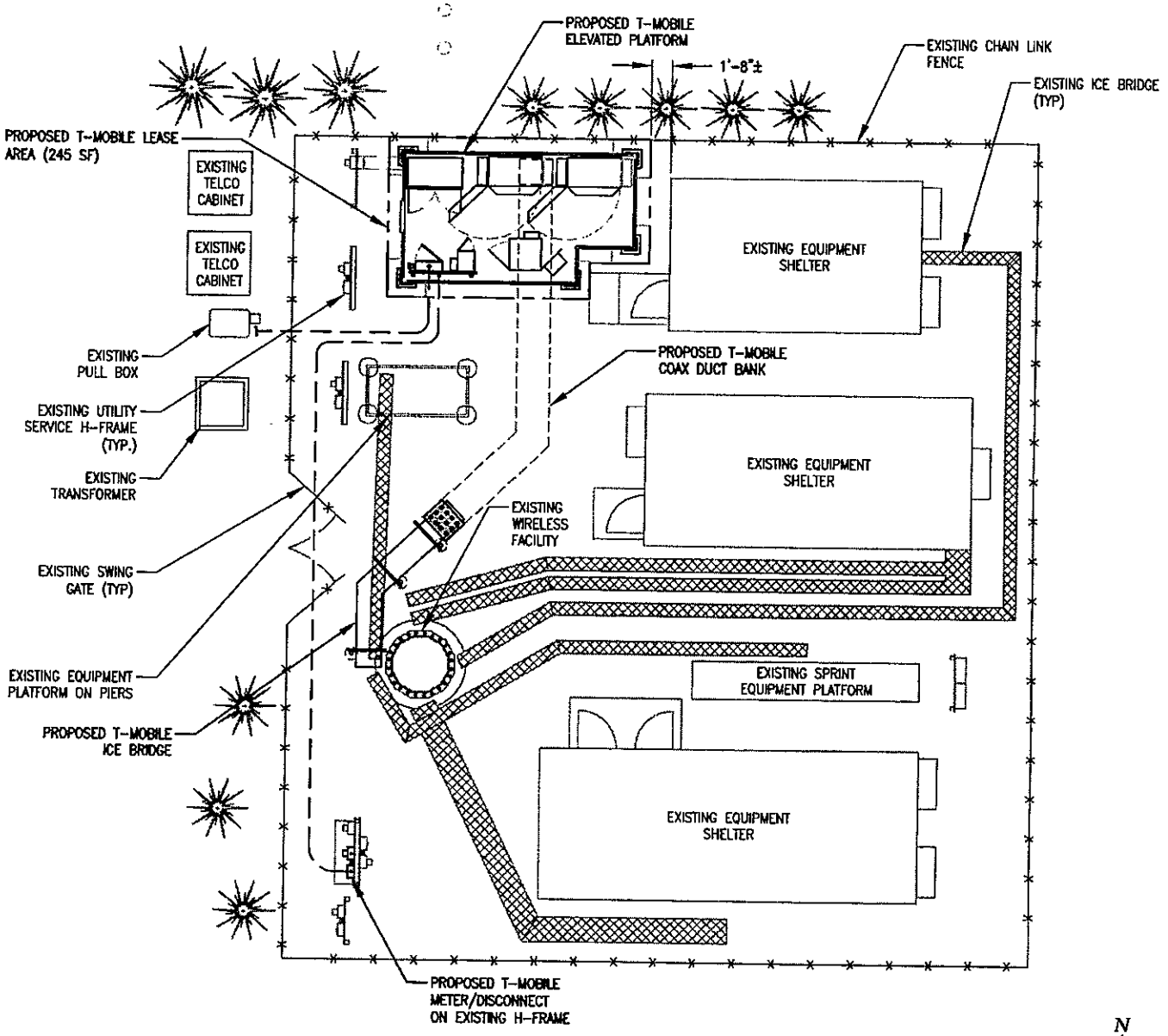
EXHIBIT "A"

Engineer's Drawings:

1. Site location
2. Site Plan (showing Property and Premises), location of existing improvements and proposed improvements

See Attached

NOTE:
PROPOSED T-MOBILE ICE BRIDGE TO BE INSTALLED ABOVE EXISTING ICE BRIDGE.



NOTE:
EXISTING TREES SURROUNDING COMPOUND TO REMAIN.

LEASE EXHIBIT – PLAN (OPTION 2)

NOT TO SCALE

PREPARED BY
COMPASS Technology Services
9700 Patuxent Woods Drive
Columbia, Maryland 21046
443-766-1024 Fax 443-766-1025

T-Mobile Northeast LLC
12050 BALTIMORE AVENUE
BELTSVILLE, MARYLAND 20705
PHONE: (240) 264-8600
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NETWORK BUILDING & CONSULTING, LLC

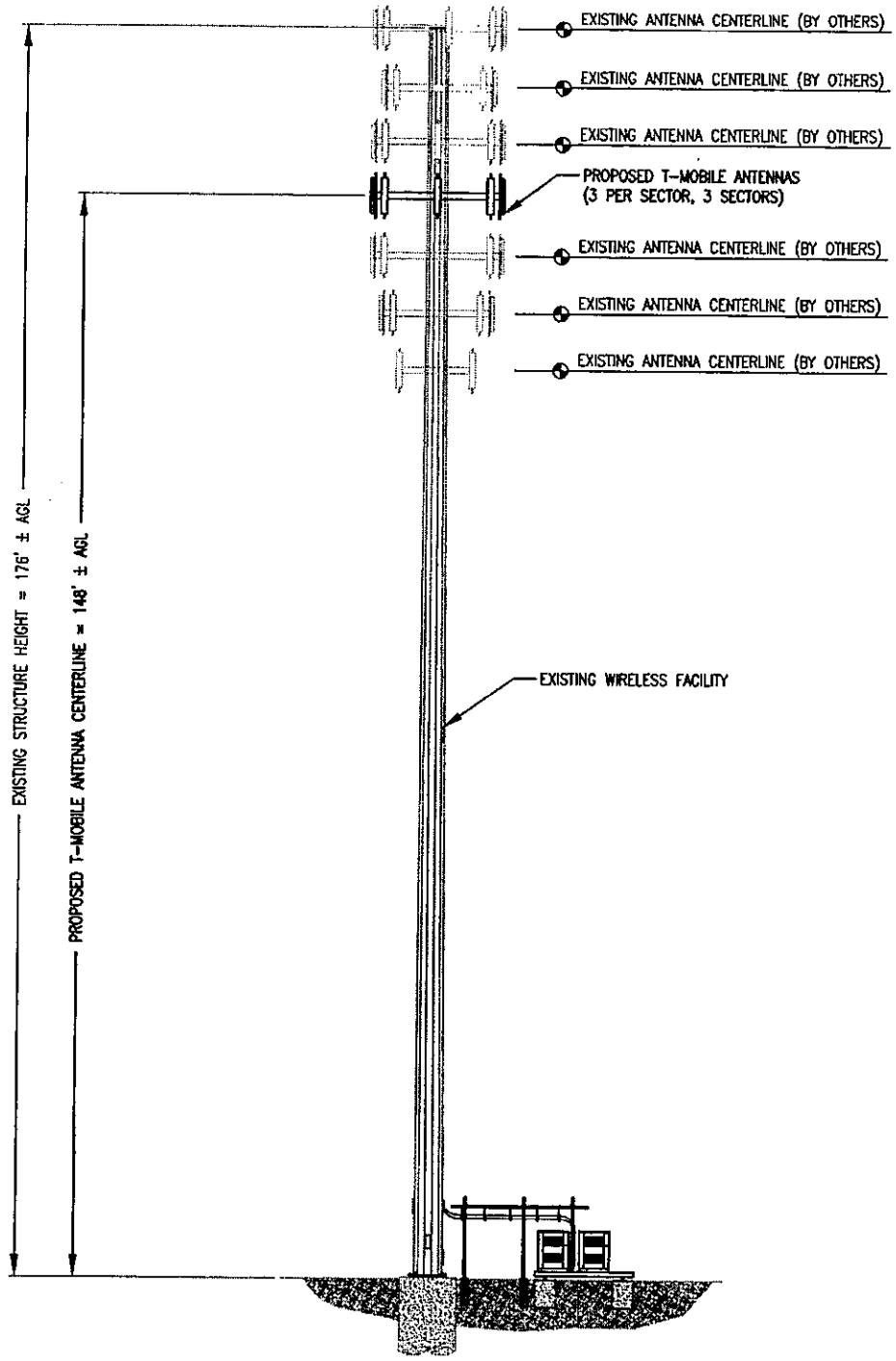
NO.	DATE	REVISIONS	BY
5	07/18/10	LEASE EXHIBIT	JRC
4	06/14/10	LEASE EXHIBIT	AJL
3	04/20/10	LEASE EXHIBIT	AJL

DRAWN BY	M. SCHMITZ
CHECKED BY	J. CUNNINGHAM
DATE	05/12/09
COMPASS PROJECT #	100211

WAN532A
CROWN 806399
14500 AVERY ROAD
ROCKVILLE, MARYLAND 20850
(CITY OF ROCKVILLE)

SITE OWNER APPROVAL

SIGNATURE DATE



NOTE:
COAX CABLES TO BE ROUTED PER
STRUCTURAL ANALYSIS (BY OTHERS)

LEASE EXHIBIT – ELEVATION

NOT TO SCALE

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COMPASS Technology Services
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NETWORK BUILDING & CONSULTING, LLC

NO.	DATE	REVISIONS	BY
4	06/14/10	LEASE EXHIBIT	AJL
3	04/20/10	LEASE EXHIBIT	AJL
2	01/20/10	LEASE EXHIBIT	VGC

DRAWN BY	M. SCHMITZ
CHECKED BY	J. CUNNINGHAM
DATE	05/12/09
COMPASS PROJECT #	100211

WAN532A
CROWN 806399
14500 AVERY ROAD
ROCKVILLE, MARYLAND 20850
(CITY OF ROCKVILLE)

SITE OWNER APPROVAL

SIGNATURE DATE

EXHIBIT "B"

Proposed Improvements

1. List of all Lessee's equipment to be placed on the Property and Premises
2. Cut sheets and drawings or photographs indicating number of each, dimensions, elevations, colors, materials, manner of attachment

The following equipment will be installed within the Premises:

Three (3) Radio equipment cabinet of dimensions; each cabinet is 5'-5" high x 4'- 3" wide x 3' – 1" deep

One (1) Battery cabinet of dimensions; 2' high x 1'- 10" wide x 1'- 8" deep

One (1) PPC (power & telco) Rack of dimensions; 7' high x 4' wide

One (1) Steel equipment elevated platform of dimensions; approx 13.5' wide x 18' long supported by five (5) piers

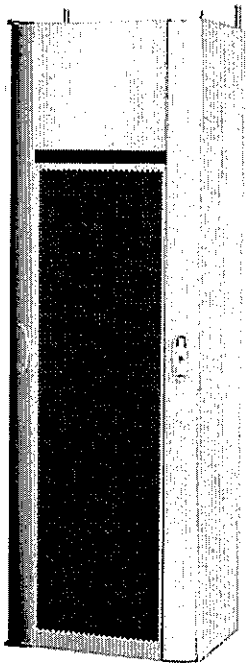
related appurtenances
Cables from the radio equipments cabinet to monopole
Ice bridge from the radio equipments cabinet to Monopole

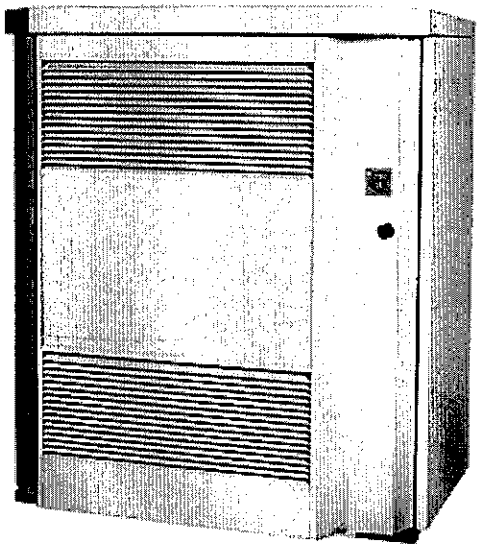
See Attached Cut Sheets

Attachment B

RBS 3206/3106 Product Description

COMMERCIAL PROD DESC





ERICSSON

Contents1

1 Introduction

The RBS 3206 and 3106 are Ericsson's new, highly efficient, scalable and flexible indoor and outdoor macro base stations. With up to twice the capacity, power and efficiency of their predecessors they primarily address the very high capacity segment. The RBS 3206 and 3106 utilize a newly designed hardware structure with which they also support both dual-band and higher order sectorization configurations in a single cabinet.

With the same world-leading foot print and installation requirements as the existing Ericsson macro offerings, the new base stations are not only a natural complements to the existing macro products in Ericsson's product portfolio, but they also constitute compelling migration paths into the future, leveraging on the same HSDPA and Enhanced Uplink implementations available for all Ericsson WCDMA RBS products as well as all other base band and transport network interface hardware modules.

The RBS 3206, available with a multitude of power supply voltage alternatives, is the versatile indoor version of the new base station design, whereas the RBS 3106, with its compressor-free climatic system, is the rugged, self contained version of the same.

These two new high capacity base stations build upon Ericsson's well-proven and highly successful designs, the RBS 3202 and RBS 3101. These Ericsson macro base stations have been successfully deployed in commercial networks throughout the world for several years and will continue to support capacity and functionality growth well into the future, due to their capable and flexible architecture.

With the RBS 3206 and 3106, integration, scalability and flexibility have been taken to a new level providing ample benefits to the telecom operators in terms of capacity, size and lowered operating costs.

1.1 The RBS 3000 Product Family

The RBS 3206 and 3106 are both members of the RBS 3000 family where they complement the Macro RBS segment.

The RBS 3000 family's comprehensive range of radio base stations with superior radio performance and unique features provides cost effective coverage and capacity from urban to rural as well as for in-building radio applications.

Ericsson's excellent WCDMA and GSM co-siting characteristics, enable effective co-siting with GSM for optimized capital and operational expenditures.

The unique Ericsson Connectivity Packet Platform platform (CPP), embedded in all nodes in the radio access network, allows for star, ring or chain transport structures. An RBS can connect other base stations acting as a concentration hub for traffic. All necessary functions for building AAL2, and ATM PVC/PVP switching on PDH/SONET transport are included in the platform, and the platform will also fully support efficient IP transport over PDH/SONET and Ethernet networks. By implementing the AAL2 switching feature transmission savings up to 65% can be achieved.

RBS 3000 family is 3G and fully HSDPA optimized with scalable capacity and smooth evolution to enhanced up-link and other WCDMA capacity enhancing features.

1.2 RBS 3206/3106 Macro Base Station Products

Main Characteristics:

- Macro coverage and extended macro coverage
- Outdoor or Indoor cabinet
- Up to 6 sectors in one cabinet
- Up to two frequency bands in one cabinet (dual band)
- Up to 4 carriers per sector
- Multiple power output options with up to 60 W per cell-carrier
- Up to 1536/1536 channel elements in uplink/downlink
- HSDPA and Enhanced-Uplink support.
- Support for remote radio units (RRU)
- 4-way Rx diversity and 2-way Tx diversity prepared.
- Multiple power supply voltage options.

Installation

The RBS is delivered pre-tested and pre-configured to site including a built-in self-test mechanism and the Equipment Configuration Wizard, leading to reduced installation time and faster network rollout.

Operation and Maintenance:

The RBS is accessible for the execution of management tasks from any node in the network. The following features exist to ensure minimal service impact during change or maintenance activity:

- Software corrections and software upgrades can be performed whilst the RBS is in operation.
- RBS hardware (plug-in units) can be replaced during operation (hot-swap principle).
- RBS hardware can be added while the RBS is in operation.
- The RBS has a root-cause fault location capability.

Transmission:

All common transmission standards are supported and different transmission configurations (cascading, star and tree) can be combined to support different network topologies using the transmission capabilities incorporated in the RBS.

Reliability:

The RBS includes a number of redundancy concepts (such as N+1 redundancy, load sharing and processor cluster) for increased availability and reduced downtime.

Expandability:

The RBS architecture is designed for easy expansion of capacity and/or coverage by addition of extra hardware. The expansion HW is designed so that it can be freely moved between nodes making more flexible expansion scenarios possible.

The RBS hardware structure is prepared for future capacity enhancements utilizing even more integrated hardware solutions.

Evolution:

Through the way the HW has been organized and modularized the RBS is well prepared for future capacity improvements and further reductions in power consumption when such become available.

The Indoor Cabinets (Two Variants Available)

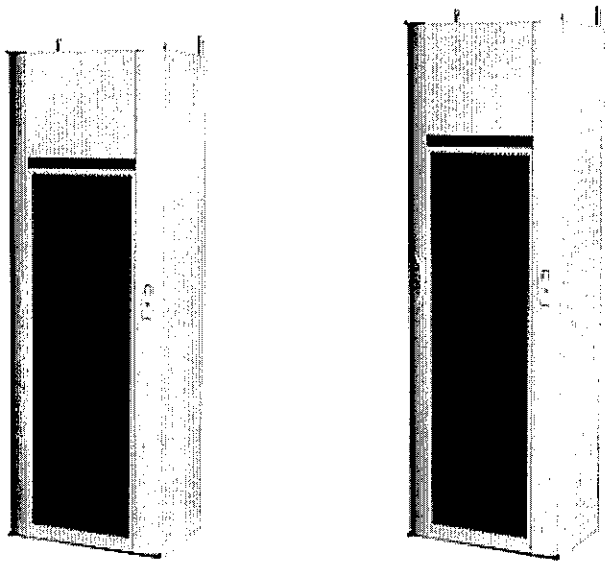


Figure 1 RBS 3206 F and E Cabinet

- Indoor specified
- RBS 3206F cabinet with slots for 6 radio units (single and dual band configurations)
- RBS 3206E cabinet with slots for 9 radio units (dual-band configurations only)
- The cabinets fulfil seismic requirements
- Minimal footprint
- Hot-spot heat management and fan control

The RBS 3206 cabinet footprint is the same as for the GSM RBS 2206 and WCDMA RBS 3202 cabinet. The RBS 3206 cabinet is intended for indoor sites with primarily high capacity and high coverage requirements. The RBS 3206 can be equipped with an optional integrated power supply voltages other than -48 VDC or a space for auxiliary transport network equipment.

The Outdoor Cabinet

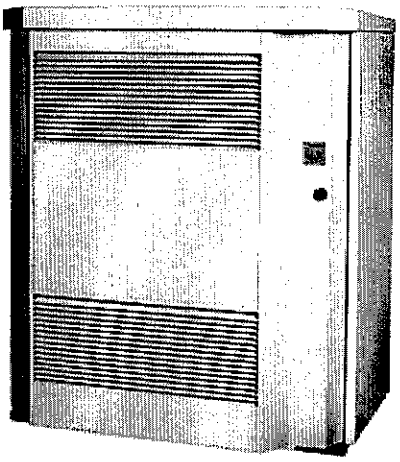


Figure 2 RBS 3106 Cabinet

- Specified for outdoor environment
- Can be configured for both 6 and 9 radio units.
- The cabinet fulfils seismic requirements
- Vandal protected
- Forced convection and heat exchanger (Eco-Cooling)

The RBS 3106 cabinet has the same footprint as the GSM RBS 2106 and the WCDMA RBS 3101.

The RBS 3106 cabinet is a weatherproof outdoor cabinet for outdoor sites with primarily high capacity and high coverage requirements. The RBS 3106 houses integrated power supply with optional backup batteries, space for transmission equipment and a climate package for ensuring an indoor climate for all units inside, including the batteries.

2 Descriptions

The RBS HW is modularly structured into several subsystems for easy expansion and evolution purposes. From a physical viewpoint the subsystem are located together on shelves in the cabinet. The shelves are basically identical between the cabinets.

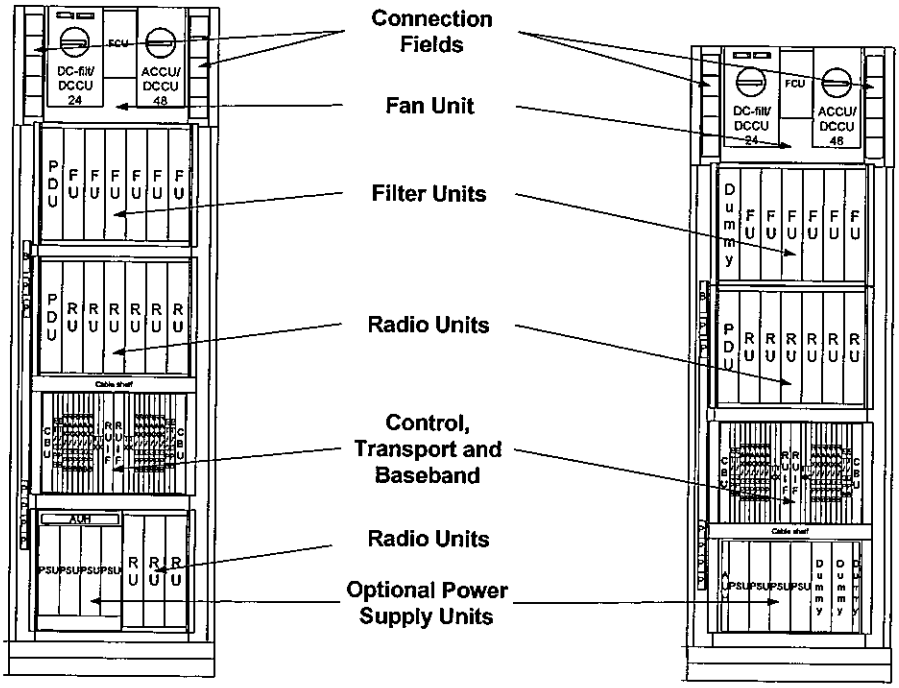


Figure 3: RBS 3206 E and F Cabinets

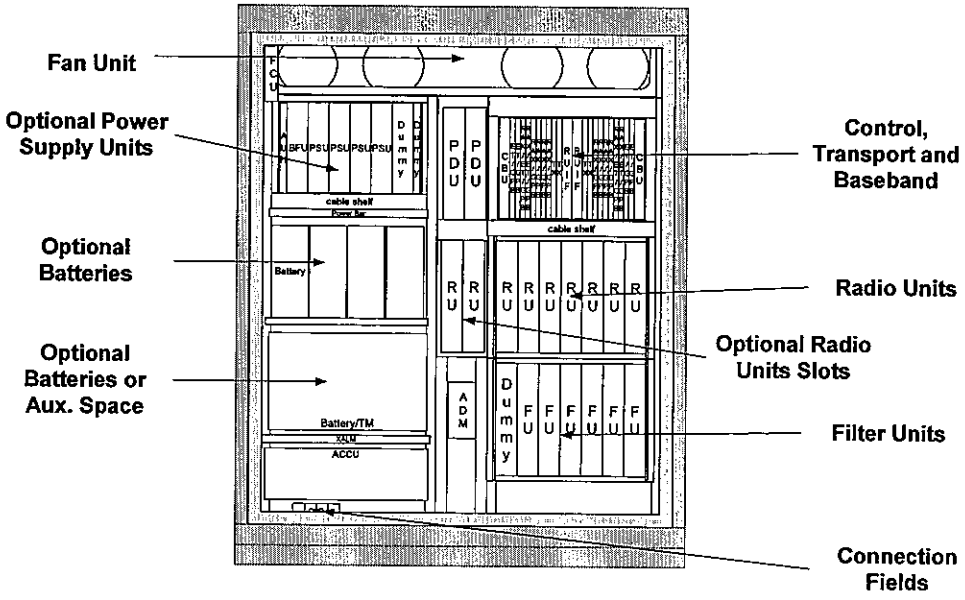


Figure 4: RBS 3106

2.1 Hardware Architecture

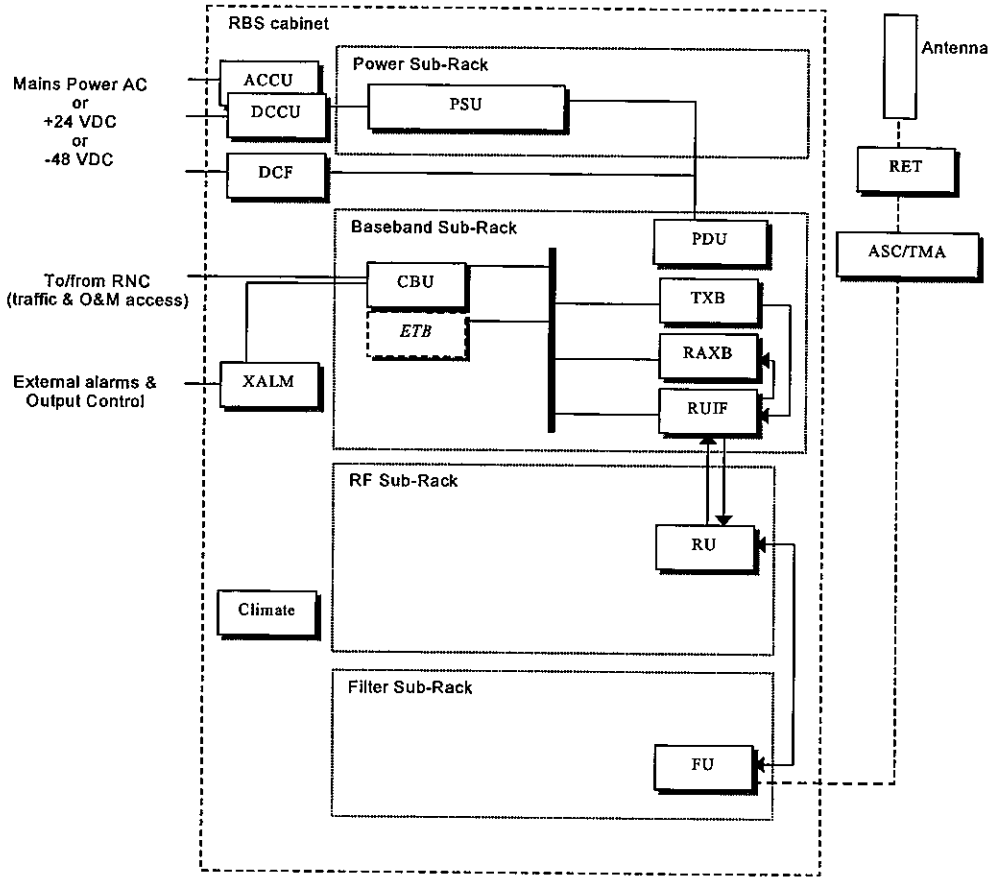


Figure 5 RBS Hardware Structure/Architecture

2.2 Units and Modules

2.2.1 Control Base Unit (CBU)

The CBU is the central control unit of the RBS. It executes the main part of the control functions in the RBS and controls the boards via the board processors (BPs).

The CBU contains the ATM switch and interfaces to the other units in the sub-rack via the backplane. The CBU board also contains power filtering and distribution for the BB and Control sub-rack.

The CBU also stabilizes the clock signal extracted from the transport network connection or from the optional External GPS equipment. A number of timing signals is created by the CBU and distributed to the rest of the RBS.

Four IMA capable E1/T1/J1 transport network ports are provided by the CBU.

The CBU can be duplicated for load sharing or redundancy. A maximum of two CBUs can be installed.

2.2.2 Exchange Terminal Board (ETB)

The Exchange Terminal Boards (ETBs) provide optional transport network connection ports. The use of ETBs are optional since the CBU already provides for the most common transport network connectivity requirements.

An ETB comprises functions for interfacing the physical transport network line to the RBS internal ATM switch. The number and type of ETB boards can be chosen for different transmission standards and speeds. The number of boards can vary from one up to eight, which also makes it possible to configure the RBS as a transmission hub.

N+1 redundancy is possible if one of the ETB slots is used for installing a redundant board. This requires that a redundant transmission line is available.

The transport link interfaces are implemented as an integral part of the ATM platform on which the RBS is based. The capacity of the links can be adapted to the traffic bandwidth needs of each RBS and its role in the transport network.

Different transmission configurations can be designed to support different network topologies. Cascading, star, tree and ring configurations can be used and combined in any suitable structure.

The RBS can be configured as a transmission hub (concentrator) for ATM traffic both with VC cross-connect and with AAL2 switching.

The transport network configuration is controlled via the Ericsson O&M System, OSS-RC.

2.2.3 Base Band in General

The amount of channel elements (CE) can be optimized to fit the current need depending on the type of users and the amount of users using the different services. The table below defines the Maximum Baseband Traffic Capacity that can be housed in one RBS cabinet. Capacity for common channels and Softer Handover is provided built-in as standard in addition to the specified traffic capacity. The capacity can be pooled over all sectors, over carrier frequencies and, in the case of a dual band configuration, over frequency bands.

2.2.4 Base Band Random Access Receiver Board (RAXB)

The RAXB is divided in main functional units:

- Demodulator (DEM)
- Random Access (RA)
- Decoder (DEC)
- Board Processor (BP)

The DEM comprises functionality for RAKE receiver, channel estimation and maximum ratio combining (MRC).

The RA comprises a random access detector.

The DEC module comprises functionality for de-interleaving and decoding.

Extra capacity is added by software keys and/or by adding more boards up to maximum capacity.

Redundancy is provided by load sharing between the RAXB.

Up to 12 RAXBs can be installed. Standard configurations up to 3x2, 6x1 or 3x1+3x1 dual band support up to 6 RAXBs, i.e. up to 768 R99 channel elements for UL. Configurations beyond 6 cell-carriers (beyond 3x2) require software support for so called, "Large Configurations", which then enables the use of up to a total of 12 RAXBs, i.e up to 1536 R99 UL channel elements. Any of the RAXB slots can be fitted with boards for either R99 traffic or boards for Enhanced Uplink (or boards for a combination of both).

A more detailed description of the base band units can be found in ref. **Error! Reference source not found. "Error! Reference source not found.**

2.2.5 Base Band Transmitter Board (TXB)

The TXB comprises functionality for:

- Encoding (ENC)

- Modulation and spreading (MOD)
- Board Processor (BP)

Redundancy is provided by load sharing between the TXB.

Up to 4 TXBs can be installed. Standard configurations up to 3x2, 6x1 or 3x1+3x1 dual band support up to 2 TXBs, i.e. up to 768 R99 DL channel elements. Configurations beyond 6 cell-carriers (beyond 3x2) require software support for so called, "Large Configurations", which then enables the use of up to a total of 4 TXBs, i.e up to 1536 R99 channel elements. Any of the TXB slots can be fitted with HSDPA capable HW, the HS-TX15 or HS-TX45.

A more detailed description of the base band units can be found in ref. **Error! Reference source not found. "Error! Reference source not found.**

2.2.6 Radio Unit (RU)

The RU includes all necessary functionality for signal clipping, D/A conversion and modulation and RF amplification for the TX path, as well as A/D conversion and filtering for the RX path.

One RU can support one or more cell-carriers, both Rx and Tx, depending on the type of RU. Different RU types can be mixed in the same cabinet. Multi-band configurations can be built by installing RUs (and corresponding FUs) for different frequency bands.

Up to 6 RUs can be fitted in one F cabinet and 9 in an E cabinet. The 9 RU configurations possible in the E cabinet are of interest for dual-band configurations in combination with fragmented spectrum allocations and/or high power requirements. 9 RU configurations are normally not useful for single band applications.

2.2.7 Filter Unit (FU)

The Filter Unit comprises RF parts, such as RF filters, Low Noise Amplifier and splitters. The FU also supplies power to the ASC/TMA and RET.

A duplex filter connect both receiver and transmitter to a common antenna. The duplex filter minimizes the number of required feeders and antennas.

Alarm and control communication with the ASC and RET are handled via the FU. The control mechanism is different for the 2100 and 850, 1900 MHz bands:

- The 2100 MHz FU supports the Ericsson high gain ASC with built in RET support and a more advanced communication protocol through the feeders. It also supports the high-gain W-TMA without RET support.

- The 850 and 1900 MHz FUs support Ericsson (or compatible) GSM ddTMA with 15 VDC power supply through the feeders and DC current alarm supervision.

The 850 and 1900 FUs also have extra amplified Rx ports for simplified antenna sharing with co-sited GSM or TDMA RBSs. The 850 and 1900 FUs also includes HW for VSWR supervision of feeders and antennas (for 2100 MHz the VSWR function is located in the ASC).

The FU (all bands) also enables 4-way RX diversity by the provision of 4 antenna ports per sector in 3-sector configurations. In this configuration the VSWR-supervision in the 850, 1900 MHz FU works on the 2 combined TX/RX branches. The 2 remaining RX-only branches are DC-supervised in this configuration.

2.2.8 Radio Unit Interface Board (RUIF)

The RUIF board is the interface board in the BB sub-rack interfacing the RUs in the radio sub-rack. The RUIF carries both the digital I/Q signals, for the transmit and receive paths, as well as the digital control signals to and from the RUs and the BB and Control back-plane. The timing signals from the CBU are also transferred to the RUs through the RUIF.

2.2.9 Optical Radio Unit Interface Board (OBIF)

The OBIF board is an optical variant of the RUIF board that makes it possible to connect remote radio units to the macro RBSs.

Two versions of the OBIF board are possible, one version that supports optical connections and one that supports both optical and electrical connections at the same time. The latter OBIF board allows mixing internal and remote radio units more flexibly.

2.2.10 Power Supply Unit (PSU) AC/DC

PSUs are optional and only required when a supply voltage different than –48 VDC is desired.

The PSU converts the incoming power supply voltage to -48 VDC 2-wire system voltage.

The PSU can be duplicated for N+1 redundancy and faster battery backup re-load time for all configurations up to 6 Radio Units.

There are PSU options possible for AC mains, +24 VDC and -48 VDC 3 wire power supplies.

2.2.11 Power Distribution Unit (PDU)

The PDU is used for internal DC distribution. It contains the fuses for the individual connections an a capacitor unit for power supply hold-over for the digital parts of the RBS.

2.2.12 AC Connection Unit (ACCU)

The ACCU connects the incoming AC power and distributes the AC power to the AC PSUs. The ACCU in the RBS 3106 also contains circuit breakers and the cold start function.

2.2.13 DC Connection Unit (DCCU)

The DCCU connects the incoming DC power (except the standard –48 VDC 2-wire connections) and distributes the power to the DC PSUs. It's used for +24 VDC and –48 VDC (3 wire) connections. The DCCU is only used in the RBS 3206.

2.2.14 DC Filter (DCF)

A DC-filter is used to connect –48 VDC (2 wire) incoming voltage. A DCF is used in both RBS 3206 and RBS 3106.

2.2.15 Battery Fuse Unit (BFU)

The Battery Fuse Unit supervises and connects/disconnects the battery backup when the battery voltage falls below a preset level. The BFU is only used in the RBS 3106.

2.2.16 Climate Unit (CLU)

The CLU is only used in the outdoor RBS 3106.

The cooling principle in the RBS 3106 is enclosed forced convection. The climate unit is autonomously controlled and alarms are reported via the CBU.

The CLU is based on an air-to-air heat exchanger (HEX) dimensioned to handle high ambient temperatures. It has a limited power consumption compared to similar compressor equipped climate systems, which helps keeping the cooling capacity intact when operating on batteries. It also requires a minimum of maintenance, compared to compressor-based systems.

Central Fan Unit and Hot Spot Measuring

A central fan controls the airflow in the cabinet. A Fan Control Unit (FCU) sets the fan speed based on hot spot measurements received from each board in the RBS. This ensures the fan speed is always optimal in every situation.

To eliminate the need for preventive maintenance, the central fan unit is designed with N+1 redundancy, i.e. the RBS will still be operational if one of the fans fails, even under the most severe conditions.

2.2.17 Door Alarm (RBS 3106 Only)

Door alarm is standard on RBS 3106.

2.2.18 Smoke Alarm (RBS 3106 Only)

Smoke alarm is possible to order as an option.

2.2.19 75 ohm Transport Network Interface Adaptation

Cabinet internal equipment for conversion of 75 ohm to 120 ohm electrical interface is available as an option. For the RBS 3106 Outdoor this option is always combined with the over-voltage protection circuitry to save space. See also chapter **Error! Reference source not found.** "**Error! Reference source not found.**".

2.2.20 Battery Backup Options

External battery backup options are available for both the RBS 3206 and the RBS 3106. The RBS 3106 can also be equipped with internal battery backup. For the high capacity option the so-called extra equipment space in RBS 3106 is used for batteries.

Several external battery backup options are available for both the RBS 3106 and the RBS 3206.

Battery Base-Frame, BBU 9500 (RBS 3106 Only)

The battery base-frame for RBS 3106 can provide up to 340 Ah battery run-time capacity. It has the same footprint as the cabinet and is 500 mm high and replaces the optional cable base frame (which is 250 mm high). This is an optional Ericsson RBS Site Solution Product.

Battery Backup System BBS 8500 (RBS 3106)

This is a flexible outdoor specified battery backup system that can serve up to three RBS nodes even with different power supply voltages and that provide significantly extended backup times compared to the internal battery backup option. This is an optional Ericsson RBS Site Solution Product.

Power and Battery Cabinet PBC 6500 (RBS 3206)

This is a flexible indoor specified battery backup system that can serve up to three RBS nodes even with different power supply voltages and that provide very large battery backup capacities and times. This is an optional Ericsson RBS Site Solution Product.

2.2.21 External Alarm and Output Control (X-ALM)

The RBS can monitor and control customer equipment via the External Alarm and Output Control function (X-ALM). The X-ALM can be mounted inside the RBS 3106 cabinet the alarms are still referred to as external alarms although they can be cabinet internal, such as the smoke alarm, for example. The X-ALM is external to the RBS 3206 cabinet. For the RBS3206 Indoor the X-ALM is combined with over-voltage protection circuitry and the whole package is referred to as the EACU. For the RBS 3106 Outdoor over-voltage protection circuitry is ordered separately in required numbers for all external alarm connections. Alarms internal to the cabinet, such as the smoke alarm do not require over-voltage protection.

The X-ALM can handle 32 external alarms and 4 output control ports. Alarms that are cabinet external are limited in numbers not just by the amount that can be handled physically by the X-ALM but also by the number of OVPs that can be fitted, see chapter **Error! Reference source not found. "Error! Reference source not found.**".

2.2.22 Over-Voltage Protection Devices

Over-voltage protection for cabinet external connections, such as transport network connections, alarms and GPS interfaces shall be installed inside the RBS 3106 cabinet and outside the RBS 3206 cabinet. For the RBS 3206 the EACU (combined X-ALM and OVPs) can be used.

For RBS3106 all OVP devices are placed together, competing for a limited space in the RBS 3106 cabinet. Space is provided for a total of 10 OVP devices. Each OVP device has 1 or more actual connections (ports). The following list describes the available OVP devices and the amount of ports available. Note that optical connections do not need OVPs in order to be routed out of the cabinet.

- E1/T1/J1 2 ports
- E1/T1/J1 w/ 75 Ohm adaptation 2 ports
- E3/T3 1 port

- GPS — 1 connection
- Alarm Inputs — 4 connections
- Control/Binary Outputs — 2 connections

2.2.23 Extra Equipment Space

Both the RBS 3206 (F cabinet only, not E) and the RBS 3106 provide space for extra equipment in the cabinet in the form of a 6U high 19 inch rack. The RBS 3106 Outdoor provides the 19 inch Extra Equipment Space with up to 100 Ah of internal battery backup and power supply modules. With the 200 Ah battery backup option the 19 inch Extra Equipment Space no longer available in the RBS 3106 since the space is then occupied with batteries.

The RBS 3206F Indoor base station provides space for either 19 inch Extra Equipment Space or power supply modules (PSUs), but not both at the same time. The RBS 3206E does not provide any 19 inch Extra Equipment Space (but space for optional PSUs is still available).

The Extra Equipment Space can be used to hold Ericsson transport network equipment such as the DXX Network Switches and Traffic Nodes or Mini-Link modems. Appropriate third party equipment can also be fitted, see technical specification in chapter **Error! Reference source not found.** "**Error! Reference source not found.**".

2.2.24 Antenna System Controller (ASC)

The Antenna System Controller (ASC) is a high gain double dual duplex TMA (ddTMA) and RET integrated unit available for the 2100 MHz band.

The ASC is mounted in the antenna tower near to the antenna. The ASC is used on the receiving paths in order to lower the overall receiver noise figure. Its ddTMA includes two duplex filters per branch that makes it possible to use the same feeder for receive and transmit signals.

The ASC contains 2 TX/RX branches in one unit, i.e. only one ASC per sector is needed.

The ASC power is supplied and supervised from the FU in RBS, via the RF feeder.

Compared to the WTMA (described below) the ASC also includes features like:

- Interface to an auxiliary unit, such as a RET (Remote Electrical Tilt) Unit with communication with the RBS modulated over the feeder.
- Antenna port VSWR measurement capability
- Largely automatic commissioning

- Supreme RF characteristics, optimum gain set based on feeder loss data.

2.2.25 Wideband Tower Mounted Amplifier (WTMA)

The WTMA is a high gain dual ddTMA available for the 2.1 GHz band.

The WTMA is mounted in the antenna tower near the antenna. The WTMA is used on the receiving paths in order to lower the overall receiver noise figure. Its ddTMA includes two duplex filters per branch that makes it possible to use the same feeder for receive and transmit signals.

The WTMA contains 2 TX/RX branches in one unit, i.e. only one WTMA per sector is needed.

The WTMA power is supplied and supervised from the FU in RBS, via the RF feeder.

2.2.26 Tower Mounted Amplifier (TMA)

The TMA is a medium gain ddTMA available for the 1900 and 850 MHz band.

The Tower Mounted Amplifier is mounted in the antenna tower near the antenna. The TMA is used on the receiving paths in order to lower the overall receiver noise figure. An Ericsson (or compatible) GSM Dual Duplex fixed gain TMA with 15 VDC supply power and DC alarm supervision over the RF feeder can be used. The DC alarm supervision limits of the FU are adjustable to fit a multitude of TMA configurations.

2.2.27 Internal Remote Electrical Antenna Tilt (Internal RET)

The Remote Electrical Tilt (RET) function is used for optimization of the Radio Network performance. The (RET) can be integrated in the antenna and enables remote control, from OSS-RC, of the vertical tilt angle of the antenna lobe.

In the 2100 MHz configuration the RET is powered by the FU via the ASC. If no ASC is used, for example when using a TMA (or nothing), as is always the case in the 1900 and 850 MHz products, the RET is powered from the FU via a so called on the RF feeder. The RIU is an Ericsson optional RBS Site Solution product.

The operation of the RET is controlled via the CBU.

2.3 Redundancy

The RBS 3206 and 3106 can be equipped with a minimum of hardware or as a high redundancy configuration. Redundancy is achieved by adding additional hardware.

Two type of redundancy principles are used.

- Redundancy based on N+1 principle: If one unit breaks, another unit takes over and the RBS will still have full capacity.
- Load sharing: If one unit breaks, the functionality will be maintained whilst the capacity is reduced.

For the redundancy option a mixture of these two principles are used throughout the RBS.

The control redundancy packet includes n+1 redundancy for the Connectivity Platform parts. This redundancy kit is recommended for large transport network hub configurations although it is not a prerequisite to use the RBS as a hub.

Redundancy in the base band parts is achieved through load sharing by simply equipping the RBS with more base band boards than needed.

Redundancy can even be provided in the radio parts of the RBS for all configurations with more than one frequency per sector. This is achieved by installing separate radio and filter units for the different frequencies. At the most one frequency or the diversity (Tx and Rx) is lost in one sector.

2.4 Software

The RBS is based on the generic RBS 3000 application platform software. The software is down-loadable via the OSS-RC interfaces (via the RNC or locally) and is stored in a non-volatile program store in the CBU.

The RBS 3000 family software platform provides generic support for the application software and includes an execution platform with operating system, ATM transport and O&M infrastructure. RBS Application SW handles the RBS HW, and is built on the platform SW.

3 Technical Specifications

3.1 Radio Specifications

3.1.1 System Data

3.1.1.1 2.1 GHz

Receiver:	1920-1980 MHz
Transmitter:	2110-2170 MHz
Channel bandwidth:	5 MHz
Duplex Separation:	190 MHz

3.1.1.2 1900 MHz

Receiver:	1850-1910 MHz
Transmitter:	1930-1990 MHz
Channel bandwidth:	5 MHz
Duplex Separation:	80 MHz

3.1.1.3 850 MHz

Receiver:	824-849 MHz
Transmitter:	869-894 MHz
Channel bandwidth:	5 MHz
Duplex Separation:	45 MHz

3.1.2 Transmitter

The RBS is available with a number of cell-carrier output power classes

- 20 W
- 30 W (2100 MHz band only)
- 40 W
- 60 W (2100 MHz band only)

3.1.3 Receiver

3.1.3.1 Receiver Sensitivity

The typical static 12.2 kbps RBS reference sensitivity according to 3GPP 25.104 v.3.10.0 with 2-way RX diversity measured at the antenna input port of the ASC/TMA and the RBS respectively.

Receiver sensitivity 2.1 GHz:
Receiver sensitivity (with ASC): -128.5 dBm
Receiver sensitivity (no ASC): -127.5 dBm

Receiver sensitivity 1900,850 MHz:
Receiver sensitivity (with TMA): -127.1 dBm
Receiver sensitivity (no TMA): -127.5 dBm

3.2 Mechanical Dimensions

Table 3-1 Cabinet Dimensions

	Height Incl. mounting frame [mm/inches]	Footprint		Depth Incl. Door [mm/inches]
		Width [mm/inches]	Depth [mm/inches]	
RBS 3206F	1850/72.8	600/23.6	400/15.8	470/18.5
RBS 3206E	1950/76.8	600/23.6	400/15.8	470/18.5
RBS 3106	1630/64.2	1300/51.2	710/30.0	926/36.5

3.3 Weight

Table 3-2 RBS Weight

	Typical 3x1 [kg/lbs]	Fully Configured [kg/lbs]
RBS 3206F	150/330	200/440
RBS 3206E	152/333	220/490
RBS 3106	630/1400	850/1889

3.4 Power Supply Voltage Specifications

3.4.1 RBS 3106

The RBS 3106 can be powered from a -48 VDC or a single, two or three phase AC supply.

Table 3-3: RBS 3106 DC Supply Options

Nominal Voltage	Voltage Range
-48 VDC	-40.5 to -57.0 VDC

Table 3-4: RBS 3106 AC Mains Supply Options

Voltage Range [VAC +/- 10%]	[Hz]	Configuration
200 – 250 VAC	50/60	1 Wire + N + GND
100 – 433 VAC	50/60	2 or 3 Wires + N + GND

3.4.2 RBS 3206

The RBS 3206 can be powered from a -48 or +24 VDC or a single phase AC supply.

Table 3-5 RBS 3206 DC Supply Options

Nominal Voltage	Voltage Range
-48 VDC	-40.5 to -57.0 VDC
+24 VDC	+20.5 to +29.0 VDC

Table 3-6: RBS 3206 AC Mains Supply Options

Voltage Range [VAC +/- 10%]	[Hz]	Configuration
120 – 250 VAC	50/60	1 Wire + N + GND

3.5 Power Consumption Specifications

The RBS 3206 has a typical power consumption as follows (at 25° Celsius, -48 VDC):

Table 3-7 Indoor RBS DC Power Consumption

Configuration (power/cell-carrier)	**Band**	**Typical Power Consumption (kW)**
3x1 20/30 W	2100	0.7 / 0.8
3x2 20/30 W (Dual Tx)	2100	1.2 / 1.4
3x2 20/30 W	2100	0,8 / 1.0
3x3 20/30 W	2100	1.5 / 1.7
3x1 40 W	1900	1.0
3x2 40 W	1900	1.9
3x1 40 W	850	1.0
3x2 40 W	850	1.9

The RBS 3106 has typical power consumption as follows (according to yearly average conditions for climate zone Frankfurt, AC consumption).

Table 3-8 Outdoor RBS AC Power Consumption

Configuration (power/cell-carrier)		**Typical Power Consumption (kW)[1]**
3x1 20/30 W	2100	1.4 / 1.4
3x2 20/30 W (Dual Tx)	2100	1.9 / 2.1
3x2 20/30 W	2100	1.5 / 1.7
3x3 20/30 W	2100	2.2 / 2.5
3x1 40 W	1900	1.7
3x2 40 W	1900	2.7
3x1 40 W	850	1.7
3x2 40 W	850	2.7

3.6 Transport Network Interface Specifications

The 3206 and 3106 can be equipped with several different types of transport network interface cards.

Table 3-9 Transport Network Interface Types

Board	Name	Speed (Mbps)	Ports/ Board	Standards Compliance
ET-MC1	J1	1.5	8	JT-G703/ JT-G704/ JT-I431a
	T1	1.5	8	ANSI-G.703/G.704
	E1	2	8	ETS 300 420 ITU G.703/G.
ET-M3	J2	6	2	JT-G703/ JT-G704
	E3	34	2	ITU G.703/G.704
	T3	45	2	ANSI G.703/G.704
ET-M4	STM-1/OC-3c	155	2	ANSI T1.105-1995 ITU I.432.2 G.703 ITU G.957
	Mega-link	155	2	NTT (Mega-link)
ET-MC41s	Channelized STM-1/OC-3	155	1	ANSI T1.105-1995 ITU I.432.2 G.703 ITU G.957

There are 8 positions (slots) for transport network interface cards. Each transport network board occupies one slot. Boards of different types can be mixed.

[1] Service outlet, power for extra transmission space and heater not included.

3.7 Extra Equipment Space Specifications

The RBS 3206F (not RBS 3206E) and 3106 provide a 19 inch wide space for e.g. customer transport network equipment.

	RBS 3206F	RBS 3106
Width	19 inch (both inch and mm standard supported)	19 inch (both inch and mm standard supported)
Height	6U	6U
Depth	350 mm (13.5 inches)	350 mm (13.5 inches)
Max Power (-48VDC)	300 W	500 W
Max. Heat Dissipation	150 W	300 W

3.8 Interface Connections Specifications

3.8.1 External Connections

The RBS 3206 Connection Field at the top of the cabinet is prepared for the following interfaces.

Table 3-10 RBS 3206 Cabinet External Interface Connections

Function	Connector Type	Number of Interfaces
Antenna feeders	7/16	2-12
E1/T1/J1-ports	RJ-45	0-40*
E1/T1/J1-ports 75 Ω	BNC	0-16*
E3/T3 –ports	Coax	0-16*
STM-1 ports	Opto (SC)	0-16*
EC bus w/o power	RJ-45	0-2
EC bus w/ power (for EACU)	RJ-45	1
Ethernet, Site LAN	RJ-45	0-2
GPS	DSUB 9-pole	0-2
AC	Screw terminals	1
DC +24 VDC	Screw terminals	1
DC –(48-60) VDC	Screw terminals	1
DC –48 VDC	Screw terminals	1
Battery power	Screw terminals	1
Grounding point	M8 stud	1

* Limitations in the connection field of the cabinet or number of boards more than one type of transport network interface is used.

The RBS 3106 connection field is prepared for following external interfaces.

Table 3-11 RBS 3106 Cabinet External Interface Connections

Function	Connector Type	Number of interfaces
Antenna feeders	7/16	2-12
E1/T1/J1-ports 120Ω	Screwless terminals	0-16*
E1/T1/J1-ports 75Ω	Screwless terminal	0-16*
E3/T3 –ports	Screwless terminal with OVP, BNC without OVP	0-4*
STM-1 ports	Opto (SC)	0-2
Minilink	Coax N	0-6
GPS	Screwless terminals	0-2*
AC mains	Screw terminals	1
Battery backup	Screw terminals	1
Grounding point	M8 stud	1
External Alarms	Screwless terminals	0-8*
Binary Outputs	Screwless terminals	0-4*

* Limitations in the number of OVP devices that can be fitted, see chapter **Error! Reference source not found. "Error! Reference source not found."**

3.8.2 Internal Connection and Interfaces

The RBS 3206 has the following interfaces available and accessible from inside the cabinet.

Table 3-12 RBS 3206 Cabinet Internal Interface Connections

Function	Connector Type	Number of interfaces
ESD grounding point	Button BS/3/8"	1
System voltage test port	Banana jack 2 mm	1 pair
TX Monitor	QMA	(Part of special jumper cable)
BFN for production test and RS232 debug	"Emily"	1*

* One connector on the CBU, split into two via cable

The RBS 3106 has the following interfaces available and accessible from inside the cabinet.

Table 3-13 RBS 3106 Cabinet Internal Interface Connections

Function	Connector Type	Number of interfaces
ESD grounding point	Button BS 3/8"	1
System voltage test port	Banana jack 2 mm	1 pair
AC Service Outlet	Dep. on country	1
TX Monitor	QMA	(Part of special jumper cable)
BFN for production test and RS232 debug	"Emily"	1*
Ethernet, Site LAN	RJ-45	1-2

* One connector on the CBU, split into two via cable

3.9 Battery Backup Capacity

Battery backup gives great flexibility to the RBS 3106 and RBS 3206 where, e.g., rural sites can be equipped with ample battery backup capacity.

For battery backed up sites with frequent AC mains failures, the optional additional PSU (PSU redundancy) is highly recommended as this provides faster battery recharge.

Internal Battery (RBS 3106 Only)

The RBS 3106 optional internal battery backup provides several hours of operation, depending on configuration. Example of typical figures for a typical traffic scenario (40% traffic Load) in a climate and temperature corresponding to average conditions in the climatic zone Frankfurt , Germany (or similar).

Node Configuration	100 Ah	200 Ah
RBS 3106, 2100 MHz, 3x2 30W (Dual Tx)	1.5 h	3.5 h

For other battery backup alternatives please see chapter **Error! Reference source not found. "Error! Reference source not found.**".

3.10 Cabinet Color

The RBS 3206 is available in one color

Table 3-14 RBS 3206 Colors

Color	Reference Number	Ericsson Number
Grey	NCS 1002-R	MZY 38320/985

The RBS 3106 is available in two different colors.

Table 3-15 RBS 3106 Colors

Color	Reference Number	Ericsson Number
Grey	RAL 7035	MZY 543 03/8119
Green	NCS 8010-G 10 Y	MZY 543 03/685

3.11 Electromagnetic Compatibility (EMC)

The RBS fulfils the Electromagnetic Compatibility (EMC) requirements according to:

- 3GPP TS 25.113
- EN 301 489-23
- European EMC Directive 89/336/EEC
- 1999/5/EC Radio and TTE directive
- FCC (CFR Title 47) Part 15, 22 and 24

The RBS is labeled in order to show this compliance.

3.12 Environmental Specifications

3.12.1 Product Safety

In accordance with the Low Voltage Directive (LVD 73/23/EEC plus 93/68/EEC) within the European Union the RBS models comply with the following requirements regarding product safety:

- IEC 950-1 / EN 60950-1
- IEC 215 / EN 60215
- IEC 60 529 / EN 60 529

North American Market:

- Code of Federal Regulation 21 CFR 1040.10 and 1040.11
- ANSI/UL 60 950-1 / CSA C22.2 No.60950-1

The RBS is labeled in order to show this compliance

3.12.2 Environmental Conditions

The requirements for climatic/mechanical environment are based on ETSI standard ETS 300 019 Classification of Environmental Conditions and IEC 721

3.12.3 Storage Requirements

The RBS complies with ETS class 1.2 Weather Protected, Not Temperature Controlled Storage Locations in ETS 300 019-1-1.

3.12.4 Transportation Requirements

The RBS complies with ETS class 2.3 Public Transportation in ETS 300 019-1-2.

3.12.5 Earthquake Protection

Reliable function during seismic exposure: Test method according to IEC/EN 60 068-2-57.

3.12.6 In-Use Requirements

3.12.6.1 RBS 3206 In-Use Requirements

Weather protected and temperature controlled locations according to:

- ETSI EN 300 019-1-3 Class 3.1
- IEC/EN 60 721-3-3.

Table 16: RBS 3206 Environmental Specifications

Environmental Parameters	Normal Operation (1)	Non-destructive Conditions (2)
Temperature	+5 to +40 C°	-10 to +55 C°
Relative Humidity	5 – 85%	5 – 90%

(1) Normal operation describe the environmental conditions where full performance is guaranteed.

(2) Non-destructive conditions describe environmental stress above the limits for normal conditions where full performance cannot be guaranteed. When the environmental stress has dropped to normal conditions, restoring full RBS performance requires no manual intervention on site. Non-destructive conditions refer to a period of maximum 96 consecutive hours, and a total of maximum 5.5 days in a three-year period.

3.12.6.2 RBS 3106 In-Use Requirements

All stated temperatures are ambient temperatures in a shaded environment. In addition to the temperature a solar radiation load of 1120 W/m^2 has been factored in.

Non-weather protected locations according to:

- ETS 300 019-1-4 Class 4.1 (extended to -33°C to +45° C)
- IEC/EN 60 721-3-4.

Table 17: RBS 3106 Environmental Specifications

Environmental Parameters	Normal Operation (1)	Non-destructive Conditions (2)
Temperature	-33 to +45 C°	-40 to +60 C°
Relative Humidity	15 – 100%	15 – 100%

(3) Normal operation describe the environmental conditions where full performance is guaranteed.

(4) Non-destructive conditions describe environmental stress above the limits for normal conditions where full performance cannot be guaranteed. When the environmental stress has dropped to normal conditions, restoring full RBS performance requires no manual intervention on site. Non-destructive conditions refer to a period of maximum 96 consecutive hours, and a total of maximum 5.5 days in a three-year period.

3.12.7 Ingression Protection (RBS 3106)

The RBS 3106 is protected for the ingression of water and dust and fulfils the IP55 requirements according to the standard IEC/EN 60 529.

3.12.8 Acoustic Noise

Sound pressure levels for each direction is according to ISO 11201 bystander, calculated in accordance with ISO 11203 from ISO 9614 measurements.

3.12.8.1 RBS 3206 Acoustic Noise

Typical sound pressure level (SPL) from any side of the cabinet at 25°C:

(TBD) dB(A)

Maximum sound power at 25°C:

Better than 6.1 Bel (estimate)

3.12.8.2 RBS 3106 Acoustic Noise

The acoustic sound pressure levels at typical traffic and measured according to ISO 7779 and ETS 300 753.

Typical sound pressure level (SPL) from any side of the cabinet at 25°C:

(TBD) dB (A)

Maximum sound power at 25°C:

Better than 6.4 Bel (estimate)

4 Configurations

4.1 Radio Configurations

The figures below show the configurations that are supported by the RBS 3206 and RBS 3106. Some configurations will be made available in the future whereas some are available from start. Also, additional configurations, beyond what is shown below, are feasible with new plug-in-units that may be made available in the future.

Table 4-1 Single Band RBS Configurations[2]

Sector x Carrier	Radio Units	Power/Cell-Carrier (W)		
		850 MHz	1900 MHz	2.1 GHz
1x1	1x1	20/40	20/40	20/30/40/60
1x2	1x1	20	20	20/30
1x2 (Dual Tx)	1x2	20/40	20/40	20/30/40/60
1x3	1x2	20	20	20/30
1x4	1x2	20	20	20/30
2x1	2x1	20/40	20/40	20/30/40/60
2x2	2x1	20	20	20/30
2x2 (Dual Tx)	2x2	20/40	20/40	20/30/40/60
2x3	2x2	20	20	20/30
2x4	2x2	20	20	20/30
3x1	3x1	20/40	20/40	20/30/40/60
3x2	3x1	20	20	20/30
3x2 (Dual Tx)	3x2	20/40	20/40	20/30/40/60
3x3	3x2	20	20	20/30
3x4	3x2	20	20	20/30
4x1	4x1	20/40	20/40	20/30/40/60
4x2	4x1	20	20	20/30
6x1	6x1	20/40	20/40	20/30/40/60
6x2	6x1	20	20	20/30

[2] The description is limited to configurations with the same power for every cell-carrier and the same number of carriers per sector (fully symmetrical configurations.

Table 4-2 Dual Band RBS Configurations[3]

Power per Cell-Carrier (W)	850 MHz	1900 MHz	2.1 GHz
20	3x1/3x2	3x1/3x2	
20	3x1	3x3	
40	3x1	3x1/3x2	
20		3x1/3x2	3x1/3x2
40		3x1	3x1
20	3x1/3x2		3x1/3x2
20	3x1		3x3
40	3x1		3x1/3x2

4.2 Baseband Capacity

Table 4-3 Maximum Baseband Capacity

	Capacity (CE)
Uplink	1536
Downlink	1536

[3] Only 3 sector configurations shown, 1 and 2 sector configurations are also possible. The description is limited to configurations with the same power for every cell-carrier and the same number of carriers per sector (fully symmetrical configurations.

5 Installation

The RBS site is prepared with the mains power, antennas, feeders, transmission and grounding base prior RBS installation. All internal RBS connections are pre-wired with connectors - installed and tested in factory.

Cable interfaces for antenna jumpers, power and transmission are located in the bottom of the cabinet (RBS 3106) or at the top (RBS 3206).

During installation the field technician is only required to insert a few site-specific parameters via a thin client, for example, IP address, site name, etc. Built-in commissioning software allows the field technician to access all functions in RBS without the need for special external software, except the thin client software.

The RBS node is equipped with an advanced built in self-test. For the configuration and verification tests a thin client and an UE are used.

Information about the installed hardware can be retrieved from the RBS, which makes it easy to generate an inventory list including all installed equipment.

6 Operation and Maintenance

6.1 Live Expansion

Expansion of the RBS capacity is achieved by the addition of plug-in unit boards. If antennas, feeders etc. are prepared in beforehand, expansion can be done without shutting down power or disturbing the live traffic. However, a restart may be necessary to bring the expanded capacity into service in some cases.

The Equipment Configuration Wizard within the Element Manager is used for the expansion of new hardware. The operator specifies the new expansion through a graphical user interface, and the RBS verifies that the proper hardware is installed.

The live-expansion and Equipment Configuration Wizard principles allow quick and simple expansion.

6.2 Hot Repair Hardware Maintenance

The Hot-repair support facilitates a faulty unit being replaced with minimum impact to traffic.

The hot-repair principle allows a faulty board to be removed and replaced without affecting other boards or functionality in the RBS. The board is blocked and then de-blocked before the board can be brought into service. Start-up test of the newly inserted board is carried out automatically before the board is taken into service, without the need for operator intervention.

6.3 RBS Element Management Principles

The Embedded Element Management is implemented in the network element within the RBS. This means that the network element contains all functions for self-management. All software necessary for management of a network element, including graphical user interfaces and documentation are accessible from via the network element itself.

6.3.1 Accessibility

A "thin client" is required, which is an off-the-shelf commercial computer with a Java Virtual Machine and a web browser installed (standard software). The web browser starts the embedded Element Manager, from which all other graphical user interfaces can be accessed.

6.3.2 Security

The Security Management solution provides security on the Application Layer. Cornerstones of Application Layer security are user authentication and access control (to verify that a user is authorized to perform a certain operation on a certain target at a given time). Single logon is one main feature in the Security Management solution. Single logon implies that the operator will only have to go through a security logon procedure once after sitting down for a suite of O&M tasks in the WCDMA RAN network.

The authorization mechanism is based on roles where the security administrator can define roles and attach/detach users to these roles. Roles are associated with privileges, such as a resource or a group of resources and an operation or a set of operations that the role is authorized to perform on those resources. In addition to this conditional constraints can be set, e.g. at what time of day and week a user is authorized to work.

6.4 Element Management Functions

6.4.1 Start & Restart

Start and restart functions apply to both complete and partial parts of the RBS, including a restart escalating recovery function.

6.4.2 State Handling

With the lock function a user may prohibit usage of and cease alarms for a resource upon which maintenance shall be performed. With the Unlock function the user may take the resource into operation again when the maintenance is finished.

A typical usage is if the user wishes to replace equipment (for example a board). The user locks the equipment to take it out of traffic and to cease alarms during replacement, replaces it and unlocks it to take it into traffic again.

6.4.3 Fault and Test Management

Included in the system there are built-in self-tests and built-in supervision to verify and supervise the hardware.

All alarms are logged in the base station in an Active alarm list and stored in an alarm log. They can be remotely or locally accessed via the Element Manager, or remotely via OSS-RC. In each alarm there is unambiguous information that pinpoints a Plug-In-Unit (replaceable unit). There is an Operation Procedure documentation on-line connected to each alarm with suggested repair actions. These can be viewed from the Element Manager.

6.4.4 Software Management

The software management feature allows the operator to install an Upgrade Package (UP) on a node and upgrade the node.

All new or changed software is transferred as an Upgrade Package (UP) to the node.

Four different types of UPs exist:

- Major package; contains new major functionality,
- Maintenance packages; contains some new functionality and improvements,
- Correction packages; contains planned fault corrections,
- Emergency Corrections.

The installation phase includes transfer of the UP from a central placed FTP server and installation of it on the flash disc in the node. The upgrade phase includes activation of the installed software.

6.4.5 Configuration Management

The configuration of the nodes is divided into three different layers: the equipment layer, the transport network layer and the radio network layer. The principle used is that the equipment configuration shall, to as large an extent as possible, be set in factory or managed by the element management functions. Support for configuring the transport network and the radio network parts are both functions in the element manager and OSS-RC.

The Equipment Configuration Wizard and other wizards guides the operator through the configuration of the RBS and site specific data.

Configuration data is provided with default values. It is included as a part of the software delivery package.

6.4.6 External Alarms

The External Alarm administration provides the means to issue alarms for equipment not included in the RAN product portfolio. Units outside the managed system generate external alarms, for example, from smoke detector, burglar, temperature and sensor alarms.

6.4.7 External Control

External output ports are provided for control of external site equipment, for example, site access door latch. This is an optional functionality provided via X-ALM.

6.5 Site LAN

The RBS has an Ethernet connection for IP transport. It provides transparent IP access for supervision from OSS-RC and NMS.

A thin client can be connected on site to the RBS in order to perform on site maintenance work.

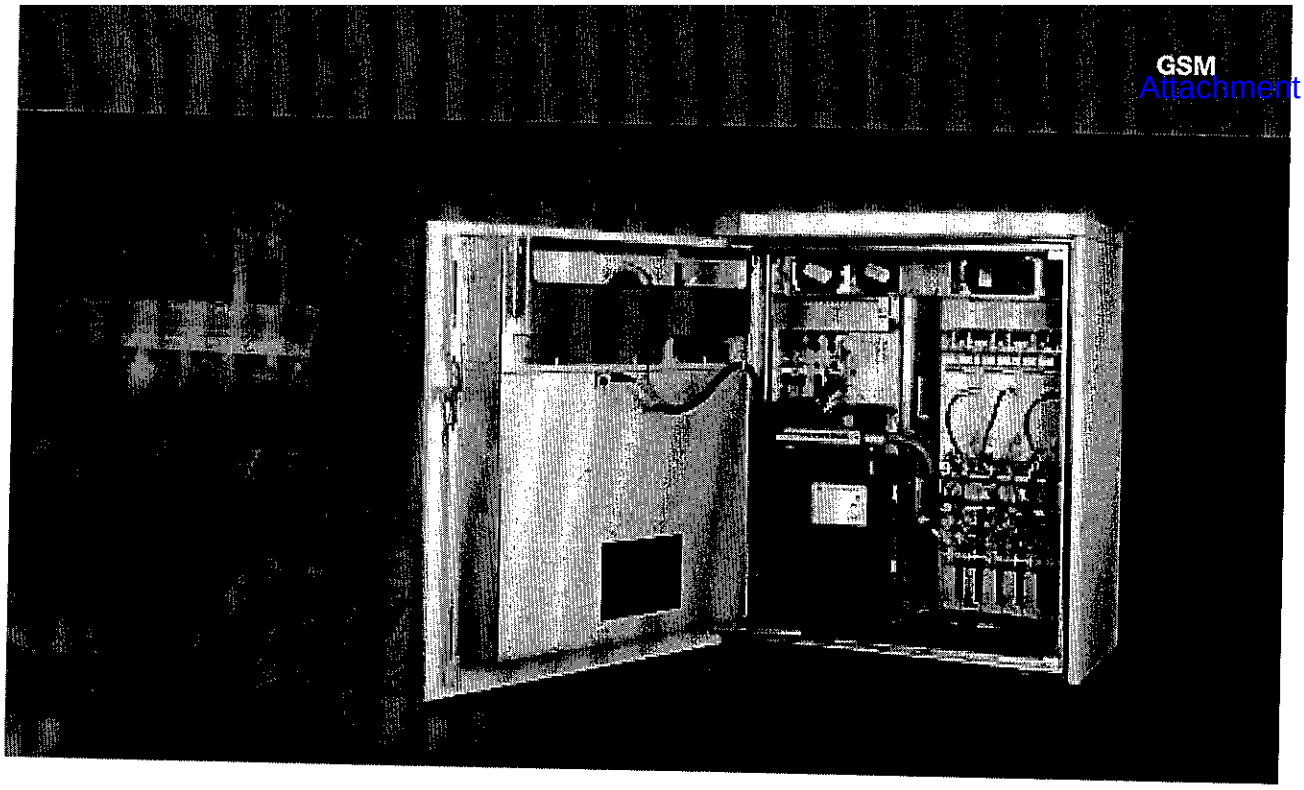
7 Acronyms and Abbreviations

3GPP	3rd Generation Partnership Project
ACCU	AC Connection Unit
ASC	Antenna System Controller
ATM	Asynchronous Transfer Mode
BFU	Battery Fuse Unit
BB/TM	Battery Backup/Transmission Module
BER	Bit Error Rate
BFU	Battery Fuse Unit
BP	Board Processor
BTS	Base Transceiver Station
CBU	Control Base Unit
CF	Connection Field
CLU	Climate Unit
CSU	Combiner and Splitter Unit
CU	Capacitor Unit
C/I	Carrier/Interference
dB	Decibel
dBm	Decibel relative to 1 mW
DCCU	DC Connection Unit
ddTMA	Dual Duplex TMA
DF	Distribution Frame
DL	Down-Link
DPX	Duplex, Duplexer
E1	Transmission interface E1
E3	Transmission interface E3
EMC	Electromagnetic Compatibility
ET	Exchange Terminal
FDD	Frequency Division Duplex
FU	Filter Unit
GPB	General Processor Board (MP)
HEX	Heat Exchanger
HTTP	Hyper Text Transfer Protocol
HW	Hardware
IDM	Internal Distribution Module
IP	Internet Protocol
MET	Main Earthing Point
MMI	Man Machine Interface
MP	Main Processor
MTBF	Mean Time Between Failures
NMS	Network Management Systems
O&M	Operation and Maintenance
OMC	Operation and Maintenance Center
OVP	Over Voltage Protection
OTSR	Omni Transmit Sector Receive
PA	Power Amplifier
PDU	Power Distribution Module
PIU	Plug-In-Unit
PSU	Power Supply Unit
PCCU	Power and Climate Control Unit
RAN	Radio Access Network
RANOS	Radio Access Network Operation Support
RAXB	Baseband Receiver Board
RBS	Radio Base Station
RET	Remote Electrical antenna Tilt
RF	Radio Frequency
RNC	Radio Network Controller
RRU	Remote Radio Unit
RTOS	Real time Operating System
RU	Radio Unit
RUIF	Radio Unit Interface
RX	Receiver
STM	Synchronous Transfer Mode
SW	Software
T1	Transmission interface T1
TBD	To Be Defined
TMA	Tower Mounted Amplifier
TRX	Transceiver
TU	Timing Unit
TXB	Baseband Transmitter Board
TX	Transmit
UE	User Equipment
UL	Up-Link
UP	Upgrade Package
UMTS	Universal Mobile Telephony System
VAC	Volts, Alternating Current
VDC	Volts, Direct Current
WCDMA	Wideband Code Division Multiple Access
VSWR	Voltage Standing Wave Ratio
X-ALM	External Alarm Module

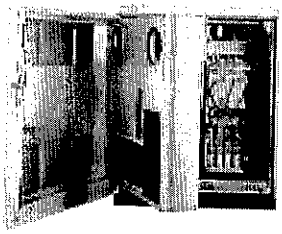
8 References

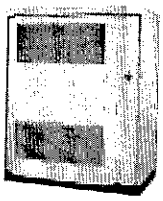
[1] 1/221 01-FGC 101 811 Uen, RBS 3000 Base band Product Description

[2] 221 03-FAP 130 731, RBS 3206/3106 Product Package Description



RBS 2106





RBS 2106 *is a high capacity, outdoor macro base station supporting up to twelve transceivers per cabinet. It is possible to build one, two and three sector configurations including dual band GSM 900/GSM 1800, in one cabinet. The RBS 2106 supports Enhanced Data rates for Global Evolution (EDGE) and Wideband Code Division Multiple Access (WCDMA) through plug-in units.*

The RBS 2106 is a member of the highly successful radio base station family RBS 2000. The RBS 2000 family supports a wide range of applications ranging from extreme coverage to extreme capacity.

Being a RBS 2000 member guarantees coexistence with the installed base of RBS 200 and RBS 2000 products. Ericsson's synchronization based BSS features ensure that transceivers from different generations of radio base stations can easily form common cells. Operators can therefore bridge the past with the future. By making existing sites futureproof, investments are protected while migrating to 3G.

ERICSSON

Part of the grow-on-site concept

Since it is becoming increasingly difficult to find new base station sites, it is of great interest to remain on existing sites as long as possible. Site space is often a limiting factor for capacity growth. The powerful RBS 2106, included in Ericsson's grow-on-site toolbox, addresses this problem.

On many sites, two or more existing cabinets can be replaced by one RBS 2106, thereby solving the site space problem by making room for another cabinet. This is of major importance, since it makes it possible to reuse and collocate GSM and WCDMA equipment. Furthermore, the plug-in WCDMA transceiver unit (W-TRU) can later be directly housed in the RBS 2106.

Doubled capacity – superior performance – same footprint

The 12-transceiver RBS 2106 cabinet has the same footprint as RBS 2102 but has doubled capacity, thanks to new double-capacity transceivers and combiners.

The double transceiver unit (dTRU) has some powerful features. The RBS 2106 has better output power than current RBS 2000 products, which are the best on the market today. The improved radio performances mean increased site-to-site distance, and therefore, fewer sites. Another example of a cost saving feature is 121 km Extended Range.

The RBS 2106 comes with two new, extremely flexible combiners. Examples of configurations for 900 and 1800 MHz, supported by the filter combiner (CDU-F), are 3x4, 2x6, 1x12 and dual band 8+4 or 4+8 in one cabinet. CDU-F supports up to 12 transceivers. The other combiner (CDU-G) for 900, 1800 and 1900 MHz can be configured in two modes: capacity mode and coverage mode, making it very flexible. In coverage mode, the output power from the CDU-G is increased, making it perfect for rural sites or when fast rollout is required at a minimum cost. To build a 3x4 configuration, one RBS 2106 cabinet is equipped with three CDU-Gs.

Prepared for the future

The RBS 2000 family is prepared for GSM data services, including General Packet Radio Service (GPRS), High Speed Circuit Switched Data (HSCSD) and 14.4 kbit/s timeslots.

To meet the operators' need for faster datacom solutions, RBS 2106 supports EDGE. A powerful Distribution Switch Unit (DXU) and fast internal buses guarantee full EDGE support. This new DXU is also prepared for IP based Abis transmission.

With the optional BSS feature RBS 2000 synchronization, it is possible to have up to 32 transceivers in one cell. With the optional BSS feature RBS 200 and RBS 2000 in the same cell, it is possible to expand an existing RBS 200 cell with RBS 2106, and thereby introduce EDGE and WCDMA through plug-in units.

Key features

- Six double transceiver units (dTRU), that is, 12 transceivers
- Filter and hybrid combining one, two, or three sectors in one cabinet
- Improved radio performance
- Synthesized and baseband frequency hopping
- Supports 12 transceiver EDGE on all timeslots
- Supports 900, 1800 MHz and 1900 MHz
- Extended Range 121 km
- Duplexer and TMA support for all configurations
- Four transmission ports supporting up to 8 Mbit/s
- Optional built-in transmission equipment
- Prepared for IP based Abis transmission
- Prepared for GPS assisted positioning services
- Internal and external battery back-up

Technical specifications for RBS 2106

Frequency band:	E-GSM 900, GSM 1800, GSM 1900
Tx:	925–960, 1805–1880, 1930–1990 MHz
Rx:	880–915, 1710–1785, 1850–1910 MHz
Number of transceivers:	2–12
Number of sectors:	1–3
Transmission interface:	1.5 Mbit/s (T1), 2 Mbit/s (E1)
Footprint (H x W x D):	1614 x 1300 x 710 mm including installation frame (63 1/2 x 51 1/5 x 28 in.)
Dimension (H x W x D):	1614 x 1300 x 940 mm (63 1/2 x 51 1/5 x 37 in.)
Weight without batteries:	550 kg (1211 lbs.)
Power into antenna feeder:	33 W / 45.2 dBm (GSM 900) 25 W / 44.0 dBm (GSM 1800 / 1900)
Receiver sensitivity:	-110 dBm (without TMA)
Power supply:	200-250V AC, 50 / 60 Hz
Integrated battery back-up:	Typical 1 hour (fully equipped)
External battery back-up:	Optional 2 hours
Operating temperature:	-33°C – +45°C (-27°F – +113°F)
Weatherproofing:	Min level IP55 in IEC 529

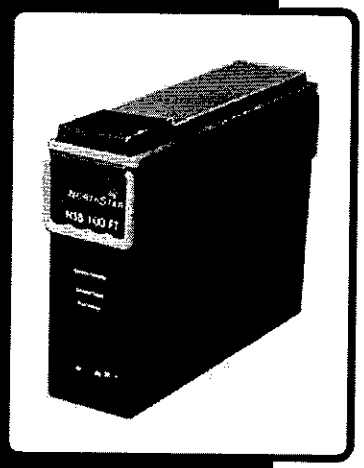
Ericsson Radio Systems AB
www.ericsson.com

AE/LZT 123 6493

NORTHSTAR
BATTERY COMPANY
NOTHING IS MORE RELIABLE

NSB-100-FT

TELECOM



KEY FEATURES

- Specifically designed for mission-critical applications. Excels at high-rate discharge and recharge, extreme temperature range, deep or shallow cyclic applications.
- High cyclic life capability +500 C/3 @ 80% DOD.
- 10 year float life at 25°C (77°F) — 15 year float life at 20°C (68°F).
- Flame retardant (UL 94 VO) PC-ABS plastic case and cover.
- 3 step terminal seal design to ensure leak-free operation. Female M8 brass terminals provide maximum high rate performance and no annual retightening.
- Integral handles ensure ease of handling.
- Approved as non-hazardous cargo for ground, sea and air transportation.

ALL NORTHSTAR PRODUCTS ARE COMPLIANT WITH:

- Telcordia SR4228
- Bellcore GR-63-Core, Issue 1
- DOT 49CFR173.159(d) (i) and (ii)
- UL Approval
- British and German telecom standards

Northstar Battery Company is proud to be registered to ISO-9001:2000 and ISO-14001 standards.

ELECTRICAL CHARACTERISTICS

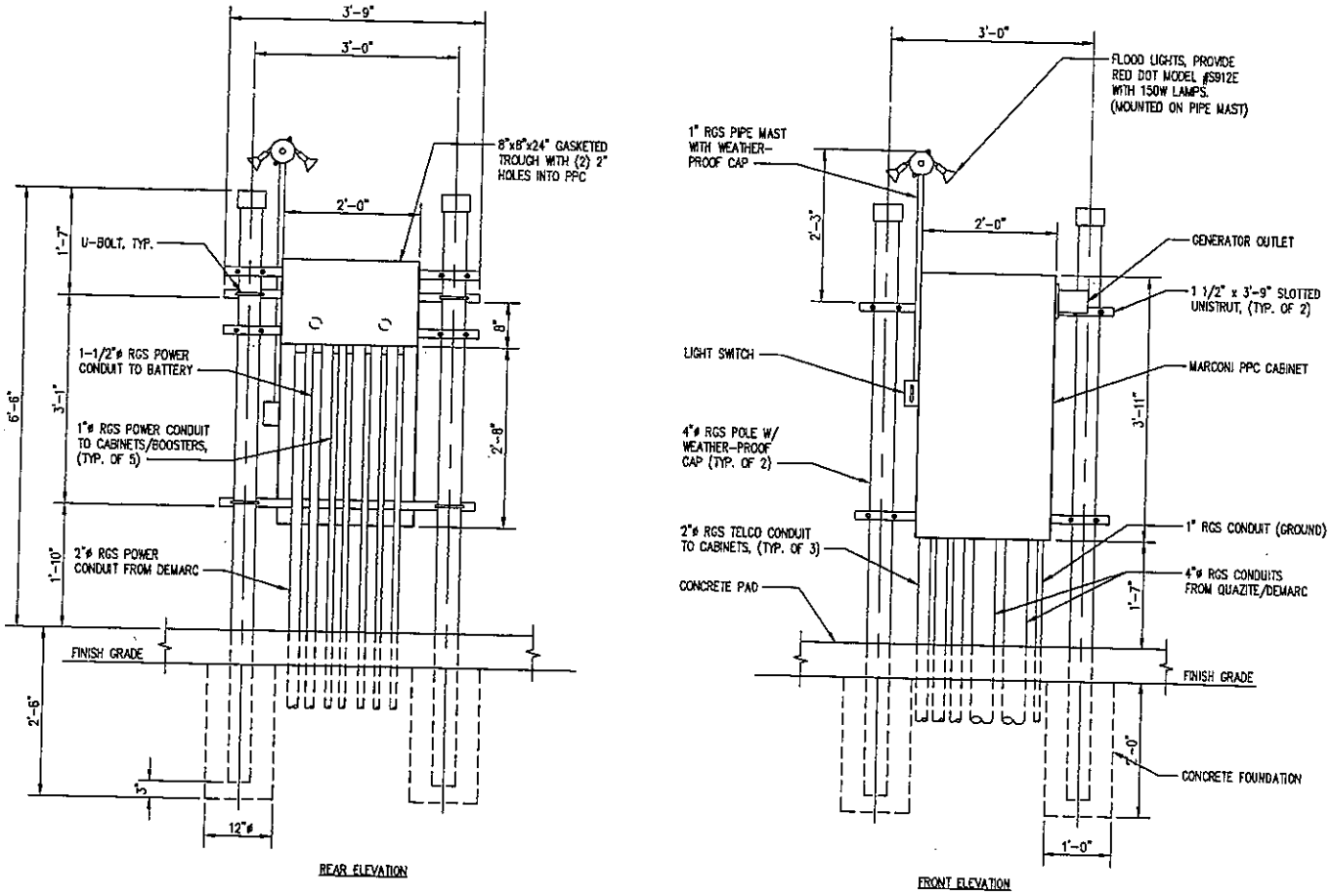
Refer to the NSB detailed performance tables for additional current, capacity and power information.

	Int'nl Standards @ 20°C	*NA Standards @ 77°F*
8 hour capacity to 1.75 VPC	98.6 amp-hours	100.5 amp-hours
10 hour capacity to 1.80 VPC	100 amp-hours	101.4 amp-hours
Float voltage	2.29 +/- .02 volts per cell	2.27 +/- .02 volts per cell
Cyclic Recharge	2.45 VPC — no current limit	
Shelf life	2 years	
Impedance (1KHz)	2.5 mΩ	
Short Circuit Current	3,500 Amps	
Voltage	12 Volts	

MECHANICAL CHARACTERISTICS

	SI Units	*English Units*
Height	287.0 mm	11.30 inches
Width	107.6 mm	4.24 inches
Length	396.0 mm	15.59 inches
Weight	35.6 kilograms	78.5 pounds
Terminal Torque	8.0 Newton-meters	71 inch-pounds

Form: SES-542-04 Issued: 05/05/04 ECO: 343-S04



PPC RACK DETAIL

SCALE: 3/8"=1'-0"

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1575 Eye Street, N.W. Suite 350
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PHONE: (202)408-0960
FAX: (202)408-0961

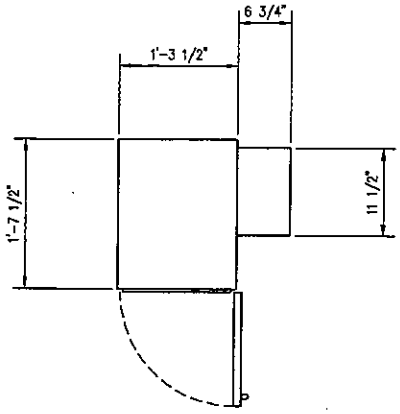
SUBMITTALS

DATE	DESCRIPTION	REV.
02-25-10	LEASE EXHIBIT REVIEW	A
03-26-10	FINAL	0

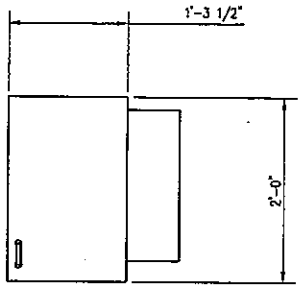
T-MOBILE NORTHEAST LLC
12050 BALTIMORE AVENUE
BELTSVILLE, MD 20705
PHONE: (240) 264-8600

TITLE:
PPC RACK DETAIL

PROJECT NO: 1042.722
DESIGNER: J.D.S. | ENGINEER: C.S.



PLAN VIEW



FRONT VIEW

RAC24 CABINET DETAIL

SCALE: 1/2"=1'-0"

PURCELL RAC24 OUTDOOR
EQUIPMENT CABINET

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communication services, inc.

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