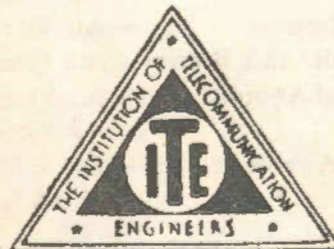


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Student's Award 1963

FOURTEENTH ANNUAL REPORT

1966 - 67



THE INSTITUTION OF TELECOMMUNICATION ENGINEERS (India)
NEW DELHI

PROGRAMME

December 8, 1967

Annual General (Business) Meeting : (Mavalankar Auditorium)

3-00 P.M.

- (a) Confirmation of the minutes of the 13th Annual General Meeting :
- (b) Consideration and confirmation of the 14th Annual Report and the audited statement of accounts for the year 1966-67 (ended 30th September, 1967).
- (c) Election of Auditors for the year 1967-68.

4-00 P.M.

- (a) Arrival of the Chief Guest—Dr. S. Bhagavantam
- (b) Introduction of the new Council members to the Chief Guest
- (c) Tea

4.30 p.m. INAUGURAL MEETING (Mavalankar Auditorium)

Welcome Address	— Dr. P. K. Kapre
Inaugural Address	— Dr. S. Bhagavantam
Presidential Address	— Air Vice-Marshal K.A. Joseph
Announcement of Office Bearers	— Air Vice-Marshal K.A. Joseph
Announcement of Awards	— Air Vice-Marshal K.A. Joseph
Citations	— Air Vice-Marshal K.A. Joseph
Presentation of Awards	— Dr. S. Bhagavantam
Vote of thanks	— Shri S.S. Aiyar

ELEVENTH TECHNICAL CONVENTION (Constitution Club)

December 9, 1967—10.00 a.m. to 1.00 p.m.—First Session
December 10, 1967—10.00 a.m. to 1.00 p.m.—Second Session
2.00 p.m. to 7.00 p.m.—Third Session

EXHIBITION OF ELECTRONIC EQUIPMENT

The exhibition will be inaugurated at 5-30 p.m. on the 8th December, 1967, in the Mavalankar Auditorium, Rafi Marg, New Delhi and will remain open between 9.30 a.m. and 7.00 p.m. on the 9th and 10th December, 1967

December 9, 1967 at 3.30 p.m.—First Bhabha Memorial Lecture to be delivered by Dr. Vikram A. Sarabhai.

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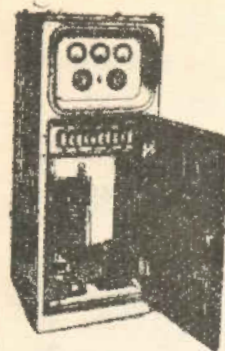
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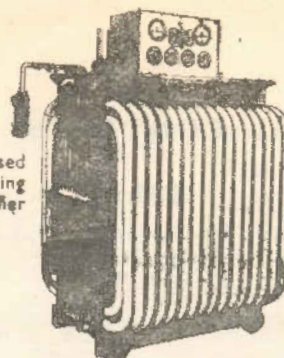
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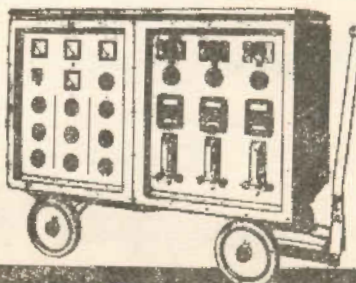


Emergency Lighting
Equipment for Hospital,
Factory, Theatre &
Picture Houses, etc.

Oil-immersed
Electroplating
Rectifier



Automatic Mobile Battery
Charger for Railway Coaches

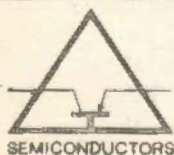


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MSBC-16

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INTRODUCTION

The Council of the Institution of Telecommunication Engineers takes great pleasure in presenting the 14th Annual Report of the Institution. During the year under review, it is gratifying to note that the Institution has shown progress in all directions. The membership of the Institution has increased by 524 over the last year's figure. The total number of members as on the 30th September, 1967 was 6707. The graduateship examination was duly conducted twice during the year and the total number of candidates who appeared in these examinations was 4023. 241 candidates completed the examination and received the Graduateship Diplomas. Many others have passed in parts. In the Journal of the Institution of Telecommunication Engineers, 54 papers were published during the year. Local centres of the Institution including Delhi, Bangalore, Bombay and Madras were extremely active during the year. Technical lectures were held in all the four centres. Besides, emphasis was laid in Delhi and at Bangalore for special programmes for student members including screening of technical films and visits to installations. The Bangalore centre had an interesting programme of student chapter in which a series of lectures was arranged specially for the benefit of student members appearing in the Graduateship examination. Better and improved facilities for our Student members are constantly engaging the attention of the Council. A new *ad-hoc* Committee at Calcutta local centre, representing various interests in the Electronics and Telecommunication field promises greater activity in that region. The excess of income over expenditure during the year was Rs. 41,769.40. A well established Library catering mostly to the needs of student members and also of utility to other members of the profession has come into existence. The Institution has taken active part in various other professional organisations where representation was sought. Effective contribution has been made to the Indian Parliamentary and Scientific Committee. The details of the activities of the Institution in various fields are given in this Annual Report.

THE COUNCIL (1966-67)

The Council of the Institution of Telecommunication Engineers for the year 1966-67 and the constitution of various Committees are given below :

PRESIDENT

Dr. P. K. Kapre

IMMEDIATE PAST PRESIDENTS

Lt. Gen. R. N. Batra

Shri C. P. Vasudevan

VICE-PRESIDENTS

Shri S. S. Aiyar

Dr. Saroj Datta

Shri S. N. Mitra

HONORARY TREASURER

Lt. Col. B. K. Rai

OTHER MEMBERS

Shri B. V. Baliga

Dr. N. B. Bhatt

Brig. H. Chukerbuti

Shri C. A. Cornelius

Air Vice-Marshal K. A. Joseph

Shri S. K. Kanjilal

Brig. S. K. Malhotra

Prof. H. Rakshit

Shri T. V. Ramamurti

Gr. Capt. I. W. Sabhaney

Brig. B. J. Shahaney

Lt. Col. J. N. Shahani

Dr. Amarjit Singh

Col. Hari Singh

Shri S. Thiruvengkatachari

Dr. G. R. Toshniwal

Dr. Lal C. Verman

SECRETARY

Shri S. K. Rana

Staff and Finance Committee

Dr. P. K. Kapre

Lt. Gen. R. N. Batra

Shri C. P. Vasudevan

Air Vice-Marshal K. A. Joseph

Shri S. K. Kanjilal

Shri S. S. Aiyar

Dr. Saroj Datta

Shri S. N. Mitra

Lt. Col. B. K. Rai

Examination Committee

Dr. Saroj Datta

Shri S. N. Mitra

Lt. Col. B. K. Rai

Shri T. V. Ramamurti

Shri K. C. Ramadoss

Brig. H. Chukerbuti

Dr. M. Chowdhuri

Shri D. C. Bhattacharji

Editorial Committee

Shri S. N. Mitra

Dr. N. B. Bhatt

Dr. Saroj Datta

Shri T. V. Ramamurti

Gr. Capt. I. W. Sabhaney

Shri S. Thiruvengkatachari

Dr. G. R. Toshniwal

Shri K. N. Gopalakrishnan

Shri T. S. Subramanian

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Membership Committee

Shri S. S. Aiyar
Air Vice-Marshal K. A. Joseph
Dr. N. B. Bhatt

Shri R. Raghavachari
Shri S. N. Ranganathan
Lt. Col. J. N. Shahani

I.T.E. Awards Committee

Shri S. K. Kanjilal
Dr. Saroj Datta
Shri S. N. Mitra
Dr. Amarjit Singh
Dr. G. R. Toshniwal
Shri S. Thiruvengkatachari

Building Committee

Shri S. K. Kanjilal
Dr. Saroj Datta
Shri S. N. Mitra
Lt. Col. B. K. Rai

Library Committee

Air Vice-Marshal K. A. Joseph
Shri S. N. Mitra
Dr. N. B. Bhatt
Lt. Col. B. K. Rai
Lt. Col. J. N. Shahani

Co-ordination Committee

Air Vice-Marshal K. A. Joseph
Shri S. S. Aiyar
Shri S. N. Mitra
Lt. Col. B. K. Rai
Lt. Col. J. N. Shahani

During the year, the Council formed a Sub-Committee with the following members to consider amendments to Bye-laws of the Institution.

Air Vice-Marshal K. A. Joseph
Dr. Saroj Datta
Shri S. N. Mitra
Lt. Col. B. K. Rai
Lt. Col. J. N. Shahani

The following members retired this year from the Council of the Institution.

Shri V. B. Baliga
Shri C. A. Cornelius
Shri S. N. Mitra
Prof. H. Rakshit
Shri T. V. Ramamurti
Brig. B. J. Shahaney

The election to fill up the vacancies caused by the retirement of the above members was held in accordance with Bye-laws 39 and 44. The following members have been duly elected to the Council of the Institution.

Maj. Gen. I. D. Verma
Shri N. V. Sheno
Shri S. M. Agarwal
Shri Uma Shankar
Shri B. S. Rau
Shri S. N. Ranganathan
Prof. G. K. Bhagavat

The Council wishes to place on record its deep appreciation of the services rendered by the retiring members of the Council and welcomes the new members to the Council.

The Council for 1967-68

- ✓ Air Vice-Marshal K. A. Joseph (President)
- ✓ Dr. P. K. Kapre
- ✓ Shri C. P. Vasudevan
- ✓ Lt. Gen. R. N. Batra
- ✓ Shri S. S. Aiyar
- Shri S. M. Agarwal
- Prof. G. K. Bhagavat
- Dr. N. B. Bhatt
- Brig. H. Chukerbuti
- ✓ Dr. Saroj Datta
- Shri S. K. Kanjilal
- Brig. S. K. Malhotra
- ✓ Lt. Col. B. K. Rai
- Shri S. N. Ranganathan
- Shri B. S. Rau
- Gr. Capt. I. W. Sabhaney
- Shri Uma Shankar
- Dr. Amarjit Singh
- Col. Hari Singh
- Shri N. V. Sheno
- Dr. G. R. Toshniwal
- ✓ Shri S. Thiruvengkatachari
- ✓ Maj. Gen. I. D. Verma
- Dr. Lal C. Verman

MEMBERSHIP

The membership of the Institution is at present of seven categories, viz:

1. Honorary Fellows (HF)
2. Fellows(F)
3. Members(M)
4. Associate Members (AM)
5. Associates (A)
6. Graduates (G)
7. Students (S)

In addition, there is another class of membership known as Sustaining Members. Table 1 and figs. 1 and 2 show the growth of

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members of the Institution in various categories, year by year, ever since the Institution came into existence.

TABLE 1

Years	H.F.	F	M	A.M.	S.M.	A	G	S	Total Membership
1953-54	—	—	—	120	—	85	360	385	950
1954-55	2	—	19	132	—	72	282	244	751
1955-56	3	1	26	186	—	102	520	446	1284
1956-67	4	1	27	195	—	79	489	302	1097
1957-58	5	1	31	243	12	63	466	267	1088
1958-59	5	1	36	256	13	45	456	238	1050
1959-60	5	3	35	273	13	36	484	607	1456
1960-61	4	3	39	288	14	36	471	1121	1976
1961-62	6	10	39	300	15	35	492	2089	2986
1962-63	5	10	43	288	16	25	454	2811	3722
1963-64	5	13	50	318	17	22	460	3590	4475
1964-65	5	13	57	317	16	17	835	4116	5376
1965-66	4	15	56	330	16	13	958	4791	6182
1966-67	5	16	68	345	17	14	940	5301	6706

It will be seen from the above table that ever since 1959 when the graduateship examination of the Institution was recognized by the Government and the Union Public Service Commission, there has been a steep increase in the category of student membership. From 1964 onwards, there has been a rise in the number of Graduate members. It is hoped that in the years to come more and more members will join the Institution in the other categories of membership.

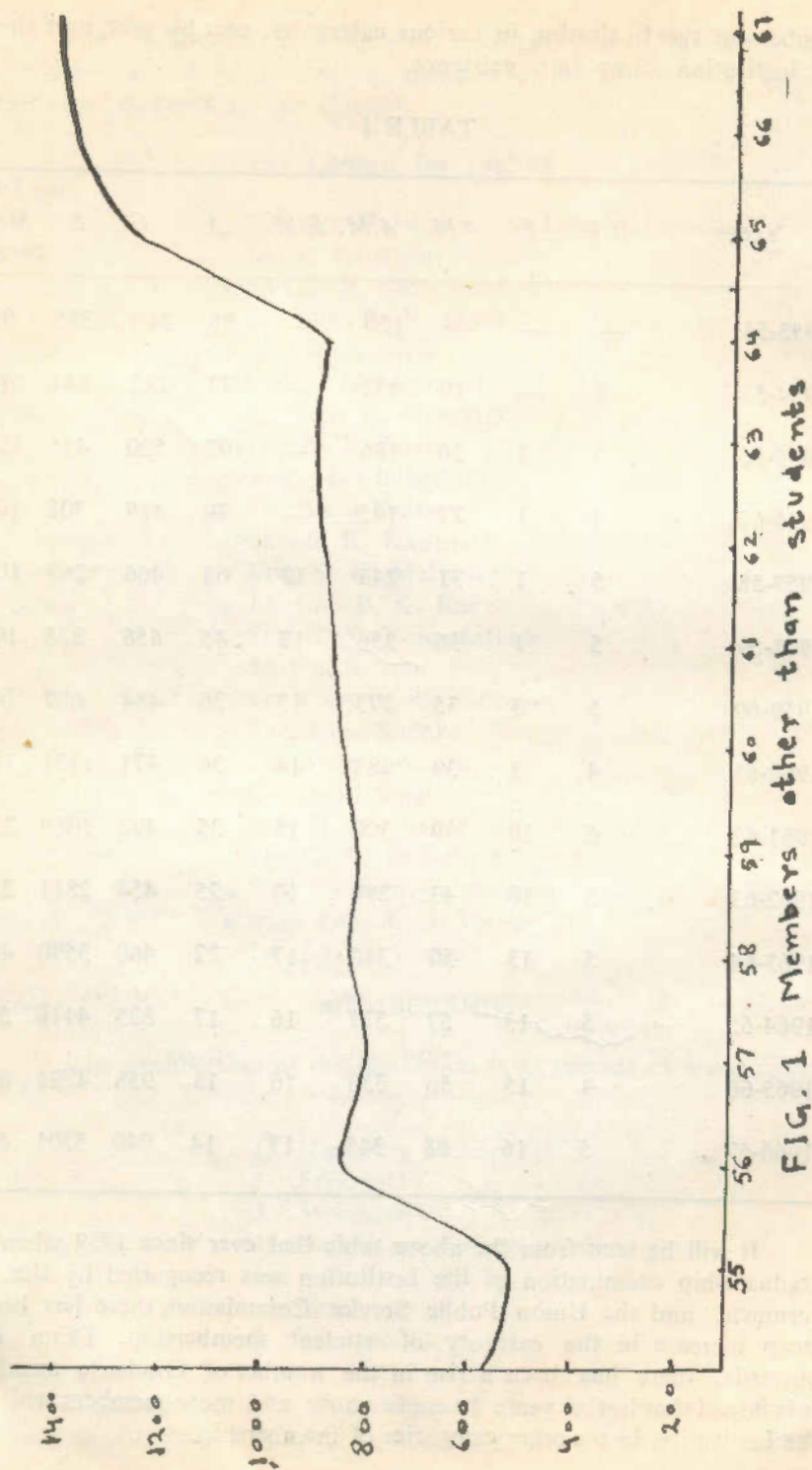


FIG. 1 Members other than students

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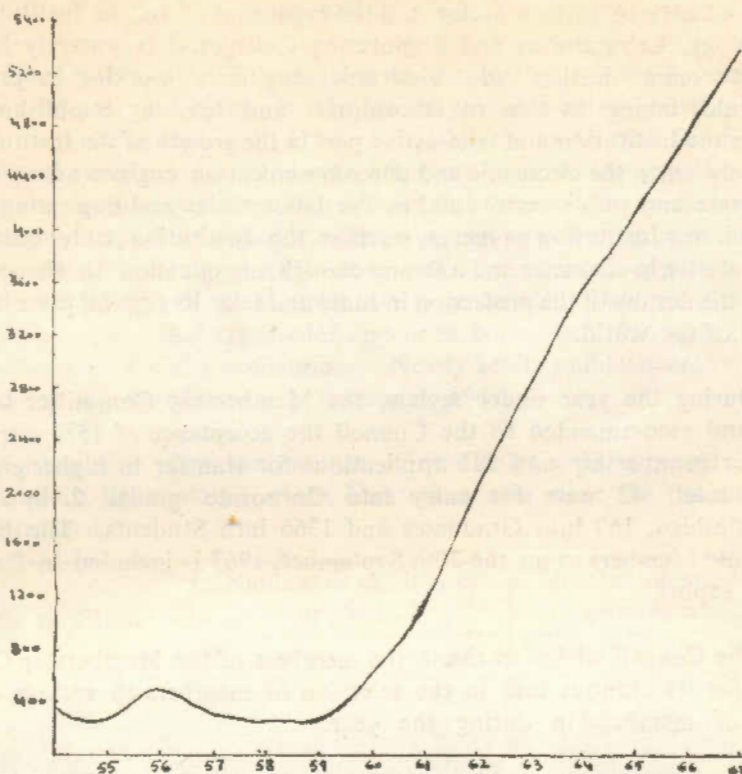


FIG. 2. STUDENT MEMBERS

Fellows

The Council takes great pleasure in announcing the election of Dr. P. K. Kapre, Industrial Director, Philips India Ltd., and Shri T. V. Ramamurti, Scientist-in-charge (DPEC), National Physical Laboratory, distinguished members of the Institution and of the profession, as fellows of the Institution

A close survey of the composition of the membership indicates that a large percentage of members belongs to public sector and Government departments. This is partly unavoidable as the major users of electronic equipment and components are from the communication departments of the Government of India. Considering the phenomenal growth of elec-

tronic industry in private sector and the expansion of Indian Institutes of Technology, Laboratories and Engineering Colleges, it is sincerely hoped that telecommunication and electronic engineers working in private sector undertakings as also in laboratories and teaching establishments will join the Institution and take active part in the growth of the Institution. It is only when the electronic and telecommunication engineers from both the private and public sectors and in the laboratories and Engineering colleges join our Institution *en masse*, so that the Institution truly becomes representative in character and a strong enough organization to shape and mould the destiny of the profession in India and take its rightful place in the council of the world.

During the year under review, the Membership Committee considered and recommended to the Council the acceptance of 1579 applications for membership and 127 applications for transfer to higher grades. Of the total, 42 were for entry into Corporate grades, 2 into the Associateships, 169 into Graduates and 1366 into Students. The list of Corporate Members as on the 30th September, 1967 is included in Part-II of this report.

The Council wishes to thank the members of the Membership Committee for its arduous task in the selection of members to various categories of membership during the year.

Members are requested to pay their dues in the month of October of every year membership subscription and to kindly intimate any change in their addresses or qualifications to the Secretariat for corrections and in the official records of the Institution.

According to Bye-law 28, any member whose annual subscription remains unpaid three months after the due date shall not be entitled, to attend or take part in the meetings of the Institution or to receive notices or publications of the Institution.

According to Bye-law 29 again any member whose annual subscription remains unpaid for two years, may, by a resolution of the Council, be struck off the rolls of the Institution.

Every year the Institution has to write off a large amount of money due to failure on the part of certain members to pay their membership subscriptions even after repeated reminders. We are aware that nobody wishes to be a defaulter intentionally but paying membership subscription in due time has somehow escaped the attention of some members. We, once again, appeal to all members to ensure prompt payment and spare us of this unpleasant duty of withholding the supply of literature or striking their names off the rolls.

EXAMINATION

The Graduateship Examination of the Institution has become very popular after its recognition by the Ministry of Education and the Union Public Service Commission in 1959. Candidates who pass the Grad. I.T.E. Examination are considered to have a qualification equivalent to a University degree in telecommunication engineering and they can be considered for appointment to posts in superior engineering services. The examination had a very modest beginning in 1956 when only 22 candidates appeared. The increasing popularity of the examination is reflected in 1899 the following table which shows that candidates appear in November 1966 and 2124 in May 1967 Grad. I.T.E. Examinations. Nearly 2500 candidates are expected to take up the examination in November 1967.

Table below gives the number of candidates who appeared in the Graduateship Examination of the Institution, ever since the examination was instituted :

Year of Exam.	Number of candidates applied		Number of candidates completed	
	November	May	November	May
1956	..	22
1956-57	..	26
1957-58	..	47
1958-59	..	58	..	3
1959-60	..	199	..	9
1960-61	236	290	13	22
1961-62	376	600	39	36
1962-63	1177	1444	60	78
1963-64	1659	1855	144	179
1964-65	1925	1765	146	99
1965-66	1947	1846	69	89
1966-67	1899	2124	130	111

67-68 2479 2501
It will be noticed from this table that there has been a rapid increase in the number of candidates appearing for the examination from 1963 onwards. Examinations are held at eighteen centres throughout India, namely at Agra, Bangalore, Bombay, Calcutta, Chandigarh, Delhi, Ernakulam, Gauhati, Hyderabad, Jabalpur, Jaipur, Lucknow, Madras, Nagpur, Poona, Rajkot, Srinagar and Trivandrum ; Chandigarh and Srinagar having been recently started.

The total number of candidates, who have successfully completed the Graduateship Examination in November 1966 and May 1967 was 130 and 111 respectively.

According to Regulation 5 of the Examination Regulations, candidates wishing to appear for Section 'B' of Grad. I.T.E. Examination should have had five years of experience in technical capacity or should produce an Eligibility Certificate from one of the Referees (appointed by the Council), that he has prosecuted and engaged himself in the engineering profession for an aggregate period of not less than 24 months. Accordingly a system of Refereeship has been introduced for the benefit of those candidates who do not possess an experience of five years in the field of telecommunication engineering. The list of Referees is published in Appendix IV in Part II of the Report. Candidates are advised to register themselves with the referees early. It is incorrect to communicate with referees through letters and answer their queries on the subject matter of their study through letters again.

It has been observed that the percentage of student members successful in passing the Grad. I.T.E. Examination is rather low. The Council is already concerned with this problem and has taken various measures including facilities for training. It is gratifying to note that the Ministry of Defence organized in 1963 a regular part-time training for the students who were preparing for the Grad. I.T.E. Examination. Tutorial colleges for such training have now been functioning with great success at Bangalore, Bombay, Delhi and Poona. This is a significant step towards assisting persons in the profession to achieve academic standards. The Council expresses its thanks to the Ministry of Defence and their staff at these tutorial colleges for their assistance during the past years in support of the Institution's programme of activities.

Much will depend on the extent to which the training facilities provided are utilised by the student members. There is always scope for improvement. Constructive suggestions to improve the present facilities offered will be welcome and can be forwarded to the Secretary of the Institution.

There has been phenomenal progress in recent years in the field of electronics, specially in Control and Computer Engineering. Keeping in view this advance, the Examination Committee recommended inclusion of two more papers; e.g. Control Engineering and Computer Engineering in Section 'B' of Grad. I.T.E. Examination. The Council has accepted this recommendation. Also a paper on 'Electronic Measurements' has been added in Section 'B' from November 1967 Grad. I.T.E. Examination. With this addition, the number of papers in Section 'B' is now 13.

The Examination Committee also revised the syllabus for the paper on Applied Electronics and Circuits—Part II Section 'A' of Grad. I.T.E. Examination; keeping in view the recent developments.

1966-67
Awards

The Council takes this opportunity of thanking the Examination Committee for conducting the examination, appointing the examiners, modernating the question papers and declaring the results of the two examinations. The Council also expresses its thanks to the Chairmen and Honorary Secretaries of the various local centres, as well as heads of many Colleges, Universities, Technical Institutions and members of the profession for their cooperation and facilities extended to the Institution in conducting the examination at their respective centres.

Studentship Award

In the year 1963, the Council decided to give Studentship Award of the value of Rs. 100/- to a candidate who secured the highest first class marks in both the papers of Section 'B', in the first attempt and completes the Grad I.T.E. Examination. Since then the following candidates have been given the Studentship Award :

November 1963	Shri Thakur Kapil Dev Lal Shrivastava
May 1964	Shri K. Seshadri
November 1964	Shri Vijay Kumar Goyal
May 1965	Shri U. S. Bhatnagar
November 1965	Shri Shreeram Waman Damle
May 1966	Shri Purushotam Gajanan Adhi

The Council has great pleasure in announcing the Studentship Award to Shri Amar Nath Sahai for November 1966 examination.

The Council offers its congratulations to Shri Amar Nath Sahai the recipient of the Studentship Award for 1966-67.

EXEMPTIONS

The Examination Committee in their 36th meeting held on the 4th April, 1966 appointed a sub-committee to consider afresh the exemptions already granted by the Institution to various qualified persons.

In order to facilitate the work, the Secretariat obtained recent Syllabii and Question Papers for the last five years (Subject and year-wise) from various Engineering Colleges, I.T.Is., Universities and Board of Technical Education, throughout India, for the detailed consideration by the sub-committee appointed for the purpose.

The sub-committee has since submitted its suggestions and recom-

mendations regarding the grant of exemptions from Grad. I.T.E. Examination which are under the active consideration of the Examination Committee. The decision of the Council on the recommendations of the Examination Committee is expected soon.

JOURNALS OF THE INSTITUTION

The Institution is publishing two journals entitled 'Journal of the Institution of Telecommunication Engineers' and "Students Journal".

The Journal of the Institution of Telecommunication Engineers, a monthly, publishes observations and researches in the telecommunication as well as the allied fields. The Journal of the Institution of Telecommunication Engineers started in March 1955 as a quarterly publication. Up to September 1959 it continued as a quarterly journal. From December 1959 it was made a bimonthly issue. It continued as a bimonthly publication up to June 1963. From July 1963 it was made a monthly publication. Fifty three papers were published in the year under review. We are glad to report that Abstracts and Patented Products in India have been included in our Journal.

The Council is happy to announce that sufficient contributions from specialists in the field of telecommunication and electronics are forthcoming. The list of papers published in the Journals of the Institution is given in Appendix I, Part II of this Report.

Students' Journal, a quarterly, started in December 1959. It caters to the need of student members of the Institution in supplementing their studies for the Grad. I.T.E. Examination. The articles published in the journal cover the scope of the syllabus of the Graduateship Examination of the Institution. The Students' Journal has gained its popularity within a very short period after its publication. This is evident from the fact that a large number of persons other than student members are subscribing to this quarterly. The Council also invites specialists to contribute papers to the Students' Journal of the Institution so that the benefit of specialised knowledge is made available to the student members of the Institution. This helps them to prepare for the Graduateship Examination. To encourage student members to contribute articles in the Students' Journal, the Council of the Institution decided in 1965 to award, during each calendar year one I.T.E. (Students) Award worth Rs. 200/- to the best contribution in the Students' Journal of the Institution. It is sincerely hoped that the student members also will take advantage of this encouragement and contribute articles for publication in the Students' Journal.

The Council wishes to express its thanks to the various Universities, Research Laboratories and Libraries in this country and abroad who have

been continuously subscribing to the Journals of the Institution and to many telecommunication, electronic and Radio Industries in India and abroad, who have been advertising their products in these journals.

I. T. E. AWARDS

In order to give incentive to contributors of articles in the journals, the Council of the Institution of Telecommunication Engineers is giving the following awards :

Journal of the Institution of Telecommunication Engineers

1. I.T.E. Award Rs. 500/-
(Named S. K. Mitra Memorial Award from 1964)
- 2. I.T.E. Awards (two from 1965) Rs. 250/- each

Students' Journal

I.T.E. (Students) Award (from 1965) Rs. 200/-

The following awards had been given so far to the best contributors of original papers to the Journals of the Institution :

I.T.E., Awards Rs. 500/-

<i>Year of Award</i>	<i>Recipient</i>	<i>Paper</i>
1955-59	— Shri S. N. Mitra	Magneto-Ionic Triple Splitting over Delhi (Sept. 1959 issue)
1960	— Shri Chaman Lal	Flutter Fading of Short-wave Radio Signals in Equatorial Regions and its connections with Spread Echoes, Magnetic storms and the Radiation Belt (August 1960 issue).
1961	— Dr. C. S. G. K. Setty	Observations of Ionospheric F-layer at Night (March 1961 issue).

- 1962 — Prof. S. Sampath and Shri K. V. Ramanan Evaluation of Amplification Factors in Multi-grid tube by the Electrolytic Tank Method (Jan. 1962 issue).
- 1963 — Shri K. P. P. Nambiar and Mr. R. H. Murphy A. C. Series Motor Speed Control with Silicon Controlled Rectifiers (January 1963 issue).

Re-named S. K. Mitra Memorial Award

- 1964 — Shri R. Seshasayee Transistorized Channeling Equipment (January/February 1964).
- 1965 — Shri H. J. Mirchandani and V. M. Sundaram A 7Kmc/s microwave terminal for short haul applications (November 1965 issue).

I.T.E. Awards from 1965

- 1965 — Shri B. S. Murthy Liquid epitaxial growth of germanium (May 1965 issue).
- 1965 — Shri R. Singh and Dr. K. S. Balain Growth and photo etching of oxide layers on silicon (March 1965 issue).

Students' Journal**I.T.E. Award from 1965**

- 1965 — Dr. V. Ramachandran Articles on Wave filters in 1965 issues of the Students' Journal.

The 'I.T.E. Award Committee' for the year 1966 consisted of the following members :

1. Shri S. K. Kanjilal (Chairman)
2. Dr. Saroj Datta
3. Shri S. N. Mitra

4. Dr. Amarjit Singh
5. Shri S. Thiruvengkatachari
6. Dr. G. R. Toshniwal

The Council wishes to express its sincere gratitude to the members of the I.T.E. Award Committee for their arduous task in selecting the best contributors.

LIBRARY

A well equipped Library is an asset to any professional organisation like ours. With kind assistance received in 1963 from the Ministry of Education, the Institution has been able to build up a good library of technical books to meet the needs of our members. The Institution has supplied a set of text books to Bombay, Madras and Jabalpur local centres and to Telecommunication Tutorial College, New Delhi. This arrangement will, to some extent, meet the requirements of student members in their studies for Grad. I.T.E. Examination. The list of books in the library has been printed in a booklet form and will be supplied to members on request. The total number of books available in the Library is 2157. During the year the following 53 books have been received for review from various publishers :

1. WORLIS, JOSEPH, Recent advances in biological psychiatry, Vol. 3 (Plenum Press)
2. MAGISON, ERNESTC, Electrical Instruments in Hazardous Location (Plenum Press)
3. RAO, V. V. L., Worked examples in metric system for engineering Students (Tech. India Publications)
4. SRINIVASAN, S. A., Basic concepts in signal (Asia Publishing House)
5. NARANG, K. L., Defect, reason and remedy in electrical machines (Tech. India Publications)
6. SKOBEL'TSYN, D. V., Soviet Maser Research (Consultants Bureau)
7. THERAJA, B. L., Text book of electrical technology (Niraj Prakashan)
8. ANAN'EVA, A. A., Ceramic acoustic detectors (Consultants Bureau)
9. KRASYUN, B. A., Electrospark machining for metals (Consultants Bureau)
10. SOLOMIN, G. A., Methods of determining Eh and PH in the sedimentary rocks (Consultants Bureau)

11. SALUJA, S. N., Classified examples in applied mechanics (Tech. India Publications)
12. BURROWS, W. H., Graphical techniques for engineering computations (Chemical Publishing Co.)
13. GUBAMOO, A. I., Quantum Electron theory of amorphous conductors (Consultants Bureau)
14. GUBAMOO, A. I., Fundamentals of electrical engineering in M. K. S. System Units (Tech. India Publications)
15. VISHWA NATH, Engineering Mathematics (Tech. India Publications)
16. JULES ARAOS, Solar system radio astronomy (Plenum Press)
17. VISHWA NATH, Technical Mathematics (Tech. India Publications)
18. BOEKHORSTA AND STOK, I. Television deflection system
19. BOBIKOV, O. I., Ultrasonics and its industrial applications (Consultants Bureau)
20. PENDER HAROLD AND MC. ILWAIN KNOR, Electrical engineers hand book ; Electric Communication and Electrons (Willy Engineering)
21. ROZENBERG, L. D., AND OTHERS, Ultrasonic cutting (Consultants Bureau)
22. DAS, P. N., Carrier Current Engineering ; including long distance telephony (Modern Book Agency)
23. DAS, P. N., Introduction to automatic telephony (Modern Book Agency)
24. DAS, P. N., Line Telegraphy (Modern Book Agency)
25. DAS, P. N., Introduction to Manual Telephony (Modern Book Agency)
26. CARTER, G. W., Simple Calculation of electrical Transmitter (University Press)
27. MILLER, W. E., Digital computer application to process control (Plenum Press)
28. HAMMOND, P. H., Theory of self-adaptive control systems (Plenum Press)
29. SAXTON, J. H., Advances in radio research, Vol. 2 (Academic Press)

52. HEAD, J. W., Mathematical techniques in electronics and engineering analysis (London Iliffe Book)
53. GROSZKOWSKIZANUSZ, Frequency of self-oscillation (Paragman Press)

The Council takes this opportunity of thanking the publishers who have very generously supplied their latest publications to the Institution for review in the Journals. The Institution is receiving 92 journals in exchange of the Journal of the Institution. The list of exchange journals is shown in Appendix II in Part II of the Report.

LOCAL CENTRES

The local centres play a vital role in propagating the objectives of the Institution and serve the members residing at different parts of the country. Five such local centres have been set up which are functioning at Bangalore, Bombay, Calcutta, Jabalpur and Madras.

The centres continue to maintain their activities and organize series of lectures and interesting programmes for the members. The details of the various local centres are given below :

Bangalore Local Centre

CHAIRMAN	— Shri G. U. Menon
HONORARY SECRETARY	— Maj. M. S. Nagarajan

The office of the local centre is located at the Telecommunication Tutorial College, 62 Jayamahal Road, Hebbal, Bangalore—6.

The Bangalore centre arranged a visit to the Indian Telephone Industries and members were taken round all the departments of the factory. Arrangements for visits to Bharat Electronics Limited and Auto Trunk Exchange were also made for the benefit of the members.

Students' Chapter for maintaining closer contacts between the Student members and the Committee was organized. There was a series of lectures for the benefit of the Student members of the Bangalore Local Centre of the Institution viz ;

3 April 67	Maj. M. S. Nagarajan	Communication Transmitters
4 April 67	Shri C. G. Subramanian	Micro-electronic Technique
5 April 67	Shri M. N. Gadre	Airport Radar
6 April 67	Shri M. J. S. Rengachar	Antennas
7 April 67	Shri V. Mohan	Transistor Technology
8 April 67	Shri P. Krishnamurthy Rao	Telex ARQ and Tape relay working
11 April 67	Maj. V. S. Rangaswamy	Communication Receivers
12 April 67	Shri V. Arunachalam	Trends in Land Line Communication
13 April 67	Col. D. Swaroop	Radar Technology
14 April 67	Shri M. S. Jaisimha	Telephone, Microphone and Receivers
15 April 67	Dr. R. Shankaranarayana	Digital Computer
17 April 67	Shri K. Swaminathan	Trunk Exchanges

It is interesting to note that Bangalore Local Centre has brought out an insignia, which is available for sale at Rs. 4/- each.

Bombay Local Centre

CHAIRMAN

— Shri P. M. Agerwala

HONORARY SECRETARY

— Shri K. P. P. Nambiar

The following lectures were arranged under the auspices of this centre :

1. 'Electronics in Trombay' by Mr. A. S. Rao, Director, Electronics Division, Bhabha Atomic Research Centre (Trombay) at Tata Auditorium on the 20th October 1966. He said, "Nuclear electronics is a typical modern branch of technology, resulting from the application of electronics to meet the needs initially of nuclear research, and later of the entire atomic industry. It is now, well recognized that without a full-fledged programme for the design and development of nuclear electronic equipment, no country can embark on any meaningful atomic energy programme. Thus, in any developing country, which does not already have an organized electronic

industry, a self-reliant atomic energy programme will necessitate not only the indigenous development of nuclear electronic instruments, but also an organized work on other aspects of electronics such as computers, process instruments and control systems."

2. 'Evolution in Transistor Technology' by Dr. B. H. Wadia, Director, Semiconductors Ltd., Poona at Tata Auditorium on the 7th November 1966. The lecture linked the early transistors with the status of electron tube technology tracing their development with the deeper understanding of solid materials and their electronic properties.

Madras Local Centre

HONORARY SECRETARY

— Prof. N. M. Janardhan

The following lectures were arranged under the auspices of this centre:

1. 'Noise and Vibration Measurement' by Mr. B. Langvad, of M/s Bruel and Kjaer, Denmark at the College of Engineering, Guindy on the 25 November 1966. The speaker who had a large number of coloured slides developed the technique of noise measurement by the use of sound level meters. He pointed out the possible sources of error and the necessary precautions to be taken. The speaker had some interesting spectrographs of some sources of noise, viz. (i) an electric fan and (ii) a pair of gears.

2. 'Microwaves and Satellite Communication' by Dr. D. K. Banerjee, Indian Institute of Technology, Madras at the College of Engineering, Guindy on the 7th December 1966. Dr. Banerjee started by explaining the need for microwaves in satellite communication, how the frequency has to be much higher than the short-wave range so that the ionosphere is no longer a barrier. He indicated the range of frequencies now in use as being in the 4-7 Gc/s. region and also that it goes up to 31 Gc/s. After referring to the various types of satellites possible such as spin established, gravity stabilized and tumbling type, he took up for discussion the performance required of the microwave equipment.

3. 'Space Communication' by Prof. K. S. Hegde, Government Engineering College, Guindy, Madras at his College on the 1st February 1967.

Delhi

At Delhi, the Institution arranged 15 lectures and screened films on Electronics and Telecommunications on three occasions especially for student members, at the National Institute of Sciences of India Auditorium and at the U.S.I.S. Auditorium respectively which were well attended. The

lectures maintained a high level of interest. Some of the lectures were jointly sponsored by the Institution of Engineers (India), the Institution of Electrical Engineers, the Institution of Electronic and Radio Engineers; and the National Institute of Sciences of India. Besides, the introduction of programmes, students' get-togethers were a novel feature at Delhi this year. The technical films and visits to Connaught Place Telephone Exchange and A.I.R. Studios at Broadcasting House were well appreciated by student members.

Lectures

<i>Date</i>	<i>Subject</i>	<i>Speaker</i>
6-12-66	General Instrumentation for Noise and Vibration measurements and Analysis.	Mr. B. Langvad, Engineer of Bruel and Kjaer, Denmark.
26-12-66	Some Experimental Techniques and Results in Nuclear Magnetic Resonance Spectroscopy at Radio Frequencies.	Dr. Weston A. Anderson, Research Director, Varian Associates, USA.
23-1-67	New Possibilities for Sound Amplifier	Dr. W. G. Proctor, Director, Varians AG, Zurich.
10-3-67	Some Aspects of Medical Electronics.	Dr. S. K. Guha, Harcourt Butler Technological Institute, Kanpur.
13-3-67	(i) Development trends in Radio relay engineering. (ii) Radio Relay Systems for High, Medium and Low Channel capacities.	Mr. H. J. Graeber, M/s Siemens A.G., Munich.
17-3-67	Automation and Control.	Prof. Emrys Williams, President, I.E.R.E., Head of the Deptt. of Electrical Engg., University of Wales.
20-3-67	Recent Advances in Semiconductor and Quantum Electronic Devices for Microwaves.	Dr. I. M. Stephenson, University College, London.
27-3-67	Blackout of Communications by Missiles.	Dr. M. S. Sodha, Indian Institute of Technology, Delhi.

18-7-67	Overseas Communication Service—Present and Future.	Mr. G.D. Gokaran, Director, O.C.S., New Delhi.
26-7-67	Electronic Digital Communications	Prof. Peter M. Dollard, State University, New York.
2-8-67	Electrical Communications.	Prof. Ernest S. Luce.
4-8-67	Electronic Logic Circuits	Prof. James V. Malone.
16-8-67	Satellite Radio Beacon Experiment in National Physical Laboratory.	Dr. A. P. Mitra, National Physical Laboratory, New Delhi.
5-9-67	National Subscriber Dialling.	Mr. P. K. Roy Chowdhri, P and T Directorate, New Delhi.
15-9-67	How the brain works.	Mr. N. P. Rao, Defence Science Laboratory, Delhi.

Films

8-5-67	Ring Round the World
8-6-67	<p>Trios :Television and Infra-Red Observation Satellites Meeting in Space : Rendezvous of Gemini 6 and 7 in Space. Syncom : Launching a satellite synchronised with Earth's rotation.</p> <p>Guest of Honour : Visit of Prime Minister—Mrs. Gandhi to the U.S.A.</p>
31-7-67	<p>Live VIA Early Bird</p> <p>The Little Giant</p> <p>Science in Space</p> <p>Construction of Agronne Research Reactor</p> <p>Celebration Colour</p>

The Council takes this opportunity to thank all the speakers, the sister Institutions, United States Information Services, the General Manager, Delhi Telephones, and the Chief Engineer, All India Radio for their co-operation and assistance in making the programmes a success.

OBITUARY

Dr. Manohar Balaji Sarwate, a Fellow of the Institution of Telecommunication Engineers, passed away on Sunday, the 19 February 1967 in Geneva. The day before, Dr. Sarwate entered the hospital for simple gall bladder operation. He stood the surgery well but later developed a rare complication which proved fatal.

Dr. Sarwate was a founder member of the ITE and his interest contributed to the healthy and rapid growth of the Institution in its early formative years. He was a member of the Institution's first Council, formed in 1953. He took active part in the affairs of the Institution right up to 1959 when he left India for Geneva to take over as the Deputy Secretary General of the International Telecommunication Union. He exhibited unremitted interest over the welfare of the Institution even from Geneva.

Dr. Sarwate was born at Saugor on the 15th March 1910. He graduated as a Bachelor of Science from the Bombay University in 1932 and obtained the Diploma in Electrical Technology of the Indian Institute of Science, Bangalore, in 1935. He was awarded the Ph.D. Degree in Engineering by the Liverpool University in 1938.

During the Second World War, he was engaged in the United Kingdom on the development of radar facilities for military aviation. He served as an officer of the Royal Air Force where he rose to the rank of Squadron Leader. He was mentioned in despatches. After the war, he joined the Civil Aviation Department of the Government of India and in 1948 he was appointed as the Director of Communications. In that capacity he guided the development of the Aeronautical Communication Services for Civil Aviation in India.

He was closely associated with the negotiations the Government of India had with the Compagnie Generale De Telegraphic Sans, Fil, Paris, for the establishment of Bharat Electronics Limited. In 1953, he was appointed as the Adviser, Wireless Planning and Coordination in the then Ministry of Transport and Communications, Government of India. He represented India at all the important conferences held by the International Telecommunication Union. He also participated in the annual sessions of the Administrative Council of the Union.

On account of his singular intimacy with international telecommunications and his close association with all the activities of the International Telecommunication Union, he was nominated in 1959 as India's candidate in the contest for the post of Deputy Secretary General of the Union. He was elected to that post by a vast majority and he took charge of the assignment in 1959.

Again at the election for the post of Secretary-General of the Union in 1965, he was nominated by the Indian Government as a candidate. He was elected to that post attracting a good response mainly on account of his personal merits. It was an honour to India and to the community of Telecommunication Engineers in this country that this highest post, ever to be held by an Asian, was earned by him. Destiny intervened bringing his career to an end hardly a year after he took over as Secretary General.

Dr. Sarwate's eminence as an engineer, administrator, diplomat and an International Civil Servant was not dependent on chance factors. He was eminent by the striking and intrinsic qualities of head and heart he possessed. Through these, he distinguished himself from his surroundings by several orders of merit magnitude. He was meticulous in everything that he did. There was no detail too small to escape his attention, if such a detail was of even the remotest importance to his objectives and aims. He set for himself high standards of achievement and reached them with all the power and perseverance at his command.

He was too quick to recognize merit in others and equally quick in winking at others faults. This is well illustrated in a personal remark he made not long ago that during his entire career as a superior officer he had never written an unkind word in the performance records of any one working under him. However, on matters of strong conviction, he showed great courage in expressing his views utterly regardless of likely inconveniences to himself.

One could multiply examples to illustrate that Dr. Sarwate was even a distinguished person, knowledgeable, humble, meticulous almost to a fault and pleasant. Above all, he was a competent leader with enormous motivation to carry along with him great organizations with dignity and responsibility. In his passing away many of his friends, colleagues in profession and even casual acquaintances in various walks of life have felt with sincerity the loss of an outstanding personality.

V. V. RAO

SECRETARIAT

The office of the Institution is housed at 72, Ring Road, Lajpat Nagar-III, New Delhi-14. The staff of the Secretariat consists of the following :

1. Secretary	1
2. Assistant Secretaries	2
3. Stenographer	1
4. Office Assistants	3
5. Librarian	1
6. U.D.C.'s	4
7. Accounts Clerk	1
8. Typist-Clerks	7
9. Daftry	1
10. Peons	4
11. Chowkidar	1
12. Sweeper	1

During the year under review, the Secretariat has processed over four thousand examination applications and 1579 membership applications. Examination was conducted at 18 centres successfully and the results were duly announced well in time.

The smooth running of the Secretariat is entirely due to the willing co-operation of the office bearers and ungrudging hard work put in by the officials of the Secretariat. The Council wishes to place on record its appreciation of the silent but hard work put in by the staff of the Secretariat.

BUILDING

The Institution of Telecommunication Engineers, ever since its inception, have been housed in rented buildings. The possession of a permanent accommodation for the Institution has been engaging the attention of the members of the Council for the last five years or so. The Delhi Development Authority agreed to allot a piece of land in the Civil Lines area for constructing a building for the Institution. It will, however, take some time to develop the area.

Efforts are simultaneously being made to get from the Works and Housing Ministry a piece of land in a more central locality in New Delhi for constructing a building. Simultaneously, prospects are being explored of buying a suitable building as an interim measure.

MINUTES OF THE THIRTEENTH ANNUAL GENERAL MEETING

The business meeting of the Thirteenth Annual General Meeting commenced at 3-00 P.M. on the 9th December 1966 in the Banquet Hall of Hotel Oberoi Intercontinental, Wellesley Road, New Delhi, with Dr. P. K. Kapre in the Chair.

Agenda Item No. 1 : (Confirmation of the minutes of the 12th Annual General Meeting).

Lt. Gen. R. N. Batra proposed that the minutes of the 12th Annual General Meeting might be confirmed. The proposal was seconded by Brig. H. Chukerbuti. As there was no comment the minutes of the 12th Annual General Meeting were approved.

Agenda Item No. 2 : (Adoption of the 13th Annual Report for the year 1965-66).

The 13th Annual Report for the year 1965-66 which was circulated to the members in advance was taken as read.

Shri C. P. Vasudevan proposed that the Annual Report might be adopted. The proposal was seconded by Lt. Col. B. K. Rai. The report was adopted as there were no comments.

Agenda Item No. 3 : (Appointment of Auditors for the year 1966-67).

Shri S. S. Aiyar proposed that M/s Khanna and Annadhanam, Chartered Accountants might be appointed as Auditors for the year 1966-67. This was seconded by Shri S. N. Mitra. As there was no other nomination, M/s Khanna and Annadhanam were appointed as Auditors for the year 1966-67.

Agenda Item No. 4 : (Any other matter).

The activities of the student members in the Institution were discussed and it was observed that—

(a) the articles in the Students' Journal should cover the subjects for the Grad. I.T.E. examinations ; and

(b) The Students' Journal should be brought out in time.

The meeting was informed that this was already receiving the attention of the Editorial Committee.

JAMES THIRTEENTH ANNUAL GENERAL MEETING

The Thirteenth Annual General Meeting of the Institution of Telecommunication Engineers (India) was held on the afternoon of the 9 December 1966 at the Banquet Hall of Hotel Oberoi Intercontinental, New Delhi. Besides the cream of telecommunication engineers many other distinguished guests also graced the occasion. Dr. A. N. Jha, Lieutenant Governor, Delhi inaugurated the session.

Dr. Saroj Datta welcomed the Chief Guest and said that Dr. Aditya Nath Jha was too well-known to be introduced by him." He mentioned that Dr. Jha was not a total stranger in the field of telecommunications and electronics.

Narrating the birth of telecommunications he mentioned that the telecommunications were really born when Alexander Graham Bell uttered his famous sentence, "Mr. Wattson, come here—I want you." He, then, explained the vital role which telecommunications has been playing these days, and also mentioned the endeavours of the Institution to develop the science and technology of telecommunications in our country.

Outlining some difficulties encountered by the Institution he said, "We are not without our tale of woes. We have not yet been able to build up the Institution as completely as it should. A large percentage of membership is confined to the Government Departments and allied Public Sector organisations only.....The limitation of accommodation, the limited library facilities and above all lack of funds deter us at every step." Explaining why the Institution had called upon an administrator to inaugurate this session of a body of professionals, deliberating in the highly sophisticated field of electronics, he said, "An administrator is precisely interested in the effective control of the administrative machinery for the progress and upliftment of industry and business to achieve security and plenty for the community. The outlook of electronics engineering is basically the same. It is the 'Control of Many by a Few', be it in a vacuum tube, in a transistor or be it information in a communication channel."

In the end, he congratulated Dr. Kapre, the President, for getting elected for a second term.

Dr. A. N. Jha in his inaugural address said that he was a fellow-sufferer as he had also come across delays being caused by the administrative difficulties encountered when a non-technical officer assumes the disguise of an expert. He explained the growing importance of telecommunications and mentioned that some day it would be possible for people of the whole of globe to see and hear simultaneously a speaker on television by the application of communication satellites. Carried

away by the applauding audience he even dared to suggest that some day it may be possible to bring back to life the words of the renowned people of the past. He touched upon lightly on many technical problems which the present telecommunication experts are looking into.

Dr. P. K. Kapre in his Presidential address discussed the "Bhabha Committee Report" entitled "Electronics in India" and mentioned some of the bottlenecks which are delaying the fulfilment of the objectives of the Report. He made some suggestions which may be of some help in speeding up the progress of telecommunications. In the second half of his speech he discussed the present position of television in India and stressed the ever-growing importance of Television Industry in the country by saying "When I was speaking about it last year, I doubted whether in view of the shortage of foreign exchange and the rather precarious financial condition of the country, spending large sums of money on television was justified and was it not a better proposition to spend the same, on developing the radio industry instead. Now that the Government has finally decided to set up TV in three or more cities in addition to Delhi, I would only like to suggest that if a thing is worth doing, it is worth doing well and that the Government should set up at least one station thoroughly to act as a model to be copied when the other stations are set up."

Shri S. N. Mitra offered a vote of thanks to all concerned and expressed sincerest and heart-felt gratitude on behalf of the I.T.E. and on his own behalf to Dr. A. N. Jha, the Chief Guest for having spared his valuable time to inaugurate the Annual function of the Institution and also for a forth-right and extremely interesting address. He thanked Dr. Kapre, the President of the Institution for handling the affairs of the Institution in a manner most conducive to the progress and prosperity of the Institution. He thanked the contributors of various papers to be presented at the Technical Convention, the exhibitors who had taken part in the Exhibition and the various industries who had given advertisements in the publications of the Institution.

TENTH TECHNICAL CONVENTION

The Tenth Technical Convention of the Institution of Telecommunication Engineers was held on the 10th and 11th Decemer 1966 at Hotel Oberoi Intercontinental, New Delhi. Invitations were extended to research organisations in Government Departments, Council of Scientific and Industrial Research, industries, universities and public institution in India to send papers for being presented at the Technical Convention. Invitations were also extended to similar organizations outside India. It is encouraging to record that 69 technical papers were received and 64 were read and discussed. The subjects covered were : Electrical Com-

communication Systems, System and Control Engineering, Electronic Computers, Microwave Electronics, Lasers, Masers, Medical Electronics, Industrial Electronics, Nuclear Electronics, Acoustic and Audio Engineering, Broadcast and Television, Antenna and Propagation, Noise : Radio, Atmospheric, Cosmic, Galactic and Solar, Space Electronics, Navigation Electronics, Semiconductor Electronics, Electronic Components including Circuit Theory, Electronic Instrumentation and Measurements, Medium, HF, UHF, Networks and Circuit Theory. Four sessions were arranged and papers were grouped subject-wise to provide an opportunity for group discussion on specialized subjects.

FIRST SESSION

The first session containing 11 papers dealt with Electrical Communication Systems, System and Control Engineering and electronic Computers.

The session started with Dr. P. K. Kapre in the chair who welcomed the participants and expressed his appreciation of the large number of papers being presented on different subjects in the Technical Convention. Dr. Kapre was called for some important business and Dr. Saroj Datta then took over the chair. The first paper entitled 'A new type Analogue Multiplier and Divider' was presented by Shri G. Maruthi Krishna, Osmania University, Hyderabad. The paper was in two parts. The first part dealt with design of an A.C. Multiplier using the square law characteristic of electronic devices. The second part of the paper described an analogue divider using switching circuits. Prof. Alladi Prabhakar from Osmania University, Hyderabad, next presented his paper on 'Digital Compensation in Sampled Data Systems'. He described the techniques of programming the computer for different types of compensation. Three papers were then presented by Shri V. Seshadri, I.I.T., Madras. The first was 'A Simplified Formulation of Optimization Indices', wherein he presented a method of straight-line approximations which permit the expression of the various integral criteria as relatively simple algebraic functions of the step-transient parameters of a system, namely the rise time, settling time and the times and values of the first and second overshoots. The second was 'On the Choice of Optimum Gain for Linear Feed-back Control Systems'. He mentioned the results of an attempt to develop a frequency-domain approach to the direct determination of optimum gain for linear systems. The third paper presented by him was 'Certain Empirical Correlations between Time-Domain and Frequency-Domain Parameters of Relative Stability in Linear Feedback Control System'. He outlined the results of certain studies exploring the existence of possible correlations for linear systems between the relative stability parameters in real frequency-domain analysis. This was followed by a paper entitled

'Worst Case Design of Transistorised Digital Circuits' by Shri C. K. Sane, Telecommunication Research Centre, P and T Dte., New Delhi. He described the various parameters which influence the worst case design of transistorised digital circuits. Thereafter Shri M. S. Vasudeva from Indian Institute of Science, Bangalore, presented his paper on a 'A New Approach for Getting the Analogous and Dual Networks'. He described the changes associated with duality and the two analogies viz. classical and mobility analogies.

In the next paper presented by Dr. M. Lal from University of Roorkee, Roorkee, on 'Non-linear Adaptive Control Systems—Identification and Characterization', he mentioned a procedure by which a non-linear system belonging to class n , defined by Zadeh, can be characterized and a model of the system can be constructed. Thereafter Shri Harpreet Singh, from the same university, presented the computerizations of various passive network synthesis techniques. This was then followed by a paper entitled 'Increased Output Powers at VHF Using Multiplicity of Low Power Silicon Planar Transistors' read by Shri P. K. Rangole from Central Electronics Engineering Research Institute, Pilani. He pointed out the special problems relating to the design of multi-transistor driver and output stages and suggested the ways of overcoming them. The last paper of the session was presented by Shri A. K. Mehrotra from I.I.T., New Delhi, on 'An automatic Phase Lock system with Adjustable Noise Bandwidth'. He described a scheme by which the noise bandwidth of an automatic phase lock system is automatically reduced to any desired value after the system is locked.

At the end the Chairman thanked the speakers for their contributions and concluded the session.

SECOND SESSION

The second session of the technical convention was devoted to Microwave Electronics, Lasers, Masers, Medical Electronics, Industrial Electronics and Nuclear Electronics. Dr. N. B. Bhatt, Director, Solid State Physics Laboratory, Delhi was the Chairman of the session. Shri C. L. Garg (Defence Science Laboratory) presented a paper on 'How to Build a Pulsed Ruby Laser'. He described the general requirements for the construction of a pulsed ruby laser, being constructed at their laboratory. In the next paper on 'A Negative Resistance Lower Side Band Up-Converter Parametric Amplifier at 1284 mc/s', Dr. Y. S. N. Murthy of Defence Electronics Research Laboratory described the design details on an experimental negative resistance lower side band up-converter parametric amplifier. Shri V. Narayana Rao from the same Laboratory presented a paper on 'A Negative Resistance Parametric Amplifier in the

L-Band Region'. He described the design details of it. Thereafter, Shri D. K. Sachdev, from Telecommunication Research Centre, presented a paper on 'Microwave Sources with Frequency Multipliers'. He outlined the design procedures for the different types of VHF drivers, multipliers and harmonic generators. In the next paper presented by Dr. B. V. Rao, Indian Institute of Technology, Bombay, on 'A Study of Microwave Sectoral Horn and Lens Antennas', the speaker narrated the study of the collimating properties of metal plate lenses for X-band H plane sectoral horns. This was followed by a paper entitled 'S-Band Cavity-Backed Helical Antenna', by Dr. Y. S. N. Murthy from Defence Electronics Research Laboratory, Hyderabad. He described the design details and results obtained on cavity backed helical antennas. The studies were carried out by him in the frequency region 2.2 to 3.8 m/cs. Shri S. Balaram from Civil Aviation Department, New Delhi, presented a paper on 'Square Stepped Helical Antenna'. He described the construction of a square stepped helical antenna, radiating in the axial mode and its impedance and radiation characteristics were presented. The next paper was presented by Shri A. K. Nagle, Atomic Energy Establishment, Trombay, on "A MOSFET" d.c. amplifier for Nuclear Instrumentation" wherein he described the design aspects of a completely transistorised d.c. amplifier using Metal Oxide Silicon Field Effect Transistor in the input stage. The paper on 'X-Band Balance Mixer' was then presented by Shri M. D. Raj Narayan, Defence Electronics Research Laboratory, Hyderabad. He described the details of the balanced mixer designed for X-band frequencies and the results obtained. The present balanced mixer in conjunction with an external matching element results in a noise figure of the order of 12 db. when a preamplifier is used. Thereafter Shri V. K. Agarwala from National Physical Laboratory, New Delhi, presented a paper on 'Broadbanding of Waveguide Junction Circulators'. He mentioned that by proper matching, circulator action is possible over a much wider frequency band. For broadband matching over a desired frequency band, dielectric loaded junction has been found to be quite useful. In the next paper presented by Shri D. V. Karandikar, Atomic Energy Establishment, Trombay, on 'Plasma Jets—Their Technology and Applications', the speaker mentioned that a family of high temperature generators—plasma torches—has been developed, using high intensity electric arcs, to produce gas streams at temperatures between 5000 and 50,000°C. This article gives the design and construction of two such torches (1) The R-F Plasma torch (2) The DC Plasma torch. The last paper of the session was presented by Dr. O. P. Gandhi from C.E.E.R.I., Pilani on 'Injected Beam Type Crossed Field Microwave Tube at C.E.E.R.I.' He described the design and development of an injected beam type M-BWO giving an output of more than 200 watts CW at S-band.

The Chairman then thanked the speakers for their contribution and wound up the session.

THIRD SESSION

The third session of the Technical Convention was held on the 11th December 1966 when papers on Acoustics and Audio Engineering, Broadcast and Television, Antenna and Propagation, Noise : Radio, Atmospheric, Cosmic, Galactic and Solar, Space Electronics, Navigation Electronics were read and discussed.

Shri Chaman Lal, Wireless Adviser to the Government of India, Department of Communications, New Delhi presided over the session.

Shri D. Bhattacharya from I.I.T., Kharagpur, presented the first paper of the session on 'A Low-Frequency Helical Antenna for Sub-surface Communication'. He described the development of a simple antenna structure of limited dimensions suitable for low frequency and underground communication. Shri C. M. Patel from Physical Research Laboratory, Ahmedabad, next read a paper on 'Horizontal Drifts in the F-Region of the Ionosphere over Ahmedabad'. He outlined an attempt made by him to study the relation between the drift speed, magnetic activity and the daily sunspot number. He found that the drift speed does not show any significant relation with magnetic activity or sunspot number. Shri Tuhi Ram Tyagi from National Physical Laboratory, New Delhi, next read a paper on 'Satellite Beacon Studies of the Ionosphere over Delhi'. He described the total electron content (Is) measurements made from the Faraday fading records obtained at Delhi during low solar activity, and showed the method of calculating the electron content values over Delhi with maximum accuracy. Shri R. S. Sastry from the same organisation presented a paper on 'Instrumentation of Rocket-Borne Riometer for D-Region Studies'. He outlined briefly the principle and application of the Rocket-Borne Riometer method of studying the D-region absorption. This was followed by another paper 'Multifrequency Observations of Sudden Cosmic Noise Absorption and X-Ray Flares' read by Shri C. V. Subrahmayam from N.P.L., New Delhi. He suggested that SCNA events for which the frequency ratio is lowered, appreciably below the pre-flare value is an indicator of 'non-thermal' type of X-Ray bursts. Again from the same organisation Shri Tuhi Ram Tyagi presented a paper on behalf of Shri B. C. Narasinga Rao on 'Electron Density Distribution in the Equatorial F-Region'. He arrived at the results that at mid-night the height distribution followed \propto -Chapman profile, and at midday, it followed linear distribution excepting near the peak of the layer. This was followed by another paper 'Effects of East-West Horizontal Drifts on the Equatorial F-Region' read by Shri B. C. Narasinga Rao from N.P.L., New Delhi. He described theoretically the effects of east-west horizontal drifts on the diurnal variation of electron density in the equatorial F-region. In the next paper,

Shri S. B. S. Subrahmanya Sarma from the same department read a paper on 'Absorption of Cosmic Radio Noise at 28.6 mc/s by the F-layer and Upper Regions'. He presented the detailed analysis of results concerning F-layer and the regions above it. The paper on 'Noise Sensitive Public Address System with Automatic Level Control' was read by Shri B. A. N. Raju from Civil Aviation Department, New Delhi. He described and showed the automatic adjustment of pre-amplifier depending on the environmental noise. Shri S. C. Majumdar from the same department read a paper on 'Transhorizon VHF Propagation over Ground-Air Paths'. He described the results of observations over five transhorizon radiopaths. The paper on 'Echo Equalisers' was read by Shri A. K. Sanyal from Telecommunication Research Centre, New Delhi. He described in detail the technique based on 'paired echo' theory and showed the results of such an echo equaliser designed in the Telecommunication Research Centre for amplitude equalisation in the 60 to 6000 kc/s frequency band for use in the 1380 channel coaxial cable system. Shri G. V. Anand from Indian Institute of Science, Bangalore, described in his paper on 'Nonlinear Resonance in Stretched Strings with Viscous Damping', the phenomena of amplitude jumps and nonplanar oscillations, which are the characteristic features of the nonlinear resonance in stretched strings. In the next paper, Shri R. K. Arora from the University of Roorkee, described the 'Application of Dynamic Programming to Antenna Array Synthesis'. Thereafter Lt. Col. S. Misra from Electronics and Radar Department Establishment, Bangalore presented a paper on 'Staggered Modulation in Beam Riding Guidance'. This was then followed by a paper entitled 'Corpuscular Effect of a Solar Flare as observed through sudden increase in Long Wave Field Intensity 'SIL' read by Shri Mangal Sain from All India Radio, New Delhi. His paper was an analytical study of magnetic storm in relation to the occurrence of 'SIL'. He viewed that the most probable value of delay between an occurrence of SIL and that of magnetic storm has been found to be 23 hrs. The most probable value of duration of a magnetic storm has been found to be 25 hrs. as against 34 hrs. found for type 3 flares as observed through 'SIL'. Shri P. Benjamin from Research Deptt. of All India Radio, New Delhi read a paper on 'Indices for Prediction of f_oF_2 '. He described the possibility of using the variation of Solar Flux at 2800 mc/s in place of sunspot number. In the next paper, Shri Shiv Prasad Kosta from C.E.E.R.I., Pilani, described the 'Design of the Television Receiving Antennas'. The last paper of the session was 'A Method for Calculating D-Region Electron Density with Special Reference to Rise in Electron Density during Solar Flare', read by Shri P. R. Sen Gupta from I.I.T., Kharagpur.

The Chairman wound up the session and thanked the speakers for their contributions.

FOURTH SESSION

The fourth and the last session of the technical convention was held on the 11th December 1966, in which papers on Semiconductor Electronics, Electronic Components including Circuit Theory were presented and read. Shri T. V. Ramamurti, Scientist, National Physical Laboratory, New Delhi, was in the chair.

Shri K. P. P. Nambiar, Philips India Ltd. Bombay, on behalf of Shri J. Wijtsma presented the first paper of the session on 'Electronic Components and Printed Circuits'. He described the advantages of Electronic Components and printed circuits. Shri J. G. Advani from Faculty of Technology and Engineering University of Baroda, next read a paper on 'Linear Frequency Transformations and A. C. Active Networks'. Shri G. D. Murthi from A.E.E.T., Bombay, next read 2 papers on 'Practical Methods of Design of Active Filters' and 'Design of Crystal Band Pass Filter'. In his first paper he showed the good agreement that is obtained between theory and practice in the design of Active Filters. In the second paper he presented the detailed design of synthesizing a crystal band pass filter in the range of 11.5 mc/s region for a prescribed attenuation. The next paper was presented by Shri W. V. Ramana from the same department on 'Preparation, Purification and Single Crystal Growing of Indium Antimonide'. He described the methods and techniques used for the preparation of very high purity 'indium antimonide'. This was followed by another paper on 'Realization of Resistive N-Port Networks without Tree Transformations—I and II' by Shri V. K. Jain from Birla Institute of Technology and Science, Pilani. Shri K. C. Chadha from Defence Electronics Research Laboratory, Hyderabad, next read a paper on 'Noise Generation in Avalanche Diodes'. He described the possibilities of optimising the use of avalanche diodes for use in random noise generators. Dr. T. K. Bhattacharya from Atomic Energy Establishment, Trombay, Bombay, presented a paper on 'Current Saturation in n-GaAs'. He discussed the possible reasons for the reported saturation in n-GaAs. Next Dr. S. K. Hajela of Telecommunication Research Centre presented a paper on 'Solid State Static Inverters'. He gave a detailed description of a 4 KVA static inverter designed at their Centre for use in 'No break' power plants for carrier communication equipment, coaxial and microwave systems. Shri R. K. Dutta from Central Electronics Engineering Research Institute, Pilani, described in his paper on 'A Simplified Approach to the Design of a High Frequency Triangular Wave Generator', a novel technique of modifying the basic multivibrator circuit. This was followed by another paper 'Low-Noise Front-End Amplifiers for Wide-Band Receivers' read by Shri R. Chandrasekaran from Defence Electronics Research Laboratory, Hyderabad. He described the design and development of a novel low-noise front-end wide-band amplifier for a broad-band receiver in the frequency range of 100-150 mc/s. Dr. R. Parshad from National Physical Laboratory, New Delhi,

then presented a paper on 'Radio Frequency and Microwave Standards at National Physical Laboratory'. He gave a brief description of their programme and also reviewed the progress made in this direction. Thereafter, Dr. G. N. Garud from I.I.T., Madras presented a paper entitled 'Wideband Amplification with Transistors'. The author has developed a design procedure for transistorised distributed amplifiers. Further, he worked out the design of an amplifier using OC 615 (Telefunken). Shri Umashanker Singh from Central Electronics Engineering Research Institute, presented a paper on 'Oscilloscope Time Base Generators Based on EMITTER COUPLED MULTIVIBRATOR'. He described two types of experimental time base circuits using the high frequency silicon transistors available in India. This was followed by two more papers viz., 'Planar Silicon transistor and diodes' and 'Varactor diodes' by Dr. K. S. Balain and Shri W. S. Khokle respectively from the same Institute. Dr. Balain briefly reported the work being done at their Institute on Planar Silicon transistors and diodes and similarly Shri Khokle reported on Varactor diodes. Shri Prahlad H. Ron from Atomic Energy Establishment, Trombay, next, presented a paper on 'Design and Construction of R. F. Power Supplies'. He described the design and construction of a 30 kv regulated and 90 kv unregulated power supply. He also enumerated the advantages of high frequency rectified supplies over conventional power supplies. Thereafter the paper entitled 'Development of Cathode-ray-oscilloscope Tubes' was presented by Shri G. K. Bhide from the same department. He briefly outlined the work carried out in connection with the development of cathode-ray-oscilloscope tubes in general. The next paper was also presented from the same department on 'Space Charge Limited High Frequency Currents in Insulators in the Presence of Traps' by Shri P. R. Dastidar. This was followed by three papers from Solid State Physics Laboratory and the first was on 'Germanium Epitaxial Tunnel Diodes' read by Shri S. P. Naik. He outlined the work done concerning the development of Germanium epitaxial tunnel diodes in their Laboratory. The second was on 'Germanium PNP Switches' by Km. K. Khanna. She described the fabrication procedure, technique of stabilizing the characteristics and switching characteristics of the germanium PNP switches fabricated in the laboratory. In the third paper on 'Silicon Planar Epitaxial Varactors' presented by Shri K. R. Wadhera, he described the fabrication procedure employed and the results obtained on planar varactors as well as planar diffused varactors. The last paper of the session was 'Advances in Insulation Technology for Communications', read by Dr. Jagmohan Garg from Garg and Associates Pvt. Ltd., Ghaziabad. He discussed the advances in insulation technology for communications in India by the advent of new plastics.

The Chairman thanked the speakers for their valuable contributions and making the symposium a great success.

EXHIBITION OF ELECTRONIC EQUIPMENT

An Exhibition of Electronic components, measuring instruments and equipment was organized simultaneously with the Annual General Meeting and the Technical Convention. The exhibition was held at the adjoining room of Banquet Hall of Hotel Oberoi Intercontinental, New Delhi, on the 9, 10 and 11 December 1966 and was declared open by Dr. A. N. Jha, Lieutenant Governor, Delhi, after inauguration ceremony. The Council wishes to thank all the participants in the exhibition for their cooperation in making it a success. A list of the firms that participated in the exhibition is given below :

1. M/s Ahuja Radios
2. M/s Associated Instrument Manufacturers India Pvt. Ltd.
3. M/s Bharat Electronics Ltd.
4. Central Electronics Engineering Research Institute.
5. M/s Continental Device India Ltd.
6. M/s Delton Cable Co.
7. M/s Dodsai Pvt. Ltd.
8. M/s Eastern Electronics.
9. M/s Electric Instrumentation
10. M/s Garg & Associates Pvt. Ltd.
11. M/s Golden Industries.
12. The Indian Telephone Industries Ltd.
13. M/s National Ekco Radio and Engineering Co. Ltd.
14. National Physical Laboratory.
15. M/s National Insulated Cable Co. of India Ltd.
16. M/s M. C. Engineering Co.
17. M/s Philips India Ltd.
18. Solid State Physics Laboratory.
19. M/s Toshniwal Bros. Pvt. Ltd.

PART — II

1. LIST OF HONORARY FELLOWS OF THE INSTITUTION

Honorary Fellows of the Institution are distinguished persons in their own fields and their names are given below :

RADHAKRISHNAN, S. (Dr.), D. Litt. (Agra), D. Litt. (Allahabad), D. Litt. (Andhra), D. Litt. (Annamalai), L.L.D. (Banaras Hindu University), D.L. (Calcutta), L.L.D. (Jabalpur), D. Litt. (Lucknow), L.L.D. (Madras), L.L.D. (Mysore), L.L.D. (Osmania), D. Litt. (Patna), D.Sc. (Roorkee), D. Litt. (Saugor), D. Litt. (Visvabharathi).

Foreign Universities : L.L.D. (Bagota), L.L.D. (Brussels), L.L.D. (Buenos Aires), D. Litt. (Cambridge), L.L.D. (Ceylon), L.L.D. (Columbia, U.S.A.), L.L.D. (Hawaii Univ.), L.L.D. (Howard), L.L.D. (London), L.L.D. (Maing), L.L.D. (McGill, Canada), L.L.D. (Mexico), L.L.D. (Oberlin, U.S.A.), D.C.L. (Oxford), L.L.D. (Prague), L.L.D. (Rome), L.L.D. (Sofia Univ.), L.L.D. (Wroslaw), L.L.D. (Moscow).

Other Distinctions : Bharat Ratna, Vidyachakravarti-Kelaniya Parivina, Fellow of the British Academy, Pour Le merite-Germany, Hony. Fellow of the Academy of Sciences of the Republic of Rumania, Hony. Fellow of the Academy of Sciences of the Republic of Mongolia, Hony. Professor-University of Moscow, Professor Emeritus—Calcutta University, Professor Emeritus—Oxford University, Hony. Fellow of all Souls College Oxford, Sarvagama Sarvabuma-Calcutta Sanskrit College, Goethe Plaque, Master of Wisdom (Mongolia), German Book Sellers Peace Prize 1961, Wlodzimierz Pietrzak Prize by Warsaw University for Philosophical Science, Bharatbhusamani—Institute of Indology, Dwarka, former President of the Republic of India, Madras.

BHAGAVANTAM, S. (Dr.), Ph.D., Scientific Adviser to the Minister of Defence, South Block, New Delhi-11.

KANTEBET, S. R., Retired Director General, Overseas Communication Service, Bombay, Apte Road, Poona-4.

KOTHARI, D. S. (Dr.), M.Sc., Ph.D., F.N.I., Chairman, University Grants Commission, Bahadur Shah Zafar Marg, New Delhi-1.

THACKER, M. S. (Prof.), D.Sc. (Hc), D. Litt. (Hc), B.Sc. (Engg.), M.I.E.E. (London), M.I.M. (London), M. Inst. F. (London), M.I.E., M.I.R.E., M. Ind., I.M.M.Ele. Chem.S., F.Am.I.E.E. F.I.A.Sc., Chairman Industrial Licensing Committee, Ministry of Industry & Company Affairs, New Delhi.

List of the Fellows of the Institution

The fellows of the Institution elected by the Council are as follows :

Year of Election	Mem. No.		Service on Council
1962	1797	Agerwala, P. M., C. E. (Hons.), 7 Sangam, Little Gibbs Road, Bombay-6.	1955-57 V.P. 1957-58 P. 1958-59 1959-61

<i>Year of Election</i>	<i>Mem. No.</i>		<i>Service on Council</i>
1962	66	Aiya, S. V. Chandrasekhar (Prof.), M. A. (Cantab), M.I.E.E. (London), Head of the Department of Electrical Communication Engineering, Indian Institute of Science, Bangalore.	1953-56 V.P. 1958-59 P. 1959-60 1960-63
1962	537	Baliga, B. V., B.A., D.I.I.Sc, BEL House, Bharat Electronics Ltd., Jalahalli, Bangalore.	V.P. 1953-57 P. 1957-58 1958-62 1964-67
1956	951	Batra, B. R., Retired Chief Engineer, Posts and Telegraphs, 9, National Court, 13, Loudon Street, Calcutta-15.	P. 1953-55 1955-59
1963	1376	Batra, R. N. (Lt. Gen.), Director General, Civil Defence, Ministry of Home Affairs, South Block, New Delhi-11.	1953-56 V.P. 1962-63 P. 1963-64 1964-67
1959	612	Iyappa, A. C. (Lt. Gen.), Managing Director, Bharat Electronics Ltd., Jalahalli, Bangalore	V.P. 1953-55 P. 1955-56 1956-60
1963	643	Jagdeesh Prasad, C.E. (Hons), General Manager, Bharat Heavy Electrical Ltd., Hardwar (U.P.).	1953-56 1957-60 P. 1961-62 1962-63 1963-66
1965	1590	Joseph, K. A. (Air Vice Marshal), B.Sc. (Engg.), M.Aero.S.I., A.M.I.E.R.E., Director of Signals, Air Headquarters, New Delhi-11.	1953-57 V.P. 1958-61 1962-63 V.P. 1963-64 1965-67
1965	542	Kanjilal, S. K., B.E., Senior Member (T.O.), P & T Board, Parliament Street, New Delhi-1.	1953-57 H.T. 1958-59 1959-61 1962-63 V.P. 1963-65 1966-67
1966	2411	Kapre, P. K. (Dr.), M.Sc., Ph.D. (London), F.I.E.E., D.I.C. (London), M.I.E., M.I.M., B.L., Industrial Director, Philips India Ltd., 53, Jor Bagh, New Delhi-3.	1956-59 V.P. 1960-63 V.P. 1964-65 P. 1965-67
1962	3698	Rakshit, H. (Prof.), D.Sc., F.Inst.P., F.N.J., 47-W.C., Bonnerjee Street, Calcutta-6.	1964-67

<i>Year of Election</i>	<i>Mem. No.</i>		<i>Service on Council</i>
1966	2399	Ramamurti, T.V., B.E. (Elec.), D.I.I.Sc., Officer-in-charge (D.P.E.C.U.), National Physical Laboratory, Hill Side Road, New Delhi-12.	1953-55 1959-60 J.S. 1960-62 1964-67
1963	877	Ramchandani, A. C., B.Sc., B.Sc. (Tech.) Manchester, M.I.E.E., A.M.C.T. (London), Retired Chief Engineer, A.I.R., B-1/66, Safdarjung Development Area, New Delhi-16.	H.S. 1953-55 1955-56 1957-58 V.P. 1958-60 V.P. 1961-63 S. 1963-64 to 1965-66
1959	775	Sreenivasan, K. (Prof.), B.Sc., A.I.I.Sc., M.I.E.E. (London), M.A.I.E.E., S.M.I.R.E., F.A.Sc., Director, Madras Institute of Technology, Chromepet, Madras.	V.P. 1953-56 P. 1956-57 1957-61
1962	1098	Vasudevan, C. P., B.E., Adviser, World Bank, 5457, Nabrasca Avenue, Washington DC-20015 (U.S.A.).	1955-58 1959-60 V.P. 1960-62 1963-64 1965-67
1962	676	Verman, Lal C. (Dr.), B.S. (E.E.) Michigan, M.S., Ph.D. (Cornell), F.Inst.P., M.I.E., F.N.I., Chief Adviser to the Institute of Standards and Industrial Research of Iran, Tehran, Iran.	1953-55 V.P. 1956-58 V.P. 1959-60 P. 1960-62 1962-65 1965-67

2. LIST OF THE MEMBERS OF THE INSTITUTION

<i>Year of Election</i>	<i>Mem. No.</i>		<i>Service on Council</i>
1962	1774	Agarwal, S. M., B.Sc., A.M.I.E. (India), Joint Secretary, Department of Defence Supplies, Ministry of Defence, New Delhi-11.	J.S. 1958-59 1957-58 1959-60 1963-66
1965	12	Aiyar, S. S., B.Sc. (Engg.), D.I.I.Sc., Chief Engineer, All India Radio, Broadcasting House, New Delhi-1,	H.S. 1955-58 V.P. 1965-67
1965	8039	Amarjit Singh (Dr.), M.Sc., M.E.S., Ph.D., S.M.I.E.E.E. (New York), Director, Central Electronics Engineering Research Institute, Pilani (Rajasthan).	1966-67

<i>Year of Election</i>	<i>Mem. No.</i>		<i>Service on Council</i>
1955	41	Bhashyam, S. R., B.E. (Hons.), S.M.I.R.E. (New York), Post Master General, Ahmedabad.	
1964	398	Bhattacharjee, D. C., B.Sc. (Hons.), D.I.I.Sc., Director of Frequencies, All India Radio, New Delhi-1.	
1955	543	Bhatt, N. B. (Dr.), M.Sc., Sc.D. (U. S. A.), F. Inst. P., S.M.I.E.E.E., A.M.I.E.E., M.Ac. S.A., Director, Solid State Physics Laboratory, Lucknow Road, Delhi-7.	1953-55 1964-65 1966-67
1955	2125	Chakravarti, S. P. (Prof.), M.Sc. (Physics), M.Sc. (Engg.), M.I.E.E., D.I.C., S.M.I.R.E., F.A. Sc. (Bangalore), M.I.E., 93, Mall Road, Lucknow (U.P.).	1953-57 V.P. 1957-58 1958-60 1962-63 V.P. 1963-65
1962	1831	Chaman Lal, M.Sc. (Physics), Wireless Adviser to the Government of India, Department of Communications, Patel Bhavan, New Delhi-1.	1965-66
1967	11138	Chatterjee, J. S. (Dr.), M.Sc., D. Phil., M.I.E.E. (London), S.M.I.E.E.E. (U.S.A.), Head of the Electronics and Telecommunication Engineering Department, Jadavpur University, Calcutta-32.	
1967	3323	Chaudhari, M. (Dr.), B.Sc. (Hons.), M.Sc., Ph.D., D.I.C., S.M.I.E.E.E. (U.S.A.), Birla Institute of Technology and Science, Pilani (Rajasthan).	
1964	6664	Chukerbuti, H. (Brig.), Willington Gymkhana Club, Coonoor, Nilgiris (S. India).	1965-67
1957	2051	Cornelius, C. A., B.Sc. (Engg.), Managing Director, Hindustan Teleprinters Ltd., Industrial Estate, Guindy, Madras-32.	1964-67
1966	1330	Datta, Saroj (Dr.), M.Sc., Ph.D., D.I.C. (London), M.I.E.E., M.I.E.R.E., Director of Communications, Civil Aviation Department, Block II (East), R. K. Puram, New Delhi-22.	1961-63 H.T. 1963-64 1965-66 V.P. 1966-67
1965	8470	Desikachar, P. R., B.Sc. (Hons.), M.Sc. (Wireless), M.S.E.E., M.I.R.E. (U.S.A.), M.I.E.E.E. (U.S.A.), U. N. Technical Assistance Board, P.B. No. 913, Khartoum, Sudan.	

<i>Year of Election</i>	<i>Mem. No.</i>		<i>Service on Council</i>
1958	39	Gadadhar, N. V., B. E. (Elect.) D.I.I.Sc., Senior Councillor, International Radio Consultative Committee, International Telecommunication Union, Geneva.	J.S. 1957-58 H-S. 1958-59 1960-61
1963	5562	Garewal, K. S. (Brig.), B.Sc. (Physics), National Defence College, 6, Tees January Marg, New Delhi-11.	1963-66
1966	651	Gill, P. S. (Maj. Gen.), B.A., Chief Signal Officer, HQ Southern Command, Poona-1.	
1962	256	Gupta, I. K., B.Sc., C.E. (Hons), Managing Director, Hindustan Cables Ltd., P.O. Hindustan Cables, Rupnarainpur, District Burdwan (W.B.).	
1964	2440	Hari Singh (Col), B.Sc. (Hons.), M.Sc., A.M.I.E.R.E., Director, C.M.O. Directorate, Ministry of Defence, Room No. 149, Gate No. 12, 'F' Block, DHQ P.O., New Delhi-11.	1966-67
1963	2690	Iyengar, K. R. K., B.Sc. (Hons.), D.I.I.Sc., M.Sc. (Elect. Engg.), Deputy Director, Intelligence Bureau, Ministry of Home Affairs, New Delhi.	1960-61 J.S. 1961-62 H.S. 1962-63
1962	5096	John Brown (Dr.), M.A., Ph.D., D.Sc. (Engg.), A.M.I.E.E., S.M.I.R.E. (New York), Department of Electrical Engineering, University College, Gower Street, London W.C.-2.	
1963	2639	Joshi, C. P., M.Sc., State Radio Officer, Police Radio Headquarters, Mahanagar, Lucknow (U.P.).	
1963	1857	Khurana, S. R. (Brig.), M.A., Director of N.C.C. Gujarat, Ahmedabad-3.	
1967	11334	Krishnamurthi, M. (Dr.), M.Sc., Ph.D., A.M.I.E.R.E., Deputy Director (Tech.), Cabinet Secretariat, Block V (East), Level III, R. K. Puram, New Delhi-22.	
1957	210	Lakhanpal, D. D., B.A., B.Sc. (Tech.) Manchester, M.I.E., M.I.E.E., M.I.E.R.E., S.M.I.R.E., Managing Director, Murphy India Ltd., 29, New Queens Road, Bombay-4.	1953-56 V.P. 1956-57 1960-63
1955	902	Mahalingam, N., B.A., A.M.I.E.E. (London), 14, Surya Sadan, 88, Sewri Wadala North, Bombay-31,	H.T. 1953-55 1955-56

<i>Year of Election</i>	<i>Mem. No.</i>		<i>Service on Council</i>
1966	608	Malhotra, S. K. (Brig.), B.A., Director, Electronics and Radar Development Establishment, High Grounds, Post Box No. 108, Bangalore.	1966-67
1967	3193	Mani, A. (Miss), B.Sc. (Hons.), A.I.I.Sc., Director, Instruments, Meteorological Office, Poona-5.	
1966	879	Matange, N. D., B.Sc. (Engg.), M.Sc. (Elect. Engg.) (California), Project Officer, Western Project Circle, All India Radio, Bombay.	
1961	839	Mehta, K. K. (Brig.), B.Sc., A.M.I.E.R.E., Director of Electronics, Research and Development Organization, Old Armed Forces Mess, 14, 11-A, Janpath, New Delhi-1.	1959-62 1963-64
1962	988	Mehta, V. (Brig.), B.Sc., Police Wireless Directorate Coordination, Rail Bhavan, Rafi Marg, New Delhi-1.	
1965	8430	Misra, S. (Lt. Col.), B.Sc. (Hons.), M.Sc., M.E. (E.E.), M.I.R.E., M.I.E., M.I.E.E.E., (U.S.A.), Electronics and Radar Development Establishment, High Grounds, Post Box No. 108, Bangalore-1.	
1964	42	Mitra, S. N., M.Sc. (Cal. et Cantab), F.N.I., F.R.A.S. (London), Director of Technical Laboratories, Ministry of Home Affairs, R. K. Puram, New Delhi-22.	H.S. 1960-62 1962-63 1964-66 V.P. 1966-67
1966	1835	Mohindra, L. C., M.I.R.S.E., A.M.I.E.E., F.I.P.E., Senior Deputy General Manager-designate Central Railway, Bombay, (82, Shahajahan Road, New Delhi-11).	
1960	1798	Muthanna, M. S., B.E., M.I.E., General Manager, Bombay Telephones, Telephone Bhawan, Colaba, Bombay-5.	
1967	11129	Narasimhan, K. (Air Cdr.), B.A., A.M.I.E.R.E. (U.K.), Joint Director of Signals, Air Headquarters, New Delhi-11.	
1955	2181	Natarajan, R., B.A., 417, 17th Cross, Malleswaram, Bangalore-3.	
1965	876	Raghavachari, R., B.Sc. (Hons.), D.I.I.Sc., Project Officer, Control Circle, Akashvani Bhavan, New Delhi-1.	

<i>Year of Election</i>	<i>Mem. No.</i>		<i>Service on Council</i>
1966	9704	Raghunath, K. (Col.), B.E. (Mech.), A.M.I.E., Deputy Director, E.M.E., H.Q. IV Corps, C/o 99 A.P.O.	
1962	5011	Ramanathan, A. R., B.E. (Mech.), M.Sc. (E.E.), A.M.I.E., M.I.E.R.E., I.T.U. Telecommunication Expert, U.N. Technical Assistance Board, P.O. Box No. 274, Monrovia, Liberia.	
1965	1485	Ramchandani, D. N., B.E. (Mech. and Elect.), 8, Raisina Road, New Delhi-1.	
1967	11081	Ramchandra Rao, B. (Prof.), M.Sc., D.Sc., S.M.I.E.E.E., M.I.E.R.E., Professor and Head of the Department of Physics, Andhra University, Visakhapatnam-3 (A.P.).	
1965	6663	Ramnath, K. R. (Capt.) I.N., B.E. (Elect.), Commanding Officer, I.N.S. Valsura, Jamnagar.	
1959	47	Rao, B. V., B.Sc., A.M.I.E.E., 13-4 Field Street, Mangalore-1.	
1955	2412	Rao, C. R., M.Sc., D.I.I.Sc., Civil Aviation Adviser, I.C.A.O., T.A. Mission, P.O. Box 1165, Jeddah, Saudi Arabia.	1956-57
1967	2432	Rao, G. R. S., B.Sc. (Hons.), M.Sc., D.I.I.Sc., 5, 'Girishant', 351-A, V. P. Road, Khar, Bombay-52-AS.	
1955	695	Rau, B. S., B.E., (Elect.), Deputy Director General (L), P and T Directorate, Parliament Street, New Delhi-1.	H.T. 1955-57 1959-62
1962	2415	Sarwate, V. V., B.Sc., M.Sc. (Wireless), D.I. I.Sc., M.S. (Elect. Comm.) Principal, Government Engineering College, Bilaspur (M.P.).	
1955	878	Sastry, M. L., B.Sc. (Engg.), A.M.I.E.E., C/o U.N. Laboratory Office, Post Box No. 553, Riyadh (Saudi Arabia).	1956-59 1965-66
1955	1486	Sengupta, N.K., B.Sc., (Engg.), M.I.E. (India), Managing Director, Heavy Engineering Corporation, Durgapur (W.B.).	1958-61
1962	872	Seshasayee, R., B.E. (Hons.), I.T.U. Expert With Telecommunication Training Centre, C/o Regional Representative, U.N. Technical Assistance Board, P.O. Box 618, Bangkok (Thailand).	1962-63 J.S. 1963-64 1964-65

<i>Year of Election</i>	<i>Mem. No.</i>		<i>Service on Council</i>
1958	2694	Seymour, J. W., S.M.I.R.E., M.A.I.E.E., 108 Heather Road, Oaklyn, N. J. 08107.	
1963	2487	Shahane, B. J. (Brig.), A.C.G.I. (London), Managing Director, Instrumentation Ltd., Kota-Jhalawar Road, Kota (Raj.).	1960-63 1964-65 V.P. 1965-66 1966-67
1955	919	Shanti Swarup, B.E. (Hons), M.I.E., General Manager, P and T Electrification Circle, 4, New Road, Alipur, Calcutta-27.	
1967	147	Subrahmanyam, T. R., B.E., S.M.I.E.E.E. (New York), Electrical Division, M/s Voltas Ltd., 8, Netaji Subhas Road, Calcutta-1.	
1962	250	Sundaram, K. N., M.A. (Physics), M.A.S.E.E., Deputy Educational Adviser, Ministry of Education, New Delhi.	
1960	1984	Sundaram, P.S.M., B.Sc. (Engg), Project Manager, C/o United Nations Technical Assistance Board, Khartoum, Sudan.	
1966	7349	Swaroop, D. (Lt. Col.), B.Sc., D.I.I.Sc., A.M.I.E., A.M.I.E.R.E., Electronics and Radar Development Establishment, High Grounds, P.B. No. 108, Bangalore-1.	
1964	611	Talwar, K. N. (Brig.), Commandant, School of Signals, Mhow (M.P.).	J.S. 1958-59 1959-61
1965	1796	Thadani, H.R., M.Sc. (Tech.) Manchester, 220/1, Lower Circular Road, Calcutta-17.	1953-55 V.P. 1955-56 1956-57
1965	535	Thiruvengkatachari, S., B.Sc. (Hons.), D.I.I.Sc., A.M.I.E., Additional Chief Engineer, All India Radio, Broadcasting House, Parliament Street, New Delhi-1.	1966-67
1961	3636	Toshniwal, G. R. (Dr.), D.Sc., S.M.I.E.E.E. F.N.I., Chairman, Board of Directors, Toshniwal Bros. Pvt. Ltd., & Managing Director, Toshniwal Industries Pvt. Ltd., 'Rival' Katcheri Road, Ajmer (Raj.).	1966-67
1956	2362	Uma Shanker, B.Sc., C.E., Managing Director, Indian Telephone Industries Ltd., Bangalore.	1957-60 1962-65

<i>Year of Election</i>	<i>Mem. No.</i>		<i>Service on Council</i>
1962	4995	Venkataraman, Krishna, M.A. (Physics), Retired Project Officer A.I.R., 'Dare House' 115-B, Mowbrays Road, Teynampet P.O., Madras-18.	
1964	24	Venkataramiah, Y., B.Sc. (Hons.), D.I.I.Sc., A.M.I.E., Planning Officer, Planning and Development Unit, All India Radio, Parliament Street, New Delhi-1.	
1961	106	Venkateshwaran, S. P., B.A. (Hons.), F.A. Sc. F.N.I., M.Ac.S.I., 8, Ramakrishna Marg, Faizabad Road, Lucknow-7 (U.P.).	
1964	2481	Varma, I. D. (Maj. Gen.), Director of Signals and Signal Officer-in-Chief, Army Headquarters, New Delhi-11.	
1959	388	Wagle, M. M., B.Sc. (Elect. and Mech.), Engineer-in-Charge, Rural Broadcasting, Eros Building, 42, Queen's Road, Bombay-1.	

3. List of The Associate Members of the Institution

1957	2570	Ahluwalia, J. C. (Lt. Col.), A.M.I.E., Production Manager, 509, Army Base Workshop, Agra (U.P.).
1967	11542	Ahmed, Rais (Prof.), M.Sc., M.Sc. (Engg.), D. Phil., Department of Physics, Aligarh Muslim University, Aligarh (U.P.).
1955	2395	Ahuja, I. S., General Manager and Technical Director, Ahuja Radios, 3-Okhla Industrial Estate, New Delhi-20.
1959	2747	Anand, J. C. (Lt. Col.), B.Sc. (Hons.), M.I. E.E.E., Inspector of Electronics, Inspectorate of Electronics, Ministry of Defence (DGI), Commissariate Road, Hastings, Calcutta-22.
1967	3602	Anand Kumar (Dr.), B.Sc. (Hons.), M.Sc., D.I.I.Sc., M.E., Ph.D., M.I.E.E.E. (New York), Lecturer, Department of Electrical Communication Engineering, Indian Institute of Science, Bangalore-12.
1964	7340	Andhare, V. K. (Lt. Col.), A.M.I.E., School of Signals, Mhow (M.P.).

<i>Year of Election</i>	<i>Mem. No.</i>	<i>Service on Council</i>
1966	472	Antani, A. M., B.Sc. (Engg.), Station Engineer, All India Radio, Dharwar (Mysore State).
1964	550	Apte, V. K. (Lt. Col.), CMO, Ministry of Defence, 'F' Block, New Delhi-11.
1965	8785	Arjunani, I. G., B.E. (Elect.), Executive Engineer (Elect.), Department of Light-house and Lightship, 15/8, East Patel Nagar, New Delhi-12.
1962	5533	Arunachalam, V., B.A. (Hons.), Divisional Engineer Telegraphs, Long Distance Division, No. 175, Vasanthanagar, Bangalore-1.
1960	3286	Asirvadham, D. (Lt. Col.), B.A., Shanthi Nagar, Arogyavaram P.O., Chittoor District, (A.P.).
1960	4667	Awasthi, Y. S. (Lt. Col.), B.A., Commander Signals, 10, Mountain Division C/o 33 A.P.O.
1962	5099	Badrinath, H. V., B.Sc. (Hons.), D.I.I.Sc., B-40, D-II Quarters, Moti Bagh-I, New Delhi-23.
1956	4708	Bahl, S. K. (Maj.), B.Sc., A.M.I.E., Inspector of Signals Trade Training, Jabalpur (M.P.).
1957	2593	Baij Nath (Wg. Cdr.), 73/C-II Moti Bagh, New Delhi-23.
1967	11541	Bains, B. S. (Maj.), B.Sc. (Hons.), M.Sc., Staff Officer-2 (Signals) HQ, Eastern Command, Simla-3 (H.P.).
1957	233	Balachandani, K. M., B.E., Chief Engineer, Overseas Communication Service, Industrial Assurance Building, 2nd Floor, Veer Nariman Road, Church Gate, Bombay-1.
1965	9297	Balasubramaniam, K. (Lt. Col.), GSO-I, Signals Directorate, General Staff Branch, Army Headquarters, New Delhi-11.
1954	820	Balasubramanian, A. S., B.Sc., D.I.I.Sc., Deputy Planning Officer, All India Radio, Akashvani Bhavan, New Delhi-1.
1957	1551	Balasubramanian, T. V., B.Sc. (Hons.), Assistant Chief Engineer, P & T Directorate, New Delhi-1.

<i>Year of Election</i>	<i>Mem. No.</i>		<i>Service on Council</i>
1955	1721	Balasundaram, N., B.Sc., A.M.I.E.E., S.M.I. R.E., Director and Chief Engineer, Eastern Electronics, New Industrial Town, Faridabad.	
1964	748	Banerjea, A., B.E., Director of Phones Traffic, Office of the Director General, P and T Directorate, Parliament Street, New Delhi-1.	
1963	536	Banerjee, A. K., B.Sc. (Hons.), M.Sc., Research and Development Organization, Ministry of Defence, New Delhi-11.	
1955	1939	Banerjee, B. M., M.Sc. (Physics), Reader, Saha Institute of Nuclear Physics, 922, Acharya Prafulla Chandra Road, Calcutta-9.	
1965	1165	Bapu Seetharam, H. R., B.Sc. (Hons.), D.I.I.Sc., Manager (Inspection), Bharat Electronics Ltd., Jalahalli P.O., Bangalore-13.	
1960	3209	Baral, S. S. (Prof.), B.Sc. (Hons.), M.Sc., D.Sc., P.R.S. Membre Societe des Radio Electriciens, Professor, Department of Communication Engineering, Bengal Engineering College, Howrah-3 (W.B.).	
1966	9205	Bartake, J. B. (Lt. Col.), Commanding Officer, 6 Technical Training Regiment, Ponda (Goa).	
1963	861	Basak, D. N., B.Sc. (Hons.), B.Sc. (Engg.), M.I.R.S.E., M.A.A.R., Signal Engineer, C/o Chief Engineer's Office, Nigerian Railway Corporation, Ebute Metta Lagos, Nigeria.	
1954	1052	Basu, A. (Maj.), M.Sc., A.M.I.E.R.E., 7 Infantry Division, Signal Regiment, C/o 56 A.P.O.	
1957	2524	Basu, L. M., M.Sc., A.M.I.E.R.E., C/o Chartered Bank, 31, Chowringhee Road, Calcutta-16.	
1954	923	Basu, M. K., M.Sc., Wireless, Adviser, Cabinet Secretariat, South Block, New Delhi-11.	
1954	4612	Basu, P. K., M.Sc. (Wireless), Station Engineer, All India Radio, Mall Road Transmitters, Mall Road, Delhi-7.	

<i>Year of Election</i>	<i>Mem. No.</i>	<i>Service on Council</i>
1955	621	Batra, S. K. (Lt. Col.), B.A., Army Headquarters, W/E Directorate (GS Branch), D.H.Q. P.O., New Delhi-11.
1960	2936	Benedetti, S. J., M.Sc. (Southampton Univ.), M.A. (Phil.), M.A. (Divinity), Observatorio de Fisica, Cosmecha, Casilla-7, San Miguel (F.N. P.G.S.M.), Argentina.
1962	5652	Beotra, R. C. (Maj.), B.A., B.E., A.M.I.E., Director of Electronics, HQ R and D, 11-A, Janpath, New Delhi-1.
1958	2648	Bhagvat, G. K. (Prof.), B.E. (Hons.) (Telecommunication), Dr. Ing. (Munich), Indian Institute of Technology, Powai, Bombay-76.
1956	2483	Bhagwat, D. R. (Maj.), Officer Commanding Maharashtra and Gujarat Area, Signal Coy, Colaba, Bombay-5
1967	10524	Bhandari, R. C. (Maj.), A.M.I.W.S. (India), C/o C. S. Mehta Esq., 4, Minto Park, Alipore, Calcutta-27.
1961	2423	Bharara, H. L., B.A. (Hons.), Deputy Director (Engineering), Post and Telegraphs, J and K Circle, Srinagar.
1964	6931	Bhardwaj, B. D. (Lt. Col.), DCSO, Headquarters, Maharashtra and Gujarat Area, Colaba, Bombay-5.
1960	920	Bharma, N. C. (Sqn. Ldr.), B.Sc., B.E. (Hons.), HQ Central Air Command, I.A.F., Air Force Station, Bomrauli, Allahabad (U.P.).
1960	3252	Bhasin, B. (Lt. Col.), A.M.I.E., A.M.M.E.A., Assistant Director, Defence Electronics Research Laboratory, Hyderabad-5 (A.P.).
1964	7336	Bhasin, K. D. (Brig.), Inspector of Signals Trades Training, C/o Inspectorate of Signals Trades Training, Jabalpur (M.P.).
1956	2453	Bhatnagar, H. M., Technical Manager, The National Ekco Radio and Engineering Co. Ltd., Mahakali Caves Road, Chakala Andheri (East), Bombay-69.

<i>Year of Election</i>	<i>Mem. No.</i>	<i>Service on Council</i>
1956	2733	Bhatnagar, U. S., Engineer, Telegraphs Division, Ministry of P.T.T., Kuwait (Arabia).
1957	2555	Bhatt, V. J., B.Sc., (Elect. and Mech.), India Radio and Electronics Corporation, 13/14, Rani Building, Prarthana Samaj, Bombay-4 BR.
1959	3218	Bhattacharya, A. B., B.Sc., M.Sc., M.I.E.R.E., Ericsson Telephone Sales Corporation AB, 5, Commissariate Road, Calcutta-22 (W.B.).
1954	993	Bhide, N. M. (Lt. Col.), Bharat Electronics Ltd., Jalahalli, Bangalore.
1958	2647	Biswas, G. (Wg. Cdr.), Air Force Station, Baroda (Gujarat).
1959	780	Biswas, N. N. (Dr.), B.Sc., (Hons.), Ph.D. (Engg.), D.I.I.Sc., A.I.I.Sc., S.M.I.E.E.E. (U.S.A.), Professor of Telecommunication Engineering, Department of Electronics and Communication Engineering, University of Roorkee, Roorkee (U.P.).
1955	1723	Biswas, S. R., M.Sc., Deputy Planning Officer (Retired), A.I.R., 42, Havelock Square, New Delhi.
1964	6902	Borges, W. J., St. Xavier's Technical Institute, Cruickshank Road, Bombay-1.
1965	2376	Borwanker, A. K. (Maj.), B.Sc., B.E., C/o Directorate of Production and Inspection Electronics, Ministry of Defence (DGI), 'G' Block, New Delhi-11.
1954	673	Bose, K. K., (Dr.), B.E., Dipl. Eng. (Munich), Dr. Engg. (Dresden), A.M.I.E., Electro-Control Devices Corporation, 13, North Road, Jadavpur, Calcutta-32.
1959	661	Chakrabarty, D. C. (Capt.), Superintendent of Police (Wireless), Chandigarh.
1961	3569	Chakrabarty, D.P. (Prof.), M.E.E., Professor and Head of the Department of Electrical Engineering, Madhav Engineering College, Gwalior-5 (M.P.).
1958	2599	Chakrabarty, S. K. (Wg. Cdr.), Directorate of Signals, Air Headquarters New Delhi-11.

<i>Year of Election</i>	<i>Mem. No.</i>		<i>Service on Council</i>
1954	3927	Chatterjee, B. (Dr.), B.Sc., (Hons.), M.Sc., Ph.D. (Elect. Comm. Engg.), F.I.P.S., M.I.R.E. (U.S.A.), Department of Communication Engineering, Indian Institute of Technology, Kharagpur (W.B.).	
1966	9854	Chaudhuri, S. C. (Maj.), B.Sc. (Hons.), D.I.I.Sc., A.M.I.E.R.E. (London), Signals Directorate, G.S. Branch, DHQ P.O., New Delhi-11	
1954	781	Chiplunker, V. N., M.Sc. (Physics), D.I.I.Sc., M.I.E.E.E. (New York), Lecturer, Department of Electrical Communication Engineering, Indian Institute of Science, Bangalore-12.	
1954	1114	Chippada, S. (Maj.), 2 Andhra Signals Regiment, N.C.C., Government Arts College, Rajahmundry (A.P.).	
1966	10539	Choudhry, P. N. (Dr.), Ph.D. (Elect. Engg.), Deputy General Manager, Telephones, T-35, Atul Grove Lane, New Delhi-1	
1960	1948	Choudhury, N. K. D., M.Sc. (Physics), M.S. (Elect. Engg.), Assistant Director, Central Building Research Institute, Roorkee (U.P.).	
1956	2428	Choudhury, S. S. (Lt. Col), B.Sc., Deputy Director, National Cadet Corps Directorate, Madras and Pondicherry, Fort Street, George, Madras-9.	
1954	2118	Chopra, K. S. (Gp. Capt.), B.A., Commanding Signal Officer, H.Q. Western Air Command, I.A.F., Palam, Delhi Cantt.	1963-66
1954	1518	Clement, C. J., B.E. (Elect.), B.E. (Mech.), General Manager, Telephones, Madras.	
1963	6167	Collaco, A. F. (Capt.), I.N., B.A. (Hons.), Director of Naval Signals, Naval Headquarters, New Delhi-11.	
1961	1201	Das, N. D. (Maj.), B.Sc. (Hons.), M.A., Ganesh Baug, Palghat-3.	
1957	2211	Das, Paresh Nath (Dr.), B.Sc. (Hons.), M.Sc., D. Phil. (C.U.), M.I.E.E. (London), C. Eng., S.M.I.E.E.E. (U.S.A.), Assistant Professor, Jalpaiguri Engineering College, P.O. Dangujhar, Jalpaiguri.	

<i>Year of Election</i>	<i>Mem. No.</i>	<i>Service on Council</i>
1957	1111	Dasgupta, J., M.Sc. (Physics), Meteorologist, Indian Meteorological Department, The Observatory Workshop, Lodi Road, New Delhi-3.
1960	1202	Dasgupta, Ranjit, Chief Superintendent, Development, Indian Telephone Industries Ltd., Bangalore-16.
1967	10801	Dayal, N. (Lt. Col.), B.Sc., A.M.I.E. (India), Assistant Director, Production and Inspection (Electronics,) Ministry of Defence (DGI), Room No. 47, 'G' Block, New Delhi-11.
1964	7363	Deodhar, R. G., B.Sc. (Hons.), B.E., 14A/62, Western Extension Area, Karol Bagh, New Delhi-5.
1954	874	De Sarkar, S. S., B.Sc. (Hons.), M.Sc., District Signal and Telecommunication Engineer, C/o Chief Signal and Telecommunication Engineer, North Eastern Railway, Gorakhpur (U.P.).
1957	2579	Deshpande, V. D. (Col), NC.C. Group Headquarters, Station Bungalow, Kolhapur-1.
1963	2695	Deva, Yashwant (Maj.), A.M.I.E. (India), II-C, Model Town, Phagwara.
1965	7746	Dhawan, K. (Maj.), B.Sc., 9, Mountain Division, Signal Regiment, C/o 99 A.P.O.
1964	7272	Dhillon, M. S. (Lt. Col), 'S' Communication, Z, Signal Regiment, C/o 65 A.P.O.
1966	9451	Dhodi, J. S. (Maj.), A.M.I.E., Det. Tech. Group No. 16, Scaling, Central Ordnance Depot, Agra Cantt (U.P.).
1960	3974	Diwan, R. D. (Capt.), 106 Communication Zone, Signal Regiment (T.A.), (P and T), Bellygunge Maidan Camp, Calcutta-19.
1966	10120	Dixit, G. B., B.Sc. (Hons.), 47, 13th Cross, 8th Main Road, Malleswaram, Bangalore-3.
1960	2843	Dutta, Shambhu Nath, B.Sc. (Hons.), B.E.E., Deputy Commercial Engineer, Damodar Valley Corporation, 27, Anderson House, Calcutta-27.

<i>Year of Election</i>	<i>Mem. No.</i>		<i>Service on Council</i>
1959	1053	Dwivedi, M.B. (Maj.), M.Sc., Directorate of Electronics, Research and Development Organization, 11-A, Janpath, New Delhi-1.	
1964	9844	Fadnavis, N. G. (Cdr.), I.N., B.Sc. (Engg.), No. 79, Moti Bagh, C-II, Shanti Path, New Delhi-23.	
1960	3224	Fanderlinden, R. B. (Capt.), I.N. (Retired), 72, McMillan Street, Victoria Park, W. Asutralia.	1965-67
1960	529	Ferris, W. V. (Maj.), B.Sc., Eastern Command Signal Regiment, Alipore Camp, Calcutta-27.	
1954	170	Gadre, B. K., B.Sc., D.I.I.Sc., M.I.E., Narayan Nivas, D. L. Vidya Road, Dadar, Bombay.	
1954	696	Gairola, S. N. (Brig.), M.Sc., A.M.I.E.R.E., Chief Signal Officer, Headquarters Eastern Command, Fort William, Calcutta-21.	
1954	656	Ganesan, V. (Air Cdr.), B.Sc. (Hons.), D.I.I.Sc., Defence Research and Development Laboratory, Chandrayan Gutta Lines, Hyderabad-5 (A.P.).	
1955	2416	Ghose, A. K., M.Sc., S.M.I.E.E.E., M.I.R.E., A.M.I.E.E., Reader in Line Communication Engineering, Engineering College, Banaras Hindu University, Varanasi-5 (U.P.).	
1960	3256	Ghose, S. C. (Sqn. Ldr.), Officer Commanding, No. 1 Central School Trade Test Board, Air Force Hostel, Bangalore-6.	
1954	155	Ghosh, A. C., M.Sc., Assistant Project Officer, Eastern Project Circle, All India Radio, Eden Garden, Calcutta-1.	
1964	3596	Ghosh, A. K., M.Sc. (Tech.), M.I.E.E.E., Assistant Executive Engineer (Radio), Department of Lighthouses and Lightships, 'Deep Bhavan' Pandit Nehru Marg, Jamnagar (Gujarat).	
1957	2543	Ghosh, B. M., B.Sc., 21, Mahatma Gandhi Road, Bangalore.	

<i>Year of Election</i>	<i>Mem. No.</i>	<i>Service on Council</i>
1960	3096	Ghosh, P. K., B.Sc., M.Sc., Station Engineer, All India Radio, Broadcasting House, New Delhi-1.
1959	3337	Gill, Kulwant Singh (Lt. Col.), Officer Commanding, Special Signal Regiment, Malta Lines, Delhi Cantt.
1965	8749	Godbole, M. V. (Maj.), B.E. (Hons.), A.M.I.E., 83, Field Workshop Coy, C/o 99 A.P.O.
1962	5036	Gogate, V. M., B.Sc., Grad. I.E.R.E., K-4/1 Multistorey Building, R. K. Puram, New Delhi-22.
1954	379	Gokarn, G. D., B.Sc. (Hons.), S.M.I.E.E. (U.S.A.), Communication Adviser and India's Representative on the Commonwealth Telecommunication Board, India House, Adwiche, London-WCF-2 (U.K.).
1954	538	Goolry, K. S. (Lt. Col.), (Retired), B.A., A.M.I.E.R.E., No. 1355, G. T. Road, Near Hyde Market, Amritsar.
1954	2360	Gopalan, S., 22 Luz Avenue, Mylapore, Madras-4.
1954	1846	Gopal Krishnan, K. N., B.Sc. (Hons.), D.I.I.Sc. Controller, Radio Construction and Development Unit, Safdarjung Airport, New Delhi-3.
1955	1021	Gowrishankar, S. M., B. E., Director, Signal and Telecommunication, Government of India, Ministry of Railways, Rail Bhawan, New Delhi.
1964	6903	Grewal, H. B. S. (Lt. Col.), HQ Indian Military, Academy, P.O. Prem Nagar, Dehradun (U.P.).
1959	109	Gulati, O. P., M.Sc., Engineer-in-Charge, A.I.R., 18, Abbot Road, Lucknow (U.P.).
1965	9102	Gulati, R. R., A.M.I.E., Lecturer in Telecommunication Engineering, Birla Institute of Technology and Science, Pilani (Rajasthan).
1957	2592	Gupta, J. S. (Prof.), B.E. (Elect.), Professor of Electrical Engineering, Regional Engineering College, Kurukshetra.

<i>Year of Election</i>	<i>Mem. No.</i>		<i>Service on Council</i>
1957	934	Gupta, S. M., Assistant Director of Communication, Civil Aviation Department, Block II (East), R. K. Puram, New Delhi-22.	
1960	705	Gupte, R. K. (Lt. Col.), A.M.I.E., Directorate of Planning Co-ordination (DP), (Electronics Division), Ministry of Defence, 11-A, Janpath, New Delhi-1.	
1954	438	Harish Chandra (Gp. Capt.), M.Sc., D.I.I.Sc., Director, J.C.E.C., Plot No. 108, Church Road, New Delhi-1.	1958-59 J.S. 1959-60 1960-61
1960	3505	Harris, G. S. (Wg. Cdr.), 'Highland View', Risa Colony, Shillong-3 (Assam).	
1954	586	Hart, M. B. (Lt. Col), HQ 17 Mountain Division, C/o 99 A.P.O.	
1962	1978	Hattangady, V.R., B.Sc., A.M.I.E.R.E., Deputy Superintendent, Ancillary Overhaul Division, Air India, Santa Cruz (East), Bombay-29.	
1955	1922	Hegde, K. S. (Prof.), B.E., M.A. (Engg.), Principal, Government Engineering College, Guindy, Madras-25.	1962-63
1966	10127	Herbert, L. (Maj.), B.Sc., A.M.I.E. (India), Military College of Telecommunication Engineering, Mhow (M.P.).	
1965	782	Indiresan, P. V. (Dr.), B.Sc. (Hons.), D.I.I.Sc. (E.C.E.), Ph.D., A.M.I.E.R.E., Indian Institute of Technology, New Delhi-29.	
1965	8757	Jagdish Raj (Maj.), B.A., 33 Corps Signal Regiment, C/o 99 A.P.O.	
1962	5145	Jagdishwar Lal, B.Sc. (Hons.), Deputy Chief Engineer Planning, P and T Directorate, Parliament Street, New Delhi-1.	
1965	9143	Jajaneswar Das (Dr.), M.Sc., D.Sc., A.M.I.E.E. (London), Assistant Professor, Department of Electronics and Communication Engineering, Indian Institute of Technology, Kharagpur (W.B.).	

<i>Year of Election</i>	<i>Mem. No.</i>	<i>Service on Council</i>
1956	2497	Janardhan, N. M. (Prof.), B.E. (Telecommunication), B.E. (Hons.) (Adelaide), Professor, Department of Electronics and Communication Engineering, College of Engineering, Guindy, Madras-25.
1958	2677	Jayachandra, M.Sc. 39/21, Old Idgah Colony, (Nagarkanti Colony), Agra (U.P.).
1957	2521	Jayaraman, T. R., B.Sc., D.I.I.Sc., I.A.S., Secretary, Government of India, Education Department, Government of Mysore, Bangalore-1.
1966	2627	Jirafe, W. J. (Dr.), B. E. (Hons.) (Telecommunication), M. Tech., Ph.D., Department of Electrical Engineering, Indian Institute of Technology, Powai, Bombay-76.
1959	2792	John, A. G., B.A., M.Sc., Station Engineer, All India Radio, Calicut (Kerala).
1954	831	Joseph, T. T., M.A., 15 Arjun Bhavan, Shah-jahanabad, Bhopal (M.P.).
1954	1417	Joshi, Dinshaw F. D., B.Sc., B.E. (Elect. and Mech.), A.M.I.E., Additional General Manager, Telephones, Telephone Building, Waudby Road, Bombay-1.
1960	2865	Joshi, K. L., B.Sc. (Hons.), M.Sc., Department of Electrical Communication Engineering, College of Engineering, Poona-5.
1958	2680	Joshi, M. V., B.E. (Elect. and Mech.), D.I.C., 76, Sunder Nagar, New Delhi-11.
1954	989	Juneja, R. R., B.A., Elektrogears Pvt. Ltd., 27, Rowland, Calcutta-20.
1964	7346	Juneja, S. L. (Lt. Col.), Commander Signals, 19 Infantry Division, C/o 56 A.P.O.
1954	4019	Juneja, S. V. S. (Col.), HQ. 101, Communication Zone Area, C/o 99 A.P.O.
1965	9162	Kabraji, R. Z. (Maj. Gen.), General Officer Commanding, HQ 6 Mountain Division, C/o 56 A.P.O.

<i>Year of Election</i>	<i>Mem. No.</i>		<i>Service on Council</i>
1954	3	Kagalwala, Abid, M.E.E. (U.S.A.), A.M.I.E.E., A.M.I.E. (India), Chartered Electrical Engineer, Glolite Electricals, Champs Bhimji Road, Mazagaon, Bombay-10.	
1960	1704	Kale, R. S., B.Sc. (Hons.), 888, Laxmibai Nagar, New Delhi-3.	
1954	1112	Kalra, S. N., Director General, Overseas Communication Service, G.O.I., Industrial Assurance Building, 2nd Floor, Veer Nariman Road, Church Gate, Bombay-1.	1953-56 1957-60
1963	5982	Kapoor, B. N. (Maj.), M.Sc., 27 Mountain Division, Signal Regiment, C/o 99 A.P.O.	
1964	6854	Kapoor, G. D. (Maj.), B.Sc., No. 4 U.P. Signal Coy, N.C.C., Banaras Hindu University, Varanasi-5 (U.P.).	
1967	10558	Kapur, H. S. (Maj.), B.Sc., GSO-2 (SD), Headquarters Western Command, Simla-3 (H.P.).	
1967	11164	Karnik, K. J. (Cdr.), I. N., Deputy Director, Directorate of Development and Inspection (Marine Stores), Ministry of Defence (DGI), DHQ P.O., New Delhi-11.	
1954	629	Karnik, V. R. (Gp. Capt.), M.Sc., F-19, Green Park, New Delhi.	
1965	8758	Kasturi, G. (Maj.), B.Sc., Inspector of Electronics, Chief Inspectorate of Electronics Wing, Gun Carriage Factory, P.O. Jabalpur (M.P.).	
1960	2928	Katarya, C. P. (Lt. Col.), B.Sc., 'Z' Communication Zone, Signal Regiment, C/o 56 A.P.O.	
1962	981	Kaul, P. M., Divisional Engineer Telephones, Bangalore.	
1954	148	Keshava Chandra, M.Sc., Planning Officer, (Tape Recording Unit), All India Radio, Akashvani Bhawan, Parliament Street, New Delhi-1.	
1965	9131	Ketkar, L. G. (Maj.), B.Sc. (Hons.), Chief Inspectorate of Electronics, Bangalore-6.	
1960	466	Khanna, R. K., B.Sc., M.Sc., L.I.B., D-35, Road No. 1, Andrews Gunj, New Delhi-16,	

<i>Year of Election</i>	<i>Mem. No.</i>	<i>Service on Council</i>
1960	724	Kheterpal, S. P. (Maj.), M.Sc., School of Signals, Mhow (M.P.).
1953	674	Kini, M. M., B.E. (Elect.), Deputy General Manager, Bombay Telephones, Bombay.
1967	11514	Kohli, P. L. (Maj.), 19, Infantry Division, Signal Regiment, C/o 56 A.P.O.
1954	157	Kohli, S. S., M.Sc., Engineer-in-Charge, High Power Transmitters, All India Radio, Kingsway, Delhi-9.
1957	2509	Kotadia, K. M. (Dr.), B.Sc. (Hons.), D.I.I.Sc., Ph.D., S.M.I.R.E., Department of Physics, Gujarat University, Ahmedabad.
1957	4628	Kotwal, M. K. (Maj.), B.Sc., IV Corps Signal Regiment, C/o 56 A.P.O.
1958	2608	Krishnamoorthy, K. S., B.Sc. (Hons.), D.M.I.T., Officer on Special Duty, Bharat Electronics Ltd., Jalahalli, Bangalore-13.
1960	3219	Krishnamurthy, N., B.Sc., M.Sc., Deputy Assistant Planning Officer, Tape Recording Unit, All India Radio, Akashvani Bhavan, New Delhi-1.
1966	9652	Krishnaswamy, M. V., B.Sc. (Hons.), D.I.I.Sc., Engineer-in-Charge, Overseas Communication Service, Industrial Assurance Building, 2nd Floor, Veer Nariman Road, Churchgate, Bombay-1.
1967	11061	Kulkarni, V. P. (Dr.), B.Sc., M.Sc., M.Tech., Ph.D., Pool Officer, Electronics Division, National Physical Laboratory, New Delhi-12.
1964	1720	Kulshrestha, A. P., Regional Manager, Indian Telephone Industries Ltd., 12-B, Faiz Bazar, Delhi-6.
1956	2687	Lahiri, D. B. (Lt. Col), 2, Technical Training Regiment, 1 Signal Training Centre, Jabalpur (M.P.).
1965	3159	Lakshminarayana, N., B.Sc., Assistant Professor in Telecommunication Engineering, College of Engineering, Kakinada-3 (A.P.).

<i>Year of Election</i>	<i>Mem. No.</i>		<i>Service on Council</i>
1963	6055	Lam, D. M., B.Sc. (Hons.), D.I.I.Sc., Director of Telegraphs, Technical Development Circle, P and T Ridge Road, Jabalpur (M.P.).	
1958	2623	Lazarus, N. P., A.M.I.E.R.E., A.R.Ae. S., A.M.Ae.S.I., Communication Superintendent, Air India THQ., Bombay-29.	
1961	3586	Le Peltier, R. M. (Maj.), A.M.I.E., Commanding Officer, HQ 29, Madras Battalion (N.C.C.), Madurai-14.	
1955	2403	Madan, P. (Brig.), B.Sc. (Hons.), Officer on Special Duty (Planning), Bharat Electronics Ltd., Jalahalli P.O., Bangalore-13.	1953-55
1964	6879	Madhava Raja, V., B.Sc. (Hons.), M.Sc., Flat No. 22, 2nd Floor, 'SUJATA' Swami Vivekananda Road, Bandra, Bombay-50.	
1963	92	Mahajan, D. R., B.E., Assistant Chief Engineer (Wireless), P & T Directorate, Parliament Street, New Delhi-1.	
1955	74	Maiya, B. C. S., M.A., Divisional Engineer Telegraphs, Telecommunication Training Centre, General Post Office Building, Nagpur.	
1954	453	Major, D. S. (Lt. Col.), Petit Mansions, 85, Sleater Road, Bombay-7.	
1954	602	Malhans, J. S. (Lt. Col.), General Staff Branch (MT-12), Army Headquarters, New Delhi-11.	
1963	2114	Marathe, B. R. (Dr.), M.Sc. (Wireless), Ph.D. (Physics), Senior Scientific Officer, Central Electronics Engineering Research Institute, Pilani (Rajasthan).	
1956	2480	Masand, C. W., B.Sc. (Engg.), D.I.I.Sc., M.S. (U.S.A.), A.M.I.E. (India), M.A.S.H.R.A.E. (U.S.A.), Technical Director, Masand Industries, Kapurthala (Pb.).	
1958	3654	Mathew, Thomas, B.Sc., M.Sc., 131 Nehru Road, Santa Cruz (East), Bombay-55.	
1955	699	Mathur, N. S. (Col.), Commandant, HQ No. 1 Signal Training Centre, Jabalpur (M.P.).	

<i>Year of Election</i>	<i>Mem. No.</i>		<i>Service on Council</i>
1963	6177	Mehra, S. C. (Maj.), HQ. Partapur Sector, C/o 56 A.P.O.	
1965	8748	Mehrotra, S. L. (Maj.), M.Sc., The Special Signal Regiment, Delhi Cantt.	
1957	456	Mehta, K. M., B.Sc., D.I.I.Sc., Engineer-in-charge, High Power Transmitters, All India Radio, Bombay.	
1958	2641	Menon, K. G. (Wg. Cdr.), No. 2 Wing, Indian Air Force Station, Poona-6.	
1954	1556	Mirchandani, H. J., B.E. (Mech. and Elect.), Chief Engineer (Transmission), Indian Telephone Industries Ltd., Bangalore-16.	
1956	2494	Mishra, S. C., B.Sc., Regional Manager, Indian Telephone Industries, 9-B, Govindpur Road, Calcutta-31.	
1957	2686	Mital, R. N., B.Sc., B.E. (Hons.), 2, Ramkishore Road, Civil Lines, Delhi-6.	
1962	2418	Mithal, G. K., B. E. (Hons.), Reader in Advance Electronics, Government Engineering College, Jabalpur (M.P.).	
1965	765	Mitra, S. K., M.Sc., Station Engineer, All India Radio, Malwa House, Indore (M.P.).	
1955	1853	Mitter, E. A. (Maj.), B. A., 8, Commission Lane, Delhi-6.	
1960	3095	Mohan, M. Ananda, Senior Technical Officer, Office of the Controller of Communication, Madras Region, Madras Airport, Madras-27.	
1958	584	Mohantry, A. P., B.Sc., Superintendent of Police (Signals), Cuttack (Orissa).	
1964	2046	Mukherjee, A. B., B.Sc., M.Sc., 4, Bakul Tala Lane, 'Hari Bhavan', P.O. Konnagar, District Hooghly (W.B.).	
1965	8504	Mukherjee, S. C., M.Sc., 20-B, Sankaripara Road, Calcutta-25.	
1957	2506	Mukherji, S. N., B.Sc. (Hons.), M.Sc., Governing Director, W. J. Alcock & Co., 7, Hastings Street, Calcutta.	

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<i>Year of Election</i>	<i>Mem. No.</i>	<i>Service on Council</i>
1957	2586	Murgai, B. S., Divisional Engineer (Telegraphs), Technical and Development Circle, P and T, Ridge Road, Jabalpur (M.P.).
1967	11063	Murthy, Y. N. Keshava, B.Sc., D.I.I.Sc., C/o Voltas Limited, (Project Engineering Division), 19, Grahman Road, Ballard Estate, Bombay-1.
1966	9484	Murty, B. S., B. Sc. (Engg. Hons.), Director, Coaxial Trunk Cable Project, Jayahagar, Bangalore-11.
1955	75	Nabar, S. M., B.Sc. (Hons.), D.I.I.Sc., A.M.I.E., Superintendent of Police (Wireless), Government Flat 'D' Arsenal Road, Poona-1.
1965	8747	Nagar, B. L., B.Sc., 5/3, West Patel Nagar, New Delhi.
1955	2417	Nagaraja, N. S. (Dr.), B.Sc. (Hons.), Ph.D., D.I.I.Sc., Lecturer, Indian Institute of Science, Bangalore.
1955	4312	Nagarajan, M. S. (Maj.), M.A., A.M.I.E., Chief Inspectorate of Electronics, Hebbal P.O., Bangalore-6.
1954	5	Nageswaran, K., B.A. (Hons.), D.I.C. (London), RESA Company, 3/6, Mount Road, Madras-2.
1954	660	Naidu, R. K. P., (Maj.), B.A., 'Q' Communication Zone, Signal Regiment, Poona-1.
1954	540	Naidu, V. K. P., B.Sc., International Civil Aviation Organization, Technical Assistance Mission, P.O. Box 1165, Jeddah, Saudi Arabia.
1966	10335	Nair, B. K. S. (Cdr.), B.Sc., M.I.E.E.E., A.M.I.E.R.E., A.M.I.E. (India), J.C.E.C., Plot No. 108, Church Road, G.P.O., New Delhi-1.
1964	6171	Nair, B. R., B.Sc. (Engg.), Senior Engineer Crossbar, Indian Telephone Industries Ltd., Bangalore-16.
1954	652	Nair, C. U. K. (Lt. Col.), B.A., National Cadet Corps Directorate, Kerala and Laccadives, Pangodi, Trivandrum-6.

<i>Year of Election</i>	<i>Mem. No.</i>	<i>Service on Council</i>
1960	3135	Nair, K. K. (Prof.), M.Sc., D.I.I.Sc., M.I.E.E.E. Professor of Telecommunication Engineering, University College of Engineering, Osmania University, Hyderabad-7 (A.P.).
1963	1615	Nair, V. G., Regional Director Telecommunication, Madras.
1958	851	Nambiar, K. M. K. (Wg. Cdr.), Communication Officer, Hindustan Aeronautics Limited, Nasik Road.
1964	6716	Nambiar, K. P. P., M.Sc. (London), D.I.C., A.M.I.E.E. (London), M.I.E.E.E. (U.S.A.), 14, Park View, Little Gibbs Road, Malabar Hill, Bombay-6.
1958	4209	Nambudiripad, M. N., B.S., A.M.I.E.R.E., St. Albert's College, Ernakulam (Kerala).
1959	2766	Nanda, C. M. (Col.), B.A., M.A., A.M.I.E.R.E., C/o National & Grindlays Bank Limited, 10, Parliament Street, New Delhi-1.
1959	887	Narasimhan, P. R., B.E., Assistant Planning Officer, All India Radio, P and D Unit, Akashwani Bhavan, New Delhi-1.
1961	3706	Narasimhan R. (Lt. Col.), Deputy Chief Signal Officer, Headquarters Madras, Mysore and Kerala Area, St. Thomas Mount, Madras-16.
1955	903	Narasimiah, B. N., 18, I-Main Road, Ramamohanpura, Sreerampuram P.O., Bangalore-21.
1958	918	Narayanan, V. S. (Wg. Cdr.), B.Sc. (Hons.), Air Force Station, Barnala, Sangrur District (Punjab).
1954	532	Narayanaswamy, A. S., M.Sc., Deputy Planning Officer, Planning and Development Unit, All India Radio, Akashwani Bhavan, Parliament Street, New Delhi-1.
1967	11048	Narula, V. P., B.Sc. (Engg.), D.I.I.Sc., C/o, The Bharat Transformer Corporation, 'A' Tank, Patiala.
1966	9767	Natu, K. V., B.E., Factory Manager, Philips India Limited, Loni Kalbhor (C.R.), NR Poona.

<i>Year of Election</i>	<i>Mem. No.</i>		<i>Service on Council</i>
1964	6109	Nayar, K. R., Director of Telegraphs, Kerala Circle, Trivandrum-1.	
1954	1546	Nilkantan, P. S., B.A., M.Sc., Planning Officer, All India Radio, Akashwani Bhavan, Parliament Street, New Delhi-1	
1959	2780	Ohri, D. D. (Wg. Cdr.), Wireless Experimental Centre, Delhi Cantt.	
1966	2611	Pai, K. N., B.Sc., 18 Sunder Mansion, 91 Govandi Road, Chembur, Bombay-71.	
1954	457	Pai, K. V., B.E. (Electrical), Technical Expert C/o E.C.A.F.E, Bangkok, Thailand.	
1954	501	Pai, M. V., B.Sc. (Engg.), A.M.I.E. (India), A.I.R.E., C/o Shri K. G. Pai, 'Guru Nanak Nivas', Block No. 8, Plot No. 183, Sion Road (West), Sion, Bombay-22-DD.	
1957	2545	Pal, P. C., B.Sc. (Hons.), M.Sc., M.I.R.E. (New York), Reader Government Engineering College, Jabalpur (M.P.).	
1954	461	Palekar, D.W., M.Sc., A.C.G.I., A.M.I.E. (London), Engineer-in-charge, All India Radio, Goraya (Pb.).	
1959	2630	Pandhi, Ranbir, (Sqn. Ldr.), Air Force Station, Baroda-6.	
1965	9198	Pant, N. (Maj.), M.Sc., Project Engineer, Experimental Satellite Communications Earth Station, 4-5 Vijay Park Cooperative Housing Society, Navrangpura, Ahmedabad-9.	
1954	905	Panwar, B.S. (Col.), Commandant, Headquarters 2 STC., Panjim (Goa).	
1958	2645	Parthasarathy, M. N., M.A., A.M.I.E.R.E., 76 North Tank Square, Triplicane, Madras-5.	
1955	567	Patil, N. A. (Lt. Col.), 2 Army Headquarters Signal Regiment, Signals Enclave, New Delhi-10.	
1966	10406	Patil, S. T., B.E., M/s. Hindustan Brown Boveri, Limited, No. 1 Jorbagh Nursery, New Delhi-3.	

<i>Year of Election</i>	<i>Mem. No.</i>		<i>Service on Council</i>
1954	1610	Pattabhiraman, J., B.Sc., D.I.I.Sc., C/o Resident Representative of the U.N. Development Programme in Ghana, a.i. P.O. Box No. 1423, Accra (Ghana).	
1954	1358	Patterson, W. D. (Lt. Col.), B.Sc., Signals Directorate, Army Headquarters, DHQ P.O., New Delhi-11.	
1965	895	Pendharkar, S. B., B.E. (Telecommunication), Philips India Limited, 68, Najafgarh Road, New Delhi-15.	
1954	159	Phatak, D. V., B.E., Planning Officer, Planning and Development Unit, All India Radio, Parliament Street, New Delhi-1.	
1954	747	Pichumoni, K. K., Divisional Engineer (Retired), P and T, 16, Benwells Road, Cantt., Tiruchirappalli.	
1960	972	Pinto, K. A. J. (Sqn. Ldr.), Air Force Station, Halwara.	
1965	819	Prabhakar, Alladi (Prof.), B.E., M.E., M.I.E.E.E. (U.S.A.), Professor, Department of Telecommunication Engineering, College of Engineering, Osmania University, Hyderabad-7 (A.P.).	
1960	2836	Prabhu, M. A., B.A., Chief Installation Test Engineer (VHF), Bharat Electronics, Jalahalli, Bangalore-13.	
1957	2591	Puri, Y. R. (Lt. Col.), Assistant Director (Communications), Directorate General, Border Security Force, Ministry of Home Affairs, New Delhi.	
1964	7364	Purakayastha, S. K. De (Prof.), M.Sc. (Cal.), S. M. (Harvard), M.I.E.E.E. (U.S.A.), M.I.E.E. (U.K.), Professor and Head of the Electrical Engineering Department, Assam Engineering College, Jalukbari, Gauhati-13 (Assam).	
1958	2621	Rai, B. K. (Lt. Col.), B.Sc. (Engg.), D.I.I.Sc., M.I.E.R.E., M.R.S.G.B., M.A.R.S.L., Assistant Director (P.I.L.), Ministry of Defence (D.G.I.), New Delhi-11.	1965-66 HT 1966-67
1958	2646	Rajagopal, D. (Wg. Cdr.), B.Sc., Dilkush, 5, Laxmana Chetti Street, Thyagarayanagar, Madras-17.	

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1965	9276	Rajan, R. A. (Lt. Col.), B.Sc., TSO-1, CD Directorate, G.S. Branch, Army Headquarters, DHQ P.O., New Delhi-11.
1954	4327	Rajan, R. M. (Lt. Col.), B.Sc., Officer Commanding, Southern Command Signal Regiment, Poona-1.
1964	1683	Raju, D. V. S., B.Sc., D.M.I.T., M.I.E.E.E., Electronic and Industrial Instruments Co. Pvt. Ltd., 17/B, Industrial Estate, Sanatnagar, Hyderabad-18 (A.P.).
1967	11209	Ramachandran, V. (Dr.), B.Sc., D.I.I.Sc. (E.C.E.), D.I.I.Sc. (Electronics), Ph.D., M.I.E.E.E. (U.S.A.), Assistant Professor, Department of Electrical Engineering, Nova Scotia Technical College, Halifax (N.S.), Canada.
1960	740	Ramadoss, E. N. (Lt. Col.), B.Sc., GSO-1, Headquarters, 23 Mountain Division, C/o 99 A.P.O.
1963	6056	Ramadoss, K. C., B.E. (Telecommunication), Director of Microwave Installation, C/o District Manager, Hyderabad (A.P.).
1956	1489	Rama Kant, B.Sc. (Elect. and Mech.), General Manager Telephones, Calcutta-1.
1962	2184	Ramakrishna (Maj.), B.Sc., M.A., 83 Field Workshop Coy, E.M.E. (638 E.M.E. Bn.), C/o 99 A.P.O.
1955	2104	Raman, K. V., B.A., Deputy General Manager Telephones (Retired), Flat No. 17, Plot 88 'Surya Sadan', Cooperative Housing Society, Wadala, Bombay-31-DD.
1955	3922	Raman, S. (Maj.), B.Sc., M.A. (Mathematics), M.I.R.E., A.M.I.E.R.E., Officer-in-Charge, DET Technical Group EME, No. 15, 509 Army Base, Workshop, Agra.
1965	701	Ramanand, V. S. (Lt. Col.), B.Sc., Officer Commanding, IV Corps Signal Regiment, C/o 99 A.P.O.
1958	2603	Ramanany, P. U. (Wg. Cdr.), Directorate of Signals, Air Headquarters, New Delhi-11.

<i>Year of Election</i>	<i>Mem. No.</i>		<i>Service on Council</i>
1960	568	Ramanathan, G., B.Sc., D.I.I.Sc., D.I.C. (London), Installation Engineer, All India Radio, Western Project Circle, New Broadcasting House, Bombay-1.	
1963	1953	Ramanathan, P. M., B.E. (Telecommunication), Lecturer in Telecommunication Engineering, College of Engineering, Guindy, Madras-25.	
1965	8537	Ramaswami, N., Senior Engineer, Indian Telephone Industries Ltd., Dooravaninagar, Bangalore-16.	
1965	7628	Ramesh Chander (Maj.), B.A. (Hons.), A.M. I.E., 216 Field Workshop Coy, E.M.E., C/o 56 A.P.O.	
1955	822	Rana, S. K., B.Sc. (Hons.), Deputy General Manager, P and T (Retired), Secretary, The Institution of Telecommunication Engineers (India), 72, Ring Road, Lajpat Nagar III, New Delhi-14; Res : C-151, Greater Kailash, New Delhi-14.	
1954	1411	Ranganathan, S. N., B.E. (Electrical), Deputy Director General, P and T Directorate, Parliament Street, New Delhi-1.	1963-64 H.T. 1964-66
1954	607	Ranji, H. K. (Lt. Col.), B.E. (Electrical), 116 Kaka Nagar, New Delhi-1.	
1956	901	Rao, B. N. (Maj.), B.Sc., Signals No. 2 High Street, Cooke Town, Bangalore-5.	
1965	8427	Rao, B. S. (Dr.), M.Sc. (Tech.) Ph.D., Scientist, Central Electronics Engineering Research Institute, Pilani (Rajasthan).	
1963	16	Rao, B. S. S., M.Sc., A.M.I.E.R.E., Principal, A. V. Parekh Technical Institute, Rajkot (Gujarat).	
1963	231	Rao, G. Prabhakara (Maj.), M.Sc., A.M.I.E.R.E., 'Signals', CSO's Branch, Headquarters Eastern Command, Fort William, Calcutta-21.	
1960	2911	Rao, K. L., B.Sc., B.A., D.I.C., M.A. (Cantab), M.I.R.E., A.M.I.E.E., Office of the Installation Engineer, All India Radio, Staman, Madras Port, Madras.	

<i>Year of Election</i>	<i>Mem. No.</i>	<i>Service on Council</i>
1962	2597	Rao, R. N. (Wg. Cdr.), B.E., D.I.I.Sc., D.C.Ae., A.M.I.E., A.F.R.Ae.S., Assistant Director, Defence Electronics Research Laboratory, Hyderabad-5 (A.P.).
1958	2607	Rao, S. (Wg. Cdr.), ALISDA, D.T.D. & P. (AIR), 275, Ragamahal Extension, Bangalore-6
1958	3928	Rao, V. Hanumentha, B.E. (Telecommunication) Deputy Superintendent, Police Communications, Hyderabad (A.P.).
1958	1520	Rao, V. Kuppa, B.A., Divisional Engineer Telephones (Retired) P and T, 1st Floor, Kamal Kunj, Telong Cross Road No. 1, Matunga, Bombay-19.
1957	397	Rao, V. V., B.Sc., Deputy Wireless Adviser, Wireless Planning Coordination, Patel Bhavan, Parliament Street, New Delhi-1.
1963	5531	Rathan, J. L. (Maj.), B.Sc., 7 Haddows Road, Nungambakkam, Madras-6.
1966	10124	Ravindran, P.M. (Maj.), B.Sc., A.M.I.E. (India) Defence Standardisation Cell (Electronics), C/o LRDE, High Grounds, Post Box No. 108, Bangalore-1.
1957	2583	Ray, A. K., B.Sc. (Hons.), M.Sc., Superintending Engineer (Communication), Damodar Valley Corporation, P.O. Maithon Dam, District Dhanbad.
1954	10	Ray, N. C. M.Sc., D.I.I.Sc., Senior Superintendent of Police (Radio), Bhopal (M.P.)
1963	6054	Reddi, C. K., B.E. (Electrical), Regional Director, Telecommunication Western Region, Central Telegraph Office Building, Bombay-1.
1962	3683	Reddy, K. L., B.E. (Electrical), District Manager Telephones, Hyderabad (A.P.).
1965	8447	Revanker, G. N., B.E. (Hons.) (Telecommunication), Assistant Professor, Type IV, Quarter No. 8, Indian Institute of Technology, Powai, Bombay-76.
1967	10449	Rishi, K. (Lieut. Cdr.), B.Sc., Naval Signals Directorate, Naval Headquarters, New Delhi.

<i>Year of Election</i>	<i>Mem. No.</i>		<i>Service on Council</i>
1955	1696	Row, K. S. (Lt. Col.), B.Sc., Headquarters 2 Signal Training Centre, Panjim (Goa).	
1955	1090	Row, C. V. Suryanarayana (Wg. Cdr.), B.E., D.I.I.Sc., A.M.I.E., A.M.Ae.S.I., No. 507, Signal Unit, Air Force, C/o 99 A.P.O.	
1961	3797	Roy, R. N. (Dr.), B.Sc. (Hons.), M.Sc., D. Phil., Associate Professor, Saha Institute of Nuclear Physics, 92, Acharya Profulla Chandra Road, Calcutta-9.	
1964	7284	Roy, S.C. (Lt. Col.), Commander, NCC Groups Headquarters, Kalyani, District Nadia (W.B.).	
1964	7249	Roychowdhury, P. K. (Lt. Col.), Commanding Officer, 17, Mountain Division, Signal Regiment, C/o 99 A.P.O.	
1954	564	Sabhaney, I. W. (Gp. Capt.), Deputy Director (G.W.) Air Headquarters, Room No. 185, New Delhi-11.	1965-66
1957	2	Sahadev, N. L., B.A. (Hons.), M.Sc. (Physics), Project Officer, All India Radio, Eden Garden, 4th Floor, Calcutta-1.	
1965	1413	Sahgal, N. S. D. (Maj.), C/o Chief Inspectorate of Electronics, P.O. Hebbal, Bangalore-6.	
1954	1472	Sajnani, N. B., B.Sc., 46 Henry Street, Toronto, 2 B, Ontario (Canada).	
1956	77	Samant, M. G. (Prof.), B.Sc., D.I.I.Sc., College of Engineering, Poona-5.	
1958	2638	Sampath, S. (Prof.), B.Sc. (Hons.), D.I.I.Sc., M.S. (Electronic Engineering), Deputy Director, Indian Institute of Technology, Madras.	1961-63
1957	2590	Sampson, D. S. (Sqn. Ldr.), Air Force Station, Bamrauli, Allahabad (U.P.).	
1958	2670	Sandhu, G. S., B.Sc. (Hons.), Divisional Engineer, Telegraphs (Construction), Jammu.	
1967	10834	Sangal, D. K., B.E., M.I.E.E.E. (New York), Deputy Chief Engineer, P and T Board, Parliament Street, New Delhi-1.	

<i>Year of Election</i>	<i>Mem. No.</i>		<i>Service on Council</i>
1965	205	Sankaranarayana, P. H., B.Sc. (Hons.), M.A., Divisional Engineer, Telegraphs (Long Distance), Telephone Kendra, Patna-1.	
1959	2782	Sankararaman, S., B.E., Works Manager (Transmission), Indian Telephone Industries Limited, Dooravaninagar, Bangalore-16.	
1954	1754	Sapre, S. D. (Gp. Capt.), B.A. (Hons.), B.Sc., D.I.I.Sc., Directorate of Signals, Army Headquarters, Vayusena Bhavan, New Delhi-11.	
1967	2557	Sardesai, S. N., B.Sc., B.E. (Hons.) (Telecommunication), M.I.E.E.E., Assistant Divisional Engineer, 15A/23, Sector 4, Bhilai-1 (M.P.).	
1954	45	Sarin, D. D., B.Sc. (Engg.), Planning Officer, Planning and Development Unit, All India Radio, Akashvani Bhavan, New Delhi-1.	
1954	2261	Sarin, J. C. (Maj.), B.Sc., Grad. I.E.R.E., Signals Directorate, Army Headquarters, DHQ P.O., New Delhi-11.	
1964	7261	Sarin, Tej (Brig.), B.A., CSO-IV Corps., C/o 99 A.P.O.	
1958	925	Satish Chand (Wg. Cdr.), B.Sc. (Engg.), Chief Instructor, Air Force Technical College, Jalahalli (West), Bangalore-15.	
1967	11067	Satish Chandra (Maj.), B.Sc., M.Sc., XXXIII Corps Signal Regiment, C/o 99 A.P.O.	
1954	815	Swahny, R. N. R. (Col.), 'P' Communication, 'Z' Signal Regiment, Mangal Lancer Lines, Alwar (Rajasthan).	
1963	6042	Saxena, A. P., M.I.E.E.E., Commandant, Signals Bn., Central Reserve Police, Neemuch.	
1954	2866	Sehgal, J. L., B.A., Scientific and Technical Officer, Telecommunication Research Centre, P and T Directorate, Parliament Street, New Delhi-1.	
1956	2431	Sen, D. N., B.Sc. (Hons.), M.Sc., Martin Burn Limited, 12, Mission Road, Calcutta.	

<i>Year of Election</i>	<i>Mem. No.</i>		<i>Service on Council</i>
1954	698	Seshamani, B. (Col.), B.Sc., Deputy Director (W.E.), GS Branch, Army Headquarters, DHQ P.O., New Delhi-11.	
1961	3589	Sethi, N. J. S. (Col.), Commandant, Border Security Force Signal Training School, East Block No. 9, R. K. Puram, New Delhi-22.	
1967	10766	Setty, C. S. G. K., (Dr.), B.Sc. (Hons.), M.Sc., Ph.D., A. Inst. P., Department of Physics and Astrophysics, University of Delhi, Delhi-7.	
1957	392	Shah, J. G. (Dr.), B.E. (Electrical), D.I.I.Sc., Ph.D., A.M.I.E., M.I.E.E.E. (U.S.A.), C.V.M. Bungalow, No. 14, Vallabh Vidyanagar (Via) Anand.	
1955	2404	Shahani, J. N. (Lt. Col.), M.Sc., M.I.E.R.E., S.M.I.R.E., 21, Ratendon Road, New Delhi-3.	1953-55 J.S. 1960-61 1961-62 J.S. 1962-63
1959	1968	Shamarao, P. L., M.I.R.E., (U.S.A.), No. 124 Srikrishnarajindra Road, Basavangudi, Bangalore-4.	
1963	6057	Shanta, B. H. (Miss), B.Sc. (Hons.), M.A., D.I.I.Sc., Deputy Director, Telecommunication Research Centre, P and T Directorate, Parliament Street, New Delhi-1.	
1959	2124	Shenoi, N. V., B.E. (Electrical), Director, Telecommunication Research Centre, P and T Directorate, Parliament Street, New Delhi-1.	1963-65 V.P. 1965-66
1960	3535	Shrivastava, K. K. (Prof.), B.E. (Hons.) M.E., Professor of Telecommunication Engineering, Government Engineering College, Jabalpur (M.P.).	
1957	2580	Shukla, R. (Wg. Cdr.), Room No. 151, Directorate of Signals, Air Headquarters, DHQ P.O., New Delhi-11.	
1954	557	Singh, Ajit (Brig.), B.A., HQ XV Corps, C/o 56 A.P.O.	
1954	3079	Singh, Bhagwat (Maj.), B.Sc., 6 Technical Training Regiment (Type 'B'), 2 Signal Training Centre, Ponda (Goa).	

<i>Year of Election</i>	<i>Mem. No.</i>		<i>Service on Council</i>
1954	1487	Singh, B. N. (Dr.), B.Sc. (Hons.), M.Sc., (Wireless), D.Sc., Director, Defence Research and Development Organization, Instruments Research and Development Establishment, Raipur, Dehradun (U.P.).	
1958	2651	Singh, Gurumukh (Wg. Cdr.), Deputy Director, Radio Engineering, Directorate of Signals, Air Headquarters, New Delhi-11.	
1962	5535	Singh, Hardayal (Lt. Cdr.), B.E., I.N.S., 'Valsura', Jamnagar (Gujarat).	
1954	1532	Singh, Hazara (Lt. Col.), Officer Commanding Eastern Command, Signal Regiment, Lucknow.	
1954	655	Singh, Jagir (Wg. Cdr.), B.A., No. 6 G.T.S., Air Force Jalahalli, Bangalore-14.	
1954	829	Singh, Joginder (Maj.), B.A., CAFSO Branch, Air Headquarters, New Delhi-11.	
1963	6320	Singh, Joginder (Maj.), Headquarters Uttar Pradesh Area, Bareilly (U.P.).	
1964	7303	Singh, R. C. (Maj.), (Retired), L-27, Kailash Colony, New Delhi-14.	
1954	475	Singh, Shiv (Lt. Col.), Ist Panjab Signals N.C.C., Thapar Institute of Engineering and Technology Patiala.	
1954	4760	Sinha, A., Divisional Engineer Telegraphs, Varanasi (U.P.)	
1965	8067	Sinha, Ananda Mohan (Maj.), B.Sc., A.M.I.E., Officer Commanding, E.M.E. Branch, Headquarters, Eastern Command, Fort William, Calcutta-21.	
1958	2619	Sinha, K. N., (Wg. Cdr.) B.Sc., Senior Signals Officer, No. 2 Wing, Air Forces, C/o 56 A.P.O.	
1947	1331	Smith, D.C. (Lt. Col.), 10 Infantry Division, Signal Regiment C/o 56 A.P.O.	
1960	3530	Sobti, B. K. (Maj.), B.Sc., 2 Mountain Division, Signal Regiment, C/o 99 A.P.O.	
1964	6892	Sodhi, M. S. (Lt. Col.), Signals Directorate Army Headquarters, DHQ P.O., New Delhi-11.	

Year of Election	Mem. No.		Service on Council
1965	2462	Somasundaram, R. S., B.Sc. (Hons.), Assistant Director, Telecommunication Research Centre, P and T Directorate, New Delhi-1.	
1959	384	Srinivasan, S., M.Sc., Director, Indian Standards Institution, 534 Sardar V. Patel Road, Sandhurst Bridge, Bombay-7.	
1958	2617	Srinivasan, T. (Gp. Capt.), B.Sc. (Hons.), 'GITA', 5, 17-A, Cross Road, 10-A, Main Road, Malleswaram, Bangalore-3	1961-63
1967	10663	Srirangan, T. V., B.E., D.I.I.Sc., Deputy Director, Telecommunication Research Centre, P and T Board, New Delhi-1.	
1966	9192	Srivatsan, B. S., B.E. (Electrical), D.I.I.Sc., Engineer (Electrical), Department of Lighthouses and Lightships, 6, Chapel Road, Hastings, Calcutta-22.	
1954	1470	Subburatnam, S., B.Sc. (Hons.), Chief Controller of Telegraphy Stores, 3-A Chowringhee Place, Calcutta-13.	
1955	1460	Subrahmanyam, Ganti (Prof.), B.E., M.A., (Elect. Engg.), M.I.R.E., Professor of Telecommunication Engineering, College of Engineering, Kakinada-3 (A.P.).	
1958	1842	Subramanian, A., B.A. (Hons.), A.M.I.E.E., Director of Telegraphs, 146, Chittaranjan Avenue, Calcutta-7.	
1955	1569	Subramanian, C. R., B.Sc., M.S. (E.E.), D.I. I.Sc., 'Rajam House, 6 Palace Cross Road, Bangalore-20.	
1964	6942	Subramanian, H. (Maj.), B.Sc., 1 Armoured Divisional Signal Regiment, C/o 56 A.P.O.	
1958	1934	Subramanian, T. S., B.Sc. (Engg.), Deputy Director, Telecommunication Research Centre, P & T Directorate, New Delhi-1.	
1955	1087	Sud, B. D., C.E. (Hons.), M.I.E., Member, P and T Board (Administration), P and T Directorate, Parliament Street, New Delhi-1.	
1965	8427	Sud, K. C. (Maj.), 26, Infantry Division, Signal Regiment, C/o 56 A.P.O.	

<i>Year of Election</i>	<i>Mem. No.</i>		<i>Service on Council</i>
1954	582	Sujan, V. B., D.F.H., A.M.I.E.E. (London), 8, Jenkins House, Henry Road, Apollo Bunder, Bombay-1.	
1963	6110	Sundaram, V. M. (Lt. Col.), B.E. (Telecommunication), XV Corps Signal Regiment, C/o 56 A.P.O.	
1954	146	Suri, R. L., B.A., A.M.I.E.T., M.A.I.P., F.A.S.A., 8, Pandit Pant Marg, New Delhi-1.	
1957	11011	Suri, S. K., B.Sc. (Hons.), M.Sc. (Hons), M.S. (U.S.A.), A.M.I.E.R.E., Scientist-in-Charge, Instrumentation, Room 222, National Physical Laboratory, Hill Side Road, New Delhi-12.	
1965	8817	Sushil Nath (Maj.), A.M.I.E., Signals Directorate, G. S. Branch, Army Headquarters, DHQ P.O., New Delhi-11.	
1963	7286	Swaminathan, K., District Manager, Telephone Richmond Road, Bangalore-25.	
1964	9498	Swarup, S. (Maj.), B.Sc., CSO Branch, HQ Western Command, Simla-3.	
1954	43	Tandon, R. K., M.Sc., B.Sc. (Elect. Comm. Engg.), A.C.G.I., Senior Scientific Officer, National Physical Laboratory, New Delhi-12.	
1954	808	Taskar, N. T., B.Sc., B.E., ITU Expert, C/o Resident Representative of U.N. Development Programme in Iraq, a.i., P.O. Box 2048, Alwyiah P.O., Baghdad, Iraq.	
1956	2493	Tod, D. S., B.Sc., M.S.R.E., Associate Partner, Henn-Collins Crocker Associates, McMillan House, Cheam Common Road, Worcester Parle, Surrey (England)	
1967	435	Trivikrama Rao, B. V. (Prof.), B.Sc., (Hons.), M.Sc., A.M.I.E.R.E. (London), Air Force Technical College, Jalahalli West, Bangalore-15.	
1961	3717	Tyagi, B. D. (Maj.), M.E., A.I.D.E.E., A.M.A.I.E.E., A.M.I.E., Officer Commanding, 405 Infantry troops Workshop, E.M.E., C/o 99 A.P.O.	

<i>Year of Election</i>	<i>Mem. No.</i>		<i>Service on Council</i>
1954	961	Vaidya, K. D., B.E., C/o Director Telecommunication, Edith Covell Street, Port Louis, Marutius.	1965-66
1966	9853	Varma, K. R. Sukumara (Maj.), B.Sc., 250 Field Workshop Coy, E.M.E., C/o 99 A.P.O.	
1966	4114	Vedwa, R. K. (Sqn. Ldr.), B.Sc., A-469, Defence Colony, New Delhi-3.	
1965	805	Venkataraman, K., M.A., M.E., Associate Professor, Department of Electronics Engineering, Birla Institute of Technology and Science, Pilani (Rajasthan).	
1967	10781	Venkataraman, S., B.A. (Hons.), Divisional Engineer, Telegraphs, Telecommunication Training Centre, P and T, Trivandrum-1.	
1966	10144	Venkateswaran, P. S. (Maj.), B.Sc., A.M.I.E. (India), 206 Field Workshop Company (641 EME Battalion), C/o 99 A.P.O.	
1954	4347	Verma, B. D. (Maj.), B.Sc., B.E. (Hons.), A.M.I.E. (India), E.M.E., Chief Inspectorate of Electronics, Ministry of Defence (DGI), Government of India, Jalahalli P.O., Bangalore-13.	
1959	2748	Virdee, K. S., B.Sc., Semiconductors, Behind Block No. 26, West Patel Nagar, New Delhi-8.	
1960	3268	Virdi, T. S. (Lt. Cdr.), B.Sc., B.T., I.N.S. Shakti, C/o Fleet Mail Office, Bombay-1.	
1965	1656	Vithal, D. V. R., B. E. (Telecommunication), M.S. (U.S.A.), M.I.E.E.E., Reader, Department of Telecommunication Engineering, University College of Engineering, Osmania University, Hyderabad-7 (A.P.)	
1966	10805	Wad, B. Y. (Capt.), I. N., B.Sc., Director of Electrical Engineering, Naval Headquarters, New Delhi-11.	
1957	2573	Wagle, M. M., B.E. (Mech. and Elect.), Deputy Chief Engineering Telephones (Engg.) P and T Directorate, New Delhi-1	
1957	429	Yadav, Ram, B.Sc., Station Engineer, All India Radio, Rajkot (Gujarat).	

APPENDIX—I

List of Papers Published in the Journal of the Institution of Telecommunication Engineers and the Students' Journal from October 1966 to September 1967

Journal of the Institution of Telecommunication Engineers

Vol. 12, No. 10 October-66

- Target Resolution of a Doppler Radar with Statistically Variable PRF—R. P. Shenoy.
Speed of Fading of Radio Waves Reflected from the Ionosphere over Ahmedabad—
C. M. Patel.
Precise Temperature Controller for a Three-zone diffusion Furnace—S. S. Ramamurthi
V. G. Kagal, M.P.S. Menon, M. M. Pandya and T. V. Viswanathan.
Design of a Frequency Independent Log-Periodic Antenna for 500-3000 Mc/s—Shiv
Prasad Kosta and M. D. Singh.
A Thermoelectric Generator for Powering Transistorized Communication Equipment—
N. Choudhuri.

Vol. 12, No. 11 November-66

- Prediction of Propagation Delay in RTL Circuits by Charge Control Approach—K. V.
Ramanan and G. Bhanumurthy.
R. C. Band Elimination Filters having Some Specified Responses—(Miss) A. Badrinath.
Axial Mode Triangular Helical Antenna—S. Balaram and T. S. Venkataraman.
A Study of E Layer Critical Frequencies during a Sunspot Cycle for the Prediction of
 f_oE —M. K. Rao and P. L. Malhotra.

Vol. 12, No. 12 December-66

- A Transistorized Automatic PRF Doubler—S. V. Dabadghao.
Comparative Study of Non-linear Sampled Data Systems Incorporating Hold Circuits—
B. N. Garudachar and V. Srinarayan.
Studies in the Posicast Control Techniques—G. C. De and G. K. Dubey.
Diffusion of Boron and Phosphorus in Silicon—Jaipal Singh and B. R. Marathe.
Spread F at Temperate and High Latitudes—K. B. Kapasi.

Vol. 13, No. 1 January-67

- Switching Transients of Transistors with Speed up Capacitors—K. V. Ramanan and
G. L. Sethi.
Lunar Semi-Diurnal Variation in the Mid-day f_oF_2 over Singapore and Baguio—B. R.
Rao and Iqbal Ahmed.
Some Simple Transistor Multivibrator Circuits of Constant Frequency Output—R. Parshad
and V. K. Jain.

Vol. 13, No. 2 February-67

- A Method of Measuring Capacitance at very high Frequencies and its Application to
the Study of Capacitance of Reverse Biased Scim-Conductor Diodes—M. Krishna-
murthi and K. C. Chadha.

- Beam Shaping of H-Plane Sectoral Horns by Metal Flanges—G. P. Srivastava and K. G. Nair.
 General Linear System Simulation with an Operational Amplifier—H. C. Pande and R. S. Shukla.
 The Development of Precision Metal Film Resistors at Trombay—L. Satyanarayana and U. Venkateswarlu.

Vol. 13, No. 3 March-67

- Square stepped Helical Antenna—S. Balaram and D. V. Ramachandran.
 A Transistorized Isograph and Network Synthesizer—C. Holt Smith, Alladi Prabhakar and K. B. Mahajan.
 Corpuscular effects of a solar flare as observed through sudden increase in longwave field intensity 'SIL'—Mangal Sain.

Vol. 13, No. 4 April-67

- Horizontal drifts in the F-region of the Ionosphere over Ahmedabad—C. M. Patel.
 Indices for Prediction of f_oF_2 —C. S. R. Rao and P. Benjamin.
 Drift Compensation of Transistorized Differential Amplifier (D. C.)—B. N. Chatterji.
 A Log-Periodic Aerial for VHF Band—K. R. Phadke.
 Broadbanding of Waveguide Junction Circulators—K. Chandra, R. Parshad and V. K. Agarwal.

Vol. 13, No. 5 May-67

- Certain Empirical Correlations between Time-Domain and Frequency-Domain Parameters of Relative Stability in Linear Feedback Control Systems—V. Seshadri and V. Ramachandra Rao.
 On the Choice of Optimum Gain for Linear Feedback Control Systems—V. Seshadri and G. C. Das.
 Design of Television Receiving Antennas—Shiv Prasad Kosta and Murlidhar Singh.
 Low Threshold GaAs Laser Diodes—P. Parikh.
 Some Aspects of Medical Electronics—S. K. Guha.

Vol. 13, No. 6 June-67

- A Simplified formulation of Optimization Indices—V. Seshadri.
 Transhorizon VHF Propagation over Ground-Air Paths—S. C. Majumdar.
 Day-to-day fluctuations in the Critical frequency of the F_2 layer in the Asian Zone—R. K. Suryanarayana.
 An X-Band Cross-bar balanced Mixer—V. Narayana Rao, Y. S. N. Murty, M. D. Rajnarayan and A. Gangadhara Rao.
 Solid state static Injectors—S. K. Hajela and N. V. Pai.

Vol. 13, No. 7 July-67

- Realization of Resistive N-Port Networks without Tree Transformations—V. K. Jain and K. S. Chalapati Rao.
 Application of the Fluctuation Theory of Luminance Discrimination to Television—P. S. Moharir.
 Dielectric Loaded Conical Helix Antenna—O. P. N. Calla.
 The Effect of Antenna Aperture on the Reception of cosmic radio noise at the Ground—S. S. Degaonkar and M. A. Abdu.
 Wide Band Parametric Amplifier with External Tuner—O. P. Gandhi and R. C. Kumar.

Vol. 13, No. 8 August-67

Current Saturation in n-Gi As—T. K. Bhattacharya.

Properties of Ferrite Antenna Rods made from Iron ore and its effect on Receiver performance—T. V. Ramamurti, C. V. Ganapathy, V. N. Sharma and R. S. Khanduja.

Soft Ferrite Manufacture from Mineral Iron Ore—T. V. Ramamurti, C. V. Ganapathy, S. C. Gupta and G. Govindaswamy.

Ionospheric absorption on 2.6 Mc/s at Ahmedabad—M. C. Sharma.

Application of Dynamic Programming to Antenna Array Synthesis—R. K. Arora and Madhavendra Nath.

Vol. 13, No. 9 September-67

Axiomatic derivation of Maxwell's Equations—N. Seshagiri.

A Crossed field Gun for low noise operation—M. L. Sisodia and O. P. Gandhi.

S-Band three port Stripline Circulator—R. C. Kumar.

Transmission loss of composite plate and other constructions—P. C. Sarkar.

Students' Journal

Vol. 7, No. 4, December-66

Design of Composite Filters—V. Ramachandran.

Vacuum Tubes II. Processes—P. K. Verma.

Transistor Circuit Configurations—R. Ramaswamy.

Vol. 8, No. 1, March-67

The Lattice Filters—V. Ramachandran

Vol. 8, No. 2, June-67

The Image Network and its Parameters—V. Ramachandran.

Vacuum-Tube Amplifiers—Uma Shanker Saxena.

Vol. 8, No. 3, September-67

Plasma and its Effects on Radiations from Different types of Antennas—R. K. Gupta.

Transister Parametlers — R. Ramaswamy

APPENDIX — II

List of Journals Received in Exchange of the Journal of the Institution

1. A.T.E. Journal, Automatic Telephone and Electric Co., Strouger Works, Liverpool (U.K.).
2. A.W.A. Technical Review, Amalgamated Wireless Australasia, 554-Paramatta Road, Ashfield, New South Wales.
3. Acta Electronica, 23, Rue du Retrait, Paris-20, France.
4. Council for Applied Research, Stockholm-5.
5. Aerial—Marconi's Wireless Telegraph Co. Ltd., Marconi House, Chelmsford, Essex (U.K.).
6. Alta Frequenza-Associazione Electrotecnica Italiana, Via San Paolo 10, Milano (Italy).
7. Ann. Radioelect. Annales de Radioelectricite-Compagnia Generale de T.S.F. Centre d'Information et de Documentation, 12, Tue Carducci, Paris 19.
8. Annales de Telecommunication, Centre National d'Etude des Telecommunications, Paris.
9. Australian Journal of Physics, Commonwealth Scientific and Industrial Research Organisation, 314, Albert Street, East Melbourne, C.2, Victoria.
10. Annales de Geophysique, Service des Publication du CNRS, 15, Quai Anatole—France, Paris-7.
11. Bell Laboratories Record, Bell Telephone Laboratories, 463, West Street, New York.
12. Bell System Technical Journal, Bell Telephone Laboratories, 463, West Street, New York.
13. Bibliography of Scientific Publications of South and South East Asia, National Physical Laboratory, Hillside Road, New Delhi-12.
14. British Communications and Electronics, Heywood and Co. Ltd., Drury House, Russell Street, Drury Lane, London-W.C. 2.
15. Bulletin of the Institution of Engineers (India), 8, Gokhale Road, Calcutta.
16. Bulletin Signalique Des Telecommunication, Paris.
17. Cables et Transmission, SOTELEC, 16, Rue de la Baume, Paris-8.
18. Communications and Electronics, American Institute of Electrical Engineers, New York.
19. E. T. J. Japan—Electrotechnical Journal of Japan. Institute of Electrical Engineers of Japan (Denki-Gakai), Yurakucho, Chiyoda-ku, Tokyo.
20. Electrical and Mechanical Engineering Transactions, Institution of Engineers, Australia.
21. Electrical Communication, International Telephone and Telegraph Corporation, 67, Broad Street, New York-4, N.Y.
22. Electrical Engineering Abstracts—Institution of Elect. Engineers, Savoy Place, London W. C. 2.
23. Electrical-India, 14, Sidh Prasad, Ghatkopar Mahu Road, Bombay-71.
24. Electro-Technology, High Grounds, Bangalore.
25. Electrotechniek, Radactie Electrotechniek, Zwarteweg 1, Den Haag (Holland).
26. Electronic Engineering, Morgan Brothers, 28, Essex Street, Strand, London, W.C. 2.
27. Electronic Technology, Iliffe and sons, Dorset House, Stamford Street, London, S.E.1.
28. Elektronik, Francis-Verlag, 13B-Munchen-37.

28. English Electric Journal, English Cl. Stafford.
29. Entwicklungs Berichte der Siemens and Halske AG, Munchen-25, Hofmannstr-51.
30. Ericsson Review, L. M. Ericsson, Stockholm-32.
31. Electronic Industries, (U.S.A.) Chestnut and 56th Streets, Philadelphia, Pennsylvania 19139.
32. G.E.C. Journal of Science and Technology, Erith, Kent.
33. G.E.C. Telecommunications, Central Electric Co. Ltd., Telephone, Radio and Television Works, Coventry.
34. Geomagnetism : Aerologia (Russian)—The Library of the Sciences of the U.S.S.R., Exchange Department, Leningrad, V-O. 164 Birgevaia Linija-1, U.S.S.R.
35. General Radio Experiments (U.S.A.). General Radio Company, West Concord, Massachusetts.
36. Het PTT-Bedrijf-The Netherland PTT-Netherlands Postal and Telecommunication Services, 12, Korienskaade, The Hague, Netherlands.
37. Hewlett-Packard Journal, Hewlett-Packard Co. 257, Page Mill Road, Palo Alto, California.
38. IBM Journal of Research and Development, Post Box No. 218, Yorktown Heights, New York.
39. Indian Journal of Meteorology and Geophysics, Meteorological Department, Civil Lines, Delhi-6.
40. Industrial India—All India Manufacturers Organisation, 4th Floor, Co-operative Insurance Buildings, Ferozeshah Mehta Road, Bombay.
41. Instrument India, Navyug Nivas, Opp. Minerva Cinema, Lamington Road, Bombay-7.
42. Ionospheric Data, National Physical Laboratory of India, Hillside Road, New Delhi-12.
43. I.S.I. Bulletin, Indian Standards Institution, Manak Bhawan, New Delhi-1.
44. Indian Journal of Applied and Pure Physics, C.S.I.R. Hillside Road, New Delhi.
45. Indian Journal of Technology, C.S.I.R. Hillside Road, New Delhi.
46. Industrial Electronics, Riffe Electrical publication, Worset House, Stamford street, London, S.E. 1.
47. Ionospheric Prediction, N.P.L. Hillside Road New Delhi-12.
48. Indian Science Abstracts, INSDOC, Hillside Road, New Delhi-12.
49. Journal of the Acoustical Society of America, American Institute of Physics, East 45th Street, New York-17 N.Y.
50. Journal of the Aeronautical Society of India, Aeronautical Society of India, Indraprastha Estate, New Delhi-1.
51. Journal of the Applied Meteorology, American Meteorological Society, 45, Beacon Street, Boston, Mass.
52. Journal of the Audio Engineering Society, Post Box No. 12, Old Chelsea Station, New York-11, N.Y.
53. Journal of the Franklin Institute, Benjamin Franklin, Parkway at Twentieth St., Philadelphia, 3, Pennsylvania.
54. Journal of the Geophysical Research, 5241, Broad Road, Northwest, Washington-15.
55. Journal of the Indian Institute of Science, Bangalore.
56. Journal of the Institute of Electrical Communication Engineers of Japan, 2-8 Fujimicho Chiyoda-ky, Tokyo.
57. Journal of the Institution of Engineers India, 8-Gokhale Road, Calcutta.
58. Journal of the Institution of the Military Engineers, College of Military Engineering, Kirkee, Poona.
59. Journal of Mathematics and Physics, Massachusetts Institute of Technology Cambridge, 39, Mass.
60. Journal of the Radio Research Laboratories, Ministry of Posts and Telecommuni-

- cations, Kokubunji, P.O. Katitama-gun, Tokyo.
61. Journal of the Scientific Research, Banaras Hindu University, Varanasi.
 62. Journal of Research of the National Bureau, of Standards, U.S. Government Printing Office, Washington 25, D.C.
 63. Journal of Scientific and Industrial Research, Council of Scientific and Industrial Research, Old Mill Road, New Delhi.
 64. Journal of the Society of Motion Picture and Television Engineers, 55-West 42nd Street, New York-36, N.Y.
 65. Memoirs of Scientific and Industrial Research, Osaka University, Osaka, Japan.
 66. New Zealand Journal of Science, Department of Scientific and Industrial Research, Post Box 8018, Wellington.
 67. Onde Electrique, l'Onde Electrique, Societe des Radioelectriciens, 10, Avenue Priere Larousse Malakoff (Seine).
 68. Philips Research Reports, Philips Gloeilampenfabrieken, Eindhoven, Holland.
 69. Philips Technical Review Philips Gloeilampenfabrieken, Eindhoven, Holland.
 70. Philip Telecommunication Review, Philips, Gloeilampenfabrieken, Eindhoven, Holland.
 71. Post Office Electrical Engineers' Journal, Institution of Post Office Electrical Engineers, G.P.O., 2-12, Gresham Street, London, E.C.
 72. Poste E Telecommunication, Via della Vite, Rome.
 73. Proceeding of Cambridge Philosophical Society, Free School Lane, Cambridge.
 74. Proceeding of the Institution of Radio Engineers-Part-B (Radio and Electronic Engineers), Savoy Place, London W.C. 2.
 75. Proceedings of Institution of Radio Engineers, Australia Science House, Gloucester Street, Sydney.
 76. Q.S.T. American Radio Relay League, 30, La Salle Road, West Hartford, Connecticut.
 77. R.C.A. Review, Radio Corporation of America, R.C.A. Laboratories Division, Princeton, New Jersey.
 78. Radio and Electronics, 6, Shilaja, Peddar Road, Bombay-26.
 79. Radio Times of India, 27, New Queen's Road, Bombay.
 80. Rundfunktechnische Mitteilungen, Institute for Rundfunktechnik, Mittelweg, 113, Humburg-13.
 81. Revista Electrotecnia, Association Argentine de Electrotechicos, Posadas 1657, Buenos Aires.
 82. Revista de Telecommunication Consejo Technico de Telecommunication Palacio de Communications, Madrid.
 83. Rozprawy Elektrotechniczne, Panstwowe Wydawnictwo Naukowe, Przewodnik Przemyslowy 79, Warsaw.
 84. Science and Engineering, Indian Society of Engineers, 12-B, Netaji Subhash Road, Calcutta-1.
 85. Sdelovaci Technika Krakovska 8, Prague-11 (Czechoslovakia).
 86. Technical Journal of Japan Broadcasting Corporation-NHK (Japanese), Japan Broadcasting Corporation, Tokyo (Japan).
 87. Technische Mitteilungen P.T.T. Schweizerische Post-Telegraphen and T. Telephone Verwaltung, Speicher gasse 6 Bern.
 88. Telecommunications, Ridge Road, Jabalpur.
 89. Telecommunication Journal of Australia, Telecommunication Society of Australia, Box No. 4050, G.P.O. Melbourne, Victoria, Australia.
 90. Teleteknik, 16, Kannikegade, Arthus C., Denmark.
 91. Telonde 'Compagnie Generale de Telegraphie San Fil, 99, Boulevard Haussman, Paris-8.
 92. Wireless World, Iliffe and Sons, Dorset House, Stamford Street, London, S.E.1.

APPENDIX — III

The Following is the Pannel of referees appointed at the different towns in accordance with regulation 5(a) (ii)

ANDHRA PRADESH

- Shri Ganti Subrahmanya, Professor in Telecommunication Engineering, College of Engineering, Kakinada.
Shri K. K. Nair, Professor of Telecommunication Engineering, College of Engineering, Osmania University, Hyderabad.
Air Com. V. Ganesan, Defence Research and Development Laboratory, Chandrayagutta Lines, Hyderabad-5.
Shri V. Hanumantha Rao, Deputy Superintendent, Police Communications, Hyderabad.
Shri S. Ramakrishna, Deputy Chief Scientific Officer, Defence Research Laboratory, Hyderabad.

ASSAM STATE

- Col. P. N. Luthra, Advisor to Governor of Assam, Shillong.
Gr. Capt. G. S. Harris, Air Force Officers' Mess, Eastern Air Command, Shillong.

BIHAR STATE

- Lt. Col. S. S. Bedi, Cdr. N. C. C., Group Headquarters, Muzaffarpur.
Shri G. Ramanathan, Station Engineer, All India Radio, Patna.

DELHI

- Shri S. M. Agarwal, Joint Secretary, Department of Defence Supplies, Ministry of Defence, New Delhi-11.
Shri K. R. K. Iyengar, Deputy Director, Intelligence Bureau, Ministry of Home Affairs, New Delhi.
Maj. Gen. M. N. Batra, Director, Military Intelligence, Army Headquarters, New Delhi.
Lt. Col. B. K. Rai, Assistant Director (P.I.L.) Ministry of Defence, (DGI), New Delhi.
Shri A. S. Balasubramanian, Deputy Planning Officer, All India Radio, Akashvani Bhavan, New Delhi.
Shri Keshava Chandra, Planning Officer (Tape Recording Unit), All India Radio, Akashvani Bhavan, New Delhi-1.
Gr. Capt. H. Chandra, Director of Joint Communications and Electronics Committee, Cabinet Secretariat, New Delhi-11.
Lt. Col. Y. R. Puri, Assistant Director Communications, Border Security Force, South Block, New Delhi-11.
Gr. Capt. S. D. Sapre, Deputy Director of Signals, Air Headquarters, New Delhi-11.
Dr. Saroj Datta, Director, Communication, Office of the Director-General of Civil Aviation, Block 2 East, R. K. Puram, New Delhi-22.
Shri R. K. Tandon, Senior Scientific Officer, National Physical Laboratory, New Delhi.

GUJARAT STATE

Wg. Cdr. G. Biswas, Air Force Station, Baroda.
Shri J. G. Shah, Bungalow No. 14, Vallabh Vidyanagar, Via Anand, Gujarat.
Shri Yadav Ram, Station Engineer, All India Radio, Rajkot.

KERALA STATE

Shri A. G. John, Deputy Installation Engineer, All India Radio, Kozhikode.
Shri M. N. Nambooripad, Lecturer, St. Albert's College, Ernakulam.
Shri V. Arunachalam, Divisional Engineer Telegraphs, Incharge, Telecommunication Training Centre, Trivandram.

MADHYA PRADESH

Shri P. C. Pal, Department of Telecommunication Engineering, Government Engineering College, Jabalpur.
Prov. V. V. Sarwate, Principal, Government Engineering College, Bilaspur.
Brig. K. N. Talwar, School of Signals, Mhow.
Shri N. C. Ray, Senior Superintendent of Police, Radio, Bhopal.
Shri G. K. Mithal, Reader in Advance Electronics, Government Engineering College, Jabalpur.
Shri J. S. Gupta, Associate professor of Electrical Engineering, Madhav Engineering College, Gwalior.
Prof. K. K. Shrivastava, Government Engineering College, Jabalpur.

MADRAS STATE

Shri S. R. Bhashyam, Post Master General, Madras Circle, Madras.
Prof. K. S. Hedge, Principal, College of Engineering, Guindy, Madras.
Shri K. Nageewaran, C/o RESA Company, 3/6, Mount Road, Madras-2.
Prof. S. Sampath, Deputy Director, Indian Institute of Technology, Madras-36.
Prof. K. Sreenivasan, Director, Madras Institute of Technology, Chorompet, Madras.
Shri C. A. Cornelius, Managing Director, Hindustan Teleprinters Ltd., Industrial Estate Guindy, Madras-32.

MAHARASHTRA STATE

Shri K. L. Joshi, Department of Electrical Communication Engineering, College of Engineering, Poona.
Shri S. N. Kalra, Director General, O.S.C., Radio House, Apollo Bunder, Bombay.
Shri M. M. Kini, Deputy General Manager, Telephones, Bombay.
Shri D. D. Lakhanpal, Managing Director, Murphy India Ltd., 29, New Queens Road, Bombay.
Shri K. M. Mehta, Engineer-in-Charge, High Power Transmitters, All India Radio, Bombay.
Shri B. C. S. Maiya, Divisional Engineer Telegraphs, Telecommunication Training Centre, G.P.O. Building, Nagpur.
Shri M. S. Muthana, General Manager, Bombay Telephones, Telephone Bhavan, Colaba, Bombay.
Prof. M. G. Samant, Department of Electrical Communication Engineering, College of Engineering, Poona.
Shri B. Rajagopalan, Director of Telegraphs, Nagpur-1.

Fr. W. J. Borges, St. Xavier's Technical Institute, Cruickshank Road, Bombay.
Shri M. M. Wagle, Engineer-in-Charge, Rural Broadcasting, Eros Building, Bombay.
Shri K. M. Balchandani, Director, O.C.S., Apollo Bundar, Bombay.
Shri P. B. Chetty, Station Engineer, All India Radio, Poona.

MYSORE STATE

Shri V. N. Chiplunkar, Lecturer, Department of Electrical Communication Engineering, Indian Institute of Science, Bangalore.
Dr. N. S. Nagaraja, Lecturer, Indian Institute of Science, Bangalore.
Shri C. R. Subramanian, 12, Jayamahal Road, Bangalore.
Shri Uma Shankar, Managing Director, Indian Telephone Industries Ltd., Dooravaninagar, Bangalore.
Brig. P. Madan, Officer on Special Duty (Planning), M/s. Bharat Electronics Ltd., Jalahalli, Bangalore.
Shri P. S. Nagar, Engineer in Charge, All India Radio, Bangalore.

ORISSA STATE

Shri A. C. Ghosh, Station Engineer, All India Radio, Cuttack.
Shri A. P. Mohanty, Superintendent of Police (Signals), Cuttack.

PUNJAB AND HARYANA STATES

Brig. Jaswant Singh, Brig. Incharge Administration, I Corps, HQ, C/o 56 A. P. O.
Sqn. Ldr. K. N. Sinha, No. 16 S.U.A.F., Air Force Station, Ambala.
Shri N. Balasundaram, Director, Eastern Electronics, New Township, Faridabad.

UTTAR PRADESH

Shri C. P. Joshi, State Radio Officer, U. P. Police Radio Head Quarters, Maharagar, Lucknow.
Shri D. N. Basak, Deputy Chief Signal and Telecommunication Engineer, Railway Electrification, Old D. S. Building, Allahabad.
Shri N. K. D. Choudhury, Assistant Director, Central Building Research Institute, Roorkee.
Shri A. K. Ghosh, Reader in Line Communication Engineering, Engineering College, Banaras Hindu University, Varanasi.
Lt. Col. H. B. S. Garewal, G.S.O.I. (Training), Indian Military Academy, Dehra Dun.
Prof. N. N. Biswas, Department of Electronics and Communication Engineering, University of Roorkee, Roorkee.

WEST BENGAL

Dr. K. K. Bose, Electro-control Devices Corporation, 13, North Road, Jadhavpur, Calcutta-32.
Shri Shanti Swarup, General Manager, P and T Electrification Circle, 4, New Road, Calcutta-1.
Shri R. R. Juneja, Electrogears Private Ltd., 27, Rowland Road, Calcutta-20.
Shri A. K. Ghosh, Narua, Roypara, Chandernagore, Distt. Hoogly (West Bengal).
Prof. S. S. Baral, Head of the Deptt. of Physics and Communication Engineering, B. E. College, Howrah.

- Lt. Col. J. C. Anand, Inspector of Electronics, Chief Inspectorate of Electronics Wing, Ministry of Defence (DGI), Commissariate Road, Hastings, Calcutta-22.
- Shri A. B. Bhattacharya, Manager, Errisson Telephones Sales Corporation, A. B. No. 5, Commissariate Road, Calcutta.
- Dr. R. N. Roy, Associate Professor, Saha Institute of Nuclear Physics, 92, Acharya Profulla Chandra Road, Calcutta-9.
- Dr. B. Chatterjee, Communication Engineering Department, Indian Institute of Technology, Kharagpur, (West Bengal).
- Dr. Pares Nath Das, Assistant Professor, Jalpaiguri Engineering College, P.O. Dangavjhar, Jalpaiguri.

JAMMU AND KASHMIR STATE

Shri H. L. Bharara, Deputy Director Telecommunication, J and K Circle, Srinagar.

APPENDIX - IV

List of Papers Presented at the 10th Technical Convention-1966

1. A new type analogue Multiplier and Divider—G. Maruthi Krishna.
2. Digital Compensation in Sampled Data Systems—Alladi Prabhakar.
3. A Simplified Formulation of Optimization Indices—V. Seshadri.
4. On the Choice of Optimum Gain for Linear Feedback Control Systems—V. Seshadri.
5. Certain Empirical Correlations between Time-Domain and Frequency-Domain Parameters of Relative Stability in Linear Feedback Control System—V. Seshadri.
6. Worst Case Design of Transistorised Digital Circuits—C. K. Sane.
7. A New Approach for getting the Analogous and Dual Networks—M. S. Vasudeva.
8. Nonlinear Adaptive Control Systems—Identification and Characterization—M. Lal.
9. Design of Passive Networks Using Digital Computer—Harpreet Singh.
10. Increased Output Powers at VHF Using Multiplicity of Low Power Silicon Planar Transistors—P. K. Rangole.
11. An Automatic Phase Lock System with Adjustable Noise Bandwidth—A. K. Mehrotra.
12. How to build a pulsed Ruby Laser—C. L. Garg.
13. A Negative Resistance Lower Side Band Up-Converter Parametric Amplifier at 1285 mc/s.—Y.S.N. Murty.
14. A Negative Resistance Parametric Amplifier in the L-Band Region—V. Narayana Rao.
15. Microwave Sources with Frequency Multipliers—D. K. Sachdev.
16. A Study of Microwave Sectoral Horn and Lens Antennas—B. V. Rao.
17. S-Band Cavity-Backed Helical Antenna—Y. S. N. Murty.
18. Square Stepped Helical Antenna—S. Bularam.
19. A 'MOSFET' d.c. Amplifier for Nuclear Instrumentation—A. K. Nagle.
20. X-Band Balance Mixer—M. D. Raj Narayan.
21. Broadbanding of Waveguide Junction Circulators—V. K. Agarwala.
22. Plasma Jets—Their Technology and Applications—D. V. Karandikar.
23. Injected Beam Type Crossed Field Microwave Tube at C.E.E.R.I.—O. P. Gandhi.
24. A Low-Frequency Helical Antenna for Sub-surface Communication—D. Bhattacharya.
25. Horizontal Drifts in the F-Region of the Ionosphere over Ahmedabad—C. M. Patel.
26. Satellite Beacon Studies of the Ionosphere over Delhi—Tuhi Ram Tyagi.
27. Instrumentation of Rocket-Borne Riometer for D-Region Studies—R. S. Sastry.
28. Multifrequency Observation of sudden Cosmic Noise Absorption and X-Ray Flares—C. V. Subrahmaniam.
29. Electron Density Distribution in the Equatorial F-Region read by Tuhi Ram Tyagi.
30. Effects of East-West Horizontal Drifts on the Equatorial F-Region—B. C. Narsinga Rao.
31. Absorption of Cosmic Radio Noise at 28.6 mc/s by the F-Layer and Upper Regions—S. B. S. Subrahmanya Sarma.
32. Noise Sensitive Public Address System with Automatic Level Control—B. A. N. Raju.

33. Transhorizon VHF Propagation Over Ground-Air Paths—S. C. Majumdar.
34. Echo Equalisers—A. K. Sanyal.
35. Nonlinear Resonance in Stretched Strings with Viscous Damping—G. V. Anand.
36. Application of Dynamic Programming to Antenna Array Synthesis—R. K. Arora.
37. Staggered Modulation in Beam Riding Guidance—Lt. Col. S. Mishra.
38. Corpuscular Effect of a Solar Flare as Observed Through Sudden Increase in long Wave Field Intensity 'SIL'—Mangal Sain.
39. Indices for Prediction of f_oF_2 —P. Benjamin.
40. Design of the Television Receiving Antennas—Shiv Prasad Kosta.
41. A Method for Calculating D-Region Electron Density with special reference to rise in Electron Density during Solar Flare—P. R. Sengupta.
42. Electronic Components and Printed Circuits—read by K. P. P. Nambiar.
43. Linear Frequency Transformations and A. C. Active Networks—J. G. Advani.
44. Practical Methods of Design of Active Filters—C. D. Murthi.
45. Design of Crystal Band Pass Filter—C. D. Murthi.
46. Preparation, Purification and Single Crystal Growing of Indium Antimonide—W. V. Ramana.
47. Realization of Resistive N-Port Networks without Tree Transformations—I & II V. K. Jain.
48. Noise Generation in Avalanche Diodes—K. C. Chadha.
49. Current Saturation in n-GaAs—T. K. Bhattacharya.
50. Solid State Static Inverters—S. K. Hajela.
51. A Simplified Approach to the Design of a High Frequency Triangular Wave Generator—R. K. Dutta.
52. Low-Noise Front-End Amplifiers for Wide-Band Receivers—R. Chandrasekaran.
53. Radio Frequency and Microwave Standards at National Physical Laboratory—Ram Parshad.
54. Wide Band Amplification with Transistors—G. N. Garud.
55. Oscilloscope Time Base Generators based on 'Emitter Coupled Multivibrator'—Umashanker Singh.
56. Planar Silicon Transistor and Diodes—K. S. Balain.
57. Varactor diodes—W. S. Khokle.
58. Design and Construction of R. F. Power Supplies—Prahla H. Ron.
59. Development of Cathode-ray-oscilloscope Tubes—G. K. Bhide.
60. Space Charge limited High Frequency Currents in Insulators in the Presence of Traps—P. R. Dastidar.
61. Germanium Epitaxial Tunnel Diodes—S. P. Naik.
62. Germanium PNP Switches—Km. K. Khanna.
63. Silicon Planar Epitaxial Varactors—K. R. Wadhera.
64. Advances in Insulation Technology for Communications.—Dr. Jagmohan Garg.

PART III

ACCOUNTS FOR THE YEAR ENDED 30th SEPTEMBER 1967

Report of the Auditors to the Members

We have examined the attached Balance Sheet of the Institution of Telecommunication Engineers, New Delhi as at 30th September 1967 and also the accompanying Income and Expenditure Account for the year-ended on that date in which are incorporated the returns of the Bangalore and Bombay Centres certified by the persons in-charge, and have to report as follows :

1. Formal Trust Deed for the staff provident fund has not been executed yet and the amounts representing 'employees' and 'employers' contribution are being deposited in a separate bank account and not accounted for in the Institution's Accounts. We have not audited these accounts.
2. No provision has been made in the accounts for Income-tax.
3. The accounts have been properly drawn up and we have obtained necessary information and explanations required.
4. That according to the best of our information and as per explanations given to us, the Accounts give a true and correct view :

(a) in the case of the Balance Sheet, of the state of the affairs of the Institution as at 30th September 1967 ; and

(b) in the case of the Income and Expenditure Account, of the Income for the year-ended on that date.

Asaf Ali Road, New Delhi-1.
December, 5th, 1967.

Khanna and Annadhanam
Chartered Accountants

The Institution of Telcommunication
Balance Sheet as at

As at 30-9-1966 Rs.	LIABILITIES	Rs.	P.	Rs.	P.
<i>Surplus Fund :</i>					
2,41,385	Balance as per last Balance Sheet	3,20,603	77		
79,219	Add : Excess of Income over Expenditure for the year as per annexed Account.	41,769	40	3,62,373	17
<i>Reserve Fund :</i>					
9,393	Balance as per last Balance Sheet			9,392	62
<i>Building Fund :</i>					
1,18,283	As per last Balance Sheet	1,45,471	46		
	Add :				
18,043	Admission Fees	19,943	00		
2,553	Transfer Fees	3,802	00		
6,592	Interest received or accrued on Fixed Deposits	9,045	24	32,790	24
				1,78,261	70
<i>Reserve for Bad Debts :</i>					
4,859	Balance as per last Balance Sheet	6,781	75		
18,000	Add : Provision for the year	25,000	00		
4,136	Amounts written off in earlier years recovered during the year	4,378	50	29,378	50
26,995				36,160	25
20,213	Less : Amount written off during the year			33,343	70
6,782					2,816 55
<i>Liabilities :</i>					
4,036	Members at Credit	3,875	50		
8,575	Journal Subscription received in Advance	5,329	42		
	Sundry Creditors :				
12,240	(a) For Expenses	11,432	14		
193	(b) Others	1,241	54	12,673	68
1,598	Deposit from Staff			2,595	09
87,300	Examination Fees received in Advance			1,11,410	00
6,135	Registration Fee Suspense			6,500	00
				1,42,383	69
6,02,327				6,95,227	73

Engineers New Delhi
30th September, 1967

As at 30-9-1966 Rs.	ASSETS	Rs.	P.	Rs.	P.
	<i>Fixed Assets :</i>				
74,937	As per Schedule attached			78,880	99
	<i>Investment at Cost :</i>				
	<i>Government Securities :</i>				
30,000	4½% Ten Year Defence Deposit Certificate			30,000	00
	<i>Current Assets :</i>				
20,413	1. Interest accrued on Fixed De- posits and Investments	8,930	72		
9,931	2. Stock of paper at cost (as certified by the Secretary)	8,381	11		
23,024	3. <i>Sundry Dues :</i>	25,451	75		
	(a) Due from Members for Fees				
1,511	(b) Due for Journal Subscrip- tion (includes Rs. 613.54 Considered Doubtful—Last year Rs. 709.37)	1,166	68		
	(c) Due for Advertisement :				
6,901	(i) Institution's Journal— (includes Rs. 159.38 Considered Doubtful— last year Rs. 127.50)	9,807	74		
348	(ii) Student Journal (includes Rs. 182.75 Considered Doubtful—Last year Rs. 178.50)	559	89	10,367	63
40	(d) Due for Examination Fee— Considered Doubtful				
642	(e) Sundry Debtors (includes Rs. 224.31 Considered doubtful—Last year Rs. 120.20)			2,163	31
2,058	4. <i>Advances and Prepayments :</i>	1,627	00		
4,850	(a) Advances to staff & Others	4,850	00		
1,407	(b) Advance against Printing of Publication	3,274	75	9,751	75
	(c) Prepaid Expenses				
176062	TOTAL CARRIED OVER			175093	94

The Institution of Telecommunication
Balance Sheet as at

As 30-9-1966 Rs.	LIABILITIES	Rs.	P.	Rs.	P.
6,02,327	TOTAL BROUGHT FORWARD			6,95,227	73
6,02,327	TOTAL CARRIED OVER			6,95,227	73

NOTE :—Previous year's figures have been suitably recast for purposes of comparison.

Auditors' Report

As per our report to the Members attached separately.

Asaf Aali Road, New Delhi
December, 5, 1967

(58) Khanna and Annadhanam
Chartered Accountants

Engineers, New Delhi
30th September, 1967

As at 30-9-1966 Rs.	ASSETS	Rs.	P.	Rs.	P.
				1,75,093	94
176062	TOTAL BROAD FORWARD				
	<i>Cash and Bank Balances :</i>	897	87		
527	(a) Cash in hand				
272	(b) Postage and Revenue Stamps in hand	938	51		
734	(c) Imprest with Local Centres— (as certified by the Secretaries of the Local Centres)	8,508	10		
	(d) With Scheduled Banks :				
	(i) On fixed Deposits—Rs. 1,45,471 46 earmarked against Building Fund	3,95,480	50		
2,92,481	(ii) On Current Account	2,742	12		
71,116	(iii) On Savings Account— Rs. 2,595 09 earmarked against Staff Deposit	1,11,566	69	5,20,133	79
61,135					
6,02,327	TOTAL			6,95,227	73

Dr. P. K. Kapre
President

Lt. Col. B. K. Rai
Honorary Treasurer

S. K. Rana
Secretary

The Institution of Telecommunication
Income & Expenditure Account for the

As on 30-9-1966 Rs.	EXPENDITURE	Rs.	P.	Rs.	P.
	To Establishment (including Rs. 13,275.72 Salary and Honorarium paid to Secretary—Last year Rs. 19,212)			94,711	68
82,494	„ Employers' Contribution to Provident Fund			2,085	91
1,054	„ Medical Aid to Staff (includes Rs. 159.55 paid to Secretary—Last year Rs. 144)			2,022	78
1,815	„ Rent and Electricity			32,042	97
18,531	„ Printing and Stationery			9,307	14
6,942	„ Postage and Telegram			3,874	65
3,419	„ Telephone Charges			3,111	78
2,711	„ Sundry Expenses			7,763	66
6,022	„ Bank Charges			109	61
85	„ Audit Fee			1,000	00
1,000	„ Institution's Journal Expenses :				
6,045	Cost of Paper	12,374	69		
10,210	Printing Charges	19,623	12		
4,579	Block Making Charges	10,510	51		
5,456	Postage and Packing	7,633	16		
1,187	Reprints Cost	2,668	82	52,813	30
	„ Student Journal Expenses :				
1,770	Cost of Paper	3,178	65		
2,812	Printing Charges	5,922	68		
865	Block Making Charges	663	54		
2,211	Postage and Packing	3,053	73		
..	Cost of Reprints	282	00		
150	Honorarium	200	00	13,300	60
..	„ Hot and Cold Weather Charges			111	00
35,393	„ Examination Expenses			39,524	70
533	„ Insurance			442	50
	„ Local Centre Expenses	3,378	74		
1,783	Less : Receipt for Advertisements etc.	2,949	10	429	64
1,700	„ I.T.E. Award			1,200	00
200	„ Student Award			200	00
845	„ Expenses pertaining to previous year			2,076	20
7,117	„ Annual General Meeting Expenses			27,532	66
7,680	„ Depreciation			7,687	99
18,000	„ Provision for Bad Debts			25,000	00
79,219	„ Excess of Income over Expenditure for the year transferred to Surplus Fund			41,769	40
3,11,828				3,68,118	17

December, 5 1967

Asaf Ali Road, New Delhi

(Sd.) Khanna & Annadhanam

Chartered Accountants

Engineers, New Delhi
Year Ended 30th September, 1967

As on 30-9-1966 Rs.	INCOME	Rs.	P.	Rs.	P.
1,11,783	By Membership Fees			1,25,568	50
4,580	„ Sale of Institution's Publications			4,147	75
	„ <i>Income from Institution's Journal :</i>				
6,222	Subscription	11,374	27		
8,677	Advertisement	19,391	94		
1,207	Sale of Reprints	1,386	27	32,152	48
	„ <i>Income from Student Journal :</i>				
274	Subscription	590	56		
241	Advertisement	458	39	1,048	95
1,62,964	„ Examination Fees			1,82,952	00
11,456	„ Interest on Fixed Deposits and Investments			16,575	34
1,807	„ Application Fee			1,841	00
	„ Publication Grant from National Institute of Sciences of India			1,000	00
1,000	„ Difference in Exchange			2,138	72
582	„ Provision made in earlier years no longer required			433	43
1,000	„ Miscellaneous Income			260	00
35					
3,11,828				3,68,118	17

(Sd) P.K. Kapre.
President

(Sd) Lt. Col. B.K. Rai.
Honorary Treasurer

(Sd) S.K. Rana.
Secretary

The Institution of Telecommunication Engineers, New Delhi

Schedule of Fixed Assets Accompanying and forming of the part Balance Sheet as on 30th September, 1967

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Particulars	Cost or Book value as on 30-9-1966	Additions during the year	Total Cost or Book value as on 30-9-1967	Depreciation		Total	Net value of Assets as on 30-9-1967	Net value of Assets as on 30-9-1966
				Written off upto 30-9-1966	Written off during the year			
1. Adama Machine	1,003.28		1,003.28	703.76	29.95	733.01	269.57	299.52
2. Cycle	279.50		279.50	264.12	3.08	267.20	12.30	15.38
3. Duplicating Machine	4,985.25		4,985.25	1,727.99	325.73	2,053.72	2,931.63	3,257.26
4. Fans	1,126.12		1,126.12	492.90	63.32	556.22	569.90	633.22
5. Franking Machin "	1,468.50		1,468.50	279.02	118.95	397.97	1,070.53	1,189.48
6. Fire Extinguisher	325.50		325.50	32.55	29.30	61.85	263.65	292.95
7. Furniture	10,359.09	6,733.63	17,092.72	2,268.95	888.44	3,157.39	13,935.33	8,090.14
8. Library Books	66,304.86	347.05	66,651.91	22,084.10	4,440.70	26,524.80	40,127.11	44,220.76
9. Library Equipments	13,773.70		13,773.70	4,140.62	963.31	5,103.93	8,669.77	9,633.08
10. Numbering Machine	45.62		45.62	25.45	1.21	26.66	18.96	20.17
11. Typewriters	10,194.41	1,430.00	11,624.41	2,909.07	653.65	3,562.72	8,061.69	7,285.34
12. Wall Clock	..	286.00	286.00	..	28.60	28.60	257.40	..
13. Water Cooler	..	2,835.00	2,835.00	..	141.75	141.75	2,693.25	..
	1,09,865.83	11,631.68	1,21,497.51	34,928.53	7,687.99	42,616.52	78,880.99	74,937.30
Last year's Figures	1,08,406.33	1,459.50	1,09,865.83	27,248.84	7,679.69	34,928.53	74,937.30	

Asaf Ali Road, New Delhi
December, 5th, 1967

(Sd.) P. K. Kapri
President

As per our report on the Balance Sheet.

(Sd.) Lt. Col B. K. Rai
Honorary Treasure

Sd. Khanna and Annadhanam
Chartered Accountants

(Sd.) S. K. Rana
Secretary

I. T. E., NEW DELHI, INDIA