

ANNEXTURE A

Concept Note: Development of a National GEO-Stationary Satellite Communications Programme

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1. Executive Summary

Sentech SOC Ltd, as South Africa's state-owned digital Infrastructure Company and a key enabler of national communications infrastructure, seeks to partner with strategic industry players to design, fund, develop, and operationalise a **Geostationary (GEO) satellite system** that will serve as a cornerstone of South Africa's digital transformation and communications sovereignty agenda.

This initiative is aligned with:

- National Development Plan (NDP) 2030
- SA Connect Programme (Phase 2 and beyond)
- Bridging the Digital Divide agenda
- Development of Sovereign Digital Infrastructure

The programme aims to:

- Provide universal broadband and broadcasting capabilities
- Enable secure and resilient government communications
- Reduce reliance on foreign satellite capacity
- Position South Africa as a regional satellite hub within SADC

Sentech invites partners to contribute across:

- Funding and financing structures
- Satellite system design and engineering
- Manufacturing, launch, and operations
- Skills development, training, and technology transfer
- Development of an implementation

2. Strategic Context and Alignment

2.1 National Policy Alignment

This programme directly supports:

- NDP 2030: Expanding broadband access and enabling inclusive economic growth
- SA Connect: Delivery of connectivity to underserved and rural communities
- National Digital and Future Technologies Strategy
- Industrialisation and localisation frameworks

2.2 Regional and Continental Alignment

- SADC Digital Infrastructure initiatives
- African Union digital transformation agenda
- Potential for **SADC Shared Satellite Programme participation**

2.3 Sentech Strategic Positioning

Sentech's mandate as a **digital Infrastructure company** positions it to:

- Act as the **National Satellite Operator (NSO)** or anchor operator
- Integrate satellite services with terrestrial broadband networks
- Deliver wholesale capacity to government, broadcasters, Internet service providers and telecommunications operators

3. Problem Statement / Needs Analysis

South Africa faces persistent structural challenges:

- Connectivity gaps in rural and remote areas
- Limited resilience in terrestrial network infrastructure
- Dependence on foreign satellite capacity providers
- High cost of satellite bandwidth
- Huge capital outflows in foreign exchange resulting from acquiring satellite capacity services
- Lack of a sovereign communications platform
- Failure to develop skills in the upstream value chain to drive development of sovereign solutions

Without intervention:

- National security risks increase
- Cost of connectivity remains high
- Rural inclusion targets remain unmet
- Capital flight persists

4. Strategic Rationale and Drivers

4.1 Digital Inclusion and Universal Access

Satellite solutions remain the most practical and economically viable technology for:

- Rural broadband
- Maritime and aeronautical coverage
- Disaster recovery services

4.2 Sovereignty and Security

- National satellite infrastructure ensures secure government communications
- Protects critical national systems

4.3 Economic Development

- Reduces foreign exchange outflows for satellite services
- Creates local industry opportunities (manufacturing, operations, services)
- Enables digital economy growth (e-commerce, e-health, e-education)

4.4 Regional Leadership

- Establish South Africa as a regional satellite hub
- Support SADC integration initiatives

5. Vision, Objectives and Success Criteria

5.1 Vision

To establish a secure, sovereign, and inclusive national satellite communications platform that enables universal connectivity and economic growth.

5.2 Strategic Objectives

- Deliver nationwide broadband coverage
- Provide secure government communications capability
- Enable broadcasting and media distribution services
- Support 5G and next-generation network backhaul
- Build local satellite capability and skills

5.3 Success Metrics

- % population coverage
- Cost reduction in satellite capacity
- Number of connected underserved sites
- Revenue generation and sustainability

- Local skills and jobs created

6. Concept of Operations (CONOPS)

The GEO Satellite System will:

- Provide broadband, broadcasting, and enterprise connectivity services
- Serve multiple user segments:
 - Government departments
 - Telecommunications operators
 - Broadcasters
 - Enterprises and rural communities

Operating Model

- Hybrid model:
 - Public-private partnership (PPP)
 - Sentech as anchor tenant/operator
 - Commercial wholesale model

7. Technical Architecture (High-Level)

7.1 Space Segment

- GEO satellite platform (HTS / VHTS capability)
- Multi-band payload:
 - Ka-band (broadband)
 - Ku-band (broadcasting)
- Design lifetime: 15–20 years
- Scalability for future expansion

7.2 Ground Segment

- Gateway earth stations – primary and secondary (strategically located)
- Network Operations Centre (NOC)
- Telemetry, Tracking, and Control (TT&C) facilities

7.3 User Segment

- VSAT terminals
- Direct-to-home (DTH) broadcast receivers
- Enterprise and mobility terminals

7.4 Integration

- Seamless integration with:
 - SA Connect infrastructure
 - Fibre and wireless networks
 - Cloud and data centre platforms

8. Regulatory and Policy Framework

The project will adhere to:

- **ITU Radio Regulations (spectrum and orbital slot coordination)**
- National spectrum licensing frameworks
- ICASA regulatory environment
- Cross-border frequency coordination within SADC

Key requirements:

- Orbital slot acquisition/retention
- Frequency coordination and filings
- Compliance with international treaties

9. Institutional and Governance Model

9.1 Lead Implementing Entity

- Sentech SOC Ltd (Programme owner/operator)

9.2 Government Stakeholders

- Department of Communications and Digital Technologies
- National Treasury
- Defence and security agencies
- Department of Science and Innovation

9.3 Programme Governance

- Steering Committee

- Programme Management Office (PMO)
- Technical Advisory Board

9.4 Partner Ecosystem

- Satellite manufacturers
- Launch service providers
- Financial institutions
- Technology and training partners

10. Implementation Model and Phasing

Phase 1: Feasibility and Structuring

- Technical and financial feasibility
- Partner selection and contracting

Phase 2: Design and Procurement

- Satellite system design
- Procurement of space and ground segments

Phase 3: Manufacturing and Launch

- Satellite build and testing
- Launch campaign

Phase 4: Commissioning and Operations

- In-orbit testing
- Commercial rollout

11. Financial Model and Funding Strategy

11.1 Funding Requirements

- Project Feasibility and Bankability Funding
- Satellite manufacturing and launch
- Ground infrastructure development
- Operations setup

11.2 Funding Mechanisms

Sentech invites partners to:

- Provide equity investment

- Structure debt financing
- Offer export credit financing
- Participate through PPP models

11.3 Revenue Model

- Wholesale bandwidth sales
- Government capacity contracts
- Broadcasting services
- Regional services (SADC markets)

12. Economic and Social Impact

- Expansion of broadband access to underserved areas
- Job creation (engineering, operations, support)
- Development of local space and ICT industries
- Improved service delivery (health, education, government)

13. Risk Assessment and Mitigation

Key Risks

- Technical risks (launch failure, system failure)
- Regulatory delays
- Market competition (LEO constellations)
- Financial sustainability

Mitigation Measures

- Insurance strategies
- Hybrid architecture (GEO + LEO interoperability)
- Strong governance and partner selection

14. Strategic Partnership Framework

Sentech seeks partners capable of contributing to:

14.1 Funding

- Equity investors
- Multilateral development banks
- Export credit agencies

14.2 Design and Development

- Satellite OEMs
- Payload designers
- System integrators

14.3 Launch and Operations

- Launch providers
- Ground segment operators
- Network management providers

14.4 Training and Skills Development

- Local capacity building programmes
- Technology transfer
- Graduate and technical training pipelines
- Establishment of national satellite competence centres

15. Monitoring, Evaluation and Reporting

- Defined KPIs and milestones
- Regular reporting to governance structures
- Independent audits and performance reviews

16. Implementation Roadmap and Immediate Next Steps

Short-Term Actions

- Partner engagement and market sounding
- ITU filing review and strengthening
- Feasibility funding mobilisation

Medium-Term Actions

- Financial close

- Design and procurement

Long-Term

- Regional expansion (SADC)
- Future satellite constellation strategy

17. Conclusion and Call for Partnership

Sentech invites global and regional partners to collaborate in delivering a transformational national infrastructure programme and development of an implementation model that will:

- Enable universal connectivity
- Strengthen national sovereignty
- Drive economic growth and digital inclusion
- Position South Africa as a leader in satellite communications in Africa