# STAREX-IS 1900 Outdoor BTS
# System Description

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## Introduction

This document describes STAREX-IS Outdoor BTS offering CDMA2000 service.

The organization of this document is as follows:

- Chapter 1 : System Overview
- Chapter 2 : Hardware Architecture
- Chapter 3 : Software Architecture
- Chapter 4 : Function
- Chapter 5 : Operation and Maintenance
- Chapter 6 : Abbreviations

# 1. System Overview

## 1.1. Introduction

BTS (Base Station Transceiver Subsystem) is located between MS and BSC in STAREX-IS using CDMA digital mobile communication technology and performs the function of controlling and maintaining calls. That is, it leads MS to initially recognize BTS, downloads necessary data, assigns traffic channel as to call request, and opens speech path.

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In addition, it can offer various new functions such as high-speed data service, multimedia service, new handoff, etc. defined in IS-2000.

As STAREX-IS BTS is a full ATM based system, it can best meet the network architecture defined in IOS v4.0 and IS-2000.
In addition, it provides easy migration to 3X with a network architecture that can offer high-speed data service.

Interface between BSC and BTS can not only provide existing T1/E1 interface method, but STM-1 OC-3 interface method, thus enabling stable and quick processing of various control signals and traffic signals sent and received between BTS and BSC, and offering more reliable service.

STAREX-IS Outdoor BTS is installed outdoors, and according to the characteristics of installation area, it can optionally select and use 1FA/3Sector or 4FA Omni.

STAREX-IS Outdoor BTS all accommodates the following functions:

- Call control and call resource management
- Loading function
- Configuration and operation information processing function
- Fault treatment function
- Measurement and statistic function
- Radio signaling processing, radio link test and TPTL
- Packet routing and transmission.

# 1.2. Specifications and Performance Specifications

## 1.2.1. Specifications

| Item | Outdoor BTS | |
|---|---|---|
| Max. Carriers | 1FA/3Sector | 4FA Omni |
| Max. Trunk | 16 E1/T1 | 16 E1/T1 |
| Number of CC | 8EA/BTS<br>(Max. 512CE) | 8EA/BTS<br>(Max. 512 CE) |
| Type of Amplifier | HPA(30Watts/Module) | LPA(60Watts/Module) |
| Number of Amplifier | 3EA/BTS<br>(90Watts) | 2EA/BTS<br>(120Watts) |
| RF Power @ Front End Ant Port | 16Watts/FA | 16Watts/FA |

## 1.2.2. Frequency Band

- Uplink (MS→ BTS) : 1,850 ~ 1,910 MHz
- Downlink (BTS→ MS) : 1,930 ~ 1,990 MHz

## 1.2.3. RF Specification

- Receiver Specification

| Parameter | Description | Comments |
|---|---|---|
| Operation Band | 1,850 ~ 1,910 MHz | |
| Diversity | Dual Diversity on Rx | |
| Frequency Transition | Straight Transition of license Block Operation | |
| RF Interface | 50 Ω Nominal Impedance | |
| Noise Figure | 5dB (Max) | |
| Sensitivity | FER is 1.0% or less with 95% Confidence | -119dBm per RF Input Port |
| Dynamic Range | FER is 1.0% or less with 95% Confidence | Not less than –65dBm /1.23MHz in AWGN and Eb/No of 10 dB ± 1dB |
| Conducted Spurious Emissions | Less than –80dBm in 30KHz RBW, RX Band.<br>Less than –60dBm in 30KHz RBW, TX Band.<br>Less than –47dBm in 30KHz RBW, All Other Frequencies | |

- Transmitter Specification

| Parameter | Description | Comments |
|---|---|---|
| Operation Band | 1,930 ~ 1,990 MHz | |
| Diversity | Option of Diversity on TX | |
| Frequency Transition | Straight Transition of License Block Operation | |
| Frequency Tolerance | Within ±5 x $10^{-8}$ of the FA (±0.05ppm) | |
| Pilot Time Tolerance | 10μs | |
| Pilot Channel to Code Channel Time Tolerance | The time error between the Pilot Channel and all code channels comprising the Forward CDMA is within ±50ns | |
| Pilot Channel to Code Channel Phase Tolerance | The phase differences between the Pilot Channel and all code channels sharing the same Forward CDMA should not exceed 0.05 radians | |
| Waveform Quality | ρ is greater than 0.912 (excess power < 0.4dB) | |
| Total Power | within +2dB and -4dB of nominal power | |
| Code Domain Power | 27dB or more below the total power in each inactive channel | |
| Conducted Spurious Emission | -45dBc ± 885kHz @30kHz RBW<br>-55dBc ± 1.98MHz@ 30 kHz RBW<br>(Pout ≥ 33dBm)<br>-13dBm ± 2.25MHz@ 1MHz RBW | |

## 1.3. Electrical, mechanical, and environmental conditions

### 1.3.1. Mechanical Features

**(1) General Features**

- As BTS is designed in module structure offering easy extension and functional change, according to technology development and service migration, it can easily add new function and accommodate technology development.
- Outer box of BTS is attached with a port for ground.
- BTS is composed of instruments with enough shielding effects in consideration of influence from EMI.

**(2) Rack Size**

940(W)× 700(D)× 1800(H)

**(3) Rack Weight**

1FA/3Sector : 600Kg, 4FA Omni : 650Kg

**(4) Cooling**

Fan

**(5) Power**

- DC Input : +21.5 ~ 30V(DC)
- AC Input : 220V(AC)

**(6) Environmental Conditions**

- Operating Temperature Limits : -30℃ ~ +50℃
- Relative Humidity Limits : 0 ~ 90%

# 2. Hardware Architecture

BTS is located between MS and BSC to control and maintain call as to MS.

That is, it downloads necessary data so that MS recognizes BTS at first, assigns traffic channel as to call request, and opens call path.

The figure below is the entire configuration diagram of CDMA2000 1X Outdoor BTS.

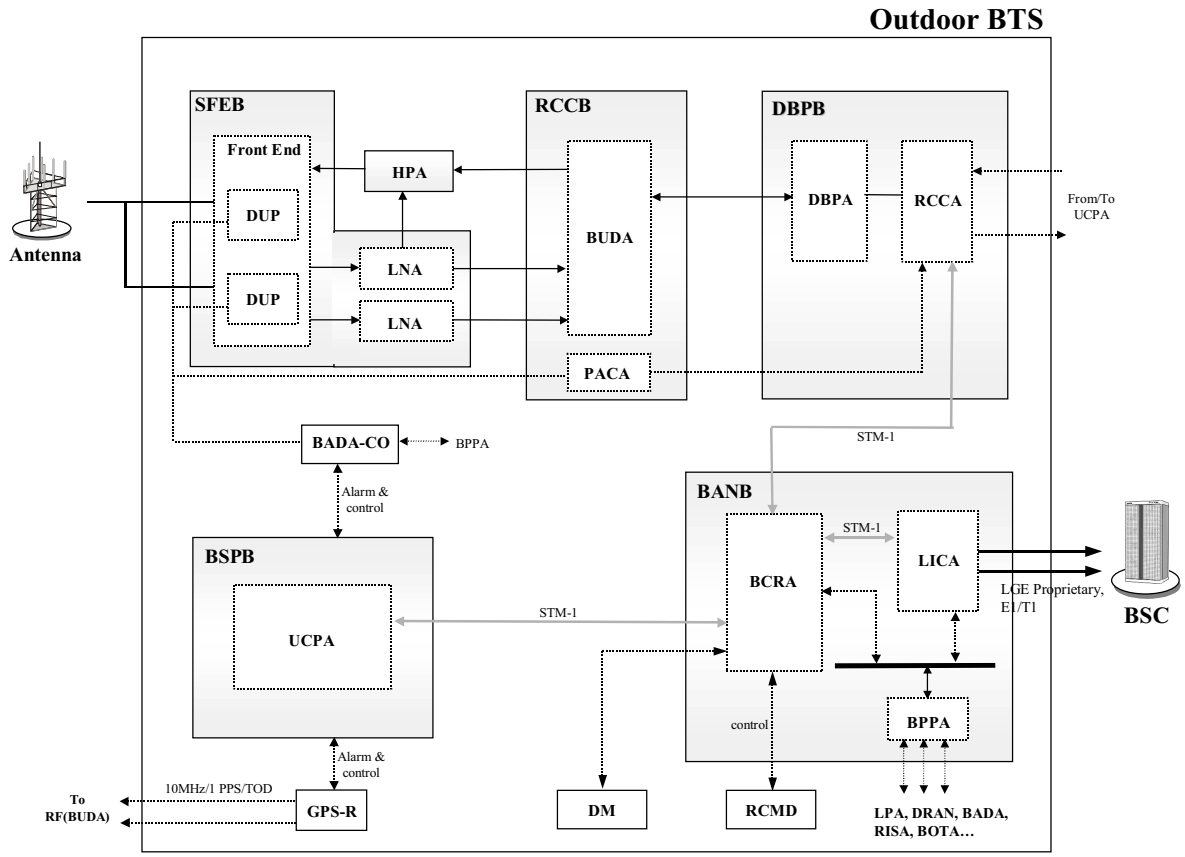


**Figure 2-1 Outdoor BTS H/W configuration**

## 2.1. BANB (BTS ATM Network Block)

BANB(BTS ATM Network Block) provides ATM Network function to switch all traffics and control ATM cells generated from BSS.

BANB offers T1/E1 Link interface with main BSC, and accommodates a maximum of 16 E1. And, it provides STM1 I/F with RCCA of DBPB.

In 1x Outdoor BTS, BANB consists of one BCRA that performs in-BTS cell routing function with UCPA, one LICA that offers T1/E1 interface with main BSC, one BPPA that offers RS-422 HDLC interface with BTS Peripheral, and one RCMD that offers PSTN remote control function.

## 2.2. DBPB (Digital Bank Processor Block)

DBPB(Digital Bank Processor Block), as a block to process CDMA Channel, performs each channel call processing and digital and analog signaling for RF block interface, and consists of DBPA(Digital Baseband Processing Board Assembly) and RCCA(Radio and Channel Control board Assembly).

## 2.3. RCCB (Radio & Channel Control Block)

RCCB is composed of BUDA(Base station sector conversion & Up/Down converter Assembly) and PACA(Power Adjustment & Control Board Assembly).

## 2.4. SFEB (Front End Block)

SFEB, as a block that processes RF Tx/Rx function, takes charge of bulk power amplification of Tx signals, low noise amplification of Rx signals, Tx/Rx frequency conversion, and Tx/Rx diversity.
SFEB consists of A path and B path per sector, and each unit is composed of duplexer, Low Noise Amplifier, Directional Coupler and splitter.

## 2.5. BSPB (Base Station Signaling Processor Block)

BSP provides BTS initialization function, call processing (Voice, High-speed Packet) function, landline/wireless resource allocation and release function, and landline/wireless link management function.

## 2.6. Amplifier

The amplifier receives Tx signals up-converted from BUDA and performs bulk power amplification.

- LPA(Linear Power Amplifier) : Used in 4FA Omni.

- HPA(High Power Amplifier) : 1FA 3Sector)

HPA(High Power Amplifier), as shown in the Figure below, performs the function of amplifying output signal level to copy CDMA signal whose frequency was up from BTS Up Converter at a free space. By minimizing spurious ingredients generated because of AMP's own un-linear characteristics, it meets IS-97D.

## 2.7. Others

### 2.7.1. BOTA (BeacOn Transmitter Assembly)

BOTA supplies a function to transmit required FA, Pilot channel, and sync channel with Hopping Beacon performing board in consistent cycle during some period. If general BTS using lots of FAs and small BTS using a few FA are adjacently arranged and when MS in busy status is moved from BTS supporting lots of FAs to BTS area using a few FA, BOTA board should be inserted in small BTS using a few FA for smooth hand off.

### 2.7.2. RISA (RF & IF Supervisor Assembly)

RISA(RF & IF Supervisor Assembly) is RF & IF Supervisor Assembly Unit to remotely monitor Front-End Tx output, LNA receipt output, BUDA IF output, BOTA output, and GPS output.

In particular, RISA converts signals which went through IFMA and RFMA into digital signals, converts them into frequency spectrum, discriminates signal status and transfers signals to BTS unit control part.

In addition, it measures frequency spectrum as to RF main measurement port signals, and displays sample port level and actual path level. Although there is no command, it independently monitors RF, and upon execution, it provides a mode for specific channel concentration monitor and all channel sequence monitor. Monitoring cycle can be set and it measures Channel Power. With monitor point signal status discrimination and alarm function, it can set alarm and warning value. Status management and control is done through protocol processing by upper interface(BPPA&ARIA) and HDLC specifications.

### 2.7.3. RFMA (RF Multiplexing board Assembly)

RFMA is to provide the function of setting RF signal path to the input port of RISA, and the main functions are as follows:

- Tx Antenna Output(Max 3 point)
- Tx BUDA RF Output(Max 3 point)
- RX LNA Output(Max 6 point)

### 2.7.4. IFMA (IF Multiplexing board Assembly)

IFMA is to provide the function of setting IF signal path to the input port of RISA, and the main functions are as follows:

- Rx BUDA IF Output(Max 12 point)

### 2.7.5. GPS-S

This receives time information from GPS and provides TOD(Time of Day), 10MHz, 1PPS.

GPS-S is largely classified into 3 parts:

(1) Receiver part

Receives L1 Band Signal, orbit information, and mount hour information from GPS.(maximum of 8 CH)

(2) Processor / Oscillator part

By comparing, controlling and generating various signals received from the receiver, it displays various signals that the system wants. (TOD, 1PPS, 10MHz)

By processing, storing and comparing received GPS data, it plays an important role in obtaining stable output, and through various LEDs, it shows the operation of GPS-S.

(3) Power Supply Part

The power part used by GPS-S uses DC power, mounts DC/DC Converter, receives +24VDC and runs the oscillator, processor, and receiver of GPS-S.

### 2.7.6. Rectifier

PSOP is developed to supply stable power from outdoor BTS, and the basic function includes system DC power supply and Cold Starter function as environment control function.

### 2.7.7. Battery

Upon commercial power failure, the battery supplies power to the system, and 30-minute system backup is possible.

# 3. Software Architecture

## 3.1.1. S/W component definition

**(1) BCMS (BTS Call and Management Subsystem)**

This is a subsystem responsible for processing call of BTS and this is inserted into BSP Processor(UCPA board).

**(2) BRMS (BTS cell Router Management Subsystem)**

This is a subsystem control BTS ATM cell, inserted into BCRA, and composed of blocks of RCCB, RDLB, RDHB, RSAB, RMSB, and RTMB. This subsystem controls LICA board and through this, carries out trunk interface and AAL2/AAL5 conversion and controls ATM connection.

# 4. Function

The function of STAREX-IS Outdoor BTS is based on TIA/EIA/IS-2000, and meets TIA/EIA /IS-97-C.
Also, functions and services provided by IS-95A/B were applied in the same way in cdma2000 1x, and cdma2000 1x system uses protocol revision from MS, and processes messages between MS and system by using CAI messages.
In consideration of maritime service, it can provide maximum coverage, and implements various assignment methods regarding channel change and resource assignment of BTS.

## 4.1. BTS Control Part Function

### 4.1.1. BTS Initialization Function

If power is supplied to BTS, BSP Booter starts to operate.
By requesting loading from BSP Booter to BSM, and downloading OS, PLD, own application and lower application, application starts up.

### 4.1.2. Allocation and release function of wire/wireless resources

For BTS resources allocation method to effectively utilize wireless and wire channel, appropriate resources allocation method is required. Resources allocation can be classified into wireless resources(FA, traffic channel, and Walsh code channel) allocation method and wire resources(frame offset) allocation method. BTS allocates wireless resources after allocating wire resources.

### 4.1.3. Management function of wire/wireless link

This manages status of wire/wireless links upon request by the operator and carries out operator notification and automatic recovery function.

## 4.2. RF Tx/Rx Unit Function

RF Tx/Rx unit performs the following detailed functions.

### 4.2.1. Bulk power amplification of transmitting signal

LP(HPA) module receives BUDA output functioning frequency upward conversion as input to amplify transmitting signal as bulk power for sending it Duplexer transmitting filter.

### 4.2.2. Amplification of low noise of receiving signal

LNA is used as low noise amplifier of receiving signal. LNA input port is connected to Duplexer receiving filter output port, and LNA output port is connected to Divider to be sent to BUDA as receiving signal.

### 4.2.3. Frequency conversion of Tx/Rx signal

BUDA provides the transmitting path which converts analog signal upward into IF frequency and RF frequency to be sent to LPAU(HPAU). And also, BUDA provides the receiving path which converts RF receiving signal downward into RF frequency and IF frequency being input from LNA.

### 4.2.4. Tx/Rx Diversity function

To provide receiving Diversity function, two receiving paths are provided into two Antennas, two Duplexer receiving band filters, two LNAs, and BUDA Board by Sector.
In addition, two RF transmitting paths are provided to provide transmitting Diversity function(Option).
Because this carries out frequency upward function and BUDA provides one TX path, two BUDAs are required.
Because LPA(HPA) is separately provided by each path and two Duplexer Filters are used by Sector, two transmitting paths should be provided. Besides, two Antennas are used for both Tx and Rx by Sector.

### 4.2.5. Tx/Rx signal RF and IF output test and test port provision

Directional coupler is applied to duplexer Tx/Rx filter to provide Tx/Rx sample port. In the meantime, BUDA is provided with IF sample port.

### 4.2.6. Remote control, status report, and level report function of RF Tx/Rx devices

BUDA PLL status converting Up/Down frequency, reference signal input status, TX Gain status, RX Gain status, and etc. are reported to upper Processor Board and TX Gain and Rx Gain is adjusted by main Processor Board.
Much information notifying abnormal status of LPA(HPA) amplifying RF signal is reported to upper Processor Board. LNA amplifying receiving signal reports Function Fail Alarm to upper Processor Board.

## 4.3. Function of the digital processing part

### 4.3.1. Provision of all forward, reverse channels set forth in TIA/EIA IS-2000

### 4.3.2. Forward/reverse independent CE use for asynchronous data service

Both forward and reverse, 64CE is divided to enable resource management.

### 4.3.3. Modulation/demodulation function.

This function carries out digital signal processing for 8K/13Kbps voice call, packet data call, and circuit data call.

### 4.3.4. TD, OTD, STS Function Provision

Provides TD(Transmission Diversity), OTD(Orthogonal Transmission Diversity), STS(Space Time Spreading) function.

### 4.3.5. QOF Function Provision

QOF(Quasi-Orthogonal Function) is a method to amplify Forward link capacity by making a new code capable of corresponding with walsh code through wearing orthogonal walsh code with quasi-orthogonal Masking although it is not perfectly orthogonal.

### 4.3.6. Turbo Encoding/Decoding Function Provision .

### 4.3.7. Quick Paging Channel Provision

This is a function which records whether slotted page message of corresponding terminal exists or not before 100ms of paging channel slot slotted page message not to wake up the corresponding terminal per corresponding paging slot for improving Battery time of the terminal.

### 4.3.8. Deployment and switch over of overhead channel

### 4.3.9. Test call function

This is a function to test Voice/Data call in wireless section between the terminal and BTS and can be classified in the following method.

- MS loopback
- Markov Call function.

### 4.3.10. DM function

This is a function for quality analysis and optimization of wireless network, system performance analysis, two way wireless network optimization, analysis of the impact of wireless environment,

and etc.

## 4.4. GPS receiving function

This function receives visual information from GPS satellite and provides TOD(Time Of Day), 10MHz, and 1PPS to BTS.

## 4.5. BTS Call Processing Function

Call processing means that mobile subscribers allocate many resources of the system to connect appropriate call paths. Call processing can be generally classified into Mobile To Mobile call and Mobile To Land call, and Land to Mobile call according to call processing target subscribers. Call processing procedure is composed of originating call setting, terminating call setting, and call setting release step.

BTS processes originating and terminating data for call, circuit, and high, middle, and low data and performs the following detailed functions.

### 4.5.1. Voice call function

This function carries out the following detailed functions:

- Origination/termination function
- QPCH function
- Frame offset resource assignment function
- In-BTS ATM resource assignment function
- Channel assignment
- Walsh code assignment function
- Test call setup function.

### 4.5.2. Data call function

Data call processing procedure, similar to general call processing procedures, interworks with MSC via 3G IOS v4.0 Protocol to perform the validity and authentication of subscribers. Then, it uses MIP to connect call. That is, Bearer Path is not connected to MSC, but connected to BSC-PDSN.

Upon service negotiation procedure execution in the course of call setup for data service, they negotiate whether to accept service option regarding packet data service, and according to system configuration and resource status, low-speed, medium-speed and high-speed packet data are executed.

BTS performs the function of redistributing data bandwidth dynamically between subscribers by reducing data rate of individual subscribers already in service to accommodate additional subscribers according to the increase of data call subscribers by sector/FA.

If packet paging is requested while MS is in dormant status, it should be processed, and it is executed by

transferring service option between PCF and MSC/VLR.

Data call function performs the following detailed functions:

- IS-2000 high-speed, medium-speed, low-speed packet data cal processing
- Circuit Data call processing
- Supports IS-2000 Protocol for Packet Data service.

### 4.5.3. Location Registration Function

Location registration method provided by IS-95A/B system includes power-up, power-down, timer-based, distance-based, zone-based, parameter-change, order, implicit registration, and traffic-channel location registration. cdma2000 1x System provides additionally User-Zone-Base location registration in addition to existing method.

### 4.5.4. Power Control Function

Because the signal power allocated to a MS works as noise to other MSs, allocate the power to the MS requiring relatively small power and allocate the extra power to a MS requiring more power to consistently maintain SNR level which all MSs receive.

### 4.5.5. H/O Processing Function

This function maintains the call in service not to be cut off for enhancing the call quality in mobile exchange system when mobile subscribers get out of the current service area and move other adjacent area.

This provides H/O function by H/O type (Voice, High-speed Circuit Data, High-speed Packet Data).

- Dynamic Threshold Soft H/O
- Inter-Frequency Hard H/O Support
- Inter-Sector Soft H/O
- Inter-BTS Soft H/O
- Inter-BSC Soft H/O
- Inter-MSC Soft H/O
- MAHHO(Mobile Assisted Hard H/O)

### 4.5.6. BTS Resource Management Function

BTS resource management function can be implemented. In particular, in relation to data call, resource management of walsh code should be efficiently done. BSP performs resource management so that it can assign one without idle walsh code to the maximum.

### 4.5.7. Hopping Beacon Function

Hopping Beacon function does not increase FA, uses Beacon device to change pilot transmission frequency at consistent time interval so that the terminal can perform handoff function.

### 4.5.8. Spot Beam Function

This is a function which distributes lots of power to a specific dense area to use the power efficiently.

### 4.5.9. Video Call Function

## 4.6. Supplementary Device Interface Function

This function carries out the following detailed functions:

(1) Coupler can be attached for repeater interface.

- Tx path RF or IF
- Rx path RF or IF

(2) IPC Node distribution function for supplementary device interface (for NMS)

(3) Provides port to provide GPS 10MHz for supplementary device.

(4) Provides 1PPS input/output port for supplementary device.

(5) Provides Even Second/System Clock Port.

# 5. Operation and Maintenance

For the operation and maintenance of BTS, this performs processor status management, device status management, configuration information and operation information management.

## 5.1. Operation Function

### 5.1.1. Alarm, Monitor of Incidental Facilities of BTS

Environmental alarm and fault treatment such as alarm and power, temperature/humidity, and door open/close of incidental facilities of BTS are gathered by BCPA and processed via H/W Alarm. To accommodate that, a separate interface unit that can gather alarm and fault information of each module should be additionally installed.

### 5.1.2. Overload Control Function

Overload control restricts access through the restriction of termination call, origination call and access overload class step by step.

### 5.1.3. BTS Control through Remote Access

BTS remote control through BSM is possible.

### 5.1.4. Specific Call Trace Function

You can display Call Flow and Message Contents in BSM.

### 5.1.5. Major Processor Debugger Function

Provides the function of checking or controlling data such as BTS processor, device and channel resource status/fault, configuration/operation information through the debugger port of main processors of BTS by portable PC.

### 5.1.6. Operator Terminal Access Function

### 5.1.7. BTS Configuration Change and Search Function, Status Display Function

## 5.2. Maintenance Function

### 5.2.1. Self-diagnosis and auto/manual test

Both self-diagnosis, auto test through BTU and manual test through BSM are ppossible.

### 5.2.2. OCNS(Orthogonal Channel Noise Simulator) Function

Orthogonal Channel Noise Simulator (OCNS) plans to secure stability of transmitted power by measuring not only other cell over Forward Link, but noise effect generated owing to other MS within cell under test.

That is, the digital gain measured changes according to the number of subscribers accommodated in the system, and this value is related to pilot, sync, paging, traffic channels, and stored in Channel Element Controller. Cell controller uses data rate and digital gain measured to send certain power at any time.

### 5.2.3. CAI Performance Test

CAI performance test can be measured through Cell DM and Mobile DM.

### 5.2.4. Statistic Information Gathering and Reporting

BTS provides statistic function on Paging, CAI(Common Air Interface), BTS performance, CE(Channel Element), radio channel quality, and processor.

All statistic items provide On Demand and Hourly gathering function.

### 5.2.5. H/W and S/W Alarm Gathering, Reporting

H/W alarm is detected by the main processor of each shelf and reported to BSP, and the main processor and power alarm are detected by alarm detection module in BSP and reported to BSP.

S/W alarm is generated through calculation by application, and it includes Overpower Call Block Alarm, Call Setup Rate Alarm, and reported from the call processing block of RCP or BSP to BSP.

### 5.2.6. MS Loopback call and Markov call function

The purpose of BTS Lookback test is to measure the quality in specific radio section or specific channel by using measured FER(Forward, Reverse) after setting up Lookback call in radio section between channel and MS.

BTS Markov test is to measure the quality in specific radio section or specific channel by using measured FER(Forward, Reverse) after setting up Markov cal in radio section between channel and MS. If Markov test starts, first, power ON BTU and set Matrix Switch to receive paging from designated sector. Then, if Markov call is set up by termination or origination call, it measures FER(Frame Error Rate) from MS (Forward) and Channel Element(Reverse) respectively after maintaining call for a certain time.

### 5.2.7. BTS DM Function

This is to analyze the quality of radio network, optimization, system performance, bothway radio network optimization, and radio environment influence.

### 5.2.8. Call Simulation Function

# 6. Abbreviations

| | |
|---|---|
| ABID | Alarm Buffer Interface Daughter board |
| ACBB | AAL 2 Control Back Board |
| AIM | ATM cell Interface Module |
| ARIA | Alarm & Remote control Interface board Assembly |
| AUBB | ATM low speed sUbscriber Back Board |
| AXBB | ATM Switch Back Board |
| BABB | BTS ATM Network BackBoard |
| BADA | Base station Analyze & Diagnostic Assembly |
| BANB | BTS ATM Network Block |
| BAFB | BTS Alarm & Fault Management Block |
| BCCB | BTS Call Control Block |
| BCMS | BTS Call and Management Subsystem |
| BCRA | BTS Cell Router Board Assembly |
| BDGB | BTS DiaGnostic Block |
| BDLB | BTS Down Loading Block |
| BDHB | BTS Data Handling Block |
| BHCB | BTS Handoff Control Block |
| BMSB | BTS Measurement & Statistics Block |
| BOTA | BeacOn Transmitter Assembly |
| BPPA | BTS Peripheral Processor Board Assembly |
| BRMB | BTS Resource Management Block |
| BRMS | BTS cell Router Management Subsystem |
| BPMB | BTS Power Management Block |
| BSMS | BTS Status Management Block |
| BSPB | BTS Signaling Processor Block |
| BTCB | BTS Transparent Message Control Block |
| BTGB | BTS Timing Generation Block |
| BTMB | BTS Test Management Block |
| BTS | Base Station Transceiver Subsystem |
| BUDA | Base station sector conversion & Up/Down converter Assembly |
| CAI | Common Air Interface |
| CCM | Core Control Module |
| CDM | CDMA Data & Hot Link interface control Module |
| CRP | Cell Router Control Processor |
| CSM | Cell Site Modem |
| DBCB-O | Digital Baseband & Control back Board – Outdoor Type |
| DBPA | Digital Baseband Processing board Assembly |
| DBPB | Digital Bank Processor Block |
| FER | Fault Error Rate |

| | |
|---|---|
| GPS-D | Global Positioning System – Distribution |
| GPS-R | Global Positioning System – Receiver |
| HDLC | High-level Data Link Control |
| HPA | High Power Amplifier |
| LICA | Line Interface Controller Board Assembly |
| LNA | Low Noise Amplifier |
| LPA | Linear Power Amplifier |
| MAC | Medium Access Control |
| OCNS | Orthogonal Channel Noise Simulator |
| OTD | Orthogonal Transmission Diversity |
| PACA | Power Adjustment & Control board Assembly |
| QOF | Quasi-Orthogonal Function |
| RCCA | Radio & Channel Control board Assembly |
| RCCB | BTS cell Router Connection Control Block |
| RCMD | Remote Control Modem Daughter Board |
| RDHB | BTS cell router Data Handling Block |
| RDLB | BTS cell router Down Loading Block |
| RISA | RF & IF Supervisor Assembly |
| RIMA | RF & IF Multiplexing board Assembly |
| RMSB | BTS cell Router Measurement & Statistics Block |
| RSAB | BTS cell Router Status & Alarm Management Block |
| RSSI | Received Signal Strength Indicator |
| RTMB | BTS cell Router Test Management Block |
| SDM | Shelf status Detecting Module |
| SIM | Serial Interface Module |
| STM | System Timing Module |
| STS | Space Time Spreading |
| UCPA | Universal Control Processor board Assembly |