



LS of South Africa Radio Communication Services (Pty) Ltd

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Company Profile

# LS of South Africa Radio Communication Services



# 1 Company Background

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LS of South Africa Radio Communication Services was founded in 1999 to address RF spectrum management and radio network planning requirements in Africa, with a particular focus on Southern Africa.



Over the past two decades LS of SA's portfolio of services and products has expanded to adapt to customer requirements in the African market, and it offers a wide range of RF-related products and services from its offices in Johannesburg, South Africa.

LS of SA is a subsidiary of LS telcom AG, with its headquarters based in Lichtenau, Germany, a listed company on the German stock exchange, which provide additional technical assistance and resources where and when required. At the same time LS of South Africa also support the other LS telcom offices around the world where our expertise are required.

The scope of our projects ranges from RF related broadcasting, telecommunication, automated spectrum management and monitoring systems, engineering and consulting and RF planning in regulatory, commercial, mining, industrial and PPDR (Public Protection and Disaster Relief) environments.

## Our Contribution to the RF Industry

We actively contribute to research and development efforts, and are associated with numerous industry organisations, including:

- International Telecommunications Union (ITU-R and ITU-D)
- African Telecommunications Union (ATU)
- Southern African Digital Broadcasting Association (SADIBA)
- TETRA Association

## Quality Management

From a quality management perspective, LS telcom is ISO 9001:2015 certified for its quality management system for development, sales, consulting and engineering and project implementation of soft- and hardware systems and IT services in the field of spectrum management, radio monitoring, wireless network planning and concepts.

## 2 Services and Products

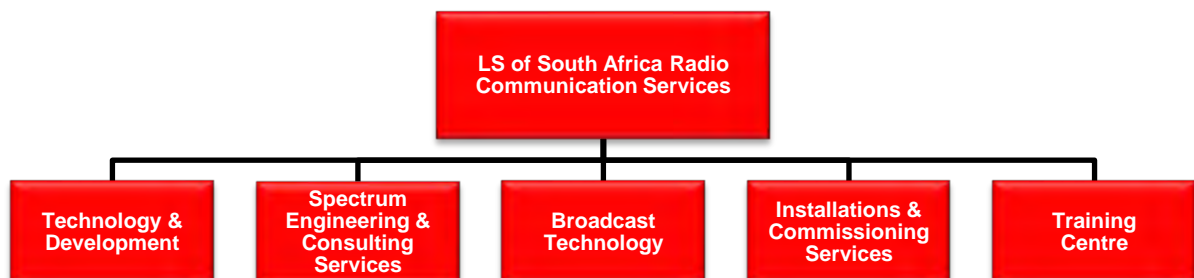
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The core focus of the business is RF engineering-related products and services. These include:

- RF spectrum management advisory services
- LS SPECTRA and mySPECTRA automated RF spectrum management system
- LS OBSERVER RF spectrum monitoring system
- Broadcast and telecommunication frequency plan development
- Feasibility studies for new site, network and technology deployments incl. 5G.
- RF spectrum and mast audits including scaled 3D rendered images of mast and antennas
- RF spectrum planning including National Radio Frequency Plan compilation
- RF interference analysis, identification/hunting and resolution
- Point-to-point and point-to-multipoint microwave link planning, measurements and interference free frequency identification using drone technology
- RF network and site area coverage and interference analyses
- Radiation safety compliance simulations and surveys
- Airborne RF spectrum and site infrastructure audits by means of Remotely Piloted Aircraft Systems (RPAS)
- Mobile, fixed, portable and airborne RF spectrum monitoring systems
- Anechoic chamber measurements for RF characterisation of equipment and to identify in band and out of band radiation characteristics including antenna pattern measurements
- Turnkey radio projects for broadcasting, industrial and PPDR environments
- Spectrum Management and Radio Communication Solution provider for Defence and Security
- Solution provider for ILS and VoR calibration using Drone based technology

## 3 Company Structure

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## 3.1 Technology and Development

This division is tasked with the research and development of new technologies and methods for performing activities related to, among other disciplines, spectrum monitoring and analysis. Hardware and software systems from various manufacturers are integrated to offer innovative new solutions in the RF engineering field.

One of the latest successes of this division is the development and realisation of one of the world's first RPAS (Remote Piloted Aircraft System) based RF measurement platform. These services are offered from South Africa and has been executed in in more than 40 countries around the world.

## 3.2 Spectrum Engineering & Consulting Services

### 3.2.1 Spectrum Management

LS telcom's world-renowned SPECTRA and new mySPECTRA automated spectrum management systems comprise various modules that include administrative management (Licensing and Billing), spectrum planning and spectrum monitoring components. Specialised versions are available for aeronautical and military spectrum management.

LS of SA provides expert advice on national and regional spectrum management, including spectrum coordination activities, spectrum audits and spectrum re-farming.

LS of SA also offers ancillary services, such as database sanitation and spectrum audits for regulators and network operators to verify database accuracy. This is achieved by comparing monitoring data to licensing data provided by the client.

LS of South Africa has the capability to develop National Radio Frequency Plans (NRFP's) based on te outcome of the most recent World Radio Conferenced(WRC) from the ITU. Such studies can also include Migration Plans, IMT Roadmaps as well as Spectrum Outlook documents.All such documents can also be made available on the applicable web sites with search and sort functions.

LS of South Africa performs software testing on all of LS telcom's abovementioned components, giving its Consulting division intricate insight into the latest features and functionality of LS telcom's spectrum management system offerings.

### 3.2.2 Spectrum Monitoring

In terms of spectrum monitoring, LS telcom offers the modular LS OBSERVER system, enabling the client to develop a highly effective, dynamic and compact monitoring network. LS OBSERVER is available in fixed and mobile configurations, and enables the user to conduct geolocation of signals of interest using a variety of methods (TDoA, AoA, PoA etc.).

LS OBSERVER can be combined with conventional monitoring front-ends from other manufacturers, enabling regulatory authorities to expand on its current monitoring setup without the need for complete replacement of its existing monitoring equipment.

LS telcom's MONITORplus software enables the user create and run monitoring orders for equipment from various manufacturers including ARGUS, ESMERELDA and SCORPIO interfaces as well as to display and interpret monitoring data. Direction finding calculations and display of the results is also done in MONITORplus.

### 3.3 Broadcast Technology

Utilising its CHIRplus\_BC broadcast planning tool, LS of SA provides coverage simulations and identifies available frequencies for new entrants to the broadcast environment. CHIRplus\_BC enables the identification of potential existing and greenfield broadcast sites.

LS of SA is able to create complete broadcast frequency plans for regulatory authorities. Planning of single- and multi frequency networks can also be done, taking into account frequency coordination with neighbouring countries.

From a hardware perspective, LS of SA has vast experience in the installation and commissioning of broadcast transmission systems and integration of these systems with the associated equipment (antennas, masts, UPS systems, programme input equipment, combiners, rigid lines, cooling systems and feeder cables etc.).

Studio design and installation, both conventional and containerised, is done in-house by LS of SA.

Through its various partnerships and agencies, LS of SA offers a vendor-agnostic approach to broadcast projects and their implementation, ensuring that projects are not bound to the specifications and costing of any one equipment manufacturer.

Using its remote piloted aircraft solution, LS is able to verify that equipment installations are done according to specification and that the client will receive optimal return on investment from its infrastructure.

During the operations and maintenance phase of the now-operational broadcast installation, the RPAS platform can then be used to provide high-resolution photo and video records of the installation's condition, checking for cable damage, lightning damage, corrosion etc.



## 3.4 Installation & Commissioning Services

LS of SA has converted in excess of 160 steel shipping containers for the installation of RF transmission and backup power generation equipment. Containers are manufactured to the highest standards and each unit is subjected to LS of SA's stringent quality assurance processes.

We also offer various other versions specifically suited for deployment in areas not accessible by vehicle or in very harsh conditions.

LS of SA can advise the client on detailed design, based on the user requirement specification, but can also offer conceptual design, taking into account ergonomics and HVAC configurations.

LS of SA builds monitoring vehicles for regulatory authorities looking to locate illegal spectrum users, and broadcasters wishing to monitor broadcast quality.

Taking into account the inherent systems integration component of the abovementioned installations, LS of SA integrates, among others, transmitter, generator, UPS, telemetry, cooling and ventilation systems.

LS of SA's dedicated commissioning teams are available to perform both off-site pre-commissioning and factory acceptance testing with the client, as well as on-site installation and commissioning.

We as LS of SA recently design, supply and deployed an FM network of more than 60 transmitter stations and more 350 transmitters complete with monitoring and control capabilities from a Network Operations Centre (NOC). The system was successfully commissioned and accepted by the client.

## 3.5 Training Centre

The LS of SA training centre is based at LS of SA's head office in Johannesburg, and offers cost-effective training solutions tailored to the needs of developing countries.

LS of SA offers the following training courses:

- LS SPECTRA Software Tool Training
- FM broadcast engineering
- FM radio 101
- DVB-T2 technology
- Spectrum management
- Broadcast planning (using CHIRplus\_BC)
- Microwave link planning (using CHIRplus\_FX)

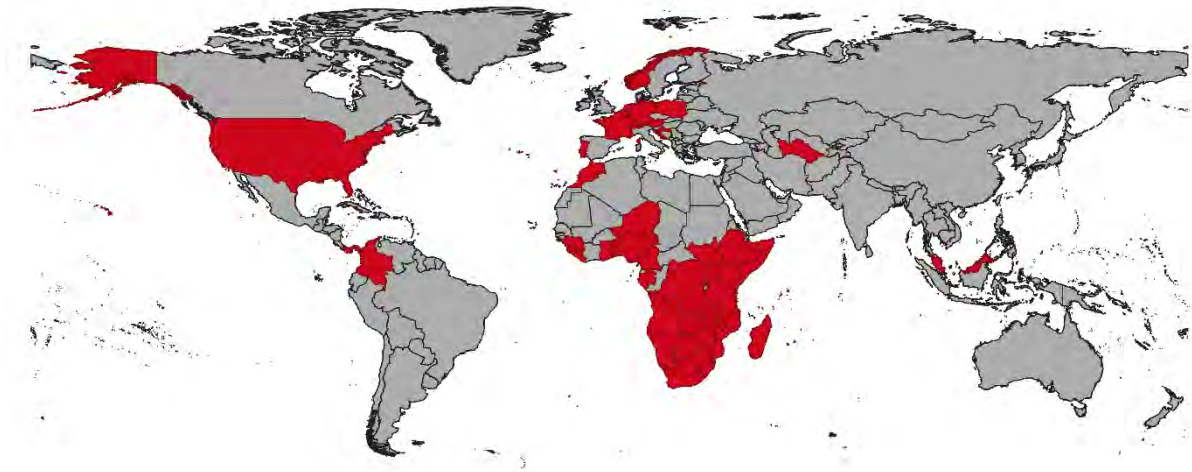
We also offer bespoke training courses specific to the needs of clients, topics include Digital Dividends 1 & 2, Dynamic Spectrum Access/White Space, Spectrum Economy, Spectrum Auctions, Coexistence between LTE and DTT to name but a few.

## 4 Clients

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Internationally, the LS telcom group has successfully completed projects in more than 90 countries with more than 300 customers.

LS of SA has successfully completed projects in 44 countries over the past 24 years, our clients include (marked in red):





## 5 Major Projects

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### 5.1 Spectrum management

- Supply of RF engineering software (SPECTRAemc) – Astronomy Management Authority in Southern Africa
- Military Spectrum Management Consulting
- Supply of spectrum management systems – Regulators in SADC
- Supply of spectrum management system – Astronomy Management Authority in Southern Africa

### 5.2 RF Planning

- Development of 7-mux ITU-notified and coordinated DTT frequency plan – (South Africa and neighbours)
- DTT and FM frequency planning for Namibia, Malawi, Ethiopia, Seychelles, Uganda, Nigeria, Niger, South Africa, Sierra Leone, Guinea, Kenya, Mozambique, Madagascar, Namibia, South Sudan, Swaziland, Lesotho
- Feasibility study for outdoor Wi-Fi deployment – Johannesburg City Parks and Zoo
- WiFi coverage, capacity and interference studies.
- Investigations into PPDR systems to determine reasons for poor RF performance.
- Microwave frequency studies to identify most suitable interference free channels for use at specific sites.
- Feasibility studies for various LPWAN IoT networks
- Microwave link planning for TETRA backhaul at various mines in South Africa.
- Indoor coverage planning for tri-band DAS system for Milpark hospital – Alan Dick Africa
- Development and update of IMT Roadmap and Radio Frequency Spectrum Assignment Plans (RFSAPs) – ICASA (South Africa)
- Development of frequency plans for digital sound broadcasting and review of analogue FM frequency plan – various clients
- Development of Radio Frequency Spectrum Assignment Plans (RFSAP's)

### 5.3 Spectrum monitoring, surveys and audits

- FM spectrum audit and optimisation – UCC (Uganda)
- DTT performance measurements for broadcasters across Africa, Asia, Europe and South America
- Broadcast monitoring vehicles – Sentech, Multichoice etc
- Spectrum audit for LPWAN network
- SARFSA National spectrum audit 9 kHz to 500 MHz – DoC (South Africa)
- LTE EMF site surveys and simulations – Ericsson and others in South Africa



- MTN Hakskeenpan LTE site survey using remotely piloted aircraft for Bloodhound SSC land speed record attempt – Ericsson (South Africa)
- Spectrum audit at ARMSCOR Alkantpan weapons testing range to determine impact on SKA radio telescope - DST Astronomy Management Authority (South Africa)
- National broadcast site audits – CRAN (Namibia)
- Broadcast site surveys in Madagascar – Rohde & Schwarz
- RF spectrum audits at various mines to characterise ISM band usage (Various clients in South Africa)
- National broadcast monitoring investigation for UHF in South Africa

## 5.4 Shelters and/or installations

- DTT installations – Zambia, South Africa, Nigeria, Ghana and Kenya
- Supply of shelters for Sishen iron ore mine TETRA network – SAAB Grintek Technologies (South Africa)
- Supply of communications system – De Beers Voorspoed Mine (South Africa)
- Medium wave broadcast installations – Magic 828 and LM Radio (South Africa)
- Supply of FM equipment kits – UNESCO (Cameroon) and UNDP (DRC)
- Supply of DTT transmission and generator shelters – Multichoice
- Supply and installation of shelters and RF equipment for DTT rollout in Swaziland and Lesotho – Rohde & Schwarz
- Supply of shelters in support of national FM broadcasting network upgrade - MICT/LNBS (Lesotho)
- Upgrade of PIE racks for Radio Veritas and Radio Pulpit Medium Wave Broadcasting Services – Sentech (South Africa)
- Supply of replacement Medium Wave broadcasting transmitters – Sentech (South Africa)
- Large FM broadcast turnkey project in Asia
- FM broadcast replacement project Seychelles
- TETRA projects

## 5.5 Consulting

- DTT and DTH broadcasting equipment evaluation – USAASA (South Africa)
- Review and development of broadcast and telecoms technical standards – BOCRA
- Provision of independent expert on transmission issues – KBC (Kenya)
- Project management on DTT rollout – MYTV (Malaysia)
- Engineering and design of conversion from analogue (MPT1327) to digital trunkin for Kolomela iron ore mine – Anglo American (South Africa)
- EMF Radiation Safety Simulations and Site Surveys – Ericsson (South Africa)

## 6 Contact Details

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Koenie Schutte

Chief Executive Officer

Tel: +27 (0)11 958 5153

Mobile: +27 (0)82 902 6272

Email: [KSchutte@LSofSA.co.za](mailto:KSchutte@LSofSA.co.za)

Find us online at [www.LSofSA.co.za](http://www.LSofSA.co.za)