## To

The General Manager
Department of Corporate Relations

## BSE Limited

Sir Phiroze Jeejeebhoy Towers, Dalal Street, Fort,
Mumbai -400 001

Scrip code: 532493

To
The Vice President, Listing Department
The National Stock Exchange of India Limited
Exchange Plaza
Bandra Kurla Complex, Bandra (East)
Mumbai 400051

Scrip code: ASTRAMICRO

Dear sir,

## Sub: Astra Microwave Products Limited - Press Release and Investor Presentation - Reg.

With reference to the above stated subject, please find enclosed herewith the Press Release and Investor Presentation on Q3FY23 Standalone Results.

This is for your information and record.
Thanking you,
Yours faithfully,
For Astra Microwave Products Ltd

| ANJANEYUL | Somet |
| :---: | :---: |
| U |  |
| THALLAPALL |  |

## T.Anjaneyulu

G.M - Company Secretary

## ASTRA MICROWAVE PRODUCTS LIMITED Q3FY23 Standalone Results

Friday, 10 ${ }^{\text {th }}$ February 2023, Hyderabad - Astra Microwave Products Limited, engaged in the business of design, development and manufacture of RF and Microwave Components, sub-systems and systems used in defense, space, meteorology and telecommunication announced its un-audited Financial Results for the quarter ended December 31 ${ }^{\text {st }}, 2022$.

## Recorded highest ever quarterly EBITDA \& PAT Booked orders worth Rs. 89.5 Crores during Q3FY23;

## Standalone Q3 FY23 Result Highlights

- The Revenues stood at Rs. 218.9 crores for Q3FY23 as against Rs. 199.1 crores for Q3FY22; growth of 9.9\% YoY
- Gross margins jumped from 30.0\% in Q3FY22 to $41.1 \%$ in Q3FY23. This surge has been driven by a higher focus on domestic markets
- EBIDTA of Rs. 53.0 crores for Q3FY23 was double in contrast to the EBIDTA of 26.2 in Q3FY22
- The company reported Profit after Tax of Rs. 30.3 crores in Q3FY23 saw a multifold increase as compared to Rs. 12.1 crores in Q3FY22 with margins going up to $13.8 \%$ from $6.1 \%$
- Geographical spread of total revenue for the quarter stands as follows: India - 68\% and Exports 32\%



## Standalone 9M FY23 Result Highlights

- The Revenues stood at Rs. 550.9 crores for 9MFY23 as against Rs. 496.1 crores for 9MFY22; growth of $11.1 \%$ YoY
- Gross profit increased by $50.7 \%$ to Rs. 215.7 crores in 9MFY23 vs Rs. 143.1 crores in 9MFY22
- Our 9MFY23 EBITDA of Rs. 118.4 crores was double the EBITDA in 9MFY22
- The company reported Profit after Tax of Rs. 64.3 crores in 9MFY23 as against Rs. 24.7 crores in 9MFY22 with margins soaring to $11.7 \%$ from $5.0 \%$
- Geographical spread of total revenue stands as follows: India - 67\% and Exports - 33\%



## Orderbook Update

- Order book of Rs. 1,733.6 Crores as on December 31, 2022, which is primarily executable in the next 12 to 38 months period.
- Orders booked during the quarter till $31^{\text {st }}$ December 2022 are worth Rs. 89.5 Crores.

Commenting on the performance Mr. S G Reddy, Managing Director, Astra Microwave Products Limited said, "Our efforts in terms of revenue shift towards domestic markets continued to pay-off in Q3FY23. This focused approach helped us achieve our highest ever quarterly profits both in terms of EBITDA as well as PAT of Rs. 53 Crores and Rs. 30.3 Crores, respectively.

Going ahead, our healthy orderbook of Rs. 1,733.6 Crores, continues to mirror a similar geographic mix with domestic orders dominating the pie. Also, our sales contribution from the space segment is expected to be grow in the foreseeable future. This will help us further diversify our sales mix and enhance our margins.

India's defence production policy like Atmanirbhar Bharat Abhiyan and higher focus on our category in the recent budget will give an impetus to our growth in the future. This combined with the strides that we are making, Astra is targeting to achieve Rs. 2,000 Crores revenues over the next 4 to 5 years."

## About Astra Microwave Products Limited

Astra Microwave Products Limited (Astra) was incorporated in 1991 by a team of distinguished scientists with experience in RF/Microwave/Digital electronics and management of projects with high technology content. The company has grown substantially since inception with continuous investments in infrastructure, captive test facilities and other resources. The company has various certificates such as AS9100D \& BS EN ISO 9001:2015, ISO27001:2013, ISO9001:2015, ISO14001:2015, ISO45001:2018, ISO/IEC17025:2017. The company's product portfolio spans across Defense, Space, Meteorology, Homeland Security and Systems Verticals.

Astra has 3 Automatic assembly lines for PCBA assembly, 5 class 10K cleanrooms, functional test infrastructure that extends from 30 MHz up to 40 GHz , in-house Environment test facilities including EMI/EMC facility and a first for any Indian Private Industry - Near Field Antenna test and measurement range.

Starting with a diverse range of microwave products like filters, transmitters, receivers, antennas etc., the company has produced actual space-borne hardware that has flown on Indian satellites.

## Safe Harbor Statement

Statements in this document relating to future status, events, or circumstances, including but not limited to statements about plans and objectives, the progress and results of research and development, potential project characteristics, project potential and target dates for project related issues are forward-looking statements based on estimates and the anticipated effects of future events on current and developing circumstances. Such statements are subject to numerous risks and uncertainties and are not necessarily predictive of future results. Actual results may differ materially from those anticipated in the forward-looking statements. The company assumes no obligation to update forward-looking statements to reflect actual results changed assumptions or other factors.

## For further details please contact:

| Company | Investor Relations Advisor |
| :--- | :--- |
| Astra Microwave Products Ltd. |  |
| Astra Microwave Products Limited | Strategic Growth Advisors Pvt Ltd. |
| CIN No: L293091G1991PLC013203 | CIN No: U74140MH2010PTC204285 |
| Mr. T. Anjaneyulu, GM - Company Secretary | Shikha Puri / Dharmik Kansara |
| Email id: secretarial@astramwp.com | Email id: shikha.puri@sgapl.net / dharmik.k@sgapl.net |
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# ASTRA Microwave Products Ltd 

## ASTRAMICRO.BO ASTRAMICRO.NS ASTM.IN

Investor Presentation - Q3 FY23

Astra Microwave Products Ltd.

www.astramwp.com

Radar Electronics | Electronic Warfare I Missiles
Telemetry
Meteorology

## Safe harbour

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## ASTRA: A Company With Deep Domain Expertise...

Astra Microwave Products Limited (AMPL) was incorporated as a Private Limited Company in 1991.

AMPL is into Design, Development and Manufacturing of RF \& Microwave Systems, sub-systems and components.

With over 30 years of experience in microwave radio frequency (RF) applications, AMPL has moved up the value chain from sub-systems to high value-added systems.

AMPL's products find applications in high end markets of Defense, Space, Telecom, Meteorology and Civil communications.

Working with various Indian Govt. Labs, Indian Defense PSUs, ISRO, and many foreign OEM's.

```
39.1% Gross
    Margins
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9M FY23 Standalone Financial Snapshot

## WEALTH OF EXPERIENCE

- More than 30 years of domain expertise in microwave radiofrequency (RF) applications domain
- Promoted by a team of distinguished scientists from DRDO


## STRONG R\&D CAPABILITIES

- Track record of new product development; now graduated to a SYSTEM integrator in Radars
- Dedicated R\&D facility at Bengaluru to manufacture radars


## STATE-OF-THE-ART FACILITIES

- 5 facilities in Hyderabad
- Continuous investment in World Class Infrastructure for Assembly, Functional and Environment testing. Astra's facilities are approved by several foreign companies for production


## LONGSTANDING RELATIONSHIP WITH CUSTOMERS

- Recognized as a qualified vendor by defense research establishments
- Clientele includes Indian Government Laboratories, Indian Defense
- Public Sector Undertakings, Indian Space Research Organization and many foreign OEM's


## Poised for Strong Growth Amidst Sectoral Tailwinds



## Leadership

## Significant Equity Holders

## Business \& Technology Team

## \& Directors



PA Chitrakar
Non-Executive Director
Head of R\&D


Atim Kabra
Executive Director
Strategy \& Business Development


Dr. Avinash Chander
Chairman \& Independent Director


Kiran Dhingra
Independent Director

S. Gurunatha Reddy

Managing Director

Maram Venkateshwar Reddy
Joint Managing Director


## Journey so far

## $30+$ Years of Astra Microwave Products Ltd.



Astra Microwave Products Ltd. Radar Electronics | Electronic Warfare | Missiles | Telemetry | Space | Meteorology | Hydrology | Telecom

## Offerings

Components \& MMICs

- Design
- Prototyping
- Testing \& Qualification
- Production



## Subsystems

BTS:

## Systems

- Design
- Manufacturing
- Integration
- Testing \& Qualification
- Installation \&

Commissioning


## Product Range

Astra has designed, developed and produced critical sub systems and systems for its customers for building various airborne, naval and ground based platforms.

Radar, Missile Electronics, Electronic Warfare, Satellites, MMIC and Communication

Defence

- Radars
- Electronic Warfare
- Missile Electronics
- Telemetry
- Counter-Drones


## Hydro/Meteorology

- Water Level Measurement (Bubbler/ Radar Sensor)
- Automatic Weather Stations (AWS)
- Agromet Met Stations (AMS)
- Automatic Rain Gauge (ARG) X Band Doppler Weather Radar


## Space

- Flight Model Application
- Ground based

Application

- INSAT MSS Terminals


## Other areas of work

- Antennas
- MMIC
- Contract Manufacturing
- Homeland Security


## Expertise \& Capabilities of AMPL (1/2)

## Radar

- Design \& development of Gallium Arsenide (GaAs) and Gallium Nitride (GaN) TRMs across all frequency bands VHF, UHF, L, S, $\mathrm{C}, \mathrm{X}, \mathrm{Ku}$ and Ka band with various power levels.
- Design and development of all kind of radar sub-systems including power amplifiers, receivers, exciters, filters, synthesizers, converters etc.
- In-house development of Signal Processing \& Radar Data Processor
- Only Indian Company with proven capability of developing Active Array Antenna Unit (AAAU) for airborne radars of fighter aircraft - Uttam Radar for LCA Mk IA. Variant of Uttam with GaN TRMs is proposed for modernising existing radars of Su-30 Mk I and for future LCA Mk 2 and AMCA fighter aircrafts
- AMPL is developing Pulse Phased Array Tracking Radar, AAAU for Ship Borne Radars, DBF based Counter Drone Radar, Bird Detection \& Monitoring Radars, Telemetry Tracking System and manufacturing Coastal Surveillance Radars, Counter Drone Radar and Ground Penetration Radars
- AMPL has been supplying Wind Profile Radars, Doppler Weather Radars, Automatic Weather Stations to IMO


## Electronic Warfare (EW)

- AMPL has been supplying various kind of EW sub systems and components to DPSUs, such as Direction finding Receivers, Passive Homing Head for RF Seekers used in NGARM, Jammers, Filters, Amplifiers, Receivers etc.
- AMPL has been EW sub-systems and components to programs of Indian Airforce, Indian Navy and Indian Army. AMPL has been associated with Jammer's program of LCA and other fighter platforms in India.


## Telemetry

- Astra has been supplying various sub-systems for Telemetry applications such as S- Band FM Transmitter Airborne RF Trans receiver, Ground Up Down Converters, C \& S band switch antenna systems, Telemetry Tracking Systems etc.
- Astra has been supplying telemetry sub-systems to LCA and Intermediate Jet Trainer (IJT) aircraft.



## Expertise \& Capabilities of AMPL (2/2)

## Missiles



- Leading company in India to design, develop and supply Radio Proximity Fuze, Airborne Diplexer, Transponder, transmitter, Command Guidance Unit, HAPS etc
- AMPL has developed Solid-State High-Power Amplifiers in Ku-band to replace Multi Beam Klystrons used in AMPL \& Akash NG missiles
- It has been associated with the program to develop AESA Seekers for SLCM \& AMPL missiles
- New generation Course Correction Electronic Fuze has been added for smart ammunition
- AMPL has taken up the development of TeraHertz Proximity Sensor with DRDO which is an advanced version of proximity
- sensor for guided weapons


## Satellites

- AMPL has been supplying various key microwave subsystems for ground and space based or payload applications
- It has supplied critical TR modules for Synthetic Aperture Radars (SAR) used in RISAT Satellites
- AMPL can provide required microwave electronics for launch vehicle sub-systems for private sector players
- AMPL has been a part of NAVIC module which has immense scope of application going ahead


## SATCOM

## AEW\&CS

- AMPL has been supplying MSS terminals for communication during disasters
- AMPL has supplied complete gamut of Radar, EW \& Datalink products for AEW\&CS-1 developed by DRDO





## Growing defence products opportunity

India's extensive modernisation plans, an increased focus on homeland security to increase government allocation for defence expenditure along with Make in India focus are expected to drive healthy growth in the sector.

Growing Defence Budget (in Bn \$)


India is the 3rd largest military spender

Defence Budget Components - FY22

Source: Ministry of Defence, various news articles

## Business Potential till 2028



The Indian government has taken various initiatives to promote on indigenization in this space:

## Atma Nirbhar Bharat <br> Imports Embargo

The Indian government has set the defence production target at USD 25 bn by 2025 (including US\$5 bn from exports by 2025)
ISRO has planned multiple deep space and experimental missions to strengthen India's position in global space industry through new technology development

Indigenous shipbuilding with a remarkable increase in capability and programme fulfillment
Defence Acquisition Procedure, 2020

| Category | Indigenous Content (IC) |
| :--- | :--- |
| Buy (Indian-IDDM) | Indigenous design and $\geq 50 \%$ |
| Buy (Indian) | In case of indigenous design $\geq 50 \%$ <br> Buy and Make (Indian) |
| $\geq 50 \%$ of the 'Make' portion Category <br> Buy and Make | not present |
| Buy (Global - | $50 \%$ or more |
| Manufacture in India) | Foreign Vendor - Nil/ Indian Vendor <br> Foreign Vendor |

## Total Addressable Market

Major opportunities for AMPL of around Rs 24,000-25,000 Crs across all sectors till FY28.


## Esteemed Clientele



## Robust Order Book



## Performance Highlights



## Margins

## Standalone Profit \& Loss

| PARTICULARS (Rs. In Cr) | Q3FY23 | Q3FY22 | YOY | 9MFY23 | 9MFY22 | YOY |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Revenue from Operations | 218.9 | 199.1 | 9.9\% | 550.9 | 496.1 | 11.1\% |
| Raw Material Consumption | 128.9 | 139.2 |  | 335.3 | 353.0 |  |
| Gross Profit | 90.0 | 59.8 | 50.5\% | 215.7 | 143.1 | 50.7\% |
| Gross Profit Margin | 41.1\% | 30.0\% | 11.1\% | 39.1\% | 28.8\% | 10.3\% |
| Employees Expenses | 24.4 | 18.4 |  | 61.9 | 50.1 |  |
| Other Expenses | 12.6 | 15.2 |  | 35.4 | 35.1 |  |
| EBITDA | 53.0 | 26.2 | 102.2\% | 118.4 | 57.9 | 104.4\% |
| EBITDA Margin | 24.2\% | 13.2\% | 11.0\% | 21.5\% | 11.7\% | 9.8\% |
| Other Income | 1.6 | 1.3 |  | 4.7 | 5.2 |  |
| Depreciation | 5.9 | 5.8 |  | 17.1 | 15.5 |  |
| EBIT | 48.6 | 21.7 | 123.8\% | 105.9 | 47.6 | 122.5\% |
| EBIT Margin | 22.2\% | 10.9\% | 11.3\% | 19.2\% | 9.6\% | 9.6\% |
| Finance Cost | 7.8 | 5.4 |  | 19.8 | 15.6 |  |
| Profit before Tax | 40.8 | 16.3 | 149.8\% | 86.1 | 32.0 | 169.3\% |
| Profit before Tax Margin | 18.6\% | 8.2\% | 10.4\% | 15.6\% | 6.4\% | 9.2\% |
| Tax | 10.5 | 4.2 |  | 21.8 | 7.3 |  |
| PAT | 30.3 | 12.1 | 149.8\% | 64.3 | 24.7 | 160.2\% |
| PAT Margin \% | 13.8\% | 6.1\% | 7.7\% | 11.7\% | 5.0\% | 6.7\% |
| EPS (in Rs.) | 3.50 | 1.40 |  | 7.42 | 2.85 |  |

## State of the Art Infrastructure

Astra has advanced in-house facilities for lower turnaround time for product realization appreciated by domestic and foreign customers.


## State of the Art Infrastructure

## Assembly Infrastructure

## Functional Testing

- 450,000 sq.ft. of research, design,
- Near Field Test Range (NFTR)


## Environment Testing

- EMI/EMC Test facility
development and manufacturing across 6 units

Digital Signalling

- HASS/HALTChambers
- Environment Chambers (-650C to +1750C;

98\% RH)

- Vibration systems
- WeissChamber

Function and pulse generators

- Open air antenna test range
- Spectrum Analyzers, Vector Network

Ray, and functional test using Flying probe
tester.

## meter

- DistortionAnalyzer
- Class 10000 clean rooms
- Laser Welding
- SMTLines
- ATE-ATS facility
 $m=\square$


SMT Lines

## Strong R\&D Capabilities

Through its focus on R\&D, the company develops innovative designs useful for the manufacture of cost-effective products.


## Dedicated Facility <br> in Bengaluru



## Key product developments

Strong track record of new product development and seamless execution leading to new orders.

Defence - Developed sub-systems for various defence programs and new technologies in India for radars such as Ashlesha, LRTR, CSR, AESA radars, BFSR, 3D-CAR, AEW\&C and electronic warfare equipment

Space - Developed sub-systems for India's RISAT \& GSAT program, Resourcesat, Megatronics, Cartosat.

Meteorology - Developed and manufactured DWR (Doppler Weather Radar), Wind Profiler Radar (WPR), automatic weather stations along with met towers, Agromet towers, hydrology stations.

Total workforce (as on March 31st, 2022) - 1,240


Astra has a highly experienced workforce (including 401 technocrats of which two are Doctorates) which keeps the company on forefront of technology. Its employees are continuously trained through Inhouse workshops and external programs.

## Serving Markets Through

## Build To Specifications (BTS) Orders

The company's strong relationship with large corporations builds its brand equity and helps it in establishing itself as a prime contractor for large and longer-term programs in the marketplace. AMPL works on high-value complex projects awarded by companies.

- Receipt of order from the customers (such as government research rganisations - Domestic \& Foreign, private entities etc.)
- Customers provide the electrical and mechanical specifications of the modules or sub-systems as per their system requirements

- Work with the customer team to specify the target specifications of the required module or sub system presenting the system presenting the
various options and lates technologies involved to finalize the target specifications.

Realization of the
product

- Realizing the product using the engineering expertise in-house and deliver a fully qualified deliver a fully qualified product (airborne, naval or ground application) to its customers.

Approval from
Authority
Once the system is qualified by the customer production orders are released.

## Receipt of orde from OEMs

- Works with systems integrators like DPSUs (Defence Public Secto Undertakings) and others for commercialization of the products


## Build To Print (BTP) Orders

Astra Microwave has produced more than USD 150 million worth of high-end modules under BTP route.

Receipt of order
from global OEMs

- Works with many foreign OEMS for producing thei products in India under this mode for meeting their offset requirements.
- Key customers include Elta Systems Ltd, ELBIT, Rafael, Thales.

- Once the prototype is approved by the OEM, production commences.

Production
Production based on designs shared by OEMs

Production linked revenues

Marginal value addition - Acts as a capacity filler

## Strategy for Growth



New product development
To accelerate growth

Develop products in close association with government research organizations for defence and space.

Gol has introduced policy measures promoting Indigenous shipbuilding.

Grow business by producing new and innovative products.

Enter commercial end user markets for radars.


Focus on Research \& Development


Joint Ventures and Strategic alliances

## Reap benefits of

 sectoral tailwindsInvest in modern technology and equipment's to address changing industry trends and customer requirements.

Leverage strong R\&D base to broad base domestic offerings.

Developing digital expertise by spending more on R\&D.

Through JV or strategic alliances, offer improved technology and products.

Target the offset requirement in large defence procurement programmes of Gol.

Exploring the areas in the anti drone, EW, satellites, SDRs and electro-optics through JVs.

In discussion with our JV partners
to expand the origin 21.30 like in the SDR product portfolio to develop EO (electro-optics) product line.

By doing extensive investments to strengthen our position as a systems vendor.
Bidding for the whole system -
the complete radar system - for
both DRDO and for future MoD
requirements.

Atma Nirbhar Bharat initiative is To encouraging the industry develop the system either through in-house development or through foreign technology tie-up.

## Opportunities

Various government initiatives are encouraging the industry to develop the system either through in-house development or through foreign technology tie-up.

Astra in alliance with System Knowledge of its partners aims to deliver the product that meets Government thrust on Atma Nirbhar Bharat.

Getting opportunity from the Services to build for the intersystems.
Indian industries are getting opportunities to develop and supply products which are published as negative import list by GOI.
Wide Array of
Opportunities
dueto
Government Initiatives

Astra will utilise its skill on design and production of high-end defense equipment in India and would also cater to the after-sale support.

Indigenous integrated and strategic defence and aerospace electronics solutions provider which is well positioned to benefit from the Atma Nirbhar Bharat inititative.

We aim to achieve 70\% Domestic 30\% Export Revenue distribution over next 2-3 years. Domestic business on an average carries 40 to $45 \%$ of gross margin as against 8 to $10 \%$ gross margin in exports.


## Competitive landscape

|  | Systems | Supplied >25 Radars | Sub-Systems | Components | MMIC | Planar Antenna Testing (NFTR) |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| BDL | ( |  |  |  |  |  |
| BEL | ( | ( | ( | ( | ( | ( |
| L\&T | ( |  |  |  |  |  |
| Mahindra Defence | ( |  |  |  |  |  |
| Bharat Forge | ( |  | ( |  |  |  |
| Adani Defence | ( |  | ( |  |  |  |
| Astra Microwave | - | ( | - | ( | ( | - |
| Paras Defence | ( |  | ( |  |  |  |
| Data Patterns | ( |  | ( | ( |  |  |
| Centum Electronics |  |  | ( | ( |  |  |
| CoreEL |  |  | ( | ( |  |  |
| Mistral |  |  | ( | - |  |  |
| Alpha Design | ( |  | ( | - |  |  |
| TASL | ( |  | ( |  |  |  |

## ANNEXURE

## Standalone Profit \& Loss

| PARTICULARS (Rs. In Cr) | FY22 | FY21 | FY20 | FY19 | FY18 |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Revenue from Operations | 735.0 | 589.2 | 461.6 | 286.2 | 360.5 |
| Total Raw Material | 524 | 418 | 267 | 159 | 152 |
| Gross Profit | 211.2 | 170.7 | 194.7 | 126.9 | 208.5 |
| Gross Profit Margin | 28.7\% | 29.0\% | 42.2\% | 44.3\% | 57.8\% |
| Employee Expenses | 73 | 64 | 66 | 61 | 66 |
| Other Expenses | 51 | 42 | 45 | 36 | 33 |
| EBITDA | 86.9 | 64.2 | 83.8 | 29.8 | 109.5 |
| EBITDA Margin | 11.8\% | 10.9\% | 18.2\% | 10.4\% | 30.4\% |
| Other Income | 7 | 12 | 12 | 24 | 8 |
| Depreciation | 22 | 23 | 25 | 29 | 27 |
| EBIT | 72.6 | 52.8 | 70.5 | 25.7 | 90.9 |
| EBIT Margin | 9.9\% | 9.0\% | 15.3\% | 9.0\% | 25.2\% |
| Finance Cost | 20 | 21 | 8 | 9 | 12 |
| Profit before Tax | 52.7 | 31.4 | 62.7 | 16.7 | 78.9 |
| Profit before tax margin | 7.2\% | 5.3\% | 13.6\% | 5.9\% | 21.9\% |
| Tax | 12 | 7 | 15 | 4 | 18 |
| PAT | 40.3 | 23.9 | 47.3 | 12.5 | 60.7 |
| PAT Margin \% | 5.5\% | 4.1\% | 10.3\% | 4.4\% | 16.8\% |
| EPS (Rs.) | 4.65 | 2.76 | 5.47 | 1.45 | 7.01 |

## Standalone Balance Sheet



## Subsidiaries \& JV

## Subsidiaries

- BEPL is a fully owned subsidiary of Astra Microwave
- Established with State-of-the-Art manufacturing \& test facilities to meet Global Standards. This combined with experienced man power \& stabilized processes ensure that the needs of various Industry Segments can be met easily
- A dependable player with excellent technological capabilities and a long-term commitment to the defense, aerospace, medical and industrial electronics industry
- Products are known for ruggedness and reliability and conform to the latest quality standards. BEPL can handle both high-mix, low/medium volume products as well as high volume production for our customers.



## Capabilities

## Engineering <br> Capabilities

## Research \& Development

- Expertise in development of critical products for Radar, EW, Missile, Telemetry and Space Elx
- PCB Design
- Mechanical design \& simulation
- ATE design
- Test validations
- Environment \& EMI/ EMC qualification
- Antenna Testing \& Calibration


## Digital System R\&D <br> Capability <br> 80+ R\&D Manpower in Digital domain

- Xilinx Alliance Partner
- Hardware Design
- Firmware Development
- Software Development
- Algorithm Development and simulation
- GUI development
- Real Time Operating System
- System Level Integration
- Inhouse Cadence team for RF \& High speed Digital PCB design including SI, PI and Thermal Analysis


## Test Facilities

- Near Field Test Range (NFTR)
- Open Air Antenna Test Range
- Far Field Test Range (RF Anechoic Chamber)
- EMI/EMC Test Facility
- Vibration/Shock Machine/ Bump Test Facilities
- HASS Chamber
- ATE and ATS Facilities
- Other Facilities
- Multilayer Microstrip Antenna Assembly Facility
- Thermovac Facilities
- Laser Welding Machine


## Quality Standards

- Compliant to AS 9100D
- Inward Inspection
- In-process Inspection
- Final Inspection
- Counterfeit part control
- Reliability Engineering
- Reliability prediction and estimation
- FMECA \& FRACAS
- Process standardization


## Products: Defence

## Radar Electronics

- Active Antenna Array Units - L, S,C,X,Ku-Bands
- TR Modules- V/UHF, L, S, C, X, Ku and Ka-Bands
- Wideband TR modules
- Solid State Power Amp lifiers
- Receiver Exciters upto Ka Band
- Central Units- L \& S Bands
- Antenna Beam forming units
- All receiver subsystems
- Array Group Receivers
- Monopulse Receivers
- Waveform Generators
- Own MMIC's


## Electronic Warfare

- Antennas
- EDLVA and BLI Super

Components

- EW Simulators
- DIFM Receivers
- Front End Receivers
- Up/down converters
- Homodyne Receivers


## Missile Electronics

- Command Guidance Units
- Radio Proximity Fuze
- L, S, C \& X-Band Transponders
- Phased Array based Telemetry

Tracking System

- Sub-systems for Gimbal based and AESA Seeker
- Ground and Air-borne data link systems


## Telemetry

- Data and Video Telemetry transmitters, transponders, encoders \& decoders
- Telemetry Receivers

Products



AAAU for Naval Radar
AAAU for Naval Radar


Phased Array Telemetry System (PATM)- ITR, DRDO
 Counter Drone System
Received (LATOT from DRDO)
 Bird Detection
Monitoring Rada


## Products: Meterology

## Ground-based

- Water Level Measurement (Bubbler/ Radar Sensor)
- Agromet Meteorological Stations (AMS)
- Automatic Rain Gauge (ARG)
- Automatic Weather Stations (AWS)
- Mini boundary layer masts
- 50 m tower masts
- Agro met towers


Agro-Meteorology


Weather Monitoring Station


Flood Monitoring Station


Meteorology Radar Systems


Data Buoy


Avalanche Radar


1 kW VHF TRMs:
NARL (MST Radar)


Multi Mission Met Data Rx \& Processing System (MMDRPS) : Antrix/IMD


Wind Profiler Radars: NARL


53 MHz ST Radar: Kolkata University

## Products: Space

## Ground-based

- Sub-systems for Multi-object Tracking Radar
- Coherent frequency generators
- L-band modulators
- $8 x 8$ switchable routers for earth station
- V/UHF T/R modules for ST radar
- Ka-band indoor/outdoor units


## Flight Model

- Sub-systems for SAR Payloads
- Sub-systems for

Geostationary Satellites

- Sub-systems for Remote

Sensing Satellites

- Fabrication of Flight sub systems
- Screening of components of FM
- Examples:
- C-band T/R modules
- SSPA
- X-band phase shifter, power amplifier
- S-band transmitter


## Association

Proud to be associated with every major satellite launch in India

- RISAT, RISATIA
- GSAT Series
- HTS GSAT Series (GSATII, GSAT19)
- ASTROSAT
- GISAT
- IRNSS
- Ka band payload GSAT-20 and
- Remote sensing satellites of ISRO
- Mega tropics
- Cartosat
- Resourcesat
- SARAL


## Defence Satellite Programs

- Kautilya (EMISAT):

Development of Quad
Super Het Rx (0.5-18 GHz)

- Anvesha : Development of Communication Modules


## Navigation

- Integrated NavIC \& GPS

Receivers - MEITY

## Major Opportunities: Radar Programs



## Indian Air Force



## Bharat Electronics

Program:
Mountain Radar
Opportunity: Rs
130 Cr
Timeline: FY26
Product:


## HAL

Program: Uttam Product:
AESA Radar (LCA Mk 1A)
Opportunity: Rs 450 Cr
Timeline: FV25-27

## HAL

Program: Uttam Product:
AESA Radar (LCA
Mk2)
Opportunity: Rs 300 Cr
Timeline: FY28-30

HAL
Program: Uttam Product:
AESA Radar (Su-30
Mk I)
Opportunity: Rs
$1,000 \mathrm{Cr}$
Timeline: FV26-30

## DRDO

Program: Long
Range Radar
(LRR)
Opportunity: Rs
1,000 Cr
Timeline: FY24

## DRDO

Program: LRSAM Product:
Radar
Opportunity: Rs
500 Cr
Timeline: FY24


## Major Opportunities: Radar Programs



## Major Opportunities: Missiles




## Major Opportunities

## EW



## Bharat Electronics

Program: EW Products Opportunity: Rs 230 Cr Timeline: FY25-27

## Bharat Electronics

Program: DR118-DST, MASS,
BIT for Su-30 MkI
Opportunity: Rs 250 Cr
Timeline: FY24-26

## Space

MoD, ISRO, Satellite Users
Program: SAR, Commn.
Payload Satellites
Opportunity: Rs 925 Cr
Timeline: FY24-30

Product:


## Major Opportunities

## Systems



## Special Projects



## State Govts for Survey of India

Program: CORS
Receiver
Opportunity: Rs
500 Cr
Timeline: FV25-30

MoD, MHA, State Police

## Program:

Robotics
Opportunity: R 75 Cr
Timeline: FY25-30

Smart Cities, NHAI and state traffic Police Dept Program: 70 GHzITS Product: Radar Timing Receiver Opportunity: Rs 100 C Timeline: FV25-30

## Quality certifications

## Industry Leading Certifications



## Awards \& Accolades



LAToT Ceremony for
Coastal Surveillance Radar


Excellence in Innovation, Design Technology, R\&D 2021


Counter-Drone System LAToT Handing over Ceremony


Award for Excellence in Aerospace Indigenisation-2021


ELCINA EFY Award for
Business Excellence

## CSR

Our Contribution towards the Society


Funds provided to technology incubators

## Rural development

 projects

## Thank You

## For more information please contact:

$\square$
Astra Microwave Products Ltd.
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