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INTERNATIONAL TELEGRAPH CONSULTATIVE COMMITTEE

C.C.I.T.

DOCUMENTS

of the

VIIIth PLENARY ASSEMBLY

(GENEVA, 1956)

LIST OF PARTICIPANTS

EXTRACTS FROM MINUTES OF PLENARY MEETINGS

RECOMMENDATIONS ISSUED BY THE C.C.I.T.

REPORTS AND RESOLUTIONS

INTERNATIONAL TELECOMMUNICATION UNION

FEBRUARY 1957

INTERNATIONAL TELEGRAPH CONSULTATIVE COMMITTEE
C.C.I.T.

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The Study Groups considered that certain extracts from memoranda, notes, comments, etc., ought to be published. Proposals in this sense were made to the Plenary Assembly. In cases where such proposals were adopted, the texts in question have been added hereinafter to the texts of Recommendations.

Other extracts from preparatory documents, which are of permanent interest or are necessary for the continuation of studies, will appear in a Supplement, to be issued separately.

INTERNATIONAL TELECOMMUNICATION UNION

FEBRUARY 1957

INDEX

Organization of the C.C.I.T. VIIIth and last Plenary Assembly	4
List of participants	5
Extracts from minutes of Plenary Meetings	15
1st Plenary Meeting	15
2nd Plenary Meeting	17
3rd Plenary Meeting	18
4th Plenary Meeting	21
5th Plenary Meeting	23
6th and last Plenary Meeting	25
Report on the activities of the C.C.I.T. by the Interim Director	29
Report by the Finance Committee on the extraordinary expenses of the C.C.I.T.	34
C.C.I.T. Recommendations and Resolutions	39
Numbering of Recommendations and Resolutions	39
Index of contents	39
Text of Recommendations	
A	44
B	45
C	93
D	115
E	129
F	139
G	173
H	192
I	227
List of documents of the VIIIth Plenary Assembly.	245

Note : Questions, the study of which is to be undertaken or is to continue as a result of decisions taken by the VIIIth Plenary Assembly, are contained in the Documents of the Ist Plenary Assembly of the C.C.I.T.T. (*Red Book*).

ORGANIZATION OF THE C.C.I.T. VIIITH PLENARY ASSEMBLY

(Geneva, November-December 1956)

From Thursday, 22 November, to Friday, 7 December : meetings of C.C.I.T. Study Groups.

From Saturday, 8 December, to Friday, 14 December : meetings of the Plenary Assembly and of its Committees.

All meetings were held in the

SALLE DU CONSEIL GÉNÉRAL (Bâtiment électoral), IN GENEVA.

The Chairman of the VIIIth Plenary Assembly was Mr. Wyss of the Swiss Delegation with Mr. Connelly (Canada) and Mr. Kayata (Lebanon) as Vice-Chairmen.

The following delegates took the chair at meetings of Committees and Study Groups :

Plenary Assembly Committee

Budget : Mr. Knaf (Luxembourg)

Study Groups

I	Mr. Albanese (Italy).
II	Mr. van Lommel (Netherlands).
III	Mr. Pellé (France).
IV and C.C.I.T./C.C.I.R. Joint Committee . .	Mr. Jolley (United Kingdom of Great Britain and Northern Ireland).
VI	Mr. Collet (France).
VII	Mr. Jolley (United Kingdom of Great Britain and Northern Ireland).
VIII	Mr. Weninger (Austria).
IX	Mr. Wyss (Switzerland).
X	Mr. Gnome (Italy).
• XI	Mr. Perry (Netherlands).

LIST OF PARTICIPANTS TO THE VIIITH PLENARY ASSEMBLY OF THE C.C.I.T.

The letter P indicates participation in Plenary Sessions.

A roman number I, II, III, IV, VI, VII, IX, X or XI indicates participation in Meetings of that Study Group.

A. Administrations

AUSTRALIA (Commonwealth of)

M. L. M. HARRIS Head of Delegation	P	Sectional Engineer, Long Line Section, Engineering services Division, Central Office, P.M.G.S. Department, Melbourne
M. F. L. C. TAYLOR	P	Sectional Engineer, Australian Post Office Staff, Australia House, Strand, London

AUSTRIA

M. N. WENINGER, Rapporteur principal of C.C.I.T. Study Group 8 Head of Delegation	P - II - VIII	Ingénieur, Chef de Division, Bundesministerium, Vienne
Dr F. SCHMIDL	II - VII - VIII	Baurat, Bundesministerium, Vienne
M. O. MEINL	P - IX - X - XI	Amtsrat, Bundesministerium, Vienne
M. K. STANGL	P - IV - IX	Bundesministerium, Vienne

BELGIUM

M. R. VANDENHOVE Head of Delegation	P	Ingénieur en chef, Directeur d'Administration, Régie des Télégraphes et des Téléphones, Bruxelles
M. F. SOVET	IX - X - XI	Directeur d'Administration, Régie des Télégraphes et des Téléphones, Bruxelles
M. L. LAMBIN	P - II - III - VII	Ingénieur en chef, Directeur, Régie des Télégraphes et des Téléphones, Bruxelles

The BIELORUSSIAN S.S.R.

M. P. V. AFANASIEV Head of Delegation	P - II	Ministère des Postes et des Télécommunications, Minsk
M ^{me} R. S. PETROVA	P - VIII - IX - X - XI	"

BULGARIA (People's Republic of)

M. V. HARIZANOV Head of Delegation	P	Ministère des postes, des télégraphes et des téléphones, Sofia
M. N. BELOPITOV	P	"

CANADA

M. W. E. CONNELLY Head of Delegation	P - IX - X - XI	c/o Controller of Telecommunications, Department of Transport, Ottawa
M. J. R. LAMB	P - II - V - IX - X	"
M. C. J. COLOMBO	P - II - VII	"
M. T. D. MERRIGAN	P - IX - X - XI	"

CHINA

M. SHUIEN CHEN Head of Delegation	P	Deputy Director General of Telecommunications, Ministry of Communications, Taipei
M. Argon C. T. KUAN	P	Adviser, 35, via Lorenzo II Magnifico, Rome
M. Paul S. T. CHANG	P	Engineer, Taiwan Telecommunication Administration, Taipei

DENMARK

M. G. V. C. PEDERSEN Head of Delegation	P	Ingénieur en chef, Chef de la Division technique, Direction générale des postes et des télégraphes, Copenhague
M. H. LAURSEN	P	Chef de la Section des télégraphes et des téléphones, Direction générale des postes et des télégraphes, Copenhague
M. I. H. LARSEN	P - II - III - VII - VIII - XI	Ingénieur des Télégraphes, Direction générale des postes et des télégraphes, Copenhague
M. A. Ingemann PEDERSEN	P	Sous-chef de l'Exploitation des Télécommunications, Direction générale des postes et des télégraphes, Copenhague
M. C. B. NIELSEN	VIII - X - XI	Direction générale des postes et des télégraphes, Copenhague

SPAIN

M. J. GARRIDO Head of Delegation	P - IX - X	Jefe de Sección, Dirección General de Telecomunicaciones, Madrid
M. G. GELLA Deputy Head of Delegation	P - II - III - VI	Ingeniero-Profesor de la Escuela de Telecomunicaciones, Madrid
M. M. Foz	P - VI - XI	Jefe de Administración, Dirección General de Telecomunicaciones, Madrid

UNITED STATES OF AMERICA

M. H. E. COWGILL Head of Delegation	P - IV - X - XI	Federal Communications Commission, Washington D. C.
M. M. H. WOODWARD Deputy Head of Delegation	P - IV - X - XI	"
M. T. E. NELSON	P	American Embassy, Bonn
M. T. H. MITCHELL		R.C.A. Communications, Inc., 66 Broad Street, New York
M. W. EDGAR, Jr.		American Cable and Radio Corporation, c/o Commercial Cable Company and Mackay Radio, Paris

FRANCE

M. J. R. ROUVIÈRE Head of Delegation	P	Directeur général des Télécommunications, Ministère des P.T.T., Paris
M. A. DREVET Deputy Head of Delegation	P	Directeur adjoint, Ministère des P.T.T., Paris
M. P. BASSOLE	II	Ingénieur, Direction du Service des Lignes Souterraines à Grande Distance (L.S.G.D.), 24, rue Bertrand, Paris
M. L. J. COLLET, Rapporteur principal of C.C.I.T. Study Group VI	P - VI	Ingénieur général au Centre National d'Etudes des Télécommunications, Issy-les-Moulineaux
M. D. FAUGERAS	III - VII - XI	Ingénieur en chef, Direction générale des Télécommunications, Ministère des P.T.T., Paris
M. J. A. LABEYRIE	IV	Ingénieur, Service des recherches et du contrôle technique (S.R.C.T.), Issy-les-Moulineaux

FRANCE (ctd)

M. H. MARTIN	II	Ingénieur, S.R.C.T., Issy-les-Moulineaux
M. P. PELLÉ, Rapporteur principal of C.C.I.T. Study Group III	P - II - III - VII	Ingénieur en chef, S.R.C.T., Issy-les-Moulineaux
M. R. J. C. ROQUET	P - I - IV - VIII	Ingénieur en chef, Direction générale des Télécommunications, Ministère des P.T.T., Paris
M. R. SOURGENS	P - III	Ingénieur, S.R.C.T., Issy-les-Moulineaux
M. G. TERRAS	P - IX - X - XI	Administrateur, Direction générale des Télécommunications, Ministère des P.T.T., Paris
M. R. VARGUES	P - VIII - IX - X - XI	"

IRELAND

M. S. O'DROMA, Head of Delegation	P	Chief of Division, Department of Posts and Telegraphs, Dublin
M. T. P. SHERIDAN	II - VII - XI	Technical Expert, Leitrim House, Dublin

ITALY

M. le Grand Officier G. GNAME, Rapporteur principal of C.C.I.T. Study Group X Head of Delegation	P - IX - X - XI	Inspectorat général des Télécommuni- cations, Ministère des Postes et des Télécommunications, Rome
M. A. BIGI, Rapporteur principal of the General Switching Programme Sub- Group, Deputy Head of Delegation	P - VIII - X - XI	"
M. C. ALBANESE, Rapporteur principal of C.C.I.T. Study Group I	P - I - VI	"
M. M. BONACCI	I - II - III	Inspectorat général des Télécommuni- cations, Ministère des Postes et des Télécommunications, Rome
M. B. VIESI	VII - VIII	"
M. L. FEI	P - IX - X - XI	"
M. S. COLI	IV - VI	"
M. A. CARUSO, Secretary	IX - X - XI	"
M. F. MESCHINO	II	"
M. D. GARELLI	III	"
M. A. SPASIANO	P - VIII - X - XI	"

JAPAN

M. H. MATSUDA Head of Delegation	P	Controller of Telecommunications, Mi- nistry of Postal Service, Tokyo
M. K. OGATA	P - I - IV	Nippon Telegraph and Telephone Public Corporation, Tokyo
M. S. YAMAGISHI	P	Kokusai Denshin Denwa Co. Ltd., Tokyo
M. S. OSHIMA	P	"
M. T. SAITO	P - IX - X - XI	"
M. M. SATO	P	Assistant Permanent Delegate of Japan to the International Organizations, Geneva

LAOS (Kingdom of)

M. SITHAT, Head of Delegation	P	Direction des Postes et des Télécommu- nications, Vientiane
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LEBANON

M. N. KAYATA, Head of Delegation	P	Chef de l'exploitation télégraphique, Direction des Postes et des Télécom- munications, Beyrouth
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LUXEMBOURG

M. Ch. KNAF P Chef de bureau, Section des Télécommunications, Administration des P.T.T., Luxembourg
Head of Delegation

NORWAY

M. J. RINGSTAD, P Ingénieur en chef, Direction générale des Télécommunications, Oslo
Head of Delegation
M. A. STRAND P Chef de bureau, Direction générale des Télécommunications, Oslo

PAKISTAN

M. M. N. MIRZA, P Chief Engineer, Pakistan Posts and Telegraphs, Karachi
Head of Delegation

NETHERLANDS

M. J. D. H. VAN DEN TOORN, P Directeur général des Postes, Télégraphes et Téléphones, La Haye
Head of Delegation
M. A. J. EHNLE, P Direction générale des Postes, des Télégraphes et des Téléphones, La Haye
Deputy Head of Delegation
M. H. L. VAN LOMMEL P - II - III - " Rapporteur principal of C.C.I.T. Study Group II
M. T. PERRY, P - VII - VIII - IX - X - XI " Rapporteur principal of C.C.I.T. Study Group XI
M. P. DE GROEN IX " M. A. C. JANSEN P - II - VII - VIII - XI " Prof. R. M. M. OBERMAN II - VII " M. F. W. HÖLD II " M. F. ELENBAAS II Philips' Telecommunicatie Industrie, Hilversum
M. J. N. A. VAN POETEREN VI Direction générale des Postes, des Télégraphes et des Téléphones, La Haye
M. P. HARKEMA VII Philips' Telecommunicatie Industrie, Hilversum
M. P. J. CLEMENS VII - VIII Bell Telephone Company, Antwerp
M. B. A. HARTEVELD VIII Direction générale des Postes, des Télégraphes et des Téléphones, La Haye
M. J. DULLEMOND IX - X - XI " M. C. F. GALJAARD XI "

POLAND (People's Republic of)

M. Z. SZPIGLER, P Vice-Ministre des Postes et des Télécommunications, Varsovie
Head of Delegation
M. W. FIJALKOWSKI, P - I - II - III - IV - VI - VII - VIII Professeur à l'Ecole Polytechnique, Varsovie
Deputy Head of Delegation
M. H. ZDZIECH P - II - XI Vice-Directeur de Département, Ministère des Postes et des Télécommunications, Varsovie
M. K. SZYMAŃSKI P - IX - X - XI Chef de section, Ministère des Postes et des Télécommunications, Varsovie
M. J. KARAS P - IX - X - XI Inspecteur supérieur, Ministère des Postes et des Télécommunications, Varsovie
M. M. GAŚSIOROWSKI P Chef de section, Ministère des Postes et des Télécommunications, Varsovie

FEDERAL GERMAN REPUBLIC

M. R. FERNAU, Head of Delegation	P - IX - X - XI	Ministerialrat, Bundesministerium für das Post- und Fernmeldewesen, Bonn
M. H. BITTER	P - IV	Oberpostrat, Fernmeldetechnisches Zentralamt, Darmstadt
M. O. REHEUSSER	P - III - VII	Oberpostrat, Fernmeldetechnisches Zentralamt, München
M. W. GÄRTNER	P - I - II	Oberpostrat, Fernmeldetechnisches Zentralamt, Darmstadt
M. W. SCHAAF	P - VIII - IX - X - XI	„
M. G. GRIMSEN	III	C. Lorenz A.G., Stuttgart-Zuffenhausen
M. S. MAHLISS	VI - VII - VIII - IX	Oberpostrat, Fernmeldetechnisches Zentralamt, Berlin
M. H. ODEN	P - VII	C. Lorenz A.G., Stuttgart
M. H. MEBES	P - IV	Rudolf Hell, Kiel-Dietrichsdorf

FEDERAL PEOPLE'S REPUBLIC OF YUGOSLAVIA

M. R. PETROVIĆ, Head of Delegation	P - II - III - VII	Directeur de l'Institut des P.T.T., Beograd
M. I. SVETEL	P - IX - X - XI	Chef de la Division du Service P.T.T. International, Beograd
M. R. BERAHA	P - IV - VII - VIII	Ingénieur, Direction générale des P.T.T., Beograd

UKRAINIAN S.S.R.

M. N. D. PASETCHNIK, Head of Delegation	P - II - III - VII	Ministère des postes et des télécommu- nications de la R.S.S. de l'Ukraine, Kiev
M. E. A. ZAIONTCHKOVSKI	P	„

ROUMANIAN PEOPLE'S REPUBLIC

M. A. BODEAGA, Head of Delegation	P - II - III	Ministère des Postes et des Télécommu- nications, Bucaresti
M ^{me} L. DĂCONESCU	P - VIII - IV - VII	„

UNITED KINGDOM of GREAT BRITAIN and NORTHERN IRELAND

M. E. H. JOLLEY, O.B.E., Rapporteur principal of C.C.I.T. Study Groups IV, V and VII, Head of Delegation	P - IV - VI - VII - VIII	Staff Engineer, Engineering Department, Alder House, London
M. J. W. FREEBODY	P - II - III	Assistant Staff Engineer, Alder House London
M. D. G. C. LAWRENCE	P - VIII - X - XI	Principal, External Telecommunications Executive, Union House, St. Martin's le Grand, London
M. S. H. SMITH	P - VIII - X - XI	Senior Executive Officer, Accountant General's Department, Union House, St. Martin's le Grand, London
M. L. K. WHEELER	I - IV	Senior Executive Engineer, Post Office Research Station, Dollis Hill
M. V. J. TERRY	II	Standard Telephone and Cables Ltd., London
M. C. W. A. MITCHELL	II - IV	Senior Executive Engineer, External Tele- communications Executive, Union House, St. Martin's le Grand, London
M. R. W. FRASER	II - XI	Standard Telephone and Cable Ltd., London
M. F. B. WILLIS	II	General Electric Co. Ltd., Coventry

UNITED KINGDOM (ctd)

M. J. A. B. DAVIDSON	IV	Muirhead and Co. Ltd., Beckenham, Kent
M. K. J. AMOS	III	Creed and Company Ltd., Croydon
M. A. E. T. FORSTER	P - VII	Senior Executive Engineer, Engineering Department, Alder House, London
M. V. F. B. MEDLAND	VIII - IX	Chief Telecommunications Superintendent, External Telecommunications Executive, Union House, St. Martin's le Grand, London
M. H. F. WOODMAN	III - IV - VII - XI	Creed and Company Ltd., Croydon
M. H. E. WILCOCKSON	P - VIII - XI - VI	Assistant Staff Engineer, Engineering Department, Alder House, London
M. K. C. J. HILL	IX	Senior Telecommunications Superintendent, External Telecommunications Executive, Union House; St. Martin's le Grand, London
M. D. G. CLARKE	X	Higher Executive Officer, External Telecommunications Executive, Union House, St. Martin's le Grand, London
M. R. MURRAY	XI	Senior Executive Officer, Accountant General's Department, Union House, St. Martin's le Grand, London
M. A. C. TIMMIS	III	Automatic Telephone and Electric Co., London

SWEDEN

M. NORDSTRÖM, Head of Delegation	P	Ingénieur en chef, Direction générale des Télécommunications, Stockholm
M. SVEDHEM	P	Directeur du Trafic, Direction générale des Télécommunications, Stockholm
M. BERGLUND	P - II	Directeur de Section, Direction générale des Télécommunications, Stockholm
M. BERGVILL	P - VII - XI	Ingénieur de Section, Direction générale des Télécommunications, Stockholm
M. LJUNGQVIST	IX - XI	Premier secrétaire de Division, Direction générale des Télécommunications, Stockholm
M. ONNERMARK	P - X	Directeur de Section, Direction générale des Télécommunications, Stockholm
M. HEIMBÜRGER	P - IX - X - XI	Chef de Division, Direction générale des Télécommunications, Stockholm

SWITZERLAND (Confederation)

M. A. WETTSTEIN, Head of Delegation	P	Directeur de la Division des Téléphones et Télégraphes, Direction générale des P.T.T., Berne
M. A. LANGENBERGER, Deputy Head of Delegation	P	Chef du Service du Téléphone et du Télégraphe, Direction générale des P.T.T., Berne
M. H. WYSS, Rapporteur principal of C.C.I.T. Study Group IX	P - VII - VIII - IX - X - XI	Chef de section du Télégraphe, Direction générale des P.T.T., Berne
M. G. BAGGENSTOS	P - I - III - VI - IX	Ingénieur à la Section du Télégraphe, Direction générale des P.T.T., Berne
M. R. STAMPBACH	II	Technicien, Direction générale des P.T.T., Berne
M. F. HAUSELMANN	VII	Chef de service, Direction générale des P.T.T., Berne
M. P. FARINE	X	Inspecteur, Direction générale des P.T.T., Berne

SWITZERLAND (ctd)

M. J. FREY	IX	Secrétaire, Direction générale des P.T.T., Berne
M. H. KELLER	XI	Secrétaire, Direction générale des P.T.T., Berne
M. J. JUNOD	II - VII - IX	Ingénieur, Direction générale des P.T.T., Berne

Experts

M. F. OTT	I - II - III - VII	Ingénieur, Hasler S. A., Berne
M. E. RIGERT	P - II - III - VII	Ingénieur, Albiswerk S. A., Zurich
M. R. FLATT	III	Ingénieur, Autelca S. A., Gumligen
M. R. ZINDEL	IX - X	Chef d'exploitation, Radio-Suisse S. A., Berne

CZECHOSLOVAKIA

M. F. KROUTL, Head of Delegation	P	Ingénieur en chef, Ministère des Postes et Télécommunications, Praha
M. J. BUSAK	P	Conseiller juridique supérieur, Ministère des Postes et Télécommunications, Praha

TURKEY

M. V. BASAR, Head of Delegation	P - I - VII - VIII - X	Ingénieur en chef des Postes, Télégraphes et Téléphones, Ankara
------------------------------------	------------------------	--

U.S.S.R.

M. I. V. KLOKOV Head of Delegation	P	Ministère des Postes et des Télécommu- nications, Moscou
M. V. N. AMARANTOV	II - III - IV	„
M ^{me} V. D. BESHTCHEKOVA, Translator		„

B. Exploitations privées reconnues
Recognized private operating agencies

American Cable and Radio Corporation

M. W. EDGAR Jr.	P - XI	Vice-President of the Commercial Cable Company and Mackay Radio and Telegraph Company, Paris
M. T. GREENISH	P - XI	Manager of the Mackay Station, Tangier

Cable and Wireless Ltd.

M. L. A. WILKINS	X - XI	Cable & Wireless Ltd., London
M. E. G. COPPER	III - IV - VII	„
M. W. D. TALBOT	II - III - VII	„

Compagnie française de Câbles sous-marins

M. G. VERGRIETE	P	Directeur général, Compagnie française de Câbles sous-marins, Paris
M. R. CHEVALIER	P - IX - XI	Secrétaire général, Compagnie française de Câbles sous-marins, Paris

Compagnie générale de T.S.F.

M. ROPER	P	Chargé de Mission, Compagnie Générale de T.S.F., Paris
M. BERCEAU	P - IX - X - XI	Chef du Service des Exploitations, Compagnie Générale de T.S.F., Paris

Companhia portuguesa Radio Marconi

M. E. MENDES BARBOSA P - VI - IX - X - XI Companhia Portuguesa Radio Marconi,
131, rua de S. Julião, Lisbonne

Deutsch-Atlantische Telegraphengesellschaft

M. F. ZAUBITZER P - IX - X Deutsch-Atlantische Telegraphengesell-
schaft, KÖLN

Grande Compagnie des Télégraphes du Nord

M. Bent SUENSON P Administrateur-Directeur, Grande Com-
pagnie des Télégraphes du Nord,
Copenhague

M. N. E. HOLMBLAD P Directeur, Grande Compagnie des Télé-
graphes du Nord, Copenhague

M. K. W. SIMONSEN P - VIII - IX - X XI Chef de bureau, Grande Compagnie des
Télégraphes du Nord, Copenhague

M. W. A. MORTENSEN P - VIII - IX - X XI „

M. B. A. K. GEHLSHOEJ II - III - VII Ingénieur, Grande Compagnie des Télé-
graphes du Nord, Copenhague

Italcable

Prof. A. SPASIANO P - X - XI Italcable, Rome

Radio Austria A.G.

Dr H. WENZEL P Directeur général, Radio Austria A.G.,
Wien

M. M. ASLAN P - VIII - IX - X XI Directeur, Radio Austria A.G., Wien

Dr H. SOBOTKA P - I - II - III - VIII Ingénieur en chef, Radio Austria A.G.,
Wien

**C. Organismes scientifiques et industriels
Scientific and industrial organizations**

Compagnie industrielle des Téléphones

M. AMEAU II Ingénieur, Compagnie industrielle des
téléphones, Paris

M. RIOU II Ingénieur en chef, Compagnie indus-
trielle des téléphones, Paris

M. DEMARTRES VII - VIII Ingénieur, Compagnie industrielle des
téléphones, Paris

Le Matériel Téléphonique

M. G. BONNET VIII Le Matériel Téléphonique, Boulogne-
Billancourt

M. A. BESSONNET VII „

Lignes Télégraphiques et Téléphoniques

M. MANIÈRE II - III Lignes Télégraphiques et Téléphoniques,
Confians-Sainte-Honorine, France

Manufacture belge de Lampes et de Matériel électronique (M.B.L.E.)

M. KARLIN II - III - VII - VIII IX - XI Manufacture belge de Lampes et de
Matériel électronique, Bruxelles

Olivetti Telescriventi

M. D. GARELLI III Olivetti Telescriventi, Turin

Siemens und Halske A.G.

Dr. LOCKEMANN	I	Ingénieur en chef, Siemens und Halske A.G., München
M. FULLING	II	Ingénieur en chef, Siemens und Halske A.G., München
M. SCHONHAMMER	II	„
M. WUSTENEY	III	Ingénieur en chef et Directeur Siemens und Halske A.G., München
M. ROSSBERG	VII	Ingénieur en chef, Siemens und Halske A.G. München
M. JIPP	I - II - III - VII - XI	Directeur, Ingénieur en chef Siemens und Halske A.G., München

Société anonyme de Télécommunications

M. J. CLAISSE	I - II - III - IV	Société anonyme de Télécommunications, Paris
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Société d'Applications générales d'électricité et de Mécanique (S.A.G.E.M.)

M. MERLE	III	Directeur du Département Téléimprimeurs, S.A.G.E.M., Paris
M. BERJON	III - VII	Ingénieur, S.A.G.E.M., Paris

**D. Organisations internationales
International organizations**

International Air Transport Association (I.A.T.A.)

M. S. KREJCIK	P	I.A.T.A., Technical Liaison Office for European and African Region, London
M. R. A. GRATZ	P - XI	„
M. D. A. W. DALTON	P - XI	„
M. G. MONNIOT	P - X - XI	„

International Electrotechnical Commission (C.E.I.)

M. COLLET	VI	Inspecteur général adjoint des P.T.T., Centre National d'Etudes des Télécommunications, Issy-les-Moulineaux
M. K. J. BOHREN	VI	Direction des P.T.T., Berne

Organisation internationale de police criminelle (Interpol)

M. J. TREVES	IV - XI	Chef du Service des Transmissions, Ministère de l'Intérieur français, Paris
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World Meteorological Organization (W.M.O.)

M. V. SUNDARAM	P - II - IV - IX - X XI	Organisation Météorologique Mondiale, Campagne Rigot, Genève
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Union internationale des chemins de fer (U.I.C.)

M. RIGHI	II	Chef de service, U.I.C., Paris
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E. International Telecommunication Union (I.T.U.)

General Secretariat

Dr. M. A. ANDRADA	P	Secretary-General
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International Radio Consultative Committee (C.C.I.R.)

Prof. Dr B. VAN DER POL	P	Director of the C.C.I.R., Villa Bartholoni, Geneva
M. L.W. HAYES	P	Vice-Director of the C.C.I.R., Villa Bartholoni, Geneva
M. J. VAN DER MARK	P	Counsellor, C.C.I.R., Villa Bartholoni, Geneva

International Telephone Consultative Committee (C.C.I.F.)

M. G. VALENSI	P	Director of the C.C.I.F., Maison des Congrès, Geneva
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G. Secretariat of the Conference

Mr. H. TOWNSEND	Interim Director of the C.C.I.T.
Mr. J. BESSEYRE	Senior Counsellor, C.C.I.T.
Mr. L.V. LEWIS	Senior Counsellor, General Secretariat

Head of Linguistic Service

Mr. J. REVOY

Head of Finance and Supply

Mr. R. FRITZ

Head of Typing Pool

Mrs. FALCOU

Head of Roneo Service

Mrs. M. FIX

Head of Messenger Service

Mr. J. MEYER

Secretariat

Miss H. LANG-STEVENSON

Mrs A. CASSETTA

Reception and Information

Miss J. BRUNDSCHWIG

Mrs. S. LAGER

EXTRACTS FROM MINUTES OF PLENARY MEETINGS

1st Plenary Meeting — Saturday, 8 December 1956

(Opening Session)

Mr. *Townshend*, Interim Director of the C.C.I.T., declared the VIIIth Plenary Assembly of the C.C.I.T. open, and gave the floor to Dr. *Andrada*, Secretary-General of the I.T.U., who spoke as follows :

“Ladies and Gentlemen,

“I have already had the honour of greeting many of you on behalf of the Union at the opening of the XVIIIth Plenary Assembly of the C.C.I.F. However, I thought it fitting that I should be with you again today when the VIIIth Plenary Assembly of the C.C.I.T. starts its work.

“I should first of all like to extend a most hearty welcome to those of you who were not present on 3 December and, at the risk of repeating myself, I must pay a well-earned tribute to the experts who, since 1925, have devoted themselves in the C.C.I.T. to the development of international telegraphy.

“Like the C.C.I.F., the C.C.I.T. will begin a fresh life in the new amalgamated Committee ; for that reason I think that this Assembly, which will be the last of your Committee, should be dominated not by a spirit of sadness at memories of the past, but by one of optimism and confidence in a promising future.

“I do not want to take up your time, which is valuable, but before I conclude may I, in your presence, offer my warmest congratulations to my esteemed and distinguished collaborator, Mr. *Townshend*, on the outstanding way in which, during recent years, he has performed his task as Interim Director of the C.C.I.T. without in any way neglecting the responsibilities falling to him as Assistant Secretary-General. I know, too, Mr. *Townshend* would reproach me if I did not at the same time acknowledge the debt our organization owes to Mr. *Besseyre*, his able and intelligent assistant.

“It only remains for me to offer you my best wishes for success in your work and to assure you that, in addition to the specialized Secretariat working under Mr. *Townshend*’s orders, you can count on my collaborators and myself to help you at any time and in every way possible.

“Thank you, Ladies and Gentlemen, for your kind attention.”

After thanking the Secretary-General of the Union, Mr. *Townshend*, Interim Director of the C.C.I.T., informed the Assembly of the proposals made that morning at the meeting of Heads of Delegations regarding the Chairmanship and Vice-Chairmanship of the VIIIth Plenary Assembly. They were as follows :

As Chairman, Mr. *H. Wyss* (Switzerland)

As Vice-Chairmen, Mr. *Connelly* (Canada) and
Mr. *Kayata* (Lebanon).

These proposals were *unanimously adopted by the Assembly*, and Mr. *Townshend* accordingly invited Mr. *Wyss* to take the Chair.

(Applause.)

Mr. *Wyss* (Switzerland), Chairman of the VIIIth Plenary Assembly of the C.C.I.T., thanked the delegates for the confidence they had placed in the Swiss P.T.T. Administration and in himself, and said he was pleased to accept the invitation to take the Chair at the Assembly. He conveyed his Administration's good wishes to the Assembly.

He recalled the close relationship between the telegraph and telephone services—which would be officially recognized in a few days by the amalgamation of the two existing Committees—and went on to pay tribute to the Study Groups for their work since the Arnhem Assembly.

He then welcomed the Secretary-General of the Union, the Directors of the C.C.I.F. and the C.C.I.R., the Interim Director of the C.C.I.T., the observers from the International Civil Aviation Organization, the International Air Transport Association, the International Electro-technical Commission, the International Railway Union, the International Chamber of Commerce and the World Meteorological Organization, and all the delegates of Administrations and Recognized Private Operating Agencies.

He asked the Assembly to rise to their feet in memory of Mr. Bayard, Telecommunication Engineer in the French Administration and specialist in the theory of telegraph transmission, who died on 15 April 1956.

He concluded by offering the good wishes of the Assembly to the following officials, who had retired since 1953 :

Dr. L. Neher, former Director-General of the P.T.T. (Netherlands) ;

Mr. W. J. Norfleet, Chief Accountant, Federal Communications Commission (United States of America) ;

Commodore E. M. Webster, Commissioner, Federal Communications Commission (United States of America) ;

Colonel A. H. Read (United Kingdom of Great Britain and Northern Ireland) ;

Mr. A. E. Thompson (Creed & Co.).

The Assembly then *adopted the following programme and schedule* : Plenary meetings would be held every morning, from 10 a.m. to 12.30 p.m., with the following agenda :

Monday, 10 December : consideration of the Reports of S.G. VII, IV and V ;

Tuesday, 11 December : consideration of the Reports of S.G. VIII, X and III ;

Wednesday, 12 December : consideration of the Reports of S.G. I and II ;

Thursday, 13 December : consideration of the Reports of S.G. IX, XI and VI ;

Friday, 14 December : consideration of the Report by the Interim Director on the Committee's activities since the Plenary Assembly at Arnhem, consideration of the Report by the Finance Committee, other business.

The Assembly unanimously *adopted* the proposal made at the meeting of Heads of Delegations concerning the *setting up and composition of a Finance Committee*. It was thus decided that the Committee should have the same composition as the Finance Committee of the XVIIIth Plenary Assembly of the C.C.I.F., i.e. :

Chairman : Mr. *Raus* (Luxembourg) who, until his arrival in Geneva, would be replaced by Mr. *Knaf* (Luxembourg).

Members : delegates of *Spain, France, India, Italy, the Federal German Republic, the United Kingdom of Great Britain and Northern Ireland, and Switzerland*.

Mr. *Fritz* and Mr. *Prélaz*, officials of the General Secretariat, would assist the Committee in its work.

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Mr. *Cowgill* (United States of America) then made the following statement, and asked for it to be included in the minutes of the meeting :

“ The United States is very pleased to participate in this Eighth and last Plenary Assembly of the C.C.I.T. The United States, as a government, is interested in the work of Study Groups IV, V, X and XI only, and with respect to these Study Groups, the United States Delegation speaks for its Government, recognized United States private operating agencies, and United States users of the telegraph services. The United States Delegation includes representatives of certain recognized United States private operating agencies which hold membership in the C.C.I.T. in their own right. These representatives, as well as others who may be present, representing only their companies, are also interested in the work of others of the Study Groups in the interest of their own companies. Any proposal submitted or statement made at this meeting by any representative of a recognized United States private operating agency concerning the work of Study Groups other than Study Groups IV, V, X and XI must be considered as reflecting the views of his company only and is not to be understood to commit the Government of the United States, or any other United States private operating agency, to a given course of action. ”

2nd Plenary Meeting — Monday, 10 December 1956

Subjects discussed

1. Minutes of the first Plenary Meeting (Document A.P. VIII/35).
2. Final Report of Study Group VII (Documents A.P. VIII/15, 21, 21 bis, 30).
3. Final Report of Study Group IV (Documents A.P. VIII/5, 27, 27 bis).
4. Final Report of Study Group V (Documents A.P. VIII/6, 18, 28, 28 bis).
5. Other business.

1. *Minutes of the First Plenary Meeting* (Document A.P. VIII/35)

Approved without comment.

2. *Final Report of Study Group VII* (Documents A.P. VIII/15, 21, 21 bis, 30)

Mr. *Jolley* (United Kingdom of Great Britain and Northern Ireland), Chairman of Study Group VII, introduced the documents and expressed his appreciation of the valuable help afforded by the rapporteurs in the solution of some difficult problems, especially the standardization of signalling in the fully automatic Telex service. They had shown an excellent spirit of compromise and very satisfactory progress had been made.

Documents A.P. VIII/15, 21, 21 bis and 30 were *unanimously approved* with some slight amendments.

3. *Final Report of Study Group IV* (Documents A.P. VIII/5, 27, 27 bis)

Mr. *Collet* (France), Chairman of the Drafting Committee, in connection with the change from “ Herz ” to “ c/s ” mentioned in the French text of Document A.P. VIII/27 bis, pointed out that this did not apply to those parts of the text which were original contributions from Administrations.

Documents 27 and 27 bis were *unanimously approved*, after consideration page by page.

4. *Final Report of Study Group V* (Documents A.P. VIII/6, 18, 28, 28 bis)

After consideration page by page, the above documents were *unanimously approved* with the following amendment :

At the suggestion of Mr. *Hayes*, Vice-Director of the C.C.I.R., and with the approval of the Delegate of the United States of America, it was *decided* to replace the *Remark* on page 7 of Document A.P. VIII/6 by the wording shown on page 5 of Document A.P. VIII/18, which had been approved by the Plenary Assembly of the C.C.I.R. at Warsaw.

Annexes 2 and 3 of Document A.P. VIII/6, being within the sphere of S.G. IV, were reproduced purely for information and hence were not discussed.

5. *Other Business*

a) *Obituary*

The Assembly rose to its feet to observe one minute's silence in commemoration of Mr. F. W. Phillips, deceased the previous week. Mr. *Gneme* (Italy) expressed his appreciation of a colleague with whom he had often worked and suggested that a letter of sympathy be addressed to the family of Mr. Phillips.

Agreed.

b) Mr. *Townshend*, Interim Director of the C.C.I.T., asked for countries wishing to take part in the expenses for the use of the Russian language to inform the Secretariat accordingly.

3rd Plenary Meeting — Tuesday, 11 December 1956

Subjects discussed

1. Approval of the Minutes of the Second Plenary Meeting (C.C.I.T. Document A.P. VIII/37).
2. Final Report of Study Group VIII (C.C.I.T. Document A.P. VIII/34).
3. Final Report of Study Group X (C.C.I.T. Document A.P. VIII/22, with corrigenda Documents A.P. VIII/29 and 32).
4. Final Report of Study Group III (C.C.I.T. Document A.P. VIII/33, amended by Document A.P. VIII/33 bis).

1. *Approval of the Minutes of the Second Plenary Meeting* (Document A.P. VIII/37)

Approved.

2. *Final Report of Study Group VIII* (C.C.I.T. Document A.P. VIII/34)

Mr. *Weninger* (Austria), Chairman of Study Group VIII, introducing the Final Report, recalled the nature of the questions treated and the questionnaire to which they had given rise. The aim of the study was a special network solely for international public traffic, perhaps because such a solution seemed the easiest way out. But the Arnhem questionnaire provided for nothing of that kind.

At the first meeting of the Study Group (Geneva, 26-28 October 1955), national Telex networks were already well developed. Several countries had made proposals for a special network for public traffic and others were introducing public traffic into their Telex networks.

The basic result of the meeting in October 1955 was a request for the continued co-existence of the two systems, which led to the preparation of new questionnaires by the working groups. The outcome was embodied in Recommendation VIII/1:

The period from October 1955 to 30 May 1956 was marked by various studies and by the beginning of the operation of certain networks, so that on 30 May 1956 many public stations in the Netherlands, the Federal German Republic, Switzerland and Austria already had a fully automatic international public service and Yugoslavia joined these countries on 1 June.

The evolution of the question since the June meeting had made it possible to answer the questions set and to issue Document A.P. VIII/7, dated 6 June (Preliminary Report on the work of Study Group VIII).

The last meeting of Study Group VIII (4-6 December) had led to a definition of the rules for the general public traffic in the form of 13 draft Recommendations contained in the Final Report and submitted to the Plenary Assembly for approval.

He wished to thank the Chairman of Study Group VII for his valuable collaboration and expressed his satisfaction that the Plenary Assembly had approved the proposed text for Question VII/1 in the form desired by Study Group VIII; that approval automatically involved the deletion of the last paragraph of the Final Report of Study Group VIII.

As a result of its examination of Questions VIII/1, VIII/2, VIII/3 and VIII/4 and the studies they had required of the Administrations concerned, the work of Study Group VIII could be regarded as concluded and the further existence of the Study Group was unnecessary.

At the end of the Study Group's existence, he wished to express his gratitude to the Vice-Chairman, Mr. Marsen, and to Mr. Besseyre for his excellent advice.

The Final Report of Study Group VIII (Document A.P. VIII/34) was examined page by page and *approved* with minor drafting changes.

The Delegate of the *People's Republic of Poland* pointed out the very special interest of national Administrations for the work done by Study Group VIII, which he felt should be marked out for special praise.

(*Applause.*)

The *Chairman* also congratulated Study Group VIII on its very valuable achievement.

3. *Final Report of Study Group X*

(C.C.I.T. Document A.P. VIII/22, with corrigenda Documents A.P. VIII/29 and 32)

Documents A.P. VIII/29 and 32 were *approved unanimously*.

Mr. *Gneme* (Italy), Chairman of Study Group X, introduced the Final Report (Document A.P. VIII/22) as follows:

"The Plenary Assembly of the C.C.I.T. at Arnhem had entrusted Study Group X with the study of the questions mentioned in Document A.P. VIII/32, which mainly concern services offered to telegraph users and the relevant rates. These questions are of interest to all the Adminis-

trations of the Members of the Union and the recognized private operating agencies. I therefore felt it advisable for all the Administrations of the Union and the recognized private operating agencies to be asked by the Interim Director of the C.C.I.T. for any views or suggestions they might have on the subject. On the basis of the Rapporteurs contributions and the replies received from the Administrations and recognized private operating agencies, I prepared a report which was discussed at the meeting of Study Group X in Geneva in July 1955, where 9 preliminary draft recommendations and one opinion were adopted. Study Group X also recognized that the question of transit rates in the European system could not be dealt with separately but had to be studied in the general framework of tariffs in the European system and that, in order to do this, it was primarily necessary to know the cost of the various operations in the routing of telegrams in the European system. To establish such costs, Study Group X set up a Working Party with Mr. Vargues in the Chair, which, in conclusion of its work, submitted the report which appears in Annex 2 to Document A.P. VIII/22.

At the meetings of Study Group X, held from 22 to 29 November, it again examined the preliminary draft recommendations adopted at the July 1955 meeting, together with new Questions and suggestions (see Annexes 1, 2, 3 and 4 to Document A.P. VIII/22 and the amendments to Documents A.P. VIII/29 and 32, already adopted).

I should like to thank the Vice-Chairman of Study Group X and all the Rapporteurs for their active and competent collaboration in the work of the Group and I am at your disposal for any explanations you may desire."

The *Chairman* thanked Mr. Gneme.

The Final Report of Study Group X (Document A.P. VIII/22) was examined page by page.

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Page 22, Question X/6 (Study of the possibility of revising the Telegraph Regulations)

The *Chairman* pointed out that the text had been replaced by a revised version appearing in Document A.P. VIII/29.

In connection with the *Note*, Mr. *Perry* (Netherlands) said that if the new Study Group wished to produce results in time for the forthcoming Telegraph and Telephone Conference, it would have to work hard and rapidly. He suggested the setting up of a small Working Party to meet in March 1957 to draw up a procedure of work for the Study Group. The Netherlands would be glad to welcome such a Working Party.

The Delegate of *Czechoslovakia* having suggested that the Administrations of the Members of the Union and the recognized private operating agencies should be consulted first, on account of the importance of the matter, a discussion arose between Mr. *Perry*, Mr. *Gneme*, the Delegates of the *People's Republic of Poland and Czechoslovakia*, at the outcome of which the following text was drafted and approved :

The present *Note* to stand as in Document A.P. VIII/29. Add the two following new paragraphs :

"In view, however, of the urgency and complexity of the problem, the VIIIth Plenary Assembly of the C.C.I.T. recommends the First Plenary Assembly of the New C.C.I.T. to set up a small Working Party drawn from the Study Group in question, to prepare preliminary proposals for the consideration of that Study Group, whose work, it believes, might in this way be expedited.

The Director of the New C.C.I.T. should at once inform all the Members and Associate Members of the Union, so that any Administrations that may so wish will be able to send in their views for communication to the Working Group in time to be taken into account by the Group."

Mr. *Townshend*, Interim Director of the C.C.I.T., explained that the Secretariat would produce a comprehensive document to convey to the First Plenary Assembly of the New C.C.I.T. the various proposals made by the VIIIth Plenary Assembly of the C.C.I.T. The text just approved would be inserted as an annex, to make its importance clear.

The Final Report of Study Group X (Document A.P. VIII/22) was thus *unanimously approved*, with some amendments.

The *Chairman* thanked Mr. Gnome and his Study Group for having brought their work to a successful conclusion.

4. *Final Report of Study Group III*

(C.C.I.T. Document A.P. VIII/33, amended by Document A.P. VIII/33 bis)

Mr. *Pellé* (France), Chairman of Study Group III, introduced the document and made two main points: first, the introduction of the idea of the probability of exceeding measured values in study of margins and distortion would perhaps make it possible in future to guarantee a minimum error rate and, in any case, would provide new working elements. Indications concerning practical measurements on teleprinters had led to a revision of Recommendation C.4.

Second, the increasingly varied uses of telegraphy and the fact that some alphabets had more letters than the Latin alphabet required the establishment of a telegraph alphabet with more signs than the International Alphabet No. 2. Thus, independently of the speed of transmission and the equipment used, such new requirements should be studied to find out whether a new telegraph alphabet would meet them economically (New Question III/6).

In conclusion, the development of equipment required new supervisory and control signals once the communication was established, without modifying the International Telegraph Alphabet No. 2 (New Question III/1).

He wished to thank the Vice-Chairman and the members of his Study Group for the zeal and good-will they had shown.

The Final Report of Study Group III (Document A.P. VIII/33) was examined page by page and *unanimously approved* with some amendments.

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The *Chairman* thanked Mr. *Pellé* and his Study Group for their excellent work.

4th Plenary Meeting — Wednesday, 12 December 1956

*Subjects discussed**

1. Approval of the Minutes of the Third Plenary Meeting (C.C.I.T. Document A.P. VIII/38).
2. Final Report of Study Group IX (C.C.I.T. Document A. P. VIII/23, amended by Document A. P. VIII/23 bis — E).
3. Final Report of Study Group II (C.C.I.T. Document A.P. VIII/26, amended by Document A.P. VIII/26 bis — E).

1. *Approval of the Minutes of the Third Plenary Meeting* (Document A.P. VIII/38)

This document was *approved*.

2. *Final report of Study Group IX*

(C.C.I.T. Document A.P. VIII/23, amended by Document A.P. VIII/23 bis)

Mr. *Wyss* (Switzerland), Chairman of Study Group IX, introducing the Final Report, recalled the questions that had been studied; including two (83 and 87) which had been added after the Arnhem Plenary Assembly.

The Study Group had met on three occasions, in Geneva : 17-25 October, 1955, 4-8 June, and 26-29 November 1956.

He wished to thank the rapporteurs of the Study Group for their excellent work, and in particular the Vice-Chairman, Mr. *Fernau*, who had prepared the questionnaire for the new Telegraph Statistics, as well as Messrs. *Midland*, *Mähliß*, *Bitter* and *Ljungqvist* (Chairmen of working parties).

Document A.P. VIII/23 bis (Amendments to the Final Report) was *approved unanimously*, subject to some amendments.

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The Final Report of Study Group IX (Document A.P. VIII/23) was examined page by page.

Page 2, Question 62 :

On a proposal by Mr. *Perry* (Netherlands), it was *decided* to draw up the new statistics for 1956 ("1957" at the bottom of pages 2 and 3 to read "1956").

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Page 14. After some discussion it was *decided* to delete the titles and texts of "Telex conversation" and "Telex transit call", and to leave it to the secretariat to align the English and French texts of the list of definitions on Pages 11 to 14.

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The *Chairman* intervened to thank Cable and Wireless Ltd. for its valuable cooperation with the Study Group in the examination of the question on Service Codes.

Page 47, Annex 7 :

The *Chairman* read out a letter from the Director of the C.C.I.F. (Document A.P. VIII/31) expressing the opinion of the C.C.I.F. that Draft Recommendation IX/7 should not be approved for the time being.

In the course of a lengthy discussion between Mr. *Besseyre*, Mr. *Gneme* (Italy), Mr. *Vargues* (France) and Mr. *Townshend* (Interim Director of the C.C.I.T.) it became apparent that the C.C.I.T. and the C.C.I.F. agreed on the substance of the Recommendation, but had not yet aligned the drafting. It was obvious that the Recommendation could not be published with the other recommendations of the VIIIth Plenary Assembly of the C.C.I.T. or the XVIIIth Plenary Assembly of the C.C.I.F., and after further discussion it was eventually *decided*, on a proposal by Mr. *Besseyre*, to leave Question No. 87 under study and to add the following Note :

" *Note :* The New C.C.I.T. is recommended to set up a Working Party composed of representatives from the competent Study Groups, for the purpose of preparing a text which will satisfy both the telegraph and telephone services. This text would be transmitted to the Administrations and recognized operating agencies in the European system for approval."

It was also *decided* to add two Annexes after this Note, the first containing the text drawn up by Study Group IX and the second the text prepared by C.C.I.F. Study Groups 6 and 7.

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The Final Report of Study Group IX (Document A.P. VIII/23) was then *unanimously approved*.

3. *Final Report of Study Group 2*

(C.C.I.T. Document A.P. VIII/26, amended by Document A.P. VIII/26 bis)

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The *Chairman* then asked Mr. van Lommel, Chairman of Study Group II, if he would like to make any comments on the Final Report of his Study Group.

Mr. *van Lommel* first of all thanked the rapporteurs of his Study Group for their excellent work, mentioning the pleasant atmosphere of mutual understanding that had always existed among them. He thought their work had both a practical and a theoretical value and was not merely a compromise but the right solution.

They had achieved standardization of many of the characteristics of frequency-shift systems and he believed it was the first time that the C.C.I.T. had drawn up specifications for certain types of equipment; these ought to be of great value even before they were applied on a large scale.

Furthermore, they had agreed on the organization of fault locating and clearing in the Telex and Gentex networks.

Mr. *van Lommel* then took the opportunity of drawing the attention of the Administrations to the importance of the tests they had been asked to carry out to reveal conditions in existing networks.

The *Chairman* thanked Study Group II and Mr. van Lommel on behalf of the Plenary Assembly.

The Final Report of Study Group II (Document A.P. VIII/26) was thus *unanimously approved* with minor amendments.

5th Plenary Meeting — Thursday, 13 December 1956

Subjects discussed

1. Final Report of Study Group I (Documents A.P. VIII/20, 20 bis and 24).
2. Final Report of Study Group XI (Documents A.P. VIII/25 and 25 bis).
3. Final Report of Study Group VI (Document A.P. VIII/36).

1. *Final Report of Study Group I* (Documents A.P. VIII/20, 20 bis and 24)

Mr. *Albanese* (Italy), Chairman of Study Group I, introducing the Final Report, recalled the meetings of the Study Group since the Arnhem Plenary Assembly. The Final Report had been examined by the Drafting Committee, which had made a number of drafting amendments; these had been introduced in the appropriate places of the report.

Mr. *Albanese* drew the attention of the Plenary Assembly particularly to those parts of Document A.P. VIII/20 which dealt with replies to Questions 3, 4 and 5 and with the new Question I/5.

In Question 3 it was a matter of adapting the definition of modulation first of all to telegraphy in general and then to the special requirements of facsimile and alphabetic telegraphy ;

Question 4 involved the introduction of the concepts of “ semateme ”, “ semation ” and “ semator ” ;

In Question 5 the concepts of “ error rate of a telegraph communication ” and “ efficiency factor in time ” had to be specified ;

With regard to new Question I/5 it was necessary in using the expression “ channel ” to avoid the risk of confusion which might arise when considering frequency-division or time-division multiplex.

Mr. Albanese concluded by expressing his warmest thanks to those who had collaborated with him, and in particular Mr. Roquet, Vice-Chairman of the Study Group, and Mr. Collet, Mr. Jolley and Mr. Besseyre, who had all afforded him the most valuable help.

The Assembly then *adopted* Document A.P. VIII/24, which was a corrigendum to the Final Report of Study Group I, and Document A.P. VIII/20 *bis*, which contained the amendments made to the Final Report by the Drafting Committee.

.....

Examination of the replies to Questions 1 and 4 was postponed until the report of Study Group VI was studied.

The Final Report of Study Group I was thus *adopted unanimously*, with some amendments and the *Chairman* congratulated Mr. Albanese on the excellent work that had been accomplished, thanking at the same time the other members of Study Group I.

. 2. *Final Report of Study Group XI* (Document A.P. VIII/25 and 25 *bis*)

Document A.P. VIII/25 *bis* was *approved*.

The Final Report of Study Group XI (Document A.P. VIII/25) was examined page by page.

.....

The Final Report of Study Group XI was then *approved* with some amendments.

Mr. *Perry*, Chairman of Study Group XI, recalled the ten years of existence of the Study Group and expressed his gratitude to the various members who had given their collaboration and confidence, especially the Vice-Chairman, Mr. *Vargues*. He trusted that the excellent spirit which had always been in evidence in Study Group XI would also prevail in the Telex Study Group of the New C.C.I.T.

The *Chairman* thanked Mr. *Perry* and all those who had taken part in the work of Study Group XI. It was certainly thanks to their efforts that Telex had been able to make such strides as a modern means of telecommunication.

3. *Final Report of Study Group VI* (C.C.I.T. Document A.P. VIII/36)

Document A.P. VIII/36 was examined page by page.

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Mr. Collet (France), Chairman of Study Group VI, stressed the importance of the two notes at the end of the Final Report of his Study Group, particularly the second, on the continuation of the preparatory work for producing the list of Definitions of Essential Telecommunication Terms. A joint meeting of the Vocabulary Groups of the three International Consultative Committees was an urgent necessity, since the International Electrotechnical Commission (I.E.C.) had recently taken certain initiatives in the matter and it would not be advisable for several different vocabularies to exist, prepared by different authorities. The I.E.C. draft, for the time being, existed only in English and included terms the definition of which was similar to the definitions adopted by the C.C.I.T. and the C.C.I.F., but it contained others which showed a basic difference. There was no doubt that the C.C.I. drafts were best suited for the purposes of telecommunication Administrations. Accordingly, to avoid serious disorder, it would be advisable to convene a joint group of the C.C.I.s which should, as a first step, assemble the draft vocabularies they had prepared into a single document and then get into touch with the I.E.C. as soon as possible.

The Final Report of Study Group VI was *approved* and the *Chairman* thanked Mr. Collet and his collaborators for their very appreciable work in preparing definitions which were of major importance for the development of telecommunications.

With the approval of Document A.P. VIII/36 with some minor amendments, the parts of the Final Report of Study Group I which had been left in abeyance were also *approved*.

6th and Last Plenary Meeting — Friday, 14 December 1956

Subjects discussed

1. Approval of the minutes of the fourth and fifth Plenary Meetings (Documents A.P. VIII/39 and 41).
2. Report by the Finance Committee on the extraordinary expenses of the C.C.I.T. from 1953 (after Arnhem) until 1956 (Document A.P. VIII/40).
3. Report on the activities of the C.C.I.T. by the Interim Director (Document A.P. VIII/16).
4. Closing speeches.

1. *Approval of the Minutes of the Fourth and Fifth Plenary Meetings* (Documents A.P. VIII/39 and 41)

The Minutes of the Fourth Plenary Meeting (Document A.P. VIII/39) were *approved*.

The Minutes of the Fifth Plenary Meeting were *approved* with some amendments.

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2. *Report by the Finance Committee on the Extraordinary Expenses* *of the C.C.I.T. from 1953 (after Arnhem) until 1956* (Document A.P. VIII/40)

Mr. Knaf (Luxembourg), introducing the Report, said:

“The Members of the Committee confidently assumed the task, the results of which are submitted in Document A.P. VIII/40.

In most cases it was obviously impossible to audit all the vouchers so readily submitted by the Secretariat, but a sampling check of the various bills convinced us that the books had been kept with the utmost care and that the estimates of expenditure for the VIIIth Plenary Assembly were as exact as possible. No exaggeration was observed and we were able to draw up the list of participants in the expenses for the period 1953 to 1956.

The Finance Committee therefore recommends the approval of this Report.”

The Report of the Finance Committee (Document A.P. VIII/40) was *approved unanimously*.

The *Chairman* said that he was sure the Plenary Assembly would carry out with great pleasure the recommendation contained in the last paragraph of the Report. On behalf of the Assembly, he thanked Mr. Townshend for the excellent organization of the meetings and his careful and economic management of the finances of the C.C.I.T.

He also thanked Mr. Knaf and the members of his Committee for their excellent work.

Mr. *Townshend*, Interim Director of the C.C.I.T., after thanking the Chairman, said that the bulk of the burden had fallen on Mr. Besseyre, while the greater part of the financial work had been done by his colleagues in the Secretariat. It was a pleasure to know that the Assembly was content.

3. *Report on the Activities of the C.C.I.T. by the Interim Director* (Document A.P. VIII/16)

At the *Chairman's* request, Mr. *Townshend*, Interim Director of the C.C.I.T., introduced his Report as follows :

“ The Report contained in Document A.P. VIII/16 covers the activities of the C.C.I.T. between the end of the Arnhem Plenary Assembly in June 1953 and the autumn of this year— that is, in effect, up to the beginning of the present Plenary Assembly. It is, I believe, self-explanatory and needs no further introduction from me now.

Since, however, this is the closing meeting of the last Plenary Assembly of the present telegraph C.C.I.T. before its work is merged in that of the New amalgamated C.C.I.T., I should like very briefly to review the position as I see it from a rather longer and broader point of view than is possible in the triennial Report.

The C.C.I.T. is nearly as old as its sister, the C.C.I.F., but, in my judgement, it was handicapped in its earlier years—I mean before the second World War—by having no Director. Everybody knows that the remarkable success of the C.C.I.F. from the outset and throughout has been largely due to its Director, Mr. Valensi, who, as the work grew, had to build up a small staff of highly qualified assistants. In point of fact, the need to provide the C.C.I.T. with a Director began to be felt by the Administrations of the Union and provision was actually made for the post of Director of the C.C.I.T. by the Plenipotentiary Conference of Atlantic City in 1947 as part of the major reorganization of the Union which was then carried out and upon which the post-war work of the Union is based. However, the Plenary Assembly of the C.C.I.T. in 1948 decided to do without a Director as a measure of economy and to carry on without a technical staff, although more than 80 % of the work is strictly technical. In 1950 I succeeded Mr. Mulatier as an Assistant Secretary-General of the Union and the Administrative Council, when appointing me to that post, asked me to continue to carry on the responsibilities for the C.C.I.T. which Mr. Mulatier had been carrying—in addition, of course, to the normal work of an Assistant Secretary-General. The post of Director of the C.C.I.T., authorized by the Plenipotentiary Conference of Atlantic City in 1947, but not filled, thus continued to be left

vacant after 1950, with the resulting continued economy of the pay of one Class A post. In accepting this additional responsibility, however, I felt strongly that I must have, in order to help me to discharge it, a highly qualified technical man as the nucleus of a specialized C.C.I.T. Secretariat. The Administrative Council agreed and created a post which in the spring of 1950 was filled by Mr. Besseyre, who was the successful candidate in an open competition.

The resulting organization was extremely cheap but, with good-will and hard work, it proved workable as a make-shift. At the Plenipotentiary Conference of Buenos Aires at the end of 1952, the question of amalgamating the C.C.I.T. and the C.C.I.F. was discussed and I advised the Conference that such a step would certainly effect no economy at all and therefore must be judged wholly on efficiency grounds. I also advised the Conference that the existing cheap arrangement could be continued for some time but not indefinitely. As delegates are aware, amalgamation was somewhat later decided upon, on efficiency grounds, after much discussion. The real issue, in my view, was one of date—sooner or later amalgamation was inevitable, but it was possible to argue at any given time that it might be premature. In point of fact, there has been growing pressure on the C.C.I.T. organization since the last Plenary Assembly of Arnhem and I am glad to feel that as from the New Year I shall be able to hand over my responsibility for the C.C.I.T. work to the new Director of the amalgamated C.C.I.T., who will have the full qualifications—and also adequate time—to discharge all the duties laid upon the Director in the Convention. Close team-work is an essential feature of the I.T.U. and it will be a pleasure to me, during the remaining time before I retire from the I.T.U. service, to help the new Director as much as I can.”

The *Chairman* said :

“ The account just rendered by Mr. Townshend gives us some idea of the responsibilities which the interim Director of the C.C.I.T. has had to bear. Thanks to him and his collaborators, we receive, without any trouble on our part, all the numerous documents required in our work and can meet with the sole object of finding solutions for our problems. I realize how much hard work is behind this achievement and, on behalf of the Plenary Assembly, I thank you, Mr. Director, for having directed the business of the C.C.I.T. with so much tact and care.”

Mr. *Valensi*, Director of the C.C.I.F., agreed with Mr. Townshend that the team spirit had always been a feature of the I.T.U. and in particular of the relations between the C.C.I.T. and the C.C.I.F. He thought that was a good omen for the even closer international union represented by the marriage of the two Consultative Committees. He wished to address all his best wishes for success and prosperity to the New C.C.I.T.

The Report on the activities of the C.C.I.T. by the Interim Director (Document A.P. VIII/16) was *unanimously approved*.

4. *Closing Speeches*

The *Chairman* addressed the Assembly as follows :

“ Ladies and Gentlemen,

At the conclusion of the VIIIth and last Plenary Assembly of the C.C.I.T., I think we can declare ourselves satisfied with the results obtained. We had set ourselves the object of establishing a firm basis for the New C.C.I.T. to continue the study of telegraph matters in the best possible conditions.

This object has certainly been achieved and, in addition, we can record a gratifying development of our international agreements expressed in the form of recommendations. These recommendations are definitely a *sine qua non* if our telegraph services are to take full advantage of the new possibilities offered by modern technique.

I am thinking in particular of the bases established for the modernization of measurement methods, the essential terms which have been defined and the new notions which have been introduced. These acquisitions undoubtedly constitute an efficient working tool for the continuance of our studies.

The standardization of transmission equipment, in particular frequency-shift VF telegraph systems, the establishment of fuller standards for transmission and the extension of maintenance instructions are so many additional helps which will facilitate the planning, interconnection and operation of telegraph networks.

The more extensive standardization of switching installations and the bases which have been created for the study of a modern method of supervising telegraph apparatus will enable us easily to extend the general telegraph service and the Telex service by automatic switching.

Moreover, since 1953, and largely thanks to the efficient work done in the C.C.I.T., the idea of a European automatic switched network for the general telegraph service has become a reality.

On the operational side, we have prepared a new questionnaire for the telegraph and Telex statistics—an important basis for any planning work. It can also be expected that an I.T.U. publication containing the main codes in use in telecommunication services will appear in the near future.

On the horizon is a facsimile service between subscribers which, if developed, will be largely facilitated by the instructions drawn up for the standardization of apparatus.

Lastly, we have tackled the very foundations of tariffs and, by the calculation of costs, have laid new bases for—may I say—less arbitrary rates.

It is clear that we owe all this gratifying progress to all those who have been so wholeheartedly devoted to the cause of the C.C.I.T.

That is why, on behalf of the Plenary Assembly, I take the liberty of congratulating and thanking for their brilliant efforts :

Dr. Andrada, Secretary-General of the Union ; Mr. Townshend, Interim Director of the C.C.I.T. ; the Directors of the C.C.I.F. and the C.C.I.R., Mr. Valensi and Prof. Dr. van der Pol ; the Senior Counsellors, Mr. Besseyre and Mr. Lewis ; the Group Chairmen and their Administrations, the Rapporteurs and their Administrations and Recognized Private Operating Agencies ; the Secretariat ; the interpreters and all those who, directly or indirectly, have contributed to the success of the meetings since Arnhem.

I sincerely trust that in the New C.C.I.T. we shall once again find this spirit of mutual comprehension and collaboration which has enabled us to reach the end of this three-year period with the certainty that we have made a step forward and served the common interest.

I hope that in the new C.C.I.T. we shall still be able to rely on the knowledge and experience of those who have deserved special merit for fearlessly giving the best of themselves with no ulterior motive.

All that remains is for me to wish you all a good journey back home and thank you for your assistance during this last Plenary Assembly. ”

Mr. *Gneme* (Italy), Doyen of the I.T.U., said :

“ As doyen of the Union, having participated from the very beginning in the Plenary Assemblies of the International Telegraph Consultative Committee and having acted as Study Group Chairman, allow me to take the floor to recall the great work done to develop and perfect the telegraph service by the issue of so many Recommendations, Resolutions and Opinions which have guided Administrations and Recognized Private Operating Agencies in the organization of their services.

It is not without regret that we see the existence of our Committee brought to an end as a separate organ of the Union. On this occasion we feel it our duty to tender our warmest thanks to the Interim Director, Mr. Townshend, and to the Senior Counsellor, Mr. Besseyre, for their indefatigable work in organizing the C.C.I.T.—the Study Group meetings and the Plenary Assemblies—which have always received the full documentation required in good time and for the help given to the Administrations and Recognized Private Operating Agencies whenever difficulties have arisen.

We also tender our thanks to all their collaborators in this excellent achievement.

In conclusion, we hope that the New Telegraph and Telephone Consultative Committee will follow the precedent of our Committee in its organization and in the execution of its work to achieve the aims of the Union and, in particular, to promote the development of technical facilities and their most efficient operation with a view to improving the efficiency of telecommunication services and making them, so far as possible, generally available to the public.”

The *Chairman* replied :

“ These words pronounced by Mr. Gneme, Doyen of the I.T.U. affect us deeply. He is one of the most praise-worthy persons on account of his long activity in the service of the C.C.I.T. Allow me, Mr. Gneme, to thank you and to give you my very best wishes. ”

Mr. *Gella* (Spain) was sure that he was expressing the feeling of the Assembly in tendering his thanks to the Chairman, Mr. Wyss, for his very valuable assistance in furthering the work of the Assembly. They were very grateful to him.

The *Chairman* said that the compliment was far from being deserved. The progress achieved was not due to him, but to the delegates.

The sixth and last meeting of the VIIIth Plenary Assembly of the telegraph C.C.I.T. rose at 11 a.m.

Report on the activities of the C.C.I.T.
by the Interim Director

(Document C.C.I.T. A.P. VIII/16)

1. This report covers the period between the end of the VIIth Plenary Assembly (Arnhem, June, 1953) and 15 September, 1956.

There was a very considerable study group activity during this period, and the important decision was taken that the C.C.I.F. and C.C.I.T. should become one body with effect from 1 January, 1957.

Study Group activities

2. The VIIth Plenary Assembly had apportioned 81 questions for study by the various C.C.I.T. Study Groups, and since the Arnhem Assembly further 6 questions have been added (they are given in C.C.I.T. Document A.P. VIII/3).

3. The following study group meetings were held for the consideration of these questions :
Study Group I (General Telegraphy), in *Geneva* from 20 to 27 June, 1955 ;
Study Group II (Transmission), in *Geneva*, from 10 to 28 February, 1956 ;

- Study Group III (Apparatus), in *Geneva*, from 14 to 21 February, 1956
 (preceded by a working group meeting held in *Paris*, from 19 to 21 January 1956);
- Study Group IV (Phototelegraphy and Facsimile), in *London*, from 17 to 21 April, 1956;
- Study Group V (Joint C.C.I.T.-C.C.I.R. Study Group for Phototelegraphy), in *London*, from 23 to 25 April, 1956;
- Study Group VI (Vocabulary, Symbols), in *Geneva*, from 28 June to 13 July, 1955;
- Study Group VII (Switching), in *Geneva*, from 21 to 28 February, 1956;
- Study Group VIII (European switched general-service network), in *Geneva*, from 26 to 28 October, 1955 and again in *Geneva* from 30 May to 2 June, 1956;
- Study Group IX (Operations), in *Geneva*, from 17 to 25 October, 1955, and again in *Geneva*, from 5 to 8 June, 1956;
- Study Group X (Rates), in *Geneva*, from 4 to 13 July, 1955
 (the Working Group of Study Group X, studying the cost of routing telegrams, will meet in *Geneva* from 19 to 21 November, 1956, just before the start of the Study Group meetings which are to precede the Plenary meetings of the VIIIth Plenary Assembly);
- Study Group XI (Telex), in *Geneva*, from 30 June to 10 July, 1954
 (the Working Group of Study Group XI, studying the costs of leased circuits and of Telex calls, met in *Geneva* from 6 to 10 July, 1956);
- The Sub-Committee for liaison with the C.C.I.F. in connection with the General Trunk Switching Plan, met in *Lahore*, in December, 1953, during the meeting held by the Sub Group for the Switching Plan in the Middle East and Southern Asia, and in *Geneva*, from 10 to 15 September, 1954, on the occasion of the C.C.I.F. XVIIth Plenary Assembly.

C.C.I.T. Chairmen and Vice-Chairmen attended, too, the meeting held in *Geneva* (29 February to 8 March, 1956) by C.C.I.F. and C.C.I.T. Chairmen and Vice-Chairmen, with a view to drawing up a draft list of study groups for the New C.C.I.T. and suggesting working methods for the new body.

Thus all the C.C.I.T. Study Groups will have met at least once between the VIIth Plenary Assembly (Arnhem, 1953) and the VIIIth Plenary Assembly (Geneva, 1956). Most of these meetings have been held in Geneva.

4. By 15 September, 1956, the papers contributed in connection with study group activities have led to the publication of:

	16	documents	for	Study	Group	I
56	''	''	''	''	''	II
30	''	''	''	''	''	III
43	''	''	''	''	''	IV
18	''	''	''	''	''	V
46	''	''	''	''	''	VI
27	''	''	''	''	''	VII
26	''	''	''	''	''	VIII
75	''	''	''	''	''	IX
69	''	''	''	''	''	X, and
63	''	''	''	''	''	XI

All in all, then, 469 documents, running to 2580 pages, all of them issued in both English and French.

5. Only thanks to the staggering work over the entire period between the two Plenary Assemblies was it possible to organize these 18 meetings and to handle all these documents. Certainly, the programme for 1956 represents the very limit of what can be done with the exiguous resources of the C.C.I.T. Secretariat.

6. These activities are summed up in the general preliminary reports drawn up by the Study Group Chairmen for the benefit of their Study Groups and of the Plenary Assembly itself. In what follows, I shall do no more than succinctly describe how matters stand as regards the main questions under study on the eve of the VIIIth and last Plenary Assembly of the C.C.I.T.

7. In the field of *telegraph transmission*, the study of telegraph distortion, both theoretical and practical, has been carried vigorously forward by Study Groups I, II, and III. Previously studies of telegraphic distortion had presupposed that signal restitution was not defective, i.e. that all the significant instants of telegraphic modulation were to be found, in the same order, on restitution, and in the same conditions. Studies were limited to the degree of distortion of the significant instants, assuming that restitution was not defective.

But in the world of radio this essential prerequisite is by no means invariably obtained—a fact for which allowance had to be made in any study of telegraphic distortion that was to meet the practical requirements of the C.C.I.R. and C.C.I.T.

The necessary basis for study of defective modulation and restitution has been provided by Study Group I, which has defined the “rate of error” (and its complement, the “efficiency factor”), and by Study Group IX, which has laid down limits for that rate.

The wire-telegraphy specialists, for their part, have laid down that a measurement of distortion must show what the probability is that the particular degree of distortion will be exceeded during transmission of a considerable number of signals. Even when the degree of distortion is high, this probability is never nil, which signifies that there can be no absolute guarantee of fidelity, and that the idea of error rate is useful in wire telegraphy too.

The radiotelegraph specialists, although rightly concentrating on the error rate, also know that the degree of distortion of a modulation or not defective restitution cannot be neglected.

Thus the gap between radiotelegraphists and wire-telegraphy experts, between error rate and degree of distortion, has been bridged.

The work accomplished by Study Groups II and III shows, too, that for any particular type of telegraph communication, there is a good chance of obtaining a relationship between the probable error rate and the distribution of the distortion probabilities. In this manner, it may well be possible to link two factors. The first (the error rate) is the one which is of interest from the operating point of view, but its measurement is a lengthy business, and in practice cannot be more than occasional. On the other hand, the distribution of distortion probabilities can be speedily ascertained by means of the distortion analysers which Administrations are now constructing. Study of this relationship between the two factors will certainly constitute a major item during the first few years in the life of the New C.C.I.T.

Study of the composition of distortion has also made progress and a practical formula has been proposed.

As regards transmission equipment, a draft recommendation lays down a sensitivity threshold for voice-frequency telegraph receivers, and study of the use of frequency modulation for voice-frequency telegraphy is in full swing.

Several proposals are devoted to circuits used for voice-frequency telegraphy, whether those circuits be carrier circuits or radio ones. The increasingly widespread use of radio relay links will necessitate study of voice-frequency telegraphy on circuits using such links. The promises made to the C.C.I.T., that such circuits would be in every respect comparable to the C.C.I.F.

standardized circuits and would accept standardized voice-frequency telegraph systems without special precaution do not seem to be borne out.

8. There has also been a great deal of activity in the realm of *telegraphic switching*. The tendency is towards full automatic working, both in the Telex and the general public service. But the diversity of dialling and signalling methods used in national networks, and the differing ways in which answer-back codes are made up, constitute a serious difficulty for Study Groups VII and VIII.

Study Group VIII has decided to propose that national networks be interconnected to form the European switched general public service; the national network may be the network used for the internal service as well, or a special network reserved for international traffic. This solution, clearly, is a very liberal one, but not technically the simplest. Several countries have already begun a switched service between themselves on these principles.

The increasingly widespread use of switching between national networks is a factor making for ever greater interdependence. There is a real need for standardization of fault signalling, of measurement methods and equipment. This has been considered by Study Groups II and III.

And indeed this interdependence is extending more and more to networks throughout the world; thanks to the use of radio channels for switching purposes a development is rendered possible by improvements in error detecting and correcting devices and in regenerative repeaters; it will probably owe something, too, to the new facilities offered by submarine telephone-type cables. A need for standardization of new signals for "start of message", "message separation", "connection of a perforating receiver", etc., is already making itself felt. Already Study Group III is faced with an apparent need for extension of International Alphabet No. 2.

9. In the realm of *facsimile telegraphy*, the development of direct-recording equipment offers fresh fields for operational purposes. For example, the possibility of constituting networks of subscribers to a switched facsimile service.

The question of standardizing phototelegraph apparatus has been reviewed, and conditions have been defined in which wire or radio circuits may be used for phototelegraphy.

10. As regards actual *operations*, Study Group IX is proposing an up-to-date form of general statistics, operating procedures for page-printing teleprinters, the laying-down of maximum rates of error in telegraph communications, and regulations governing the use of phototelegraph communications. Lastly, a good deal of work has been done, too, in the study of service codes, and the assembly of expressions for inclusion in a volume to be published by the I.T.U. General Secretariat is now completed. It will be for the C.C.I.T. to decide whether or not to go further —i.e., whether a study should be made of the desirability of amalgamating these codes, so as to eliminate overlapping.

As regards *rates*, studies of costs have been finished for telegraph circuits and Telex calls in the European system. In all likelihood, study of the average routing costs for an international telegram in the European system will have been completed before the VIIIth Plenary Assembly.

Such data will be exceedingly helpful in preparing and reviewing rates for leased circuits and Telex calls, and in considering rates for telegraph circuits used for transmission of transit telegrams.

As a result of the studies Study Group X has made of rates and word count, numerous proposals have been submitted. Some of them advocate the use of entirely new methods in this field.

During 1954, Study Group XI submitted (by means of the "provisional recommendation" procedure) eight recommendations or amendments to recommendations. Of these, seven obtained general approval and became provisional recommendations (Document A.P. VIII/4). Among them, that relative to determination of how many circuits are required to carry a given traffic is especially worthy of attention.

The increasing use of full automatic switching from subscriber to subscriber gives rise to problems in connection with operating procedures and international accounting. Liaison between the European Telex service and similar services in other continents gives rise to problems of cooperation, because of differences in modulation speed and especially in alphabet. Hence the work undertaken by Study Group XI is very far from finished.

11. The Plenary Assembly will be confronted with :

A *draft glossary of definitions* of essential telegraph terms (grey volume) ; and with a :

C.C.I.T. contribution to the International Telecommunication Vocabulary, in English and French. These two documents are the fruit of work done by Study Group VI in cooperation with the other study groups, as reviewed by a drafting committee made up of the C.C.I.T. Secretariat and an engineer made available to the C.C.I.T. by the United Kingdom Post Office.

These two documents—if they are approved by the Plenary Assembly—will represent the telegraph contribution to the work of the future C.C.I.T.-C.C.I.R. committee which will draw up the International Telecommunication Vocabulary.

12. *Changes among the Chairmen and Vice-Chairmen :*

Mr. Lillicrap (United Kingdom of Great Britain and Northern Ireland), Vice-Chairman, Study Group X, has had to resign. He has been replaced by Mr. D. G. C. Lawrence (United Kingdom), with the assent of the Chairman (Mr. Gnome).

13. *Publications prepared by the C.C.I.T. Secretariat :*

The C.C.I.T. Secretariat has prepared :

- (i) The documents of the VIIth Plenary Assembly (Arnhem, 1953) ;
- (ii) The supplements to the above documents, containing those preparatory documents of that Assembly which were of abiding interest or were useful in pursuing the studies decided on by the Assembly.

(These documents have been published in English and French and can be purchased from the General Secretariat. The demand for a Spanish version was very feeble.)

- (iii) C.C.I.T. Recommendation H.1, constituting the provisional regulations for the Telex service (brought up to date further to the provisional recommendations issued in 1954).

This document was published by the General Secretariat (and can be purchased from it) in English, Spanish, and French.

- (iv) A list of stations taking part in the phototelegraph service, in accordance with the request made in Recommendation D.5.
- (v) Each year, a programme for the periodical maintenance of international voice-frequency channels.

14. *Activities of the Secretariat :*

Besides their work in connection with documents for the study groups and the VIIIth Plenary Assembly (registration, revision, checking of translations and of despatch), and their work in preparing meetings of study groups and Plenary Assemblies in 1956, the Interim Director and his staff have :

- (i) taken part in the work of the Technical Assistance ;
- (ii) attended meetings of the I.T.U. Administrative Council ;
- (iii) attended meetings of C.C.I.F. and C.C.I.R. study groups dealing with matters of concern to the C.C.I.T. ;
- (iv) attended the XVIIth Plenary Assembly of the C.C.I.F. (Geneva, 1954), and the VIIIth Plenary Assembly of the C.C.I.R. (Warsaw, 1956) ;
- (v) attended the Meeting of C.C.I.T. and C.C.I.F. Chairmen and Vice-Chairmen.

15. *Staff* :

Besides the Interim Director, who is at the same time Assistant Secretary-General, the permanent C.C.I.T. staff during this period was as follows :

One Senior Counsellor, Class C ; and

One Assistant Administrative Officer (secretary), Class 4 ; and (from 1 January, 1956) :

One secretary-typist, Class 6.

Documents have been mimeographed and despatched by the General Secretariat, under the supervision of the C.C.I.T. Secretariat.

16. Thus constituted, there is no doubt that the C.C.I.T. Secretariat has often been hard-pressed and has not always been able to follow the activities of study groups as it would have wished. I would point out, as an example, that in three years it has been possible to send the Senior Counsellor off on one single study mission only (in February, 1954, on telegraph switching).

It is to be hoped that amalgamation of the C.C.I.F. and C.C.I.T. will improve matters in this respect.

On the whole, though, I can safely say that during this period 1953-1956 the C.C.I.T. has proved remarkably efficient and economical. It would be unjust not to attribute a share of the merit to the devoted interest in the work of their study groups displayed by the Chairmen and Rapporteurs.

In general, the assistance of the General Secretariat has been highly appreciated, and cooperation between the C.C.I.T. Secretariat and the General Secretariat has been (generally speaking) easy.

H. TOWNSHEND,
Interim Director, C.C.I.T.

**Report by the Finance Committee on the extraordinary expenses
of the C.C.I.T. from 1953 (after Arnhem) until 1956**

(Document C.C.I.T. A.P. VIII/40)

In accordance with Administrative Council Resolution No 83 (amended), the Finance Committee set up by the Plenary Assembly at its meeting on 8 December 1956, consisting of the following countries under the chairmanship of Mr. Knaf, the delegate of Luxembourg :

Spain (Mr. Foz)

Federal German Republic (Mr. Zerbel)

France (Mr. Terras)

United Kingdom of Great Britain and Northern
Ireland (Mr. Murray)

India (Republic of) (Mr. Batra)

Italy (Mr. Verlicchi)

Switzerland (Mr. Langenberger)

examined the expenses relating to the VIIIth Plenary Assembly of the C.C.I.T. at a meeting held on 11 December 1956.

The Committee was assisted in its work by Mr. Weber, Head of the Finance Section of the I.T.U., Mr. Prelaz of the Finance Section of the I.T.U. and Mr. Fritz of the General Secretariat, attached to the C.C.I.T.

The extraordinary expenses for 1953, 1954 and 1955 (see Annex 1, page 3) had been audited by the Federal Finance Control Department and approved by the Administrative Council.

The extraordinary expenses for 1956 could be subdivided into :

1. Expenditure for the Study Groups in 1956 and for the preparatory work of the VIIIth Plenary Assembly, of which the vouchers had been supplied by the Interim Director and checked by a working party set up by the Finance Committee (page 4, column 3 of Annex 1).
2. Expenses and estimated expenses relative to the VIIIth Plenary Assembly (page 4, column 5 of Annex 1). These expenses represented the closest estimate that could be made and which the Finance Committee had approved, supplementary information and documents having been supplied.

The Finance Committee noted with particular satisfaction the conditions under which the State of Geneva had agreed to lease the Bâtiment Electoral. The Finance Committee wished to stress that the organization of the VIIIth Plenary Assembly of the C.C.I.T. had been excellent and that there had been no cases of exaggeration from the financial point of view.

The needs of the delegates had been attended to in a way which left nothing to be desired ; the large number of documents issued during the meetings were exemplary, for they only dealt with the core of the questions under consideration and were drafted clearly and accurately.

Annex II contains a list of the Members and Associate Members of the Union, the Recognized Private Operating Agencies, the scientific or industrial organizations and the international organizations which were to contribute to the extraordinary expenses of the C.C.I.T. for the period running from 1953 (after Arnhem) to the end of 1956. The cost of using the Russian language will be borne by those Members and Associate Members of the Union who requested that it should be used and by those who may in future state that they wish to do so.

It is pointed out that the contributory shares for extraordinary expenses payable to the I.T.U. are subject to the provisions of Article 13, paragraph 9, of the Buenos Aires Convention (1952), as far as interest on overdue payments is concerned ; this interest begins accumulating from the thirtieth day after the date on which invoices for extraordinary expenses are sent to Members and Associate Members.

The Finance Committee recommended the Plenary Assembly to approve the report and to convey its gratitude to the Interim Director and to his assistants for the first-class way in which the finances of the C.C.I.T. had been managed.

(Signed) : KNAF,
Chairman.

ANNEX I

Recapitulation of the extraordinary budgets and expenses of the C.C.I.T. from 1953 (after Arnhem) until 1956

	<i>Budget</i>	<i>Expenses</i>
1953 (Lahore)	5,000.—	5,909.75 *
1954	63,000.—	52,467.25 *
1955	86,500.—	60,070.82
1956	245,000.—	211,937.65 (estimate)
	<u>399,500.—</u>	<u>330,385.47 (estimate)</u>

* These expenses were provisionally apportioned at the end of 1954 in accordance with the provisions of Chapter 20, paragraph 4, of the General Regulations annexed to the Buenos Aires Convention, 1952. They will be incorporated, like those of 1955, in the extraordinary expenses of the Study Groups and the Plenary Assembly of 1956 and will be apportioned among participants in those expenses, allowances being made for payments that have already been made.

Extraordinary budget of the C.C.I.T., 1956
Estimate of extraordinary expenses of the VIIIth Plenary Assembly of the C.C.I.T.

Subheads and items	1956 Budget S.Gs and VIIIth P.A., Geneva	Expenses for 1956 S.Gs and preparatory work of VIIIth P.A.	Budget balance available	Expenses and estimated expenses of VIIIth P.A.	Difference + Budgetary surplus, — deficit
<i>I. Staff expenses</i>					
1. Administration	24,000.—	6,175.65	17,824.35	12,934.70	+ 4,889.65
2. Languages	92,000.—	51,934.10	40,065.90	67,633.65	— 27,567.75
3. Roneo	17,000.—	2,169.50	14,830.50	8,060.—	+ 6,770.50
4. Insurance	5,000.—	354.20	4,645.80	150.85	+ 4,494.95
<i>II. Premises and equipment</i>					
5. Premises, furniture, machines.	31,000.—	1,065.70	29,934.30	15,453.60	+ 14,480.70
6. Document production	23,000.—	7,281.10	15,718.90	9,737.05	+ 5,981.85
7. Office supplies and overheads.	12,000.—	5,341.83	6,658.17	5,073.32	+ 1,584.85
8. Simultaneous interpretation and other technical equipment	9,000.—	2,489.—	6,511.—	1,360.—	+ 5,151.—
9. Unforeseen	21,000.—	6.—	20,994.—	5,883.55	+ 15,110.45
<i>III. Cash expenses</i>					
10. Interest on advances	6,000.—	3,000.—	3,000.—	3,000.—	—.—
<i>Expenses of an exceptional nature</i>					
<i>IV. Representation</i>					
11. Participation in meetings of a C.C.I. or of other international organizations	3,000.—	2,833.85	165.15	—.—	+ 166.15
<i>V. Preparatory work</i>					
12. Publication and distribution of reports	2,000.—	—.—	2,000.—	—.—	+ 2,000.—
	<u>245,000.—</u>	<u>82,650.93</u>	<u>162,349.07</u>	<u>129,286.72</u>	<u>+ 33,062.35</u>
Expenses for interpretation in Rus- sian	—.—	—.—	—.—	6,236.—	6,236.—

ANNEX II

Statement of the Members, Associate Members, Recognized Private Operating Agencies, scientific or industrial organizations, and international organizations which are to contribute to the extraordinary expenditure of the C.C.I.T. for the period 1953 (after Arnhem) to 1956

	<i>Represented at the VIIIth PA</i>	<i>Number of units</i>
a) <i>Members</i>		
Argentine (Republic)		25
Australia (Commonwealth of)	x	20
Austria	x	0.5
Belgium	x	8
Bielorussian Soviet Socialist Republic	x	3
Brazil		25
Bulgaria (People's Republic of)	x	1
Cambodia (Kingdom of)		1
Canada	x	20
China	x	15
Denmark	x	5
Egypt	x	5
Spain	x	3
United States of America	x	30
Finland		3
France	x	30
Hungarian People's Republic		1
Ireland	x	3
Israel (State of)		1
Italy	x	20
Japan	x	25
Laos (Kingdom of)	x	0.5
Lebanon	x	0.5
Luxembourg	x	0.5
Morocco		1
Monaco		0.5
Norway	x	5
New Zealand		5
Pakistan	x	15
Netherlands, Surinam, Netherlands Antilles, New Guinea	x	10
Poland (People's Republic of)	x	10
Federal German Republic	x	20
Federal People's Republic of Yugoslavia	x	1
Ukrainian Soviet Socialist Republic	x	5
Roumanian People's Republic	x	1
United Kingdom of Great Britain and Northern Ireland	x	30
Sweden	x	10
Switzerland (Confederation)	x	10
Czechoslovakia	x	8

	<i>Represented at the VIIIth PA</i>	<i>Number of units</i>
Overseas Territories of the French Republic and Territories administered as such		20
Turkey	x	5
Union of South Africa and Territory of South-West Africa		13
Union of Soviet Socialist Republics	x	30
 b) <i>Recognized Private Operating Agencies</i>		
American Cable and Radio Corporation	x	0.5
Cable and Wireless Ltd	x	5
Compagnie Générale de T.S.F.	x	0.5
Companhia Portuguesa Radio Marconi	x	0.5
Deutsch-Atlantische Telegraphengesellschaft	x	0.5
Grande Compagnie des Télégraphes du Nord	x	3
Compagnie française de câbles sous-marins	x	0.5
Kokusai Denshin Denwa Company, Ltd	x	0.5
Nippon Telegraph and Telephone Public Corporation	x	1
Radio Austria, A.G.	x	0.5
R.C.A. Communications, Inc.		0.5
Società Italcable	x	0.5
 c) <i>Scientific or industrial organizations</i>		
Compagnie Industrielle des Téléphones	x	0.5
Etablissements Edouard Belin	x	0.5
Manufacture belge de lampes et de matériel électronique	x	0.5
Siemens und Halske, A.G.	x	3
Société anonyme des lignes télégraphiques et téléphoniques (L.T.T.)	x	0.5
Société anonyme de télécommunications	x	0.5
Société anonyme " Le Matériel Téléphonique "	x	0.5
Société anonyme " Les Télémprimeurs "	x	0.5
Société d'applications générales d'électricité et mécanique (S.A.G.E.M.)	x	0.5
Philips' Telecommunicatie Industrie	x	1
Società « Olivetti Telescriventi »	x	0.5
 d) <i>International organizations</i>		
International Air Transport Association (I.A.T.A.)	x	*
International Chamber of Commerce (I.C.C.)	x	*
International Electrotechnical Commission (I.E.C.)	x	*
International Criminal Police Commission (I.C.P.C.)	x	*
International Conference on Main High-Tension Networks (C.I.G.R.E.)		*
United Nations	x	*
International Civil Aviation Organization (I.C.A.O.)	x	*
International Standardisation Organization (I.S.O.)		*
World Meteorological Organization (W.M.O.)	x	*
International Union of Producers and Distributors of Electric Power (U.I.P.D.E.E.)		*
International Railway Union (I.R.U.)	x	*
Total units		<u>467.5</u>

* Organization exempted from contributing to expenses, under the terms of Administrative Council Resolution No. 222 (amended).

RECOMMENDATIONS PUBLISHED BY THE VIIITH PLENARY ASSEMBLY OF THE C.C.I.T. AND PREVIOUS RECOMMENDATIONS MAINTAINED

I. Numbering of Recommendations

The Recommendations are divided into the following groups, designated by a letter :

- A Organization of the C.C.I.T. and procedure ;
- B Transmission ;
- C Alphabetic telegraph apparatus ;
- D Facsimile ;
- E Telegraph switching (including reperforator switching) ;
- F Speed of transmission and working methods ;
- G Regulations and tariffs ;
- H Telex service and leased circuits ;
- I Vocabulary, symbols, definitions, etc.

In each group, the Recommendations are numbered in a continuous series in the chronological order of their appearance, the number of the series being preceded by the letter designating the group.

Example : B 12 for the twelfth Recommendation issued on the questions of transmission.

II. Index of Recommendations and Resolutions

The C.C.I.T. having ceased to exist as from 31 December 1956, Recommendations under Category A no longer apply.

B. Recommendations applying to questions of Telegraph Transmission

No.	Title	Page
B.1	Deleted. (See List of Definitions)	
B.2	Deleted. (See List of Definitions)	
B.3	Balancing of artificial lines and the adjustment of apparatus in the case of duplex circuits with rapid equipment on special lines (aerial or cable)	45
B.4	Characteristic factor of the quality of balance	47
B.5	Switching methods	47
B.6	Grounding	47
B.7	Grounding of installations connected to a long-distance cable circuit	48
B.8	Standardization of direct current telegraph circuits employing telephone cables	49
B.9	Coexistence in a single non-submarine cable of telephony and direct current telephony	50
B.10	Coexistence on the same conductors of a cable of harmonic telegraphy or phototelegraphy, on one hand, and telegraphy on phantom or double phantom circuits, on the other	51
B.11	Standardization of amplitude-modulation voice-frequency telegraphy	51

No.	Title	Page
B.12	Standardization of the method of modulation in harmonic frequency telegraphy	53
B.13	Coexistence in the same cable of telephony and harmonic frequency telegraphy	53
B.14	Use of carrier telephone systems for voice-frequency telegraphy	58
B.15	Recommendation on the transmitted power for voice-frequency telegraph systems	61
B.16	Use of static relays for transmission	61
B.17	Coexistence in the same cable of telephony and supra-acoustic telegraphy	62
B.18	Utilisation of the inter-channel frequency band and of carrier telephone circuits for telegraph transmission	63
B.19	Non-simultaneous transmission of telegraphy and telephony on rented international telephone circuits	63
B.20	Conditions to be fulfilled by regenerative repeaters	64
B.21	Conditions to be fulfilled by regenerative repeaters employed for 7 unit start-stop transmission	64
B.22	Standardization of the capacity of telegraph circuits	65
B.23	Deleted	
B.24	Tolerable limits for the degree of rhythmic distortion of telegraph circuits excluding apparatus	66
B.25	Standard limits to be applied in planning international point-to-point telegraph communications and switched networks, by means of start-stop apparatus conforming to C.C.I.T. recommendations	66
B.26	Siting of regenerative repeaters in international Telex circuits	67
B.27	Types of lines	68
B.28	Standardization of aerial telegraph conductors	68
B.29	Designation of international telegraph circuits	69
B.30	Organization of the maintenance of international telegraph circuits	69
B.31	Deleted	
B.32	Determination of the standardized test distortion of the elements of a complete circuit	71
B.33	Tests of circuits equipped with start-stop apparatus	72
B.34	Periodicity of maintenance measurements to be carried out on the channels of international voice-frequency telegraph systems	72
B.35	Maintenance measurements to be made on V.F. telegraph systems	73
B.36	Permissible limits for the degree of distortion on an international V.F. telegraph channel	73
B.37	Routine maintenance programme for international voice-frequency telegraph systems	74
B.38	Reserve channels for maintenance measurements on channels of international V.F. telegraph systems	75
B.39	Reserve circuits for V.F. telegraphy	75
B.40	Maximum acceptable limit for the duration of interruption of telegraph channels arising from failure of the normal power supplies	76
B.41	Causes of disturbances to signals in V.F. telegraph channels and their effect on telegraph distortion	77
B.42	Appearance of false calling and clearing signals in circuits operated by switched teleprinter services	78
B.43	Pilot channel for voice-frequency telegraph systems using amplitude modulation	80
B.44	Maintenance measurements on international sections of international telegraph circuits	80
B.45	Threshold of sensitivity for amplitude-modulated voice-frequency telegraph receivers	81
B.46	Standardization of operating conditions for static sending relays of amplitude-modulated voice-frequency telegraph systems	82
B.47	Choice of methods of modulation for Voice-frequency Telegraph systems	82
B.48	Standardization of frequency shift modulated voice-frequency telegraph systems	83
B.49	Voice-frequency telegraphy on radio circuits.	85

No.	Title	Page
B.50	Simultaneous communication by telephone and telegraph on a telephone circuit	86
B.51	Conventional degree of distortion	87
B.52	Choice of type of telegraph distortion measuring apparatus	87
B.53	Changes of level and interruptions in voice-frequency telegraph channels	88
B.54	Measurement of noise in telephone circuits used for voice-frequency telegraphy	89
B.55	Organization of locating and clearing faults in international telegraph switched networks	89

C. Recommendations applying to Alphabetic Telegraph Apparatus

C.1	Definition of the apparatus margin	93
C.2	Addition to the definition of the margin of start-stop apparatus	93
C.3	Standardization of multiplex apparatus	94
C.4	Standardization of transmission characteristics of start-stop apparatus	94
C.5	Intercontinental standardization of the modulation rate of start-stop apparatus	95
C.6	Standardization of the number of characters per line in page printing start-stop apparatus	96
C.7	Secondaries of letters F, G, H of start-stop apparatus	96
C.8	Confirmatory symbols in connection with the " Who are You " and " warning bell " signals in start-stop apparatus	96
C.9	Standardization of the start-stop apparatus of the subscribers' telegraph service	97
C.10	Interconnection of page-printing and tape-printing start-stop apparatus	97
C.11	Use of the secondary of " D " to operate the answer-back unit in intercontinental service	98
C.12	Use of the combination 32 of the international telegraph alphabet N° 2	99
C.13	Start-stop teleprinter apparatus motor control for public or private point-to-point circuits	99
C.14	Characteristics of relays	100
C.15	Limitation of the period of relay bounce	102
C.16	Determination of relay characteristics	102
C.17	Unbalance of differential relays	103
C.18	Adjustment of relays	106
C.19	Start-stop reperforating apparatus	108
C.20	Standardization of the characteristics of the paper used on start-stop page printing apparatus	108
C.21	Standardization of sprocket feed mechanisms used on start-stop page-printing apparatus	109
C.22	Suppression of unwanted reception in radiotelegraph multi-destination teleprinter system	112
C.23	Conditions which must be satisfied by synchronous systems operating in connection with start-stop teleprinter systems	112
C.24	Use on radio circuits of 7-unit synchronous systems giving error correction by automatic repetition	113

D. Recommendations applying to questions of Facsimile

D.1	Standardization of phototelegraph apparatus	115
D.2	Deleted	
D.3	Coexistence of telephony and phototelegraphy in long-distance telephone cables	119
D.4	Phototelegraph transmission over combined radio and metallic circuits	126
D.5	Deleted	
D.6	Direction of scanning for direct recording facsimile systems not required to receive and record half-tones	127
D.7	Facsimile transmission of Meteorological Charts over radio circuits	128

E. Recommendations applying to questions of telegraph switching

No.	Title	Page
E.1	Signalling conditions for use in the International Telex Service	129
E.2	Standardization of dials and dial pulse generators for the International Telex Service. . .	133
E.3	Arrangements in switching equipment to minimise the effects of false calling signals . . .	133
E.4	Exchange of information regarding signals destined to be used over international circuits concerned with switched teleprinter networks	134
E.5	Requirements to be met by regenerative repeaters in international connections	134
E.6	Telex signalling on radio channels	136
E.7	Signalling conditions for use in the international Telex service—considerations affecting numbering schemes for automatic switching networks	137
E.8	Signalling conditions in the “Gentex” service.	137
E.9	Prevention of connection to faulty stations and/or station in the “Gentex” service . . .	138

F. Recommendations applying to questions of speed of transmission and working methods

F.1	Speed of transmission of international telegrams	139
F.2	Deleted	
F.3	Acceleration of transmission and delivery of international telegrams	143
F.4	Handing in of telegrams by Telex service subscribers	143
F.5	General telegraph statistics	144
F.6	Service codes	151
F.7	Maximum tolerable rate of error for land-line telegraphic communications operated with five-unit start-stop apparatus	164
F.8	Maximum tolerable error rate for radiotelegraph communications using five-unit start-stop apparatus (including mixed communications consisting of wire and radio circuits)	165
F.9	Receipt of telegrams in pages in an agreed form and without errors	165
F.10	“Message separation” signal	166
F.11	Constitution of the European switching network for the general public telegraph service using start-stop teleprinters	167
F.12	The use of tape printing teleprinters in the “Gentex” service	168
F.13	Call number of offices connected to the “Gentex” service.	168
F.14	List of call numbers of offices participating in the “Gentex” service	169
F.15	Acknowledgement of receipt in the “Gentex” service	170
F.16	Connection of restricted service offices to the “Gentex” network.	170
F.17	Overflow in the “Gentex” service	171
F.18	Grade of service for international trunk circuits used in the “Gentex” service	171
F.19	Suspense arrangements in the “Gentex” service.	171
F.20	Barring arrangements in the “Gentex” service	172

G. Recommendations and Resolution applying to questions of regulations and tariffs

G.1	Structure of Telegraph Regulations and classification of telegrams.	173
G.2	Deleted	
G.3	Deleted	
G.4	Charges for phototelegrams	179
G.5	Special rates for meteorological telegrams	180
G.6	Study of a new system of charging	181
G.7	Basis of charging	181

No.	Title	Page
G.8	Word-counting — Preparation of a vocabulary	181
G.9	Introduction into the Telegraph Regulations of the concept of fraudulent joining and alteration of words.	182
G.10	Should letter-telegrams be abolished?	182
G.11	Phototelegrams	183
G.12	Action to be taken in case of interruption of telegraph circuits — Possible use of Telex circuits	183
G.13	Accounting procedure to be applied in the case where a telephone circuit used for V. F. telegraphy is replaced by another following a different route	183
G.14	Accounting in the public telegraph service	184
G.15	Accounting in the "Gentex" service	184
G.16	General study of tariffs in the European system	185
	Resolution No. G.1 — Telegraph rates for transmission of transit telegrams	190

H. Recommendations applying to questions of Telex service and leased circuits

H.1	Draft regulations for the Subscribers' Telegraph Service by start-stop apparatus in the European system	192
H.2	Use of tape-teletypewriters in the Telex service	211
H.3	Duplex operation in the Telex service	212
H.4	Tables of international Telex traffic	212
H.5	Leasing of telegraph circuits	213
H.6	Accounting for the rental of the leases of international telegraph circuits	215
H.7	Tariff applicable to lease of circuits to meteorological services	216
H.8	Metering of traffic on leased telegraph circuits	216
H.9	Conference and broadcast calls in the international Telex service	220
H.10	Determination of the number of international Telex circuits required to carry a given volume of traffic	220
H.11	Time-to-answer by operators at international Telex positions	223
H.12	List of Telex circuits and routes	223
H.13	Leased telephone circuits used simultaneously for telegraphy and telephony	224
H.14	Rates for Telex calls	225

I. Recommendations applying to questions of Vocabulary, Definitions, Symbols, Classification

I.1	List of Definitions	227
I.2	Study requested in Resolution No. 14 of the Paris Telegraph and Telephone Conference concerning certain definitions relating to the international telegraph service	228
I.3	Letter symbols	231
I.4	Graphical symbols	232
I.5	Universal decimal classification	244

A. RECOMMENDATIONS CONCERNING ORGANIZATION
AND PROCEDURE OF THE C.C.I.T.

The International Telegraph Consultative Committee having ceased to exist as from 31 December 1956, Recommendations under Category A no longer apply.

B. RECOMMENDATIONS APPLYING TO QUESTIONS OF TELEGRAPH TRANSMISSION

B.1 Definitions relating to transmission in alphabetic telegraph systems

*(former Recommendation 301, Warsaw, 1936,
modified at Brussels, 1948, at Arnhem, 1953 and at Geneva, 1956)*

Definitions under Recommendation B.1 are included in the Draft List of essential Telegraph Terms (See Recommendation I.1).

B.2. Additional definitions relating to telegraph transmission

(Arnhem, 1953, amended at Geneva, 1956)

Definitions under Recommendation B.2 are included in the Draft List of essential Telegraph Terms (See Recommendation I.1).

B.3. Balancing of artificial lines and the adjustment of apparatus in the case of duplex circuits with rapid equipment on special lines (aerial or cable)

(former Recommendation 351, Warsaw, 1936)

The C.C.I.T.,

unanimously declares the view

that the following rules are applicable for the balancing of artificial lines and for the adjustment of apparatus in the case of international duplex circuits with rapid equipment on special lines (aerial or cable).

On a line involving several relay stations, the balancing of the artificial lines should be carried out at the same time, insofar as possible, over the various sections of the circuit.

It is a line of this type to which the procedure below is applicable; the method to be adopted when the circuit does not include any relay stations is easily deduced from it.

Service communications may be exchanged either by Morse over the circuits to be adjusted or by telephone over a service circuit.

We will suppose in what follows that this exchange takes place by Morse.

Assume a circuit A B C D with two relay stations, B and C, between the terminals of the line, A and D.

a) To carry out the balancing, stations B and C are placed in the disconnect position.

Station A calls station B (likewise station D calls station C) and says: "give R". Station B answers: "here is R", and, in the case of simple current, sees that its key remains in the rest position, whereas, in the case of double current, it substitutes for its resting battery the resistance provided for the purpose.

(B.3)

Station A immediately proceeds to establish a balance between the artificial and real lines.

Station B observes its galvanometer for several moments, to make sure that the intensity of received current is sufficient and, in the case of double current, that this intensity is the same for both directions of current. If in this respect it observes anything irregular, it immediately informs station A, furnishing all useful information.

Station A, as soon as it has obtained balance, calls B; the latter places his resting battery in the circuit if need be, and A says: "here is R" and proceeds as has been described above for B giving R to A.

Station B now establishes balance of the artificial and real lines in the direction of A, and A in turn observes the needle of its galvanometer in order to measure the intensity of the received current, and possibly the equality of this intensity for both directions of current.

When B has completed the balancing, it calls A, the latter restores his resting battery, if necessary, and B asks A to wait in order to deal with the section toward C.

When the two repeater stations have completed the balancing in both directions, they exchange the signal "DF" with each other as well as with their neighbouring end stations, and establish direct communication. The end stations test the circuit. The intermediate stations observe the passage of the signals and carry out the operations that may be necessary.

b) The end stations then connect the circuit to the working apparatus (Baudot, Siemens, Wheatstone, etc.) in order to proceed to the operations preliminary to their being used for the handling of traffic.

At first, the end stations transmit one after the other and then both together, for two minutes at a time, a series of "alternations" in order to determine, or to permit other repeater stations to determine, whether it is necessary to refine the adjustment of the armature travel of the relay(s), and whether it is advisable to modify somewhat the value of one artificial line or the other.

c) After this, the two end stations transmit simultaneously for 1 or 2 minutes the repetition of a letter or of a small group of letters in Morse signals which are reproduced in the monitoring apparatus (Morse or Sounder) of the repeater station. With the Baudot or Siemens apparatus these Morse signals are obtained by a suitable sequence of emissions.

d) Then the stations are put into correspondence with each other and the equipment adjusted for transmissions first in one direction and then in the other.

It is evident that the imperfections which then appear are the fault of the equipment or the batteries of the end or intermediate stations and that the balances are completely beyond question.

e) Everything being in order with respect to line balances, both end stations, one after the other, transmit while their receiving apparatus is functioning.

If their transmission disturbs their reception, it is proof that at the station which is carrying out the test or at one of the relay stations—in the direction of the other end—the balance is insufficient.

f) The end stations often have to request the relay stations to allow a slight displacement or the armature of the relay which transmits the signals to them either toward the working stop or toward the resting stop. This is done with the aid of the Morse key substituting momentarily, if necessary, for the transmitter employed during operation. This procedure is briefly indicated. For example: the letter "P" (plus) preceded by the call-signal of the station to which the request is addressed to say "displace toward the working stop" and the letter "M" (minus) preceded by the same call signal to say "displace toward the resting stop". It is self-evident that, when there is only one relay station on the line, the transmission of the call signal is pointless.

B.4. Characteristic factor of the quality of balance

(former Recommendation 352, Brussels, 1948, amended at Geneva, 1956)

The C.C.I.T.,

considering

that the quality of a telegraphic communication is best characterized by distortion ;
that the measurement of telegraphic distortion is now a common practice ;

unanimously declares the view

a) that the quality of balance of a duplex telegraph circuit can provisionally be characterized by the difference in the degrees of distortion of the signals restituted :

1. when no signals are transmitted on the sending channel ;
2. when signals are transmitted over that channel ;

b) that measurements should be made at both ends of the circuit.

Comment : The quality of balance thus characterized is applicable to standardized telegraph systems for which measurements of the degree of distortion are usually made.

B.5. Switching methods

(former Recommendation 411, Warsaw, 1936)

The C.C.I.T.,

considering

that it is possible to obtain a satisfactory service by single or double switching methods, and with batteries insulated or not insulated from the ground,

unanimously declares the view

that it devolves upon the Administrations or Private Operating Agencies to employ any method for the operation of international circuits, provided that it allows faultless service.

B.6. Grounding

(former Recommendation 412, Warsaw, 1936, amended at Geneva, 1956)

The C.C.I.T.,

considering

that when a cable is not exposed to any induction phenomena, the grounding of the centre point of the source of current may have the advantage of ensuring a more perfect symmetry of the supply voltages of the telegraph circuit in relation to the cable envelope and in relation to the other circuits of the same cable ;

that, in the case of a cable exposed to induction phenomena, it is very difficult to fulfil the conditions listed in the Green Book of the C.C.I.F. (Volume II *bis*, Recommendation No. 1, with grounded power supplies, and that this grounding is not indispensable ;

(B.6)

unanimously declares the view

that, when use is made of batteries employed in common for local circuits and line circuits, it is advisable to ground the centre point of these batteries in cases when no induction phenomena is to be feared;

that, in the case of cable exposed to considerable induction phenomena, it is advisable to use a separate source, with not grounding, for each circuit.

B.7. Grounding of installations connected to a long-distance cable circuit
(former Recommendation 452, Warsaw, 1936, amended at Geneva, 1956)

The C.C.I.T.,

considering

that the C.C.I.F. Recommendation relating to the grounding of a long-distance cable telephone line (*Green Book*, Volume II (*bis*)) applies to direct current telegraphy;

that, in many cases, the induced voltages to be expected in long distance telephone cables with grounded telegraph installations are today still low enough for no disruptive discharge between wires to be feared;

that, in addition, because of the development of high tension networks and the electrification of railways, it may be feared that induced voltages may in the future cause disruptive discharges between wires;

that it is not yet known which method is most advisable for the wiring of direct current telegraph installations in order to satisfy conditions of the above Recommendations,

unanimously declares the view

1. that it is advisable not to ground at any point in a long-distance cable circuit;
2. that, as a general rule, it is advisable not to ground at any point in an installation (telephone or telegraph) which is connected by metal to a long-distance cable telephone circuit;
3. that if, however, for special reasons, it is necessary to ground an installation directly connected to the conductors of a cable, it is necessary to take the following precautions:
 - a) the grounding must be carried out in such a way that the balance of the circuits in relation to the ground and to adjacent circuits is not disturbed;
 - b) the disruptive voltage of all the other conductors of the cable together, in relation to the circuit connected to ground, must be appreciably higher than the highest voltage which, as a result of induction from adjacent power lines, could exist between these conductors and the circuit connected to ground;
4. that the most advisable and economical method of avoiding grounding (2) or the danger of such grounding (3 b) must be found for the wiring of direct current telegraph installations;
5. that an investigation must be made, for wirings which have grounding at present, to ascertain whether condition 3 b will continue to be satisfied in the event that new distribution networks or new electric railway lines are put into operation, in which case suitable measures must be taken.

B.8. Standardization of direct current telegraph circuits employing telephone cables

(former Recommendation 401, Warsaw, 1936, amended at Geneva, 1956)

The C.C.I.T.,

considering

that, to effect smooth co-operation of direct current telegraph devices functioning on channels in telephone cables (infra-acoustic telegraphy, telegraphy on phantom or double phantom cables) as much from the technical as from the operational point of view, it is necessary that the equipment of the circuits should be established on uniform principles,

unanimously declares the view

that in the matter of direct current telegraph circuits making use of telephone cables, terminated at their extremities by telegraph relays, served at the modulation rate of 50 bauds, and making use of currents taking only two values in steady state, circuit and supervisory equipment should satisfy the following conditions :

- a) for the excitation of relays and the transmission of signals, a working current and a resting current of equal intensity in steady state, but in opposite directions, should be used ;
- b) as a general rule, arrangement will be in differential duplex ; however, in certain special cases, particularly those of telephone cables with unidirectional transmission, operation will be carried out by separate channels for the two directions of transmission ;
- c) the excitation current of the receiving relay will be between 2 and 4 milliamperes for infra-acoustic telegraphy and between 4 and 8 milliamperes for telegraphy on phantom and double phantom circuits ;
- d) in general, repeaters will comprise separate receiving and transmitting relays ; however, in special cases, the same relay may serve for both functions ;
- e) equipment will be constructed in such a way that one may, easily and speedily :
 - replace the source of current by a resistance equal to the internal resistance of that source ;
 - insert, during operation, an apparatus for measuring distortion ;
 - change lines and apparatus by means of jacks and plugs ;
- f) supervisory equipment should allow the following operations to be accomplished in the minimum time :
 - emission of symmetrical alternations at the modulation rate of 50 bauds ;
 - measurement in steady state of the effective of operational currents, receiving relays and currents coming from transmitting relays ;
 - measurement of currents in local circuits ;
 - determination of data concerning the quality of the circuit balance.

B.9. Coexistence in a single non-submarine cable of telephony and direct current telegraphy
(former Recommendation 451, Warsaw, 1936, amended at Arnhem, 1953, and at Geneva, 1956)

The C.C.I.T.,

considering

that technical processes exist by which telephone traffic and telegraph traffic can be passed through the same cable either on separate conductors or even on common conductors; that by these processes, if the precautions described below are observed, the telephone circuits, including phantom circuits, are to all intents and purposes uninfluenced by the telegraphy as regards both their electrical properties and the flow of traffic;

that, even when the cable is subject to the influence of electric power installations (particularly AC railway lines), undisturbed telephone and telegraph services can be obtained by the use of devices which have been proved to be effective;

that, moreover, the simultaneous use of a long-distance cable for international telephony and telegraphy is to be recommended for economic reasons,

unanimously declares the view

that it is possible to allow in a single cable (non-submarine) the coexistence of telephony and D.C. telegraphy, provided that the conditions listed below are fulfilled:

A. Simultaneous telegraphy on single or double phantom circuits.

(Note: The Vith Plenary Assembly of the C.C.I.T., Brussels, 1948, considered that the study of questions concerning infra-acoustic telegraphy had become pointless and should be abandoned.)

1. The E.M.F. introduced by the telegraph transmitter into the circuit containing the cable conductors must not exceed 50 volts.

2. Where a resistance of 30 ohms, substituted for the cable conductors, is placed across the terminals of this telegraph transmitter, the current flowing through this resistance must not exceed 50 milliamperes.

This limit is raised to 100 milliamperes if the cable is fitted with coils having a powdered iron core or a core of some other material with equally satisfactory characteristics.

3. The disturbance noises produced by all the telegraph apparatus on a telephone circuit must not exceed, at the point of relative level of -1.0 neper or -8.7 decibels and with an impedance of 600 ohms, a value which corresponds to a psophometric E.M.F. of 1 millivolt. To fulfil this condition, it is advisable to insert low-pass filters in the transmission on all telegraph circuits operated by direct current. This limit may have to be lowered when the telephone circuit is already subject to considerable disturbance from an adjacent power-line.

4. The simultaneous telegraph installations must not introduce unbalance relative to earth in the telephone circuits (Directives for the protection of telecommunication lines against the harmful effects of industrial power-lines).

5. The increase in crosstalk produced by the simultaneous telegraphy installations in the telephone circuits must not exceed a value corresponding to a decrease of 0.5 neper or 4.34 decibels in the near-end crosstalk attenuation.

6. The circuits of which the single or double phantom circuits used for telegraphy are composed must not be used for broadcast relays.

(B.9)

B. Telegraphy and telephony coexistent on separate conductors.

1. Case in which the telegraph uses coil-loaded conductors which may afterwards be used for telephony :

The conditions set out above under A. 1., 2. and 3. must be fulfilled.

2. Case in which the telegraph uses unloaded conductors :

The conditions set out above under A. 3. only must be fulfilled.

B.10. Coexistence on the same conductors of a cable of harmonic telegraphy or phototelegraphy, on one hand, and telegraphy on phantom or double phantom circuits, on the other

(former Recommendation 391, Warsaw, 1936)

The C.C.I.T.,

considering

that it is advisable not to complicate harmonic telegraphy or phototelegraphy circuits,

unanimously declares the view

that, when the telegraph current on phantom or super-phantom circuits does not influence the magnetic field of the loading coils, the technical conditions stipulated for the coexistence of telephony and telegraphy on phantom or double phantom circuits are also applicable for the coexistence of harmonic telegraphy or phototelegraphy, on one hand, and telegraphy on phantom or double phantom circuits, on the other ;

that when the telegraph current influences the magnetic field of the loading coils and there is doubt about their qualities as far as the effects of these fluctuations are concerned, it is not advisable to resort to such coexistence ;

that, in general, it is not advisable to resort to such coexistence.

B.11. Standardization of amplitude-modulated voice-frequency telegraphy

(former Recommendation 511, Brussels, 1948, modified at Arnhem, 1953, and at Geneva, 1956)

The C.C.I.T.,

considering

that it is desirable that certain data relating to amplitude-modulation voice-frequency telegraphy in international use be uniformly established ;

that there are cases, for example that where 2-wire circuits are used, and where it is not possible for the apparatus at one of the ends to be operated at the same frequency in the outgoing and incoming channels,

unanimously declares the view

1. that it is advisable to adopt for international telegraphy the series of frequencies formed by uneven multiples of 60, the lowest frequency being 420 c/s :

(B.11)

Channel Number	Frequency c/s	Channel Number	Frequency c/s
1	420	13	1860
2	540	14	1980
3	660	15	2100
4	780	16	2220
5	900	17	2340
6	1020	18	2460
7	1140	19	2580
8	1260	20	2700
9	1380	21	2820
10	1500	22	2940
11	1620	23	3060
12	1740	24	3180

This numbering is valid whatever use is made of the channel (e.g. traffic channel, pilot channel, etc.) or the method employed to obtain the line frequencies e.g. by group modulation.

2. that, however, in special cases (for example circuits using long submarine telegraph cable on a section of their route), the Administrations concerned may agree upon the use of a different series of frequencies ;

3. that the frequencies applied to the bearer telephone circuit should not deviate by more than 6 c/s from the nominal value when the telegraph channels supplied are operating over a telephone circuit composed exclusively of audio-frequency sections, and not more than 3 c/s in other cases ;

4. that the power levels of carrier waves transmitted on the line and measured successively in as short a period as possible should not differ from one another by more than 0.2 neper when they are operating on a constant impedance ;

5. that the power of each of the carrier waves transmitted on the line should not vary in operation by more than ± 0.1 neper when it operates on a constant impedance ;

6. that the envelope of the current transmitted to the line should have a slope of about 10 % of the steady state amplitude per millisecond at the moment when, on its first rise, its ordinate reaches a value equal to half its steady state of amplitude ;

7. that it must be possible to subject any channel to a test without withdrawing from service a channel other than the return channel of the circuit planned ;

8. that local tests must be made at each of the ends before making the two terminal exchanges work together, if this is necessary ;

9. that, in graded harmonic frequency telegraphy, it is desirable that the same frequencies be used separately for circuits established on different successive sections of a 4-wire circuit ;

10. that, in graded harmonic frequency telegraphy, the attenuation of the filters which pass a group of frequencies must, in the suppressed frequency band, be higher by at least 4 nepers than that shown in the transmission band ;

11. that, in graded harmonic frequency telegraphy, in order to facilitate local tests, the frequencies used for communications set up between two international exchanges in one direction, should also be used in the opposite direction, if possible.

B.12. Standardization of the method of amplitude modulation in harmonic frequency telegraphy
(former Recommendation 512, Warsaw, 1936, amended at Arnhem, 1953, and at Geneva, 1956)

The C.C.I.T.,

considering

that it is possible, in the present state of harmonic frequency telegraphy, to recommend a uniform method of amplitude modulation,

unanimously declares the view

That it is to be recommended that amplitude-modulated voice-frequency telegraphy be operated in such a way that the voice frequency is transmitted on the line when the stop element of the International Telegraph Alphabet No. 2 is being transmitted.

B.13. Coexistence in the same cable of telephony and harmonic frequency telegraphy

(former Recommendation 516, Warsaw, 1936,
at Geneva, 1951, at Arnhem, 1953 and at Geneva, 1956)

The C.C.I.T.,

considering

that the coexistence of telephony and harmonic frequency telegraphy in a single cable presents no obstacle, particularly as far as crosstalk is concerned, when the total power of the telegraph currents is kept below a certain limit;

that the C.C.I.F. has studied the conditions of coexistence of telephony and harmonic frequency telegraphy (*Green Book*, Volume III, page 168)

unanimously declares the view

that harmonic frequency telegraph installations should satisfy the following conditions:

The instantaneous maximum voltage produced by the whole of the telegraph signals corresponding to the frequencies simultaneously used on a single circuit must not exceed that of a sine wave with a power of 5 milliwatts at the point of relative level zero calculated from the level diagram of the telephone circuit.

The harmonic frequency telegraph transmitter is not, in the majority of cases, connected to the input of the telephone circuit, but to a point where the relative level h is different from zero.

The power of the sine wave corresponding to the instantaneous maximum power permissible in that point is thus:

$$P_{\max} = 5 e^{(2h)} \text{ milliwatts } (h \text{ in nepers}).$$

The maximum voltage for an impedance Z of the circuit is thus:

$$U_{\max} = [5 \cdot 10^{-3} e^{(2h)} Z]^{1/2} \text{ volts.}$$

In the frequency division multiplex telegraphy with n frequencies, this voltage U_{\max} will not be exceeded, if, for any of the frequencies, the r.m.s. value U_f of the voltage does not exceed the n th part of U_{\max} .

$$U_f = \frac{1}{n} U_{\max}$$

(B.13)

Or, introducing the relative voltage level h_v in the place of the relative power level h ,

$$h_v = h + \log_e \sqrt{\frac{Z}{600}}$$

it comes :

$$U_f = \frac{1}{n} e^{(h_v)} \sqrt{3} \quad \text{volts.}$$

The measurements are taken during transmission of a continuous dash on each frequency in the circuit one after the other. For this purpose, each generator is adjusted in such a way as to attain, for each frequency, the voltage indicated above. The measurement of the voltage which is to be taken at the input of the circuit used for multiplex harmonic frequency telegraphy may be taken with any standard voltmeter.

If usual level measuring sets are used, which are calibrated for absolute levels, the value of the absolute level not to be exceeded is, for a n channels system :

$$h_{\text{meas}} = \log_e \frac{U_f}{0,775} = h_v + 0,8 - \log_e n \quad \text{in nepers.}$$

If the absolute voltage level rises at the input of the harmonic frequency telegraph circuit to $h_v = 0.7$ neper, or 6.1 decibels, for example, it will be necessary to make adjustments according to the following measurement scale :

- 3-channel system : $h_{\text{meas}} = 0.7 + 0.8 - \log_e 3 = + 0.4$ neper or $+ 3.5$ decibels
- 6-channel system : $h_{\text{meas}} = 0.7 + 0.8 - \log_e 6 = - 0.3$ neper or $- 2.0$ decibels
- 12-channel system : $h_{\text{meas}} = 0.7 + 0.8 - \log_e 12 = - 1.0$ neper or $- 8.7$ decibels

It is considered that there is no necessity to check the voltages and the powers in operation.

considering furthermore

that the C.C.I.F., in close consultation with the C.C.I.T., has studied the conditions to be fulfilled by international telephone circuits used for V.F. Telegraphy and the maintenance measurements to be made on such circuits,

and that C.C.I.F. has issued Recommendations on these matters,

unanimously declares the view

that the C.C.I.T. can agree with the C.C.I.F. Recommendations on this subject contained in the *Green Book*, 1951, Volume III, pages 169 and 291. These Recommendations are reproduced in the Annex.

ANNEX

1. In V.F. telegraphy it is preferable to use four wire circuits.

The type of load to be carried depends on the number of carrier frequencies to be transmitted. For instance, for systems in which the number of channels is not greater than 12, the medium load may be carried even for long distance transmissions, whereas for systems employing 18 channels instead of 12, circuits with a load lighter than the medium load should be used.

With two wire circuits, two way operation (duplex) would be impossible because these circuits cannot be balanced with sufficient accuracy to avoid mutual interference. However, a two wire circuit may be used for V.F. telegraphy if low frequencies are used for transmission in one direction and high frequencies for transmission in the other direction.

(B.13)

2. A four wire circuit used for V.F. telegraphy differs in composition from a four wire telephone circuit owing to the absence of four wire terminations and echo suppressors.

Points A and B (figure 1) at which the circuit used for V.F. telegraphy is switched to its reserve circuit (conventionally considered as the input and the output of the four wire circuit used for V.F. telegraphy) should respectively be at the same relative levels in these two circuits, such levels being determined by the hypsogram of the telephone circuit.

The relative level at point A should not exceed -0.4 neper.

The relative level at point B should be at least $+0.4$ neper.

a) The graph in figure 2 shows for the different frequencies what are the variations, in relation to the nominal value of 800 c/s, of the difference in the relative power levels between the input and the output of the circuit (point A and B).

b) The permissible tolerances for the relative power level at the output of frontier repeaters correspond to those laid down for 4 wire telephone circuits, assuming that, in making maintenance measurements, a power equivalent to 1 milliwatt at the point of zero relative level deduced from the hypsogram of the telephone circuit is applied at the input of the circuit used for V.F. telegraphy.

These tolerances are shown in the graph given in figure 3 attached.

It seems unnecessary to lay down special tolerances for the variations, in terms of the frequency, of the through level measured at the output of a frontier repeater since this figure can easily be calculated on the basis of the permissible tolerances for the relative power level.

c) The relative power level at the point where the V.F. circuit, at the reception end, is switched to its reserve circuit must remain as constant as possible in time. Moreover, any interruption of the circuit, however short, is harmful to telegraph transmission. Great care should therefore be exercised when taking measurements on circuits and repeaters, when switching batteries, etc. To draw the attention of staff to this point, the circuits used for V.F. telegraphy should be specially marked in terminal offices and in repeater stations.

d) Special steps should be taken to ensure that no modulation is caused on circuits and in repeaters. Such modulation might be caused, inter alia, by fluctuations of battery voltages, or by the connection of sub-audio telegraphy equipments to the conductors of the cable.

3. Recommendations applicable to the establishment and maintenance of four-wire telephone circuits are also applicable to circuits used for V.F. telegraphy. Maintenance measurements, however, are confined to measurement of equivalent and level in the frequency band used for V.F. telegraphy.

Periodical measurements at 800 c/s should be taken at the same intervals recommended for international telephone circuits, i.e. monthly for circuits with less than 15 repeaters, and weekly for circuits with more than 15.

Measurements at different frequencies should be taken half-yearly. All these measurements should be taken by applying, at the input of the circuit used for V.F. telegraphy, a power corresponding to 1 milliwatt at the point of zero relative level deduced from the hypsogram of the telephone circuit.

The frequencies for measurements are as follows :

Circuits permitting the use of 18-frequency systems : 300, 500, 800, 1400, 2000, 2200, 2400, 2600 c/s.

Circuits permitting the use of 24-frequency systems : 300, 500, 800, 1400, 2000, 2400, 2800, 3000, 3200, 3300 c/s.

Any interruption of such a circuit, even of very short duration, spoils the quality of the telegraph transmission. It is therefore desirable to take great care when making measurements on circuits used for voice-frequency telegraphy.

To draw the attention of staff to this matter, channel equipment for circuits used for voice-frequency telegraphy should be specially marked in the terminal exchanges and where necessary in repeater stations where the circuits are accessible.

It is desirable that the maintenance measurements on the “reserve circuit” should be made just before the maintenance measurements are made on the “normal circuit”, so that the reserve circuit can replace the normal circuit whilst the latter is tested. For the changeover it is recommended that as far as possible a procedure is used which avoids any mutilation of the telegraph signals.

When several voice-frequency telegraph systems are in use between two repeater stations, if the maintenance measurements on the telephone circuits between these stations are spread over several days, the tests on the circuits carrying the telegraph systems should also be spread over these days ; this makes the execution of the telegraph tests easier.

The maintenance measurements to be made on international voice-frequency telegraph channels concern only the telegraph Services.

Further, in connection with measurements on voice-frequency telegraph channels, it is for the telegraph Services to determine what documents should be exchanged.

Measurements on telegraph circuits used in switched networks (Telex circuits, amongst others) concern only the telegraph Services.

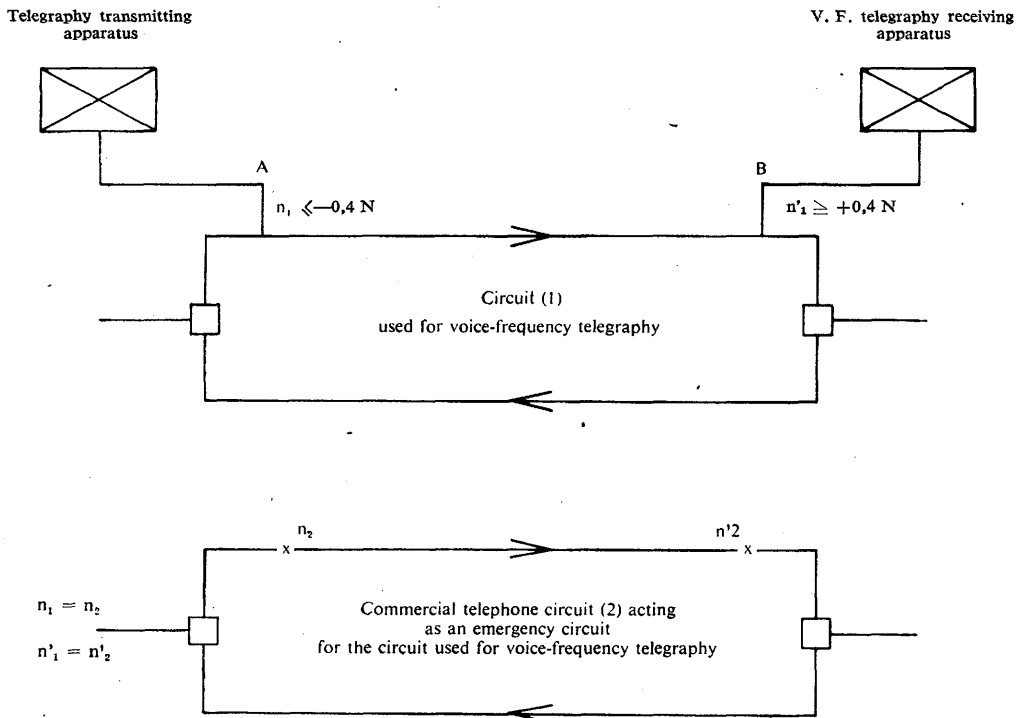


Fig. 1. — Diagram of a circuit used for V.F. telegraphy (1) and of its reserve circuit (2). A and B Points of :

1. connection between the telephone circuit used for V.F. telegraphy and the V.F. telegraphy equipments
2. switching from the circuit used V.F. telegraphy to its reserve circuit.

(B.13)

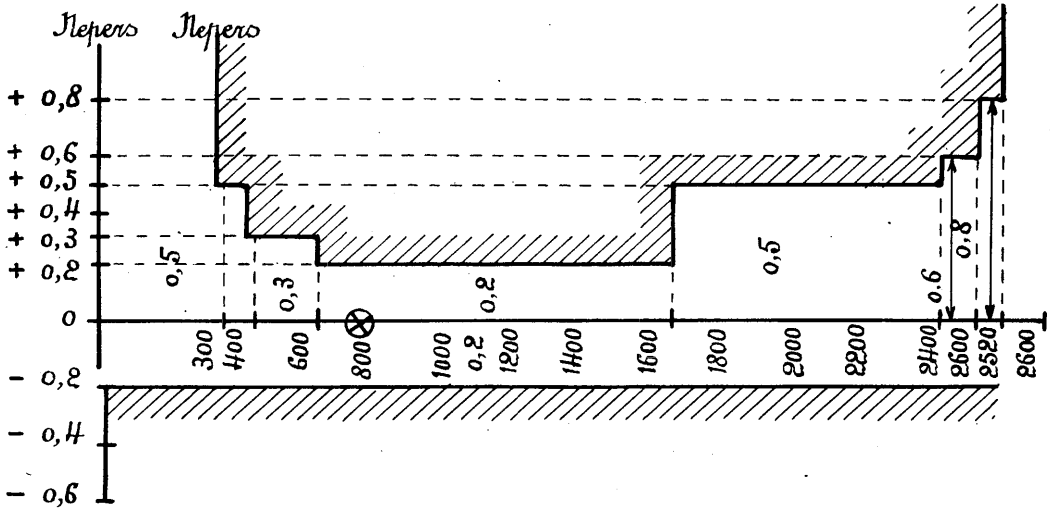


Fig. 2. — Graph. No. 2. — Limits for the variation, as a function of frequency, in relation to its nominal value at 800 c/s, of the difference of relative power levels between the origin and the extremity of a circuit used for voice-frequency telegraphy (telephone circuit with passband of 300 — 2,600 c/s).

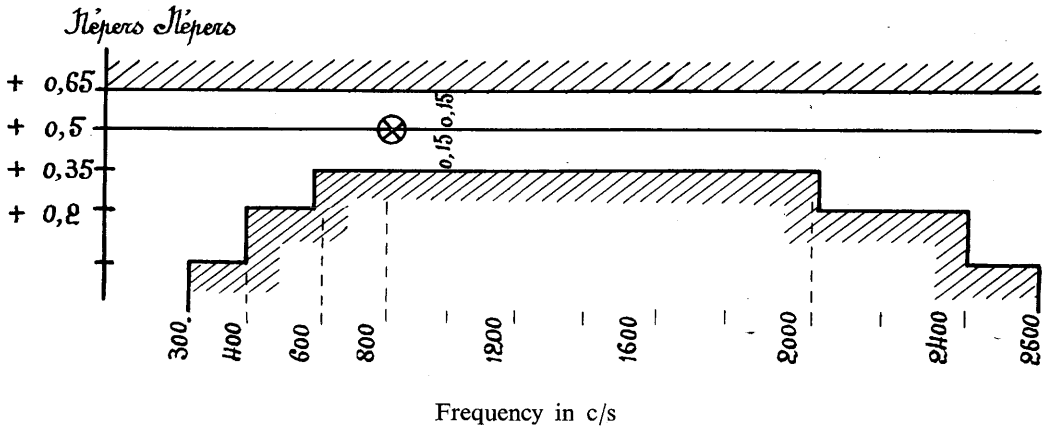


Fig. 3. — Graph. No. 3. — Limits for the absolute power level on the occasion of maintenance measurements at the output of a frontier-repeater (frontier side) of an international circuit with passband 300 — 2,600 c/s used for voice-frequency telegraphy, a power corresponding to 1 milliwatt at the point of zero relative level (as deduced from the hypsogram of the telephone circuit) being applied at the origin of the voice-frequency telegraph circuit.

B.14. Use of carrier telephone systems for voice-frequency telegraphy

(former Recommendation 518, Brussels, 1948, amended at Arnhem, 1953 and at Geneva, 1956)

The C.C.I.T.,

considering

that the C.C.I.F. has given Recommendations for :

1. the maximum total power of the telegraph currents which can be sent over a carrier telephone circuit ;
2. the attenuation distortion of the telephone channel ;
3. the phase distortion of the telephone channel ;
4. the stability of the virtual carrier frequencies of the carrier systems ;
5. the near-end signal crosstalk ratio between the two directions of transmission of a telephone circuit ;

unanimously declares the view

1. that the C.C.I.T. can accept the Recommendations on this subject contained in the C.C.I.F. *Green Book*, 1954, Volume III, pages 151-154, reproduced in the following extract in which, however, the note on page 153 concerning Figs. 34 and 35 has been amplified in accordance with the reply made by the 3rd Study Group of C.C.I.F. in November 1956.

Extract : Essential characteristics for a carrier-current telephone channel required to carry 24 voice-frequency telegraph channels each operating at 50 bauds.

a) *Output power and noise*

Telephone administrations are prepared to provide the telegraph services with telephone channels throughout the entire European system, each channel permitting the use of an 18-channel voice-frequency system at 50 bauds per telegraph channel.

In future carrier lines, the telephone administrations will be able to provide the telegraph services with telephone channels permitting the use of 24-channel voice-frequency telegraph systems (each at 50 bauds), on condition that the power of the telegraph current on each telegraph channel, when a continuous dash is being transmitted, is equal to 9 microwatts at the points of relative level zero.

This precaution is indispensable to avoid overloading the repeaters and modulators of the carrier systems. With this restriction on the telegraph power transmitted, the voice-frequency telegraph system will be able to make full use of the frequency band between 360 and 3240 c/s.

The power of 9 microwatts corresponds to

$$\frac{5 \text{ milliwatts}}{(24)^2}$$

This number is subject to revision if a statistical study of the peaks of the total telegraph current (on a telephone channel providing 24 telegraph channels) shows this to be advisable.

It may happen that a telephone channel gives a relatively high level of noise, in which case the telegraph service must abandon the use of 24 telegraph channels on such a telephone channel and limit itself to 18 channels only. In such a case the maximum permissible power for each telegraph channel is

$$\frac{5 \text{ milliwatts}}{18^2} = \text{about } 15 \text{ microwatts}$$

(B.14)

Note. — The power per telegraph channel should not in any case ever exceed

$$\frac{5 \text{ milliwatts}}{12^2}$$

or about 35 microwatts, calculated for a 12-channel telegraph system in accordance with the principles indicated above.

(b) Attenuation distortion

In the above-mentioned band (360 to 3240 c/s) the variation of equivalent with frequency of a carrier telephone channel should in the worst case be within the limits of graph No. 1 of figure 34 which will be adopted for telephone working.

For the majority of carrier telephone channels used for voice-frequency telegraphy, it is recommended that in general graph No. 5 of figure 35 should be used in all cases where a circuit intended to provide 24 telegraph channels is set up on a single group link * for either a normal or reserve circuit for voice-frequency telegraphy.

Note. — Telephone channels 1 and 12 of a group may show greater attenuation distortion than the other channels of the group. It is recommended that the use of these channels 1 and 12 for voice-frequency telegraphy should be avoided.

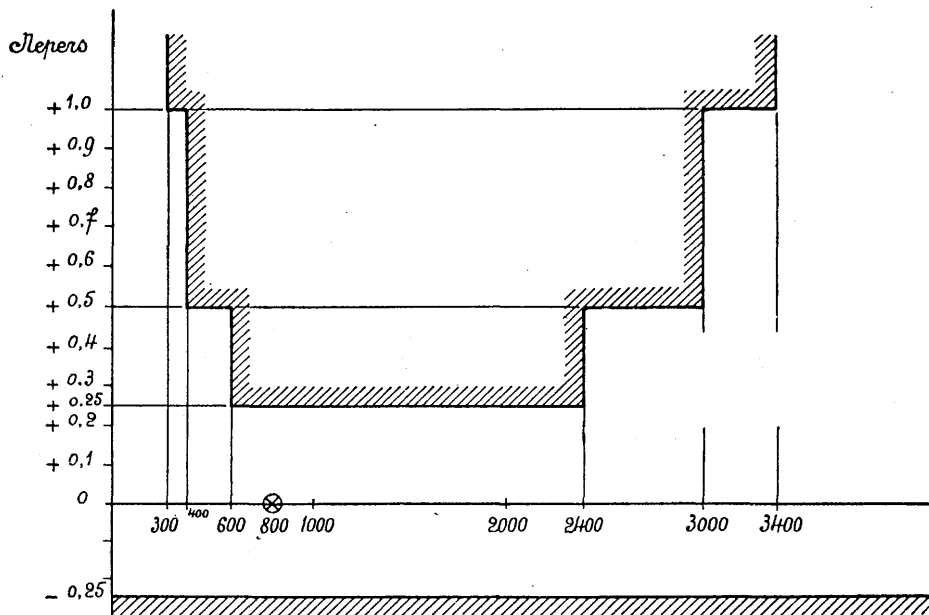


Fig. 34. — Graph. No. 1. — Variation with frequency of the equivalent in terminal service, relative to the value measured at 800 c/s (international circuit transmitting the band of frequencies 300 to 3400 c/s)

* A group link is a transmission path of defined band width (48/kc/s) connecting two group distribution frames or equivalent points. It extends from the point where the group is first assembled to the point where it is dispersed to channels. The term normally covers both directions of transmission.

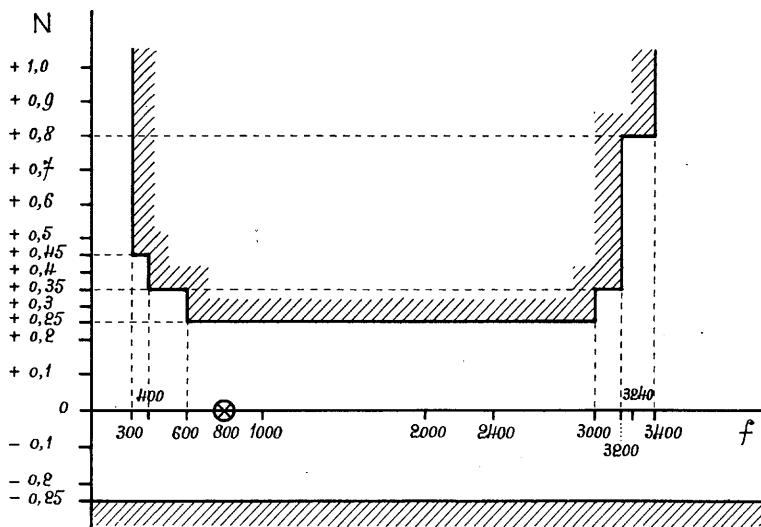


Fig. 35. — Graph. No. 5. — Variation with frequency of the equivalent in terminal service relative to the value measured at 800 c/s (circuit routed on a single group link to provide 24 voice-frequency telegraph channels)

f = frequency c/s

N = variation of equivalent (Nepers)

Note. — The curve of the variations of the equivalent as a function of frequency should be inside the unshaded area. The measured 800 c/s value is, according to the maintenance instructions (*Green Book*, Volume III, page 290), brought as nearly as possible to its nominal value.

(c) *Phase distortion*

Practical experience obtained up to the present shows that it is not necessary to introduce a supplementary clause relative to the slope of the “group delay-frequency” characteristic in the C.C.I.F. specifications for carrier systems, even considering the case where a telegraph link consists of telephone channels of several carrier systems connected in tandem. It may happen that under adverse conditions some telephone channels of such a connection are of insufficient quality to provide 24 telegraph channels. In such a case a better combination of telephone channels must be chosen for the telegraph service and this better combination will always be possible. By way of information, annex 4 of the *Book of Annexes* of Volume III of the *Green Book* gives the result of a calculation made by the French Telephone Administration.

(d) *Frequency stability*

It has already been foreseen that in future carrier systems the virtual carrier frequencies will be stable to about ± 2 c/s based on the requirements of voice-frequency telegraphy.

So far as the stability of the frequencies provided by the carrier frequency generators for voice-frequency telegraphy is concerned, the C.C.I.F. has recommended that the frequencies should not differ by more than 3 c/s from the nominal value when the telegraph channels are routed on a telephone circuit which is not made up exclusively of ordinary audio-frequency telephone sections.

(B.14)

(e) *Crosstalk*

The near-end signal crosstalk ratio between the two directions of transmission of a telephone circuit using a duplex voice-frequency telegraph system must be at least 4 nepers or 35 decibels with reservation on agreement by the C.C.I.T.

Taking into consideration the crosstalk introduced by equipment, a near-end signal crosstalk ratio of 35 decibels can in general be guaranteed between the two directions of any telephone circuit for the "nominal maximum circuit on coaxial pairs" if a ratio of 50 decibels is obtained between the two directions of transmission for each channel "modulator-demodulator", a value specified by certain Administrations. Any telephone circuit on modern carrier systems in cable could then be used for duplex voice-frequency telegraphy.

B.15. Recommendation on the transmitted power for voice-frequency telegraph systems

(former provisional Recommendation 519, Geneva, 1951, amended at Arnhem, 1953)

The C.C.I.T.,

considering

that the C.C.I.F. has announced the psophometric potential difference provisionally admissible on telephone circuits;

that the C.C.I.F. has also given figures for the maximum total power of telegraph currents which may be transmitted over a circuit (see Recommendations B.13 and B.14);

that the receiver sensitivity of systems of voice frequency telegraphy varies,

unanimously declares the view

that the standard transmitted power for voice frequency telegraph systems of up to 24 channels should be 9 microwatts at points of zero relative level in the circuit;

that when a circuit has a relatively high noise level, the number of telegraph channels should be reduced and the transmitted power per channel should be increased up to the maximum admitted by the C.C.I.F.

Observation : For one telegraph channel, in any case, the power must not exceed

$$\frac{5 \text{ milliwatts}}{(12)^2}$$

(around 35 microwatts), as calculated, according to the above rules, for a 12 telegraph channel system.

B.16. Use of static relays for transmission

(former Recommendation 338, Brussels, 1948)

The C.C.I.T.,

considering

that the substitution of static relays utilizing the properties of metal rectifiers for electromagnetic transmitting relays for voice-frequency telegraphy is already widely adopted and assures a reduction of distortion of the transmitted signals, great stability, and dispenses with all necessity for adjustment once the device is in service;

(B.16)

that the devices in use in different countries differ in detail but operate satisfactorily, so that it appears unnecessary to recommend any particular one, and that it seems sufficient to indicate how the characteristics of interest in the practical application of such devices can be defined, without specifying the values of these characteristics, with the exception of the difference in the attenuation introduced by the relay in the transmitting and the non-transmitting conditions ;

unanimously declares the view

a) that the use of static relays utilizing metal rectifiers properties for transmission on voice-frequency telegraph channels is advantageous ;

b) that in the study of the specification of a static relay the following quantities should be considered :

1. Band of carrier frequencies to which the device is adapted.
2. Input resistance (or impedance characteristics) of the direct current control circuit.
3. Maximum value of the controlling direct current (as determined by the dimensions and properties of the rectifiers used).
4. Minimum value of the controlling direct current (as determined by the curvature of the characteristics of the rectifiers used).
5. Impedance of the system as measured from the carrier current input terminals *a)* in the case of transmission and *b)* in the case of non-transmission of signals.
6. Impedance of the system as measured from the line terminals *a)* in the case of transmission and *b)* in the case of non-transmission.
7. Voltage of the carrier frequency.
8. Loss introduced by the relay in the case of transmission, in the case of non-transmission, and in the absence of any controlling direct current.
9. Maximum coefficient of harmonic distortion.
10. Particulars of the variations in the essential properties of the relay with changes of temperature, ageing, etc.
11. Symmetric of the device ;

c) that the difference in the loss introduced by the relay in the cases both of transmission and of non-transmission should be as high as possible and, in any case, at least equal to 3.5 nepers or 30 decibels.

B.17. Coexistence in the same cable of telephony and supra-acoustic telegraphy

(former Recommendation 547, amended at Geneva, 1951)

The C.C.I.T.,

considering

that this process provides only one telegraph channel, in addition to the telephone channel, and that it can only be applied in comparatively few cases (lightly loaded, or unloaded circuits, which cannot be used for multi-channel carrier telephony) ;

that in such cases, the Administrations and private operating agencies concerned could in most cases by common agreement contemplate the possibility of making use of some other more suitable process, which would provide, in addition to the V.F. telephone channel more than one telegraph channel ;

(B.17)

unanimously declares the view

that the use of supra-acoustic telegraphy should not prejudice the quality of transmission over the adjacent telephone channel and that, in particular, it should not limit the band of frequencies necessary for good speech reproduction (300 to 3400 c/s at least).

B.18. Utilisation of the inter-channel frequency band of carrier telephone circuits for telegraph transmission

(former provisional Recommendation 557, Geneva, 1951)

The C.C.I.T.,

unanimously declares the view

that in the present state of technical development the utilisation of the inter-channel frequency band of carrier telephone circuits for telegraph communication is neither technically nor economically desirable.

B.19. Non-simultaneous transmission of telephony and telegraphy on leased international telephone circuits

(former provisional Recommendation 531, Geneva, 1951, amended at Arnhem, 1953 and at Geneva, 1956)

The C.C.I.T.,

considering

that the C.C.I.F. has issued Recommendations on the subject of telegraph transmission on leased international telephone circuits, vide C.C.I.F., *Green Book*, Volume III, page 157,

unanimously declares the view

that it can adopt this text which is reproduced hereafter.

1. The frequency of 1500 c/s is recommended for private telegraph transmissions between telephone stations permanently connected by leased international circuits.

2. For the steady telegraph emission of a continuous dash, a maximum power of 0.3 mW (corresponding to an absolute power level of -0.6 nepers, or about -5 db) at a point of zero relative level.

When leasing an international telephone circuit that might be used for such telegraph transmissions, it is advisable to ensure, by measurements, that this limit is not exceeded.

Administrations and private operating agencies concerned are responsible, as regards their own national networks, for taking the necessary precautions to avoid interference to their domestic telephone services from such telegraph transmissions. Such precautions may consist in limiting the telegraph transmission power or the duration of use of telegraphy, or may concern the method of telegraph transmission.

3. V.F. ringing sets on telephone circuits leased for private telegraph transmissions between two permanently connected telephone stations, must be insensitive to telegraph signals. It has

(B.19)

been observed that one existing type of ringing set is sensitive to them, but measures may be taken to correct such ringing sets so that there is no great difficulty for the frequency chosen.

4. The maximum limit of 250 milliseconds adopted for the hangover time of echo suppressors on international telephone circuits does not appear long enough to suppress (even partially) the transmission of the answer-back signals when start-stop apparatuses reply.

B.20. Conditions to be fulfilled by regenerative repeaters

(former provisional Recommendation 601, 1952) amended at Geneva, 1956)

The C.C.I.T.,

unanimously declares the view

1. that regenerative repeaters for start-stop signals should work at a speed of 50 bauds, with a speed tolerance in service not greater than ± 0.5 per cent. ;
2. that the effective synchronous margin of regenerative repeaters should be at least 40 per cent. ;
3. that the difference between the significant instants of modulation retransmitted by a start-stop regenerative repeater and the corresponding instants of modulation of a perfect start-stop apparatus having the same average modulation rate, should not exceed ± 1 millisecond, it being assumed that the significant instants of the commencement of the start signals are the same in the two cases ;
4. that the significant instants corresponding to the beginning of the start signals emitted by the start-stop regenerative repeater should in no case be spaced by less than 7 unit intervals.
5. that the studies to be made on the inter-working of start-stop and 7 unit synchronous apparatus may lead to a slight reduction of the receiving and retransmitting cycles of start-stop regenerative repeaters below 7 unit intervals.

B.21. Conditions to be fulfilled by regenerative repeaters employed for 7 unit start-stop transmission

(former provisional Recommendation 602, 1951, amended at Geneva, 1956)

The C.C.I.T.,

in view of Recommendation B.26 regarding the siting of regenerative repeaters in international telex circuits ;

in view of Recommendation C.4 on the transmission cycle of start-stop apparatus ;

considering

that as there are at present large numbers of start-stop instruments having a 7 unit transmission cycle, it is necessary to define the conditions to be satisfied by 7 unit regenerative repeaters ;

that, since it is unlikely that the growth of the international Telex network will demand the use of regenerative repeaters on transit international trunk circuits for some years, the regeneration of 7 unit signals need only concern those Administrations having start-stop instruments which transmit 7 unit signals,

(B.21)

unanimously declares the view

that the duration of the stop element should never be less than 18 milliseconds, and consequently the mean speed must be :

- a) either the theoretical speed, with a tolerance of $\pm 0,1$ %, in which case it is necessary to employ a device to control the duration of the stop signal ;
- b) or the mean speed of the transmitter, with a suitable tolerance, in which case such a device is unnecessary ;

that the degree of gross start-stop distortion of the retransmitted signals, including the stop signal, should be less than 10 % ;

that the synchronous margin should not be less than 40 % ;

that it seems desirable to permit dialling impulses to bypass the regenerative repeater when the transmission of these impulses has to be envisaged, but that the study of this question should, however, continue ;

that the arrangements to be adopted for the present for the transmission of dialling impulses should be bilaterally agreed between the Administrations concerned ;

that the regenerative repeaters should be capable of retransmitting the various supervisory signals employed in switching systems (except that when arrangements are made for the dialling impulses to bypass the regenerative repeater it could equally be unnecessary for certain of the supervisory signals to be transmitted by the regenerative repeater).

B.22. Standardization of the capacity of telegraph circuits

(former Recommendation 372, Warsaw, 1936)

The C.C.I.T.,

considering

that the standardization of the capacity of telegraph circuits serves to ensure an economical organization of the international telegraph network,

unanimously declares the view

1. that the telegraph transmission channels making use of telephone cables should allow the operation of standardized equipment with a modulation rate of 50 bauds ;
2. that, for the services using equipment which work at a different speed, Administrations should reserve the right of mutual agreement among themselves on the employment of special circuits ;
3. that the existing aerial lines should be excepted from capacity standardization.

B.23. Examination of the influence of the various component sections on the degree of distortion of a complete telegraph circuit

(former Recommendation 312, Warsaw, 1936)

(Recommendation suppressed in Geneva, 1956)

(B.23)

B.24. Tolerable limits for the degree of rhythmic distortion of telegraph circuits excluding apparatus
(*Arnhem, 1953*)

The C.C.I.T.,

considering

that, to facilitate the study of plans for the establishment of international telegraph circuits, it is convenient to set limits for the degree of rhythmic distortion of the telegraph circuits and channels ;

that, for whatever purpose normally used, these circuits should be capable of use with start-stop apparatus ;

that, in certain cases, limits have been set by Recommendations B. 25 and B. 26 for the rhythmic distortion of the trunk sections of circuits and for that of voice-frequency telegraph channels ;

unanimously declares the view

1. that circuits should be established and maintained in such a manner that the degree of rhythmic distortion will not exceed 28 %, whether they are equipped with regenerative repeaters or not.

2. that the degree of rhythmic distortion of each channel which may form part of a circuit should be as small as possible, and should not in any case exceed 10 %.

B.25. Standard limits to be applied in planning international point-to-point telegraph communications and switched networks, by means of start-stop apparatus, conforming to C.C.I.T. recommendations
(*former provisional Recommendation 375, 1951, amended at Arnhem, 1953*)

The C.C.I.T.,

considering

that Administrations must agree on the composition of the international section and the national sections before setting up an international point-to-point telegraph circuit ;

that, for the inter-connection of switched public or private national networks a chart showing the distribution of telegraph distortion between national networks and international circuits connecting the international terminal exchanges is required ;

that, for this purpose, provisional standards, based on the results of practical experience and on studies of the composition of telegraph distortion should be laid down for Administrations ;

that, unless otherwise specified, these standards apply to modulation at the standard rate of 50 bauds ;

that, on well maintained channels, the following values should not normally be exceeded on the trunk sections :

Number of channels within the trunk section	The limit of bias of reversals at the modulation rate employed for adjustment shall be equivalent to the following values at 50 bauds :	Limit of the degree of rhythmic distortion on Standard text
1	4 %	10 %
2	7 %	18 %
3	10 %	24 %
4	12 %	28 %

(B.25)

unanimously declares the view

a) that, in planning international telegraph communications, whether point-to-point or by switching, the Administrations should use the following standard limits valid for start-stop apparatus and for channels conforming to the recommendations of the C.C.I.T. :

1. Limit of the degree of gross start-stop distortion, measured by a start-stop distortion measuring set at the beginning of the trunk section of the circuit (i.e. at the point where the circuit enters the long-distance line telegraph equipment) and including the effect of the emission distortion of the transmitting apparatus 12 %
2. Limit of the degree of rhythmic service distortion for the standard text caused by the trunk section of the circuit :
 - when one voice-frequency telegraph channel is used for the communication 10 %
 - when two voice-frequency telegraph channels are used for the communication 18 %
 - when three voice-frequency telegraph channels are used for the communication 24 %
 - when four voice-frequency telegraph channels are used for the communication 28 %
3. Limit of the degree of the gross start-stop distortion, measured by a start-stop distortion measuring set, which can be present in signals transmitted into the local section of the circuit without the receiving apparatus failing to translate any of the signals which it should be able to receive 30 %

b) that these standards take no account of the possibility of including regenerative repeaters in circuits ;

c) that these standards presuppose that the distortion introduced by the local section of the circuit is negligible, and that, should that not be so, Administrations should agree amongst themselves on the degree of distortion admissible in the various sections of the communication, and on the number of voice-frequency telegraph channels which can be used ;

d) that these standards should be regarded as provisional and that they be given further study (see question 22/9 of Study Group 9 of the C.C.I.T.T.).

e) that Administrations should however use them, in order to agree on the maximum number of voice-frequency telegraph channels which may compose the international section of a circuit and in order to determine the characteristics of their national networks due to be connected to the networks of other countries, on the understanding that the rhythmic service distortion, originated by the trunk section, may not in any circumstances exceed 28 %.

B.26. Siting of regenerative repeaters in international Telex circuits
(former provisional Recommendation 389, 1951, amended at Geneva, 1956)

The C.C.I.T.,

considering

that insufficient experience has been acquired in the use of regenerative repeaters ; that it nevertheless seems desirable to lay down a provisional rule governing the siting of regenerative repeaters, with a view to the preparation of plans for international telegraph communications by switching ; that it would also appear desirable that the signals transmitted by an international terminal exchange should not be affected by a relatively high degree of distortion,

unanimously declares the view

— that, when the transmission quality demands it, Administrations agree with each other on the necessity of inserting regenerative repeaters and take the necessary steps so that the location

chosen ensures that the expenses are equally shared between the Administrations and is appropriate to the organization of their Telex and general switching networks and to the quality of transmission which it is possible to provide on complete connections.

B.27. Types of lines

(former Recommendation 361, Warsaw, 1936)

The C.C.I.T.,

considering

that cable lines are better protected from disturbance than aerial lines,
that it will however be necessary in certain cases to continue to employ aerial lines,

unanimously declares the view

that for the international high-speed telegraph-service as much use as possible should be made of the circuits of the long-distance cable system.

B.28. Standardization of aerial telegraph conductors

(former Recommendation 371, Warsaw, 1936)

The C.C.I.T.,

considering

that it is desirable to standardize the characteristics of international telegraph conductors ;
that the tests made with the object of obtaining circuits not subject to contact and to variations of insulation, by using wires provided with insulation other than rubber and paper, have not given satisfactory results ;
that the use of wires insulated by rubber would not guarantee the perfect handling of traffic for a very long period and would increase expenses ;
that the use of wires insulated by paper and lead would greatly increase costs,

unanimously declares the view

1. that, for aerial conductors used in the international high-speed telegraph service, it is desirable to employ copper or bronze wires answering the following specifications :

	diameter	tensile strength	resistivity at
	at least	at least	20 degrees centigrade
			maximum
Copper	3	40	1,820
Bronze	2.5	60	2,780
	m/m	kg/mm ²	microhms-cm

2. that it is not desirable to replace open wires by insulated wires with the aim of improving the electrical properties of the conductors.

B.29. Designation of international telegraph circuits

(former provisional Recommendation 360, 1951, amended at Arnhem 1953)

The C.C.I.T.,

unanimously declares the view

that international telegraph circuits will be designated :

a) first by the localities or terminal offices, arranged in alphabetical order according to the spelling of the country ;

b) by an indication of the service using the circuit according to the following table :

Public service, point to point circuit	TG
Private service, point to point circuit	TGP
Circuit of the public switching network	TGX
Telex circuit	TX
Circuit of a private switching network	TXP
Service circuit	TS

c) by a serial number, using a separate continuous series for each group of circuits.

Note : In order to avoid the possibility of confusion in the case of TGP and TXP circuits, a number formerly allotted to a ceased circuit should not be re-allotted to a new circuit until a period of at least 2 years has elapsed.

B.30. Organization of the maintenance of international telegraph circuits

(former Recommendation 366, Brussels, 1948, amended in conformity with provisional Recommendation, 1951 and at Geneva, 1956)

The C.C.I.T.,

considering

that, in order to ensure satisfactory co-operation between Administrations and Private Telegraph Operating Agencies interested in the maintenance of international telegraph circuits, and in order to ensure the maintenance of satisfactory transmission in the international telegraph service, it is necessary to unify the essential action to be taken for the establishment and maintenance of international telegraph circuits,

unanimously declares the view

1. that periodical maintenance measurements should be taken on international V.F. telegraph systems, and that documents relating to such measurements should be exchanged ;

2. that a *permanent Committee* should be entrusted with the task of solving all questions of an urgent character relating to the application of the Recommendations of the C.C.I.T. and the C.C.I.F. in regard to the establishment and maintenance of international telegraph circuits ;

3. that the said permanent Committee should act in constant contact with the corresponding permanent Sub-Committee already appointed by the C.C.I.F. ;

4. that the responsibilities for the maintenance of satisfactory transmission, and (as and when necessary) the removal of faults on an international V.F. telegraph system should be assumed by one of the terminal stations of the system ;

the terminal station in question to be known as the *System Control Station* ;

(B.30)

the said station to be appointed for the purpose by the Administrations and Private Telegraph Operating Agencies concerned on the occasion of the establishment of the V.F. telegraph system concerned.

the System Control Station to be entrusted with co-ordination of the execution of the maintenance measurements to which paragraph 1 above relates ;

5. that the responsibilities for the maintenance of satisfactory transmission, and (as and when necessary) the removal of faults on an international telegraph system should be allocated between the different stations concerned as indicated below.

One station of the circuit should assume the principal responsibility for the maintenance of satisfactory service on the circuit.

The station in question should be known as the *Controlling Testing Station*.

This station should be equipped with testing equipment to enable it to make telegraph transmission measurements and in this connection it exercises an executive control over all the other stations on the circuit.

It should be appointed by agreement between the Administrations concerned on the occasion of the establishment of the telegraph circuits concerned.

It should be, wherever possible, one of the terminal stations of the circuit, save in so far as otherwise agreed by the services concerned.

For example, in the case of V.F. telegraph circuits, the Controlling Testing Station should be one of the terminal voice-frequency telegraph stations as nominated by mutual agreement between the Administrations concerned.

The controlling station is responsible for coordinating all operations required when there is a breakdown in the circuit. It keeps a record of all circuit breakdowns.

To facilitate supervision, a reference number must be allocated to each breakdown reported.

When a fault comes to the notice of another station on the circuit, this station should take steps to secure suitable action on the part of other stations concerned ; but the Controlling Testing Station is nevertheless responsible for ensuring that the fault is cleared as soon as possible.

The Controlling Testing Station should be in a position to furnish all requisite information in reply to enquiries on the subject of faults—e.g. in regard to the time of any fault, the location of the fault, the orders given for dealing with it and the times of restoration of the circuit.

In order, however, to increase the flexibility of the organization and the rapidity of the removal of faults, the Controlling Testing Station will confine itself in each foreign country to securing the co-operation of a *station* to be known as the *Sub-Control Station* of the circuit.

The Sub-Control Station should assume, within its own territory, the responsibilities indicated above in the case of the Controlling Testing Station and should therefore be equipped with testing equipment to enable it to make telegraph transmission measurements.

Such delegation of responsibility shall not affect the authority of the Controlling Testing Station, with which the primary responsibility for the maintenance of satisfactory service on the circuit will continue to rest.

The Sub-Control Station shall be appointed by the technical Service of the Administration concerned.

It shall furnish detailed information to the Controlling Testing Station regarding faults occurring in its own country.

“Administrations or Private Recognized Telegraph Operating agencies shall be free to organize this maintenance measurement on those portions of international point-to-point circuits and switched connections (including apparatus) which lie wholly within their control, but the methods adopted should be not less efficacious than those recommended for international circuits.”

To facilitate the control of tests, circuits shall be divided into *Test Sections* (parts of a circuit between two telegraph stations). Each section shall be under the control of a *Testing Station* responsible for the localization and removal of faults on the section concerned. The Testing Station shall furnish detailed information as to the faults occurring in the section under its control to the Sub-Control Station (or, if necessary, the Controlling Testing Station).

In the case of V.F. telegraph channels, each channel shall constitute a test section. The Testing Station will in this case be the principal V.F. telegraph station at the end of the section concerned.

B.31. International telegraph circuit advices
(former Recommendation 367, Brussels, 1948)
(suppressed in Geneva, 1956) .

B.32. Determination of the standardized test distortion of the elements of a complete circuit
(former Recommendation 311 Warsaw, 1936, amended at Geneva, 1956)

The C.C.I.T.,

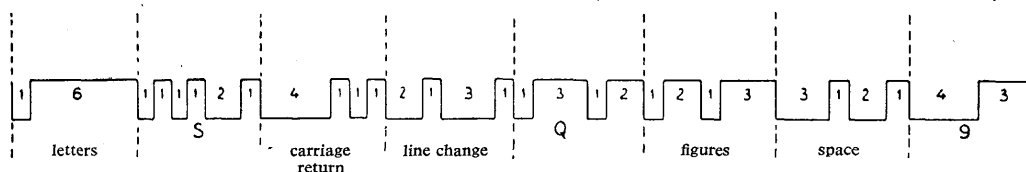
considering

that, for a precise definition of the degree of service distortion permitting the comparison of results of measurements obtained under similar conditions in different places, it is advisable to standardize the wording of the text which should be transmitted for the text ;

that it is best to choose a text which can be received directly by start-stop apparatus and which also presents a sequence of the combinations recognized as those which generally cause the maximum distortion,

unanimously declares the view

that the text to transmit in the course of measurements of the degree of service distortion should be the following :



this text corresponds to the following sequence of signals emitted by a start-stop apparatus, letters, S, carriage return, line change, Q, figures, space, 9 ;

and considering, on the other hand,

that in maintenance adjustments and in the various distortion measurements that may arise in the study of lines and equipment, it would be necessary to make use of a single apparatus offering the possibility of transmitting the different combinations of signals recognized as the most practical for this purpose ;

that the unification of the list of these combinations would permit comparison of results obtained in various places,

(B.32)

unanimously declares the view

that it is appropriate to recommend the construction of special transmitters for distortion measurements which could transmit, with one or the other polarity :

1. the specified text for the measurement of the degree of distortion ;
2. a continuous sequence of alternations, the duration of each element being that of the unit interval corresponding to the anticipated telegraph modulation rate ;
3. a continuous sequence of alternations, the duration of each element being double the unit interval corresponding to the anticipated telegraph modulation rate ;
4. a continuous sequence of signals, each formed by an emission of a duration equal to that of the unit interval, followed by an emission of a kind distinct from the first and equal duration to that of six unit intervals.

B.33. Tests of circuits equipped with start-stop apparatus

(former Recommendation 304, Brussels, 1948)

The C.C.I.T.,

unanimously declares the view

1. that it is not necessary to standardize an international text for the measurement of the margin of a teleprinter ;
2. that nevertheless it would be of interest to recommend to the operating Administrations the use of either of the following texts according to choice :

VOYEZ LE BRICK GÉANT QUE J'EXAMINE PRÈS DU WHARF.
THE QUICK BROWN FOX JUMPS OVER THE LAZY DOG.

B.34. Periodicity of maintenance measurements to be carried out on the channels of international voice-frequency telegraph systems

(former provisional Recommendation 363, 1951)

The C.C.I.T.,

considering

that for such supervision, maintenance measurements on international voice-frequency telegraph channels are necessary,

unanimously declares the view

1. that maintenance measurements be carried out on international voice-frequency telegraph channels once a month ;
2. that they should be carried out shortly after carrying out maintenance measurements on the telephone circuit used for the V.F. telegraph system ;
3. that for the time being there is no need to carry out measurements more frequently on channels making up long circuits or circuits used in switching networks.

(B.34)

B.35. Maintenance measurements to be made on V.F. telegraph systems

(former provisional Recommendation 369, 1951)

The C.C.I.T.,

having regard to Recommendation B.34 on the periodicity of maintenance measurements to be made on international V.F. telegraph channels,

considering

that it should be clearly laid down what maintenance measurements are indispensable to ensure the correct operation of V.F. telegraph channels,

unanimously declares the view

1. that maintenance measurements and any necessary adjustments of V.F. telegraph channels should be made of :

- a) the voltages and frequencies of the V.F. carrier supplies (these measurements must be made at least once a month, but in the case of a central V.F. carrier supply, daily tests are recommended) ;
- b) the power supply voltages (these measurements should be made at least once per month)
- c) the output level of each " send " filter ;
- d) the output level of each " receive " filter ;
- e) the receiving apparatus, to ensure that it is operating at the optimum point of its level regulation characteristic ;
- f) the receiving relay, if necessary ;
- g) the distortion with symmetrical signals 1/1 or 2/2 after adjustment of the relay or of the receiving equipment for minimum distortion ;
- h) the distortion on dissymmetrical signals 1/6 and 6/1, if necessary ;
- i) the distortion on the standard text given in Recommendation B.32. (It would be advisable for the last measurement to be made at the levels : normal, maximum and minimum) ;

2. that unless otherwise specified, the measurements should be made at a modulation rate of 50 bauds ;

3. that the results of the measurements made on the international channels should be exchanged directly by telegraph or telephone between the measuring stations.

B.36. Permissible limits for the degree of distortion on an international V.F. telegraph channel

(former provisional Recommendation 520, 1951, amended at Arnhem, 1953)

The C.C.I.T.,

considering

that the numerous tests made on V.F. telegraph equipment in service now make it possible to establish limits for the degree of distortion outside which a V.F. telegraph channel must be regarded as being out of order ;

(B.36)

that, in accordance with Recommendation B.35, these tests should be made with reversals, 1/6 and 6/1 signals, and with standard text at the modulation rate used for adjustment ;

that the results of measurements on 6/1 and 1/6 signals depend, to a very large extent, on the receiving equipment and therefore do not permit a general Recommendation to be given ;

that, when equipment is put into service and when it is adjusted, the minimum distortion should be sought and therefore limits for the degree of distortion need not be established in this case,

unanimously declares the view

1. that the degree of bias distortion of reversals on an international voice-frequency telegraph channel at the modulation rate employed for adjustment should not exceed a value corresponding to 4 % at the standard modulation rate of 50 bauds ;

2. that the degree of rhythmic service distortion of an international V.F. telegraph channel on the standardized text should not exceed 10 % ;

3. that the limits for the degree of distortion obtained on an international V.F. telegraph channel with measurements on 6/1 and 1/6 signals should when desired be established by Administrations according to the receiving equipment used.

These limits, except where otherwise stated, apply to a modulation rate of 50 bauds and take account of the accuracy of the measuring equipment.

They are provisional and may be amended according to the technical development of V.F. telegraphy and of studies of telegraph distortion.

B.37. Routine maintenance programme for international voice-frequency telegraph systems

(former provisional Recommendation 368, 1951)

The C.C.I.T.,

considering

that the periodical maintenance measurements on international voice-frequency telegraph systems referred to in Recommendation B.30 should be facilitated to the greatest possible extent ;

that it is advantageous to Administrations and Private Operating Agencies to know the dates on which maintenance measurements are to be carried out on all the Test Sections outside their territory of telegraph circuits passed through their network,

unanimously declares the view

1. that for each voice-frequency telegraph system, one or more days should be appointed for maintenance measurements, the initiative being taken by the technical service responsible for the System Control Station in agreement with the technical services of the two Administrations or Private Operating Agencies concerned ;

2. that the dates for the measurements should be communicated once a year (on 1 October) to the Secretariat of the C.C.I.T.T. ;

3. that the Secretariat of the C.C.I.T.T. should undertake to collect the information thus obtained into a document entitled : *Routine maintenance programme for international voice-frequency telegraph systems*, and to communicate them to administrations and Private Operating Agencies which are members of the C.C.I.T.T. and which ask for them ;

4. that if, exceptionnally, agreement is not reached between technical services with regard to the dates for measurements, the matter be referred to the permanent committee mentioned in Recommendation B.30, which will make proposals designed to remedy such a state of affairs as quickly as possible.

(B.37)

B.38. Reserve channels for maintenance measurements on channels of international V. F. telegraph systems

(former provisional Recommendation 362, 1951)

The C.C.I.T.,

considering

that it is desirable that maintenance measurements on the channels of international voice-frequency telegraph systems should disturb communications as little as possible,

unanimously declares the view

that, whenever possible, measurements on a working channel of a voice-frequency telegraph system should be carried out only after the channel concerned has, if necessary, been replaced by a spare channel,

and to this end, the C.C.I.T. considers that it is desirable that one channel should be reserved for this purpose in each voice-frequency telegraph system.

B.39. Reserve circuits for V.F. telegraphy

(former Recommendation 514, Brussels, 1948, amended by provisional Recommendation, 1951)

The C.C.I.T.,

considering

that it is expedient to standardize some of the methods to be adopted for replacing defective 4-wire circuits in V.F. systems ;

that, although it does not appear necessary for these methods to be the same in details in every country, it would be advisable to reach agreement regarding the general directives to be followed ;

that the use of circuits on carrier telephone systems for V.F. telegraphy is expected to become general in the future ;

that it would be of interest if the curves showing the differences in relative power levels, in relation to frequency, between the normal voice-frequency telegraph circuit and its reserve circuit at the sending end and receiving end respectively, should not differ at any frequency by more than 0.2 neper, so that when a voice-frequency telegraph system is switched to its reserve circuit, there should be no variation in power level causing excessive distortion in the voice-frequency telegraph system, especially for the upper and lower frequencies in the frequency band transmitted ;

that, the telephone network being what it is, no such limitation can be guaranteed. Generally speaking, the voice-frequency telegraph circuit and its reserve circuit are made up differently, and it often happens that one is an audio-frequency circuit while the other is a telephone channel of a carrier-system. Although adjustments can be made to the " equivalent frequency " curve of an audio-frequency circuit, it is difficult to modify the curve in the case of a telephone channel in a carrier-system, since it depends essentially on the filter characteristics of the carrier-system,

unanimously declares the view

a) that it is recommended :

1. that a telephone circuit should be designated as the reserve circuit for each circuit used in systems of voice-frequency telegraphy ;
2. that this reserve circuit should, whenever possible, be routed differently from the normal circuit ;

(B.39)

3. that the maintenance measurements to be taken on telephone reserve circuits should be the same as those carried out on normal voice-frequency telegraph circuits and that special arrangements should therefore be devised for the maintenance of these circuits ;
- b) that it is desirable that the changeover from the normal voice-frequency telegraph circuit to the reserve circuit should take place, if possible, without interruption, it being generally understood that in the future many telegraph channels will be connected to switched networks ;
- c) that, with this aim in view, it is recommended :
 1. that the normal voice-frequency circuit and the reserve circuit should pass through the same changeover point situated at each of the terminal stations concerned ;
 2. that the changeover should be effected at two points situated at the same relative telephone power level on the normal voice-frequency telegraph circuit and on the reserve circuit ;
 3. that the procedure to be adopted for the changeover from the voice-frequency telegraph circuit to the reserve circuit and vice-versa should be jointly agreed upon by both Administrations or Private Operating Agencies concerned ;
- d) that, should breakdowns occur simultaneously both in the normal voice-frequency telegraph circuit and the reserve circuit, the technical departments of the Administrations or Private Operating Agencies should take immediate joint action to find a temporary remedy ;
- e) that from the point of view of the distortion which may occur in certain telegraph channels of voice-frequency systems, it would be desirable that there should be the greatest possible similarity between the curves showing differences in relative power levels in relation to frequency, between the sending and receiving ends respectively of the normal circuit and the reserve circuit, when the changeover takes place between a circuit used for voice-frequency telegraphy and its reserve circuit.

B.40. Maximum acceptable limit for the duration of interruption of telegraph channels arising from failure of the normal power supplies

(former provisional Recommendation 336, 1951)

The C.C.I.T.,

considering

that it is not the function of the C.C.I.T. to issue Recommendations on the actual methods of arranging the automatic replacement of a normal power supply by a reserve supply, but to indicate to the C.C.I.F. which is responsible for such Recommendations regarding power supplies for all line equipment, that the replacement of one supply by another should not cause any interruption of such a nature as to disturb seriously the telegraph communication ;

and that in switched telegraph networks an interruption of 0.3 second of the telegraph current would be translated into a release of switches, and that the relays controlling the release are arranged to operate in slightly less than 0.3 second,

unanimously declares the view

that it is desirable that no interruption of the telegraph current should occur as a result of failure of a normal power supply.

If, however, it is impracticable to avoid an interruption, then its duration should in no case exceed 0.150 second.

(B.40)

B.41. Causes of disturbances to signals in V.F. telegraph channels and their effect on telegraph distortion

(former provisional Recommendation 711, 1951, amended at Arnhem, 1953 and at Geneva, 1956)

The C.C.I.T.,

considering

that the great majority of international telegraph circuits are routed on V.F. telegraph channels ;
that V.F. telegraph channels are liable to disturbance from the following causes :

1. Variations in the voltage and frequency of the source of telegraph carrier frequency due to variations in the power supply, and variations in the signalling load in the case where the carrier source supplies several channels.
2. Abrupt or gradual changes in the transmission equivalent of the telephone circuit.
3. Intelligible crosstalk from other telephone circuits, particularly near end crosstalk.
4. Unintelligible crosstalk resulting from the cross-modulation of telephone circuits when operated by carrier currents.
5. Noise induced from electrical power and traction systems.
6. Telegraph crosstalk from other telegraph channels, e.g.
 - a) production of odd harmonics of the telegraph carrier frequencies in certain channels falling within the pass band of other channels ;
 - b) intermodulation in filter coils etc.
7. Variations of power supplies affecting the amplifier and detector of the V.F. telegraph channel and sometimes the receiving relay.
8. The effects of mechanical vibration upon valves (microphonicity) and relays.
9. Bad contacts (e.g. test points and valve bases) and badly soldered joints.
10. Deterioration of component parts, e.g. ageing valves.
11. Failure of power supplies, e.g. on changeover from main to reserve supply.
12. Accidental disconnexions made during the course of maintenance and construction works.
13. On overhead lines, effects of atmospheric electricity, frost, etc...

that the disturbances account for practically all the distortion in telegraph channels, except for characteristic distortion (which is chiefly a function of filter and amplifier—detector design), some bias (due to misadjustment of controls and relays etc.) and, in the case of the lower frequency channels, the distortion which arises from the low ratio of carrier frequency to signalling frequency ;

that many of the causes of disturbance are individually negligible and the more important of the other have been found, in the experience of several Administrations, to be capable of elimination by careful maintenance both on the V.F. telegraph equipment and at all points on the telephone circuit ;

that the C.C.I.T.T. are also studying the causes of disturbance in telephone circuits and the precautions to be taken to minimise their occurrence ;

and that the results of the C C.I.T.T. study will be of great importance to telegraphy ;

that, as result of the considerable investigations already made by certain Administrations on the causes of disturbances in telephone and telegraph circuits, the relative order of importance of these causes appears to be approximately as follows :

a) *in the case of telephone circuits :*

- high resistance and unsoldered connections ;
- noisy and microphonic valves, and poor contact between valve pins and valve holders ;
- working parties engaged on cable operations ;
- noisy and high-resistance U-links ;
- changes in line level not compensated at the detector input ;
- cross talk ;
- errors in setting up, for example incorrect equalization, line transformers incorrectly connected, faulty components ;

- b) *in the case of V.F. telegraph equipment :*
high resistance and unsoldered connections ;
valves deteriorated beyond permissible limits ;
bad contacts ;
faults on power changeover equipment ;
frequency error of the carrier supply,

unanimously declares the view

that it is desirable for Administrations to undertake investigations of the causes, and frequency of occurrence of disturbances on V.F. telegraph channels routed on the various types of telephone circuit likely to be employed for international telegraph circuits ;

that in doing these tests and in order that the results may be of the greatest use to telegraphy and telephony, the incidence of disturbances should be measured according to their duration as follows :

- a) Lasting less than 5 milliseconds
b) „ between 5 and 20 milliseconds
c) „ „ 20 and 100 „
d) „ „ 100 and 300 „
e) „ more than 300 milliseconds

that the results should be classified according to the type of telephone circuit, viz. audio or carrier, cable of overhead line.

“Measurements of disturbances should be made at the direct current output of the voice-frequency telegraph channel which is under observation.”

Note : 1) In connection with the study of these disturbances, attention is drawn to the Netherlands contribution made to the 7th Plenary Assembly of the C.C.I.T. (document A.P. 7/51, paragraph 2, published in the Supplements to Arnhem Documents, page 200).

- 2) See questions 2 of Study Group 4 and 6 of Study Group 9 of the C.C.I.T.T.

B.42. Appearance of false calling and clearing signals in circuits operated by switched teleprinter services

(former provisional Recommendation 712, 1951, amended at Arnhem, 1953)

The C.C.I.T.,

in view of provisional Recommendation B.4, on the causes of disturbances affecting signals in telegraph channels, and their effect on the distortion of telegraph signals ;

considering

that precautions should be taken with circuits used in switched teleprinter services to prevent the appearance of parasitic signals which would give rise to false calling and clearing signals,

that special monitoring or indicating devices should be provided on voice-frequency telegraph systems, the channels of which are used for international switched circuits,

that special steps might well be taken to discover the causes of false signals due to transient changes in transmission level or momentary increases in noise level, on voice-frequency telegraph circuits,

that it would be desirable to reach agreement with the C.C.I.F. on operating standards in this connection,

(B.42)

unanimously declares the view.

that the following precautions should be taken :

- a) to avoid false clearing signals—the security and stability of power supplies and of sources of carrier frequencies, both telegraph and telephone, should be ensured ;
- a characteristic marking should be used to denote telegraph and telephone circuits used for the operation of switched teleprinter circuits, both in terminal and intermediate stations ;
 - precise instructions should be given to staff in order that false entry into the above-mentioned circuits may be avoided ;
 - the number of non-soldered connections should be reduced as much as possible, together with the number of break points, unsoldered connections, e.g. U links and screw terminals, etc., should be checked with particular care. In this connection, attention is drawn to the methods of inspection by vibration tests used by the United Kingdom Administration (described in the note appearing on page 276 of C.C.I.F. Volume III *bis*) ;
 - the amplitude of variations in the equivalent of telegraph circuits used for voice-frequency telegraphy should be limited, and abrupt variations in this equivalent should be studiously avoided ;

- b) to avoid false call signals :

- limit the cross-talk mentioned in provisional Recommendation B.41 ;
- limit induced voltage caused by electric power of traction systems ;
- limit the microphonicity of valves in repeaters and of valves used in voice-frequency telegraphy ;
- reduce the sensitivity of voice-frequency modulators and receivers to disturbing signals, while keeping an adequate margin for regulation of level ;
- avoid, in switched teleprinter services, the use of supervision signals having a short duration in relation to the transitory phenomena due to filters and time-constants in the level-regulators of voice-frequency telegraph systems ;

these precautions, inasmuch as they concern telephone circuits used for voice-frequency telegraphy, must be taken simultaneously on normal and relief circuits ;

for the permanent monitoring of groups of voice-frequency telegraph channels the lines of which are used for international switched circuits, it is advisable to use a monitoring channel. An alarm should be given to indicate when either the system or the monitoring channel is out of order ;

it would be advisable to register the transmission level, in order to discover and localize the causes of the false signals on circuits behaving particularly badly ;

it is not yet possible to lay down operating standards in this connection.

(See question 28 of Study Group 9 of the C.C.I.T.T.)

B.43. Pilot channel for voice-frequency telegraph systems using amplitude modulation

(Arnhem, 1953) (See question 17)

The C.C.I.T.,

in view of Recommendations B.41 and B.42 ;

considering

that it is necessary to indicate transmission level variations on telephone circuits used to carry switched international telegraph circuits ;

that various frequencies (viz. 320 c/s, 1020 c/s, 1740 c/s and 2580 c/s) have been proposed for the pilot channel which is the subject of Recommendation B.42 ;

unanimously declares the view

that it is desirable to use a pilot channel to give an alarm in case of abnormally low receiving levels ;

that tests should be carried out to compare the results obtained with the various frequencies proposed with a view to an international Recommendation for the frequency to be used for the monitoring channel.

Note : For these tests it would be of advantage to make recordings to enable the amplitude and duration of the level variations to be analysed. Attention is drawn to this subject in Recommendation B.41.

B.44. Maintenance measurements on international sections of international telegraph circuits

(Arnhem, 1953)

The C.C.I.T.,

in view of Recommendations B.25 and B.34,

considering

that, for the technical supervision of international telegraph circuits, it is necessary to make periodic measurements of their international sections when they are made up of two or more channels ;

that, for these sections, the maintenance measurements can only be rhythmic distortion measurements ;

unanimously declares the view

1. that it is desirable to make maintenance measurements on the international sections of international telegraph circuits ;

2. that these measurements should be made monthly on sections consisting of a single channel and three-monthly on sections consisting of two or more channels in tandem ;

3. that the measurements should be rhythmic distortion measurements :

a) with reversals,

b) with standard text according to Recommendation B.32 and if desired,

c) with 1/6 and 6/1 signals ;

(B.44)

4. that unless otherwise specified the measurements should be made at a modulation rate of 50 bauds ;

5. that, for channels in service, the following values must not normally be exceeded on international sections.

Number of channels within the international section	Limit of bias of reversals at the modulation rate employed for adjustment shall be equivalent to the following values at 50 bauds	Limit of rhythmic distortion on standard text
1	4 %	10 %
2	7 %	18 %
3	10 %	24 %
4	12 %	28 %

6. that these values do not take into account the possibility of inserting regenerative repeaters in the international sections ;

7. that these values can only be regarded as provisional and the study of them should be continued.

B.45. Threshold of sensitivity for amplitude-modulated voice-frequency telegraph receivers

(Geneva, 1956)

The C.C.I.T.,

considering

1. that, in the absence of a voice-frequency signal, the detectors of a voice-frequency telegraph system should not respond to noise ;

2. that, in accordance with C.C.I.T. Recommendation B.15, the power allocated to one channel of a 24-channel voice-frequency telegraph system is 9 micro-watts at a point of zero level (corresponding to a level of — 2.4 nepers) ;

3. that the C.C.I.F. is at present engaged in studies regarding the maximum values of noise which may be experienced on carrier telephone circuits, but it is nevertheless necessary to make a provisional recommendation regarding the threshold of sensitivity for the receiving equipment of amplitude-modulated voice-frequency telegraph systems now ;

4. that the experience of certain Administrations has shown that the operation of the receiving equipment of a voice-frequency telegraph system is not in general disturbed by noise, if during no-tone periods a signal whose frequency corresponds to the nominal frequency of the channel and whose voltage corresponds to an absolute level of — 4.5 nepers at a point of zero relative level is applied without producing any response in the receiving relay ;

unanimously declares the view

1. that it is necessary to fix a threshold of sensitivity for the detector of an amplitude-modulated voice-frequency telegraph channel ;

2. that, when a signal, the frequency of which is equal to the nominal frequency of the channel, and whose level is 2.1 nepers below the normal signal level of the channel, is applied to the detector of a 24-channel voice-frequency telegraph system, the receiving relay should not respond.

Note : It will be useful to review this recommendation when the studies now in progress regarding the maximum value of noise have been finished.

B.46. Standardization of operating conditions for static sending relays of amplitude-modulated voice-frequency telegraph systems

(Geneva, 1956)

The C.C.I.T.,

considering

1. that it is essential that voice-frequency telegraph receivers should operate to the condition corresponding to a start element (clearing signal) when the control current fails in the sending relay ;
2. that it is necessary under the foregoing condition for the sending static relay to have adequate attenuation even in the presence of parasitic currents such as may occur in the sending line associated with the channel ;
3. that it is not considered to be very objectionable if the receiver operates to the condition corresponding to stop polarity for short intervals (e.g. false calling signals) as the result of the combined effects of line noise and the incompletely suppressed signal from the sending relay ;
4. that it is of little consequence whether the suppression of the signal resulting from the interruption of the control current is instantaneous or occurs after a short delay (e.g. due to a slow relay) ;

unanimously declares the view

1. that, in the event of failure of the control current in the sending static relay, the attenuation of the residual signal relative to the nominal level should be at least 3.1 nepers (27 decibels) ;
2. that this attenuation of the signal need not occur immediately after the failure of the control current.

B.47. Choice of Methods of modulation for voice-frequency Telegraph systems

(Geneva, 1956)

The C.C.I.T.,

considering

1. that most voice-frequency carrier telegraph systems are applied either to land lines conforming to C.C.I.F. Recommendation (*Green Book*, Volume III, second part, Section 4) or to carrier telephone channels (operating through coaxial or multiple pair cables) which conform to C.C.I.F. Recommendation (*Green Book*, Volume III, second part, Section 7) ;
2. that some voice-frequency telegraph systems are applied to telephone channels subject to greater variations of equivalent than are permissible according to C.C.I.F. Recommendation (*Green Book*, Volume III, first part, Section 1.3.4), but that, in general, the variations in equivalent of these telephone channels are not rapid, for example, climatic variations in telephone circuits in aerial lines ;
3. that some voice-frequency telegraph systems are applied to telephone channels, which are subject to excessive noise and whose equivalent may vary widely and rapidly, for example, some carrier telephone channels working on open wire lines ;
4. that, despite improvements that have been made by telephone Administrations, there remain many telephone circuits of all types whose equivalent varies suddenly to an extent and with a frequency of occurrence which is important, and that it may prove impossible to reduce this trouble to a negligible degree ;

(B.47)

unanimously declares the view

1. that amplitude-modulated voice-frequency telegraph systems standardized by the C.C.I.T. (i.e. those conforming to Recommendations B.11, B.12, B.14 and B.15) do give satisfactory service when applied to telephone circuits conforming to C.C.I.F. Recommendation (*Green Book*, Volume III, second part, Section 1), provided the frequency and amplitude of sudden variations in the equivalent of these telephone circuits is small ;

2. that amplitude-modulated voice-frequency telegraph systems can give satisfactory service on telephone lines whose equivalent varies slowly by more than ± 1 neper, provided that there are very few large and sudden variations of equivalent, and provided that special measures are taken (such for example as the provision of a pilot channel), but that, on the other hand, at least equally satisfactory service can readily be obtained in these same circumstances by a frequency-shift modulated voice-frequency telegraph system ;

3. that when the equivalent of a telephone circuit varies widely and rapidly, and particularly when noise is severe, a frequency-shift modulated voice-frequency telegraph system is less adversely affected than any other known type of voice-frequency telegraph system.

B.48. Standardization of frequency shift modulated voice-frequency telegraph systems

(Geneva, 1956)

The C.C.I.T.,

considering

1. that it is necessary to introduce frequency-shift modulated voice-frequency telegraph systems particularly for operation over very long international telephone circuits under unfavourable conditions ;

2. that it is desirable to standardize certain properties of such systems ;

3. that it is important from the economic point of view to make the utmost use of long telephone circuits allocated for voice-frequency telegraphy ;

4. that the maximum powers which may be transmitted have been fixed by the C.C.I.F. ;

5. that it is of great importance that the frequency-shift modulated voice-frequency channels should be suitable for switched service ;

6. that most of the carrier telephone channels available for voice-frequency telegraphy introduce only very small frequency errors into the signals which pass through them ;

7. that to ensure good performance when telegraph channels are connected in tandem it is important that a channel should not add excessive distortion to signals which are already distorted by transmission over other channel ;

unanimously declares the view

1. that frequency-shift modulated voice-frequency telegraph systems should be able to provide 24 channels ;

2. that the nominal modulation rate should be standardized at 50 bauds ;

3. that it is desirable to adopt for the mean frequencies the series of frequencies furnished by the odd multiples of 60 c/s ; the lowest frequency being 420 c/s in conformity with paragraph 1 of Recommendation B.11 ;

4. that these frequencies should not deviate from their nominal values by more than 2 c/s ;

(B.48)

5. that the difference between the two characteristic frequencies (corresponding to the start and the stop conditions) should be 60 c/s, although a difference of 70 c/s may be used by mutual agreement between the Administrations concerned ;

6. that the tolerance permitted in this difference should be at most ± 3 c/s ;

7. that the total average power transmitted to the telephone line by all the channels of a system should normally be limited to 135 microwatts at a point of zero relative level. This sets, for the average power of a telegraph channel (at a point of zero relative level), the limits given in table I.

TABLE 1

Normal limits for the power per telegraph channel in frequency-modulated voice-frequency telegraph systems.

Voice-frequency telegraph system	Allowable power per telegraph channel at a point of zero relative level		
	In microwatts	In an absolute power level	
		neper	decibel
12 telegraph channels, or less	11.25	— 2.25	— 19.5
18 telegraph channels	7.5	— 2.45	— 21.25
24 telegraph channels	5.6	— 2.6	— 22.5

Nevertheless, by agreement between interested Administrations or Private Operating Companies these power limits may be raised for frequency modulated telegraph signals established on an audio telephone circuit or on a very long voice-frequency telegraph circuit routed on a channel of an open wire carrier system, or on the channel of a radio relay system, or on a channel of a cable carrier system. The limits thus raised should never exceed those which have been fixed for the power (at a point of zero relative level) corresponding to the transmission of a continuous tone for amplitude modulated voice-frequency telegraphy and which are recalled in table 2.

TABLE 2

Limits which may be applied, by agreement between Administrations, for the power per telegraph channel in frequency-modulated voice-frequency telegraph systems.

Voice-frequency telegraph system	Allowable power per telegraph channel at a point of zero relative level		
	In microwatts	In an absolute power level	
		neper	decibel
12 telegraph channels, or less	35	— 1.67	— 14.5
18 telegraph channels	15	— 2.1	— 18.25
24 telegraph channels	9	— 2.4	— 20.9

8. that the frequency for the corresponding transmitted condition to the start polarity is the higher of the two characteristic frequencies and that corresponding to the stop polarity is the lower ;

9. That, in the absence of control current in the modulator of a channel, the frequency transmitted should be that corresponding to the start polarity ;

10. that, in the event of the telephone circuit being cut, the receiving equipment should assume the condition corresponding to the start polarity ;

11. that the number of significant conditions of modulation is fixed at two but that the number may be increased if necessary by mutual agreement between the Administrations concerned.

B.49. Voice-frequency telegraphy on radio circuits

(Geneva, 1956)

A. Radio circuits the frequency of which is below approximately 30 Mc/s

The C.C.I.T.,

considering

1. that it is necessary to distinguish between the case in which the radio frequency used is below approximately 30 Mc/s, and the case in which the radio frequency used is greater than approximately 30 Mc/s ;

2. that, in the case of radio circuits whose frequency is less than approximately 30 Mc/s, it appears that the use of amplitude-modulated voice-frequency telegraph systems, as defined by Recommendations B.11, B.12, B.14 and B.15 of the C.C.I.T., cannot be recommended ;

3. that, in the case of radio circuits whose frequency is less than approximately 30 Mc/s, the nature of the telephone channels available for telegraph operation may vary widely according to the radio system used, and that several systems of telegraph transmission are available (e.g. two or four tone telegraph systems, frequency-change modulated systems, etc.) ;

4. that as a result of this third consideration, a general standardization of the characteristics of the voice-frequency telegraph systems to be used on radio circuits whose frequency is below approximately 30 Mc/s cannot be recommended at present ;

unanimously declares the view

1. that amplitude-modulated voice-frequency telegraph systems as standardized by C.C.I.T. Recommendations B.11, B.12, B.14 and B.15 cannot be recommended ;

2. that in general frequency-change modulation is the method to be recommended (two and four-tone telegraph systems being considered, for the purpose of this recommendation, as frequency-change modulated systems) ;

3. that frequency-change modulated systems, if designed for cable circuits, must often be specially adapted for use on radio circuits as mentioned in the 19th Report of the C.C.I.R. (London 1953) paragraph 2.

B. Radio circuits the frequency of which is above approximately 30 Mc/s

The C.C.I.T.,

considering, further

1. that it would be very desirable if telephone circuits which are derived from radio systems whose frequency is above about 30 Mc/s and which are allocated for telegraph service, could be suitable for the application (without modification) of standardized voice-frequency telegraph systems conforming with C.C.I.T. Recommendations B.11, B.12, B.14 and B.15 ;

(B.49)

2. that the C.C.I.T. does not know whether the quality of the telephone circuits thus derived would be adequate for the standardized voice-frequency telegraph systems, nor in what ranges of radio frequencies operation would eventually be satisfactory ;

3. that on the other hand the C.C.I.T. is studying the standardization of frequency change modulated systems ;

declares the view

that attention should be drawn to the difficulties (frequency or level variations, interruptions, etc.) which may result from the use of telephone circuits derived from radio telegraph systems whose frequency is above approximately 30 Mc/s for telegraphy,

and that regular tests of the operation of voice-frequency telegraph systems on telephone circuits derived from such radio systems should be made.

B.50. Simultaneous communication by telephone and telegraph on a telephone circuit

(Geneva, 1956)

The C.C.I.T.,

considering

1. that the exceptional use of a leased telephone circuit for simultaneous communication by telephone and telegraph is envisaged in Recommendation H.13 of the C.C.I.T. and Recommendation 21 *bis* of the C.C.I.F. ;

2. that the C.C.I.F. has indicated conditions under which the simultaneous use of telephone circuits for telephony and telegraphy is technically tolerable ;

3. that standardization of the characteristics of apparatus permitting simultaneous use of a telephone circuit for telephony and telegraphy is not justified, but that it is necessary to limit the power of the signals transmitted and to avoid the use of frequencies that will interfere with any telephone signalling equipment which may remain connected to the telephone circuit ;

4. that new demands for the allocation of particular frequencies for special purposes frequently arise and the number of frequencies used for any one purpose should not be unnecessarily multiplied,

unanimously declares the view

1. that in the case of the simultaneous use of a telephone circuit for telephony and telegraphy, the telegraph signal, if continuously transmitted, should be maintained at or below a level of — 1.5 nepers at a point of zero reference level ;

2. that not more than three such telephone circuits should be included in any one primary group of 12 telephone circuits nor more than 15 in any one coaxial cable system ;

3. that the telegraph signals transmitted must not interfere with any signalling apparatus that may remain connected to the telephone circuit ;

and notes

that some Administrations have permitted the use for simultaneous telephony and telegraphy of the frequencies 1680 c/s and 1860 c/s both by amplitude and by frequency-shift modulation.

B.51. Conventional degree of distortion

(Geneva, 1956)

The C.C.I.T.,

considering

1. that in telegraph communications used in the general service, in the telegraph subscribers' service and in the leased land-line circuit service using 5-unit start-stop apparatus, a maximum admissible rate of error of 3 per 100 000 alphabetic telegraph signals transmitted should be provisionally recommended;

2. that, at present, interruptions of the telephone circuit account for a much higher error rate than that recommended by the C.C.I.T.;

3. that, therefore, without taking into account the degree of distortion caused by apparatus and voice-frequency telegraph channels, it is at present impossible to obtain an error rate of 3 for 100 000 telegraphic signals;

4. that, because the number of interruptions is likely to be diminished in the future, it is appropriate, in anticipation, to recommend a limit for that part of the error rate which is due to distortion;

5. that, in view of the foregoing considerations it appears reasonable provisionally to recognize an error rate due to distortion of 2 false translations in 100 000 alphabetic telegraph signals;

6. that, in planning telegraph circuits, it may be convenient to limit the conventional degree of gross start-stop distortion of complete circuits (including telegraph apparatus) to the nominal margin of the receiving apparatus;

7. that, if the conventional degree of gross start-stop distortion of signals is to agree with the margin of a receiver to which they are applied when the error rate is 2 erroneous translations per 100 000 alphabetic telegraph signals, then it is believed that the value assigned to the probability mentioned in the definition of conventional distortion (B 53) must be 1 occurrence of excessive distortion per 100 000 significant instants of modulation;

unanimously declares the view

1. that the conventional degree of distortion shall be the degree of distortion the probability of exceeding which is 1 per 100 000, i.e. 1 occurrence of distortion exceeding the conventional degree of distortion per 100 000 significant instants of modulation.

2. that, to make direct observations of this conventional degree of distortion, it is necessary to measure it during one hour as often as may be necessary. These measurements, unless otherwise specified, should be made during "busy hours" and on "busy days";

3. that, when calculating the degree of conventional distortion from rapid observations, it is necessary to ensure that these basic observations correspond to the average conditions existing during a period of one hour, which unless otherwise stated should be a "busy hour" on a "busy day".

B.52. Choice of type of telegraph distortion measuring apparatus

(Geneva, 1956)

The C.C.I.T.,

in view of Recommendation B.55

A. *considering*

1. that tests of distortion made with the text specified in Recommendation B.32 are normally applied only to telegraph channels;

2. that it may in principle be desirable to measure the distortion of telegraph channels in terms of start-stop distortion, but that degrees of distortion determined in rapid measurements are at best only arbitrary indications of the quality of transmission;

(B.52)

3. that appropriate standards for the quality of telegraph channels in terms of isochronous distortion have been established, and that it would be necessary to set other standards for start-stop measurements ;
4. that all important terminals of voice-frequency telegraph systems are equipped with isochronous distortion measuring equipment and that their replacement by start-stop instruments would be expensive ;

unanimously declares the view

1. that, for the normal maintenance of telegraph channels, isochronous distortion measuring sets should be used ;
2. that Administrations may nevertheless by mutual consent, use, for this purpose, start-stop distortion measuring sets, but that if they do, new standards for the quality of transmission of telegraph channels in terms of start-stop distortion should be established ;

B. *considering also*

1. that measurements of the quality of start-stop signals cannot normally be made without start-stop distortion measuring sets ;
2. that the planning and establishment of telegraph networks is to be judged in terms of conventional degrees of start-stop distortion, and that degrees of start-stop distortion may also prove to be the best basis for calculations of the summation of degrees of distortion and for calculation of conventional start-stop distortion ;

unanimously declares the view

that all International Switching and Testing Centres (I.S.T.C.'s) should be equipped with start-stop distortion measuring apparatus.

B.53. Changes of level and interruptions in voice-frequency telegraph channels

(Geneva, 1956)

The C.C.I.T.,

considering

1. that an alarming situation for the Telegraph Service has been created by interruptions on voice-frequency telegraph channels, and by changes of level which have the same effect as interruptions ;
2. that the consequences are such that, at present, the error rate which is attributed to voice-frequency telegraph channels is still very far above the tolerable limit fixed by considerations of operational requirements (3 in 100 000 for international communications, including apparatus) ;
3. that certain Administrations have observed an improvement in the situation, and that this improvement seems to result from the measures taken by the telephone services, for instance, systematic percussion tests, precautions in the switching of power supplies, etc. ;
4. that it has been confirmed that the number of interruptions is much increased during the normal hours when maintenance staff are present, and is reduced when, despite very heavy traffic, maintenance is suspended, so that the Telegraph Administrations are now convinced that one of the principal causes of interruptions on telegraph channels is intervention by maintenance personnel and perhaps by operating personnel ;
5. that it has also been observed that the number of interruptions appears greater on international circuits than on national circuits ;

unanimously declares the view

that the drive against interruptions should be continued vigorously and that, in order to observe the progress of this drive, Administrations should continue to make systematic observations of the frequency and duration of interruptions on voice-frequency telegraph channels ;

(B.53)

and draws the attention

of the Maintenance Study Group of the C.C.I.T.T. especially to the study of practical measures to remedy the situation.

B.54. Measurement of noise in telephone circuits used for voice-frequency telegraphy

(Geneva, 1956)

The C.C.I.T.T.,

considering

1. that, although the noise voltage present on a telephone line may not exceed the recommended psophometric limit, relatively strong interfering voltages may be present, particularly at the lowest and highest frequencies used for voice-frequency telegraphy ;

2. that in voice-frequency telegraph systems every channel receiving a signal of given strength is equally sensitive to noise voltages in its own allotted frequency range and that the signals received on telephone circuits tend to be weakest for the highest and lowest voice-frequency telegraph channels. The limitation of psophometric voltage on a telephone circuit therefore gives little protection to the highest and lowest telegraph channels ;

3. that the measurements of noise voltages as " signal to noise ratios " for equal signal inputs at all frequencies within the normal range of telephonic frequencies, though ideal for voice-frequency telegraph purposes, would be inconvenient as a test ;

4. that the measurement of unweighted noise voltage by means of an instrument equally sensitive to voltages of all frequencies within the telephone band, 300-3400 c/s, is easy and that suitable instruments are available ;

5. that a limitation upon the unweighted noise voltage in a telephone circuit would conform more nearly to telegraph requirements than a limitation upon psophometric voltage ;

unanimously declares the view

that measurement of unweighted noise voltage in the telephone band of 300-3400 c/s should be made when these circuits are used for voice-frequency telegraphy.

B.55. Organization of locating and clearing faults in international telegraph switched networks

(Geneva, 1956)

The C.C.I.T.T.,

considering

that it is desirable that faults affecting communication between stations on international switching networks (e.g. Telex and General Service) should be reported and cleared as quickly as possible ;

that it is necessary to unify the essential action to be taken and methods to be employed for locating and clearing faults ;

that, for this purpose it is necessary to determine the essential testing equipment which is to be provided at the switching centres responsible for locating and clearing faults ;

unanimously declares the view

1. that it is necessary to set up switching and testing centres (S.T.C.s) as defined by the following :

switching centres equipped with measuring apparatus for testing Telex subscribers and public station lines and equipment and also telegraph channels ;

2. that each Telex subscriber and each public station in the general switching service should have access to an S.T.C. for the purpose of reporting faults and co-operating in tests ;

3. that the international switching and testing centres (I.S.T.C.s) are the S.T.C.s which are also international line-head offices ;

(B.55)

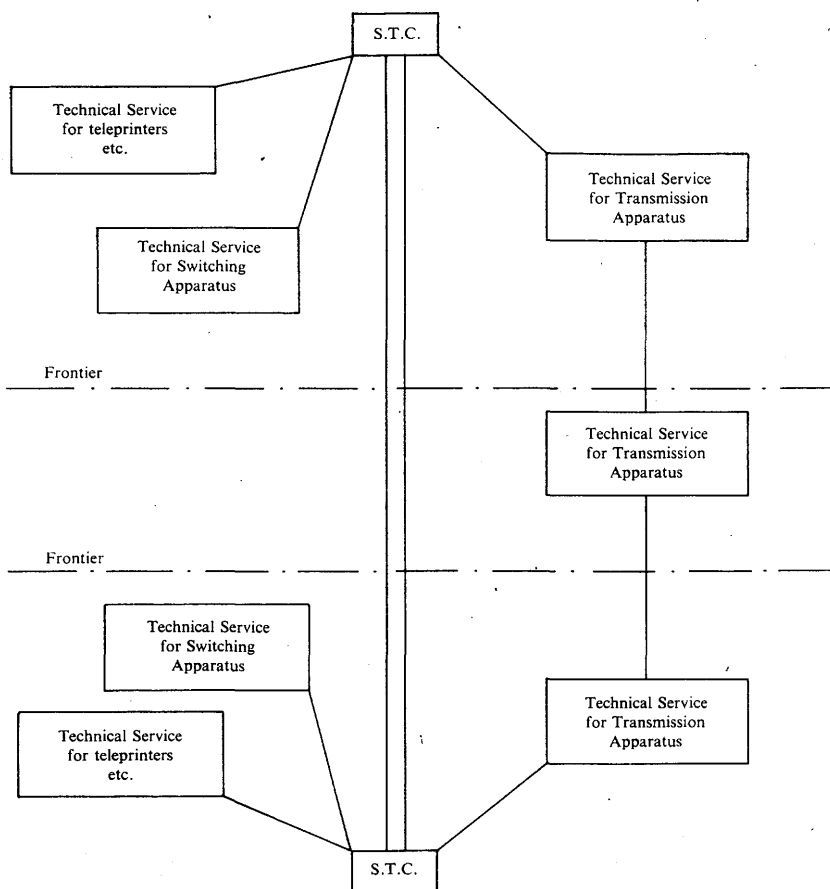
4. that all S.T.C.'s should be subscribers to the Telex network, both for the purpose of receiving fault reports and for communication for maintenance purposes. They should also be provided with a telephone exchange line. The Telex and telephone numbers should be furnished to the Secretariat of the C.C.I.T. and any subsequent changes should be similarly advised. The Secretariat should have a complete list published and arrange for the issue of amendments thereto at regular intervals. The list should indicate the I.S.T.C.s;

5. that each S.T.C. should be responsible for co-ordinating action in locating and clearing faults on all station lines connected to the exchange and on all trunk circuits for which it is nominated as the controlling office. It should also co-operate with other S.T.C.s in locating faults on connections established through two or more exchanges.

It should carry out a preliminary location of faults by finding out whether they affect channels, switching gear or apparatus. The faults are then accurately located by the engineers responsible for each part of the circuit and the S.T.C. co-operates with them for this purpose: it may assume the direction of the fault-locating procedure should there be disagreement between these services.

Internationally, it is responsible to the S.T.C.s of other countries with which it has Telex connections.

The organization of the liaison between the S.T.C. and the different technical services is shown in the following diagram :



The S.T.C.s must check that the performance given by the equipment involved in the switched service, i.e. V.F. channels, switching equipment and apparatus, is satisfactory ;

6. that the staff employed at S.T.C.s should be selected with a view to avoiding language difficulties and should be conversant with all types of telegraph equipment used in the switching network, i.e. automatic or manual switching equipment, V.F. telegraph equipment, telegraph machines and regenerative repeaters. The staff need not necessarily be fully competent to maintain all these items of equipment, but should have sufficient knowledge of them to be able to form an appreciation of the effect that faults on any of them may have on a switched connection. In addition, the staff of I.S.T.C.s should have some general knowledge of the types of equipment used in the countries to which they are connected, particularly of the signalling conditions which will be encountered ;

7. that each S.T.C. should be provided with the following measuring equipment :

- a) A 50-baud start-stop distortion meter.
- b) A test transmitter for generating undistorted 50-baud start-stop-signals.
- c) Apparatus to measure the modulation rate of teleprinters at a distance.
- d) Apparatus for measuring the speed and impulse ratio of dials, where appropriate.
- e) Apparatus for measurement of the condition of direct current lines ; for example, continuity, resistance, insulation.

The arrangements for access to established connections for making test measurements should be such as not to cause interruption or reduce the quality of transmission.

Considering that some Administrations have found it desirable to have available at the S.T.C. other items of apparatus to expedite the clearing of faults, all Administrations are invited to consider the utility of these devices, namely :

- f) Apparatus for measuring teleprinter margin.
- g) Recording distortion meters for testing established connections.
- h) Apparatus for measuring continuously, periodically and automatically, the distortion on subscribers' lines and apparatus ;

8. that the following procedure for reporting, locating and clearing faults should be adopted :

Faults should be reported to the S.T.C. concerned by the subscribers or operators who have experienced difficulty in operation. In the same way, it would be useful, in order to give the S.T.C.s a full picture of the situation, that the maintenance engineers should inform them of faults noted during the periodic maintenance operations. Faults should preferably be signalled by teleprinter, if their nature does not preclude this procedure.

A reference number should be given by the S.T.C. to the subscriber or service notifying the fault. This number can then be quoted in any subsequent enquiries as to the progress of fault clearance.

On account of the difficulties that may arise in the detection of faults on the international section of a communication (due to lack of knowledge of languages, etc.), care should be taken in each country to see that the national sections of the communication, including subscribers' lines and apparatus, are not involved before approaching the S.T.C. of the corresponding country.

The S.T.C. notified of a fault should therefore begin by ascertaining that it is not located in the national section of the communication and for this purpose should, if necessary, approach the other S.T.C.s of its country concerned in the circuit. The S.T.C. of the distant country is then advised and, in turn, checks the national section routed over its network. The international section of the communication is not checked until the terminal national sections of telegraph circuit have been definitely exonerated. The S.T.C.s in different countries will communicate with each other, either directly or via their I.S.T.C.s, as determined by the Administrations concerned.

If the tests of the two local ends fail to reveal any fault condition, the S.T.C. should report the fault to its I.S.T.C. who will decide what further action, if any, is necessary. As a rule, isolated fault reports would not justify a test of all trunk circuits on a route, and it would be assumed that the condition giving rise to the fault would be cleared on the next routine adjustment. If however several fault reports were received, some of which might have been due to a faulty circuit on a particular route, then a special routine test of all the circuits on the route might be justified.

In general it is considered that the procedure will be broadly the same for manual, semi-automatic and automatic systems.

C. RECOMMENDATIONS APPLYING TO ALPHABETIC TELEGRAPH APPARATUS

C.1. Definition of the apparatus margin

(former Recommendation 302, Warsaw, 1936)

The C.C.I.T.,

unanimously declares the view

that it is advisable to adopt the following definitions :

In general, the margin of a telegraph apparatus represents the maximum degree of distortion of the circuit at the end of which the apparatus is situated which is compatible with the correct translation of all the signals which it may possible receive.

It is useful to consider in particular the *theoretical* margin, the *effective* margin, and the *nominal* margin.

The *theoretical* margin is that which could be calculated from the construction data of the apparatus, assuming that it is operating under perfect conditions.

The *effective* margin of an apparatus considered individually is that which could be measured on the apparatus under actual operating conditions.

The *nominal* margin of a type of apparatus represents the minimum value set for the effective margin of these pieces of apparatus under standard operating and adjustment conditions for the type.

C.2. Addition to the definition of the margin of start-stop apparatus

(former Recommendation 303, Brussels, 1948)

The C.C.I.T.,

unanimously declares the view

that it is necessary to complete the definition of the margin of apparatus given in Recommendation C.1 by the following definitions :

For start-stop apparatus :

1. The margin is the maximum degree of *start-stop distortion* of the modulation, which it is possible to apply to the apparatus compatible with the correct translation of all the signals which it should be able to receive, whether the signals composing the modulation are transmitted at intervals or whether they follow one another with the maximum rapidity corresponding to the modulation rate.

2. In particular, it is convenient to consider :

a) the *net* or *normal* margin, which is represented by the degree of distortion indicated in 1, when the rate of modulation applied to the apparatus is exactly equal to the standard theoretical rate ;

(C.2)

- b) the *synchronous* margin which is represented by the degree of distortion indicated in 1, when the mean unit interval of the modulation applied supplied to the apparatus is equal to that which would result from a transmission from the apparatus under examination, assuming it to include a transmitter as well as a receiver.

C.3. Standardization of multiplex apparatus
(former Recommendation 631, Warsaw, 1936)

The C.C.I.T.,

considering

that it is advisable to standardize certain data relating to international multiplex apparatus ;
that synchronization by special signals is the most simple,

unanimously declares the view

1. that the types of plates be standardized as follows :
12 contact plates for installations working on double duplex ;
17 contact plates for installations working on triple duplex ;
25 contact plates for installations working on quadruple simplex or duplex ;
2. that the speed be fixed at 180 r. p. m., but that a speed of 210 r. p. m. may nevertheless be used for manual or joint transmission apparatus ;
3. that synchronization be achieved with the help of special signals ;
4. that alphabet No. 1 be applied in all multiplex installations.

C.4. Standardization of transmission characteristics of start-stop apparatus
(Arnhem, 1953, amended at Geneva, 1956)

The C.C.I.T.,

considering

that it is desirable to standardize the transmission characteristics of start-stop apparatus used in international service ;

that these transmission characteristics are those which must be obtained in service, the equipment being maintained in a good state of operation ;

that these characteristics take into account the results of measurements made on equipment at present in service but do not necessarily represent the maximum modern technical possibilities ;

that to ensure correct operation of receiving apparatus, bearing in mind the distortion introduced by the circuits, it is necessary to use for transmission a lengthened stop signal ;

unanimously declares the view

that the transmission characteristics of start-stop apparatus used in international service should be the following :

1. the standard modulation rate should be 50 bauds ;
2. the difference between the mean modulation rate of the apparatus when in service and the standardized rate should not exceed $\pm 0.75\%$;

(C.4)

3. the nominal duration of the transmitting cycle should be at least 7.4 units (preferably 7.5) the stop element lasting for at least 1.4 units (preferably 1.5) ;

4. the synchronous start-stop distortion should not exceed 5 % and the gross start-stop distortion of the signals transmitted should not exceed 10 %, whether the signals composing the modulation are transmitted at intervals or follow each other with the maximum rapidity corresponding to the modulation rate ;

5. the receiver must be able to translate correctly in service the signals coming from a transmitter with a nominal transmitting cycle of 7 units ;

6. apparatus in service should be maintained and adjusted in such a manner that their net effective margin is never less than 35 %.

Note : Administrations are recommended to withdraw apparatus which does not correspond to these standards from the international service as soon as possible.

C.5. Intercontinental standardization of the modulation rate of start-stop apparatus

(Arnhem, 1953)

The C.C.I.T.,

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 U.S.A.) 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 intercontinental 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 intercontinental services, notwithstanding difference 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 interwork ;

6. that, furthermore on certain intercontinental circuits, e.g. radio circuits, the employment of special forms of synchronous equipment in association with storage equipment is sometimes essential and is already in use in the intercontinental sections of start-stop circuits,

unanimously declares the view

that, when it is necessary in the intercontinental service to operate between start-stop apparatus having a modulation rate of 50 bauds and start-stop apparatus having a non-standard modulation rate, then conversion equipment, for example automatic storage and retransmission equipment, must be inserted in the international circuits concerned in a manner to be agreed bilaterally between the Administrations and/or Private Operating Agencies concerned.

C.6. Standardization of the number of characters per line in page printing start-stop apparatus
(former Recommendation 651, Warsaw, 1936, amended at Arnhem, 1953)

The C.C.I.T.,

considering

it desirable that certain data relating to the start-stop apparatus of the international service be uniformly established;

unanimously declares the view

that the number of characters which the textual line of the page-printing apparatus may contain should be fixed at 69.

C.7. Secondaries of letters F, G, H of start-stop apparatus
(former Recommendation 653, Brussels, 1948)

The C.C.I.T.,

considering

a) that some Administrations exercise, whereas others do not, the right granted by the Telegraph Regulations to assign the secondaries of letters F, G and H to internal use;

b) that it is desirable to avoid disadvantages which might result from exercising this right in international services,

unanimously declares the view

1. that the use of secondaries of F, G and H should be prohibited in international services, except by direct agreement between Administrations;

2. that, in all services, the secondaries of F, G and H should be shown in some special manner on the keyboard;

3. that services in which these secondaries are not used should place on the secondary position on the printing blocks of the letters F, G and H an arbitrary sign, such, for instance, as a square, the appearance of such sign on the paper to indicate an abnormal impression.

C.8. Confirmatory symbols in connection with the „ Who are you ” and „ warning bell ” signals in start-stop apparatus

(former Recommendation 654, Brussels, 1948)

The C.C.I.T.,

considering

that some Administrations desire that a confirmatory symbol be printed by start-stop apparatus whenever the “ Who are you ” or “ warning bell ” signals have been transmitted or received;


that it is in the interest of the manufacturers of such apparatus that the Administrations concerned should agree to the adoption of the same graphical symbols;


that, in view of the fact that on certain apparatus the reception of the signal “ secondary of J ” (bell signal), causes no movement of the paper, certain precautions must be taken to permit the co-operation of apparatus printing a confirmatory symbol and apparatus which prints no confirmatory symbol,

(C.8)

unanimously declares the view

that such Administrations as are desirous of confirming the reception or the transmission of signals "secondary of D" ("Who are you" signal) or "secondary of J" shall effect this confirmation by printing :

the symbol  for the confirmation of the signal "secondary of J" ;

the symbol  for the confirmation of the signal "secondary of D" ;

that for control of the warning bell, several signals "secondary of J" one signal "carriage return" one signal "line feed" and one signal "carriage return" should be transmitted in the order indicated.

C.9. Standardization of the start-stop apparatus of the subscribers' telegraph service

(former Recommendation 661, Warsaw, 1936, amended at Brussels, 1948)

The C.C.I.T.,

considering

that the start-stop apparatus is capable of receiving communications without the help of an operator ;
that this advantage may be useful to the subscribers to the international telegraph service operated by start-stop apparatus ;

that it is therefore desirable that a caller subscriber should be able to check the identity of his correspondent, if there is no reply,

unanimously declares the view

that it is advisable

1. to supply a code transmitter to all the subscribers' posts taking part in the international service of start-stop telegraphy subscribers ;
2. to effect the disconnection of the code transmitter by the combination of number 4 (letter D) in the alphabet No. 2, preceded by the signal "figures" ;
3. to compose the code-emission by a series of 20 signals, as follows :
 - 1 signal "letters",
 - 1 carriage return,
 - 1 line feed,
 - 1 signal "letters" or, if necessary, "figures",
 - 15 signals chosen by each Administration for the code signal of the subscriber,
 - 1 signal "letters" ;
4. when the code signal does not comprise 15 characters, to distribute them by inserting as many "letters" signals as are necessary to make up the total of 15 signals ; this would give the caller subscriber the chance of noting clearly the end of the requested code transmission.

C.10. Interconnection of page-printing and tape-printing start-stop apparatus

(former Recommendation 655, Brussels, 1948, amended at Arnhem, 1953)

The C.C.I.T.,

considering

that it is necessary to take technical measures to permit the interconnection of page-printing and tape-printing start-stop apparatus ;

that some Administrations desire that a confirmatory symbol be printed by tape-printing start-stop apparatus whenever they send or receive the signals “ carriage return ” or “ line feed ”;

that it is in the interest of the manufacturers of such apparatus that the Administrations should agree to the adoption of the same graphical symbols;

unanimously declares the view

1. that tape-printing start-stop apparatus required to work in cooperation with page-printing apparatus should be equipped with :

- a) keys for the transmission of the “ carriage return ” and “ line feed ” signals ;
- b) means to ensure the transmission of the “ carriage return ” and “ line feed ” signals in time to prevent any overprinting on the 69th character ;

2. that such Administrations as are desirous of confirming on a tape machine the reception or transmission of the signals “ carriage return ” and “ line feed ” shall effect this confirmation by printing :

- a) the symbol < for the signal “ carriage return ” ;
- b) the symbol ≡ for the signal “ line feed ” ;

3. that, if the printing of the symbols indicated in paragraph 2 is not desired, the reception of at least one of these signals shall nevertheless cause the paper to move forward. When one only of these signals causes the paper to move forward, the signal should preferably be the “ line feed ” signal.

C.11. Use of the secondary of “ D ” to operate the answer-back unit in intercontinental service
(*Arnhem, 1953*)

The C.C.I.T.,

considering

that the use of different signs or functions for combination 4 in the *figure* case of the International Alphabet No. 2 on start-stop apparatus having to work together in the same system leads to operational difficulties which ultimately amount to rendering the use of this combination impossible ;

that the use of this combination to operate the answer-back unit, by allowing the caller to check the connection and the satisfactory working of his correspondent's apparatus, results in a considerable reduction in the time of establishing the communication, thereby facilitating operation of the service ;

unanimously declares the view

1. that combination 4 (*figure* case) of the International Telegraph Alphabet No. 2 should be reserved exclusively, both in international service, and in intercontinental service, for operating the answer-back unit ;

2. that, in intercontinental service, when apparatus not permitting the use of the answer-back unit is being operated, the methods of using combination 4, *figure* case, should be the subject of bilateral agreement between the Administrations and/or Private Operating Agencies concerned.

C.12. Use of the combination 32 of the International Telegraph Alphabet No. 2

(Arnhem, 1953, amended at Geneva, 1956)

The C.C.I.T.,

considering

1. that signal 32 is not at present the subject of any proposal for standardized international use ;
2. that certain Administrations are already using or are considering the use of signal 32, either as a signal participating in the selection of a character on start-stop apparatus or as a signal controlling switching or functional operations ;

unanimously declares the view

1. that signal 32 of the International Telegraph Alphabet No. 2 be placed at the disposal of Administrations to be freely used in their national service ;
2. that nevertheless every use of this signal be communicated by the Administrations concerned to the Study Group dealing with technical aspects of telegraph apparatus.

(See Question 4/8 of Study Group 8 of the C.C.I.T.T.)

C.13. Start-stop teleprinter apparatus motor control for public or private point-to-point circuits
(former Recommendation 656, Brussels, 1948, and provisional Recommendation 657, 1951, amended at Arnhem, 1953)

The C.C.I.T.,

considering

that in the case of public and private point-to-point circuits it is desirable that the teleprinter motors shall be started with the commencement of traffic signalling, and stopped with the cessation of such signalling;
that the general practice on such circuits is to utilize a time-delay device associated with the teleprinter which allows of such operation ;

unanimously declares the view

a) that in the case of public and private point-to-point circuits, the terminal apparatus shall be so equipped as to allow of the starting and stopping of the teleprinter motors with the commencement and completion respectively of the traffic ;

b) that these facilities shall normally be provided by means of a time-delay device incorporated in the teleprinter, whereby the teleprinter motor is started immediately upon commencement of the signalling of traffic, and is stopped within a time not less than 45 seconds after the last signal of traffic ;

considering

that more strict unification of the delay-time of these automatic devices might give rise to serious technical complications ;

that precautions should thus be taken lest an operator, the motor of whose apparatus is still rotating, should transmit signals to an apparatus of which the motor has just stopped ;

(C.13)

unanimously declares the view

c) that, in the case of a pause in transmission for a period equal to or longer than 30 seconds, operators or subscribers are recommended to send the signal 29 of Alphabet No. 2 ("letter-shift") and to wait at least 2 seconds after the emission of this signal before recommencing transmission ;

considering

that for reasons associated with the unification of terminal apparatus and for others, certain Administrations have expressed a preference for the utilization of a method whereby calling and clearing signals are used, as in the Telex service, to effect the starting and stopping of the teleprinter motors ;

unanimously declares the view

d) that, notwithstanding b) above, Administrations can, if they find it convenient, arrange between themselves to use an alternative method whereby the teleprinter motor is started by the use of a call signal, and stopped by the use of a clearing signal. In such cases the calling and clearing signals employed should conform to those standardized for the Telex service, namely Recommendation H.1, article 23.

C.14. Characteristics of relays

(former Recommendation 612, Prague, 1934)

The C.C.I.T.,

considering

that it is useful to define more clearly the characteristics of the function and use of telegraph relays ;
that in choosing definitions, it is more important to determine quantities which can be measured by simple methods and ordinary equipment rather than theoretic quantities not easily measured which would be applicable only in improvement research ;
that the alternative of such a choice is to limit the general range of application of the definitions ;

unanimously declares the view

that, in the case of electro-magnetic relays which have a single control circuit, the principal characteristics of the function and use may be defined in the following way :

Degree of distortion of a relay

The degree of distortion of a relay for a determined telegraphic speed may be defined as the degree of distortion of the signals re-established by the relay when it is controlled by a periodic alternating current whose frequency, expressed in cycles per second, will have a value equal to half of the anticipated telegraphic speed, expressed in bauds.

Degree of bias distortion of a relay

When a relay is supplied by an alternating current, and during a period T the armature rests against one of the stops for a time t_1 , and against the other for a time t_2 , the degree of bias distortion of the relay is the ratio $(t_1 - t_2)/T$.

This quantity may be measured by means of the auxiliary installation for the neutral adjustment of relays, described in Recommendation C.18.

(C.14)

Sensitivity

When the relay is supplied by a sinusoidal current with a frequency of 25 c/s, the definite functioning of the relay, i.e. the passage of its index from one stop to another, takes place only when the maximum intensity of the control current (or again, the maximum excitation value expressed in ampere-turns) is greater than a certain value characteristic of the sensitivity of the relay.

Necessary control current or necessary excitation

When it is desirable to find out more precisely in what conditions a relay may be employed in service, the idea of sensitivity is replaced by that of necessary control current or necessary excitation.

These terms are applied to the lower limits which the maximum intensity of the control current or the maximum excitation of the relay cannot reach without producing the following effect, provided that the relay has been completely neutralized and supplied with sinusoidal current of 25 c/s:

1. The distortion proper of a relay surpasses 0.05 (5 %).
2. The passage time of the armature, measured for example by means of the installation described in Recommendation C.18, surpasses 5 ms.

Constancy

An indication of the constancy of a relay is given by the functioning time of the apparatus, supplied by a current whose intensity is twice that of the necessary current at the end of which the bias distortion of the relay has reached 5 %.

Magnetic stability

If the bias distortion of a relay, which has been completely neutralized and subjected to considerable continuous excitation for three seconds, is measured when the excitation value is twice that of the necessary excitation, the ratio of the greatest value that the previous continuous excitation may have, without causing a bias distortion of more than 0.05 (5 %) to the value of the necessary excitation, is considered as being characteristic of the magnetic stability.

Mechanical stability

The greatest distance to which one can shift a contact stop of the relay, which has been completely neutralized beforehand without causing a bias distortion of more than 0.05 (5 %), when the relay receives, for measuring purposes, an excitation whose value is twice that of the necessary excitation, is considered as being characteristic of the mechanical stability.

For a more thorough examination of the relays, it is useful to collect similar measurements, employing different excitation values.

Distortion of a relay supplied by non-sinusoidal currents

In a thorough study of types of relays, it is useful to measure the distortion of signals re-established by the relay when the currents controlling it are non-sinusoidal.

In particular, a transmitter for measuring distortion and conforming to the C.C.I.T. Recommendations can be used for these additional tests and the relay can be supplied in such a way that the wave-shape of the testing currents offers some similarity to that of the currents the relay may receive in service.

Electrical characteristics of relays

For practical requirements a relay may be sufficiently characterized with regard to its electrical properties by :

- a) the value of its ohmic resistance ;
- b) the value of its effective resistance and its effective reactance, for an alternating sinusoidal current of 25 c/s with its intensity expressed as a function of the necessary control intensity ;
- c) the number of turns of its windings.

C.15. Limitation of the period of relay bounce

(former Recommendation 613, Prague, 1934)

The C.C.I.T.,

considering

that too long a period of armature bounce is a serious cause of distortion ;
that it seems possible to lessen the amount of bounce in modern relays by appropriate construction of the armature ;

unanimously declares the view

that it is desirable that the period of bounce of relays employed in the international service should not exceed

- 1 ms for relays employed in transmission,
- 2 ms for relays employed in reception,

these relays being controlled by an alternating sinusoidal current of 25 c/s with an intensity equal to twice that of the necessary control current.

C.16. Determination of relay characteristics

(former Recommendation 614, Warsaw, 1936)

The C.C.I.T.,

considering

that the definition of the values of the principal characteristics mentioned in Recommendation C.14 depends on knowledge of the distortion of signals by these relays when they are adjusted and supplied in specific conditions,

unanimously declares the view

that a determination of the various characteristics of relays may be made in the following conditions :

(C.16)

The values of relay characteristics are determined from the curve showing the variations in the degree of distortion of the relay in terms either of the intensity of the control current, of the intensity of the previous continuous excitation current or of the shifting of the contact stop around the neutral position.

The degree of bias distortion of signals re-established by a relay, for a given telegraphic speed, may be measured by means of a device set up according to the following principles :

The control current of the relay is, as the case may be, produced by an alternating current generator, or obtained by modulating the continuous current by means of an oscillating device, so that the characteristic instants of modulation, whether they are separated by equal or unequal intervals of time, are all produced at the same phase of the cycle of this device.

The stops of the relay under examination are attached to an appropriate electric circuit, and the coming into contact of the relay armature with its stops instantly provokes an optical phenomenon (light flash, deviation of the spot of a cathode oscillograph, deviation of the light ray of an oscillograph...).

By employing a suitable mechanical or electrical system, synchronous with the generating or modulating device of the relay control current, the optical phenomenon provoked by the function of the relay is shown on a screen in a position which indicates exactly at what phase of the cycle of the generating device the relay has functioned.

Thus, if the re-establishment of the signals were perfect, the positions corresponding to the successive contacts of the armature with a specified stop would be merged. The observation of the zone in which these positions are dispersed allows the degree of distortion of the re-established signals to be determined.

To ensure sufficient accuracy in determining relay characteristics, the device used should allow a reading to the hundredth part of the cycle's duration.

C.17. Unbalance of differential relays

(former Recommendation 615, Warsaw, 1936)

The C.C.I.T.,

considering

that the differential relays used for the duplex service, or connected in such a way that their windings are traversed by homopolar currents, should satisfy special requirements concerning their electric and magnetic balance,

unanimously declares the view

that, in order to ensure that these relays are constructed or adjusted in a satisfactory manner, they may be subjected to tests, the principle of which is described below.

1. Balancing for the duplex service

1st method. The circuit of diagram I is set up.

L represents the winding (or the group of windings) of the relay connected on the line side ;

(C.17)

E represents the winding (or the group of windings) connected on the balancing network side ;

R_L and R_E are adjustable resistances ;

S_1 is a source of sinusoidal current, of frequency equal to 25 p/s and of negligible internal reactance ;

S_2 is a source of disturbing current (for example, a transmitter producing regular alternations of a rectangular form, corresponding to a telegraph speed a little different from 2×25 bauds).

The resistances R_L and R_E are chosen in such a manner that, on the one hand, the time constants of the circuits traversed by the currents generated by the disturbing transmitter are of the order of 5 ms and that, on the other hand, there is equality between the total resistances of the circuits on either side of the branch containing the disturbing generator.

This being so, the disturbing generator is excluded from the circuit. The output of the generator S_1 is assessed in such a manner that the value of the current traversing the windings of the relay is half of that which flows through the winding L under normal service conditions, and the relay is adjusted in a perfectly symmetrical manner.

Then the distortion of the relay is measured.

Then the disturbing generator is connected in the circuit ; its voltage is selected so that the intensity of the current circulatory in the windings of the relay is at least equal to that used under normal service conditions, and preferably quite large. The distortion is then measured under these new conditions.

The increase in the degree of distortion observed gives an indication of the competence of the relay in the duplex service.

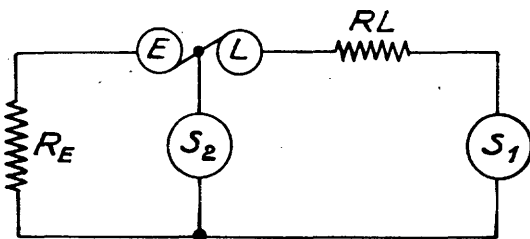


Fig. 1

2nd method. The circuit of diagram II is set up.

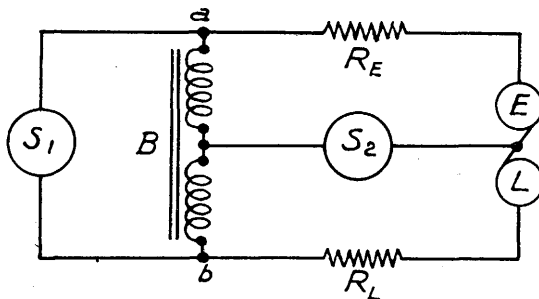


Fig. 2

In this diagram E , L , R_E , R_L , S_1 and S_2 represent the same elements as in diagram I.

B is an inductance coil of two perfectly symmetrical windings, connected in such a way that its impedance, measured between points a and b is high, and that, on the contrary, the impedance it presents to the circuits traversed by the current generated by the disturbing transmitter is negligible.

The adjustments and the tests are carried out under the same conditions as in the first method.

With this second method, a greater sensitivity is obtained than with the first.

2. Balancing for homopolar currents

This balancing may be used in the case of a relay with four windings likely to be connected in service in accordance with diagram III.

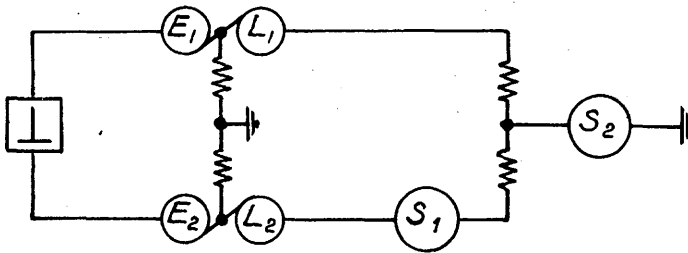


Fig. 3

The windings connected on the balancing network side are E_1 and E_2 . Those connected on the line side are L_1 and L_2 .

The testing of the balance may be carried out by the same methods as for relays serving in duplex, with the slight difference that, in the test connections, the winding (or the group of windings) E is replaced by the group of windings E_1 and L_2 , connected in series, and the winding (or group of windings) L by the combination of windings E_1 and L_2 connected in series (diagram IV).

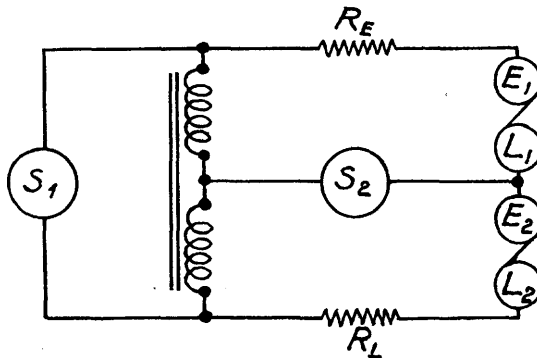


Fig. 4

C.18. Adjustment of relays

(former Recommendation 618, Warsaw, 1936)

The C.C.I.T.,

considering

that, on long aerial lines, the electrical characteristics of which vary constantly and considerably, the adjustment of the relay, performed on the installation which it serves when it is supplied by the line currents, sometimes makes it possible to compensate for the line irregularities and to ensure permanence of operation ;

that, on the other hand, on stable lines the adjustment of the relay may be performed almost entirely on a special auxiliary installation, which reduces to a minimum the immobilization of the lines and the intervention of service correspondence ;

that a certain number of relays are constructed in such a way as to permit three types of adjustment : the adjustment of the magnetic current, the setting of the travel of the armature (separation of the stops) and, lastly, the displacement of the armature from neutral position with respect to the stops ;

that the effect of a change in the first factors is very important and can be determined only after a study necessitating measurements made with apparatus unavailable to the personnel responsible for ordinary operation ;

therefore, the security of service requires that the corresponding adjustment must not be subject to the control of these personnel ;

that, on the other hand, the third adjustment is often useful and may easily be checked ;

unanimously declares the view

1. that there is no reason to recommend any special methods for the adjustment of the relay equipment of long aerial lines ;

2. that, as far as the relay equipment of stable circuits is concerned, particularly those using long-distance cable circuits :

only adjustment which allows modification of the unbalance of the functioning of the relay may be performed when the relay is in service ;

the adjustment tolerances of the magnetic circuit and the setting of the armature travel, or, for certain types of relay, the methods to be employed for making the proper adjustment and setting, should be fixed in permanent specifications ;

that the adjustments be performed as far as possible on auxiliary installations, such as those cited below as an example, which make it possible to determine whether the relay has the necessary sensitivity, is perfectly neutralized, or, on the other hand, is functioning in the desired direction at a suitable level, that is, is working with sufficient regularity.

Example of an auxiliary installation for the neutral adjustment of relays (fig. 1)

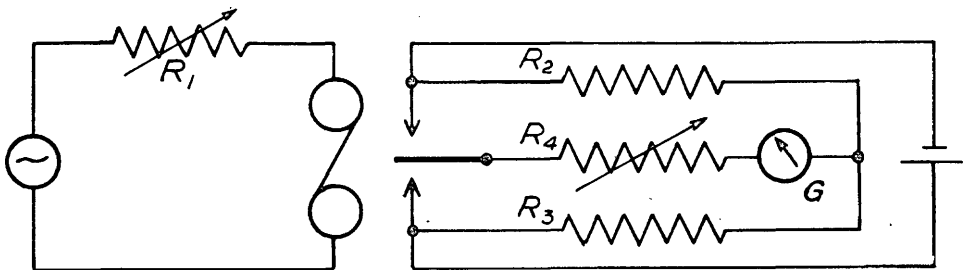


Fig. 1

(C.18)

The relay is supplied through a rheostat R_1 by an alternating current generator of 25 cycles per second.

The contact stops of the armature are converted at the same time to the terminals of a source of direct current and are bridged by equal resistors R_2 and R_3 in series. The armature is connected to the common point of R_2 and R_3 through a sensitive zero-centre galvanometer G capable of integrating the current that flows through it and an additional rheostat R_4 .

When the armature rests against one stop the galvanometer is traversed by a current of definite direction and magnitude. When the armature rests against the opposite stop the current passing through the galvanometer is reversed but of the same magnitude as before. Finally when the armature is not against either of the stops, no current flows through the galvanometer.

When the armature rests against one of its stops 1, the rheostat R_4 may be adjusted for the galvanometer to indicate 100 divisions.

If the relay is then excited by a periodic current, the needle of the galvanometer indicates a value n proportional to the average current flowing through the galvanometer. If t_1 represents the time that the armature rests against stop 1, and t_2 the time against the opposite stop 2, in the course of a cycle T ,

$$\frac{n}{100} = \frac{t_1 - t_2}{T}$$

In particular, $t_1 = t_2$ corresponds to neutral adjustment of the relay when the galvanometer needle remains at zero.

Example of an auxiliary installation for determining the time of armature travel (fig. 2)

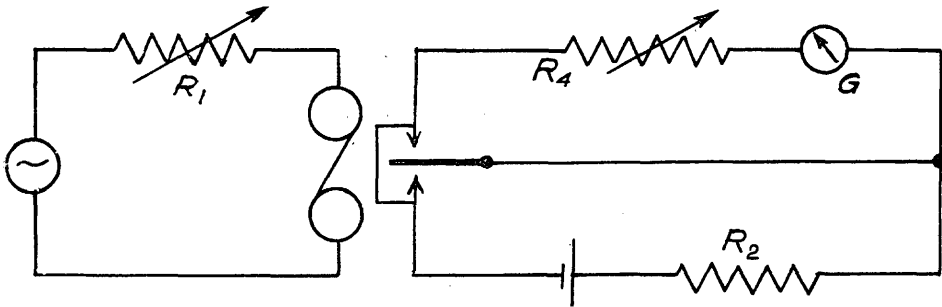


Fig. 2

The relay is supplied through a rheostat R_1 by an alternating current generator of 25 cycles per second.

The two contact stops of the armature are short-circuited by an external link. The armature is connected to the stops, on one side through a source of direct current and a resistance R_2 limiting the output of this source in case of short circuit, and on the other side through a sensitive galvanometer G and an additional rheostat R_4 .

When the armature remains against one stop or the other, the branch containing the galvanometer is short-circuited, and no current passes through the galvanometer. On the other hand, when the armature does not touch either of the stops, the galvanometer is traversed by a current whose intensity may be adjusted by the setting of rheostat R_4 .

While the armature is kept in this intermediate setting, R_4 may be set so that the galvanometer reads 100 divisions.

If the relay is then excited by means of a periodic current, the needle of the galvanometer will indicate m divisions.

The ratio $\frac{m}{100}$ then represents the fraction of the period during which the armature does not touch either contact, that is to say, if the phenomenon of bounce is negligible, the ratio of the time necessary for the travel of the armature from one stop to the other as compared with the duration of the period.

C.19. Start-stop reperforating apparatus

(Arnhem, 1953)

The C.C.I.T.,

unanimously declares the view

1. that it is recommended to make arrangements to avoid the mutilation of signals transmitted at the head of a message and received on start-stop reperforating apparatus.

[If the reperforating apparatus is provided with local means for feeding the paper, not more than one mutilated signal should be tolerated. (This mutilation results from the reception of signals during the feeding of the paper.) The wording of the message must make allowances for this fact].

(Devices fulfilling this requirement are at present known to exist.)

2. that pending standardization of the conditions of utilization on an international network of perforated tape retransmission apparatus, the choice of the retransmitting device is left to the discretion of each Administration concerned.

C.20. Standardization of the characteristics of the paper used on start-stop page printing apparatus

(Geneva, 1956)

The C.C.I.T.,

considering

1. that various types of page printing teleprinters are used in the international services and they have different characteristics affecting the paper employed;

2. that it is necessary to provide for differences in the practices of various Administrations and private services;

3. that correct inter-operation is sufficiently assured by the standardization of the number of characters in a line (see Recommendation C.6);

unanimously declares the view

that it is not necessary to recommend any international standardization of the characteristics of the paper used on start-stop page printing apparatus.

**C.21. Standardization of sprocket-feed mechanisms used
on start-stop page-printing apparatus**

(Geneva, 1956)

The C.C.I.T.,

considering

1. that certain of the dimensional characteristics of the sprocket-feed mechanisms used on Teleprinters are closely related to the dimensional characteristics of the paper used ;

2. that in Recommendation C.20 it has been deemed unnecessary to recommend any international standardization of the characteristics of the paper used on start-stop page-printing apparatus ;

unanimously declares the view

that standardization of the principal characteristics of sprocket-feed mechanisms used on teleprinters in international service is undesirable.

Note : The following details relating to the operation of sprocket-feed page mechanisms used in the internal services of the Federal German Republic may be of interest to other Administrations :

The platen has eleven pins on each side (see Figure 1 in Drawing 87/1). These pins permanently engage in the holes on the two sides of the form. The spacing between pins is slightly less than half an inch. Hence seven copies can be used.

Figure 2 in Drawing 87/1 shows the dimensions of the sprocket-punched paper.

Dimensions are as follows :

- a) Spacing between lateral holes : 12.7 mm = half an inch.
- b) Spacing between two rows of lateral holes : 203.2 mm = 8 inches.

These are identical to those normally used for this purpose in the United States and United Kingdom.

The forms are separated length-wise by « y » score lines. The « x » lines determine the width of the form. The form itself measures 192 × 304.8 mm.

The carbon paper, 192 ± 1 mm wide, is not scored (see Figure 2 of Drawing 87/1).

With 3 layers of paper, all layers are perforated, and can be provided by a spare roll.

If it is desired to print more copies, only the layer immediately against the platen is perforated (see Figure 3 of Drawing 87/1).

All the other layers of paper are narrower (196 ± 1 mm).

(C.21)

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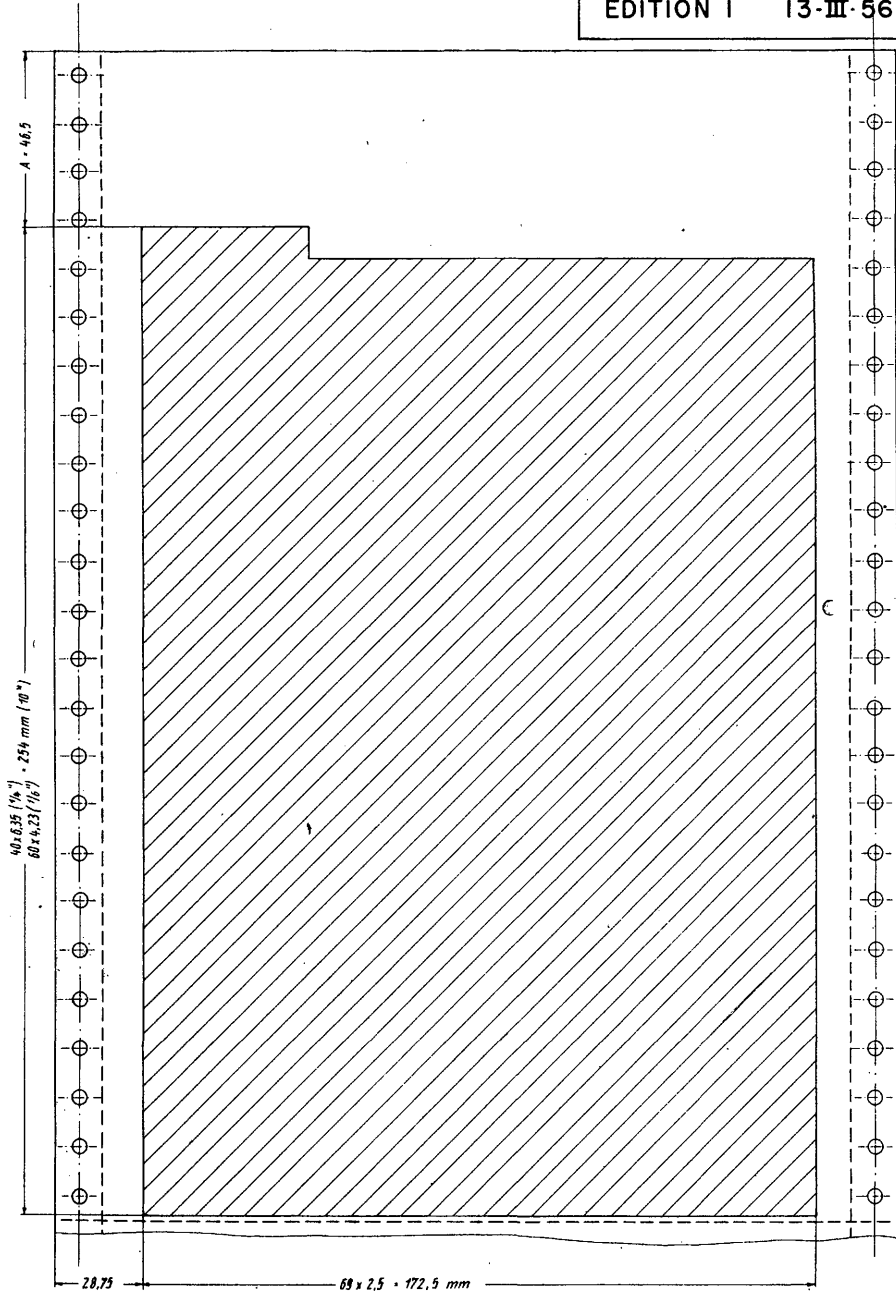


Figure 4

(C.21)

In this case, all the layers, including the carbon, have to be stapled close to the separation line « y ». Then it will be impossible for the forms to be provided by a roll. The various layers of paper so clipped are folded in zig-zag.

All paper tolerances are valid for 65 % relative humidity of the atmosphere.

Figure 4 (Drawing 87/2) shows the printed part of the form for a spacing of 4.23 mm and of 6.35 mm between the printed lines. Space A is so chosen that the printed form last received can be torn off, while the next one is ready for printing. In the free space A, the heading of a commercial firm can be printed in advance.

C.22. Suppression of unwanted reception in radiotelegraph multi-destination teleprinter systems
(Geneva, 1956)

The C.C.I.T.,

considering

1. that in a radio-telegraph system in which a radio teleprinter transmitter broadcasts messages simultaneously to a number of receiving stations, this broadcast is sometimes only required by a restricted number of these stations ;
2. that it is desirable in such cases to prevent the reception of the message at the other offices to avoid wastage of paper ;
3. that such wastage can be avoided by the use of selective calling systems whereby only those stations required to receive the transmission are connected whilst it is in progress ;
4. that various technical methods are available for achieving this, using either :
 - a) pulse signalling (e.g. by dial) ;
 - or b) signalling with 5-unit signals ;
5. that a wide variety of systems may be devised based upon the methods in 4 above ;
6. that such systems are normally only used for special services in which agreement can be reached on the particular type of system to be adopted ;

unanimously declares the view

1. that when it is desired to avoid wastage of paper at receiving stations in radio-telegraph multi-destination teleprinter systems a selective calling system should be used ;
2. that it is neither necessary nor desirable to recommend the use of any particular type of system for international use ;
3. that Administrations who either use or contemplate the use of such devices employing the signals of Alphabet No. 2 should, if possible, choose the signals from those referred to in Question 4 of Study Group 8 of the C.C.I.T.T. and should be invited to inform the Committee entrusted with the technical study of telegraph apparatus of the signals which they find most suitable for their particular system.

C.23. Conditions which must be satisfied by synchronous systems
operating in connection with start-stop teleprinter systems

(Geneva, 1956)

The C.C.I.T.,

considering on the one hand

that the receiving portion of the sending end of the synchronous system can be linked to a teleprinter receiver ;

(C.23)

that the receiving portion of the sending end termination shall satisfy the conditions laid down in Recommendation C.4, paragraphs 1, 2, 5 and 6 ;

considering on the other hand,

that the retransmitting portion of the receiving end of the synchronous system can be linked to a start-stop transmitter having special characteristics, because of the high speed stability of synchronous systems,

unanimously declares the view

that the start-stop signals provided by the retransmitting portion of the receiving termination of the synchronous system shall have the following characteristics :

1. Nominal modulation rate, 50 bauds.
2. Gross start-stop distortion of the signals, less than 5 %.
3. Interval between the beginnings of successive start elements, 145 5/6 milliseconds with a tolerance of $\pm 1/10\ 000$.

Note : See comments on Question 6/8 of C.C.I.T.T. Study Group 8.

**C.24. Use on radio circuits of 7-unit synchronous systems
giving error correction by automatic repetition**

(Geneva, 1956)

The C.C.I.T.T.,

considering

a) that it is essential to be able to interconnect terminal startstop apparatus employing International Telegraph Alphabet No. 2 by means of radio-telegraph circuits ;

b) that radio-telegraph circuits are required to operate under varying conditions of radio propagation, atmospheric noise and interference that introduce varying degrees of distortion which may at times exceed the margin of the receiving apparatus ;

c) that, in consequence, the transmission of 5-unit code signals over radio circuits is liable to errors and that such errors are not automatically detectable by the receiving apparatus ;

d) that an effective means to reduce the number of wrongly printed characters is the use of codes permitting the correction of errors, either by their intrinsic constitution or by detecting the error and automatically causing repetition ;

unanimously declares the view

1. that when the use of a 5-unit code on a radio circuit results in an intolerable error rate and there is a return circuit, a 7-unit automatic error-correction system be considered. In such a case, the 7-unit system described below should be adapted as a preferred system ;

2. that the 7-unit code employed should conform with that indicated in the following table, except that on certain channels the signalling conditions employed for the A and Z elements are reversed in accordance with paragraph 3 ;

(C.24)

	5-Unit Code	7-Unit Code
A	Z Z A A A	A A Z Z A Z A
B	Z A A Z Z	A A Z Z A A Z
C	A Z Z Z A	Z A A Z Z A A
D	Z A A Z A	A A Z Z Z A A
E	Z A A A A	A Z Z Z A A A
F	Z A Z Z A	A A Z A A Z Z
G	A Z A Z Z	Z Z A A A A Z
H	A A Z A Z	Z A Z A A Z A
I	A Z Z A A	Z Z Z A A A A
J	Z Z A Z A	A Z A A A Z Z
K	Z Z Z Z A	A A A Z A Z Z
L	A Z A A Z	Z Z A A A Z A
M	A A Z Z Z	Z A Z A A A Z
N	A A Z Z A	Z A Z A Z A A
O	A A A Z Z	Z A A A Z Z A
P	A Z Z A Z	Z A A Z A Z A
Q	Z Z Z A Z	A A A Z Z A Z
R	A Z A Z A	Z Z A A Z A A
S	Z A Z A A	A Z A Z A Z A
T	A A A A Z	Z A A A Z A Z
U	Z Z Z A A	A Z Z A A Z A
V	A Z Z Z Z	Z A A Z A A Z
W	Z Z A A Z	A Z A A Z A Z
X	Z A Z Z Z	A A Z A Z Z A
Y	Z A Z A Z	A A Z A Z A Z
Z	Z A A A Z	A Z Z A A A Z
carriage return	A A A Z A	Z A A A A Z Z
line feed	A Z A A A	Z A Z Z A A A
figures	Z Z A Z Z	A Z A A Z Z A
letters	Z Z Z Z Z	A A A Z Z Z A
space	A A Z A A	Z Z A Z A A A
unperforated tape	A A A A A	A A A A Z Z Z
signal repetition	_____	A Z Z A Z A A
signal α	_____	A Z A Z A A Z
signal β	_____	A Z A Z Z A A

Note : Symbols A and Z have the meanings defined in paragraph B.4 of the Annex to Recommendation I.4—Graphical Symbols.

3. that the channels are in conformity with the following arrangement :
 - a) *Two channels* :
 channels A and B consecutive
 (A. direct keying
 B. reversed keying).
 - b) *Four channels* :
 channels A and B consecutive,
 channel C interlaced with channel A,
 channel D interlaced with channel B,
 (A. direct keying, C. reversed keying,
 B. reversed keying, D. direct keying).
4. that the repetition cycle for the correction of errors shall be four characters for normal circuits which are not subject to excessive delay ;
5. that, in the case where such systems are utilized for the establishment of Telex communications :
 - a) the receiving and transmitting portions of the radio channel be in conformity with Recommendation C.23 ;
 - b) the signalling conditions be in conformity with Recommendation E.6.

D. RECOMMENDATIONS APPLYING TO QUESTIONS OF FACSIMILE

D.1. Standardization of phototelegraph apparatus

(*ex Recommendation 681, amended by provisional Recommendation in 1951,
at Arnhem, 1953 and at Geneva, 1956*)

The C.C.I.T.,

considering

that the transmission of pictures is possible only if certain characteristics of the transmitting and receiving equipments are identical,

unanimously declares the view

that phototelegraph apparatus and the associated modulating and demodulating equipment should be constructed and employed according to the following standards :

Direction of Scanning

At the transmitting apparatus the plane (developed in the case of a drum transmitter) of the message surface is scanned along lines running from right to left commencing at the top so that scanning commences at the top right-hand corner of the surface and finishes at the bottom left-hand corner : this is equivalent to scanning over a right-hand helix on a drum. The orientation of the message on the scanning plane will depend upon its dimensions and is of no consequence.

At the receiving apparatus scanning takes place from right to left and top to bottom (in the above sense) for " positive " reception and from left to right and top to bottom (in the above sense) for " negative " reception.

Index of co-operation

The index (M) is defined by the formula

$$M = \frac{D}{P} = DF$$

where D is the diameter of the drum,

P is the pitch of the helix formed by a series of scanning lines,

F is the scanning density (or lines per unit length),

The normal index is 352.

The preferred alternative index, for use when less dense scanning is required, or when the characteristics of circuits (and particularly combined line and radio circuits) so demand, is 264.

The foregoing standards assume that the size of the scanning spot bears the most appropriate relationship to the index of co-operation in use.

Drum Factor

The drum factor is the ratio :

$$\frac{\text{usable drum length}}{\text{drum diameter}} = \frac{L}{D}$$

(D.1)

Before a picture is transmitted, it is necessary to verify that

$$\frac{\text{transmitter drum length used}}{\text{transmitter drum diameter}}$$

is not greater than the receiver drum factor.

Dimensions of drum and picture

The normal drum diameter is 66 mm.

The preferred alternative drum diameters are 70 and 88 mm.

The drum factor shall be not less than 2.4.

In the case of the normal drum, the width of the two picture-retaining clips together may not exceed 15 mm. An allowance of 5 mm is also made for phasing. Thus, since the total circumference of the drum is about 207 mm, the usable circumference will be 187 mm.

The normal dimensions of the pictures are 130 mm × 180 mm.

The existence of a number of variations from the recommended values of drum diameter and index of co-operation has been observed and it is recommended that Administrations and Private Operating Agencies should for the future endeavour to conform, as far as possible, with the recommended values.

The following table gives corresponding values of M, D, P and F for apparatus in most common use :

M	D(mm)	P(mm)	F(lines/mm)
264	66	1/4	4
264	70	1/3.77	3.77
264	88	1/3	3
350	70	1/5	5
352	66	3/16	16/3
352	88	1/4	4

Drum Rotation Speed

The following are the normal and approved alternative combinations of drum rotation speed and index of co-operation :

	Drum rotation speed (r.p.m.)	Index of Co-operation	
		Metallic Circuits	Combined metallic and radio circuits
Normal conditions	60	352	352
	90		264
Lower speed for use when radio propagation conditions demand it	45		264
Alternatives for use when the phototelegraph apparatus and metallic circuits are suitable	90	264 and 352	
	120		264 and 352

(D.1)

Note : In the case of transmitters operating on metallic circuits, the index 264 is not intended to be used with an 88 mm drum. In the case of transmitters operating on combined metallic and radio circuits, the index 264 associated with a drum diameter of 88 mm is only intended to be used exceptionally.

The rotation speed of transmitters must be maintained as nearly as possible to the nominal speed and in any case within ± 10 parts in 10^6 of the nominal speed. The rotation speed of receivers must be adjustable and the range of adjustment should be at least ± 50 parts in 10^6 from the nominal speed. After regulation, the speeds of the transmitting and receiving sets should not differ by more than 10 parts in 10^6 .

Judder

The stability of the rotation speed should be such that the maximum shift of the drum surface from the average position should not exceed one quarter of the pitch (P) of the helix formed by the scanning lines, which at normal index 352, means that the maximum angle of the oscillations should not exceed 0.08 degree measured from the average position.

Positive and Negative Reception

Selection of positive or negative reception should be made by adjustment at the receiver.

Equalization of Speeds

When phototelegraph stations have available a standard of frequency which is better than ± 5 parts in 10^6 , verification of the synchronism between the two stations may be dispensed with. In view of the saving of time, this method should be adopted wherever possible.

To compare the speeds of a transmitter and receiver, an alternating current whose frequency bears an unvarying relationship to the transmitter drum speed, and has a nominal value of 1020 c/s, is used. This current is received by some form of stroboscope at the receiver.

The speed of the receiver is adjusted to within 10 parts in 10^6 of the speed of the transmitter ; the required condition is indicated when the phase slip of the stroboscopic display does not exceed one white sector plus one black sector (or their equivalent) in either two minutes or one minute according to whether the flashing frequency is equal to or double the comparison frequency.

Where there is the possibility that the transmitter and receiver may be connected by a circuit liable to introduce frequency changes, for example, by a carrier telephone circuit, the use of the simple 1020 c/s synchronizing tone is unsatisfactory. The preferred method of overcoming this difficulty is to transmit the phototelegraph carrier (1900 c/s or 1300 c/s) modulated by the 1020 c/s synchronizing tone.

At the receiving end the 1020 c/s synchronizing frequency is restored by detection and can then be used in the normal manner. For technical reasons the use of 1900 c/s is to be preferred and Administrations should endeavour to use this frequency.

Phasing

Phasing is performed after the speeds of the transmitter and receiver drums have been equalized and before scanning of the picture area begins.

The transmitter emits a series of short phasing signals within the periods when the scanning beam is passing across the dead sector (clip position).

The phasing signals are used at the receiver to position the drum so that they fall within the dead sector.

The phasing operation aims to ensure that a given instant in the phototelegraph signal bears the same time relation in both transmitter and receiver to the instant at which the scanning beam passes out of the dead sector.

For amplitude modulation transmission the phasing signal should be sent at the level of the white signal. Any frequency convenient for transmission may be used, for example the 1020 c/s synchronizing tone or the phototelegraph carrier.

For frequency modulation transmission the phasing signals should be at the white frequency.

Modulation and Demodulation Equipment

1. Amplitude Modulation

Phototelegraph equipment shall normally provide for transmission and reception of an amplitude modulated audio-frequency carrier, which is the normal mode of transmission for international metallic circuits.

The level of the output signal of the transmitter shall be greatest for white and least for black. It is desirable that the ratio of nominal white signal to nominal black signal should be approximately 30 decibels.

To simplify multi-destination operation and AM/FM conversion for radio operation, it is desirable that the amplitude of the transmitted signal should vary linearly with the photocell voltage and that no corrections for tone scale should be made at the phototelegraph transmitting station.

For audio-frequency telephone circuits the frequency of the picture carrier-current is fixed at about 1300 c/s. This frequency gives the least delay distortion on lightly loaded underground cables.

In the case of carrier telephone circuits providing a transmission band from 300 to 3400 c/s, a carrier-current frequency of about 1900 c/s is recommended.

2. Frequency Modulation

Preferably phototelegraph apparatus should also provide for transmission and reception of a frequency-modulated audio-frequency carrier for use when the characteristics of the metallic portion of the circuit permit:

- a) on combined metallic and radio circuits,
- b) on wholly metallic circuits.

In such a case, the characteristics of the frequency-modulated output should be:

Mean Frequency	1,900 c/s
White Frequency	1,500 c/s
Black Frequency	2,300 c/s
Phasing signal frequency	1,500 c/s

The deviation of frequency should vary linearly with photocell voltage or, in the case of conversion from amplitude modulation to frequency modulation, with the amplitude of the amplitude-modulated carrier.

(D.1)

The stability of the apparatus must be such that the frequency corresponding to a given tone does not vary by more than 8 c/s in a period of 30 seconds and by more than 16 c/s in a period of 15 minutes.

D.2. Synchronization of phototelegraph apparatus working on carrier-current circuits or on coaxial cables

(former Recommendation 587, Brussels, 1948)

(Suppressed in Geneva, 1956 ; text incorporated in Recommendation D.1)

D.3. Coexistence of telephony and phototelegraphy in long-distance telephone cables

(Recommendation 586, Warsaw, 1936, amended at Geneva, 1956)

The C.C.I.T.,

considering

that both audio and carrier telephone circuits may be used for phototelegraphy ;

that phototelegraph transmission on telephone circuits may, in special cases, use frequency modulation as an alternative to amplitude modulation ;

unanimously declares the view

that phototelegraph transmission on telephone circuits demands that the following conditions be observed :

1. Two-wire circuits have no practical value for phototelegraphy owing to reaction coupling phenomena.

For the same reason, four-wire circuits should be extended to the phototelegraph stations on a four-wire basis at the appropriate amplifier stations, the terminating sets and echo-suppressors being invariably disconnected.

2. The conditions relating to the transmission equivalent of four-wire circuits used for phototelegraphy are, in general, the same as in the case of telephony.

a) The emission voltage for the phototelegraph signal corresponding to maximum amplitude should be so adjusted that the absolute power level of the signal, at the zero relative level point deduced from the hypsogram of the telephone circuit, is 0 neper (0 decibel) for amplitude-modulation phototelegraph transmission and -1.15 neper (-10 decibels) for frequency-modulation phototelegraph transmissions. In the case of amplitude-modulation the level of the signal corresponding to black is usually about 30 decibels lower than that of the signal corresponding to white.

From indications given by the C.C.I.F., it appears that, if the circumstances are such that it is desired to use frequency modulation of a sub-carrier for phototelegraphy or a facsimile transmission and it is impractical to disconnect the signal receiver associated with the terminal, then in the case of the one-frequency system, it would be recommendable that a blocking signal be transmitted along with the picture signal to operate the guard circuit and render the receiver inoperative.

It is also apparent that the frequency of such a blocking signal should lie well outside the range of frequencies involved in the picture transmission and the frequency and the

(D.3)

level of the blocking signal must depend on the characteristics of the VF receiver (or receivers in the case of a tandem international connection), as designed by different Administrations to meet the specification to be prescribed for international signalling.

In the case of the two-frequency international signalling system, the C.C.I.F. have indicated their view that no interference will take place.

- b) If phototelegraph transmissions take place simultaneously from a transmitting station to several receiving stations, arrangements shall be made at the junction point so that, on the circuits following the junction point, the same power levels are maintained as those prescribed for individual transmissions.
- c) The attenuation distortion between phototelegraph stations should not exceed 1.0 neper (8.7 decibels) in the band of frequencies to be transmitted for phototelegraphy. As a distortion of 1.0 neper (8.7 decibels) is already assumed for the telephone circuit itself, it may be necessary at times to compensate for the distortion of the lines joining the phototelegraph stations to the amplifier stations.
- d) The equivalent should remain as constant as possible during transmission of pictures. In the case of amplitude modulation, the effect of abrupt variations of even 0.1 neper (0.9 decibel) has an influence upon the pictures transmitted. It is, moreover, necessary to avoid any interruption of the circuit, however rapid. For this reason the greatest attention should be paid to the measurements made on the amplifiers and lines and to the changing of batteries. To reduce the risk of disturbance it is desirable for the main trunk exchanges to be excluded from the circuit when it is extended to the phototelegraph stations.

Special precautions should be taken to make sure that no modulation of the carrier current is caused whether by the line or by the amplifiers, even if this modulation is inaudible. Such modulation may be caused, in particular, either by variations in the voltage of battery supplies or by sub-audio telegraph installations.

3. The differing propagation times of the various frequencies and the final width of the transmitted frequency band give rise to transient phenomena (at the build-up and decay) which limit the speed of phototelegraph transmission. The frequency bandwidth used should be narrower—and consequently the transmission speed lower—the greater the difference in propagation time within the transmission band.

Delay distortion limits the range of satisfactory phototelegraph transmission.

Practical information on group delay distortion is contained in the Annex I to this Recommendation.

Annex II contains information on the relative performance of amplitude modulated and frequency modulated transmissions on audio and carrier telephone circuits.

4. Interfering currents, whatever their nature, should not exceed the limits recommended by the C.C.I.F., in the *Green Book*.

5. It is desirable that the circuits used for phototelegraphy be marked with a characteristic sign in the terminal centres and in the intermediate amplifier stations; in addition, special instructions should be given to personnel, so that they do not interfere while a picture transmission is taking place.

(D.3)

ANNEX I TO DRAFT RECOMMENDATION D.3

Delay distortion

The C.C.I.F. provisionally recommends the following for either audio or carrier-type international circuits :

If t_m is the group delay for the nominal lower limit of the band of frequencies transmitted,

t_M is the group delay for the nominal upper limit of the band of frequencies transmitted,

t_{min} is the minimum group delay in the band of frequencies transmitted than we should have

$$\begin{aligned}t_m - t_{min} &\leq 20 \text{ milliseconds,} \\t_M - t_{min} &\leq 10 \text{ milliseconds.}\end{aligned}$$

In practice, for a single modern-type carrier system (providing at least 12 channels) (and in particular for channels in the middle of the basic group of such a system) the delay distortion is much less than the above limits. However, it would not be economically justifiable to make a more severe specification (in respect of delay distortion) than the present Recommendation purely in view of the occasional use of a few circuits for high-speed phototelegraph transmission.

Annexes 1 to 4 which follow give information on the delay distortion which can be met in practice.

Naturally in the case of a circuit rented on a yearly basis, specially for phototelegraph transmission, it will be possible to choose by agreement between Administrations a circuit which satisfied more severe limits than those indicated above for delay distortion.

Note from Secretariat

The Annexes 1 to 4 mentioned by the C.C.I.F. are the following contributions :

Annex 1 — Contribution by the American Telegraph and Telephone Company, with C.C.I.T. curve 11. This contribution has been published in Volume II of the Supplements to the Arnhem Documents on page 423. The curve is on page 425.

Annex 2 — Contribution by the Administration of the United Kingdom. This contribution has been published in Volume II of the Supplements to the Arnhem Documents, on pages 428 to 430.

Annex 3 — Contribution by the Administration of the Netherlands. This contribution has been published in Volume II of the Supplements to the Arnhem Documents on pages 426 to 427.

Annex 4 — Contribution by the Administration of the Federal German Republic. This contribution does not exactly reproduce the contribution sent to the C.C.I.T. on this subject in April 1953 and published in Document A.P. VII/23 of the Plenary Assembly, Arnhem, as also on pages 420 to 422 of Volume II of the Supplements to the Arnhem Documents. This contribution is therefore reissued, with its new text and new curves, in a new document (Document S.G. IV/21).

To these should be added :

Annex 5 — Contribution by the French Administration, contained in C.C.I.T. Document S.G. IV/33-E. Contributions included in document S.G. IV/21 and S.G. IV/33 are the following :

C.C.I.T. Document S.G. IV/21

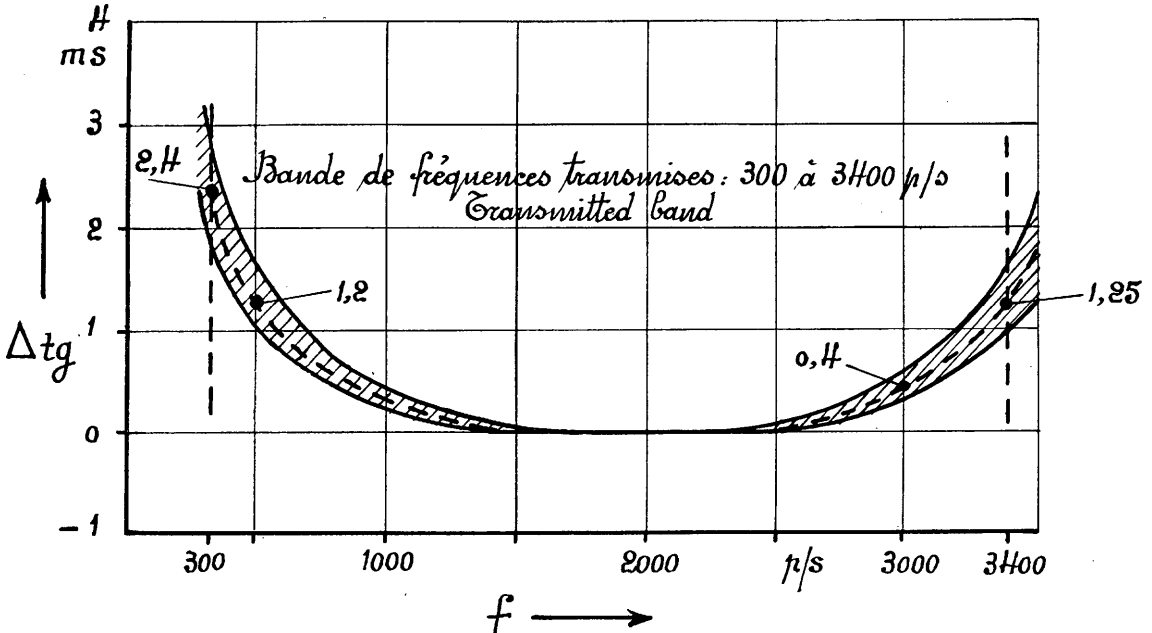
SOURCE :

FEDERAL GERMAN REPUBLIC

TITLE : **Envelope delay on telephone channels of carrier systems on balanced pairs in cable (5 groups or 12 — 12 type) used by the Administration of the Federal German Republic**

(Replaces the contribution published on pages 420 - 422 of the Supplements to the Arnhem Documents)

C.C.I.T. Figure 12—edition 2—(Figure 39 of the C.C.I.F. *Green Book*) below shows the variation in the envelope delay on a telephone channel of the new German carrier systems for long-distance traffic (system V 60 providing 60 telephone channels on balanced pairs) with respect to the minimum envelope delay. The propagation time curves (valid for the extreme channels also), registered at terminal equipments of different types, are to be found on the hatched area; for the curve of average values traced in dashes, a variation in envelope delay of 2.4 milliseconds is obtained at the lower end and 1.25 milliseconds at the upper end of the 300 to 3400 c/s effectively transmitted frequency band.



République Fédérale d'Allemagne :

Variation du temps de propagation de groupe sur une voie téléphonique des systèmes V 60, par rapport au temps de propagation de groupe minimum.

Federal German Republic :

Envelope delay on V 60 system carrier telephone channel, referred to the minimum delay.

(Figure 39 du *Livre Vert* du C.C.I.F.)

(Diagram 39 of C.C.I.F. *Green Book*)

CCIT	N 12	E / F
SG IV / 21		
Issue 2	Juin 1955	

Case of a nominal maximum circuit :

If the coaxial type nominal maximum circuit arrangement is applied to balanced pair carrier circuits, the only phase distortion on channels 2 to 11 of a 12-channel group arises through the filters of the channel modulation equipment. Delay distortion caused by triple modulation and demodulation on the channel amounts to only about three-quarters of the admissible tolerance according to the Recommendations made by the C.C.I.F. up to the present. The difference between the envelope delay at the frequency in question and the minimum envelope delay should not exceed 10 milliseconds at 300 c/s and 5 milliseconds at 3400 c/s.

Case in which groups or supergroups are transferred from one system to another :

The Administration of the Federal German Republic thinks it would be inadvisable to narrow down once more the tolerance limits fixed up till now by the C.C.I.F. because, for the end channels 1 and 12 of a group, additional delay distortion might arise through the group or supergroup modulation equipment

(D.3)

or through the transfer of the groups without demodulation or remodulation. Similarly, for carrier systems used on two-wire type circuits with different frequency bands, small additional variations of the delay distortion arise, in both transmission directions (for example the German Z 12 K system) is the end channel adjacent to the band of frequencies eliminated by the directional filters, and in cases where several intermediate repeaters are inserted, these variations may mean that the tolerance allowed for the time of propagation is exceeded.

The delay distortion shown on the following diagram refers to telephone channels which have only receiving equipment for channel modulation. Several group or supergroup modulations are permissible. However, with filters showing a sharp increase of loss in the band of eliminated frequencies (for example, group transfer filters for the frequency band 60 to 108 kc/s) there may be some slight increase in the delay distortion on the end channels 1 and 12 of a group.

Case of circuits used permanently for phototelegraphy :

If it is insisted that the telephone circuits used for phototelegraphy include only one channel receiving and transmitting equipment and are not at the end channels of a group, very slight delay distortion may be obtained, especially since phototelegraphy occupies only a part of the carrier channel where the delay distortion is relatively smaller (very much less than a millisecond). Then it is no longer necessary to fix tolerances. In the case of permanent phototelegraph circuits it will in most cases be possible to fulfil this condition.

Extracts from Document S.G. IV/33

SOURCE :

FRANCE

TITLE :

Contribution to studies by Study Group IV

Question No. 45

The C.C.I.F. specifications, as reproduced in Document S.G. IV/20, make it impossible to give a clear-cut reply to the question raised, as the informations given are too vague.

The French Administration has undertaken propagation time measurements on unloaded symmetrical-pair carrier systems (quads already defined 9/10°).

Paris-Limoges 802 A + 803 A channel 1
802 M + 503 M channel 12

The measurements were made by loop.

On the curves given in the attached Diagram 86, it will be seen that the group delay distortion does not exceed :

In the band 1000 — 3000 c/s \pm 0.35 ms. for channel 1
 \pm 0.40 ms. for channel 2
In the band 1000 — 2350 c/s \pm 0.15 ms. for channel 1
 \pm 0.20 ms. for channel 2

The minimum distortion appears in the band around 1800 to 2000 c/s.

These figures, which refer to two circuits in tandem, are very liberal. Theory indicates and practice confirms that the transmission of a picture is still satisfactory when the group delay distortion is equal to the duration of the elementary spot.

In the present case let us recall the figures :

at index 352, speed 60 r.p.m., the duration of the scanning spot is about 0.9 ms. and the band occupied is 1100 c/s.

at index 352, speed 120 r.p.m., the duration of the scanning spot is about 0.45 ms. and the band occupied 2200 c/s.

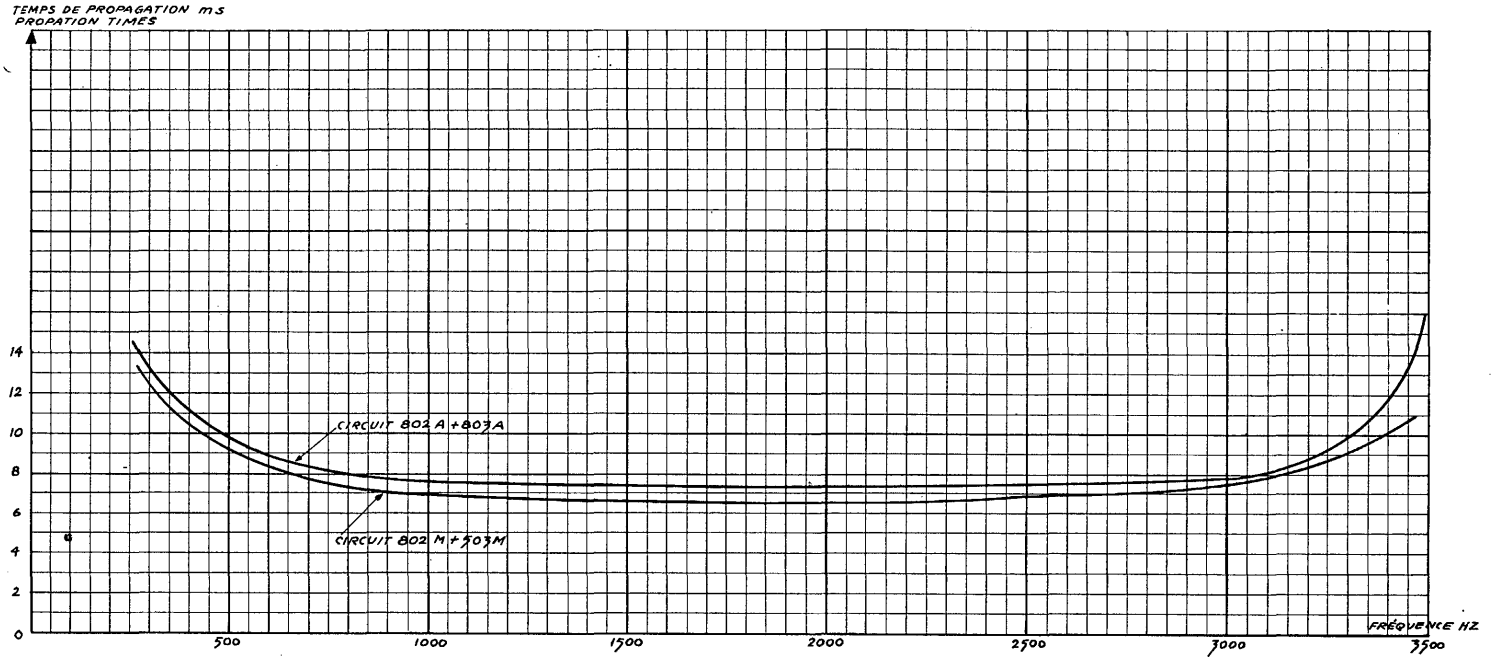
It therefore seems that by centering the carrier around 1800 to 2000 c/s—for example at 1900 c/s—it should be possible in most cases to operate at 120 r.p.m. with satisfactory results.

These figures should nevertheless be given a reasonable test, and it would be advisable to check that the noise level of the carrier circuits permits correct transmission in every case, bearing in mind the desire of the C.C.I.F. to lower the transmission levels. •

Comment : If it is desired to increase the transmission speed, the solution would seem to be to use index 264 at a speed of 180 r.p.m. The French Administration has carried out successful tests in this direction.

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(D.3)



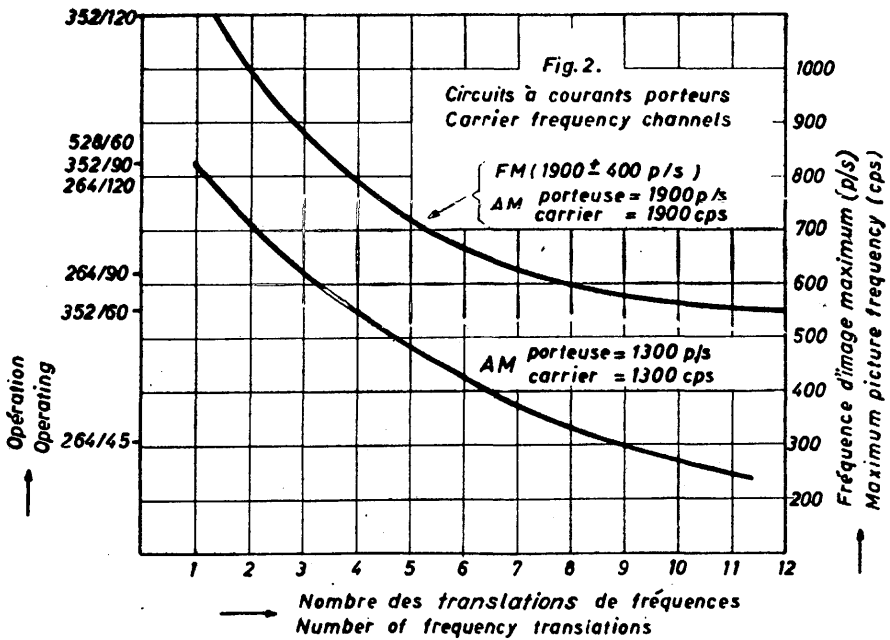
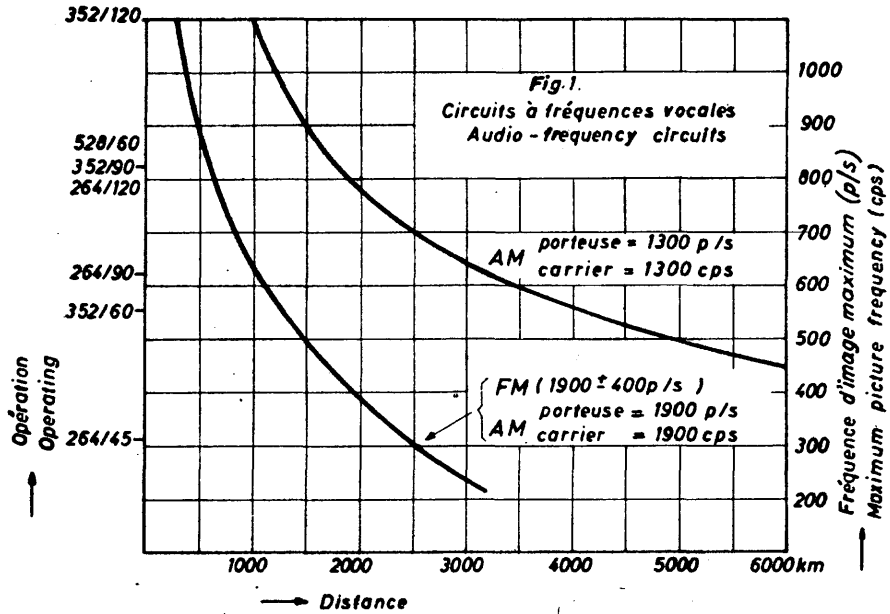
TEMS DE PROPAGATION EN FONCTION DE LA FRÉQUENCE SUR DES CIRCUITS A COURANTS
PORTEURS 12 VOIES

PROPAGATION TIMES IN RELATION TO FREQUENCY OF CIRCUITS ON 12 CHANNELS CARRIER SYSTEMS

CCIT N° 86 E/F

SG IV/33

EDITION 1 9-III-56



C.C.I.T. N° 67.
SG IV/24
Issue 1 Août 1955

Portée
de transmission phototélégraphique
Ränge
of photo-telegraph transmission

Annex II to draft Recommendation D.3

CONTRIBUTION BY THE FEDERAL GERMAN REPUBLIC

(extracted from C.C.I.T. Document S.G. IV/24-E)

Diagram No. 67 shows the range of loaded circuits for the variants allowed by Recommendation D.1.

The curves show physical circuits lightly coil-loaded, without phase compensators. Greater ranges are obtained for phantom circuits and when phase compensators are inserted. For phototelegraph transmissions on carrier telephone circuits, the range does not depend on distance, but only on the number of channel translations.

D.4. Phototelegraph transmission over combined radio and metallic circuits

(ex Recommendation 582, 583, 584, Brussels, 1948, amended at Arnhem, 1953, and at Geneva, 1956)

The C.C.I.T.,

considering

that the C.C.I.R. has issued Recommendation 227 relating to phototelegraph transmission over combined radio and metallic paths ;

that the C.C.I.F. has approved the conditions under which frequency modulation may be used for phototelegraphy over international telephone circuits ;

unanimously declares the view

that phototelegraph transmission over combined radio and metallic circuits should be in accordance with the following recommendations :

1. Over the radio path the sub-carrier frequency modulation system should be used with the following characteristics :

- a) Sub-carrier frequency 1900 c/s
- White frequency 1500 c/s *
- Black frequency 2300 c/s
- b) Stability of frequencies such that the variations are less than :
 - Instantaneous 8 c/s
 - During 15 minutes 16 c/s

2. For the present the following apparatus characteristics should be used :

	<i>a</i>	<i>b</i>
Index of cooperation	352	264
Speed of rotation of drum in r.p.m.	60	90
		45 **

* The 1500 c/s frequency is also used for the phasing frequency.
** Lower speed for use when radio propagation conditions demand it.

3. Frequency modulation or amplitude modulation may be used in the metallic portions of the combined circuit. When conversion from amplitude modulation to frequency modulation (or vice versa) is required, the conversion should be such that the deviation of the frequency modulated carrier varies linearly with the amplitude of the amplitude modulated carrier.

The standards for both amplitude modulated and frequency modulated transmissions will be found in Recommendations D.1 and D.3 of the C.C.I.T. Recommendation D.3 applies only to the metallic portion of the combined circuit.

The location of the modulation converters, where these are necessary, is to be decided by each Administration. To facilitate telephone communication it is desirable to place the modulation converters at the terminal phototelegraph stations or at the picture control station in the case of transmissions over combined radio and metallic circuits.

Remarks : The Recommendations of paragraph 2 above are not intended to require the imposition of such standards on users who use their own equipment for the transmission of pictures over private circuits.

D.5. Exchange of information regarding stations taking part in the phototelegraphy service

(Arnhem, 1953)

(Recommendation suppressed in Geneva, 1956)

**D.6. Direction of scanning for direct recording facsimile systems
not required to receive and record half-tones**

The C.C.I.T.,

considering

that there is not yet sufficient information as to the requirements which would need to be met in the use in the international telegraph service of direct recording facsimile systems (not required to receive and record half tones) to permit full standardization of the equipment ;

but that, nevertheless, in order to avoid future difficulties it is very desirable to standardize the direction of scanning to be employed ;

unanimously declares the view

that the direction of scanning to be employed in connection with direct recording facsimile systems (not required to receive and record half-tones) which are intended for use in the international telegraph service, should be such that the plane (developed in the case of a machine using a drum) of the message surface is scanned along lines running from *left to right* commencing at the top, so that scanning commences at the *top left-hand corner* of the surface and finishes at the bottom right-hand corner : this is equivalent to scanning over a left-hand helix on a drum.

D.7. (C.C.I.R. Recommendation 226)
Facsimile transmission of meteorological Charts over radio circuits
(C.C.I.T. : Geneva, 1956 : C.C.I.R. : Warsaw, 1956)

The C.C.I.R. and the C.C.I.T.,

considering

- a) that increasing use is being made of facsimile telegraphy for the transmission of meteorological charts for reception on direct-recording apparatus;
- b) that it is desirable to standardize certain characteristics of the radio circuits for this purpose;

declares the view

that when the sub-carrier frequency-modulation system is employed for the facsimile transmission of meteorological charts over radio circuits, the following characteristics should be used :

Sub-carrier frequency	1,900 c/s
Black frequency	1,500 c/s
White frequency	2,300 c/s

Note : The normal index of cooperation is 576 associated with a speed of 60 r.p.m. The same index of cooperation is also used in association with speeds of 90 and 120 r.p.m. It is to be observed that whereas with the drum speed of 60 r.p.m. satisfactory reception can usually be expected, the quality of the recording may be impaired at higher drum speeds depending upon the composition of the circuit and the presentation of the original document.

**E. RECOMMENDATIONS APPLYING TO QUESTIONS
OF TELEGRAPH SWITCHING**
(including REPERFORATOR SWITCHING)

E.1. Signalling conditions for use in the International Telex Service
(*Arnhem, 1953, amended at Geneva, 1956*)

The C.C.I.T.,

considering

1. that it is desirable to obtain further standardization of the signalling conditions for the Telex service;
2. that it is useful to define more clearly the signals at present mentioned in Article 23 of Recommendation H.1,

unanimously declares the view

that in general so far as signalling over international Telex circuits is concerned, the country of departure should conform to the signalling requirements of the country of arrival. Nevertheless, when in the case of fully automatic service this requirement would entail considerable difficulty, alternative arrangements may be adopted by agreement between the two Administrations concerned;

that the following signals shall be employed:

1. *Free line condition*

The "free line" is characterized by a permanent signal corresponding to the start impulse in accordance with International Telegraph Alphabet No. 2 on the forward and backward signalling paths.

2. *Call*

The "call" is characterized by the inversion of the condition specified in paragraph 1 on the forward signalling path.

3. *Call-confirmation signal*

A "call-confirmation" signal shall be returned over the backward signalling path following the initiation of a call to prove the continuity of the line and the response of the distant terminal equipment.

4. a) *Proceed-to-select signal*

In the case of international Telex circuits terminated on distant automatic switching equipment which cannot accept the selecting information immediately after a calling signal is received, a "proceed-to-select" signal shall be returned over the backward signalling path after the call confirmation signal, to indicate that the selecting information may be transmitted.

If the interval between the transmission of the calling signal from the switching centre in the country of origin and the return of the "proceed-to-select" signal to this centre is short enough to permit the continuity of the international line to be confirmed in due time by the equipment in the outgoing country, the "proceed-to-select" signal may be used to indicate the "call confirmation" and "proceed-to-select" conditions. In this case a separate "call confirmation" signal need not be provided.

b) *Proceed-to-transmit signal*

In the case of international Telex circuits terminated on a distant manual switchboard, a "proceed-to-transmit" signal shall be returned over the backward signalling path following the initiation of a call, to indicate that the teleprinter of the distant operator has been connected to the international circuit.

5. *Selection signals*

a) The selection signals should be in conformity with International Alphabet No. 2, or dial signals in conformity with Recommendation E.2.

b) In the case of dial selection into a system employing letters in the national numbering scheme, figures only will be used on international circuits, because of the difficulty in transmitting signals other than figures from dials.

c) In the case of selection from a dialling system into a system employing keyboard selection, the "Prepare for digits" signal will be Combination 30 (Figures).

d) In those cases where an "end-of-selection" signal is required, this signal shall be Combination 26.

e) In systems which use keyboard selection and which require an "end-of-selection" signal, the subscribers' numbers shall consist of a uniform number of characters. A smaller uniform number of characters is however admitted for special services, but the first character must always be the same for all these special services.

6. *Call-connected signal*

A "call-connected" signal shall be returned over the backward signalling path to indicate that the call has been extended to a called subscriber. In the case of fully automatic switching between subscribers, this signal will start the equipment for determining the charge for the call.

7. *Idle circuit condition*

On an established connection, the "idle-circuit" is characterized by a permanent signal corresponding to the stop impulse, in accordance with International Telegraph Alphabet No. 2, on the forward and backward signalling paths.

8. *Clearing signal*

A "clearing" signal is characterized by a reversion to the condition specified in paragraph 1 on either signalling path, maintained until the complete release of the circuit.

Equipment terminating an international Telex circuit shall be arranged to interpret such a signal as a clearing signal when it has persisted for a period of not less than 300 milliseconds.

When a clearing signal is received by equipment at one end of an international Telex circuit, the signal shall be returned to the other end in not less than 350 milliseconds, and maintained until the complete release of the circuit.

Guard arrangements at both ends of an international Telex circuit shall be such that the circuit cannot be used for a new call until the distant equipment is free to accept another call. During this guard period the free-line condition shall be maintained on the international Telex circuit.

9. *Service Signals*

If a "busy", "out of order", "office closed", or "number unobtainable" (i.e. not connected, service ceased or service forbidden) condition is encountered in the distant network, this shall be indicated by the return of a signal to the calling end. If this is done by means of

(E.1)

written indications, the code expressions mentioned in Article 26 of Recommendation H.1 should be used. It is desirable that in this case the code expression should be preceded by the Carriage Return, Line Feed, Letter Shift characters and be followed by the clearing signal.

Characteristics of the signals defined in paragraphs 3, 4, 5, 6 and 9

The characteristics of these signals can be divided into two basic groups : Type A and Type B, as given in tables I a, I b and II.

It is to be noted, however, that there is the possibility of the use of teleprinter signals as selection signals in association with Type B. For the time being, it is recommended that these signals should be used only after agreement between the Administrations concerned.

I. International Telex circuits terminated on distant automatic switching equipment

Table 1 a. Semi-Automatic Working to subscribers

Signal	Type A	Type B
Call-confirmation (See 3 and 4 a) above)	Permanent stop polarity	25 ms pulse of stop polarity
Proceed-to-select (See 4 a) above)	i) Teleprinter signal(s) ii) Permanent stop polarity	25 ms pulse of stop polarity
Selection (See 5 above)	Teleprinter signals	Dial pulses
Call Connected (See 6 above)	Teleprinter signals <i>Note</i> : the teleprinter signals may be preceded by a 150 ms (\pm 11 ms) pulse of start polarity	Stop polarity for at least two seconds
Busy (See 9 above)	Teleprinter signals followed by clearing signal	i) 200 ms pulse of stop polarity followed by start polarity for 1200 ms (Note 1) ii) 200 ms of stop polarity followed by teleprinter signals and start polarity for at least 1000 ms (Note 1)
Out of Order and number unobtainable (See 9 above)	Clearing signal normally preceded by teleprinter signals	i) Permanent start polarity ii) 200 ms pulse of stop polarity followed by start polarity for 1200 ms (Note 1) iii) 200 ms pulse of stop polarity followed by teleprinter signals and start polarity for at least 1000 ms (Note 1)

Note 1 : This sequence of signals may be repeated until the clearing signal is sent over the forward signalling path.

Table 1 b. Fully-Automatic Working between subscribers

Signal	Type A	Type B
Call confirmation (See 3 and 4 a) above)	Permanent stop polarity	25 ms pulse of stop polarity
Proceed-to-select (See 4 a) above)	i) 40 ms (\pm 5 ms) pulse of start polarity	25 ms pulse of stop polarity
Selection (See 5 above)	ii) Permanent stop polarity	Dial pulses
Call-connected (See 6 above)	Teleprinter signals 150 ms (\pm 11 ms) pulse of start polarity followed by stop polarity for at least 2 seconds	Stop polarity for at least 2 seconds
Busy (See 9 above)	Teleprinter signals followed by clearing signal	i) 200 ms pulse of stop polarity followed by start : polarity for 1200 ms (Note 1) ii) 200 ms pulse of stop polarity followed by teleprinter signals and start polarity for at least 1000 ms (Note 1)
Out-of-Order and number unobtainable (See 9 above)	Clearing signal normally preceded by teleprinter signals	i) Permanent start polarity ii) 200 ms pulse of stop polarity followed by start polarity for 1200 ms (Note 1) iii) 200 ms pulse of stop polarity followed by teleprinter signals and start polarity for at least 1000 ms (Note 1)

Note 1 : This sequence of signals may be repeated until a clearing signal is sent over the forward signalling path.

II. International Telex circuits terminated on distant manual switching equipment

Signal	Type A	Type B
Call-confirmation (See 3 above)	Permanent stop polarity	25 ms pulse of stop polarity
Proceed to transmit (See 4 b) above)	Teleprinter signals	"Stop" polarity followed by teleprinter signals
Call-connected (See 6 above)	Teleprinter signals	Teleprinter signals
Busy, Out-of-order and Number unobtainable (See 9 above)	Teleprinter signals	Teleprinter signals

(E.1)

**E.2. Standardization of dials and dial pulse generators
for the international Telex service**

(ex Provisional Recommendation 869, 1951, amended at Arnhem, 1953 and at Geneva, 1956)

The C.C.I.T.,

considering

1. that, when dials, and dial pulse generators are used for the process of automatic selection of subscribers to the International Telex network, it is advantageous to standardize as far as possible the characteristics of such dials and dial pulse generators ;
2. that, the standardization of the dialling speed and lost motion periods of dials presents no technical difficulty ;
3. that, for the satisfactory working of certain automatic systems, the time between successive pulse trains should not be less than 500 milliseconds, but that experience has shown that the minimum time taken by an experienced operator to rotate the dial is of the order of 300 milliseconds ;
4. that pulse ratios from 1.2 : 1 to 1.9 : 1 will ensure the satisfactory working of existing automatic switching systems ;
5. that these pulse ratios can be usefully adopted with a view to simplifying direct dialling between subscribers ;

declares the view

1. that in the International Telex Service, when dials or dial pulse generators are used for the automatic selection of subscribers :
 - (a) the dialling speed shall be standardized at 10 pulses per second with a tolerance of plus/minus ten per cent ;
 - (b) the lost motion period of dials shall be not less than 200 milliseconds nominal value ;
 - (c) the inter digit pause of dial pulse trains generated by dial pulse generators shall not be less than 600 ms ;
2. (a) that the pulse ratio must be between 1.2 : 1 and 1.9 : 1, the nominal ratio may be chosen as lying between 1.5 : 1 or 1.6 : 1 ;
 - (b) that, when the selection signals pass through a regenerative repeater it may be advantageous to use a nominal ratio of 1.5 : 1.

E.3. Arrangements in switching equipment to minimize the effects of false calling signals

(Geneva, 1956)

The C.C.I.T.,

considering

- that transmission systems at present in use for international Telex trunks are liable to generate false calling signals ;
- that such false calling signals can seize and engage switching equipment, thereby reducing the grade of service. This is of particular importance with systems in which common equipment normally used only to set up calls is seized by false calling signals ;
- that the ill effects of false calling signals can be minimized by delaying the operation of the calling relay at the termination of the international Telex trunk circuit ;
- that, however, when direct dial selection is employed over an international trunk line, unless it is a manually selected circuit, not preceded by a stage of automatic selection, there is normally insufficient time available between successive digits to permit the use of slow operating relays ;

(E.3)

— that, nevertheless, Administrations may agree between one another to use digit storage at the outgoing end of the circuit so that the intertrain pause can be increased to permit the calling relays to be made slow to operate ;

unanimously declares the view

1. that the design and maintenance of transmission systems should be such as to reduce to a minimum the number and duration of false calling signals. In this connection attention is drawn to the merits of F.M. V.F. systems, particularly with long overhead lines ;

2. that, wherever possible, calling relays on international Telex trunk circuits should have an operate lag of at least 100 milliseconds. Administrations using circuits on lines prone to long duration false calling signals may agree to use calling relays with longer operate lags.

**E.4. Exchange of information regarding signals destined to be used
over international circuits concerned with switched teleprinter networks**

(Geneva, 1956)

The C.C.I.T.,

considering

that certain signals and certain characteristics of signals used in the international Telex service have been standardized in Recommendation E.1 ;

that further standardization of these signals is under study ;

that there is also a need to agree on standardized signals for the European Switched Network for the public service ;

that in view of the foregoing an exchange of information regarding the precise nature of the signals proposed to be used in the above-mentioned services by interested Administrations would be very useful ;

that certain Administrations have already supplied such details regarding their Telex services in a useful form (see Documents S.G. VII/28, 29, 30, 31 and 32 published in the "Supplements to the Documents of the VIIIth Plenary Assembly of the C.C.I.T. ") ;

unanimously declares the view

that Administrations concerned in the international Telex service and the European Switched Network for the public service be invited to supply to the C.C.I.T. time-sequence diagrams showing in each case the signals at present transmitted or proposed to be transmitted over the international circuit for incoming calls. The diagrams should show not only the sequence and characteristics of the signals, but also the timing tolerances to be expected.

E.5. Requirements to be met by regenerative repeaters in international connections

(Geneva, 1956)

The C.C.I.T.,

considering

— that it may be desirable to include regenerative repeaters in teleprinter switching networks ;

— that the only signals other than teleprinter signals that must be transmitted by a regenerative repeater are the clearing signal and the call connected signal (reference 3.1.3 below), since all other signals can be bypassed ;

— that other signals may be transmitted by regenerative repeaters ;

(E.5)

unanimously declares the view

1. that when regenerative repeaters are used in switching systems, the clearing signal should be retransmitted with a minimum of delay. This delay is of course the same as for the retransmission of teleprinter signals ;

2. that to ensure the correct retransmission of the clearing signal and the call connected signal (reference 3.1.3 below) the regenerative repeater must not automatically insert the stop element in either of these signals ;

3. that for other signals that may pass through regenerative repeaters, the tolerances at the origin and after retransmission through the regenerative repeaters are as stated below :

Note : The characteristics and tolerances quoted are for the signals at the origin. The tolerances at the input to the regenerative repeater will depend on the degree of distortion in the transmission path from the origin to the input of the regenerative repeater. The tolerances at the output will depend on the normal tolerances for the regenerative repeater.

3.1 *Pulse signals*

3.1.1 *Call-confirmation (Proceed-to-select) signal—Type “ B ” signalling.*

A pulse of stop polarity of duration from 17.5 ms to 35 ms. The nominal duration of the pulse after transmission through the regenerative repeater should not be less than 20 ms nor more than 40 ms.

(*Note* : This signal will be transmitted over only one international trunk circuit and should thus normally pass through not more than one regenerative repeater.)

3.1.2 *Dial Selection signals—Type “ B ” signalling.*

These signals have been standardized (Recommendation E.2 refers) at a dial speed of 10 pulses per second $\pm 10\%$, and a pulse ratio (start : stop) between the tolerances of 1.2 : 1 and 1.9 : 1 with a nominal ratio lying between 1.5 : 1 and 1.6 : 1. Such signals after retransmission through several regenerative repeaters should not fall outside the tolerances above stated.

3.1.3 *Call connected signal—Type “ A ” signalling.*

A pulse of start polarity lasting 150 ± 11 ms. The nominal duration of the pulse after retransmission through several regenerative repeaters should be within the limits of 140 to 160 ms.

3.1.4 *Busy signal—Type “ B ” signalling.*

Pulses of stop polarity lasting 200 ms $\pm 30\%$, separated by intervals of start polarity lasting 1.2 seconds $\pm 30\%$. After retransmission through several regenerative repeaters neither the pulses nor the intervals should be shortened by more than 10%.

3.2 *Sequence signals (involving a single change of polarity)*

3.2.1 *Calling signal—Types “ A ” and “ B ” signalling.*

3.2.2 *Call connected signal—Type “ B ” signalling.*

These signals (inversion from start to stop polarity) have no timing tolerances as such. It is, however, essential that they should be retransmitted by a regenerative repeater with a minimum of delay, which in any case should not exceed 20 ms.

E.6. Telex signalling on radio channels

(*Synchronous 7-unit systems affording error correction by automatic repetition*)
(Geneva, 1956)

The C.C.I.T.,

considering

1. that there are radio circuits working in association with 5-unit start-stop apparatus, which make use of error correcting synchronous systems having a special error detecting 7-unit code enabling errors to be corrected ;
2. that these synchronous systems use two combinations, α and β , on the radio section, respectively, characteristic of the permanent condition of start and stop polarity in the start-stop part of the communication ;
3. that, no matter what may be the duration of the permanent polarity received from the start-stop circuit, this polarity appears at the output of the radiotelegraph system, with a variable duration having a minimum value equal to one cycle of the synchronous system or a value equal to a multiple of the duration of that cycle ;
4. that it is desirable to standardize the signalling conditions to be used on these synchronous error correcting radiotelegraph systems ;
5. that the experience acquired with manual Telex switching through these radiotelegraph systems seems sufficient to justify the laying-down of general rules specifying signalling arrangements for manual and semi-automatic working in such international radio channels ;

unanimously declares the view

that the signals enumerated in Recommendation E.1, to be used in establishing international Telex calls over radio channels comprising synchronous systems with error-correction by automatic repetition, should be characterized as follows :

A. *Free Line Condition*

Combination α on the "forward" and "backward" signalling paths.

B. *Call*

Transition from combination α to combination β on the forward signalling path.

C. *Call-confirmation signal*

Transition from combination α to combination β on the backward signalling path.

D. 1. *Proceed-to-select signal*

On the backward signalling path—one or more teleprinter signals.

2. *Proceed-to-transmit signal*

On the backward signalling path—one or more teleprinter signals.

E. *Selection signals*

Teleprinter signals on the forward signalling path.

F. *Call-connected signal*

On the backward signalling path—one or more teleprinter signals.

G. *Idle-circuit condition*

Combination β on the forward and backward signalling paths.

(E.6)

H. *Clearing signal*

Appearance of combinations α in the direction in which the clearing signal is sent.

I. *Service signals*

Corresponding teleprinter signals (OCC, NC, NA, NP, DER, ABS), followed by the clearing signal (α signals).

Note : See Recommendation C.24 for signals α and β .

**E.7. Signalling conditions for use in the international Telex service
Considerations affecting numbering schemes for automatic switching networks**

(Geneva, 1956)

The C.C.I.T.,

considering

that with fully automatic working between subscribers in the international Telex service it is desirable to envisage the possibility :

a) to route traffic over the appropriate international trunk route where more than one such route exists between two countries ;

b) to enable the appropriate tariff to be determined automatically (in the originating country), even if the objective country is divided into several tariff zones ;

unanimously declares the view

1. that subscribers' national numbering plans should be systematically arranged ;
2. that, where more than one international trunk route exists between two countries, the corresponding geographical division and hence the appropriate point of entry should be identifiable by examination of the initial digits of the called subscriber's number ;
3. that where a multiple tariff scale exists, the different tariff zones should be identifiable in the originating country by the initial digits of the called subscriber's number ;
4. that the number of initial digits to be examined should be limited, preferably to one, but in any case should not exceed two. When a single digit provides the discrimination it will usually be the first digit, but, where the subscribers' numbers have a uniform initial digit (usually "0") to permit discrimination on internal calls, the following (second) digit should be used.

Note : 1. The attention of Administrations (and Recognized Private Operating Agencies) is drawn to the considerable technical advantage which would result from the adoption of a single tariff between two countries.

2. The adoption of regulations similar to those of the above Recommendation in order to bar certain communications may facilitate the solution of Question 4/10 of Study Group 10 of the C.C.I.T.T.

E.8. Signalling conditions in the "Gentex" service

(Geneva, 1956)

The C.C.I.T.,

considering

that different signalling systems are in use for the "Gentex" service ;

that it is desirable to have regulations for interworking between these different systems ;

(E.8)

unanimously declares the view

that in general so far as signalling over international "Gentex" circuits is concerned, the country of departure should conform to the signalling requirements of the country of arrival ;

that, nevertheless, when this requirement would entail considerable difficulty, alternative arrangements may be adopted by agreement between the two Administrations or Private Operating Agencies concerned.

**E.9. Prevention of connection to faulty stations
and/or station lines in the "Gentex" service**

(Geneva, 1956)

The C.C.I.T.,

considering

that correct reception of the answer-back code at the beginning and end of a telegram should safeguard the correct transmission of the telegram ;

that it accordingly becomes essential to provide adequate signalling for cases when a teleprinter is temporarily unable to participate in the international service, on account of paper trouble, faults, etc.

A. unanimously declares the view

that faults during the transmission of a telegram shall be signalled as far as possible by the automatic transmission of a clearing signal ;

recognizing however

that it will be impossible to signal all faults that may occur on an established connection,

unanimously declares the view

that it is essential that absence of paper on a receiving teleprinter should be signalled by the clearing signal :

B. unanimously declares the view

that, since the receiving Administration is responsible for the receipt of the telegram when the answer-back signals have been correctly exchanged, it is responsible for making the necessary arrangements to ensure security of operation (for example, if the tape should break or become jammed) ;

that in the case of a faulty station line or teleprinter at the moment of the call, the existing automatic switching networks use one or more of the following signalling conditions : no "call-connected" signal, "busy" signal, service code "DER" or no return of answer-back. All these signalling conditions ensure that a telegram is not transmitted over a faulty connection ;

that in the case of a faulty station line out of an office group it is essential that the faulty line should be busied out as quickly as possible so that traffic may be offered automatically to all the other lines in the group.

F. RECOMMENDATIONS APPLYING TO QUESTIONS OF SPEED OF TRANSMISSION AND WORKING METHODS

F.1. Speed of transmission of international telegrams

(former recommendation 801, Warsaw, 1936, amended at Brussels, 1948, at Arnhem, 1953
and at Geneva, 1956)

The C.C.I.T.,

considering

1. the present speed of communications by telephone and by airmail ;
2. the need for Administrations and Private Operating Agencies to be acquainted with the times of transmission of telegrams :
 - a) to enable them to seek means of improving such times of transmission ;
 - b) in order that they may possess factual data enabling them to judge to what extent the service is adequate for special categories of messages (such, for example, as those concerning the booking of seats in aircraft and general matters concerning air transport) ;
3. that to meet the above needs it is necessary to be able to base comparisons on representative statistics relating to the largest possible number of important international circuits ;

unanimously declares the view

1. that all administrations and Private Operating Agencies should cause statistics of the time of transmission of international telegrams, making due allowances for difference in meridional time, to be compiled annually during three working days in the second fortnight of the month of October, such statistics to be drawn up by the receiving office in two returns and according to the forms A and B contained in Annex 1 to the present Recommendation ;
2. that the Secretary-General should centralize the statistical data and communicate the results, in suitable diagrammatic form, in the *Telecommunication Journal* ;
3. that the diagram published in the *Telecommunication Journal* should be accompanied by two tables on the models indicated in Annex 2 to this Recommendation, showing, for each country of origin, the times of transmission of its outward telegrams as revealed by the returns taken by the receiving offices ;
4. that in order that Administrations and Private Operating Agencies may have information about the quality of their services, copies of the forms A and B furnished by receiving Administrations should be sent by the Secretary-General to each forwarding Administration and Private Operating Agency concerned ;
5. that the Secretary-General should give Administrations an idea of the comprehensiveness of the statistics and acquaint them with any observations of Administrations and particularly with any observation of the Administration of origin regarding the particulars of their outward traffic furnished by receiving Administrations ;
6. that although it is not at present possible to fix a maximum time for the transmission of international telegrams, it is nevertheless desirable :
 - a) that 75 % of the telegrams originating in the locality of the sending office should be transmitted to the receiving office within a period of 30 minutes ;
 - b) that 75 % of the other telegrams from the country of the sending office should be transmitted to the receiving office within a period of 45 minutes.

(F.1)

Annex 1

FORMS TO BE COMPLETED BY RECEIVING OFFICES

RETURN A

Country

Return of speed of transmission on important connections (1) of ordinary telegrams received between 0900 and 1900 hours (2) originating in the locality of the sending office.

Connection :		Method of operation (apparatus, wire, wireless)	Number of telegrams received within a period of					Total of telegrams examined	Remarks
Sending offices 3)	Receiving offices 4)		15 min.	16-30 min.	31-60 min.	61-120 min.	over 120 min.		
			between time of acceptance and time of receipt						
Totals									
Percentages									

Notes :

1. The two terminal Administrations to agree as to the connexions to be included in the statistics ; Only those circuits which are operated for at least ten consecutive hours should be included.
2. In the case of extra-European circuits, where the maximum traffic falls outside these hours, the return should be taken during the ten busiest consecutive hours on each route on each day ;
3. Offices in the connected country, linked direct with offices in the country which keeps the statistics ; In the case where the sending office belongs to a Private Operating Agency, indicate the name of the Operating Agency in question.
4. Corresponding offices in the country which keeps the statistics.

RETURN B

Country

Return of speed of transmission, on important connections (1) of ordinary telegrams received between 0900 and 1900 (2) originating in localities other than that of the sending office, but in the same country.

Connection :		Method of operation (apparatus, wire, wireless)	Number of telegrams received within a period of						Total of telegrams examined	Remarks
Sending offices 3)	Receiving offices 4)		15 min.	16-30 min.	31-45 min.	46-60 min.	61-120 min.	over 120 min.		
			between time of acceptance and time of receipt							
Totals										
Percentages										

Notes :

1. The two terminal Administrations to agree as to the connections to be included in the statistics; Only those circuits which are operated for at least ten consecutive hours should be included.
2. In the case of extra-European circuits, where the maximum traffic falls outside these hours, the return should be taken during the ten busiest consecutive hours on each route on each day;
3. Offices in the connected country, linked direct with offices in the country which keeps the statistics; In the case where the sending office belongs to a Private Operating Agency, indicate the name of the Operating Agency in question.
4. Corresponding offices in the country which keeps the statistics.

Annex 2

TABLES TO BE PUBLISHED IN THE TELECOMMUNICATION JOURNAL

in accordance with para. 3 of the operative part of Recommendation F.1

TABLE A

Table showing, for each country of origin, the speed of transmission of ordinary telegrams originating in the locality of the sending office, based on statistics furnished by receiving offices.

Country of origin	Number of outward telegrams (with percentage of the total number of telegrams examined) reaching the receiving office within a period of										Total of telegrams examined	
	15 min.		16-30 min.		31-60 min.		61-120 min.		over 120 min.			
	no.	%	no.	%	no.	%	no.	%	no.	%		

TABLE B

Table showing, for each country of origin, the speed of transmission of ordinary telegrams originating in a locality other than that of the sending office, but in the same country, based on statistics furnished by receiving offices.

Country of origin	Number of outward telegrams (with percentage of the total number of telegrams examined) reaching the receiving office within a period of										Total of telegrams examined		
	15 min.		16-30 min.		31-45 min. 5)		46-60 min. 5)		61-120 min.			over 120 min.	
	no.	%	no.	%	no.	%	no.	%	no.	%		no.	%

5. It should be noted that the period from 31-60 minutes is subdivided in Form B, whereas it is not in Form A.

F.2. Technical methods of reducing transmission delays

(former Recommendation 805, Warsaw, 1936)

(Suppressed in Geneva, 1956)

F.3. Acceleration of transmission and delivery of international telegrams

(former Recommendation 808, Warsaw, 1936, amended at Brussels, 1948)

The C.C.I.T.,

considering

the competition with the telegraph service of other rapid means of communication,

unanimously declares the view

a) that it is desirable to accelerate the transmission and delivery of telegrams, and to generalize such methods as have proved themselves effective ;

b) that Administrations taking steps to promote the use of international telegraphy and to accelerate the delivery of telegrams, should be invited to communicate the action taken to the C.C.I.T.

F.4. Handing in of telegrams by Telex service subscribers

(Arnhem, 1953)

The C.C.I.T.,

considering

1. Resolution 17 annexed to the International Telegraph Regulations (Paris, 1949) ;
2. Article 40, paragraph 1 (4) of the Telegraph Regulations,

unanimously declares the view

1. that when a telegram is transmitted by Telex to a telegraph office by a Telex subscriber resident in the locality in which that office is situated, it will suffice to give the name of that telegraph office in the preamble as the office of origin, without any supplementary indication ;

2. that when a telegram is transmitted by Telex to a telegraph office by a subscriber resident in a locality other than that in which that telegraph office is situated, the office of origin may be given in the preamble in the form " Stockholm telexed from Sundsvall ", this indicating that a Telex subscriber at Sundsvall has sent his message by Telex to the public telegraph office at Stockholm.

F.5. General telegraph statistics

(Geneva, 1956)

The C.C.I.T.,

considering

— that the present form of the General Telegraph Statistics was decided by the International Telegraph Conference, Madrid, 1932;

— that since that time there have been important changes in the working of the international telegraph service, notably the introduction of new services (e.g., Telex service) and technical developments (e.g., automatic switching);

— that the General Telegraph Statistics should take account of these changes;

unanimously declares the view

— that the General Secretariat of the Union should draw up the General Telegraph Statistics in accordance with the formula in the Annex.

Note 1 : In the chapter "Definitions" the new statistics show under continents the same territories as those actually appearing in the General Telegraph Statistics prepared annually by the General Secretariat of I.T.U.

The C.C.I.T. is of opinion that this arrangement, which has been in use since 1932, is susceptible of revision but, as it had insufficient information, it was not possible to make any changes. Nevertheless, it agreed to complete the list of countries of Central and Eastern Asia shown under the paragraph "Asia", 2nd sub-paragraph, by the addition of CHINA.

(The C.C.I.T. would draw the attention of the telegraph Administrations concerned and of the next Telegraph and Telephone Conference to this point.)

Annex : 1.

Annex to Recommendation IX/3

GENERAL TELEGRAPH STATISTICS

compiled from official documents by the General Secretariat of the
International Telecommunication Union

General observations

These statistics apply only to the public telegraph network.

The letter E in a column heading under the name of a country means : government operation.

The letter P in a column heading under the name of a country means : operation by Recognized Operating Agencies.

A dash in one of the columns indicates that the information is not available, or that the service to which the heading refers does not exist or has been suspended.

The explanatory notes in the statistical table sent to Administrations for completion are given below. They show how certain headings are to be interpreted.

The definitions of the terms used in the statistical table are also given below in alphabetical order. Some of them are adapted to the special requirements of the table.

(F.5)

Explanatory notes

1. Combined circuits made up of wire and radio sections are considered as fixed radio circuits (see Section IV).
2. Including speaker circuits, but excluding the circuits mentioned under E of Section III,
2 bis. Including speaker circuits, but excluding the circuits mentioned under D of Section IV.
3. Circuits between countries of the extra-European system or between a country in the extra-European system and a country in the European system.
4. Put an X opposite the system if used, and an 0 if it is not used.
5. Indicate the number of equipments installed and available for operation, whether the apparatus be in use or not.
6. Count as a single unit the whole equipment (transmission and reception) for a telegraph transmission channel (i.e., for one direction of transmission).
Each country will count the equipment on its own territory as one half of a unit in the case of an international telegraph transmission channel.
(For example, a voice-frequency telegraph equipment rack operating 18 outgoing transmission channels and 18 incoming reception channels will count as 18 units; the equipment at the distant end will also count as 18 units, or, all in all 36 units for this particular 18-frequency two-way voice-frequency system. This number will be reduced to 18 in the case of an international system.)
7. If telephone exchanges intervene in establishing communication, they are not counted under this heading.
8. Under this heading are to be included the Telex subscribers' stations (rented) and the telegraph stations (or offices) which have access, either directly or indirectly (for example, through a private switchboard) to the switching network.
9. For Administrations with exchange equipment enabling them to determine this figure.
10. Circuits operated in manual and/or semi-automatic service may be connected to a manual switchboard. A manual switchboard usually consists of several operator's positions.

Definitions

<i>Continents :</i>	For statistical purposes, continents are delimited as follows (this delimitation, in accordance with the desire expressed by the Telegraph Regulations Committee at the Madrid Conference (1932) has been maintained by later conferences) :
<i>Africa :</i>	North Africa (including the Azores, Madeira, the Canaries, Cape Verde Islands) ; West Africa ; East Africa (including the Seychelles, Madagascar, Reunion, Mauritius) ; South Africa.
<i>America :</i>	North America (including Greenland, Bermuda, and the Bahamas) ; Central America ; West Indies ; South America (including the Falklands and South Georgia).
<i>Asia :</i>	Includes Turkey in Asia, the Syrian Republic, Lebanon, Israel, Jordan, Arabia, etc. ; Central and Eastern Asia ; the U.S.S.R. in Asia, Japan, India, Cambodia, Laos, Viet-Nam, Pakistan and China ; Asiatic archipelago : Indonesia, Borneo, Republic of the Philippines.
<i>Europe :</i>	Northern Europe (including the Faroes and Iceland) ; Central Europe ; Western Europe ; Eastern Europe (including the U.S.S.R. in Europe and Turkey in Europe) ; Southern Europe (including Malta).
<i>Oceania :</i>	Australia ; Dutch New Guinea and New Guinea (Territory of) ; New Zealand ; Pacific archipelago (Melanesia, Polynesia, Micronesia).

- European system* : includes all the countries of Europe, with Algeria and those territories outside Europe which have been declared by the respective Administrations to belong to this system (No. 160 of the International Telegraph Regulations, Paris revision, 1949).
- Extra-European system* : Comprises all countries other than those in the European system.
- Facsimile telegraphy* : A system of telegraphy providing reproduction in the form of fixed images (photographic or otherwise) of the form, and possibly of the depth of tone and of the colours, of an original document, whether written, printed, or pictorial.
- Fixed service* : A radio service between specified fixed points.
- General telegraph service* : A telegraph service for the use of the public, providing for the acceptance and delivery of telegrams.
- Phototelegraphy* : A system of facsimile having special regard to tone reproduction, in which the reception involves photographic processes.
- Phototelegram* : A facsimile telegram which must be transmitted by phototelegraphy.
- Point-to-Point (telegraph circuit)* : A circuit permanently established between specific stations.
- Public phototelegraph station* : A phototelegraph station set up in a telegraph centre, and used for the public phototelegraph service.
- Public telegraph network* : A network set up to provide a telegraph service for the public and belonging to an Administration operating telecommunications (or Recognized Private Operating Agency). May be used for the general telegraph service, the Telex service or the leased circuit service.
- Public (telegraph) office* : A telegraph office in direct contact with users for the handing-in or delivery of telegrams.
- Radio station* : A combination of transmitters and receivers, including the accessory equipment required for carrying on a definite radiocommunication service.
- Service (telegraph) circuit* : A special circuit used for communications in connection with the management of the telegraph service.
- Subscriber's line (or station line)* : Permanent circuit between a subscriber's telegraph station or a telegraph post and the switching centre which serves it.
- Switching centre* : A centre with equipment for switching.
- Switching centre (automatic)* : An installation in which the switching manœuvres are carried out by electrically-controlled apparatus without the intervention of an operator.
- Switching centre (manual)* : An installation in which the switching manœuvres are carried out by an operator.
- Telegraph centre* : A place in which the necessary resources in material and personnel are assembled to fulfil a specific function in operating a telegraph service.
- Telegraph circuit* : A permanent connection between two instrument rooms or switching centres, without intermediate switching.
- (Telegraph) office* : A centre equipped with telegraph apparatus for the transmission or reception of telegrams.
- (Telegraph) station* : An installation operated by a telegraphist or a user, comprising a transmitting (or receiving) apparatus, and the necessary auxiliary equipment.
- Telegraph network* : A group of stations, installations, centres and lines, coordinated for the purpose of providing a telegraph service.
- Telegraph service* : Any service for the transmission of telegrams.
- Telex communication* : The effect given to the booking of a Telex call when it has been established between the calling and the called stations.
- Telex service* : A telegraph service enabling its subscribers to communicate directly and temporarily among themselves, by means of start-stop apparatus and of circuits of the public telegraph network.

- Transit telegram* : A telegram routed across one or more transit countries.
- Trunk circuit* : A permanent circuit between the switching equipment at two switching centres.

Telegraph statistics 19..

- I. *Population, according to the latest census*
- II. *Area (in square kilometres)*
- III. *Public telegraph network (wire) (1)*
- A. *Number of point-to-point telegraph circuits used in the general telegraph service (2)*
- a) internal
- b) international, between countries in the European system
- c) international, in the extra-European system (3)
- B. *Number of trunk telegraph circuits*
1. Circuits exclusively used by the general telegraph service (2)
- a) internal
- b) international, between countries in the European system
- c) international, in the extra-European system (3)
2. Circuits exclusively used for the Telex service
- a) internal
- b) international, between countries in the European system
- c) international, in the extra-European system (3)
3. Circuits jointly used by both the general telegraph service and the Telex service
- a) internal
- b) international, between countries in the European system
- c) international, in the extra-European system (3)
- C. *Number of subscribers (or station) lines to switching centres*
1. Telex subscribers' lines
2. Lines from stations in telegraph centres and offices.
- D. *Number of telegraph circuits permanently leased to users*
- a) internal
- b) international, between countries in the European system
- c) international, in the extra-European system (3)
- E. *Number of circuits exclusively used for facsimile telegraphy (or phototelegraphy)*
- a) internal
- b) international, between countries in the European system
- c) international, in the extra-European system (3)

IV. *Public telegraph network of the fixed radio service (1)*

A. *Number of point-to-point telegraph circuits used in the general telegraph service (2)*

- a) internal -----
- b) international, between countries in the European system -----
- c) international, in the extra-European system (3) -----

B. *Number of trunk telegraph circuits*

1. *Circuits used exclusively by the general telegraph service (2 bis)*

- a) internal -----
- b) international, between countries in the European system -----
- c) international, in the extra-European system (3) -----

2. *Circuits exclusively used for the Telex service*

- a) internal -----
- b) international, between countries in the European system -----
- c) international, in the extra-European system (3) -----

3. *Circuits jointly used by both the general telegraph and Telex services*

- a) internal -----
- b) international, between countries in the European system -----
- c) international, in the extra-European system (3) -----

C. *Number of telegraph circuits permanently leased to users*

- a) internal -----
- b) international, between countries in the European system -----
- c) international, in the extra-European system (3) -----

D. *Number of circuits exclusively used for facsimile telegraphy (or photo-telegraphy)*

- a) internal -----
- b) international, between countries in the European system -----
- c) international, in the extra-European system (3) -----

V. *Equipments for the circuits and station lines mentioned in Sections III and IV*

Number of equipments (5) (6)

- a) for within-band telegraphy -----
- b) for sub-audio telegraphy -----
- c) for supra-audio telegraphy -----
- d) for telegraphy on phantom or super-phantom circuits -----
- e) for voice-frequency-division telegraphy -----
- f) for time-multiplex telegraphy -----
- g) for interband telegraphy -----
- h) for error detection (with or without automatic correction) -----
- i) number of radiotelegraph transmitters -----
- j) number of radiotelegraph receivers -----

VI. *Offices, radio stations, switching centres, telegraph stations*

A. *Number of telegraph offices* -----

- 1. belonging to the Telegraph Administration -----
- 2. belonging to State railways or to railway companies -----
- 3. belonging to Recognized Private Operating Agencies -----

(F.5)

- B. *Number of radio stations in the fixed service (general telegraphy and/or Telex)*
 - 1. transmitting
 - 2. receiving
- C. *Number of switching centres (7) (Switching centres under E excluded)*
 - 1. Switching centres used exclusively for the general telegraph service
 - a) automatic switching centres
 - b) manual switching centres (10)
 - 2. Switching centres used exclusively for Telex service
 - a) automatic switching centres
 - b) manual switching centres (10)
 - 3. Switching centres common to the general telegraph service and to the Telex service
 - a) automatic switching centres
 - b) manual switching centres (10)
- D. *Number of telegraph stations connected to switching centres (8)*
 - 1. Telex subscribers' stations
 - a) connected to automatic switching centres
 - b) connected to manual switching centres (10)
 - 2. stations in telegraph centres or offices
 - a) connected to automatic switching centres
 - b) connected to manual switching centres (10)
- E. *Number of switching centres serving exclusively the facsimile (or phototelegraphy) service*
- F. *Semaphore stations with a public telegraph service*

VII. *Telegraph apparatus in telegraph centres (or offices) used in the general and Telex networks (including service apparatus)*

- 1. Type of apparatus used (4)
 - a) Morse (or sounder or buzzer)
 - b) Wheatstone, Greed-Wheatstone
 - c) Hughes
 - d) Baudot
 - e) Siemens (rapid printers)
 - f) Siemens-Hell
 - g) Murray
 - h) start-stop
 - i) facsimile
- 2. Number of start-stop apparatus in service
 - a) standardized in accordance with C.C.I.T. Recommendations
 - 1. tape-printing
 - 2. page-printing
 - b) not in accordance with C.C.I.T. Recommendations
 - 1. tape-printing
 - 2. page-printing
- 3. Number of facsimile telegraph apparatus used by Administrations and Recognized Private Operating Agencies
 - a) direct-recording facsimile apparatus
 - b) phototelegraph apparatus

VIII. *Telegraph traffic*

A. *Traffic of the countries in the European system*

- 1. internal traffic of the country
 - a) total number of outward telegrams
 - b) number of outward phototelegrams

- 2. International traffic in the European system
 - a) number of full-rate and urgent telegrams, outward
 - number of full-rate and urgent telegrams, inward
 - b) number of letter-telegrams, outward
 - number of letter-telegrams, inward
 - c) number of press telegrams, outward
 - number of press telegrams, inward
 - d) number of transit telegrams (each telegram counted once only)
 - e) number of outward, inward and transit phototelegrams

- 3. International traffic in the extra-European system
 - a) number of full-rate and urgent telegrams, outward
 - number of full-rate and urgent telegrams, inward
 - b) number of letter-telegrams, outward
 - number of letter-telegrams, inward
 - c) number of press telegrams, outward
 - number of press telegrams, inward
 - d) number of transit telegrams (each telegram counted once only)
 - e) number of outward, inward and transit phototelegrams

B. *Traffic of countries in the extra-European system*

- 1. Internal traffic of the country
 - a) total number of outward telegrams
 - b) total number of outward phototelegrams

- 2. Traffic with countries in the same continent
 - a) number of full-rate and urgent telegrams, outward
 - number of full-rate and urgent telegrams, inward
 - b) number of letter-telegrams, outward
 - number of letter-telegrams, inward
 - c) number of press telegrams, outward
 - number of press telegrams, inward
 - d) number of transit telegrams (each telegram counted once only)
 - e) number of outward, inward and transit phototelegrams

- 3. Traffic with Europe
 - a) number of full-rate and urgent telegrams, outward
 - number of full-rate and urgent telegrams, inward
 - b) number of letter-telegrams, outward
 - number of letter-telegrams, inward
 - c) number of press telegrams, outward
 - number of press telegrams, inward
 - d) number of transit telegrams (each telegram counted once only)
 - e) number of outward, inward and transit phototelegrams

- 4. Traffic with other continents
 - a) number of full-rate and urgent telegrams, outward
 - number of full-rate and urgent telegrams, inward
 - b) number of letter-telegrams, outward
 - number of letter-telegrams, inward
 - c) number of press telegrams, outward
 - number of press telegrams, inward
 - d) number of transit telegrams (each telegram counted once only).
 - e) number of outward, inward, and transit phototelegrams

IX. *Telex service traffic*

A. *Inland traffic of the country*

- 1. Number of chargeable calls (irrespective of duration) exchanged between subscribers' posts (9)
- 2. Total number of chargeable minutes (9)
- 3. Total number of pulses in millions noted on the meters of subscribers' lines (9) (indicating the gold franc amount corresponding to one pulse)

B. *International traffic with countries in the European system*

- 1. Number of chargeable calls (irrespective of duration), outward, inward, and transit (9)
- Total number of chargeable minutes (9)
 - a) outward
 - b) inward
 - c) transit

C. *International traffic with countries in the extra-European system*

- 1. Number of chargeable calls (irrespective of duration) outward, inward, and transit (9)
- 2. Total number of chargeable minutes (9)
 - a) outward
 - b) inward
 - c) transit

F.6. Service codes

(Geneva, 1956)

The C.C.I.T.,

considering

that it would be useful for the operating services of Administrations and Recognized Private Operating Agencies to have a collection of the various codes used in the international telegraph service ;

that it would be desirable for such a collection to contain, besides the codes used in the international telegraph service, the codes and abbreviations commonly used in other telecommunication services ;

that an assembly of the various codes now in use into a single volume might serve as a basis for a more unified system of service codes ;

in view also of C.C.I.R. Resolution 18 ;

(F.6)

unanimously declares the view

1. that the various codes and abbreviations commonly used in international telecommunication services should be assembled in one volume and published by the General Secretariat of the I.T.U. ;
2. that this publication should be prepared in accordance with the directives annexed to the present Recommendation.

**Directives for the publication, in one separate volume,
of the various codes and abbreviations commonly used
in international telecommunication services**

1. C.C.I.T. Question 61 read as follows :

Study in collaboration with the C.C.I.R., of the possibility of collecting together in a separate volume, to be published by the General Secretariat of the Union, the various codes which are considered useful in the international telegraph service (line and radio), with a view to the universal use of this code book in the operation of these services.

2. C.C.I.R. Resolution 18 (London, 1953, as amended at Warsaw, 1956) is associated with this question :

C.C.I.R. Resolution 18

**PUBLICATION OF SERVICE CODES
IN USE IN THE INTERNATIONAL TELEGRAPH SERVICE**

(Study Group XIII)

(Warsaw, 1956)

The C.C.I.R.,

considering

- a) that the C.C.I.T. during its VIIIth Plenary Assembly, adopted the following question :
“ The study, in collaboration with the C.C.I.R., of the possibility of assembling in a separate volume, to be published by the General Secretariat of the Union, the various codes regarded as useful in the International Telegraph Service (line and radio) for universal use by that service ” ;
- b) that the C.C.I.T. has requested the C.C.I.R. to collaborate in the study of that question ;
- c) that it is of importance to assemble all service codes useful in the telegraph service (such as those contained in App. I of the International Telegraph Regulations, Q-code, etc.) ;

unanimously resolves

1. that the C.C.I.R. should co-operate with the C.C.I.T. in assembling the volume mentioned under (a) above, on the understanding that the C.C.I.T. assume the supervision and responsibility for this work ;
2. that the assembling in one volume of the various codes at present in use will be a first step towards a more unified system of service codes ;
3. that the Administrations should examine the need for unifying the codes for operational requirements.

3. The code documents suggested by the various Administrations for inclusion (partly or wholly) in the proposed book are summarized, classified and numbered below along with a reference to their origin where this is not apparent :

(F.6)

Code Documents already adopted internationally

- I. Telegraph Regulations.
- II. Radio Regulations, Appendix 9, Section I—The “ Q ” code as a whole—see page 251 et seq.
- III. Radio Regulations, Appendix 9. Section II—Miscellaneous abbreviations and signals—see page 270 et seq.
- IV. Radio Regulations. Appendix 11, paragraph 3 (1). Spelling analogy code—see page 275 et seq.

Code documents which are Recommendations adopted by Plenary Assemblies

- V. C.C.I.R. VII Plenary Assembly, 1953. Recommendation 141—SINPO Code. Tabulation and footnotes (a) to (d)—see pages 188 and 189.
- VI. C.C.I.R. VII Plenary Assembly 1953, Recommendation 141—SINPFEMO Code. Tabulation and footnotes as in V.
- VII. C.C.I.T. VII Plenary Assembly, 1953. Recommendation H, Article 26. Code expressions used in the international Telex service—see Arnhem Documents page 152.

Code documents of Recognized Private Operating Agencies

- VIII. Cable and Wireless Limited Service Code.
- IX. The Cable and Wireless Limited “ Z ” Code.
- X. The Cable and Wireless Limited Facsimile Reporting Code.
- XI. Italcable “ Dizionario delle Abbreviazioni Telegrafiche ”.

4. The C.C.I.T. had the following task :

4.1 to recommend those documents numbered I-XI, the material of which it considered should be included in part or in whole, in the code book, and to specify recommended material within these documents in detail. (Subsequently referred to as “ Selection of material ”) ;

4.2 to consider and comment upon the question of duplication between code letter groups. (Subsequently referred to under “ Duplication ”.) (N. B. It did not deal with the question of different code letter groups with the same, or nearly the same meaning, as this comes under the heading of unification, which may be dealt with later) ;

4.3 to recommend how selected code material should be arranged within the code book. (Subsequently referred to as “ Arrangement of Material ”) ;

4.4 to recommend a title for the book (subsequently referred to under “ Title ”).

5. *Selection of material*

From the code documents numbered I-XI, the following were selected for inclusion in the code book without alteration :

- III. Radio Regulations. Miscellaneous abbreviations and signals, taking into account the amendments made by the VIIIth Plenary Assembly of the C.C.I.R.
- IV. Radio Regulations. Spelling analogy code.

- V. SINPO code, taking into account the amendments made by the VIIIth Plenary Assembly of the C.C.I.R.
- VI. SINPFEMO code, taking into account the amendments made by the VIIIth Plenary Assembly of the C.C.I.R.
- X. The Cable and Wireless Limited Facsimile Reporting Code. This is described in detail in Appendix 1 to this report.

The following code was accepted with one additional item :

- VII. Code expressions used in the international Telex service. The addition here is :

SVH Safety of life Telex call (see C.C.I.T. Recommendation H.1, Article 10).

The remaining code documents Nos. I, II, VIII, IX and XI were accepted in part only. The material selected for retention as it stands or with slight modification is specified in Appendices 2, 3, 4, 5 and 6 respectively. These appendices also contain comments concerning the results of the selection and, in some cases, the future treatment of material.

6. *Arrangement of material*

The C.C.I.T. considered that the material in the code book should be arranged in three main sections headed :

Decoding
Coding
Miscellaneous.

The suggested content of each chapter is detailed in Appendix 7.

7. *Title*

The title for the code book suggested by the C.C.I.T. is :

CODES AND ABBREVIATIONS FOR THE USE
OF THE INTERNATIONAL TELECOMMUNICATION SERVICES

Published by the International Telecommunication Union

8. *Duplication*

The C.C.I.T. found that four different types of duplication existed, namely :

8.1 The same code letter group with the meaning worded in precisely the same terms in more than one of the basic code documents.

8.2 The same code letter group with more than one meaning.

8.3 Different code letter groups with exactly, or virtually, the same meaning.

8.4 Code letter groups in the selected material which are used for purposes, other than service code usage, elsewhere in the field of telecommunications.

Duplication of type 8.1 can be easily identified and removed as necessary during the compilation of the "Decoding" section of the book.

Duplication of type 8.2 will similarly be easily identifiable during the same process. Both entries will have to be retained but they should be specially noted to indicate the different circumstances in which each is to be used.

(F.6)

Duplication of type 8.3 does not require to be dealt with here as it comes under the heading of "unification" as already indicated in paragraph 4 of the report. Until "unification" takes place, both entries should appear in the code book in their appropriate places.

The only specific instance of duplication of type 8.4 which came under the notice of the C.C.I.T. was that which exists, at least in theory, between 3-letter code groups, used in the Cable and Wireless Limited "Z" code and the 3-letter call signs in the Z series, which are referred to in Radio Regulations, Chapter VII, Article 19 et seq. (see page 94). The Cable and Wireless Limited "Z" code is already widely used in the radio field and for this reason has very strong claims for inclusion in the code book. At the same time, the 3-letter call signs in the Z series, if not already in use, may be at any time. The C.C.I.T. had no evidence of trouble arising from this duplication. However, the C.C.I.R. reserved the right to reconsider this case if confusion should arise in the future with call signs in the "Z" series.

9. *Other items of interest*

Information available within the C.C.I.T. indicated that, by accident rather than design, the code documents accepted for inclusion in the telegraph code book included all these codes used in the international telephone service, namely :

VI. SINPFEMO code.

IV. The spelling analogy code—Radio Regulations, Appendix 11 paragraph 3 (1) refers.

Appendix 1

CABLE AND WIRELESS LTD. FACSIMILE REPORTING CODE

This code is used to indicate :

a) *Quality of a Picture to be transmitted*

This is indicated by a 3-digit code group taken from the following tabulation. The code group is inserted after the destination in the address.

Code digit	Contrast (first digit)	Definition or focus (second digit)	General quality (third digit)
1	Very flat	Blurred all over	Poor
2	Flat	Main features blurred	Fair
3	Normal	Slightly blurred all over	Fairly good
4	Contrasted	Background blurred - main features clear	Good
5	Very contrasted	Sharp focus and definition throughout	Excellent

b) *Quality of Picture received*

This is indicated by a 5-digit code group taken from the following tabulation :

Code digit	Contrast (first digit)	Fading (second digit)	Stagger (third digit)	Spurious modulation (fourth digit)	General quality (fifth digit)
1	Very flat	Very frequent	Severe	Severe	Useless
2	Flat	Frequent	Pronounced	Pronounced	Poor
3	Normal	Moderate	Moderate	Moderate	Fair
4	Contrasted	Infrequent	Slight	Slight	Good
5	Very contrasted	Negligible	Negligible	Negligible	Excellent

Appendix 2

TELEGRAPH REGULATIONS

1. The C.C.I.T. agreed that all codes and abbreviations contained in Annex 1 should be retained as they stand (*N. B.* A number of these codes have been taken from the Cable and Wireless Ltd. Service Code, in which case they are identified by underlining).

2. All codes and abbreviations appearing in the text of the Regulations were extracted and examined to determine which were suitable in the light of modern practice for inclusion in the code book.

3. The selected material is recorded below by reference to the paragraph of Telegraph Regulations in which it appears :

<i>Number of Telegraph Regulations</i>	<i>Paid Service Indications</i>	
68	= Priorité Nations =	Telegram from or to the United Nations
	= Urgent =	Urgent
	= RPx =	Reply paid x
	= TC =	Collation
	= PC =	Telegraphic notification of delivery (telegram with)
	= PCP =	Postal notification of delivery (telegram with)
	= FS =	To follow
	= FS de x =	To follow (from the place or places of reforwarding)
	= Réexpédié de x =	Telegram redirected to any other address
	= TMx =	x addresses
	= CTA =	Communicate all addresses
	= Express =	Express
	= XP =	Express paid
	= Poste =	Post
	= PR =	Registered post
	= GP =	Poste restante
	= GPR =	Poste restante registered

= PAV =	Air-mail
= TR =	Telegraph restant
= LX =	Telegram to be delivered on a de luxe form on a happy occasion
= LXDEUIL =	Telegram to be delivered on a de luxe form on an occasion of mourning
= MP =	Personal delivery
= Jour =	Day delivery
= Nuit =	Night delivery
= TFX =	Telegram for which delivery by telephone has been requested
= TELEX x =	Telegram for which delivery by Telex has been requested
= J x =	x days
= Lettre =	ST to which the reply should be given by ordinary letter
= Lettre RCM =	ST to which the reply should be given by registered letter
= RM =	Retransmission of a radiotelegram by a ship or aircraft station
= SEM =	Semaphore telegram
= Presse =	Press telegram
= OBS =	Meteorological telegram
= ELT =	} Letter telegram of the European system
= ELTF =	
= LT =	} Letter telegram of the extra-European system
= LTF =	

225 to 229 and 247

Transmission indicators (Teleprinter)

MOM Wait (alphabets Nos. 1 and 2)
 E E E Error in transmission (alphabet No. 2)

259

Transmission indicators (Morse)
 (where original has equivalent letters)

K Invitation to transmit (e.g. see reg. 303)

322

Use of codes

refers to codes in Appendix No. 1

323

Service communications

RQ

to precede the communication

324 to 331

Stop transmission signals

BK (for Morse Duplex and Wheatstone Duplex)
 PP }
 OO } (repeated) (for start-stop instruments)

347

Priority telegrams

X

To precede the serial number

354

Acknowledgment of receipt

LR

at request of sending telegraphist

360 to 363

Service instructions

B only in exchanges by means of Morse and aural receiving apparatus, and when the transmitting office corresponds direct with the office of destination.

X

as in 347

SVH

Safety of life at sea or in the air

S

Sender requests priority for Government telegram

F

Government telegram without priority request

A Ordinary service telegram or advice
A Urgent Urgent service telegram or advice
ADG Service telegram or advice relating to interruption of communications
ST Paid service advice
RST Reply to paid service advice
MDT Money order telegram or postal cheque telegram
OBS Meteorological telegram
Urgent Urgent private telegram
CR Notification of delivery (appears also in Regulation 502).

382 *Correction of number of words*

= CTF
words = Used when there is a difference in the word counts

399 *Corrections*

CTF At end of the preamble with nature of rectification (see also Reg. 835)

626, 648
and 650 *Phototelegrams — special services*

= KP = Dispatch to the sender of a print from the received film

= Kx = Extra copies for delivery to the addressee

= PC =

= PCP =

= TMx =

= CTA =

= XP =

} As in Regulation 68

= Postxp = Dispatch to destination by express post.

= PR =

= GP =

= GPR =

= TR =

= Jour =

= Nuit =

} as in Regulation 68

= Film = Delivery to the addressee of the negative film instead of the positive print

= Urgent = As in Regulation 68

835 and 837 *Paid Service*

CTSFN Correction will follow if necessary

CTP Retain charge paid

Appendix No. 1 *Code expressions*

BQ Reply to RQ

DF I am putting you through

Dx Duplex

LR Up to what point (word or telegram) have you received?
We have received up to...

OK We agree (or It is correct)

RQ Designation of a request

SX Simplex

ANH Congestion

RPTAA Repeat all after...

RPTAL Repeat everything you have transmitted

RPTWA Repeat word after...

(F.6)

and the following Cable and Wireless service code words :

ATHAS	MAHVU	PATOS	RAJEV	ROFJO
AYGUN	MANAG	PIPKU	RAJFU	RUCMU
AYJEW	MAWET	PITUG	RAJGO	RUCOS
AZKES	MIDUN	POFIH	RAJIF	RUCXO
AZWET	NACBA	POHCO	REGAD	RUCYD
BABSO	NEDIB	POMDU	REJAB	RUCZA
DACYS	NEFAT	POSAG	REKEG	RUFAJ
BINYA	NEKLO	PUFOB	RESIN	RUFKU
CODUN	NEMYD	PYHOP	RICOD	RUFMO
DADRO	NIGYC	PYSAT	RIHUB	TIBOH
JAJAR	NOVEF	RACYB	RIJAG	WAPUC
JIFAG	OHBIN	RAFIS	RIKEN	WEFXU
JOKID	OPWIG	RAFUJ	RISOB	WEJOD
JUFAR	ORDAD	RAFYS	ROCOG	WEJYV
JYBAG	ORJOB	RAHOT	ROFAB	XESCU
JYDOT	PASCA	RAJAJ	ROFER	XESLA

Appendix 3

Q CODE — SEE RADIO REGULATIONS, APPENDIX 9
PAGE 251 AND SEQ

1. The C.C.I.T. agreed that all Q codes in the general services section QRA - QUZ, as listed in Radio Regulations, including those few spare codes to which a meaning had not yet been allotted, should be retained as basic material for the code book. Additionally, new codes approved for use since the Radio Regulations were printed should also be included. These codes will be used subject to their approval by the next Radio Conference.

Code	Question	Answer
QSS	What frequency will you use ?	I will use the working frequency kc/s (normally the last three figures only of the frequency to be inserted).
QSE	Must I keep watch for you (or for) on kc/s (Mc/s) ?	Keep watch for me (or for) on kc/s (Mc/s)
QSH	—	I cannot hear you (or) on kc/s (Mc/s)
QSF	—	Start transmitting on kc/s (Mc/s) and if communication is not established in 5 minutes go back to the other frequency on which you have been transmitting.
QTM	What is your magnetic heading ?	My magnetic heading is degrees.

2. The aeronautical (QAA - QNZ) and maritime (QOA - QQZ) sections of the Q code were excluded on the grounds of their limited and specialized field of operation and the fact that there was little or no support for their inclusion in the replies from Administrations to the original enquiry.

Appendix 4

CABLE AND WIRELESS LTD. "SERVICE CODE"

N. B. The Study Group's findings have been framed so that they refer to the August, 1955 reprint of the Cable and Wireless Ltd. Service Code book, amended to cover subsequent alterations up to 1st June 1956 (English Edition). The French edition of the book is not always an exact equivalent of the English because the issue of reprints and amendments usually takes place at different times.

Service Code

1. The codes accepted for inclusion in the I.T.U. handbook by the Study Group were as follows:

All allocated code letter groups in the number range 00001-02172 (end) except the following :

00046	01575/01660
00049	01671/01739
00068/69	01744/01778
00071	01811
00149/198	01814
00219	01835
00225	01840/41
00230/31	
00351	01862/64
00555/00790	01868
00867/70	01877/80
00888	01909
00942	01918/25
00948	
00953	01931/52
00956/57	01987/92
00977	01997
00985	02001/15
01020/21	02017
	02025/27
01035	02085
01045	02091/96
01049	02104
01054	02117/24
01062	02133
01065	02139/54
01102	02156/58
01111	02167
01258	02222/71
01265	02282/95
01278	
01326	
01337	
01375	
01382/83	
01385	
01390	
01392/96	
01398	
01475	

2. Of the expressions retained, the following should be amended as indicated below :

- 00048 Please service if in agreement our traffic statement for
- 00053 Please rush your estimated figures for
- 00067 Your statement for
- 00085 Destination correct, see " Official List of Telegraph Offices open for International Traffic ", page
- 00086 Destination not in the " Official List of Telegraph Offices open for International Traffic ". We forward to correct if necessary.
- 00313 Your contains word counting evasions, we check confirm.
- 00811 Connecting Administration/company complains.
- 00842 Please explain delay to addressee/sender.
- 01055 Connecting Administration/company's error.
- 01056 Connecting Administration/company's tracing error.
- 01057 Connecting Administration/company confirms following words correct.
- 01269 Connecting Administration/company claims address not registered. The message is still undelivered.
- 01436 Connecting Administration/company's correction.
- 01438 Connecting Administration/company's repetition follows.
- 01514 Still waiting connecting Administration/company's reply (repetition).
- 01802 When and to which Administration/company transferred.
- 01845 If arranged inform
- 02099 Waiting reply from Connecting Administration/company.
- 02114 Give RP in gold francs

Heading of " Censorship " Section to " Restrictions (Censorship, etc.) "

3. As described in the foreword of the Cable and Wireless Ltd. book, this 5-letter service code has been designed to incorporate a measure of protection against mutilation. It is based on a checking procedure between " Paired " " codes ", each of which is an exact reversal of its partner. The C.C.I.T. considered that for the purposes of the I.T.U. code book, this feature could be disregarded without material disadvantage.

4. The detail of the foregoing paragraph has been discussed and agreed with Cable and Wireless Ltd. The alterations in paragraph 2 will be incorporated in their code book by issue of amending instructions later. The Company was most cooperative and raised no objection to the inclusion in the I.T.U. code book of the material listed in this Appendix. They pointed out *a*) that codes excluded under paragraph 1 of this Appendix were in active use by them, and *b*) that in all the circumstances they would retain their own book which would continue to be amended from time to time to cater for addition of new codes and deletion of such codes as may fall out of use in the future. In this connection they make the following points :

- 4.1 They would prefer that codes in their book, at present unallocated, should remain the property of the Company. If, later, the I.T.U. wished to add codes and expressions to the I.T.U. code book, then the I.T.U. should designate its own 5-letter group codes. (*N. B.* Codes excluded from the I.T.U. code book in accordance with paragraph 1 of this Appendix should rank as unallocated codes and be treated in the same way.)
- 4.2 That to avoid confusion between the I.T.U. code book and the Cable and Wireless Limited code book there should be consultation between responsible bodies when codes and meanings common to both volumes are to be amended, or new ones added.
- 4.3 Pending the publication of the I.T.U. Handbook, Cable and Wireless Ltd. will advise of any changes to their code book which may affect the compilation of the I.T.U. code book.

Appendix 5

Z CODE

(as at 1st June 1956)

1. All "Z" codes were accepted by the Study Group for inclusion in the I.T.U. code book except the following :

ZFF

2. A few of the codes accepted required minor clarification as indicated below :

ZYC Delete "ARQ" insert "Automatic error correction".

ZYR } Delete "MUX rev's" insert "Multiplex revolutions".
ZXX/X }

ZXC } Delete "PIX" insert "Pictures".
ZXP }

Appendix 6

ITALCABLE CODE "DIZIONARIO DELLE ABBREVIAZIONI TELEGRAFICHE"

1. The whole of this only document was examined item by item, but the initial selection produced only about 50 items. These items were, in the main, 5-letter group codes and there were a few 2 and 3 abbreviations and codes. The latter group were later found to be duplicated in other code documents and it was the impression of the C.C.I.T. that the 5 letter group codes were broadly covered by equivalent expressions and 5 letter group codes contained in the Cable and Wireless Limited "Service Code".

2. The C.C.I.T. also noted that the greater majority of the few codes and abbreviations produced by their initial selection had, in fact, been taken from codes of American Cable Companies not included in the basic code documents listed for consideration.

3. From the information available to the C.C.I.T. it appeared that there was no great demand for inclusion in the code book of material in this particular document.

4. In all the circumstances, the C.C.I.T. were of the opinion that since the material which they had selected would in effect, be carried forward into the code book from other sources, the Italcable Code could, for all practicable purposes, be regarded henceforth as excluded from the list of selected basic code documents.

Appendix 7

ARRANGEMENT OF MATERIAL WITHIN THE CODE BOOK

1. The examination by the C.C.I.T. showed that the accepted code documents were of two fundamentally different types, namely

1.1 those containing a series of individual code and abbreviation items, each comprising a letter group with an assigned meaning. All accepted code documents except these mentioned in 1.2 fall in this category ;

1.2 those of a different form namely :

SINPO

SINPFEMO

The spelling analogy code

The Cable and Wireless Limited Facsimile Reporting Code.

2. As stated in paragraph 6 of the report, it was considered that the code book should be divided into three main sections, namely

A coding section

A decoding section

A miscellaneous section.

Clearly the four items mentioned in 1.2 of this Appendix are proper to the " Miscellaneous Section " since no question of separate arrangement for coding and decoding arises as a practical issue.

3. The arrangement for the material referred to in paragraph 1.1 of this Appendix should, it was considered, be arranged as follows :

Decoding Section

In this section all code letter groups and abbreviations irrespective of source should be listed in alphabetical order down the left hand side of the page with their meaning to the right. The " Q " and " Z " codes should be excluded from this alphabetical sequence, although this sequence should carry at the appropriate position a cross reference showing where these two codes are to be found elsewhere in the book, namely the " Miscellaneous Section ".

Coding Section

This section should comprise :

3.1 Those 5-letter group codes appearing in Telegraph Regulations (Appendix 1), plus those accepted from the Cable and Wireless " Service Code " (Document No. IX) but excluding duplication. This material should be classified according to the fields of operation in which the codes are used. The Cable and Wireless Limited " Service Code " provides the basic pattern of arrangement required and the few additional codes contained in Telegraph Regulations Appendix 1 should be merged into this arrangement.

3.2 The second portion of this section should consist of groups of codes headed according to their usage thus :

3.2.1 " Telex Codes "

3.2.2 " Miscellaneous Telegraph Codes " comprising :

Miscellaneous abbreviations and signals — Miscellaneous codes and abbreviations taken from the text of the International Telegraph Regulation.

The codes and abbreviations from the foregoing services should be arranged in alphabetical order.

4. *Miscellaneous Section*

Part I

As indicated in paragraph 1.2 of this Appendix the following should appear in the "Miscellaneous" section, each separately and with its own heading:

- Document No. V SINPO
- Document No. VI SINPFEMO
- Document No. IV Spelling Analogy Code
- Document No. X Cable and Wireless Limited Facsimile Reporting Code

As indicated in paragraph 3 of this Appendix (Decoding Section), the C.C.I.T. considered that the following should also appear in this section:

- Document No. II "Q" Code (Series QRA-QUZ)
- Document No. IX Cable and Wireless Limited Z Code. (Subject to reservation)

5. It might be argued with some justification that both the "Q" code (alphabetical arrangement) and the Z code should appear in the "Decoding Section" and that the "Q" code (functional arrangement) should appear in the "Coding Section".

Both codes, however, are subject to special qualifying instruction e.g. some codes letter groups can have numbers added to them e.g. QRK/1-5 and ZSI/1-5. Moreover the Q code has a dual significance in that the letter code group can be used as either a question or an answer. Since the question of special instruction can more conveniently be covered when the "Q" and "Z" codes appear as separate entities, the C.C.I.T. considered it best to place them in the "Miscellaneous Section" where all material will be arranged on this form.

Part II

(Codes of some importance, but which have not been included as they lie outside the scope of the I.T.U.)

1. International code of Signals Vol. II.
2. Communication Codes and Abbreviations, published by I.C.A.O.

F.7. Maximum tolerable rate of error for land-line telegraphic communications operated with five-unit start-stop apparatus

(Geneva, 1956)

The C.C.I.T.,

considering

a) that operations would be facilitated if a standard were defined such as would make it possible to assess the quality of telegraphic communications;

b) that for this purpose, the rate of error for telegraphic communications, as defined, would do (ratio between the number of alphabetic signals incorrectly translated to the number of such signals in the message, keying being correct);

c) that in defining this standard, thought should be given to the quality obtainable with present-day technique;

d) that to this end measurements have been made by certain Administrations;

e) that the standard should be reviewed and adapted to keep it in step with future technical progress;

unanimously declares the view

1. that provisionally, for land-line telegraph communications, in the general service, the subscribers' service and the leased circuits service, operated with five-unit start-stop apparatus, the maximum tolerable rate of error to be recommended should be 3 in 100 000 alphabetic telegraph signals transmitted;

2. that Administrations and Recognized Private Operating Agencies should pursue the study of this question in order that the provisional standard may be modified to keep it abreast with the progress of telegraph technique.

(F.7)

**F.8. Maximum tolerable error rate for radiotelegraph communications
using five-unit start-stop apparatus
(Including mixed communications consisting of wire and radio circuits)**

(Geneva, 1956)

The C.C.I.T.,

considering

- a) that the propagation difficulties existing on certain radio circuits make unavoidable some errors in transmission;
- b) that the type of transmission to be used on radio circuits may depend on the rate of errors which may be tolerated;
- c) that therefore it should be useful to establish the maximum error rate;
- d) that for this purpose the error rate as defined for telegraph communications should be used, i.e. the ratio of alphabetic telegraph signals incorrectly translated to the number of alphabetic telegraph signals of the message, assuming that the signalling be correct;
- e) that for land line communications a maximum tolerable error rate of 3 in 100 000 alphabetic telegraph signals has been provisionally accepted (recommendation F.7.);
- f) that this error rate cannot be used as such for radiotelegraph communications on account of essentially variable conditions particular to this type of transmission,

unanimously declares the view

1. that the quality of service must be the same for telegraph communication in the general service, for the subscriber service, and the leased circuit service;

2. that in order to assure with present day technique a good quality of telegraph service, it is advisable to recommend provisionally, for the whole of a telegraph communication including a radio path, a maximum tolerable rate of error of 10 in 100 000 alphabetic telegraph signals transmitted.

However, depending on the communications concerned, this error rate cannot always be maintained during the entire period of the service. The Administrations and Recognized Private Operating Agencies concerned should come to an understanding between themselves during which percentage of time the maximum tolerable error rate must be respected;

3. that it devolves upon the C.C.I.R. to establish methods of measurement necessary for a practical control of the error rate on radiotelegraph communications;

4. that the Administrations and Recognized Private Operating Agencies continue the study of this question in order that the provisional standard may be modified to keep it abreast with the progress of radiotelegraph technique.

F.9. Receipt of telegrams in pages in an agreed form and without errors

(Geneva, 1956)

The C.C.I.T.,

considering

that certain offices use page-printing teleprinters for reception, and hence want the corresponding offices to transmit their traffic in a predetermined form;

that the standards governing the lay-out of the various parts of a telegram often vary according to the receiving office;

that certain receiving offices use the sheet on which the telegram has been received for delivery to the addressee;

that, consequently, introduction of a standard lay-out for telegrams transmitted, when the corresponding receiving office is using a page-printing teleprinter, means that the transmitting office must transmit its traffic without errors;

(F.9)

unanimously declares the view

1. that when page-printing teleprinters are used for reception, the corresponding office or offices should transmit traffic to that office without error, according to the following lay-out :

Line Spacing

2

1 sdz202 sz ur287 recb90 ¹⁾
indiana harborind 29 2 1638 ²⁾

3

1 It fs
miss gisella cohen, grand hotel eden geneva

4

1 1000 francs cabled to Lucerne july 28 through swiss bank corporation stop
please cable if not received love

1 ³⁾ daddy

2

coll It fs 1000 28

10

(10 "letter-shift" signals)

2. and that the transmitting office should make provision to eliminate errors before transmission.

1. Preamble, the parts referred to in numbers 361 and 362 of the Telegraph Regulations.
2. Preamble, the parts referred to in numbers 363 to 374 of the Telegraph Regulations.
3. Minimum 5 blanks before signature.

Notes :

a) The Administrations and Recognized Private Operating Agencies which use window envelopes for delivery should ensure that such windows are long enough for the address to be put on one line of 69 signs, the height of the windows being left for the Administrations and Agencies concerned to determine.

b) Administrations and Recognized Private Operating Agencies may to some extent adapt the vertical line spacing of their teleprinters for the receipt of telegrams, to ensure a suitable lay-out.

c) It is considered that ten "letter-shift" signals can usefully be inserted after the ten spacings separating telegrams, to provide for cases in which the receiving office uses perforated-tape retransmission.

F.10. „Message separation” signal

(Geneva, 1956)

The C.C.I.T.,

considering

that as regards perforated-tape semi-automatic and automatic retransmission, it would be useful to standardize a “message separation” signal for insertion immediately after the end of a telegram or at the end of a series of telegrams similarly routed;

unanimously declares the view

that for perforated-tape semi-automatic or automatic retransmission a decision should be taken on a standardized message separation signal for insertion immediately after the end of a telegram or of a series of telegrams similarly routed.

**F.11. Constitution of the European Switching Network
for the general public telegraph service using start-stop teleprinters**

(Geneva, 1956)

The C.C.I.T.,

considering

that the European Start-Stop Teleprinter Network using switching to carry the international traffic of the general telegraph service in Europe can be organized according to different plans;

that one of these plans—Plan A—entails the creation of a European network completely separate from the national networks;

that, in Plan A, the telegraph stations, lines and switching equipments used for terminating international calls in the territory of countries which are parties to the European Switching Network are independent of the telegraph stations, lines, and switching equipments used in the inland services of these countries;

that such a plan would have the advantage of entailing the construction of a completely new network, which would benefit from the latest advances in switching technique, with a simple plan of numbering and of answer-back codes thoroughly adapted to this network;

that on the other hand, separation, within a country, of systems of telegraph lines and operating stations into one group for the inland service and an independent group for the international service, would be costly;

that, for this reason, only the major telegraph offices of a country would be connected to the European Switching Network;

that, in addition, the creation of such a network (which, if full advantage is to be taken of the points in its favour, would have to be designed for a single signalling system and a single operating procedure) would require lengthy international studies and hence would take several years;

that, at the present time, several European countries are operating, or will shortly operate, national switching networks, and are ready to start a switching service from country to country;

that application of Plan A would require the unanimous agreement of the participants in the European Switching Network;

that, for the reasons explained above, such agreement cannot be obtained;

unanimously declares the view

that, for the time being, the creation of a European network completely independent of national networks cannot be proposed for the European Switching general public Network;

(F.11)

considering further

that another plan—Plan B—entails interconnection, by switching, of the national networks now being operated by switching (or which are to be so operated) ;

that this plan presents an advantage in that it could be implemented by bilateral agreement between Administrations, and in certain relations could be very speedily applied ;

that it presents another advantage in that it does not restrict the further development of the network, since it does not limit the connection of the European Switching Network to a few major offices and hence would make it possible to do away with more retransmissions of telegrams ;

that it is more economical than Plan A ;

that the right of Administrations freely to choose which of their offices are to be connected to the European Switching Network cannot be challenged ;

that some Administrations have decided to connect a fair number of their telegraph offices to the European Switching Network ;

that, on the other hand, other Administrations have decided to separate the national and international networks in their territories ;

that, for this reason, full application of Plan B is inconceivable, and it would be well to recommend an intermediate solution combining Plans A and B ;

unanimously declares the view

that the European Switching general public service Network should be so constituted that some Administrations would be able to use their national networks to terminate international communications, while others would be able to use a specialized network for international traffic in their territories (Plan C) ;

that, as regards trunk circuits between the switching centres of different countries, the Administrations concerned should be free to choose between use of international Telex trunk circuits and the constitution of trunk circuits reserved for general traffic ;

that to offset the diversity of operating conditions and technical equipment which might result from application of Plan C, standardization of operating methods and signalling should be carried as far as the essential characteristics of the national networks permit ;

that, in order to facilitate and expedite a thorough study of the possibility of Plan C being put into operation by all countries, it is desirable that countries having some experience of the technical, operational and charging problems of this Plan should communicate all possible information on the subject to the other Administrations interested, through the medium of the C.C.I.T. ;

considering finally

that operation entirely by automatic switching is much less expensive than manual or semi-automatic operation ;

that it would be desirable to adopt, at least on a provisional basis, an abbreviated name for such a network ;

unanimously declares the view

that those networks, the interconnection of which is envisaged would have to be operated entirely by automatic switching ;

that provisionally the word "GENTEX" would be used to designate the switching network for the general telegraph service.

F.12. The use of tape printing teleprinters in the "Gentex" service

(Geneva, 1956)

The C.C.I.T.,

considering

that efficient operation of the "GENTEX" network requires a certain degree of uniformity in the teleprinters used in the positions of this network ;

unanimously declares the view

that, for the time being, the "GENTEX" network should be operated with tape-printing teleprinters.

F.13. Call number of offices connected to the "Gentex" network

(Geneva, 1956)

The C.C.I.T.,

considering

that Administrations need henceforth to gauge the maximum capacity of the registers which they may have to construct, and bear in mind the numbering plans and size of the various national networks ;

that it will be necessary to limit the number of figures of the call number in the "GENTEX" service ;

that the call number in the international service of an office connected to the "GENTEX" network would have to comprise, besides a prefix representing the called country, a national call number based on a numbering plan appropriate to the called country ;

unanimously declares the view

that there should be no more than eight digits in the national call number of an office connected to the "GENTEX" network.

F.14. List of call numbers of offices participating in the "Gentex" Service

(Geneva, 1956)

The C.C.I.T.,

considering

that the offices participating in the "GENTEX" service need information about the call numbers of offices connected to the service and others not so connected but usually handling a considerable amount of international traffic ;

that, for the time being, it is not advisable to insert the numbers of these offices in the Official List of Telegraph Offices open for international traffic ;

unanimously declares the view

that each country participating in the "GENTEX" network should draw up lists of the call numbers of the offices connected to this network and of other offices not so connected but usually handling a reasonable amount of international traffic and then forward them to other countries concerned ;

that such lists might, at some appropriate time, be assembled into a joint document published by the I.T.U.

(F.14)

Note : These lists will not include every office in the country, but only those which constantly handle international traffic.

These lists will provide the following information :

- a) In the first column, an alphabetical list of the offices concerned ;
- b) in the second column, the call number ;
- c) in the third column the answer-back signals of the offices connected to the " GENTEX " network or of the offices servicing offices not connected thereto ;
- d) a fourth column shall be reserved for service information. In it, Administrations and Recognized Private Operating Agencies shall put, if necessary, a reference to a general note concerning offices with restricted service and giving the requisite information for the routing of telegrams addressed to such offices ;

Notes :

1. the list shall be preceded by a general note regarding the routing of telegrams for offices other than those mentioned in the list ;
2. these lists shall be presented on forms size A4.

F.15. Acknowledgment of receipt in the " Gentex " service

(Geneva, 1956)

The C.C.I.T.,

considering

that the primary aim of the " Gentex " service is to expedite the handling of traffic ;

that practice has shown that, for a great part of the general traffic, an acknowledgment of receipt is unnecessary and that it suffices to exchange answer-back signals at the beginning and end of the transmission of each telegram ;

unanimously declares the view

that acknowledgment of receipt (according to Article 44 of the I.T.R.) be restricted to SVH, S, F and MDT telegrams. This acknowledgment of receipt will be given as soon as possible in the form of an ordinary service message sent from the receiving office to the transmitting office ;

that for ordinary telegrams (excepting SVH, S, F and MDT) the correct receipt of the receiving station's answer-back signals at the beginning and end of the transmission of each telegram shall take the place of the acknowledgment of receipt for the calling station.

F.16. Connection of restricted service offices to the " Gentex " network

(Geneva, 1956)

The C.C.I.T.,

considering

that the operation of the " Gentex " network would be facilitated if only offices which are always opened were connected to the network ;

that on the other hand certain countries which do not provide overflow working to an office always open cannot dispense with the connection to the " Gentex " network of restricted service offices ;

(F.16)

unanimously declares the view

that Administrations and Recognized Private Operating Agencies may also give access to the switched network to offices with restricted service hours, provided they give the Administrations and Private Operating Agencies concerned all the necessary information regarding the routing of telegrams intended for these offices ;

that these Administrations and Recognized Private Operating Agencies shall so arrange that any change in the routing of telegrams intended for their offices with restricted service shall take place at the same time for all such offices, so that offices in a country of departure will always be able to send their telegrams to an office with a more extended service in the country of destination ;

that offices to which traffic for offices with a restricted service is addressed should be as few as possible.

F.17. Overflow in the "Gentex" service

(Geneva, 1956)

The C.C.I.T.,

considering

that the acceptance of overflow depends essentially on the technique in use in the country concerned ;

unanimously declares the view

that every country must be free to decide whether it will practice overflow within its territory or not. Where however overflow arrangements are in force, the operator of the country of departure should be clearly informed whenever connection has been established with an overflow position. Hence the requisite indication must be provided by the answer-back of the overflow position.

F.18. Grade of service for international trunk circuits used in the "Gentex" service

(Geneva, 1956)

The C.C.I.T.,

considering

that the main purpose of the "Gentex" service is to ensure that general service traffic shall be passed without delay, whilst also ensuring a sufficient use of groups of international circuits intended to carry the general service traffic,

unanimously declares the view

that the grade of service corresponding to a probability of loss of 1 in 50 as set out in column 3 of Table B of Recommendation H.10 should be used for the groups of International Trunk Circuits used for the "GENTEX" service.

F.19. Suspense arrangements in the "Gentex" service
(Geneva, 1956)

The C.C.I.T.,

considering

that in a large number of European systems a suspense period is not provided for ;
that it is consequently not possible to make the use of a suspense period compulsory ;
that, nevertheless, certain countries wish to retain the possibility of a suspense period in their systems;

unanimously declares the view

that Administrations and Recognized Private Operating Agencies may, when a called station is engaged, allow a suspense period before sending out the " busy " signal. This suspense period might be from 30 to 60 seconds and would be signalled to the sending office by the code word " MOM ".

F.20. Barring arrangements in the "Gentex" service
(Geneva, 1956)

The C.C.I.T.,

considering

that every care should be taken to prevent subscribers from avoiding the full payment of charges;
that any complications should be avoided in the search for, or the charging of, telegrams ;
that, for these reasons a subscriber to the Telex network in one country must be forbidden to connect himself to an office in the " Gentex " network of another country ;
that, for other reasons an office of the " Gentex " service of one country should be forbidden to connect itself to any subscriber in the Telex network of another country ;

unanimously declares the view

that Administrations and Recognized Private Operating Agencies should prohibit by means of administrative regulations and, if possible, by technical means, the use of teleprinters by Telex subscribers for sending telegrams to public telegraph offices in another country ;

that Administrations and Recognized Private Operating Agencies should prohibit their offices connected to the " GENTEX " network from transmitting telegrams directly to or receiving telegrams transmitted directly by Telex subscribers in another country.

Note : The technical means required in order to prohibit undesirable connections are the subject of new Question 4/10 of C.C.I.T. Study Group 10.

G. RECOMMENDATIONS APPLYING TO QUESTIONS OF REGULATIONS AND TARIFFS

G.1. Structure of the Telegraph Regulations and classification of telegrams (former provisional Recommendation 875, 1951, amended at Geneva, 1956)

The C.C.I.T.,

having considered the questions contained in Resolution 7 annexed to the International Telegraph Regulations, Paris, 1949,

unanimously declares the view

1. that the proposal of Czechoslovakia for deleting the signals of the Hughes and Siemens instruments from the Telegraph Regulations should be maintained;

2. that the proposal of the General Secretariat of the Union to modify the structure of Chapters V and VI of the Telegraph Regulations, Paris 1949, should be maintained in the amended form shown in Annex 1 to this Recommendation;

3. that it is possible, in the form shown in Annex 2 to this Recommendation, to approve the modification of the structure of Chapter XXII of the Telegraph Regulations, Paris, as suggested in:

a) proposal 307 of Belgium, submitted at the Paris Conference;

b) the new proposals presented to Study Group X by the delegates of Sweden and Switzerland;

4. that the provisions of paragraphs 2 and 3 concerning modification of the structure of Chapters V, VI and XXII of the Paris Telegraph Regulations be examined further by the next International Telegraph Conference;

5. that the proposals of Administrations and Recognized Private Operating Agencies should be based on the existing text of the Paris Telegraph Regulations;

requests

The Secretary-General of the Union to invite the attention of Administrations and Recognized Private Operating Agencies to these provisions, when asking them to submit to him their proposals for the forthcoming Telegraph and Telephone Administrative Conference;

In addition to the collection of proposals, the Secretary-General will have to prepare a separate document with two columns, the first bearing the number of the proposal as in the collected proposals and the second carrying a reference to the Article and paragraph of the text of Chapters V, VI and XXII, in accordance with Annexes 1 and 2 to Recommendation G.1.

Annex No. 1 *

**PROPOSAL FOR THE REARRANGEMENT OF THE PROVISIONS
OF CHAPTERS V AND VI OF THE TELEGRAPH REGULATIONS (PARIS REVISION, 1949)**

<i>Classification proposed</i>	<i>References to provisions of the Paris Regulations</i>	<i>Version proposed</i>
1	2	3

CHAPTER V

Preparation and Handing-in of Telegrams

Article 8

Various parts of a telegram

§ 1.	Art. 13	Without change.
§ 2.	Art. 16, § 2 (completed)	§ 2. Telegrams which contain only an address shall not be admitted, whether or not this is preceded by one or more paid service indications.

Article 9

Wording of telegrams

§ 1. (1)	Art. 12, § 1 (completed)	§ 1. (1) The original telegram must be written in characters which are used in the country of origin and are taken from the table of telegraph signals (Article 10, § 1).
§ 1. (2)	Art. 12, § 3	(2) Every footnote, insertion, erasure, elimination or correction must be approved by the sender or his representative.
§ 2. (1)	Art. 18, § 8 (1)	§ 2. (1) Combinations or alterations of plain language words, contrary to the usage of the language to which they belong, shall not be allowed in plain language telegrams.
§ 2. (2)	Art. 18, § 8 (2) Art. 20, § 2 and Art. 21, § 2 in part (combined)	(2) Nevertheless, family names belonging to one person, names of telegraph offices and of land and mobile stations as defined in Article 12, § 12 and Article 16, § 1, names of towns, countries and territorial subdivisions, the full or abbreviated names of places, squares, boulevards, streets and other public ways, names of ships, designations of aircraft, and railway trains, and similar designations, compound words which can be justified if required, whole numbers, fractions, decimal or fractional numbers, written in words, may be grouped as a single word which shall be counted in accordance with Article 17, § 1.
§ 2. (3)	Art. 18, § 8 (3)	(3) Sub-paragraph (2) above shall likewise apply to numbers written in letters in which the figures are represented separately or in groups, for example: Thirtythree instead of threethousandthirty or sixfoursix instead of sixhundred and fortysix.

* The cross-references in the texts below relate to the present Annex and not to the Paris Telegraph Regulations.

*Classification
proposed*

*References
to provisions
of the Paris
Regulations*

Version proposed

1

2

3

Article 10

Characters which may be used

§ 1.	Art. 12, § 1	1. The following characters may be used in the wording of telegrams: (the remainder without change)
§ 2.	Art. 12, § 2.	No change.
§ 3.	Art. 12, § 5.	No change.
§ 4.	Art. 12, § 4:	Combination of sub-paragraphs (1) and (2).
§ 5.	Art. 12, § 6.	No change.
§ 6. (1)	Art. 12, § 7 (1)	(1) For expressions such as 30 ^a , 30 ^{ne} , 1 ^o , 2 ^o , B , 1' (minute), 1" (second), etc., which cannot be reproduced by instruments, the sender must substitute... (the remainder without change)
§ 6. (2)	Art. 12, § 7 (2) }	No change.
§ 6. (3)	Art. 12, § 7 (3) }	

Article 11

Forms of paid service indications

§ 1.	Art. 14, § 1	No change.
§ 2.	Art. 14, § 5 (amended)	Paid service indications may be written in any form, but they shall be transmitted only in the abbreviated form prescribed in paragraph 1 above. If necessary, the counter officer shall strike out the indication written by the sender and replace it by the abbreviated form prescribed for transmission, preceded and followed by double hyphens (example = TC =).
§ 3.	Art. 14, § 2	No change.
§ 5.	Art. 14, § 3	No change.
§ 4.	Art. 14, § 4	

Article 12

Wording of the address

§ 1.	Art. 15, § 1	} No change.
§ 2.	Art. 15, § 2	
§ 3. (1)	Art. 15, § 4	
§ 3. (2)	Art. 15, § 3	
§ 4.	Art. 15, § 5	
§ 5.	Art. 15, § 6	
§ 6.	Art. 15, § 7	
§ 7.	Art. 15, § 8	
§ 8.	Art. 15, § 9	
§ 9.	Art. 15, § 10	
§ 10.	Art. 15, § 11	
§ 11.	Art. 15, § 12	
§ 12.	Art. 15, § 13	
§ 13.	Art. 15, § 14	
§ 14.	Art. 15, § 15	

<i>Classification proposed</i>	<i>References to provisions of the Paris Regulations</i>	<i>Version proposed</i>
1	2	3

Article 13

**Wording of the text
Plain language and secret language**

<p>§ 1. Art. 16, § 1 Art. 9, § 1</p> <p>a) <i>plain language</i></p> <p>§ 2. Art. 10, § 1 § 3. Art. 10, § 2 § 4. Art. 10, § 3 § 5. Art. 10, § 4 § 6. Art. 9, § 2</p> <p>b) <i>secret language</i></p> <p>§ 7. Art. 11, § 1 § 8. Art. 11, § 2 § 9. Art. 11, § 3 § 10. Art. 11, § 4 § 11. Art. 11, § 5 § 12. Art. 11, § 6 § 13. Art. 9, § 3 § 14. Art. 9, § 2 (second sentence)</p>	<p style="font-size: 3em;">}</p>	<p><i>Deleted.</i></p> <p>No change.</p> <p>§ 6. All Administrations and recognized private operating agencies shall accept, in all their relations, telegrams in plain language.</p> <p>No change.</p> <p>§ 14. Administrations may refuse to accept and to deliver private telegrams wholly or partly in secret language, but they must allow these telegrams to pass in transit, except in the case of suspension defined in Article 30 of the Convention.</p>
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Article 14

Wording of the signature. Legal verification

Art. 17	No change.
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CHAPTER VI

Counting of Words

Article 15

Rules applicable to all parts of a telegram

<p>§ 1. Art. 18, § 1 § 2. Art. 18, § 2 § 3. Art. 18, § 5</p>	<p style="font-size: 3em;">}</p>	<p>No change.</p> <p>3. The following shall be counted as one word in all languages : a) each of the forms prescribed for the transmission of paid service indications (Article 11, § 1). sub-paragraphs b) to f) without change.</p>
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(G.1)

<i>Classification proposed</i>	<i>References to provisions of the Paris Regulations</i>	<i>Version proposed</i>
1	2	3
§ 4. § 5. § 6. § 7.	Art. 18, § 6 Art. 18, § 7 Art. 18, § 4 Art. 18, § 9	} No change.
Article 16		
Counting of words in the address		
Art. 19.		No change.
Article 17		
Counting of words in the text		
§ 1.	Art. 20, § 1 Art. 20, § 2	No change. <i>Deleted</i> : see Article 9, § 2 (2)
Article 18		
Counting of words in the signature		
§ 1. § 2.	Art. 21, § 1 Art. 21, § 2 Art. 18, § 3	No change. <i>Deleted</i> : see Article 9, § 2 (2). § 2. The verification of the signature, as transmitted, shall be included in the number of chargeable words on the basis of fifteen characters per word.
Article 19		
Indication of the number of words in the preamble		
Art. 22		No change.
Article 20		
Irregularity in the counting of words Correction of errors		
Art. 23		No change.
Article 21		
Examples of counting of words		
Art. 24		No change.

Annex No. 2

PROPOSAL FOR THE REVISION OF THE PROVISIONS OF CHAPTER XXII
OF THE TELEGRAPH REGULATIONS (PARIS REVISION, 1949)

CHAPTER XXII

Press telegrams

Article 75

General remarks

1. Press telegrams are telegrams the text of which is made up of information and news for publication in newspapers and other periodical publications or for radio broadcasting. They shall enjoy a special reduced rate.
2. (1) Press telegrams shall bear, at the beginning of the address, the paid service indication = Presse =, written by the sender.
(2) In press telegrams (699) at the reduced rate.
3. Administrations and Recognized Private Operating Agencies which do not admit press telegrams (either ordinary or urgent) must accept them in transit, subject to Article 76 *bis*, § 5.
4. (1) Press telegrams may be addressed only to newspapers or periodical publications, to government or private news agencies or bureaux, or to authorized radio broadcasting companies or stations, and only in their name, and not in the name of a person connected in any capacity whatever with any of such entities.
(2) In multiple press telegrams, all the addresses must fulfil the conditions of this Article.
(3) The use of registered addresses shall be authorized.
(4) Administrations and Recognized Private Operating Agencies (696) press rates.

Article 75 *bis*

Conditions of Admission

1. (1) Press telegrams must not contain any passage, advertisement, or communication (714) free of charge. They may contain only material for publication or broadcasting.
(2) However, instructions relative to the publication or broadcasting of the telegram shall be admitted, provided that such instructions are placed between brackets (for which a charge shall be paid) at the beginning or at the end of the text. The number of words thus added to the text properly so called (excluding the brackets) shall not exceed 10 per cent of the total number of chargeable words in the text, and shall not exceed 20.
2. (1) Stock exchange (715) press telegrams.
(2) In case of doubt (716) to establish the fact.

Article 76

Languages admitted

1. (1) Press telegrams must be expressed (707-711) of the country to which they belong.
(2) The sender (712) in this language.
2. The languages mentioned (713) in which the telegram is expressed.

(G.1)

Article 76 bis

Tariff and charging

1. The terminal and transit rates (701) in other relations.
2. The charge per word (702) over the same route.
3. The minimum number of chargeable (703) at ten.
4. The copying fee (704) multiple telegrams.

The transit rate which the Administrations and Recognized Private Operating Agencies referred to in Article 75, § 5., receive, shall be that which results from the application of the provisions of §§ 1. and 2. above, according to whether ordinary or urgent press telegrams are concerned (706).

Article 77

Application of the normal tariff

(No change.)

Article 78

Transmission and delivery of press telegrams

(No change.)

Article 79

Miscellaneous Provisions

1. With respect to any matter (724) operating agencies.
2. The provisions (725) concerned.

G.2. New tariff systems

(former provisional Recommendation 903, 1951)

(Suppressed at Geneva, 1956)

G.3. Telegraph circuits for the transmission of transit telegrams

(Arnhem, 1953)

(Suppressed at Geneva, 1956)

G.4. Charges for phototelegrams

(Arnhem, 1953)

The C.C.I.T.,

having regard to Resolution 16 annexed to the Telegraph Regulations, Paris, 1949,

considering

that it is advisable to standardize the scales of charges for phototelegrams in international relations;

(G.4)

the difference that at present exists between the charge for the period during which the circuit is in use in the case of 1) phototelegrams exchanged between public stations and 2) phototelegrams exchanged between a private station and a public station, or between two private stations ;

that the charges for phototelegrams between public stations should be increased so that they correspond more closely to the expenses of the Administrations and/or Recognized Private Operating Agencies,

declares the view (by a majority of 20 votes against 3 votes)

that the regulations concerning phototelegrams should continue to appear in the International Telegraph Regulations ;

that the scale of charges provided in Article 68 of the International Telegraph Regulations should be replaced by the following :

	Area of Phototelegram transmitted	Total photo-telegraphy charge in Francs	Share of charge accruing to each Administration	
			Terminal	Transit
1st step	Up to 150 sq.cms.	$18 + 3y$	$9 + 3a$	$3b$
2nd step	Above 150 sq.cms. and up to 250 sq.cms.	$18 + 4y$	$9 + 4a$	$4b$
3rd step	Above 250 sq.cms. and up to 350 sq.cms.	$18 + 5y$	$9 + 5a$	$5b$
with an increase of one y for each additional step of 100 sq.cms.				

that the provisions of paragraph 620 of the Telegraph Regulations, Paris, 1949, should be replaced by the following :

“ In the case of divided phototelegrams (600), the areas of the separate pieces should be aggregated and the total charge should be the same as for an undivided picture of the same total area.”

G.5. Special rates for meteorological telegrams

(Arnhem, 1953)

The C.C.I.T.,

having examined the questions relating to special rates for meteorological telegrams ;

considering

that it has not been possible to reach unanimous agreement on the deletion of paragraph 728 of the International Telegraph Regulations ;

unanimously declares the view

that further study should not be undertaken and that the question should be referred to the next International Telegraph and Telephone Conference.

(G.5)

G.6. Study of a new system of charging

(Geneva, 1956)

The C.C.I.T.,

considering

1. that a new tariff system, in which the charge per telegram would include a charge per word transmitted, to be apportioned as is the present practice among Administrations, and a fixed charge per telegram would be more logical than the present system;
2. that the operators of telecommunication systems, while applying rates as low as possible, must derive from their operations a revenue enabling a sound financial administration to be maintained;
3. that if rates for long messages were reduced, the rates for short messages would have to be increased;
4. that there are few users who send long or short messages exclusively, and hence when there are charging anomalies, they usually cancel each other out and cause no damage;

unanimously declares the view

that pending a solution to the question of rates in general, in the European system, it is not desirable at present to adopt a new charging system under which the charge for a telegram would include a charge per word for transmission, to be apportioned between the Administrations and Recognized Private Operating Agencies concerned, and a fixed charge per telegram, to be apportioned between the terminal Administrations.

G.7. Basis of charging

(Geneva, 1956)

The C.C.I.T.,

considering

1. that assessment of charges, simply by counting *characters*, is excluded for practical reasons,
2. that the adoption of another simple and practical unit for telegram charges would only be possible if changes were made in the technique and telegraph transmission systems applicable to the major part of the traffic;

unanimously declares the view

that for the time being, and taking into account the provisions of paragraph 164 of the Telegraph Regulations, only the word pure and simple can be used for evaluating the text of a telegram, and that study of the matter should be continued.

G.8. Word-counting—Preparation of a vocabulary

(Geneva, 1956)

The C.C.I.T.,

considering

1. the proposal to recommend to Members of the Union the setting up of committees comprised of representatives of Administrations, Recognized Private Operating Agencies and organisations representing the users of international telegraph services of all countries with a common language, with the purpose of drawing up vocabularies of commercial terms characteristic of the language or in current use in the country concerned with an indication of the corresponding number of telegraph words;

(G:8)

2. that the difficulties of reckoning the charge for such terms should not be exaggerated, for they can be overcome by a liberal interpretation of the Telegraph Regulations and by making a study of some special cases relating to the counting of signals, expressions etc. appearing in the Regulations ;

3. that the high cost of preparing, circulating and keeping up-to-date of such vocabularies would be out of all proportion to their actual value ;

4. that under paragraph 149 of the Regulations, appropriate measures can be taken to prevent any abuse in the use of the terms in question ;

5. that lists of these terms, already published by some of the Administrations and recognised private operating agencies, are now used by many other Administrations and Recognized Private Operating Agencies ;

unanimously declares the view

a) that there is no call to recommend Members of the Union to set up committees to draw up vocabularies of characteristic commercial terms in the various languages, with an indication of the corresponding number of chargeable words ;

b) that it is preferable to leave Administrations and Recognized Private Operating Agencies to reach such agreements, and take such action, as they may see fit in this field.

G.9. Introduction into the Telegraph Regulations of the concept of fraudulent joining and alteration of words

(Geneva, 1956)

The C.C.I.T.,

considering

that application of the rules laid down in the Regulations usually prevents abuse arising from the joining or alteration of words ; and that in any case it is for Administrations and Recognized Private Operating Agencies concerned to take the necessary steps ;

unanimously declares the view

that there is no call to introduce into the Regulations the concept of fraudulent joining and alteration of words in telegrams by senders with the object of avoiding payment of the proper charge.

G.10. Should letter-telegrams be abolished ?

(Geneva, 1956)

The C.C.I.T.,

considering

that the category of letter-telegrams meets a public need and is in the interests of Administrations and Recognized Private Operating Agencies ;

unanimously declares the view

that for the time being at least, the optional category of letter-telegrams should be maintained. According to paragraph 744 of the Telegraph Regulations, Administrations and Recognized Private Operating Agencies must accept letter-telegrams in transit ; the transit charge accruing to these Administrations and Recognized Private Operating Agencies is reduced by 50 %.

(G.10)

G.11. Phototelegrams

(Geneva, 1956)

The C.C.I.T.,

considering

a) that the Telegraph Regulations contain rules for the phototelegraph service, applicable only to the European system, while as regards the extra-European system, the Administrations and Recognized Private Operating Agencies concerned are left free to determine for themselves, by mutual agreement, the charges for phototelegrams and the rules that shall apply thereto ;

b) that paragraph 596 of the Telegraph Regulations lays down that anything capable of being transmitted as a phototelegram may be accepted for phototelegraphic transmission ;

unanimously declares the view

that Administrations and Recognized Private Operating Agencies have to abstain from applying to telegrams to be transmitted as phototelegrams restrictive provisions as regards the languages, characters or symbols used in drawing them up. While abiding by these provisions, Administrations and Recognized Private Operating Agencies can lay down supplementary rules for the presentation of telegrams to be transmitted as phototelegrams.

G.12. Action to be taken in case of interruption of telegraph circuits

Possible use of Telex circuits

(Geneva, 1956)

The C.C.I.T.,

considering

that such interruptions are individual cases which may arise in many different ways ;

unanimously declares the view

that for the time being, the procedure to be adopted should be settled by agreement between the Administrations and Recognized Private Operating Agencies concerned, and that a study of the matter should be continued. (See question 30/21 of Sub-Group 1 of C.C.I.T.T. Study Group 2.)

G.13. Accounting procedure to be applied in the case where a telephone circuit used for V.F. telegraphy is replaced by another, following a different route

(Geneva, 1956)

The C.C.I.T.,

considering

that such cases are fairly uncommon, but that it might be desirable to propose rules in the future, in the light of experience ;

(G.13).

unanimously declares the view

that for the time being no general procedure can be recommended to cover the above-mentioned case, and that it would be better to leave Administrations and Recognized Private Operating Agencies to enter into special arrangements when they consider it to be desirable, and that the question should be kept under study. (See Question 32/21 of Sub-Group 1 of C.C.I.T.T. Study Group 2.)

G.14. Accounting in the public telegraph service

(Geneva, 1956)

The C.C.I.T.,

considering

1. that in general, and for the needs of the operation of the international switching system for the general telegraph service in particular, the accounting between Administrations and Recognized Private Operating Agencies should be prepared on the basis of the transmitted traffic ;

2. that several Administrations and Recognized Private Operating Agencies, especially in the extra-European system, prefer that accounts should be prepared on the basis of the received traffic ;

unanimously declares the view

that for the time being there is no point in modifying the existing rules for the drawing up of accounts in the telegraph service, since the provisions of paragraph 901 of the Telegraph Regulations permit Administrations and Recognized Private Operating Agencies to adopt such measures as they consider appropriate for drawing up accounts.

G.15. Accounting in the "Gentex" service

(Geneva, 1956)

The C.C.I.T.,

considering

that by reason of the operation of the "Gentex" service a greater number of telegraph offices are asked to collect the data required for international accounts ;

that the rendering of accounts for incoming traffic obliges all these offices to keep a special record of the international telegrams received ;

unanimously declares the view

that for the needs of the operation of the "GENTEX" service the accounting between Administrations and Recognized Private Operating Agencies should be prepared on the basis of the outgoing traffic.

G.16. General study of tariffs in the European system

(Geneva, 1956)

The C.C.I.T.,

considering

1. the decision taken by the Study Group, at its meeting in July, 1955, to set up a working party,
— to draw up a questionnaire for transmission to all the Administrations of the European system asking for information, to be furnished confidentially, in regard to the current cost of each of the different operations involved in the treatment of telegrams of the European system ;
— to examine the data so furnished and to present a report, in the light of the data, upon the principles to be followed in establishing rates for European telegrams ;
2. the report established by the working party (annexed below) ;
3. the value of this report for tariff studies which may be undertaken by all the Administrations and Recognized Private Operating Agencies of the European system,

unanimously declares the view

- a) that the report by the working party should be sent by the Director of the C.C.I.T.T. to all the Administrations and Recognized Private Operating Agencies of the European system ;
- b) that the said Administrations and Recognized Private Operating Agencies should make known their comments and suggestions as soon as possible, and in any case not later than 1 June, 1957, so that a meeting of the appropriate Study Group of the new C.C.I.T.T. may be held before proposals are handed in for the Telegraph and Telephone Conference, which is scheduled to take place in the second half of 1958 ;

instructs

the Director of the C.C.I.T.T. to give effect to the provisions of this Recommendation.

Report from the working party set up to study the costs involved in the handling of telegrams in the European system

1. The questionnaire drawn up by the Working Party of Study Group X was sent to the Administrations of the European system. From among some thirty Administrations, eleven replies have been received, which may be regarded as a satisfactory proportion.
2. After examining these replies, the Working Party agreed to adopt the various elements which have been entered in the Questionnaire (Annex 1) as a basis for its calculations. During the discussions, it was made clear that the costs of computing the charges for telegrams accepted by telephone or Telex were included in the figure inserted against paragraphs b) and c) of the first part of the Questionnaire. It was also pointed out that in the second part dealing with the delivery of telegrams an item c) bis should be added in respect of operations at the receiving telegraph centre, analogous to item d) in the first part.

A. Calculations of the cost of an outgoing telegram : first part of the Questionnaire

Fixed amount

Telegrams handed in at the counter

- a) 1. 55 gold centimes
2. 20 gold centimes

(G.16)

	Telegrams accepted by telephone	
b)	90 gold centimes
	Telegrams accepted by Telex	
c)	70 gold centimes
	Average cost of acceptance operations :	
	25 % at 75 c. =	1875
	60 % at 90 c. =	5400
	15 % at 70 c. =	<u>1050</u>
	Per hundred telegrams	8325
	Per telegram	83.25
	plus	
d)	<u>12</u>
		95.25 gold centimes

Variable amount

To determine circuit costs, consideration was given to the findings contained in the report prepared by the Working Party of Study Group XI entrusted with the establishment of the costs of an international telegraph circuit.

It may be useful to recall that these costs are as follows :

One end of a voice-frequency channel . . .	1500 gold francs per year
Per hundred km of circuit	900 gold francs per year

According to these figures, the cost of an international circuit 300 km long (average length accepted by the Working Party) amounts to 4,200 gold francs.

Assuming that such a circuit can handle 5000 words per day for 300 days, the circuit-share in the transmission (or reception) of one word is

$$\frac{4200}{5000 \times 300} = 0.28 \text{ gold centimes.}$$

For the cost of transmission, allowance was made for the fact that a telegram from a place other than the town in which the international telegraph office is situated gives rise, within the country considered, to a double operation (transmission-reception). It was not thought necessary to consider a circuit-share for transmission over the internal network as the coefficient 1.3 adopted for the average number of transmissions over this network (item 3b), 4) of the Questionnaire) seems adequate to cover both handling and circuit costs.

Taking into account the standards found for items 3, a), 1., 2., and 3, b) 3.-3., b), 4., the cost of transmitting one word is

60 % at 2 centimes	
40 % at 4 centimes × 1.3,	

i.e., 3.28 gold centimes.

The total cost of transmitting (or receiving) one word is thus

0.28	
<u>3.28</u>	
3.56	gold centimes per word.

As an indication, the cost of a telegram of 15 words (average length of an ordinary telegram) is thus

1. Fixed amount	0.9525 gold francs
2. Variable amount, 3.56 × 15	<u>0.534</u> gold francs
Total	1.4865 gold francs

to which should be added 10 % overheads, which brings the cost up to 1.63 gold francs in round figures.

B. Calculation of costs for the delivery of telegrams : second part of the Questionnaire

Fixed amount

Delivery by messenger :

a) 1.	80 gold centimes
2.	<u>20</u> gold centimes
	100 gold centimes

Delivery by telephone :	
b)	90 gold centimes
Delivery by Telex :	
c)	60 gold centimes
Average cost of delivery operations :	
60 % at 100 c.	= 6000
20 % at 90 c.	= 1800
20 % at 60 c.	= <u>1200</u>
Per hundred telegrams	9000
Per telegram	90 gold centimes
Plus	
c) bis	<u>10</u> gold centimes
Total.	100 gold centimes

Variable amount

This is established as for outgoing telegrams (see above). As an indication, the cost of a telegram routed over a circuit 300 km long is 1 gold franc plus 0.534, that is, 1.534 plus 10 % overheads = 1.68 gold francs in round figures.

C. Average cost of transit operations

Considering the elements available, the Working Party thought fit to establish the cost per word of a transit telegram.

Three cases were examined.

1. Direct transmission without VF repeaters in the intermediate country.
2. Direct transmission with VF repeaters in the intermediate country.
3. Transit with retransmission in the intermediate country.

In all three cases allowance was made for a circuit with an average load of 5000 words per day during 300 days.

First case

On the basis of 900 gold francs per 100 km per year, the cost of one word in transit amounts to 0.06 gold centimes per 100 km.

Second case

Fixed amount applicable to the two VF equipments of the intermediate country (1,500 gold francs per equipment per year) :

Per word. 0.20 gold centimes

Variable amount, as above :

0.06 gold centimes per 100 km.

Third case

It is recalled that the transmission (or reception) of one word was estimated at 2 gold centimes. The cost of one word in this case is thus

$$(2 + 2) 1.1 + 0.2 + 0.06 \frac{\text{km}}{100}$$

the figure 1.1 being adopted to make allowance for the 10 % increase for overheads. This increase does not apply to the two other elements as the Working Party of Study Group XI had already included it in its figures.

Questionnaire on the cost of the various operations involved in the handling of international telegrams (European System) completed by the figures adopted by the working party

Note : The costs are expressed in centimes of the gold franc.

FIRST PART

Acceptance of telegrams

Note : Expenses involved in the acceptance of telegrams are indicated *per telegram* irrespective of the number of words or category.

a) <i>Handing-in at the counter of a telegraph office</i>											
1. Expenses in connection with the acceptance of the telegram, counting of words, recording, collection of charges		55									
2. Expenses in connection with the transport of the telegram from the handing-in office to the telegraph office (this transport may be by messenger, pneumatic tube, telephone, telegraph, etc.)		20									
b) <i>Acceptance by telephone</i>											
Expenses in connection with the reception of an outgoing telegram telephoned by a user		90									
c) <i>Acceptance by Telex</i>											
Expenses in connection with the reception of an outgoing telegram		70									
d) <i>Miscellaneous Information</i>											
Expenses in connection with operations preliminary to the transmission at the station serving the international telegraph circuit (including internal transport—by messenger, etc. supervision of the routing of telegrams, etc.)		12									
% of telegrams accepted	<table border="0" style="display: inline-table; vertical-align: middle;"> <tr> <td style="font-size: 2em; vertical-align: middle;">}</td> <td>— at the counter</td> <td>25</td> </tr> <tr> <td></td> <td>— by telephone</td> <td>60</td> </tr> <tr> <td></td> <td>— by Telex</td> <td>15</td> </tr> </table>	}	— at the counter	25		— by telephone	60		— by Telex	15	
}	— at the counter	25									
	— by telephone	60									
	— by Telex	15									
	Total	100									

SECOND PART

Delivery of Telegrams

Notes :

Delivery costs are not included in the case of letter-telegrams delivered by post.
 Costs of transcription onto an ornamental form in the case of de luxe telegrams are not included.
 Expenses are expressed *per telegram*, irrespective of the number of words or the category.

a) <i>Delivery by messenger</i> :		
1. Calculation of the cost of delivering a telegram by telegraph messenger		80
2. Cost of transporting the telegram from the receiving telegraph office to the telegraph office responsible for sending the messenger (by pneumatic tube, cyclist, telephone, etc.)		20
b) <i>Telephoning the incoming telegram</i>		
Estimated cost		90
c) <i>Transmission to the addressee by Telex</i>		
Estimated cost		60
c) <i>bis Operations at the incoming telegraph office</i>		
Estimated cost		10

(G.16)

d) *Miscellaneous information :*

% of telegrams delivered	{	— by messenger	60
		— by telephone	20
		— by Telex	20
		Total	<u>100</u>

THIRD PART

Expenses in connection with transmission (or reception)

Expenses in connection with the transmission or reception of telegrams are indicated in gold centimes per telegraph word.

a) *Transmission or reception costs :*

1. Estimated cost per word for transmission or reception of a telegram at a station operating an international telegraph circuit 2
(Expenses internal to the international telegraph office, excluding circuit expenses)
2. Estimated cost per word for transmission or reception on the internal network. 2

b) *Miscellaneous information*

1. Average length of international telegraph circuit sections in your country (round figures) 300 km
2. Estimate the average load (in number of words and per day) of an international telegraph circuit (or channel) 5000 words
3. In international outgoing or incoming traffic, what is the percentage of telegrams to or from the town in which the international telegraph office is situated (traffic giving rise to no retransmission in the internal network) 60 %
4. Estimate the average number of transmissions required to pass telegraph traffic in your country's network 1.3
5. What is the average length of telegrams of the European system ?
 - ordinary telegrams 15 words
 - ELT letter-telegrams 30 words

FOURTH PART

Overheads

By what percentage should the figures for operating cost indicated in the Questionnaire be increased to cover overheads. 10 %

*Cost per word of an incoming or outgoing international telegram—variable amount—
for different circuit lengths*

Length of circuit 1	Cost of Circuit 2	Circuit share in transmission of one word 3	Cost of transmission 4	Total cost per word (3 + 4) 5
300 km	4,200 gold francs	0.28 gold centimes	3.28 gold centimes	3.56 gold centimes
400 »	5,100 »	0.34 »	3.28 »	3.62 »
500 »	6,000 »	0.40 »	3.28 »	3.68 »
600 »	6,900 »	0.46 »	3.28 »	3.74 »
700 »	7,800 »	0.52 »	3.28 »	3.80 »
800 »	8,700 »	0.58 »	3.28 »	3.86 »
900 »	9,600 »	0.64 »	3.28 »	3.92 »
1000 »	10,500 »	0.70 »	3.28 »	3.98 »

Table showing costs for transit per word according to technique used and in relation to circuit length

Circuit length	Direct transmission	Transmission using VF repeaters			Transit by retransmission			
		Fixed amount for repeaters	Line costs	Total	Fixed amount for repeaters	Line costs	Operator costs	Total
1	2	3	4	5	6	7	8	9
km	gold cent.	gold cent.	gold cent.	gold cent.	gold cent.	gold cent.	gold cent.	gold cent.
100	0.06	0.2	0.06	0.26	0.2	0.06	4.4	4.66
200	0.12	0.2	0.12	0.32	0.2	0.12	4.4	4.72
300	0.18	0.2	0.18	0.38	0.2	0.18	4.4	4.78
400	0.24	0.2	0.24	0.44	0.2	0.24	4.4	4.84
500	0.30	0.2	0.30	0.5	0.2	0.30	4.4	4.90
600	0.36	0.2	0.36	0.56	0.2	0.36	4.4	4.96
700	0.42	0.2	0.42	0.62	0.2	0.42	4.4	5.02
800	0.48	0.2	0.48	0.68	0.2	0.48	4.4	5.08

Resolution G.1

TELEGRAPH RATES FOR TRANSMISSION OF TRANSIT TELEGRAMS

(Geneva, 1956)

The C.C.I.T.,

in view of

- a) Resolution 18 annexed to the Telegraph Regulations, Paris, 1949,
- b) Recommendation G.3 of the C.C.I.T., Arnhem, 1953,
- c) Question 64 of its study programme,

considering

- a) that modern technique makes it possible to establish wire circuits between European countries without common frontiers in an efficient manner and at reasonable cost ;
- b) that the Telex service and the specialized leased networks are using such circuits in appreciable numbers ;
- c) that the fees for the transit sections of Telex and leased circuits are calculated respectively from their time of occupation for Telex traffic and on the basis of a flat rental for leased circuits ;
- d) that on the other hand, as regards the public telegraph service, Administrations and Recognized Private Operating Agencies are entitled to ask, in return for the use of transit sections, fees calculated according to the number of words transmitted and the transit charges per word, as prescribed in the Telegraph Regulations ;
- e) that in certain of these cases and even for comparatively light traffic, the amounts payable to the transit countries can be higher than the prices paid for circuits which are technically identical but are used for the Telex service or for the leased circuit service ;
- f) that nevertheless the fees for the transit sections used both for Telex and lease are regarded as generally adequate ;
- g) that some Administrations have expressed a wish that for direct wire transit, a tariff per circuit with a maximum rate based on the leased circuit system shall be applied ;

(G.16)

being of the opinion

that efforts should be made to reach a reduction in transit charges or fees when the terminal countries are corresponding by direct communication or by automatic selection for the transmission of telegrams in the public telegraph service, until such time as the question of terminal and transit rates in the European system has been studied ;

expresses the opinion

1. that by special arrangement terminal and transit Administrations and Recognized Private Operating Agencies might as far as possible agree on a reduced transit charge per word for a given relation with, if appropriate, a minimum monthly charge for the availability of the circuit ;

2. that taking account of paragraph 190 of the International Telegraph Regulations, the special arrangements in question might envisage a reduction in the transit quota per word now included in a given total charge, with a view to the whole or part of this reduction providing a decrease in the total charge per word to be paid by the sender.

H. RECOMMENDATIONS APPLYING TO QUESTIONS OF TELEX SERVICE AND LEASED CIRCUITS

H.1. Draft Regulations for the Subscribers' Telegraph Service by start-stop apparatus in the European system

(former Recommendation 861, Brussels, 1948, amended by provisional Recommendation, 1951 ;
at Arnhem, 1953 and at Geneva, 1956)

The C.C.I.T.,

unanimously declares the view

that the following Regulations should be adopted for the Subscribers' Telegraph Service in the European system :

REGULATIONS FOR THE SUBSCRIBERS' TELEGRAPH SERVICE BY START-STOP APPARATUS IN THE EUROPEAN SYSTEM

TABLE OF CONTENTS

CHAPTER I		
<i>Application of the Regulations—Definitions</i>		
Art. 1	General provision	194
Art. 2	Scope of the Regulations	194
Art. 3	Definitions	194
CHAPTER II		
<i>International Telex network—Nature and duration of the Telex service</i>		
Art. 4	Constitution of international Telex circuits	195
Art. 5	Rapid Telex service	196
Art. 6	Duration of service—Legal time	196
CHAPTER III		
<i>General provisions relating to Telex correspondence</i>		
Art. 7	Restrictions on the use of a Telex station	196
CHAPTER IV		
<i>Directories</i>		
Art. 8	Compilation of directories	197
Art. 9	Supply of directories	197
CHAPTER V		
<i>Classes of Telex calls</i>		
Art. 10	Classes of Telex calls	198
Art. 10 bis	Telex calls concerning the safety of life	198
Art. 11	Government Telex calls	198
Art. 12	Service Telex calls	199
Art. 13	Ordinary private Telex calls	199
Art. 14	Subscription Telex calls	199
Art. 15	Requests for information	200

(H.1)

CHAPTER VI

Booking of Telex calls

Art. 16	Form of booking of Telex calls	200
Art. 17	Validity of Telex bookings	200
Art. 18	Modification of Telex bookings	200

CHAPTER VII

Priority and operating procedure

Art. 19	Priority of Telex calls	200
Art. 20	Establishment and disconnection of Telex calls	201
Art. 21	Limitation of the duration of Telex calls	201
Art. 22	Organization of the rapid Telex service by telegraph circuits	202
Art. 23	Signalling in the service	202
Art. 24	Supplementary provisions for signalling	202
Art. 25	Operating procedure on international Telex positions	203
Art. 26	Code expressions used in the Telex service	204

CHAPTER VIII

Characteristics of the start-stop apparatus

Art. 27	Characteristics of the start-stop apparatus	204
---------	---	-----

CHAPTER IX

Tariffs and charging—adjustment of charges and reimbursements

Art. 28	Telex rates	205
Art. 29	Chargeable duration of a Telex call	205
Art. 30	Composition of the tariff	206
Art. 31	Charging during periods of light traffic	206
Art. 32	Charges for government Telex calls	206
Art. 33	Charges of subscription Telex calls	206
Art. 34	Charges for requests for information	207
Art. 35	Right to round off charges	207
Art. 36	Fixing of monetary equivalents	207
Art. 37	Charges in particular cases—adjustment of charges and reimbursements	208

CHAPTER X

Accounting

Art. 38	Accounting	208
---------	----------------------	-----

CHAPTER XI

Directives for subscribers

Art. 39	Operating procedure for Telex communication	209
---------	---	-----

	<i>ANNEX I</i> Operating procedure for Telex communication	209
--	--	-----

	<i>ANNEX II</i> Use of emergency routes	211
--	---	-----

CHAPTER I

Application of the Regulations—Definitions

Article 1

General provision

These Regulations fix the rules to be followed for the subscribers' telegraph service, permitting the users to communicate directly and temporarily by means of start-stop apparatus. This service is called Telex service.

Article 2

Scope of the Regulations

(1) The provisions of the present Regulations shall apply to the international Telex services of the European system as defined by the Telegraph Regulations.

(2) Countries outside the European system may decide to apply the provisions of the present Regulations.

Article 3

Definitions

1. *Booking of a Telex call :*

The initial request made by a subscriber for obtaining a Telex call.

If the method of operation in the country of origin makes it necessary for the calling subscriber to renew his request, each time that the initial or subsequent requests have been unsuccessful, the booking of a Telex call is the request which receives satisfaction.

2. *Telex call :*

The effect given to the booking of a Telex call when communication has been established between the calling and the called stations.

3. *Government Telex call :*

See Article 11.

4. *Service Telex call :*

See Article 12.

5. *Ordinary private call :*

See Article 13.

6. *Subscription Telex call :*

See Article 14.

7. *Direct Telex call :*

Telex call established by means of a single international Telex circuit.

8. *Telex transit call :*

Telex call established by means of more than one international Telex circuit.

9. *Telex exchange :*

Installation permitting the establishment of Telex calls.

10. *Telex circuit :*

An electric connection permitting the establishment of a Telex communication between two Telex exchanges in both directions.

(H.1)

11. *International Telex circuit* :
Telex circuit connecting two Telex exchanges in two different countries.
12. *Direct transit Telex circuit* :
International Telex circuit passing through one or more transit countries but involving no intermediate Telex exchange.
13. *International Telex terminal exchange* :
A Telex exchange at the end of an international Telex circuit.
14. *Chargeable duration of a Telex call* :
The period of time to be considered for calculating the charge for this call.
15. *Unit charge in a particular international Telex service* :
Charge for an ordinary three-minute Telex call during periods when no tariff reductions are operative.
16. *Normal Telex route* :
The route which must be chosen in the first place for passing Telex traffic in a particular service.
17. *Auxiliary Telex route* :
A route (other than the normal route) to be used whenever it is in the interest of rapidity of the service. Unless there is agreement to the contrary between the countries concerned, the auxiliary Telex route shall pass through the same countries as the normal route.
18. *Emergency Telex route* :
A route to be used in case of complete interruption or major breakdown of the normal and auxiliary routes. Its itinerary differs from that of the normal or auxiliary Telex routes, either because it does not pass through all the countries traversed by the normal or auxiliary routes, or because it traverses one or more countries through which the normal or auxiliary Telex routes do not pass.
19. *International Telex position* :
Manual position in an international terminal Telex exchange, for establishing Telex calls between two countries.
20. *International Telex transit exchanges* :
An international Telex terminal exchange which has been chosen to establish Telex communications between two countries other than its own.

CHAPTER II

International Telex network—Nature and duration of the Telex service

Article 4

Constitution of international Telex circuits and routing

- § 1. International Telex circuits are made up by means of telegraph circuits.
- § 2. The networks of the countries operating the Telex service shall be connected, as far as possible, directly.
- § 3. In case of breakdown, any defective international circuit (or section of an international circuit) must be repaired with all requisite speed, and, pending repair, must be replaced so far as possible and with the minimum delay.
- § 4. Each intermediate Administration (or Recognized Private Operating Agency) shall provide the sections of international circuits passing through the territory which it serves.
- § 5. For each relation, the Administrations (or Recognized Private Operating Agencies) concerned shall, by mutual agreement, decide upon one or more normal Telex routes, and to the extent possible, upon auxiliary Telex routes and emergency Telex routes.

(H.1)

- § 6. In this respect, the Administrations (and/or Recognized Private Operating Agencies) shall conform, as far as possible, with the principles recommended by the C.C.I.T. as regards the constitution and maintenance of circuits and installations.
- § 7. If it should become necessary to use the auxiliary or emergency Telex routes, the countries concerned shall take urgent measures to make them available.
- § 8. The Administrations or Recognized Private Operating Agencies shall forward to the General Secretariat:
 - (a) a list of international Telex circuits in service at 31 December of each year, showing the constitution of these circuits and the location of the regenerative repeaters;
 - (b) a list of the international relations existing at the same date, with an indication of the available routes (normal, auxiliary and emergency).

The General Secretariat shall assemble this information in the form of a document published annually. Any amendments to this document shall be communicated by the Administrations (or Recognized Private Operating Agencies) concerned to the General Secretariat who will bring them to the knowledge of the other Administrations (and Recognized Private Operating Agencies) by means of the fortnightly Notification.

Article 5

Rapid Telex service

- § 1. As far as possible, the Telex service is effected as a demand service. Hence the number of circuits between two networks and the number of positions operated at the international Telex exchange shall be calculated as for such traffic.
- § 2. When the Telex service is effected normally as a demand service, no priority shall be given to certain classes of Telex calls.
- § 3. In cases of congestion or faults, and generally in cases when the Telex service, temporarily, is not effected as a demand service, the provisions of article 19, on priority of communications, shall be in force.

Article 6

Duration of service—Legal time

- § 1. Each Administration (or Recognized Private Operating Agency) shall fix the hours of working of its exchanges.
- § 2. The Administrations (and/or Recognized Private Operating Agencies) concerned shall arrange, so far as possible, to fix the same period of working at neighbouring frontier exchanges which have close relations with each other.
- § 3. International Telex terminal exchanges must, so far as possible, afford continuous service.
- § 4. Exchanges which are not open continuously shall be bound to prolong the service 12 minutes beyond the normal closing hours in favour of Telex calls actually proceeding and those already prepared.
- § 5. Exchanges shall use the legal time of their country or of their zone. Each Administration (or Recognized Private Operating Agency) shall notify this time or times to the General Secretariat which will advise the other Administrations (and/or Recognized Private Operating Agencies).

CHAPTER III

General provisions relating to Telex correspondence

Article 7

Restrictions on the use of a Telex station

- § 1. Administrations reserve the right to suspend the Telex service in the cases mentioned in Articles 29 and 30 of the Convention.
- § 2. Administrations (and Recognized Private Operating Agencies) must refuse to offer Telex service to a telegraphic reforwarding agency well known to be organized for the purpose of transmitting or receiving telegrams intended for telegraphic retransmission with the object of evading the full payment of the charge due for the whole distance.

(H.1)

CHAPTER IV

Directories

Article 8

Compilation of directories

- § 1. As far as possible each Administration (or Recognized Private Operating Agency) shall publish a directory of its subscribers at least once a year (for example, on 1st April).
- § 2. It is to be recommended that directories should have the uniform dimensions of 210 mm. × 148 mm. (A.5).
- § 3. (1) The directory shall be composed of two separate lists, a *list of subscribers* and a *list of answer-back codes*.
(2) The *list of subscribers* shall be drawn up :
(a) in the alphabetical order of the towns where the stations are located ;
(b) within this first classification, in the alphabetical order of the subscribers' names.
(3) It shall be arranged according to the following model :

Town	Subscriber's name and address	Subscriber's exchange	Call number	Answer-back code
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- (4) The *list of answer-back codes* shall be compiled in alphabetical order on the following model :

Answer-back code	Subscriber's name and address	Subscriber's exchange	Call number
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- § 4. (1) The directories sent to the Administrations (and/or Recognized Private Operating Agencies) of a country shall be set up in Roman script.
(2) When they are written in a language other than the language used in that country, they shall be accompanied by an explanatory note to facilitate the use of such directories. This note shall be drawn up in whatever official language of the Union shall have been agreed upon by the Administrations (and/or Recognized Private Operating Agencies) concerned.
- § 5. (1) Once a quarter (for instance, 1 July, 1 October, 1 January) each Administration (or Recognized Private Operating Agency) shall send to the other Administrations a supplement to its directory, containing all the changes that have occurred in the position of its network during the preceding quarter.
(2) The arrangement and lay-out of the supplements must be exactly the same as those of the directories (see § 2 and § 3 above).

Article 9

Supply of directories

- § 1. Each Administration (or Recognized Private Operating Agency) shall supply free of charge to the Administrations (and/or Recognized Private Operating Agencies) of the countries with which Telex service is open, a sufficient number of copies of its subscribers' lists for the benefit of the performance of the service.
- § 2. (1) In order to be able to cope with the subscribers' demands each Administration (or Recognized Private Operating Agency) must inform the other Administrations (and/or Recognized Private Operating Agencies) not later than 1 February, how many directories it will require.

(H.1)

(2) Unless otherwise arranged, these directories shall also be supplied to the Administrations (and/or Recognized Private Operating Agencies) free of charge.

(3) However, distribution of these directories to subscribers must be against payment of an amount in national currency not less than the sale price in the country of origin.

§ 3. (1) A subscriber wishing to obtain a copy of the Telex directory of another country must apply to his own Administration (or Recognized Private Operating Agency).

(2) If an application for its directory is received direct by an Administration (or Recognized Private Operating Agency) from a subscriber in a foreign country, the request shall be forwarded by that Administration (or Recognized Private Operating Agency) to the Administration (or Recognized Private Operating Agency) of the subscriber's country.

CHAPTER V

Classes of Telex calls

Article 10

Classes of Telex calls

§ 1. The following classes of Telex calls shall be admitted :

- (a) Safety of Life Telex calls (SVH) ;
- (b) Government Telex calls ;
- (c) Service Telex calls ;
- (d) Ordinary private Telex calls ;
- (e) Request for information.

§ 2. In addition *subscription* calls may be admitted by special agreement between Administrations (and/or Recognized Private Operating Agencies) concerned. In such cases the provisions of Articles 14 and 33 apply.

§ 3. Administrations (and/or Recognized Private Operating Agencies) may decide by special agreement among themselves to admit classes of Telex calls other than those mentioned above.

Article 10 bis

Telex calls concerning the safety of life

Safety of life calls (SVH) are those requested in accordance with Article 36 of the International Telecommunication Convention, Buenos Aires, 1952.

Article 11

Government Telex calls

§ 1. By analogy with the definition given in Annex 3 to the Convention, *Government Telex calls* are those originating with one of the authorities specified below :

- (a) the Head of a State ;
- (b) the Head of a Government and members of a Government ;
- (c) the Head of a colony, protectorate, overseas territory or territory under suzerainty, authority, trusteeship or mandate of a Member or Associate Member of the United Nations ;
- (d) Commanders-in-Chief of military forces, land, sea, or air ;
- (e) diplomatic or consular agents ;
- (f) the Secretary-General of the United Nations, the Heads of principal organs and the Heads of subsidiary organs of the United Nations ;
- (g) the International Court of Justice at the Hague.

§ 2. The person booking a government Telex call shall be required, if asked to do so, to state his name and rank.

§ 3. A government Telex call shall have priority only if priority has been specifically requested by the calling subscriber.

(H.1)

Article 12

Service Telex calls

- § 1. (1) *Service Telex calls* are those which relate to the working of the international Telex or telegraph service ; such calls may be exchanged free of charge between the Administrations (and/or Recognized Private Operating Agencies) concerned with the international Telex service.
- (2) However, in services between Administrations of the European system, the telephone service may use free of charge the Telex service conducted by Administrations of the European system for the exchange of Telex calls concerning the working of the international telephone service, which shall then be regarded as service Telex calls.
- § 2. Service telex calls may be requested only by persons authorized to do so by their respective Administration (or Recognized Private Operating Agency).
- § 3. The Secretary-General of the Union and the Directors of the International Consultative Committees are authorized to request service Telex calls.
- § 4. Service Telex calls must be made, so far as possible, outside the busiest hours.

Article 13

Ordinary private Telex calls

Ordinary private Telex calls are Telex calls, other than service or government calls, which do not receive any special treatment.

Article 14

Subscription Telex calls

- § 1. *Subscription Telex calls* are those which are arranged to take place daily, between the same stations, at the same time, agreed upon in advance, for the same duration, and which have been booked for at least one whole month, or for one or more indivisible periods of seven consecutive days.
- § 2. Subscription Telex calls must relate exclusively to the personal affairs of the correspondents or those of their firms.
- § 3. (1) Subscription Telex calls shall be subject to the acceptance, by the person requiring them, of a subscription contract. The subscription contract may take effect from any date, but for those taken on a monthly basis the first day of the month shall be regarded as the commencing date. Any balance of payment due for service given prior to that date shall be added to the first monthly account.
- (2) The monthly subscription shall be extended from month to month unless it has been cancelled by either party at least eight days before the end of the current month. Nevertheless, by agreement between the Administrations (and/or Recognized Private Operating Agencies) concerned, earlier cancellation may be permitted, after the first month, subject to eight days notice being given in advance.
- (3) A subscription contract made for one or more indivisible periods of seven consecutive days shall not be renewable by tacit agreement.
- § 4. The time and duration of subscription Telex calls shall be fixed by the international Telex terminal exchanges concerned, with due regard to the subscriber's request and the commitments of the service.
- § 5. If, at the time specified in the subscription contract, there is, between the international Telex terminal exchanges concerned, a circuit on which no Telex call is in progress and on which there is no priority government call on hand, the call shall be set up at the time fixed. Otherwise, it shall be set up as soon as possible on the first circuit fulfilling these conditions after the time fixed.
- § 6. A subscription Telex call shall be definitely disconnected when the caller gives the signal that the call is ended before the expiry of the duration specified for each subscription call. If, at the end of this duration, the caller has not already given the signal that the call is ended, the operator shall warn the caller and disconnect the call, unless the call can be continued without blocking other traffic.
- § 7. Subscribers shall arrange for their stations to be free at the time fixed for the call.

Article 15

Requests for information

A request for information is a request made by a person with the object of ascertaining :

- (a) whether a certain person, whose name is given, together with the additional details necessary for identification (for example, his complete address), is a Telex subscriber, and if so, what is his call number and answer-back code.
- (b) the name of the person to whom a given call number or answer-back code in a specified Telex system is allotted.

CHAPTER VI

Booking of Telex calls

Article 16

Form of booking of Telex calls

In the booking of a call, the Telex installation of the subscriber required must be designated by the name of the country, the subscriber's exchange and call number, as it appears in the official directory of the country concerned.

Article 17

Validity of Telex bookings

In case the Telex service is not effected on a demand basis, bookings of Telex calls not completed shall cease to be valid :

- (1) where all the exchanges concerned are open continuously :
 - (a) at midnight, if the Telex call has been booked before 10 p. m. on the same day ;
 - (b) at 8 a. m. if the Telex call has been booked after 10 p. m. the previous evening.
- (2) Where all the exchanges concerned are not open continuously : at the time of closing of the Telex service at the end of the day.

Article 18

Modification of Telex bookings

- § 1. In the case of all bookings of Telex calls, and subject to the provisions of article 17, relative to the validity of bookings, the caller may, so long as the required subscriber has not been obtained :
 - (a) cancel his booking ;
 - (b) specify the time after which the booking should be cancelled ;
 - (c) change the number of the station required within the territory of the country of destination.
- § 2. Modifications of bookings shall be permitted free of charge; the Administration (or Recognized Private Operating Agency) of origin may, however, make a special charge covering the additional work of recording. This charge shall not enter into the international accounts.

CHAPTER VII

Priority and operating procedure

Article 19

Priority of Telex calls

- § 1. In the circumstances envisaged in Article 5, § 3, international Telex calls shall be connected in the following order :
 - (a) Telex calls concerning safety of life, which benefit by the provisions of Article 36 of the International Telecommunication Convention of Buenos Aires, 1952 ;
 - (b) service calls concerning the re-establishment of international telecommunication links which have been totally interrupted ;

(H.1)

- (c) Government Telex calls for which priority has specifically been requested ;
- (d) Government Telex calls for which priority has not been requested, ordinary private Telex calls, service Telex calls other than those mentioned in (b).

§ 2. In the international Telex terminal exchange, calls shall take rank according to their category and the time of their receipt at this exchange (see Article 20 § 6 (2)).

Article 20

Establishment and disconnection of Telex calls

- § 1. Administrations (and/or Recognized Private Operating Agencies) shall agree directly between themselves upon the most appropriate method of operation to be applied in the international relations that concern them, account being taken of the undermentioned provisions.
- § 2. In the manual service, all bookings, modification of bookings and advices of cancellation shall be transmitted as quickly as possible to the international Telex terminal exchange charged with establishing the Telex calls booked.
- § 3. In the manual service calling signals on international circuit must be answered immediately. If, after a suitable period of calling the exchange called does not reply, it shall be asked by any appropriate means to resume the service on the international circuit in question; any international Telex terminal exchange that is in a position to help in this matter must do so.
- § 4. For the operation of international Telex circuits, the French language shall be used between Administrations (and/or Recognized Private Operating Agencies) having different languages, in the absence of special agreements between them for the use of other languages.
- § 5. International Telex terminal exchanges connected with each other by several international Telex circuits, may, by mutual agreement, allocate certain of these circuits specially for the establishment of Telex transit calls or for the passing of Telex traffic in one direction only.
- § 6. (1) In the case of manual switchboards in the country of origin and destination and when there is congestion on a particular international Telex route, recourse may be had to the advance preparation of calls. Preparation shall consist in completing all the operations necessary in order that the two stations (calling and called) may be connected together without any loss of time on the international circuit.
(2) On circuits which have not been allocated for the passing of traffic in a single direction, Telex calls of the same category are, in principle, established in alternate order; the international Telex terminal exchanges concerned may, by mutual agreement, modify temporarily the conditions of alternation, if that would be advantageous from the point of view of the flow of traffic and maintenance of the chronological order, as laid down in Article 19, § 2.
(3) Telex calls already prepared must not be delayed for the benefit of calls of superior rank, with the exception of SVH calls.
- § 7. Without prejudice to the provisions of article 25 the operator directing the calls at the international Telex position shall verify that transmission between the correspondents is satisfactory; he shall note the time when the call is established as well as the time when the Telex call ends and/or its duration. He shall record service incidents and other items, necessary for the preparation of the international accounts.
- § 8. With the exception of the cases provided for in Article 14, § 6 and Article 21, § 3 operators are forbidden to cut off, or to break into, an established call which is proceeding normally.

Article 21

Limitation of the duration of Telex calls

- § 1. (1) In general, the duration of ordinary private Telex calls and service Telex calls shall not be limited.
(2) However, in case of congestion, the international terminal Telex exchanges concerned may agree to limit the duration of calls to twelve or even to six minutes.
- § 2. (1) The duration of government Telex calls shall not be limited.
(2) However, transit Administrations (and/or transit Recognized Private Operating Agencies) shall have the right, in the case of breakdown or congestion, to limit the duration of government Telex calls to twelve minutes when these calls are established through the intermediary of one of their exchanges.
(3) The operator of the transit country in such a case shall advise the controlling operator that restrictions on duration are in force.
- § 3. If the duration of the call is limited, the caller shall be informed, when the call is about to be connected, that it will be cut off after the due time.

Article 22

Organization of the rapid Telex service by telegraph circuits

- § 1. It is strongly recommended that the Telex network of each country be on an automatic switching basis and that the operator of the originating international Telex position be able to select the called subscriber directly.
- § 2. Wherever the above conditions are realized, the operator of the originating international Telex position will receive the demand, and establish and control the call. The equipment of the outgoing position must be adapted to that of the Telex networks of the country of destination.
- § 3. The operator of the originating international position must be acquainted with the necessary operating particulars of the network of the country of destination. The Administration of arrival will give all the necessary technical information to the Administration of departure.
- § 4. Two Administrations may agree to introduce automatic switching by direct selection between the subscribers of their respective networks without the assistance of an international Telex position.
- § 5. If the two networks employ manual switching, the conditions must be such as to permit, as far as possible, of demand service; the calls must be controlled by the operator of the originating country.
- § 6. (1) If one network employs manual switching and the other automatic switching, the originating international Telex position will control the call.
(2) If, however, the country of destination has an automatic switching system, the Administrations interested may agree to allow the operator of the originating international Telex position to select directly the called subscriber where the conditions of § 2 and § 3 above are realized.
(3) Inversely, if it is the originating country that has an automatic switching system, the Administrations concerned may agree to allow calls from the originating country to arrive automatically at the international Telex position in the country of destination, which will control these calls.

Article 23

Signalling in the service

(See C.C.I.T. Recommendation E.1)

Article 24

Supplementary provisions for signalling

- § 1. The international Telex position must be equipped in such a way as to receive the clearing signal from both sides.
- § 2. A signal to recall the operator of that position to an established connection is not foreseen.
- § 3. Precautions must be taken that in the event of the operator of the international Telex position delaying to remove the plug on reception of the clearing signals, a new call from a subscriber on one network shall not pass to the other network.
- § 4. When communication has been established, the answer-back signals of apparatus used at the intermediate Telex positions must not be sent to line, when figure-shift D is received.
- § 5. The international Telex position must be provided with equipment to determine the chargeable time of calls controlled by these positions, this timing equipment to be brought into operation in accordance with the provisions of article 25, but to be stopped on receipt of the first clearing signal.
- § 6. (1) The subscriber's equipment must be arranged in such a way that :
 - (a) a call can be received, the answer-back taken, the message transmitted and the connection cleared without the intervention of the called subscriber ;
 - (b) the motor of the teleprinter will rotate continuously for the duration of an established Telex connection ;
- (2) When a subscriber's equipment is connected with a line used by the telephone as well, the stipulations of this paragraph are not necessarily applicable.

(H.1)

- § 7. In exceptional cases, Administrations may grant to subscribers the facility to free themselves from the stipulations of Article 24, § 6, 1 (a) for periods previously notified. In such cases means must be provided for the transmission of the code expressions ABS either automatically, or in the case of manual exchanges, by the incoming switchboard operator.
- § 8. If a subscriber's apparatus is such that he can use his teleprinter outside communication periods in order to prepare perforated tapes, for local checking of those tapes, for staff training, etc., the possibility of taking the answer-back may be delayed for a period not exceeding 3 seconds after connection is established with the called subscriber.

Article 25

Operating procedure on international Telex positions

- § 1. (1) If the called subscriber can be obtained directly by the controlling international Telex operator (according to article 22), this operator :
- (a) holds the calling subscriber and selects a free circuit ;
 - (b) selects the called subscriber ;
 - (c) establishes communication with the called subscriber and obtains the answer-back of the called subscriber which must also be received by the calling subscriber ;
 - (d) obtains the answer-back of the calling subscriber which must also be received by the called subscriber ;
 - (e) operates the timing equipment ;
 - (f) on reception of the clearing signal, clears down the connection.
- (2) If the called subscriber is engaged, the controlling international Telex operator signals OCC, followed by RAP in the case where the calling subscriber has to be re-called, and then cuts off the calling subscriber.
- § 2. (1) If the called subscriber is obtained by two international Telex positions :
- (a) the controlling international Telex operator holds the calling subscriber and selects a free circuit ;
 - (b) the operator at the second international Telex position announces himself by the abbreviated name of his Telex exchange ¹ ;
 - (c) the controlling international Telex operator signals the particulars of the called subscriber ;
 - (d) the operator of the second international Telex position :
 - 1. holds the circuit from the international Telex position at which the call is controlled,
 - 2. selects the called subscriber,
 - 3. signals the letters DF to the controlling international Telex position,
 - 4. establishes communication between it and the called subscriber ;
 - (e) the controlling international Telex operator :
 - 1. establishes communication with the calling subscriber and obtains the answer-back of the called subscriber, which must be received at the same time by the calling subscriber,
 - 2. obtains the answer-back of the calling subscriber which must also be received by the called subscriber,
 - 3. operates the timing equipment,
 - 4. on receiving the clearing signal, clears down the connection.
- (2) If the called subscriber is engaged, the operator of the second international Telex position signals OCC and clears down the international circuit.
- § 3. (1) If the called subscriber is obtained by more than two international Telex positions :
- (a) the controlling international Telex operator holds the calling subscriber and selects a free circuit ;
 - (b) the operator at the second Telex position announces himself by his abbreviated name (see § 2 (1 (b))) ;
 - (c) the controlling international Telex operator signals the particulars of the called subscriber ;
 - (d) the operator at the second international Telex position connects the third international Telex position and signals THRU to the calling international Telex position ;
 - (e) the operator of the third international Telex position announces himself by his abbreviated name (see § 2 (1 (b))) ;
 - (f) the controlling international Telex operator signals the particulars of the called subscriber ;

¹ It is recommended that, as far as possible, the abbreviated name of the Telex exchange shall be transmitted by means of the answer-back unit and shall be so constituted as to permit the identification of the operator's position concerned in the connection of an international call.

- (g) the operator of the third international Telex position :
1. holds the circuit from the international Telex position at which the call is controlled,
 2. selects the required subscriber,
 3. signals the letters DF to the controlling international Telex position,
 4. establishes communication between it and the called subscriber ;
- (h) the controlling international Telex operator :
1. establishes the communication with the calling subscriber,
 2. obtains the answer-back of the called subscriber, which must also be received by the calling subscriber,
 3. obtains the answer-back of the calling subscriber, which must also be received by the called subscriber,
 4. operates the timing equipment,
 5. on receiving the clearing signal, clears down the connection.
- (2) If the operator of the second international Telex position finds all the circuits to the third position engaged, he should signal NC and clear down the international circuit.
- (3) If the called subscriber is engaged, the international Telex operator of the exchange of arrival should follow the procedure indicated in § 2 (2).
- § 4. All instructions necessary for the efficient handling of a subscriber's international Telex traffic may only be given to that subscriber through the medium of the international terminal exchange to which he is connected.

Article 26

Code expressions used in the international Telex service

In service correspondence the following code expressions should be used :

ABS	absent subscriber, office closed
BK	I cut off
CFM	confirm
COL	collation
CRV	how do you receive ?
DER	out of order
DF	you are in communication with the called subscriber
G	you may transmit
MNS	minutes
MOM	wait, waiting
NA	correspondence to this subscriber is not admitted
NC	no circuits
NP	the called party is not, or is no longer a subscriber
OCC	subscriber is engaged
OK	agreed
P, or figure O,*	stop your transmission
QOK	do you agree ?
R	received
RAP	I will call you again
RPT	repeat
SVP	please
TAX	what is the charge ?
TEST SVP	please send a test message
THRU	you are in communication with a Telex position
TPR	teleprinter
E E E	error

* To be repeated until the transmission is brought to a stop.

CHAPTER VIII

Characteristics of the start-stop apparatus

Article 27

Characteristics of the start-stop apparatus

The start-stop apparatus used in the Telex service must have the following characteristics :

- (1) The transmission signals are those of the start-stop apparatus, based on the International Alphabet No. 2 as mentioned in the Telegraph Regulations.

(H.1)

- (2) The receivers shall be able to work with seven signals of equal duration.
- (3) The modulation rate is 50 bauds.
The number of characters that a line of the page-printing apparatus may contain is fixed at 69.
- (5) The subscriber's start-stop apparatus must be equipped with an answer-back device having the subscriber's code, which is released by the signal corresponding to the secondary of letter "D".
- (6) The answer-back transmission comprises a series of 20 signals, as follows :
 - 1 signal " letters "
 - 1 carriage return
 - 1 line-feed
 - 1 signal " letters " or " figures " (as appropriate)
 - 15 signals, at the choice of each Administration, for the composition of the subscriber's code
 - 1 signal " letters ".
- (7) When a subscriber's code is composed of less than 15 characters, as many " letters " signals are interspersed as are necessary to make up the 15, this being done with a view to giving the calling subscriber the possibility of seeing clearly the end of the transmission of the called subscriber's code.
- (8) For the composition of the code, it is recommended that an abbreviated name designating the subscriber should be used, followed by the name of the locality where he resides; nevertheless, Administrations are at liberty to employ any other way of composing the answer-back code, in particular by using the subscriber's number.
- (9) The nominal duration of the transmitting cycle should be at least 7.4 units (preferably 7.5), the stop element lasting for at least 1.4 units (preferably 1.5).
- (10) The receiver must be able to translate correctly in service the signals coming from a transmitter with a nominal transmitting cycle of 7 units.

CHAPTER IX

Tariffs and charging—Adjustment of charges and reimbursements

Article 28

Telex rates

- § 1. The unit charge is the charge in respect of an ordinary private Telex call of three minutes' duration, effected during periods when no reduction in tariff is operative.
- § 2. The amount of the unit charge be fixed on the basis of the gold franc by agreement between the Administrations (and/or Recognized Private Operating Agencies) concerned.
- § 3. The unit charge expressed in gold francs shall always be the same in both directions in a given relation, regardless of the Telex route (normal, auxiliary, emergency) used for the establishment of a communication in this relation.
- § 4. Except where there are arrangements to the contrary between the Administrations and/or Recognized Private Operating Agencies concerned :
 - (1) Any Telex call of a duration of three minutes or less shall be charged as for three minutes ;
 - (2) When the duration of a call exceeds three minutes, a charge per minute shall be made for the period in excess of the first three minutes. Any fraction of a minute shall be charged as for one minute. The charge per minute shall be one-third of the charge for three minutes.
- § 5. The provisions of this article shall not apply to services between frontier districts. The Administrations (and/or Recognized Private Operating Agencies) shall determine by agreement between themselves the rate to be applied according to the case.

Article 29

Chargeable duration of a Telex call

- § 1. The chargeable duration of a Telex call begins at the moment the connection is established between the calling and the called subscribers.
- § 2. It ends the moment when the calling or called subscriber gives the clearing signal.

- § 3. After each Telex call, the operator of the international Telex position at the caller's end shall determine the chargeable duration of the call, unless different arrangements have been made by agreement between the Administrations (and/or Recognized Private Operating Agencies) concerned, taking into account, where necessary, any difficulties of transmission or any incidents which he may observe. The operator may, if he considers it appropriate, agree on this subject with the international Telex position on the side of the called subscriber.
- § 4. If after a call, a subscriber claims a reduction in charges as a result of difficulties or incidents during a call, he may be invited by his Administration to supply copies of the message in question as transmitted and received. If the faults are clearly attributable to either of the subscribers, no reduction in the charge shall be made.

Article 30

Composition of the tariff

- § 1. The rates for Telex calls referred to in Article 28 shall be made up of the terminal rates and any transit rate or rates.
- § 2. Each Administration (and/or Recognized Private Operating Agency) shall fix its terminal and transit rates.
- § 3. (1) For the fixing of terminal rates, the territory of the Administrations (and/or Recognized Private Operating Agencies) concerned may be divided into charge zones.
(2) Where there is a division into charge zones it is understood that, in a given international relation and over a given route, the terminal rate shall be uniform within each charge zone.
(3) Each Administration (or Recognized Private Operating Agency) shall fix the number and extent of the charge zones for its services with each of the other Administrations (and/or Recognized Private Operating Agencies).
(4) It is however desirable that the number of charge zones should be kept to a minimum.

Article 31

Charging during periods of light traffic

- § 1. (1) Administrations (and/or Recognized Private Operating Agencies) shall decide between themselves during what periods of light traffic a reduction in rates may be considered.
(2) In relations for which such arrangements have been made, the charge applied for any Telex call during a period of light traffic shall be equal to three fifths (3/5) of the charge which would be applied to such a call during a period in which no reduction in charge is operative. This provision shall not, however, affect Article 28, § 5.
- § 2. Telex calls extending into both the period during which no reduction in charge is operative and the period of light traffic shall be charged as follows :
- (a) for a Telex call not exceeding three minutes in duration : the tariff in force in the Administration (or Recognized Private Operating Agency) of origin at the moment when the call begins ;
- (b) for a Telex call exceeding three minutes in duration : the first three minutes shall be charged in accordance with the tariff in force in the Administration (or Recognized Private Operating Agency) of origin at the moment when the call begins ; the additional minutes shall be charged in accordance with the tariff in force in the system of that Administration (or Recognized Private Operating Agency) at the moment when each of these minutes begins.

Article 32

Charges for Government Telex calls

Government Telex calls shall be charged as ordinary private Telex calls.

Article 33

Charges for subscription Telex calls

- § 1. In general, subscription Telex calls shall be subject to the charge for ordinary private Telex calls of the same duration exchanged during the same period.

(H.1)

- § 2. However, if a demand service is impossible during certain periods of heavy traffic, as may be determined for each relation by the international Telex terminal exchanges concerned, then Administrations (and/or Recognized Private Operating Agencies) may agree between themselves to apply to subscription Telex calls a charge as a maximum equal to twice the charge for an ordinary private Telex call of the same duration, exchanged during a period in which no reduction for ordinary private Telex calls is operative.
- § 3. When a Telex demand service is in force in any particular relation, the Administration (and/or Recognized Private Operating Agency) concerned may agree to admit subscription Telex calls lasting longer than 60 minutes; these calls to be charged 75 % of the charge for the period in which the subscription call is in course.
- § 4. (1) The monthly subscription charge shall be reckoned on the basis of thirty days.
(2) The monthly subscription charge may, however, be reckoned on the basis of twenty-five days, if the subscriber waives the use of his subscription on any one day of the week, being the same one each week and being specified in advance in the agreement.
(3) The subscription charges for one or more periods of seven consecutive days shall be reckoned on the basis of seven days, but no reduction shall be admitted if the subscriber waives the use of one or more calls.

Article 34

Charges for requests for information

- § 1. A request for information is charged for in the international service only if it is not accompanied by the booking of a call and if also it involves the use of an international circuit.
- § 2. In such circumstances the charges made for the request for information shall be one third (1/3) of that pertaining to a three minute Telex call exchanged between the person requesting the information and the person about whom the information is requested, during the charging period in which the request for information is forwarded by the international terminal exchange of origin.

Article 35

Right to round off charges

- § 1. The charges to be collected in accordance with agreements made between Administrations (and/or Recognized Private Operating Agencies) may be rounded up or down to meet the monetary or other convenience of the country of origin.
- § 2. Modifications adopted by virtue of the foregoing paragraph shall apply only to the charge collected in the country of origin and shall not involve any alteration in the share of the charges proper to the other Administrations (and/or Recognized Private Operating Agencies) concerned. The rates must be rounded up or down to the monetary unit or fraction of the monetary unit in use in the country concerned.

Article 36

Fixing of monetary equivalents¹

- § 1. For the collection of charges from the public, each country should, in principle, apply to the rate expressed in gold francs an equivalent in its national currency approaching as nearly as possible to the value of the gold franc. However, when the equivalent is not applied or when the equivalent applied is less than the true equivalent, the accounts shall nevertheless be prepared in gold francs in conformity with Article 30.
- § 2. (1) Each country should, so far as practicable, notify to the General Secretariat the equivalent it has chosen, as well as the date from which it will collect charges according to such equivalent.
(2) The General Secretariat shall draw up a table of the information it receives and forward it to all Members and Associate Members. It shall also inform them of the date on which new charges based on any new equivalent come into force, and shall bring any subsequent information to their notice.

¹ Common provisions of the Telegraph and Telephone Regulations.

Article 37

Charges in particular cases

Adjustment of charges and reimbursements

- § 1. (1) When, through the action of the Telex service, correspondents experience difficulty in the course of a Telex call, the chargeable duration of the call shall be reduced to the total time during which Telex conditions have been satisfactory; the international Telex position of origin shall decide, by virtue of article 29 § 3, whether the charge for the minimum period of three minutes shall be paid.
- (2) Any complaint made after the completion of the call shall be investigated by the international terminal exchange of origin. According to circumstances, the international terminal exchange or exchanges concerned shall communicate direct to the international terminal exchange of origin the information which may be necessary for the enquiry.
- § 2. (1) When, through the action of the correspondents, a subscription call has not taken place or has not lasted for the prescribed duration, no compensation shall be given and no reimbursement made.
- (2) When, through the action of the Telex service, it has not been possible for a subscription call to take place, or for it to last for the prescribed duration, such a call shall be replaced by a call of a duration equivalent to the time not used, to be exchanged as soon as practicable after the prescribed time, with priority over other calls of the same class. If the call cannot be replaced or made good in this manner, only the charge proper to the time used shall be included in the international accounts. In reckoning the charge for the time used, the charge relative to the whole time prescribed for a subscription call shall be taken as the basis, and this basic charge shall be equal to one twentyfifth (1/25) or one thirtieth (1/30) of the amount of the monthly subscription, irrespective of the month concerned. For a subscription call contract made for seven consecutive days, the basic charge shall be equal to one seventh (1/7) of the amount of the subscription.
- § 3. For any Telex call, other than a subscription Telex call, in the case of refusal by the calling station or in the absence of a reply from the latter when it is rung to take the call, the cost of one minute of ordinary private call exchanged between the two stations concerned during the charge period in which the refusal or the non-reply took place shall be payable.
- § 4. A call booked with an incorrect number and established with the station having that number shall be charged as for a duration of three minutes. If the incorrect booking is replaced immediately by another booking of a call to the same country, however, only the cost of one minute's Telex call exchanged during the charge period when the wrong number was requested shall be payable.

CHAPTER X

Accounting

Article 38

Accounting

- § 1. Unless otherwise arranged, the charges relating to the Telex service shall form the subject of separate monthly accounts to be drawn up by the Administration of the country of origin. These accounts shall be prepared so as to show for each chargeable period the number of calls and the number of minutes charged in each category grouped according to zones of destination. Furthermore, if the traffic has been transmitted by routes with differing itineraries, the traffic transmitted over each route shall be shown separately with an indication, if the case arises, whether it is an emergency route (see Annex 2).
- § 2. Except in the case of a special agreement between the Administrations concerned, the Administration of the country of origin shall transmit to the Administration of the country of destination the monthly accounts in as many copies as there are countries concerned, including the countries of origin and destination. After final acceptance of the accounts, the Administration of the country of destination shall send a copy of the account, endorsed with its acceptance, to the Administration of the country of origin as well as to the Administration of each other country concerned.
- § 3. (1) The provisions of the Telephone Regulations dealing with exchange and acceptance of account as well as conservation of vouchers and payment of balances are applicable.
- (2) By agreement between the Administrations (and/or Recognized Private Operating Agencies) concerned the accepted monthly accounts shall be included separately in the quarterly telephone or tele-

(H.1)

graph accounts presented in accordance with telephone procedure by the creditor transit and terminal Administrations to the debtor terminal Administration. Alternatively separate quarterly accounts in respect of Telex traffic may be prepared. The settlement of the accounts can then be effected either with the Telephone or with the Telegraph Department of the creditor Administrations by arrangement.

CHAPTER XI

Directives for subscribers

Article 39

Operating procedure for Telex communication

For the transmission of a Telex communication, the subscriber must follow the directions given him in an instruction drawn up in accordance with the detailed directives contained in the Annex No. 1 to the Regulations.

The instructions to subscribers should also comprise information regarding the code expressions used in the international Telex service which are listed in Article 26 of the Regulations.

Annex No. 1

Operating procedure for Telex communication

I. Formation of the text

- § 1. (1) The heterogeneous groups (composed of two or three sorts of characters : letters, figures, signs) are transmitted without spaces or interspacing signs, as well as the homogeneous groups (words, whole numbers,).
- (2) However, when a group, or part of a group, is composed of a whole number and an ordinary fraction, the fraction is separated from the number by means of a dash without space. Examples : for "one and three quarters" : 1— $\frac{3}{4}$
for "three quarters" followed by "eight" : $\frac{3}{4}$ —8.
- § 2. The inverted commas sign (quotation mark) (« ») shall be signalled by transmitting the apostrophe sign (') twice, at the beginning and the end of the text within the inverted commas (quotation marks) (" ").
- § 3. To indicate the sign $\frac{0}{0}$ or $\frac{0}{00}$, the figure 0, the fraction bar, and the figures 0 or 00 shall be transmitted successively.
- § 4. When the accents on a letter are essential to the sense of the text, repeat at the end of the message the group containing such letter, placing this letter between two spaces. Examples :
ach e te for achète, achet e for acheté.
- § 5. Groups in which figures intervene (particularly numbers) to be repeated at the end of the message.
- § 6. To pass to the beginning of the next line, i.e. to start a new line, press first "carriage return", then "line feed", and again "carriage return".
- § 7. An error is corrected in the following manner :
- (a) in manual transmission, the signal "space" and the letter E are signalled alternately three times, restarting the transmission from the last group correctly sent ;
- (b) in perforating, the wrong group and everything following it is "effaced" by depressing the "letter" key.
- § 8. A subscriber preparing a perforated tape for automatic transmission must take care :
- (a) that the signal "who are you" does not appear on the tape ;
- (b) that in starting a new line, the provisions of § 6 are followed ;
- (c) that the tapes are perforated to the end. He should accordingly finish perforated tapes with a series of "letters" perforations.

- § 9. Letters or signs coupled with the letters F, G and H should not be used in international communications, except in the case of countries with which there are special arrangements. (Each country will inform its subscribers of the letters or signs used in the country as secondaries of letters F, G and H, will mark these distinctively on the keyboard, and will indicate the countries with which there are special arrangements.)

II. Operating procedure

- § 10. Since the establishment of a connection is always indicated by the transmission, through the intermediary of the international Telex position, of the answer-back of the called subscriber followed by that of the calling subscriber, subscribers should not intervene before the transmission of these two codes is completed.
- § 11. (1) The caller checks whether the answer-back which he has received is in fact that of the called subscriber. (If it is not, he should interrupt the communication, and inform the international Telex position.)
(2) The calling subscriber can, however, check whether the connection is satisfactory by obtaining the code of the called subscriber.
- § 12. If he considers it desirable, he operates the call bell and ends with the change of line followed by "letter".
- § 13. The calling subscriber should then proceed as follows :
- (a) he starts a new line (see § 6) and transmits the signal "letters";
 - (b) he transmits any particulars of the message such as "urgent", "acknowledge receipt", etc.;
 - (c) he starts a new line;
 - (d) he transmits his message, starting a new line as often as necessary;
 - (e) he starts a new line;
 - (f) he repeats the groups mentioned in § 4 and § 5;
 - (g) if he has several messages, he follows each message by the groups to be checked, by the sign + and by starting a new line;
 - (h) after the transmission of the message (or, as the case may be, of the last message), and/or of the groups to be checked, has been completed, he sends the signs + ?, followed by "letters", thus indicating to the correspondent that the latter can transmit in his turn.
If he receives no reply, he signals his own code, and then obtains the answer-back of the correspondent;
 - (i) he sends the sign + twice, then "letters";
 - (i) he gives the clearing signal.
- § 14. The called subscriber answers, if present, as soon as he receives notification of the end of the transmission (+ ?), in the following manner : he transmits the signal "R", followed by the number of messages received.
- § 15. During an exchange of messages, the following rules must be observed :
- (a) before each transmission, the signal "letters" must be sent;
 - (b) to interrupt the correspondent, transmit the letter P or the figure 0 until the correspondent stops sending;
 - (c) to invite the correspondent to transmit, signal + ?, followed by the signal "letters";
 - (d) to ask him to wait, transmit the combination : "MOM".
- § 16. If during a transmission there has been a pause of more than 30 seconds, transmission is resumed by the signal "letters" and then 2 seconds are allowed to elapse before continuing.
- § 17. If for any reason it is necessary to send a test message over an international circuit, one of the two following texts should be used :

VOYEZ LE BRICK GÉANT QUE J'EXAMINE PRÈS DU WARF.
THE QUICK BROWN FOX JUMPS OVER THE LAZY DOG.

Annex No. 2

Use of emergency routes

When emergency Telex routes are used, the following provisions shall apply, except in the case of arrangements to the contrary among the Administrations (and/or Recognized Private Operating Agencies) concerned :

(1) Charges for Telex calls exchanged exceptionally over emergency routes shall be the same as when the normal route is used.

(2) All Telex calls exchanged over emergency routes shall be entered in the international accounts for the whole of their chargeable duration.

(3) When an emergency route is used, the total rate for the normal route (between the first charge zones of the terminal countries) shall be divided equally among the various Administrations concerned with the emergency route in question, whatever may be the nature and length of the circuits used. (When the exchange to which the subscriber is connected is beyond the first charge zone, the country of origin shall credit the account of the country of destination with an additional charge equal to the difference between the charge corresponding to the location of exchange to which the subscriber is connected and that appropriate to the first charge zone). In order that this procedure may be applied in the case of a call involving an international transit exchange, the operator at the transit exchange must in all cases advise the operator at the international terminal exchange in the country of origin of the emergency route used.

Examples : 1. *Switzerland-France.* Emergency route : Zürich-Frankfurt.

Total rate for the normal route (between first charge zones) : 1 gold franc. Apportionment if the emergency route is used : Switzerland-Germany-France : each receives $\frac{1.0}{3} = 0.333$ gold francs.

2. *Switzerland-Great Britain.* Emergency route : Zürich-Brussels.

Total rate for the normal route : 3.70 gold francs. Apportionment if the emergency route is used : Switzerland-France-Belgium-Great Britain : each receives $\frac{3.70}{4} = 0.925$ gold francs.

H.2. Use of tape-teleprinters in the Telex service

(former provisional Recommendation 864, 1951)

The C.C.I.T.,

considering

that the Administrations are not unanimously of the opinion that the use of page-printers in the Telex service should be made obligatory ;

that in these circumstances it is necessary to define the characteristics of tape-printers used in the Telex service to permit their satisfactory interconnection with page-printing teleprinters ;

that the existence of different operating procedures for page and tape-printers would be highly undesirable,

unanimously declares the view

1. that Administrations deciding to authorize the use of tape-printers in the Telex service should make the necessary technical arrangements for their satisfactory interworking with page-printers ;

2. that such Administrations should also issue special instructions to the users of tape-machines to insure absolute adherence to the page operating procedure ;

3. that tape-printers connected with the Telex service should therefore be provided with the following features :

a) end of line indicator (character counter) ;

(H.2)

- b) keys permitting the transmission of " Carriage return " and " Line feed " signals ;
 - c) confirmation of the receipt of the " Carriage return " and " Line feed " signals by printing the symbols agreed in Recommendation C.10 ;
4. that, as a result of the use of a uniform operating procedure throughout the Telex service, special directory markings to indicate users of tape-machines are unnecessary.

H.3. Duplex operation in the Telex service

(Arnhem, 1953, amended at Geneva, 1956)

The C.C.I.T.,

considering

- a) that the introduction of duplex operation in the international Telex service may be of interest ;
- b) that there is justification for prescribing certain technical directives to be observed by the Administrations that desire to carry out trials of duplex operation in the international Telex service ;

unanimously declares the view

1. that the Administrations which decide to authorize duplex operation in the international Telex service should make the requisite technical arrangements to maintain the answer-back procedure recommended by the C.C.I.T. (cf. Recommendation H.1, Art. 24 and 25) ;
2. that the possibility of taking a local record should be maintained for Telex installations equipped for duplex operation and, in particular, that these installations should be equipped with two teleprinters when duplex working is not carried out systematically, making use of an automatic transmitter ;
3. that, in the case where duplex international Telex communication would be permitted, the tariffs for the duplex communication would be on the same basis as the simplex communication ;
4. that, however, Administrations may require from subscribers having the possibility of duplex connections a surcharge established either on the basis of a flat rate or on each call ;
5. that the rapporteurs of the Administrations operating a duplex Telex service either internally or in the international system should advise the Telex study group of the technical arrangements and operating methods adopted.

H.4. Tables of international Telex traffic

(Arnhem, 1953, amended at Geneva, 1956)

The C.C.I.T.,

considering

- the interest to Administrations and Recognized Private Operating Agencies of knowing how the international Telex service is developing ;
- that with this in view the General Secretariat established annual statistics derived from information provided by Administrations and Recognized Private Operating Agencies ;
- that these statistics will henceforth be included in the General Telegraph Statistics ;

(H.4)

considering further

that the comparative tables of traffic which have existed for several years at the instance of the Chairman of the competent Study Group of the C.C.I.T. ;

that the tables are of great interest for following the development of the service ;

that it is desirable to give them an official character by compiling them through the General Secretariat ;

unanimously declares the view

that the General Secretariat should publish annually, by means of the Telecommunication Journal, the statistical data listed below :

1. A general table of international Telex traffic in January, expressed as the number of chargeable minutes in relation to the number of direct circuits in service ;

2. A comparative table showing figures of international Telex traffic in January for different years ;

3. A comparative table showing annual international Telex traffic for these same years.

H.5. Leasing of telegraph circuits

(ex Recommendation 951, amended in 1951 and at Geneva, 1956)

The C.C.I.T.,

having examined Resolution No. 9, annexed to the Telegraph Regulations, Paris 1949, and having noted the proposals submitted by Administrations to the VIIIth Plenary Assembly ;

considering

that it is desirable to make regulations for lease of lines worked by start-stop apparatus, but that nevertheless Administrations have expressed divergent views in this regard ;

unanimously declares the view

that the subject should be further studied and that, pending the results of these studies, the stipulations of Recommendation No. 951 of Brussels and Resolution No. 9 should be replaced by the following text :

1. Lease of telegraph circuits

(European System)

§ 1. In relations of the European system where, after the requirements of the public telegraph service and of the Telex service have been satisfied, telegraph circuits are available, such circuits may be leased to one or more users on the following terms :

§ 2. (a) As a general rule, it shall be assumed that the circuit leased will be available throughout the 24 hours.

(b) However, it shall be for Administrations or Recognized Private Operating Agencies to decide whether in certain cases a lease may be for a shorter period. The rental and conditions will then be fixed by agreement between the Administrations and/or Recognized Private Operating Agencies concerned.

§ 3. (1) A lease is considered as *single* when there is only one user at each end of the circuit. A lease is considered as *multiple* when there is more than one user at either or both ends of the circuit.

(H.5)

- (2) A circuit may be leased jointly by two or more users ("multiple") only when these users are *directly* engaged in the same type of undertaking.
- (3) The correspondence passed over leased circuits must concern only the undertaking or undertakings for which the circuit(s) has (have) been leased.
- § 4. (1) A user shall be considered as any undertaking that transmits and/or receives messages over a leased circuit.
- (2) If an undertaking has several operating stations connected to the same end of the circuit, this undertaking shall be considered as a single user only.
- § 5. If correspondence transmitted over a leased circuit is transferred to another circuit ("single" or "multiple") leased by one or more users, whether by retransmission or by switching, the rental for both circuits shall be considered as "multiple".
- § 6. An international leased circuit crossing a transit country shall be charged for as one circuit if no intermediate station is installed in the transit country. If, however, a user is connected to the circuit in the transit country, the circuit shall be divided for charging purposes into two sections which shall be charged for independently.
- § 7. (1) As a general rule, the lease must be for at least one month, counting from the day on which the circuit is made available to the user.
- (2) The lease shall be renewable from month to month by tacit agreement. If either party intends to terminate the contract a fortnight's notice shall be given before the end of the current lease period.
- (3) The lease shall be payable in advance.
- (4) One of the users taking part in the lease may be accepted by the Administrations or Recognized Private Operating Agencies as responsible for the fees due from all the users sharing in the lease of the circuit.
- § 8. By agreement between the Administrations and/or Recognized Private Operating Agencies concerned, a lease may be granted for a period of less than one month.
- § 9. (1) For a lease of one month or more the fee shall be calculated as follows, U being the Telex unit charge* in the relation in question:
- (a) for a single lease, per whole month:
2000 U (6000 minutes);
- (b) for a multiple lease, per whole month:
2750 U (8250 minutes).
- (2) Any fee for fractions of a month shall be calculated according to the number of days concerned, as follows:
- (a) single lease: 200 minutes, per day,
- (b) multiple lease: 275 minutes, per day.
- § 10. For leases lasting less than one month, authorized in accordance with § 8 above, the fees shall be calculated as follows:

* Regulations for the subscribers' telegraph service by start-stop apparatus in the European system (Recommendation H.1, Article 3 — No. 15).

"15. Unit charge in a particular international Telex service: Charge for an ordinary three-minute Telex call during periods when no tariff reductions are operative."

In relations in which the Telex service has not yet been introduced, the Telex unit charge shall correspond to half the telephone unit charge.

(a) lease for ten days or less :

the fee shall be $\left\{ \begin{array}{l} 80 \text{ U daily for single lease} \\ 110 \text{ U daily for multiple lease} \end{array} \right.$
plus a surcharge of 10 U no matter how long a period the lease is to run for.

(b) lease for from 11 to 25 days :

the fee shall be $\left\{ \begin{array}{l} 80 \text{ U daily for single lease,} \\ 110 \text{ U daily for multiple lease.} \end{array} \right.$

(c) lease prolonged beyond the 25th day, up to one month :

the fee shall be $\left\{ \begin{array}{l} 2000 \text{ U for single lease,} \\ 2750 \text{ U for multiple lease.} \end{array} \right.$

§ 11. The total receipts from the rental for a circuit shall normally be divided among the Administrations and Recognized Private Operating Agencies concerned in proportion to their share of the rates for the Telex service.

§ 12. (a) The rental conditions laid down above shall be applicable to circuits operated by start-stop apparatus fulfilling the provisions of the Telegraph Regulations and the Recommendations of the C.C.I.T.

(b) The lease of circuits worked by other apparatus or by start-stop apparatus not fulfilling the provisions under a), shall be subject to special agreement between Administrations and/or Recognized Private Operating Agencies.

§ 13. The Administrations or Recognized Private Operating Agencies reserve to themselves the undisputed right to resume possession of the leased circuit if required in the general interest.

§ 14. In case of interruption of the circuit and at the request of the parties concerned, the Administrations or Recognized Private Operating Agencies may make repayment.

No refund shall be made for an interruption lasting less than twenty-four hours, but the period between 9 a.m. and 3 p.m. may in this respect count as twenty-four hours.

For every day the interruption lasts, the amount to be refunded shall be equal to the charge for 200 minutes of Telex call (single lease) and 275 minutes of Telex call (multiple lease).

2. Lease of telegraph circuits (extra-European system)

In the extra-European system, Administrations or Recognized Private Operating Agencies shall determine by special agreement the conditions under which circuits should be leased.

H.6. Accounting for the rental of the leases of international telegraph circuits

(former provisional Recommendation 953, 1951)

The C.C.I.T.,

having examined paragraph 14 of Resolution No. 9-II of the International Telegraph Conference, Paris, 1949, and

considering

that it is desirable to adopt a uniform method of accounting for the rental for the lease of telegraph circuits in the European system ;

(H.6)

unanimously declares the view

that each terminal Administration should collect and retain its own share of rental for a circuit between adjacent countries ;

that, when transit countries are involved, the terminal Administrations agree with the transit Administrations as to the method and amount of collection and accounting.

H.7. Tariff applicable to lease of circuits to meteorological services

(Arnhem, 1953)

The C.C.I.T.,

having regard to Resolution No. 12 annexed to the Telegraph Regulations, Paris, 1949 ;

considering

that no preferential reductions should be granted in the rental for leased telegraph circuits, whatever be the character of the organizations using them ;

declares the view by 19 votes against 1

that therefore no preferential tariff should be granted for the leasing of circuits to the meteorological services ;

and requests

the Secretary-General of the Union to bring this matter to the notice of the Administrations and/or Recognized Private Operating Agencies and to ask them to envisage the application of this Recommendation as from 1 January 1954.

H.8. Metering of traffic on leased telegraph circuits

(former provisional Recommendation 952, 1951)

The C.C.I.T.,

considering

1. that the required system of metering is based on transmission time, and that such metering shall be effected by recording the time of transmission in both directions on the circuit, in fractions of 10 seconds (or six seconds), whether transmission is by duplex or simplex ;
2. that the technical design of a device for metering on the lines stated in 1. presents no difficulties ;
3. that the standardization of the detail of such a device is unnecessary and may be, because of circuit detail variations in different countries, undesirable ;
4. that it is, however, essential that the performance limits of such a device should be standardized ;

unanimously declares the view

that metering equipment, where used, shall conform to the following provisions :

1. that the metering device shall become operative as soon as transmission begins in either direction of the circuit ;

(H.8)

2. that the meter shall register once per unit time period, during which signals have been transmitted ;
3. that the unit time period shall be ten (or six) seconds ;
4. that the device becomes inoperative at the end of the last unit scanning period in which a transmission signal was received ;
5. that the device shall be inoperative during any prolonged interruption of the circuit.

Annex

By way of example, designs of metering equipment developed by the Netherlands and United Kingdom Administrations, are given below, together with brief circuit details :

Diagram of Netherlands Equipment—Fig. 1

Brief Circuit Operation :

By means of the polarized relays T1 and T2, it is possible to read on both transmission paths. If messages are transmitted on one transmission path or on both paths, the A relay is energized as soon as the impulse contact *i* is closed. The A relay remains energized via the a1 contact until the impulse of the central impulse device is finished. Via the a2 contact the meter M is energized. The a3 contact delays the release of the A relay in order to ensure that the meter M gets an impulse of sufficient length, if the A relay is energized just towards the finish of an impulse. The supervising relays S1 and S2 prevent metering if for some length of time ' start ' polarity is on the line, which may be the case with breakdowns or clearing signal.

Diagram of UK equipment — Fig. 2

Brief Circuit Operation :

Relay M with its associated resistor and capacitor is designed to have a release lag of approximately 300 mS and to hold to telegraph signals. Also the release lag of relay B is required to be less than the operate lag of relay G.

Telegraph signals are detected on either or both lines by the polarized relay A. The contact A1 normally rests on the mark contact, so that relay M be normally operated. At the first change from mark to space, relay B operates via A1, G2 and P1 and holds over its second winding via B1, M1 and G3y. If, at any time, a long space signal releases relay M, the hold circuit for relay B is broken by M1.

When an earth pulse is received, relay P operates, and if relay B is held over its second winding, P1 operates relay G via B2. Relay G locks via G1, prepares for the meter operation at G2 and releases relay B at G3y.

At the end of the earth pulse, relay P releases and earth is applied to operate the meter via P1 and G2 for a period equal to the release lag of the relay G.

Relay G releasing, restores the circuit normal.

The Netherlands Administration has carried out tests to ascertain the probable error in the estimation of the transmission time, with the apparatus described above. It is clear that the timing pulses cannot, in general, be coincident with the commencement of traffic, or for that matter with the completion of traffic, and that there will be, because of this, some difference between the actual and measured times of traffic. It is to be expected that, with traffic of normal type, the difference would be small, since the chance of shortening is equal to that of lengthening. This has been confirmed by the tests carried out by the Netherlands Administration.

The United Kingdom Administration prefers, for practical reasons, to use a 6 second pulse rather than a 10 second pulse. This also has the advantage that meter registrations can be read directly in minutes.

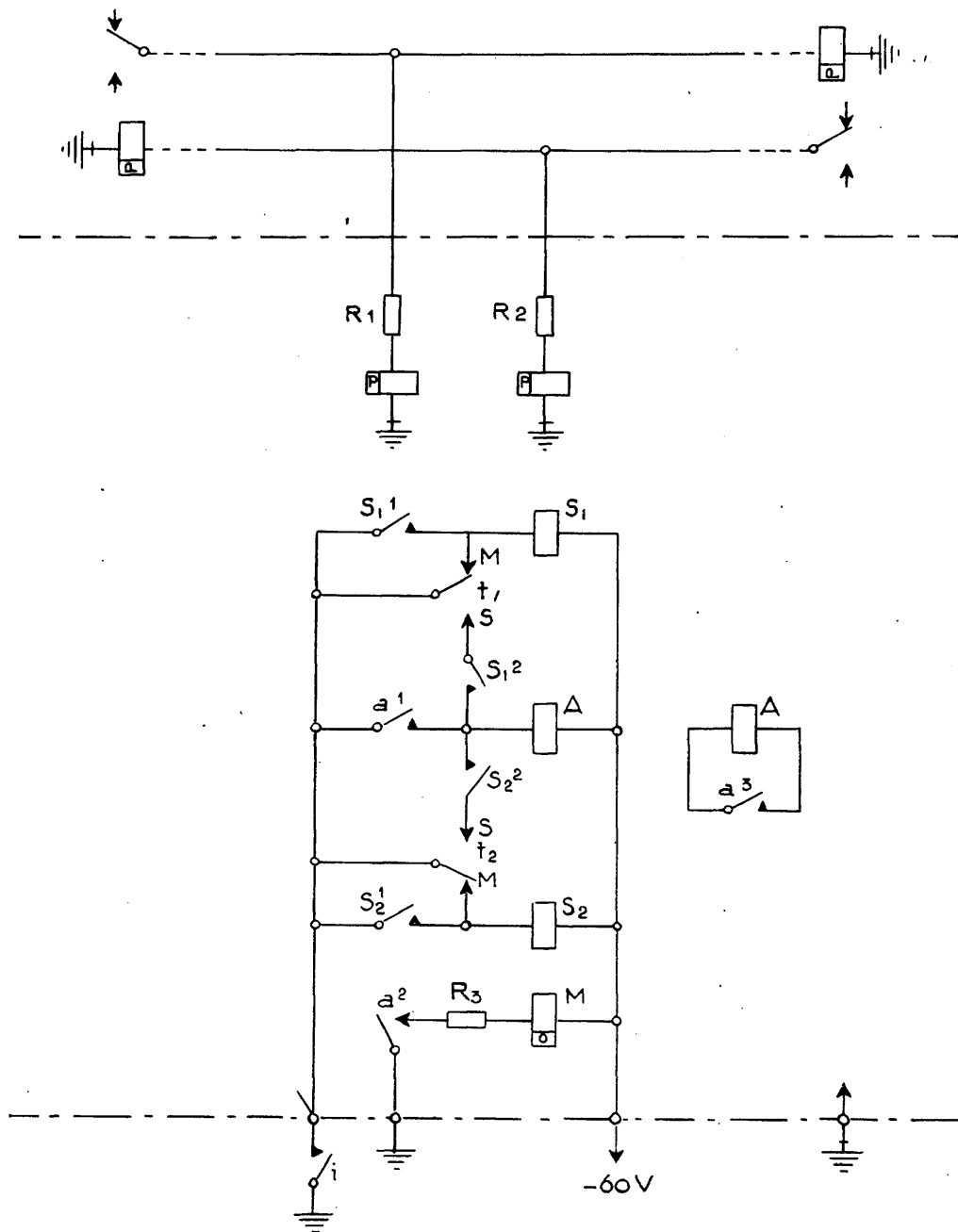


Fig. 1. — Traffic meter for rented telegraph circuits.

(H.8)

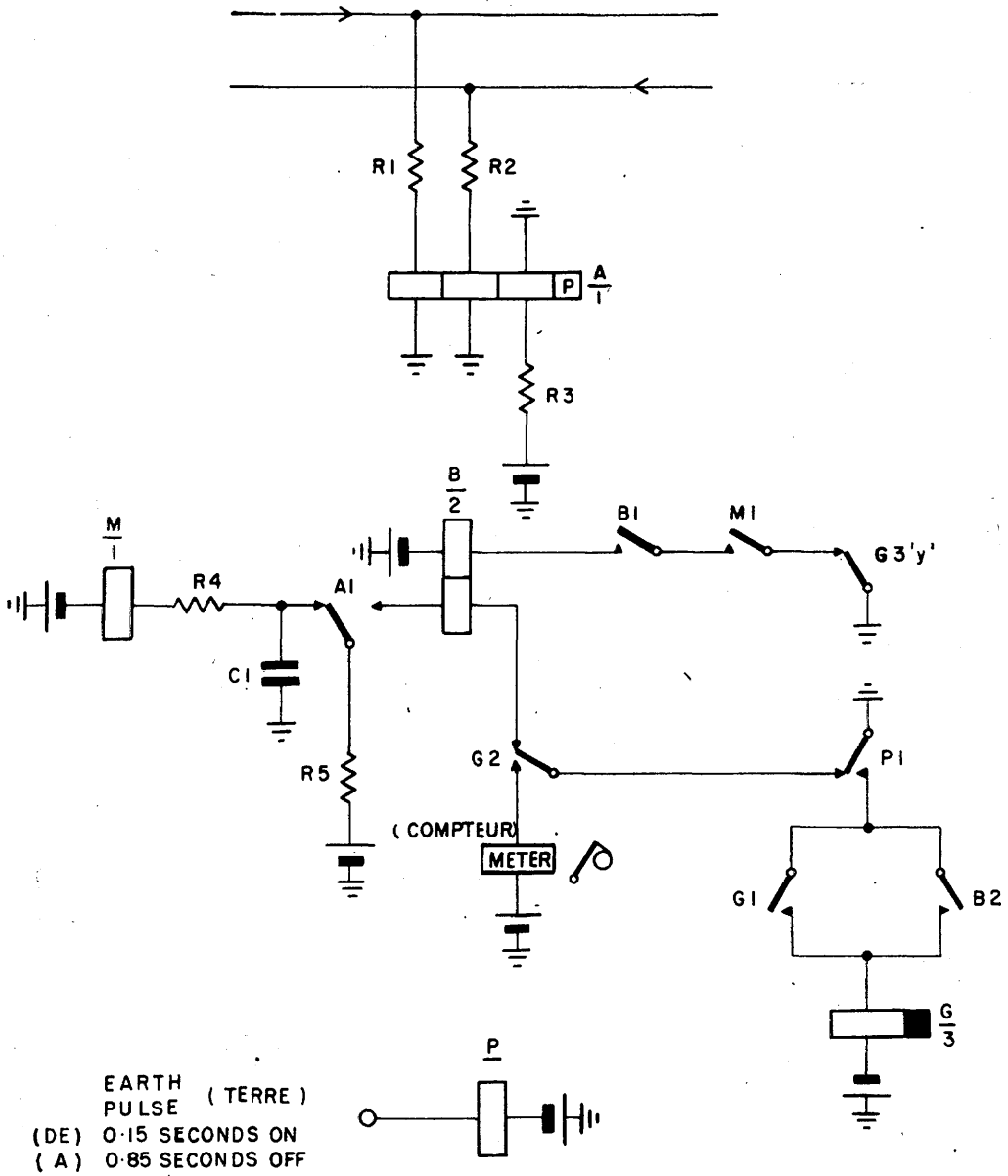


FIG. 2

METERING CIRCUIT FOR RECORDING THE TRANSMISSION TIME OF A RENTED TELEGRAPH CIRCUIT.

CIRCUIT DE COMPTAGE POUR L'ENREGISTREMENT DU TEMPS DE TRANSMISSION SUR UN CIRCUIT TÉLÉGRAPHIQUE LOUÉ

H.9. Conference and broadcast calls in the international Telex service

(Provisional Recommendation, 1954)

The C.C.I.T.,

considering

a) that insufficient experience is yet available to permit the formulation of recommendations for the appropriate technical arrangements for the establishment of international conference or broadcast calls in the Telex network ;

b) that Administrations and Recognized Private Operating Agencies should continue to give attention to the methods of operating to be used in the establishment of calls in these categories, by reason of the difficulties which are caused when the called subscribers are busy ;

unanimously declares the view

1. that the study of Questions 69 * and 70 * should be continued ;
2. that the rapporteurs of the Administrations and Recognized Private Operating Agencies, permitting the establishment of broadcast and conference calls in their internal Telex network, should advise the competent Study Group of the technical arrangements and operating methods employed.

H.10. Determination of the number of international Telex circuits required to carry a given volume of traffic

(Provisional Recommendation, 1954)

The C.C.I.T.,

considering

1. that it is essential to provide an adequate number of circuits between two Telex networks in order to provide the rapid service stipulated in Recommendation H1 ;

2. that the use of tables for the determination of the number of circuits as a function of the traffic to be dealt with during the busy hour is an established practice in all Administrations, and is a convenient means of indicating a standard ;

3. that international Telex circuits may be selected either at manual positions, or via automatic switching equipment, particularly where subscriber to subscriber dialling is employed between two networks ;

unanimously declares the view

that, provisionally, Administrations and Recognized Private Operating Agencies should use Table A or B below, according to the system of selection employed (i.e. manual selection or automatic selection) in the international service.

* These questions will be amalgamated into question 20/21 of Sub Group 1 of Study Group 2 of the C.C.I.T.T.

TABLE A

Traffic capacity table for manually selected circuits (Note 1)

Number of circuits (a)	Average intensity for traffic carried in the busy hour, expressed in Erlangs, for a grade of service (probability of loss) of :		
	1 in 10 (b)	1 in 30 (c) (Note 3)	1 in 50 (d) (Note 3)
1	0.2	0.066	0.034
2	0.9	0.43	0.33
3	1.5	0.89	0.76
4	2.3	1.49	1.29
5	3.2	2.17	1.92
6	(Note 2)	2.92	2.67
7		3.77	3.44
8		4.66	4.25
9		5.56	5.09
10		6.47	5.93
11		7.39	6.79
12		8.31	7.67
13		9.24	8.57
14		10.2	9.48
15		11.1	10.4
16		12.1	11.3
17		13.0	12.3
18		13.9	13.2
19		14.9	14.1
20		15.9	15.0

- Note 1.* Table A makes allowance for the manual operator to continue the search for a free line over the group of circuits concerned for a period of 30 seconds if all are engaged, after which the search is abandoned and the call suspended.
- Note 2.* Column (b) of Table A will, in general, only be used in respect of small groups of circuits of considerable length, having due regard to the desire to provide a rapid service, as well as to economic considerations.
- Note 3.* In all other cases the figures of column (c) shall be used in preference to those of column (d).
- Note 4.* Table B is in accordance with the formula of Erlang, and therefore does not allow for a period of search (e.g. delayed hunting or continuous hunting). It is recommended to use for preference the figures corresponding to a probability of loss of 1 in 50.

General notes

- Note 5.* If, for the purpose of design (as distinct from the maintenance of a rapid service) it is desired to obtain values of "traffic offered" in Erlangs, these may be determined by adding to the figures of "traffic carried" in Tables A and B the respective values of "traffic lost" for the value concerned.
- Note 6.* Tables A and B are directly applicable only to full availability groups of circuits which are operated either wholly as both-way circuits, or wholly as unidirectional circuits. Where groups of circuits are divided into both-way unidirectional components, the division and number of circuits in each component will be agreed between Administrations.

TABLE B

Traffic capacity table for automatically selected circuits (Note 4)

Number of circuits	Average intensity for traffic carried in the busy hour, expressed in Erlangs for a grade of service (probability of loss) of:	
	1/30	1/50
1	0.034	0.020
2	0.289	0.22
3	0.73	0.59
4	1.27	1.07
5	1.88	1.63
6	2.53	2.23
7	3.23	2.87
8	3.95	3.56
9	4.70	4.26
10	5.47	4.98
11	6.25	5.72
12	7.05	6.48
13	7.86	7.25
14	8.68	8.04
15	9.51	8.83
16	10.34	9.63
17	11.18	10.44
18	12.04	11.25
19	12.89	12.07
20	13.75	12.91
21	14.62	13.75
22	15.50	14.60
23	16.38	15.46
24	17.27	16.31
25	18.15	17.16
26	19.05	18.02
27	19.95	18.89
28	20.85	19.75
29	21.75	20.62
30	22.65	21.49
31	23.55	22.36
32	24.46	23.25
33	25.37	24.13
34	26.27	25.01
35	27.18	25.90
36	28.09	26.79
37	29.0	27.69
38	29.92	28.58
39	30.84	29.48
40	31.76	30.38

H.11. Time-to-answer by operators at international Telex positions

(Provisional Recommendation, 1954)

The C.C.I.T.,

considering

- a) that a rapid answer to calling signals by the operators at incoming international Telex positions is essential to ensure a rapid Telex service (cf. Recommendation H.1, Article 5);
- b) that a rapid answer is a very important factor in the efficient utilization of international Telex circuits;
- c) that the time-to-answer has a direct effect on the costs of staffing and of switchboard provision,

unanimously declares the view

that Administrations should endeavour to provide, at international Telex terminal exchanges, a sufficient number of incoming operating positions, and of operators; to ensure that the average time taken by operators to answer calling signals does not exceed 10 seconds, that 95 % of calls are answered in 30 seconds or less:

H.12. List of Telex circuits and routes

(Provisional Recommendation, 1954)

The C.C.I.T.,

considering

- a) the publication, envisaged in Article 4, para. 8 of the international Telex regulations (Recommendation H.1), of a list of Telex routes;
- b) the value of regulating the use of different routes;
- c) the preparation of a description of international Telex circuits which is in progress

and taking into account

that the information which it would be desirable to ask the General Secretariat to publish should include:

1. a list of international Telex circuits with a brief description of the routing and of the location of the regenerative repeaters;
2. a list of routes (normal, auxiliary and emergency) which may be used in international Telex relations;

unanimously declares the view

that all Administrations and Recognized Private Operating Agencies participating in the international Telex service should forward annually to the General Secretariat:

- a) a list, drawn up in accordance with the annexed table, showing the international Telex circuits in use at 31 December;
- b) a list drawn up in the following form showing, for each relation, the various routes:

Relation	Routes			Remarks
	Normal *	Auxiliary	Emergency	

Note : Publication of this information will be undertaken by the General Secretariat in the manner indicated in Article 4, para. 8 of Recommendation H.1.

* Indicate the transit country if any.

Annex

Description of international Telex circuits

1	2	3	4	5	6	7 8		9	10	11	12	13	14
						Transmission A-B	Transmission B-A						
Terminal exchange A (see a)	Terminal exchange B	Routing (see b)	No. of circuits (see c)	No. of V.F. links per circuit (see d)	Location of intermediate V.F. equipment if any (see d)	Location of regenerative repeaters, if any		No. of unidirectional circuits for A-B traffic	No. of unidirectional circuits for B-A traffic	No. of circuits for both-way traffic	Operating method A to B (see e)	Operating method B to A (see e)	Comments and any special features

Explanatory Notes

- a) One line in the table should be used for a description of Telex circuits between A and B. However, if the circuits are divided into several groups according to the particular route, one line should be devoted to a description of the circuits in each of those groups.
- b) Briefly characterize the route followed by each group of circuits.
- c) Indicate the number of circuits described in the same line.
- d) V.F. — voice frequency
- e) *Automatic* if the subscribers of a country can directly dial the subscribers in another *semi-automatic* if action by a manual operator at A or B is required (then indicate at which office such action is taken); *manual* if action by manual operator is required at both A and B.

H.13. Leased telephone circuits used simultaneously for telegraphy and telephony

(Provisional Recommendation, 1954)

The C.C.I.T.,

considering

- a) that Recommendation B.19 refers only to the case where the leased telephone circuit is used for alternate telegraphy and telephony,
- b) that the use of simultaneous telegraphy and telephony over a leased telephone circuit can give rise to significant disturbances, if technical precautions which are difficult to arrange are not taken,
- c) that the tariff for the lease of a telephone circuit used in this manner necessitates a more extensive study.

unanimously declares the view

1. that it is not desirable in present circumstances to permit the use of leased telephone circuits for simultaneous telegraphy and telephony,
2. that it is not desirable to permit the user of a leased telephone circuit to employ this for the purpose of establishing several telegraph circuits for simultaneous use,
3. that if, exceptionally, authorization were given for the uses envisaged in paragraphs 1 and 2 above, the rental should not be lower than the sum of the rentals for the various channels of communication considered separately,
4. that for such exceptional use, the technical arrangements should ensure that no disturbance is caused to the telegraph and telephone services.

(H.13)

H.14. Rates for Telex calls

(Geneva, 1956)

The C.C.I.T.,

having examined the results of the study on the cost of an international Telex call,

considering

- a) the development of automatic operation in the international Telex service of the European system,
- b) the new methods of fixing rates arising from this automatic operation,
- c) the difficulty of maintaining a close relationship between Telex and telephone rates,
- d) the desirability of advising uniform bases for the determination, by the countries concerned, of the different elements entering in the composition of the Telex rates according to the switching system used;

unanimously declares the view

that Administrations and Recognized Private Operating Agencies of the European system should fix their terminal and transit quotas independently of all relationship with the rates charged in the telephone service;

that, where this suggestion is adopted, Administrations and Recognized Private Operating Agencies should, in determining their quotas in the Telex service, as far as possible take into consideration the Recommendation contained in the following table.

*Guidance on the establishment of rates for 3-minute Telex calls
in the European system*

Operational Method	Terminal traffic (part of international service)		Transit traffic ***		
	Fixed cost and switching cost for each international Telex centre	Circuit cost (for 100 km crowflight distance) *	Operational Method	Fixed cost	Cost for 100 km crowflight distance *
Manual service	Gold fr. 0.84	Gold fr. 0.09	<i>Direct transit</i>	Gold fr.	Gold fr.
Semi-automatic outgoing service	0.63	0.0675	a) manual operation	—	0.09
Automatic or semi-automatic incoming service	0.1575	0.0675	b) automatic or semi-automatic operation	—	0.0675
Outgoing fully automatic service	**	**	<i>Transit with interconnected VF telegraph circuits</i>		
			a) manual operation	0.30	0.09
			b) automatic or semi-automatic operation	0.225	0.0675
			<i>Transit by switching</i>	To be determined according to switching costs, depending on the system used.	

* For the calculation of revenue based on the length of circuits, any fraction less than 50 km can be rounded up to a maximum of 50 km and any fraction between 50 and 100 km can be rounded up to 100 km.

** Study to be continued.

*** It is pointed out that in the study undertaken to determine the cost price, it has been suggested that a uniform average charge of 0.12 gold francs per 100 km crowflight could be accepted for unswitched transit traffic as a whole.

I. RECOMMENDATIONS APPLYING TO QUESTIONS OF VOCABULARY, DEFINITIONS, SYMBOLS, CLASSIFICATIONS

I.1. List of definitions

(Geneva, 1956)

The C.C.I.T.,

having regard to Resolution No. 283 of the Administrative Council (VIIIth Session, 1953);

unanimously declares the view

that the "Draft List of Essential Telegraph Terms", established in July 1955, may, subject to the amendments to be attached to this Draft List, be submitted forthwith to the joint Study Group set up by the International Consultative Committees of the International Telecommunication Union, for the purpose of being combined with the List of Definitions drawn up by the C.C.I.F. to constitute the telephone and telegraph sections of the List of Definitions of Essential Telecommunications Terms;

that this combined document may be forwarded to the International Electrotechnical Commission, requesting the latter to take it into consideration in the International Electrotechnical Vocabulary which is in the process of being prepared;

that henceforth Administrations and Recognized Private Operating Agencies should, when the occasion arises, use the terms contained in the combined list of the Draft Lists of Definitions already established in preference to any others.

Note by the C.C.I.T.T. Secretariat: The Draft List of Essential Telegraph Terms (*Grey Book*) was sent to all Administrations in 1955. Definitions which were added or amended by the VIIIth Plenary Assembly of the C.C.I.T. have been included in an "Annex to the Draft List of Essential Telegraph Terms". The "Draft List" and its "Annex" will be used to establish the telephone and telegraph sections of the List of Definitions of Essential Telecommunication Terms.

If, as is hoped, the telephone and telegraph sections of the List of Essential Telecommunication Definitions is published in 1957, it will be circulated among Administrations.

If this hope is not fulfilled, however, the "List of Essential Telegraph Terms" will be published by combining the "Draft List of Essential Telegraph Terms" and the "Annex to the Draft List", and this new List will be sent to the Administrations.

I.2. Study requested in Resolution No. 14 of the Paris Telegraph and Telephone Conference concerning certain definitions relating to the international telegraph service

(Arnhem, 1953)

The C.C.I.T.,

having regard to resolution No. 14 of the Telegraph and Telephone Conference, Paris 1949 ;

considering, first of all

that it is apparent from the observations submitted by the various Administrations and Private Operating Agencies that the wording of the definition of *Telecommunication* given in Annex 3 of the Convention gives rise to various interpretations as to the scope of the sphere of telecommunications ;

considering, further

that the definition of *Hertzian waves* given in the same document, and used to define Radiocommunication, does not appear to make sufficient distinction between the utilization of electromagnetic waves of frequencies between 10 kc/s and 3,000,000 Mc/s for carrier current telegraphy and telephony by cable or open wire; or even by wave-guides, and their utilization when they are propagated, without being guided, in free space ;

that, however, the terms *Telecommunication* and *Hertzian Waves* are of interest to services other than the international telegraph service ;

unanimously declares the view

that, with a view to establishing draft definitions of these terms for submission to International Telecommunication Conferences, it would seem desirable for a study of them to be made jointly by the International Consultative Committees of the Union ;

that for the purposes of this study it is suggested that the following draft definitions be examined :

Telecommunication

Any process that enables a correspondent to pass to one or more given correspondents (telegraphy or telephony), or possible correspondents (broadcasting), information of any nature delivered in any usable form (written or printed matter, fixed or moving pictures, words, music, visible or audible signals, signals controlling the functioning of mechanisms, etc.) by means of any electromagnetic system (electrical transmission by wire, radio transmission, optical transmission, etc., or a combination of such systems).

Télécommunication.

Tout procédé permettant à un correspondant de faire parvenir à un ou plusieurs correspondants déterminés (cas de la téléphonie et de la télégraphie) ou éventuels (cas de la radiodiffusion), des informations de nature quelconque, délivrées sous toute forme utilisable (document écrit ou imprimé, image fixe ou mobile, parole, musique, signaux visibles ou audibles, signaux de commande de mécanismes, etc. . . .), en utilisant n'importe quel système électromagnétique (transmission électrique par fil, transmission radioélectrique, transmission optique, etc., ou combinaison de ces divers systèmes).

Hertzian Waves

Electromagnetic waves of frequencies between 10 kc/s and 3,000,000 Mc/s propagated without guide in free space.

Ondes hertziennes.

Ondes électromagnétiques dont la fréquence est comprise entre 10 kc/s et 3.000.000 Mc/s se propageant, sans être guidées, dans l'espace libre.

(I.2)

considering, finally,

- that it seems possible to give new definitions of the following terms :

Telegraphy, Telegram, appearing in Annex 2 to the Atlantic City Convention (which has become Annex 3 to the Buenos Aires Convention), which are perhaps better adapted to the requirements of the international telegraph service ;

- that furthermore it seemed desirable to give definitions of the terms :

Alphabetic Telegraphy, Alphabetic Telegram, Facsimile Telegraphy, Facsimile Telegram, Phototelegraphy, Phototelegrams, Telegraph Service, Public (Telegraph) Network, Private (Telegraph) Network, General (Telegraph) Service, Telex Service, and Leased Circuits (or Network) Service, liable to satisfy the recognized needs of the international telegraph service ;

unanimously declares the view

that the following draft definitions should be submitted to forthcoming international telecommunication conferences :

Telegraphie

Domaine des télécommunications traitant de tout procédé permettant d'obtenir la reproduction à distance du contenu de documents tels que : écrits, imprimés, images visuelles fixes, ou la reproduction à distance, sous une telle forme, de toute information.

Telegraphy

Branch of telecommunication which is concerned in any process providing reproduction at a distance of documentary matter such as written, printed or pictorial matter, or the reproduction at a distance of any kind of information in such a form.

Télégramme

a) Contenu d'un document, qu'il soit sous forme d'écrit, d'imprimé ou d'image fixe, confié au service télégraphique général en vue de sa transmission par télégraphie et de sa remise au destinataire ; ce contenu en cours de transmission ou après sa transmission.

Note : Sauf spécification contraire, ce terme comprend aussi le radiotélégramme.

b) Le document lui-même et sa reproduction faite soit en cours de transmission, si cela est nécessaire, ou faite pour la remise au destinataire.

Telegram

a) Documentary matter, whether in written, printed or pictorial form, entrusted to the general telegraph service with a view to its transmission by telegraph and delivery to the addressee ; these contents in the course of, or after, transmission.

Note : Unless otherwise specified, this term also covers radiotelegrams.

b) The document itself and any reproduction made in course of transmission, if necessary, or made for delivery to the addressee.

Télégraphie alphabétique

Système de télégraphie des textes au moyen de la transmission de signaux correspondant chacun à un élément du texte (lettrés, chiffres, signes de ponctuation, etc.) ou à un groupe de ces éléments.

Alphabetic telegraphy

System of telegraphing texts by means of the transmission of signals, each corresponding to an element of the text (letters, figures, punctuation marks, etc.) or a group of these elements.

Télégramme alphabétique

Télégramme qui peut être transmis par télégraphie alphabétique (sauf indication contraire, le mot télégramme désigne un télégramme alphabétique).

Alphabetic telegram

Telegram which may be transmitted by alphabetic telegraphy (unless otherwise stated, the word "telegram" means an alphabetic telegram).

Télégraphie fac-similé

Système de télégraphie permettant d'obtenir la reproduction sous forme d'images fixes (photographiques ou non), d'un dessin et éventuellement de l'intensité des teintes ou des couleurs, d'un document original comportant de l'écriture, des caractères imprimés, des images fixes.

Facsimile telegraphy

A system of telegraphy providing reproduction in the form of fixed images (photographic or otherwise), of the form, and possibly of the depth of tone or of the colours, of an original document, whether written, printed or pictorial.

Télégramme fac-similé

Fac-similé

Télégramme qui doit être transmis par télégraphie fac-similé.

Note : En l'absence d'un terme spécial, et sauf spécification contraire, ce terme s'applique restrictivement à un télégramme fac-similé qui peut être reçu par un procédé d'enregistrement direct.

Facsimile Telegram

A telegram which must be transmitted by facsimile telegraphy.

Note : In the absence of a special term, and unless the contrary is specified, this term refers solely to a facsimile telegram which can be received by a process of direct recording.

Phototélégraphie

[*Téléphotographie*]

Système de télégraphie fac-similé ayant surtout pour objet la reproduction de nuances et utilisant à la réception des procédés photographiques.

Phototelegraphy picture transmission (AM) [Telephotography]

A system of facsimile having special regards to tone reproduction, in which the reception involves photographic processes.

Phototélégramme

Télégramme fac-similé qui *doit* être transmis par phototélégraphie.

Phototelegram

Facsimile telegram which *must* be transmitted by phototelegraphy.

Service télégraphique

Tout service assurant la transmission d'information par télégraphie.

Telegraph service

Any service for the transmission of information by telegraphy.

Réseau (télégraphique) public

Réseau constitué en vue de l'exécution du service télégraphique pour le public, qui est la propriété d'une administration exploitante de télécommunication (ou d'une exploitation privée reconnue) et qui peut être utilisé pour assurer le service télégraphique général, le service télex et le service de location de circuits.

Public (telegraph) network

A network set up to perform a telegraph service for the public. It belongs to a telecommunication operating body (Administration or Private Operating Agency), and may be used to provide general telegraph service, Telex service or leased circuits service.

Réseau (télégraphique) privé

Réseau constitué en vue de l'exécution d'un service télégraphique spécial, par un organisme autre qu'une administration exploitante de télécommunication ou une exploitation privée reconnue ; généralement, le réseau est la propriété de cet organisme.

Private (telegraph) network

A network set up to provide a special telegraph service by an organization other than a telecommunication operating Administration or a Private Operating Agency ; generally, the network is the property of that organization.

Service (télégraphique) général

Service télégraphique à l'usage du public et qui assure l'acceptation et la remise des télégrammes (ancienne définition du service télégraphique public).

General (telegraph) service

A telegraph service for the use by the public ; it provides for acceptance and delivery of telegrams (old definition of public telegraph service).

Service télex

Service télégraphique permettant à ses abonnés de correspondre directement et temporairement entre eux au moyen d'appareils arithmiques et de circuits du réseau télégraphique public.

Telex service

A telegraph service enabling its subscribers to communicate directly and temporarily among themselves by means of start-stop apparatus and of circuits of the public telegraph network.

(Service de) location de circuits (ou de réseaux)

Service consistant à mettre à la disposition d'un usager (ou d'un groupe d'usagers) pour son (ou leur) utilisation exclusive des circuits du réseau télégraphique public.

Leased circuits (or network) service

A service whereby a circuit (or circuits) of the public (telegraph) network is made available to a user or group of users for his (of their) exclusive use.

I.3. Letter symbols

(former Recommendation 221, amended at Arnhem, 1953)

The C.C.I.T.,

considering

that universal use of common notations, or notations drawn up according to the same conventions facilitates the reading of documents on the technical aspect of communication ;

that a revised list of letter symbols for the principal terms used in electrotechnics has already been drawn up by the International Electrotechnical Commission, and that during its preparation several suggestions on this subject made by the C.C.I.T. have been taken into consideration ;

(I.3)

unanimously declares the view

that in preparing technical documents on telegraphy, it is desirable to conform with the recommendations of Publication 27 of the International Electrotechnical Commission (International Letter Symbols used in Electricity-Third Edition, 1953).

I.4. Graphical symbols

(former Recommendations 226, amended at Arnhem, 1953 and at Geneva, 1956)

The C.C.I.T.,

considering

— that the list of graphical symbols for telecommunication, prepared in June 1935 by a Joint Committee set up by the International Telephone, Telegraph and Radio Consultative Committees, and perfected and subsequently approved by the International Electrotechnical Committee, is at present in general use and is very serviceable;

— that experience has shown, however, the need for modification of detail either to clarify the nomenclature or to make the symbols clearer or easier to draw;

— that, in addition, new technical developments and new operating methods require the introduction of new symbols;

— that the C.C.I.s, for their part, have already begun the study of the revision of this list;

unanimously declares the view

— that with a view to drawing up a common list of amendments to the list of graphical symbols concerning the whole of telecommunications for submission to the International Electrotechnical Committee for its approval, it would be advisable to adopt the same procedure as was used for the drawing up of this list, i.e. the setting up of a joint study group in which the C.C.I.T.T. would be represented by members of its study group on graphical symbols;

— that the proposals already submitted to the C.C.I.T. by certain telegraph administrations relating to symbols, of interest to all branches of telecommunications, be forwarded to this study Group;

— that this joint study group be invited to take the proposals annexed hereto as a basis for its discussions on symbols used in telegraphy.

Annex to Recommendation I.4

GRAPHICAL SYMBOLS

A. *The use of general and special symbols.*

1. A general symbol concerns a group of objects with a common characteristic. Wherever it is possible to divide these groups into broad categories, each of the latter has been given its own symbol, either by supplementing the general symbol by some special sign (design, letter or group of letters), or where possible by putting together several general symbols or basic symbols which define the various characteristics of the category in question.

Some of the symbols created in this way may themselves be regarded as general symbols, from which special symbols are derived by the same process.

2. Recourse need not be had to special symbols when, in some other way (e.g. by title, legend or reference to a specification), the particular features concerned can be adequately distinguished, or when the feature concerned is obvious from an examination of the diagram as a whole.

3. As a general rule, a diagram or drawing should show only those features that are essential and a knowledge of which is necessary to understand it.

(I.4)

B. Representation of the positions occupied by the moving parts (for example relay armatures) in a circuit diagram.

1. In a diagram representing a complete telegraph connection, all the positions which the moving parts in this connection should simultaneously occupy, so that the electromagnet of the receiver shall be in a given position (A or Z), should be designated in the same way as this position.

2. In the case of a point-to-point circuit, the moving parts should all be shown in position Z.

3. In the case of a diagram of a switched connection, the moving parts should all be shown in the position corresponding to the free condition of the circuits.

Thus, for example, in the standardized international Telex system the position in question is A.

4. Position A is that which corresponds to the start signal of a standardized start-stop apparatus controlling the connection ; position Z is that which then corresponds to the stop signal.

5. In a diagram representing a constituent part of a particular telegraph connection, the same conventions are applied.

C. Proposed amendments to the list of graphical symbols.

In the tables below, the letter N placed before a number indicates that it is proposed to change either the legend, or the diagram, or the number of the former symbol, or to introduce a new symbol.

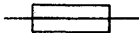
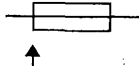
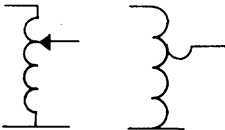
The tables in Section III would be substituted for the corresponding tables in Publication 42 of the I.E.C. ; they include those of the former symbols that would be retained without alteration.

SECTION I

Symboles communs aux télécommunications

Symbols common to telecommunications

- a) For use in circuit diagrams
- a) Symboles pour schémas électriques détaillés

Number Numéro	Legend Légende	Symbol Symbole
101	Fuse, general symbol <i>Coupe-circuit à fusible, symbole général</i>	
102	Branch fuse <i>Coupe-circuit à fusible placé sur une dérivation</i>	It is proposed to suppress this No. <i>Suppression proposée de ce numéro</i>
103	Fuse, with alarm contact <i>Coupe-circuit à fusible à signalisation</i>	
140	Auto-transformer <i>Autotransformateur sans fer (2 variantes)</i>	


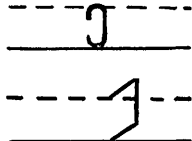
b) *Symboles pour schémas électriques d'ensemble*
 b) *Symbols for use on skeleton drawings*

Numéro <i>Number</i>	Légende actuelle <i>Present legend</i>	Numéro proposé <i>Proposed number</i>	Légende proposée <i>Proposed legend</i>
382	Appareil émetteur, symbole général. Transmitting apparatus, general symbol.	382	Appareil travaillant en émetteur, symbole général. Apparatus working as a transmitter, general symbol.
383	Appareil récepteur, symbole général. Receiving apparatus, general symbol.	383	Appareil travaillant en récepteur, symbole général. Apparatus working as a receiver, general symbol.
384	Appareil émetteur et récepteur a et b, permettant l'émission et la réception simultanées, c travaillant à l'alternat. Symboles généraux. Exemples : Transmitting and receiving apparatus, a and b, enabling simultaneous transmission and reception, c for alternate transmission and reception. General symbols.	384 a et b	Appareil travaillant simultanément en émetteur et en récepteur. Apparatus working simultaneously as a transmitter and receiver.
		384	Appareil travaillant simultanément en émetteur et en récepteur. Apparatus working simultaneously as a transmitter and receiver.
		384 c	Appareil travaillant à l'alternat en émetteur et en récepteur. Apparatus working alternately as a transmitter and receiver.
		384 c	Appareil travaillant à l'alternat en émetteur et en récepteur. Apparatus working alternately as a transmitter and receiver.

SECTION III

Symboles pour la télégraphie
Symbols for telegraphy

a) *Symboles pour schémas électriques détaillés*
 a) *Symbols for detailed electrical diagrams*

Numéro provisoire <i>Provisional Number</i>	Nom <i>Name</i>	Symbole <i>Symbol</i>
N 701	Manipulateur morse. Morse key. <i>Note :</i> — Le symbole n° 57 peut être appliqué également. — Symbol N° 57 may also be used.	
N 711	Balais et couronnes d'un distributeur. Distributor, brush and ring.	

(I.4)

Numéro
provisoire
*Provisional
Number*

Nom
Name

Symbole
Symbol

N 721

Enroulement de relais télégraphique (symbole général).

a)



Winding of a telegraph relay ; general symbol.

b)



Notes :

1. Dans le symbole 721-a, la lettre P est utilisée pour désigner un relais polarisé ; elle est remplacée par NP dans le cas d'un relais non polarisé.

S'il est nécessaire de préciser qu'il s'agit d'un relais télégraphique, la lettre T est ajoutée à proximité immédiate du symbole.

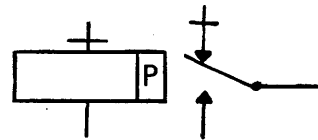
2. La variante a) sera seule utilisée, dans le présent document, pour la figuration des symboles suivants.

1. In symbol 721-a, letter P is used to designate a polarized relay ; it is replaced by NP in the case of a non-polarized relay. If it is necessary to indicate clearly that it is a telegraph relay, the lettre T is added adjacent to the symbol.

2. Variant a) alone will be used in the present document in the representation of the symbols below.

N 723

Relais télégraphique polarisé (symbole général).
Polarized telegraph relay (general symbol).



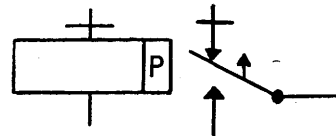
Note : L'extrémité de l'enroulement du relais marquée par une petite sécante est celle par laquelle doit entrer le courant, pour faire basculer l'armature du relais vers la pièce de contact marquée elle aussi par une petite sécante.

The end of the relay winding marked by a small stroke is that by which the current should enter in order to move the armature of the relay towards the contact similarly marked.

N 723-1

Relais télégraphique polarisé, à 2 positions, dont une position préférentielle.

Two position, polarized telegraph relay, with magnetic or mechanical bias.



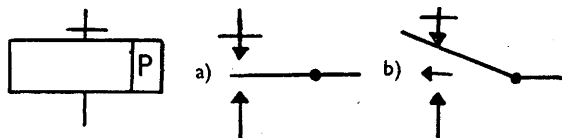
Note : La flèche attachée à l'armature indique de quel côté se trouve la position préférentielle.

The arrow attached to the armature shows the direction of the bias.

N 723-2

Relais télégraphique polarisé à 3 positions, dont une position préférentielle centrale.

Centre stable polarized telegraph relay.



Numéro
provisoire
Provisional
Number

Nom
Name

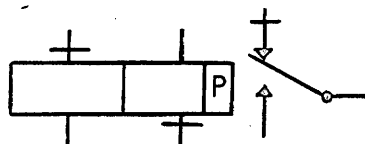
Symbole
Symbol

Note : La représentation *b*) doit être utilisée quand le relais est figuré dans des conditions d'alimentation mettant l'armature dans une des positions latérales.

Representation *b*) should be used when the relay is shown in a condition which causes the armature to rest in one of its side positions.

N 723-3

Relais télégraphique polarisé à plusieurs enroulements (Exemple relatif à deux enroulements).
Polarized telegraph relay with several windings (Example showing two windings).



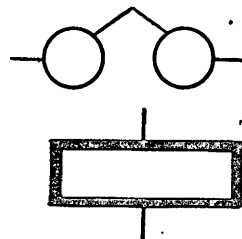
Notes :

1. On utilise les petites sécantes dans les mêmes conditions que pour le symbole 723, en considérant chaque enroulement comme s'il était alimenté seul.
2. Ce symbole peut être utilisé pour la représentation d'un relais différentiel.
3. Les enroulements peuvent être indiqués en différents endroits du schéma : la lettre P doit alors être reproduite pour chacun d'eux.

1. The small strokes are used in the same way as in symbol 723, considering each winding as if it alone were energized.
2. This symbol may be used to represent a differential relay.
3. The windings may be shown in different parts of the diagram ; the letter P should then be reproduced on each winding.

N 731

Enroulement d'électro-aimant récepteur de téléimprimeur.
Winding of a teleprinter receiving electromagnet.



Notes :

1. Pour indiquer si l'électro-aimant est polarisé ou non, on peut ajouter au symbole, suivant le cas, P ou NP. Cette ou ces lettres sont placées dans la variante *a*) à l'intérieur des cercles et, dans la variante *b*), à l'intérieur d'une petite case prolongeant le rectangle (comme pour les enroulements de relais).
2. Le symbole *b*) se distingue de celui de l'enroulement d'un relais par l'épaisseur des traits.
1. To indicate whether or not the electromagnet is polarized, P or NP respectively may be added to the symbol. These letters are placed in variant *a*) inside the circles and in variant *b*) inside a small square added to the rectangle (as for relay windings).

Numéro provisoire <i>Provisional Number</i>	Nom <i>Name</i>	Symbole <i>Symbol</i>
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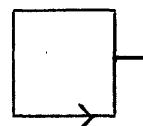
2. Symbol *b)* differs from the symbol for the winding of a telegraph relay by the thickness of the lines.

b) *Symboles pour schémas électriques d'ensemble*
b) *Symbols for skeleton drawings*

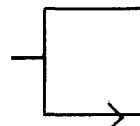
751 Appareil ou équipement télégraphique, symbole général.
Telegraph apparatus, general symbol.



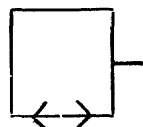
N 751-1 Appareil émetteur (utilisable seulement pour l'émission), symbole général.
Transmitting apparatus, usable only for transmitting, (general symbol).



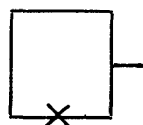
N 751-2 Appareil récepteur (utilisable seulement pour la réception), symbole général.
Receiving apparatus, usable only for receiving, (general symbol).



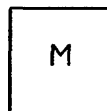
N 751-3 Appareil émetteur et récepteur permettant seulement le travail à l'alternat, symbole général.
Transmitting and receiving apparatus usable for working in one direction only at a time (general symbol).



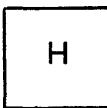
N 751-4 Appareil émetteur et récepteur permettant l'exploitation simultanée dans les deux sens, symbole général.
Transmitting and receiving apparatus usable for simultaneous working in both directions (general symbol).



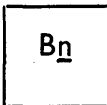
752 Appareil Morse.
Morse telegraph apparatus.



753 Appareil Hughes.
Hughes telegraph apparatus.



754 Appareil multiple Baudot.
Baudot telegraph apparatus.



Note : *n* désigne le nombre de secteurs, s'il est utile de l'indiquer.


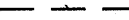




If required, *n* designates the number of sectors.

Numéro provisoire <i>Provisional Number</i>	Nom <i>Name</i>	Symbole <i>Symbol</i>
N 754-1	Appareil Baudot-Verdan. Baudot-Verdan telegraph apparatus.	BV
N 755	Appareil Hell. Hell telegraph apparatus.	HS
N 756	Appareil arythmique. Teleprinter apparatus.	a) A b) TP
N 757	Appareil de télégraphie fac-similé, symbole général. Facsimile telegraph apparatus (general symbol).	F
N 757-1	Appareil phototélégraphique. Phototelegraph apparatus.	FP
N 757-2	Appareil de télégraphie fac-similé non phototélégraphique. Direct Recording Facsimile telegraph apparatus (not a phototelegraph apparatus).	FF
758	Appareil télégraphique Wheatstone. Wheatstone telegraph apparatus.	W
N 759	Appareil utilisant le code sous-marin. Apparatus using the submarine telegraph cable code.	a) C b) CC
N 760	Appareil pour le service télex Apparatus for the Telex service.	TX

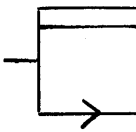
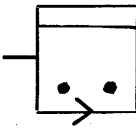
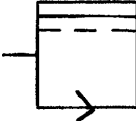
Note : Les symboles 760-1... à 760-6 inclus ne sont jamais employés seuls. Associés aux symboles généraux des appareils télégraphiques, ils permettent de représenter des appareils ayant certaines particularités de construction ou de fonctionnement : toutes celles de ces particularités qui correspondent à des fonctions essentielles nécessaires pour la compréhension du schéma, doivent alors être figurées.

Numéro provisoire <i>Provisional Number</i>	Nom <i>Name</i>	Symbole <i>Symbol</i>
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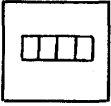



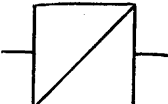
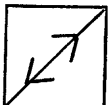
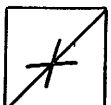
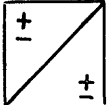
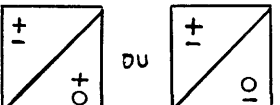
Symbols 760-1—760-6 are never used alone. Used with the general symbols for telegraph apparatus they show apparatus with special features of design or operation ; all the specific features corresponding to essential operations necessary for the understanding of the drawing should then be represented.

N 760-1	Impression sur bande. Tape printing.	
N 760-2	Perforation de bande. Tape perforating.	
N 760-3	Impression sur bande et perforations simultanées. Simultaneous tape printing and perforating.	
N 760-4	Impression sur page. Page printing.	
N 760-5	Clavier dactylographique. Keyboard.	
N 760-6	Emission automatique. Automatic transmission.	

Note : Les symboles 760-a à 760-m sont donnés à titre d'exemples.
Symbols 760-a to 760-m are given as examples.

N 760-a	Appareil seulement récepteur à impression sur bande. Tape-printing apparatus, for reception only.	
N 760-b	Appareil imprimeur sur bande avec clavier dactylographique. Tape-printing apparatus with keyboard.	
N 760-c	Appareil seulement récepteur donnant une bande imprimée et une bande perforée. Tape-printing and tape-perforating apparatus, for reception only.	






Numéro provisoire <i>Provisional Number</i>	Nom <i>Name</i>	Symbole <i>Symbol</i>
N 760-d	Appareil seulement récepteur à impression sur page. Page-printing apparatus, for reception only.	
N 760-e	Appareil imprimeur sur page avec clavier dactylographique. Page-printing apparatus with keyboard.	
N 760-f	Appareil imprimeur sur page avec clavier dactylographique et dispositif de perforation de bande. Page-printing and tape-perforating apparatus with keyboard.	
N 760-g	Émetteur automatique. Automatic transmitter.	
N 760-h	Perforateur à clavier dactylographique. Keyboard perforator.	
N 760-i	Perforateur et émetteur automatique : les bandes perforées peuvent être coupées et introduites une à une dans l'émetteur. Keyboard perforator and automatic transmitter : the tapes can be cut and fed, one by one, to the transmitter.	
N 760-k	Récepteur-perforateur de bande, associé à un émetteur automatique dans un appareil unique. Reperforator (receiving perforator) and automatic transmitter.	
N 760-l	Récepteur-perforateur et émetteur automatique : les bandes perforées peuvent être coupées et introduites une à une dans l'émetteur. Reperforator and automatic transmitter : the tapes can be cut and fed, one by one, to the transmitter.	
N 760-m	Récepteur-perforateur, dont la bande perforée alimente sans coupure un émetteur automatique. Reperforator with tape fed continuously to an automatic transmitter.	

Numéro provisoire <i>Provisional Number</i>	Nom <i>Name</i>	Symbole <i>Symbol</i>
N 761	Clavier Baudot. Baudot keyboard.	
N 762	Traducteur Baudot. Baudot translator.	
N 763 (ex. 712)	Distributeur d'appareil multiple. Multiplex distributor. <i>Note</i> : Le nombre d'arcs de cercle correspond au nombre de secteurs. The number of arcs corresponds to the number of sectors.	
N 764 (ex. 771)	Parleur. Telegraph sounder.	
N 781	Translation, symbole général. Telegraph repeater, general symbol.	
N 782	Translation pour l'alternat. Telegraph repeater for working in one direction only at a time.	
N 783	Translation pour la transmission simultanée dans les deux sens. Telegraph repeater for simultaneous working in both directions.	
N 784	Translation à double courant (exemple). Double-current telegraph repeater (example).	
N 785	Translation à double courant/simple courant (exemple). Double-current/single current telegraph repeater (example).	

Numéro provisoire <i>Provisional Number</i>	Nom <i>Name</i>	Symbole <i>Symbol</i>
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Note : Dans les symboles 784 et 785 les signes supérieurs de la partie gauche et de la partie droite représentent les polarités se correspondant. Le zéro représente l'absence de courant.

In symbols 784 and 785, the upper signs in the right-hand and left-hand parts present corresponding polarities. The zero indicates absence of current.

N 786	Translation régénératrice. Regenerative telegraph repeater.	
N 787	Translation à double courant/courant à fréquence acoustique. Double current/audio frequency telegraph repeater.	
N 791	Equipement pour télégraphie à fréquence acoustique. Audio-frequency telegraph equipment.	
N 792	Equipement pour télégraphie supra-acoustique ou par courants porteurs de haute fréquence. Super-audio-frequency telegraph equipment.	
N 793	Equipement pour télégraphie infra-acoustique. Sub-audio-frequency telegraph equipment.	

B. *Liste complémentaire de propositions de modifications à apporter au fascicule 42.*
Complementary list of proposed modifications to be carried into fascicule 42.

Section III.

Symboles pour la télégraphie.
Symbols for telegraphy.

C. Symboles pour plans et cartes d'exploitation.
Symbols for plans.

1^e Supprimer les symboles 801, 802, 803, 804 et 805.
Delete symbols 801, 802, 803, 804 and 805.

(I.4)

2° Modifier ainsi les symboles 811 et 812 :

811 Voie de transmission télégraphique à courant simple.
Single current telegraph channel.

$\frac{+}{0}$ ou $\frac{0}{-}$ suivant la polarité.
or

812 Voie de transmission télégraphique à courant double.
Double current telegraph channel.

\pm

3° Ajouter les symboles suivants :

Section I.

Symboles communs aux télécommunications.

Symbols common to telecommunications.

a) Symboles pour schémas électriques détaillés.

Symbols for use on circuit diagrams.

Numéro provisoire <i>Provisional Number</i>	Nom <i>Name</i>	Symbole <i>Symbol</i>
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Contacts (d'appareils) commandés mécaniquement.
Mechanically-operated contacts.

		Type a)	Type b)
90	Contacteur Make		
91	Rupteur Break		
92	Contacts à fermeture avant rupture. Make before break.		
93	Contacts à permutation. Break and make.		

Notes :

1. Dans les symboles du type a) le rectangle représente le contact mobile.
2. Dans les symboles du type b) il faut indiquer que le contact est commandé mécaniquement.
1. In the symbols of type a) the rectangle represents the moving contact.
2. To the symbols of type b) an indication must be added to show that the contact is operated mechanically.

I.5. Universal decimal classification

(former Recommendation 241, amended at Arnhem, 1953)

The C.C.I.T.,

considering

that a proposal has been made to study the advantages of the *universal decimal classification* of the International Federation for Documentation for indexing technical documents and literature relating to telegraphy ;

that, in principle, the indication by the author himself of the most suitable number would enable the classification of documents, and compilation of an index to be performed by staff not familiar with the technicalities involved or with foreign languages ;

that numerous scientific and technical periodicals already make use of this system, although with various national differences, or in conformity with various editions, all more or less different one from the other, of the official tables ;

that the International Federation for Documentation has undertaken the revision of the section of the official tables relating to electrotechnics in general, and more particularly to telecommunications, with a view to its closer adaptation to certain acknowledged requirements, and has asked the I.T.U. to arrange for this revision ;

that, however, the principle of universal decimal classification itself, while applicable to activities of an essentially general character, is open to question when it is applied to collective studies bearing on various points of detail, inasmuch as, even though it avoids undesirable juxtapositions in the filing of documents, it lends itself less readily to the search for texts relating to a specific secondary subject ;

unanimously declares the view

a) that, falling in line with the attitude taken by the C.C.I.F. and the C.C.I.R., the C.C.I.T. shall take no official share in revising the universal decimal classification work now in hand ;

b) that, however, the International Federation for Documentation shall be informed that the C.C.I.T. would desire to be kept acquainted with the results of this revision as regards telecommunication in general and telegraphy in particular ;

c) that, while not declining to support the preparation of this classification, the C.C.I.T. may ask telegraph Administrations to assist the committee which is to perform the work of revision within the International Federation for Documentation ;

d) that, when the work of revision is finished, the C.C.I.T. may study whether this method of classification might suitably be recommended to its members either generally or for particular purposes.

List of documents of the VIIIth Plenary Assembly of the C.C.I.T.

No.	TITLE
A.P. VIII/ 1	Preliminary report on the work of Study Group II (Technical aspects of the establishment, operation and maintenance of telegraph channels)
A.P. VIII/ 2	Preliminary report on the work of Study Group III (Technical aspects of telegraph apparatus)
A.P. VIII/ 3	List of questions set for study after the VIIth Plenary Assembly. (Arnhem, 1953)
A.P. VIII/ 4	Report by the interim director on the approval of provisional Recommendations issued from 1954 to 1956
A.P. VIII/ 5	Preliminary report on the work of Study Group No. IV (Phototelegraphy and facsimile)
A.P. VIII/ 6	Report of the joint C.C.I.T./C.C.I.R. Study Group for phototelegraphy to the C.C.I.R. VIIIth Plenary Assembly and to the C.C.I.T. VIIIth Plenary Assembly
A.P. VIII/ 7	Preliminary Report on the work of Study Group VIII (European switched network for the General public service)
A.P. VIII/ 8	Preliminary Report on the activities of Study Group IX (Operational methods and quality of service)
A.P. VIII/ 9	Report on the general telegraph statistics
A.P. VIII/10	Proposed modification of Recommendation F.1 : Speed of transmission of international telegrams
A.P. VIII/11	Report on C.C.I.T. Question 61 Service Codes
A.P. VIII/12	Preliminary Report on the work of Study Group VI (Vocabulary, symbols, classification)
A.P. VIII/13	Preliminary General Report on the progress of Work in Study Group X (tariffs) for the Study Group meeting to be held prior to the VIIIth Plenary Assembly of the C.C.I.T.
A.P. VIII/14	Preliminary Report on the Work of Study Group I (Telegraphy, general technique)
A.P. VIII/15	Preliminary Report on the Work of Study Group VII (Technical aspects of switching in the service of start-stop apparatus)
A.P. VIII/16	Report on the activities of the C.C.I.T. by the interim Director
A.P. VIII/17	Preliminary Report on the work of Study Group XI (International service of telegraph subscribers and rates relating thereto)
A.P. VIII/18	Action taken by the VIIIth Plenary Assembly of the C.C.I.R. on the report by the C.C.I.T./C.C.I.R. joint Study Group for phototelegraphy (C.C.I.T. Document A.P. VIII/6)
A.P. VIII/19	Ordinary and extraordinary expenditure of the C.C.I.T. since the VIIth Plenary Assembly
A.P. VIII/20	Final Report of Study Group I of the C.C.I.T.
A.P. VIII/20 bis	Amendments proposed by the Drafting Committee to the final Report of Study Group I (Documents C.C.I.T. A.P. VIII/20 and C.C.I.T. A.P. VIII/24)
A.P. VIII/21	Final Report of Study Group VII to VIIIth Plenary Assembly of the C.C.I.T. (Technical Aspects of Switching in the Service of Start-Stop Apparatus)
A.P. VIII/21 bis (second issue)	Final Report of Study Group VII : Amendments to the English text proposed by the Drafting Committee
A.P. VIII/22	Final Report on the work of Study Group X (Services offered to users and rates other than Telex rates)
A.P. VIII/23	Final Report of Study Group IX (Operational methods and quality of service) to the VIIIth Plenary Assembly of the C.C.I.T.

No.	TITLE
A.P. VIII/23 <i>bis</i>	Final Report of Study Group IX : Amendments to the English text proposed by the Drafting Committee
A.P. VIII/24	Concerns the French text only
A.P. VIII/25	Final Report by Study Group XI for the VIIIth Plenary Assembly of the C.C.I.T. (International service of telegraph subscribers and rates relating thereto)
A.P. VIII/25 <i>bis</i>	Final Report by Study Group XI (Document A.P. VIII/25) : Amendments to the English text proposed by the Drafting Committee
A.P. VIII/26	Final Report of Study Group II (Technical aspects of the establishment, operation and maintenance of telegraph channels)
A.P. VIII/26 <i>bis</i>	Final Report of Study Group II (C.C.I.T. Document A.P. VIII/26-E) : Amendments to the English text proposed by the Drafting Committee
A.P. VIII/27	Final Report of Study Group IV (Phototelegraphy and Facsimile)
A.P. VIII/27 <i>bis</i>	Final Report of Study Group IV (C.C.I.T. Document A.P. VIII/27) : Amendments to the English text proposed by the Drafting Committee
A.P. VIII/28	Supplementary Note to the Report of the joint C.C.I.T./C.C.I.R. Study Group for phototelegraphy
A.P. VIII/28 <i>bis</i>	Amendments proposed by the Drafting Committee to the Supplementary Note by the Chairman of Study Group V (Document C.C.I.T. A.P. VIII/28-E)
A.P. VIII/29	Corrigenda to Document C.C.I.T. A.P. VIII/22 (Final Report of Study Group X)
A.P. VIII/30	Concerns the French text only
A.P. VIII/31	Communication from the Director of the C.C.I.F. to the VIIIth Plenary Assembly of the C.C.I.T. concerning the Draft Operational Rules for Phototelegraph Communications (C.C.I.T. Document A.P. VIII/23)
A.P. VIII/32	Corrigendum No. 2 to C.C.I.T. Document A.P. VIII/22 (Final Report of Study Group X)
A.P. VIII/33	Final Report of Study Group III for the VIIIth Plenary Assembly of the C.C.I.T. — Technical aspects of telegraph apparatus
A.P. VIII/33 <i>bis</i>	Final Report of Study Group III (Document A.P. VIII/33) : Amendments to the English text proposed by the Drafting Committee
A.P. VIII/34	Final Report by Study Group VIII (European telegraph network operated by start-stop apparatus)
A.P. VIII/34 <i>bis</i>	Note informing that it has not been possible to submit C.C.I.T. Document A.P. VIII/34 to the Drafting Committee
A.P. VIII/35	Minutes of the first Plenary Meeting
A.P. VIII/36	Final Report of Study Group VI (Vocabulary, symbols classification)
A.P. VIII/37	Minutes of the Second Plenary Meeting
A.P. VIII/38	Minutes of the Third Plenary Meeting
A.P. VIII/39	Minutes of the Fourth Plenary Meeting
A.P. VIII/40	Report by the Finance Committee on the extraordinary expenses of the C.C.I.T. from 1953 (after Arnhem) until 1956
A.P. VIII/41	Minutes of the Fifth Plenary Meeting
A.P. VIII/42	Minutes of the Sixth and Last Plenary Meeting
A.P. VIII/43	List of Participants
A.P. VIII/44	List of Documents

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