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Development Meeting on the Manufacture  
of Telecommunication Equipment  
(including low-cost receivers for sound  
broadcasting and television)

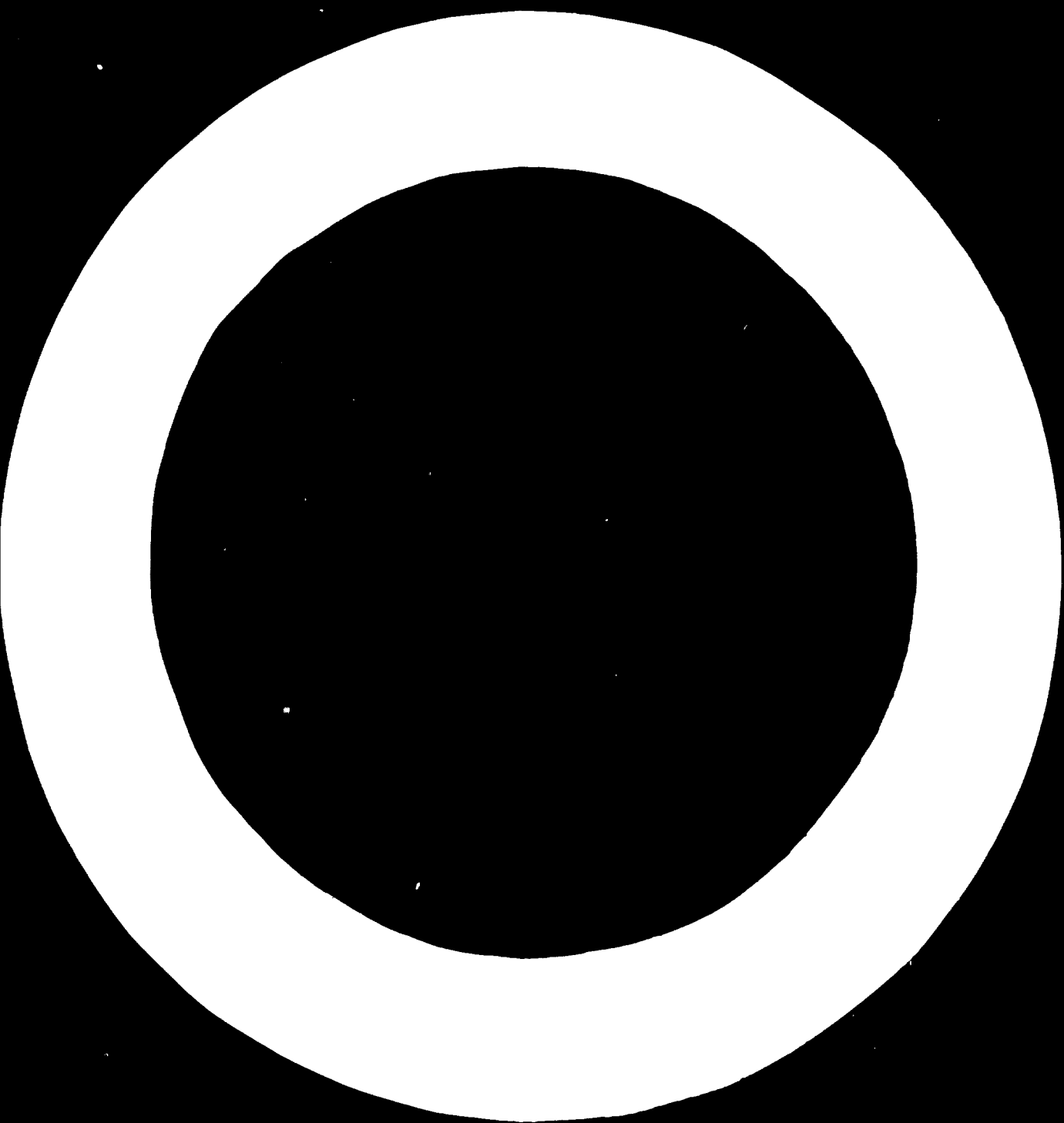
Vienna, 13 - 24 October 1969

STATE OF MANUFACTURE OF TELECOMMUNICATION EQUIPMENT IN PAKISTAN 1/

by

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## INTRODUCTION

Electronics holds an important position in the social and economic life of a nation. It sets the pace of industrial and technological developments. It exercises profound influence on the social, cultural and political life of a nation through the medium of radio, television and communication networks. Electronics have accelerated production by automation in about all the developed countries of the world. Electronics are vital in defence for command and control, fire direction and surveillance and are essential components of tactical and strategic weapon systems. In fact electronics are the nerves that control the sinews of a nation.

2. The Electronics Industry is still in a rudimentary stage of development in our growing economy. It has a very short history in Pakistan. In 1947, on partition of the sub-continent, there was no Electronic Industry in the country. A few entrepreneurs had, however, started assembling radio receivers from imported components by 1950. An investment of Rs 2 million was reported up to 1955. There were 7 radio assemblers producing about 30 thousand sets annually. By 1960 the assembling capacity was increased to 75 thousand radio receivers per annum. Sanctions were given to 10 units by the Government and from then on the growth was rapid. By 1962, in a period of two years, the capacity increased to 1.5 lac radio sets of some 20 makes and 50 varieties.

3. An Electronic Committee was set up by the Government in 1961 which carried out a survey of radio industry in 1962. The Electronics Committee submitted its report by the end of that year and made the following recommendations :-

- (a) Standardization of Radio Receivers.
- (b) Manufacture of Standard Components by a single organization.
- (c) Manufacture of non-standard components by the assemblers.
- (d) Increase in production of radio receivers to about 4 lac sets per annum by 1966.

1ac = 100,000

- 1 -

4. As a result of sound guidance provided by the Electronics Committee report the production did increase so much so that the financial allocation was enhanced from Rs 8 million in 1962 to Rs 22.5 million in 1965. In Public Sector also the allocation rose from Rs 15 million during 1955-60 to Rs 45 million during 1960-65; and was fully utilized.

5. Rapid progress has been made since 1965 and production capacity of radio sets has increased to about 5 lacs.

## PRESENT STATE

### General Background

6. In early 1967 a paper on the Electronic Industry was prepared by the Ministry of Defence based on a brief survey carried out by the Director General Munition Production (DGLP). The paper contained certain recommendations for the development of Electronics Industry to meet the civil and military requirements. One of the recommendations was the formation of an Electronics Committee to plan, guide and co-ordinate the activities of the Electronics Industry with the ultimate object of making the country self-sufficient in this field. This high power Electronics Committee was headed by the Secretary, Ministry of Industries and Natural Resources. It had 11 members including the Secretaries Finance, Defence, Communications, Information and Broadcasting, the Secretaries Provincial Industries, the Director General Munition Production and Procurement (DGLPP), the Director General Investment Promotion and Supplies (DGIP and S), the Chairman Atomic Energy Commission and the Chairman National Science Council. This committee created an Electronics Sub-Committee headed by the Chairman Pakistan Council of Scientific and Industrial Research (PCSIR). The Electronic Sub-Committee carried out a comprehensive survey of the Electronics Industry both in Public and Private Sectors and submitted its report in January 1968. The factual state of the Electronics Industry based on this survey report is briefly described in the subsequent paragraphs.

## Private Sector

7. In Private Sector about 22 units are manufacturing radios and 9 units are assembling television sets. The present production capacity of radios is estimated at approximately 5 lak sets per annum. The effective assembling capacity of television sets is of the order of 20 thousand sets a year. The industry is also capable of producing 20 thousand Public Address sets a year with some imported components. The total production capacity of the Electronics Industry in respect of consumer electronics goods is estimated to be approximately Rs110 million per annum.

### 8. Non-Standard Components

Three industrial units have already been sanctioned for the manufacture of non-standard components. These components are also being manufactured by the radio assemblers themselves in varying quantities ranging from 20 to 80 percent of their total requirements. Amongst the radio and television manufacturers, the following larger firms have more comprehensive production potentials and technical know-how.

### 9. Radio and General Appliances (RGA)

This firm manufactures radios and television sets and has recently under-taken the assembly of VHF transceivers. It has reasonable potential for the manufacture of commercial non-standard components and with assistance should be able to make components for professional equipment also. The firm has qualified and trained personnel and facilities for quality control and development. Given the necessary facilities the firm can expand into professional field and can also supply components to others.

### 10. Pectel Yamagan

The firm produces radios and television receivers. It has trained engineers and technicians and limited development facilities. With assistance the firm can advance in the professional field.

### 11. Mahomed Ibrahim and Co.

The firm produces radio receivers, television receivers, public address sets, water heaters and water coolers. It employs qualified and trained engineers and other personnel. The quality

control and development facilities are available. They also manufacture non-standard components for radio and television sets and public address equipment. With assistance this firm is fully capable of manufacturing sophisticated components and equipment for professional application.

12. Standard Components

There is only one factory (ELMAC) in existence which is making certain standard components. It is a public limited company in which Philips have 70 percent share. The total investment so far is Rs5.5 million. It was established in 1965 and is now meeting the requirement of transistor and diodes and to some extent that of potentiometers. It can only produce germanium type of transistors which are fast becoming obsolete. The components for the assembly of semiconductors are imported in semi-finished form and the foreign exchange cost is high. The industry is on cash-cum bonus licensing. It had imported some materials to the tune of Rs1.89 lac during 1966. This shows that foreign exchange savings accruing from the present scale and depth of production are negligible. The firm, however, holds the view that the situation would improve with implementation of its plans for diversity of production. It has actually started producing some capacitors and potentiometers. Besides ELMAC, the Radio and General Appliances (RGA) is producing some standard components such as potentiometers and speakers.

13. Public Sector

There are only two industries in existence in the Public Sector. They are the Telephone Industries of Pakistan (TIP) and the National Radio Telecommunication Corporation (NRTC). Both of these factories are administered and controlled by the Telephone and Telegraph Department under the Ministry of Communications.

14. Telephone Industries of Pakistan (TIP)

The TIP was established as a private limited company in 1952 with the initial share capital of Rs50 lacs, in collaboration with Siemens of West Germany. The Government holds 88 percent of the share capital. The factory manufactures telephones, exchanges, carrier equipment and assembles teleprinters. It also manufactures



railway signalling equipment and some paper capacitors. The factory has qualified and trained personnel with the technical know-how to manufacture a wide range of standard components for their own use and for the industrial units in the Private Sector. It has a large training department and integrated facilities for research and development. It has excellent quality control arrangements for a large range of products. At present it is the only factory in the country which has some capacity for the indigenous production of professional electronics equipment. It has an adequate base and valuable nucleus on which a bigger and more comprehensive electronics complex can be built. The total investment in TLP on production facilities so far is over Rs43 million and annual production capacity is approximately Rs30 million. The procurement of telephones, carrier equipment and ancillaries during the last 16 years is estimated over Rs550 million out of which at least 33 percent was produced by the TLP.

15. National Radio Telecommunication Corporation (NRTC)

The NRTC is a private limited company set up in 1966 for the production of radio transceivers for the Defence Services. It is assembling H.F. and VHF transceivers. The factory has been established in collaboration with Nippon Electric Company (NEC) of Japan.

16. Planned Production Capacities in Public Sector

The P and T Department was sanctioned Rs90 million in 1967 for expansion of existing production capacities and installation of new capacities in the current plan period. TLP was directed to increase its production capacity for telephones and exchanges from 30 thousand to 50 thousand lines annually. This has been achieved. The present assembly capacity of TLP of teleprinters is of the order of 500 teleprinters per annum. The NRTC is only carrying out assembly with almost 100 percent imported components. It is intended to utilize indigenous production facilities gradually to manufacture components and accessories. It has also been suggested to integrate both the factories, TLP and NRTC, to increase and diversify production facilities so that national requirements both in public and Private Sectors are partially met by them.

17. Problems of the Industry

(a) The radio and television manufacturers are not fully utilising the indigenous facilities available for production of mechanical and electrical components for their products. It is due to the fact that they are apprehensive of supplies not being made in time and products being sub-standard. They also feel that dependence on others may hold up their productions. In addition the supporting industries demand quick returns resulting in higher cost of components. This has resulted in procurement of machinery and equipment by the assemblers themselves. As the foreign exchange requirements of a large number of radio manufacturers could not be fully met, some of them have larger facilities for manufacture of some components while the others have greater capacity for producing certain other types. Consequently the existing facilities in the electronics industry are not being fully utilised by the majority of the industrial units.

(b) Research centres, educational institutions and technical and industrial assistance agencies afford little assistance to the electronic industry due to lack of communications between them.

(c) There are no basic industries for the processing and supply of raw materials to the electronics industry. Thus some components which could be easily produced indigenously are being imported by some radio manufacturers.

(d) The manufacture of electronics products is not undertaken in depth due to lack of tools, know-how and raw materials.

(e) No adequate machinery exists for the exchange of ideas amongst the manufacturers in order to co-ordinate and spell out the need of the industry. Also there is lack of coherent and concerted efforts directed towards the development of this industry on national basis so far as the Private Sector is concerned.

18. Electronics Products Requirements

The total cumulative requirements of electronic equipment of all public as well as private users during the period up to 1980

is estimated to be approximately worth Rs4,000 million for the expansion of existing facilities and services. The existing equipment to the value of about Rs1,500 million would have lost most of its utility in the next decade or so, and would need replacement. Thus the total requirement would rise to Rs5,500 million. The requirement of components for the production of this equipment would cost nearly Rs2,050 million. The raw materials would cost about Rs570 million. These are very conservative estimates and optimum requirements are expected to be much higher as the requirements of some users were not available at the time of survey. If we add 30 percent to these production requirements, we come to the figure of approximately Rs7,120 million to be required up to 1960. Thus the requirements spread over to the end of the Fifth five year plan. The plan-wise distribution of requirement is as under:-

<u>Item</u>	<u>Billion of Rupees</u>			<u>Total</u>
	<u>Third Plan</u>	<u>Fourth Plan</u>	<u>Fifth Plan</u>	
Radio + TV receivers	823	823	224	1470
VHF Transmitters LP + HP	-	17	26	43
HF " "	-	80	135	215
Transceivers	54	186	135	375
Navigation Aids	-	36	45	81
Telephones and Exchanges	150	555	1080	1785
Carrier Equipment	55	135	235	425
Microwave Equipment	-	168	232	400
Radars	-	240	360	600
Computers	-	74	176	250
Electro Medical Equipment	-	35	58	93
Test Equipment	-	38	73	111
<b>Total:</b>	<b>1096</b>	<b>2422</b>	<b>3600</b>	<b>7116</b>

FUTURE DEVELOPMENTS

19. The equipment to the value of approximately Rs7,120 million will be required to be produced during the period up to 1980. Taking into account the existing production capacity of approximately Rs150 million annually, it will be necessary to generate an additional production capacity of Rs600 million annually by the end of 1980 i.e. at the end of the Fifth Five Year Plan. For the production requirements of end items to the value of Rs7,120 million a total investment to the tune of Rs520 million would be needed up to 1980. The distribution of this amount is envisaged as under:-

(a) <u>End Items</u>	<u>Million of Rs.</u>
1. Radio and television receivers and allied equipment	30
2. Radio Transmitters, Transceivers and Navigation aids	57
3. Telephone and Telegraph equipment	113
4. Carrier equipment	33
5. Microwave and radar	77
6. Computers and test equipment	28
7. Electro Medical	7
Total:	<u>345</u>

(b) <u>Components and Accessories</u>	
1. Resistor and Capacitors	30
2. Semi Conductors	25
3. Electron tubes and picture tubes	40
4. Non-standard components	36
Total:	<u>131</u>

Grand Total = Rs520 million.

20. Development Plan.

The Development Plan for the Electronics Industry has been drawn up for the investment of Rs. 20 million and production of End Items to the value of Rs. 7,120 millions. The plan is briefly described under the following headings:-

- (a) Basic Principles
- (b) Investment for Production
- (c) Allocation of Production tasks
- (d) Research and Development
- (e) Manpower requirements
- (f) Location of Industry
- (g) Measures for accelerating growth
- (h) Implementation and co-ordination.

21. Basic Principles.

The following basic principles have been kept in view in formulating the plan:-

- (a) Maximum utilization of existing resources
- (b) Improvement, diversification and augmentation of production in existing unit.
- (c) Co-ordination of production, research and development at the national level to effect economies
- (d) Acceleration of growth in Private Sector
- (e) Utilization of experienced groups to undertake industries involving large capital outlay, advanced technical know-how and managerial skills
- (f) Phasing out of foreign assistance and attainment of self-sufficiency in shortest possible time
- (g) Avoidance of monopolistic practices commensurate with the economies of production
- (h) Development of export potentials

22. Investment for Production.

The existing production resources amount to a total capacity of approximately Rs. 20 million annually. The details of investment of Rs. 20 million and production of End Items to the value of Rs. 7,120 have already been given in paragraphs 16 and 17 of this report.

23. Allocation of Production Tasks

(a) Private Sector

The Private Industry prefers manufacture of simple items with small capital outlay and aims at quick returns on investment. It has therefore been envisaged that Private Sector will deal with the manufacture of radio and television receivers, tape recorders, public address sets, dictaphones, simple calculating machines, intercommunication sets, non-standard and standard components and processing of raw materials.

(b) Public Sector

The Public Sector enterprises have accelerated industrial growth in the past, by taking initiative in the fields where private enterprise has been hesitant. Nevertheless progress in the Public Sector enterprises has not been uniform, and generally lacked vigour and resourcefulness associated with the Private Sector enterprises. Anytime the amalgamation of TIF and NRTC and participation of Private Sector in both of them would lead to the desired results. The Public Sector will have to undertake manufacture of end items which have not so far been allocated to the Private Sector

24. Research and Development

Very little research and development is being carried out in electronics except that some small beginning has been made in Pakistan Atomic Energy Commission (PAEC), Pakistan Council of Scientific and Industrial Research (PCSIR), Telecommunication Research Centre (TRC) and the Defence Science Organization. It had been decided to establish a central agency to co-ordinate research and development in Electronics. The Electronics Production Board (EPB) is being established in the country for this purpose. Efforts are being made to set up a National Electronics Research Centre (NERC) by PCSIR, Electronics Production Equipment Design Laboratory (EPEDL) by PITAC and Precision Instrument Development Centre (PIEC) by PCSIR.

25. Manpower Requirements

(a) The total manpower employed in the Electronics Industry at present is:-

i) Scientists and engineers	100
ii) Supervisory staff	600
iii) Skilled and semi skilled workers	6000
Total:	<u>6700</u>

(b) Requirement in 1980 would be :-

i) Scientists and engineers	1500
ii) Supervisory staff	5500
iii) Skilled and semi skilled workers	8000
Total:	<u>15000</u>

(c) Only 50 graduates in Electronics engineering come out of Universities annually. The facilities would have to be increased to turn out 100 engineers every year and the syllabus would have to be revised to meet the industrial requirements. More technical institutions will have to be created to train manpower as technicians and skilled workers.

26. Location of Industry

The existing Electronic industry is suitably located, except TIF and KRFD, which are not near any industrially developed city. A township will have to be developed near these factories.

27. Measures for Accelerating Growth

- (a) Radio and television industry is being streamlined and balanced.
- (b) Higher priority in finance and technical assistance is being considered.
- (c) Licensing of new enterprises should be on long term basis.
- (d) Public and Private sectors should be made complementary.
- (e) Standardization of components and products should be undertaken immediately.
- (f) Research and Development as well as production should be co-ordinated at the national level.

14.

Implementation of the 1960

of the... In... given the... of the... requirement in the field of... by 1960.

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