The Defence Electronics Company
with commitment to Quality, Technology and Innovation
Bharat Electronics Limited

Domain knowledge, the capability to design and manufacture products that suit the exacting standards of the Indian Defence Forces and long-term customer support make up the core competence of Bharat Electronics Limited (BEL), a name that’s synonymous with defence electronics in India.

Guided by a vision to make the country self-reliant in strategic electronics, BEL was established in Bangalore in 1954 by the Government of India under the Ministry of Defence (MoD). Starting with the manufacture of a few communication products, BEL now designs and manufactures a host of products in the areas of Military Communication, Radars, Naval Systems, Weapon Systems, GH Systems, Electronic Warfare, Avionics, Tank Electronics, Electro Optics, Shelters, Telecom & Broadcast, Professional Electronic Components and Solar Photovoltaic Systems.

A Navratna Public Sector Undertaking BEL is India’s foremost defence electronics company. While defence continues to contribute to nearly 80 to 85% of the Company’s revenue, BEL has expanded its horizons beyond defence electronics and touched a chord with the common man through civilian products like the Electronic Voting Machines, Tablet PC and solar-powered traffic signalling systems and solar power systems.

BEL has extensive design and manufacturing infrastructure and a highly skilled workforce spread over its 9 Units located across the country. The Company maintains its technological leadership with strong in-house R&D at all its Units, backed by two Central Research Laboratories, and in association with DRDO & other leading defence labs.

BEL exports its products and services to various countries. BEL has seven AS9100 certified Strategic Business Units, which can cater to the offset requirements of defence and aerospace majors. The Company offers electronic manufacturing facilities on ‘Build to Print’ and ‘Build to Spec’ basis.

... BEL offers wide range of products, systems and solutions to its valued customers ...
Empowering the Nation’s Defence Forces

PRODUCT PROFILE

NAVAL SYSTEMS
- Radar Systems
- Sonar Systems
- Fire Control Systems
- Communication Systems

LAND BASED RADARS
- Surveillance Radars
- Tracking Radars
- Fire Control Radars
- Secondary Surveillance Radars

WEAPON SYSTEMS
- Akash
- Upgraded Schilka
- LR SAM
- MR SAM
- SR SAM
- NAMICA

MILITARY COMMUNICATION
- Tactical Radios
- Radio Relays
- Military Switching & Networks
- Tactical Communication System
- Encryption Products

ELECTRONIC WARFARE & AVIONICS
- ELINT / COMINT / SIGINT Systems
- EW Systems
- Integrated & Networked EW Systems
- Digital Flight Control Computers
- Avionic Systems

TANK ELECTRONICS
- Weapon Stabilisers
- Drive Systems for Guns
- Fire Control Systems
- Land Navigation System
- Vehicle Intercom System
- NBC Protection System
- Fire Detection and Suppression System

ELECTRO-OPTICS
- Laser Range Finders
- Night Vision Devices
- Gap Measuring Devices
- Sighting Systems
- Integrated Observation Equipment

CIVILIAN PRODUCTS
- Electronic Voting Machines
- Weather Radars
- Broadcast Systems
- Solar Products
- Solar Powered Traffic Management Systems

COMPONENTS & SECURITY SYSTEMS
- Professional Electronic Components
- EW Supercomponents & T/R Modules
- Batteries and Fuel Cells
- Surveillance / Access Control Solutions
- X-Ray Systems

SIMULATORS
- Weapon Training Simulators
- Driving Simulators
- System Simulators

SHELTERS & MASTS
- Equipment Shelters for different platforms
- CBRN Shelter System
- Expandable Shelters
- NBC Shelters
- Pneumatic / Hydraulic Masts

C4I SYSTEMS
- C4I Systems for Army, Navy and Airforce
- Artillery Combat Management Systems
- Air Defence Combat Management Systems
- Naval Combat Management Systems
- Battlefield Surveillance and Management Systems
- Coastal Surveillance Systems
- Decision Support Systems

LAND BASED RADARS
- Surveillance Radars
- Tracking Radars
- Fire Control Radars
- Secondary Surveillance Radars

WEAPON SYSTEMS
- Akash
- Upgraded Schilka
- LR SAM
- MR SAM
- SR SAM
- NAMICA

MILITARY COMMUNICATION
- Tactical Radios
- Radio Relays
- Military Switching & Networks
- Tactical Communication System
- Encryption Products

ELECTRONIC WARFARE & AVIONICS
- ELINT / COMINT / SIGINT Systems
- EW Systems
- Integrated & Networked EW Systems
- Digital Flight Control Computers
- Avionic Systems

TANK ELECTRONICS
- Weapon Stabilisers
- Drive Systems for Guns
- Fire Control Systems
- Land Navigation System
- Vehicle Intercom System
- NBC Protection System
- Fire Detection and Suppression System

ELECTRO-OPTICS
- Laser Range Finders
- Night Vision Devices
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- Integrated Observation Equipment

CIVILIAN PRODUCTS
- Electronic Voting Machines
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- Weapon Training Simulators
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SHELTERS & MASTS
- Equipment Shelters for different platforms
- CBRN Shelter System
- Expandable Shelters
- NBC Shelters
- Pneumatic / Hydraulic Masts

C4I SYSTEMS
- C4I Systems for Army, Navy and Airforce
- Artillery Combat Management Systems
- Air Defence Combat Management Systems
- Naval Combat Management Systems
- Battlefield Surveillance and Management Systems
- Coastal Surveillance Systems
- Decision Support Systems
Empowering the Nation’s Defence Forces

MILITARY COMMUNICATION

- Tactical Radios
- Radio Relays
- Military Switching & Networks
- Tactical Communication System
- Encryption Products

Software Defined Radio

VHF (Frequency hopping) Radio, Stars V Mk II

HF Transreceiver

Handheld Radio VPS Mk III

Frequency Hopping Radio Relay (FHRR)

Outdoor Unit (ODU)  Indoor Unit (IDU)

Next Generation Bulk Encryption Unit
Empowering the Nation’s Defence Forces

We cover the entire spectrum

VLF/HF Receiver
HF Transceiver (20W)
VHF Transceiver
VHF Base Station/Repeater
UHF Radio Relay (LB & HB)

10KHz 100KHz 1MHz 30MHz 100MHz 136MHz 400MHz 512MHz 1GHz 2GHz 6GHz

VLF Receiver
HF Transceiver (100W)
VHF Transceiver
V/UHF Transceiver
UHF Base Station/Repeater
FHRR
HCRR
LAND BASED RADARS

- Surveillance Radars
- Tracking Radars
- Fire Control Radars
- Secondary Surveillance Radars

3D Tactical Control Radar

Battery Level Radar

Weapon Locating Radar

Central Acquisition Radar - ROHINI
NAVAL SYSTEMS

- Radar Systems
- Sonar Systems
- Fire Control Systems
- Communication Systems

3D Low Level Light Weight Radar - ASLESHA

3D Surveillance Radar - REVATHI

Low Level Light Weight Radar - BHARANI

HUMSA-NG
Empowering the Nation’s Defence Forces

### NAVAL COMMUNICATION SYSTEMS

#### Data Link - II System

#### Integrated Communication Network System

**Advanced Naval Gun Fire Control System (Lynx-U1)**

- **Tx/Rx Unit**
- **Display Unit**
- **Antenna & Pedestal**

**Downmast Navigation Radar (DNR)**

- **Tx/Rx Unit**
- **Display Unit**
- **Antenna & Pedestal**

**NAVAL COMMUNICATION SYSTEMS**

**Optical Link**

**Ku Band**

**C Band**

**GSAT-7**

- **UAVs**
- **Aircraft Terminals**
- **Small Ship Terminals**
- **Submarine Terminals**
- **Large Ship Terminals**

**HUB 1**

- Geographic redundant to Hub 1

**HUB 2**
C4I SYSTEMS

- C4I Systems for Army, Navy and Airforce
- Artillery Combat Management Systems
- Air Defence Combat Management Systems
- Naval Combat Management Systems
- Battlefield Surveillance and Management Systems
- Coastal Surveillance System
- Decision Support Systems

Coastal Surveillance System

Air Defence Control & Reporting System
Integrated Air Command & Control System

**WEAPON SYSTEMS**

- Akash
- Upgraded Schilka
- LR SAM
- MR SAM
- SR SAM
- NAMICA

**Akash Air Defence Weapon System**

**Upgaded L70 gun**

**Upgraded SCHILKA**
Empowering the Nation’s Defence Forces

ELECTRONIC WARFARE & AVIONICS

• ELINT/COMINT/SIGINT Systems
• RWR/ESM/ECM Systems
• Integrated & Networked EW Systems
• Digital Flight Control Computers
• Avionic Systems

Radar Warning Receivers

Avionics Products for LCA

ELECTRO OPTICS

• Laser Range Finders
• Night Vision Devices
• Gap Measuring Devices
• Sighting Systems
• Integrated Observation Equipment

Night Vision Products

Night Vision Monocular
Night Vision Binocular
Night Vision Goggles
Hand Held Thermal Imager - Uncooled
Advanced Uncooled Thermal Imager
Advanced Night Sight for Small Arms
TI Sight for Sniper & MMG
TI Sight for Fly Catcher Radar
Multi Function Hand Held Thermal Imager
Empowering the Nation’s Defence Forces

TANK ELECTRONICS

- Weapon Stabilisers
- Drive Systems for Guns
- Fire Control Systems
- Land Navigation System
- Vehicle Intercom System
- NBC Protection System
- Fire Detection and Suppression System

Integrated Observation Equipment

Gap Measuring Device - GMD Mk III

Laser Products

- Laser Range Finder
  - Air Defense
- Laser Designator
  - cum-Range Finder
- Integrated SurveillanceSight
- Laser Range Finder
  - with Sight
- Lightweight Laser Target Designator
- Eye Safe Laser Range Finder

Instant Fire Detection and Suppression System

Fire Wire
Alarm Unit
To 24 Volt Power Supply
Halon Cylinders with Pressure Guage
IR Detectors
Empowering the Nation’s Defence Forces

Advanced Land Navigation System (ALNS) for Armoured Fighting Vehicles

- Inertial Measurement Unit
- Control and Display Unit (CDU)
- Driver’s Display Unit (DDU)
- GPS Receiver (Position Indicator)

Commander’s Panoramic Sight for MBT-ARJUN

- Panoramic Sight Head
- Sight Electronic Unit
- Sight Control Unit

Gunner’s Main Sight for MBT-ARJUN

- GUNNER’S PRIMARY SIGHT
- GUNNER’S SIGHT ELECTRONICS UNIT
- GUNNER’S CONTROL DISPLAY
- COMMANDER’S CONTROL DISPLAY

T-90 Stabiliser

- Control Unit -K1
- Gyro unit
- Angle limiter
- Amplidyne
- Electric motor
- Elevation hydraulic system

Combat Net Radio
Empowering the Nation’s Defence Forces

TACTICAL COMMUNICATION SYSTEM

Backbone Network of TAC C3I System

DEFENCE MOBILE COMMUNICATION SYSTEMS

Mobile Satellite Services

Mobile Cellular Communication Network
Empowering the Nation’s Defence Forces

TELECOM & BROADCAST SYSTEMS

Digital Mobile Radio Relay (DMRR)

Satcom

- Distance Education
- Telemedicine
- Agriculture
- Internet Access
- e-Governance

Mobile Communication Terminals
Empowering the Nation’s Defence Forces

SHELTERS & MASTS

- Equipment Shelters for different platforms
- CBRN Shelter System
- Expandable Shelters
- NBC Shelters
- Pneumatic/Hydraulic Masts

CBRN Surveillance System

MIL grade ISO 20 ft Shelter

Mobile RecceLite Control System Shelter

BFSR-MR with Hydraulic Mast

2-3 Expandable Shelter
Empowering the Nation’s Defence Forces

COMPONENTS & SECURITY SYSTEMS

- Professional Electronic Components
- MW Supercomponents & T/R Modules
- Batteries and Fuel Cells
- Surveillance / Access Control Solutions
- X-Ray Systems

Hybrid Microcircuits

MW TUBES

- Coupled cavity TWT
- Mini TWT
- Klystron

Integrated Super Component

BE 80501 Embedded Flash Microcontroller

Vacuum Interruptors

Perimeter Intrusion Detection System (PIDS)

Closed Circuit Television (CCTV) Surveillance System
CIVILIAN PRODUCTS

- Electronic Voting Machines
- Weather Radars
- Broadcast Systems
- Solar Products
- Solar Powered Traffic Management Systems

MANUFACTURING FACILITIES

Super Components Assembly

X-RAY Inspection Machine

CNC Vertical Machine

Wave Soldering Machine

Solar Pumping & Lighting Systems

Solar Traffic Signal

Doppler Weather Radar

Electronic Voting Machine
Empowering the Nation’s Defence Forces

**QA FACILITIES**

- Electronic Assembly Line
- Pick & Place Machine
- Automatic Test Facility
- Walk-in Chamber
- Climatic Test Chamber
- EMI / EMC facility
- Thermal Cycling
BEL exports components, products and systems to several countries across the globe. BEL exports products like HF & VHF Communication equipment, Battlefield Surveillance Radar-Short Range, Opto-electronic products like Eye Safe Laser Range Finders, Night Vision Devices and solar products & components to countries in Africa, Latin America, Southeast Asia, SAARC, Middle East and CIS.

BEL is closely working with various global aerospace and defence companies to secure business under the mandatory Offset Clause in the RFPs for Indian defence procurement. These companies have visited BEL’s facilities and based on their feedback, necessary action has been taken to upgrade infrastructure and processes. Seven of BEL’s Strategic Business Units (SBUs) / Units have got AS 9100 certification to address the aerospace business. Further, efforts are being made to establish long-term supply chain relationships with global players.

Apart from the export of products and services, contract manufacturing business from USA and Europe is also being addressed on ‘Build to Print’ and ‘Build to Spec’ basis. BEL also offers turnkey system solutions like Coastal Surveillance Radar Systems.
RESEARCH & DEVELOPMENT

Research & Development (R&D) is BEL’s forte and focused attention is given to core technology areas like Radars, Communications, C4I Systems, Electronic Warfare and Electro Optics. BEL spends over 7% of its turnover on R&D. Over 1,600 engineers are engaged in R&D.

BEL has a three-tier R&D set-up comprising of Development and Engineering (D&E) Divisions at all its 9 Units, which develop products and associated technologies in their respective business segment; a Central D&E Division and two Central Research Laboratories (CRLs) at Bangalore and Delhi for carrying out futuristic, cutting-edge research.

BEL also interacts with other development agencies like DRDO, ISRO, CSIR, C-DOT, C-DAC, leading academic institutions like IITs, IISc and NITs and select multinational companies for joint development of technology.

The Company has an R&D Plan in place based on customers’ perspectives and the technology road map. A Knowledge Management Portal has been created to document all the R&D projects.

BEL’s constant quest to maintain technological leadership has ensured that over 80% of the turnover is from products developed indigenously.

QUALITY

BEL is committed to consistently deliver enhanced value to customers through continual improvement of products and processes. Right from inception, BEL has understood the quality and reliability requirements of its customers and has been striving to enhance their satisfaction level.

BEL has adopted the Total Quality Management (TQM) philosophy in 1990 under the acronym ‘TORQUE’ which stands for Total Organisational Quality Enhancement.

All Units / SBUs of the company have been certified for ISO 9001 Quality Management System and ISO 14001 Environment Management System. Seven Units / SBUs are also certified for AS 9100 Aerospace Standards. The Central Software Development group of the company has CMMi Level 5 certification.

BEL also accomplishes continual improvement of products and processes through deployment of Six Sigma methodology; key processes’ stabilization and capability improvement through Statistical Process Control techniques; reduction of cycle time in all transaction areas; improvement in quality of design through DFSS projects; employee motivation and empowerment through self-certification, QCC and Suggestion Schemes; introduction of lean manufacturing concepts to achieve on-time delivery; and customer satisfaction surveys to measure and improve the satisfaction level of customers.

The Company has adopted CII-EXIM Bank Business Excellence Model to improve its overall strategic and operational excellence.

The Bharat Electronics Quality Institute was set up in 1999 to impart education to the company’s officers, customers and suppliers on various facets of quality management.

The Corporate Standards Department established over four decades ago has evolved more than 4,000 standards on drafting, materials, systems & procedures, manufacturing processes, quality & workmanship, etc. These standards have provided effective support in design, manufacturing, vendor development and process standardisation.
A ‘CUSTOMER’ IS THE MOST IMPORTANT VISITOR ON OUR PREMISES. HE IS NOT DEPENDENT ON US. WE ARE DEPENDENT ON HIM. HE IS NOT AN INTERRUPTION ON OUR WORK. HE IS THE PURPOSE OF IT. HE IS NOT AN OUTSIDER ON OUR BUSINESS. HE IS A PART OF IT. WE ARE NOT DOING HIM A FAVOR BY SERVING HIM. HE IS DOING US A FAVOR BY GIVING US AN OPPORTUNITY TO DO SO.

•MAHATMA GANDHI
For any Customer Queries / Complaints:

Call us at BSNL / MTNL
Toll Free Number: 1800 425 0433

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