and the suburban communities as well as the extensive network of the Ontario Provincial Police lent all available equipment. Traffic control and search and rescue operations claimed the greater part of their effort and on Saturday afternoon the Red Cross requested the assistance of the army. In response to this request equipment was dispatched from Camp Borden and by Monday the Royal Canadian Corps of Signals had an organized system in operation assisting in debris clearance, search and rescue and traffic control.

● Officials in charge of communications during Hurricane Hazel included personnel of the city and provincial police departments, the Royal Canadian Corps of Signals, and personnel of communications equipment manufacturers in the Toronto area. The photo above shows: Sgt. G. Long, Toronto Police, Sgt. H. V. Allsopp, Provincial Police, Sgt. Rice, Toronto Police, Ivor Nixon, Pye (Canada) Limited, Capt. G. McLean, Royal Canadian Corps Signals, Al Jones, Rogers Majestic Electronics, Bill Choate, Canadian Westinghouse Company, Wally Jones, Canadian Marconi Company, and Bill Holroyd, Communications Consultants Limited.

But . . . .?

Despite the assistance rendered by the Manufacturers' Network, police and fire services, the army and the Amateur Radio Emergency Corps, there remains the fact that a greater and more efficient effort could have been put forward to bring relief and order out of the chaos of nature's onslaught if the various municipalities had possessed adequate communications equipment and the personnel to operate it. Such, however, is still not enough for without a central organization to filter information to the proper authorities, necessitating as this does the possession of proper equipment and personnel, there can be little hope that any future occurrence of a similar nature and proportion will taken any less toll of life and property in the Toronto area.

The possibility of seeing the required type of filter and communications control headquarters a reality would seem to depend on an agreement between federal and city authorities as to who should pay for it. Since the answer to this question seems to be somewhere in the unforseeable future it will be some time before Toronto is prepared — communications wise — to cope efficiently with any major size disaster.

For further data on advertised products use page 64.

● Attending the Tenth Annual Meeting of Canadian Radio Technical Planning Board, Chateau Laurier, Ottawa, Thursday, December 16th, 1954, are *seated (left to right)*: L. G. Buck, S. Bonneville, representing Telephone Association of Canada; R. C. Poulter, Director of Publicity, Canadian Radio Technical Planning Board; J. E. Hayes, representing Canadian Broadcasting Corporation; G. C. W. Browne, Director of Telecommunications, Department of Transport; Stuart D. Brownlee, Secretary-Treasurer, Canadian Radio Technical Planning Board; Ralph A. Hackbusch, retiring President, Canadian Radio Technical Planning Board; C. W. Boadway, newly-elected President, Canadian Radio Technical Planning Board; A. B. Hunt, representing the Engineering Institute of Canada; C. F. Patterson, representing the Institute of Radio Engineers; E. L. Palin, representing the Canadian Education Association; F. Mathers, representing the American Institute of Electrical Engineers. *Standing (left to right)*: C. J. Acton, W. B. Smith, C. M. Brant, F. G. Nixon of the Telecommunications Division, Department of Transport; T. J. Allard, representing the Canadian Association of Radio & Television Broadcasters; J. C. R. Punchard, representing the Radio-Television Manufacturers Association of Canada; H. E. Rice, representing the Canadian Electrical Manufacturers Association; F. H. Pounsett, representing the Radio-Television Manufacturers Association of Canada; A. Reid, representing the American Radio Relay League; G. B. Tebo, representing the Hydro-Electric Power Commission of Ontario; A. S. Runciman, representing the Canadian Electrical Association.

Tenth Annual Meeting - - - -

Canadian Radio Technical Planning Board

Top ranking scientists and engineers of the Canadian Radio Technical Planning Board met in Ottawa recently to discuss ways and means to prevent interference to television and radio reception. Their findings will be made available to the Government and the electronics industry so television viewers will have clearer and brighter pictures and radio listeners better reception.

At the recent meeting, C. W. Boadway, Communications Engineer of the Ontario Hydro Electric Power Commission, was elected President, and H. S. Dawson, Manager of Engineering Electronics Equipment Department, Canadian General Electric Company, was elected Vice-President, Stuart D. Brownlee was re-elected Secretary-Treasurer.

(Turn to page 47)

● G. C. W. Browne, Director of Telecommunications, Department of Transport, presenting a citation to Ralph A. Hackbusch, retiring President of the Canadian Radio Technical Planning Board, on behalf of the fourteen associations and groups that sponsor the Board.

For further data on advertised products use page 64.

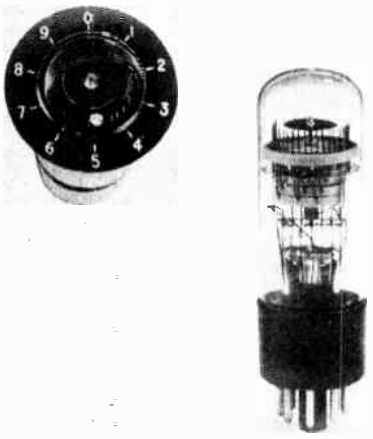
NEW PRODUCTS

(Continued from page 35)

● *High Speed Counting Tube*

Item 609

A new cold cathode counting tube with a maximum input frequency of 20,000 counts per second is now available for use in fast registers and counters. This new tube designated Model GC-10D has a scale of 10 and is the latest addition to the line of "Dekatron" Counting Tubes which are now being used in electronic counting apparatus. With these the position of the glow on any one of the tubes the count may be determined by noting 10 radially spaced cathodes, around an axially positioned anoce.



The GC-10D may be used in conjunction with slower counting stages employing the "Dekatron" Model GC-10B tube (4 kc. maximum). Resetting of the tubes may be accomplished by a simple push button. A light shield and bezel (Type 11807) with etched numbers makes notation of the glow position more convenient for recording and counting. The tube has an octal base with cathode number 0 brought out to an individual pin.

● *Combination Cleaner And Lubricant*

Item 610

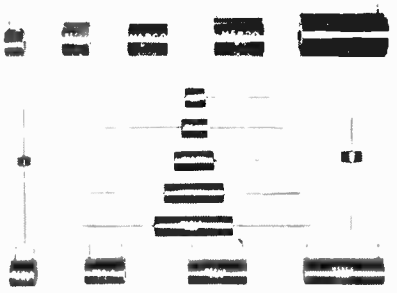
"Spra-Kleen" is the name of a new noise-preventing chemical for the serviceman. Developed as a two-in-one electrical contact cleaner and lubricant, "Spra-Kleen" is said to be fast and easy to use in all contacts,

relays, switches, controls and other moving parts. Since the chemical is released under pressure and has a directional nozzle, remote parts like controls are easy to reach without being removed.

● *Encapsulated Precision Resistors*

Item 611

Encapsulated, approved MIL-R-93A and commercial types provide positive moisture and mechanical protection. Available in all resistance values, temperature coefficients and tolerances down to .01 per cent. Also matched sets.

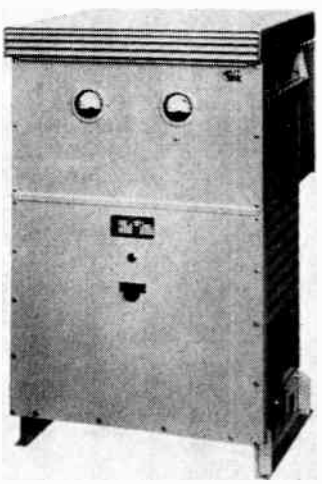


In addition, these resistors will pass the new pending "Grade A" characteristic specification of MIL-R-93A which includes salt water immersion and temperature cycling.

● *Automatically Regulated D.C. Power Rectifiers*

Item 612

A new line of "Stavolt" D.C. Power Rectifiers has been announced. "C & C" Stavolt units are closely regulated by a unique magnetic amplifier control of stable and permanent



qualities. No tubes — lamps — carbon piles or varistors are employed.

Ten standard 28 volt production models with capacities up to 1000 amperes in either mobile or stationery types are available.

Important size and weight reduction has been accomplished by the use of latest core and insulation materials and aluminum construction throughout. All components are encapsulated for long, trouble-free service under severe environmental conditions. Weatherproof construction.

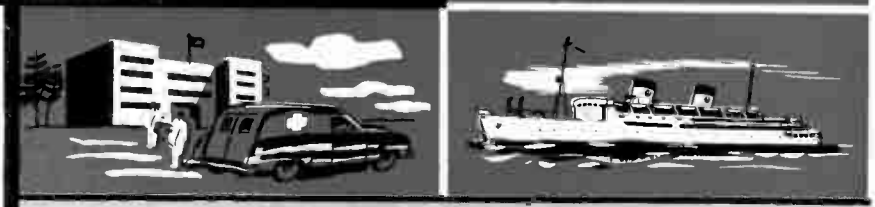
Continuously variable between 25-29 volts D.C.; D.C. Regulation plus or minus 1.0 per cent with plus or minus 10 per cent change in the A.C. input and any load variation from zero to full load; D.C. ripple 2.0 per cent R.M.S.; Recovery time 0.2 seconds. Available for parallel operation. Other ranges and closer tolerances can be furnished.

For further information on NEW PRODUCTS use handy coupons on page 64

For further data on advertised products use page 64.

cae* electronics serve

- Agriculture
- Aviation
- Mining
- Manufacturing
- Medicine
- Shipping



Equipment and Systems for:—

Multi-Channel Microwave/Communication Systems

Flight Simulators

Nuclear Instruments

Moisture Meters

Visual Omni-Direction Radio Range

Aviation Communication Systems

Marine Communication Systems

Radar Systems

Search and Rescue and Homing Equipment

Automatic Flight Control Systems

Protection Systems

Hydraulic and Pneumatic Cylinder Systems

Sintered Plate Batteries (Nickel-Cadmium Type)

CAE CONSUMER PRODUCTS

Dumont Television

Ariston Products

with FACILITIES FROM COAST-TO-COAST

The science of electronics is one of the major contributors to Canada's unprecedented economic expansion. Almost daily the electronics industry is discovering and developing more efficient and more economical means of performing many vital functions on land, at sea and in the air. Canadians everywhere are enjoying a higher standard of living and a more secure future through the practical application of electronics to every walk of life.

In skilled personnel, in modern precision equipment and in practical experience, CAE is qualified to undertake a wide variety of assignments in practically every phase of electronics.

cae

cae *specialists are readily available for consultation on your electronic problems*

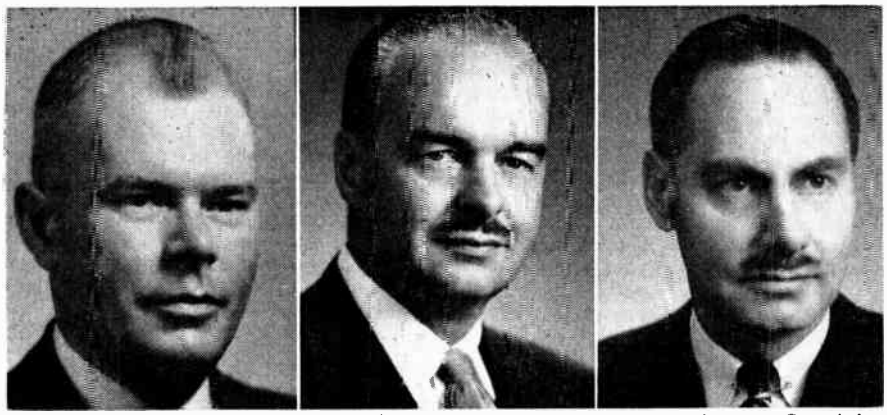
***CANADIAN AVIATION ELECTRONICS, LTD.**

MONTREAL • OTTAWA • TORONTO • WINNIPEG • VANCOUVER

3842

THE LARGEST CANADIAN-OWNED ELECTRONICS COMPANY

For further data on advertised products use page 64.



● *Left:* C. W. Boadway, P.Eng., Communications Engineer of the Hydro Electric Power Commission of Ontario who was elected President of the Canadian Radio Technical Planning Board. *Center:* Stuart D. Brownlee, who was re-elected Secretary Treasurer of the Canadian Radio Technical Planning Board. *Right:* H. S. Dawson, of Canadian General Electric, who was elected Vice-President of the Canadian Radio Technical Planning Board.

(Continued from page 44)

The retiring President, Ralph A. Hackbusch, President of Hackbusch Electronics Limited, was presented, with a citation in recognition of "his enterprise and leadership in formulating sound engineering principles and organizing technical facts to assist in the development of the Canadian radio industry and radio services of the Nation". Mr. Hackbusch, who was President of the Canadian Radio Technical Planning Board from 1949 until the present time, is a well-known figure in the Canadian electronics industry. Among other positions he holds, is Director of Engineering of the Radio-Television Manufacturers Association of Canada.

Current problems being considered by the Board relate to the setting up of engineering standards for color television, when this is eventually put on the market, microwave allocations, and a proposed increase in AM broadcast transmission power to offset interference now occurring in some radio sets due to the proximity of television receivers. Also, it is hoped to publish a colored chart, in the near future, showing the frequency wavebands allocated to Canada, by international agreement, and how these are utilized.

For further data on advertised products use page 64.

BOOK REVIEW

The **Electrical Engineer's Reference Book** is a comprehensive exposition, arranged in 32 sections, of modern standard practice and a survey of the most recent information on new developments in all branches of electrical engineering.

Each of the main technical sections is a self-contained treatise on a specific branch of the subject written by a recognized authority.

This new edition has been extended to include several new Sub-sections, the most important being: Generators for Steam and Gas Turbine Drive; Generators for Hydro-Electric Plant; Power Station Batteries: Diesel Engine Power Plant; Surge Protection and Testing of E.H.T. Transformers (with special reference to the 275-kV Supergrid); Testing of Induction and of Synchronous Motors; Controlled Expansion Alloys; Argon Shielded Welding. The major part of the Section on Cables has been completely re-written, to take account of the new British Standards recently published.

The "Progress" Section — a unique feature of this work — is again entirely new, and includes an authoritative survey of recent extensions to B.E.A. power generating plant, together with a wealth of first-hand information, profusely illustrated, covering the most recent progress and developments which have taken place in all the main branches of electrical manufacture.

The Electrical Engineer's Reference Book by **Molloy, Say and Walker** is publish by **George Newnes Limited, London, England** and is available in Canada through the **British Book Service (Canada) Limited, 1068 Broadview Avenue, Toronto, contains 2,184 pages, hard cover bound, price $12.00.**

Television, The Electronics of Image Transmission in Color and Monochrome, by V. K. Zworykin and G. A. Morton, the second edition of this famous book, reflects the tremendous technological advances that have raised television from a restricted experimental field to a nationwide, major industry. In the 14 years since the work was first published, engineering development has been so profound that, in preparing the second edition, the authors have had to revise or completely rewrite every chapter. They have also added a number of chapters on aspects which have become important in recent years.

A special feature of the new edition is its detailed discussion of color television. The book is the first to cover this branch at all fully. Its consideration of both the theoretical and practical aspects is detailed enough to give the reader a sound working understanding of this new and important development. Also new in this edition is a comprehensive discussion of industrial television and other related topics.

Throughout the book, the problems of television are presented from the standpoint of the fundamental physical processes involved At the same time the technical coverage is broad, with detailed considerations of the practical construction and operation of television devices. The careful analyses offered by the authors permits the reader to establish limits of performance for both ideal and practical television tubes and equipment.

Television, The Electronics of Image Transmission in Color and Monochrome is published by **John Wiley and Sons Inc., 440 Fourth Avenue, New York. Hard cover bound, contains 1037 pages, price $17.50.**

Crystal Rectifiers and Transistors, consulting editor, **M. G. Say, Ph.D., M.Sc., M.I.E.E.**

The first section of this book deals with the development and preparation of the germanium and silicon crystals, and their characteristic properties with a brief survey of commercial forms. Subsequent sections give technical data relating to types of crystal rectifiers and transistors, which have been recently developed by the leading manufacturers, including:

British Thomson-Houston Co. Ltd.
General Electric Co. Ltd.
Mullard Ltd.
R.C.A. Photophone Ltd.
Standard Telephones & Cables Ltd.
Sylvania Electric Products Inc.
Westinghouse Brake & Signal Co. Ltd.

Details of the apparatus required for testing transistors are given. The final section deals with applications such as, sound detection and noise limiting, spot limiting, oscillators and amplifiers; experimental circuits are illustrated.

It is hoped that this book will be found of value to all electrical and communication engineers who require a practical guide to this increasingly important subject.

Crystal Rectifiers and Transistors is published by **George Newnes Limited, London, England** and is available in Canada through the **British Book Service (Canada) Limited, 1068 Broadview Avenue, Toronto, contains 170 pages, hard cover bound, price $3.60.**

TRENDS

(Continued from page 11)

★ Automation is no longer a dream in Canada but is being put to use. For example, the Canadian Post Office in conjunction with the electronics industry is developing an automatic mail sorting office. Trans Canada Airlines in conjunction with industry is making good progress on an electronic inventory of available airline seats which should speed passenger handling.

* * *

★ A visionary picture of the television receiver of 1964 is envisioned as having a picture screen thin enough to hang on a wall in the manner of a picture. The circuitry will be contained in the frame using printed wiring and miniaturized components. Controls for the equipment would be located in a small box beside a chair. Observing that this prediction comes from Dr. Lloyd T. DeVore, Manager of the General Electric's Electronics Laboratory it carries enough authority to lead one to consider where to hang that picture of Grandpa come 1964.

* * *

★ Electronic testing of defects in steel rails was carried out for the Canadian Pacific Railways between August 15 and October 1. The tests took place in the vicinities of Lethbridge, Fort Macleod and Dunmore and the work was performed by the Sperry Rail Service.

* * *

★ Domestic production by companies in the Canadian electrical manufacturing industry is estimated at $973,657,664 for 1953, an increase of 16.6 per cent over 1952, according to a statement released by O. W. Titus, President of the Canadian Electrical Manufacturers Association, at the group's 10th annual meeting held recently. "Prime factor behind the industry's increase in production last year was the television boom," Mr. Titus stated. "In 1953, television sets alone accounted for $81,305,000."

THE EDITOR'S SPACE

(Continued from page 5)

Thanks to the Marconi officials in Montreal for their invitation to attend the official opening of their new laboratories. Couldn't manage to break away at the right time but would sure appreciate the opportunity of looking over the new facilities at some future date.

* * * *

Hit the deck Dad, it's arrived — a new electronics hobby kit developed for children! "With the aid of this new Electronics Kit," the announcement says, "it won't be long before children interested in this field will be performing experiments which will provide most of the answers they seek." The kit has been prepared by R.C.A. in collaboration with the Encyclopaedia Britannica and the Museum of Science and Industry. It will be distributed exclusively to the laboratory supply field by the Central Scientific Company, Chicago. This bit of intelligence I will put in my "top secret" drawer and hide away from the answer seeking element of the family. This strategy will be followed as the result of a chemistry set delivered to our house by Santa Claus two years ago from which was brewed concoctions to odiferous as to be suspect of the dog's sudden illness and ten day hospitalization at the local veterinary's. Santa's bill for the chemistry set $10.95. Vet's bill for the dog, $35.00.

* * * *

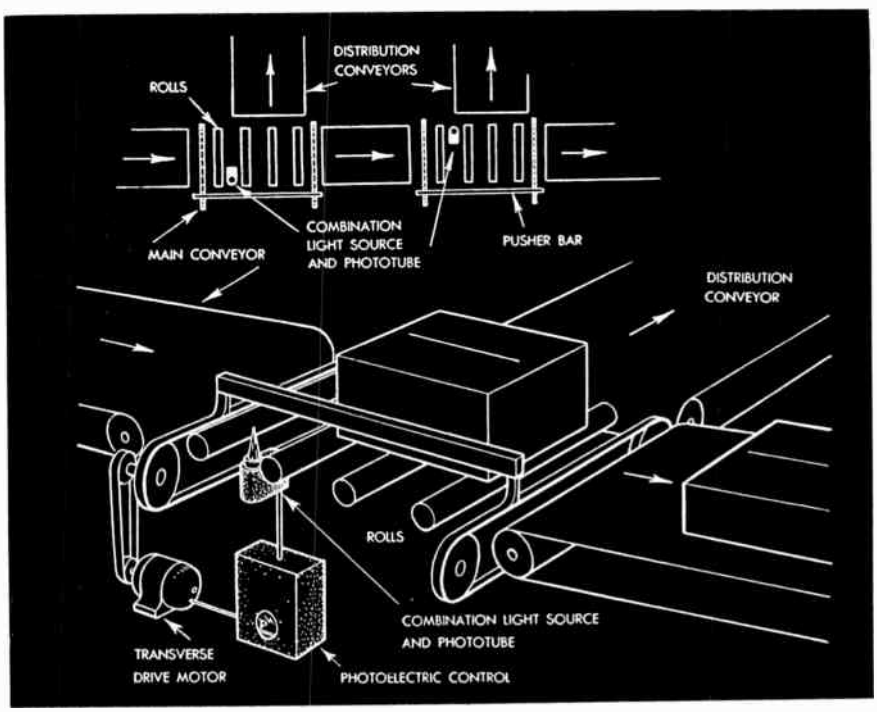
Why doesn't someone invent a tuning eye for television receivers of the same type built into radio sets some years back? Or does anyone remember what radio sets looked like? Seriously, wouldn't such a device facilitate the focussing of the picture and obviate the necessity of perambulating back and forth across the room to judge the focus of the picture or is mine an isolated case of annoyance?

Control Engineering - - -

Package Sorting For Warehousing

IN a glassware manufacturing plant, a main conveyor carries cartons of three types of glassware from the manufacturing area to the warehouse. Once in the warehouse, each type of ware must be sorted and sent to its own storage area. Since the cartons containing any one type of ware differ widely in all dimensions, it is not feasible to sort by size and shape. Before an automatic sorting system was devised, two men were in constant attendance to push cartons from the main conveyor onto the proper distribution conveyors.

Two photoelectric controls solved the problem of automatic sorting. One is located at the right-hand side of the conveyor at the first discharge point in the warehouse. The other is at the left-hand side of the conveyor at the second discharge point.



The actuating device for the scanners is a small strip of reflecting tape put on by the packer when he assembles a carton. For one type of ware this strip is located along one edge of the carton bottom and extends almost to the middle of the carton. For the second type of ware the strip is located along the same edge of the carton bottom, but from the middle to the opposite side of the carton. No tape is used for cartons carrying the third type of ware. The cartons are placed on the conveyors so that the tape is at right angles to the direction of carton travel. The tape on one type of ware is at one side of the conveyor. The tape on the second type of ware is at the opposite side of the conveyor.

The scanners "look" at the carton bottoms between the conveyor rollers at each discharging point. One scanner located at one edge of the conveyor "sees" only one tape location. The other scanner is located at the opposite edge and "sees" only the other tape location. Making observation at the bottoms of the cartons insures correct focus because all tapes are at a fixed distance from the scanners.

Upon "seeing" a reflecting tape pass the photoelectric control operates a pusher bar mechanism which removes the carton from the main conveyor onto the proper distribution conveyor. Cartons without a reflecting tape pass right by the first two distribution conveyors to the third storage area.

This new sorting system has resulted in increased efficiency, sorting speed, and accuracy in warehousing of various types of glassware. At the same time, warehouse labor cost has been greatly reduced.

For further data on advertised products use page 64.

M. H. Patterson Named Vice-President And General Manager Of Expanded 3M Company

Integration of two wholly-owned Canadian subsidiaries has been reported by Minnesota Mining and Manufacturing Company, Saint Paul, Minnesota.

M. H. PATTERSON

The two subsidiaries, Minnesota Mining and Manufacturing of Canada Limited, London, Ontario, and Irvington Varnish and Insulator Co. of Canada Limited, Hamilton, will operate under the control of one management. The Hamilton plant becomes a varnish and insulator unit in the 3M company and will continue to manufacture varnished cambrics and other coated electrical insulation materials, extruded plastic tubing and coated and laminated bottle-cap lining materials. These products will supplement and round out the electrical insulation, coated abrasives, pressure sensitive tapes and reflective materials made by the 3M company. Maynard H. Patterson is Vice-President and General Manager of the expanded 3M operation.

T. A. Lindsay Named Executive Vice-President Phillips Electrical Company (1953) Limited

The Board of Directors of Phillips Electrical Company (1953) Limited announces the appointment of Mr. T. A. Lindsay, at present Director and Vice-President (Sales), to the position

T. A. LINDSAY

of Executive Vice-President. He will be responsible to the Board for the executive operation and general administration of the Company.

Mr. Lindsay is well known throughout Canada for his many activities in the wire and cable field.

R. T. D. Graham Appointed Defense Project Manager

R. T. D. Graham, a University of Toronto graduate who joined the Canadian Westinghouse Company in 1949, has been appointed Manager of defense projects for the Industrial Products Division. In his new post, Mr. Graham will undertake the responsibility for co-ordination of the division's projects related to the naval shipbuilding program and other associated operations.

R. T. D. GRAHAM

Ocean Falls, B.C. To Be Served By Radiotelephone Extension Year's End

The $1,000,000 chain of radiotelephone stations from Vancouver to the northern tip of Vancouver Island will be extended to Ocean Falls before the end of this year.

The coastal chain provides radio relay equipment at Parksville, Cape Lazo (near Comox), Campbell River, East Thurlow Island, Hardwicke Island, Alert Bay and San Josef.

For further data on advertised products use page 64.

For further data on advertised products use page 64.

● No larger than an overnight travelling case is the phenomenal new radar now being built by Sperry. The new lightweight system which weighs 150 pounds can "see" all around one of the Great Lakes at one "glance". One photo taken on the radar screen clearly showed Buffalo and Detroit, Toledo and Toronto at opposite extremities of Lake Erie, 250 miles apart.

Aviation - - -

Versatile Airborne Radar Adds To Flying Safety

A NEW, compact airborne radar that assures greater safety for troop-carrying transports and essential cargo planes has been revealed by the USAF Air Research and Development Command.

The new device is the smallest and lightest radar system, for its high power and wide range of aircraft uses, so far publicly announced.

A single 5-inch radar screen combines many radar functions of search and surveillance, accurate navigation over uncharted airlanes, detection of distant storms and best-weather routes, anti-collision warning of mountaintops and tall structures, or of other nearby aircraft while flying at any altitude up to 50,000 feet.

Exceptional performance ability in these life-saving functions, already tested and proved by the Air Force, is reduced to a single lightweight system weighing 150 lbs. This includes an oddly-shaped "turtle shell" antenna only 18 inches in size, that is gyro-stabilized for positive steadiness against pitch and roll of the plane.

In addition, it incorporates radar beacon interrogation and reception. The versatile combination is officially designated as radar set APN-59.

Development of the rugged though miniature system was jointly sponsored by the Air Force and the manufacturer over many years, to meet space and weight limits, as well as growing need for such radar aids in

For further data on advertised products use page 64.

the faster, modern aircraft of today. (As speeds increase, so do structural effects of the extreme turbulence sometimes encountered within severe storm clouds.)

Besides storm warning, other multi-purpose advantages of the combination suggest equal military value for Army and Navy aircraft as well — in air-sea rescue, special patrol and refueling missions, among many other tactical uses which suggest themselves.

Small Set — Big Range

Immediate production of these miniature systems in quantity for Air Material Command is presently under way at the Sperry company.

Earlier test sets proved that the new APN-59 has the power, despite small sibe, to "see" all around one of the Great Lakes at a single "glance". One photo taken off the radar screen clearly shows Buffalo and Detroit, Toledo and Toronto at opposite extremities of Lake Erie, 250 miles apart.

A wide choice of range scales for the viewing screen can be selected by the operator, for close-up enlargements variable from 3 to 30 miles; or fixed ranges of wider areas at 50 miles, 100 and 240 miles. Areas shown may be orientated to current heading of the aircraft, or optionally to true North or any desired compass bearing for exact measurement of drift.

One or more radar indicators may be operated with the system, and for larger planes an optional 30-inch antenna also is being produced.

"A prototype model of the APN-59 system recently introduced indicates merely its small size and weight, not the wide range and variety of uses of which it is capable.

The new set has been thoroughly flight-tested, and has known performance abilities far beyond its size. It operates in the "X-Band" or 10,000 megacycle band of the spectrum (approximately 10 billion cycles per second) with surprising sharpness and clarity.

"Sub-miniature tubes and other miniature components are employed with unusually rugged circuitry, to such effect that the complete indicator and synchronizer units, including a 5-inch radar screen, are contained within a compact aluminum case only 6½ x 6½ x 16 inches over all.

Varied Characteristics

Without revealing its many tactical uses, the following performance abilities and characteristics may be stated:

Two beam configurations — pencil beam, or fan beam.

Gyro-stabilized antenna — 18-inch or 30-inch, as space permits.

Two types of presentation — ground pattern, or various cloud levels.

Weather warning; near or long range search.

Adjustable contrast of ground pattern; short and long range.

Multiple pulse lengths, automatically applied.

Radar beacon interrogation and reception.

Full 360° or sector scanning.

Terrain clearance (mountain peaks, etc.); or nearby aircraft.

Ground mapping, and exact drift measurement. (2 ways; by heading marker, or Doppley drift).

Delayed and expanded sweep magnification.

Remote gyro installation — if desired for less radome space.

Pressurized as required, for non-cabin components.

Variable range marker, plus fixed range markers.

"Air Force pilots and navigators," according to Dr. W. T. Cooke, Sperry radar engineering director, "will welcome this versatile radar aid as a reliable, complete navigation system which terminates at last their great dependence upon accurate information from the ground.

"Even over areas where ground signals are adequate and trustworthy," he said, "every aviator can appreciate this means of obtaining comparative data and guidance directly in the plane. Such complete knowledge of location and surroundings serves to increase understanding of ground commands, while for polar navigation or other great circle courses, such assistance is vitally necessary."

For further data on advertised products use page 64.

Phillips Electrical Company Announce Sales Staff Changes

Following the appointment of Mr. T. A. Lindsay as Executive Vice-President of Phillips Electrical Company (1953) Limited, the following changes in the sales organization are announced. Mr. F. W. Barnhouse is appointed General Sales Manager, and will be assisted by Mr. E. H. Lloyd, Marketing Manager and Mr. D. C. Brazier, Sales Manager.

Mr. Barnhouse has served in an executive capacity for the past ten years, and has been more than nineteen years in the wire and cable field. Mr. Lloyd had been with British Insulated Callender's Cables Limited for many years before joining Phillips in 1953. Mr. Brazier has an extensive knowledge of the industry and has been with the company more tha nten years.

F. W. BARNHOUSE

E. M. LLOYD

D. C. BRAZIER

Collins-Canada Limited To Manufacture In Toronto

W. S. Kendall, Resident Manager of Collins Radio Company of Canada, Ltd., has announced the establishment of an engineering research development and manufacturing operation in its recently leased facilities at 11 Bermondsey Road, Toronto, Ontario. The Canadian company is a subsidiary of Collins Radio Company, Cedar Rapids, Iowa, a leader in the design and manufacture of airborne communication and navigation equipment and ground communication equipment for industrial and governmental purposes.

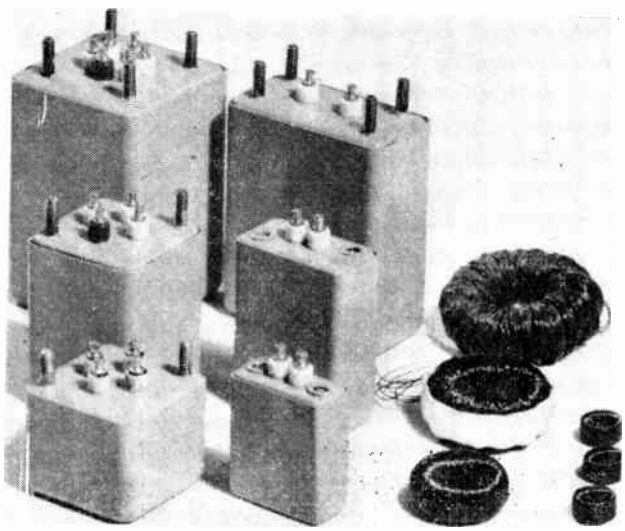
Collins-Canada, was organized a year ago to sell Collins' products and services in Canada, with one of its initial tasks being that of providing engineering and manufacturing "know-how" to a Canadian manufacturer for a large quantity of an equipment of the parent company's original design. With the acquisition of manufacturing facilities and creation of an engineering research and development organization the company will design and manufacture communication equipment especially adapted to Canadian needs.

The parent company, which began business twenty years ago as a manufacturer of amateur radio equipment, has for many years been a leading producer of commercial broadcast transmitters and studio equipment, microwave and point to point communication systems, industrial components for electronic equipment, and a fully integrated line of airborne communication, navigation and flight control equipment. The output of its Cedar Rapids, Dallas and Burbank factories is at an annual rate of in excess of $90,000,000. Employing 7,000, Collins heavily accents engineering research and development. The 1,500 people engaged in this activity comprise more than 20 per cent of total organization.

For further data on advertised products use page 64.

For further data on advertised products use page 64.

TOROIDAL COILS - FILTERS MAGNETIC - AMPLIFIERS



TOROIDS may be supplied in all sizes including "Wedding Rings". Inductance, distributed capacity, temperature stability and other parameters closely controlled.

TOROIDAL TRANSFORMERS with any arrangement of closely coupled windings and taps may be supplied.

FILTERS may be designed and built to exacting standards.

Optimum characteristics are possible through advanced design techniques.

MAGNETIC AMPLIFIERS using toroidal construction and quality materials provide high gain, fast stable response and long life.

All components may be supplied in hermetically sealed units complying with JCNAAF T-19 specifications.

BAYLY ENGINEERING LTD.

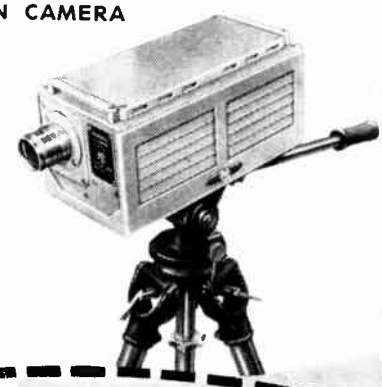
FIRST STREET - AJAX

EM. 8 - 6866

PYE INDUSTRIAL TELEVISION

PYE INDUSTRIAL TELEVISION CAMERA

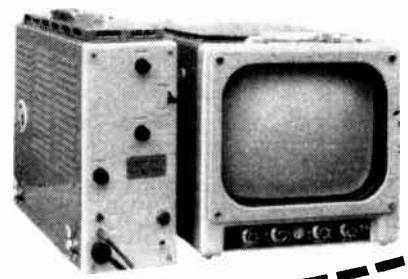
Only 5" x 5" x 10" and weighing 8½ lbs.. the camera is available with flameproof and weatherproof housings.



PYE CONTROL UNIT AND MONITOR

Control Unit provides remote optical and electronic control of camera up to 300 ft.

Monitor: a number of monitors may be viewed up to 1000 ft. distant.



Wherever "point to point" transmission of visual information is valuable, industrial television works wonders. Many industries, research laboratories, schools, hospitals are already using it to increase efficiency and cut costs.

For a television camera lens can operate where the human eye cannot penetrate — as for instance in the "working heart" of process machinery.

The cost of the equipment is lower than you imagine — saves itself easily in operation. We invite enquiries.

TELEVISION DIVISION

PYE CANADA LIMITED

60 Front Street West, Toronto

SERVICE FROM COAST TO COAST

193 E. Hastings St. Vancouver

1191 University St. Montreal

P.O. Box 321, St. John's, Nfld.

For further data on advertised products use page 64.

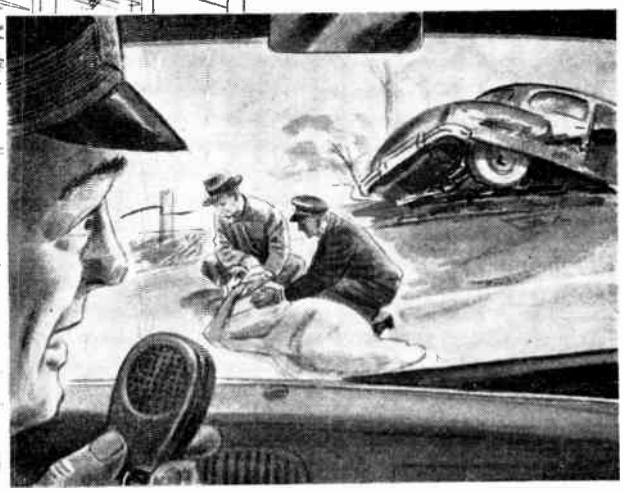
It won't let you down

CONTINUOUS DUTY OPERATION Marconi 2-WAY RADIO takes you everywhere in an emergency

It's in times of crisis . . . an automobile accident, city fire or forest fire, that the instant communication provided by 2-way radio can help save lives and property — if it operates properly!

Because MARCONI 2-way radio is designed to give "Continuous Duty Operation," that is, operate 24 hours of the day indefinitely without breakdown or loss of power, MARCONI equipment always operates properly . . . has longer life and reduced maintenance and repair costs.

Why not let MARCONI specialists analyze your operation and recommend the type of equipment that will most efficiently and economically suit your particular requirements?



In addition to increasing fire and police protection, Marconi 2-Way Radio increases efficiency of construction and road building, logging, mining, truck-transport and taxi operations.

What's more, if repair work is needed, you can always count on extra fast service because wherever you operate in Canada, there's always a Marconi expert nearby. Replacement parts are always available.

CANADIAN Marconi COMPANY
MONTREAL 16, QUE.

Continuous Duty Operation for Mobile Radio was *first* originated in Canada by MARCONI

CANADA'S LARGEST ELECTRONIC SPECIALISTS

For further data on advertised products use page 64.

For further data on advertised products use page 64.

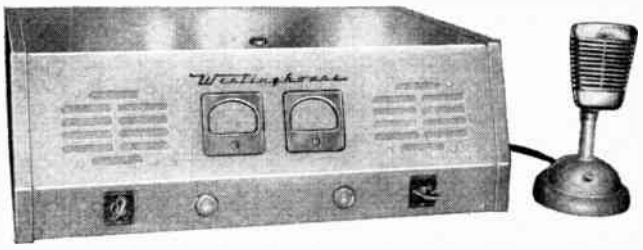
In the factory . . . on the road . . . in times of emergency . . . in all aspects of modern living — TWO-WAY RADIO IS A VITAL LINK THAT KEEPS MEN AND MATERIALS MOVING.

NEW HORIZONS AT 450 MC/S

The latest range of two-way radio available from Westinghouse is designed to operate in the 450-470 mc/s band. It is the most modern means of communication in the commercial and industrial field . . . offering you high quality and reliability of operation on an uncongested frequency band.

Wherever speedy and reliable communications must be maintained, this new equipment can be a great time-saving investment.

Ask WESTINGHOUSE SALES ENGINEERS to show you how two-way radio can speed up *your* operations.



450-470 MC/S Base Station Console. 15 watts. RF output. Supplied complete with accessories for desk mounting.

450-470 MC/S mobile transmitter receiver. 10 watt RF output. Supplied with all accessories for complete installation. Reliable in operation, simple to maintain.

Communicate with

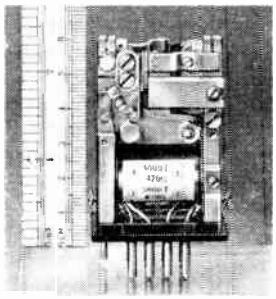
WESTINGHOUSE

55A745

CANADIAN WESTINGHOUSE COMPANY LIMITED

ELECTRONICS DIVISION, HAMILTON, AND OFFICES IN ALL PRINCIPAL CITIES

For further data on advertised products use page 64.

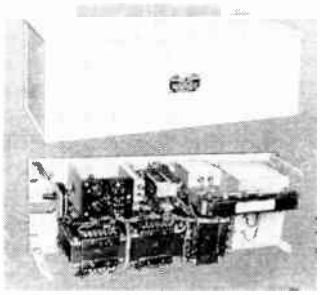


Carpenter Polarized Relay (Type 5) has high operational speed — freedom from contact rebound and positional error—good contact pressures — high sensitivity — accurate signal repetition—exceptional thermal stability.

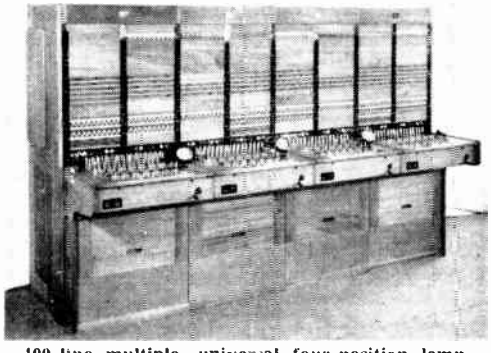
Magneto Wall Telephone (Desk models also available)

VISIT OUR SHOWROOMS 26 DUNCAN ST. TORONTO

TMC



"Syncycle" static converter, mains to ringing frequency that is 60 cps. to 20 cps.



400-line multiple, universal four-position lamp signalling switchboard.

OUR TELECOMMUNICATION EQUIPMENT MEANS BETTER SERVICE *to your subscribers and more* PROFITS *to you*

At our spacious showroom you will see everything in the most up-to-date equipment for efficiency and economy in the operation of a Telephone company or station. There you can inspect and test this T.M.C. equipment that is helping to keep Telephone subscribers satisfied and Telephone companies happy all over Canada and the rest of the world — and you will be pleasantly surprised at the low cost.

TELEPHONE MANUFACTURING COMPANY LIMITED

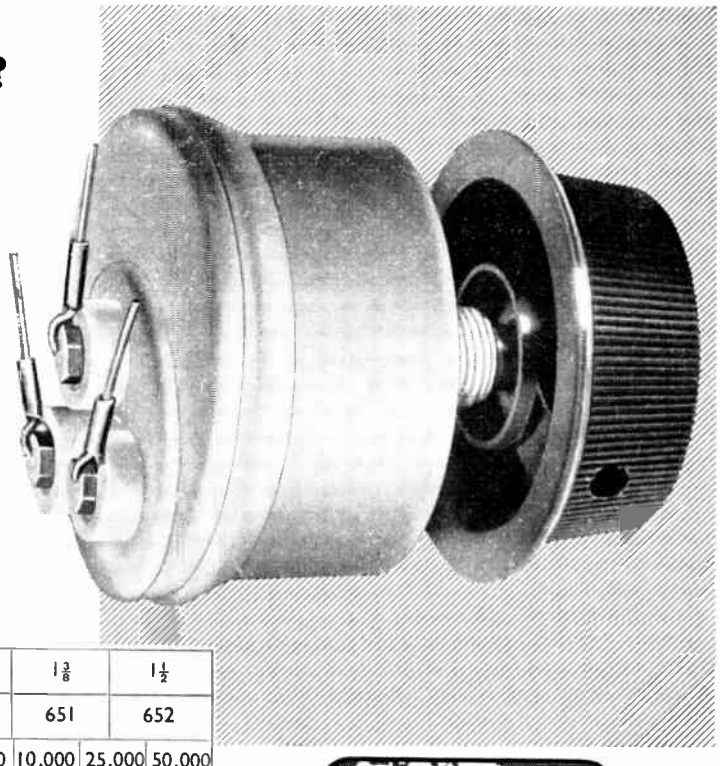
Canadian Branch Office and Showroom

SAXONY BUILDING - 26 DUNCAN STREET

TORONTO - EM. 6-5314

DAMP? HEAT? COLD? FUMES? VIBRATION & SHOCK?

BERCO



Hermetically sealed potentiometers have been JAN approved for use in Arctic and Tropical conditions.

Shaft Length (inches) ...				7/8		1		1 1/8	1 1/4	1 3/8	1 1/2		
Part No.				647		648		649	650	651	652		
Ohmic value ...	5	10	25	50	100	250	500	1,000	2,500	5,000	10,000	25,000	50,000
Current (amps.)	1	.7	.45	.32	.22	.14	.1	.07	.045	.032	.022	.014	.01

CANADIAN ELECTRIC RESISTORS LIMITED

Curity Avenue · Toronto 16 · Ontario · Telephone: Plymouth 5-1891

Manufacturers and Sole Licensees for Berco Products in Canada

CERL

BR 1241-AH

For further data on advertised products use page 64.

NOW MANUFACTURING IN CANADA

AMPHENOL —— ELECTRONIC COMPONENTS

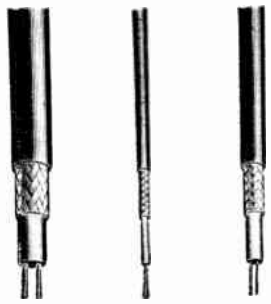
For many years one of the best known trade names in the field of electrical-electronic components, AMPHENOL now returns to Canada as Amphenol Canada Ltd., with 30,000 sq. ft. of manufacturing plant and offices at 300 Campbell Ave., Toronto. As soon as the necessary experience in tooling and manufacturing techniques is acquired, all production will be using Canadian manpower, management and engineering. Licensing of patents is also part of the general agreement. Production is already underway on RF Connectors and plans are proceeding on schedule to ultimately manufacture all AMPHENOL components.

PRECISION MADE COMPONENTS FOR THE ELECTRONICS INDUSTRY

AMPHENOL makes over 11,000 separate catalogued components that are used and relied upon by the electronics industry the world over. These components include the famous AN connectors, RF connectors, cables and many special types of sockets, plugs and connectors. Their applications vary, but the distinguishing feature of all AMPHENOL components is present in each: . . . Quality.

Better design, better construction on all RF Connectors.

Versatile Plugs — unique designs, sturdy construction.

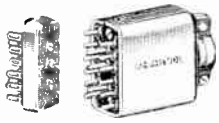


Cable quality guaranteed by strict controls, rigid inspection.

Fastest connect and disconnect with Blue Rivvon Connectors.

New improved AN Connectors now feature gold plated contacts.

Hundreds of different miniature and industrial Tube Sockets.



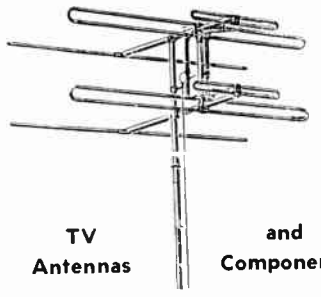
Rack and Panel connectors for many special applications.

Small, compact Miniature Connectors for special electronic needs.

WE INVITE YOUR INQUIRIES

AN Electrical and RF Connectors
Microphone Connectors
Radio and Industrial Tube Sockets
RF Cable
TV, FM and Communication Antennas
Cable Assemblies
Radio and Radar Components

TWIN 75 LEAD
TWIN 150 LEAD
TWIN 300 LEAD



TV Antennas and Components

AMPHENOL CANADA LIMITED

300 CAMPBELL AVENUE, TORONTO 9, ONTARIO

1500 St. Catherine St. W.
MONTREAL, QUE.

Radiovision Sales Limited, 325 Tenth Ave. West
CALGARY, ALTA

For further data on advertised products use page 64.

LONDON REPORT

(Continued from page 7)

the pilot for at least half an hour and probably longer depending upon the life of the battery. This battery weighs less than 29 oz. and yet supplies power to operate the beacon for from six to eight hours.

SARAH — another light-weight combined beacon and R/T transmitter introduced last year by Ultra Electric is now available in an improved form. By using the latest sub-miniature components and new techniques the size and weight has been greatly reduced without impairing the efficiency. SARAH is used by the R.A.F. and the air forces of Holland, France and Norway.

A large number of Burndept emergency airborne transmitter/receivers, operating on the International Distress Frequency, similar to sets fitted by the R.A.F., have been ordered for the Dutch Air Force. This combined transmitter and receiver has proved in actual flying tests that communication is possible up to 284 miles at a height of 40,000 feet.

For emergency use two 12-volt batteries are included. A modified form of this equipment has been designed for use in dual-control trainer aircraft of the Indian Air Force.

Helping The Comet

Distance Measuring Equipment exhibited by Ferranti shows on a meter dial in the aircraft the exact distance in miles from a ground beacon, with an accuracy of 4 per cent. As this device operates in the 1000 Mc/s. band, it is not affected by rain or cloud conditions and there are, of course, no variations due to daylight or darkness.

For the Murphy D.M.E., which has a range of 200 miles at an altitude of 20,000 feet, a new remotely-controlled monitor has been introduced for the ground beacon.

This provides a check on the performance of the beacon transmitter without having to enlist the aid of an aircraft. It is connected to the beacon by land-line and if the performance of the beacon falls below a certain pre-determined level it is switched out of circuit and its stand-by equipment automatically comes into service.

The airborne portion of the D.M.E. is specified for installation in all Comets MK II and III as well as the Bristol Britannia.

The Ministry of Supply has ordered 3,600 of these equipments and a large number have been ordered from abroad.

For further data on advertised products use page 64.

Tube life in time-proved GATES 5/10kw AM transmitters "exceeds estimates"

QUINCY
ILLINOIS
U. S. A.

GATES

MANUFACTURING
ENGINEERS
SINCE 1922

Gates Radio Company

Eitel-McCullough, Inc.
San Bruno, California

Gentlemen:

A few years ago our engineering department was requested to design several entirely new transmitters in the 5/10KW power range for both medium and short wave commercial service. One of the requirements was the establishment of a modern tube complement that would substantially reduce tube cost both initially and in greater life expectancy.

After considerable investigation and exhaustive tests in our own development section, the Eimac 3X2500F3 was decided upon. Performance-wise, the results were excellent but even successful abuse tests could not be a substitute for several years that must pass to obtain records on life expectancy.

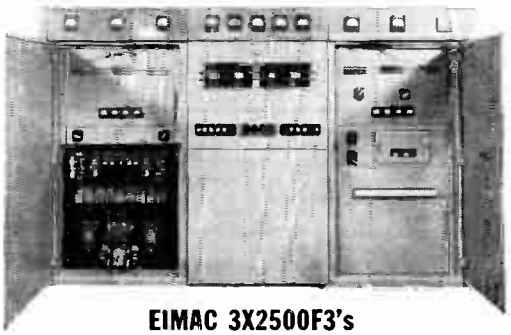
These several years have now passed. Gates transmitters employing the 3X2500F3 are all over the world in every kind of service including 24-hour a day international communications, broadcasting and many 5KW mobile units for military service. Checks indicate, as both radio frequency amplifiers and Class B modulators, the life expectancy is not only meeting our original estimates and expectations but in many instances far exceeding them.

We congratulate you on an excellent product that has indeed saved the industry untold thousands in tube expense and again express our appreciation for the excellent cooperation of your engineering department.

Yours very truly,

GATES RADIO COMPANY

P. S. Gates
President



EIMAC 3X2500F3's IN GATES 5/10KW AM TRANSMITTERS

GATES TRANSMITTER	MODULATOR	PA
BC-5B	2 Eimac 3X2500F3's	Eimac 3X2500F3
BC-10B	2 Eimac 3X2500F3's	2 Eimac 3X2500F3's

Eimac 3X2500F3's featured in Gates models BC-5B and BC-10B the world over.

Eimac

EITEL-McCULLOUGH, INC. SAN BRUNO, CALIFORNIA

For further data on advertised products use page 64.

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 Advertiser's Name For Information

Advertiser	Page
☐ A.D.S. magnetic relays	35
☐ Adcola electric soldering instruments	28
☐ Aerovox capacitors	49
☐ Amphenol electronic components	61
☐ Astron high temperature metallized paper capacitors	58
☐ Automatic Electric torroids and filters	7
☐ Automatic Electric communications equipment	19
☐ Aviation Electric vibration isolators	28
☐ Bach Simpson wavemeter and modulator indicator	2
☐ Bayly torroidal coils	56
☐ Bendix-Scinflex waterproof plugs	31
☐ Bendix two-way multimaster	47
☐ Berco potentiometers	60
☐ Bohne springs	51
☐ British General Electric uniselector	72
☐ Broadcast & Communications consulting service	54
☐ Burgess batteries	47
☐ Canada Wire & Cable magnet wire	76
☐ Canadian Aviation electronic equipment	46
☐ Canadian General Electric microwave equipment	10
☐ Canadian General Electric two-way radio equipment	75
☐ Canadian Marconi miniaturlzed controls	68
☐ Canadian Marconi radiotrons	3
☐ Canadian Marconi two-way radio	57
☐ Canadian Marconi electronic instruments	55
☐ Canadian Stackpole fixed composition resistors	4
☐ Canadian Westinghouse two-way radio	59
☐ Cannon Electric plugs	44
☐ Cannon Electric steel shell plugs	45
☐ Computing Devices electronic components	33
☐ Connoisseur turntable	52
☐ Consolidated Electronics feed-thru and stand-off terminals	43
☐ Cossor high speed oscilloscope	5
☐ Cossor portable twin beam scope	62
☐ Daven switches	43
☐ Dawe wide range oscillator	51
☐ Eclipse-Pioneer autosyn-synchros	74
☐ Eimac tubes	63
☐ Essco catalog	40
☐ Hackbusch electronic equipment	37
☐ Hammond transformers	63
☐ Hellerman binding systems	32
☐ Herring electronic products	34
☐ Hooker electronic components	62
☐ Jennings vacuum capacitors	35
☐ Kester solder	29
☐ Leak amplifier	53
☐ Lenkurt compandor unit	71
☐ Measurements Corporation megacycle meters	41
☐ Measurements Engineering amplifiers	70
☐ Micro Lab pickup	36
☐ Motorola two-way radio	38-39
☐ McCurdy extended range VV meter	50
☐ National vulcanized fibre barriers	42
☐ Norma portable instruments	37
☐ Northern Electric junction transistors	73
☐ Osborne Electric communications protection	58
☐ P.S.C. Applied Research engineers and technicians wanted	12
☐ Phillips magnet wire	8
☐ Polypenco non-metallics	65
☐ Prodelin tri-loop V.H.F. antennas	69
☐ Pye industrial television camera	48
☐ Snelgrove quartz crystals	30
☐ Sorensen electric frequency changer	66
☐ Struthers-Durn relays and timers	36
☐ Telephone Mfg. Co. tele-communications equipment	60
☐ U.S. Engineering printed circuits	40
☐ X-Ray & Radium Industries electric cable	55

Check New Product Item For Further Information

					☐ 605
☐ 580	☐ 585	☐ 590	☐ 595	☐ 600	☐ 606
☐ 581	☐ 586	☐ 591	☐ 596	☐ 601	☐ 607
☐ 582	☐ 587	☐ 592	☐ 597	☐ 602	☐ 608
☐ 583	☐ 588	☐ 593	☐ 598	☐ 603	☐ 609
☐ 584	☐ 589	☐ 594	☐ 599	☐ 604	☐ 610

Company Name .....

Your Name .....

Your Position .....

Address .....

Check Advertiser's Name For Information

Advertiser	Page
☐ A.D.S. magnetic relays	35
☐ Adcola electric soldering instruments	28
☐ Aerovox capacitors	49
☐ Amphenol electronic components	61
☐ Astron high temperature metallized paper capacitors	58
☐ Automatic Electric torroids and filters	7
☐ Automatic Electric communications equipment	19
☐ Aviation Electric vibration isolators	28
☐ Bach Simpson wavemeter and modulator indicator	2
☐ Bayly torroidal coils	56
☐ Bendix-Scinflex waterproof plugs	31
☐ Bendix two-way multimaster	47
☐ Berco potentiometers	60
☐ Bohne springs	51
☐ British General Electric uniselector	72
☐ Broadcast & Communications consulting service	54
☐ Burgess batteries	47
☐ Canada Wire & Cable magnet wire	76
☐ Canadian Aviation electronic equipment	46
☐ Canadian General Electric microwave equipment	10
☐ Canadian General Electric two-way radio equipment	75
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☐ Snelgrove quartz crystals	30
☐ Sorensen electric frequency changer	66
☐ Struthers-Durn relays and timers	36
☐ Telephone Mfg. Co. tele-communications equipment	60
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☐ 583	☐ 588	☐ 593	☐ 598	☐ 603	☐ 609
☐ 584	☐ 589	☐ 594	☐ 599	☐ 604	☐ 610

Company Name .....

Your Name .....

Your Position .....

Address .....

Addenda Electronics And Communications 1954 Directory

PAGE 30. ADD TO LIST OF FIRMS REPRESENTED BY THE CANADIAN MARCONI COMPANY, ELECTRONIC TUBE AND COMPONENTS DIVISION, 830 BAYVIEW AVENUE, TORONTO, THE FOLLOWING:
Hunt Capacitors (Canada) Limited.
Marconi Transformers, Toronto.
The Turner Company, Cedar Rapids, Iowa.
Radio Valve Company of Canada, Toronto.

PAGE 34. ADD: Joseph Sankey and Sons, Canada, Limited, Smiths Falls, Ontario.

PAGE 34. ADD: Kerr-Machin Associates, 26 Truman Road, Willowdale P.O., Toronto. Representing: Saxonburg Ceramics, Saxonburg, Pa.

PAGE 36. ADD: McVity, J. R. G. and Company, 51 Dalewood Road, Toronto, representing: Burnell & Co. Inc., 45 Warburton Ave., Yonkers 2, N.Y.
Canadian Videocraft Ltd., 42 Gladstone Ave., Toronto 3, Ont.
Chicago Dial Co., 2917 South La Salle St., Chicago 16, Ill.
Danbury-Knudsen, Inc., P.O. Box 170, Danbury, Conn.
Fansteel Metallurgical Corp., 2200 Sheridan Road, North Chicago, Ill.
Industrial Products Company, Division of Danbury-Knudsen Inc., P.O. Box 148, Danbury, Conn.
The James Knights Company, 131 So. Wells St., Sandwich, Ill.
Lundey Associates, 694 Main St. Waltham 54, Mass.
Northwest Fabricators Division, Precision Plastic Products, Inc., 1539 N. Throop St., Chicago 22, Ill.
Precision Plastic Products, Inc., 225 N. Racine Ave., Chicago 7, Ill.
Radio Materials Corp., 3325 N. California Ave., Chicago 18, Ill.

PAGE 38. ADD TO LIST OF FIRMS REPRESENTED BY CHARLES W. POINTON:
Astron Corp., East Newark, N.J.
Carter Motor Company, Chicago, Ill.
Allen D. Cardwell Mfg. Corp., Plainville, Conn.
Garrard Engineering and Mfg. Co. Ltd., Swindon, England.
General Industries Co., Elyria, Ohio.
General Cement Mfg. Co., Rockford, Ill.
T. Leeman, London, England.
Pickering and Co. Inc., Oceanside, N.Y.
John F. Rider, Publisher, Inc., New York, N.Y.
Schauer Mfg. Corp., Cinn, Ohio.
Trimm Inc., Libertyville, Ill.

PAGE 38. PLAYFORD, E. W., LIMITED INCORRECTLY LISTED AS REPRESENTING HARDWICK, HINDLE INC., OF NEWARK, N.J. Canadian representative of this firm is M .J. S. Electronic Sales Ltd., 2028 Avenue Road, Toronto.

PAGE 40. SPERRY GYROSCOPE CO. OF CANADA LTD., CORRECT ADDRESS: Sperry Gyroscope Company of Canada Ltd., P.O. Box 710, 6011 Cote de Liesse Road, Montreal, Que.

PAGE 46. ADD: Electric Soldering Iron Co., 1547 West Elm St., Deep River, Conn. Represented by Canadian Marconi Company, 830 Bayview Ave., Toronto 17.

PAGE 46. ADD: The Daven Company, 191 Central Ave., Newark 4, N.J. Represented by: Adams Engineering Ltd., 1500 St. Catherine St. West, Montreal, Quebec.

PAGE 46. ADD: Clarostat Manufacturing Co. Washington Ave., Dover, N.H. Represented by The Canadian Marconi Company, 830 Bayview Avenue, Toronto 17.

PAGE 48. ADD: Gates Radio Company, Quincy, Illinois. Represented in Canada by: Canadian Marconi Company, 2442 Trenton Ave., Montreal, Quebec.

(Turn to page 66)

electronic frequency changers

250VA and 1000VA capacity

60~ to 60~ or 60~ to 400~

accuracy to ±0.01%

- *accurate control of frequency*
- *accurate control of voltage*
- *good wave shape*
- *portable*
- *no special wiring or installation*

SPECIFICATIONS

Model	FCD250	FCD1000	FC1000
Input voltage	95-130VAC, 1Ø, 50-60~	208 or 230VAC, 1Ø, 50-60~	208 or 230VAC 1Ø, 50-60~
Output voltage	115VAC, 1Ø, adjustable between 110-120 volts		
Output frequency	400~, adjustable ±10%	400~, adjustable ±10%	60~, adjustable between 45 and 65
Output voltage regulation	±1.0%	±1.0%	±1.0%
Output frequency regulation	±1.0% in standard models; ±0.01% with auxiliary frequency standard (output frequency is fixed when using frequency standard)		
Capacity	250VA	1000VA	1000VA
Load range	0.1 to full load		
Distortion	5% maximum		
P. F. range	Down to 0.7 F		
Time constant	0.25 seconds		
Envelope modulation	2% maximum		

These industrial and laboratory frequency changers resulted from contracts for precision inverters. They should prove useful for testing components or complete instruments that must operate over variable frequency conditions. They can also be used as sources for precision 60~ or 400~ for timing applications, or used with servo and/or gyro motors in design work.

Sorensen electronic frequency changers are also being used with field equipment such as geophysical vans, where motor generator set frequency control is often inadequate. Another use will be for checking equipment designed for 50~ (foreign) usage; conversely, the same instrument can be used to convert 50~ line to 60~ source.

Electronic frequency changers of other ratings are now in design. We shall be happy to send further information, or to correspond with you concerning your individual requirements. Address Sorensen & Co., Inc., 375 Fairfield Avenue, Stamford, Conn. In Europe, write directly to Sorensen A.G., Gartenstrasse 26, Zurich 2, Switzerland.

SORENSEN

375 FAIRFIELD AVENUE, STAMFORD, CONN.

In Canada: CHAS. W. POINTON LTD., 6 Alcina Avenue, Toronto 10, Ont.

For further data on advertised products use page 64.

DIRECTORY ADDENDA

(Continued from page 65)

PAGE 48. ADD: Insuline Corp., of America, 186 Granite Street, Manchester, N.H. Represented by the Canadian Marconi Company, 830 Bayview Avenue, Toronto 17.

PAGE 49. ADD: Jackson Electrical Instrument Co., 18 South Patterson Blvd., Dayton 1, Ohio. Represented by the Canadian Marconi Company, 830 Bayview Avenue, Toronto 17.

PAGE 51. ADD: National Company Inc., 61 Sherman Street, Malden 48, Mass. Represented by the Canadian Marconi Company, 830 Bayview Avenue, Toronto 17.

PAGE 53. ADD: Sperry Gyroscope Company of Canada Ltd., P.O. Box 710, 6011 Cote de Liesse Road, Montreal, Quebec.

PAGE 54. ADD: Webster-Chicago Corp., 5610 West Bloomingdale Ave., Chicago, Ill. Represented by the Canadian Marconi Company, 830 Bayview Avenue, Toronto.

PAGE 54. ADD: The Turner Company, 903-17th Street, Cedar Rapids, Iowa. Represented by the Canadian Marconi Company, 830 Bayview Avenue, Toronto 17.

PAGE 57. CANADIAN MARCONI COMPANY, MONTREAL, QUEBEC, SHOULD READ CANADIAN MARCONI COMPANY, TORONTO, ONTARIO.

PAGE 57. ADD: Clarostat Mfg., Co., Ltd., Dover, N.H. Potentiometers, wire-wound resistors.

PAGE 58. ADD: Electric Soldering Iron Co., Deep River, Conn. Soldering Irons, soldering pots, control stands, etc.

PAGE 59. HUNT, A. H. LTD., LONDON, ENGLAND, SHOULD READ: HUNT CAPACITORS (CANADA) LTD., TORONTO, ONTARIO.

PAGE 59. ADD: Jackson Electrical Instrument Co., Dayton, Ohio. Servicing instruments.

PAGE 59. ADD: Insuline Corp., of America, Manchester, N.H. Test leads, probes, metal racks, panels and cabinets, hardware.

PAGE 60. ADD: National Co., Inc., Malden, Mass. Communications receivers and components, Hi-Fi tuners, amplifiers and preamplifiers.

PAGE 60. ADD: Kerr-Machin Associates, 26 Truman Road, Willowdale P.O., Toronto. Ceramics, Steatite tubing, capacitor sleeves, etc.

PAGE 61. ADD: Radio Valve Co., of Canada Ltd., Toronto, Ontario. Radiotrons receiving, commercial and special purpose tubes, TV picture tubes.

PAGE 62. ADD: Sperry Gyroscope Company of Canada Ltd., P.O. Box 710, 6011 Cote de Liesse Road, Montreal, Quebec. Oscillators, attenuators, amplifiers, transmitters, klystron tubes, etc.

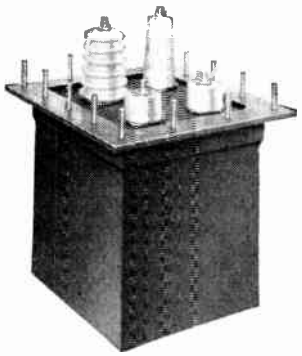
PAGE 63. ADD: The Turner Co., Cedar Rapids, Iowa. Microphones, TV boosters, UHF converters.

PAGE 63. ADD: Webster-Chicago Corp., Chicago, Ill. Record changers, wire and tape recorders and accessories.

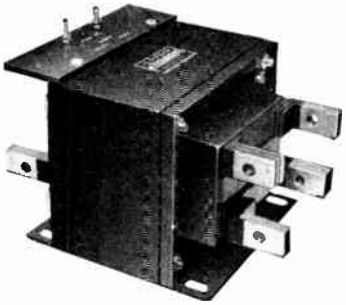
PAGE 100. HICKOCK PRODUCTS. CORRECT ADDRESS: The Hickok Electrical Instrument Company, 10514 Dupont Avenue, Cleveland 8, Ohio.

PAGE 113. ENCAPSULATED PRECISION RESISTORS, CORRECT ADDRESS OF MANUFACTURER: MAPCO INC., 35-37 ABBETT AVENUE, MORRISTOWN, N.J.

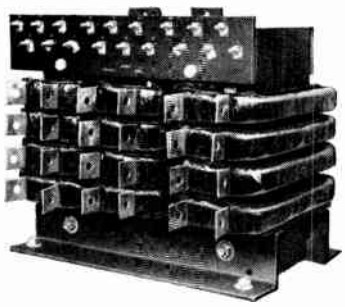
PAGE 28. ADD: A. T. R. ARMSTRONG LIMITED, REPRESENTING: Alprodco Inc. Kempton, Indiana; Grayhill, 561 Hillgrove Ave., La Grange, Illinois; L. L. Constantin & Co., Lodi, New Jersey; Grigsby-Allison Co. Inc., 407 N. Salem Ave., Arlington Heights, Illinois; Heldor Manufacturing Corp., 238 Lewis Street, Paterson, New Jersey; Kulka Electric Mfg. Co. Inc., 633 South Fulton Ave., Mount Vernon, N.Y.; Lion Fastener Inc., Honeoye Falls, New York; Potter & Brumfield Mfg. Co. Inc.; (subsidiary of: AM & F) Princeton, Indiana; Sarkes Tarzian Inc., 415 N. College Ave., Bloomington, Indiana; Sterling Engineering Co. Inc., (subsidiary of: AM & F) Laconia, New Hampshire; Tru-Ohm Products Division, Model Engineering & Mfg. Inc., Huntington, Indiana.



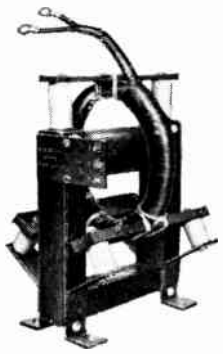
PULSE TRANSFORMER



HI-CURRENT TRANSFORMER



3 PHASE RECTIFIER TRANSFORMER



LOW CAPACITY FILAMENT

MIDGET AUDIO TRANSFORMER

The TRANSFORMER *is always* IMPORTANT

Engineers in every industry where transformers are used realize that a "standard type" will not always do the job. That is why more and more companies depend on HAMMOND to make them the "SPECIAL" to do exactly what is intended.

Did you know that in 27 years' service to industry, Hammond has produced over 37,000 different specials in quantities both large and small and in sizes from miniature weighing 1/3 of an ounce to 55 KVA weighing over 1,000 lbs.

In our modern factory will be found the latest in production and test facilities, and what is more important, a competent staff to insure top quality from start to finish. This coupled with the most advanced design techniques and best materials available assure you of the finest transformers possible.

if you need "SPECIALS" *specify* HAMMOND

Hermetically Sealed Transformers
Plate Supply Transformers
Filament Transformers
Multi-winding Transformers
Input and Filter Chokes
Selenium Rectifier Transformers (single and 3 phase)
A.C. Solenoids
Power Rectifier Transformers
Navy Type "PR"
Input, Interstage, and Output Transformers of all types
Cathode Ray Transformers
Modulation Transformers
High "Q" Inductors
Industrial Control Transformers

For complete information on our standard items, write for Catalogue #65A.

HAMMOND MANUFACTURING CO. LIMITED
GUELPH CANADA

For further data on advertised products use page 64.

From "The House of Resistors"* come these outstanding

miniaturized controls

CARBON AND WIRE-WOUND

Series 48 (⅝" dia.) composition-element controls. 500 ohms to 5 megohms, linear; 2500 ohms to 2.5 megohms, non-linear. Standard tolerances: 100,000 ohms and under, plus/minus 10%; above, 20%. 0.2 watt rating. • Series 49 (¾" dia.) wire-wound controls. 10 ohms to 10,000 ohms; special, 1 to 10 ohms, 10,000 to 20,000 ohms, Standard tolerances: plus/minus 5%; special, 1%. 1.5 watt rating; special, 2 watt.

...AND NOW WITH SWITCH

Factory-attached S.P.S.T. switches for both Series 48 and 49. Multipole decked switch assemblies available. Single and dual units, with or without switch. Sturdy—yet tiny!

CONSULT US regarding your control and resistor requirements for miniaturized assemblies. Write for engineering data. Let us quote.

CLAROSTAT® Controls & Resistors

*Trade-mark

Ask your Distributor now or write to:

ELECTRONIC TUBE & COMPONENTS DIVISION
CANADIAN Marconi COMPANY
830 Bayview Avenue, Toronto, Ontario.
Branches: Vancouver • Winnipeg • Montreal • Halifax • St. John's, Nfld.

For further data on advertised products use page 64.

Edo Names Canadian Marconi Co. Ltd. As Distributor

Appointment of Canadian Marconi Company, Limited, of Montreal as Distributor in Canada for Edo marine electronic products is announced jointly by A. M. Brown, Jr., Edo Vice-President, Sales and J. J. Kingan, General Manager, Canadian Marconi Company.

Under the new arrangement, Canadian Marconi will serve as exclusive sales and service agents for the various Edo-developed products for navigation, depth recording and fish finding.

These products include the Edo Fishcope which has proven highly successful in finding fish electronically, the lineof Edo Deep Depth Sounders including the UQN which measures ocean depth from 0 to 6000 fathoms and a new Survey Depth Recorder for precise measurement of harbor and channel depths, and the new Edo Loran, a relatively low-cost navigation system suitable for all types of commercial vessels and fishing boats.

CANADIAN ACHIEVEMENT

(Continued from page 17)

phase (character). Such differences in amplitude and phase are utilized by EM systems to detect the presence of the secondary field; at the same time EM also measures conductivity, thereby differentiating between poor conductors such as water and better conductors such as sulphide bodies.

Aeromagnetic Surveys' EM system utilizes a large external coil, similar in appearance to war-time "degaussing" equipment, as a transmitter; and incorporates the receiving coil into a towed bird which is lowered at the end of a 500-foot cable during flight, to glide about 150 feet below and some distance astern of the aircraft.

Use of the electromagnetic detector necessitates flying within 500 feet of the ground, and thus precludes EM surveys over exceptionally rugged country. Under favorable terrain condition — over ordinary wet outcrop, for instance rather than thick wet clay — the primary field will penetrate to depths of 300 feet below the earth's surface and detect sulphide bodies.

Aeromagnetic Surveys' General Manager, D. G. MacKay, points out that EM and magnetometer findings complement each other neatly: the magnetometer giving a regional picture of geology and structure and also revealing presence of magnetic mineral concentrations; while the electromagnetic detector indicates concentrations of sulphide bodies which may or may not be magnetic (i.e., susceptible to detection by the magnetometer).

For further data on advertised products use page 64.

J. E. Thomas Named Works Manager At Phillips

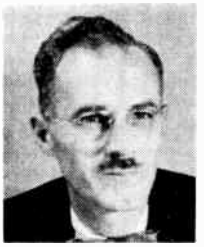
Following the appointment of Mr. A. Lauder as Vice-President (Production and Engineering), Mr. J. E. Thomas becomes General Works Manager of Phillips Electrical Company (1953) Limited. Mr. Thomas has been with the Company since 1946, and has been Production Manager for the past few

J. E. THOMAS

years. He brings a thorough background of production experience to his new position. Before joining Phillips, Mr. Thomas had been with the wire and cable division of Canadian General Electric for many years. He is well known in the electrical field.

C. H. Fraser Appointed Senior Liaison Engineer For P.S.C.

C. H. (Clare) Fraser has been appointed Senior Liaison Engineer, Sales Division, PSC Applied Research Limited, Toronto, Managing Director J. M. Bridgman has announced. Mr. Fraser served more than four years with the U.K. Inspection Board at Research Enterprises Ltd., Leaside, during the war on inspection of radar equipment, and for seven years was Sales Manager for Electronic Associates of Toronto.



C. H. FRASER

Cesco Appoints Toronto Branch Manager

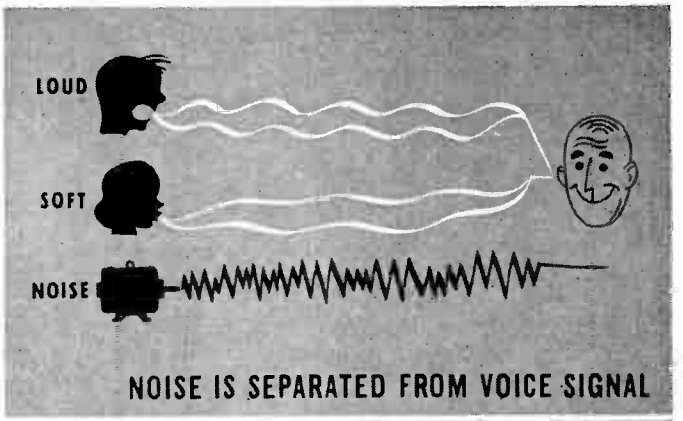
M. I. Rosenthal, president and general manager of Canadian Electrical Supply Company Limited has announced the appointment of J. Scott Benning to the position of branch manager of the company's Toronto branch.

For further data on advertised products use page 64.

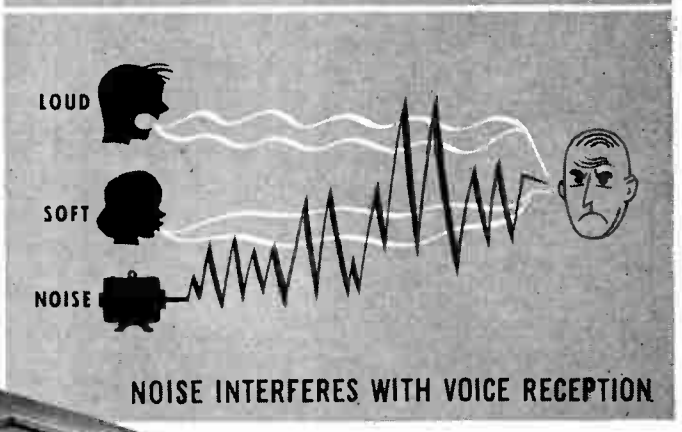
RADIO CIRCUITS can sound like this

...instead of this

with the addition of Lenkurt



NOISE IS SEPARATED FROM VOICE SIGNAL



NOISE INTERFERES WITH VOICE RECEPTION

Type 5090B 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

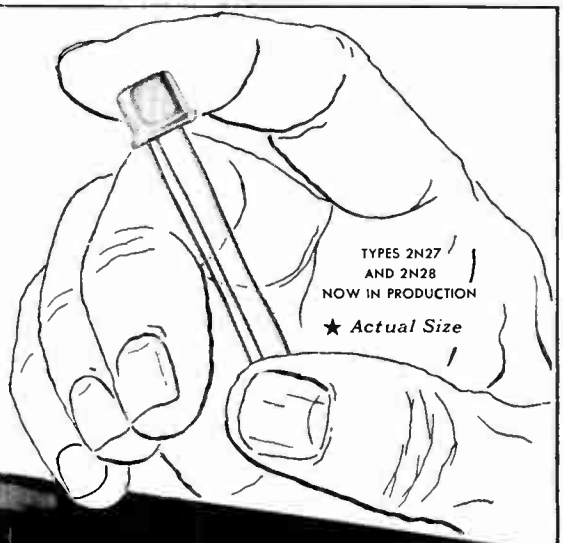
Head Office: 185 Bartley Drive, Toronto 16

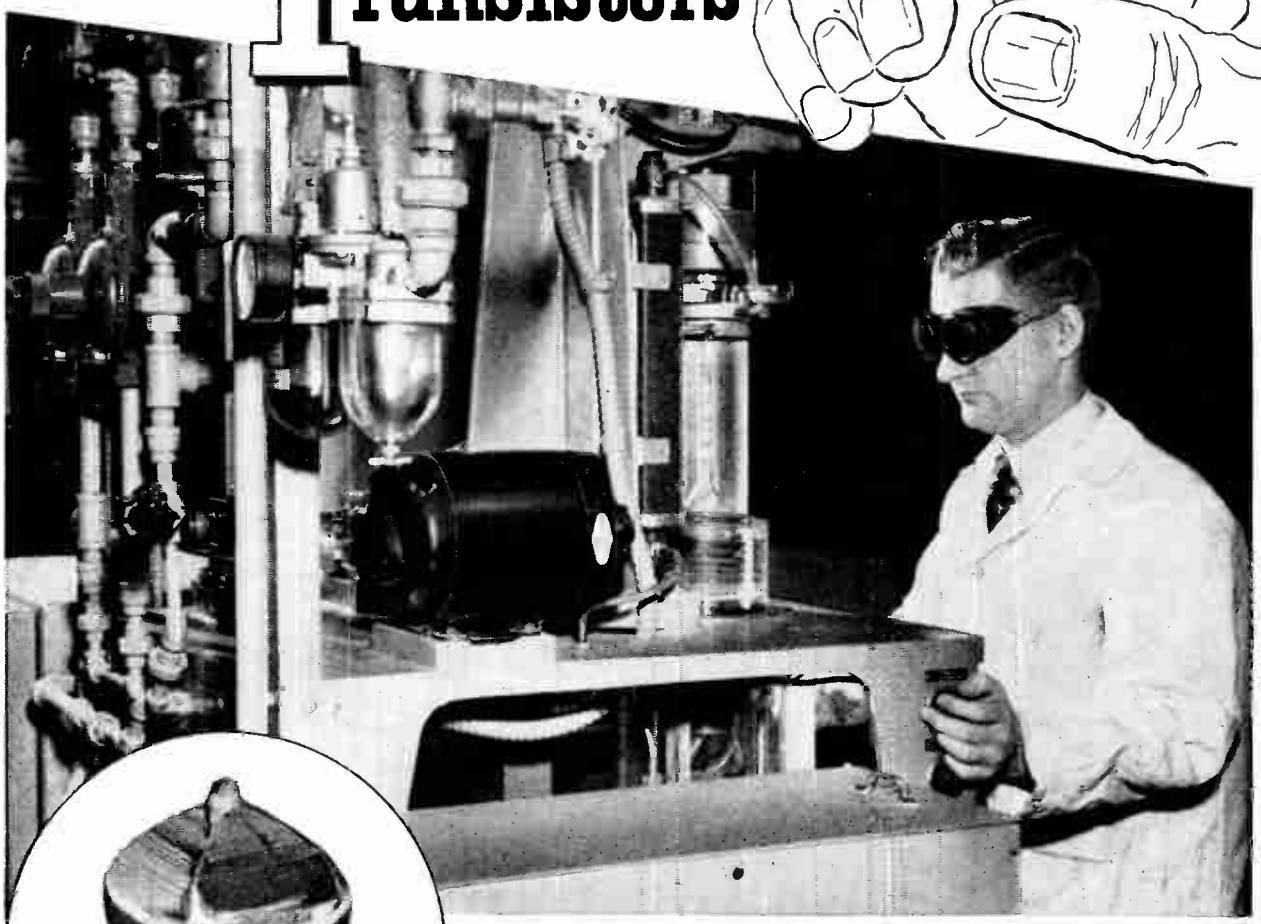
MONTREAL • OTTAWA • BROCKVILLE • HAMILTON • WINNIPEG • REGINA • EDMONTON • VANCOUVER

For further data on advertised products use page 64.

For further data on advertised products use page 64.

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

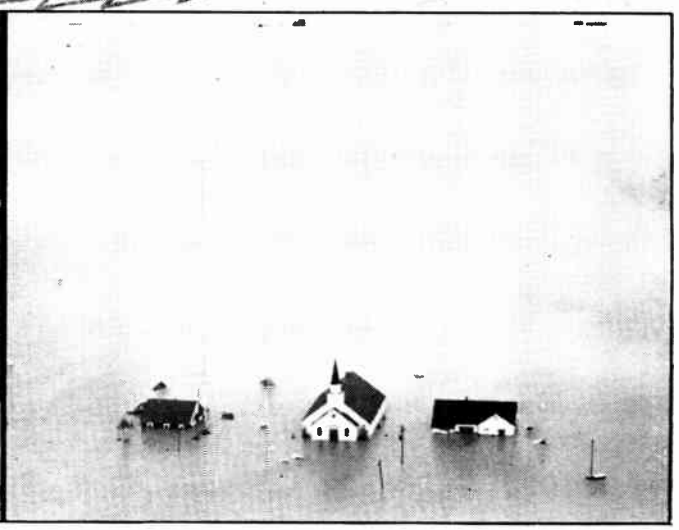
For further data on advertised products use page 64.

ADVERTISERS' INDEX

For further data on advertised products use page 64.

Don't risk one life in your community ... install reliable 2-WAY RADIO protection

When trouble strikes don't risk one life in your community. Give everyone the protection of the most reliable communications system available . . . G-E 2-Way Radio. Time and again, in the face of disaster, 2-Way Radio has made it possible to save lives, prevent excess property damage. It carried on despite rain, snow, fire or flood when other lines were out or inaccessible. G-E 2-Way Radio is designed and built for more efficient and economic service under Canadian conditions. C-G-E engineers will help you plan and install a coordinated system of protection for your Police, Fire and Utility departments.



2-WAY MOBILE RADIO

Mobile Radio Sales,
Electronic Equipment Department,
Canadian General Electric Co. Ltd.,
830 Lansdowne Ave., Toronto, Ont.

We would like to discuss the possible installation of 2-Way Radio protection with your engineers. Please contact:

Name.....

Dept.....

Address.....

City.....Prov.....

CA

731W-454

CANADIAN GENERAL ELECTRIC COMPANY LIMITED

For further data on advertised products use page 64.

F W PRUZIOSI
2336 HINGSTON AVE
MONTREAL 28 P Q

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For further data on advertised products use page 64.