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D00675



Distr.
LIMITED

ID/WG.15/25
20 October 1969

ORIGINAL: ENGLISH

United Nations Industrial Development Organization

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

Vienna, 13 - 24 October 1969

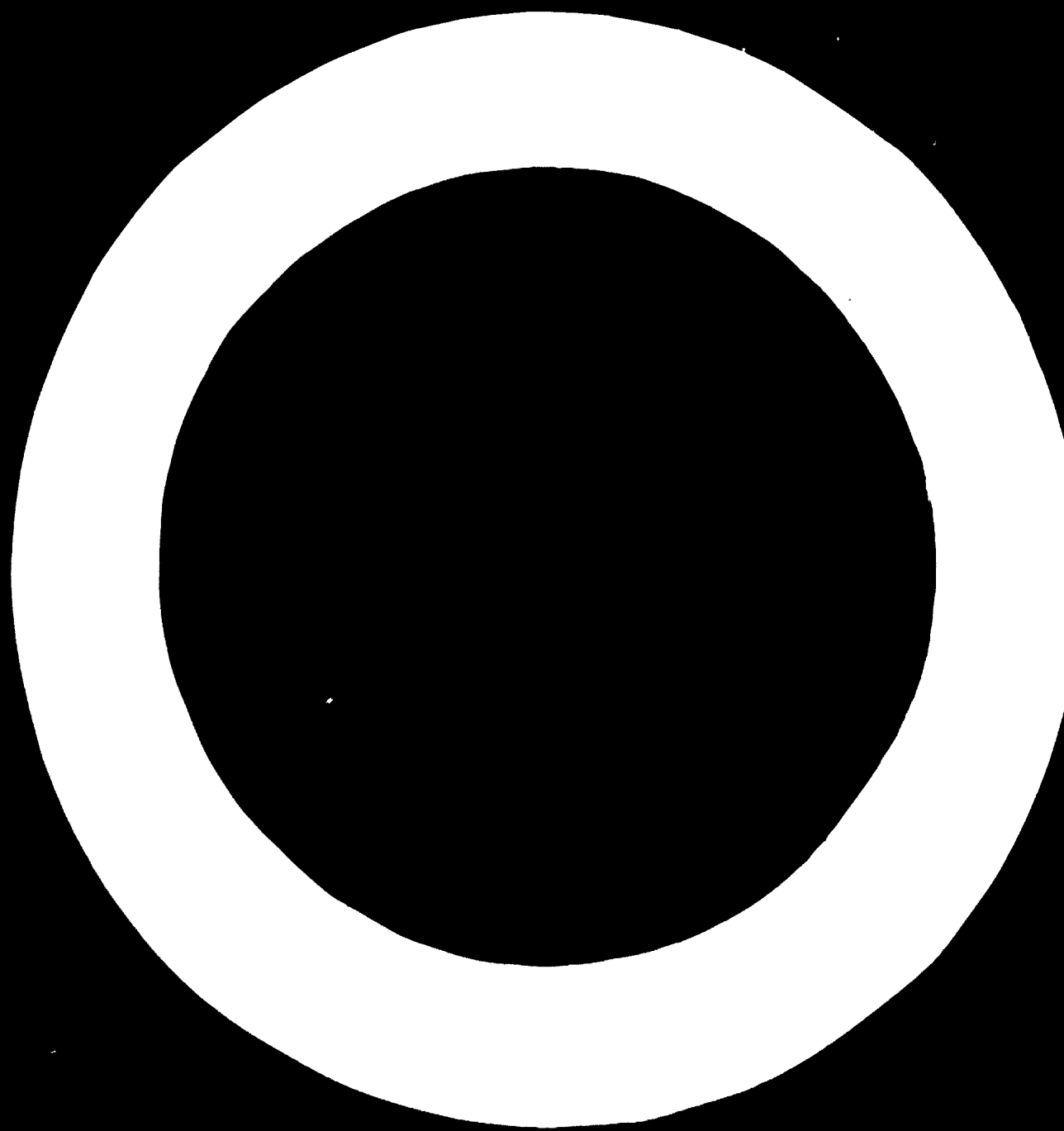
**STATUS OF THE MANUFACTURE OF TELECOMMUNICATIONS
EQUIPMENT IN ETHIOPIA** ✓

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id.69-5417

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Introduction

In this paper an attempt will be made to portray the industries that could be considered as allied to telecommunications, the activities of the telecommunication operating agency, the approximate annual consumption of various telecommunication equipments and pieces parts and finally the various technical training projects within the country.

Various problems facing our such industries are also touched upon. Naturally this paper will lay emphasis on the activities of the Imperial Board of Telecommunications, indicating the size of its annual requirements and how such requirements are to be provided locally.

I. The following are those industries which are directly or indirectly related to telecommunications.

Except for the establishment of a radio receiver assembly plant in Addis Ababa there are no manufacturers of specialized telecommunications equipment in Ethiopia.

1. Philips (Ethiopia) Ltd. a subsidiary of Philips, Gloeilampenfabriek, Eindhoven. This company is the major supplier of radio receivers, electrical fittings and equipment in Ethiopia. Two years ago Philips set up a small broadcast radio receiver assembly plant in Addis Ababa. This assembly plant has now a production of 5,000 three band radio receivers per year with an output of 22 receivers per working day.

The assembly plant consists of two rooms of approximately 50 square meters each. One room is used as a store and the other for assembly, testing and packing.

One supervisor and four workers form the staff for this assembly unit. A technical assistance agreement with Philips of Eindhoven exists for which a small royalty per set is paid. Administration, sales and procurement is carried out by Philips (Ethiopia) for which an overheads charge is made per set.

One hundred percent of all parts including packing cases are imported from Philips,indhoven and are subject to import taxes and charges of 55%. This is made up of 35% on invoice price plus 12% transaction tax, 1% municipality tax and the rest for handling and transiting. To this 55% import tax must be added a 5% production excise tax.

Regardless of how efficient such a plant operator the burden of such high taxation will make such assembly plants very difficult to operate economically.

It is interesting to note that the import tax on assembled radio receivers in the cheaper ranges is 10% less than that on piece parts or spare parts. Steps have been taken at government level to review that tax policy but until such taxes are revised the plant will be operating uneconomically because an identical set can be imported 15% cheaper than the cost of assembling after paying all applicable taxes in such cases.

The Philips (Ethiopia) assembly plant is modeled on the so-called Utrecht pilot plant which was established by Philips in Holland to assist underdeveloped countries to plan and set up small scale production plants.

The supervisor of the assembly plant has an educational background of 9th grade level and received his training with Philips in Addis Ababa. The four assemblers are also of elementary school education and their sole technical knowledge has been that gained since joining the assembly plant.

No difficulty was experienced in training this staff and no previous experience was necessary. A highly trained technician was employed for the first six months, but found the work to be boring and requested a transfer.

Under the same conditions as exist in Ethiopia the Utrecht pilot plant has established target times for each assembly operation which would result in the production of one receiver every 10.1 minutes. This is the equivalent of 28 sets per 7 hour working day. Six months after the Addis Ababa plant was opened the production reached 15 receivers per day after another six months it increased to 17 receivers a day. The daily output is now 22 receivers.

Examination of the production costs indicates direct and indirect labour costs and overheads of 1/3 of total costs. Such costs have a retail price of about US\$40 per set which is moderately high and thus have a limited market.

It is apparent from the above that unless a different government tax policy is established it will be uneconomical to assemble radios sets from totally imported parts. It is severely uneconomical to produce plastic parts such as resistors, condensers, etc. in Ethiopia at this time as the market for such parts is at present very low. Perhaps some advantage could be obtained by manufacturing plastic items, such as combs, knobs, etc. printed circuit boards, wire, nuts and bolts, etc.

The market for radio receivers is growing at about 15% annually and is estimated that approximately 60,000 radio receivers will be sold in Ethiopia this year. Of this amount 40,000 are probably of the low cost models, i.e. with Radio Techno market value of \$13. The size of the market could probably be expanded if sets in the range of \$20-25 were available to the mass of the people. The population of Ethiopia is at the order of 24,000,000 and so does indicate a very large potential market.

For general information the market for televisions sets is about 1,500 sets per year.

II. Allied telecommunication industries

1) Plastic industry

There are three main factoring plants in Ethiopia located in and around Addis Ababa.

One of these plants produces plastic covered wire for electrical or telecommunication use using imported ac wire. At present P.V.C. type plastic materials are being used.

In all three plants in use processes and machinery used are used to produce household items, clothing and footwear. All plants are managed by technically qualified persons who have received training in similar industries in developed countries.

At least one of these factories would be willing to manufacture items specifically for telecommunications use if they could receive assistance for any capital expenditures and be given assurance of a guaranteed market.

The Board of Telecommunications is a government owned agency operating on a self financing basis. The Charter establishing the Board exempts it from paying any form of government tax. It is thus normally cheaper for the market to buy finished products from abroad than to buy products that have to be imported, imported raw material and processed in Ethiopia, as such products are subject to many taxes as indicated earlier in the case of radio receivers.

However a study could be made and perhaps an arrangement reached with the Ministry of Finance on refund of taxes paid for products used by the Board of Telecommunications.

ii) Electricity Industry

There are no important secondary manufacturers in Ethiopia. The annual consumption of 1.5 volt batteries of the common 1.5 volt variety is estimated at 2,000,000 units per year. Two companies manufacture secondary batteries for the use of call signs and use in vehicles.

Activities of the Federal Board of Telecommunications (FOT)

The FOT is a unit of the Government of Ethiopia which has received a license to provide all secondary telecommunication services within Ethiopia.

The FOT was established in 1952 and began operations on January 1st 1953. It has been established on a self financing organization and is free from all direct and indirect taxes.

The FOT has a capital of 100 million shillings over the past five years at 10% interest. Its assets are 100 million shillings and revenue 100 million shillings per year. Its expenditures, including depreciation, and investment amount 100 million shillings. The price of raw material purchased 1966/73 increases the total expenditure to 100 million shillings of which 50% was covered by loans from the Swedish International Development Co-operation Agency.

Ethiopia had on December 1967 36,834 telephone apparatus installed of which 30% were connected to automatic exchanges. An increase of 4,500 telephone apparatus is forecast for 1968. The number of apparatus forecast for end of 1973 is 64,000.

Interurban traffic in Ethiopia is carried mainly by open wire long lines of which 3,700 pairs kilometers consist with 10,000 kms. of physical pairs. 25% circuits of carrier equipment are installed on these lines. In addition 20 radio transmitting and receiving centers are operated for international communications and for isolated national circuits.

2,000 kms of wide band microwave radio links will be installed during the present investment period and subscriber toll dialling will also be introduced between our major cities and towns.

IBTE operates the transmitting and studio equipment of the Ethiopian Broadcast Services. Five 100 KW broadcast transmitters and several smaller ones are operated and maintained by IBTE.

The above summary will indicate that IBTE has a large expenditure annually for maintenance, construction and new equipment. Except for very few items such as wood poles, cement, wood and paint all requirements are imported.

IBTE has a Manufacturing Section which is formed of the following workshops. concrete, blacksmith and carpentry. Other workshops consist of a well-equipped Garage and Mechanical Workshop, a Radio Laboratory and Workshop and a Telephone Workshop.

The activities of these sections or workshops are as follows:-

A. Manufacturing Section

- i) Concrete Workshop manufacture of cable ducts, cable cover slabs, marker posts, stay anchors and foundation posts. Modern molding and vibrating equipment is used.
- ii) Blacksmith Workshop. Manufacture of cross arms, transposition brackets, metal parts of stay anchors, metal frames for furniture and switchboards.

The material used is mainly imported semi-processed iron and steel.

- iii) Carpentry and Joinery Workshop. This workshop manufactures furniture for use in IBTE's offices and business office. It also makes wooden chassis for manual switchboards. A major activity of this workshop is the construction of dismantable kiosks for use in the provinces for small installations such as telephone pay stations, small manual

exchanges, carrier equipment terminal and repeater stations. The workshop is well equipped with modern wood working machines.

The 1967 production of this Manufacturing Section is shown on annex I.

A total of eighty skilled and semi-skilled workmen are employed in this manufacturing section. The chief of the section has a secondary school background and has had three years training in Germany.

- B. Garage and Workshop. This workshop is concerned with the maintenance of vehicles and stationary electric generating sets. Small simple metal parts are manufactured as replacement parts for engines, motors and telecommunication equipment. The workshop is equipped with one modern lathe and some old type machine tools.
- C. Radio Laboratory and Workshop. This workshop has the responsibility of checking radio equipment upon receipt from manufacturers and for maintenance and control of measuring instruments. The workshop is equipped with coil winding equipment and lathes etc. and can rewind or rebuild most coils and transformers.
- D. Telephone Workshop. This workshop is responsible for the reconditioning of damaged or recovered telephone apparatus **and small private branch exchange intercommunication equipment.** It also builds manual exchanges for private and public installations. It has a small tool room for the manufacture of small parts for older type apparatus. A total of 1,200 telephone instruments and 100 PBX's and intercommunication sets were reconditioned in this workshop during 1968.

As of the end of 1968 there were 3032 employees including ten foreign staff within the Board of which 1,181 were classified as technical personnel.

IV. Technical training in Ethiopia

There are three major technical training programmes in Ethiopia which could provide technical staff for telecommunication industries.

- i) The College of Engineering. This College is part of the University of Addis Ababa.

The College has facilities for mechanical and electrical engineering and graduated 40 engineers in 1969 (approximately).

- ii) Bahr Dar Polytechnic. This polytechnic is under the Ministry of Education and trains technicians for four years after completion of 10 grade high school. It is very well equipped and at international standard. In 1969, 129 technicians in three main streams were graduated.

- iii) Addis Ababa and Asmara Technical Schools. These two technical schools operate under the Ministry of Education. The entrance level is 8th grade and the training is for four years. The specialized courses include those for electronics operators, metal workers, auto mechanics, machine tool operators and die technicians. In 1969, 151 specialized technicians were graduated.

- iv) The Telecommunications Institute is part of the Board of Telecommunications (ETB) and teaches specialized telecommunication skills such as radio, telephone and telegraph techniques at various levels and operating techniques for switchboard and equipment operation. Both in-service and pre-service training is carried out. 97 employees were trained during 1969.

Production of manufacturing high standards

I. Furniture

1200 pieces including 100 chairs, 200 tables, 100 stools, desks, 200 benches, 200 beds, 200 sofas.

With a value of US \$ 1,200,000

II. Electrical fittings

Thirty standard 1/2 x 1/2 x 1/2 wooden blocks complete with furniture and fittings for electrical fittings.

With a value of US \$ 1,200,000

III. Electrical fittings

Various electrical fittings, 11,000 cross bars, 1, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80, 85, 90, 95, 100, 105, 110, 115, 120, 125, 130, 135, 140, 145, 150, 155, 160, 165, 170, 175, 180, 185, 190, 195, 200, 205, 210, 215, 220, 225, 230, 235, 240, 245, 250, 255, 260, 265, 270, 275, 280, 285, 290, 295, 300, 305, 310, 315, 320, 325, 330, 335, 340, 345, 350, 355, 360, 365, 370, 375, 380, 385, 390, 395, 400, 405, 410, 415, 420, 425, 430, 435, 440, 445, 450, 455, 460, 465, 470, 475, 480, 485, 490, 495, 500, 505, 510, 515, 520, 525, 530, 535, 540, 545, 550, 555, 560, 565, 570, 575, 580, 585, 590, 595, 600, 605, 610, 615, 620, 625, 630, 635, 640, 645, 650, 655, 660, 665, 670, 675, 680, 685, 690, 695, 700, 705, 710, 715, 720, 725, 730, 735, 740, 745, 750, 755, 760, 765, 770, 775, 780, 785, 790, 795, 800, 805, 810, 815, 820, 825, 830, 835, 840, 845, 850, 855, 860, 865, 870, 875, 880, 885, 890, 895, 900, 905, 910, 915, 920, 925, 930, 935, 940, 945, 950, 955, 960, 965, 970, 975, 980, 985, 990, 995, 1000.

Total value of this production was US \$ 1,200,000

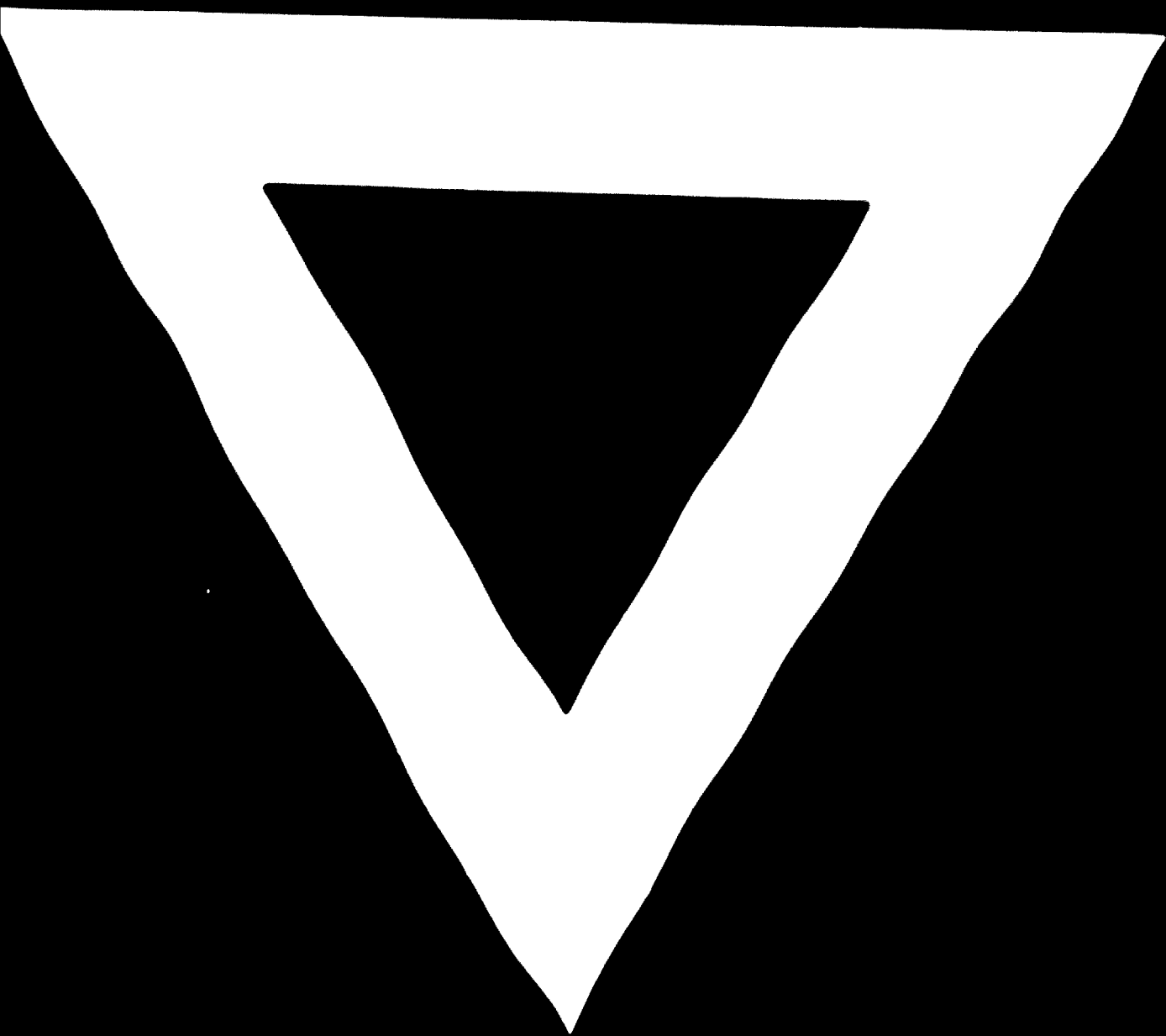
IV. General services

The production consisted of 6,000 electrical fittings, 1,410 four tube conduit and 1,200 cement blocks. The conduit and blocks are in one meter lengths. 1,000 steel corner plates, 100 pieces of kiosk form tie poles, and 1000 electrical indicator poles were also manufactured.

Total value of this production was US \$ 1,200,000

The workshops also carried out repair and modification work.





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