

# Public Address Amplifiers

PRODUCT CODE (ASICC)	:	78202
QUALITY AND STANDARDS	:	IS 10426 :1983
PRODUCTION CAPACITY	:	Qty. : 7200 Nos. (per annum) Value : Rs. 86,40,000.
YEAR OF PRODUCTION	:	2002 - 2003
PREPARED AND UPDATED BY	:	Small Industries Service Institute 22 Godown, Industrial Estate Jaipur -302 006 (Rajasthan) And Office of the Development Commissioner (Small Scale Industries), Electronics and Electrical Division, 7th Floor, Nirman Bhavan, New Delhi-110 011

## INTRODUCTION

Public Address Amplifiers, popularly known as sound systems, find extensive application at public meetings, social functions, religious places, schools and colleges, hotels, elections auditoria, etc. In this area considerable expertise has been built up in the country, particularly in the small scale sector. The item is reserved for manufacture in the small scale sector.

## MARKET POTENTIAL

The total electronics production during 2001-02 is Rs. 12,700 crores compared to Rs. 7600 crores in 1996-97. Consumer electronics sector is the back bone of the electronics industry and contributes to one-third of the total electronics production.

With the indigenous availability of electronic components, the price of P.A.

amplifiers has come down considerably. The demand of this item has been growing in line with the consumer electronics growth. It is felt that there will be substantial growth for this product in the years to come. There is also a great export potential for this product.

## BASIS AND PRESUMPTIONS

- i) The basis for calculation of production capacity has been taken on single shift basis on 75% efficiency.
- ii) The maximum capacity utilization on single shift basis for 300 days a year. During first year and second year of operations the capacity utilization is 60% and 80% respectively. The unit is expected to achieve full capacity utilization from the third year onwards.

- iii) The salaries and wages, cost of raw materials, utilities, rents, etc. are base on the prevailing rates in and around Jaipur. These cost factors are likely to vary with time and location.
- iv) Interest on term loan and working capital loan has been taken at the rate of 16% on an average. This rate may vary depending upon the policy of the financial institutions/agencies from time to time.
- v) The cost of machinery and equipments refer to a particular make/model and prices are approximate.
- vi) The break-even point percentage indicated is of full capacity utilization.
- vii) The project preparation cost etc. whenever required could be considered under pre-operative expenses.
- viii) The essential production machinery and test equipment required for the project have been indicated. The unit may also utilize common test facilities available at Electronics Test and Development Centres (ETDCs) and Electronic Regional Test Laboratories (ERTLs) set up by the State Governments and STQC Directorate of the Department of Information Technology, Ministry of Communication and Information Technology, to manufacture products conforming to Bureau of Indian Standards.

### IMPLEMENTATION SCHEDULE

The major activities in the implementation of the project has been listed and the average time for

implementation of the project is estimated at 12 months:

<i>Sl. No.</i>	<i>Name of Activity</i>	<i>Period in Months (Estimated)</i>
1.	Preparation of project report	1
2.	Registration and other formalities	1
3.	Sanction of loan by financial institutions	3
4.	Plant and Machinery:	
	a) Placement of orders	1
	b) Procurement	2
	c) Power connection/ Electrification	2
	d) Installation/Erection of machinery/Test Equipment	2
5.	Procurement of raw materials	2
6.	Recruitment of Technical Personnel etc.	2
7.	Trial production	11
8.	Commercial production	12

### Notes

1. Many of the above activities shall be initiated concurrently.
2. Procurement of raw materials commences from the 8th month onwards.
3. When imported plant and machinery are required, the implementation period of project may vary from 12 months to 15 months.

### TECHNICAL ASPECTS

#### Process of Manufacture

Electronic components such as resistors, capacitors, diodes, transistors etc., are mounted on PCB cards. Each card is tested for gain, distortion, frequency response etc. All these cards are mounted in the chassis along with pre-tested transformer and power supply cards. The interconnections between the

PCB's and for the front/back panel are done. The final assembly is again tested for output power, distortion, frequency response, impedance and noise level etc. The chassis is placed in a cabinet and is finally tested for the acoustical performance.

### Quality Control and Standards

IS Specification	IS 10426 :1983
Power rating	30/50 Watts.
Outputs	Loud speakers of 4, 8 and 16 Ohms: 70V, 100V, via transformer free from earth.
Input	Microphone : 4 inputs: 1.5mV/4.7 K ohms

### Signal Processing

Distortion	: Less than 10% at rated output Signal/Noise ratio at 1 KHz: 60 dB.
Frequency response	: 60 Hz to 15 KHz $\pm$ 3dB
Tone control Bass control	: $\pm$ 60dB at 100 KHz
Treble control	: 6dB at 10 KHz $\pm$
Power Supply	: 230 V, 50 Hz AC

### Production Capacity (per annum)

Quantity	Value (Rs.)
7200	86,40,000

Motive Power 5 KVA.

### Pollution Control

The Govt. accords utmost importance to control environmental pollution. The small-scale entrepreneurs should have an environmental friendly attitude and adopt pollution control measures by process modification and technology substitution.

India having acceded to the Montreal Protocol in Sept. 1992, the production and use of Ozone Depleting Substances

(ODS) like Chlorofluoro Carbon (CFC), Carbon Tetrachloride, Halons and Methyl Chloroform etc. need to be phased out immediately with alternative chemicals/solvents. A notification for detailed Rules to regulate ODS phase out under the Environment Protection Act, 1986 have been put in place with effect from 19th July 2000.

The following steps are suggested which may help to control pollution in electronics industry wherever applicable:

- i) In electronic industry fumes and gases are released during hand soldering/wave soldering/Dip soldering, which are harmful to people as well as environment and the end products. Alternate technologies may be used to phase out the existing polluting technologies. Numerous new fluxes have been developed containing 2-10% solids as opposed to the traditional 15-35% solids.
- ii) Electronic industry uses CFC, Carbon Tetrachloride and Methyl Chloroform for cleaning of printed circuit boards after assembly to remove flux residues left after soldering, and various kinds of foams for packaging.

Many alternative solvents could replace CFC-113 and Methyl Chloroform in electronics cleaning. Other Chlorinated solvents such as Trichloroethylene, Perchloroethylene and Methylene Chloride have been used as effective cleaners in electronics industry for many years. Other organic solvents such as Ketones and Alcohols are effective in removing both solder fluxes and many polar contaminants.

## Energy Conservation

With the growing energy needs and shortage coupled with rising energy cost, a greater thrust in energy efficiency in industrial sector has been given by the Govt. of India since 1980s. The Energy Conservation Act, 2001 has been enacted on 18th August'2001, which provides for efficient use of energy, its conservation and capacity building of Bureau of Energy Efficiency created under the Act.

The following steps may help for conservation of electrical energy:

- i) Adoption of energy conserving technologies, production aids and testing facilities.
- ii) Efficient management of process/manufacturing machineries and systems, QC and testing equipments for yielding maximum Energy Conservation.
- iii) Optimum use of electrical energy for heating during soldering process can be obtained by using efficient temperature controlled soldering and desoldering stations.
- iv) Periodical maintenance of motors, compressors etc.
- v) Use of power factor correction capacitors. Proper selection and layout of lighting system; timely switching on-off of the lights; use of compact fluorescent lamps wherever possible etc.

## FINANCIAL ASPECTS

### A. Fixed Capital

#### (i) Land and Building

Built up area	200 Sq. mtrs.
Office, Stores	50 Sq. mtrs.
Working shed (Fabrication, Assembly and testing and quality control)	150 Sq. mtrs.
Rent	Rs. 5000 (per month)

#### (ii) Machinery and Testing Equipments

Sl. No.	Description	Ind./ Imp.	Qty.	Total (Rs.)
1.	Drilling Machine (1/2 <sup>2</sup> )	Ind.	1	5,000
2.	Bench Grinder	Ind.	1	7,000
3.	Oscilloscope (20 MHz Dual Trace)	Ind.	1	20,000
4.	Allied equipments like Microphones, sound columns.	Ind.	2 each	8,000
5.	DC Regulated power supply (30 V, 2A)	Ind.	2	9,000
6.	3½ Digit Digital multimeter	Ind.	2	7,000
7.	Analog multimeter	Ind.	2	1,500
8.	Audio Test System (Consisting of distortion factor meter, signal generator, level meter and output power meter)	Ind.	2 sets	30,000
9.	Digital LCR/Q Meter	Ind.	1	15,000
10.	Insulation Tester (500 V)	Ind.	1	6,000
		Total		1,08,500
11.	Electrification and Installation charges @ 10% of the cost of machinery and equipment as required			10,850
12.	Cost of office equipment/ working tables			30,000
13.	Cost of moulds/ fixtures/tools and jigs			15,000
14.	Pre-operative expenses			10,000
		Total		65,850
		Total Fixed Cost		1,74,350
		or Say		1,74,000

## B. Working Capital (per month)

### (i) Staff and Labour

Sl. No.	Designation	No.	Salary (Rs.)	Total (Rs.)
1	Manager	1	5,000	5,000
2	Accountant/Clerk	1	3,000	3,000
3	Peon/Chowkidar	1	2,000	2,000
4	Supervisor	1	3,500	3,500
5	Skilled Worker	4	3,000	12,000
6	Semi-Skilled Worker	4	2,500	10,000
7	Unskilled Worker	2	2,000	4,000
Total				39,500
<i>Perquisites @ 15% of Salaries</i>				5,925
Total				45,425
				or Say 45,000

### (ii) Raw Materials (per month)

Sl. No.	Description	Qty.	Value (Rs.)
1.	Transformers (set of 3) Mains/ Output/Driver	1 set	400
2.	Transistors (set of 15) (Power/ Low frequency)	1 set	85
3.	Capacitors (a set of 25) (Electrolytic, Ceramic Polyester)	1 set	55
4.	Printed Circuit Board (a set of 2)	1 set	40
5.	Diodes (a set of 10)	1 set	12
6.	Switch (DPDT)	1 set	15
7.	Connectors $\frac{3}{4}$ Nos. set	1 set	50
8.	Terminals strip (2/4 way)	1 set	7
9.	Slide Switch ( 3 way)	1 set	7
10.	Resistors (a set of 50 Nos.)	1 set	10
11.	Volume control (a set of 5 Nos.)	1 set	50
12.	Mains Lead	1 No.	15
13.	Chassis with plastic parts/ hardware and front anodized aluminium plate	1 No.	130
14.	Package etc.	1 No.	25
Total			901

Total Value of Raw Materials Required  
(per month)  $600 \times 901$  Rs. 5,40,600

(iii) Utilities (per month)	(Rs.)
Power	2,500
Water	200
Total	2,700

(iv) Other Contingent Expenses (per month) (Rs.)	(Rs.)
Rent	5,000
Postage and Stationery	1,000
Telephone	2,000
Consumable stores	2,000
Repairs and Maintenance	500
Transport charges	10,000
Advertisement and Publicity	5,000
Insurance	500
Sales expenses	3,000
Misc. expenses	1,000
Total	30,000

(v) Total Recurring Expenditure Rs. 6,18,300  
(per month) (i+ii+iii+iv)

## C. Total Capital Investment

(i) Fixed capital	Rs. 1,74,000
(ii) Working capital	Rs. 18,54,900
Total	Rs. 20,28,900

## FINANCIAL ANALYSIS

(1) Cost of Production (per year)	(Rs.)
Total recurring expenditure	74,19,600
Depreciation on machinery and equipment @ 10%	10,850
Depreciation on moulds, tools and fixtures @ 25%	3,750
Depreciation on office equipments @ 20%	6,000
Interest on total investment @ 16%	3,24,624
Total	77,64,824
Or Say	77,64,900

(2) Turnover (per annum)

Item	Qty.	Rate (Rs.)	Total (Rs.)
Public Address Amplifier	7200	1,200	86,40,000

(3) Net Profit (per year) (Before Tax) Rs. 8,75,100

(4) Net Profit Ratio

$$= \frac{\text{Net Profit per year} \times 100}{\text{Turnover per year}}$$

$$= \frac{8,75,100 \times 100}{86,40,000}$$

(5) Rate of Return

$$= \frac{\text{Net Profit per year} \times 100}{\text{Total Investment}}$$

$$= \frac{8,75,100 \times 100}{20,28,900}$$

$$= 43.13\%$$

(6) Break-even Point

Fixed Cost (per annum)	(Rs.)
Insurance	6,000
Depreciation on machinery and equipment (Tools, fixtures and office equipment)	20,600
Rent	60,000
Interest on total investment	3,24,624
40% of Salary and wages	2,16,000
40% of other contingent expenses and utilities (excluding rent and insurance)	1,30,560
Total	7,57,784
or Say	7,57,000

B.E.P.

$$= \frac{\text{Fixed Cost} \times 100}{\text{Fixed Cost} + \text{Net Profit}}$$

$$= \frac{7,57,000 \times 100}{7,57,000 + 8,75,100}$$

$$= 46.41\%$$

#### Additional Information

(a) The Project Profile may be modified/tailored to suit the individual entrepreneurship qualities/capacity, production

programme and also to suit the locational characteristics, wherever applicable.

- (b) The Electronics Technology is undergoing rapid strides of change and there is need for regular monitoring of the national and international technology scenario. The unit may, therefore, keep abreast with the new technologies in order to keep them in pace with the developments for global competition.
- (c) Quality today is not only confined to the product or service alone. It also extends to the process and environment in which they are generated. The ISO 9000 defines standards for Quality Management Systems and ISO 14001 defines standards for Environmental Management System for acceptability at international level. The unit may therefore adopt these standards for global competition.
- (d) The margin money recommended is 25% of the working capital requirement at an average. However, the percentage of margin money may vary as per bank's discretion.

#### Addresses of Machinery and Testing Equipment Suppliers

1. M/s. Applied Electronics Ltd. (Aplab), 4th Floor, 4E/14, Jhandewalan Extension, New Delhi - 110 055.
2. M/s. Toshniwal Brothers (Delhi) Pvt. Ltd. 3E/8, Jhandewalan Extension, New Delhi - 110 055.

3. M/s. Unitron Limited  
I, Industrial Area, N.I.T.  
Faridabad - 121 001.
4. M/s. Automatic Electric Ltd.  
Rectifier House,  
570, Naigum Cross Road, Wadala,  
P.O. Box. 7103,  
Mumbai - 400 031.
5. M/s. British Physical Laboratories  
India Limited  
304, Ashok Bhawan,  
93, Nehru Place,  
New Delhi - 110 019.
6. M/s. Philips  
68, Shivaji Marg,  
New Delhi.
7. M/s. Systronics,  
202, 1206, Harsha House,  
Near Milan Cinema,  
Karampura Road,  
New Delhi - 110 015.
8. M/s. Orient Corporation  
(For Tools)  
423/424, Shah and Nahar Estate  
(A-2), Lower Parel (W),  
Mumbai - 400 013.
9. M/s. Noble Electronics  
354, Lajpat Rai Market,  
Delhi.

#### Raw Material Suppliers

1. M/s. Hindustan Conductors Ltd.  
(Solid State Devices),  
306 and 307, B.M.C. House,  
N-1-Block, Middle Circles,  
Connaught Circus,  
New Delhi - 110 001.

2. M/s. Murugappa Electronics Ltd.  
Industrial Products Division,  
Plot No. 66, Door No. 3,  
Thiruvalluvar Salai,  
Thiruvanmiter,  
Chennai - 600 001.
3. M/s. Pecco Electronics and  
Electricals Limited  
68, Shivaji Marg,  
New Delhi - 110 015.
4. M/s. Usha Rectifier Corporation  
(India) Limited  
Jeevan Tara Building,  
Parliament Street,  
New Delhi - 110 001.
5. M/s. Precision Electronics  
Components Mfg. Co.  
1-3-1-31, Lower Tank,  
Bond Road, Kavadiguda,  
Hyderabad.
6. M/s. Keltron,  
Keltron Chambers,  
18/7, Arya Samaj Road,  
Karol Bagh,  
New Delhi-110 005
7. M/s. Bharat Electronics Ltd.  
Jalahalli Post,  
Bangalore.
8. M/s. Semi Conductors  
Phase-8, SAS Nagar,  
Punjab.
9. M/s. Electronics Trade and  
Technology Development Corpn.  
15/48 Malcha Marg,  
Chankyapuri,  
New Delhi.