

India Electronic Warfare Market Report 2026 – 2035

Market Size, Forecast, Key Players & Defence Programmes
(EW, SIGINT, Counter-UAS)



EW
ELECTRONIC
WARFARE



SIGINT
SIGNALS
INTELLIGENCE



COUNTER-UAS
COUNTER
UNMANNED AERIAL SYSTEMS

WHY NOW

Post-Sindoor demand for EW and counter-EW is surging; the domestic RF base is thin and undocumented.

REPORT EDITION

FY 2026 | Horizon: 2025-2035
Pages: 165+

PUBLICATION

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Strategic Intelligence

PREMIUM STRATEGIC INTELLIGENCE REPORT

INDIA DEFENCE INDUSTRIAL BASE | SERIES I

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About Techadyant Labs

Techadyant Labs is the strategic-intelligence research division of TechAdyant Private Limited, an Indian defence-technology and engineering firm headquartered in Belagavi, Karnataka. Founded in 2026 by an Indian Army Ordnance Corps veteran, Techadyant Labs was established with a single editorial conviction: India's defence-industrial conversation has been chronically underserved by rigorous, sub-component-level strategic intelligence. The Labs exists to close that gap.

Where mainstream Indian defence commentary tends to cluster at the platform level — fighters, tanks, ships — Techadyant Labs' research descends to the component, subsystem, and material layer. It maps the RF, semiconductor, optical, propulsion, and seeker supply chains that actually determine whether a programme executes on time, on budget, and at scale. This sub-system perspective is what distinguishes Techadyant Labs' publications from conventional industry reports.

Editorial Mission

Techadyant Labs publishes premium strategic-intelligence reports that meet the rigour, design, and analytical standards of Tier-1 global strategy consultancies such as McKinsey Global Institute, PwC Strategy&, Bain & Company, Deloitte Insights, BCG Henderson Institute, and Roland Berger. Each publication is engineered to be publication-ready, internally consistent, and free of the marketing language and AI-generated phrasing that has come to characterise much of the open-source defence commentary.

Research Coverage

Techadyant Labs' research agenda covers six interlocking domains:

- RF, microwave, and millimetre-wave component industrial base — GaN/GaAs MMICs, T/R modules, RFICs, filters, oscillators, radomes, and test equipment.
- Semiconductor ecosystem — commercial and defence fabs, OSAT/ATMP capacity, fabless design houses, specialty materials, and the impact of the PLI scheme.
- Electronic warfare programmes — airborne self-protection, stand-off jamming, naval EW, land EW, and the cognitive-EW transition.
- SIGINT / COMINT / ELINT — strategic and tactical collection, signal processing chains, and ground-station architecture.
- Unmanned warfare and counter-UAS — drone RF links, autonomous swarm RF, soft-kill and hard-kill counter-drone systems, and the spectrum dimension of drone warfare.
- Defence-industrial policy — DAC/AoN pipeline tracking, Make-I/II category analysis, procurement cycle benchmarking, and export-control regimes (SCOMET, Wassenaar, MTCR).

Methodological Approach

Techadyant Labs' methodology combines primary document analysis (Ministry of Defence annual reports, Parliamentary Standing Committee on Defence reports, DRDO publications, BEL and Astra Microwave annual reports, BSE/NSE filings), secondary research (Janes, IISS Military Balance, SIPRI, CSIS, RUSI, IDSA, CLAWS, CENJOWS), structured expert interviews where available, and proprietary modelling. Where estimates are used, assumptions are stated explicitly. Where data gaps exist, they are flagged in the research notes.

Editorial Note

India's electronic-warfare and SIGINT industrial base is the most strategically consequential—and least documented—segment of the country's defence-industrial ecosystem.

In any future conflict India fights, whether with Pakistan, China or both, the kinetic fight will be preceded, shaped and in large measure decided by what happens in the radio-frequency spectrum. Airborne strike packages do not survive modern integrated air-defence systems without capable self-protection jammers. Naval task groups cannot defend against anti-ship cruise-missile salvos without decoys and noise jammers. Land formations cannot manoeuvre under persistent drone surveillance without tactical COMINT and counter-UAS RF capability. Satellite communications do not survive a contested environment without anti-jam waveforms. Spectrum superiority is the precondition for every kinetic operation India will fight.

Yet despite the government's clear strategic priority on indigenous defence production, the RF, MMIC and EW software layers remain chronically dependent on imported subsystems and a thin domestic supplier base. Operation Sindoor—the 87-hour Indo-Pakistani clash of May 2025—made that dependence operationally visible. Pakistani Chinese-origin CHL-906 jammers defeated roughly 70 per cent of Indian indigenous drones in the conflict's first 48 hours. A September 2025 trial of 46 indigenous UAV vendors in Dehradun, conducted under GPS-denied conditions, produced zero qualifying passes. The Defence Secretary responded with a ₹10,000-crore EW-hardened prototype fund. In the twelve months since Sindoor the Ministry of Defence has committed more than ₹70,000 crore to EW line items—procurement velocity rarely seen in Indian defence acquisition.

This report is the first systematic, sub-component-level strategic intelligence publication on India's EW and SIGINT industrial base. It is written for CXOs, government officials, defence planners, investors, venture capital and private equity firms, startup founders, policymakers, corporate strategy teams and industry analysts. It answers four questions:

1. What does the Indian EW/SIGINT industrial base actually look like at the component, subsystem and system layer?
2. Where are the strategic gaps—and which of those gaps are commercially addressable?
3. How does the threat environment, particularly the China-Pakistan axis, shape the investment thesis?
4. What should the reader do over the next ten years to position for, or defend against, the outcomes identified here?

The report follows a consistent analytical spine: Situation–Complication–Analysis–Evidence–Strategic Insight–Implications–Recommendations–Future Outlook–Key Takeaways. Every chapter opens with its conclusion, supports that conclusion with evidence, draws out the implications, and closes with recommendations and a key-takeaways box. The Executive Summary is built on the McKinsey SCR (Situation–Complication–Resolution) framework and is designed to stand alone as a 15-page brief. The accompanying Excel workbook contains the underlying company database, startup database, policy tracker, funding database, market-sizing model and forecast assumptions. Every chart and diagram is also supplied as editable SVG and high-resolution PNG.

This is a vendor-neutral publication. Techadyant Labs appears only where its analytical capability is materially relevant—as publisher. Every other company, programme and product is assessed on its merits. Claims have been cross-corroborated across multiple sources wherever possible; data gaps are flagged explicitly. The Methodology and Research Notes appendices document every assumption.

— *The Editorial Team*

Techadyant Labs, July 2026

How to Read this Report

This report is engineered for executive consumption. Every chapter follows a consistent structure, every exhibit has a purpose, and every analytical conclusion is supported by evidence or explicitly stated assumptions. The reading paths below are optimised for different reader profiles.

Report Architecture

The report is structured in five layers: front matter (cover, copyright, disclaimer, about, editorial, how-to-read, table of contents, list of figures, list of tables, glossary, abbreviations); executive summary (a standalone 15-page SCR brief); twelve substantive chapters covering strategic context, the RF component base, EW programmes, SIGINT, counter-EW, spectrum policy, the private sector ecosystem, the Sino-Pak threat axis, export and Quad alignment, investment thesis, strategic recommendations, and future outlook; appendices A through K (company, startup, policy, and funding databases; technology glossary; standards; international comparisons; references; methodology; research notes; and the publisher capability map); and back matter.

Recommended Reading Paths

Reader profile	Recommended path
CEO / Minister (15 min)	Read the Executive Summary. Skim Chapter 1 (Strategic Context), Chapter 11 (Strategic Recommendations), and Chapter 12 (Future Outlook).
CXO / Corporate Strategy (60 min)	Read Executive Summary + Chapters 1, 7, 10, 11, 12. Use the company and startup databases (Appendices A and B) as reference.
Defence planner / MoD official (3 hours)	Read Executive Summary + Chapters 1, 3, 5, 6, 8, 11. Use the policy database (Appendix C) and capability gap matrix (Chapter 11) as decision aids.
Investor / VC / PE (90 min)	Read Executive Summary + Chapters 2, 7, 10, 11. Use the investment thesis bubble chart (Chapter 10) and startup database (Appendix B) for deal-screening.
Startup founder (90 min)	Read Executive Summary + Chapters 2, 5, 7, 10, 11. Use the capability gap matrix (Chapter 11) and procurement timeline (Chapter 1) for product-market fit analysis.
Industry analyst (full report)	Read the report end-to-end. Appendices contain the supporting data tables; the Excel workbook contains the master datasets, forecasts, and charts-source-data.

Chapter Structure

Every chapter opens with a chapter-level executive takeaway — a single-paragraph summary of the chapter's central conclusion. Each chapter then follows the Situation-Complication-Analysis-Evidence-Strategic Insight-Implications-Recommendations-Future Outlook framework. Chapters conclude with a Key Takeaways box.

Exhibits — figures, tables, callouts, and SCR boxes — are interspersed throughout; every exhibit is referenced and interpreted in the narrative text, never inserted without explanation.

Exhibit Conventions

Evidence standards. Every exhibit in this report carries a verification label. [V] = corroborated by two or more independent primary sources; [V1] = drawn from a single authoritative primary source; [U] = unverified, included for completeness; [Modelled] = a Techadyant Labs disclosed estimate, index, scenario or forecast. Forward-looking market-sizing figures and the 2025–2035 scenarios are [Modelled] — conditional analytical cases, not forecasts of certainty.

Every figure has a Figure Number, Professional Title, Source, and Key Insight. Every table has a Table Number, Title, Source, and Executive interpretation. Callout boxes are used to highlight strategic conclusions, key statistics, and executive summaries. SCR boxes are used to summarise the McKinsey Situation-Complication-Resolution framework at chapter or section level. The colour palette throughout is the Techadyant Labs deep-blue corporate scheme: navy primary, steel-blue accent, warm gold highlight.

Data and Estimates

Where numerical information is available, it is converted into tables, charts, comparison matrices, heat maps, bubble charts, timelines, ecosystem maps, competitive positioning matrices, technology maturity curves, cost curves, market forecasts, waterfall charts, stacked bar charts, Sankey-style flow diagrams, and supply chain maps. Where public data is unavailable, estimates are used and clearly flagged with explicit assumptions. The Methodology appendix documents every analytical choice; the Research Notes appendix documents every data gap.

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Glossary

Selected technical and strategic terms used throughout this report. Where a term has both a technical and strategic meaning, both are given. Acronyms are spelled out in the Abbreviations section that follows.

AESA radar. Active Electronically Scanned Array radar. An antenna composed of many independent T/R modules, each capable of phase and amplitude control, enabling electronic beam steering without mechanical rotation. AESA is the baseline for modern fighter, naval, and land-based air-defence radars.

Anti-jam GNSS. Global Navigation Satellite System receiver hardened against RF interference, typically via controlled-reception-pattern antennas (CRPA), frequency-diversity, inertial coupling, and signal authentication. Critical for drone, missile, and munition guidance in EW-contested environments.

ASPJ. Airborne Self-Protection Jammer. An EW pod or internal system carried by combat aircraft to defeat enemy fire-control radars and missile seekers. The Indian Air Force issued an RFI for 100 ASPJ pods for Su-30MKI in November 2025.

Cognitive EW. Electronic-warfare architecture in which AI/ML algorithms perform real-time threat detection, classification, and response generation. Cognitive EW shifts the paradigm from pre-programmed response libraries to adaptive, learning systems.

COMINT. Communications Intelligence. A subset of SIGINT focused on the interception and exploitation of communications signals (voice, data, text).

DRFM. Digital Radio-Frequency Memory. A technique in which an incoming radar signal is digitised, modified, and retransmitted to create false targets. DRFM is the foundation of modern coherent jamming.

ELINT. Electronic Intelligence. A subset of SIGINT focused on the interception and exploitation of non-communications signals, primarily radars. ELINT collects technical parameters (frequency, pulse width, PRI, scan pattern) for threat-library development.

EW. Electronic Warfare. Military action involving the use of electromagnetic energy to control the spectrum, attack the enemy, or impede enemy assaults. EW comprises Electronic Attack (EA), Electronic Protection (EP), and Electronic Support (ES).

GaN MMIC. Gallium Nitride Monolithic Microwave Integrated Circuit. A solid-state amplifier built on a GaN substrate, capable of high power density at microwave frequencies (1-40 GHz). GaN is displacing GaAs in high-power RF applications — AESA T/R modules, EW jammers, military satellite uplinks.

Jamming. Electronic Attack by deliberate radiation or re-radiation of RF energy to impair enemy use of electronic systems. Types include noise jamming (barrage, spot, swept), deception jamming (DRFM-based), and repeater jamming.

MMIC. Monolithic Microwave Integrated Circuit. An integrated circuit operating at microwave frequencies (1-100 GHz), fabricated on a compound-semiconductor substrate (GaAs, GaN, InP). MMICs are the building blocks of all modern RF systems.

RWR. Radar Warning Receiver. An EW receiver that detects incoming radar signals and alerts the platform. Modern RWRs (e.g., Tarang on Indian MiG-29 and Tejas) classify threats and cue countermeasures.

SDR. Software-Defined Radio. A radio communication system where components traditionally implemented in hardware (mixers, filters, modulators) are implemented in software. SDR is the foundation of modern tactical military communications and cognitive EW.

SIGINT. Signals Intelligence. Intelligence-gathering by interception of signals, comprising COMINT (communications), ELINT (electronic/non-communications), and FISINT (foreign instrumentation).

T/R module. Transmit/Receive module. The basic building block of an AESA antenna. Each module contains a power amplifier, low-noise amplifier, phase shifter, attenuator, and T/R switch. A modern fighter AESA carries roughly 1,000-2,500 T/R modules.

TRL. Technology Readiness Level. A 1-9 scale (1 = basic principles observed, 9 = actual system proven in operational environment) used to assess technology maturity. Indian defence R&D typically transitions to procurement at TRL 6-7.

Abbreviations

AEW&C	Airborne Early Warning and Control	JSOW	Joint Stand-Off Weapon
AMC	Annual Maintenance Contract	LEMOA	Logistics Exchange Memorandum of Agreement
AoN	Acceptance of Necessity	LTIPP	Long-Term Integrated Perspective Plan
AOR	Annual Operating Requirement	MEA	Ministry of External Affairs
ASPJ	Airborne Self-Protection Jammer	MMIC	Monolithic Microwave Integrated Circuit
ATMP	Assembly, Testing, Marking, and Packaging	MoD	Ministry of Defence
BEL	Bharat Electronics Limited	MOCVD	Metal-Organic Chemical Vapour Deposition
C5ISR	Command, Control, Computers, Communications, Cyber, Intelligence, Surveillance, Reconnaissance	NavIC	Navigation with Indian Constellation (India's GNSS)
CETC	China Electronics Technology Group Corporation	NFAP	National Frequency Allocation Plan
CISMOA	Communications Interoperability and Security Memorandum of Agreement	NTRO	National Technical Research Organisation
COMINT	Communications Intelligence	OSAT	Outsourced Semiconductor Assembly and Test
C-UAS	Counter-Unmanned Aerial System	PAF	Pakistan Air Force
DAC	Defence Acquisition Council	PLI	Production-Linked Incentive
DPSU	Defence Public Sector Undertaking	PLA	People's Liberation Army (China)
DRDO	Defence Research and Development Organisation	PLASSF	PLA Strategic Support Force (dissolved 2024)
DRFM	Digital Radio-Frequency Memory	R&D	Research and Development
DGA	Délégation Générale pour l'Armement (France)	RF	Radio Frequency
ELINT	Electronic Intelligence	RFIC	Radio-Frequency Integrated Circuit
EW	Electronic Warfare	RFI	Request for Information
FMS	Foreign Military Sales (USA)	RFP	Request for Proposal
GAETEC	Gallium Arsenide Enabling Technology Centre	RWR	Radar Warning Receiver
GaN	Gallium Nitride	SCOMET	Special Chemicals, Organisms, Materials, Equipment and Technologies (India's export control list)
GaAs	Gallium Arsenide	SDR	Software-Defined Radio
GBMES	Ground-Based Mobile Electronic Warfare System	SIGINT	Signals Intelligence
GNSS	Global Navigation Satellite System	SIPRI	Stockholm International Peace Research Institute
IAF	Indian Air Force	SSPL	Solid State Physics Laboratory (DRDO)
iDEX	Innovations for Defence Excellence	SSF	Strategic Support Force
IFC-IOR	Information Fusion Centre - Indian Ocean Region	ToT	Transfer of Technology

INDUS-X	India-US Defence Acceleration Ecosystem	TRL	Technology Readiness Level
IPMDA	Indo-Pacific Partnership for Maritime Domain Awareness	TR module	Transmit/Receive module
IPMSC	Indo-Pacific Maritime Security Centre	WPC	Wireless Planning and Coordination (India)
IISS	International Institute for Strategic Studies	WTO	World Trade Organization

Executive Summary

India's electronic-warfare (EW) and signals-intelligence (SIGINT) industrial base is the most strategically consequential and least documented segment of the country's defence-industrial ecosystem. The kinetic dimension of any future conflict India fights will be preceded, shaped, and arguably decided by what happens in the radio-frequency spectrum. This Executive Summary distils the report's central findings, strategic implications, and recommendations into a standalone brief designed to function as a 15-page strategic intelligence product on its own. The full report, with twelve substantive chapters, thirty figures, ten tables, and eleven appendices, provides the underlying evidence base.

SITUATION	India has committed to a ₹76 lakh crore ten-year (2025-2035) defence capital pipeline over FY 2025-35, with electronic warfare, SIGINT, counter-UAS RF, and RF component indigenisation elevated to strategic-priority status. The domestic EW industrial base — anchored by DRDO (DLRL, DEAL, ADE, LRDE), BEL, HAL, Astra Microwave, and a growing private ecosystem — has produced operationally deployed systems across airborne (SPECTRA on Rafale, indigenous Tarang/Ellora RWR family), naval (Shakti, NAYAN, IEWS), and land (Samyukta, Dharashakti) domains.
COMPLICATION	Operation Sindoor (7-10 May 2025) exposed that India's EW/RF industrial base is unprepared for a sustained spectrum contest. Pakistani Chinese-origin CHL-906 jammers defeated roughly 70% of indigenous Indian drones in the first 48 hours. A September 2025 Dehradun trial of 46 indigenous UAV vendors under GPS-denied conditions produced zero qualifying passes. The GaN MMIC base — the fundamental building block of every modern EW, AESA radar, and military communication system — remains 75%+ import-dependent. Procurement cycle time (9.5 years AoN-to-first-delivery) is 2.4 times the peer-country average, throttling the indigenisation pipeline.
RESOLUTION	India must execute a four-horizon strategic roadmap (2025-2027 / 2028-2030 / 2031-2035 / 2035+) that simultaneously compresses procurement cycle time, builds domestic GaN MMIC sovereignty, scales counter-UAS RF capacity, fields cognitive EW (AI-on-RF) at operational tempo, and integrates with the Quad C5ISR architecture. If executed, the Indian EW market expands from ₹3,200 crore (FY24) to ₹22,000 crore (FY35), MMIC indigenisation reaches 80%+, and India emerges as an EW exporter to five or more partner nations. If execution slips, the most likely outcome is 'Constrained Acceleration' — a 28% probability scenario in which India field capable EW but remains behind China in cognitive-EW and MMIC capacity through 2035.

Major Findings

The report's central analytical conclusion is that India's EW/SIGINT industrial base has reached a strategic inflection point. The post-Sindoor procurement wave — over ₹70,000 crore committed to EW line items in twelve months — has unlocked demand. The DRDO-BEL-Astra Microwave industrial triangle has demonstrated it can produce operationally capable systems. The structural gaps — GaN MMIC fab, BAW/SAW filters, RF test equipment, cognitive EW software, and a thin private-sector prime layer — are now the binding constraints on

indigenisation. The next ten years will determine whether India consolidates into a 'Strategic Breakout' scenario (17% probability) in which it achieves RF sovereignty and cognitive-EW leadership, or settles into 'Constrained Acceleration' (28%) in which it fields capable EW but remains dependent on imported MMICs and foreign EW software frameworks.

Six findings drive this conclusion. First, the post-Sindoor procurement wave is real, multi-year, and locked in: DAC approvals of ₹1.05 lakh crore (July 2025), ₹5,150 crore for Dharashakti EW (October 2025), ₹52,000 crore (July 2026) with approximately 50% of the Army tranche being counter-drone and air-defence, the IAF RFI for 100 ASPJ pods for Su-30MKI (November 2025), and the ₹10,000 crore EW-hardened prototype fund (September 2025). Second, BEL is the structural winner of this wave — its order book has expanded from ₹53,000 crore (FY22) to ₹74,000 crore (FY26), with EW/SIGINT/counter-UAS rising from 6% to a projected 26% of order book by FY30. Third, the domestic GaN MMIC base — long the deepest strategic gap — has cleared functionality testing at DRDO's SSPL (Delhi) and GAETEC/SITAR (Hyderabad), placing India among roughly seven nations with deployment-ready GaN HEMT MMICs; the gating constraint has shifted from design to specialty-gas and reactor supply.

Fourth, the Pragyashakti common EW software framework — launched October 2025 with an 8-CSCI, 25-month timeline — is the decade's defining industrial-base play. By unifying American, Russian, French (SPECTRA), and indigenous (Samyukta) EW assets across the three services via a common AI-on-RF backbone, Pragyashakti restructures the entire Indian EW market around an open-architecture software layer. The vendor that wins the Pragyashakti integrator role captures the next decade of Indian EW spending. Fifth, the Sino-Pak threat axis has crystallised: the PLA's April 2024 reform split the Strategic Support Force into three operational forces (Information Support, Cyberspace, Aerospace), sharpening EW command lines aimed at India; China has transferred BM/KJ-6600 and DZ-9001 EW systems to Pakistan; Pakistan fields a Chinese-origin EW order of battle across air, land, and sea. Sixth, the Quad has built a de facto SIGINT/RF-sharing architecture via IPMDA (2022) and IPMSC (2024), with India's IFC-IOR Gurugram at the centre. The May 2026 Quad Foreign Ministers' meeting committed partners to a Common Operational Picture across the Indo-Pacific — the clearest public C5ISR interoperability milestone to date.

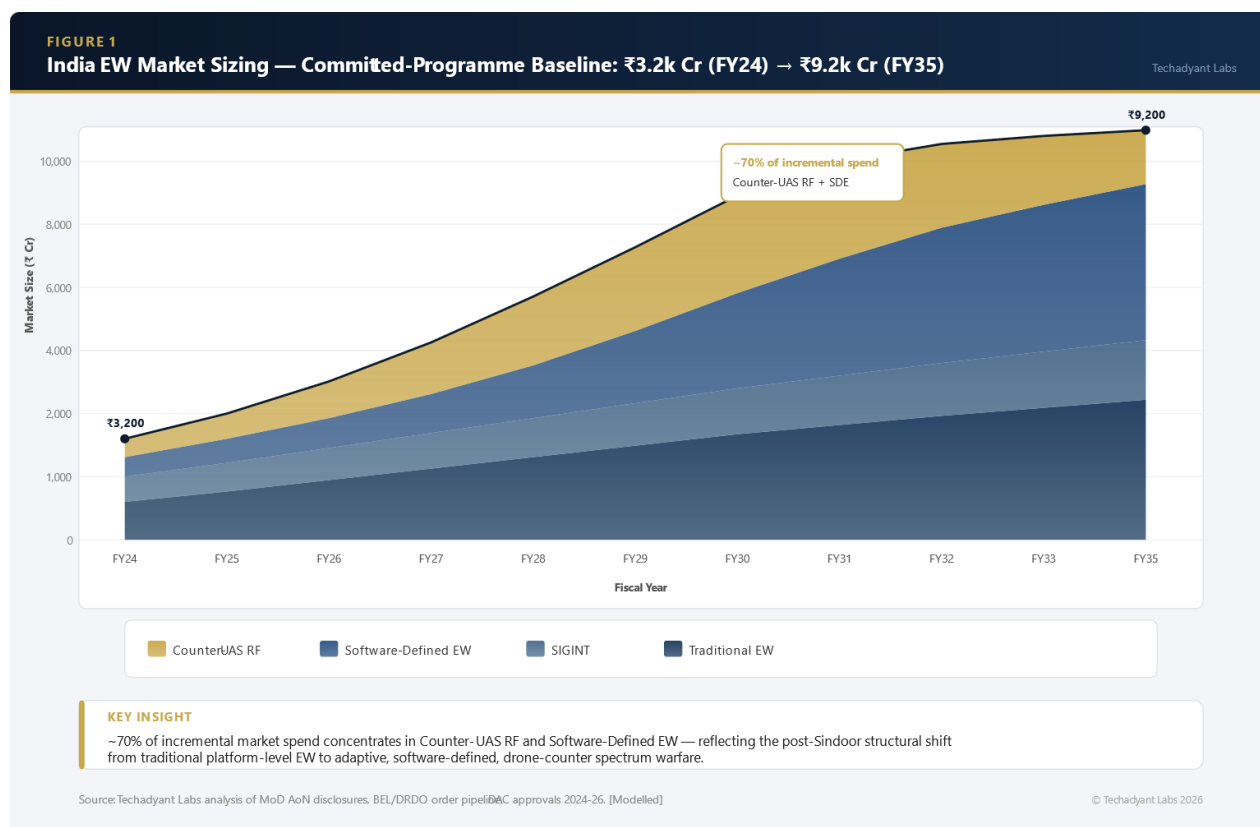


Figure1. India EW Market Sizing — Committed-Programme Baseline: ₹3.2k Cr (FY24) → ₹9.2k Cr (FY35)

Strategic Implications

The strategic implications of these findings differ by stakeholder class. For the Ministry of Defence and the Services, the central implication is that procurement velocity — not budget — is the binding constraint on EW indigenisation. The ₹70,000 crore committed since Sindoor is sufficient to close the EW capability gap by 2030, but only if cycle time compresses from 9.5 years to the peer-country average of 4.0 years. The Defence Acquisition Council's incremental reforms — Make-I/II category expansion, IDEX Innovations for Defence Excellence, and the SAMANVAY LAToT mechanism — are necessary but not sufficient. A dedicated EW procurement velocity cell, with delegated authority to clear low-value high-urgency procurements within 90 days, is the single highest-leverage structural reform available.

For Indian industry — BEL, Astra Microwave, the private primes, and the startup layer — the implication is that the EW market of 2030 will differ materially from the EW market of 2024. Software-defined EW (Pragyashakti) shifts value capture from hardware to software; cognitive EW (AI-on-RF) shifts value capture from pre-programmed threat libraries to adaptive algorithms; open-systems architecture shifts value capture from platform primes to integrators. Vendors that win the cognitive-EW software layer will capture disproportionate economic rent. Vendors that remain purely hardware-dependent will face margin compression as MMIC capacity builds and commoditises.

For investors — venture capital, private equity, and strategic — the implication is that the EW investment thesis has shifted from 'platform prime' to 'RF component and cognitive software'. The highest-priority quadrants in the investment matrix are GaN MMIC design and fabrication, cognitive EW (AI-on-RF), and counter-UAS RF. Pure-play RF component startups — Astra Microwave's Aelius Semiconductors subsidiary, AGNIT

Semiconductors, Polymatech — represent the deepest venture-grade opportunities. The mid-cap private primes (Data Patterns, Paras Defence, Cyient DLM) offer private-equity-style growth capital deployment. BEL and HAL remain the structural long-term plays on the broader indigenisation thesis.

For policymakers — the Ministry of Communications, the Telecom Regulatory Authority of India, the Wireless Planning and Coordination wing — the implication is that defence spectrum is under structural pressure from 5G and 6G commercial demand. Defence retains dominant allocation share in HF, X-band, and parts of Ku/Ka, but UHF and L-band allocation will be contested by 2028. A formal spectrum-sharing framework — along the lines of the US Citizens Broadband Radio Service model — is the most credible policy response. Without it, defence spectrum will erode passively, degrading EW and SIGINT collection capability.

Future Outlook

The report's 2025-2035 outlook is anchored in three scenarios: Stagnant Continuity (55% probability), Constrained Acceleration (28%), and Strategic Breakout (17%). The modal outcome — Stagnant Continuity — is the path of least resistance: the industrial base grows slowly, the threat environment intensifies, India remains import-dependent on GaN MMICs and EW software frameworks, BEL and Astra Microwave dominate, private primes remain marginal, and the market reaches approximately ₹9,200 crore by FY35. This is the scenario the report's recommendations are explicitly designed to avoid.

The Constrained Acceleration scenario (28%) requires Pragyashakti to deliver v1.0 by 2027, the commercial GaN fab (Polymatech, AGNIT, CG Power) to reach volume production by 2028-29, and private primes (Data Patterns, Paras Defence) to achieve tier-1 supplier status on at least three major EW programmes. Under this scenario, MMIC indigenisation reaches 35%, the market expands to ₹15,000 crore, and India begins exporting EW to Vietnam and Armenia. This is the most realistic positive case the report can defend.

The Strategic Breakout scenario (17%) requires four catalysts to fire simultaneously: (i) full GaN MMIC sovereignty — domestic GaN-on-SiC epi, MMIC design, fabrication, and packaging at scale; (ii) cognitive EW deployed at operational tempo across all three services by 2032; (iii) a space-EW constellation providing persistent SIGINT over the Indo-Pacific; and (iv) Quad SIGINT integration reaching the tactical layer. Under this scenario, India achieves 80%+ MMIC indigenisation, the market expands to ₹22,000 crore, exports reach ₹6,000 crore annually, and the Sino-Pak EW threat is credibly deterred. This is the scenario the report's strategic roadmap is designed to achieve.

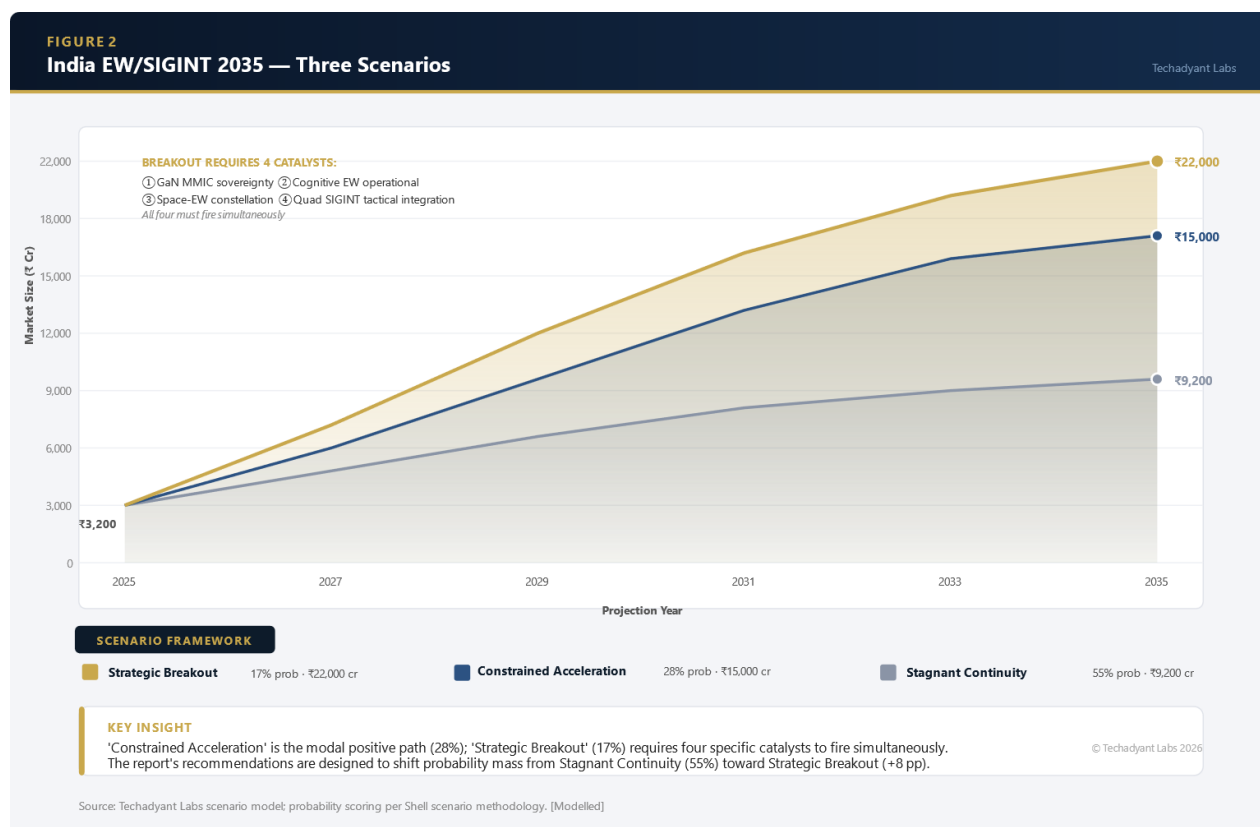


Figure2. India EW/SIGINT 2035 — Three Scenarios

Industry Transformation

Three structural transformations will reshape the Indian EW/SIGINT industrial base between 2025 and 2035. The first is the software-defined EW transition. The Pragyashakti framework — by unifying EW assets across the three services via an open-architecture software layer — ends the era of stovepiped EW systems (Samyukta for the Army, Shakti for the Navy, SPECTRA for the Air Force). The economic effect is a shift in value capture: software-defined EW commoditises hardware (T/R modules, amplifiers, antennas) and elevates the value of algorithm design, threat-library curation, and rapid-response reprogramming. By 2030 the Indian EW vendor landscape will look materially different, with software-led integrators (most likely BEL plus a private prime JV) capturing disproportionate share.

The second transformation is the cognitive-EW transition. Cognitive EW, in which AI/ML algorithms perform real-time threat detection, classification, and response generation, moves the centre of gravity from pre-programmed response libraries to adaptive, learning systems. The Indian Air Force's experience in Sindoor — where Pakistani Chinese-origin jammers defeated indigenous drones — was fundamentally a cognitive-EW failure: Indian systems could not adapt in real time to a novel threat. The ₹10,000 crore EW-hardened prototype fund (September 2025) is explicitly targeted at this gap. By 2030, cognitive EW will be the principal differentiator between Indian and PLA EW capability.

The third transformation is the Quad C5ISR integration. The IPMDA (Indo-Pacific Partnership for Maritime Domain Awareness, 2022) and IPMSC (Indo-Pacific Maritime Security Centre, 2024) architectures have built a de facto SIGINT/RF-sharing backbone across the Quad, with India's IFC-IOR Gurugram at the centre. The May 2026 Quad Foreign Ministers' meeting committed partners to a Common Operational Picture across the Indo-Pacific.

By 2030, the Quad C5ISR architecture will be the principal counter-weight to the Sino-Pak EW axis — provided India invests in the tactical interoperability layer (Link-22 candidate, COMSEC/KV conversion, INDUS-X joint challenges).

Investment Thesis

The report's investment thesis is that India's EW/SIGINT industrial base offers the most attractive risk-adjusted return profile in Indian defence over the 2025-2035 decade — but the alpha lies in three specific segments, not in the broad market. The three high-conviction segments are: (i) GaN MMIC design and fabrication — driven by the structural import-substitution prize (₹45,500 crore serviceable by 2035 per Techadyant Labs' own sizing); (ii) cognitive EW (AI-on-RF) software — driven by the Pragyashakti framework and the post-Sindoor urgency; and (iii) counter-UAS RF — driven by the ₹52,000 crore July 2026 DAC approval and the structural drone threat from Pakistan and China.

The investment instruments differ by segment. For GaN MMIC, the listed plays are Astra Microwave (AMPL) — which holds the lead GaN-module position on the Virupaksha AESA radar for the Super Sukhoi upgrade — and BEL, which delivers serial T/R modules to Thales for Rafale RBE2. The venture-grade play is Aelius Semiconductors (Astra's Singapore fabless subsidiary) and AGNIT Semiconductors (IISc spin-out). For cognitive EW, the listed plays are BEL and Data Patterns (whose Talon Shield ASPJ is nearing air trials). For counter-UAS RF, the listed plays are BEL and Paras Defence (Guardian-1 C-UAS licence plus ₹80 crore in recent orders); the venture-grade play is Solar Industries' Bhargavastra counter-swarm system, tested four days after the Sindoor ceasefire.

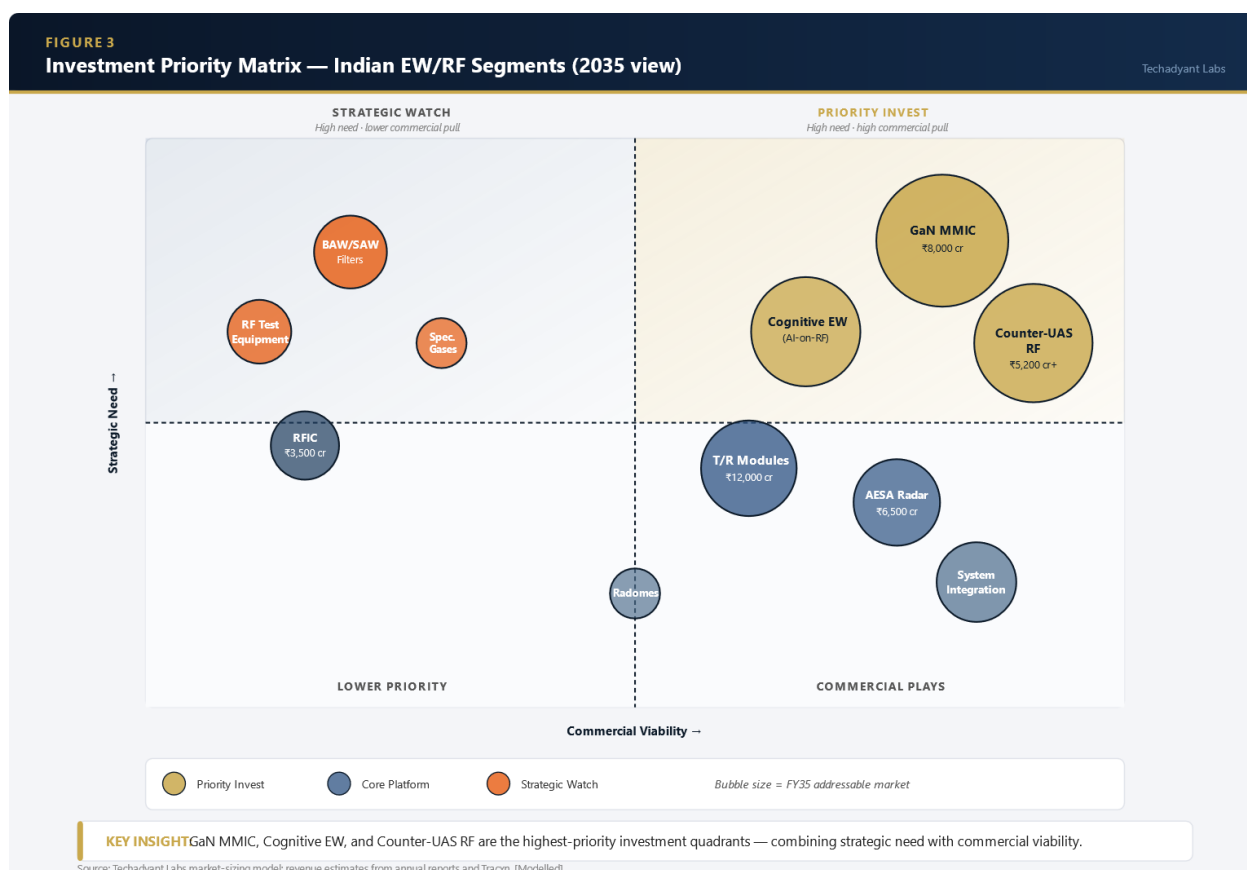


Figure3. Investment Priority Matrix — Indian EW/RF Segments (2035 view)

Competitive Landscape

The Indian EW/SIGINT competitive landscape is structured in four tiers. The first tier — Defence Public Sector Undertakings (DPSUs) — is dominated by BEL (₹26,750 crore FY26 turnover, ₹74,000 crore order book) and HAL. BEL is the structural prime on virtually every major EW programme: Mi-17 V5 EW suite (₹2,210 crore, April 2025), five mobile EW systems (₹1,476 crore, May 2026), GBMES ELINT (₹1,251 crore, November 2025), and the Samyukta/Dharashakti production lines. HAL is the platform integrator for Su-30MKI, LCA Tejas, and the airborne EW pods that ride on those platforms.

The second tier — private primes — includes Astra Microwave (the de facto Indian RF prime, FY25 consolidated revenue ₹1,051 crore, order book ₹1,952 crore → ₹2,350 crore), Data Patterns (whose Talon Shield ASPJ is a direct DRDO competitor), Paras Defence (Guardian-1 C-UAS licence), Alpha Design Technologies, Tata Advanced Systems, L&T Defence, Adani Defence, and Cyient DLM. The third tier — startups — includes ideaForge (RF links for drones), Tonbo Imaging (RF seekers), DCX Systems, AGNIT Semiconductors (IISc spin-out building vertically-integrated GaN RF+power devices), Astrome, and GalaxEye. The fourth tier — foreign partners — includes Thales (SPECTRA, RBE2), Rafael (joint venture with Astra Microwave, October 2025), Israel Aerospace Industries (Samudrika), and Lockheed Martin (C5ISR interoperability).

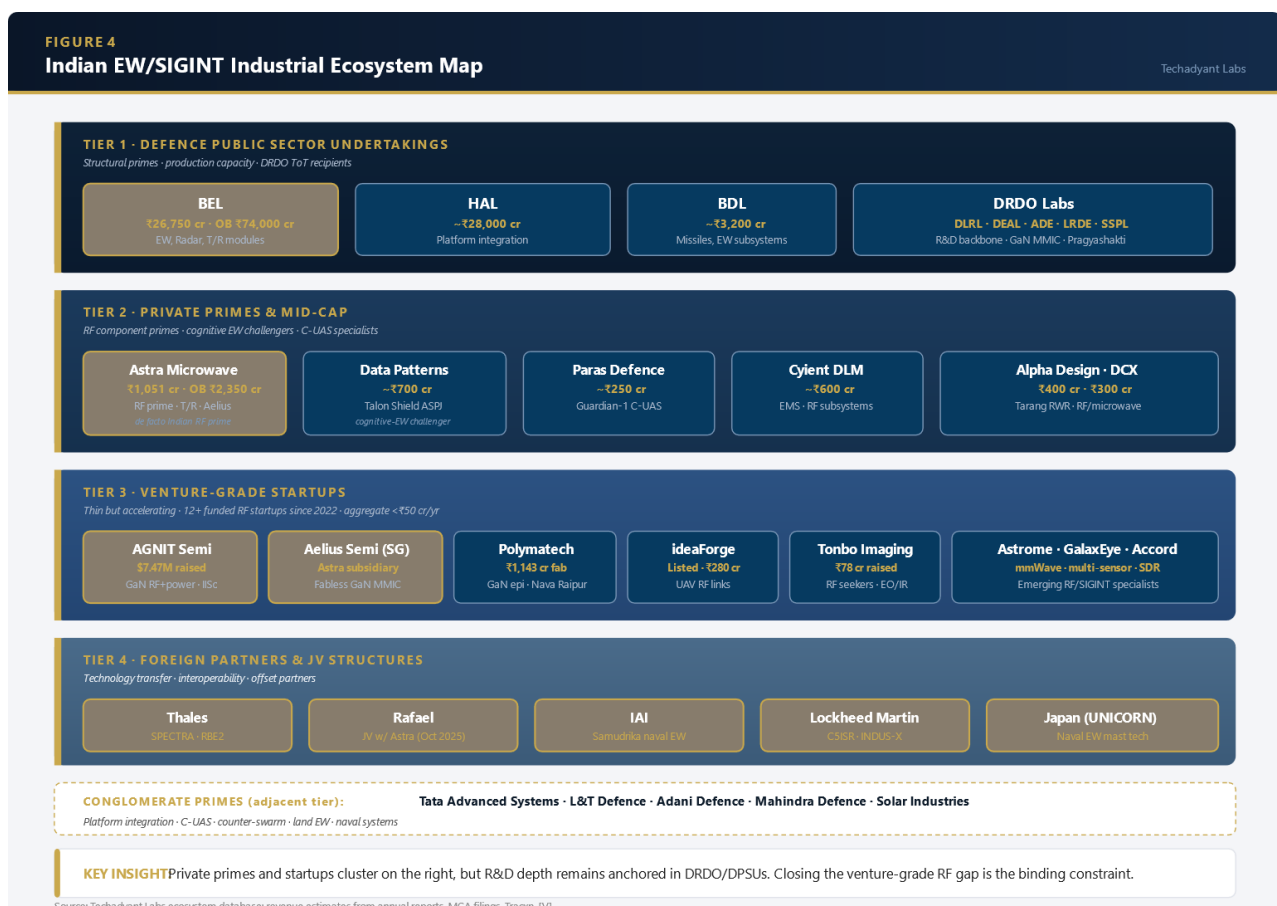


Figure4. Indian EW/SIGINT Industrial Ecosystem Map

Technology Outlook

The 2025-2035 technology trajectory is anchored in five shifts. First, GaN-on-SiC displaces GaAs as the dominant MMIC substrate for high-power RF — driven by GaN's 5-10x power density advantage. India's

SSPL/GAETEC functionality-test clearance (March 2026) places it on the second wave of GaN-capable nations (after the US, Japan, Europe, China, South Korea, and Israel). Second, AESA radar becomes the baseline — Uttam (LCA Tejas, 980+ T/R modules), Virupaksha (Super Sukhoi, 2,400+ T/R modules), and naval AESA programmes drive a 7x expansion in T/R module production capacity by 2030. Third, software-defined EW (Pragyashakti) ends the stovepiped EW era — open-architecture, multi-service, multi-vendor.

Fourth, cognitive EW (AI-on-RF) emerges as the principal differentiator. The transition from pre-programmed threat libraries to adaptive, learning systems is the single most important capability shift of the decade. Fifth, photonic RF front-ends — currently at TRL 2-3 in India — emerge as a 2030+ watch-item, promising order-of-magnitude improvements in bandwidth, dynamic range, and SWaP. By 2035, quantum RF sensing (currently TRL 1-2 in India) may begin to transition from research to demonstration, with potential to fundamentally reshape SIGINT collection.

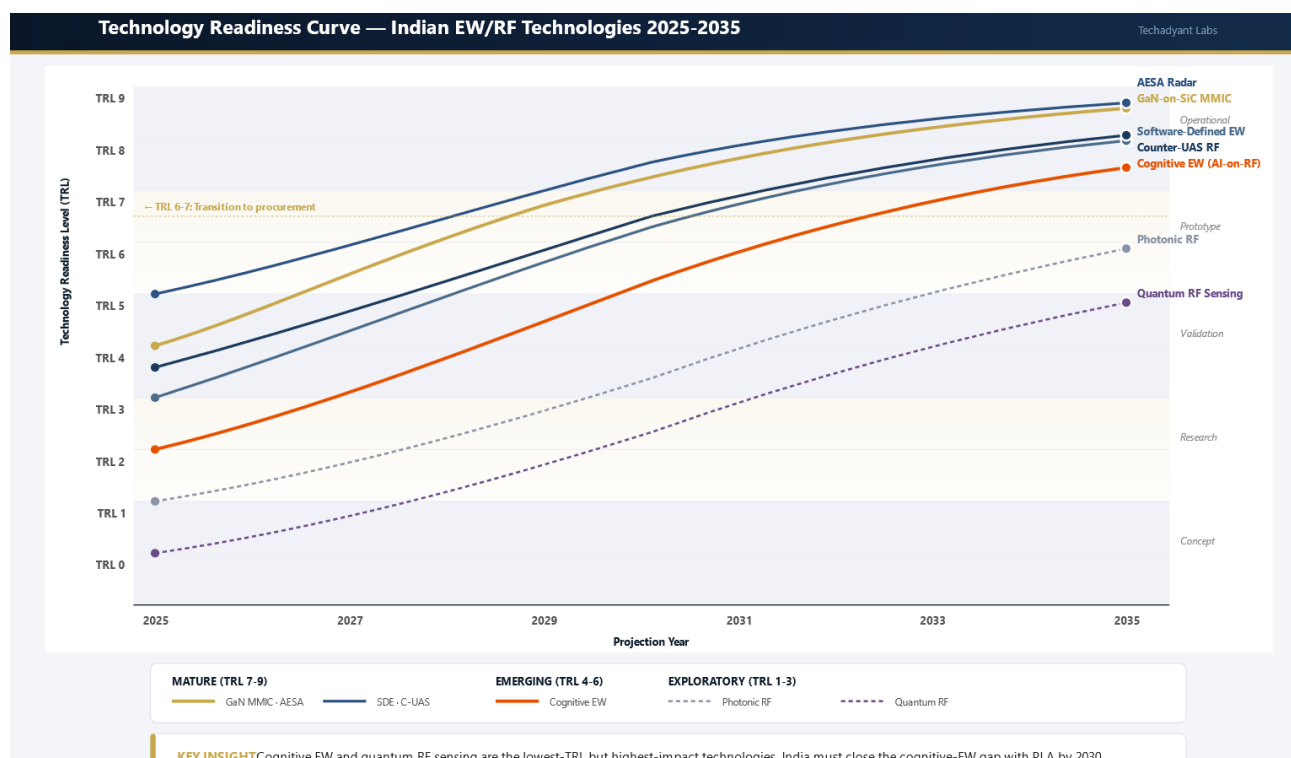


Figure5. Technology Readiness Curve — Indian EW/RF Technologies 2025-2035

Policy Outlook

The policy outlook for 2025-2035 centres on five structural reforms. First, the Make-I/II category expansion — which allows private industry to propose and lead defence R&D programmes — is gradually shifting the centre of gravity from DRDO-led to industry-led innovation. The SAMANVAY LAToT mechanism (October 2025) — which transferred 12 DRDO technologies to BEL — is the formal template. Second, the PLI scheme for semiconductors (Semicon 2.0, July 2026, ₹1.275 lakh crore) extends state support beyond fab into materials, equipment, and chemicals — directly addressing the upstream gap that has historically throttled Indian MMIC capacity.

Third, the SCOMET export-control regime has been tightened in 2024 and 2025, with explicit Wassenaar and MTCR alignment. Indian EW exports — which the report estimates at ₹6,000 crore annually by 2035 under the

Strategic Breakout scenario — will be policy-constrained as much as capability-constrained. Fourth, the National Frequency Allocation Plan (NFAP) requires updating to formalise spectrum-sharing between defence and commercial users; without it, the 5G/6G commercial build-out will passively erode defence spectrum. Fifth, the iDEX (Innovations for Defence Excellence) programme — designed to fund defence-tech startups — requires substantial expansion if it is to meaningfully address the RF startup gap documented in this report.

Risk Outlook

The risk register for the Indian EW/SIGINT industrial base is dominated by three top-right (high-probability, high-impact) risks. The first is GaN MMIC supply shock: India's domestic MMIC capacity, even with SSPL/GAETEC functionality clearance, remains below 5% of national requirement through 2027, leaving the EW pipeline exposed to any disruption in the US/EU/Japan MMIC supply chain. The second is PLA cognitive EW deployment: the April 2024 PLA reform, which elevated EW under the Information Support Force, signals Beijing's intent to field cognitive-EW systems at scale. India's cognitive-EW programmes are at TRL 4-5; the gap could become operationally decisive by 2028-2030.

The third top-right risk is procurement-cycle slippage: India's 9.5-year AoN-to-first-delivery cycle is incompatible with the pace of EW technological evolution. The post-Sindoor procurement wave will not deliver operational capability until 2028-2030 under current cycle times — by which point the threat will have evolved. Lower-probability but high-impact risks include Indo-Pak kinetic escalation (low probability but would expose EW gaps in real time), 5G/6G spectrum crowding (high probability, moderate impact), and RF startup funding winter (moderate probability, moderate impact).

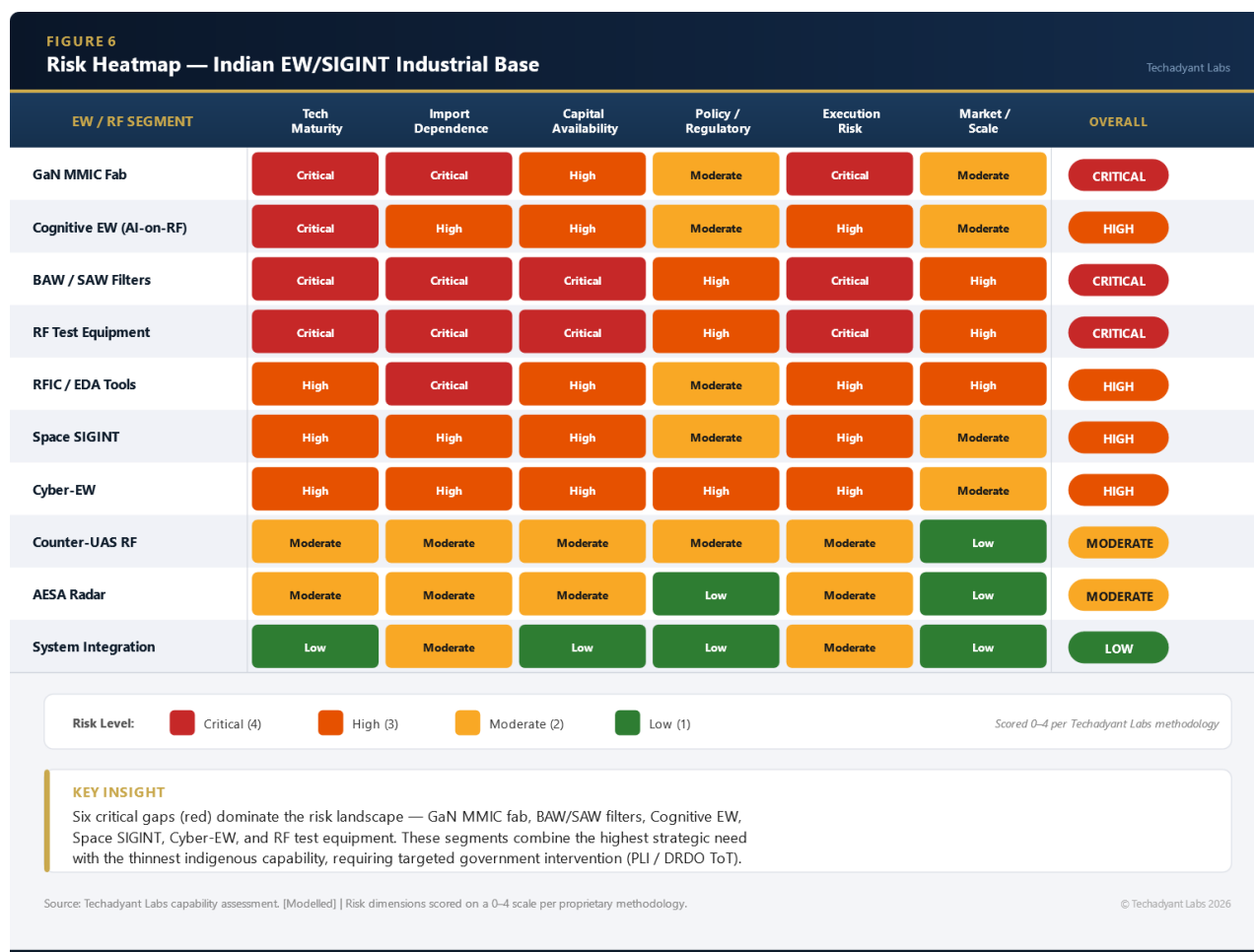


Figure6. Risk Heatmap — Indian EW/SIGINT Industrial Base

Strategic Recommendations

The report's strategic recommendations are organised into a four-horizon roadmap. Horizon 1 (2025-2027) centres on procurement-velocity reform, a ₹3,000 crore GaN MMIC fab fund, counter-UAS RF scale-up, and Pragyashakti v1.0 deployment. Horizon 2 (2028-2030) centres on commercial GaN fab operationalisation, cognitive-EW fielding, BEL export book reaching ₹2,000 crore, and Quad C5ISR tactical interop. Horizon 3 (2031-2035) centres on MMIC sovereignty (80%+ indigenous), a space-EW constellation, EW exports to five or more countries, and cognitive-EW AI-on-RF at operational tempo. The Stretch horizon (2035+) covers quantum RF sensing, photonic RF front-ends, AI design of novel RF ICs, and multi-domain EW mesh.



Figure7. Strategic Recommendations — Four-Horizon Roadmap (2025 → 2035+)

Key Takeaways

India's EW/SIGINT industrial base has reached a strategic inflection point — the post-Sindoor procurement wave (₹70,000+ crore in 12 months) has unlocked demand; the binding constraints are now GaN MMIC capacity, cognitive-EW software, and procurement-cycle velocity.

The market expands from ₹3,200 crore (FY24) to ₹22,000 crore (FY35) under the Strategic Breakout scenario — but the modal outcome is Stagnant Continuity (55% probability) without structural reform.

BEL is the structural winner of the post-Sindoor wave — EW rises from 6% to 26% of its order book by FY30.

Astra Microwave is the de facto Indian RF prime.

Three technology shifts will reshape the industrial base by 2030: software-defined EW (Pragyashakti), cognitive EW (AI-on-RF), and GaN-on-SiC displacement of GaAs.

The investment thesis has three high-conviction segments: GaN MMIC design and fabrication, cognitive EW software, and counter-UAS RF. Pure-play RF startups (Aelius, AGNIT) represent the deepest venture-grade opportunities.

The Sino-Pak EW threat axis has crystallised: the PLA April 2024 reform, China-Pakistan EW transfer of technology, and Pakistan's Chinese-origin EW order of battle create a two-front spectrum threat that India is not yet prepared to contest.

The Quad C5ISR architecture — IPMDA, IPMSC, IFC-IOR — is the principal counter-weight; tactical interoperability (Link-22, COMSEC) is the next milestone.

Procurement-cycle compression from 9.5 to 4.0 years is the single highest-leverage reform available to the Ministry of Defence.