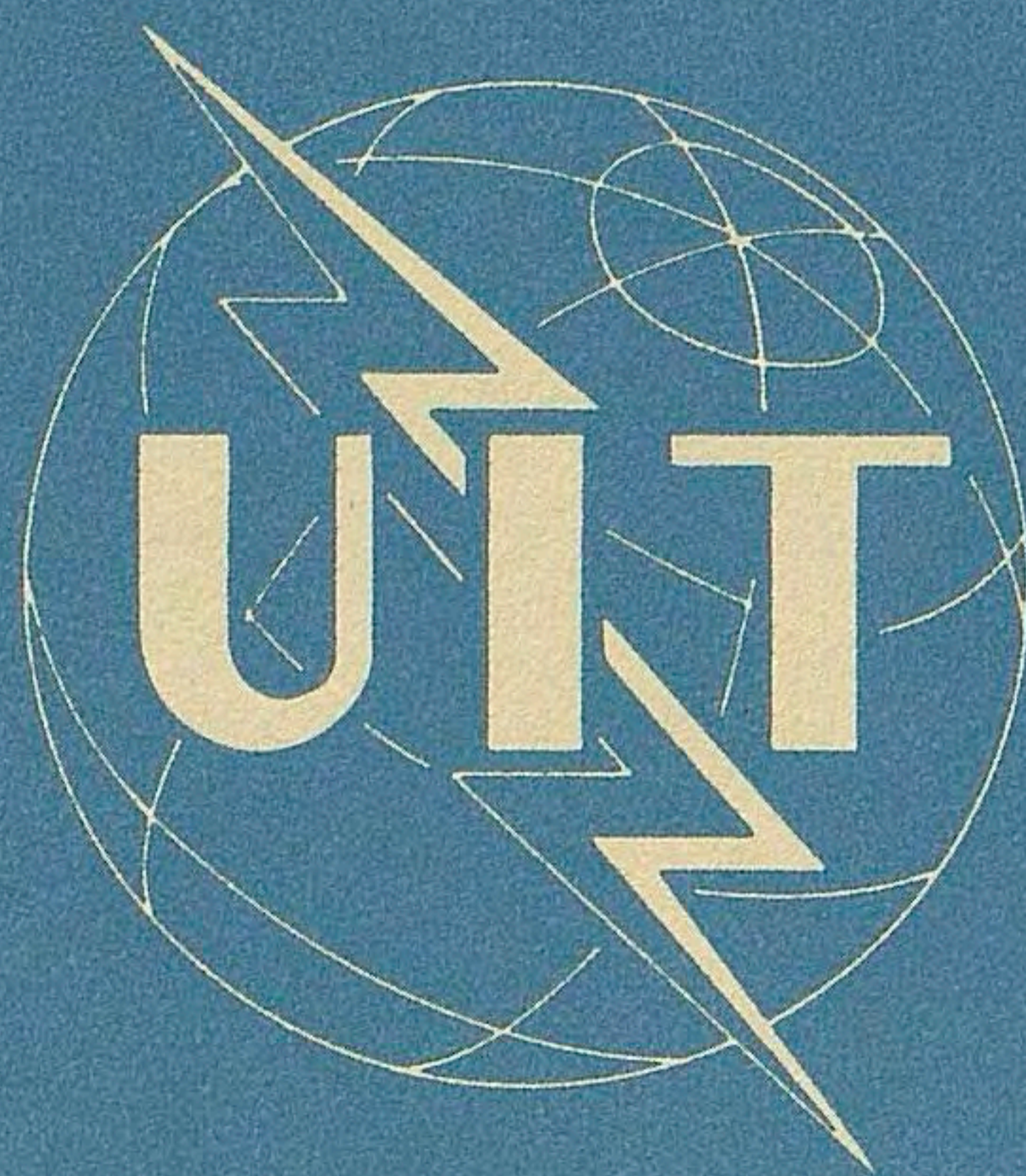


JOURNAL DES TÉLÉCOMMUNICATIONS
TELECOMMUNICATION JOURNAL
BOLETÍN DE TELECOMUNICACIONES



JOURNAL UIT

FÉVRIER 1954 • N° 2

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BOLETIN DE TELECOMUNICACIONES

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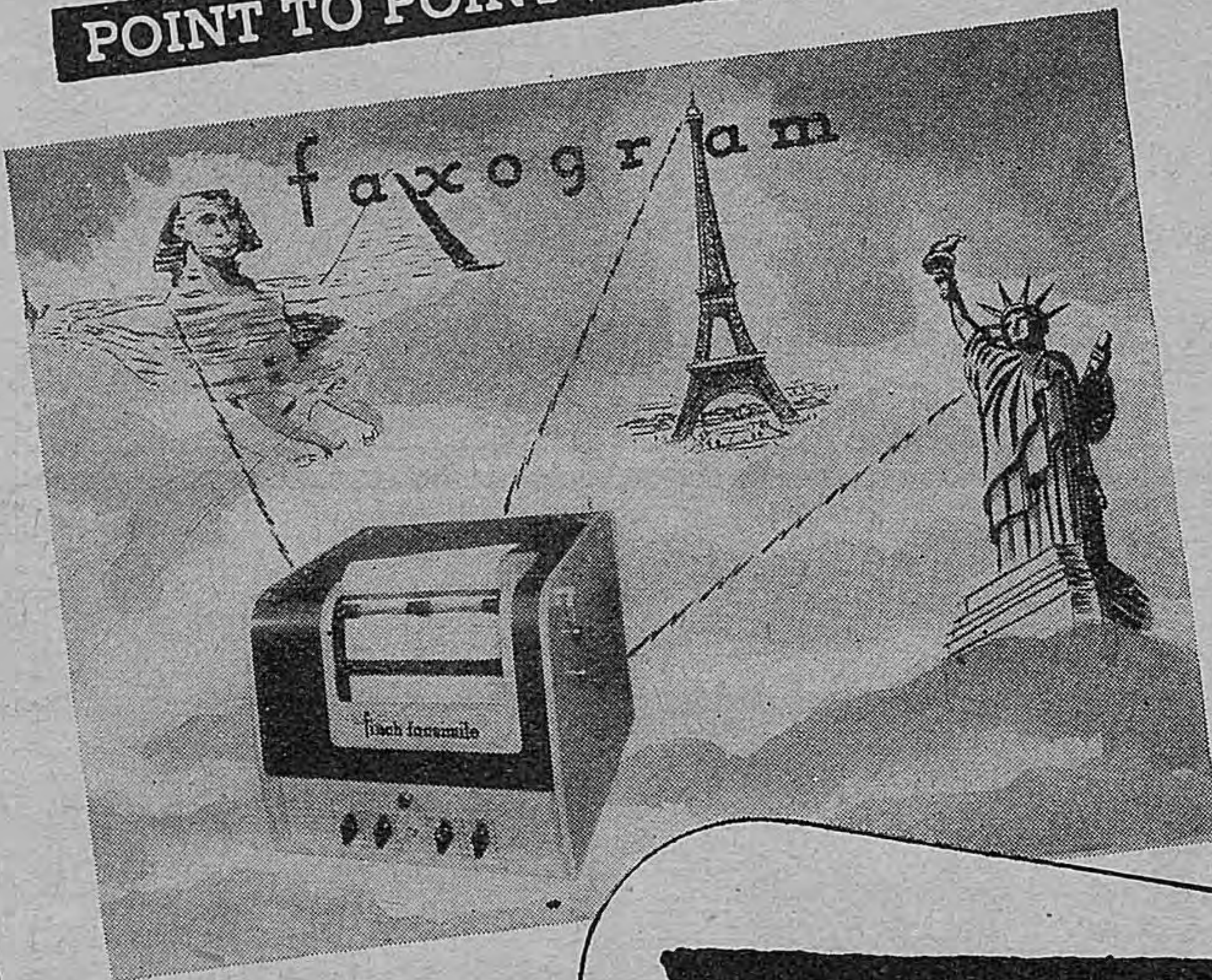
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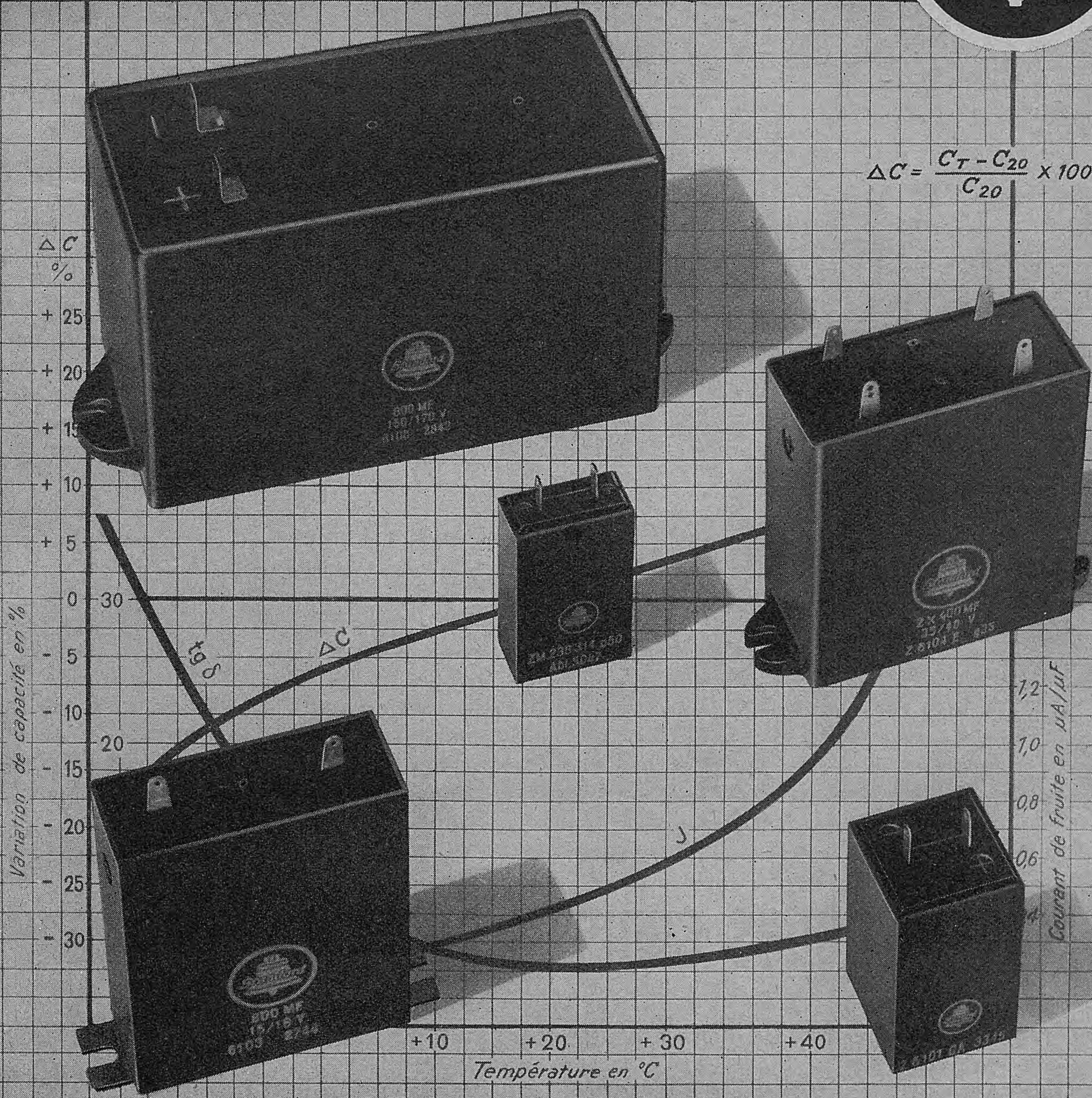
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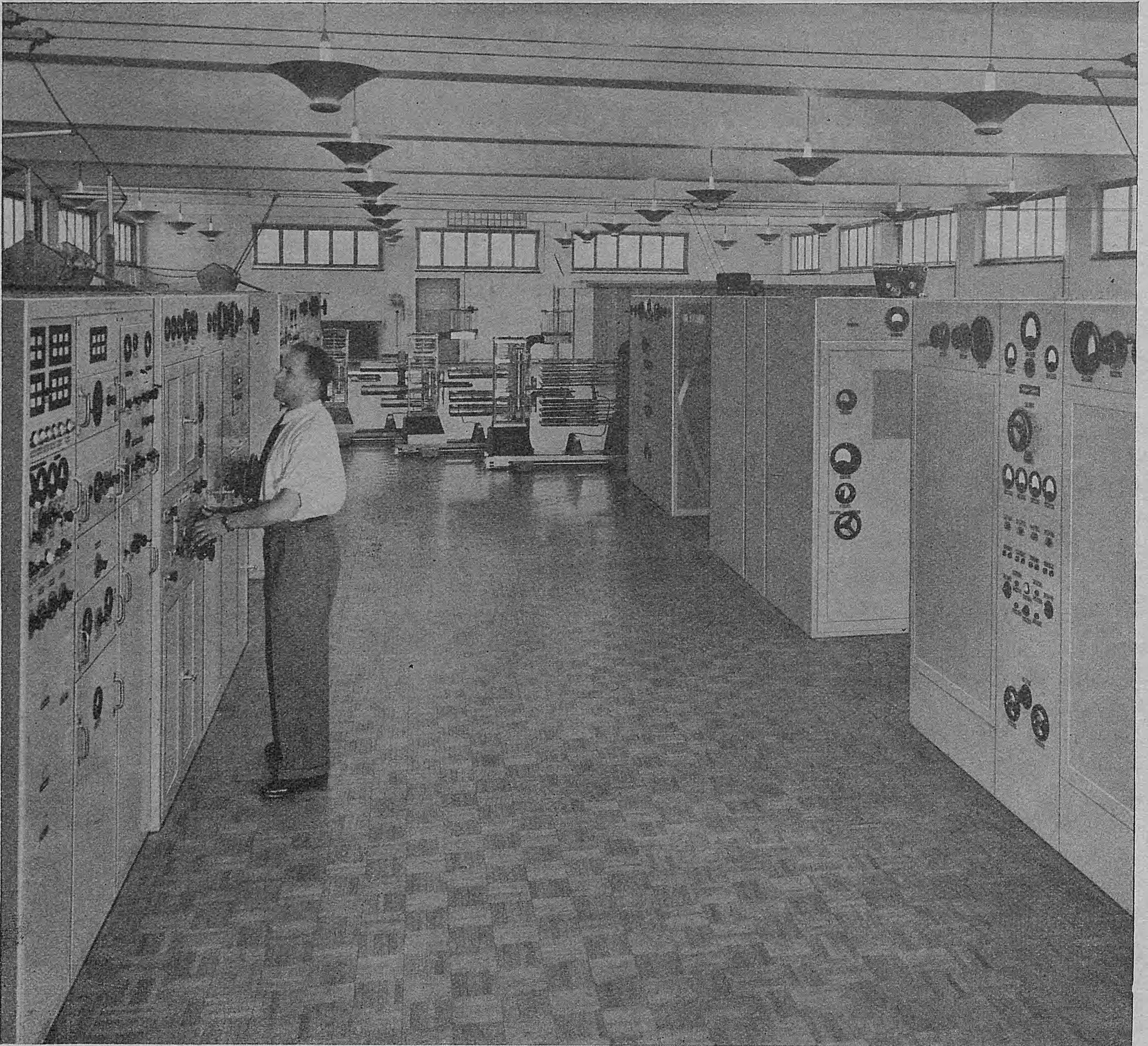


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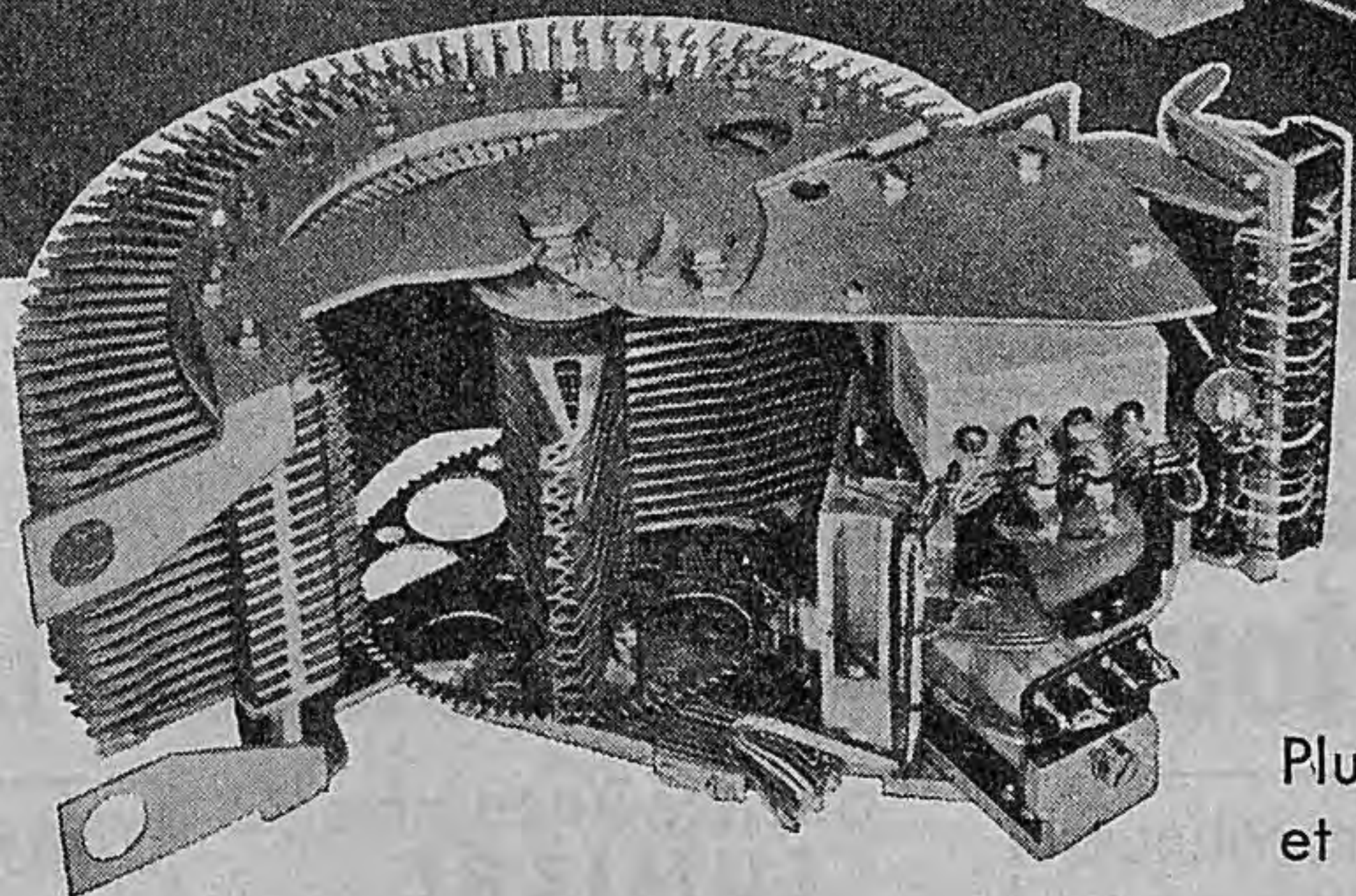
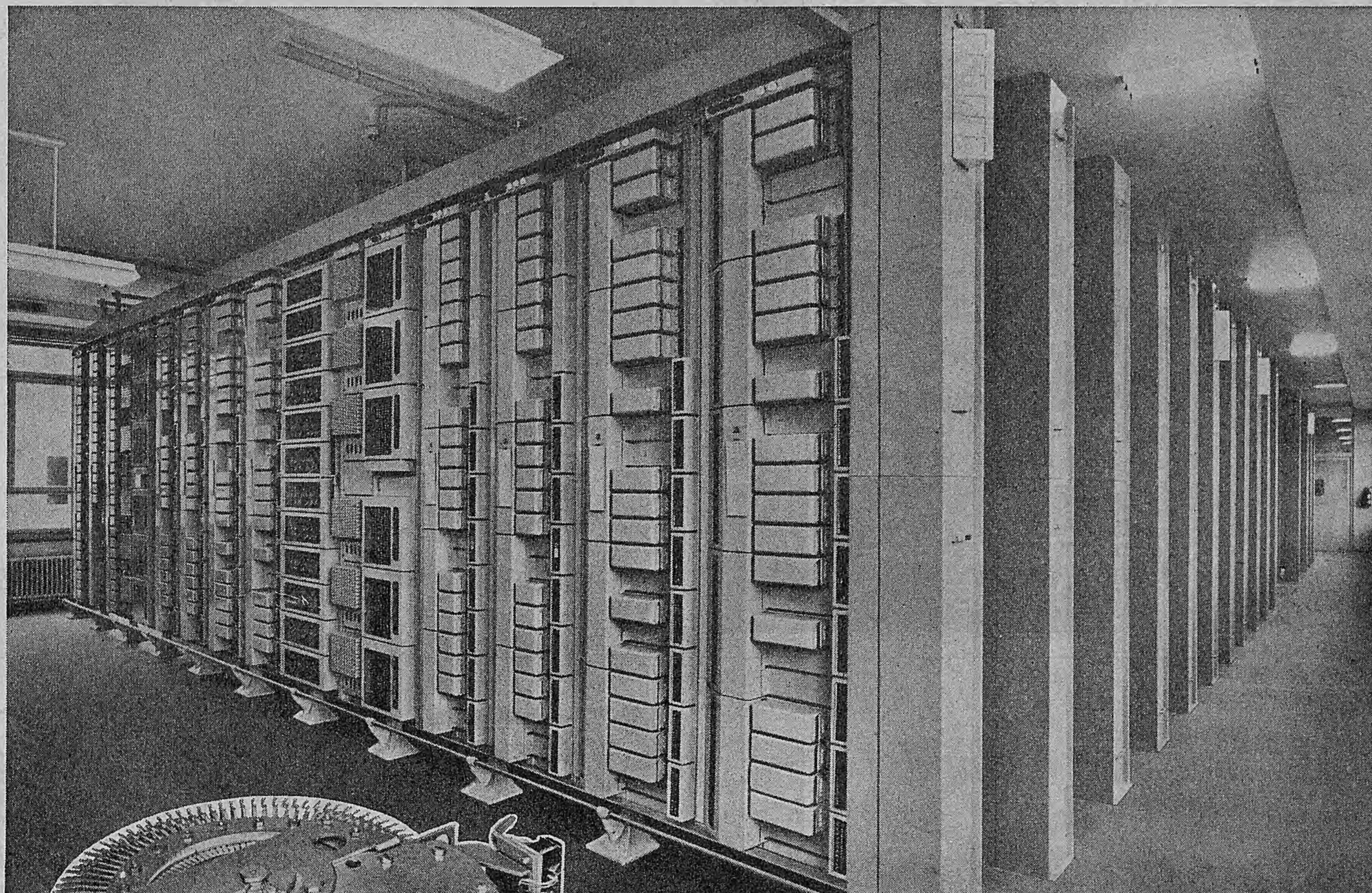
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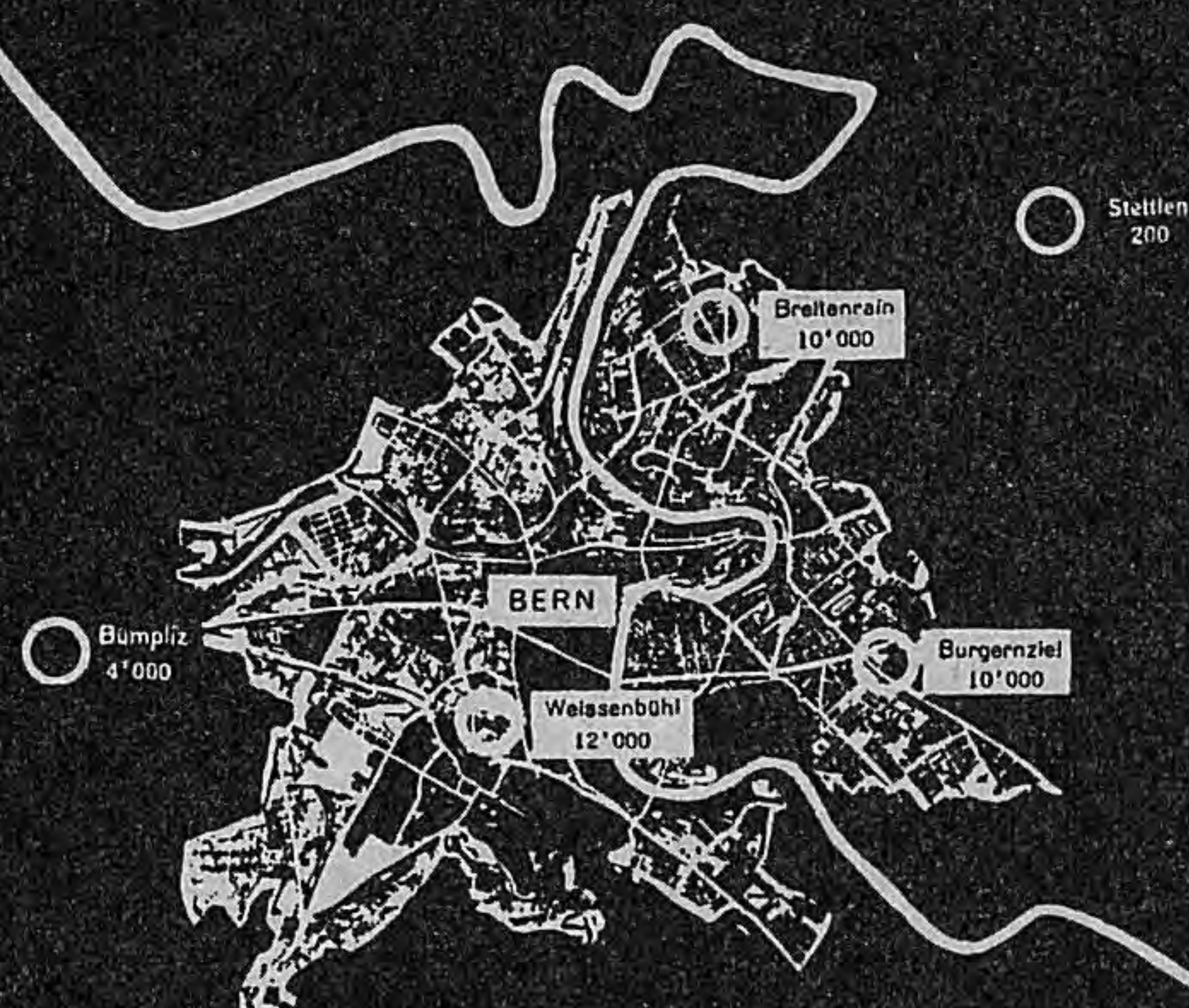
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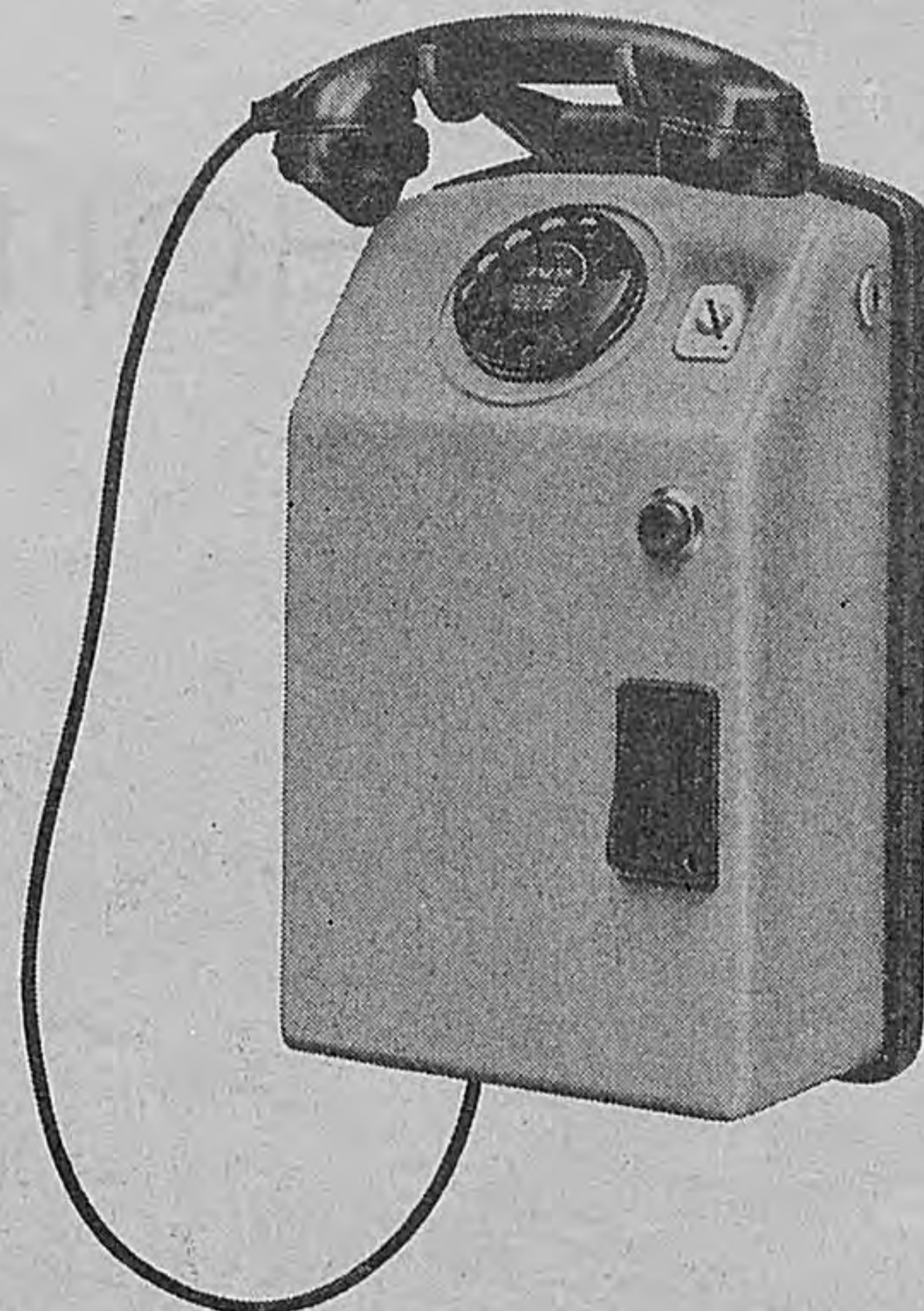


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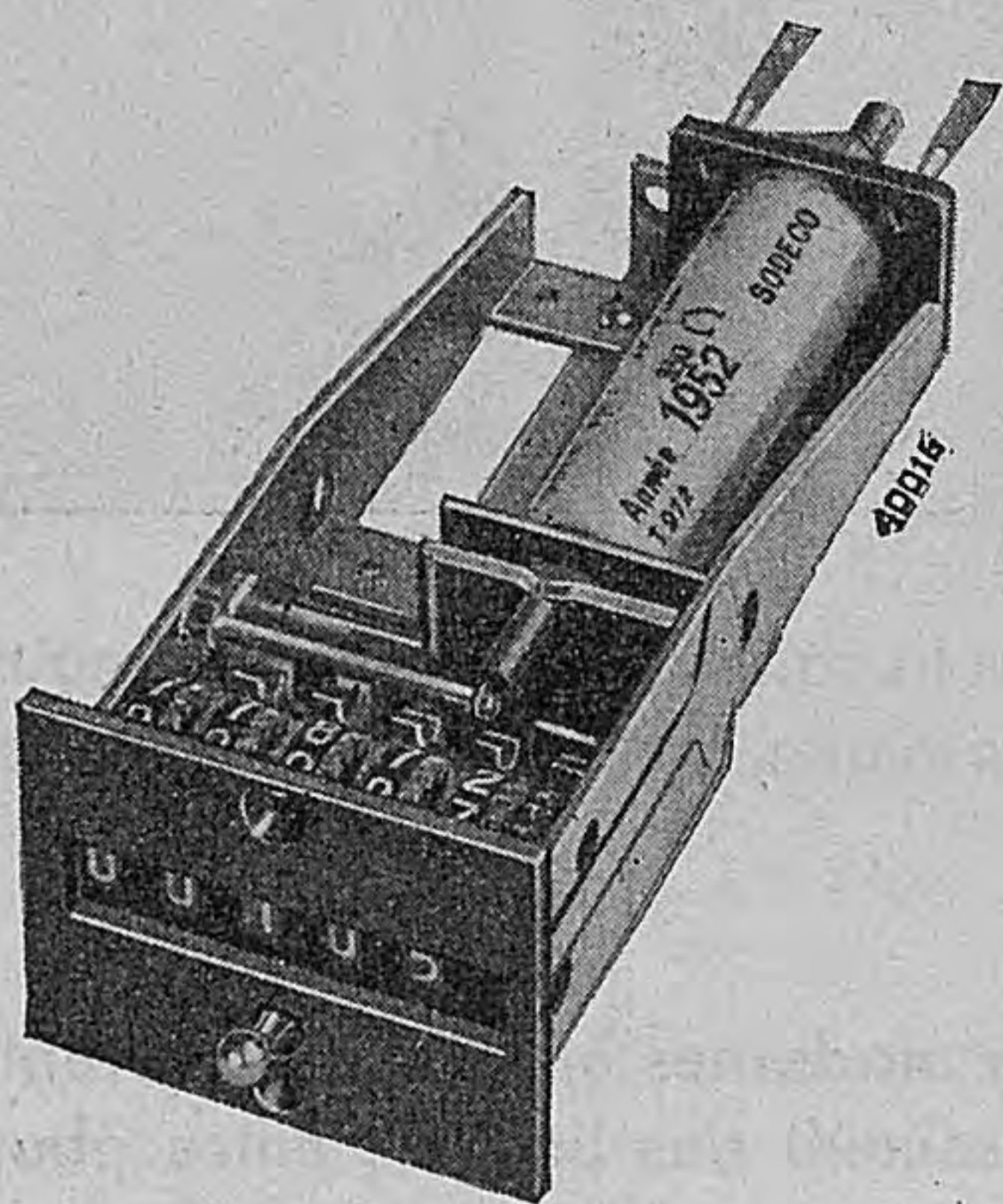
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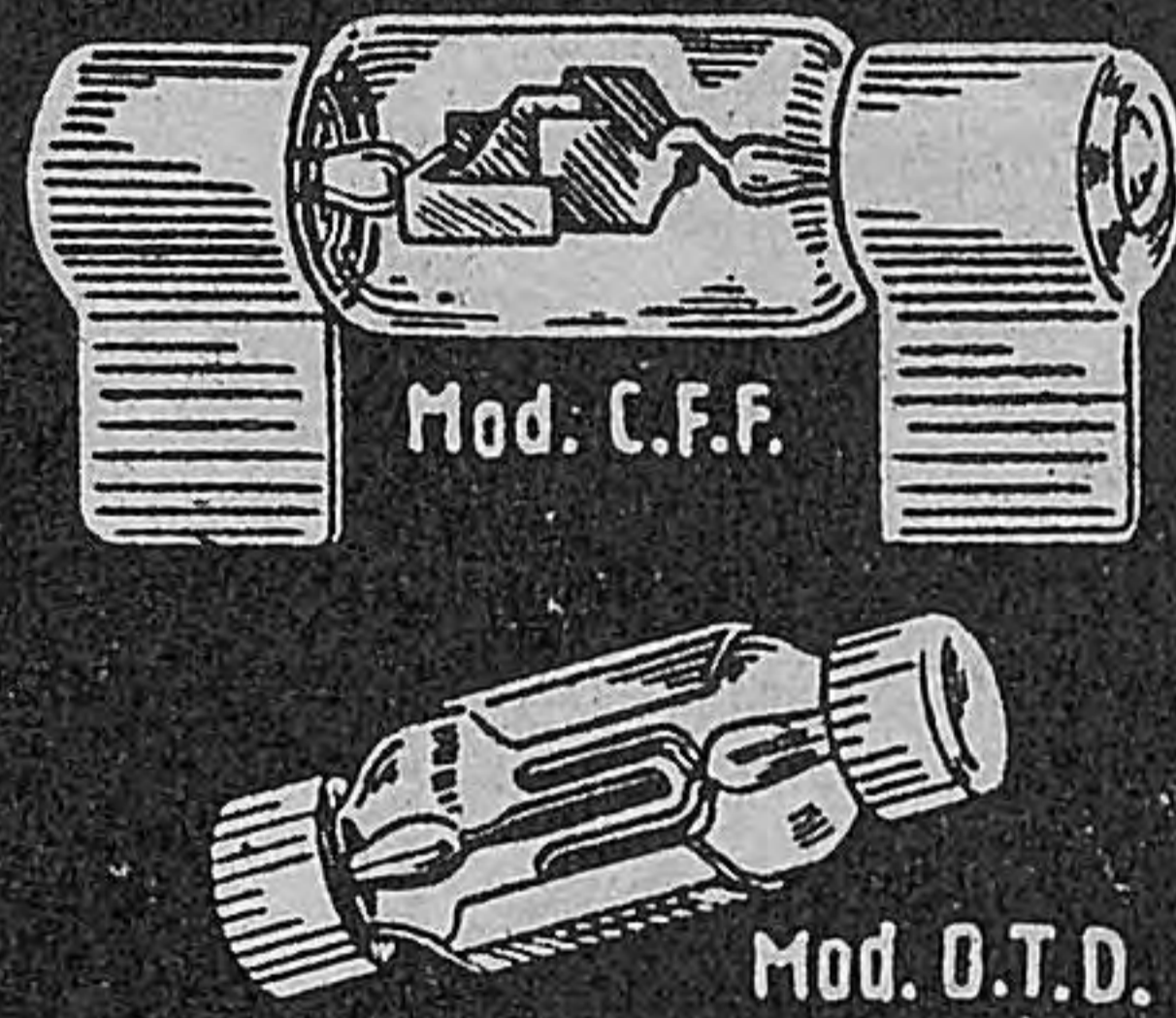
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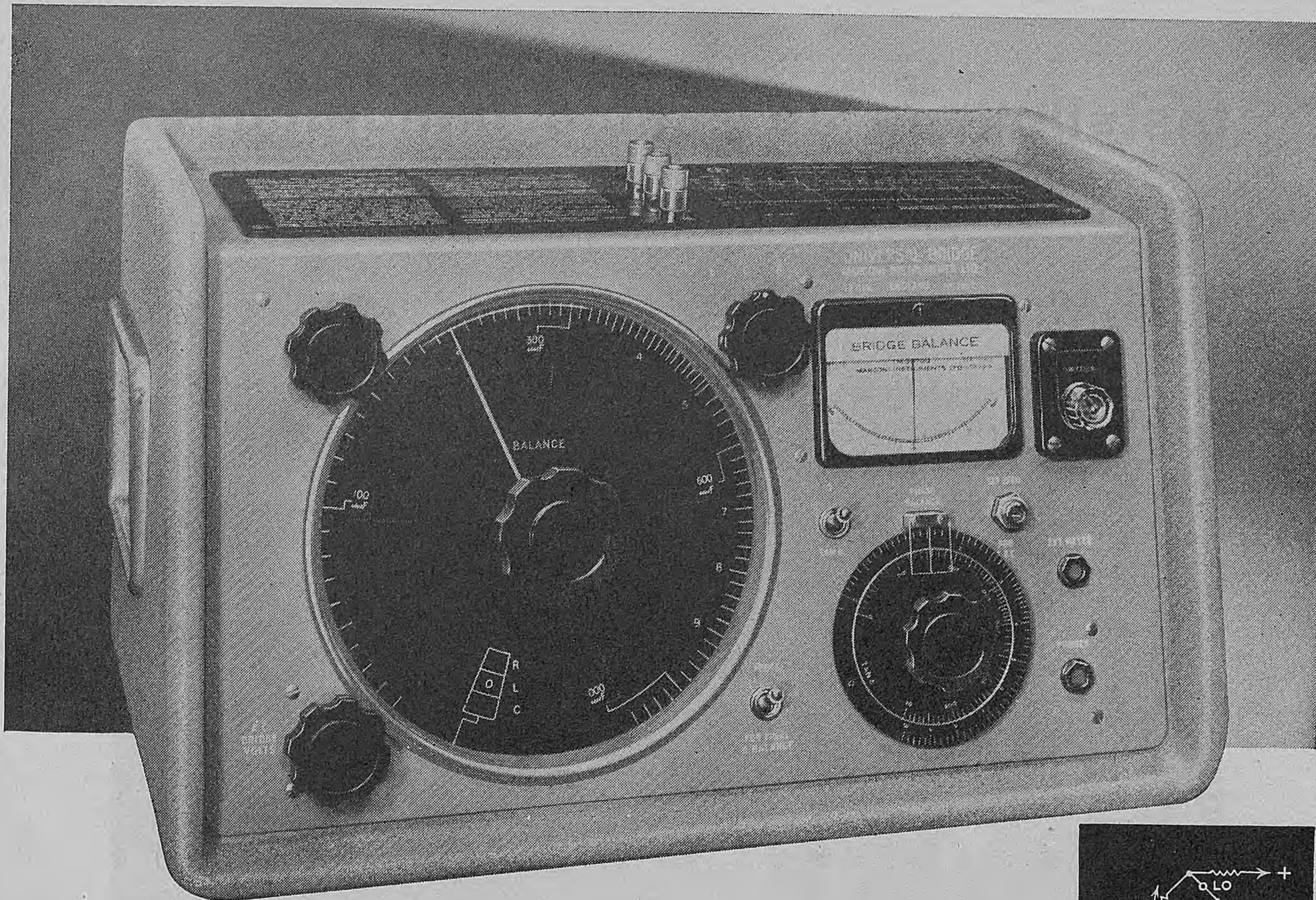
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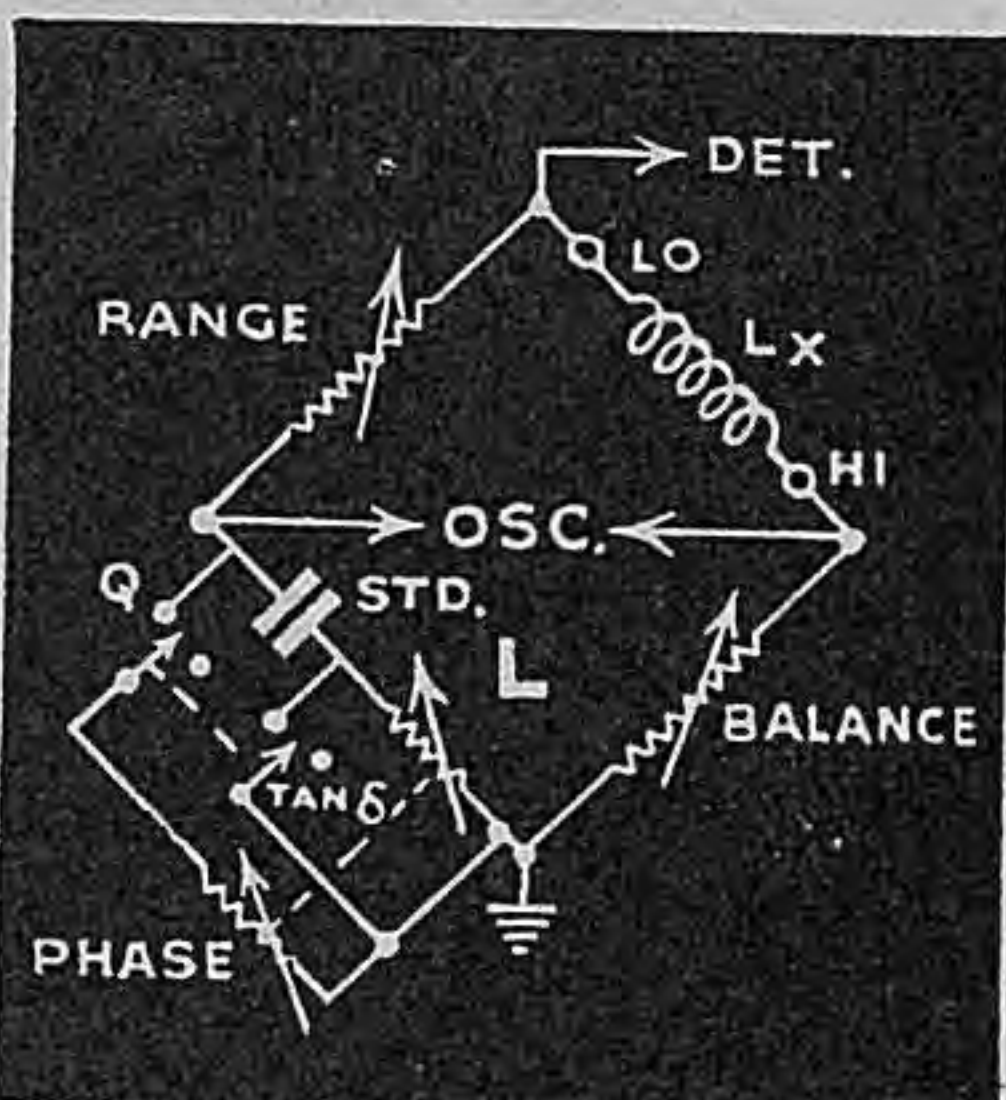
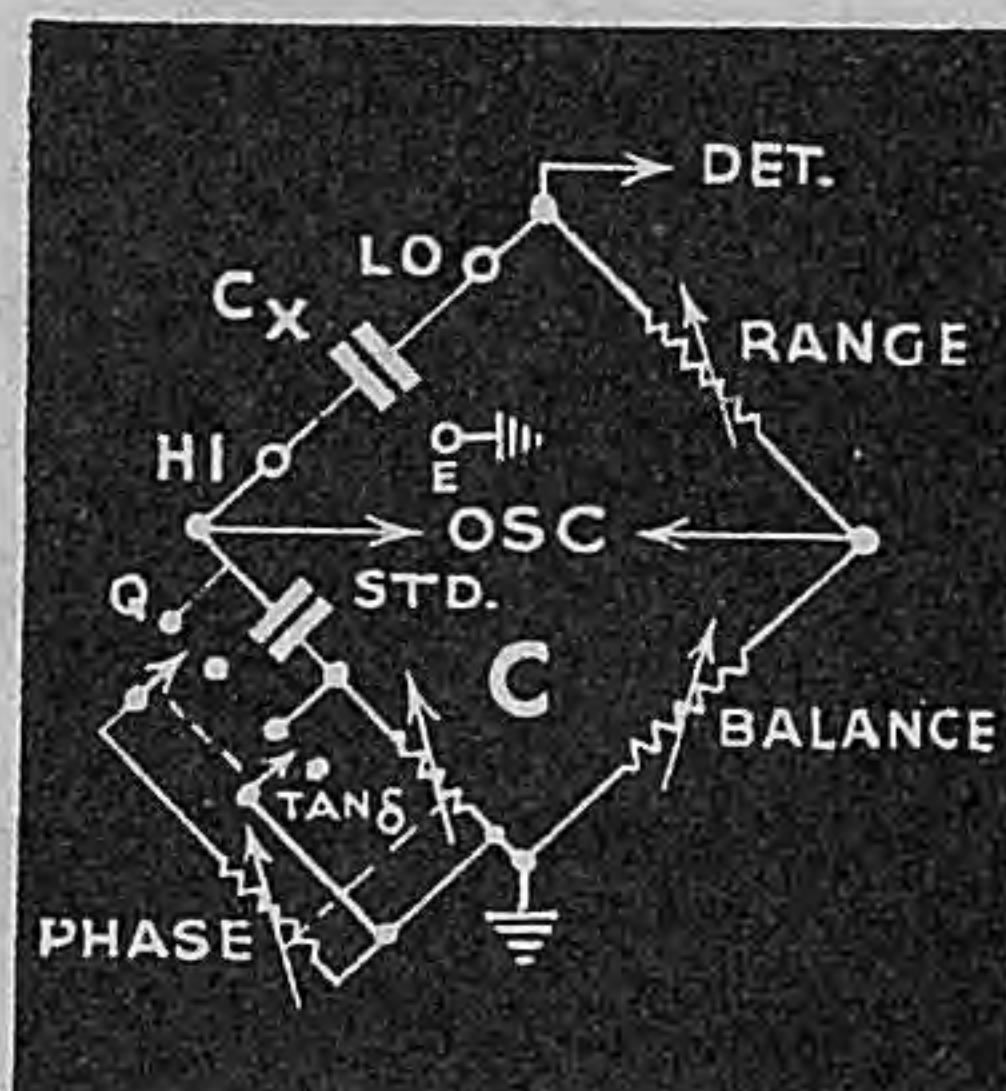
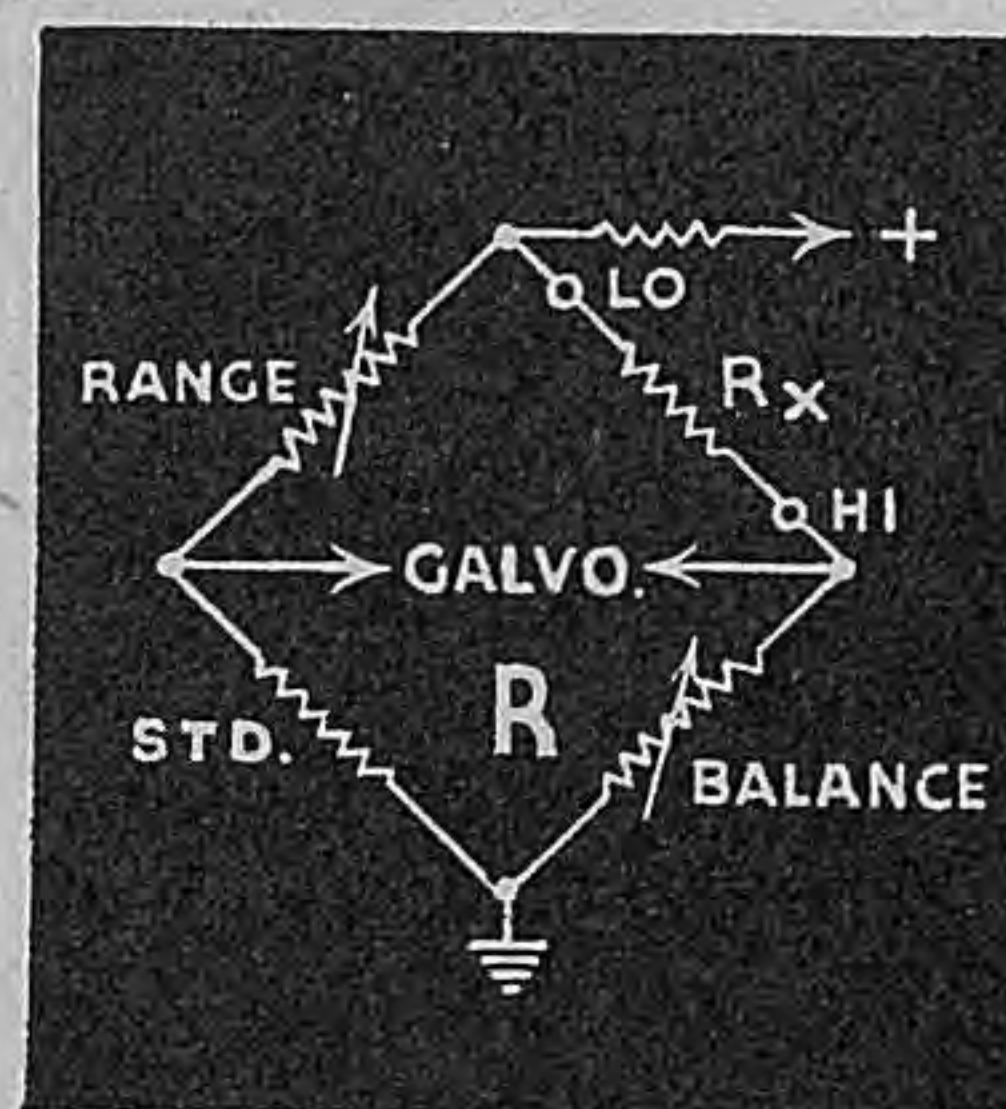
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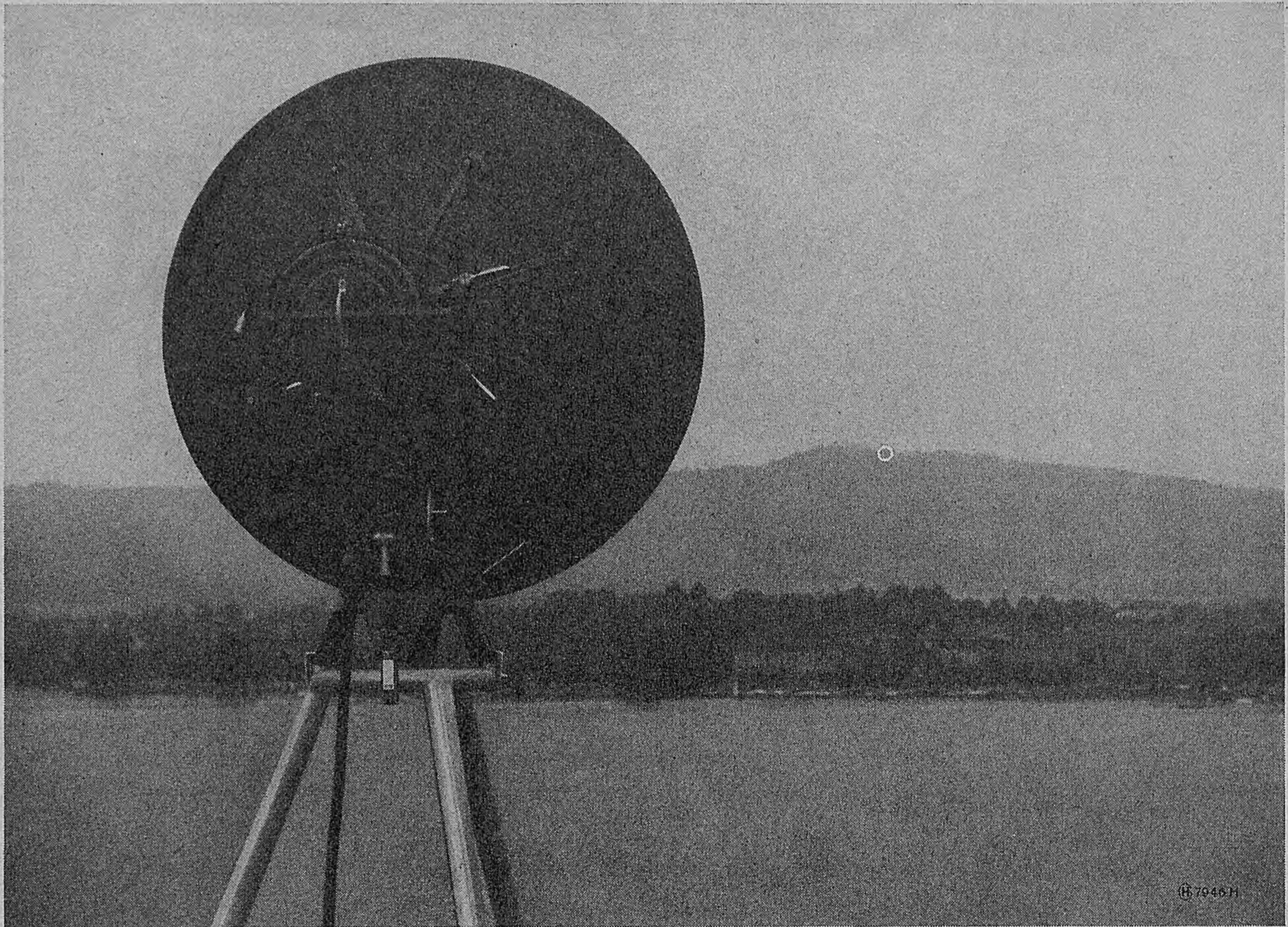


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Journal télégraphique (1869-1933)
57 volumes published

Telecommunication Journal (since 1934)
Volume 20

Opinions expressed in the articles appearing in the Telecommunication Journal are the authors' personal opinions and do not necessarily reflect those of the Union.

The VIIIth Plenary Assembly of the International Telegraph Consultative Committee

(Arnhem, 5-13 June, 1953)

(Translation)

At its 6th meeting, which was held in Brussels in 1948, the CCIT Plenary Assembly had decided to hold its 7th meeting in 1951. In 1950, however, it was decided that this 7th meeting should be postponed until 1953 and in 1951 only the Study Groups met in Geneva. An account of their work appeared in the July 1951 number of the *Telecommunication Journal*.¹

(See the photograph in the French Part, page 26f)

The formal inaugural meeting of the CCIT VIIIth Plenary Assembly.

In 1953, the Administration of the Netherlands was good enough to renew the invitation it had already extended to the CCIT, namely, that the VIIIth Plenary Assembly should be held in the Netherlands, and it offered the pleasant city of Arnhem as the place of the meeting.

The Arnhem municipal theatre was chosen for this purpose. Accommodation of a CCI Plenary Assembly in a theatre gave rise to some unusual problems for which the Dutch Administration found some most ingenious solutions.

The auditorium was used for plenary meetings and for meetings of the larger Study Groups. Delegations were seated in the stalls and the pit, while the Chairman's dais was on the stage in front of the simultaneous interpretation booths. The boxes were made available to the guest international organizations, while the balconies were open to the public. The equipment for simultaneous interpretation in English, French and Spanish—booths and transportable distribution units—was provided by the Union. It was assembled and maintained by technicians from the Dutch Administration, who managed to adapt it most successfully to the characteristic shape of a theatre auditorium. This equipment gave entirely satisfactory service throughout the meeting.

¹ *Telecommunication Journal*, 1951, No. 7, page 258.

The lounges of the first and second balconies had been turned into committee rooms, with consecutive interpretation in English and French.

The secretariat, the translators and the supplies were accommodated in the actors' dressing rooms, which were numerous and well-lit. The CCIT secretariat was, it is true, a little cramped and hemmed in with documents, but it is accustomed to working with limited resources. The typists were housed in the greenroom and the mimeograph operators were in the basement, where it was cool.

Delegates, of course, enjoyed the usual facilities: document distribution, post office, with telegraph and telephones, cloak-rooms, reception and information desk and bar, while a series of television receivers showed the Coronation of Her Majesty Queen Elizabeth II.

* * *

The administrations of the following thirty countries sent delegations to the Assembly:

Australia; Austria; Belgium; Brazil; People's Republic of Bulgaria; Cambodia; Canada; China; Denmark; Spain; United States of America; France; Ireland; Italy; Japan; Luxembourg; Norway; New Zealand; Pakistan; Netherlands; Federal German Republic; Roumanian People's Republic; Federal People's Republic of Yugoslavia; United Kingdom of Great Britain and Northern Ireland; Sweden; Switzerland; Oversea Territories of the French Republic; Turkey; Union of South Africa; Union of Soviet Socialist Republics.

The following recognized private operating agencies sent representatives to Arnhem:

Radio Austria A.G.; Italcable; Great Northern Telegraph Company; Portuguese Radio Marconi Company; *Deutsch-Atlantische Telegraphengesellschaft*; Nippon Telegraph and Telephone Corporation; Cable and Wireless Ltd.; *Groupe des Compagnies françaises de câbles*; *Compagnie générale de télégraphie sans fil*; Kokusai Denshin Denwa.

Industrial organizations were represented either in the official delegations sent by administrations to the Study Groups, or independently, or partly in those delegations and partly independently (as for example, in the case of the Federal German Republic). In this

way, representatives of 10 such concerns were separately represented, the Study Group meetings (1 Belgian, 1 German, 1 Italian and 7 French).

The following eight international organizations sent observers :

International Air Transport Association ; International Union of Producers and Distributors of Electric Power ; International Civil Aviation Organization ; International Chamber of Commerce ; International Criminal Police Commission ; World Meteorological Organization ; CCIF ; CCIR.

* * *

The Study Groups met from Tuesday, 26 May 1953, to Sunday, 7 June. The Plenary Assembly and its committees met from Friday, 5 June, to Saturday, 13 June. There were ten plenary meetings.

The inaugural ceremony of the Plenary Assembly was held on Friday, 5 June, at 11 o'clock, with Mr. J. Algera, *Minister van Verkeer en Waterstaat*, in the Chair. Mr. Algera was assisted by Mr. Quarles van Ufford, Her Majesty's Commissioner for the Province of Gelderland, and by Mr. L. Neher, Director General of the PTT.

Mr. van der Toorn, head of the Netherlands Delegation, was Chairman of the Assembly, while at the inaugural ceremony the Assembly elected Mr. Webster, head of the United States Delegation, as Vice-Chairman.

The Assembly set up a Budget Committee (Chairman: Mr. Wyss, Switzerland) and two working groups to consider the advisability of amalgamating the CCIF and the CCIT. Their Chairmen were Mr. Collet (France) and Mr. O'Broin (Ireland).

The Chairmen of the Study Groups (the terms of reference of which had been defined at Brussels) were as follows :

Study Groups

I	Telegraphy, General technique	Mr. Albanese (Italy)
II	Technical aspects of the establishment, operation and maintenance of telegraph channels	Mr. van Lommel (Netherlands)
III	Technical aspects of telegraph apparatus	Mr. Pellé (France)
IV and joint CCIT/CCIR Study Group	Phototelegraphy and facsimile	Mr. Jolley (United Kingdom of Great Britain and Northern Ireland)
VI	Vocabulary, symbols, classification	Mr. Collet (France)
VII	Technical aspects of switching in the service of start-stop apparatus	Mr. Jolley (United Kingdom of Great Britain and Northern Ireland)

VIII	European telegraph network operated by start-stop apparatus	(Interim Chairman) Mr. Besseyre, CCIT.
IX	Operational methods and quality of service	(Interim Chairmen) Mr. Besseyre, CCIT ; Mr. L. V. Lewis, General Secretariat.
X	Services offered to users and rates other than telex rates	Mr. Gneme (Italy)
XI	International service of telegraph subscribers and rates relating thereto	Mr. Perry (Netherlands)

There was no Editorial Committee.

* * *

The VIIth Plenary Assembly of the CCIT had on its agenda the normal programme of a CCI Assembly : the issuing of recommendations based on proposals submitted by the Study Groups, the choice of the studies to be pursued until the VIIIth Plenary Assembly, and the constitution of the Study Groups. It had in addition a special question to consider : the advisability of amalgamating the CCIF and the CCIT.

* * *

Progress made from 1949 to 1953¹

As regards general telegraphy, the question of telegraph distortion dominated the work of Study Group I. Up to 1948, the CCIT had been concerned solely with distortion affecting the characteristic instants of a telegraph modulation or restitution. This presupposed, of course, that the characteristic instants indicated by the code and the text to be transmitted were present in the modulation or restitution, without omission or addition. The assumption was plausible with wire telegraphy as it then was, but is untenable for wireless telegraphists. Their first concern, before studying the position of the characteristic instants of a telegraph modulation, is to know whether all the desired characteristic instants actually are present, without omission or addition.

¹ The VIIth Plenary Assembly, Arnhem, made great use of the work done by the Study Groups in Geneva (March, 1951) ; hence readers desiring a general picture of the questions considered should consult the July 1951 number of the Telecommunication Journal since, to avoid repetition, the work done in March 1951 and confirmed by the Arnhem Assembly has not been described here.

Hence the notion of defective modulation introduced into Recommendation B.1. A modulation is defective when the characteristic instants obtained do not appear in the same order as the characteristic instants desired, or, in other words, when characteristic instants disappear or are added. Obviously, we must be able to set a measurable value to defective modulation thus defined. Quantitative measurement of distortion is by no means easy; the most accurate method would be to count the characteristic instants added and the characteristic instants missing, adding the two together and finding the relation between the number thus obtained and the number of characteristic instants which, in theory, should have been present in the particular modulation. This method, however, does not seem very practical; the CCIT, therefore, went no further than to define the efficiency factor to be used in assessing how far a restitution is defective as the ratio of the number of correctly translated signals to the number of signals transmitted, the keying being correct. Question 5, however, leaves room for a revision of this definition.

Obviously, it is only after the quality index of a modulation has been estimated that additional information on the quality of that modulation can be provided by measuring the degree of telegraph distortion. The note accompanying the definition of defective modulation in Recommendation B.1. shows that defective modulation will inevitably entail false translation, whereas telegraph distortion may entail false translation according to its degree and the quality of the receiver. Here is the note:

Note: a defective modulation (or restitution) does not of itself enable the transmitted text (or texts) to be reconstituted, whereas a modulation (or restitution) which is not defective according to this definition does not necessarily permit the reconstitution of the text (or texts), this possibility depending upon the degree of distortion which the modulation (or restitution) suffers."

As the work done by Study Group II in 1951 had been very thorough, the VIIth Plenary Assembly had only slight changes to make in the proposals issued in 1951 for the maintenance of the telegraph network. Henceforward, the CCIT's activities in this connection will bear essentially on disturbance affecting telegraph channels on voice-frequency telephone circuits, carrier current or coaxial cable; such disturbance occurs so often that telegraphists (and perhaps telephonists too) have been somewhat surprised. The initiative having been taken by the CCIF, telephonists have now tackled the question seriously. Numerous statistics have been obtained, and the vibration test method of source-detection evolved by the General Post Office has already brought about an appreciable reduction in disturbance.

As regards telegraph transmission equipment, mention should be made of an inquiry into the standardization of voice-frequency telegraph equipment using frequency modulation. Until then, a good many administrations had been of the opinion that because of its high cost as compared with amplitude modulation equipment, frequency modulation equipment would have to be reserved for special cases. Manufacturers have now announced their ability to offer frequency modulation equipment at prices comparable with those of amplitude modulation equipment, with the result that administrations have been led to consider the possibilities of frequency modulation for normal voice-frequency telegraphy purposes.

* * *

On start-stop teleprinters some important recommendations were issued by the VIIth Plenary Assembly.

The CCIT had been well aware that international regulations laying down the modulation rate of start-stop teleprinters would be of considerable interest, from both the technical and the economic points of view; as early as its second meeting (Berlin, 1929), it had recommended a speed of 50 bauds. That recommendation was followed by all the administrations which then took part in CCIT activities, but the resulting standardization left untouched a big user of start-stop teleprinters—the United States. Until quite recently, this was no great disadvantage, but to-day the start-stop teleprinter service is operated across and above the oceans and TEX/TELEX subscribers can correspond with stations in Europe, on request, from New York or Washington. Adoption of a single modulation rate would have considerably simplified network switching problems. However, it has not so far been possible to reach agreement, and although Recommendation C.4 advises that apparatus incapable of complying with the recommended modulation rate of 50 bauds should be withdrawn from international service as soon as possible, Recommendation C.5 opens the door to the co-existence of several modulation rates in a preamble which deserves quotation:

"The CCIT

considering:

1. that the standardized modulation rate recommended for start-stop apparatus employed in international (including intercontinental) service is 50 bauds, in accordance with Recommendation C.4;
2. that there are nevertheless certain areas (notably in the USA) in which a different modulation rate for start-stop apparatus is employed;

3. that, even though it is recognized that universal adoption of a standardized modulation rate would be advantageous in the inter-continental service, it is not possible, at present, to secure universal adoption of a standard ;

4. that it is essential to do everything possible to facilitate the establishment of inter-continental services, notwithstanding the differences in modulation rates which may exist between the start-stop apparatus employed ;

5. that there are in existence methods, employing automatic storage equipment in the circuit, which enable start-stop apparatus having different modulation rates to inter-work."

It is certainly not without keen regret that CCIT Study Group III found itself obliged to submit this Recommendation to the Assembly for approval, but point 4 of the above preamble, the result of steady progress made by inter-continental communications, was decisive.

Mention should also be made of the fact that the stop element of the transmitting cycle of a start-stop apparatus should be equal to at least 1.4 times the unit interval. This recommendation was entailed by investigation of communications with regenerative repeaters. Hence the 7-unit cycle is no more.

Telex progress throughout the world is making the use of the automatic answer-back unit more and more necessary. Recommendation C.11 confirms that the secondary of "D" should be reserved in the international service for operating the answer-back unit.

A question which has given rise to a good deal of discussion since the Brussels meeting is an extension of the facilities offered by Alphabet No. 2, thanks to a third inversion operated by combination 32. Inquiries made of operating administrations and companies have failed to reveal any great desire for such an extension. The VIIth Plenary Assembly did not commit itself for the time being ; it made combination 32 available to administrations for their national service (Recommendation C.12), but at the same time, in Questions 35 and 36, it left the door open for a third inversion and use of combination 32 in the international service.

Study of "radio teleprinter" systems and the interworking of start-stop and synchronous systems did not lead to any definite proposals by the Assembly.

* * *

As regards facsimile equipment, Arnhem saw the first meeting of the CCIT-CCIR joint Study Group on phototelegraphy. The report submitted by this Group to the Plenary Assembly appears on page 188 of the "Documents".

As regards phototelegraph apparatus (i.e., apparatus capable of receiving half-tone pictures), the

diversity of equipment used throughout the world, the diversity of the dimensions of the pictures to be transmitted, and the widely different transmitting conditions by wire and radio make it more and more difficult to reach agreement on a single standard. Recommendation D.1, on the standardization of phototelegraph apparatus, which replaces Recommendation 681, expresses the opinion that new equipment brought into use in future should possess at least one of the groups of characteristics accepted by the CCIT. An inquiry is shortly to be undertaken to review the question of drum length (Question 48), and the CCIT has asked that a list of stations taking part in the phototelegraph service be drawn up (Recommendation D.5), in order that the whole question of drum length may be set on a firm basis.

As regards facsimile machines receiving documents in two contrasted tones only—black and white, for example—the old Question VI.8 has become Question 46, in which the use of such equipment for transmission of public telegrams, its use for transmission of commercial or business documents (in this connection it seems that there is a tendency towards the use of phototelegraph equipment), and the matter of facsimile equipment for large-size documents (maps, for example) have been made into separate questions.

* * *

Rules were defined for international telex signalling ; Recommendation E.1 states what signals are to be used, but for the constitution of the signal, in the case of four signals out of eight, no standardization could be obtained, because of the different switching systems used in national networks. However, it proved possible to classify national networks in two groups, and the types of signals which might be used by those two groups were indicated.

The use of switched regenerative repeaters raised the question of the transmission by these repeaters of switching signal pulses—a question which has a bearing on the standardization of telex dials and on the characteristics of regenerative repeaters. Since, in addition, some administrations use signals from the start-stop code emitted by the teleprinter for dialling control (thus doing away with the dial), the problem is complex and its solution had to be deferred (Questions 27, 55 and 56).

* * *

The study of the European international switched network for the public service did not make much headway between 1949 and 1953 ; it was retained and more clearly defined in Question 57. The idea of

constituting a single network for the telex service and the public service was abandoned.

* * *

In the operating field, former Recommendation 801—now F.1—was amended in such a way that the times of transmission of telegrams noted by the receiving country and classified by transmitting country are to be communicated to the transmitting country for its own information, while Study Group IX and the Director of the CCIT will review the situation periodically and recommend methods of improving transmission times.

New recommendations on operating methods are few but the volume of studies to be continued or undertaken is, on the other hand, considerable: standardization of page-printing reception in the public service (Question 58), the study of which has made great progress thanks to precise proposals from Switzerland and Sweden; the reception of telegrams on forms prepared in advance (Question 59); use of reperforators (Question 60) and the assembly, with a view to future combination, of the various service codes used internationally in both wire and radio communications (Question 61).

* * *

Recommendation G.4 proposes a new scale of charges for phototelegrams in the public service; generally speaking, these charges are higher than those in the Telegraph Regulations. In the early days of the phototelegraph service, administrations had assessed costs on the basis of an assumed volume of traffic that has not been confirmed by experience. Charges now have to be adjusted to fit the facts.

On the whole, the VIIIth Plenary Assembly of the CCIT did not take a favourable view of reductions in charges in favour of certain categories of users: although Recommendation G.5 shows that agreement could not be reached between the advocates and the opponents of a reduction for meteorological telegrams, a very large majority were unwilling to propose reductions for the lease of circuits to the meteorological service (Recommendation H.7).

The study of proposals by Portugal and Denmark for a revision of the rates for telegrams in the public service had encountered little enthusiasm in Study Group X. The tariff reforms of the 1949 Paris conference were too fresh in people's minds. But this question is never exhausted and several proposals for further study were accepted by the Arnhem Assembly—a study of rates and a study of the related question, word-counts (see Question 63).

Much was written and said on rates for the lease of transit circuits to administrations. The question

is still being studied and is of great topical interest (Questions 64, 65 and 67).

The VIIIth Plenary Assembly did not deal with Resolutions 8 and 11 of the Paris Conference concerning telegraph traffic to be routed over the fixed telecommunication network of the aeronautical service except to take note of Administrative Council Resolution 284 (Arnhem Documents, page 189) which, in effect, takes the study of this matter out of the hands of the CCIT Study Groups.

* * *

Certain details were amended in the Recommendation which acts as the Telex Regulations (Recommendation H.1); the provisional recommendation issued in 1951 concerning the lease of circuits to replace Resolution No. 9 of the Paris Conference (1949) was confirmed, which does not mean that discussion of the matter is now closed: Question 73 requires the study of the retransmission of messages, multiple lease charges, reductions for the lease of several circuits to the same user, etc.

As regards telex, attention was turned to improving the speed of the service (Questions 74, 75, 76), settling the accounting problems raised by the use of auxiliary and emergency routings and by the use of automatic dialling (Questions 77, 78, 79, 81). Lastly, a study of the costs of telegraph circuits and telex calls was asked for, with a view to a possible revision of telex charges and leasing rates (Questions 71, 72).

* * *

The CCIT VIIIth Plenary Assembly gave much consideration to the question of telegraph statistics. The General Telegraph Statistics prepared annually by the ITU General Secretariat are somewhat confused in Part III (telegraph network) and Part V (apparatus) and in addition give a wrong idea of telegraph traffic: in actual fact, they merely cover that part of the traffic which is now becoming more and more widely known as public traffic (see draft definition, Arnhem Documents, page 219): the considerable expansion of telex networks and leased circuits is causing a continuous drop in public traffic, clearly shown in the General Statistics which, on the other hand, entirely ignore the increase in traffic between telex subscribers and over leased circuits.

The CCIT was thus called upon to study the revision of these General Statistics (Question 62); in the meantime it recommended the preparation of statistics for the telex service (Recommendation H.4) and advocated the study of how to prepare a descriptive list of telex circuits (Question 78).

* * *

The Arnhem Assembly took advantage of the experience gained since 1949 to improve the working methods of the Plenary Assembly and the Study Groups (Recommendation A.1) and to review the publication of CCIT documents (Recommendation A.2). It thoroughly revised the graphical symbols used in telegraphy—a revision that was necessary, as the symbols in use dated back to 1935 (Recommendation I.4). An interesting new Recommendation is to be found in Section B of the Annex to Recommendation I.4. It deals with the representation of the two positions in a two-condition telegraph system: rejecting the old expressions start, stop, mark and space which led to considerable confusion and refusing to use the signs 0 and 1, often used by specialists in binary calculations and equally liable to lead to confusion, the Assembly recommended the use of the letters A and Z, A (first letter of the alphabet) being the position which corresponds to the start signal of a standardized start-stop apparatus and Z (end of the alphabet) being the position corresponding to the stop signal.

On the other hand, for the definitions of terms used in telegraphy, the Assembly followed Study Group VI with caution and the definitions prepared by that Study Group were booked for subsequent study (Questions 50 and 51).

Amalgamation of the CCIF and the CCIT

As the outcome of Resolution No. 2 of the Buenos Aires Plenipotentiary Conference, the agenda of the CCIT VIIth Plenary Assembly included the detailed study of the possibility of amalgamating the CCIT and the CCIF and the issue of a Recommendation on the subject for the next telegraph and telephone administrative conference.

A detailed account of the relevant discussions and the texts of the resolution adopted with the reports annexed to the resolution are published in the "Documents of the VIIth Plenary Assembly of the CCIT". The final resolution, adopted by 16 votes to 11, states that amalgamation would not be in the best interests of the Union but shows what precautions should be taken to provide the maximum safeguard for telegraphy if the amalgamation were to take place in spite of the opinion of the CCIT.

In favour of the resolution, i.e., *against* amalgamation: 16 delegations:

Australia, Austria, Belgium, Cambodia, Canada, China, Spain, United States of America, France, Japan, Luxembourg, New Zealand, Netherlands, Portugal, United Kingdom, Switzerland.

Against the resolution, i.e., *in favour* of amalgamation: 11 delegations:

P.R. of Bulgaria, Denmark, Italy, Ireland, Norway, Federal German Republic, FPR of Yugoslavia, Roumanian PR, Sweden, Turkey, USSR.

Abstention: 1 delegation:

Union of South Africa.

Attention should also be drawn to the fact that the VIIth Plenary Assembly studied this matter of amalgamation with great thoroughness. Practically all the delegations expressed their views and since one of the arguments often brought forward in favour of amalgamation was the saving that would be effected in the combined expenses of the CCIF and the CCIT and the simplification of the work which would arise from the amalgamation of Study Groups dealing with related questions, the Assembly set up two working groups.

Group A had to examine the studies one by one to find out whether there was any overlapping as between the CCIF and the CCIT—they found none. Some studies had both telegraph and telephone aspects (e.g. maintenance and establishment of networks) but arrangements for the requisite collaboration had already been made by the Directors of the CCIF and the CCIT.

Group B had to study the financial effects of amalgamation and reached the conclusion that amalgamation would mean additional expenditure.

It is interesting to note that the CCIT Plenary Assembly had instructed the Interim Director to study whether, under the Buenos Aires Convention, specialized telegraph Plenary Assemblies could, if necessary, be held in case of amalgamation. The Interim Director's report, approved by the Plenary Assembly (Arnhem Documents, page 193), concluded in the affirmative.

* * *

The VIIth Plenary Assembly kept the same Study Groups that had been working between Brussels and Arnhem. Study Group V (Protection) was definitely abolished. The Chairmen and Vice-chairmen of the Study Groups were nominated in a personal capacity by application of Chapter 15 of the General Regulations annexed to the Buenos Aires Convention.

Lastly, the VIIth Plenary Assembly decided on a new classification of CCIT Recommendations.

The Recommendations were classified in groups and given index letters as follows:

- A Organization of the CCIT and procedure
- B Transmission
- C Alphabetic telegraph apparatus

- D Facsimile
- E Telegraph switching
- F Working methods
- G Regulations and tariffs
- H Telex service and leased circuits
- I Vocabulary, symbols, definitions, etc.

In each group the Recommendations bear numbers from a continuous series according to the date of their issue ; the serial number is preceded by the group index letter.

* * *

Finally, before dispersing, the VIIth Plenary Assembly proposed that the VIIIth Assembly should meet in Geneva during the first half of 1956.

* * *

There is no denying that during the first three weeks at Arnhem delegates had plenty of work to

do ; fortunately, however, the Administration of the Netherlands provided some very pleasant outings. During these hours of relaxation, the delegates were free to admire the artistic wealth, the technical resources and the attractive landscape of Holland. It was even the right season to appreciate the Dutch gastronomic specialities (I am thinking particularly of the arrival of " new herring ").

But the work going on in the streets of Arnhem and the huge stretches of waste land reminded delegates that the war had swept over the fair features of the Arnhem countryside ; the strenuous efforts of the Dutch people to overcome the ravages of war, together with the catastrophe that had befallen them only a few months before the meeting, were plain for all to see and constitute not the least among the lessons that could be learned at the VIIth Plenary Assembly of the CCIT.

J. Besseyre.

Colour Television in the United States of America

Editorial note. — *The following information, taken from an announcement by the Federal Communications Commission, Washington, constitutes a sequel to the series of articles on colour television in the United States, which appeared in the Telecommunication Journal*¹, December and January numbers.

Compatible color television is being made possible by action of the Federal Communications Commission in adopting the new color transmission standards which were developed and advocated by industry through its National Television System Committee.

The changed standards will go into effect shortly (30 days after publication in the Federal Register). However, the advent and extent of TV reception in color depends upon the availability of color transmitters and receivers as well as color programs.

The Commission finds that the NTSC specifications "provide a reasonable basis for the development of a color television service in the public interest". Accordingly, they are being substituted for the noncompatible system approved in 1950 as the best of three systems then proposed, but which has not since been exploited.

At that time the Commission stated that if a satisfactory compatible system had been available it would have been adopted. The NTSC, which is an association of technicians representative of many manufacturers of TV equipment, has since been evolving and testing improvements. As a result, a compatible process is now replacing the noncompatible system.

"The accomplishment of a compatible color television system that can operate within a 6 megacycle bandwidth is a tribute to the skill and ingenuity of the electronics industry", says the Commission in its covering report and order. "The proposed color television signal specifications produce a reasonably satisfactory picture with a good overall picture quality" and are sufficiently flexible to accommodate later improvements and refinements. Also, "color pictures can be transmitted satisfactorily over existing intercity relay facilities, and improvements in intercity relay facilities may be reasonably anticipated".

This achievement by industry's cooperative effort extending over a period of more than two years has been made possible by utilizing the most advanced techniques in optics, mechanics and electronics. While the complexity and intricacy of the NTSC specifications present some initial disadvantages, the

Commission relies on industry's representations that they are "equipment limitations" and not necessarily inherent "system limitations". Accordingly, it is adopting them on the basis of the following factors:

First, "there is overwhelming support" for them; "there is virtual unanimity" that they "are fundamentally capable of producing satisfactory color television pictures", and "there is also substantial agreement" that they "have a potential for growth".

Second, they "will furnish an incentive and stimulus to manufacturing and research organizations to devote their efforts to the equipment problems"; that "history has demonstrated that American industry is capable of devising practical and economical equipment on a mass production basis"; and that the Commission has "the assurance of the industry that the enormous engineering and production ingenuity at their command will be focused on these remaining problems".

Third, they "are broad enough to permit considerable latitude to competing companies in the future development of more economical and efficient equipment", without affecting the future compatibility of the more than 27 million TV receivers now in use.

Fourth, the compatible system "will afford the consumer a greater degree of freedom than would an incompatible system in choosing whether or not to purchase a color receiver . . . since the public will, in any event, continue to receive the program material in monochrome".

Adoption of the new standards does not mean that color reception by the general public will be possible immediately. Not only will broadcasters require special transmitting and other equipment, which is not now available in quantity, but color receivers, too, will have to be manufactured, distributed, and placed on sale.

All this will require time. How long it will take depends upon how quickly manufacturers can tool up and get into production, and how soon color programs appear on the air in sufficient number to induce TV viewers to buy the special sets necessary to receive them in color.

¹ *Telecommunication Journal*, 1953, page 194e; 1954, page 16e.

But meanwhile, existing TV sets, in addition to continuing to receive monochrome transmissions, will be able to receive color programs in black-and-white without change or other adjustment to the receivers. Also, color receivers, when available, will be able to receive monochrome transmissions in black-and-white.

The new standards make it possible to keep compatible color transmission within the framework of the black-and-white service. Also, they are suitable for and make no differentiation between VHF and UHF color operation. In other words, the television standards as now augmented cover both color and monochrome transmission and are elastic enough to take care of improvements in either as time goes on.

A detailed description of the new color system is attached to the Commission's report and order (Docket 10637).

Being more complicated, color receiving and transmitting apparatus will naturally cost more than monochrome equipment, and require finer adjusting and more frequent servicing. Mass production can be expected to lower the cost of color TV receivers. (The estimated retail price of initial receivers will be from \$800 to \$1,000, with the cost to manufacturers of a color tube with a viewing surface approximating that of a 12-inch monochrome tube at between \$175 and \$200.)

By the same token, the additional susceptibility of the color receiver to interference, and its own sub-carrier radiation, will require close attention in receiver and transmitter design to minimize the interference problem.

Thus, observes the Commission, the new color specifications afford both an opportunity and a challenge to industry.

BOOK REVIEW

News Agencies, their Structure and Operation ¹

This work has recently been published by UNESCO in English and French editions. Its object may be gathered from the following two extracts from the Foreword of the English edition:

"The Constitution of Unesco states that the organization will 'collaborate in the work of advancing the mutual knowledge and understanding of peoples, through all means of mass communication'. Thus the Organization was doing no more than carry out one of its fundamental obligations, when it set itself, from its inception, to study the problems involved in the transmission of news and the informing of public opinion. If the free flow of information and ideas is to be ensured, the progress which has been achieved in the field of technology, and which has made possible the faster and fuller transmission of news must be utilized to serve an ever greater part of mankind."

.....

"For the man in the street, his sources of news lie in the newspaper, the radio, the newsreel and the documentary, but a special study was needed to examine the way in which the raw news material reaches these media and to understand the functioning of national and world news agencies and the relations between them."

* * *

The book has been devoted to what are known as "telegraphic news agencies" and thus it has a considerable interest to those concerned in the administration and operation of telecommunication services. This is particularly true of three of the seven chapters dealing respectively with Telecommunication and the Transmission of News (IV), The International Regulation of press messages (V), and News Agencies and Radio Broadcasting (VI). The chapters less directly concerned

¹ *English edition*: One volume, paper covers; pp. 208; tables, 5 folding maps and partly folding diagrams; 27 x 21 cm; published by UNESCO, Paris; 1953. Price 3.50 dollars; 21s.; 1000 French francs.

with telecommunications, which deal with the history, organization and scope of News Agencies—national and "world"—contain much detailed information of general interest. In particular, the final chapter, entitled "How the general public in each country receives its news", gives food for thought to all readers of the press.

The Foreword contains a gracious acknowledgment of assistance received from the General Secretariat of the ITU and the directors of news agencies.

The character of the work is essentially documentary as distinct from polemical.

The special significance of the book for the ITU is perhaps the fact that it is one of three recent publications which serve to focus attention on the telecommunication aspect of press activities. The other two are the Report by Mr. Salvador P. López, Rapporteur on Freedom of Information, submitted to the Economic and Social Council and the work of Mr. Francis Williams entitled "Transmitting World News" which was reviewed in the *Telecommunication Journal*.²

Both of these works make reference to the possibilities of widening press telecommunication facilities by means of action which might be taken at the next Telegraph and Telephone Conference. In this connection Chapter V of the book reviewed in the present note is of special interest since it shows how these facilities have already been developed by successive conferences of the ITU. Incidentally Chapter 4 contains a statement to the effect that reduced internal telephone press rates had been created in the United States of America. This would appear to be due to a misunderstanding. It is understood that there are no reduced internal telephone press rates in the United States and that the position will be made clear in future editions of the book.

The appendix reproduces the provisions regarding press telegrams contained in the London 1903 and Paris 1949 revisions of the International Telegraph Regulations and it will perhaps suffice to refer to restrictive provisions of the 1903 Regulations which have since disappeared. These Regulations were applicable solely to the European system and they laid down that press telegrams could only be handed in during certain allotted hours and that except by special arrangement they would be transmitted only between the hours of 6 p.m. and 9 a.m.

² *Telecommunication Journal*, No. 8, August 1953, p. 122e.

NOTES AND NEWS

International Telecommunication Convention (Buenos Aires, 1952). — The Government of the Republic of El Salvador has acceded to the International Telecommunication Convention (Buenos Aires, 1952). The instrument of accession, dated 23 December, 1953, was on 6 January, 1954, deposited with the General Secretariat.

(Source : *Official communication*)

International Telegraph Consultative Committee. — The *Manufacture belge de lampes et de matériel électronique* Company (electronic valves and equipment) has expressed the wish to participate, in an advisory capacity, in the work of CCIT Study Groups II, III, and VII. The Belgian Administration has given its consent.

— The following French manufacturing concerns have expressed a wish to participate, in an advisory capacity, in the work of certain CCIT Study Groups :

Société d'Applications générales d'électricité et de mécanique, Paris ;

Société anonyme des Lignes télégraphiques et téléphoniques, Conflans-Sainte-Honorine (Seine-et-Oise) ;

Compagnie industrielle des téléphones, Paris ;

Etablissements Edouard Belin, Rueil-Malmaison (Seine-et-Oise) ;

Société anonyme « Les Téléimprimeurs », Paris ;

Société anonyme « Le Matériel téléphonique », Boulogne-Billancourt (Seine) ;

Société anonyme de télécommunications, Paris.

The French Administration has given its consent.

— The Olivetti Company has expressed a wish to participate in CCIT activities. The Italian Administration has given its consent.

(Source : *Official communications*)

Technical Assistance. — *Ethiopia.* — The Government of Ethiopia has selected the following three experts as instructors at the Telecommunications Institute, Addis Ababa :

Mr. A. Spälti (Switzerland), who will be Director of the Institute, will at the same time be in charge of instruction in wire telecommunication.

Mr. P. M. Eldridge (Canada) and Mr. P. R. Wharton (Canada) will be radio instructors.

Malaya. — Mr. A. J. Edwards (United Kingdom of Great Britain and Northern Ireland) has been appointed very-high-frequency radio expert by the Government of Malaya.

(Source : *Official communications*)

International Congress on Sound Recording Processes and their Extension to the Recording of News. — This congress, to meet in Paris from the 5th to the 10th of April, 1954 (organized by the French Radioelectricians'

Association, Malakoff, Seine, France), will discuss the following subjects :

Basic techniques used : mechanical, photographic, magnetic recording, etc. ;

Applications : records, cinema, broadcasting, television, memory devices, electronic calculators, accounting and statistical machines, automatic telephone devices, etc. ;

Recent developments in the materials or products used : photographic emulsions, magnetic products (ferrites, ferro-crystals), semi-conductors (germanium or silicon diodes or triodes).

A public exhibition of equipment will enable a comparison to be made between the various French and foreign products in this field.

(Source : *Radio Technical Digest*)

Administrative Changes. — *Saudi Arabia.* — A Ministry of Communications has been set up in Saudi Arabia, comprising the Department of Posts, Telegraphs and Telephones, the Broadcasting Department (Technical Section), the Department of Roads and Public Works, and the Railway Department.

His Royal Highness Prince Talal has been appointed Minister of Communications.

— *Laos.* — His Royal Highness Prince Chantharangsi was on 1 February, 1954, appointed Director of the National Posts and Telecommunication Administration of Laos. On that same date, Mr. Henry Bouchon took up his duties as Counsellor to the Minister of Posts and Telecommunications.

— *United Kingdom of Great Britain and Northern Ireland.* — Mr. R. J. P. Harvey, C.B., Director of Radio and Accommodation, has succeeded Col. A. H. Read, C.B., O.B.E., T.D., D.L., Director of Overseas Telecommunications, who retired on 31 January, 1954. Mr. Harvey has also taken over Col. Read's duties in connection with matters relative to United Kingdom Membership of the Union.

— *Turkey.* — Mr. Arif Demirer, Assistant Secretary-of-State in the Ministry of Communications, has been appointed Director General of Posts, Telegraphs and Telephones, in succession to Mr. Orhan Kubat, who has been transferred to other duties.

(Source : *Official communications*)

De Luxe Telegrams. — The Administration of the French Protectorate of Morocco has announced that *de luxe* telegram facilities are not available in relations with the Moroccan Office in Tangier.

— *De luxe* (= LXDEUIL =) telegram facilities are again available in the Federal German Republic, in relations with all countries which have made reciprocal arrangements with the Federal Republic for such facilities.

(Source : *Official communications*)

Telecommunication Network. — A direct radiotelephone circuit between Lisbon and Bissau (Portuguese Guinea) was opened on 11 January, 1954.

— Sweden has opened the following communications : A telephone communication with Buenos Aires radio on 1 January, 1953 ; Telex communications with Poland via Berlin East, on 1 December, 1953, with Tokyo radio on 25 July, 1953, and with Austria on 1 December, 1953. In addition, a new telegraph circuit Malmö-Hamburg was opened on 10 July, 1953.

(Source : *Official communications*)

United Kingdom Telecommunications Statistics. — In the three months, ending on 30 September 1953, there were 102 000 new demands for telephone service (the highest quarterly figure for over two years) and 99 000 new subscribers' exchange connections were installed. The number of shared service connections at 30 September was 663 000 compared with 625 000 at 30 June.

The number of telephones in service at the end of the period was 6 052 000, a net increase during the quarter of 64 000 (including an increase of some 580 public call offices). The number of outstanding applications was 384 000, representing a decline in the quarter of some 24 000.

72 100 000 inland trunk calls were made of which 19 273 000 (some 27 per cent) were at the cheap rate. In the corresponding quarter of the previous year the figures were 68 005 000 and 17 998 000 (some 26 per cent) respectively.

The number of inland telegrams (excluding Railway and Press) amounted to 9 409 000 including 1 727 000 (18 per cent) greetings telegrams. In the same quarter of 1952 the figures were 9 961 000 and 1 712 000 (17 per cent).

At the end of September, 1953, there were 47 926 telephonists, 9 019 telegraphists and 54 915 engineering workmen employed. The corresponding figures for September, 1952, were 48 361, 9 630 and 54 459.

(Source : *Post Office Telecommunications Journal*)

Sale of telephone and telegraph facilities in British Columbia. — The sale of the Canadian government telephone and telegraph facilities in British Columbia to the Canadian National Telegraph Company and the British Columbia Telephone Company has been approved by the Cabinet in Ottawa. Each company will pay \$750 000 for the facilities. The system comprises 18 000 miles of line to farflung points linking 167 communities with the outside world. The system also includes 3 200 miles of line serving Vancouver Island and the lower mainland.

(Source : *Wire and Radio Communications*)

Change of the name of a Telephone Company. — The Mutual Telephone Company, which operates communications services throughout the six Hawaiian Islands, changed its name on 1 February 1954 to the Hawaiian Telephone Company. The change of the name was to be marked by a brief and appropriate ceremony at the company headquarters in Honolulu.

The history of the telephone in Hawaii goes back to 1878. Two years after Alexander Graham Bell's invention, Senator Charles H. Dickey of Haiku, Maui, had a

pair of instruments installed to connect his home with his store, a few hundred yards away. A year later, the first telephone exchange, capable of handling 50 lines, was set up in Kahului, Maui. After its charter from King Kalakaua on 16 August 1883, with a \$30 000 capitalization, owned by 202 stockholders, the Mutual Telephone Company began operations with 100 subscribers in competition with the Hawaiian Bell Company in Oahu, which had no connection with the mainland Bell System and which had been founded in 1880. In 1894, the Mutual Company acquired control of Hawaiian Bell. By 1929, six other companies were consolidated with the Mutual Company, which linked the separate systems on each island into a unified network.

At present the company serves more than 125 000 telephones. The 100 000th telephone was installed three years ago.

The system of the company is today more than 95 % dial and plans are under way to convert all telephones in the Islands to dial in the next three years. The dial system was introduced in Honolulu in 1910.

(Source : *Telecommunications Reports*)

The telephone service in Nyasaland. — The inter-territorial trunk telephone service has now been extended to Namitete in Nyasaland.

Beginning on 17 January 1954, the Sunday radiotelephone service is now available from subscribers in Nyasaland to Beira, via Salisbury. The hours of service are the following : 10-11.30 a.m. (South African Time).

The telephone service is now available to Kasupe (Nyasaland), via Zomba.

(Source : *Official Communications*)

Automatic trunk telephony in Sweden. — Automatic switching first appeared in Swedish trunk telephony in 1940, when the system was introduced in the three neighbouring circuit groups at Borås, Kinna, and Svenljunga. These networks provided a testing ground for observations as to the advisability of introducing automatic switching in areas of some size.

The first step towards the introduction of automatic switching in the major trunk channels was taken in 1949, when the system was adopted for traffic between the Norrköping and Linköping groups of networks. Later the system was extended to a number of other trunk channels, so that, to-day, automatic switching is used in some 1300 trunk circuits in more than 50 major relations, among them those between Stockholm and Örebro, Göteborg and Borås, and Malmö and Hälsingborg.

In most cases, introduction of this system caused a considerable rise in traffic. The number of calls increased by 50 to 100 %, whereas the average duration of calls diminished by 10 to 20 %.

Moreover, the automatic system has led to a reduction in the charges to be paid by subscribers. At the present time the country is divided up, for charging purposes, into sectors, and, from the point of view of automatic switching, into groups of networks. A charging sector may comprise one or several groups of networks. The charge for a call between two charging sectors depends on the distance between the charging centres of those sectors.

In the manual switching system, the three-minute unit charge is determined as follows :

For distances of : km	Crowns
45	0.30
46 to 90	0.50
91 to 180	0.80
181 to 270	1.10
271 to 450	1.40
Beyond 450	1.70

For automatically switched calls, the charge is determined by meters connected to the subscribers' lines. The meter of the calling subscriber is put forward by an amount depending on the distance between his charging centre and that of the subscriber called. Thus, for distances for which, with manual switching, the unit charge is 0.30, 0.50, and 0.80 crowns, the meter advances a step every 45, 24, and 15 seconds respectively. Every time the meter goes forward a step, 0.06 crowns are debited to the subscriber.

Hitherto automatic switching has been introduced in trunk relations only for which, with manual switching, the unit charge was between 0.30 and 0.80 crowns, and it is planned, in the first place, to render automatic all traffic in this category (some 73 % of total Swedish trunk traffic). However, plans are afoot to introduce the automatic system also in longer channels carrying a great deal of traffic, for example, that between Stockholm and Göteborg, 465 km. long. It is estimated that some 3.5 million crowns a year have so far been saved in staff expenses by the introduction of automatic switching.

(Source : *Official communication*)

The first transatlantic telephone cable. — As announced on 1 December 1953 in Canada, the United Kingdom and the United States of America, an agreement for the provision of the first transatlantic telephone cable has been signed by the United Kingdom Post Office, the American Telegraph and Telephone Company and the Canadian Overseas Telecommunication Corporation.

It is hoped to publish further information about this important development in later issues of the *Telecommunication Journal*.

(Source : *Post Office Telecommunications Journal and Wire and Radio Communications*)

Broadcasting in Finland. — At the end of 1953, there were 905 317 radio receivers in Finland, as against 853 101 in 1952—an increase of 52 216.

(Source : *Official communication*)

Television in Italy. — Italian television was officially inaugurated in Milan, Turin and Rome, on 3 January, 1954, after twenty months of experimental transmissions. The three ceremonies were televised.

Provisionally, there are 35 hours of television programme a week. There will be no commercial television for at least a year, but commercial television may perhaps be introduced later, when television has acquired a larger audience. Television services will be financed by a licence fee (15 000 lire per year per receiver) and by the licence fee for commercial sound broadcasting.

(Source : *EBU Bulletin*)

Broadcasting and television subscribers in Switzerland. — At the end of January, 1954, there were, in Switzerland, 1 163 484 radio receivers, of which 228 976 belonged to wire-relay subscribers. There was an increase of 5 411 sets in January, 1954.

At the end of January, there were 1200 television subscribers, an increase, during the month, of 280.

(Source : *Official communication*)

The Experimental Television Centre, Geneva. — The City of Geneva has been granted an official licence by the Swiss PTT Administration for cantonal television transmissions, the transmitter for the public trials being installed in the Villa Mon-Repos.

At the end of November last, this Centre was exhibited to the authorities and to the press.

The Genevese studio will operate in accordance with real old Swiss tradition, offering original contributions from the various parts into which the country, linguistically, is divided. The Dôle transmitter will not be ready for use before the beginning of 1955, so that the autonomous Genevese experiment is likely to last at least a year.

(Source : *EBU Bulletin*)

Television in Czechoslovakia. — An important step forward for Czechoslovak television was realized on 1 May, 1953, when, as an experiment, a television transmitter was brought into service (625-line transmission). Transmissions have proved of excellent quality and there is considerable public interest in them. Transmitter and receivers are products of Czechoslovak industry.

(Source : *Official communication*)

General Secretariat publications. — The ITU General Secretariat has just published Table C (Rates in the European System), 2nd edition, 1954¹, together with Booklet No. 2 of the Summary of Monitoring Information received by the IFRB for the period August to October, 1953 (trilingual edition in English, French, and Spanish)².

¹ Price : 0.85 Swiss francs, carriage included.

² Price : 9.75 Swiss francs, carriage included.

WORKS RECEIVED

International Telex Service — Annuaire international Téléx — Internationales Fernschreiber-Verzeichnis, 2nd edition.¹

Cours sur les ondes ultra-courtes. Théorie élémentaire et applications des ondes métriques, décimétriques, centimétriques, by Y. PLACE. (Cours professionnels des postes, télégraphes et téléphones.) [*Course in ultra-short waves. Theoretical elements and applications of metric, decimetric and centimetric waves* (PTT training courses).]²

Les lignes à retard et leur utilisation, by G. POTIER. (Collection technique et scientifique du CNET.) [*Delay lines and their uses*. (Technical and scientific collection of the CNET).]³

Traité de L 43. Livre I: Les communications locales (Circuits du Central automatique de Tunis Angleterre), by G. ALTIER. [*Treatise on L 43. Book I: Local communications (Circuits of the automatic exchange Tunis Angleterre)*.]⁴

United Nations. Laws and practices concerning the conclusion of treaties: with a select bibliography on the law of treaties. (United Nations legislative series.)⁵

United States. FCC. Statistics of the communications industry in the United States for the years 1948, 1949, 1950.⁶

Ocean electronic navigational aids. Loran, radiobeacon, and radar beacon systems and Loran, radio-direction finder, and radar ship equipment. Revised edition (1949).⁷

¹ One volume, half-cloth; pp. 756 + 16*; map; 24 × 21 cm; Telex-Verlag Jaeger & Co., Darmstadt and Verkehrs- und Wirtschaftsverlag AG., 18 Talstrasse, Zurich I; 1953; price 25.50 German marks, 25.50 Swiss francs, 7.50 dollars.

² One volume, paper covers; pp. 185; illustrated; tables, formulae, diagrams; 25 × 16 cm; Eyrolles, 61, bd Saint-Germain, Paris 5^e; 1953; price 1300 French francs.

³ One volume, paper covers; pp. viii + 102; tables, formulae, diagrams; 30 × 21 cm; Gauthier-Villars, 55 quai des Grands-Augustins, Paris; 1953; price 1500 French francs.

⁴ Two volumes, paper covers; diagrams; 26 × 21 cm; PTT Office, Tunis (no date); price 500 French francs.

⁵ One volume, paper covers; pp. xi + 189; 23 × 15 cm; United Nations, New York; 1953 (United Nations publication. Sales No. 1952.V.4); price 3 dollars, 22s.6d., 12 Swiss francs.

⁶ Three volumes, cloth bound; tables; 23 × 15 cm; Washington, 1950-1952; for sale by the Superintendent of Documents, US Government Printing Office; price 50 cents.

⁷ One volume, paper covers; pp. iii + 73; illustrated; maps; 23 × 15 cm; US Coast Guard, 1949; for sale by the Superintendent of Documents, US Government Printing Office, Washington 25, D.C.; price 50 cents.

Simplified drafting practice: a modern approach to industrial drafting, by W. L. HEALY and A. H. RAU.⁸

Microwave theory and techniques, by H. J. REICH, Ph. F. ORDUNG, H. L. KRAUSS and J. G. SKALNIK.⁹

Introduction to solid state physics, by Ch. KITTEL.¹⁰

Simultaneous linear equations and the determination of Eigenvalues.¹¹

Very high-frequency techniques, vol. I-II. Compiled by the staff of the Radio research laboratory, Harvard University. Edited by Herbert J. REICH.¹²

Waveguide handbook. Edited by N. MARCUVITZ. (Massachusetts Institute of Technology. Radiation laboratory series, 10.)¹³

Probability and information theory, with application to radar, by P. M. WOODWARD. (Pergamon science series. Electronics and waves.)¹⁴

The flow of the news.¹⁵

Weltposthandbuch (Brüssel). [International Postal Handbook (Brussels)].¹⁶

⁸ One volume, cloth bound; pp. vii + 156; illustrated; diagrams; 28 × 22 cm; John Wiley & Sons Inc., 440 Fourth Avenue, New York 16; 1953; price 5 dollars, 26 Swiss francs.

⁹ One volume, cloth bound; pp. xiii + 901; illustrated; tables, formulae, diagrams; 23 × 16 cm; D. van Nostrand Company Inc., 250 Fourth Avenue, New York 3; 1953; price 12.50 dollars, 62.50 Swiss francs.

¹⁰ One volume, cloth bound; pp. xiii + 396; illustrated; tables, formulae, diagrams; 23 × 15 cm; John Wiley & Sons Inc., 440 Fourth Avenue, New York 16; 1953; price 7 dollars, 36.40 Swiss francs.

¹¹ One volume, cloth bound; pp. 126; tables, formulae, diagrams; 26 × 20 cm; US National Bureau of Standards; 1953; for sale by the Superintendent of Documents, US Government Printing Office, Washington 25, D.C.; price 1.50 dollars.

¹² Two volumes, cloth bound; illustrated; tables, formulae, diagrams; 23 × 15 cm; Mc Graw-Hill Book Company Inc., 330 West 42nd Street, New York 36; 1947; price 14 dollars.

¹³ One volume, cloth bound; pp. xiv + 428; tables, formulae, diagrams; 23 × 15 cm; McGraw-Hill Book Company Inc., 330 West 42nd Street, New York 36; 1951; price 7.50 dollars.

¹⁴ One volume, cloth bound; pp. x + 128; tables, formulae, diagrams; 22 × 14 cm; Pergamon Press Ltd., 242 Marylebone Road, London, N.W.1; 1953; price 21s.

¹⁵ One volume, paper covers, pp. xi + 266; tables; 24 × 16 cm; International Press Institute, Münstergasse 9, Zurich I; 1953.

¹⁶ One volume, cloth bound; pp. 525; tables, facsimiles; 30 × 22 cm; Ministry of Posts and Telecommunications, Frankfurt-am-Main; 1953.

Calendar of recent and forthcoming conferences or meetings held under the auspices of the ITU

<i>Date</i>	<i>Title</i>	<i>Place</i>
1954		
1 May	ITU Administrative Council (9th session)	Geneva
	—————	
	International Telephone Consultative Committee (CCIF) :	
17-29 May	Study Group for International Semi-Automatic Telephone Trials	} Geneva
31 May-3 June	Sub-Committee on Rapid Operating Methods	
1-15 September	Joint Group for the General Trunk Switching Programme	
1-15 September	Joint Meeting of Study Groups 6 and 8 and of the Permanent Maintenance Sub-Committee	
16 September-2 October	Study Group 4, then Study Group 3, then Study Group 5	
16 September-2 October	Permanent Maintenance Sub-Committee, then Study Group 8, then Study Groups 1 and 2	
16 September-2 October	Meeting of Study Groups 6 and 7, then Symbols Committee and Vocabulary Committee	
4-13 October	XVIIth Plenary Assembly	
14-20 October	Permanent Maintenance Sub-Committee—preparation of a programme for periodical maintenance of European international circuits, 1955	