

© Aval Communication Inc 1777 N. California Blvd, Suite 300 Walnut Creek, CA 94596		Document No: A9.10.0004.CMM	Page 1 of 8	Rev. 0.1
TTTLE: Pico BTS Installation and Commission Procedures				

Restricted Proprietary Information

This information disclosed herein is the exclusive property of Aval Communications Inc. and is not to be disclosed without the written consent of Aval Communications Inc. No part of this publication may be reproduced or transmitted in any form or by any means including electronic storage, reproduction, execution or transmission without the prior written consent of Aval Communications Inc. The recipient of this document by its retention and use, agrees to respect the security status of the information contained herein.

Issue Date: October, 1998
Revision: 0.1
Author: Rock Shih

Aval Communications Inc.
IS-136 BTS System
Pico BTS Installation and
Commission Procedures
(A9.10.0004.CMM)



DEC 27 1998

RECEIVED

3. Glossary

BTS	Base Transceiver System
DCCH	Digital Control Channel
DTC	Digital Traffic Channel
ICD	Interface Control Document
LED	Light Emitter Diode
PCM	Pulse Code Modulation
PCS	Personal Communication Service
WOSC	Wireless Office System Control

2. Reference

[1] Interface Control Document, ICD, revision August 24, 1998

Date	Author/modifier	Revision	Comment
October, 1998	Rock Shih	Rev. 0.1	Created

1.3 History

This document provides the installer the detailed installation procedure and a check list for installer to commission the Pico BTS in the field.

1.2 Purpose

This installation and commission procedures are used for the indoors Pico BTS only. The outdoors Pico BTS will be described in another document. The procedures can be used for both Cellular and PCS frequency bands. It only checks whether the installation is secure or not, whether the unit is working on not when it is powered. It does not verify the performance of the unit. All the functional tests are performed in the manufacturing floor.

1.1 Scope

This document describes the installation and commission procedures for the in-doors Pico BTS. Section 4 has a brief description of the Pico BTS which gives the user an idea what is the Pico BTS. Section 5 describes the installation Appendix A contains list of alarms for the Pico BTS. A check list for the installation and commission of the Pico BTS is provided in the Appendix B for the installer to check the Pico BTS installation and power on operation of the unit.

1. Introduction

- 1) Make sure the T1/E1, ground, and power supply cables are provided in the location where the Pico BTS is to be installed. The mounting holes on the wall have been prepared beforehand and are ready for installing the Pico BTS.
 - 2) Check the power supply voltage with DVM to make sure its supply voltage is 48VDC.
 - 3) Turn the key to the vertical position to unlock the mounting bracket.
- The Pico BTS should be tested before shipping to the site for installation. The Pico BTS is shipped in one unit (the Pico unit and the mounting bracket are locked together for shipment) with all the accessories such as screws, nuts and washers in a package. Follow the steps described below to install the Pico BTS after removing it from the package. (Note: Steps must be followed in the order listed below.)

5. Installation Procedure

The transmit and diversity receivers of four transceivers are combined/split in this module.

- Antenna and Branching services.
slot to communicates with the WOSC. The remaining slots are used to provide bearer operation using an proprietary protocol via the ST-BUS. The controller uses one of T1/E1 This module is the brain of the Pico BTS. It configures and controls the transceivers Controller/PCM Interface (E1/T1)
- Downlink Receiver
This module is used for monitoring the transmitter signal strength of the neighbor base stations.
- Transceivers
There are four transceivers in a Pico BTS. Each transceiver has 3 full-rate channel. Each Pico BTS base station can have 12 full-rate channels, one of them is used as the digital control channel(DCCH) to provide the access information to the mobiles, the remaining full-rate channels are used as digital traffic channel(DTC) for the mobiles to communicate with the Cellular/PCS system. Therefore, the maximum number of subscribers the Pico BTS base station can handle at the same time is 11.
- Master Oscillator/Power Supply
This module provides a reference frequency and a power supply unit to convert input ~~48VDC~~ (24VDC - 48VDC) to 6.5VDC for Pico BTS operation. The 48VDC is provided from the T1/E1 line or a separate power supply line..

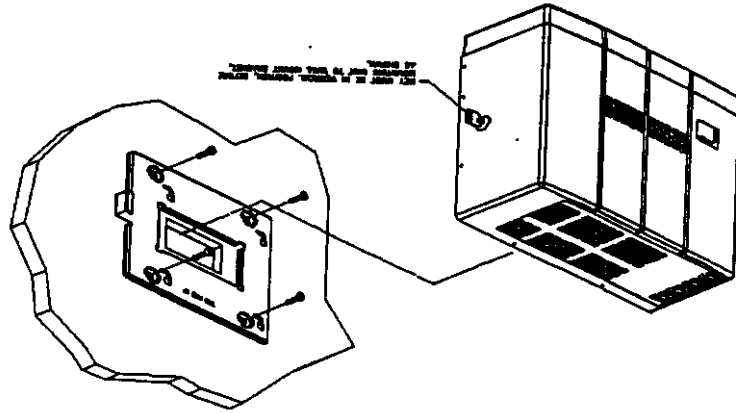
The Pico BTS base station contains the following components which are installed in a back plane and covered by an external box to prevent vandalism and intrusion..

There are three LEDs in the Pico BTS. The first LED is a green color LED. It should be illuminated when the power is turned on. If there is any failure, the second dual-color LED will be illuminated. If the yellow color is turned on, it indicates a minor alarm. If the red color is turned on, it indicates a major alarm. The third LED will be turned on when the temperature of the Pico BTS becomes too hot. Refer to Appendix A for the minor and major alarms.

The Pico BTS base station is a digital mode only base station operated in either cellular or PCS frequency band. The front view of the Pico BTS base station are shown in Figure-3.

4. System Description

Figure-1



- 4) Listen to the voice on the mobiles. The voice should get through.
 - 3) Call the second mobile from the first mobile. A call should be established. Both mobiles should display "conversation".
 - 2) Turn off and on of the mobile. The mobile should lock on the Pico BTS DCH channel by observing the display on the mobile. Repeat step 1 & 2 for a second mobile.
 - 1) Program the mobile prefer control channel to the Pico BTS DCH according to the mobile operation manual provided by the mobile manufacturer.
- The following steps will only be performed assuming you know the DCH channel assigned for the installed Pico BTS and you want to check T1/E1 connection.
- 14) Fill the Installation and Commission Check List as shown in Appendix B.
 - 13) Inform the Pico BTS control center that the unit is installed and is ready for operation. A for the alarm condition, turn off the unit and remove the unit from the wall. Refer to Appendix A for the alarm condition.
 - 12) Monitor the LED display after the unit is turned on. Check any alarm indication. If an alarm condition is indicated, turn off the unit and remove the unit from the wall. Refer to Appendix A for the alarm condition.
 - 11) Turn the key to the horizontal position to lock the unit when it is done.
 - 10) Mount the Pico BTS to the wall mount bracket.
 - 9) Turn on the Pico BTS by move the power on switch to the on position after the T1/E1 and Power supply cables to the cable slots.
 - 8) Make sure the switch is in the central position before installing the T1/E1 and Power supply cables to the cable slots.
 - 7) Connect the ground cable to the Pico BTS as shown in Figure-2.
 - 6) make sure it is securely mounted on the wall.
 - 5) Route cables through the opening of the wall mounting bracket as shown in Figure-1 and
 - 4) Separate the wall mounting bracket from the Pico BTS.

Appendix A

The following table is extracted from the ICD[1] document. It outlines all of the alarm codes and their meanings, severity, and the suggested action by the WOSC.

- Critical - BTS requires service immediately
- Major - Major performance or capacity loss
- Minor - Minor performance or capacity loss
- Info - Informational alarm

The critical and major categories are considered as major alarm. When it happens, the red color of the second LED will be turned on. When a minor alarm is detected, the yellow color of the second LED will be turned on. When an information alarm is detected, the information will be sent to the WOSC for information only, no LED will be illuminated.

Name	Alarm	Severity	Meaning	Suggested Action
WBSU Rebooting	2180	Info	WBSU has been rebooted	Perform WBSU startup procedures
WBSU Restart	2181	Info	WBSU has been warm booted	Perform WBSU startup procedures
Get Time-of-day Failed	2185	Minor	WBSU could not contact WOSC time server to get time-of-day server	
CPU Busy	2188	Info	CPU idle time < 5%	
CPU Available	2189	Info	CPU idle time > 5%	
Master Oscillator Failed	218A	Critical	Master oscillator is failed	Replace master oscillator
Power Supply Voltage Alarm	2281	Critical	Power supply output is out of range	Service required
Software Image File Corrupt	2380	Major	Download software image has CRC error	Check software download image on WOSC
Software Download Started	2381	Info	Software download in progress	
Software Download Completed	2382	Info	Software download finished	
Abis Queue Full	2383	Minor	Abis receive buffers usage is 75% of maximum capacity	Suspend forward messaging to WBSU until Abis Queue Available Alarm received
Abis Queue Available	2384	Minor	Abis receive buffers usage is below 25%	Resume forward messaging to WBSU
Card Insertion	3280	Info	Card has been inserted	Setup card
Card Reboot/Reset	3281	Minor	Card has been rebooted or	Setup card

© AVAL Communication Inc
1777 N. California Blvd, Suite 300
Walnut Creek, CA 94596

TTTLE:
Pico BTS Installation and Commission Procedures
Document No: A9.10.0004.CMM Page 6 of 8 Rev. 0.1

Card Removed	Card has been removed	Minor	3282	
Card Failed	Card does not respond	Major	3283	
Traffic Channel Failed	Fatal error in protocol stack	Minor	5280	
	Decommission and then recommission protocol stack			
	Decommission card and associated protocol stacks			
	Decommission card and associated protocol stacks			
	reset			

Appendix B

Installation and Commission Check List

Location: _____
 Company: _____
 Installer: _____
 Date: _____
 Carrier: _____

Checking List	Completed (Y/N)	Comment
Chassis Ground Cable is provided		
48 VDC Power Supply is provided		
Network Interface (T1/E1) is provided		
Connect Chassis Ground, Power Supply and Network Interface cables to the Pico BTS		
Mount and Secure the Mounting Plate to the Wall		
Power on the Pico BTS		
Mount and Secure the Pico BTS on the Mounting Plate		
Lock the Unit		
Monitor the LED to make sure there is no alarm indicated. Refer to Appendix A for detailed.		major alarm indicated
Inform the Control Center that the Unit is installed and it can be activated		
Network Interface is working		
Make a call		