Company Profile
1. INTRODUCTION

As recent as 30 years ago, many antenna masts and antennas were still being imported, costing African countries valuable foreign exchange – while the imported products regularly failed to match client needs and wants, or even local conditions. This was a dilemma that sparked off the birth of this entirely African venture, which has made its mark on the mast and tower industry on this continent with innovative designs and a continually expanding range of towers, masts and antenna products to address every customer requirement, while at the same time maintaining the highest quality standards.

Fundamentally, Mast Tower & Antenna Structures cc business centres on the design, manufacture, installation and maintenance of masts, tower structures and installations, although an increasing segment of business consists of the supply of HF antenna systems.

Other areas of expertise include the manufacture and installation of HF SSB, advanced HF automatic link establishment antenna systems, MW, HF, VHF/UHF FM and TV broadcast antenna systems.
Background

a. Year founded

The initial company, Van Reenen Electronics, was founded in 1979. Its name was changed to Mast Tower & Antenna Structures cc in 2001, to better reflect its African identity.

b. Location

Mast Tower & Antenna Structures cc is situated in an industrial park in Pretoria, South Africa. Its physical address is:

Unit 53D
Tannery Industrial Park
309 Derdepoort Ave
Silverton
Pretoria

c. Founding members

Managing Director: AL (Anton) Botha

Anton began his career in the field of Auditing, joining Hees and Van Loggerenberg Auditors in 1975 as an articled clerk. He then briefly tested the waters of the marketing field, joining a local manufacturer of agricultural machinery as a salesman in 1978. Anton joined Van Reenen Electronics in 1979 as a technician. In 1982, Anton became a director of the company, and in 2001 he was appointed Managing Director of the company.

During the past 30 years, first with Van Reenen Electronics, and later with Mast Tower & Antenna Structures cc, Anton has gained a wide range of experience in all aspects of tower and mast manufacturing and erection, as well as antenna installation, including site establishment and management. During this period Anton also acquired a diploma in Marketing and Sales Management, and a Masters in Business Administration (Henley, United Kingdom). His Masters’ dissertation dealt with remote-site control in the communications installation industry.

Founding Member: H (Henry) van Reenen

Henry began his career as a volunteer cadet in the South African Air Force in 1954, joining the Permanent Force and qualifying as a Radio Operator (Air) in 1955. In the ensuing 11 years in the SAAF, Henry completed extensive training in the field of radio communications, some of which is indicated below:

- Radio Theory/Practical Course, Marconi Radio School, Croydon, UK – 1957
- Search and Rescue and Homing (SARAH) Electronics Course, London, UK – 1957
- Radar Theory/Practical Course, RAF Kinloss, UK – 1957
- Advanced Maritime R/O Course, RAF St Mawgan, UK – 1960
- Licensed as Amateur Radio Operator ZS1XH in 1961
- Qualified as a private pilot (civil) on single-engine aircraft – 1993
- Qualified as a pilot on multi-engine aircraft (civil) in 1997

Henry resigned from the SAAF in 1965 to pursue a career in commerce, joining Beckman Instruments as a Laboratory/Instrument Technician. He successively held the posts of Sales Engineer, Depot Manager, Sales Manager, Branch Manager and National Marketing Manager.

Intent upon furthering his understanding of commerce, Henry acquired diplomas in Marketing Management during this period. In 1975, Henry set the wheels in motion for the formation of Van Reenen Electronics by leaving Beckman Instruments. He established the company Van Reenen Electronics and branched out into the field of mast and tower design and manufacturing. Henry retired from the company in 2009.
2. GENERAL DESCRIPTION OF PRODUCTS/SERVICES

Current markets

**Masts and towers**

Mast Tower & Antenna Structures cc specialises in manufacturing, erecting and maintaining communication structures. The company fields a highly experienced high-tower broadcast rigging team, as evidenced by the installation of some 36 large (12-tier) FM band II broadcast arrays and a number of UHF TV spines, antennas and feed lines for Sentech on towers varying in height from 120 to 270m on active broadcast antenna systems.

High-precision engineering projects such as the installation of microwave passive repeater systems are considered to be a speciality, several such systems having been successfully commissioned in recent years. Mast Tower & Antenna Structures cc has access to precision engineering survey expertise, including the use of GPS navigation equipment, for the alignment of microwave communications systems.

A significant portion of the business in the mast and tower sector consists of the survey, maintenance and repair of antennas, masts and tower structures. This is illustrated by the successful completion of a maintenance programme on several live antennas/masts for the SA Decca navigation chain along the South African coast and complete antenna farm overhaul and maintenance projects on active antennas for the SA Navy and SA Airforce at various locations.
Mast Tower & Antenna Structures cc also exports a significant proportion of its HF antenna product to, *inter alia*, Peru, Thailand, Eritrea, the Congo, Mozambique, Angola, India, Poland, the USSR and Mainland China.

**Aeronautical nav aids and antennas**

A large number of NDB antennas and NDB systems have been designed, manufactured and installed over the past 27 years at practically every airport and airstrip in Southern Africa.

**The HF market**

An established sector of Mast Tower & Antenna Structures cc’s business consists of the high-frequency communications market. Mast Tower & Antenna Structures cc manufactures a line of military-standard HF travelling wave dipoles. An in-house expertise gained from many years of involvement in the design of high-performance HF SSB products is utilised in the planning and implementation of HF systems.

HF SSB and data communications equipment, including advanced automatic link establishment systems equipment, is sourced through local companies in order to provide turnkey solutions. In several instances, successfully completed contracts have involved the manufacture and installation of equipment racks and the installation of radio equipment, antennas and power supplies, including battery backup supplies, in addition to all civil works associated with the erection of antenna masts.

**Other markets**

Mast Tower & Antenna Structures cc is presently actively pursuing new opportunities in the radio communications and broadcasting field.
3. MAST TOWER & ANTENNA STRUCTURES CC’S APPROACH TO SERVICE

Our marketing policy follows an aggressive quality-consciousness approach, mixed with an adherence to the principle of ‘value for money’.

In order to enhance our client support effort, our computer network runs, inter alia, on NEC 4 antenna/design and Simulation and AutoCAD programs.

Where required, we consult with graduate structural and electronic engineers with extensive experience and expertise in the fields of mast/tower structural design and antenna design and development. Mast Tower & Antenna Structures cc employs technicians and qualified riggers with extensive experience in television and FM broadcast engineering and the installation of HF communications systems (SSB and data transmission) microwave systems.

FM Broadcasting Tower
4. AWARDS

Mast Tower & Antenna Structures cc received a Certificate of Appreciation from the Air Logistics Command Ground Systems for the installation of masts, towers and antennas at sites in Durban, Cape Town and Pretoria.

Sentech commended Mast Tower & Antenna Structures cc for the erection of a 114m vertical radiating antenna at Klipheuwel in Cape Town.

5. SIZE OF BUSINESS

Mast Tower & Antenna Structures cc commands an array of teams specializing in civil works and high-mast rigging, as well as a manufacturing plant.
Section B

1. COMPANY PRODUCTS AND SERVICES

Mast Tower & Antenna Structures cc (Pty) Ltd is one of South Africa’s leading mast, tower and antenna specialists, providing these services with utmost quality and professionalism. We maintain the highest standard of safety in the manufacturing, erection and maintenance of structures. Our safety file is open for inspection at the company’s premises.

Passive Repeater Pietermaritzburg

Table of Contents

1. HEALTH AND SAFETY POLICY
2. OBJECTIVES
3. MANAGEMENT COMMITMENT
4. SUPERVISORS’ RESPONSIBILITY
5. PROJECT SPECIFIC
5.1 PROJECT SPECIFIC HAZARDS
5.1.1 Asbestos
5.1.2 Transporting employees and materials
5.1.3 Trucks and trailers
5.1.4 General practices and housekeeping
5.1.5 Lifting
5.1.6 Fire prevention
5.2 BIOLOGICAL HAZARDS AND CONTROLS
5.2.1 Snakes
5.2.2 Poison Ivy and Poison Sumac
5.2.3 Ticks
5.2.4 Bees and other stinging insects
5.3 WORKSITE ANALYSIS
5.4 JOB SAFETY ANALYSIS (JSA) AND PERSONAL PROTECTIVE EQUIPMENT
5.5 EMPLOYEE REPORT OF HAZARDS
6. ACCIDENT INVESTIGATION
7. HAZARD PREVENTION AND CONTROL
8. SAFETY AND HEALTH TRAINING
9. EMERGENCY EVACUATION AND RESPONSE
10. SITE SAFETY DOCUMENTATION
11. SITE ACCESS
12. SITE SECURITY
13. SPECIALISED SERVICES
14. FIRST AID AND FIRST AID KITS
15. COMPENSATION COMMISSIONER (COID ACT 130 OF 1993)
16. SAFETY WELFARE ON SITES
17. PERSONAL PROTECTIVE EQUIPMENT (PPE)
mast tower and antenna structures cc.

UNUSUAL 200 SERIES TRU ANGLE LATTICE MAST-TYPICAL SECTION
TRIANGULAR LATTICE STEEL - 200MM CENTRES EQUILATERAL
MAXIMUM SAFE HEIGHT 32m, 24m supporting mast & antenna
SUPPLIED IN ALL WELDED 3m LONG BOLT-TOGETHER SECTIONS.
SIDE BOARDS 21 x 2mm STRUCTURAL TUBING
DIAGONAL TRACING AND CLIMBING STEPS IN SOLID BAR
FINISH - HOT DIP GALVANISED TO SABS 763 AS AMENDED
DIMENSIONS - METRIC
SCALE - NO SCALE

SPECIALIST MAST, TOWER AND ANTENNA DESIGNERS, MANUFACTURERS AND INSTALLERS
630 Tannery Industrial Park
509 Dardaport Rd
Bellair
Pretoria
Republic of South Africa

Office in one
P.O. Box 13
Eiland Park
0047

E-mail: anton@umaakazo.co.za
mast tower and antenna structures cc.

UMSAKO 300 SERIES TRIANGULAR MAST - TYPICAL SECTION
TRIANGULAR LATTICE STEEL 300mm LEG CENTRES EQUILATERAL
MAXIMUM BASE HEIGHT GAUGED 4.5M SUPPORTING 1.75m ANTENNA
SUPPLIED IN ALL WELDED 3m OR 6m LONG BAY TOGETHER SECTIONS
SIDE RAILS - 25x3mm STRUCTURAL TUBING
DIAGONAL BRACING AND CLIMBING STEPS - 1.5mm SQUARED BAR
CLIMBING STEPS ON ONE FACE ONLY
FITTINGS - PER SECTION - 6x4.65 GR 8.8 BOLTS
FINISH - HOT DIP GALVANISED TO SABS 7163 AS AMENDED
DRAWING R:1 - F:1:50
SCALE - NO SCALE

SPECIALIST MAST, TOWER AND ANTENNA DESIGNERS, MANUFACTURERS AND INSTALLERS
8 30 Tannery Industrial Park
309 Dardaport Rd
Elsiverton
Pretoria
Republic of South Africa

Office in-ona
Suite 20
P Bag 12
Eardus Park
0047

e-mail: anton@umsakezo.co.za
Mast tower and antenna structures cc.

UMSA MA20 500 SERIES TRAPEZIAL MAST - TYPICAL SECTION
Maximum structure height 100m supporting max 175m2 antenna
Supplied in all welded sin long bolt - together sections
Side rails - 40x40mm structural tubing
Diagonal bracing and climbing steps - 32mm solid bar
Climbing steps on one face only
Flanges - per section - 4 x M16 x 1/2 bolts
Finish - hot dip galvanised to SABS 793 AS amended
Dimensions: 1:50
Scale - no scale

Optional Spire Top

Hammer Drive Anchor Stake

Optional Base Cage

Standard M24 Guy Tensioner

Dead-Man Anchor for Permanent Installations

Guy Attachment Detail

SPECIALIST MAST, TOWER AND ANTENNA DESIGNERS, MANUFACTURERS AND INSTALLERS
630 Tannery Industrial Park
209 Beaufort Road
Silverton
Pretoria
Republic of South Africa

e-mail: anton@mtandaco.co.za

Office in one
S.W. 80
P. Bag 10
Giordino Park
00437
mast tower and antenna structures cc.

UNICORNER TRIANGULAR MAST - TYPICAL SECTION

EQUILATERAL TRIANGULAR LATTICE STEEL - 750MM LEG CENTRES
MAST MOUNTED ON CONCRETE PODS SUPPORTING BASE TO BE STEELEN AT TOP
SUPPLIED IN ALL WELDED 6MM DIA BOLT - TOGETHER SECTIONS
SIDE RAILS - 10.5mm STRUCTURAL TUBING
DIAGONAL BRACING AND CLIMBING STEPS - 12mm SOLID BAR
CLIMBING STEPS NORMALLY ON ONE FACE ONLY
FLANGES - PER SECTION - 6MOL 60 X 60 X 3.8 M.T. BOLTS

FINISH - HOT DIPPED GALVANIZED TO SABS 763-1993 ANCHOR
DIMENSIONAL DRAWING

FEATURES:

- Designed by Professional Engineers
- Rugged heavy-duty construction
- Hot dipped galvanized to SABS 763-1993 (Similar to BS 729-1971)
- Wind loading calculated in accordance with SABS 0160-1989. Compliant with SSI CP 3, CH V, Part 2 or EIA-222-D available on request.
- All steel in accordance with SABS 1431-1987, Grade 300WA (Similar to BS 4360-1986, Grade 43A).
- All bolts High tensile in accordance with SABS 136-1991, Grade B8.
- Supplied complete with base hold-down bolt cage.
- 12 Month guarantee when erected in accordance with instructions.
- Installation service available.
UMSAKAZO BCM 1000 SERIES GUYED MAST - TYPICAL SECTION
TRIANGULAR LATTICE STEEL - 1000mm LEG CENTRES EQUILATERAL
MAXIMUM SAFE HEIGHT (GUyED) 130m SUPPORTING 2m2 ANTENNA
LOAD AT TOP
SUPPLIED IN KIT FORM - ALL BOLTED - IN 3 OR 6m LEG LENGTH
TO SUITE CLIENT
SIDE RAILS - 76 x 4mm CHS
BRACING - HORIZONTAL - 40 x 40 x 3mm EQUAL ANGLE
BRACING - DIAGONAL - 32 x 3mm CHS WITH PROFILED 8mm
CONNECTING TERMINATIONS
INTERNAL CLIMBING LADDER AND EXTERNAL CABLE LADDER
ENTRY INTO MAST - DIAMOND-SHAPED BRACING ABOVE TAPERED
BASE SECTION
FIXINGS - ALL HOT DIPPED GALVANISED HIGH TENSILE BOLTS Gr 6.8
FINISH - HOT DIPPED GALVANISED TO SABS 763 -
PAINT OPTION INCLUDES SCAVENGING OF GALVANISED
SURFACE FOLLOWED BY A THREE-COAT PAINT SYSTEM
DIMENSIONS ARE METRIC
NO SCALE

ACCESS DIAMOND

ACCESS LADDER

MAST IN PLAN

SPECIALIST MAST, TOWER AND ANTENNA DESIGNERS, MANUFACTURERS AND INSTALLERS
150 Tambo Industrial Park
Boksburg 1460
E-mail: anion@umsaakazo.co.za
Republic of South Africa
UMSAKAZO TELESCOPIC MASTS - FOR MOBILE, PORTABLE OR FIXED STATION APPLICATIONS. THESE ARE AVAILABLE WITH OPTIONAL MOUNTING HARDWARE FOR TRUCK, TRAILER OR CONCRETE BASE MOUNTING.

ILLUSTRATED HERE IS THE "SKYLAB 18" (18m TALL EXTENDED) IN IT'S VARIOUS CONDITIONS. AVAILABLE IN 6-12m, 7-18m, 12-24m AND 12-36m CONFIGURATION.

ALL TRIANGULAR LATTICE SECTIONS CONSTRUCTED USING TUBULAR SIDE RAILS AND SOLID BAR BRACING.

FINISH IS HOT DIP GALVANISED TO SABS 763 STANDARDS.

ALL FIXINGS ARE HIGH TENSILE GR 8.8 HOT DIPPED GALVANISED.

ACCEPTS MOST COMMERCIALY AVAILABLE ROTATORS AND WINCHES.

ANTENNA LOADS UP TO 4 ELEMENT 7MHz OR 7 ELEMENT 14MHz YAGI INSTALLATION SERVICE AVAILABLE.
Self Supporting Towers

**Series SSO Self Supporting Microwave Towers**

**SSO 12 Specifications:**

- **Height to Top of Parallel Section:** 10m
- **Maximum Wind:** 99.5km
- **Total Mass of Tower:** 250kg
- **Total Mass of Tower and Antenna:** 485kg
- **Total Horizontal Shear:** 3kN
- **Maximum Overturning Moment:** 31.7kNm
- **Section Modulus at Base:** 0.504 x 10^6
- **Maximum Wind Load on Antenna:** 0.92 kN
- **Maximum Mass of Antenna:** 173kg
- **Rigidity Area of Antenna:** 1.5m²
- **Angle of Repeatability (Assumed):** 0 deg
- **Mass of Concrete:** 9.468 kg
- **Volume of Concrete:** 0.176 m³
- **Concrete Strength Required:** 30MPa @ 28 days
- **Resistence to Overturning (Factor):** 1.42
- **Foundation Bolts:** 16 x M16 @ 160mm Centres
- **Maximum Bearing Pressure:** 50kN/m²

**Date of Design:** 1991.08.31
**Designed By:** Paul Dzudzu Ph. Eng. (S.A. No. 900458)
**C.Eng., M.I. Struct., E.F.D.S. (U.K.):**

**Construction:**
- All steel is in accordance with SABS 1431:1997 or JIS for all bolts high tensile steel - SABS 136:1991
- Lower section legs - 16mm solid bar
- Upper section legs - 16mm solid bar
- Connections welded by argon covered gas
- Painted after fabrication - HARPEX 660

**Dimensions:**
- TOWER FACE WIDTH
  - 750mm (30") centres
- SECTION LENGTH
  - 6m
- BASE ADJUSTABLE (4 x 3 x 1600mm)

**Tower is Climbed on Inside Using Built-In Climbing Steps**

**Access Via Diamond Shaped Bracing**
Series SST-A Self-supporting Antenna Towers

Available from 3 to 48m in 3m increments
Supports up to 25m² flat-plate area antenna(s) at
top of tower
Maximum antenna mass - 76 kg
Tower mass - 1,310 kg
Supplied in kit form for ease of transport and
erection
Base dimensions vary with soil conditions - that
shown here is typical of a popular shape
Base bolt cages are supplied with the structure and
a template is constructed using the lower 3m section
of tower
Typically requires 9m³ concrete
Caged climbing and cable ladders are available in 1m
or 2m sections
A complete range of antenna mounting brackets are
made to client specification
Finish: All steel materials are hot dipped galvanised
to SABS 763 Standards and Certification is supplied
May be ordered painted to client specification
mt&a structures

mast tower and antenna structures cc.

UMSAKAZO AA SERIES - ALL SOLID STEEL SELF-SUPPORTING ANTENNA TOWERS - FROM 8m TO 55m TALL TO CARRY ANTENNA LOADS OF 20m3 FLAT PLATE AREA TO 145m/sec WITH NO ODD AND SAVY WITHIN 0.8 DEGREES AS ILLUSTRATED BELOW.

Features:

- No tubular members - No undated corrosion - No scaled or flanged joints
- Welding limited to three areas on base of tower - All BOLTED construction elsewhere
- Antenna mounting brackets are custom designed to suit every antenna made - No compromise
- Caged climbing ladder, feeder cable ladder and work platforms mounted internal to structure
- Rugged heavy-duty design according to the principles of ANSI/EIA-222-E
- Wind loading calculated in accordance with SABS 160-1989 - Compliant with BS 5930:CH V, Part 2 or ANSI/EIA/TIA-222-E

All steel in accordance with SABS 1431-1987, Grade B111WA (Similar to BS4360 Grade 43A)

Hot dipped Galvanized to SABS 763 - 1988 (Similar to BS 729-1978)

All fixings hot-dipped galvanized High Tensile steel in accordance with SABS 136-1991 with SABS, 657, Part 1 - Gr 88

Supplied complete with all base rebar and assembly hardware

10 Year guarantee when erected in accordance with specifications

Shop Paint Specification on request

Please specify site category and height above sea level when ordering

Certification as required

SPECIALIST MAST, TOWER AND ANTENNA DESIGNERS, MANUFACTURERS AND INSTALLERS
539 Tammy Industrial Park
309 Dardaport Rd
Erikton
Pretoria
Republic of South Africa

e-mail: anton@umsakazo.co.za
H.F. ANTENNA SELECTION

Mast Tower & Antenna Structures cc offers a selection of HF and MF antenna designs that are adapted and tailor-made to suit client requirements and specifications. With a combined company experience of more than 120 years in the HF communications field, clients can expect – and receive – the ultimate in performance and quality.

All Mast Tower & Antenna Structures cc antennas are computer-modeled, NEC-simulated and optimised, then structurally engineered to perform optimally under all environmental conditions. Only approved materials are employed in their construction.

Full-sized antennas are erected at our works and exhaustively tested and performance-proven prior to delivery.

Short- and long-range, low- or high-power, directional or omni-directional, high- or unity-gain, fixed directional or rotating, vertically or horizontally polarized arrays are available.

A fully illustrated HF antenna addendum to the Mast and Tower Catalogue is in preparation and will become available shortly.

Listed below are some of our current products: -

Vertical curtain directional or omni-directional log-periodic arrays
Uda-Yagi arrays 6.5-30 MHz
Log-periodic arrays 2-30 MHz
Monopole conical antennas 1.5 – 100 MHz
Uni- or bi-directional Rhombic arrays (single-frequency or wideband) 1.5 to 30 MHz
Monopole radio navigation beacon antennas
Symmetrical ‘T’ radio navigation beacon antennas
Traveling-wave dipoles 3-30 MHz
Single- and multiple-frequency dipoles (base station and portable) 1.5 to 30 MHz
2. CUSTOMERS SERVICED BY MAST TOWER & ANTENNA STRUCTURES CC

Mast Tower & Antenna Structures cc manufactures and installs masts, towers and antennas for the military and the telecommunications industry. Please see section 3 below for a detailed list of past and present clients.

3. STRENGTHS AND SUCCESSES

- **Competitive advantages**
  - Adaptability and mobility
  - Many years’ experience in remote-site building
  - Turnkey solutions for remote-site building
  - Capability to offer leading-edge technologically advanced in-house designs

- **Key successes**
  - Development, manufacturing and installation of HF antennas that are extensively used in India, Algeria, Vietnam, Egypt and Saudi Arabia
  - Five-year contract with Sentech for the renewal of 33 FM antenna sites across the whole of South Africa
4. KEY PROJECTS/CLIENTS

A selection of satisfied clients is listed below. The long list of repeat customers is a clear indication of Mast Tower & Antenna Structures cc’s dedication to quality products, allied to strong customer support.

Republic of South Africa and associated states

Bophuthatswana Department of Posts and Telecommunications

- Install microwave passive repeater, Phokeng – delivery, civil work, erection, alignment
- Helicopter lifting of materials (30 tonnes)

Bophuthatswana Department of Prisons

- Design, manufacture, supply, install, test and commission HF antennas, masts and feedlines
- Install and commission HF radio equipment, power supplies and back-up batteries at 17 locations

Consolidated Diamond Mines

- Kleinizee Mine – Microwave system backbone at seven locations
- Kleinizee Mine – NDB antenna

Decca Contractors

Maintenance of Decca navigation antennas/masts along South African coast

- Installation of microwave passive repeaters at Drakensberg pumped storage scheme, Olivier’s Hoek and Eshowe, KZN
- Installation of microwave passive repeater – Thabazimbi/Iscor mine
- NDB antennas – approximately 150 locations in Southern Africa
- Light microwave towers and radio masts – various locations
ISCOR (South African Steel Corporation)

- Sishen – Saldanha Railway – 86 masts installed at 10km intervals along the entire length of the line
- Installation of microwave passive repeater – Thabazimbi

South African Airways

- HF omni-directional log-periodic (LP) array TCI 540 – civil works and installation at Johannesburg International Airport
- Refurbishment of rotating HF LP antenna
- Supply and installation of 30m guyed lattice mast supporting LP antenna
- Supply and installation of HF travelling-wave dipole antenna
- Antenna maintenance over a 22-year period

South African Department of Transport – Weather Bureau

Design, manufacture and supply masts for weather station on Marion Island, South Atlantic Ocean

South African Department of Transport – Directorate of Civil Aviation

Design, manufacture, supply, deliver and install omni-directional-radio-beacon antennas/monopole radiators – numerous sites

South African Department of Transport – Directorate of Civil Aviation

- Design, manufacture, supply, deliver and install masts, HF antennas and feeders – All major airports in RSA
- Design, manufacture, supply, deliver and install radio antenna masts – Bloemfontein, Durban and Cape Town airports
- Install VOR facility at GAV
South African Department of Water Affairs

- Vaal-Harts telemetry system – mast design, manufacture, delivery and erection
- Vaal-Gamagara telemetry system – mast/tower design, manufacture, delivery and erection

SENTECH

Contract for installation of 36 replacement FM Band II antenna systems – mostly 12-tier (x 4) antennas as part of a countrywide SABC upgrade programme (Horizontally polarised to vertical polarisation) (Approximately 720 tonnes of antenna material removed and new material installed on live antenna system) – Replacement of antennas, power supplies, feeder cables, mounting hardware, service platforms, etc. on existing tall-mast structures

SENTECH

- New headquarters building – Panorama – 48m-tall triangular self-supporting tapering lattice steel tower with an antenna mounting cage/work platform at 48m
- Installation/erection of 40 ton 110m tall medium-wave broadcast antenna and counterpoise at Klipheuwel, Cape Province
- Manufacture of special brackets and installation of FM antennas – Napier, Rustenburg, Punda Maria
- Installation of antenna protection ice screens – Napier, Villiersdorp, Queenstown

SAFAIR – Johannesburg International Airport

- Design, manufacture, deliver and erect roof-mounted mast and install rotating log-periodic array
- KLM 6/30 – Helicopter lifting of mast/antenna
- Remove antenna and mast installed earlier and replace rotator and antenna – 10 years later
South African Police Service

- Supply and install several self-supporting lattice antenna towers countrywide
- Supply 50 x 18,5m tilt-over self-supporting tubular antenna masts

South African National Defence Force

Various classified contracts, including the installation of a TCI 540 antenna, LP antennas, travelling-wave antennas, overhaul and refurbishment of complete military antenna farms that include antennas of virtually every description and supplier but inter alia Scheuerecker, Granger, Collins, Hy-Gain, Rhode & Schwarz and TCI

Transkei Department of Posts and Telecommunications

- Microwave system backbone – Masts/towers/shipping containers (GRP)/solar panel arrays
- Rural radio telephone system – masts, solar panel array, antenna installation

MTN (Mobile Telephone Networks)

GSM site maintenance (one-year contract)

United Airlines

Masts and HF antennas

Venda Broadcasting Corporation

- Extensions to towers, guying of existing masts, installation and alignment of TV broadcasting antennas
- Design, manufacture, deliver and erect 80m-tall FM broadcast mast

Neighbouring countries

Republic of Angola

TAAG – Angolan Airlines

Supply and install 30m-tall HF LP mast, assemble and install rotating 6,5 to 30 MHz LP dipole antenna for Luanda International Airport, Angola

REPUBLIC OF BOTSWANA

Botswana Information and Broadcasting

- 100m-tall FM mast – Gaborone
- 50m-tall FM masts – Mahalapye, Palapye, Selibi Phikwe, Francistown
Botswana Defence Force

Countrywide HF SSB and CW network – masts and HF antennas for SSB network

Botswana Directorate of Civil Aviation

Countrywide HF SSB network, radio navigation beacon antennas and transmitter installation countrywide

Botswana Police

- Countrywide HF SSB, Teleprinter, Facsimile and CW Network (1975/76)
  - Masts and travelling-wave dipole antennas – every police district HQ
- Microwave system backbone – Gaborone to Francistown and Selibi Phikwe
  - Mast design, manufacture, supply and erection; dish antenna installation and alignment

Botswana Department of Water Affairs

Various VHF two-way system masts

Kingdom of Lesotho

Directorate of Civil Aviation

Towers and masts, HF SSB communication system and weather instrument masts for all rural airfields – design, manufacture, deliver, install and commission

Lesotho Mounted Police

Masts for HF antenna, antennas for HF SSB communication system

Lesotho Highlands Development Authority (Lesotho Highlands Water Scheme)

VHF/UHF repeater system – installation of containers, antennas, solar panel arrays
Helicopter lifting of material and personnel

Republic of Namibia

Consolidated Diamond Mines

Design and manufacture of eight 50m microwave towers installed in ultra-harsh environmental conditions in diamond mining area on the Namibian coast

Namibian Broadcasting Corporation

Extension of 200m FM mast at Stampriet

Transnamib Airways Windhoek

Ground/Air HF (6.5 to 30 Mhz) LP antenna and mast; installation and commissioning
Oranjemund Diamond Mine

Microwave system – design, manufacture, erect – backbone of seven heavy-duty microwave towers up to 50m tall

Kingdom of Swaziland

Swaziland Broadcasting Corporation

- Design, manufacture and install extension to FM mast at L’Siteke
- Install television transmitting and receiving antennas and feeders

Swaziland Defence Force

- Countrywide UHF network – supply of masts and installation of antennas, feeders etc.
- Assist with commissioning of system
- Supply of HF antennas

Swaziland Department of Posts and Telecommunications

- Install microwave passive repeater at Piggs Peak
- Install microwave passive repeater at L’Siteki
- Design, manufacture and install various microwave towers

Swaziland Department of Water Affairs

Countrywide VHF telemetry system – design, manufacture and install masts and antennas

Swaziland Television Corporation

Design, manufacture and install antenna tower, cable ladders and gantry for TV broadcast – Nyongane
**Republic of Mozambique**

Supply guyed lattice masts to various sites 30m Self-supporting tower

---

**Republic of Eritrea**

Supply 24 HF wideband travelling-wave dipole antennas

---

**Other contracts**

---

**Civil Aviation**

RSA / Lesotho / Swaziland / Transkei / Ciskei / Namibia / Mozambique / Botswana

- More than 156 installations of non-directional radio beacon antennas and transmitters
- Foreign military contracts include the supply of US Comda 230 wide-band vertical and STICA 230 conical monopole antennas for EW and monitoring purposes. These are high-efficiency omni-directional transmit-and-receive antennas. Countries using these antennas are obviously anxious to remain anonymous. Full specifications and data sheets are however available.

*Algeria – HF antenna systems – STICA 230 conical monopole antennas for monitoring purposes*
1. COMPANY EXPERIENCE

Tools/technologies used to meet customer needs

We use NEC 4 antenna/design and simulation, and AutoCAD 2000 programs to design, and simulate the operation of, antennas.

Masts and towers are designed by our panel of graduate structural and electronic engineers. These engineers are selected for their extensive experience and expertise in the fields of mast and tower structural design.

Mast Tower & Antenna Structures cc employ technicians and qualified riggers with extensive experience in television and FM broadcast engineering and installation of HF communications systems (SSB and data transmission) microwave systems.

2. EDUCATIONAL BACKGROUND AND EXPERIENCE OF THE TEAM

Dawie Botha, Aubrey Ramotshaba, Shaun Dowling, Donovan Erasmus and Clive currently head their individual teams in the field for civil work and installations and report directly to the MD, Anton Botha.

The majority of the team have been with the company for 10 years or more in various capacities. All started off as rigger’s assistants and then, having completed various courses and approximately five years of on-the-job real-time training, became fully fledged riggers, antenna fabricators and installers, cable routers, mast painters and associated tradesmen. These men report to Isaac Thebe (riggers) and John Opperman (antenna fabrication), while Norman Kennedy heads the mast fabrication department.
Antenna Engineering Department

Summary of Experience and Capabilities: Technical Manager – Ronald Victor Verweerdt

1984 – 1988

- N6 – Post & Telecommunications: Worked on POTS, FDM, ADPCM, CM and OFDM
- SDH to 155.5Mbps and optical fiber higher-order multiplex equipment
- Installations, maintenance and fault finding
- Also radio links and microwave links working on Siemens C450 mobile networks

1988 – 1991

- Alcom Systems (Motorola SA) – RF Electronics Technician – Test and repair synthesized two-way radio of the production line (Supervisor)
- Transferred to Research and Development – Special projects, prototype construction and PC-cad
- Systems worked on were Motorola two-way comms, HF communications telemetry INTRAC and SCADA systems

1991 – 2002

- Own business – RV communications
- Projects completed – Doppler system, automatic interconnection phone patches, radio programmers, radio links and repeaters
- Other tasks – Sales, services, installation of two-way radios, repeaters and cellular phones
- Specialised in: RFI & RDF consulting and field research
- Obtained a certificate through HMS – practical high-site management

2002 – Present

Technical Manager

Tasks: Sales and planning of new two-way radio, trunking and ethernet repeater networks for network redundancy and disaster recovery
Also 802-11 a/b & g private networks
Systems worked on and commissioned

- Two-way radio networks: Motorola, Kenwood, Icom, Tait; Zetron repeater controllers
- Wireless networks: BreezeNet Ap-10, Alvarion, Tsunami 5.7 – 5/8 Ghz, Lucent Technologies (Orinoco 802-11b) 11Mbps. Senao 802-11a/b and g and Planet wireless access points and ethernet bridges
- Working knowledge of platforms on Linux/Windows-based equipment
- RS232, USB and Ethernet tcp/ip interfaces
CONTACT INFORMATION

Anton Botha (Managing Director)
E-mail: anton@umsakazo.co.za
Cell phone: +2783 442 1073