Loud Speakers

PRODUCT CODE (ASICC)	:	78224
QUALITY AND STANDARDS	:	IS 7741
PRODUCTION CAPACITY	:	Qty. : 60,000 Nos. (per annum) Value : Rs. 37,80,000
YEAR OF PREPARATION	:	2002–2003
PREPARED AND UPDATED BY	:	Small Industries Service Institute, Bamunimaidan, Guwahati -21 And Office of the Development Commissioner (Small Scale Industries), Electronics and Electrical Division, 7th Floor, Nirman Bhavan, New Delhi-110011

Introduction

Loud- speaker is an important electronic component used to convert electrical power into acoustical power. In all practical applications of loud-speakers, the following are important electrical and acoustical properties:

1. Impedance
2. Resonance
3. Frequency response
4. Power output
5. Directional effects

There are different types of loud speakers depending on operating principle and material used. Based on this, loud speakers can be classified into permanent magnet type, piezo electric type, electro static type and ribbon type.

When the Audio frequency current from the amplifier passes through the voice coil, the paper cone held by spider moves to and fro to produce vibrations combination of sealers for multiple speaker system like woofer, tweeter and cross over network. Speakers are available in round, square, elliptical, octagonal shapes.

The use of loud-speakers is mainly in the field of consumer electronic products e.g. radios, transistors sets, T.V. sets, record players, tape recorders, amplifiers (PA and entertainment), video games etc.

Market Potential

Loud Speakers are widely used in radio/tape recorder, stereo system, black and white and colour TV receivers, public address system, musical systems for reproduction of sound. multispeaker systems like tweeter, woofer and cross

over network are used for different sound effects. The cost of the speaker varies from Rs. 25 to Rs.600 depending on the type, power output, size, shape and sensitivity. There are large number of SSI/tiny units in the country manufacturing loud speakers. Because of incremental growth in entertainment electronics, there is a scope for loud speaker industry. The machinery and equipment and raw materials required for loud speakers are indigenously available. A new entrepreneur has to make marketing tie-up with manufacturers of entertainment electronic products and implement the latest quality testing system.

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 based on the prevailing rates in and around Guwahati. 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:

Sl. No.	*Name of Activity*	*Period in Months (Estimated)*
1.	Preparation of project report	1
2.	Registration and other formalities	1
3.	Sanction of loan by financial institutions	3

Sl. No.	Name of Activity	Period in Months (Estimated)
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

The incoming Raw Material and components are tested for required specifications and made dust free. The Magnet frame Assembly is done and drying is done, followed by dust free operation. The voice coil, spider and the paper cone fixed on the yoke and basket assembly by using adhesives. The rubber lining is placed along the edge of the basket. Leads are taken out to each terminal eyelet. The whole loud speaker is tested for required specification before despatch.

Quality Control and Standards

Power Rating	3 Watts
Sensitivity	69 db
Size	75 × 130 mm (Elliptical)

Production Capacity (per annum)

Quantity (Nos.)	Value (Rs.)
60,000	37,80,000

Motive Power 5 KVA (Approx.)

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.Mts.
Assembly, Testing and Stores	150 Sq.Mts.
Office	50 Sq.Mts.
Rent Payable (per annum)	Rs. 36,000

(ii) Machinery and Testing Equipments

Sl. No.	Particulars	Qty. Nos.	Imp/ Ind.	Price (Rs.)
(a)	*Machinery*			
1	Buffing and Grinding Machine	1	Ind.	5,000
2	Drilling Machine (1/2")	1	Ind.	4,000
(b)	*Testing Equipment*			
1	Loud Speaker Multitester	1	Ind.	15,000
2	Loud Speaker Whistle tester	1	Ind.	9,000
3	Automatic Fidelity Tester	1	Ind.	13,500
4	Sound Level Meter	1	Ind.	15,000
5	AF Impedence Meter	1	Ind.	6,500
6	AF Noise Generator	1	Ind.	3,000

Sl. No.	Particulars	Qty. Nos.	Imp/ Ind.	Price (Rs.)
7	Loud Speaker Polarity Tester	1	Ind.	4,500
8	Programmeable Audio Generator	1	Ind.	12,000
9	Audio Power Meter	1	Ind.	7,500
10	Loud Speaker PHC Meter	1	Ind.	13,500
11	LCR-Q Meter	1	Ind.	13,000
12	Oven	1	Ind.	25,000
13	Power Supplies	2	Ind.	20,000
14	4½ Digit Digital Multimeter	1	Ind.	10,000
15	Analog Multimeter	3	Ind.	18,000
16	DB Meter	1	Ind.	6,800
17	Electrification Charges @ 10% of cost of Machinery and Equipment		Ind	20,000
18	Tools, Jigs and Fixtures			25,000
19	Office Equipment and Furniture			50,000
(iii)	Pre-operative Expenses			10,000
	Total Fixed Capital			3,06,300
	or Say			3,07,000

B. Working Capital (per month)

(i) Staff and Labour

Sl. No.	Designation	Nos.	Salary (Rs.)	Total (Rs.)
1	Manager	1	5,000	5,000
2	Supervisor	1	3,500	3,500
3	Clerk/Typist	1	2,500	2,500
4	Peon	1	1,500	1,500
5	Watchman	1	1,500	1,500
6	Skilled Workers	4	2,000	8,000
7	Semi-Skilled Workers	3	1,500	4,500
		Total		26,500
Add Perquisites @ 15% of Total Salary				3,975
		Total		30,475
		or Say		31,000

(ii) Raw Material Requirement (per month)

Sl. No.	Description	Price/Unit (Rs.)
1	Permanent Magnet	15
2	Voice Coil	2
3	Cone Paper	4
4	Spider and Dust Cap	2
5	Rubber Gasket	2
6	Metal Basket	3
7	Electro-Mechanical parts like T-Yoke, Bore Plate, Braided Wire, Rivets, Eyelets etc.	8
8	Consumables (Solder, Flux, Chemicals, Adhesives, Packing Material)	8
	Total	44

Cost of Raw Materials for 5000 Nos. Rs. 2,20,000

Note :The Quality and Quantity of Raw Material requirement vary with Specifications and features of the Loudspeaker.

(iii) Utilities (per month)	(Rs.)
Power	4,000
Water	500
Total	4,500

(iv) Other Contingent Expenses	(Rs.)
Rent	3,000
Postage and Stationery	500
Repair and Maintenance	2,000
Telephone	500
Transport Charge	2,500
Advertisement/Publicity	3,000
Insurance	500
Miscellaneous Expenses	2,000
Total	14,000
(v) Total Recurring Expenditure (i) + (ii) + (iii) + (iv)	2,69,500
Say	2,70,000

C. Total Capital Investment

Fixed Capital	Rs. 3,07,000
Working Capital for 3 months	Rs. 8,10,000
Total	Rs. 11,17,000

FINANCIAL ANALYSIS

(1) Cost of Production (per annum)	(Rs.)
Total Recurring Expenditure	32,40,000
Depreciation on Plant/Machinery/ Equipment @ 10%	20,000
Depreciation on Office Equipment/ Furniture @ 20%	10,000
Depreciation on Jigs and Fixtures @ 20%	5,000
Interest on Total Capital Investment @ 16%	1,78,700
Total	34,53,700
or Say	34,54,000

(2) Sales Turnover (per annum)

Item	Qty. Nos.	Rate (Rs.)	Value (Rs.)
Loud Speaker	60,000	63	37,80,000

(3) Profit (per year) *(Before Taxes)* Rs. 3,26,000

(4) Net Profit Ratio

$$= \frac{\text{Profit (per annum) x 100}}{\text{Sales (per annum)}}$$

$$= \frac{326000 \times 100}{3780000}$$

$$= 8.62\%$$

(5) Rate of Return

$$= \frac{\text{Profit (per annum) x 100}}{\text{Total capital investment}}$$

$$= \frac{326000 \times 100}{1117000}$$

$$= 29.18\%$$

(6) Break-even Point

Fixed Cost (per annum)	(Rs.)
Rent	36000
Depreciation on machinery and equipment @ 10 %	20000
Depreciation on tools, jigs and fixtures @ 20%	5000
Depreciation on office furniture @ 20%	10000
Interest on total capital investment @ 16%	178700
Insurance	6000
40% Salaries and wages	148800
40% other contingent expenses and utilities (excluding rent and insurance)	72000
Total	476500

B.E.P.

$$= \frac{\text{Fixed cost x 100}}{\text{Fixed cost + Profit}}$$

$$= \frac{476500 \times 100}{476500 + 326000}$$

$$= 59.38\%$$

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/Equipment Suppliers

1. M/s. Audiolec Instruments Survey No. 10/3, lane 3 – B, Sahu Colony, Near Cumnis, College of Engineering, Karvey Nagar, Pune – 4110592.
   (Testing and Measuring Equipments)
2. M/s. Vaiseshaka Instruments
   2, Post Box Stall,
   38,Industrial Area,
   Amabala Cantt.,
   Haryana
   (Testing and Measuring Equipments)
3. M/s. Aplab
   6, Vasundhara, 6th Floor,
   2/7, Sarat Bose Road,
   Kolkata – 700020
   (Testing and Measuring Equipments)
4. M/s. East Cost Enterprises Ltd.
   33 Brabourne Road,
   Post Box No.-2217,GPO,
   Kolkata – 700001
   (Magnetiser and Demagnetiser)

Addresses of Raw Material Suppliers

1. M/s. Hindustan Ferrites
   37, American Street,
   Kolkata – 1
   (Permanent Magnate)
2. M/s. Genon (India) Pvt. Ltd.
   A-48, Naraina Industrial Estate,
   Phase – I, New Delhi – 110028.
   (Paper Cones, Spiders and Dust Caps)
3. M/s. B. M. Enterprises Pvt. Ltd.
   B–01 and B –02,
   Webel Electronics Complex
   P-I, Taratola Road,
   Kolkata – 700088.
   (Metallic Parts)
4. M/s. SAMKAY Metal Works
   A-522 Shastri Nagar,
   Sarai Rohilla, Delhi – 110082.
   (Speaker Bamsket)
5. M/s. Mohan Rubber
   RZ- 37 /3800,
   Tughlakabad Extension,
   Post Box No.- 4309,
   New Delhi –110019.
   (Rubber Gasket)
6. M/s. Shree Krishna Sales Corporation
   Behind Dipti Glass Works,
   Magoawadi, opp. Gujrat School,
   Valsad (E) , Gujrat – 396035
   (Eylets, Tags etc.)