

TV Tuners (Turret Type)

PRODUCT CODE (ASICC)	: 78251
QUALITY AND STANDARDS	: IS 10425:1983
PRODUCTION CAPACITY	: Qty. : 60,000 Nos. (per annum) Value : Rs. 37,20,000
YEAR OF PREPARATION	: 2002–2003
PREPARED AND UPDATED BY	: Small Industries Service Institute Bamunimaidan, Guwahati–781021 And Office of the Development Commissioner (Small Scale Industries), Electronics and Electrical Division, 7th Floor, Nirman Bhavan, New Delhi-110011

INTRODUCTION

Television tuner is used in the television receiver for selecting the desired Channel. It consists of R.F. amplifier stage, the mixer and local oscillator. The tuner includes provisions for fine tuning, Automatic Frequency Tuning (AFT) and Automatic Gain Control (AGC). This item is reserved for manufacture in the small scale sector.

There are two types of tuners i.e., Mechanical Type (Turret Type) and Electronic tuner. The profile is for assembly of TV tuner (Turret type).

MARKET POTENTIAL

Earlier Mechanical Type Tuner was used by both Black and White and Colour TV receiver, but due to advancement in technology and popularity of cable TV network electronic

TV tuners have replaced Mechanical tuners. Mechanical tuners are mostly used (75% of total tuners) in Black and White television receivers. Its cost varies from Rs. 50 to Rs. 80 depending on the number of channels of Television receiver. Since many people in the country are still using Black and White TV receivers, there is demand for mechanical tuners.

The new entrepreneur has to manufacture electronic tuners alongwith mechanical tuners and has to make marketing tie-up with TV receiver manufacturers and service centres for economical availability. Even the kits are available in pure assembled components. The production of mechanical tuner over the last three years declined due to the Introduction of electronic tuner. The machinery and equipment and raw materials required for manufacture of mechanical tuner is indigenously available.

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:

<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

The incoming raw material is tested for required quality specifications before being released to the production. Components shaped, formed and soldered on the PCB. The PCB and other electro-mechanical components fixed to the mechanical box. Proper shielding for IF Load is provided to avoid external noise. The tuner is tested for desired specifications before packing and despatch.

Quality Control and Standards

Operating Voltage	+ 12 V dc
AGC (Normal Gain)	1.9 V dc
Input Impedence	75 Ohms
Power Gain	B 132db, B228db
IF Output	Sound- 33.4 Mhz Video - 38.9 Mhz
Bandwidth	5.5 Mhz
Noise Figure	Better than 3.5 db
Gain Reduction	40 db

Production Capacity (per annum)

Quantity (Nos.)	Value (Rs.)
60,000	37,20,000

Motive Power 10 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 (per annum)	Rs. 36,000

(ii) Machinery and Testing Equipments

Sl. No.	Particulars	Qty. Nos.	Imp./ Ind.	Amount (Rs.)
1	VHF Sweep Generator with Marker	1	Ind.	1,00,000
2	Alignment Scope	1	Ind.	40,000
3	Oscilloscope (0 - 50 Mhz)	1	Ind.	50,000
4	Pattern Generator	1	Ind.	5,000
5	Standard TV (Black and White)	1	Ind.	15,000
6	LCR-Q Meter	1	Ind.	13,000
7	Power Supplies	1	Ind.	20,000
8	4½ Digit Digital Multimeter	1	Ind.	10,000
9	Analog Multimeter	2	Ind.	12,000
10	Electrification Charges @ 10% of Cost of Machinery and Equipment	L/S	Ind	26,500
11	Tools, Jigs and Fixtures			20,000
12	Office Equipment and Furniture			40,000
(iii) Pre-operative Expenses				10,000
Total Fixed Capital				3,61,500
or Say				3,62,500

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

Sl. No.	Designation	Nos.	Salary (Rs.)	Total (Rs.)
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 Requirements (per month)

Sl. No.	Particulars	Price/Unit (Rs.)
1	Transistors (a set of 3 nos.)	4
2	Feed through Capacitors	1
3	Ceramic Capacitors(22nos.), Low Noise Resistors(15nos.)	4
4	Ferrite Core(6nos.) and Tuning Coils(32nos.)	4
5	Mechanical Box with Switch Contact PCB	23
6	Consumables (Solder, Flux, Packing Material)	4
Total		40

Cost of Raw Materials for 5000 Sets Rs. 2,00,000

Note: Requirement of Raw Material varies with size of Tuner.

(iii) Utilities (per month)	(Rs.)
Power	2,000
Water	500
Total	2,500

(iv) Other Contingent Expenses (per month) (Rs.)	(Rs.)
Rent	3,000
Postage and Stationery	2,500
Repair and Maintenance	4,000
Telephone	2,000
Transport Charges	2,500
Advertisement/Publicity	3,000
Insurance	500

(iv) Other Contingent Expenses (per month) (Rs.)	(Rs.)
Miscellaneous Expenses	2,500
Total	20,000
(v) Total Recurring Expenditure (i) + (ii) + (iii) + (iv)	2,53,500
Or Say	2,54,000

C. Total Capital Investment

Fixed Capital	Rs. 3,62,000
Working Capital for 3 months	Rs. 7,62,000
Total	Rs. 11,24,000

FINANCIAL ANALYSIS

(1) Cost of Production (per annum)	(Rs.)
Total recurring expenditure	30,48,000
Depreciation on plant/ machinery/equipment @ 10%	26,500
Depreciation on office equipment/ furniture @ 20%	8,000
Depreciation on jigs and fixtures @ 20%	4,000
Interest on total capital investment @ 16%	1,79,840
Total	32,66,340
or Say	32,66,000

(2) Sales Turnover (per annum)

Item	Qty. Nos.	Rate (Rs.)	Value (Rs.)
TV Tuners (Turret Type)	60,000	62	37,20,000

(3) Profit (per year) (Before Taxes) Rs. 4,54,000

(4) Net Profit Ratio

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

$$= \frac{454000 \times 100}{3720000}$$

$$= 13.9\%$$

(5) Rate of Return

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

$$= \frac{454000 \times 100}{1124000}$$

$$= 40.39\%$$

(6) Break-even Point

Fixed Cost (per annum)	(Rs.)
Rent	36000
Depreciation on machinery and equipment @ 10 %	26500
Depreciation on tools, jigs and fixtures @20%	4000
Depreciation on office furniture @ 20%	8000
Interest on total capital investment @16%	179840
Insurance	6000
40% of Salaries and wages	148800
40% of other contingent expenses and utilities (excluding rent and insurance)	91200
Total	500340
or Say	500000

B.E.P.

$$\begin{aligned}
 &= \frac{\text{Fixed cost} \times 100}{\text{Fixed cost} + \text{Profit}} \\
 &= \frac{500000 \times 100}{500000 + 454000} \\
 &= 52.41\%
 \end{aligned}$$

Additional Information

- 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.
- 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.
- 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.

- 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

- M/s. Philips India
No.7, Justice Chandra Madhab Road, Kolkata-700020
(Testing and Measuring)
- M/s. Crown Electronic System
J.G-1/7A, Vikas Puri, New Delhi-18
(Testing and Measuring)
- M/s. Advance Tech Services
No.56, 2nd Floor,
Rani Jhansi Road, New Delhi-55
(Soldering Iron and Assembling Tools.)

Addresses of Raw Material Suppliers

- M/s. Continental Devices (I) Ltd.
C-120, Naraina Industrial Estate,
New Delhi-110028
(Components)
- M/s. India Associates
745, Sector 8-B, Chandigarh-18
(Components)
- M/s. Stead Electronic Industries
17-U.A., Jawahar Nagar,
Delhi-110007
(Resistors, Presets)
- M/s. B. M. Enterprises
B01 and B02 Weibel Electronics
Complex, P-1, Taratola Road,
Kolkata-700011
(Mechanical Box and accessories)