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Interoperability Specification (IOS) for cdma2000 Access Network Interfaces — Part 5 (A3 and A7 Interfaces)

(3G-IOS v5.1.1)

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1.0 Introduction

1.1 Overview

This document contains the message procedures, bitmaps, information elements, and timers used to define the A3 and A7 interfaces.

1.1.1 Purpose

The purpose of this document is to provide the standard for interfacing a Base Station (BS) with one or more BSs. This document defines the functional capabilities, including services and features, of the specified interface. These services and features are the defining characteristics that are the basis for the overall system standard.

1.1.2 Scope

This standard provides the specification for the interface which coincides with the Reference Point "A_{ter}" defined in the TR45 Network Reference Model shown in [I-2]. The scope of this standard includes the following topics:

Descriptions of the specified functional capabilities that provide wireless telecommunications services across the BS-BS interface as defined in the TR45 Network Reference Model;

Descriptions of the division of responsibility of the functions provided between the source BS and the target BS, without prescribing specific implementations;

Descriptions of the BS-BS interface standard that support DS-41 and cdma2000® [1] systems.

1.2 References

References are either normative or informative. A normative reference is used to include another document as a mandatory part of a 3rd Generation Partnership Project 2 (3GPP2) specification. Documents that provide additional non-essential information are included in the informative references section.

1.2.1 Normative References

The following standards contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below.

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[1] cdma2000® is the trademark for the technical nomenclature for certain specifications and standards of the Organizational Partners (OPs) of 3GPP2. Geographically (and as of the date of publication), cdma2000® is a registered trademark of the Telecommunications Industry Association (TIA-USA) in the United States.

[1] 3GPP2 C.S0001-E v1.0, *Introduction to cdma2000 Standards for Spread Spectrum Systems*, May 2009.
[2] 3GPP2 C.S0002-E v1.0, *Physical Layer Standard for cdma2000 Spread Spectrum Systems*, May 2009.
[3] 3GPP2 C.S0003-E v1.0, *Medium Access Control (MAC) Standard for cdma2000 Spread Spectrum Systems*, May 2009.
[4] 3GPP2 C.S0004-E v1.0, *Signaling Link Access Control (LAC) Standard for cdma2000 Spread Spectrum Systems*, June 2009.
[5] 3GPP2 C.S0005-E v1.0, *Upper Layer (Layer 3) Signaling Standard for cdma2000 Spread Spectrum Systems*, June 2009.
[6] 3GPP2 C.S0006-D v2.0, *Analog Signaling Standard for cdma2000 Spread Spectrum Systems*, September 2005.
[7] Reserved.
[8] Reserved.
[9] 3GPP2 X.S0004-E v8.0, *Mobile Application Part (MAP)*, January 2009.
[10] TIA/EIA-95-B; *Mobile Station - Base Station Compatibility Standard for Wideband Spread Spectrum Cellular Systems*, March 1999.
[11] 3GPP2 A.S0011-D v2.0, *Interoperability Specification (IOS) for cdma2000 Access Network Interfaces – Part 1 Overview*, August 2009.
[12] 3GPP2 A.S0012-D v2.0, *Interoperability Specification (IOS) for cdma2000 Access Network Interfaces – Part 2 Transport*, August 2009.
[13] 3GPP2 A.S0013-D v2.0, *Interoperability Specification (IOS) for cdma2000 Access Network Interfaces – Part 3 Features*, August 2009.
[14~17] Reserved.
[18] 3GPP2 N.S0017-B v1.0, *International Implementation of Wireless Telecommunication Systems Compliant with TIA/EIA-41*, December 2002.
[19] 3GPP2 C.S0010-C v2.0, *Base Station Minimum Performance,* February 2006.

1.2.2 Informative References

[I-1] 3GPP2 C.R1001-G v1.0, *Administration of Parameter Value Assignments for CDMA Spread Spectrum Standards*, June 2009.
[I-2] 3GPP2 S.R0005-B v2.0, *Network Reference Model for cdma2000 Spread Spectrum Systems*, May 2007.

1.3 Terminology

1.3.1 Acronyms

Acronym	Meaning
2G	Second Generation
3GPP2	Third Generation Partnership Project 2
AAL2	ATM Adaptation Layer type 2
ANSI	American National Standards Institute
ARFCN	Absolute Radio Frequency Channel Number
ASCII	American Standard Code for Information Interchange
ATM	Asynchronous Transfer Mode

Acronym	Meaning
BCD	Binary Coded Decimal
BS	Base Station
BTS	Base Transceiver System
CCSH	Code Combining Soft Handoff
CDG	CDMA Development Group
CDMA	Code Division Multiple Access
CE	Channel Element
CI	Cell Identity
CID	Connection Identifier (used with reference to AAL2)
CRC	Cyclic Redundancy Code (or check)
DCCH	Dedicated Control Channel
DS-41	Direct Spread (ANSI)-41
DTX	Discontinuous Transmission
EIA	Electronics Industry Association
EIB	Erasure Indicator Bit
ESCAM	Extended Supplemental Channel Assignment Message
ESN	Electronic Serial Number
FCH	Fundamental Channel
FER	Frame Error Rate
FPC	Forward Power Control
FQI	Frame Quality Indicator
FSN	Frame Sequence Number
GR	Gain Ratio
IE	Information Element
IMSI	International Mobile Subscriber Identity
IMT	International Mobile Telecommunications
IOS	Interoperability Specification
IP	Internet Protocol
IS	Interim Standard
JTACS	Japanese Total Access Communications
LAC	Location Area Code
LCM	Long Code Mask
LSB	Least Significant Bit
MCC	Mobile Country Code
MNC	Mobile Network Code
MEID	Mobile Equipment Identifier
MS	Mobile Station
MSB	Most Significant Bit
MSC	Mobile Switching Center
MSCID	Mobile Station Connection Identifier

Acronym	Meaning
MUX	Multiplexer
NMT	Nordic Mobile Telephone
OAM&P	Operations, Administration, Maintenance, and Provisioning
OLT	Outer Loop Threshold
OTD	Orthogonal Transmit Diversity
PATE	Packet Arrival Time Error
PCS	Personal Communications System
PMC	Packet Mode Channel
PN	Pilot Number
PWR	Power
QIB	Quality Indicator Bit
QOF	Quasi Orthogonal Function
RC1	Radio Configuration 1
RC2	Radio Configuration 2
RC3	Radio Configuration 3
RF	Radio Frequency
RPC	Reverse Power Control
RSSI	Received Signal Strength Indicator
SCH	Supplemental Channel
SCTP	Stream Control Transmission Protocol
SDU	Selection/Distribution Unit
SIR	Signal to Interference Ratio
SLC	Sector Link Count
SR3	Spreading Rate 3 (3X)
TACS	Total Access Communications
TCP	Transmission Control Protocol
TIA	Telecommunications Industry Association
UDP	User Datagram Protocol
VCCI	Virtual Channel Connection Identifier

1.3.2 Definitions

Refer to [11] for definitions.

1.4 Message Body, Coding, and Ordering of Elements

For each A3 and A7 message there are a number of information elements that are individually defined in section 4.2. Each information element in a given message is tagged with a reference in section 4.2, a direction indication (i.e., some elements within a message are bi-directional and others are not), and a mandatory/optional type (M/O) indicator. Information elements that are marked as optional carry an additional indication

of being either required (R) or conditional (C) (see below). Some information elements are reused in multiple messages.

The DIRECTION indication associated with each message element pertains to the use of that particular message element when used with the particular message (i.e., use of the message element may be different in other messages). The format of the DIRECTION indication is as follows:

Table 1.4-1 Element Flow DIRECTION Indication

Source BS -> Target BS	Element flows from the Source BS to the Target BS
Target BS -> Source BS	Element flows from the Target BS to the Source BS

The inclusion of information elements in each message is specified as follows:

M Information elements which are mandatory for the message.

O Information elements which are optional for the message.

R Required in the message whenever the message is sent.

C Conditionally required. The conditions for inclusion of this element are defined in the operation(s) where the message is used (refer to [13]) and in footnotes associated with the table defining the order of information elements in the message.

Information elements which are mandatory for a given message shall be present, and appear in the order shown in the message definitions in this chapter. Mandatory and Optional/Required IEs differ predominantly in error processing, refer to section 1.6.

Information elements which are optional for a given message are included as needed for specific conditions. When included, they shall appear in the order shown in the message definition given in this chapter.

An information element can very well be mandatory for some messages and optional for other messages.

The bitmap tables in the message subsections of 3.0 are patterned after the format for the information elements of section 4.2 and use the following conventions:

⇒ **Element Name{<# instances>:**

= Name of information element.

Different elements within a message are separated by double lines.

Fields within elements are separated by single lines.

Octets are renumbered at the beginning of every element.

[<values>] = Set of allowed values.

} Element Name The number of instances of an element is 1 by default. If the **Element Name{<# instances … }Element Name** notation is used, the <**# instances**> notation indicates:

n = exactly n occurrences of the element

n+ = n or more occurrences of the element

1..n = 1 to n inclusive occurrences of the element

label {<# instances>:

<octet 1>

<octet m>

} label = Number of instances of the bracketed set of fields where **<# instances>** notation indicates:

n = exactly n occurrences of the field

n+ = n or more occurrences of the field

1..n = 1 to n inclusive occurrences of the field

ssss ssss

… = Variable length field.

ssss ssss

1.5 Forward Compatibility Guidelines

This standard is intended to evolve to accommodate new features and capabilities. To ensure that equipment implemented to one revision level interoperates with equipment implemented to later revision levels the following guidelines are defined for the processing of messages and for the development of messages in future revisions of this standard.

Unexpected signaling information may be received at an entity due to differing levels of signaling protocol at different entities within a network: an entity using a more enhanced version of the protocol may send information to an entity implemented at a lower level of the protocol which is outside the protocol definition supported at that receiving entity.

It may happen that an entity receives unrecognized signaling information, i.e., messages, element types or element values. This can typically be caused by the upgrading of the protocol version used by other entities in the network. In these cases the following message processing guidelines are invoked to ensure predictable network behavior.

If the receiving entity is implemented to IOS v3.0 or greater, then the sending entity shall send messages that are correctly formatted for the version of the IOS declared to be implemented by the sending entity.

If the receiving entity is implemented to a CDG IOS version less than 3.1.0, then if the sending entity is at an equal or greater version than the receiver, the sending entity shall format messages according to the version of the protocol implemented at the receiving entity.

For example, a CDG IOS version 3.1.0 entity by using the following guidelines may be capable of ignoring additional new elements or fields within elements sent by an entity implemented to an IOS version higher than 3.1.0.

1.6 Message Processing Guidelines

The following message processing guidelines apply unless overridden by explicit processing directions in other places within this standard.

In the guidelines in this section, "optional" includes both "optional – conditional" and "optional – required" information elements as indicated in the message tables in section 3.0.

1. If a message is received containing a Message Type value which is not defined for the revision level implemented then the message shall be discarded and ignored. There shall be no change in state or in timers due to receipt of an unknown message.
2. If a message is received without an expected mandatory information element for the revision level implemented then the message shall be discarded and ignored. There shall be no change in state or in timers due to receipt of the message.
3. If a message is received that contains an information element which is defined for the revision level implemented but contains invalid values in some fields, these fields shall be ignored and the remainder of the information element processed to the extent possible. The message and all other information elements shall be processed to the extent possible. Failure handling may be initiated if call processing cannot continue. Also refer to message processing guidelines 9 and 10.
4. If a message is received that contains an Information Element Identifier which is not defined for the revision level implemented then that element shall be discarded and ignored. The message shall be processed to the extent possible. Failure handling may be initiated if call processing cannot continue.
5. If a known but unexpected optional information element is received, that information element shall be ignored. The message and all other information elements shall be processed.
6. If a message is received without an expected optional information element the message shall be processed to the extent possible. Failure handling may be initiated if call processing cannot continue.
7. If a field within a received information element contains a value that is specified as "reserved" or is otherwise not defined in the revision level implemented this field shall be ignored and the remainder of the information element processed to the extent possible. In this situation, all other information elements in the message shall be processed to the extent possible.
8. Octets and bits designated as "Reserved" or which are undefined for the revision implemented shall be set to zero by a sending entity and ignored by a receiving entity.
9. If an element is received containing a field that is larger than expected, i.e., is indicated as having more bits/octets than expected, then the expected bits/octets of that field shall be processed to the extent possible and the additional bits/octets shall be ignored.
10. If an element is received containing a field that is smaller than expected, i.e., is indicated as having fewer bits/octets than expected, then the length field or other indicator shall be considered correct and the bits/octets actually present in the element shall be processed to the extent possible. Failure handling may be initiated if call processing cannot continue.

1.7 Message Definition Guidelines

1. New messages shall have a Message Type that has never been previously used.
2. Information Element Identifiers may be reused in future revisions only when:
   - The old use of the element identifier is not used in the new revision, and
   - The new use of the element identifier is used only in new messages which were not defined in previous revisions.

   The old use of the element identifier shall be supported within the context of the old messages in which it was used.
3. Defined valid values of Information Elements may be changed in future revisions. The new version shall define the error handling when previously valid values are received.
4. Octets and bits which are undefined or which are defined as reserved may be used in future revisions.
5. The Mandatory/Optional designation of Information Elements within a message shall not change.
6. Mandatory Information elements shall be sent in the order specified in section 3.0.
7. New optional Information Elements in a message shall be defined after all previously defined optional Information Elements.
8. All new Information Elements shall be defined with a length field. Note that most existing Information Elements have 1 octet length fields but some existing Information Elements have 2 octet length fields. Information Element Identifier values in the range C0H-DFH inclusive shall be defined to have a 2 octet length field. All other new Information Element Identifier values shall be defined to have a 1 octet length field.
9. New information may be added to the end of an existing Information Element, provided that the Information Element is defined with a length field.

2.0 Message Procedures

Efficient inter-BS soft handoff is supported via direct BS to BS signaling and traffic connections between base stations. The A3 and A7 interfaces are used to support this form of inter-BS soft handoff.

The A3 interface, composed of signaling and user traffic subchannels, provides the ability to establish and remove A3 traffic connections. The A3 interface also provides support for operational procedures, such as turning voice privacy on and off or changing the service configuration of a call.

The A7 interface provides direct BS to BS signaling for the support of efficient soft handoff. Only a call release procedure should interrupt any handoff procedure. Multiple concurrent A7 Handoff Add procedures are prohibited for the same physical channel on the same call. Multiple concurrent A7 Handoff Drop procedures for the same physical channel on the same call are prohibited. A3 and A7 interface messages are not applicable to DS-41 base stations.

2.1 A3 Messages Procedures

This section contains message procedures for the A3 interface.

2.1.1 A3-Connect

The A3-Connect message is sent from the target BS to the source BS to initiate or add cells to one or more A3 user traffic connection. An A3-Connect Ack message is expected in response.

2.1.1.1 Successful Operation

Upon receiving the A3 Signaling Address information in the A7-Handoff Request message, if a new connection is required, the receiving BS begins the process of establishing the A3 signaling connection with the source BS. The A3 Signaling Address is used by the target BS to allocate a logical circuit to be used for A3 signaling. The SDU ID identifies the particular instance of the SDU function. If the A3 Signaling Address information is not present in the A7-Handoff Request message, the receiving BS shall select the A7 signaling link from which the A7-Handoff Request message is received as the A3 signaling link.

All cells in softer handoff are power combined and share a single A3 traffic connection.

Following the selection of the A3 signaling link, the A3-Connect message is sent from the target BS to the source BS. The target BS expects an A3-Connect Ack message indicating the result of processing the A3-Connect message and, therefore, starts timer T_{conn3}.

2.1.1.2 Failure Operation

If timer T_{conn3} expires before receipt of an A3-Connect Ack message, the target BS shall include all new cells that would have been added by the A3-Connect message to the list of non-committed cells in the A7-Handoff Request Ack message.

2.1.2 A3-Connect Ack

The A3-Connect Ack message is sent from the source BS to the target BS to indicate the result of processing the A3-Connect message.

2.1.2.1 Successful Operation

After processing the A3-Connect message from the target BS, the source BS indicates success/failure to the target BS by sending an A3-Connect Ack message. Upon receipt of the A3-Connect Ack message, the target BS stops timer T_{conn3}.

If the A3-Connect Ack message indicates that A3-Traffic Channel Status messages are to be sent, then the source BS starts timer $T_{chanstat}$ to await A3-Traffic Channel Status message(s) for all new cells on each A3 connection. One instance of this timer is started for each A3 connection to which one or more cells are being added.

2.1.2.2 Failure Operation

If an instance of timer $T_{chanstat}$ expires, the source BS may assume that a failure has occurred at the target BS during activation of the transmitter(s)/receiver(s) and delete the unreported cells from the active set attached to the A3 connection. The source BS may then send an A7-Drop Target message to the target BS to cleanly remove those cells from the A3 connection.

2.1.3 A3-Remove

A target BS uses the A3-Remove message to request that the source BS remove the indicated cells from the indicated A3 connections. This might result in the removal of an entire A3 traffic subchannel if the last cell on that traffic subchannel is removed.

2.1.3.1 Successful Operation

The target BS sends an A3-Remove message to the source BS requesting removal of the indicated cells from one or more A3 connection. The target BS starts timer $T_{discon3}$. The source BS replies with an A3-Remove Ack message. If the last cell is removed from an A3 traffic subchannel, the entire A3 traffic subchannel is also terminated.

2.1.3.2 Failure Operation

If timer $T_{discon3}$ expires, the target BS may resend the A3-Remove message and restart timer $T_{discon3}$ a configurable number of times.

2.1.4 A3-Remove Ack

The A3-Remove Ack message is used by the source BS to notify the target BS that sent the A3-Remove message of the outcome of processing the A3-Remove message.

2.1.4.1 Successful Operation

The source BS sends an A3-Remove Ack message to the target BS that sent the A3-Remove message to indicate the results of processing the A3-Remove message. One A3-

Remove Ack message is sent in response to each A3-Remove message. If the source BS does not recognize an A3 user traffic connection identified in the A3-Remove message as being associated with the Call Connection Reference value included in that message, it shall send an appropriate cause for the failure in the A3-Remove Ack message. Upon receipt of the A3-Remove Ack message, the target BS stops timer $T_{discon3}$.

2.1.4.2 Failure Operation

None.

2.1.5 A3-Drop

The purpose of the A3-Drop message is to indicate that the source BS is removing the indicated A3 traffic subchannel, e.g., as a result of OAM&P intervention.

2.1.5.1 Successful Operation

The source BS may send an A3-Drop message to indicate that the A3 traffic subchannel between the receiving BS and the source BS is about to be terminated. This is a unilateral action taken by the source BS. An appropriate cause value shall be included.

2.1.5.2 Failure Operation

None.

2.1.6 A3-Propagation Delay Measurement Report

This message is sent from the target BS to the source BS over the A3 signaling interface. It contains the CDMA serving one way delay measured at the target BS.

2.1.6.1 Successful Operation

This message is sent from the target BS to the source BS over the A3 signaling interface immediately following the acquisition of the MS and subsequently whenever the propagation delay changes by two or more PN chips.

2.1.6.2 Failure Operation

None.

2.1.7 A3-Physical Transition Directive

This message is sent from the source BS to the target BS over the A3 interface. It conveys a change to an allocated physical channel at the target BS as well as the expected time of execution for the change.

2.1.7.1 Successful Operation

When an allocated physical channel is to be changed for a call, the source BS shall transmit an A3-Physical Transition Directive to a target BS and start timer $T_{physical}$.

If a change to an allocated physical channel is already pending at the target BS, the reception of this message replaces the pending operation and the pending action time. The new transition may place the BS into the same state it already is supporting, thus effectively canceling the previously pending transition.

2.1.7.2 Failure Operation

If timer $T_{physical}$ expires, the source BS may resend the A3-Physical Transition Directive message and restart timer $T_{physical}$ a configurable number of times.

2.1.8 A3-Physical Transition Directive Ack

This A3 message is sent from the target BS to the source BS over the A3 signaling interface to convey the outcome of processing an A3-Physical Transition Directive message.

2.1.8.1 Successful Operation

Upon receipt of an A3-Physical Transition Directive from the source BS, the target BS shall transmit an A3-Physical Transition Directive Ack message to the source BS to indicate the outcome of processing the received message. The source BS shall stop timer $T_{physical}$ upon receipt of the A3-Physical Transition Directive Ack message.

2.1.8.2 Failure Operation

None.

2.1.9 A3-Traffic Channel Status

The A3-Traffic Channel Status message is used by the target BS to notify the source BS that radio transmission on the forward link has begun for the indicated cells, and that the corresponding receivers have been activated. This message is sent when the A3-Connect Ack message indicates that it is requested.

2.1.9.1 Successful Operation

When the target BS needs to notify the source BS of a status change relative to a specific set of cells on one A3 connection, it sends an A3-Traffic Channel Status message.

This message can be used to note that the indicated set of cells has begun receiving forward frames from the source BS and has begun transmitting on the forward radio link. The target BS may not send this message in response to an A3-Connect Ack message, if its transmitters(s)/receiver(s) are not turned on (i.e., the radio transmission on the forward link has not begun for the indicated cells).

Multiple instances of this message may be sent relative to a single A3 connection if, for instance, transmitter(s)/receiver(s) are activated at different times. However, all cells referenced within a single instance of this message shall be attached to the same A3 connection.

The source BS stops the instance of timer $T_{chanstat}$ for the A3 connection when the A3-Traffic Channel Status message(s) have been received containing references to all cells added to the A3 connection by the A3-Connect message.

2.1.9.2 Failure Operation

None.

2.1.10 A3-IS-95 FCH Forward

This message is sent from the source BS to the target BS on the A3 user traffic subchannel for subchannels of type "IS-95 FCH". It contains the Forward Traffic Channel frame for the served MS along with control information.

2.1.10.1 Successful Operation

This message is sent from the source BS to the target BS on A3 user traffic subchannel connections of type "IS-95 FCH" once every 20 ms.

The forward path delay shall be according to the delay budget requirements table in [12] measured from the time the first bit of the frame is transmitted from the source BS to the time the first bit of the frame is transmitted over the air interface at the channel element (CE) for any soft handoff leg. This assumes a maximum delay on the A3 traffic connection according to the delay budget requirements table in [11]. The delay limits defined in this section do not apply to satellite applications.

Forward Frame Sequence Number Alignment clarification:

The SDU function may use the Packet Arrival Time Error (PATE) and Sequence Number information received in the A3-IS-95 FCH Reverse message to ensure that all target BSs involved in soft handoff for a call simultaneously transmit identical forward air frames during identical 20 ms frame boundaries.

2.1.10.2 Failure Operation

None.

2.1.11 A3-IS-95 FCH Reverse

This message is sent from the target BS to the source BS on A3 user traffic subchannel connections of type "IS-95 FCH" once every 20 ms. It contains the decoded Reverse Traffic Channel frame received from the served MS along with control information.

2.1.11.1 Successful Operation

This message is sent from the target BS to the source BS on the A3 user traffic subchannel connections of type "IS-95 FCH" once every 20 ms following the decoding of the Reverse Traffic Channel frame.

The reverse speech path delay shall be according to the delay budget requirements table in [12] from the time the last bit of the frame is received on the air interface at the channel element of any soft handoff leg to the time the last bit of the frame is received at

the source BS. This assumes a maximum delay on the A3 traffic connection according to the delay budget requirements table in [12].

The delay limits defined in this section do not apply to satellite applications.

Forward Frame Alignment Requirements:

As part of the reverse-link processing, each target BTS channel element shall estimate the arrival time error for the A3-IS-95 FCH Forward message last received and shall set the PATE field of the next transmitted A3 IS-95 FCH Reverse message to this value.

If the value cannot be represented within the maximum range of the PATE, it shall be set to the maximum positive value. Positive PATE values indicate that the message arrived too late to be transmitted in the correct air frame. Negative PATE values indicate that the message arrived too early and therefore is required to be buffered before transmission. A zero PATE value indicates that the message arrived at the optimum time for processing and transmission.

2.1.11.2 Failure Operation

None.

2.1.12 A3-IS-2000 FCH Forward

This message is sent from the source BS to the target BS on the A3 cdma2000 user traffic subchannel channel for subchannel of type “FCH”. It contains the Forward air-frame for the served MS along with control information.

2.1.12.1 Successful Operation

This message is sent from the source BS to the target BS on A3 IS-2000 user traffic subchannel connections of type “FCH”. FCH messages are sent once every 20 ms.

The forward path message delay shall be according to the delay budget requirements table in [12] from the time the first bit of the frame is transmitted from the source BS to the time the first bit of the frame is transmitted over the air interface at the channel element for any soft handoff leg. This assumes a maximum transmission and queuing delay on the A3 traffic connection according to the delay budget requirements table in [12]. The delay limits defined in this section do not apply to satellite applications.

Forward Frame Sequence Number Alignment clarification:

The SDU function may use the PATE and Sequence Number information received in the A3-IS-2000 FCH Reverse message to ensure that all BSs involved in soft handoff for a call simultaneously transmit identical forward air frames during identical 20 ms frame boundaries.

2.1.12.2 Failure Operation

None.

2.1.13 A3-IS-2000 FCH Reverse

This message is sent from the target BS to the source BS on A3 cdma2000 user traffic subchannel connections of type "IS-2000 FCH" (cdma2000 FCH). It contains the decoded Reverse Traffic Channel frame received from the served MS along with control information.

2.1.13.1 Successful Operation

This message is sent from the target BS to the source BS on the A3 IS-2000 user traffic subchannel connections of type "IS-2000 FCH" following the decoding of the Reverse Traffic Channel frame. IS-2000 FCH frames are sent once every 20 ms.

The reverse path message delay shall be according to the delay budget requirements table in [12] measured from the time the last bit of the frame is received on the air interface at the channel element of any soft handoff leg to the time the last bit of the frame is received at the source BS. This assumes a maximum transmission and queuing delay on the A3 traffic connection according to the delay budget requirements table in [12]. The delay limits defined in this section do not apply to satellite applications.

Forward Frame Alignment Requirements:

As part of the reverse-link processing, each target BTS channel element shall estimate the arrival time error for the A3-IS-2000 FCH Forward message last received and shall set the PATE field of the next transmitted A3-IS-2000 FCH Reverse message to this value.

If the value cannot be represented within the maximum range of the PATE, it shall be set to the maximum positive value. Positive PATE values indicate that the message arrived too late to be transmitted in the correct air frame. Negative PATE values indicate that the message arrived too early and therefore is required to be buffered before transmission. A zero PATE value indicates that the message arrived at the optimum time for processing and transmission.

2.1.13.2 Failure Operation

None.

2.1.14 A3-IS-2000 DCCH Forward

This message is sent from the source BS to the target BS on the A3 IS-2000 user traffic subchannel for subchannels of type "IS-2000 DCCH". It contains the Forward air-frame for the served MS along with control information.

2.1.14.1 Successful Operation

This message is sent from the source BS to the target BS on A3 IS-2000 user traffic subchannel connections of type "IS-2000 DCCH". IS-2000 DCCH frames are sent once every 20 ms.

The forward path message delay shall be according to the delay budget requirements table in [12] measured from the time the first bit of the frame is transmitted from the source BS to the time the first bit of the frame is transmitted over the air interface at the channel element for any soft handoff leg. This assumes a maximum transmission and

queuing delay on the A3 traffic connection according to the delay budget requirements table in [12]. The delay limits defined in this section do not apply to satellite applications.

Forward Frame Sequence Number Alignment clarification:

The SDU function may use the PATE and Sequence Number information received in the A3-IS-2000 DCCH Reverse message to ensure that all BSs involved in soft handoff for a call simultaneously transmit identical forward air frames during identical frame boundaries.

2.1.14.2 Failure Operation

None.

2.1.15 A3-IS-2000 DCCH Reverse

This message is sent from the target BS to the source BS on A3 IS-2000 user traffic subchannel connections of type "IS-2000 DCCH". It contains the decoded Reverse Traffic Channel frame received from the served MS along with control information.

2.1.15.1 Successful Operation

This message is sent from the target BS to the source BS on the A3 IS-2000 user traffic subchannel connections of type "IS-2000 DCCH" following the decoding of the Reverse Traffic Channel frame. IS-2000 DCCH frames are sent once every 20 ms.

The reverse path message delay shall be according to the delay budget requirements table in [12] measured from the time the last bit of the frame is received on the air interface at the channel element of any soft handoff leg to the time the last bit of the frame is received at the source BS. This assumes a maximum transmission and queuing delay on the A3 traffic connection according to the delay budget requirements table in [12]. The delay limits defined in this section do not apply to satellite applications.

Forward Frame Alignment Requirements:

As part of the reverse-link processing, each target BTS channel element shall estimate the arrival time error for the A3-IS-2000 DCCH Forward message last received and shall set the PATE field of the next transmitted A3-IS-2000 DCCH Reverse message to this value.

If the value cannot be represented within the maximum range of the PATE, it shall be set to the maximum positive value. Positive PATE values indicate that the message arrived too late to be transmitted in the correct air frame. Negative PATE values indicate that the message arrived too early and therefore is required to be buffered before transmission. A zero PATE value indicates that the message arrived at the optimum time for processing and transmission.

2.1.15.2 Failure Operation

None.

2.1.16 A3-IS-2000 SCH Forward

This message is sent from the source BS to the target BS on the A3 user traffic subchannel connections of type "IS-2000 SCH". It contains the Forward Traffic Channel frame for the served MS along with control information.

2.1.16.1 Successful Operation

This message is sent from the source BS to the target BS on A3 IS-2000 user traffic subchannel connections of type "IS-2000 SCH" SCH frames are sent once every 20 ms. Furthermore, IS-2000 SCH messages containing Null frame content may be suppressed (i.e., not transmitted) on the A3 connection according to the restrictions outlined in the message format definition.

The forward path message delay shall be according to the delay budget requirements table in [12] measured from the time the first bit of the frame is transmitted from the source BS to the time the first bit of the frame is transmitted over the air interface at the channel element for any soft handoff leg. This assumes a maximum transmission and queuing delay on the A3 traffic connection according to the delay budget requirements table in [12]. The delay limits defined in this section do not apply to satellite applications.

If the SDU has no data to forward to the target BS during a traffic burst, the SDU shall set the Frame Content field of this message to 'Null' (7FH).

Forward Frame Sequence Number Alignment clarification:

The SDU function may use the PATE and Sequence Number information received in the A3-IS-2000 SCH Reverse message to ensure that all BSs involved in soft handoff for a call simultaneously transmit identical forward air frames during identical 20 ms frame boundaries.

2.1.16.2 Failure Operation

None.

2.1.17 A3-IS-2000 SCH Reverse

This message is sent from the target BS to the source BS on A3 IS-2000 user traffic subchannel connections of type "IS-2000 SCH". It contains the decoded Reverse Traffic Channel frame received from the served MS along with control information.

2.1.17.1 Successful Operation

This message is sent from the target BS to the source BS on the A3 IS-2000 user traffic subchannel connections of type "IS-2000 SCH" following the decoding of the Reverse Traffic Channel frame. IS-2000 SCH frames are sent once every 20 ms. Furthermore, IS-2000 SCH messages containing Null frame content may be suppressed (i.e., not transmitted) on the A3 connection according to the restrictions outlined in the message format definition.

The reverse path message delay shall be according to the delay budget requirements table in [12] measured from the time the last bit of the frame is received on the air interface at the channel element of any soft handoff leg to the time the last bit of the frame is received at the source BS. This assumes a maximum transmission and queuing delay on the A3

traffic connection according to the delay budget requirements table in [12]. The delay limits defined in this section do not apply to satellite applications.

Forward Frame Alignment Requirements:

As part of the reverse-link processing, each target BTS channel element shall estimate the arrival time error for the A3-IS-2000 SCH Forward message last received and shall set the PATE field of the next transmitted A3-IS-2000 SCH Reverse message to this value.

If the value cannot be represented within the maximum range of the PATE, it shall be set to the maximum positive value. Positive PATE values indicate that the message arrived too late to be transmitted in the correct air frame. Negative PATE values indicate that the message arrived too early and therefore is required to be buffered before transmission. A zero PATE value indicates that the message arrived at the optimum time for processing and transmission.

2.1.17.2 Failure Operation

None.

2.1.18 A3-FCH Forward Traffic Frame

2.1.18.1 Successful Operation

This A3 message is sent from the source BS to the target BS over A3 user traffic subchannel connections of type “IS-2000 FCH”. It may be used to send up to one 20 ms forward traffic channel frame and up to four 5 ms forward traffic channel frames to the target BS for transmission to the MS during the specified 20 ms interval. This message also contains control information associated with the 20 ms interval. One and only one A3-FCH Forward Traffic Frame message is sent for each 20 ms interval. This A3 message is only used if a 5 ms signaling message is being sent to the BTS. If no 5 ms signaling message is to be included, the A3-IS-2000 FCH Forward message (2.1.12) shall be used instead. This A3 message may also be used to send a 20 ms traffic frame without a 5 ms signaling message if agreed to by both vendors. This message shall not be sent to implementations running a version of the IOS earlier than IOS v4.1.

The forward path message delay shall be according to the delay budget requirements table in [12] measured from the time the first bit of the frame is transmitted from the source BS to the time the first bit of the frame is transmitted over the air interface at the channel element for any soft handoff leg. This assumes a maximum transmission and queuing delay on the A3 traffic connection according to the delay budget requirements table in [12]. The delay limits defined in this section do not apply to satellite applications.

Forward Frame Sequence Number Alignment clarification:

The SDU function may use the PATE and Sequence Number information received in the A3-IS-2000 FCH Reverse message to ensure that all BSs involved in soft handoff for a call simultaneously transmit identical forward air frames during identical frame boundaries.

2.1.18.2 Failure Operation

None.

2.1.19 A3-FCH Reverse Traffic Frame

2.1.19.1 Successful Operation

This A3 message is sent from the target BS to the source BS over A3 user traffic subchannel connections of type "IS-2000 FCH". It is used by the target BS to send up to one 20 ms decoded reverse link traffic channel frame and up to four 5 ms decoded reverse link traffic channel frames and control information to the source BS for a given 20 ms interval. This message is not to be suppressed due to streaming feedback required for EIB-based power control. One and only one A3-FCH Reverse Traffic Frame message is sent for each 20 ms interval. This A3 message is only used if a 5 ms signaling message has been received from the BTS. If no 5 ms signaling message is to be included, the A3-IS-2000 FCH Reverse message (2.1.13) should be used instead. This message shall not be sent to implementations running a version of the IOS earlier than IOS v4.1. This A3 message may also be used to send a 20 ms traffic frame without a 5 ms signaling message if agreed to by both vendors.

The reverse path message delay shall be according to the delay budget requirements table in [12] measured from the time the last bit of the frame is received on the air interface at the channel element of any soft handoff leg to the time the last bit of the frame is received at the source BS. This assumes a maximum transmission and queuing delay on the A3 traffic connection according to the delay budget requirements table in [12]. The delay limits defined in this section do not apply to satellite applications.

Forward Frame Alignment Requirements:

As part of the reverse-link processing, each target BTS channel element shall estimate the arrival time error for the A3-IS-2000 FCH Forward message last received and shall set the PATE field of the next transmitted A3-IS-2000 FCH Reverse message to this value.

If the value cannot be represented within the maximum range of the PATE, it shall be set to the maximum positive value. Positive PATE values indicate that the message arrived too late to be transmitted in the correct air frame. Negative PATE values indicate that the message arrived too early and therefore is required to be buffered before transmission. A zero PATE value indicates that the message arrived at the optimum time for processing and transmission.

2.1.19.2 Failure Operation

None.

2.1.20 A3-DCCH Forward Traffic Frame

2.1.20.1 Successful Operation

This A3 message is sent from the source BS to the target BS over A3 user traffic subchannel connections of type "IS-2000 DCCH". It may be used to send up to one 20 ms forward traffic channel frame and up to four 5 ms forward traffic channel frames to the target BS for transmission to the MS during the specified 20 ms interval. This message also contains control information associated with the 20 ms interval. One and only one A3-DCCH Forward Traffic Frame message is sent for each 20 ms interval. This A3 message is only used if a 5 ms signaling message is being sent to the BTS. If no 5 ms signaling message is to be included, the A3-IS-2000 DCCH Forward message (2.1.14) should be used instead. This message shall not be sent to implementations running a

version of the IOS earlier than IOS v4.1. This A3 message may also be used to send a 20 ms traffic frame without a 5 ms signaling message if agreed to by both vendors.

The forward path message delay shall be according to the delay budget requirements table in [12] measured from the time the first bit of the frame is transmitted from the source BS to the time the first bit of the frame is transmitted over the air interface at the channel element for any soft handoff leg. This assumes a maximum transmission and queuing delay on the A3 traffic connection according to the delay budget requirements table in [12]. The delay limits defined in this section do not apply to satellite applications.

Forward Frame Sequence Number Alignment clarification:

The SDU function may use the PATE and Sequence Number information received in the A3-IS-2000 DCCH Reverse message to ensure that all BSs involved in soft handoff for a call simultaneously transmit identical forward air frames during identical frame boundaries.

2.1.20.2 Failure Operation

None.

2.1.21 A3-DCCH Reverse Traffic Frame

2.1.21.1 Successful Operation

This A3 message is sent from the target BS to the source BS over A3 user traffic subchannel connections of type “IS-2000 DCCH”. It is used by the target BS to send up to one 20 ms decoded reverse link traffic channel frame and up to four 5 ms decoded reverse link traffic channel frames and control information to the source BS for a given 20 ms interval. This message is not to be suppressed due to streaming feedback required for EIB-based power control. One and only one A3-DCCH Reverse Traffic Frame message is sent for each 20 ms interval. This A3 message is only used if a 5 ms signaling message has been received from the BTS. If no 5 ms signaling message is to be included, the A3-IS-2000 DCCH Reverse message (2.1.15) should be used instead. This message shall not be sent to implementations running a version of the IOS earlier than IOS v4.1. This A3 message may also be used to send a 20 ms traffic frame without a 5 ms signaling message if agreed to by both vendors.

The reverse path message delay shall be according to the delay budget requirements table in [12] measured from the time the last bit of the frame is received on the air interface at the channel element of any soft handoff leg to the time the last bit of the frame is received at the source BS. This assumes a maximum transmission and queuing delay on the A3 traffic connection according to the delay budget requirements table in [12]. The delay limits defined in this section do not apply to satellite applications.

Forward Frame Alignment Requirements:

As part of the reverse-link processing, each target BTS channel element shall estimate the arrival time error for the A3-IS-2000 DCCH Forward message last received and shall set the PATE field of the next transmitted A3-IS-2000 DCCH Reverse message to this value.

If the value cannot be represented within the maximum range of the PATE, it shall be set to the maximum positive value. Positive PATE values indicate that the message arrived too late to be transmitted in the correct air frame. Negative PATE values indicate that the

message arrived too early and therefore is required to be buffered before transmission. A zero PATE value indicates that the message arrived at the optimum time for processing and transmission.

2.1.21.2 Failure Operation

None.

2.1.22 A3-SCH Reverse Traffic Frame

2.1.22.1 Successful Operation

This A3 message is sent from the target BS to the source BS over A3 cdma2000 user traffic subchannel connections of type "IS-2000 SCH". It is used by the target BS to send one 20 ms decoded reverse link traffic channel frame and control information to the source BS for a given 20 ms interval. This message is not to be suppressed due to streaming feedback required for EIB-based power control. One and only one A3-SCH Reverse Traffic Frame message is sent for each 20 ms interval.

The reverse path message delay shall be according to the delay budget requirements table in [12] measured from the time the last bit of the frame is received on the air interface at the channel element of any soft handoff leg to the time the last bit of the frame is received at the source BS. This assumes a maximum transmission and queuing delay on the A3 traffic connection according to the delay budget requirements table in [12]. The delay limits defined in this section do not apply to satellite applications.

Forward Frame Alignment Requirements:

As part of the reverse-link processing, each target BTS channel element shall estimate the arrival time error for the A3-IS-2000 SCH Forward message last received and shall set the PATE field of the next transmitted A3-IS-2000 SCH Reverse message to this value.

If the value cannot be represented within the maximum range of the PATE, it shall be set to the maximum positive value. Positive PATE values indicate that the message arrived too late to be transmitted in the correct air frame. Negative PATE values indicate that the message arrived too early and therefore is required to be buffered before transmission. A zero PATE value indicates that the message arrived at the optimum time for processing and transmission.

2.1.22.2 Failure Operation

None.

2.2 A7 Messages

A7 interface messages are not applicable to DS-41 base stations.

This section describes the messages and procedures used between base stations on an A7 connection to support direct BS to BS soft/softer handoff, access handoff, access probe handoff, and channel assignment into soft/softer handoff.

2.2.1 A7-Handoff Request

The A7-Handoff Request message is used by the source BS to request that a target BS allocate resources in one or more cells for support of a call association.

2.2.1.1 Successful Operation

When the source BS decides that one or more cells at a target BS are needed to support one or more physical channel connections for a call, the source BS sends an A7-Handoff Request message to the target BS to indicate the resources required. The source BS then starts timer T_{horeq}.

2.2.1.2 Failure Operation

If timer T_{horeq} expires, the source BS may resend the A7-Handoff Request message and restart timer T_{horeq} a configurable number of times.

2.2.2 A7-Handoff Request Ack

The A7-Handoff Request Ack message is used by the target BS to respond to a request that it allocate resources in one or more cells for support of one or more physical channel connections for a call association.

2.2.2.1 Successful Operation

When the target BS receives an A7-Handoff Request message, it determines what internal resources are needed to support the requested physical channels for the call association. Once those resources are allocated and the A3-Connect Ack message(s) has been received, the target BS responds by sending an A7-Handoff Request Ack message to the source BS. Upon receipt of the A7-Handoff Request Ack message, the source BS stops timer T_{horeq}.

2.2.2.2 Failure Operation

None.

2.2.3 A7-Drop Target

The A7-Drop Target message is used by the source BS to request that a target BS deallocate resources in one or more cells currently being used for support of one or more physical channel connections for a call association.

2.2.3.1 Successful Operation

When the source BS decides that one or more cells at a target BS are no longer needed to support one or more physical channel connections for a call association, the source BS sends an A7-Drop Target message to the target BS to indicate the resources that are no longer required. The source BS then starts timer T_{drptgt}.

2.2.3.2 Failure Operation

If timer T_{drptgt} expires, the source BS may resend the A7-Drop Target message and restart timer T_{drptgt} a configurable number of times.

2.2.4 A7-Drop Target Ack

The A7-Drop Target Ack message is used by the target BS to respond to a request that it deallocate resources in one or more cells currently being used for support of one or more physical channel connections for a call association.

2.2.4.1 Successful Operation

When the target BS receives an A7-Drop Target message, it determines what resources are no longer needed to support the call association. Once those resources are deallocated, the target BS responds by sending an A7-Drop Target Ack message to the source BS. Upon receipt of the A7-Drop Target Ack message, the source BS stops timer T_{drptgt}.

2.2.4.2 Failure Operation

None.

2.2.5 A7-Target Removal Request

The A7-Target Removal Request message is used by the target BS to request that a source BS remove one or more cells currently being used for support of one or more physical channel connections for a call association.

2.2.5.1 Successful Operation

When the target BS decides that one or more cells can no longer provide support for a call association, the target BS sends an A7-Target Removal Request message to the source BS to indicate the resources that can no longer be provided. The target BS then starts timer T_{tgtrmv}.

The target BS shall indicate in this message, on a cell by cell basis, whether its request may be denied by the source BS.

2.2.5.2 Failure Operation

If timer T_{tgtrmv} expires, the target BS may resend the A7-Target Removal Request message and restart timer T_{tgtrmv} a configurable number of times.

2.2.6 A7-Target Removal Response

The A7-Target Removal Response message is used by the source BS to respond to a request that it deallocate resources in one or more cells currently being used for support of a call association. This message can be used by the source BS to either accept or deny the request by the target BS that the cells be removed from the call association.

2.2.6.1 Successful Operation

When the source BS receives an A7-Target Removal Request message, it determines whether to remove the indicated cells from support of the call association. Once the decision has been made, the resources deallocated, and the MS instructed to remove appropriate entries from its active set, the source BS responds by sending an A7-Target Removal Response message to the target BS.

The target BS stops timer T_{tgtrmv}.

2.2.6.2 Failure Operation

None.

2.2.7 A7-Burst Request

The A7-Burst Request message is used by the source BS to request that a target BS reserve a set of radio resources in support of a traffic burst.

2.2.7.1 Successful Operation

When the source BS determines that a traffic burst is required in support of a particular service instance, it determines the cells needed to support the traffic burst, sends an A7-Burst Request message to the target BS, and starts timer T_{bstreq}. This message requests that the target BS reserve the indicated radio resources for a traffic burst beginning at a particular time and for a particular duration. This message may also be used to request an extension of an existing traffic burst by specifying the appropriate beginning and duration times. An extension to an existing traffic burst is indicated in this message by setting the start time equal to the end time of the existing traffic burst, with the same Walsh code and data rate.

2.2.7.2 Failure Operation

If timer T_{bstreq} expires, the source BS may resend the A7-Burst Request message and restart timer T_{bstreq} a configurable number of times. The resent A7-Burst Request message(s) shall only contain the cells for which the source BS has not received an A7-Burst Response message.

2.2.8 A7-Burst Response

The A7-Burst Response message is used by the target BS to respond to a request that it reserve radio resources in one or more cells to support a traffic burst.

2.2.8.1 Successful Operation

When the target BS receives an A7-Burst Request message, it determines whether it can provide the requested radio resources in support of the traffic burst. If a traffic burst for the same service instance was already committed (and possibly active) at the time the A7-Burst Request message is received, the target BS shall examine the start time, duration, and requested resources to determine if this request extends the traffic burst. The target BS then creates one or more A7-Burst Response message(s) indicating its ability to support the requested traffic burst for each of the cells included in the A7-Burst Request message. A response shall be provided for every cell in the A7-Burst Request message.

There can be at most one committed cell in each A7-Burst Response message, and multiple uncommitted cells. The target BS starts an instance of timer T_{bstcom} for each A7-Burst Response message (i.e., one timer for each cell with reserved resources). The source BS stops timer T_{bstreq} when it receives A7-Burst Response message(s) accounting for all cells that were in the A7-Burst Request message.

2.2.8.2 Failure Operation

If timer T_{bstcom} expires, the target BS shall free all radio resources reserved by the committed cell included in this message. The target BS shall send an A7-Burst Release message to inform the source BS that the resources were released.

2.2.9 A7-Burst Commit

The A7-Burst Commit message is sent from the source BS to the target BS to indicate the target radio resources that are to be used to support a traffic burst.

2.2.9.1 Successful Operation

When the source BS has gathered traffic burst commitment information from target BSs and has prepared the frame selector(s) to support the traffic burst, it sends an A7-Burst Commit message to the target BSs for each cell which is to support the traffic burst to indicate the committed target radio resources. There can be at most in each direction one committed cell in each A7-Burst Commit message.

Note that the source BS is not required to wait for all A7-Burst Responses before committing the burst, but it shall not send an A7-Burst Commit message for a given cell until after receiving the corresponding A7-Burst Response message for that cell. When the target BS receives this message, it shall prepare all indicated resources for support of the traffic burst. A burst time that requires the message to be pending for more than 7/8 of the modulo window in the future from its time of arrival shall be considered late and the message shall be processed immediately. The duration shall still be calculated from the start time specified in the message.

If the A7-Burst Commit message indicates that only part of the resources reserved by the cell are to be used for supporting the traffic burst, the remainder of the resources reserved by that cell may be freed by the target BS. Note that the A7-Burst Release message (not A7-Burst Commit) is sent if none of the resources that were reserved by the cell are to be used to support the traffic burst. Upon receipt of the A7-Burst Commit message for a given cell, the target BS stops the corresponding timer T_{bstcom}.

2.2.9.2 Failure Operation

None.

2.2.10 A7-Burst Release

The A7-Burst Release message is used by the source BS to request the target BS to release the set of target radio resources or by the target BS to inform the source BS that target radio resources have been released for one or more cells associated with a traffic burst.

2.2.10.1 Successful Operation

The source BS may send this message to the target BS anytime after receiving an A7-Burst Response message for the included cell(s), before or during a traffic burst to request release of radio resources. The target BS may send this message to the source BS anytime after sending an A7-Burst Response message for the specified cell(s), before or during a traffic burst to inform the source BS that radio resources have been released. There can be multiple cells in each A7-Burst Release message.

Upon receipt of this message, the target (source) BS immediately terminates the burst if it is in progress and releases all associated resources.

If timer T_{bstcom} is running for a given cell when an A7-Burst Release message is received from the source BS for the same cell, then the target BS shall stop timer T_{bstcom} for this cell.

2.2.10.2 Failure Operation

None.

2.2.11 A7-Reset

In the event of a failure or initialization at a BS that has resulted in the loss of transaction reference information, an A7-Reset message is sent to other known BSs to indicate the reason for the reset.

2.2.11.1 Successful Operation

Upon initialization, a (first) BS shall send an A7-Reset message to other known BSs and start timer T_4.

Upon receipt of the A7-Reset message from a BS, the receiving (second) BS releases affected virtual calls and erases all affected references. After a guard period of T_2 seconds an A7-Reset Acknowledge message is returned to the first BS indicating that all references have been cleared.

If timer T_4 is running at the second BS when the A7-Reset message is received from the first BS, the second BS shall stop timer T_4, start timer T_2, complete initialization, and return an A7-Reset Acknowledge message to the first BS when timer T_2 expires.

2.2.11.2 Failure Operation

If a BS sends an A7-Reset message to another BS and receives no A7-Reset Acknowledge message within period T_4, then it shall repeat the entire reset procedure with respect to that other BS. It is not necessary to repeat the reset procedure with respect to the MSC or to other BSs.

If an A7-Reset message is received that contains a protocol version less than the protocol version of the receiver but unknown to the receiver, then the receiver may raise an OAM&P flag and choose not to respond to the sender.

2.2.12 A7-Reset Acknowledge

The A7-Reset Acknowledge message is sent in response to an A7-Reset message.

2.2.12.1 Successful Operation

When a (second) BS has received an A7-Reset message from another (first) BS, the second BS sends an A7-Reset Acknowledge message to the first BS after a guard period of T_2 seconds to indicate that the A7-Reset message was received and that all references have been cleared. When the first BS receives the A7-Reset Acknowledge message, it stops timer T_4 if it is running and begins normal operation.

2.2.12.2 Failure Operation

None.

2.2.13 A7-Paging Channel Message Transfer

The A7-Paging Channel Message Transfer message is sent by a source BS to request that a particular message be sent on the specified paging channel(s).

2.2.13.1 Successful Operation

When a source BS sends a message to an MS on the paging channel(s) of another BS, it encapsulates that message in an A7-Paging Channel Message Transfer message and sends it to the other BS.

A Layer 2 acknowledgment indication can be requested. If such an acknowledgment is received from the MS, an A7-Paging Channel Message Transfer ACK message is used to convey that information back to the source BS. If a Layer 2 acknowledgment indication is requested by the source BS, it starts timer T_{pcm}.

When a BS receives this message, it shall complete any final formatting of the contained message and then send the message to the MS on the specified paging channel(s). If a Layer 2 acknowledgment is requested by the source BS, the message sent to the MS shall request a Layer 2 acknowledgment from the MS.

2.2.13.2 Failure Operation

If timer T_{pcm} expires, the source BS may resend the A7-Paging Channel Message Transfer message and restart timer T_{pcm} a configurable number of times, or it may initiate failure handling.

2.2.14 A7-Paging Channel Message Transfer Ack

The A7-Paging Channel Message Transfer Ack message is used to respond to a request for a Layer 2 acknowledgment included in an A7-Paging Channel Message Transfer message.

2.2.14.1 Successful Operation

When an A7-Paging Channel Message Transfer message containing a request for a Layer 2 acknowledgment is received by a target BS, the target BS transmits the paging channel message to the MS with a Layer 2 acknowledgment request included and starts its internal Layer 2 timer (refer to [1]~[6]) to await the Layer 2 acknowledgment.

When a Layer 2 acknowledgment arrives from the MS, the target BS sends the A7-Paging Channel Message Transfer Ack message to convey that information to the source BS that had requested the Layer 2 acknowledgment. If the internal Layer 2 timer at the target BS expires, this message is also sent conveying the fact that the Layer 2 acknowledgment time-out has occurred. When the source BS receives the A7-Paging Channel Message Transfer Ack it stops timer T_{pcm} if it is running.

2.2.14.2 Failure Operation

None.

2.2.15 A7-Access Channel Message Transfer

The A7-Access Channel Message Transfer message is sent by a target BS to the source BS to notify the source BS of the reception of an access channel message when the access channel message contains an access handoff list that indicates that the receiving BS is not the first accessed BS.

2.2.15.1 Successful Operation

When a BS (target BS) receives an access channel message containing an access handoff list that indicates that the receiving BS is not the first attempted BS (i.e., is not the source BS), it shall encapsulate that message in the A7-Access Channel Message Transfer message, forward it to the source BS, and start timer T_{acm}. The target BS is responsible for sending the Layer 2 acknowledgment for such forwarded access channel messages.

The source BS sends an acknowledgment for this message to the target BS using the A7-Access Channel Message Transfer Ack message.

2.2.15.2 Failure Operation

If timer T_{acm} expires, the target BS may resend the A7-Access Channel Message Transfer message and restart timer T_{acm} a configurable number of times.

2.2.16 A7-Access Channel Message Transfer Ack

The A7-Access Channel Message Transfer Ack message is sent by the source BS to acknowledge the A7-Access Channel Message Transfer message received from the target BS.

2.2.16.1 Successful Operation

When the source BS receives the A7-Access Channel Message Transfer message from the target BS, it shall send an acknowledgment for this message to the target BS using the A7-Access Channel Message Transfer Ack message. The target BS stops timer T_{acm}.

2.2.16.2 Failure Operation

None.

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3.0 Message Formats

3.1 A3 Interface Message Formats

A3 interface messages are not applicable to DS-41 base stations.

The A3 interface carries coded user information (voice/data) and signaling information between the source BS SDU function and the channel element component (BTS) of the target BS. This is a logical description of the endpoints of the A3 interface. The physical endpoints are beyond the scope of this specification.

3.1.1 A3-Connect

This A3 message is sent from the target BTS to the source BS (SDU) to initiate or add cells to one or more A3 user traffic connections.

Information Element	Section Reference	Element Direction	Type	
Message Type II	4.2.1	BTS -> SDU	M	
Call Connection Reference	4.2.23	BTS -> SDU	O	R
Correlation ID	4.2.26	BTS -> SDU	O[a]	C
SDU ID	4.2.21	BTS -> SDU	O[b]	C
A3 Connect Information	4.2.37	BTS -> SDU	O[c,d]	R
A3 Traffic IP Address	4.2.62	BTS -> SDU	O[e]	C

a. If this element is included in this message, it shall be returned in the A3-Connect Ack message.

b. If this element was included in the A7-Handoff Request message, it is required in this message.

c. At least one instance of this element is required in this message. Multiple instances of this element may be present in this message. If any A3 Traffic IP Address IE is included, then the length of the Traffic Circuit ID field is set to zero.

d. If the physical channel type is SCH, then the Extended Handoff Direction Parameters Field Length shall be set to '0' and the following fields shall be ignored in the Cell Information Record: QOF_Mask, PWR_Comb_Ind, Pilot_PN, Code_Chan, Upper QOF Mask, Lower QOF Mask, Upper Code Channel, Lower Code Channel, SR3 Incl.

e. The A3 Traffic IP Address IE contains the target BS IP address and is included if an IP-Based protocol stack is used for A3 user traffic. Multiple target BS legs can be added, so multiple instances of the A3 Traffic IP Address IEs can be included. The instances of the A3 Traffic IP Address IE shall be in the same order and shall be in one to one correspondence with the occurrences of the A3 Connect Information IE.

The following table shows the bitmap layout for the A3-Connect message.

3.1.1 A3-Connect

7	6	5	4	3	2	1	0	Octet
⇒ **Message Type II** = [01H]								1
⇒ **Call Connection Reference:** A3/A7 Element Identifier = [3FH]								1
Length = [08H]								2
(MSB)	Market ID = <any value>							3
							(LSB)	4
(MSB)	Generating Entity ID = <any value>							5
							(LSB)	6
(MSB)	Call Connection Reference = <any value>							7
								8
								9
							(LSB)	10
⇒ **Correlation ID:** A3/A7 Element Identifier = [13H]								1
Length = [04H]								2
(MSB)	Correlation Value = <any value>							3
								4
								5
							(LSB)	6
⇒ **SDU ID:** A3/A7 Element Identifier = [4CH]								1
Length = [01H to 06H]								2
(MSB)	SDU ID = <any value>							3
				…				**…**
							(LSB)	n
⇒ **A3 Connect Information:** A3/A7 Element Identifier = [1BH]								1
Length = <variable>								2
Reserved = [000]			Physical Channel Type = [0H – *IS-95* Fundamental Channel, 1H – Fundamental Channel (FCH), 2H – Supplemental Channel (SCH_0), 3H – Dedicated Control Channel (DCCH), 4H – Supplemental Channel (SCH_1)]				New A3 Indicator = [0,1] (exist, new)	3
Length of Cell Info Record = <variable>								4
Cell Info Record {1+:								
Cell Identification Discriminator = [07H]								j
(MSB)	MSCID = <any value>							j+1
								j+2

3.1.1 A3-Connect

7	6	5	4	3	2	1	0	Octet
							(LSB)	j+3
(MSB)	Cell = [001H-FFFH]							j+4
			(LSB)	Sector = [0H-FH] (0H = Omni)				j+5
Reserved = [0]	CCSH = [0,1]	SR3 Incl = [0,1]	QOF Mask = [00, 01, 10, 11]	New Cell Indicator = [0,1] (old, new)	PWR_Comb_Ind = [0,1] (no, yes)		(MSB)	j+6
Pilot_PN = <any value>							(LSB)	j+7
Code Channel = [00H - FFH]								j+8
Reserved = [000]			Rev FCH Gating = [0,1]	Lower QOF Mask = [00, 01, 10, 11]		Upper QOF Mask = [00, 01, 10, 11]		j+9
Lower Code Channel = [00H - FFH]								j+10
Upper Code Channel = [00H - FFH]								j+11
} Cell Info Record								
Length of Traffic Circuit ID = [00H, 05H]								k
Traffic Circuit ID {0, 1:								
Length of Traffic Circuit Identifier = [02H]								k+1
(MSB)	Traffic Circuit Identifier = <any value>							k+2
							(LSB)	k+3
Length of Traffic Connection Identifier = [01H]								k+4
Traffic Connection Identifier = [00H-FFH] (AAL2 CID)								k+5
} Traffic Circuit ID								
Extended Handoff Direction Parameters Field Length = [09H]								p
Extended Handoff Direction Parameters {1+:								
Search Window A Size (Srch_Win_A) = [0H-FH]				Search Window N Size (Srch_Win_N) = [0H-FH]				p+1
Search Window R Size (Srch_Win_R) = [0H-FH]				Add Pilot Threshold (T_Add) high order = [0H-FH]				p+2
T_Add (low order) = [00-11]	Drop Pilot Threshold (T_Drop) = [000000-111111]							p+3
Compare Threshold (T_Comp) = [0H-FH]				Drop Timer Value (T_TDrop) = [0H-FH]				p+4
Neighbor Max Age (Nghbor_Max_AGE) = [0H-FH]				Reserved = [0000]				p+5
Reserved = [00]	SOFT_SLOPE = [00 0000 - 11 1111]							p+6

3.1.1 A3-Connect

7	6	5	4	3	2	1	0	Octet
Reserved = [00]		ADD_INTERCEPT = [00 0000 - 11 1111]						p+7
Reserved = [00]		DROP_INTERCEPT = [00 0000 - 11 1111]						p+8
Target BS P_REV = [00H – FFH]								p+9
} Extended Handoff Direction Parameters								
Length of Channel Element ID = <variable>								q
(MSB)	Channel Element ID = <any value>							q+1
	…							…
							(LSB)	r
A3 Originating ID {1+:								
Length of A3 Originating ID = [00H - 08H]								r
(MSB)	A3 Originating ID = <any value>							r+1
	…							…
							(LSB)	s
} A3 Originating ID								
⇒ **A7 Destination ID:** A3/A7 Element Identifier = [2DH]								s+1
Length of A7 Destination ID = [00H - 08H]								s+2
(MSB)	A7 Destination ID = <any value>							s+3
	…							…
							(LSB)	t
} A3 Connect Information								
⇒ **A3 Traffic IP Address:** A3/A7 Element Identifier = [71H]								1
Length = [07H]								2
Address Type = [01H (IPv4)]								3
(MSB)								4
IP Address = <any value>								5
								6
							(LSB)	7
(MSB)	Port = [0000H-FFFFH]							8
							(LSB)	9

3.1.2 A3-Connect Ack

This A3 channel message is sent from the source BS (SDU) to the target BS (BTS) to indicate the result of processing the A3-Connect message.

Information Element	Section Reference	Element Direction	Type	
Message Type II	4.2.1	SDU -> BTS	M	
Call Connection Reference	4.2.23	SDU -> BTS	O	R
Correlation ID	4.2.26	SDU -> BTS	O[a]	C
A3 Connect Ack Information	4.2.38	SDU -> BTS	O[b]	R
A3 Traffic IP Address	4.2.62	SDU -> BTS	O[c]	C

a. If this element was included in the A3-Connect message, the value shall be returned in this message.

b. One instance of this element shall appear in this message for each corresponding A3 Connect Information element in the A3-Connect message to which this message is in response. If any A3 Traffic IP Address IE is included, then the length of the Traffic Circuit ID field is set to zero.

c. The A3 Traffic IP Address IE is included if an IP-Based protocol stack is used for A3 user traffic. N+1 instances of the A3 Traffic IP Address IE shall be included, where N is the number of instances of the A3 Connect Ack Information IE in this message. The first N instances of the A3 Traffic IP Address IE each contain a target BS IP address and shall be in the same order and shall be in one to one correspondence with the occurrences of the A3 Connect Ack Information IE. The N+1th instance of the A3 Traffic IP Address IE contains the source BS IP address and shall be included after the instances containing the target BS IP addresses.

The following table shows the bitmap layout for the A3-Connect Ack message.

3.1.2 A3-Connect Ack

7	6	5	4	3	2	1	0	Octet
⇒ **Message Type II** = [02H]								1
⇒ **Call Connection Reference:** A3/A7 Element Identifier = [3FH]								1
Length = [08H]								2
(MSB)	Market ID = <any value>							3
							(LSB)	4
(MSB)	Generating Entity ID = <any value>							5
							(LSB)	6
(MSB)	Call Connection Reference = <any value>							7
								8
								9
							(LSB)	10
⇒ **Correlation ID:** A3/A7 Element Identifier = [13H]								1
Length = [04H]								2

3.1.2 A3-Connect Ack

7	6	5	4	3	2	1	0	Octet
(MSB)	Correlation Value = <any value>							3
								4
								5
							(LSB)	6
⇒ **A3 Connect Ack Information{1+:** A3/A7 Element Identifier = [1CH]								1
Length = <variable>								2
Reserved = [00]		Soft Handoff Leg # = [0000 to 1111]				PMC Cause Present = [1] (yes)	xmit notify (send A3-TCH Status) = [0,1] (no, yes)	3
Length of Traffic Circuit ID = [00H, 05H]								k
Traffic Circuit ID *{0, 1:*								
Length of Traffic Circuit Identifier = [02H]								k+1
(MSB)	Traffic Circuit Identifier = <any value>							k+2
							(LSB)	k+3
Length of Traffic Connection Identifier = [01H]								k+4
Traffic Connection Identifier = [00H-FFH] (AAL2 CID)								k+5
***}* Traffic Circuit ID**								
Length of Channel Element ID = <variable>								j
(MSB)	Channel Element ID = <any value>							j+1
				…				**…**
							(LSB)	k
PMC Cause = [00H (No error), 02H (Already connected), 03H (Illegal A3 connect), 0AH (No resources available)]								k+1
A3 Originating ID {*1+:*								
Length of A3 Originating ID = [00H - 08H]								p
(MSB)	A3 Originating ID = <any value>							p+1
				…				**…**
							(LSB)	q
***}* A3 Originating ID**								

3.1.2 A3-Connect Ack

7	6	5	4	3	2	1	0	Octet
A3 Destination ID *{1+:*								
Length of A3 Destination ID = [00H - 08H]								r
(MSB)	A3 Destination ID = <any value>							r+1
…								**…**
							(LSB)	s
***}* A3 Destination ID** ***}*A3 Connect Ack Information**								
⇒ **A3 Traffic IP Address:** A3/A7 Element Identifier = [71H]								1
Length = [07H]								2
Address Type = [01H (IPv4)]								3
(MSB)								4
IP Address = <any value>								5
								6
							(LSB)	7
(MSB)	Port = [0000H-FFFFH]							8
							(LSB)	9

3.1.3 A3-Remove

This A3 message is sent from the target BS (BTS) to the source BS (SDU) to request that cells be removed from the A3 connections identified in this message.

Information Element	Section Reference	Element Direction	Type	
Message Type II	4.2.1	BTS -> SDU	M	
Call Connection Reference	4.2.23	BTS -> SDU	O	R
Correlation ID	4.2.26	BTS -> SDU	O[a]	C
SDU ID	4.2.21	BTS -> SDU	O[b]	C
A3 Remove Information	4.2.39	BTS -> SDU	O[c]	R
A3 Traffic IP Address	4.2.62	BTS -> SDU	O[d]	C

a. If this element is included in this message, the value shall be returned in the A3-Remove Ack message.

b. If this element was included in the A7-Handoff Request message, it is required in this message.

c. At least one instance of this element shall appear in this message. Multiple instances of this element may be present in this message. Each instance of this element pertains to one A3 traffic connection. If any A3 Traffic IP Address IE is included, then the Length of the Traffic Circuit ID field is set to zero.

d. The A3 Traffic IP Address IE contains the target BS IP address and is included if an IP-Based protocol stack is used for A3 user traffic. Multiple target BS legs can be added, so multiple instances of the A3 Traffic IP Address IE can be included. The instances of the A3 Traffic IP Address IE shall be in the same order and shall be in one to one correspondence with the occurrences of the A3 Remove Information IE.

The following table shows the bitmap layout for the A3-Remove message.

3.1.3 A3-Remove

7	6	5	4	3	2	1	0	Octet
⇒ **Message Type II** = [03H]								1
⇒ **Call Connection Reference:** A3/A7 Element Identifier = [3FH]								1
Length = [08H]								2
(MSB)	Market ID = <any value>							3
							(LSB)	4
(MSB)	Generating Entity ID = <any value>							5
							(LSB)	6
(MSB)	Call Connection Reference = <any value>							7
								8
								9
							(LSB)	10
⇒ **Correlation ID:** A3/A7 Element Identifier = [13H]								1
Length = [04H]								2

3.1.3 A3-Remove

7	6	5	4	3	2	1	0	Octet
(MSB)	Correlation Value = <any value>							3
								4
								5
							(LSB)	6
⇒ **SDU ID:** A3/A7 Element Identifier = [4CH]								1
Length = [01H to 06H]								2
(MSB)	SDU ID = <any value>							3
	…							**…**
							(LSB)	n
⇒ **A3 Remove Information:** A3/A7 Element Identifier = [20H]								1
Length = <variable>								2
Length of Traffic Circuit ID = [00H, 05H]								k
Traffic Circuit ID *{0, 1:*								
Length of Traffic Circuit Identifier = [02H]								k+1
(MSB)	Traffic Circuit Identifier = <any value>							k+2
							(LSB)	k+3
Length of Traffic Connection Identifier = [01H]								k+4
Traffic Connection Identifier = [00H-FFH] (AAL2 CID)								k+5
***}* Traffic Circuit ID**								
Number of Cells to be Removed = <any value>								1
Cell Identifier *{1+:*								
Cell Identification Discriminator = [07H]								2
(MSB)	MSCID = <any value>							3
								4
							(LSB)	5
(MSB)	Cell = [001H-FFFH]							6
			(LSB)	Sector = [0H-FH] (0H = Omni)				7
***}* Cell Identifier**								
A3 Destination ID *{1+:*								
Length of A3 Destination ID = [00H - 08H]								q
(MSB)	A3 Destination ID = <any value>							q+1
	…							**…**
							(LSB)	r
} A3 Destination ID								

3.1.3 A3-Remove

7	6	5	4	3	2	1	0	Octet
Length of A7 Destination ID = [00H - 08H]								s
(MSB)	A7 Destination ID = <any value>							s+1
…								…
							(LSB)	t
} A3 Remove Information								
⇒ **A3 Traffic IP Address:** A3/A7 Element Identifier = [71H]								1
Length = [07H]								2
Address Type = [01H (IPv4)]								3
(MSB)								4
IP Address = <any value>								5
								6
							(LSB)	7
(MSB)	Port = [0000H-FFFFH]							8
							(LSB)	9

3.1.4 A3-Remove Ack

This A3 message is sent from the source BS (SDU) to the target BS (BTS) to acknowledge completion of the request to remove cells from A3 connections.

Information Element	Section Reference	Element Direction	Type	
Message Type II	4.2.1	SDU -> BTS	M	
Call Connection Reference	4.2.23	SDU -> BTS	O	R
Correlation ID	4.2.26	SDU -> BTS	O[a]	C
A3 Destination ID	4.2.45	SDU -> BTS	O[b]	C
A7 Destination ID	4.2.44	SDU -> BTS	O[c]	C
Cause	4.2.4	SDU -> BTS	O[d]	C

a. If this element was included in the A3-Remove message, the value shall be returned in this message.

b. For each instance of the A3 Remove Information element in the A3-Remove message, an instance of the A3 Destination ID element shall be included in this message if the A3 Originating ID field was included in the A3 Connect Information element of the A3-Connect message that established the corresponding traffic connection.

c. If the A7 Originating ID element was included in the corresponding A7-Handoff Request message, and the A3 Flag field was set to '1', then the A7 Destination ID element shall be included in this message and contain the value of the A7 Originating ID.

d. This information element is included when the Call Connection Reference value that was received in the A3-Remove message is invalid.

The following table shows the bitmap layout for the A3-Remove Ack message.

3.1.4 A3-Remove Ack

7	6	5	4	3	2	1	0	Octet
⇒ **Message Type II** = [04H]								1
⇒ **Call Connection Reference:** A3/A7 Element Identifier = [3FH]								1
Length = [08H]								2
(MSB)	Market ID = <any value>							3
							(LSB)	4
(MSB)	Generating Entity ID = <any value>							5
							(LSB)	6
(MSB)	Call Connection Reference = <any value>							7
								8
								9
							(LSB)	10
⇒ **Correlation ID:** A3/A7 Element Identifier = [13H]								1
Length = [04H]								2

3.1.4 A3-Remove Ack

7	6	5	4	3	2	1	0	Octet
(MSB)	Correlation Value = <any value>							3
								4
								5
							(LSB)	6
A3 Destination ID {1+:								
⇒ **A3 Destination ID:** A3/A7 Element Identifier = [55H]								1
Length of A3 Destination ID = [01H - 08H]								2
(MSB)	A3 Destination ID = <any value>							3
	…							**…**
							(LSB)	m
} **A3 Destination ID**								
⇒ **A7 Destination ID:** A3/A7 Element Identifier = [2DH]								n+1
Length of A7 Destination ID = [01H - 08H]								n+2
(MSB)	A7 Destination ID = <any value>							n+3
	…							**…**
							(LSB)	p
⇒ **Cause:** A3/A7 Element Identifier = [08H]								1
Length = [01H]								2
ext = [0]	Cause Value = [6FH (Invalid call connection reference)]							3

3.1.5 A3-Drop

This optional A3 message is sent from the source BS (SDU) to notify a target BS (BTS) that the A3 traffic subchannel is about to be dropped.

Information Element	Section Reference	Element Direction	Type	
Message Type II	4.2.1	SDU -> BTS	M	
Call Connection Reference	4.2.23	SDU -> BTS	O	R
A3 Drop Information	4.2.40	SDU -> BTS	O[a]	R
Cause List	4.2.35	SDU -> BTS	O[b]	R
A3 Traffic IP Address	4.2.62	SDU -> BTS	O[c]	C

a. One instance of this element shall appear in this message for each A3 connection that is being dropped by the SDU function. If any A3 Traffic IP Address IE is included, then the length of the Traffic Circuit ID field is set to zero.

b. The items in this list shall be in the same order and shall be in one to one correspondence with the occurrences of the A3 Drop Information element. Each entry indicates the reason for dropping the associated A3 connection.

c. The A3 Traffic IP Address IE contains the target BS IP address and is included if an IP-Based protocol stack is used for A3 user traffic. Multiple target BS legs can be dropped, so multiple instances of the A3 Traffic IP Address IE can be included. The instances of the A3 Traffic IP Address IE shall be in the same order and shall be in one to one correspondence with the occurrences of the A3 Drop Information IE.

The following table shows the bitmap layout for the A3-Drop message.

3.1.5 A3-Drop

7	6	5	4	3	2	1	0	Octet
⇒ **Message Type II** = [05H]								1
⇒ **Call Connection Reference:** A3/A7 Element Identifier = [3FH]								1
Length = [08H]								2
(MSB)	Market ID = <any value>							3
							(LSB)	4
(MSB)	Generating Entity ID = <any value>							5
							(LSB)	6
(MSB)	Call Connection Reference = <any value>							7
								8
								9
							(LSB)	10
⇒ **A3 Drop Information:** A3/A7 Element Identifier = [1EH]								1
Length = <variable>								2
Length of Traffic Circuit ID = [00H, 05H]								3
Traffic Circuit ID {0,1:								

3.1.5 A3-Drop

7	6	5	4	3	2	1	0	Octet
Length of Traffic Circuit Identifier = [02H]								4
(MSB)	Traffic Circuit Identifier = <any value>							5
							(LSB)	6
Length of Traffic Connection Identifier = [01H]								7
Traffic Connection Identifier = [00H-FFH] (AAL2 CID)								8
} Traffic Circuit ID								
Length of Channel Element ID = <variable>								9
(MSB)	Channel Element ID = <any value>							10
…								**…**
							(LSB)	k
A3 Destination ID {1+:								
Length of A3 Destination ID = [00H - 08H]								m
(MSB)	A3 Destination ID = <any value>							m+1
…								**…**
							(LSB)	n
} A3 Destination ID **} A3 Drop Information**								
⇒ **Cause List:** A3/A7 Element Identifier = [19H]								1
Length = <variable>								2
Cause Value {1+:								
Reserved = [0]	Cause Value = [07H (OAM&P intervention), 0DH (Timer expired), 12H (Invalid call), 20H (Equipment failure), 52H (Invalid message), 6DH (Protocol error), 6EH (No response from BS)]							p
} Cause Value								
⇒ **A3 Traffic IP Address:** A3/A7 Element Identifier = [71H]								1
Length = [07H]								2
Address Type = [01H (IPv4)]								3
(MSB)								4
IP Address = <any value>								5
								6

3.1.5 A3-Drop

7	6	5	4	3	2	1	0	Octet
							(LSB)	7
(MSB)	Port = [0000H-FFFFH]							8
							(LSB)	9

3.1.6 A3-Propagation Delay Measurement Report

This A3 message is sent from the target BS (BTS) to the source BS (SDU) immediately following the acquisition of the MS and subsequently whenever the delay changes by two or more PN chips.

Information Element	Section Reference	Element Direction	Type	
Message Type II	4.2.1	BTS -> SDU	M	
Call Connection Reference	4.2.23	BTS -> SDU	O	R
One Way Propagation Delay Record	4.2.28	BTS -> SDU	O	R
SDU ID	4.2.21	BTS -> SDU	O[a]	C
A3 Destination ID	4.2.45	BTS -> SDU	O[b]	C
A7 Destination ID	4.2.44	BTS -> SDU	O[c]	C

a. If this element was included in the A7-Handoff Request message, it is required in this message.

b. If the A3 Originating ID field was included in the corresponding A3 Connect Ack Information element of an A3-Connect Ack message that established the traffic connection for the cell, then the A3 Destination ID element shall contain this information and be included in this message.

c. If the A7 Originating ID element was included in the corresponding A7-Handoff Request message, and the A3 Flag field was set to '1', then the A7 Destination ID element shall be included in this message and contain the value of the A7 Originating ID.

The following table shows the bitmap layout for the A3-Propagation Delay Measurement Report message.

3.1.6 A3-Propagation Delay Measurement Report

7	6	5	4	3	2	1	0	Octet
⇒ **Message Type II** = [06H]								1
⇒ **Call Connection Reference:** A3/A7 Element Identifier = [3FH]								1
Length = [08H]								2
(MSB)	Market ID = <any value>							3
							(LSB)	4
(MSB)	Generating Entity ID = <any value>							5
							(LSB)	6
(MSB)	Call Connection Reference = <any value>							7
								8
								9
							(LSB)	10
⇒ **One Way Propagation Delay Record:** A3/A7 Element Identifier = [09H]								1
Length = [08H]								2
Cell Identification Discriminator = [07H]								3

3.1.6 A3-Propagation Delay Measurement Report

7	6	5	4	3	2	1	0	Octet
(MSB)	MSCID = <any value>							4
								5
							(LSB)	6
(MSB)	Cell = [001H-FFFH]							7
			(LSB)	Sector = [0H-FH] (0H = Omni)				8
(MSB)	CDMA Serving One Way Delay = [0000H-FFFFH] (x100ns)							9
							(LSB)	10
⇒ **SDU ID:** A3/A7 Element Identifier = [4CH]								1
Length = [01H to 06H]								2
(MSB)	SDU ID = <any value>							3
…								…
							(LSB)	n
⇒ **A3 Destination ID:** A3/A7 Element Identifier = [55H]								1
Length of A3 Destination ID = [01H - 08H]								2
(MSB)	A3 Destination ID = <any value>							3
…								…
							(LSB)	p
⇒ **A7 Destination ID:** A3/A7 Element Identifier = [2DH]								1
Length of A7 Destination ID = [01H - 08H]								2
(MSB)	A7 Destination ID = <any value>							3
…								…
							(LSB)	q

3.1.7 A3-Physical Transition Directive

This A3 message is sent from the source BS (SDU) to the target BS (BTS). It conveys a change to an allocated physical channel at the target BS (BTS) as well as the time of execution for the change. This message shall be sent once for each A3 traffic connection for the same MS.

Information Element	Section Reference	Element Direction	Type	
Message Type II	4.2.1	SDU -> BTS	M	
Call Connection Reference	4.2.23	SDU -> BTS	O	R
CDMA Long Code Transition Info	4.2.31	SDU -> BTS	O[c]	C
Channel Element ID	4.2.32	SDU -> BTS	O[a, b]	C
Privacy Info	4.2.36	SDU -> BTS	O[g]	C
A3 Traffic Circuit ID	4.2.22	SDU -> BTS	O[b]	C
Reverse Pilot Gating Rate	4.2.8	SDU -> BTS	O[d]	C
IS-2000 Forward Power Control Mode	4.2.47	SDU -> BTS	O[e]	C
A3 Destination ID	4.2.45	SDU -> BTS	O[f]	C
IS-2000 Power Control Info	4.2.46	SDU -> BTS	O[h]	C
IS-2000 FPC Gain Ratio Info	4.2.48	SDU -> BTS	O[i]	C
A3 Traffic IP Address	4.2.62	SDU -> BTS	O[b,j]	C

a. If this element was included in the A3-Connect message, its value shall be included in this element.

b. Only one of the following IEs shall be present in this message Channel Element ID, A3 Traffic Circuit ID, or A3 Traffic IP Address element.

c. This element shall be included when the purpose of this message is to cause a change to the long code mask. If the Privacy Info element is not present, then the Long Code Mask value that corresponds to the LCM_TYPE (public or private) and that was most recently received in A7-Handoff Request shall apply.

d. This element shall be included when the purpose of this message is to cause a change in the pilot gating rate of the physical channel.

e. This element shall be included when the purpose of this message is to cause a change in the forward power control mode.

f. If the A3 Originating ID field was included in the corresponding A3 Connect Information element of an A3-Connect message that established the traffic connection, then the A3 Destination ID element shall contain this information and be included in this message. Each instance of this element corresponds to one cell in the Cell Identifier List.

g. This element shall be included when the source BS informs the target BS of a new Long Code Mask value.

h. This element shall be included when the purpose of this message is to cause a change in the FPC_PRI_CHAN and FPC_SUBCHAN_GAINs, for the physical channel (FCH or DCCH) measured by the primary power control subchannel. The action time is immediate.

i. This element shall be included when the purpose of this message is to cause a change in the Initial Gain Ratio, Gain Adjust Step Size or Min/Max Gain Ratios for the physical channel (FCH or DCCH) measured by the primary power control subchannel. The action time is immediate.

j. The A3 Traffic IP Address IE contains the target IP address and is included if an IP-Based protocol stack is used for A3 user traffic.

The following table shows the bitmap layout for the A3-Physical Transition Directive message.

3.1.7 A3-Physical Transition Directive

7	6	5	4	3	2	1	0	Octet
⇒ **Message Type II** = [09H]								1
⇒ **Call Connection Reference:** A3/A7 Element Identifier = [3FH]								1
Length = [08H]								2
(MSB)	Market ID = <any value>							3
							(LSB)	4
(MSB)	Generating Entity ID = <any value>							5
							(LSB)	6
(MSB)	Call Connection Reference = <any value>							7
								8
								9
							(LSB)	10
⇒ **CDMA Long Code Transition Info:** A3/A7 Element Identifier = [0EH]								1
Length = [02H]								2
Reserved = [0000000]							LCM_TYPE = [0,1] (public, private)	3
ACTION_TIME = [00H-FFH]								4
⇒ **Channel Element ID:** A3/A7 Element Identifier = [17H]								1
Length = <variable>								2
(MSB)	Channel Element ID = <any value>							3
…								**…**
							(LSB)	m
⇒ **Privacy Info:** A3/A7 Element Identifier = [1DH]								1
Length = [08H]								2
Reserved = [0]	Privacy Mask Type = [00001, 00010] (public, private)					Status = [0,1]	Available = [0,1]	3
Privacy Mask Length = [06H]								4
(MSB)	Privacy Mask = <any value>							5

3.1.7 A3-Physical Transition Directive

7	6	5	4	3	2	1	0	Octet
…								…
							(LSB)	10
⇒ **A3 Traffic Circuit ID:** A3/A7 Element Identifier = [00H, 03H]								1
Length = [05H]								2
Length of Traffic Circuit Identifier = [02H]								3
(MSB)	Traffic Circuit Identifier = <any value>							4
							(LSB)	5
Length of Traffic Connection Identifier = [01H]								6
Traffic Connection Identifier = [00H-FFH] (AAL2 CID)								7
⇒ **Reverse Pilot Gating Rate:** A3/A7 Element Identifier = [06H]								1
Length = [02H]								2
Reserved = [0000 00]						Pilot Gating Rate = [00, 01, 10]		3
ACTION_TIME = [00H – FFH]								4
⇒ **IS-2000 Forward Power Control Mode:** A3/A7 Element Identifier = [14H]								1
Length = [02H]								2
Reserved = [0000 0]					FPC_MODE = [000 – 110]			3
Action Time Flag = [0,1]	Reserved = [0]	ACTION_TIME = [00 0000 – 11 1111]						4
A3 Destination ID *{1+:*								
⇒ **A3 Destination ID:** A3/A7 Element Identifier = [55H]								1
Length of A3 Destination ID = [01H - 08H]								2
(MSB)	A3 Destination ID = <any value>							3
…								…
							(LSB)	k
} **A3 Destination ID**								
⇒ **IS-2000 Power Control Info:** A3/A7 Element Identifier = [0BH]								1
Length = [04H]								2
FPC_ PRI_ CHAN = [0,1]	Reserved = [0]	Rev_ Pwr_Cntl_ Delay_ Incl = [0,1]	Rev_Pwr_Cntl_Delay = [00 – 11]		Count of Subchan Gains = [011]			3
Reserved = [000]			FPC_SUBCHAN_GAIN 1 = [0 0000 – 1 1111]					4

3.1.7 A3-Physical Transition Directive

7	6	5	4	3	2	1	0	Octet
Reserved = [000]			FPC_SUBCHAN_GAIN 2 = [0 0000 – 1 1111]					5
Reserved = [000]			FPC_SUBCHAN_GAIN 3 = [0 0000 – 1 1111]					6
⇒ **IS-2000 FPC Gain Ratio Info:** A3/A7 Element Identifier = [15H]								1
Length = [08H]								2
Initial Gain Ratio = [00H – FFH]								3
Reserved = [0]	Gain Adjust Step Size = [0H – FH]				Count of Gain Ratio Pairs = [011]			4
Min Gain Ratio 1 = [00H – FFH]								5
Max Gain Ratio 1 = [00H – FFH]								6
Min Gain Ratio 2 = [00H – FFH]								7
Max Gain Ratio 2 = [00H – FFH]								8
Min Gain Ratio 3 = [00H – FFH]								9
Max Gain Ratio 3 = [00H – FFH]								10
⇒ **A3 Traffic IP Address:** A3/A7 Element Identifier = [71H]								1
Length = [07H]								2
Address Type = [01H (IPv4)]								3
(MSB)								4
IP Address = <any value>								5
								6
							(LSB)	7
(MSB)	Port = [0000H-FFFFH]							8
							(LSB)	9

1

3.1.8 A3-Physical Transition Directive Ack

This A3 signaling message is sent from the target BS (BTS) to the source BS (SDU) interface to convey the outcome of processing an A3-Physical Transition Directive.

Information Element	Section Reference	Element Direction	Type	
Message Type II	4.2.1	BTS -> SDU	M	
Call Connection Reference	4.2.23	BTS -> SDU	O	R
Cell Identifier List (Committed)	4.2.6	BTS -> SDU	O[f]	C
SDU ID	4.2.21	BTS -> SDU	O[a]	C
PMC Cause	4.2.24	BTS -> SDU	O[b]	C
Cell Identifier List (Uncommitted)	4.2.6	BTS -> SDU	O[c]	C
A3 Destination ID	4.2.45	BTS -> SDU	O[d]	C
A7 Destination ID	4.2.44	BTS -> SDU	O[e]	C

a. If this element was included in the A7-Handoff Request message, it is required in this message.

b. This element shall be included if the Cell Identifier List (Uncommitted) is included. This element identifies the cause for the cells that were unable to accommodate the change proposed in the A3-Physical Transition Directive message.

c. This information element contains the list of cells which were unable to accommodate the change proposed in the A3-Physical Transition Directive message.

d. If the A3 Originating ID field was included in the corresponding A3 Connect Ack Information element of an A3-Connect Ack message that established the traffic connection for these cells, then the A3 Destination ID element shall contain this information and be included in this message. Each instance of this element corresponds to one cell in the Cell Information Record (Committed) or (Uncommitted).

e. If the A7 Originating ID element was included in the corresponding A7-Handoff Request message, and the A3 Flag field was set to '1', then the A7 Destination ID element shall be included in this message and contain the value of the A7 Originating ID.

f. This information element contains the list of cells which were able to accommodate the change proposed in the A3-Physical Transition Directive message.

The following table shows the bitmap layout for the A3-Physical Transition Directive Ack message.

3.1.8 A3-Physical Transition Directive Ack

7	6	5	4	3	2	1	0	Octet
⇒ **Message Type II** = [0AH]								1
⇒ **Call Connection Reference:** A3/A7 Element Identifier = [3FH]								1
Length = [08H]								2
(MSB)	Market ID = <any value>							3
							(LSB)	4

3.1.8 A3-Physical Transition Directive Ack

7	6	5	4	3	2	1	0	Octet
(MSB)	Generating Entity ID = <any value>							5
							(LSB)	6
(MSB)	Call Connection Reference = <any value>							7
								8
								9
							(LSB)	10
⇒ **Cell Identifier List (Committed):** A3/A7 Element Identifier = [1AH]								1
Length = <variable>								2
Cell Identification Discriminator = [07H]								3
Cell Identification {1+:								
(MSB)	MSCID = <any value>							j
								j+1
							(LSB)	j+2
(MSB)	Cell = [001H-FFFH]							j+3
			(LSB)	Sector = [0H-FH] (0H = Omni)				j+4
} Cell Identification								
⇒ **SDU ID:** A3/A7 Element Identifier = [4CH]								1
Length = [01H to 06H]								2
(MSB)	SDU ID = <any value>							3
				…				**…**
							(LSB)	n
⇒ **PMC Cause:** A3/A7 Element Identifier = [05H]								1
Length = [01H]								2
PMC Cause Value = [05H (Requested reverse pilot gating rate not supported), 08H (Requested FPC mode change failed), 0DH (Private long code not available or not supported), 0FH (Requested privacy configuration unavailable), 10H (Long code value not available)]								3
⇒ **Cell Identifier List (Uncommitted):** A3/A7 Element Identifier = [1AH]								1
Length = <variable>								2
Cell Identification Discriminator = [07H]								3
Cell Identification {1+:								
(MSB)	MSCID = <any value>							j
								j+1
							(LSB)	j+2

3.1.8 A3-Physical Transition Directive Ack

7	6	5	4	3	2	1	0	Octet
(MSB)	Cell = [001H-FFFH]							j+3
			(LSB)	Sector = [0H-FH] (0H = Omni)				j+4
} Cell Identification								
A3 Destination ID {1+:								
⇒ **A3 Destination ID:** A3/A7 Element Identifier = [55H]								1
Length of A3 Destination ID = [01H - 08H]								2
(MSB)	A3 Destination ID = <any value>							3
			…					**…**
							(LSB)	k
} A3 Destination ID								
⇒ **A7 Destination ID:** A3/A7 Element Identifier = [2DH]								1
Length of A7 Destination ID = [01H - 08H]								2
(MSB)	A7 Destination ID = <any value>							3
			…					**…**
							(LSB)	k

3.1.9 A3-Traffic Channel Status

This A3 message is sent from the target BS (BTS) to the source BS (SDU) to provide status information with respect to one or more cells on an A3 connection.

Information Element	Section Reference	Element Direction	Type	
Message Type II	4.2.1	BTS -> SDU	M	
Call Connection Reference	4.2.23	BTS -> SDU	O	R
Cell Identifier List	4.2.6	BTS -> SDU	O	R
Channel Element Status	4.2.34	BTS -> SDU	O	R
SDU ID	4.2.21	BTS -> SDU	O[a]	C
A3 Destination ID	4.2.45	BTS -> SDU	O[b]	C
A7 Destination ID	4.2.44	BTS -> SDU	O[c]	C

a. If this element was included in the A7-Handoff Request message, it is required in this message.

b. If the A3 Originating ID field was included in the corresponding A3 Connect Ack Information element of an A3-Connect Ack message that established the traffic connection for these cells, then the A3 Destination ID element shall contain this information and be included in this message. Each instance of this element corresponds to one cell in the Cell Identifier List.

c. If the A7 Originating ID element was included in the corresponding A7-Handoff Request message, and the A3 Flag field was set to '1', then the A7 Destination ID element shall be included in this message and contain the value of the A7 Originating ID.

The following table shows the bitmap layout for the A3-Traffic Channel Status message.

3.1.9 A3-Traffic Channel Status

7	6	5	4	3	2	1	0	Octet
⇒ **Message Type II** = [0DH]								1
⇒ **Call Connection Reference:** A3/A7 Element Identifier = [3FH]								1
Length = [08H]								2
(MSB)	Market ID = <any value>							3
							(LSB)	4
(MSB)	Generating Entity ID = <any value>							5
							(LSB)	6
(MSB)	Call Connection Reference = <any value>							7
								8
								9
							(LSB)	10
⇒ **Cell Identifier List:** A3/A7 Element Identifier = [1AH]								1
Length = <variable>								2

3.1.9 A3-Traffic Channel Status

7	6	5	4	3	2	1	0	Octet
Cell Identification Discriminator = [07H]								3
Cell Identification {1+:								
(MSB)	MSCID = <any value>							j
								j+1
							(LSB)	j+2
(MSB)	Cell = [001H-FFFH]							j+3
			(LSB)	Sector = [0H-FH] (0H = Omni)				j+4
} Cell Identification								
⇒ **Channel Element Status:** A3/A7 Element Identifier = [18H]								1
Length = [01H]								2
Reserved = [0000000]							Xmit On = [0,1] (Off, On)	3
⇒ **SDU ID:** A3/A7 Element Identifier = [4CH]								1
Length = [01H to 06H]								2
(MSB)	SDU ID = <any value>							3
			…					…
							(LSB)	n
A3 Destination ID {1+:								
⇒ **A3 Destination ID:** A3/A7 Element Identifier = [55H]								1
Length of A3 Destination ID = [01H - 08H]								2
(MSB)	A3 Destination ID = <any value>							3
			…					…
							(LSB)	k
} A3 Destination ID								
⇒ **A7 Destination ID:** A3/A7 Element Identifier = [2DH]								1
Length of A7 Destination ID = [01H - 08H]								2
(MSB)	A7 Destination ID = <any value>							3
			…					…
							(LSB)	k

3.1.10 A3-*IS-95* FCH Forward

This A3 message is sent from the source BS (SDU) to the target BS (BTS) over A3 *IS-95* user traffic subchannels of type "*IS-95* FCH" (*TIA/EIA/IS-95* Fundamental Channel). It is used to send a Forward Traffic Channel frame to the target BS (BTS) for transmission to the MS. This message includes the entire Forward Traffic Channel frame and some control information.

Note: This message is the same as the A3-CEData Forward message in previous versions of this standard. The name was changed to differentiate it from the A3-IS-2000 FCH Forward message.

Information Element	**Section Reference**	**Element Direction**	**Type**
Message Type II	4.2.1	SDU -> BTS	M
Forward Layer 3 Data	4.2.29	SDU -> BTS	M
Message CRC	4.2.33	SDU -> BTS	M

The following table shows the bitmap layout for the A3-*IS-95* FCH Forward message.

3.1.10 A3-IS-95 FCH Forward

7	**6**	**5**	**4**	**3**	**2**	**1**	**0**	**Octet**
⇒ **Message Type II** = [07H]								1
⇒ **Forward Layer 3 Data {1:**								
Reserved = [0000]				Sequence Number = [0000-1111]				1
Forward Traffic Channel Gain = [00H-80H]								2
Reverse Traffic Channel E_w/N_t = [00H-0FFH]								3
Rate Set Indicator = [0H,1H]				Forward Traffic Channel Rate = [0H-3H]				4
Reserved = [0000]				Power Control Subchannel Count = [1H-6H]				5
(MSB)	Forward Traffic Channel Information + Layer 3 Fill = <any value>							6
…								…
							(LSB)	n
} Forward Layer 3 Data								
(MSB)	⇒ **Message CRC** = [0000H-FFFFH]							1
							(LSB)	2

3.1.11 A3-*IS-95* FCH Reverse

This A3 message is sent from the target BS (BTS) to the source BS over A3 user traffic subchannels of type "*IS-95* FCH" (*TIA/EIA/IS-95* Fundamental Channel). It is used by the target BS (BTS) to send a decoded Reverse Traffic Channel Frame and control information.

This message is the same as the A3-CEData Reverse message in previous versions of this standard. The name was changed to differentiate it from the A3-IS-2000 FCH Reverse message.

Information Element	**Section Reference**	**Element Direction**	**Type**
Message Type II	4.2.1	BTS -> SDU	M
Reverse Layer 3 Data	4.2.30	BTS -> SDU	M
Message CRC	4.2.33	BTS -> SDU	M

The following table shows the bitmap layout for the A3-IS-95 FCH Reverse message.

3.1.11 A3-IS-95 FCH Reverse

7	**6**	**5**	**4**	**3**	**2**	**1**	**0**	**Octet**
⇒ **Message Type II** = [08H]								1
⇒ **Reverse Layer 3 Data {1:**								
Soft Handoff Leg # = [0000 - 1111]				Sequence Number = [0000-1111]				1
Reverse Traffic Channel Quality = [00H-FFH]								2
Scaling = [00-11]		Packet Arrival Time Error = [000000-111111]						3
Rate Set Indicator = [0H,1H]				Reverse Traffic Channel Rate = [0H-6H]				4
Reserved = [0000]							EIB = [0,1]	5
(MSB)	Reverse Traffic Channel Information + Layer 3 Fill = <any value>							6
…								…
							(LSB)	n
}Reverse Layer 3 Data								
(MSB)	⇒ **Message CRC** = [0000H-FFFFH]							m
							(LSB)	m+1

3.1.12 A3-*IS-2000* FCH Forward

This A3 message is sent from the source BS (SDU) to the target BS (BTS) over A3 *IS-2000* user traffic subchannels of type "*IS-2000* FCH" (*cdma2000* Fundamental Channel). It is used to send a Forward Link air-frame to the target BS (BTS) for transmission to the MS. This message includes the entire Forward Link air-frame data and some control information. FCH Forward messages are not to be suppressed due to streaming gain-settings required for EIB-based power control.

Information Element	Section Reference	Element Direction	Type
Message Type II	4.2.1	SDU -> BTS	M
Forward Layer 3 *IS-2000* FCH/DCCH Data	4.2.14	SDU -> BTS	M
Message CRC	4.2.33	SDU -> BTS	M

The following table shows the bitmap layout for the A3-*IS-2000* FCH Forward messages.

3.1.12 A3-IS-2000 FCH Forward

7	6	5	4	3	2	1	0	Octet
⇒ **Message Type II** = [0BH]								1
⇒ **Forward Layer 3 IS-2000 FCH/DCCH Data {1:**								
FPC: SLC = [0001 to 0110]				FSN = [0000 to 1111]				1
FPC: GR = [00H - FFH]								2
RPC: OLT = [00H - FFH]								3
IS-2000 Frame Content = [00H-08H, 0AH-12H]								4
(MSB)	Forward Link Information + Layer 3 Fill = <any value>							5
…								…
							(LSB)	n
} Forward Layer 3 IS-2000 FCH/DCCH Data								
(MSB)	⇒ **Message CRC** = [0000H-FFFFH]							1
							(LSB)	2

3.1.13 A3-*IS-2000* FCH Reverse

This A3 message is sent from the target BS (BTS) to the source BS (SDU) over A3 *IS-2000* user traffic subchannels of type "*IS-2000* FCH" (cdma2000 Fundamental Channel). It is used by the target BS (BTS) to send a decoded Reverse Link air-frame and control information to the source BS (SDU). *IS-2000* FCH Reverse messages are not to be suppressed due to streaming feedback required for EIB-based power control.

Information Element	Section Reference	Element Direction	Type
Message Type II	4.2.1	BTS->SDU	M
Reverse Layer 3 *IS-2000* FCH/DCCH Data	4.2.15	BTS->SDU	M
Message CRC	4.2.33	BTS->SDU	M

The following table shows the bitmap layout for the A3-*IS-2000* FCH Reverse message.

3.1.13 A3-IS-2000 FCH Reverse

7	6	5	4	3	2	1	0	Octet
⇒ **Message Type II** = [0CH]								1
⇒ **Reverse Layer 3 IS-2000 FCH/DCCH Data** ***{1:***								
Soft Handoff Leg # = [0000 - 1111]				FSN = [0000 to 1111]				1
FQI = [0,1]	Reverse Link Quality = [000 0000 – 111 1111]							2
Scaling = [00 – 11]	Packet Arrival Time Error = [00 0000 – 11 1111]							3
IS-2000 Frame Content = [00H-08H, 0AH-12H, 7DH, 7EH]								4
RPC: S = [0000 000 – 1111 111]							QIB/EIB = [0,1]	5
(MSB)	Reverse Link Information + Layer 3 Fill = <any value>							6
…								**…**
							(LSB)	n
}Reverse Layer 3 IS-2000 FCH/DCCH Data								
(MSB)	⇒ **Message CRC** = [0000H-FFFFH]							1
							(LSB)	2

3.1.14 A3-*IS-2000* DCCH Forward

This A3 message is sent from the source BS (SDU) to the target BS (BTS) over A3 *IS-2000* user traffic subchannels of type "*IS-2000* DCCH" (*cdma2000* Dedicated Control Channel). It is used to send a Forward Link air-frame to the target BS (BTS) for transmission to the MS. This message includes the entire Forward Link air-frame data and some control information. *IS-2000* DCCH Forward messages are not to be suppressed due to streaming gain-settings required for EIB-based power control.

Information Element	Section Reference	Element Direction	Type
Message Type II	4.2.1	SDU -> BTS	M
Forward Layer 3 *IS-2000* FCH/DCCH Data	4.2.14	SDU -> BTS	M
Message CRC	4.2.33	SDU -> BTS	M

The following table shows the bitmap layout for the A3-*IS-2000* DCCH Forward messages.

3.1.14 A3-IS-2000 DCCH Forward

7	6	5	4	3	2	1	0	Octet
⇒ **Message Type II** = [0EH]								1
⇒ ***Forward Layer 3 IS-2000 FCH/DCCH Data {1:***								
FPC: SLC = [0001 to 0110]				FSN = [0000 to 1111]				1
FPC: GR = [00H - FFH]								2
RPC: OLT = [00H - FFH]								3
IS-2000 Frame Content = [00H, 20H, 21H, 7FH]								4
(MSB)	Forward Link Information + Layer 3 Fill = <any value>							5
…								…
							(LSB)	n
} Forward Layer 3 IS-2000 FCH/DCCH Data								
(MSB)	⇒ **Message CRC** = [0000H-FFFFH]							1
							(LSB)	2

3.1.15 A3-*IS-2000* DCCH Reverse

This A3 message is sent from the target BS (BTS) to the source BS (SDU) over A3 *IS-2000* user traffic subchannels of type "*IS-2000* DCCH" (*cdma2000* Dedicated Control Channel). It is used by the target BS (BTS) to send a decoded Reverse Link air-frame and control information to the source BS (SDU). *IS-2000* DCCH Reverse messages are not to be suppressed due to streaming feedback required for EIB-based power control.

Information Element	Section Reference	Element Direction	Type
Message Type II	4.2.1	BTS -> SDU	M
Reverse Layer 3 *IS-2000* FCH/DCCH Data	4.2.15	BTS -> SDU	M
Message CRC	4.2.33	BTS -> SDU	M

The following table shows the bitmap layout for the A3-*IS-2000* DCCH Reverse message:

3.1.15 A3-IS-2000 DCCH Reverse

7	6	5	4	3	2	1	0	Octet
⇒ **Message Type II** = [0FH]								1
⇒ ***Reverse Layer 3 IS-2000 FCH/DCCH Data {1:***								
Soft Handoff Leg # = [0000 - 1111]				FSN = [0000 to 1111]				1
FQI = [0,1]	Reverse Link Quality = [000 0000 – 111 1111]							2
Scaling = [00 – 11]		Packet Arrival Time Error = [00 0000 – 11 1111]						3
IS-2000 Frame Content = [00H, 20H, 21H, 7EH, 7FH]								4
RPC: S = [0000 000 – 1111 111]							QIB/EIB = [0,1]	5
(MSB)	Reverse Link Information + Layer 3 Fill = <any value>							6
…								**…**
							(LSB)	n
}Reverse Layer 3 IS-2000 FCH/DCCH Data								
(MSB)	⇒ **Message CRC** = [0000H-FFFFH]							1
							(LSB)	2

3.1.16 A3-*IS-2000* SCH Forward

This A3 message is sent from the source BS (SDU) to the target BS (BTS) over A3 *IS-2000* user traffic subchannels of type "*IS-2000* SCH" (*cdma2000* Supplemental Channel). It is used to send a Forward Link air-frame to the target BS (BTS) for transmission to the MS. This message includes the entire Forward Link air-frame and some control information.

Information Element	Section Reference	Element Direction	Type
Message Type II	4.2.1	SDU -> BTS	M
Forward Layer 3 *IS-2000* SCH Data	4.2.16	SDU -> BTS	M
Message CRC	4.2.33	SDU -> BTS	M

The following table shows the bitmap layout for the A3-*IS-2000* SCH Forward message.

3.1.16 A3-IS-2000 SCH Forward

7	6	5	4	3	2	1	0	Octet
⇒ **Message Type II** = [10H]								1
⇒ ***Forward Layer 3 IS-2000 SCH Data {1:***								
FPC: SLC = [0001 to 0110]				FSN = [0000 to 1111]				1
FPC: GR = [00H – FFH]								2
IS-2000 Frame Content = [00H, 32H – 36H, 3DH – 40H, 7FH]								3
(MSB)	Forward Link Information + Layer 3 Fill = <any value>							4
…								…
							(LSB)	n
} Forward Layer 3 IS-2000 SCH Data								
(MSB)	⇒ **Message CRC** = [0000H-FFFFH]							1
							(LSB)	2

3.1.17 A3-*IS-2000* SCH Reverse

This A3 message is sent from the target BS (BTS) to the source BS (SDU) over A3 *IS-2000* user traffic subchannels of type "*IS-2000* SCH" (*cdma2000* Supplemental Channel). It is used by the target BS (BTS) to send a decoded Reverse Link air-frame and control information. The target BS (BTS) may use the A3-*IS-2000* SCH Reverse Message to send Idle frames to the source BS (SDU) for the purpose of synchronization of the A3 link.

Information Element	**Section Reference**	**Element Direction**	**Type**
Message Type II	4.2.1	BTS -> SDU	M
Reverse Layer 3 *IS-2000* SCH Data	4.2.17	BTS -> SDU	M
Message CRC	4.2.33	BTS -> SDU	M

The following table shows the bitmap layout for the A3-*IS-2000* SCH Reverse message.

3.1.17 A3-IS-2000 SCH Reverse

7	**6**	**5**	**4**	**3**	**2**	**1**	**0**	**Octet**
⇒ **Message Type II** = [11H]								1
⇒ **Reverse Layer 3 IS-2000 SCH Data {1*:***								
Soft Handoff Leg # = [0000 - 1111]				FSN = [0000 to 1111]				1
FQI = [0,1]	Reverse Link Quality = [000 0000 – 111 1111]							2
Scaling = [00 – 11]		Packet Arrival Time Error = [00 0000 – 11 1111]						3
IS-2000 Frame Content = [00H, 32H – 36H, 3DH – 40H, 7EH, 7FH]								4
(MSB)	Reverse Link Information + Layer 3 Fill = <any value>							5
								6
							(LSB)	7
}Reverse Layer 3 IS-2000 SCH Data								
(MSB)	⇒ **Message CRC** = [0000H-FFFFH]							1
							(LSB)	2

3.1.18 A3-FCH Forward Traffic Frame

This A3 message is sent from the source BS (SDU) to the target BS (BTS) over A3 IS-2000 user traffic subchannels of type "IS-2000 FCH" (*cdma2000* Fundamental Channel). It may be used to send up to one 20 ms forward traffic channel frame and up to four 5 ms forward traffic channel frames to the target BS (BTS) for transmission to the MS during the specified 20 ms interval. This message also contains control information associated with the 20 ms interval. One and only one A3-FCH Forward Traffic Frame message is sent for each 20 ms interval. This A3 message is only used if a 5 ms signaling message is being sent to the BTS. If no 5 ms signaling message is to be included, the A3-IS-2000 FCH Forward message (3.1.12) should be used instead. This A3 message may also be used to send a 20 ms traffic frame without a 5 ms signaling message if agreed to by both vendors. This message shall not be sent to implementations running a version of the IOS earlier than v4.1.

Information Element	**Section Reference**	**Element Direction**	**Type**	
Message Type II	4.2.1	SDU -> BTS	M	
FCH/DCCH Forward Air Interval Control	4.2.49	SDU -> BTS	O	R
Forward 20 ms Data	4.2.52	SDU -> BTS	O[a,c]	C
Forward 5 ms Data	4.2.54	SDU -> BTS	O[b,c]	C
Message CRC	4.2.33	SDU -> BTS	O	R

a. This information element is included when a 20 ms forward FCH traffic channel frame is to be sent in the 20 ms interval.

b. This information element is used to support 5 ms signaling messages. This information element is included when a 5 ms forward traffic channel frame is to be sent in the 20 ms interval. Up to four instances of this element may be present in this message in order of transmission over the air interface, as indicated by the Air Interval Content Mask in the FCH/DCCH Forward Air Interval Control element. If four instances of this information element are present, then the Forward 20 ms Data Information element shall not be present.

c. At least one instance of either the Forward FCH 20 ms Data or the 5 ms Data information element shall be present, unless the *IS-2000* Frame Content type in the FCH/DCCH Forward Air Interval Control element is set to 'Null' or 'Idle'.

The following table shows the bitmap layout for the A3-FCH Forward Traffic Channel Frame.

3.1.18 A3-FCH Forward Traffic Frame

7	**6**	**5**	**4**	**3**	**2**	**1**	**0**	**Octet**
⇒ **Message Type II** = [12H]								1
⇒ ***FCH/DCCH Forward Air Interval Control {1:***								
FPC:SLC = [0001 to 0110]				FSN = [0000 to 1111]				1
FPC: GR = [00H - FFH]								2
RPC: OLT = [00H - FFH]								3
IS-2000 Frame Content = [00H-08H, 0AH-12H, 7FH]								4
Reserved = [000]			Air Interval Content Mask = [0 0000 – 1 1110]					5

3.1.18 A3-FCH Forward Traffic Frame

7	6	5	4	3	2	1	0	Octet
} FCH/DCCH Forward Air Interval Control								
⇒ ***Forward 20 ms Data {0..1:***								
(MSB)	Forward Link Information + Layer 3 Fill = <any value>							1
				…				**…**
							(LSB)	n
} Forward 20 ms Data								
⇒ ***Forward 5 ms Data {0..4:***								
(MSB)	Forward Link Information = <000000H-FFFFFFH>							k
								k+1
							(LSB)	k+2
} Forward 5 ms Data								
(MSB)	⇒ **Message CRC** = [0000H-FFFFH]							1
							(LSB)	2

1

3.1.19 A3-FCH Reverse Traffic Frame

This A3 message is sent from the target BS (BTS) to the source BS (SDU) over A3 IS-2000 user traffic subchannels of type "IS-2000 FCH" (*cdma2000* Fundamental Channel). It is used by the target BS (BTS) to send up to one 20 ms decoded reverse link traffic channel frame and up to four 5 ms decoded reverse link traffic channel frames and control information to the source BS (SDU) for a given 20 ms interval. This message is not to be suppressed due to streaming feedback required for EIB-based power control. One and only one A3-FCH Reverse Traffic Frame message is sent for each 20 ms interval. This A3 message is only used if a 5 ms signaling message has been received from the BTS. If no 5 ms signaling message is to be included, the A3-IS-2000 FCH Reverse message (3.1.13) should be used instead. This A3 message may also be used to send a 20 ms traffic frame without a 5 ms signaling message if agreed to by both vendors. This message shall not be sent to implementations running a version of the IOS earlier than v4.1.

Information Element	**Section Reference**	**Element Direction**	**Type**	
Message Type II	4.2.1	BTS->SDU	M	
FCH/DCCH Reverse Air Interval Control	4.2.50	BTS->SDU	O	R
Reverse 20 ms Data	4.2.53	BTS->SDU	O[a,c]	C
Reverse 5 ms Data	4.2.55	BTS->SDU	O[b,c]	C
Message CRC	4.2.33	BTS->SDU	O	R

a. This information element is included when a 20 ms reverse FCH traffic channel frame is decoded in the 20 ms interval.

b. This information element is used to support 5 ms signaling messages. This information element is included when a 5 ms reverse traffic channel frame is decoded in the 20 ms interval. Up to four instances of this element may be present in this message in order of reception over the air interface, as indicated by the Air Interval Content Mask in the FCH/DCCH Reverse Air Interval Control element. If four instances of this information element are present, then the Reverse 20 ms Data information element shall not be present.

c. At least one instance of either the Reverse 20 ms Data or the Reverse 5 ms Data information element shall be present, unless the *IS-2000* Frame Content type in the FCH/DCCH Reverse Air Interval Control element is set to 'Null' or 'Idle'.

The following table shows the bitmap layout for the A3-FCH Reverse Traffic Channel Frame.

3.1.19 A3-FCH Reverse Traffic Frame

7	6	5	4	3	2	1	0	Octet
⇒ **Message Type II** = [15H]								1
⇒ ***FCH/DCCH Reverse Air Interval Control {1:***								
Soft Handoff Leg # = [0000 to 1111]				FSN = [0000 to 1111]				1
Scaling = [00-11]			Packet Arrival Time Error = [00 0000 – 11 1111]					2
IS-2000 Frame Content = [00H-08H, 0AH-12H, 7DH, 7EH, 7FH]								3
FPC: S = [0000 000 – 1111 111]							EIB/QIB = [0,1]	4
Reserved = [000]			Air Interval Content Mask = [0 0000 – 1 1110]					5
Reverse Traffic Channel Quality {1..4:								
FQI = [0,1]	Reverse Link Quality = [000 0000 – 111 1111]							n
} Reverse Traffic Channel Quality								
} FCH/DCCH Reverse Air Interval Control								
⇒ ***Reverse 20 ms Data {0..1:***								
(MSB)	Reverse Link Information + Layer 3 Fill = <any value>							1
				…				**…**
							(LSB)	k
} Reverse 20 ms Data								
⇒ ***Reverse 5 ms Data {0..4:***								
(MSB)	Reverse Link Information = <000000H-FFFFFFH>							1
								2
							(LSB)	3
} Reverse 5 ms Data								
(MSB)s	⇒ **Message CRC** = [0000H-FFFFH]							1
							(LSB)	2

3.1.20 A3-DCCH Forward Traffic Frame

This A3 message is sent from the source BS (SDU) to the target BS (BTS) over A3 IS-2000 user traffic subchannels of type "IS-2000 DCCH" (*cdma2000* DCCH Channel). It may be used to send up to one 20 ms forward traffic channel frame and up to four 5 ms forward traffic channel frames to the target BS (BTS) for transmission to the MS during the specified 20 ms interval. This message also contains control information associated with the 20 ms interval. One and only one A3-DCCH Forward Traffic Frame message is sent for each 20 ms interval. This A3 message is only used if a 5 ms signaling message is being sent to the BTS. If no 5 ms signaling message is to be included, the A3-IS-2000 DCCH Forward message (3.1.14) should be used instead. This A3 message may also be used to send a 20 ms traffic frame without a 5 ms signaling message if agreed to by both vendors. This message shall not be sent to implementations running a version of the IOS earlier than v4.1.

Information Element	**Section Reference**	**Element Direction**	**Type**	
Message Type II	4.2.1	SDU -> BTS	M	
FCH/DCCH Forward Air Interval Control	4.2.49	SDU -> BTS	O	R
Forward 20 ms Data	4.2.52	SDU -> BTS	O[a,c]	C
Forward 5 ms Data	4.2.54	SDU -> BTS	O[b,c]	C
Message CRC	4.2.33	SDU -> BTS	O	R

a. This information element is included when a 20 ms forward DCCH traffic channel frame is to be sent in the 20 ms interval.

b. This information element is used to support 5 ms signaling messages. This information element is included when a 5 ms forward traffic channel frame is to be sent in the 20 ms interval. Up to four instances of this element may be present in this message in order of transmission over the air interface, as indicated by the Air Interval Content Mask in the FCH/DCCH Forward Air Interval Control element. If four instances of this information element are present, then the Forward 20 ms Data Information element shall not be present.

c. At least one instance of either the Forward 20 ms Data or the 5 ms Data information element shall be present, unless the *IS-2000* Frame Content type in the FCH/DCCH Forward Air Interval Control element is set to 'Null' or 'Idle'.

The following table shows the bitmap layout for the A3-DCCH Forward Traffic Channel Frame.

3.1.20 A3-DCCH Forward Traffic Frame

7	**6**	**5**	**4**	**3**	**2**	**1**	**0**	**Octet**
⇒ **Message Type II** = [13H]								1
⇒ ***FCH/DCCH Forward Air Interval Control {1:***								
FPC:SLC = [0001 to 0110]				FSN = [0000 to 1111]				1
FPC: GR = [00H - FFH]								2
RPC: OLT = [00H - FFH]								3
IS-2000 Frame Content = [00H, 20H, 21H, 7FH]								4
Reserved = [000]			Air Interval Content Mask = [0 0000 – 1 1110]					5

3.1.20 A3-DCCH Forward Traffic Frame

7	6	5	4	3	2	1	0	Octet
} FCH/DCCH Forward Air Interval Control								
⇒ ***Forward 20 ms Data {0..1:***								
(MSB)	Forward Link Information + Layer 3 Fill = <any value>							1
				…				**…**
							(LSB)	n
} Forward 20 ms Data								
⇒ ***Forward 5 ms Data {0..4:***								
(MSB)	Forward Link Information = <000000H-FFFFFFH>							k
								k+1
							(LSB)	k+2
} Forward 5 ms Data								
(MSB)	⇒ **Message CRC** = [0000H-FFFFH]							1
							(LSB)	2

3.1.21 A3-DCCH Reverse Traffic Frame

This A3 message is sent from the target BS (BTS) to the source BS (SDU) over A3 IS-2000 user traffic subchannels of type "IS-2000 DCCH" (*cdma2000* DCCH Channel). It is used by the target BS (BTS) to send up to one 20 ms decoded reverse link traffic channel frame and up to four 5 ms decoded reverse link traffic channel frames and control information to the source BS (SDU) for a given 20 ms interval. This message is not to be suppressed due to streaming feedback required for EIB-based power control. One and only one A3-DCCH Reverse Traffic Frame message is sent for each 20 ms interval. This A3 message is only used if a 5 ms signaling message has been received from the BTS. If no 5 ms signaling message is to be included, the A3-IS-2000 DCCH Reverse message (3.1.15) should be used instead. This A3 message may also be used to send a 20 ms traffic frame without a 5 ms signaling message if agreed to by both vendors. This message shall not be sent to implementations running a version of the IOS earlier than v4.1.

Information Element	Section Reference	Element Direction	Type	
Message Type II	4.2.1	BTS->SDU	M	
FCH/DCCH Reverse Air Interval Control	4.2.50	BTS->SDU	O	R
Reverse 20 ms Data	4.2.53	BTS->SDU	O[a,c]	C
Reverse 5 ms Data	4.2.55	BTS->SDU	O[b,c]	C
Message CRC	4.2.33	BTS->SDU	O	R

a. This information element is included when a 20 ms reverse DCCH traffic channel frame is decoded in the 20 ms interval.

b. This information element is used to support 5 ms signaling messages. This information element is included when a 5 ms reverse traffic channel frame is decoded in the 20 ms interval. Up to four instances of this element may be present in this message in order of reception over the air interface, as indicated by the Air Interval Content Mask in the FCH/DCCH Reverse Air Interval Control element. If four instances of this information element are present, then the Reverse 20 ms Data information element shall not be present.

c. At least one instance of either the Reverse 20 ms Data or the Reverse 5 ms Data information element shall be present, unless the *IS-2000* Frame Content type in the FCH/DCCH Reverse Air Interval Control element is set to 'Null'.

The following table shows the bitmap layout for the A3-DCCH Reverse Traffic Channel Frame.

3.1.21 A3-DCCH Reverse Traffic Frame

7	6	5	4	3	2	1	0	Octet
⇒ **Message Type II** = [16H]								1
⇒ ***FCH/DCCH Reverse Air Interval Control {1:***								
Soft Handoff Leg # = [0000 to 1111]				FSN = [0000 to 1111]				1
Scaling = [00-11]		Packet Arrival Time Error = [00 0000 – 11 1111]						2
IS-2000 Frame Content = [00H, 20H, 21H, 7EH, 7FH]								3
FPC: S = [0000 000 – 1111 111]							EIB/QIB = [0,1]	4

3.1.21 A3-DCCH Reverse Traffic Frame

7	6	5	4	3	2	1	0	Octet
Reserved = [000]			Air Interval Content Mask = [0 0000 – 1 1110]					5
Reverse Traffic Channel Quality {1..4:								
FQI = [0,1]	Reverse Link Quality = [000 0000 – 111 1111]							n
} Reverse Traffic Channel Quality								
} FCH/DCCH Reverse Air Interval Control								
⇒ ***Reverse 20 ms Data {0..1:***								
(MSB)	Reverse Link Information + Layer 3 Fill = <any value>							1
	…							**…**
							(LSB)	n
} Reverse 20 ms Data								
⇒ ***Reverse 5 ms Data {0..4:***								
(MSB)	Reverse Link Information = <000000H-FFFFFFH>							1
								2
							(LSB)	3
} Reverse 5 ms Data								
(MSB)	⇒ **Message CRC** = [0000H-FFFFH]							1
							(LSB)	2

3.1.22 A3-SCH Reverse Traffic Frame

This A3 message is sent from the target BS (BTS) to the source BS (SDU) over A3 *IS-2000* user traffic subchannels of type "*IS-2000* SCH" (*cdma2000* Supplemental Channel). It is used by the target BS (BTS) to send one 20 ms decoded reverse link traffic channel frame and control information to the source BS (SDU) for a given 20 ms interval. This message is not to be suppressed due to streaming feedback required for EIB-based power control. This message shall not be sent to implementations running versions of the IOS earlier than IOS v4.1.

Information Element	Section Reference	Element Direction	Type	
Message Type II	4.2.1	BTS->SDU	O	R
SCH Reverse Air Interval Control	4.2.51	BTS->SDU	O	R
Reverse 20 ms Data	4.2.53	BTS->SDU	O[a]	C
Message CRC	4.2.33	BTS->SDU	O	R

a. The 20 ms Forward Data IE is present unless the IS-2000 Frame Content type is set to Idle, Erasure, or Null.

The following table shows the bitmap layout for the A3-SCH Reverse Traffic Channel Frame.

3.1.22 A3-SCH Reverse Traffic Frame

7	6	5	4	3	2	1	0	Octet
⇒ **Message Type II** = [17H]								1
⇒ ***SCH Reverse Air Interval Control {1:***								
Soft Handoff Leg # = [0000 to 1111]				FSN = [0000 to 1111]				1
Scaling = [00-11]		Packet Arrival Time Error = [00 0000 – 11 1111]						2
IS-2000 Frame Content = [00H, 32H – 36H, 3DH – 40H, 7EH, 7FH]								3
Reserved = [0000 000]							EIB = [0,1]	4
FQI = [0,1]	Reverse Link Quality = [000 0000 – 111 1111]							5
} SCH Reverse Air Interval Control								
⇒ **Reverse 20 ms Data {1*:***								
(MSB)	Reverse Link Information + Layer 3 Fill = <variable>							1
				…				**…**
							(LSB)	n
} Reverse 20 ms Data								
(MSB)	⇒ **Message CRC** = [0000H-FFFFH]							1
							(LSB)	2

3.2 A7 Interface Message Formats

A7 interface messages are not applicable to DS-41 base stations.

3.2.1 A7-Handoff Request

This A7 interface message is sent from the source BS to the target BS to request allocation of resources to support soft/softer handoff for a call.

Information Element	Section Reference	Element Direction	Type	
Message Type II	4.2.1	Source BS -> Target BS	M	
Call Connection Reference	4.2.23	Source BS -> Target BS	O	R
Cell Identifier List	4.2.6	Source BS -> Target BS	O[a]	C
IS-95 Channel Identity	4.2.60	Source BS -> Target BS	O[b,f]	C
Band Class	4.2.25	Source BS -> Target BS	O	R
Downlink Radio Environment	4.2.7	Source BS -> Target BS	O	R
CDMA Serving One Way Delay	4.2.18	Source BS -> Target BS	O	R
Privacy Info	4.2.36	Source BS -> Target BS	O[n]	C
A3 Signaling Address	4.2.20	Source BS -> Target BS	O[c]	C
Correlation ID	4.2.26	Source BS -> Target BS	O[k]	C
SDU ID	4.2.21	Source BS -> Target BS	O[d]	C
Mobile Identity (IMSI)	4.2.3	Source BS -> Target BS	O[e]	R
Mobile Identity (ESN)	4.2.3	Source BS -> Target BS	O[q]	C
Physical Channel Info	4.2.2	Source BS -> Target BS	O[f,l]	C
Quality of Service Parameters	4.2.9	Source BS -> Target BS	O[g,f]	C
IS-2000 Power Control Info	4.2.46	Source BS -> Target BS	O[h,f]	C
IS-2000 Forward Power Control Mode	4.2.47	Source BS -> Target BS	O[i,f]	C
IS-2000 FPC Gain Ratio Info	4.2.48	Source BS -> Target BS	O[j,f]	C
A7 Originating ID	4.2.43	Source BS -> Target BS	O[m]	C
IS-2000 Service Configuration Record	4.2.13	Source BS ->Target BS	O[r]	C
Rescue Request Info	4.2.60	Source BS ->Target BS	O[o]	C
IS-2000 Non-Negotiable Service Configuration Record	4.2.27	Source BS ->Target BS	O[p]	C
Mobile Identity (MEID)	4.2.3	Source BS -> Target BS	O[q]	C

a. The list of cell identifiers shall be assumed by the target BS to be in priority order with the highest priority cell listed first.

b. The target BS shall consider only the following fields valid in this element: A3/A7 Element ID, Length, Frame Offset, Freq. Included and ARFCN. All other fields shall be ignored by the target BS.

c. If this element is omitted, the target BS shall send all A3 signaling messages related to the call to the same A7 signaling address as is used to reply to this A7 message.

d. This element is optionally included by the source BS. If included, the value shall be saved and used by the target BS on A3 signaling messages.

e. This element shall be included for OAM&P purposes.

f. Either the {IS-95 Channel Identity} element as a set, or the {Physical Channel Info, Quality of Service, IS-2000 Power Control Info, IS-2000 Forward Power Control Mode, and IS-2000 FPC Gain Ratio} elements as a set shall be present in this message, but elements from both sets shall not be present simultaneously. The IS-95 Channel Identity element is being kept in this revision of this specification for backward compatibility. For backward compatibility, the {IS-95 Channel Identity} set shall be sent to BSs implemented to any v3.x version of the IOS.

g. This element is only used for packet data calls. This information is included if available at the source BS. In this version of this standard, this element is used to carry the current non-assured mode priority of the packet data session.

h. This element shall be included when the physical channel (FCH or DCCH) measured by the primary power control subchannel is included in the Frame Selector Info Information Element. It provides information about power control for the call. (Note: information for the secondary power control subchannel is sent in the A7-Burst Commit message.)

i. This element shall be included when the physical channel (FCH or DCCH) measured by the primary power control subchannel is included in the Frame Selector Info Information Element. (Note: information for the secondary power control subchannel is sent in the A7-Burst Commit message.)

j. This element shall be included when the physical channel (FCH or DCCH) measured by the primary power control subchannel is included in the Frame Selector Info Information Element. It provides information used for forward gain equalization for the primary power control subchannel. (Note: information for the secondary power control subchannel is sent in the A7-Burst Commit message.)

k. If this element is included in this message, it shall be returned in the A7-Handoff Request Ack message.

l. A maximum of two supplemental channels (SCH) are supported by this version of this specification.

m. This element is optionally included by the source BS. If included, the value shall be saved and used by the target BS in subsequent A7 messages for this call association. If the A3 Flag field is set to ‘1’, then the value shall also be used by the target BS in all subsequent A3 messages.

n. This element is included if the Long Code Mask is available. Omission of this element implies that the ESN is used in generating the Public Long Code Mask.

o. This information element is only included if a rescue channel procedure is requested.

p. This element shall be included if the IS-2000 Service Configuration Record element is included. The source BS shall include this information element if it has this information available.

q. This information element is included for OAM&P purposes if this information is available at the source BS.

r. The source BS shall include this information element if it has this information available.

The following table shows the bitmap layout for the A7-Handoff Request message.

3.2.1 A7-Handoff Request

7	6	5	4	3	2	1	0	Octet
⇒ **Message Type II** = [80H]								1
⇒ **Call Connection Reference:** A3/A7 Element Identifier = [3FH]								1
Length = [08H]								2
(MSB)	Market ID = <any value>							3
							(LSB)	4
(MSB)	Generating Entity ID = <any value>							5
							(LSB)	6
(MSB)	Call Connection Reference = <any value>							7
								8
								9
							(LSB)	10
⇒ **Cell Identifier List:** A3/A7 Element Identifier = [1AH]								1
Length = <variable>								2
Cell Identification Discriminator = [07H]								3
Cell Identification) {1+:								
(MSB)	MSCID = <any value>							j
								j+1
							(LSB)	j+2
(MSB)	Cell = [001H-FFFH]							j+3
			(LSB)	Sector = [0H-FH] (0H = Omni)				j+4
} Cell Identification								
⇒ ***IS-95* Channel Identity:** A7 Element Identifier = [22H]								1
Length = [05H]								2
Hard Handoff = [0] (Ignored)	Number of Channels to Add = [000] (Ignored)		Frame Offset = [0H-FH]					3
Walsh Code Channel Index = [00H] (Ignored)								4
Pilot PN Code (low part) = [00H] (Ignored)								5
Pilot PN Code (high part) = [0] (Ignored)	Power Combined = [0] (Ignored)	Freq. included = [1]	Reserved = [00]	ARFCN (high part) = [000-111]				6
ARFCN (low part) = [00H-FFH]								7

3.2.1 A7-Handoff Request

7	6	5	4	3	2	1	0	Octet
⇒ **Band Class:** A7 Element Identifier = [5DH]								1
Length = [01H]								2
Reserved = [000]			Band Class = [00001(PCS), 00010 (TACS), 00011 (JTACS), 00100 (Korean PCS), 00101 (NMT-450), 00110 (IMT-2000), 00111 (North American 700 MHz Cellular Band)]					3
⇒ **Downlink Radio Environment:** A3/A7 Element Identifier = [29H]								1
Length = <variable>								2
Number of Cells = <variable>								3
Cell Identification Discriminator = [07H]								4
Downlink Radio Environment {1+:								
(MSB)	MSCID = <any value>							j
								j+1
							(LSB)	j+2
(MSB)	Cell = [001H-FFFH]							j+3
			(LSB)	Sector = [0H-FH] (0H = Omni)				j+4
Reserved = [00]	Downlink Signal Strength Raw = [000000] (Ignored)							j+5
(MSB)	CDMA Target One Way Delay							j+6
							(LSB)	j+7
} Downlink Radio Environment								
⇒ **CDMA Serving One Way Delay:** A7 Element Identifier = [0CH]								1
Length = [0BH]								2
Cell Identification Discriminator = [07H]								3
(MSB)	MSCID = <any value>							4
								5
							(LSB)	6
(MSB)	Cell = [001H-FFFH]							7
			(LSB)	Sector = [0H-FH] (0H = Omni)				8
(MSB)	CDMA Serving One Way Delay = [0000H-FFFFH]							9
							(LSB)	10
Reserved = [0000 00]						Resolution = [00, 01, 10]		11
(MSB)	CDMA Serving One Way Delay Time Stamp = [00 00H – FF FFH]							12
							(LSB)	13

3.2.1 A7-Handoff Request

7	6	5	4	3	2	1	0	Octet
⇒ **Privacy Info:** A3/A7 Element Identifier = [1AH]								1
Length = <variable>								2
Privacy Mask Information {1+:								
Reserved = [0]	Privacy Mask Type = [00001,00010] (public, private)					Status = [0,1]	Available = [0,1]	j
Privacy Mask Length = <06H>								j+1
(MSB)	Privacy Mask = <any value>							j+2
…								**…**
							(LSB)	k
} Privacy Mask Information								
⇒ **A3 Signaling Address:** A7 Element Identifier = [49H]								1
Length = [07H]								2
Address Type = [01H] (IPv4)								3
(MSB)	TCP or SCTP Port							4
							(LSB)	5
(MSB)	A3 Address = <any value>							6
								7
								8
							(LSB)	9
⇒ **Correlation ID:** A3/A7 Element Identifier = [13H]								1
Length = [04H]								2
(MSB)	Correlation Value = <any value>							3
								4
								5
							(LSB)	6
⇒ **SDU ID:** A3/A7 Element Identifier = [4CH]								1
Length = [01H to 06H]								2
(MSB)	SDU ID = <any value>							3
…								**…**
							(LSB)	m
⇒ **Mobile Identity (IMSI):** A7 Element Identifier = [0DH]								1
Length = [06H-08H] (10-15 digits)								2
Identity Digit 1 = [0H-9H] (BCD)				Odd/even Indicator = [1,0]	Type of Identity = [110] (IMSI)			3
Identity Digit 3 = [0H-9H] (BCD)				Identity Digit 2 = [0H-9H] (BCD)				4

3.2.1 A7-Handoff Request

7	6	5	4	3	2	1	0	Octet
…								…
Identity Digit N+1 = [0H-9H] (BCD)				Identity Digit N = [0H-9H] (BCD)				n
= [1111] (if even number of digits)				Identity Digit N+2 = [0H-9H] (BCD)				n+1
⇒ **Mobile Identity (ESN):** A7 Element Identifier = [0DH]								1
Length = [05H]								2
Identity Digit 1 = [0000]				Odd/even Indicator = [0]	Type of Identity = [101] (ESN)			3
(MSB)	ESN = <any value>							4
								5
								6
							(LSB)	7
⇒ **Physical Channel Info:** A7 Element Identifier = [07H]								1
Length =[06H]								2
Reserved = [000]			Rev_FCH_ Gating = [0,1]	Frame Offset = [0H – FH]				3
A3 Traffic Channel Protocol Stack = [001, 010]			Pilot Gating Rate = [00, 01, 10]		ARFCN (high part) = [000-111]			4
ARFCN (low part) = [00H-FFH]								5
Reserved = [0000]				OTD=[0,1]	Count of Physical Channels = [001 – 100]			6
Physical Channel 2 = 0H – N/A, 1H – FCH, 2H – SCH_0, 3H – DCCH				Physical Channel 1 = 0H – IS-95, 1H – FCH, 2H – SCH_0, 3H – DCCH				7
Physical Channel 4 = 0H – N/A, 1H – FCH, 2H – SCH_0, 3H – DCCH, 4H – SCH_1				Physical Channel 3 = 0H – N/A, 1H – FCH, 2H – SCH_0, 3H – DCCH, 4H – SCH_1				8
⇒ **Quality of Service Parameters:** A7 Element Identifier = [0FH]								1
Length = [01H]								2
Reserved = [0000]				Non-Assured Mode Packet Priority = [0000 – 1101]				3
⇒ **IS-2000 Power Control Info:** A7 Element Identifier = [0BH]								1
Length = [04H]								2
FPC_	Reserved	Rev_Pwr_	Rev_Pwr_Cntl_Delay =		Count of Subchan Gains =			3

3.2.1 A7-Handoff Request

7	6	5	4	3	2	1	0	Octet
PRI_CHAN = [0,1]	= [00]	Cntl_Delay_Incl = [0,1]	[00 – 11]		[011]			
Reserved = [000]			FPC_SUBCHAN_GAIN 1 = [0 0000 – 1 1111]					5
Reserved = [000]			FPC_SUBCHAN_GAIN 2 = [0 0000 – 1 1111]					6
Reserved = [000]			FPC_SUBCHAN_GAIN 3 = [0 0000 – 1 1111]					7
⇒ **IS-2000 Forward Power Control Mode:** A7 Element Identifier = [14H]								1
Length = [02H]								2
Reserved = [00000]					FPC_MODE = [000 – 110]			3
Action Time Flag = [1]	Reserved = [0]	ACTION_TIME = [00 0000] (Ignored)						4
⇒ **IS-2000 FPC Gain Ratio Info:** A3/A7 Element Identifier = [15H]								1
Length = [08H]								2
Initial Gain Ratio = [00H – FFH]								3
Reserved = [0]	Gain Adjust Step Size = [0H – FH]				Count of Gain Ratio Pairs = [011]			4
Min Gain Ratio 1 = [00H – FFH]								5
Max Gain Ratio 1 = [00H – FFH]								6
Min Gain Ratio 2 = [00H – FFH]								7
Max Gain Ratio 2 = [00H – FFH]								8
Min Gain Ratio 3 = [00H – FFH]								9
Max Gain Ratio 3 = [00H – FFH]								10
⇒ **A7 Originating ID:** A3/A7 Element Identifier = [2CH]								1
Length = [02H - 09H]								2
Reserved = [0000 000]							A3 Flag = [0,1]	3
(MSB)	A7 Originating ID = <any value>							4
…								…
							(LSB)	k
⇒ ***IS-2000* Service Configuration Record:** A3/A7 Element Identifier = [10H]								1
Bit-Exact Length – Octet Count = <variable>								2
Reserved = [0000 0]					Bit-Exact Length – Fill Bits = [000 – 111]			3
(MSB)								4
IS-2000 Service Configuration Record Content = <any value>								…

3.2.1 A7-Handoff Request

7	6	5	4	3	2	1	0	Octet
	Seventh Fill Bit – if needed = [0 (if used as a fill bit)]	Sixth Fill Bit – if needed = [0 (if used as a fill bit)]	Fifth Fill Bit – if needed = [0 (if used as a fill bit)]	Fourth Fill Bit – if needed = [0 (if used as a fill bit)]	Third Fill Bit – if needed = [0 (if used as a fill bit)]	Second Fill Bit – if needed = [0 (if used as a fill bit)]	First Fill Bit – if needed = [0 (if used as a fill bit)]	k
⇒ **Rescue Request Info:** A7 Element Identifier = [32H]								1
Length = [01H]								2
Reserved = [0000 000]							Transmit Flag = [0,1]	3
⇒ ***IS-2000* Non-Negotiable Service Configuration Record:** A7 Element Identifier = [33H]								1
Bit-Exact Length – Octet Count = [00H to FFH]								2
Reserved = [0000 0]					Bit-Exact Length – Fill Bits = [000 to 111]			3
(MSB)								4
IS-2000 Non-Negotiable Service Configuration Record Content = <any value>								…
	Seventh Fill Bit – if needed = [0 (if used as a fill bit)]	Sixth Fill Bit – if needed = [0 (if used as a fill bit)]	Fifth Fill Bit – if needed = [0 (if used as a fill bit)]	Fourth Fill Bit – if needed = [0 (if used as a fill bit)]	Third Fill Bit – if needed = [0 (if used as a fill bit)]	Second Fill Bit – if needed = [0 (if used as a fill bit)]	First Fill Bit – if needed = [0 (if used as a fill bit)]	k
⇒ **Mobile Identity (MEID):** A7 Element Identifier = [0DH]								1
Length = [08H]								2
MEID Hex Digit 1 = [0H-FH]				Odd/Even Indicator = ‘0’	Type of Identity = [001] (MEID)			3
MEID Hex Digit 3 = [0H-FH]				MEID Hex Digit 2 = [0H-FH]				4
MEID Hex Digit 5 = [0H-FH]				MEID Hex Digit 4 = [0H-FH]				5
MEID Hex Digit 7 = [0H-FH]				MEID Hex Digit 6 = [0H-FH]				6
MEID Hex Digit 9 = [0H-FH]				MEID Hex Digit 8 = [0H-FH]				7
MEID Hex Digit 11 = [0H-FH]				MEID Hex Digit 10 = [0H-FH]				8
MEID Hex Digit 13 = [0H-FH]				MEID Hex Digit 12 = [0H-FH]				9
Fill = [FH]				MEID Hex Digit 14 = [0H-FH]				10

3.2.2 A7-Handoff Request Ack

This A7 interface message is sent from the target BS to the source BS to respond to a request for allocation of resources to support soft/softer handoff for a call.

Information Element	Section Reference	Element Direction	Type	
Message Type II	4.2.1	Target BS -> Source BS	M	
Call Connection Reference	4.2.23	Target BS -> Source BS	O	R
Cell Identifier List (committed)	4.2.6	Target BS -> Source BS	O[a,f]	C
Correlation ID	4.2.26	Target BS -> Source BS	O[b]	C
Neighbor List	4.2.19	Target BS -> Source BS	O[c,f,i]	C
Cell Identifier List (uncommitted)	4.2.6	Target BS -> Source BS	O[d,f]	C
Cause List	4.2.35	Target BS -> Source BS	O[e,f]	C
A7 Originating ID	4.2.43	Target BS -> Source BS	O[g]	C
A7 Destination ID	4.2.44	Target BS -> Source BS	O[h]	C
Cell Commitment Info List	4.2.56	Target BS -> Source BS	O[f]	C
Extended Neighbor List	4.2.57	Target BS -> Source BS	O[i]	C
Cell Pilot Increment List	4.2.63	Target BS -> Source BS	O[j]	C

a. If there are no committed cells, the length field of this element shall be set to zero.

b. This field is required if a Correlation ID value was included on the A7-Handoff Request message to which this message is a response.

c. There may be multiple instances of the Neighbor List element. The number and order of instances of the Neighbor List element shall match the number and order of cell identifiers in the Cell Identifier List (committed) element.

d. If one or more cells that were requested are not being committed to the call association by the target BS, then this element is required when the receiver of this message is implemented to any v3.x version of the IOS. It shall contain the cell identifiers of all uncommitted cells.

e. If one or more cells that were requested are not being committed to the call association by the target BS, then this element is required to indicate the reasons on a cell by cell basis when the receiver of this message is implemented to any v3.x version or later of the IOS specification. The number and order of the cause values in this list shall match the number and order of cell identifiers in the Cell Identifier List (uncommitted) element.

f. Either the {Cell Identifier List (committed), Neighbor List, Cell Identifier List (uncommitted)} elements as a set, or the {Cell Commitment Info List} element as a set shall be present in this message, but elements from both sets shall not be present simultaneously. For backward compatibility, the {Cell Identifier List (committed), Neighbor List, Cell Identifier List (uncommitted)} set of elements shall be sent to BSs implemented to any v3.x version of the IOS.

g. This element is optionally included by the target BS. If included, the value shall be saved and used by the source BS in subsequent A7 messages for this call association.

h. This element is required if an A7 Originating ID value was included in the corresponding A7-Handoff Request message.

i. Either the Neighbor List information element or the Extended Neighbor List information element may be included, but not both.

j. If this IE is included, it shall correspond to all committed cells listed in either the Cell Identifier List or the Cell Commitment Info List IE. The BS shall match the Pilot Increments in the Cell Pilot Increment List IE to the order of the neighbor cell records in either Cell Identifier List or Cell Commitment Info List IE; otherwise the source BS gets the target Pilot increment values via other means, e.g. through provisioning.

The following table shows the bitmap layout for the A7-Handoff Request Ack message.

3.2.2 A7-Handoff Request Ack

7	6	5	4	3	2	1	0	Octet
⇒ **Message Type II** = [81H]								1
⇒ **Call Connection Reference:** A3/A7 Element Identifier = [3FH]								1
Length = [08H]								2
(MSB)	Market ID = <any value>							3
							(LSB)	4
(MSB)	Generating Entity ID = <any value>							5
							(LSB)	6
(MSB)	Call Connection Reference = <any value>							7
								8
								9
							(LSB)	10
⇒ **Cell Identifier List (committed):** A3/A7 Element Identifier = [1AH]								1
Length = <variable>								2
Cell Identification Discriminator = [07H]								3
Cell Identification {1+:								
(MSB)	MSCID = <any value>							j
								j+1
							(LSB)	j+2
(MSB)	Cell = [001H-FFFH]							j+3
			(LSB)	Sector = [0H-FH] (0H = Omni)				j+4
} Cell Identification								
⇒ **Correlation ID:** A3/A7 Element Identifier = [13H]								1
Length = [04H]								2
(MSB)	Correlation Value = <any value>							3
								4
								5
							(LSB)	6
⇒ **Neighbor List:** A3/A7 Element Identifier = [48H]								1

3.2.2 A7-Handoff Request Ack

7	6	5	4	3	2	1	0	Octet
Length = <variable>								2
Number of Neighbors = [00H-FFH]								3
Neighbor Info {1+:								
Pilot PN Code (low part) = [00H-FFH]								k
Pilot PN Code (high part) = [0,1]	Short Cell Identification Discriminator = [000 0111] (Discriminator Type = 7)							k+1
(MSB)	MSCID = <any value>							k+2
								k+3
							(LSB)	k+4
(MSB)	Cell = [001H-FFFH]							k+5
			(LSB)	Sector = [0H-FH] (0H = Omni)				k+6
} Neighbor Info								
⇒ **Cell Identifier List (uncommitted):** A3/A7 Element Identifier = [1AH]								1
Length = <variable>								2
Cell Identification Discriminator = [07H]								3
Cell Identification {1+:								
(MSB)	MSCID = <any value>							j
								j+1
							(LSB)	j+2
(MSB)	Cell = [001H-FFFH]							j+3
			(LSB)	Sector = [0H-FH] (0H = Omni)				j+4
} Cell Identification								
⇒ **Cause List:** A3/A7 Element Identifier = [19H]								1
Length = <variable>								2
Cause Value {1+:								

3.2.2 A7-Handoff Request Ack

7	6	5	4	3	2	1	0	Octet
Reserved = [0]	Cause Value = = [07H (OAM&P intervention), 0DH (Timer expired), 11H (Service option not available), 20H (Equipment failure), 21H (No radio resource available), 27H (2G only sector), 28H (2G only carrier), 35H (Requested FPC mode change failed), 40H (Ciphering algorithm not supported), 41H (Private long code not available or not supported), 42H (Requested MUX option or rates not available), 43H (Requested privacy configuration unavailable), 44H (SCH not supported), 46H (Long code value not available) 47H (DCCH not supported), 52H (Invalid message), 6DH (Protocol error), 6EH (No response from BS)]								k
} Cause Value								
⇒ **A7 Originating ID:** A3/A7 Element Identifier = [2CH]								1
Length = [02H - 09H]								2
Reserved = [0000 000]							A3 Flag = [0,1]	3
(MSB)	A7 Originating ID = <any value>							4
				…				…
							(LSB)	k
⇒ **A7 Destination ID:** A3/A7 Element Identifier = [2DH]								1
Length = [01H - 08H]								2
(MSB)	A7 Destination ID = <any value>							3
				…				…
							(LSB)	k
⇒ **Cell Commitment Info List:** A3/A7 Element Identifier = [65H]								1
Length = <variable>								2
Cell Discriminator Type = [07H]								3
Cell Commitment Info{1+*:*								
(MSB)	MSCID = <any value>							j

3.2.2 A7-Handoff Request Ack

7	6	5	4	3	2	1	0	Octet
								j+1
							(LSB)	j+2
(MSB)			Cell = [001H-FFFH]					j+3
			(LSB)	Sector = [0H-FH] (0H = Omni)				j+4
Count of Physical Channels = [001 - 100]			Committed =[0 (No), 1 (Yes)]	Physical Channel 1 = [0H - 4H]				j+5
Reserved = [000]			Committed =[0,1]	Physical Channel 2 = [0H - 4H]				j+6
Reserved = [000]			Committed =[0,1]	Physical Channel 3 = [0H - 4H]				j+7
Reserved = [000]			Committed =[0,1]	Physical Channel 4 = [0H - 4H]				j+8
Neighbor List {1:								
Length of Neighbor List = <variable>								k
Number of Neighbors = [00H-FFH]								k+1
Neighbor Info {1+:								
Pilot PN Code (low part) = [00H-FFH]								m
Pilot PN Code (high part) = [0,1]	Short Cell Identification Discriminator = [000 0111] (Discriminator Type = 7)							m+1
(MSB)	MSCID = <any value>							m+2
								m+3
							(LSB)	m+4
(MSB)	Cell = [001H-FFFH]							m+5
			(LSB)	Sector = [0H-FH] (0H = Omni)				m+6
} Neighbor Info								
} Neighbor List								
} Cell Commitment Info								
⇒ **Extended Neighbor List:** A3/A7 Element Identifier = [66H]								1
Length = <variable>								2
Number of Neighbors = [00H-FFH]								3
Neighbor Record Length = [00H-FFH]								4
Neighbor Info {1+:								
Pilot PN Code (low part) = [00H-FFH]								k

3.2.2 A7-Handoff Request Ack

7	6	5	4	3	2	1	0	Octet
Pilot PN Code (high part) = [0,1]	Short Cell Identification Discriminator = [000 0111] (Discriminator Type = 7)							k+1
(MSB)	MSCID = <any value>							k+2
								k+3
							(LSB)	k+4
(MSB)	Cell = [001H-FFFH]							k+5
			(LSB)	Sector = [0H-FH] (0H = Omni)				k+6
BS ID (high octet) = [00H – FFH]								k+7
BS ID (low octet) = [00H – FFH]								k+8
Neighbor Type = [00H (IS-95A/95B), 01H (IS-2000), 02H (IS-95A/B and IS-2000)]								k+9
Band Class = [0000 0 – 1111 1]					ARFCN (high bits) = [000-111]			k+10
ARFCN (low bits) = [00H – FFH]								k+11
} Neighbor Info								
⇒ **Cell Pilot Increment List:** A3/A7 Element Identifier = [72H]								1
Length = <variable>								2
Number of Pilot Increment =[00H-FFH]								3
Pilot Increment 2=[1H-FH]				Pilot Increment 1=[1H-FH]				4
Pilot Increment 4=[1H-FH]				Pilot Increment 3=[1H-FH]				n+1
…				…				n+2
Pilot Increment n+1=[1H-FH] or Reserved if odd number of Pilot Increments				Pilot Increment n=[1H-FH]				n+3

3.2.3 A7-Drop Target

This A7 interface message is sent from the source BS to the target BS to request de-allocation of resources being used to support soft/softer handoff for a call.

Information Element	Section Reference	Element Direction	Type	
Message Type II	4.2.1	Source BS -> Target BS	M	
Call Connection Reference	4.2.23	Source BS -> Target BS	O	R
Cell Identifier List	4.2.6	Source BS -> Target BS	O[a]	R
Correlation ID	4.2.26	Source BS -> Target BS	O[b]	C
A7 Destination ID	4.2.44	Source BS -> Target BS	O[c]	C

a. When the A7 target drop procedure is used during call release scenarios, the A7-Drop Target message shall contain the Cell Identifier List with zero cells included. In this case, the source should wait some implementation specific period of time to allow any in progress Adds or Drops to complete prior to sending the A7-Drop Target message.

b. If this element is included in this message, then the target BS shall include the value in the A7-Drop Target Ack message.

c. This element is required if an A7 Originating ID value was included in an A7-Handoff Request Ack message previously received from the target BS for this call association.

The following table shows the bitmap layout for the A7-Drop Target message.

3.2.3 A7-Drop Target

7	6	5	4	3	2	1	0	Octet
⇒ **Message Type II** = [82H]								1
⇒ **Call Connection Reference:** A3/A7 Element Identifier = [3FH]								1
Length = [08H]								2
(MSB)	Market ID = <any value>							3
							(LSB)	4
(MSB)	Generating Entity ID = <any value>							5
							(LSB)	6
(MSB)	Call Connection Reference = <any value>							7
								8
								9
							(LSB)	10
⇒ **Cell Identifier List:** A3/A7 Element Identifier = [1AH]								1
Length = <variable>								2
Cell Identification Discriminator = [07H]								3
Cell Identification {0+:								
(MSB)	MSCID = <any value>							j

3.2.3 A7-Drop Target

7	6	5	4	3	2	1	0	Octet
								j+1
							(LSB)	j+2
(MSB)	Cell = [001H-FFFH]							j+3
			(LSB)	Sector = [0H-FH] (0H = Omni)				j+4
} Cell Identification								
⇒ **Correlation ID:** A3/A7 Element Identifier = [13H]								1
Length = [04H]								2
(MSB)	Correlation Value = <any value>							3
								4
								5
							(LSB)	6
⇒ **A7 Destination ID:** A3/A7 Element Identifier = [2DH]								1
Length = [01H - 08H]								2
(MSB)	A7 Destination ID = <any value>							3
…								…
							(LSB)	k

3.2.4 A7-Drop Target Ack

This A7 interface message is sent from the target BS to the source BS to respond to a request for de-allocation of resources being used to support soft/softer handoff for a call.

Information Element	Section Reference	Element Direction	Type	
Message Type II	4.2.1	Target BS -> Source BS	M	
Call Connection Reference	4.2.23	Target BS -> Source BS	O	R
Correlation ID	4.2.26	Target BS -> Source BS	O[a]	C
A7 Destination ID	4.2.44	Target BS -> Source BS	O[b]	C

a. This field is required if a Correlation ID value was included in the A7-Drop Target message to which this message is a response.

b. This element is required if an A7 Originating ID value was included in an A7-Handoff Request message previously received from the source BS for this call association.

The following table shows the bitmap layout for the A7-Drop Target Ack message.

3.2.4 A7-Drop Target Ack

7	6	5	4	3	2	1	0	Octet
⇒ **Message Type II** = [83H]								1
⇒ **Call Connection Reference:** A3/A7 Element Identifier = [3FH]								1
Length = [08H]								2
(MSB)	Market ID = <any value>							3
							(LSB)	4
(MSB)	Generating Entity ID = <any value>							5
							(LSB)	6
(MSB)	Call Connection Reference = <any value>							7
								8
								9
							(LSB)	10
⇒ **Correlation ID:** A3/A7 Element Identifier = [13H]								1
Length = [04H]								2
(MSB)	Correlation Value = <any value>							3
								4
								5
							(LSB)	6
⇒ **A7 Destination ID:** A3/A7 Element Identifier = [2DH]								1
Length = [01H - 08H]								2
(MSB)	A7 Destination ID = <any value>							3

3.2.4 A7-Drop Target Ack

7	6	5	4	3	2	1	0	Octet
…								…
							(LSB)	k

3.2.5 A7-Target Removal Request

This A7 interface message is sent from the target BS to the source BS to request the de-allocation of resources being used to support soft/softer handoff for a call.

Information Element	Section Reference	Element Direction	Type	
Message Type II	4.2.1	Target BS -> Source BS	M	
Call Connection Reference	4.2.23	Target BS -> Source BS	O	R
Cell Identifier List (target)	4.2.6	Target BS -> Source BS	O[a]	R
Cause List	4.2.35	Target BS -> Source BS	O[a,b,d]	R
Correlation ID	4.2.26	Target BS -> Source BS	O[c]	C
A7 Destination ID	4.2.44	Target BS -> Source BS	O[d]	C

a. The number and order of entries in the Cell Identifier list (target) element shall match the number and order of entries in the Cause List element.

b. The allowable cause values are broken into two categories, those which indicate that the source BS may remove the resources, and those that indicate that the source BS shall remove the resources.

Cause values indicating that the source BS may remove the resources are: OAM&P intervention.

Cause values indicating that the source BS shall remove the resources are: Equipment failure.

c. If this element is included in this message, the value shall be returned in the A7-Target Removal Response message.

d. This element is required if an A7 Originating ID value was included in an A7-Handoff Request message previously received from the source BS for this call association.

The following table shows the bitmap layout for the A7-Target Removal Request message.

3.2.5 A7-Target Removal Request

7	6	5	4	3	2	1	0	Octet
⇒ **Message Type II** = [84H]								1
⇒ **Call Connection Reference:** A3/A7 Element Identifier = [3FH]								1
Length = [08H]								2
(MSB)	Market ID = <any value>							3
							(LSB)	4
(MSB)	Generating Entity ID = <any value>							5
							(LSB)	6
(MSB)	Call Connection Reference = <any value>							7
								8
								9
							(LSB)	10

3.2.5 A7-Target Removal Request

7	6	5	4	3	2	1	0	Octet
⇒ **Cell Identifier List (target):** A3/A7 Element Identifier = [1AH]								1
Length = <variable>								2
Cell Identification Discriminator = [07H]								3
Cell Identification {1+:								
(MSB)	MSCID = <any value>							j
								j+1
							(LSB)	j+2
(MSB)	Cell = [001H-FFFH]							j+3
			(LSB)	Sector = [0H-FH] (0H = Omni)				j+4
} Cell Identification								
⇒ **Cause List:** A3/A7 Element Identifier = [19H]								1
Length = <variable>								2
Cause Value {1+:								
Reserved = [0]	Cause Value = = [07H (OAM&P intervention), 20H (Equipment failure)]							k
} Cause Value								
⇒ **Correlation ID:** A3/A7 Element Identifier = [13H]								1
Length = [04H]								2
(MSB)	Correlation Value = <any value>							3
								4
								5
							(LSB)	6
⇒ **A7 Destination ID:** A3/A7 Element Identifier = [2DH]								1
Length = [01H - 08H]								2
(MSB)	A7 Destination ID = <any value>							3
…								…
							(LSB)	k

3.2.6 A7-Target Removal Response

This A7 interface message is sent from the source BS to the target BS to respond to a request for the de-allocation of resources being used to support soft/softer handoff for a call.

Information Element	Section Reference	Element Direction	Type	
Message Type II	4.2.1	Source BS -> Target BS	M	
Call Connection Reference	4.2.23	Source BS -> Target BS	O	R
Correlation ID	4.2.26	Source BS -> Target BS	O[a]	C
Cause List	4.2.35	Source BS -> Target BS	O[b,c]	C
Cell Identifier List (not removed)	4.2.6	Source BS -> Target BS	O[c]	C
A7 Destination ID	4.2.44	Source BS -> Target BS	O[d]	C

a. This element is required if a Correlation ID value was included on the A7-Target Removal Request message to which this message is a response.

b. This element is included by the source BS only if one or more cells are not to be removed from the soft/softer handoff as requested by the target BS.

c. If the Cause List element is included in this message, then the instances of cause value in that element shall match the number and order of cell identifiers in this list.

d. This element is required if an A7 Originating ID value was included in an A7-Handoff Request Ack message previously received from the target BS for this call association.

The following table shows the bitmap layout for the A7-Target Removal Response message.

3.2.6 A7-Target Removal Response

7	6	5	4	3	2	1	0	Octet
⇒ **Message Type II** = [85H]								1
⇒ **Call Connection Reference:** A3/A7 Element Identifier = [3FH]								1
Length = [08H]								2
(MSB)	Market ID = <any value>							3
							(LSB)	4
(MSB)	Generating Entity ID = <any value>							5
							(LSB)	6
(MSB)	Call Connection Reference = <any value>							7
								8
								9
							(LSB)	10
⇒ **Correlation ID:** A3/A7 Element Identifier = [13H]								1
Length = [04H]								2
(MSB)	Correlation Value = <any value>							3

3.2.6 A7-Target Removal Response

7	6	5	4	3	2	1	0	Octet
								4
								5
							(LSB)	6
⇒ **Cause List:** A3/A7 Element Identifier = [19H]								1
Length = <variable>								2
Cause Value {1+:								
Reserved = [0]	Cause Value = = [02H (Uplink quality), 03H (Uplink strength), 04H (Downlink quality), 05H (Downlink strength)]							k
} Cause Value								
⇒ **Cell Identifier List (not removed):** A3/A7 Element Identifier = [1AH]								1
Length = <variable>								2
Cell Identification Discriminator = [07H]								3
Cell Identification {1+:								
(MSB)	MSCID = <any value>							j
								j+1
							(LSB)	j+2
(MSB)	Cell = [001H-FFFH]							j+3
			(LSB)	Sector = [0H-FH] (0H = Omni)				j+4
} Cell Identification								
⇒ **A7 Destination ID:** A3/A7 Element Identifier = [2DH]								1
Length = [01H - 08H]								2
(MSB)	A7 Destination ID = <any value>							3
				…				…
							(LSB)	k

1

3.2.7 A7-Burst Request

This A7 interface message is sent from the source BS to the target BS to request the reservation of resources in support of a traffic burst.

Information Element	Section Reference	Element Direction	Type	
Message Type II	4.2.1	Source BS -> Target BS	M	
Call Connection Reference	4.2.23	Source BS -> Target BS	O	R
Correlation ID	4.2.26	Source BS -> Target BS	O	R
Mobile Identity (IMSI)	4.2.3	Source BS -> Target BS	O[a]	R
Mobile Identity (ESN)	4.2.3	Source BS -> Target BS	O[a]	C
Cell Identifier List	4.2.6	Source BS -> Target BS	O[b]	C
Forward Burst Radio Info	4.2.10	Source BS -> Target BS	O[c]	C
Reverse Burst Radio Info	4.2.11	Source BS -> Target BS	O[d]	C
A7 Destination ID	4.2.44	Source BS -> Target BS	O[e]	C
Mobile Identity (MEID)	4.2.3	Source BS -> Target BS	O[a]	C

a. This element may be included for OAM&P purposes.

b. The list of cell identifiers shall be assumed by the target BS to be in priority order with the highest priority cell listed first.

c. This element is only included when forward link radio resources are to be allocated to the burst.

d. This element is only included when reverse link radio resources are to be allocated to the burst.

e. This element is required if an A7 Originating ID value was included in an A7-Handoff Request Ack message previously received from the target BS for this call association.

The following table shows the bitmap layout for the A7-Burst Request message.

3.2.7 A7-Burst Request

7	6	5	4	3	2	1	0	Octet
⇒ **Message Type II** = [90H]								1
⇒ **Call Connection Reference:** A3/A7 Element Identifier = [3FH]								1
Length = [08H]								2
(MSB)	Market ID = <any value>							3
							(LSB)	4
(MSB)	Generating Entity ID = <any value>							5
							(LSB)	6
(MSB)	Call Connection Reference = <any value>							7
								8
								9

3.2.7 A7-Burst Request

7	6	5	4	3	2	1	0	Octet
							(LSB)	10
⇒ **Correlation ID:** A3/A7 Element Identifier = [13H]								1
Length = [04H]								2
(MSB)	Correlation Value = <any value>							3
								4
								5
							(LSB)	6
⇒ **Mobile Identity (IMSI):** A3/A7 Element Identifier = [0DH]								1
Length = [06H-08H] (10-15 digits)								2
Identity Digit 1 = [0H-9H] (BCD)				Odd/even Indicator = [1,0]	Type of Identity = [110] (IMSI)			3
Identity Digit 3 = [0H-9H] (BCD)				Identity Digit 2 = [0H-9H] (BCD)				4
…								…
Identity Digit N+1 = [0H-9H] (BCD)				Identity Digit N = [0H-9H] (BCD)				n
= [1111] (if even number of digits)				Identity Digit N+2 = [0H-9H] (BCD)				n+1
⇒ **Mobile Identity (ESN):** A3/A7 Element Identifier = [0DH]								1
Length = [05H]								2
Identity Digit 1 = [0000]				Odd/even Indicator = [0]	Type of Identity = [101] (ESN)			3
(MSB)	ESN = <any value>							4
								5
								6
							(LSB)	7
⇒ **Cell Identifier List:** A3/A7 Element Identifier = [1AH]								1
Length = <variable>								2
Cell Discriminator Type = [07H]								3
Cell Identification{1+:								
(MSB)	MSCID = <any value>							j
								j+1
							(LSB)	j+2
(MSB)	Cell = [001H-FFFH]							j+3
			(LSB)	Sector = [0H-FH] (0H = Omni)				j+4
} Cell Identification								
⇒ **Forward Burst Radio Info:** A3/A7 Element Identifier = [11H]								1

3.2.7 A7-Burst Request

7	6	5	4	3	2	1	0	Octet
Length = [0AH, 14H]								2
Forward Burst Radio Info {1..2:								
Coding Indicator = [00, 01]		SCH_ID = [0,1]	QOF Mask = <any value> (Ignored)		Forward Code Channel Index (high part) = <any value> (Ignored)			j
Forward Code Channel Index (low part) = <any value> (Ignored)								j+1
Pilot PN Code (low part) = <any value> (Ignored)								j+2
Pilot PN Code (high part) = <any value> (Ignored)	Reserved =[00]		CCSH Encoder Type = [0,1] (Ignored)	Forward Supplemental Channel Rate = [0000 – 1111]				j+3
Reserved = [000]			Forward Supplemental Channel Start Time = [0 0000 – 1 1111]					j+4
SR3 Incl = [0,1]	Start Time Unit = [000 – 111]			Forward Supplemental Channel Duration = [0000 – 1111]				j+5
Reserved = [000]			Lower QOF Mask = <any value> (Ignored)		Lower Forward Code Channel Index (high part) = <any value> (Ignored)			j+6
Lower Forward Code Channel Index (low part) = <any value> (Ignored)								j+7
Reserved = [000]			Upper QOF Mask = <any value> (Ignored)		Upper Forward Code Channel Index (high part) = <any value> (Ignored)			j+8
Upper Forward Code Channel Index (low part) = <any value> (Ignored)								j+9
} Forward Burst Radio Info								
⇒ **Reverse Burst Radio Info:** A3/A7 Element Identifier = [12H]								1
Length = [04H, 08H]								2
Reverse Burst Radio Info {1..2:								
Coding Indicator = [00, 01]		SCH_ID = [00, 01]		Reverse Supplemental Channel Rate = [0000 – 1111]				m
Reserved = [000]			Reverse Supplemental Channel Start Time = [0 0000 – 1 1111]					m+1
Rev Walsh ID = <any value> (Ignored)	Start Time Unit = [000 – 111]			Reverse Supplemental Channel Duration = [0000 – 1111]				m+2

3.2.7 A7-Burst Request

7	6	5	4	3	2	1	0	Octet
Reserved = [0H]				Rev_Burst_DTX_Duration = [0H – FH]				m+3
} Reverse Burst Radio Info								
⇒ **A7 Destination ID:** A3/A7 Element Identifier = [2DH]								1
Length = [01H - 08H]								2
(MSB)	A7 Destination ID = <any value>							3
…								…
							(LSB)	k
⇒ **Mobile Identity (MEID):** A7 Element Identifier = [0DH]								1
Length = [08H]								2
MEID Hex Digit 1 = [0H-FH]				Odd/Even Indicator = ‘0’	Type of Identity = [001] (MEID)			3
MEID Hex Digit 3 = [0H-FH]				MEID Hex Digit 2 = [0H-FH]				4
MEID Hex Digit 5 = [0H-FH]				MEID Hex Digit 4 = [0H-FH]				5
MEID Hex Digit 7 = [0H-FH]				MEID Hex Digit 6 = [0H-FH]				6
MEID Hex Digit 9 = [0H-FH]				MEID Hex Digit 8 = [0H-FH]				7
MEID Hex Digit 11 = [0H-FH]				MEID Hex Digit 10 = [0H-FH]				8
MEID Hex Digit 13 = [0H-FH]				MEID Hex Digit 12 = [0H-FH]				9
Fill = [FH]				MEID Hex Digit 14 = [0H-FH]				10

3.2.8 A7-Burst Response

This A7 interface message is sent from the target BS to the source BS to respond to a request for reservation of resources to support a traffic burst. Note that one or more A7-Burst Response messages may be used to respond to a single A7-Burst Request message. A result (committed or uncommitted) shall be provided for all cells in the A7-Burst Request message. Each A7-Burst Response message includes at most one committed cell.

Information Element	Section Reference	Element Direction	Type	
Message Type II	4.2.1	Target BS -> Source BS	M	
Call Connection Reference	4.2.23	Target BS -> Source BS	O	R
Correlation ID	4.2.26	Target BS -> Source BS	O	R
Cell Identifier List (Committed)	4.2.6	Target BS -> Source BS	O[c]	C
Cell Identifier List (Uncommitted)	4.2.6	Target BS -> Source BS	O[d]	C
Forward Burst Radio Info	4.2.10	Target BS -> Source BS	O[a,g,h]	C
Reverse Burst Radio Info	4.2.11	Target BS -> Source BS	O[b,g,h]	C
A7 Destination ID	4.2.44	Target BS -> Source BS	O[e]	C
Cause List	4.2.35	Target BS -> Source BS	O[d,f]	C
A7 Burst Retry Delay List	4.2.58	Target BS -> Source BS	O[i]	C

a. This element is only included when this message includes information about forward link radio resources that have been reserved at the cell indicated in the Cell Identifier List (Committed) element.

b. This element is only included when this message includes information about reverse link radio resources that have been reserved at the cell indicated in the Cell Identifier List (Committed) element.

c. This element is only included when this message includes information about a cell with radio resources reserved for the forward and/or reverse burst indicated in the Forward and/or Reverse Burst Radio Info element.

d. This element is only included when this message includes one or more requested cells that are not being reserved.

e. This element is required if an A7 Originating ID value was included in an A7-Handoff Request message previously received from the source BS for this call association.

f. The items in this list shall be in the same order and shall be in one to one correspondence with the cells listed in the Cell Identifier List (Uncommitted) element. Each entry indicates the reason for not committing the associated cell.

g. If this message is in response to a request for a burst extension (refer to definition of burst extension in section 2.2.7.1), then the start time and rate shall be the same as in the corresponding A7-Burst Request message.

h. The Forward (Reverse) Supplemental Channel Start Time shall not overlap with another burst on the Forward (Reverse) Supplemental Channel. The Supplemental Channel Rate shall not exceed the Rate specified in the corresponding A7-Burst Request message; however, the Supplemental Channel Duration may be any value.

i. This optional element may be included by the target BS to indicate a burst retry delay for the uncommitted cell(s) for a given call connection reference. The source

BS should use this information to determine when to send another A7-Burst Request for the same resources, another request is sent.

The items in this list shall be in the same order and shall be in one to one correspondence with the cells listed in the Cell Identifier List (Uncommitted) element. Each entry indicates the retry delay for the associated cell.

The following table shows the bitmap layout for the A7-Burst Response message.

3.2.8 A7-Burst Response

7	6	5	4	3	2	1	0	Octet
⇒ **Message Type II** = [91H]								1
⇒ **Call Connection Reference:** A3/A7 Element Identifier = [3FH]								1
Length = [08H]								2
(MSB)	Market ID = <any value>							3
							(LSB)	4
(MSB)	Generating Entity ID = <any value>							5
							(LSB)	6
(MSB)	Call Connection Reference = <any value>							7
								8
								9
							(LSB)	10
⇒ **Correlation ID:** A3/A7 Element Identifier = [13H]								1
Length = [04H]								2
(MSB)	Correlation Value = <any value>							3
								4
								5
							(LSB)	6
⇒ **Cell Identifier List (committed):** A3/A7 Element Identifier = [1AH]								1
Length = <variable>								2
Cell Identification Discriminator = [07H]								3
Cell Identification {1:								
(MSB)	MSCID = <any value>							j
								j+1
							(LSB)	j+2
(MSB)	Cell = [001H-FFFH]							j+3
			(LSB)	Sector = [0H-FH] (0H = Omni)				j+4
} Cell Identification								
⇒ **Cell Identifier List (uncommitted):** A3/A7 Element Identifier = [1AH]								1
Length = <variable>								2
Cell Identification Discriminator = [07H]								3

3.2.8 A7-Burst Response

7	6	5	4	3	2	1	0	Octet
Cell Identification {1+:								
(MSB)	MSCID = <any value>							j
								j+1
							(LSB)	j+2
(MSB)	Cell = [001H-FFFH]							j+3
			(LSB)	Sector = [0H-FH] (0H = Omni)				j+4
} Cell Identification								
⇒ **Forward Burst Radio Info:** A3/A7 Element Identifier = [11H]								1
Length = [0AH, 14H]								2
Forward Burst Radio Info {1..2:								
Coding Indicator = [00, 01]		SCH_ID = [0, 1]		QOF Mask = [00 – 11]		Forward Code Channel Index (high part) = [000 – 111]		k
Forward Code Channel Index (low part) = [00H – FFH]								k+1
Pilot PN Code (low part) = [00H – FFH]								k+2
Pilot PN Code (high part) [0,1]	Reserved = [00]		CCSH Encoder Type = [0,1] (Ignored)		Forward Supplemental Channel Rate = [0000 – 1111]			k+3
Reserved = [000]				Forward Supplemental Channel Start Time = [0 0000 – 1 1111]				k+4
SR3 Incl = [0, 1]	Start Time Unit = [000 – 111]				Forward Supplemental Channel Duration = [0000 – 1111]			k+5
Reserved = [000]				Lower QOF Mask = <any value>		Lower Forward Code Channel Index (high part) = <any value>		k+6
Lower Forward Code Channel Index (low part) = <any value>								k+7
Reserved = [000]				Upper QOF Mask = <any value>		Upper Forward Code Channel Index (high part) = <any value>		k+8
Upper Forward Code Channel Index (low part) = <any value>								k+9
} Forward Burst Radio Info								
⇒ **Reverse Burst Radio Info:** A3/A7 Element Identifier = [12H]								1
Length = [04H, 08H]								2
Reverse Burst Radio Info {1..2:								
Coding Indicator = [00, 01]		SCH_ID = [00, 01]		Reverse Supplemental Channel Rate = [0000 – 1111]				m

3.2.8 A7-Burst Response

7	6	5	4	3	2	1	0	Octet
Reserved = [000]			Reverse Supplemental Channel Start Time = [0 0000 – 1 1111]					m+1
Rev Walsh ID = <any value> (Ignored)	Start Time Unit = [000 – 111]			Reverse Supplemental Channel Duration = [0000 – 1111]				m+2
Reserved = [0H]				Rev_Burst_DTX_Duration = [0H – FH]				m+3
} Reverse Burst Radio Info								
⇒ **A7 Destination ID:** A3/A7 Element Identifier = [2DH]								1
Length = [01H - 08H]								2
(MSB)	A7 Destination ID = <any value>							3
…								…
							(LSB)	k
⇒ **Cause List:** A3/A7 Element Identifier = [19H]								1
Length = <variable>								2
Cause Value {1+:								
Reserved = [0]	Cause Value = [07H (OAM&P intervention), 20H (Equipment failure), 21H (No radio resource available), 25H (BS not equipped), 40H (Ciphering algorithm not supported), 41H (Private long code not available or not supported), 42H (Requested MUX option or rates not available), 43H (Requested privacy configuration not available) 52H (Invalid message), 6DH (Protocol error), 6EH (No response from BS)]							n
} Cause Value								
⇒ **A7 Burst Retry Delay List:** A3/A7 Element Identifier = [70H]								1
Length = <variable>								2
Burst Retry Delay {1+:								
Reserved = [0000]				Burst Retry Delay = [0000 – 1010]				p
} Burst Retry Delay								

3.2.9 A7-Burst Commit

This A7 interface message is sent from the source BS to the target BS to commit a set of resources that have been reserved to support a traffic burst. This message can contain at most one cell in each direction.

Information Element	Section Reference	Element Direction	Type	
Message Type II	4.2.1	Source BS -> Target BS	M	
Call Connection Reference	4.2.23	Source BS -> Target BS	O	R
Cell Identifier List (Forward)	4.2.6	Source BS -> Target BS	O[a]	R
Cell Identifier List (Reverse)	4.2.6	Source BS -> Target BS	O[a]	R
Forward Burst Radio Info	4.2.10	Source BS -> Target BS	O[b,h]	C
Reverse Burst Radio Info	4.2.11	Source BS -> Target BS	O[c,h]	C
IS-2000 Forward Power Control Mode	4.2.47	Source BS -> Target BS	O[d]	C
IS-2000 FPC Gain Ratio Info	4.2.48	Source BS -> Target BS	O[e]	C
A7 Destination ID	4.2.44	Source BS -> Target BS	O[f]	C
Downlink Radio Environment	4.2.7	Source BS -> Target BS	O[g]	R

a. The length field of this element shall be set to '0' if no resources are to be allocated in the indicated direction.

b. This element is only included when forward link radio resources are to be allocated to the burst.

c. This element is only included when reverse link radio resources are to be allocated to the burst.

d. This element shall be included when supporting a secondary power control subchannel for the SCH. The Action Time Flag shall be set to '1' and the ACTION_TIME field shall be ignored. The FPC_MODE value shall go into effect at the earlier of the burst start times indicated in the Forward Burst Radio Info and/or Reverse Burst Radio Info element.

e. This element shall be included when supporting a secondary power control subchannel. It provides information used for forward gain equalization for the SCH.

f. This element is required if an A7 Originating ID value was included in an A7-Handoff Request Ack message previously received from the target BS for this call association.

g. This element is the CDMA Target One Way Delay for the cells listed in the Cell Identifier List (Forward) and Cell Identifier List (Reverse) IEs.

h. If this message corresponds to a request for a burst extension (refer to definition of burst extension in section 2.2.7.1), then the start time and rate shall be the same as in the corresponding A7-Burst Response message.

The following table shows the bitmap layout for the A7-Burst Commit message.

3.2.9 A7-Burst Commit

7	6	5	4	3	2	1	0	Octet
⇒ **Message Type II** = [92H]								1
⇒ **Call Connection Reference:** A3/A7 Element Identifier = [3FH]								1
Length = [08H]								2
(MSB)	Market ID = <any value>							3
							(LSB)	4
(MSB)	Generating Entity ID = <any value>							5
							(LSB)	6
(MSB)	Call Connection Reference = <any value>							7
								8
								9
							(LSB)	10
⇒ **Cell Identifier List (Forward):** A3/A7 Element Identifier = [1AH]								1
Length = [00H, 06H]								2
Cell Identification Discriminator = [07H]								3
Cell Identification {								
(MSB)	MSCID = <any value>							j
								j+1
							(LSB)	j+2
(MSB)	Cell = [001H-FFFH]							j+3
			(LSB)	Sector = [0H-FH] (0H = Omni)				j+4
} Cell Identification								
⇒ **Cell Identifier List (Reverse):** A3/A7 Element Identifier = [1AH]								1
Length = [00H, 06H]								2
Cell Identification Discriminator = [07H]								3
Cell Identification {								
(MSB)	MSCID = <any value>							j
								j+1
							(LSB)	j+2
(MSB)	Cell = [001H-FFFH]							j+3
			(LSB)	Sector = [0H-FH] (0H = Omni)				j+4
} Cell Identification								
⇒ **Forward Burst Radio Info:** A3/A7 Element Identifier = [11H]								1
Length = [0AH, 14H]								2
Forward Burst Radio Info {1..2:								

3.2.9 A7-Burst Commit

7	6	5	4	3	2	1	0	Octet
Coding Indicator = [00, 01]		SCH_ID = [0, 1]	QOF Mask = [00 – 11]		Forward Code Channel Index (high part) = [000 – 111]			k
Forward Code Channel Index (low part) = [00H – FFH]								k+1
Pilot PN Code (low part) = [00H – FFH]								k+2
Pilot PN Code (high part) [0,1]	Reserved =[00]		CCSH Encoder Type = [0,1]	Forward Supplemental Channel Rate = [0000 – 1111]				k+3
Reserved = [000]			Forward Supplemental Channel Start Time = [0 0000 – 1 1111]					k+4
SR3 Incl = [0, 1]	Start Time Unit = [000 – 111]		Forward Supplemental Channel Duration = [0000 – 1111]					k+5
Reserved = [000]			Lower QOF Mask = [00,01,10,11]		Lower Walsh Code Channel Index (high part) = <any value>			k+6
Lower Walsh Code Channel Index (low part) = <any value>								k+7
Reserved = [000]			Upper QOF Mask = [00,01,10,11]		Upper Walsh Code Channel Index (high part) = <any value>			k+8
Upper Walsh Code Channel Index (low part) = <any value>								k+9
} Forward Burst Radio Info								
⇒ **Reverse Burst Radio Info:** A3/A7 Element Identifier = [12H]								1
Length = [04H, 08H]								2
Reverse Burst Radio Info {1..2:								
Coding Indicator = [00, 01]		SCH_ID = [00, 01]		Reverse Supplemental Channel Rate = [0000 – 1111]				m
Reserved = [000]			Reverse Supplemental Channel Start Time = [0 0000 – 1 1111]					m+1
Rev Walsh ID = [0,1]	Start Time Unit = [000 – 111]			Reverse Supplemental Channel Duration = [0000 – 1111]				m+2
Reserved = [0H]				Rev_Burst_DTX_Duration = [0H – FH]				m+3
} Reverse Burst Radio Info								
⇒ **IS-2000 Forward Power Control Mode:** A3/A7 Element Identifier = [14H]								1
Length = [02H]								2
Reserved = [0000 0]					FPC_MODE = [000 – 110]			3

3.2.9 A7-Burst Commit

7	6	5	4	3	2	1	0	Octet
Action Time Flag = [1]	Reserved = [0]	ACTION_TIME = [00 0000] (Ignored)						4
⇒ **IS-2000 FPC Gain Ratio Info:** A3/A7 Element Identifier = [15H]								1
Length = [08H]								2
Initial Gain Ratio = [00H – FFH]								3
Reserved = [0]	Gain Adjust Step Size = [0H – FH]			Count of Gain Ratio Pairs = [011]				4
Min Gain Ratio 1 = [00H – FFH]								5
Max Gain Ratio 1 = [00H – FFH]								6
Min Gain Ratio 2 = [00H – FFH]								7
Max Gain Ratio 2 = [00H – FFH]								8
Min Gain Ratio 3 = [00H – FFH]								9
Max Gain Ratio 3 = [00H – FFH]								10
⇒ **A7 Destination ID:** A3/A7 Element Identifier = [2DH]								1
Length = [01H - 08H]								2
(MSB)	A7 Destination ID = <any value>							3
	…							…
							(LSB)	k
⇒ **Downlink Radio Environment:** A3/A7 Element Identifier = [29H]								1
Length = <variable>								2
Number of Cells = [01H, 02H]								3
Cell Identification Discriminator = [07H]								4
Downlink Radio Environment {1..2:								
(MSB)	MSCID = <any value>							j
								j+1
							(LSB)	j+2
(MSB)	Cell = [001H-FFFH]							j+3
			(LSB)	Sector = [0H-FH] (0H = Omni)				j+4
Reserved = [00]	Downlink Signal Strength Raw = [000000] (Ignored)							j+5
(MSB)	CDMA Target One Way Delay = <any value>							j+6
							(LSB)	j+7
} Downlink Radio Environment								

3.2.10 A7-Burst Release

This A7 interface message is sent from the source BS to the target BS to release a set of resources which have been reserved to support a traffic burst. It may be sent at any time after A7-Burst Response has been received (sent) for the indicated cell(s). This message can also be sent either from the source BS to the target BS or from the target BS to the source BS to terminate a burst early at one or more cells.

Information Element	Section Reference	Element Direction	Type	
Message Type II	4.2.1	Source BS <-> Target BS	M	
Call Connection Reference	4.2.23	Source BS <-> Target BS	O	R
Correlation ID	4.2.26	Source BS <-> Target BS	O[d]	C
Cell Identifier List (Forward)	4.2.6	Source BS <-> Target BS	O[a]	R
Cell Identifier List (Reverse)	4.2.6	Source BS <-> Target BS	O[a]	R
IS-2000 Forward Power Control Mode	4.2.47	Source BS -> Target BS	O[b]	C
A7 Destination ID	4.2.44	Source BS <-> Target BS	O[c]	C
Cause (Forward)	4.2.4	Source BS <-> Target BS	O[e]	C
Cause (Reverse)	4.2.4	Source BS <-> Target BS	O[f]	C

a. The length field of this element shall be set to '0' if no resources are being released in the indicated direction.

b. This element is included if the source BS requires a change to the FPC Mode at the target BS.

c. This element is required when this message is sent from the source BS if an A7 Originating ID value was included in an A7-Handoff Request Ack message previously received from the target BS for this call association. This element is required when this message is sent from the target BS if an A7 Originating ID value was included in an A7-Handoff Request message previously received from the source BS for this call association.

d. This element is required when this message is sent to the target BS to release resources that were reserved but will not be used to support a traffic burst. The value shall be the same as the value in the corresponding A7-Burst Response message.

   If this element is absent then the Burst Release message shall be interpreted as releasing the entire burst on the specified cell (if a continuation of this burst has been scheduled, the continuation is also considered released).

e. This information element is included when the Cell Identifier List (Forward) information element contains cells that are being released.

f. This information element is included when the Cell Identifier List (Reverse) information element contains cells that are being released.

The following table shows the bitmap layout for the A7-Burst Release message.

3.2.10 A7-Burst Release

7	6	5	4	3	2	1	0	Octet
⇒ **Message Type II** = [93H]								1
⇒ **Call Connection Reference:** A3/A7 Element Identifier = [3FH]								1
Length = [08H]								2
(MSB)	Market ID = <any value>							3
							(LSB)	4
(MSB)	Generating Entity ID = <any value>							5
							(LSB)	6
(MSB)	Call Connection Reference = <any value>							7
								8
								9
							(LSB)	10
⇒ **Correlation ID:** A3/A7 Element Identifier = [13H]								1
Length = [04H]								2
(MSB)	Correlation Value = <any value>							3
								4
								5
							(LSB)	6
⇒ **Cell Identifier List (Forward):** A3/A7 Element Identifier = [1AH]								1
Length = <variable>								2
Cell Identification Discriminator = [07H]								3
Cell Identification {1+:								
(MSB)	MSCID = <any value>							j
								j+1
							(LSB)	j+2
(MSB)	Cell = [001H-FFFH]							j+3
			(LSB)	Sector = [0H-FH] (0H = Omni)				j+4
} Cell Identification								
⇒ **Cell Identifier List (Reverse):** A3/A7 Element Identifier = [1AH]								1
Length = <variable>								2
Cell Identification Discriminator = [07H]								3
Cell Identification {1+:								
(MSB)	MSCID = <any value>							j
								j+1
							(LSB)	j+2

3.2.10 A7-Burst Release

7	6	5	4	3	2	1	0	Octet
(MSB)	Cell = [001H-FFFH]							j+3
			(LSB)	Sector = [0H-FH] (0H = Omni)				j+4
} Cell Identification								
⇒ **IS-2000 Forward Power Control Mode:** A3/A7 Element Identifier = [14H]								1
Length = [02H]								2
Reserved = [0000 0]					FPC_MODE = [000 – 110]			3
Action Time Flag = [0,1]	Reserved = [0]	ACTION_TIME = [00 0000 – 11 1111]						4
⇒ **A7 Destination ID:** A3/A7 Element Identifier = [2DH]								1
Length = [01H-08H]								2
(MSB)	A7 Destination ID = <any value>							3
…								…
							(LSB)	n
⇒ **Cause (Forward):** A3/A7 Element Identifier = [08H]								1
Length = [01H]								2
ext = [0]	Cause Value = [01H (Radio interface failure) 0DH (Timer expired), 0EH (Better cell), 20H (Equipment failure), 51H (FPC initial gain too high) 52H (Invalid message), 6DH (Protocol error), 6EH (No response from BS)]							3
⇒ **Cause (Reverse):** A3/A7 Element Identifier = [08H]								1
Length = [01H]								2
ext = [0]	Cause Value = [01H (Radio interface failure) 0DH (Timer expired), 0EH (Better cell), 20H (Equipment failure), 51H (FPC initial gain too high) 52H (Invalid message), 6DH (Protocol error), 6EH (No response from BS)]							3

1

3.2.11 A7-Reset

This A7 message can be sent between two BSs. It indicates to the receiving entity that the transmitting entity has failed and has lost memory of the connections in progress, connections set up, and associated references.

Information Element	Section Reference	Element Direction	Type	
Message Type II	4.2.1	First BS -> Second BS	M	
Cause	4.2.4	First BS -> Second BS	O	R
Software Version	4.2.12	First BS -> Second BS	O	R

The following table shows the bitmap layout for the A7-Reset message.

3.2.11 A7-Reset

7	6	5	4	3	2	1	0	Octet
⇒ **Message Type II** = [8AH]								1
⇒ **Cause:** A3/A7 Element Identifier = [08H]								1
Length = [01H]								2
ext = [0]	Cause Value = [07H (OAM&P intervention), 20H (Equipment failure)]							3
⇒ **Software Version:** A3/A7 Element Identifier = [31H]								1
Length = <variable>								2
IOS Major Revision Level (X) = [05H]								3
IOS Minor Revision Level (Y) = [01H]								4
IOS Point Release Level (Z) = [01H]								5
Manufacturer/Carrier Software Information = <printable ASCII character>								6
…								…
Manufacturer/Carrier Software Information = <printable ASCII character>								n

3.2.12 A7-Reset Acknowledge

This A7 message can be sent between two BSs. It indicates to the receiving entity that the transmitting entity has cleared all calls and reset all references, and is ready to resume service.

Information Element	Section Reference	Element Direction	Type	
Message Type II	4.2.1	First BS <-Second BS	M	
Software Version	4.2.12	First BS <- Second BS	O	R

The following table shows the bitmap layout for the A7-Reset Acknowledge message.

3.2.12 A7-Reset Acknowledge

7	6	5	4	3	2	1	0	Octet
⇒ **Message Type II** = [8BH]								1
⇒ **Software Version:** A3/A7 Element Identifier = [31H]								1
Length = <variable>								2
IOS Major Revision Level (X) = [05H]								3
IOS Minor Revision Level (Y) = [01H]								4
IOS Point Release Level (Z) = [01H]								5
Manufacturer/Carrier Software Information = <printable ASCII character>								6
…								…
Manufacturer/Carrier Software Information = <printable ASCII character>								n

3.2.13 A7-Paging Channel Message Transfer

This A7 interface message is sent from the source BS to the target BS to request the sending of the contained message on the specified paging channels to an MS.

Information Element	Section Reference	Element Direction	Type	
Message Type II	4.2.1	Source BS -> Target BS	M	
Correlation ID	4.2.26	Source BS -> Target BS	O[a]	C
Mobile Identity (IMSI)	4.2.3	Source BS -> Target BS	O[b]	R
Cell Identifier List	4.2.6	Source BS -> Target BS	O[c]	R
Air Interface Message	4.2.41	Source BS -> Target BS	O	R
Layer 2 Ack Request/Results	4.2.42	Source BS -> Target BS	O[d]	C
Physical Channel Info	4.2.2	Source BS -> Target BS	O[e]	R

a. If this element is included in this message, the value shall be returned in the A7-Paging Channel Message Transfer Ack message.

b. This element shall contain the IMSI sent by the MS.

c. This element indicates the cells at the target BS on whose paging channel(s) the air-interface message is to be sent.

d. This element is included if the source BS wants a Layer 2 acknowledgment from the MS.

e. This element indicates the ARFCN to be used for paging. All other fields shall be ignored.

The following table shows the bitmap layout for the A7-Paging Channel Message Transfer message.

3.2.13 A7-Paging Channel Message Transfer

7	6	5	4	3	2	1	0	Octet
⇒ **Message Type II** = [8CH]								1
⇒ **Correlation ID:** A3/A7 Element Identifier = [13H]								1
Length = [04H]								2
(MSB)	Correlation Value = <any value>							3
								4
								5
							(LSB)	6
⇒ **Mobile Identity (IMSI):** A3/A7 Element Identifier = [0DH]								1
Length = [06H-08H] (10-15 digits)								2
Identity Digit 1 = [0H-9H] (BCD)				Odd/even Indicator = [1,0]	Type of Identity = [110] (IMSI)			3
Identity Digit 3 = [0H-9H] (BCD)				Identity Digit 2 = [0H-9H] (BCD)				4
…								…

3.2.13 A7-Paging Channel Message Transfer

7	6	5	4	3	2	1	0	Octet
Identity Digit N+1 = [0H-9H] (BCD)				Identity Digit N = [0H-9H] (BCD)				n
= [1111] (if even number of digits)				Identity Digit N+2 = [0H-9H] (BCD)				n+1
⇒ **Cell Identifier List:** A3/A7 Element Identifier = [1AH]								1
Length = <variable>								2
Cell Identification Discriminator = [07H]								3
Cell Identification {1+:								
(MSB)	MSCID = <any value>							j
								j+1
							(LSB)	j+2
(MSB)	Cell = [001H-FFFH]							j+3
			(LSB)	Sector = [0H-FH] (0H = Omni)				j+4
} Cell Identification								
⇒ **Air Interface Message:** A3/A7 Element Identifier = [21H]								1
Length = <variable>								2
TIA/EIA/IS-2000 Message Type = <00H to FFH>								3
Air Interface Message Length = <variable>								4
(MSB)	Air Interface Message = <any value>							5
…								…
							(LSB)	k
⇒ **Layer 2 Ack Request/Results:** A3/A7 Element Identifier = [23H]								1
Length = [01H]								2
Reserved = [0000 000]							Layer 2 Ack = [0/1]	3
⇒ **Physical Channel Info:** A3/A7 Element Identifier = [07H]								1
Length =[06H]								2
Reserved = [000]			Rev_FCH_Gating = [0,1]	Frame Offset = [0H] (ignored)				3
A3 Traffic Channel Protocol Stack = [000] (ignored)			Pilot Gating Rate = [00] (ignored)		ARFCN (high part) = [000-111]			4
ARFCN (low part) = [00H-FFH]								5
Reserved = [0000]				OTD=[0] (ignored)	Count of Physical Channels = [000] (ignored)			6
Physical Channel 2 = 0H (ignored)				Physical Channel 1 = 0H (ignored)				7
Physical Channel 4 = 0H (ignored)				Physical Channel 3 = 0H (ignored)				8

3.2.14 A7-Paging Channel Message Transfer Ack

This A7 interface message is sent from the target BS to the source BS to report the results of sending an air interface message on the specified paging channel when a layer 2 acknowledgment had been requested by the source BS.

Information Element	Section Reference	Element Direction	Type	
Message Type II	4.2.1	Target BS -> Source BS	M	
Correlation ID	4.2.26	Target BS -> Source BS	O[a]	C
Layer 2 Ack Request/Results	4.2.42	Target BS -> Source BS	O[b]	C
Cause	4.2.4	Target BS -> Source BS	O[c]	C

a. This element is included if the A7-Paging Channel Message Transfer contained this element. It contains the value received in that message.

b. This element is included to indicate success or failure in receiving a Layer 2 acknowledgment from the MS. Either this element or the Cause element shall be present in this message, but not both simultaneously.

c. Inclusion of this element indicates a failure to send the paging channel message as requested in the A7-Paging Channel Message Transfer message.

The following table shows the bitmap layout for the A7-Paging Channel Message Transfer Ack message.

3.2.14 A7-Paging Channel Message Transfer Ack

7	6	5	4	3	2	1	0	Octet
⇒ **Message Type II** = [8DH]								1
⇒ **Correlation ID:** A3/A7 Element Identifier = [13H]								1
Length = [04H]								2
(MSB)	Correlation Value = <any value>							3
								4
								5
							(LSB)	6
⇒ **Layer 2 Ack Request/Results:** A3/A7 Element Identifier = [23H]								1
Length = [01H]								2
Reserved = [0000 000]							Layer 2 Ack = [0/1]	3
⇒ **Cause:** A3/A7 Element Identifier = [08H]								1
Length = [01H]								2
ext = [0]	Cause Value = [07H (OAM&P intervention), 20H (Equipment failure) 52H (Invalid message)]							3

3.2.15 A7-Access Channel Message Transfer

This A7 interface message is sent from the target BS to the source BS to notify the source BS of the reception of the contained message on the specified access channel.

Information Element	Section Reference	Element Direction	Type	
Message Type II	4.2.1	Target BS -> Source BS	M	
Correlation ID	4.2.26	Target BS -> Source BS	O[a]	C
Mobile Identity (IMSI)	4.2.3	Target BS -> Source BS	O[b]	R
Cell Identifier	4.2.5	Target BS -> Source BS	O[c]	R
Air Interface Message	4.2.41	Target BS -> Source BS	O	R

a. If this element is included in this message, then the value shall be returned in the A7-Access Channel Message Transfer Ack message.

b. This element shall contain the IMSI sent by the MS.

c. This element indicates the cell at the target BS on whose access channel the air-interface message was received.

The following table shows the bitmap layout for the A7-Access Channel Message Transfer message.

3.2.15 A7-Access Channel Message Transfer

7	6	5	4	3	2	1	0	Octet
⇒ **Message Type II** = [8EH]								1
⇒ **Correlation ID:** A3/A7 Element Identifier = [13H]								1
Length = [04H]								2
(MSB)	Correlation Value = <any value>							3
								4
								5
							(LSB)	6
⇒ **Mobile Identity (IMSI):** A3/A7 Element Identifier = [0DH]								1
Length = [06H-08H] (10-15 digits)								2
Identity Digit 1 = [0H-9H] (BCD)				Odd/even Indicator = [1,0]	Type of Identity = [110] (IMSI)			3
Identity Digit 3 = [0H-9H] (BCD)				Identity Digit 2 = [0H-9H] (BCD)				4
…								…
Identity Digit N+1 = [0H-9H] (BCD)				Identity Digit N = [0H-9H] (BCD)				n
= [1111] (if even number of digits)				Identity Digit N+2 = [0H-9H] (BCD)				n+1
⇒ **Cell Identifier:** A7 Element Identifier = [0AH]								1
Length = [06H]								2
Cell Identification Discriminator = [07H]								3

3.2.15 A7-Access Channel Message Transfer

7	6	5	4	3	2	1	0	Octet
(MSB)	MSCID = <any value>							4
								5
							(LSB)	6
(MSB)	Cell = [001H-FFFH]							7
			(LSB)	Sector = [0H-FH] (0H = Omni)				8
⇒ **Air Interface Message:** A3/A7 Element Identifier = [21H]								1
Length = <variable>								2
TIA/EIA/IS-2000 Message Type = <00H to FFH>								3
Air Interface Message Length = <variable>								4
(MSB)	Air Interface Message = <any value>							5
…								…
							(LSB)	k

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3.2.16 A7-Access Channel Message Transfer Ack

This A7 interface message is sent from the source BS to the target BS to acknowledge the receipt of the A7-Access Channel Message Transfer message.

Information Element	Section Reference	Element Direction	Type	
Message Type II	4.2.1	Source BS -> Target BS	M	
Correlation ID	4.2.26	Source BS -> Target BS	O[a]	C

a. This field is required if a Correlation ID value was included on the A7-Access Channel Message Transfer message to which this message is a response.

The following table shows the bitmap layout for the A7-Access Channel Message Transfer Ack message.

3.2.16 A7-Access Channel Message Transfer Ack

7	6	5	4	3	2	1	0	Octet
⇒ **Message Type II** = [8FH]								1
⇒ **Correlation ID:** A3/A7 Element Identifier = [13H]								1
Length = [04H]								2
(MSB)	Correlation Value = <any value>							3
								4
								5
							(LSB)	6

4.0 Information Element Definitions

This section contains the coding of the information elements used in the messages defined in section 3.0.

The following subsections define information element formats and ranges for parameter values. In the event that text in this section conflicts with text in section 3, the text in section 3 shall take precedence. Parameter usage may vary per message in that only a subset of the defined values may be applicable in a particular message. Therefore, the allowed values are specified per message in the subsections of section 3.0.

4.1 Generic Information Element Encoding

Information elements shall always use the same Information Element Identifier for all occurrences on a specific A_n interface. Insofar as possible, the same Information Element Identifier shall be used for a given information element when it is used on more than one of the A_n interfaces.

4.1.1 Conventions

The following conventions are assumed for the sequence of transmission of bits and bytes:

- Each bit position is marked as 0 to 7. Bit 0 is the least significant bit and is transmitted first.
- In a message, octets are identified by number. Octet 1 is transmitted first, then octet 2, etc.

For variable length elements, a length indicator is included. This indicates the number of octets following in the element.

The definition of whether an information element is mandatory or optional is specified in section 3.0.

The Information Element Identifier is included for all signaling messages on the A3 and A7 interfaces.

All unused and reserved bits are set to ‘0’, unless otherwise indicated.

For future expansion purposes, some information elements have fields within them that have been reserved.

4.1.2 Information Element Identifiers

The following table contains a list of all information elements that make up the messages defined in section 3.0. The table is sorted by the Information Element Identifier (IEI) coding which distinguishes one information element from another. The table also includes a reference to the section where the information element coding can be found and a column indicating on which interface(s) the element is used. A listing of information elements, sorted by name, is included in Table 4.1.5-1, which also specifies the messages in which each information element is used.

Table 4.1.2-1 A3/A7 Information Element Identifiers Sorted by Identifier Value

Element Name	IEI (Hex)	Interface(s)	Reference
A3 Traffic Circuit ID	03H	A3	4.2.22
PMC Cause	05H	A3	4.2.24
Reverse Pilot Gating Rate	06H	A3	4.2.8
Physical Channel Info	07H	A7	4.2.2
Cause	08H	A3, A7	4.2.4
One Way Propagation Delay Record	09H	A3	4.2.28
Cell Identifier	0AH	A7	4.2.5
IS-2000 Power Control Info	0BH	A3, A7	4.2.46
CDMA Serving One Way Delay	0CH	A7	4.2.18
Mobile Identity	0DH	A7	4.2.3
CDMA Long Code Transition Info	0EH	A3	4.2.31
Quality of Service Parameters	0FH	A7	4.2.9
IS-2000 Service Configuration Record	10H	A7	4.2.13
Forward Burst Radio Info	11H	A7	4.2.10
Reverse Burst Radio Info	12H	A7	4.2.11
Correlation ID	13H	A3, A7	4.2.26
IS-2000 Forward Power Control Mode	14H	A3, A7	4.2.47
IS-2000 FPC Gain Ratio Info	15H	A3, A7	4.2.48
Channel Element ID	17H	A3	4.2.32
Channel Element Status	18H	A3	4.2.34
Cause List	19H	A3, A7	4.2.35
Cell Identifier List	1AH	A3, A7	4.2.6
A3 Connect Information	1BH	A3	4.2.37
A3 Connect Ack Information	1CH	A3	4.2.38
Privacy Info	1DH	A7	4.2.36
A3 Drop Information	1EH	A3	4.2.40
A3 Remove Information	20H	A3	4.2.39

Table 4.1.2-1 A3/A7 Information Element Identifiers Sorted by Identifier Value

Element Name	IEI (Hex)	Interface(s)	Reference
Air Interface Message	21H	A7	4.2.41
IS-95 Channel Identity	22H	A7	4.2.59
Layer 2 Ack Request/Results	23H	A7	4.2.42
Downlink Radio Environment	29H	A7	4.2.7
A7 Originating ID	2CH	A7	4.2.43
A7 Destination ID	2DH	A3, A7	4.2.44
Software Version	31H	A7	4.2.12
Rescue Request Info	32H	A7	4.2.61
IS-2000 Non-Negotiable Service Configuration Record	33H	A7	4.2.27
Call Connection Reference	3FH	A3, A7	4.2.23
Neighbor List	48H	A7	4.2.19
A3 Signaling Address	49H	A7	4.2.20
SDU ID	4CH	A3, A7	4.2.21
A3 Destination ID	55H	A3	4.2.45
Band Class	5DH	A7	4.2.25
FCH/DCCH Forward Air Interval Control	62H	A3	4.2.49
FCH/DCCH Reverse Air Interval Control	63H	A3	4.2.50
Cell Commitment Info List	65H	A3/A7	4.2.56
Extended Neighbor List	66H	A3/A7	4.2.57
A7 Burst Retry Delay List	70H	A3	4.2.58
A3 Traffic IP Address	71H	A3	4.2.62
Cell Pilot Increment List	72H	A7	4.2.63
Forward 20 ms Data	None	A3	4.2.52
Forward 5 ms Data	None	A3	4.2.54
Forward Layer 3 Data	None	A3	4.2.29
Forward Layer 3 *IS-2000* FCH/DCCH Data	None	A3	4.2.14
Forward Layer 3 *IS-2000* SCH Data	None	A3	4.2.16
Message CRC	None	A3	4.2.33
Message Type II	None	A3/A7	4.2.1
Reverse 20 ms Data	None	A3	4.2.53
Reverse 5 ms Data	None	A3	4.2.55
Reverse Layer 3 Data	None	A3	4.2.30
Reverse Layer 3 *IS-2000* FCH/DCCH Data	None	A3	4.2.15
Reverse Layer 3 *IS-2000* SCH Data	None	A3	4.2.17
SCH Reverse Air Interval Control	None	A3	4.2.51

Table 4.1.2-1 A3/A7 Information Element Identifiers Sorted by Identifier Value

Element Name	IEI (Hex)	Interface(s)	Reference
All other values are reserved.			

4.1.3 A3 and A7 Interface Information Elements

All information elements carried exclusively on the A3 and A7 interfaces in signaling messages (i.e. excluding IEs carrying control channel and traffic frames or the Message Type II and the Message CRC IEs) shall be coded with an Information Element Identifier, a Length field, and a value part as shown in the following figure.

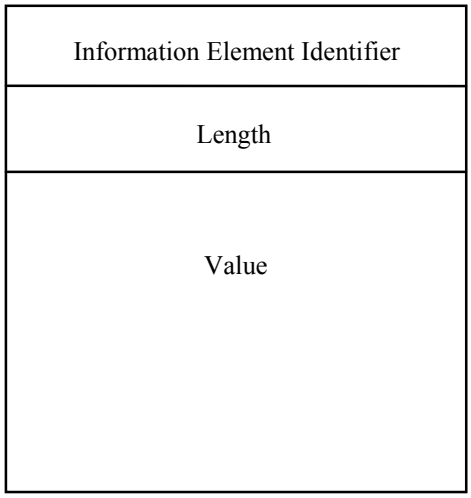

Figure 4.1.3-1 A3/A7 Information Element Generic Layout

The value component of the information element may be composed of one or more fields of varying sizes.

4.1.4 Additional Coding and Interpretation Rules for Information Elements

Information elements shall always use the same Information Element Identifier for all occurrences on a specific A3 and A7 interfaces. Insofar as possible, the same Information Element Identifier shall be used for a given information element when it is used on more than one of the A3 and A7 interfaces.

The order of appearance for each information element which is mandatory or optional in a message is laid down in the definition of the message.

Where the description of the information element in this standard contains unused bits, these bits are indicated as being set to '0'. To allow compatibility with future implementation, messages shall not be rejected simply because a spare bit is set to '1'.

An optional variable length information element may be present, but empty. For example, a message may contain an information element, the content of which is zero length. This shall be interpreted by the receiver as equivalent to that information element being absent.

4.1.5 Cross Reference of Information Elements With Messages

The following table provides a cross reference between the elements and the messages defined in this specification.

Table 4.1.5-1 Cross Reference of Information Elements with Messages

Information Element	Reference	IEI	Used in These Messages	Reference
A3 Connect Ack Information	4.2.38	1CH	A3-Connect Ack	3.1.2
A3 Connect Information	4.2.37	1BH	A3-Connect	3.1.1
A3 Destination ID	4.2.45	55H	A3-Remove Ack	3.1.4
			A3-Propagation Delay Measurement Report	3.1.6
			A3-Physical Transition Directive	3.1.7
			A3-Physical Transition Directive Ack	3.1.8
			A3-Traffic Channel Status	3.1.9
A3 Drop Information	4.2.40	1EH	A3-Drop	3.1.5
A3 Remove Information	4.2.39	20H	A3-Remove	3.1.3
A3 Signaling Address	4.2.20	49H	A7-Handoff Request	3.2.1
A3 Traffic Circuit ID	4.2.22	03H	A3-Physical Transition Directive	3.1.7
A3 Traffic IP Address	4.2.62	71H	A3-Connect	3.1.1
			A3-Connect Ack	3.1.2
			A3-Remove	3.1.3
			A3-Drop	3.1.5
			A3-Physical Transition Directive	3.1.7
A7 Burst Retry Delay List	4.2.58	70H	A7-Burst Response	3.2.8
A7 Destination ID	4.2.44	2DH	A3-Propagation Delay Measurement Report	3.1.6
			A3 Remove Ack	3.1.4
			A3-Physical Transition Directive Ack	3.1.8
			A3-Traffic Channel Status	3.1.9
			A7-Handoff Request Ack	3.2.2
			A7-Drop Target	3.2.3
			A7-Drop Target Ack	3.2.4
			A7-Target Removal Request	3.2.5
			A7-Target Removal Response	3.2.6
			A7-Burst Request	3.2.7
			A7-Burst Response	3.2.8
			A7-Burst Commit	3.2.9

Table 4.1.5-1 Cross Reference of Information Elements with Messages

Information Element	Reference	IEI	Used in These Messages	Reference
			A7-Burst Release	3.2.10
A7 Originating ID	4.2.43	2CH	A7-Handoff Request	3.2.1
			A7-Handoff Request Ack	3.2.2
Air Interface Message	4.2.41	21H	A7-Access Channel Message Transfer	3.2.15
			A7-Paging Channel Message Transfer	3.2.13
Band Class	4.2.25	5DH	A7-Handoff Request	3.2.1
Call Connection Reference	4.2.23	3FH	A3-Physical Transition Directive	3.1.7
			A3-Physical Transition Directive Ack	3.1.8
			A3-Connect	3.1.1
			A3-Connect Ack	3.1.2
			A3-Drop	3.1.5
			A3-Propagation Delay Measurement Report	3.1.6
			A3-Remove	3.1.3
			A3-Remove Ack	3.1.4
			A3-Traffic Channel Status	3.1.9
			A7-Burst Request	3.2.7
			A7-Burst Response	3.2.8
			A7-Burst Commit	3.2.9
			A7-Burst Release	3.2.10
			A7-Drop Target	3.2.3
			A7-Drop Target Ack	3.2.4
			A7-Handoff Request	3.2.1
			A7-Handoff Request Ack	3.2.2
			A7-Target Removal Request	3.2.5
			A7-Target Removal Response	3.2.6
Cause	4.2.4	08H	A7-Paging Channel Message Transfer Ack	3.2.14
			A7-Reset	3.2.11
			A3 -Remove Ack	3.1.4
			A7-Burst Release	3.2.10
Cause List	4.2.35	19H	A3-Drop	3.1.5
			A7-Handoff Request Ack	3.2.2
			A7-Target Removal Request	3.2.5
			A7-Target Removal Response	3.2.6

Table 4.1.5-1 Cross Reference of Information Elements with Messages

Information Element	Reference	IEI	Used in These Messages	Reference
			A7-Burst Response	3.2.8
CDMA Long Code Transition Info	4.2.31	0EH	A3-Physical Transition Directive	3.1.7
CDMA Serving One Way Delay	4.2.18	0CH	A7-Handoff Request	3.2.1
Cell Commitment Info List	4.2.56	65H	A7-Handoff Request Ack	3.2.2
Cell Identifier	4.2.5	0AH	A7-Access Channel Message Transfer	3.2.15
Cell Identifier List	4.2.6	1AH	A3-Traffic Channel Status	3.1.9
			A7-Drop Target	3.2.3
			A7-Handoff Request	3.2.1
			A7-Paging Channel Message Transfer	3.2.13
			A3-Physical Transition Directive Ack	3.1.8
			A7-Target Removal Response	3.2.6
			A7-Target Removal Request	3.2.5
			A7-Burst Request	3.2.7
			A7-Burst Release	3.2.10
			A7-Burst Response	3.2.8
			A7-Burst Commit	3.2.9
			A7-Handoff Request Ack	3.2.2
Cell Pilot Increment List	4.2.63	72H	A7-Handoff Request Ack	3.2.2
Channel Element ID	4.2.32	17H	A3-Physical Transition Directive	3.1.7
Channel Element Status	4.2.34	18H	A3-Traffic Channel Status	3.1.9
Correlation ID	4.2.26	13H	A3-Connect	3.1.1
			A3-Connect Ack	3.1.2
			A3-Remove	3.1.3
			A3-Remove Ack	3.1.4
			A7-Access Channel Message Transfer	3.2.15
			A7-Access Channel Message Transfer Ack	3.2.16
			A7-Burst Request	3.2.7
			A7-Burst Response	3.2.8
			A7-Burst Release	3.2.10
			A7-Drop Target	3.2.3
			A7-Drop Target Ack	3.2.4
			A7-Handoff Request	3.2.1

Table 4.1.5-1 Cross Reference of Information Elements with Messages

Information Element	Reference	IEI	Used in These Messages	Reference
			A7-Handoff Request Ack	3.2.2
			A7-Paging Channel Message Transfer	3.2.13
			A7-Paging Channel Message Transfer Ack	3.2.14
			A7-Target Removal Request	3.2.5
			A7-Target Removal Response	3.2.6
Downlink Radio Environment	4.2.7	29H	A7-Handoff Request	3.2.1
			A7-Burst Commit	3.2.9
Extended Neighbor List	4.2.57	66H	A7-Handoff Request Ack	3.2.2
FCH/DCCH Forward Air Interval Control	4.2.49	62H	A3-FCH Forward Traffic Frame	3.1.18
			A3-DCCH Forward Traffic Frame	3.1.20
FCH/DCCH Reverse Air Interval Control	4.2.50	63H	A3-DCCH Reverse Traffic Frame	3.1.21
			A3-FCH Reverse Traffic Frame	3.1.19
Forward 20 ms Data	4.2.52	None	A3-FCH Forward Traffic Frame	3.1.18
			A3-DCCH Forward Traffic Frame	3.1.20
Forward 5 ms Data	4.2.54	None	A3-FCH Forward Traffic Frame	3.1.18
			A3-DCCH Forward Traffic Frame	3.1.20
Forward Burst Radio Info	4.2.10	11H	A7-Burst Request	3.2.7
			A7-Burst Response	3.2.8
			A7-Burst Commit	3.2.9
Forward Layer 3 Data	4.2.29	None	A3-IS-95 FCH Forward	3.1.10
Forward Layer 3 *IS-2000* FCH/DCCH Data	4.2.14	None	A3-*IS-2000* FCH Forward	3.1.12
			A3-*IS-2000* DCCH Forward	3.1.14
Forward Layer 3 *IS-2000* SCH Data	4.2.16	None	A3-*IS-2000* SCH Forward	3.1.16
IS-2000 FPC Gain Ratio Info	4.2.48	15H	A7-Handoff Request	3.2.1
			A3-Physical Transition Directive	3.1.7
			A7-Burst Commit	3.2.9
IS-2000 Forward Power Control Mode	4.2.47	14H	A3-Physical Transition Directive	3.1.7
			A7-Handoff Request	3.2.1

Table 4.1.5-1 Cross Reference of Information Elements with Messages

Information Element	Reference	IEI	Used in These Messages	Reference
			A7-Burst Commit	3.2.9
			A7-Burst Release	3.2.10
IS-2000 Power Control Info	4.2.46	0BH	A7-Handoff Request	3.2.1
			A3-Physical Transition Directive	3.1.7
IS-2000 Non-Negotiable Service Configuration Record	4.2.27	33H	A7-Handoff Request	3.2.1
IS-2000 Service Configuration Record	4.2.13	10H	A7-Handoff Request	3.2.1
IS-95 Channel Identity	4.2.59	22H	A7-Handoff Request	3.2.1
Layer 2 Ack Request/Results	4.2.42	23H	A7-Paging Channel Message Transfer	3.2.13
			A7-Paging Channel Message Transfer Ack	3.2.14
Message CRC	4.2.33	None	A3-*IS-95* FCH Forward	3.1.10
			A3-*IS-95* FCH Reverse	3.1.11
			A3-*IS-2000* DCCH Forward	3.1.14
			A3-*IS-2000* DCCH Reverse	3.1.15
			A3-*IS-2000* FCH Forward	3.1.12
			A3-*IS-2000* FCH Reverse	3.1.13
			A3-*IS-2000* SCH Forward	3.1.16
			A3-*IS-2000* SCH Reverse	3.1.17
			A3-FCH Forward Traffic Frame	3.1.18
			A3-DCCH Forward Traffic Frame	3.1.20
			A3-FCH Reverse Traffic Frame	3.1.19
			A3-DCCH Reverse Traffic Frame	3.1.21
			A3-SCH Reverse Traffic Frame	3.1.22
Message Type II	4.2.1	None	A3-Physical Transition Directive	3.1.7
			A3-Physical Transition Directive Ack	3.1.8
			A3-*IS-2000* DCCH Forward	3.1.14
			A3-*IS-2000* DCCH Reverse	3.1.15
			A3-*IS-95* FCH Forward	3.1.10
			A3-*IS-95* FCH Reverse	3.1.11
			A3-Connect	3.1.1

Table 4.1.5-1 Cross Reference of Information Elements with Messages

Information Element	Reference	IEI	Used in These Messages	Reference
			A3-Connect Ack	3.1.2
			A3-Drop	3.1.5
			A3-*IS-2000* FCH Forward	3.1.12
			A3-*IS-2000* FCH Reverse	3.1.13
			A3-Propagation Delay Measurement Report	3.1.6
			A3-Remove	3.1.3
			A3-Remove Ack	3.1.4
			A3-*IS-2000* SCH Forward	3.1.16
			A3-*IS-2000* SCH Reverse	3.1.17
			A3-Traffic Channel Status	3.1.9
			A7-Access Channel Message Transfer	3.2.15
			A7-Access Channel Message Transfer Ack	3.2.16
			A7-Burst Commit	3.2.9
			A7-Burst Release	3.2.10
			A7-Burst Request	3.2.7
			A7-Burst Response	3.2.8
			A7-Drop Target	3.2.3
			A7-Drop Target Ack	3.2.4
			A7-Handoff Request	3.2.1
			A7-Handoff Request Ack	3.2.2
			A7-Paging Channel Message Transfer	3.2.13
			A7-Paging Channel Message Transfer Ack	3.2.14
			A7-Reset	3.2.11
			A7-Reset Acknowledge	3.2.12
			A7-Target Removal Request	3.2.5
			A7-Target Removal Response	3.2.6
			A3-FCH Forward Traffic Frame	3.1.18
			A3-DCCH Forward Traffic Frame	3.1.20
			A3-FCH Reverse Traffic Frame	3.1.19
			A3-DCCH Reverse Traffic Frame	3.1.21

Table 4.1.5-1 Cross Reference of Information Elements with Messages

Information Element	Reference	IEI	Used in These Messages	Reference
			A3-SCH Reverse Traffic Frame	3.1.22
Mobile Identity	4.2.3	0DH	A7 Burst Request	3.2.7
			A7-Handoff Request	3.2.1
			A7-Access Channel Message Transfer	3.2.15
			A7-Paging Channel Message Transfer	3.2.13
Neighbor List	4.2.19	48H	A7-Handoff Request Ack	3.2.2
One way Propagation Delay Record	4.2.28	09H	A3-Propagation Delay Measurement Report	3.1.6
Physical Channel Info	4.2.2	07H	A7-Handoff Request	3.2.1
			A7-Paging Channel Message Transfer	3.2.13
PMC Cause	4.2.24	05H	A3-Physical Transition Directive Ack	3.1.8
Privacy Info	4.2.36	1DH	A7-Handoff Request	3.2.1
			A3-Physical Transition Directive	3.1.7
Quality of Service Parameters	4.2.9	0FH	A7-Handoff Request	3.2.1
Rescue Request Info	4.2.61	32H	A7-Handoff Request	3.2.1
Reverse 20 ms Data	4.2.53	None	A3-FCH Reverse Traffic Frame	3.1.19
			A3-DCCH Reverse Traffic Frame	3.1.21
			A3-SCH Reverse Traffic Frame	3.1.22
Reverse 5 ms Data	4.2.55	None	A3-FCH Reverse Traffic Frame	3.1.19
			A3-DCCH Reverse Traffic Frame	3.1.21
Reverse Burst Radio Info	4.2.11	12H	A7-Burst Request	3.2.7
			A7-Burst Response	3.2.8
			A7-Burst Commit	3.2.9
Reverse Layer 3 Data	4.2.30	None	A3-*IS-95* FCH Reverse	3.1.11
Reverse Layer 3 *IS-2000* FCH/DCCH Data	4.2.15	None	A3-*IS-2000* FCH Reverse	3.1.13
			A3-*IS-2000* DCCH Reverse	3.1.15
Reverse Layer 3 *IS-2000* SCH Data	4.2.17	None	A3-*IS-2000* SCH Reverse	3.1.17
Reverse Pilot Gating Rate	4.2.8	06H	A3-Physical Transition Directive	3.1.7

Table 4.1.5-1 Cross Reference of Information Elements with Messages

Information Element	Reference	IEI	Used in These Messages	Reference
SCH Reverse Air Interval Control	42.51	None	A3-SCH Reverse Traffic Frame	3.1.22
SDU ID	4.2.21	4CH	A3-Physical Transition Directive Ack	3.1.8
			A3-Connect	3.1.1
			A3-Propagation Delay Measurement Report	3.1.6
			A3-Remove	3.1.3
			A3-Traffic Channel Status	3.1.9
			A7-Handoff Request	3.2.1
Software Version	4.2.12	31H	A7-Reset	3.2.11
			A7-Reset Acknowledge	3.2.12

1

4.2 Information Elements

4.2.1 Message Type II

The Message Type II element is used to indicate the type of a message on the A3 and A7 interfaces.

Element Format:

4.2.1 Message Type II

7	6	5	4	3	2	1	0	Octet
Message Type II								1

Table 4.2.1-1 A3 and A7 Message Type II Values

Message Name	Message Type II Value	Interface	Section Reference
A3-Connect	01H	A3	3.1.1
A3-Connect Ack	02H	A3	3.1.2
A3-Remove	03H	A3	3.1.3
A3-Remove Ack	04H	A3	3.1.4
A3-Drop	05H	A3	3.1.5
A3-Propagation Delay Measurement Report	06H	A3	3.1.6
A3-*IS-95* FCH Forward	07H	A3	3.1.10
A3-*IS-95* FCH Reverse	08H	A3	3.1.11
A3-Physical Transition Directive	09H	A3	3.1.7
A3-Physical Transition Directive Ack	0AH	A3	3.1.8
A3-*IS-2000* FCH Forward	0BH	A3	3.1.12
A3-*IS-2000* FCH Reverse	0CH	A3	3.1.13
A3-Traffic Channel Status	0DH	A3	3.1.9
A3-*IS-2000* DCCH Forward	0EH	A3	3.1.14
A3-*IS-2000* DCCH Reverse	0FH	A3	3.1.15
A3-*IS-2000* SCH Forward	10H	A3	3.1.16
A3-*IS-2000* SCH Reverse	11H	A3	3.1.17
A3-FCH Forward Traffic Frame	12H	A3	3.1.18
A3-DCCH Forward Traffic Frame	13H	A3	3.1.20
A3-FCH Reverse Traffic Frame	15H	A3	3.1.19
A3-DCCH Reverse Traffic Frame	16H	A3	3.1.21
A3-SCH Reverse Traffic Frame	17H	A3	3.1.22

Table 4.2.1-1 A3 and A7 Message Type II Values

Message Name	Message Type II Value	Interface	Section Reference
A7-Handoff Request	80H	A7	3.2.1
A7-Handoff Request Ack	81H	A7	3.2.2
A7-Drop Target	82H	A7	3.2.3
A7-Drop Target Ack	83H	A7	3.2.4
A7-Target Removal Request	84H	A7	3.2.5
A7-Target Removal Response	85H	A7	3.2.6
(unused value – available)	86H		
(unused value – available)	87H		
(unused value – available)	88H		
(unused value – available)	89H		
A7-Reset	8AH	A7	3.2.11
A7-Reset Acknowledge	8BH	A7	3.2.12
A7-Paging Channel Message Transfer	8CH	A7	3.2.13
A7-Paging Channel Message Transfer Ack	8DH	A7	3.2.14
A7-Access Channel Message Transfer	8EH	A7	3.2.15
A7-Access Channel Message Transfer Ack	8FH	A7	3.2.16
A7-Burst Request	90H	A7	3.2.7
A7-Burst Response	91H	A7	3.2.8
A7-Burst Commit	92H	A7	3.2.9
A7-Burst Release	93H	A7	3.2.10
All other values are reserved.			

4.2.2 Physical Channel Info

This element provides information about a set of physical channels for a call association.

4.2.2 Physical Channel Info

7	6	5	4	3	2	1	0	Octet
A3/A7 Element Identifier								1
Length								2
Reserved			Rev_FCH_ Gating	Frame Offset				3
A3 Traffic Channel Protocol Stack			Pilot Gating Rate		(MSB)			4
ARFCN							(LSB)	5
Reserved				OTD	Count of Physical Channels			6
Physical Channel 2				Physical Channel 1				7
Physical Channel 4				Physical Channel 3				8

Length:

This field indicates the number of octets in this element following the Length field. This field shall be set to 06H.

Rev_FCH_Gating:

This field is used to indicate reverse FCH gating capability. It is set to '1' if the BS allows the MS to perform reverse FCH gating; otherwise it is set to '0'.

Frame Offset:

This field indicates the frame offset for the given physical channel.

A3 Traffic Channel Protocol Stack:

This field indicates the protocol stack to be used with A3 traffic channels attached to the given physical channels. Valid values are shown in Table 4.2.2-1.

When using an ATM-based protocol stack, the VCCI and CID are used for addressing. When using an IP-based protocol stack, the IP address and port number are used for addressing.

Table 4.2.2-1 A3 Traffic Channel Protocol Stack

Binary Value	Protocol Stack
001	AAL2 / ATM / Physical Layer
010	UDP / IP / L2 / Physical Layer (IP-Based)
All other values	Reserved

Pilot Gating Rate:

The actual Reverse Pilot Gating Rate. This field is used to indicate the gating rate for the Reverse Pilot channel as shown in Table 4.2.2-2.

This field is used for the DCCH. If the FCH is being used this field is set to '00' (i.e. there is no pilot gating on the FCH).

Table 4.2.2-2 Reverse Pilot Gating Rate

Binary Values	Meaning
00	Gating rate 1
01	Gating rate 1/2
10	Gating rate 1/4
11	Reserved

ARFCN:

This field indicates the Absolute Radio Frequency Channel Number relative to the band class for the call association. For 3X systems, the channel number refers to the center frequency channel.

NOTE: The Frame Offset, A3 Traffic Channel Protocol Stack, Pilot Gating Rate and ARFCN are the same for ALL physical channels of a call association.

OTD:

This bit shall be set to '1' to indicate that the MS is using OTD. It is set to '0' otherwise.

Count of Physical Channels:

The number of physical channels represented in this element. In this version of the standard the value shall be 1H, 2H, 3H, or 4H. If the value is 1H, then Physical Channel 2, Physical Channel 3, and Physical Channel 4 shall be coded as '0000'. If the value is 02H, then Physical Channel 3 and Physical Channel 4 shall be coded as '0000'. If the value is 03H, then Physical Channel 4 shall be coded as '0000'.

Physical Channel n:

These fields contain the binary values used to indicate the type of physical channel associated with the indicated cells. Valid values are shown in Table 4.2.2-3.

Table 4.2.2-3 Physical Channel Info - Physical Channel

Value (hex)	Physical Channel Type
0H	*IS-95* Fundamental Channel *TIA/EIA/IS-95*
1H	Fundamental Channel (FCH) *TIA/EIA/IS-2000*
2H	Supplemental Channel (SCH_0) *TIA/EIA/IS-2000*
3H	Dedicated Control Channel (DCCH) *TIA/EIA/IS-2000*
4H	Supplemental Channel (SCH_1) *TIA/EIA/IS-2000*
All other values	Reserved

4.2.3 Mobile Identity

The purpose of the mobile identity information element is to provide the MS Electronic Serial Number (ESN), the International Mobile Subscriber Identity (IMSI) or Mobile Equipment Identifier (MEID) for cdma2000.

The IMSI does not exceed 15 digits and the ESN is a 32 bit field separated into a Manufacturer code, the Serial Number and a Reserved field. The MEID consists of 14 hexadecimal digits.

Warning: Prior to IOS v3.0 the length limit for this IE was 10 octets. Care needs to be exercised for interoperability with implementations based on the previous standard.

4.2.3 Mobile Identity

7	6	5	4	3	2	1	0	Octet
A3/A7 Element Identifier								1
Length								2
Identity Digit 1				Odd/Even Indicator	Type of Identity			3
Identity Digit 3				Identity Digit 2				4
…								…
Identity Digit N+1				Identity Digit N				k

Length:

This field is defined as the number of octets following the Length field.

Type of Identity:

This field is defined as follows:

Table 4.2.3-1 Mobile Identity - Type of Identity Coding

Binary Values	Meaning
000	No Identity Code
001	MEID
101	ESN
110	IMSI

Odd/Even Indicator (octet 3; bit 3):

This field is set to ‘0’ for an even number of digits and to ‘1’ for an odd number of identity digits.

Identity Digits (octet 3 etc.):

The MEID Identity Digit fields are coded using 14 hexadecimal digits. The Odd/Even Indicator is set to ‘0’ and bits 4 to 7 of the last octet shall be filled with an end mark coded as ‘1111’.

The IMSI Identity Digit fields are coded using BCD coding format. If the number of identity digits is even then bits 4 to 7 of the last octet shall be filled with an end mark coded as ‘1111’.

The ESN is not separated into digits, and occupies octets 4-7 with the most significant bit in octet 4 bit 7. Identity Digit 1 in octet 3 is unused and coded as ‘0000’.

Note: ESN may be the true ESN, UIM_ID or the pseudo ESN (derived from the MEID or received in a Status Response Message from the MS).

4.2.4 Cause

This element is used to indicate the reason for occurrence of a particular event and is coded as follows.

4.2.4 Cause

7	6	5	4	3	2	1	0	Octet
A3/A7 Element Identifier								1
Length								2
0/1	Cause Value							3

A Cause information element exists for multiple interfaces. The cause values defined in this document are specific to the A7 interface.

The Length is defined as the number of octets following the Length field.

The Cause Value field is a single octet field if the extension bit (bit 7) is set to '0'. If bit 7 of octet 3 is set to '1' then the cause value is a two octet field. If the value of the first octet of the cause field is '1XXX 0000' then the second octet is reserved for national applications, where 'XXX' indicates the Cause Class as indicated in the Table 4.2.4-1.

Table 4.2.4-1 Cause Class Values

Binary Values	Meaning
000	Normal event
001	Normal event
010	Resource Unavailable
011	Service or option not available
100	Service or option not implemented
101	Invalid message (e.g., parameter out of range)
110	Protocol error
111	Interworking

Table 4.2.4-2 Cause Values

6	5	4	3	2	1	0	Hex Value	Cause
Normal Event Class (000 xxxx and 001 xxxx)								
0	0	0	0	0	0	1	01	Radio interface failure
0	0	0	0	0	1	0	02	Uplink quality
0	0	0	0	0	1	1	03	Uplink strength
0	0	0	0	1	0	0	04	Downlink quality
0	0	0	0	1	0	1	05	Downlink strength
0	0	0	0	1	1	1	07	OAM&P intervention
0	0	0	1	1	0	1	0D	Timer expired
0	0	0	1	1	1	0	0E	Better cell (power budget)
0	0	1	0	0	0	1	11	Service option not available
0	0	1	0	0	1	0	12	Invalid call
Resource Unavailable Class (010 xxxx)								
0	1	0	0	0	0	0	20	Equipment failure
0	1	0	0	0	0	1	21	No radio resource available
0	1	0	0	1	0	1	25	BS not equipped
0	1	0	0	1	1	1	27	2G only sector
0	1	0	1	0	0	0	28	2G only carrier
Service or Option Not Available Class (011 xxxx)								
0	1	1	0	1	0	1	35	Requested FPC mode change failed
Service or Option Not Implemented Class (100 xxxx)								
1	0	0	0	0	0	0	40	Ciphering algorithm not supported
1	0	0	0	0	0	1	41	Private long code not available or not supported.
1	0	0	0	0	1	0	42	Requested MUX option or rates not available.
1	0	0	0	0	1	1	43	Requested privacy configuration unavailable
1	0	0	0	1	0	0	44	SCH not supported
1	0	0	0	1	1	0	46	Long code value not available
1	0	0	0	1	1	1	47	DCCH not supported
Invalid Message Class (101 xxxx)								
1	0	1	0	0	0	1	51	FPC initial gain too high
1	0	1	0	0	1	0	52	Invalid Message
Protocol Error Class (110 xxxx)								
1	1	0	1	1	0	1	6D	Protocol error
1	1	0	1	1	1	0	6E	No response from BS
1	1	0	1	1	1	1	6F	Invalid call connection reference
All other values								Reserved for future use.

4.2.5 Cell Identifier

This element uniquely identifies a particular cell and is of variable length depending on how the cell is identified. The fields of this element are as follows:

4.2.5 Cell Identifier

7	6	5	4	3	2	1	0	Octet
A3/A7 Element Identifier								1
Length								2
Cell Identification Discriminator								3
Cell Identification								Var.

Length:

This field indicates the number of octets in this element following the Length field. The length depends on the Cell Identification Discriminator (octet 3).

Cell Identifier Discriminator:

The Cell Identification Discriminator is a binary number indicating if the whole or a part of the Cell Global Identification (e.g., one or more of the following: MCC, MNC, LAC, MSCID, CI) is used for cell identification in octets 4 through n. The Cell Identification Discriminator is coded as follows:

Table 4.2.5-1 Cell Identifier - Cell Identification Discriminator List

Binary Values	Meaning
0000 0111[a]	IS-41 whole Cell Global Identification is used to identify the cell.

a. When the Cell Identifier is used to identify a cell controlled by another MSC, type 0000 0111 is used.

Cell Identifier:

This field includes a unique identification number for the cell being referenced. It is coded as indicated in Table 4.2.5-4, depending on the value of the Cell Identifier Discriminator.

Table 4.2.5-4 Cell Identifier - Cell Identification Discriminator = '0000 0111'

7	6	5	4	3	2	1	0	Octet
MSCID								4
								5
								6
Cell								7
				Sector				8

MSCID:

The MSCID is coded as defined in [9], section 6.5.2.82. MSCID is 3 octets long where the first two octets (octets 4 and 5) represent Market ID and the last octet represents the Switch Number. In the MSCID field, bit 7 of octet 4 is the most significant bit and bit 0 of octet 5 is the

least significant bit of the Market ID field. In the MSCID field bit 7 of octet 6 is the most significant bit of the Switch Number field.

Cell/Sector:

In the CI value field bit 7 of octet 7 is the most significant bit and bit 0 of octet 8 is the least significant bit. Bits 3 to 0 of octet 8 contain the sector number (0H = omni). The coding of the cell identity is the responsibility of each administrator. Coding using full hexadecimal representation may be used. The cell identity consists of 2 octets maximum. If an administration has chosen N bits for the cell identity where N <16 then the additional bits up to 16 are coded with a '0' in each in the following way:

If 8 <N<16 the bits N-8 through 7 of octet 8 are coded with a '0' in each.

If N=8 then octet 8 is coded with a '0' in each bit.

If N<8 then octet 8 is coded with a '0' in each bit and bits N through 7 of octet 7 are coded with a '0' in each.

4.2.6 Cell Identifier List

This element uniquely identifies cells and is of variable length containing the following fields:

4.2.6 Cell Identifier List

7	6	5	4	3	2	1	0	Octet
A3/A7 Element Identifier								1
Length								2
Cell Identification Discriminator								3
Cell Identification 1								4
…								…
Cell Identification n								k

The Length field is a binary value indicating the number of octets following the Length field. The Cell Identification Discriminator and Cell Identification fields are coded as in the Cell Identifier information element; refer to section 4.2.5.

4.2.7 Downlink Radio Environment

This element includes signal strength measurement information that was made by the MS. It is of variable length and is coded as follows:

4.2.7 Downlink Radio Environment

7	6	5	4	3	2	1	0	Octet
A3/A7 Element Identifier								1
Length								2
Number of cells								3
Cell Identification Discriminator								4
Cell Identification 1								variable
Reserved		Downlink Signal Strength Raw						k
CDMA Target One Way Delay (high part)								k+1
CDMA Target One Way Delay (low part)								k+2
…								…
Cell Identification n								variable
Reserved		Downlink Signal Strength Raw						n
CDMA Target One Way Delay (high part)								n+1
CDMA Target One Way Delay (low part)								n+2

The Length field is defined as the number of octets following the Length field.

Octet 3 indicates the number of cells represented by this element. For each cell, the Cell Identification, Downlink Signal Strength Raw, and CDMA Target One Way Delay fields are replicated.

In octet 4, the Cell Identification Discriminator is coded per section 4.2.5. It applies to all Cell Identification fields present in this element.

The Cell Identification is coded as per the equivalent octets described in section 4.2.5, and shall uniquely identify one cell. Only one cell can be indicated per replication.

Downlink Signal Measurement Raw is an average signal level measured by the MS for the specified cell. The method of measurement is unique to the signaling system. The signal level is the last measurement average received from the MS in its raw, not normalized format.

The range of values for this field is 0 to 63 where the units are defined by

$$\left\lfloor -2 \times 10 \times \log_{10} \mathrm{PS} \right\rfloor$$

where PS is the strength of this pilot measured as the sum of ratios of received pilot energy per chip to the total received spectral density (noise and signals) of at most k usable multi-path components, where k is the number of demodulating elements supported by the MS.

The CDMA Target One Way Delay field shall contain the estimated one-way delay from the MS to the associated target cell, according to the information reported by the MS.

The CDMA Target One Way Delay is specified as a two's-compliment value, expressed in units of 100 ns.

The BS calculates the value of the CDMA Target One Way Delay as follows:

$$\lfloor (\text{Target PN phase measured by the MS} - \text{Target pilot offset index} \times 64 + \text{CDMA Serving One Way Delay in PN chips}) / 0.12288 \rfloor$$

where:

- The target PN phase is reported by the MS in the Pilot Strength Measurement Message.
- The target pilot offset index is derived by the BS from information in the Pilot Strength Measurement Message.
- The CDMA Serving One Way Delay is maintained in information known to the one way propagation delay estimated by the BS in relation to CDMA System Time, refer to [2]. Refer also to section 4.2.18, CDMA Serving One Way Delay.

4.2.8 Reverse Pilot Gating Rate

This element indicates the Reverse Pilot Gating Rate to be used by the MS as well as the explicit time of transition to the new gating rate. The BTS uses this information to process inner loop power control.

4.2.8 Reverse Pilot Gating Rate

7	6	5	4	3	2	1	0	Octet
A3/A7 Element Identifier								1
Length								2
Reserved						Pilot Gating Rate		3
ACTION_TIME								4

Length:

This field indicates the number of octets in this element following the Length field.

Reserved:

All reserved bits shall be set to '0'.

Pilot Gating Rate:

The actual Reverse Pilot Gating Rate. This field is used to indicate the gating rate for the Reverse Pilot channel as shown in Table 4.2.8-1. This field is used for the DCCH. If the FCH is being used, then this field is set to '00', i.e., there is no pilot gating on the FCH.

Table 4.2.8-1 Reverse Pilot Gating Rate - Pilot Gating Rate

Binary Values	Meaning
00	No Gating
01	Gating rate 1/2
10	Gating rate 1/4
11	Reserved

ACTION_TIME:

This field shall be set by the BS to the CDMA System Time (refer to [1]~[6]) in units of 80 ms (modulo 64) at which the transition to the new reverse pilot gating rate is to take effect. This field shall have the same setting as was conveyed to the MS in a Resource Allocation Message, Resource Allocation Mini-Message, Universal Direction Handoff Message, Extended Release Message, or Extended Release Mini-Message on the forward traffic channel (refer to [5]). The action time value conveyed to the MS is derived by taking the least significant 6 bits of this 8-bit field.

4.2.9 Quality of Service Parameters

This element identifies the Quality of Service for a given packet service. In this version of this standard the only information carried is non-assured mode packet priority.

4.2.9 Quality of Service Parameters

7	6	5	4	3	2	1	0	Octet
A3/A7 Element Identifier								1
Length								2
Reserved				Non-Assured Mode Packet Priority				3

Length:

This field indicates the number of octets in this element following the Length field.

Reserved:

This field shall be set to ‘0000’ and ignored.

Non-Assured Mode Packet Priority:

This field indicates the priority of a non-assured packet data service as a binary value. Value ‘0000’ is the lowest priority. Value ‘1101’ is the highest priority. Values ‘1110’ and ‘1111’ are reserved.

4.2.10 Forward Burst Radio Info

This element contains information on the radio resources requested/committed by the source/target BS for a Forward link traffic burst.

4.2.10 Forward Burst Radio Info

7	6	5	4	3	2	1	0	Octet
A3/A7 Element Identifier								1
Length								2
Forward Burst Radio Info {1,2:								
Coding Indicator		SCH_ID	QOF Mask		Forward Code Channel Index (high part)			n
Forward Code Channel Index (low part)								n+1
Pilot PN Code (low part)								n+2
Pilot PN Code (high part)	Reserved		CCSH Encoder Type	Forward Supplemental Channel Rate				n+3
Reserved			Forward Supplemental Channel Start Time					n+4
SR3_Incl	Start Time Unit			Forward Supplemental Channel Duration				n+5
Reserved			Lower QOF Mask		Upper Forward Code Channel Index (high part)			n+6
Lower Forward Code Channel Index (low part)								n+7
Reserved			Upper QOF Mask		Lower Forward Code Channel Index (high part)			n+8
Upper Forward Code Channel Index (low part)								n+9
} ***Forward Burst Radio Info***								

Length:

This field indicates the number of octets in this element following the Length field.

Coding Indicator:

This field indicates the type of channel coding to be applied to the supplemental channel (SCH) during the duration of the traffic burst.

Table 4.2.10-1 Forward Burst Radio Info – Coding Indicator

Value	Privacy Mask Type
00	Convolutional Coding
01	Turbo Coding
All other values reserved	

QOF Mask:

This field contains the QOF (Quasi Orthogonal Function) mask index, as indexed in [2]. For 3X Multi-Carrier systems, this QOF mask is used with the center frequency channel.

SCH ID:

This field identifies the Forward Supplemental Channel to which the Burst Radio Info element is associated.

Forward Code Channel Index:

This field specifies one of 256 possible Walsh Codes used to channelize the downlink RF bit stream in a *cdma2000* call. For 3X Multi-Carrier systems, this Walsh code is used with the center frequency channel.

Pilot PN Code:

The Pilot PN Code is one of 511 unique values for the Pilot Channel offset. The offsets are in increments of 64 PN chips.

CCSH Encoder Type:

This bit indicates the type of turbo encoder to be applied to the supplemental channel (SCH) during the duration of the traffic burst. A value of '0' indicates default encoder type, and a value of '1' indicates complementary encoder type. If CCSH encoding is not being used, then this field shall be set to default encoder type '0'.

Forward Supplemental Channel Rate:

This field indicates the bandwidth on the forward SCH to be used for the traffic burst. The field shall be coded as in the Extended Supplemental Channel Assignment Message (ESCAM) in [5]. In the case of a burst extension (refer to definition of burst extension in section 2.2.7.1), this field shall contain the same value in the A7-Burst Request, A7-Burst Response and A7-Burst Commit messages.

Forward Supplemental Channel Start Time:

This field indicates the System Time, in Burst Action Time Units, specified by the Start Time Unit field (modulo 32), at which the burst is to start.

A burst start time that is more than 7/8 of the modulo window in the future, from its time of arrival, shall be considered late and the message shall be processed immediately. In the case of a burst extension (refer to definition of burst extension in section 2.2.7.1), this field shall contain the same value in the A7-Burst Request, A7-Burst Response and A7-Burst Commit messages.

SR3_Incl:

This field indicates the use of Spreading Rate 3 (3X). The bit shall be set to '1' if 3X Multi-Carrier is being used, and set to '0' otherwise.

Start Time Unit:

This field indicates the units of Forward Supplemental Channel Start Time. This field shall be set to one less than the number of 20 ms frames that determines the Start Time Unit.

Forward Supplemental Channel Duration:

This field contains a binary value indicating the duration of a burst. This field shall be set to '0000' to indicate that the burst in effect at the time this message is received is to stop at the Burst Action Time. The field shall be coded to '1111' to indicate a burst of infinite duration starting at Burst Action Time. Other values for this field are set according to Table 3.7.3.3.2.37-3 of [5].

Lower QOF Mask:

This field contains the QOF (Quasi-Orthogonal Function) mask index as specified in [2] that is used with the lower frequency channel in a 3X system. This field is ignored if SR3_Incl is set to '0'.

Lower Walsh Code Channel Index:

This field specifies one of 256 possible Walsh Codes used to channelize the downlink RF bit stream in a *cdma2000* call. The high order 3 bits are reserved for future expansion. This Walsh Code is used with the lower frequency channel. This field is ignored if SR3_Incl is set to '0'.

Upper QOF Mask:

This field contains the QOF (Quasi-Orthogonal Function) mask index as specified in [2] that is used with the upper frequency channel in a 3X system. This field is ignored if SR3_Incl is set to '0'.

Upper Walsh Code Channel Index:

This field specifies one of 256 possible Walsh Codes used to channelize the downlink RF bit stream in a *cdma2000* call. The high order 3 bits are reserved for future expansion. This Walsh Code is used with the upper frequency channel. This field is ignored if SR3_Incl is set to '0'.

4.2.11 Reverse Burst Radio Info

This element contains information on the radio resources requested/committed by the source/target BS for a Reverse link traffic burst.

4.2.11 Reverse Burst Radio Info

7	6	5	4	3	2	1	0	Octet
A3/A7 Element Identifier								1
Length								2
Reverse Burst Radio Info {1,2:								
Coding Indicator		SCH_ID		Reverse Supplemental Channel Rate				n
Reserved = [000]			Reverse Supplemental Channel Start Time = [0 0000 – 1 1111]					n+1
Rev Walsh ID	Start Time Unit			Reverse Supplemental Channel Duration				n+2
Reserved				Rev_Burst_DTX_Duration				n+3
} Reverse Burst Radio Info								

Length:

This field indicates the number of octets in this element following the Length field.

Coding Indicator:

This field indicates the type of channel coding to be applied to the supplemental channel (SCH) during the duration of the traffic burst.

Table 4.2.11-1 Reverse Burst Radio Info – Coding Indicator

Value	Privacy Mask Type
00	Convolutional Coding
01	Turbo Coding
All other values reserved	

SCH ID:

This field identifies the Reverse Supplemental Channel to which the Burst Radio Info element is associated.

Reverse Supplemental Channel Rate:

This field indicates the bandwidth on the Reverse SCH to be used for the traffic burst. The field shall be coded as in the Extended Supplemental Channel Assignment Message (ESCAM) in [5]. In the case of a burst extension (refer to definition of burst extension in section 2.2.7.1), this field shall contain the same value in the A7-Burst Request, A7-Burst Response and A7-Burst Commit messages.

Reverse Supplemental Channel Start Time:

This field indicates the System Time, in Burst Action Time Units, specified by the Start Time Unit field (modulo 32), at which the burst is to start.

A burst start time that is more than 7/8 of the modulo window in the future, from its time of arrival, shall be considered late and the message shall be processed immediately. In the case of a burst extension (refer

to definition of burst extension in section 2.2.7.1), this field shall contain the same value in the A7-Burst Request, A7-Burst Response and A7-Burst Commit messages.

Rev Walsh ID:

This field shall be coded as in the Extended Supplemental Channel Assignment Message (ESCAM) in [5], to indicate the Walsh cover ID that the MS is to use when transmitting on the Reverse Supplemental Channel.

Start Time Unit:

This field indicates the units of Reverse Supplemental Channel Start Time. This field shall be set to one less than the number of 20 ms frames that determines the Start Time Unit.

Reverse Supplemental Channel Duration:

This field contains a binary value indicating the duration of a burst. This field shall be set to '0000' to indicate that the burst is to stop at the Burst Action Time. The field shall be coded to '1111' to indicate a burst of infinite duration starting at Burst Action Time. Other values for this field are set according to Table 3.7.3.3.2.37-3 of [5].

Rev_Burst_DTX_Duration:

This field shall be coded as in the Extended Supplemental Channel Assignment Message (ESCAM) in [5], to indicate the maximum duration of time in units of 20 ms that the MS is allowed to stop transmission on the Reverse SCH before resuming transmission on the Reverse SCH within the reverse assignment burst duration.

4.2.12 Software Version

This element provides software version information about the sub-system originating the message. Its definition is a BS and MSC manufacturer concern.

4.2.12 Software Version

7	6	5	4	3	2	1	0	Octet
A3/A7 Element Identifier								1
Length								2
IOS Major Revision Level (X)								3
IOS Minor Revision Level (Y)								4
IOS Point Release Level (Z)								5
Manufacturer/Carrier Software Information								6
…								…
Manufacturer/Carrier Software Information								n

Each version of this standard is published with a version number in the form X.Y.Z. These three values shall be placed in octets 3, 4, and 5 respectively as binary values.

Each separate software load from a manufacturer shall have some software load identity. In addition, the carrier may require the exchange of specific information between entities in their network. This information shall be placed in octets 6-n in ASCII format as agreed between the carrier and the manufacturer.

4.2.13 *IS-2000* Service Configuration Record

This information element contains the service configuration record as defined in [2] for a cdma2000 call and as defined in [10] for a TIA/EIA/IS-95 call.

4.2.13 *IS-2000* Service Configuration Record

7	6	5	4	3	2	1	0	Octet
A3/A7 Element Identifier								1
Bit-Exact Length – Octet Count								2
Reserved					Bit-Exact Length – Fill Bits			3
(MSB)								4
IS-2000 Service Configuration Record Content								…
	Seventh Fill Bit – if needed	Sixth Fill Bit – if needed	Fifth Fill Bit – if needed	Fourth Fill Bit – if needed	Third Fill Bit – if needed	Second Fill Bit – if needed	First Fill Bit – if needed	k

Bit-Exact Length – Octet Count:

This field indicates the number of octets in this element following the Length field.

Bit-Exact Length – Fill Bits:

This field contains a binary value indicating the number of fill bits contained in the last octet of this element. If this field contains a non-zero value, the indicated number of fill bits are set to '0' and occupy the low order bit positions of the last octet of this element.

IS-2000 Service Configuration Record Content:

This field contains a Service Configuration Record coded according to [1] when the call is *TIA/EIA/IS-2000*. This field is coded according to [10] when the call is *TIA/EIA/IS-95*. The value begins in the high order bit position of octet 4 of this element and extends into the last octet of this element. Bit positions in the last octet that are not used, if any, are considered fill bits, are set to '0', and occupy the low order bit positions of the last octet.

4.2.14 Forward Layer 3 *IS-2000* FCH/DCCH Data

This element contains the CDMA Forward Fundamental and Dedicated Control Channel Frame and control information for packets flowing in the SDU to BTS direction.

4.2.14 Forward Layer 3 *IS-2000* FCH/DCCH Data

7	6	5	4	3	2	1	0	Octet
FPC: SLC				FSN				1
FPC: GR								2
RPC: OLT								3
IS-2000 Frame Content								4
Forward Link Information								Var.

Frame Sequence Number (FSN):

The SDU shall set this field to CDMA System Time in frames, modulo 16 (refer to Section 1.2 of [2]) corresponding to the transmission time of the frame over the air in the forward direction.

Forward Link Power Control: Sector Link Count (FPC: SLC):

This parameter indicates the number of legs (also known as independent power control subchannels) involved in soft handoff. Multiple sectors in softer handoff with each other are counted as a single leg. This is useful for forward link gain equalization.

Forward Link Power Control: Gain Ratio (FPC: GR):

This parameter is required for QIB/EIB (50Hz) power control. It is also useful during transitions of: soft handoff states, transmission rates, and FER target values.

The SDU shall set this field to the binary value of

$$\mathrm{Min}(\lfloor (A_t / A_p) * 128 \rfloor, 255)$$

where A_t is the full-rate Forward Link gain (in volts), and A_p is the Forward Pilot Channel (ref [2], section 3.1.3.2.2.1) gain (in volts). The SDU shall set the FPC: GR field in the range of 0 through 255.

If this field is set to zero, it shall be ignored.

Reverse Link Power Control: Outer-loop Threshold (RPC: OLT):

For RC1 and RC2, the SDU shall set this field to the desired Reverse Traffic Channel E_w/N_t; i.e. the ratio of the total demodulated Walsh symbol energy to total received power spectral density on the RF channel. E_w/N_t is thus a composite value.

The SDU shall set this field in the range of 0 through 255 corresponding to 0dB to 31.875dB in units of 0.125dB.

For RC3 and all other higher RC, the SDU shall set this field to the desired Reverse Pilot Ec/Io; i.e. the ratio of R-PICH chip energy to total received power spectral density on the RF channel.

The SDU shall set the RPC: OLT field in the range of 0 through 255 corresponding to –31.875dB to 0dB in units of 0.125dB.

IS-2000 Frame Content:

The IS-2000 Frame Content parameter uniquely identifies the data rate and number of information bits. The value is taken from Table 4.2.15-

2, Table 4.2.15-3, or Table 4.2.15-4. The IS-2000 Frame Content parameter uniquely identifies the symbol repetition rate and number of information bits.

Forward Link Information:

The SDU shall set this field to the Forward Link Information that the BTS is to send to the MS. The SDU shall include the number of Information Bits from Table 4.2.15-2, Table 4.2.15-3, or Table 4.2.15-4 corresponding to the data rate of the Forward Link frame. The SDU shall set the Information Bits to the information bits supplied by the Multiplex Option Sublayer. The bit order shall be as specified in [1].

Layer 3 Fill:

The SDU shall include the number of bits in the Layer 3 Fill column of Table 4.2.15-3 or Table 4.2.15-4 corresponding to the data rate of the Traffic Channel frame. The Layer 3 Fill bits shall be set to '0'. The fill bits are added at the end of the frame in the lower order bit positions after the Forward Link Information.

4.2.15 Reverse Layer 3 *IS-2000* FCH/DCCH Data

This element contains the CDMA Reverse Fundamental and Dedicated Control Channel frame and control information for packets flowing in the BTS to SDU direction.

4.2.15 Reverse Layer 3 *IS-2000* FCH/DCCH Data

7	6	5	4	3	2	1	0	Octet
Soft Handoff Leg #				FSN				1
FQI	Reverse Link Quality							2
Scaling		Packet Arrival Time Error						3
IS-2000 Frame Content								4
RPC: S							QIB/ EIB	5
Reverse Link Information + Layer 3 Fill								Var.

Soft Handoff Leg #:

This field is used to carry the soft handoff leg number as indicated by the source BS on the A3-Connect Ack message. The target BS shall set this field to the value contained in the Soft Handoff Leg # field in the A3 Connect Ack Information element of the A3-Connect Ack message.

Frame Sequence Number (FSN):

The BTS shall set this field to CDMA System Time in frames, modulo 16 (refer to Section 1.3 of [2]) corresponding to the receive time of the air interface frame in the reverse direction.

Frame Quality Indicator (FQI):

If the traffic frame contains Reverse Link Information, then the BTS shall set the FQI (Frame Quality Indicator) field to '1' if the Reverse Traffic Frame CRC passes, and '0' if the CRC fails.

If there is no reverse traffic frame[2], the BTS shall (using an implementation specific algorithm) set the FQI field to '1' if it can determine that a reverse traffic frame CRC would have passed, and '0' otherwise.

Reverse Link Quality:

If the reverse traffic frame contains Reverse Link Information, then the BTS shall set the Reverse Link Quality field to the Inverted Re-Encoded Symbol Error Rate or equivalent metric. The Inverted Re-Encoded SER is the binary value of:

$127 - \lfloor (\text{Min}[\text{Re-Encoded Symbol Error Rate} \times \alpha, 255]) / 2 \rfloor$

where the value of α is used to normalize the number of symbols to the 1x repetition rate as listed in the *IS-2000* Frame Content element. (Reference: [2], Table 2.1.3.1.5-1 Code Symbol Repetition).

The Inverted Re-Encoded Symbol Error Rate is the number of errors found when comparing the received symbols at the input of the channel decoder and the re-encoded symbols at the output of the channel

2 There is no Reverse Traffic Frame when only a reverse pilot channel exists. For example, this occurs during call setup before the BTS has acquired the reverse traffic channel, and it occurs when the DCCH is in DTX mode.

decoder. The Inverted Re-Encoded Symbol Error Rate computation shall include the erasure indicator bit (E), if applicable; the information bits; the frame quality indicator (F), if applicable; and the encoder tail bits (T), if applicable.

If there is no reverse traffic frame[3] detected by the BTS, the Reverse Link Quality field shall be set to '000 0000'.

If a frame erasure is detected by the BTS and the channel element has lost finger lock, then Reverse Link Quality field may (optionally) be set to '000 0001' to indicate that the MS is not acquired. If the lost finger lock option is not asserted, then the Reverse Link Quality field shall be set to '000 0000' for all erasures.

Scaling:

The BTS shall set this field to the time scale for the Packet Arrival Time Error (PATE) field. Values are indicated in Table 4.2.15-1.

Table 4.2.15-1 Reverse Layer 3 IS-2000 FCH/DCCH Data - Time Scale for the PATE

Scaling Field Value	Time Units	PATE Range
00	0.125 ms	±3.875 ms
01	1.0 ms	± 31.0 ms
10	1.25 ms	±38.75 ms
11	5.0 ms	±155 ms

Packet Arrival Timer Error (PATE):

The BTS shall set this field to the time difference between the time at which the A3-IS-2000 FCH/DCCH Forward message arrives at the BTS minus the expected arrival time in units specified by the Scaling field. This value is expressed in 2's complement format. It has a value in the range ±31 time units, as determined by the Scaling field.

IS-2000 Frame Content:

The *IS-2000* Frame Content field is used to indicate the code symbol repetition rate and number of information bits contained in the information element. Special Frame Content parameters are defined to facilitate "in-band" signaling between the source BS and target BS. The IS-2000 Frame Content parameter uniquely identifies the data rate and number of information bits. The value is taken from Table 4.2.15-2, Table 4.2.15-3, or Table 4.2.15-4.

3 There is no Reverse Traffic Frame when only a reverse pilot channel exists. For example, this occurs during call setup before the BTS has acquired the reverse traffic channel, and it occurs when the DCCH is in DTX mode.

Table 4.2.15-2 IS-2000 Frame Content - Special Frame Content Parameters

IS-2000 Frame Content (hex)	Name	Description	
		Forward	Reverse
00	Idle[1]	May be used for synchronization when air interface resources are not allocated. Refer to [13].	Used for synchronization when the BTS has not yet acquired the traffic channel, or when air interface resources are not allocated.
7D	Full Rate Likely	Not Applicable	Radio Configuration 1, Full Rate Likely
7E	Erasure[1]	Not Applicable.	Insufficient Physical Layer Frame Quality to determine data rate.
7F	Null[1]	Used during DTX mode (when transmitting Null traffic Channel frames to the MS).	Used during DTX mode (when there is only a pilot channel and no frames are being received on the traffic channel).

1. The number of information bits for these frame content types is 0.

Table 4.2.15-3 IS-2000 Frame Content - FCH Frame Content Parameters

Frame Content (hex)	Radio Configuration	Data Rate (bps)	Number of Layer 3 Fill Bits	Number of Information Bits
01h	Forward: 1 and Reverse: 1	9600	4	172
02		4800	0	80
03		2400	0	40
04		1200	0	16
05	Forward: 2 and Reverse: 2	14400	4	268
06		7200	3	126
07		3600	1	56
08		1800	3	22
09	Forward: 3,4,6,7 and Reverse: 3,5	unused	-	-
0A		9600 (20 ms)	4	172
0B		4800	0	80
0C		2700	0	40
0D		1500	0	16
0E	Forward: 5,8,9 and Reverse: 4,6	Unused	-	-
0F		14400	5	267
10		7200	3	125
11		3600	1	55
12		1800	3	21

Table 4.2.15-4 IS-2000 Frame Content - DCCH Frame Content Parameters

Frame Content (hex)	Radio Config-uration	Data Rate (bps)	Number of Layer 3 Fill Bits	Number of Information Bits
20	Forward: 3,4,6,7 Reverse: 3,5	9600	4	172
21	Forward: 5,8,9 Reverse: 4,6	14400	5	267

Table 4.2.15-5 IS-2000 Frame Content - SCH Frame Content Parameters for 20 ms Frames

Frame Content (hex)	Radio Config-uration	Data Rate (bps)	Number of Layer 3 Fill Bits	Number of Information Bits
30	Reverse: 5 Forward: 7	614400	0	12264
31	Reverse: 3	307200	0	6120
32		153600	0	3048
33	Forward:	76800	0	1512
34	3,4,6	38400	0	744
35		19200	0	360
36		9600	4	172
37		4800	0	80
38		2700	0	40
39		1500	0	16
3A	Reverse: 6	1036800	0	20712
3B	Forward: 9	460800	0	9192
3C	Reverse: 4	230400	0	4584
3D		115200	0	2280
3E	Forward:	57600	0	1128
3F	5,8	28800	0	552
40		14400	4	268
41		7200	3	125
42		3600	1	55
43		1800	3	21
90-9F	3-9	Flex Rate[1]		

[1] For Flex Rate, the four least significant bits in this field shall be set to FOR_SCH_NUM_BITS_IDX (refer to [5]).

Table 4.2.15-6 IS-2000 Frame Content - SCH Frame Content Parameters for 40 ms Frames*

Frame Content	Radio Configuration	Data Rate[4] (bps)	Number of Layer 3 Fill Bits	Number of Info. Bits
50	Reverse: 5 Forward: 7	307200	0	12264
51	Reverse: 3	153600	0	6120
52		76800	0	3048
53	Forward:	38400	0	1512
54	3,4,6	19200	0	744
55		9600	0	360
56		4800	4	172
57		2400	0	80
58		1350	0	40
59	Reverse: 6	518400	0	20712
5A	Forward: 9	230400	0	9192
5B	Reverse: 4	115200	0	4584
5C		57600	0	2280
5D	Forward:	28800	0	1128
5E	5,8	14400	0	552
5F		7200	5	267
60		3600	3	125
61		1800	1	55

* - Note that 40 ms Frames are not supported in this version of this standard.

Table 4.2.15-7 IS-2000 Frame Content - SCH Frame Content Parameters for 80 ms Frames*

Frame Content	Radio Configuration	Data Rate[5] (bps)	Number of Layer 3 Fill Bits	Number of Info. Bits
62	Reverse: 5 Forward: 7	153600	0	12264
63	Reverse: 3	76800	0	6120
64		38400	0	3048

4 These rates are not supported by [1]~[6] MAC and Signaling Layers, and are not supported in this version of this standard.

5 These rates are not supported by [1]~[6] MAC and Signaling Layers, and are not supported in this version of this standard.

Table 4.2.15-7 IS-2000 Frame Content - SCH Frame Content Parameters for 80 ms Frames*

Frame Content	Radio Configuration	Data Rate[5] (bps)	Number of Layer 3 Fill Bits	Number of Info. Bits
65	Forward: 3,4,6	19200	0	1512
66		9600	0	744
67		4800	0	360
68		2400	4	172
69		1200	0	80
6A	Reverse: 6 Forward: 9	259200	0	20712
6B		115200	0	9192
6C	Reverse: 4 Forward: 5,8	57600	0	4584
6D		28800	0	2280
6E		14400	0	1128
6F		7200	0	552
70		3600	5	267
71		1800	3	125

*- Note that 80 ms frames are not supported in this version of this standard.

Forward Power Control- Signal Power (RPC: S):

This field may be used for voice calls, subject to inter-vendor agreements.

The BTS shall set this field to the current S: S= SIR + RSSI in dBm

The SIR (Signal to Interference Ratio) is a signal to noise plus interference ratio. It is called SIR because the noise term is treated as being insignificant compared to the interference power. The RSSI is the BTS received signal strength indication.

The S can be arrived at by using Table 4.2.15-8. A 6 bit dynamic range value for SIR and a 6 bit dynamic range value for RSSI are looked up and added together to obtain the 7 bit S value. This metric is used to determine the reduced active set. Refer to [19].

Table 4.2.15-8 Signal to Noise Ratio Values

RSSI (dBm)	Ec/Io (dB)	6 bit dynamic range
-120.0	-31.5	0
-119.5	-31.0	1
-119.0	-30.5	2
-118.5	-30.0	3
-118.0	-29.5	4

Table 4.2.15-8 Signal to Noise Ratio Values

RSSI (dBm)	Ec/Io (dB)	6 bit dynamic range
-117.5	-29.0	5
-117.0	-28.5	6
-116.5	-28.0	7
-116.0	-27.5	8
-115.5	-27.0	9
-115.0	-26.6	10
-114.5	-26.0	11
-114.0	-25.5	12
-113.5	-25.0	13
-113.0	-24.5	14
-112.5	-24.0	15
-112.0	-23.5	16
-111.5	-23.0	17
-111.0	-22.5	18
-110.5	-22.0	19
-110.0	-21.5	20
-109.5	-21.0	21
-109.0	-20.5	22
-108.5	-20.0	23
-108.0	-19.5	24
-107.5	-19.0	25
-107.0	-18.5	26
-106.5	-18.0	27
-106.0	-17.5	28
-105.5	-17.0	29
-105.0	-16.5	30
-104.5	-16.0	31
-104.0	-15.5	32
-103.5	-15.0	33
-103.0	-14.5	34
-102.5	-14.0	35
-102.0	-13.5	36
-101.5	-13.0	37
-101.0	-12.5	38
-100.5	-12.0	39
-100.0	-11.5	40
-99.5	-11.0	41
-99.0	-10.5	42
-98.5	-10.0	43
-98.0	-9.5	44
-97.5	-9.0	45
-97.0	-8.5	46
-96.5	-8.0	47
-96.0	-7.5	48
-95.5	-7.0	49
-95.0	-6.5	50
-94.5	-6.0	51
-94.0	-5.5	52
-93.5	-5.0	53

Table 4.2.15-8 Signal to Noise Ratio Values

RSSI (dBm)	Ec/Io (dB)	6 bit dynamic range
-93.0	-4.5	54
-92.5	-4.0	55
-92.0	-3.5	56
-91.5	-3.0	57
-91.0	-2.5	58
-90.5	-2.0	59
-90.0	-1.5	60
-89.5	-1.0	61
-89.0	-.5	62
-88.5	0	63

QIB (Quality Indicator Bit)/EIB (Erasure Indicator Bit):

When FPC_MODE is not equal to ‘011’ or ‘100’, then the BTS shall set this field to ‘0’. When FPC_MODE is equal to ‘011’ or ‘100’, then the BTS shall set this field to ‘1’ if the QIB/EIB received from the MS is ‘1’; otherwise, the BTS shall set this field to ‘0’. Furthermore, FPC_MODE equal to ‘011’ or ‘100’ implies that a Reverse Layer 3 DCCH Data frame is generated at least once per 20 ms to convey QIB/EIB status.

Reverse Link Information:

The BTS shall set this field to the Reverse Link Information that the BTS received from the MS. The BTS shall include the number of bits in the Information column of Table 4.2.15-2, Table 4.2.15-3, or Table 4.2.15-4. corresponding to the transmission rate of the Reverse Link frame. The BTS shall set the Information Bits to the information bits received from the MS which correspond to the Multiplex Sublayer in use (refer to [1]~[6]). The BTS shall use the bit order specified in [1]~[6].

Layer 3 Fill:

The SDU shall include the number of bits in the Layer 3 Fill column of Table 4.2.15-2, Table 4.2.15-3, or Table 4.2.15-4 corresponding to the transmission rate of the Traffic Channel frame. The Layer 3 Fill bits shall be set to ‘0’. The fill bits are added at the end of the frame in the lower order bit positions after the Reverse Link Information.

4.2.16 Forward Layer 3 *IS-2000* SCH Data

This element contains the CDMA Forward Supplemental Link Frame and control information for packets flowing in the source BS (SDU) to target BS (BTS) direction. The frame content parameter is optionally set to Null for soft handoff legs incurring the greatest transmission loss. This can be determined by the reverse link signal to noise ratio (S). The signal to noise ratio can be obtained from the Reverse Layer 3 FCH/DCCH Data element Signal to Noise Ratio parameter. A threshold, driven by the Service Option and/or QoS, can be used for transmission selection. Depending on the threshold, either the best forward link or a best subset of the forward links is selected for transmission on the A3 interface, and subsequently on the air interface. Note that appropriate action-time coordinated signaling with the MS is required to exercise this option.

4.2.16 Forward Layer 3 *IS-2000* SCH Data

7	6	5	4	3	2	1	0	Octet
FPC: SLC				FSN				1
FPC: GR								2
IS-2000 Frame Content								3
Forward Link Information + Layer 3 Fill								Var.

Forward Link Power Control: Sector Link Count (FPC: SLC):

This parameter indicates the number of legs (also known as independent power control subchannels) involved in soft handoff. Multiple sectors in softer handoff with each other are counted as a single leg. This is useful for forward link gain equalization.

Frame Sequence Number (FSN):

The SDU shall set this field to CDMA System Time in frames, modulo 16 (refer to Section 1.3 of [2]) corresponding to the transmission time of the frame over the air in the forward direction.

Forward Link Power Control: Gain Ratio (FPC: GR):

This parameter is required for EIB (50Hz) power control.

The SDU shall set this field to the binary value of

$$\text{Min}(\lfloor[(A_d/A_p)*\text{SQRT}(9600/\text{Rate})]*128\rfloor, 255)$$

where A_d is the Forward Link SCH gain (in volts), and A_p is the smallest common Pilot Channel gain (in volts). (IS-2000 supports multiple pilots.)

Note: The BTS determines the Forward Link SCH gain as follows:

$$A_d = \text{FPC:GR}*A_p*\text{SQRT}(\text{Rate}/9600)/128.$$

If this field is set to zero, it shall be ignored.

IS-2000 Frame Content:

The IS-2000 Frame Content parameter uniquely identifies the data rate and number of information bits. The value is taken from Table 4.2.15-2, Table 4.2.15-3, or Table 4.2.15-4. The IS-2000 Frame Content parameter uniquely identifies the symbol repetition rate and number of information bits.

Forward Link Information:

The SDU shall set this field to the Forward Link Information that the BTS is to send to the MS. The SDU shall include the number of bits in the Information column of Table 4.2.15-2 or Table 4.2.15-5 corresponding to the transmission rate of the Forward Link frame. The SDU shall set the Information Bits to the information bits supplied by the Multiplex Option Sublayer. The bit order shall be as specified in [1].

Layer 3 Fill:

The SDU shall include the number of bits in the Layer 3 Fill column of Table 4.2.15-2 or Table 4.2.15-5 corresponding to the transmission rate of the Traffic Channel frame. The Layer 3 Fill bits shall be set to '0'. The fill bits are added at the end of the frame in the lower order bit positions after the Forward Link Information.

4.2.17 Reverse Layer 3 *IS-2000* SCH Data

This element contains the CDMA Reverse Supplemental Link frame and control information for packets flowing in the BTS to SDU direction.

4.2.17 Reverse Layer 3 *IS-2000* SCH Data

7	6	5	4	3	2	1	0	Octet
Soft Handoff Leg #				FSN				1
FQI	Reverse Link Quality							2
Scaling	Packet Arrival Time Error							3
IS-2000 Frame Content								4
Reverse Link Information + Layer 3 Fill								Var.

Soft Handoff Leg #:

This field is used to carry the soft handoff leg number as indicated by the source BS on the A3-Connect Ack message. The target BS shall set this field to the value contained in the Soft Handoff Leg # field in the A3 Connect Ack Information element of the A3-Connect Ack message.

Frame Sequence Number (FSN):

The BTS shall set this field to CDMA System Time in frames, modulo 16 (refer to Section 1.3 of [2]) corresponding to the receive time of the air interface frame in the reverse direction.

When IDLE frames are sent on the forward link for purposes of obtaining PATE for an upcoming SCH data burst, the FSN of the reverse IDLE SCH frame should be ignored. The timing of the reverse SCH IDLE frame may be asynchronous to future demodulated reverse SCH data timing.

Frame Quality Indicator (FQI):

If the traffic frame contains Reverse Link Information, then the BTS shall set the FQI (Frame Quality Indicator) field to '1' if the Reverse Traffic Frame CRC passes. Otherwise, the BTS shall set this field to '0' if the CRC fails or if there is no Reverse Link Information[6].

Reverse Link Quality:

If the reverse traffic frame contains Reverse Link Information, then the BTS shall set this field to the Inverted Re-Encoded Symbol Error Rate (SER) or equivalent metric. The Inverted Re-Encoded SER is the binary value of:

$127 - \lfloor (\text{Min}[\text{Re-Encoded Symbol Error Rate} \times \alpha, 255]) / 2 \rfloor$

where the value of α is used to normalize the number of symbols to the 1x repetition rate as listed in the *IS-2000* Frame Content element. (refer to [2]).

The Inverted Re-Encoded Symbol Error Rate is the number of errors found when comparing the received symbols at the input of the channel decoder and the re-encoded symbols at the output of the channel

6 There is no Reverse Link Information when only a reverse pilot channel exists. For example, this occurs during call setup before the BTS has acquired the reverse traffic channel, and it occurs when the SCH is in DTX mode.

decoder. The Inverted Re-Encoded Symbol Error Rate computation shall include the erasure indicator bit (E), if applicable; the information bits; the frame quality indicator (F), if applicable; and the encoder tail bits (T), if applicable.

If there is no reverse traffic frame[7] detected by the BTS, the Reverse Link Quality field shall be set to '000 0000'.

If a frame erasure is detected by the BTS and the channel element has lost finger lock, then Reverse Link Quality field may (optionally) be set to '000 0001' to indicate that the MS is not acquired. If the lost finger lock option is not asserted, then the Reverse Link Quality field shall be set to '000 0000' for all erasures.

Scaling:

The BTS shall set this field to the time scale for the PATE field. Values are indicated in Table 4.2.17-1. This field shall be set to '11' if no A3-IS-2000 SCH Forward message was received.

Table 4.2.17-1 Reverse Layer 3 *IS-2000* SCH Data - Time Scale for the PATE

Field Value	Time Units	PATE Range
00	0.125 ms	±3.875 ms
01	1.0 ms	± 31.0 ms
10	1.25 ms	±38.75 ms
11	5.0 ms	±155 ms

Packet Arrival Timer Error (PATE):

The BTS shall set this field to the time difference between the time at which the A3-*IS-2000* SCH Forward message arrives at the BTS minus the expected arrival time in units specified by the Scaling field. This value is expressed in 2's complement format. It has a value in the range ±31 time units, as determined by the Scaling field. This field shall be set to '00 0000' if no A3-*IS-2000* SCH Forward message was received.

IS-2000 Frame Content:

he IS-2000 Frame Content parameter uniquely identifies the data rate and number of information bits. The value is taken from Table 4.2.15-2, Table 4.2.15-3, or Table 4.2.15-4.

The Frame Content parameter uniquely identifies the symbol repetition rate and number of information bits.

Reverse Link Information:

The BTS shall set this field to the Reverse Link Information that the BTS received from the MS. The BTS shall include the number of bits in the Information column Table 4.2.15-2 or Table 4.2.15-5 corresponding to the transmission rate of the Reverse Link frame. The BTS shall set the Information Bits to the information bits received from the MS which correspond to the Multiplex Sublayer in use (refer to [1]~[6]). The BTS shall use the bit order specified in [1]~[6].

Layer 3 Fill:

The SDU shall include the number of bits in the Layer 3 Fill column of Table 4.2.15-2 or Table 4.2.15-5 corresponding to the transmission rate

[7] There is no Reverse Traffic Frame when only a reverse pilot channel exists. For example, this occurs when the SCH is in DTX mode.

of the Traffic Channel frame. The Layer 3 Fill bits shall be set to '0'. The fill bits are added at the end of the frame in the lower order bit positions after the Reverse Link Information.

4.2.18 CDMA Serving One Way Delay

This element specifies the estimated one-way delay from the MS to the cell associated with the REF_PN (refer to [1]~[6]). It is coded as follows:

4.2.18 CDMA Serving One Way Delay

7	6	5	4	3	2	1	0	Octet
A3/A7 Element Identifier								1
Length								2
Cell Identifier								variable
(MSB)	CDMA Serving One Way Delay							m
CDMA Serving One Way Delay							(LSB)	m+1
Reserved						Resolution		m+2
(MSB)	CDMA Serving One Way Delay Time Stamp							m+3
							(LSB)	m+4

The Length field contains the number of octets in this element following the Length field.

The Cell Identifier field identifies the reference cell. This field is comprised of a Cell Identification Discriminator and a Cell Identification and shall be formatted according to octets 3 through the end of the Cell Identifier element defined in section 4.2.5. The allowable cell discriminator values are ‘0000 0010’, and ‘0000 0111’.

The CDMA Serving One Way Delay field is the one-way delay from the MS to the cell associated with the REF_PN (refer to [1]~[6]) as estimated by the BS.

The Resolution field indicates the units used to calculate the CDMA Serving One Way Delay. The allowable values are:

00 – 100 ns

01 – 50 ns

10 – 1/16 TIA/EIA-95 PN Chip

11 – reserved

The CDMA Serving One Way Delay Time Stamp is a 16-bit binary number that contains the 16 least significant bits of the 36-bit SYS_TIME at the time that the One Way Delay was measured. The SYS_TIME is counted at the BS in units of 80 ms.

4.2.19 Neighbor List

This element contains a list of the target BS neighbor cells. This list may be used by the source BS to update the MS neighbor list. This IE is applicable only to Band Class 0. Extended Neighbor List is used for all other Band Classes.

4.2.19 Neighbor List

7	6	5	4	3	2	1	0	Octet
A3/A7 Element Identifier								1
Length								2
Number of Neighbors								3
PILOT_PN 1							(LSB)	4
PILOT_ PN 1 (MSB)	Short Cell Identification Discriminator 1							5
Cell Identification 1								6
…								…
PILOT_PN n							(LSB)	k
PILOT_ PN n (MSB)	Short Cell Identification Discriminator n							k+1
Cell Identification n								…

The Length field is a binary value indicating the number of octets following the Length field.

The Number of Neighbors field contains the number of neighboring cells included in this element.

There is one instance of the next three fields for each cell in the neighbor list.

The PILOT PN Code is one of the 511 unique values for the pilot PN sequence offset index. The offsets are in increments of 64 PN chips.

The Short Cell Identification Discriminator field is identical to Cell Identification Discriminator field specified in section 4.2.5 except that only the least significant seven bits of the eight bits of the Cell Identification Discriminator value are used.

The Cell Identification field is identical to Cell Identification field specified in section 4.2.5.

4.2.20 A3 Signaling Address

This information element identifies the network node that contains the instance of the SDU in use for the call. The target BS is responsible for checking whether a connection with the same destination address exists. If such a connection does exist, that existing connection shall be used to carry A3 signaling messages sent and received by the target BS.

4.2.20 A3 Signaling Address

7	6	5	4	3	2	1	0	Octet
A3/A7 Element Identifier								1
Length								2
Address Type								3
(MSB)	TCP/SCTP Port							4
							(LSB)	5
(MSB)	A3 Address							6
								…
							(LSB)	k

Length:

This field indicates the number of octets in this element following the Length field.

Address Type:

This field indicates the type and format of the A3 Address that follows.

TCP/SCTP Port:

This field contains the TCP or the SCTP Port address for the A3 signaling connection.

A3 Address:

This field has a variable length that is dependent on the Type field. The internal format of this field may be specified via the Type field.

Table 4.2.20-1 A3 Address Identifier Type

Type	Format of the A3 Address	Length of A3 Address
1	Internet Protocol IPv4	4 octets
2	Internet Protocol IPv6	Var.
All other values reserved		

4.2.21 SDU ID

This information element identifies a particular SDU instance within an SDU Node.

4.2.21 SDU ID

7	6	5	4	3	2	1	0	Octet
A3/A7 Element Identifier								1
Length								2
(MSB)	SDU Identifier							3
								…
							(LSB)	k

Length:

This field indicates the number of octets in this element following the Length field.

SDU Identifier:

This field has a variable length. The actual length is indicated in the Length field and is dependent upon the particular implementation. In this version of this standard, this value shall be no more than 6 octets long.

4.2.22 A3 Traffic Circuit ID

This information element is used to identify a particular circuit (virtual/physical) between a BTS and a source BS/SDU. It is useful particularly when multiple circuits supporting A3 user traffic connections may exist between the BTS and the source BS/SDU, e.g., multiple ATM virtual circuits running the AAL2 protocol.

4.2.22 A3 Traffic Circuit ID

7	6	5	4	3	2	1	0	Octet
A3/A7 Element Identifier								1
Length								2
Length of Traffic Circuit Identifier								3
(MSB)	Traffic Circuit Identifier							4
							(LSB)	5
Length of Traffic Connection Identifier								6
(MSB)	Traffic Connection Identifier							7
								…
							(LSB)	p

Length:

This field indicates the number of octets in this element following the Length field.

Length of Traffic Circuit Identifier:

This field indicates the length in octets of the Traffic Circuit Identifier.

The Traffic Circuit Identifier field shall be exactly two octets in length.

Traffic Circuit Identifier:

The value contained within this field is configured for a particular circuit (virtual/physical) by agreements between the network operator and the manufacturers involved. This field is regarded as the Virtual Channel Connection Identifier (VCCI).

Length of Traffic Connection Identifier:

This field indicates the length in octets of the Traffic Connection Identifier.

Traffic Connection Identifier:

This field contains a value that is unique within the traffic circuit and identifies a single logical connection within that traffic circuit. This field is regarded as the CID of an AAL2 virtual circuit. If this field is omitted, all circuits within the specified VCCI are indicated.

4.2.23 Call Connection Reference

This information element contains a globally unique identification for a call connection.

4.2.23 Call Connection Reference

7	6	5	4	3	2	1	0	Octet
A3/A7 Element Identifier								1
Length								2
(MSB)	Market ID							3
Market ID (continued)							(LSB)	4
(MSB)	Generating Entity ID							5
Generating Entity ID (continued)							(LSB)	6
(MSB)	Call Connection Reference Value							7
								8
								9
							(LSB)	10

Length:

This field indicates the number of octets in this element following the Length field.

Market ID:

This field represents a unique market ID that is specified by the service provider (refer to [18]).

Generating Entity ID:

This two octet field represents a unique code assigned by the operator to the entity that generates this Call Connection Reference value.

Call Connection Reference Value:

This four octet field may contain any value. It is assigned by the generating entity whose responsibility it is to guarantee its uniqueness.

4.2.24 PMC Cause

This element is used to indicate the outcome of processing an A3 or A7 interface message.

4.2.24 PMC Cause

7	6	5	4	3	2	1	0	Octet
A3/A7 Element Identifier								1
Length								2
PMC Cause Value								3

The PMC Cause Value field is coded as follows:

Table 4.2.24-1 PMC Cause Values

PMC Cause Value (Hex)	Description
00H	No error
01H	Awaiting connect
02H	Already connected
03H	Illegal A3 connect
04H	Illegal A3 remove
05H	Requested reverse pilot gating rate not supported
06H	DTMF continuous tone generation not active
07H	Unrecognized message
08H	Requested FPC mode change failed
09H	Invalid state
0AH	No resources available
0BH	Reserved (available value)
0CH	Illegal operation
0DH	Private long code not available or not supported
0EH	Requested MUX option or rates not available
0FH	Requested privacy configuration unavailable
10H	Long code value not available
All other values reserved	

4.2.25 Band Class

This information element specifies the frequency band.

4.2.25 Band Class

7	6	5	4	3	2	1	0	Octet
A3/A7 Element Identifier								1
Length								2
Reserved			Band Class					3

The Length field contains the number of octets in this element following the Length field.

The coding of the Band Class field is specified in Table 4.2.25-1. This table contains band class values defined in [I-1]. If there are any discrepancies between this table and [I-1], the latter shall be considered correct.

Table 4.2.25-1 Band Class

Binary Values	Meaning
0 0000	800 MHz Cellular System
0 0001	1.850 to 1.990 GHz Broadband PCS
0 0010	872 to 960 MHz TACS band
0 0011	832 to 925 MHz JTACS band
0 0100	1.750 to 1.870 GHz Korean PCS band
0 0101	NMT-450 band
0 0110	IMT-2000 band
0 0111	North American 700 MHz Cellular Band
All other values reserved	

4.2.26 Correlation ID

This information element is used to correlate request and response messages.

4.2.26 Correlation ID

7	6	5	4	3	2	1	0	Octet
A3/A7 Element Identifier								1
Length								2
(MSB)	Correlation Value							3
								4
								5
							(LSB)	6

Length:

This field indicates the number of octets in this element following the Length field.

Correlation Value:

This field contains a value that allows the network entity to correlate a request-response pair of messages. The value is a manufacturer concern. In this revision of this standard, this value shall be exactly 4 octets in length.

4.2.27 *IS-2000* Non-Negotiable Service Configuration Record

This information element contains the non-negotiable service configuration record as defined in [5].

4.2.27 *IS-2000* Non-Negotiable Service Configuration Record

7	6	5	4	3	2	1	0	Octet
A3/A7 Element Identifier								1
Bit-Exact Length – Octet Count								2
Reserved					Bit-Exact Length – Fill Bits			3
(MSB)								4
IS-2000 Non-Negotiable Service Configuration Record Content								…
	Seventh Fill Bit – if needed	Sixth Fill Bit – if needed	Fifth Fill Bit – if needed	Fourth Fill Bit – if needed	Third Fill Bit – if needed	Second Fill Bit – if needed	First Fill Bit – if needed	k

Bit-Exact Length – Octet Count:

This field contains the total number of octets in this element following this field represented as a binary value.

Bit-Exact Length – Fill Bits:

This field contains a binary value indicating the number of fill bits contained in the last octet of this element. If this field contains a non-zero value, the indicated number of fill bits are set to '0' and occupy the low order bit positions of the last octet of this element.

IS-2000 Non-Negotiable Service Configuration Record Content:

This field contains a Non-Negotiable Service Configuration Record coded according to [5]. The value begins in the high order bit position of octet 4 of this element and extends into the last octet of this element. Bit positions in the last octet that are not used, if any, are considered fill bits, are set to '0', and occupy the low order bit positions of the last octet.

4.2.28 One Way Propagation Delay Record

This element contains the CDMA serving one-way propagation delay and the Cell Identification.

4.2.28 One Way Propagation Delay Record

7	6	5	4	3	2	1	0	Octet
A3/A7 Element Identifier								1
Length								2
Cell Identification Discriminator								3
(MSB)	Cell Identification							4
Cell Identification							(LSB)	m
(MSB)	CDMA Serving One way Delay							m+1
CDMA Serving One way Delay							(LSB)	n

Length:

This field indicates the number of octets in this element following the Length field.

Cell Identification Discriminator:

This field uses the Cell Identification Discriminator values used with the Cell Identifier element (refer to section 4.2.5) to describe the format of the immediately following Cell_ID. Cell discriminator type ‘0000 0111’ is used.

Cell Identification:

This is the cell identification as described in section 4.2.5 for which the propagation delay measurement is included in this record. It shall be formatted according to octets 4 through the end of the Cell Identifier element defined in section 4.2.5.

CDMA Serving One Way Delay:

This is the CDMA serving one-way delay in units of 100 ns.

4.2.29 Forward Layer 3 Data

This element contains the CDMA Forward Traffic Channel Frame and control information for packets flowing in the SDU to BTS direction.

4.2.29 Forward Layer 3 Data

7	6	5	4	3	2	1	0	Octet
Reserved				Sequence Number				1
Forward Traffic Channel Gain								2
Reverse Traffic Channel E_w / N_T								3
Rate Set Indicator				Forward Traffic Channel Rate				4
Reserved				Power Control Subchannel Count				5
Forward Traffic Channel Information +Layer 3 Fill								Var.

Reserved:

The SDU shall set this field to '0000'.

Sequence Number:

The SDU shall set this field to CDMA System Time in frames, modulo 16 (refer to Section 1.3 of [2]) corresponding to the transmission time of the frame over the air in the forward direction.

Forward Traffic Channel Gain:

The SDU shall set this field to the binary value of

$$\text{Min}(\lfloor (A_t / A_p) * 128 \rfloor, 255)$$

where A_t is the full-rate Forward Traffic Channel gain (in volts), and A_p is the Pilot Channel gain (in volts).

Reverse Traffic Channel E_w / N_T :

The SDU shall set this field to the desired Reverse Traffic Channel E_w/N_t, where E_w/N_t is the ratio of the total demodulated Walsh symbol energy to total received power spectral density on the RF channel. The E_w/N_t is thus a composite value.

The SDU shall set the Reverse Traffic Channel E_w/N_t field in the range of 0 through 255 in units of 0.125dB. This provides a Reverse Traffic Channel E_w/N_t in the range of 0 through 31.875 dB.

Rate Set Indicator:

The SDU shall set this field to correspond to the Rate Set of the traffic channel frame as follows.

Table 4.2.29-1 Forward Layer 3 Data - Rate Set Indicator

Field Value	Meaning
0000	Rate Set 1
0001	Rate Set 2
All other values are reserved	

Forward Traffic Channel Rate:

The SDU shall set the field to the rate at which the BTS is to send the Forward Traffic Channel Information to the MS.

If this field indicates “Idle Frame”, then the BTS shall not transmit an air interface frame, but shall ignore all but the Sequence Number and Frame Type fields and shall use this frame to adjust the frame arrival time.

The SDU shall set this field as follows:

Table 4.2.29-2 Forward Layer 3 Data - Forward Traffic Channel Rate

Field Value	Rate Set 1 Transmission Rate	Rate Set 2 Transmission Rate
0000	9600 bps (Full Rate)	14400 bps (Full Rate)
0001	4800 bps (Half Rate)	7200 bps (Half Rate)
0010	2400 bps (Quarter Rate)	3600 bps (Quarter Rate)
0011	1200 bps (Eighth Rate)	1800 bps (Eighth Rate)
0100	Idle Frame	Idle Frame
All other values are reserved.		

Reserved:

This field shall be set to ‘0000’.

Power Control Subchannel Count:

The SDU shall set this field to the number of independent power control subchannels involved in soft handoff.

Forward Traffic Channel Information:

The SDU shall set this field to the Forward Traffic Channel Information that the BTS is to send to the MS. The SDU shall include the number of bits in the Information column corresponding to the transmission rate of the Forward Traffic Channel frame. The SDU shall set the Information Bits to the information bits supplied by the Multiplex Option Sublayer in use (refer to [1]~[6]). The bit order shall be as specified in [1]~[6].

Table 4.2.29-3 Forward Layer 3 Data - Forward Traffic Channel Information

Rate Set	Transmission Rate (bps)	Number of Information Bits per Frame
1	9600	172
	4800	80
	2400	40
	1200	16
	0	0
2	14400	267
	7200	125
	3600	55
	1800	21

Layer 3 Fill:

The SDU shall include the number of bits in the Layer 3 Fill column corresponding to the transmission rate of the Traffic Channel frame. The SDU shall set the Layer 3 Fill bits to '0'. The fill bits are added at the end of the frame in the lower order bit positions per the bit ordering specified in this standard.

Table 4.2.29-4 Forward Layer 3 Data - Layer 3 Fill

Class	Transmission Rate (bps)	Number of Layer 3 Fill Bits per Frame
Rate Set 1	9600	4
	4800	0
	2400	0
	1200	0
	0	0
Rate Set 2	14400	5
	7200	3
	3600	1
	1800	3

4.2.30 Reverse Layer 3 Data

This element contains the CDMA Reverse Traffic Channel frame and control information for packets flowing in the BTS to SDU direction.

4.2.30 Reverse Layer 3 Data

7	6	5	4	3	2	1	0	Octet
Soft Handoff Leg #				Sequence Number				1
Reverse Traffic Channel Quality								2
Scaling		Packet Arrival Time Error						3
Rate Set Indicator				Reverse Traffic Channel Rate				4
Reserved							EIB	5
Reverse Traffic Channel Information + Layer 3 Fill								Var.

Soft Handoff Leg #:

This field is used to carry the soft handoff leg number as indicated by the source BS on the A3-Connect Ack message. The target BS shall set this field to the value contained in the Soft Handoff Leg # field in the A3-Connect Ack Information element of the A3-Connect Ack message.

Sequence Number:

The BTS shall set this field to CDMA System Time in frames, modulo 16 (refer to [2]) corresponding to the receive time of the air interface frame in the reverse direction.

Reverse Traffic Channel Quality:

The Reverse Traffic Channel Quality shall consist of a one bit CRC field and a seven bit Symbol Error Rate field.

If the Reverse Traffic Frame CRC passes, the BTS shall set the most significant bit to '1'. Otherwise, the BTS shall set this bit to '0'. If the Reverse Traffic Channel frame does not have a CRC, the BTS shall set this bit to '0'.

The BTS shall set the 7 least significant bits of this parameter to the inverted Re-Encoded Symbol Error Rate or equivalent metric. The inverted Re-Encoded Symbol Error Rate is the binary value of

$127 - \lfloor (\text{Min}[\text{Re-Encoded Symbol Error Rate} \times \alpha, 255]) / 2 \rfloor$

where the value of α is used to normalize the number of symbols to the 1x repetition rate as listed in the *IS-2000* Frame Content element. (Reference: [2]).

If there is no reverse traffic frame detected by the BTS, the Reverse Link Quality field shall be set to '0000 0000'.

If the channel element has lost finger lock, the Reverse Link Quality field may (optionally) be set to '0000 0001' in the erasure frame to indicate that the MS is not acquired. If the lost finger lock option is not asserted, then the Reverse Link Quality field shall be set to '0000 0000' for all erasures.

If the most recently received forward frame received by the BTS from the SDU was an Idle Frame, then the BTS shall set the Reverse Traffic Channel Quality field to a value of 00H and shall send an Idle Frame to the SDU. The SDU shall ignore the value of this field in Idle Frames.

The Re-Encoded Symbol Error Rate is the number of errors found when comparing the received symbols at the input of the convolutional code decoder and the re-encoded symbols at the output of the convolutional code decoder.

The Re-encoded Symbol Error Rate computation shall include the erasure indicator bit (E), if applicable; the information bits; the Frame Quality Indicator (F), if applicable; and the Encoder Tail Bits (T).

Scaling:

The BTS shall set this field to the time scale for the Packet Arrival Time Error (PATE) field. Values are indicated in Table 4.2.30-2.

Table 4.2.30-2 Reverse Layer 3 Data - Time Scale for the Packet Arrival Time Error

Field Value	Time Units	PATE Range
00	125 μs	±3.875 ms
01	1.0 ms	±31.0 ms
10	1.25 ms	±38.75 ms

Packet Arrival Timer Error (PATE):

The BTS shall set this field to the time difference between the time at which the A3-IS-95 FCH Forward message arrives at the BTS minus the expected arrival time in units specified by the Scaling field. This value is expressed in 2's complement format. It has a value in the range ±31 time units, as determined by the Scaling field.

Rate Set Indicator:

The BTS shall set this field to correspond to the Rate Set of the traffic channel frame as follows. If the BTS is sending an Idle Frame to the SDU, the SDU shall ignore the contents of this field.

Table 4.2.30-3 Reverse Layer 3 Data - Rate Set Indicator

Field Value	Meaning
0000	Rate Set 1
0001	Rate Set 2
All other values are reserved	

Reverse Traffic Channel Rate:

The BTS shall set the field values as shown in the following table. The BTS shall set the field value to '0101', idle, if it has not acquired the MS.

Table 4.2.30-4 Reverse Layer 3 Data - Reverse Traffic Channel Rate

Field Value	Rate Set 1 Transmission Rate	Rate Set 2 Transmission Rate
0000	9600 bps (Full Rate)	14400 bps (Full Rate)
0001	4800 bps (Half Rate)	7200 bps (Half Rate)
0010	2400 bps (Quarter Rate)	3600 bps (Quarter Rate)
0011	1200 bps (Eighth Rate)	1800 bps (Eighth Rate)
0100	Erasure	Erasure
0101	Idle	Idle
0110	Rate Set 1 Full Rate Likely	Reserved
All other values are reserved		

Reverse Traffic Channel Information:

The BTS shall set this field to the Reverse Traffic Channel Information that the BTS received from the MS. The BTS shall include the number of bits in the Information column corresponding to the transmission rate of the Reverse Traffic Channel frame. The BTS shall set the Information Bits to the information bits received from the MS which correspond to the Multiplex Sublayer in use (refer to [1]~[6]). The BTS shall use the bit order specified in [1]~[6].

Table 4.2.30-5 Reverse Layer 3 Data - Reverse Traffic Channel Information Bits

Class	Transmission Rate (bps)	Number of Information Bits per Frame
Rate Set 1	9600	172
	4800	80
	2400	40
	1200	16
Rate Set 2	14400	267
	7200	125
	3600	55
	1800	21
Other	Erasure	0
	Idle	0

EIB (Erasure Indicator Bit):

When Rate Set 1 is being used, the BTS shall set this bit to ‘0’. When Rate Set 2 is being used, the BTS shall set this bit to ‘1’ if the EIB received from the MS is a ‘1’; otherwise, the BTS shall set this bit to ‘0’.

Reserved:

The BTS shall set this field to ‘0000000’.

Layer 3 Fill:

The BTS shall include the number of bits in the Layer 3 Fill column corresponding to the transmission rate of the Reverse Traffic Channel

frame. The BTS shall set the Layer 3 Fill bits to '0'. The fill bits are added at the end of the frame in the lower order bit positions per the bit ordering specified in this standard.

Table 4.2.30-6 Reverse Layer 3 Data - Layer 3 Fill Bits

Class	Transmission Rate (bps)	Number of Layer 3 Fill Bits per Frame
Rate Set 1	9600	4
	4800	0
	2400	0
	1200	0
Rate Set 2	14400	5
	7200	3
	3600	1
	1800	3
Other	Erasure	0
	Idle	0

4.2.31 CDMA Long Code Transition Info

This element provides the encryption mask type (public or private long code mask) to be used by the BTS as well as the explicit time of transition to the new long code mask.

4.2.31 CDMA Long Code Transition Info

7	6	5	4	3	2	1	0	Octet
A3/A7 Element Identifier								1
Length								2
Reserved							LCM_TYPE	3
ACTION_TIME								4

Length:

This field indicates the number of octets in this element following the Length field.

Reserved:

All reserved bits shall be set to '0'.

LCM_TYPE:

Long code mask type.

'0' Use Public long code mask.

'1' Use Private long code mask.

ACTION_TIME:

The field shall be set by the BS to the CDMA System Time (refer to [1]~[6]), in units of 80 ms (modulo 64) at which the transition to the new long code mask is to take effect. This field shall have the same setting as was conveyed to the MS in a Long Code Transition Request Order on the Forward Traffic Channel (refer to [1]~[6]). The Action Time value conveyed to the MS is derived by taking the least significant 6 bits of this 8-bit field.

4.2.32 Channel Element ID

This information element identifies a particular channel element instance within a target BS.

4.2.32 Channel Element ID

7	6	5	4	3	2	1	0	Octet
A3/A7 Element Identifier								1
Length								2
(MSB)	CE ID - octet 1							3
…								…
CE ID - octet m							(LSB)	m

Length:

This field indicates the number of octets in this element following the Length field. The value in this field shall be in the range 1 through 6.

CE ID:

This field contains a value that the target BS uses to identify internal resources.

4.2.33 Message CRC

This is a standard 16-bit message CRC computed over the Message Type II and the Forward Layer 3 Data (or Reverse Layer 3 Data) information elements. It is the standard generator polynomial $g(x) = x^{16} + x^{12} + x^5 + 1$ as in [19]. The polynomial representing the message over which the CRC is computed uses bit 7 of the Message Type II octet as the coefficient of the highest order term and bit 0 of the octet that precedes the CRC IE as the zero order term.

4.2.33 Message CRC

7	6	5	4	3	2	1	0	Octet
(MSB)	CRC							1
							(LSB)	2

4.2.34 Channel Element Status

This element contains the status of a set of channel elements at a target BS.

4.2.34 Channel Element Status

7	6	5	4	3	2	1	0	Octet
A3/A7 Element Identifier								1
Length								2
Reserved							Xmit On	3

Length:

This field indicates the number of octets in this element following the Length field.

Xmit On:

This field indicates whether the cells indicated in the accompanying Cell Identifier List element currently have their transmitters and receivers turned on.

‘0’ = transmitter(s) and receiver(s) is(are) off.

‘1’ = transmitter(s) and receiver(s) is(are) on.

4.2.35 Cause List

This element contains a list of cause values that can be correlated to a list of cells.

4.2.35 Cause List

7	6	5	4	3	2	1	0	Octet
A3/A7 Element Identifier								1
Length								2
Reserved	Cause Value 1							3
…								…
Reserved	Cause Value n							k

Length:

This field indicates the number of octets in this element following the Length field.

Cause Value:

This field contains one of the cause values listed in section 4.2.4.

4.2.36 Privacy Info

This element contains the CDMA long code masks (public and private).

4.2.36 Privacy Info

7	6	5	4	3	2	1	0	Octet
A3/A7 Element Identifier								1
Length								2
(MSB)	Privacy Mask Information - 1, first octet							3
…								…
Privacy Mask Information - 1, last octet							(LSB)	j
(MSB)	Privacy Mask Information - 2, first octet							j+1
…								…
Privacy Mask Information - 2, last octet							(LSB)	k
…								…
(MSB)	Privacy Mask Information - n, first octet							m
…								…
Privacy Mask Information - n, last octet							(LSB)	n

Length:

This field indicates the number of octets in this element following the Length field.

The Privacy Mask Information field is coded as follows:

4.2.36 Privacy Info

7	6	5	4	3	2	1	0	Octet
Reserved	Privacy Mask Type					Status	Available	1
Privacy Mask Length								2
(MSB)	Privacy Mask							3
								…
							(LSB)	8

Octet 1:

Bit 0 indicates if the algorithm is available (supported). Available is coded ‘1’, and not available is coded ‘0’.

Bit 1, the status indication, is coded ‘1’ to indicate active and ‘0’ to indicate inactive.

Bits 2 through 6 contain the Privacy Mask Type; refer to Table 4.2.36-1.

Bit 7 is reserved.

Octet 2:

Contains a value indicating the number of octets in the following Privacy Mask field.

Table 4.2.36-1 Privacy Info - Privacy Mask Type

Value	Privacy Mask Type
00000	Not Used - Invalid value.
00001	Public Long Code Mask
00010	Private Long Code Mask
All other values reserved	

Public Long Code Mask:

Encryption parameter for *cdma2000*. Key length is 42 bits, encoded in 6 octets, such that the 6 unused bits are set equal to '0', and occupy the high-order positions of the most significant octet.

Private Long Code Mask:

Encryption parameter for *cdma2000*. Key length is 42 bits, encoded in 6 octets, such that the 6 unused bits are set equal to '0', and occupy the high-order positions of the most significant octet.

4.2.37 A3 Connect Information

This element contains information on one or more cells to be added to a single new or existing A3 connection.

4.2.37 A3 Connect Information

7	6	5	4	3	2	1	0	Octet
A3/A7 Element Identifier								1
Length								2
Reserved			Physical Channel Type				New A3 Indicator	3
Length of Cell Info Record								4
Cell Info Record{								
Cell Identification Discriminator 1								i
Cell Identification 1								Var.
Reserved	CCSH	SR3_Incl	QOF_Mask 1		New Cell Indicator	PWR_ Comb_ Ind	(MSB)	j
Pilot_PN 1							(LSB)	j+1
Code_Chan 1								j+2
Reserved			Rev_FCH_ Gating 1	Lower QOF_Mask 1		Upper QOF_Mask 1		j+3
Lower Code_Chan 1								j+4
Upper Code_Chan 1								j+5
…								…
Cell Identification Discriminator n								k
Cell Identification n								Var.
Reserved	CCSH	SR3_Incl	QOF_Mask n		New Cell Indicator	PWR_ Comb_ Ind	(MSB)	l
Pilot_PN n							(LSB)	l+1
Code_Chan n								l+2
Reserved			Rev_FCH_ Gating 1	Lower QOF_Mask n		Upper QOF_Mask n		l+3
Lower Code_Chan n								l+4
Upper Code_Chan n								l+5
}Cell Info Record								
Length of Traffic Circuit ID								j

4.2.37 A3 Connect Information

7	6	5	4	3	2	1	0	Octet
(MSB)	Traffic Circuit ID							j+1
…								…
							(LSB)	k
Extended Handoff Direction Parameters Field Length								k+1
Extended Handoff Direction Parameters - 1st cell, 1st octet								k+2
…								…
Extended Handoff Direction Parameters - 1st cell, last octet								m
…								…
…								…
Extended Handoff Direction Parameters - last cell, 1st octet								n
…								…
Extended Handoff Direction Parameters - last cell, last octet								o
Length of Channel Element ID								o+1
(MSB)	Channel Element ID - first octet							o+2
…								…
Channel Element ID - last octet							(LSB)	p
Length of A3 Originating ID 1								p+1
(MSB)	A3 Originating ID 1							p+2
								…
							(LSB)	q
…								…
Length of A3 Originating ID n								r
(MSB)	A3 Originating ID n							r+1
								…
							(LSB)	s
Length of A7 Destination ID								s+1
(MSB)	A7 Destination ID							s+2
								…
							(LSB)	t

Length:

This field indicates the number of octets in this element following the Length field.

New A3 Indicator:

This field indicates whether a new A3 connection is to be created.

'0' = a new A3 connections is NOT to be created - this element refers to an existing A3 connection.

'1' = a new A3 connections IS to be created - this element refers to a new A3 connection.

Physical Channel Type:

This field contains the binary value used to indicate a type of physical channel associated with the indicated traffic connection. Valid values are shown as follows.

Value (binary)	Physical Channel Type
0000	*IS-95* Fundamental Channel *TIA/EIA/IS-95*
0001	Fundamental Channel (FCH) *TIA/EIA/IS-2000*
0010	Supplemental Channel (SCH_0) *TIA/EIA/IS-2000*
0011	Dedicated Control Channel (DCCH) *TIA/EIA/IS-2000*
0100	Supplemental Channel (SCH_1) *TIA/EIA/IS-2000*
All other values reserved	

Length of Cell Info Record:

This field indicates the number of immediately following octets that contain the Cell Info Record.

Cell Info Record:

This set of fields contains information on all cells attached to this A3 connection, whether they are being newly attached to this A3 connection by the current operation or they were previously attached by an earlier operation. If, after power combining is applied in the reverse direction, multiple frames exist at the BS, pre-selection is applied to these frames and a single frame is sent in the reverse direction on the A3 traffic connection.

Cell Identification Discriminator:

This field uses the Cell Identification Discriminator values used with the Cell Identifier element (refer to section 4.2.5) to describe the format of the immediately following Cell Identification.

Cell Identification:

This field contains the Cell Identification of a cell associated with this A3 connection. It shall be formatted according to octets 4 through the end of the Cell Identifier element defined in section 4.2.5.

CCSH:

This field shall be set to '1' if CCSH (Code Combining Soft Handoff) is supported by the target BS, and set to '0' otherwise. This field is only applicable to the Supplemental Channel and shall be set to '0' for all other channel types.

SR3_Incl:

This field indicates the use of Spreading Rate 3 (3X). The bit shall be set to '1' if 3X Multi-Carrier is being used, and set to '0' otherwise.

QOF_Mask:

This field contains QOF (Quasi Orthogonal Function) mask index. This QOF mask index coincides with the QOF mask index of air interface air message.

The BTS shall set this field to the QOF mask in the range ‘00’ to ‘11’ inclusive that is used with the code channel index.

New Cell Indicator:

This field indicates whether the corresponding cell is being newly added to an A3 traffic connection by the current procedure or was already existing on this A3 traffic connection.

‘0’ = an existing cell

‘1’ = a newly added cell

PWR_Comb_Ind:

Power Control symbol combining indicator.

If the Forward Traffic Channel associated with this pilot carries the same closed loop power control subchannel bits as that of the previous pilot in this message, the BTS shall set this field to ‘1’. Otherwise, the BTS shall set this field to ‘0’. The first occurrence of this field in this element shall be set to ‘0’. All subsequent occurrences of this field in this element shall be set to ‘1’.

Pilot_PN:

This field contains the pilot PN sequence offset index for the associated cell.

The BTS shall set this field to the pilot PN sequence offset for this pilot in units of 64 PN chips.

Code_Chan:

This field contains the code channel index for the associated cell.

The BTS shall set this field to the code channel index (refer to [1]~[6]) in the range 00H to FFH inclusive that is to be used on the Forward Traffic Channel associated with this pilot. For 3X Multi-Carrier systems, this code channel index is used with the center frequency channel. For the Supplemental Channel, this field is ignored.

Rev_FCH_Gating:

This field is used to indicate the reverse FCH gating capability at the target BS. It is set to ‘1’ if the target cell allows the MS to perform reverse FCH gating; otherwise it is set to ‘0’.

If the target BS allows reverse FCH gating, the target BS uses the same value of Rev_Pwr_Cntl_Delay that is specified by the source BS. Otherwise, if the target BS does not allow reverse FCH gating, the leg will not be added.

Lower QOF Mask:

This field contains the QOF (Quasi-Orthogonal Function) mask index as specified in [2] that is used with the lower frequency channel in a 3X system. This field is ignored if SR3_Incl is set to ‘0’.

Lower Code Chan:

This field specifies one of 256 possible Walsh Codes used to channelize the downlink RF bit stream in a *cdma2000* call The high order 3 bits are reserved for future expansion. This Walsh Code is used with the lower frequency channel. This field is ignored if SR3_Incl is set to ‘0’. For the Supplemental Channel, this field is ignored.

Upper QOF Mask:

This field contains the QOF (Quasi-Orthogonal Function) mask index as specified in [2] that is used with the upper frequency channel in a 3X system. This field is ignored if SR3_Incl is set to '0'.

Upper Code Chan:

This field specifies one of 256 possible Walsh Codes used to channelize the downlink RF bit stream in a *cdma2000* call. The high order 3 bits are reserved for future expansion. This Walsh Code is used with the upper frequency channel. This field is ignored if SR3_Incl is set to '0'. For the Supplemental Channel, this field is ignored.

Length of Traffic Circuit ID:

This field indicates the number of immediately following octets that contain the A3 Traffic Circuit ID value for this A3 connection.

Traffic Circuit ID:

This field is formatted exactly the same as the A3 Traffic Circuit ID element from octet 3 to the end (refer to section 4.2.22).

Extended Handoff Direction Parameters Field Length:

This field indicates the number of octets contained in each occurrence of the Extended Handoff Direction Parameters field.

Extended Handoff Direction Parameters:

This field is formatted exactly the same as the Extended Handoff Direction Parameters element (refer to section 4.2.60) from octet 3 to the end, and is repeated for each cell attached to this A3 connection in a one-to-one correspondence with the cells listed in the Cell Info Record.

Length of Channel Element ID:

This field indicates the number of immediately following octets that contain the Channel Element ID value for this A3 connection. This field shall be set to '0000 0000' if no Channel Element ID value is included in this element.

Channel Element ID:

This field is formatted exactly the same as the Channel Element ID element (section 4.2.32) from octet 3 to the end. If a value is included in this field, i.e., if the Length of Channel Element ID field contains a value other than '0000 0000', this value shall be saved and sent by the SDU function to the target BS in all subsequent A3 signaling messages.

Length of A3 Originating ID:

This field indicates the number of octets in the A3 Originating ID immediately following the Length field. The maximum value in this version of this specification is 8 octets. This field shall be set to '0000 0000' if no A3 Originating ID value is included in this element.

A3 Originating ID:

This field contains an identifier chosen by this (the near end) BS for its own use in quickly processing A3 signaling messages received from the far end BS. For example, it may be used to identify a particular leg of a particular call, or it may identify the resources supporting that leg that are internal to this BS. If an A7 Originating ID is supplied by this BS, then the far end BS includes this in the A3 Destination ID element in subsequent A3 messages to this BS related to the traffic connection.

Each instance of this field corresponds to one Cell Identification previously listed.

Length of A7 Destination ID:

This field indicates the number of octets in the A7 Destination ID immediately following the Length field. The maximum value in this version of this specification is 8 octets. This field shall be set to '0000 0000' if no A7 Destination ID value is included in this element.

A7 Destination ID:

This field is formatted exactly the same as the A3 Destination ID element (section 4.2.44) from octet 3 to the end. If the A7 Originating ID was included in the associated A7-Handoff Request message and the A3 Flag was set to '1', then this field should be set to the value of the A7 Originating ID.

4.2.38 A3 Connect Ack Information

This element contains information on a new or existing A3 connection referenced in a corresponding A3 Connect Information element from the A3-Connect message to which this message is in response.

4.2.38 A3 Connect Ack Information

7	6	5	4	3	2	1	0	Octet
A3/A7 Element Identifier								1
Length								2
Reserved			Soft Handoff Leg #			PMC Cause Present	Xmit Notify	3
Length of Traffic Circuit ID								4
(MSB)	Traffic Circuit ID - first octet							5
	…							…
Traffic Circuit ID - last octet							(LSB)	m
Length of Channel Element ID								m+1
(MSB)	Channel Element ID - first octet							m+2
	…							…
Channel Element ID - last octet							(LSB)	n
PMC Cause								n+1
Length of A3 Originating ID 1								p
(MSB)	A3 Originating ID 1							p+1
								…
							(LSB)	q
	…							…
Length of A3 Originating ID n								r
(MSB)	A3 Originating ID n							r+1
								…
							(LSB)	s
	…							…
Length of A3 Destination ID 1								t
(MSB)	A3 Destination ID 1							t+1
								…
							(LSB)	u
	…							…
Length of A3 Destination ID n								v

4.2.38 A3 Connect Ack Information

7	6	5	4	3	2	1	0	Octet
(MSB)	A3 Destination ID n							v+1
								…
							(LSB)	w

Length:

This field indicates the number of octets in this element following the Length field.

Xmit Notify:

This field indicates whether the target BS shall send an A3-Traffic Channel Status message indicating that the transmitter and receiver of the cell(s) at the target BS have been activated.

‘0’ = Target BS shall not send an A3-Traffic Channel Status message upon activation of the transmitter(s) and receiver(s).

‘1’ = Target BS shall send an A3-Traffic Channel Status message upon activation of the transmitter(s) and receiver(s).

PMC Cause Present:

This field indicates whether the PMC Cause field is present. This field is always coded as ‘1’ for backward compatibility with previous versions of the IOS.

‘1’ = A PMC Cause value is present.

Soft Handoff Leg #:

This field is used to carry the soft handoff leg number as determined by the source BS. The value in this field shall be transferred to the Soft Handoff Leg # field of the Reverse Layer 3 Data element in the A3-FCH/DCCH/SCH Reverse messages sent to the source BS.

Length of Traffic Circuit ID:

This field indicates the number of immediately following octets that contain the A3 Traffic Circuit ID value for this A3 connection. This field shall be set to ‘0000 0000’ if no A3 Traffic Circuit ID value is included in this element.

Traffic Circuit ID:

This field is formatted exactly the same as the A3 Traffic Circuit ID element from octet 3 to the end (refer to section 4.2.22). This field is optional if the Channel Element ID field of this element contains a value.

Length of Channel Element ID:

This field indicates the number of immediately following octets that contain the Channel Element ID value for this A3 connection. This field shall be set to ‘0000 0000’ if no Channel Element ID value is included in this element.

Channel Element ID:

This field is formatted exactly the same as the Channel Element ID element (section 4.2.32) from octet 3 to the end. If a value was included in the Channel Element ID field of the corresponding A3 Connect Information element, this field shall be set to the value that was saved from that element.

PMC Cause:

This field is formatted exactly the same as octet 3 of the PMC Cause element. If no error has occurred in processing the corresponding Connect Information element from the A3 Connect message, then this field shall contain a value of "No Error". If an error has occurred in processing the corresponding A3 Connect Information element from the A3-Connect message, this field shall contain an appropriate PMC Cause value as found in 4.2.24.

Length of A3 Originating ID:

This field indicates the number of octets in this element following the Length field. The maximum value in this version of this specification is 8 octets. This field shall be set to '0000 0000' if no A3 Originating ID value is included in this element.

A3 Originating ID:

This field contains an identifier chosen by this (the near end) BS for its own use in quickly processing A3 signaling messages received from the far end BS. For example, it may be used to identify a particular leg of a particular call, or it may identify the resources supporting that leg that are internal to this BS. If an A7 Originating ID is supplied by this BS, then the far end BS includes this in the A3 Destination ID element in subsequent A3 messages to this BS related to the traffic connection. Originating IDs are listed in the same order as the cells were listed in the corresponding A3 Connect Info IE.

Length of A3 Destination ID:

This field indicates the number of octets in the A3 Destination ID immediately following the Length field. The maximum value in this version of this specification is 8 octets. This field shall be set to '0000 0000' if no A3 Destination ID value is included in this element.

A3 Destination ID:

This field is formatted exactly the same as the A3 Destination ID element (section 4.2.45) from octet 3 to the end. If a value was included in the A3 Originating ID field of the corresponding A3 Connect Information element, this field shall be set to the value that was saved from that element. Each instance of this field corresponds to one cell supporting the specified A3 Traffic Circuit ID.

4.2.39 A3 Remove Information

This element contains information on one or more cells to be removed from a single existing A3 connection.

4.2.39 A3 Remove Information

7	6	5	4	3	2	1	0	Octet
A3/A7 Element Identifier								1
Length								2
Length of Traffic Circuit ID								3
(MSB)	Traffic Circuit ID							4
								…
							(LSB)	j
Number of Cells To Be Removed								j+1
Cell Identification Discriminator 1								j+2
(MSB)	Cell Identification 1							j+3
								…
							(LSB)	k
…								…
Cell Identification Discriminator n								m
(MSB)	Cell Identification n							m+1
								…
							(LSB)	n
Length of A3 Destination ID 1								q
(MSB)	A3 Destination ID 1							q+1
								…
							(LSB)	r
…								…
Length of A3 Destination ID n								s
(MSB)	A3 Destination ID n							s+1
								…
							(LSB)	t
Length of A7 Destination ID								t+1
(MSB)	A7 Destination ID							t+2
								…
							(LSB)	u

Length:

This field indicates the number of octets in this element following the Length field.

Length of Traffic Circuit ID:

This field indicates the number of immediately following octets that contain the A3 Traffic Circuit ID value for this A3 connection.

Traffic Circuit ID:

This field is formatted exactly the same as the A3 Traffic Circuit ID element from octet 3 to the end (refer to section 4.2.22).

Number of Cells To Be Removed:

This field contains a count of the number of Removed Cell Identification Discriminator/Cell Identification pairs that follow.

Cell Identification Discriminator:

This field uses the Cell Identification Discriminator values used with the Cell Identifier element (refer to section 4.2.5) to describe the format of the immediately following Cell Identification field. Cell Identification Discriminator values '0000 0010' and '0000 0111' are allowed.

Cell Identification:

This field contains the Cell Identification of a cell associated with this A3 connection. This field is formatted according to octets 4 through the end of the Cell Identifier element as defined in section 4.2.5.

Length of A3 Destination ID:

This field indicates the number of octets in the A3 Destination ID immediately following the Length field. The maximum value in this version of this specification is 2 octets. This field shall be set to '0000 0000' if no A3 Destination ID value is included in this element.

A3 Destination ID:

This field is formatted exactly the same as the A3 Destination ID element (section 4.2.45) from octet 3 to the end. If a value was included in the A3 Originating ID field of the corresponding A3 Connect Ack Information element, this field shall be set to the value that was saved from that element. Each instance of this field corresponds to one Cell Identification previously listed.

Length of A7 Destination ID:

This field indicates the number of octets in the A7 Destination ID immediately following the Length field. The maximum value in this version of this specification is 8 octets. This field shall be set to '0000 0000' if no A7 Destination ID value is included in this element.

A7 Destination ID:

This field is formatted exactly the same as the A7 Destination ID element (section 4.2.44) from octet 3 to the end. If the A7 Originating ID was included in the associated A7-Handoff Request message and the A3 Flag was set to '1', then this field should be set to the value of the A7 Originating ID.

4.2.40 A3 Drop Information

This element indicates an A3 connection that is being removed in its entirety.

4.2.40 A3 Drop Information

7	6	5	4	3	2	1	0	Octet
A3/A7 Element Identifier								1
Length								2
Length of Traffic Circuit ID								3
(MSB)	Traffic Circuit ID							j
…								…
							(LSB)	m
Length of Channel Element ID								m+1
(MSB)	Channel Element ID - first octet							m+2
…								…
Channel Element ID - last octet							(LSB)	n
Length of A3 Destination ID 1								q
(MSB)	A3 Destination ID 1							q+1
								…
							(LSB)	r
…								…
Length of A3 Destination ID n								s
(MSB)	A3 Destination ID n							s+1
								…
							(LSB)	t

Length:

This field indicates the number of octets in this element following the Length field.

Length of Traffic Circuit ID:

This field indicates the number of immediately following octets that contain the A3 Traffic Circuit ID value for this A3 connection. This field shall be set to ‘0000 0000’ if no A3 Traffic Circuit ID value is included in this element.

Traffic Circuit ID:

This field is formatted exactly the same as the A3 Traffic Circuit ID element from octet 3 to the end (refer to section 4.2.22). This field is optional if the Channel Element ID field of this element contains a value.

Length of Channel Element ID:

This field indicates the number of immediately following octets that contain the Channel Element ID value for this A3 connection. This

field shall be set to ‘0000 0000’ if no Channel Element ID value is included in this element.

Channel Element ID:

This field is formatted exactly the same as the Channel Element ID element from octet 3 to the end. If a value was included in the Channel Element ID field of the corresponding A3 Connect Information element, this field shall be set to the value that was saved from that element.

Length of A3 Destination ID:

This field indicates the number of octets in the A3 Destination ID immediately following the Length field. The maximum value in this version of this specification is 2 octets. This field shall be set to ‘0000 0000’ if no A3 Destination ID value is included in this element.

A3 Destination ID:

This field is formatted exactly the same as the A3 Destination ID element (section 4.2.45) from octet 3 to the end. If a value was included in the A3 Originating ID field of the corresponding A3 Connect Ack Information element, this field shall be set to the value that was saved from that element. Each instance of this field corresponds to one cell supporting the specified A3 Traffic Circuit ID.

4.2.41 Air Interface Message

This information element is used to contain an air-interface message or Layer 2 acknowledgement received/to be sent on a control channel(s) by a target BS.

4.2.41 Air Interface Message

7	6	5	4	3	2	1	0	Octet
A3/A7 Element Identifier								1
Length								2
TIA/EIA/IS-2000 Message Type								3
Air Interface Message Length								4
(MSB)	Air Interface Message							5
								…
							(LSB)	k

Length:

This field indicates the number of octets in this element following the Length field.

TIA/EIA/IS-2000 Message Type:

This field contains the type of the message contained in the following Air Interface Message field. It is provided to allow simpler recognition and handling by the BS. This field is coded the same as the MSG_TYPE field defined in [4].Air Interface Message Length:

This field contains a binary value indicating the number of octets in the following Air Interface Message field.

Air Interface Message:

This field contains the air-interface message received/to be sent on a control channel(s).

4.2.42 Layer 2 Ack Request/Results

This information element is used to contain a Layer 2 acknowledgement request or results received/to be sent on a control channel(s) by a target BS.

4.2.42 Layer 2 Ack Request/Results

7	6	5	4	3	2	1	0	Octet
A3/A7 Element Identifier								1
Length								2
Reserved							Layer 2 Ack	3

Length:

This field indicates the number of octets in this element following the Length field.

Layer 2 Ack:

When this element is included in the A7-Paging Channel Message Transfer message, this bit shall be set to ‘1’ to indicate that a Layer 2 acknowledgment is requested by the source BS.

When this element is included in the A7-Paging Channel Message Transfer Ack message this bit is set to ‘0’ by the target BS to indicate failure to receive a Layer 2 acknowledgment, and is set to ‘1’ by the target BS to indicate that a Layer 2 acknowledgment was received from the MS.

4.2.43 A7 Originating ID

This element contains an identifier chosen by this (the near end) BS for its own use in quickly processing A7 signaling messages received from the far end BS. For example, it may be used to identify the resources supporting the call association that are internal to this BS. If an A7 Originating ID is supplied by this BS, then the far end BS includes this in the A7 Destination ID element in subsequent A7 messages to this BS for this call association.

4.2.43 A7 Originating ID

7	6	5	4	3	2	1	0	Octet
A3/A7 Element Identifier								1
Length								2
Reserved							A3 Flag	3
(MSB)	A7 Originating ID							4
								…
							(LSB)	k

Length:

This field indicates the number of octets in this element following the Length field. The maximum value in this version of this specification is 9 octets.

A3 Flag:

If this field is set to ‘1’ in the A7-Handoff Request message, then the value of the A7 Originating ID should be returned in the A7 Destination ID parameter in all A3 messages sent from the target BS to the source BS.

A7 Originating ID:

This field has variable length. The actual length is indicated in the Length field and is dependent upon the particular implementation. In this version of this standard, this value shall be no more than 8 octets long. This value is chosen by the sending BS and is a manufacturer’s concern.

4.2.44 A7 Destination ID

This element contains an identifier chosen by the far end BS for its own use in quickly processing A7 signaling messages.

If an A7 Originating ID was supplied by the far end BS, then the near end BS includes this value in the A7 Destination ID element in subsequent A7 messages to the far end BS for this call association.

4.2.44 A7 Destination ID

7	6	5	4	3	2	1	0	Octet
A3/A7 Element Identifier								1
Length								2
(MSB)	A7 Destination ID							3
								…
							(LSB)	k

Length:

This field indicates the number of octets in this element following the Length field. The maximum value in this version of this specification is 8 octets.

A7 Destination ID:

This field has variable length. The actual length is indicated in the Length field and is dependent upon the particular implementation. In this version of this standard, this value shall be no more than 8 octets long.

4.2.45 A3 Destination ID

This element contains an identifier chosen by the far end BS for its own use in quickly processing A3 signaling messages.

If an A3 Originating ID was supplied by the far end BS, then the near end BS includes this value in the A3 Destination ID element in subsequent A3 messages to the far end BS related to the traffic connection.

4.2.45 A3 Destination ID

7	6	5	4	3	2	1	0	Octet
A3/A7 Element Identifier								1
Length								2
(MSB)	A3 Destination ID							3
								…
							(LSB)	k

Length:

This field indicates the number of octets in this element following the Length field. The maximum value is 8 octets.

A3 Destination ID:

This field has variable length. The actual length is indicated in the Length field and is dependent upon the particular implementation. In this version of this standard, this value shall be no more than 8 octets long.

4.2.46 *IS-2000* Power Control Info

This element provides information about power control for *IS-2000* channels, including information used for forward gain equalization for a given *IS-2000* power control subchannel and information used for reverse power control delay for a given IS-2000 FCH reverse gating operation mode.

4.2.46 *IS-2000* Power Control Info

7	6	5	4	3	2	1	0	Octet
A3/A7 Element Identifier								1
Length								2
FPC_ PRI_ CHAN	Reserved		Rev_Pwr_ Cntl_ Delay_Incl	Rev_Pwr_Cntl_ Delay		Count of Subchan Gains		3
Reserved				FPC_SUBCHAN_GAIN 1				4
Reserved				FPC_SUBCHAN_GAIN 2				5
Reserved				FPC_SUBCHAN_GAIN 3				6

Element Identifier:

This information element is used on multiple interfaces. When the information element is included in a message that is sent on the A1 interface, the Element Identifier field is coded as 0EH. When the information element is included in a message sent on the A7 interface, the Element Identifier field is coded as 10H.

Length:

This field indicates the number of octets in this element following the Length field.

FPC_PRI_CHAN:

This field indicates which forward link physical channel supports the power control channel (‘0’ = forward FCH, ‘1’ = DCCH).

Rev_Pwr_Cntl_Delay_Incl:

This field indicates if the reverse link power control delay is specified when the source BS is allowing the MS to perform reverse FCH gating.

The coding of this field is as follows:

‘0’ if the following reverse power control delay field is ignored

‘1’ if the following reverse power control delay field is meaningful.

Rev_Pwr_Cntl_Delay:

The base station shall set this field to the closed-loop reverse power control delay used by the MS after handoff, minus one. The field is coded in units of 1.25 ms. Refer to [2] and [5] for more details.

Count of Subchan Gains:

This field indicates the number of fields immediately following that represent the FPC_SUBCHAN_GAIN value that applies to the call depending on the number of independent soft handoff legs. In this version of the IOS, the value of this field is 3. The number of

independent soft handoff legs is sent in the A3 traffic frame. When determining the number of independent soft handoff legs, a set of legs in softer handoff are counted as a single leg. These values are shown in Table 4.2.46-1:

Table 4.2.46-1 Subchannel Gain Values

Count of Independent Soft Handoff Legs	FPC_SUBCHAN_GAIN
1 leg	FPC_SUBCHAN_GAIN 1
2 legs	FPC_SUBCHAN_GAIN 2
≥ 3 legs	FPC_SUBCHAN_GAIN 3

FPC_SUBCHAN_GAIN n:

This field specifies the power gain level of the forward link power control subchannel, relative to that of the 20 ms frames at 9600 bps or 14400 bps, on the F-FCH or F-DCCH that the forward power control subchannel is punctured on, for a given number of independent soft handoff legs as indicated in the previous table. The resolution is 0.25 dB. (Defined in [5] section 3.7.3.3.2.31, General Handoff Direction Message.)

4.2.47 *IS-2000* Forward Power Control Mode

This element specifies the forward power control mode for *IS-2000* channels.

4.2.47 *IS-2000* Forward Power Control Mode

7	6	5	4	3	2	1	0	Octet
A3/A7 Element Identifier								1
Length								2
Reserved					FPC_MODE			3
Action Time Flag	Reserved	ACTION_TIME						4

Length:

This field indicates the number of octets in this element following the Length field.

FPC_MODE:

This field specifies the forward power control operating mode. This indicates the power control subchannel configuration on the reverse pilot channel. (Refer to Power Control Subchannel Configurations defined in [2])

Action Time Flag:

This field indicates whether the FPC Mode change is immediate. If this field is set to '1', it indicates that the FPC Mode change shall occur immediately and the ACTION_TIME field shall be ignored. Otherwise (set to '0') it indicates that the FPC Mode change shall occur at the time specified in the ACTION_TIME field.

ACTION_TIME:

This field shall be set to the CDMA System Time (refer to Section 1.3 of [2]) in units of 80 ms (modulo 64) at which the values specified in the fields of this element take effect. If

(ACTION_TIME – message arrival time) mod 64 > 56

the message shall be considered late and the message shall be processed immediately.

4.2.48 *IS-2000* FPC Gain Ratio Info

This element provides information used for forward gain equalization for a given *IS-2000* power control subchannel.

4.2.48 *IS-2000* FPC Gain Ratio Info

7	6	5	4	3	2	1	0	Octet
A3/A7 Element Identifier								1
Length								2
Initial Gain Ratio								7
Reserved	Gain Adjust Step Size				Count of Gain Ratio Pairs			8
Min Gain Ratio 1								9
Max Gain Ratio 1								10
Min Gain Ratio 2								11
Max Gain Ratio 2								12
Min Gain Ratio 3								13
Max Gain Ratio 3								14

[NOTE: These fields apply either to the primary power control subchannel or to the secondary power control subchannel, depending on what message this information element is included in.]

Gain Adjust Step Size:

This field indicates the amount of forward channel gain change to be used by the target BS when making gain adjustments on the physical channel measured by the power control subchannel. The resolution is 0.25 dB.

Initial Gain Ratio:

This field indicates the initial forward link gain for the physical channel measured by the power control subchannel. It is to be used at the cell when adding a given soft handoff leg.

This field is ignored if the forward power control mode is 50 Hz (EIB).

The initial gain ratio is expressed according to the formula given for the Forward Link Power Control: Gain Ratio (FPC: GR) in the A3 traffic frame format for the corresponding physical channel.

Count of Gain Ratio Pairs:

This field indicates the number of pairs of octets immediately following that represent the Min Gain Ratio and Max Gain Ratio values that apply to the call depending on the number of independent soft handoff legs. In this version of the IOS, the value of this field is 3. The number of independent soft handoff legs is sent in the A3 traffic frame of the corresponding physical channel. When determining the number of independent soft handoff legs, a set of legs in softer handoff are counted as a single leg. These values are shown in Table 4.2.48-1:

Table 4.2.48-1 Independent Soft Handoff Legs

Count of Independent Soft Handoff Legs	Minimum Gain Ratio	Maximum Gain Ratio
1 leg	Min Gain Ratio 1	Max Gain Ratio 1
2 legs	Min Gain Ratio 2	Max Gain Ratio 2
≥ 3 legs	Min Gain Ratio 3	Max Gain Ratio 3

Min Gain Ratio:

This field indicates the minimum allowed forward link gain for the physical channel measured by the power control subchannel.

The minimum gain ratio is expressed according to the formula given for the Forward Link Power Control: Gain Ratio (FPC: GR) in the A3 traffic frame format for the corresponding physical channel.

Max Gain Ratio:

This field indicates the maximum allowed forward link gain for the physical channel measured by the power control subchannel.

The maximum gain ratio is expressed according to the formula given for the Forward Link Power Control: Gain Ratio (FPC: GR) in the A3 traffic frame format for the corresponding physical channel.

4.2.49 FCH/DCCH Forward Air Interval Control

This element contains control information for the CDMA Forward Fundamental or Dedicated Control Channel frames flowing in the SDU to BTS direction.

4.2.49 FCH/DCCH Forward Air Interval Control

7	6	5	4	3	2	1	0	Octet
FPC:SLC				FSN				1
FPC: GR								2
RPC: OLT								3
IS-2000 Frame Content								4
Reserved			Air Interval Content Mask					5

Forward Link Power Control: Sector Link Count (FPC: SLC):

This parameter indicates the number of legs (also known as independent power control subchannels) involved in soft handoff. Multiple sectors in softer handoff with each other are counted as a single leg. This is useful for forward link gain equalization.

Frame Sequence Number (FSN):

The SDU shall set this field to CDMA System Time in frames, modulo 16 (refer to Section 1.3 of [2]) corresponding to the transmission time of the frame over the air in the forward direction.

Forward Link Power Control: Gain Ratio (FPC: GR):

This parameter is required for EIB (50Hz) power control. It is also useful during transitions of: soft handoff states, transmission rates, and FER target values.

The SDU shall set this field to the binary value of

$$\text{Min}(\lfloor (A_t / A_p) * 128 \rfloor, 255)$$

where A_t is the full-rate Forward Link gain (in volts), and A_p is the smallest Pilot Channel gain (in volts). The SDU shall set the FPC: GR field in the range of 0 through 255.

Reverse Link Power Control: Outer-loop Threshold (RPC: OLT):

For RC1 and RC2, the SDU shall set this field to the desired Reverse Traffic Channel E_w/N_t; i.e. the ratio of the total demodulated Walsh symbol energy to total received power spectral density on the RF channel. The E_w/N_t is thus a composite value.

The SDU shall set this field in the range of 0 through 255 corresponding to 0dB to 31.875dB in units of 0.125dB.

For RC3 and all other higher RC, the SDU shall set this field to the desired Reverse Pilot Ec/Io; i.e. the ratio of R-PICH chip energy to total received power spectral density on the RF channel.

The SDU shall set this field in the range of 0 through 255 corresponding to -31.875dB to 0dB in units of 0.125dB.

IS-2000 Frame Content:

This field indicates the frame content type for the 20 ms air traffic frame, with the specific values taken from Table 4.2.15-2, Table 4.2.15-3, or Table 4.2.15-4.

Air Interval Content Mask:

This field contains a mask indicating the presence of a 20 ms forward traffic frame and/or 5 ms traffic frames to be transmitted by the BTS. The bits of this mask are coded as follows:

'0' = not included

'1' = included

Bit 4 indicates the inclusion of a 20 ms forward traffic frame.

The inclusion of 5 ms traffic frames in a forward traffic frame is indicated in bits 3 through 0. They are listed in time order, where bit 3 indicates the inclusion of a 5 ms forward traffic frame to be sent in the first 5 ms sub-interval of the 20 ms interval, and bit 0 indicates the inclusion of a 5 ms forward traffic frame to be sent in the fourth 5 ms sub-interval of the 20 ms interval. If no 5 ms traffic frames are included, bits 3 through 0 are coded to '0'.

4.2.50 FCH/DCCH Reverse Air Interval Control

This element contains control information for the CDMA Forward Fundamental or Dedicated Control Channel frames flowing in the BTS to SDU direction.

4.2.50 FCH/DCCH Reverse Air Interval Control

7	6	5	4	3	2	1	0	Octet
Soft Handoff Leg #				FSN				1
Scaling		Packet Arrival Time Error						2
IS-2000 Frame Content								3
RPC: S							EIB/QIB	4
Reserved			Air Interval Content Mask					5
Reverse Traffic Channel Quality {1..4:								
FQI	Reverse Link Quality							n
} Reverse Traffic Channel Quality								

Soft Handoff Leg #:

This field is used to carry the soft handoff leg number as indicated by the source BS on the A3-Connect Ack message. The target BS shall set this field to the value contained in the Soft Handoff Leg # field in the A3 Connect Ack Information element of the A3-Connect Ack message.

Frame Sequence Number (FSN):

The BTS shall set this field to CDMA System Time in frames, modulo 16 (refer to Section 1.3 of [2]) corresponding to the receive time of the air interface frame in the reverse direction.

Scaling:

The BTS shall set this field to the time scale for the PATE field. Values are indicated in Table 4.2.50-1.

Table 4.2.50-1 Reverse Layer 3 FCH/DCCH Data - Time Scale for the PLATE

Scaling Field Value	Time Units	PATE Range
00	0.125 ms	±3.875 ms
01	1.0 ms	± 31.0 ms
10	1.25 ms	±38.75 ms
11	5.0 ms	±155 ms

Packet Arrival Timer Error (PATE):

The BTS shall set this field to the time difference between the time at which the A3-Forward Layer 3 Data message arrives at the BTS minus the expected arrival time in units specified by the Scaling field. This value is expressed in 2's complement format. It has a value in the range ±31 time units, as determined by the Scaling field.

IS-2000 Frame Content:

This field indicates the frame content type for the 20 ms air traffic frame, with the specific values taken from Table 4.2.15-2, Table 4.2.15-3, or Table 4.2.15-4.

Reverse Power Control- Signal to Noise Ratio (RPC: S):

This field is coded as defined in section 4.2.15.

EIB/QIB:

When FPC_MODE is not equal to '011', '101', or '100' the BTS shall set this field to '0'. When FPC_MODE is equal to '011', '101', or '100', the BTS shall set this field to '1' if the EIB/QIB relating to the FCH/DCCH received from the MS is '1'; otherwise, the BTS shall set this field to '0'. Furthermore, FPC_MODE equal to '011', '101', or '100' implies that a Reverse Layer 3 DCCH Data frame is generated at least once per 20 ms to convey QIB status.

Air Interval Content Mask:

This field contains a mask indicating the presence of a 20 ms reverse traffic frame and/or 5 ms traffic frames received by the BTS. The bits of this mask are coded as follows:

'0' = not included

'1' = included

Bit 4 indicates the inclusion of a 20 ms reverse traffic frame.

The inclusion of 5 ms traffic frames in a reverse traffic frame is indicated in bits 3 through 0. They are listed in time order, where bit 3 indicates the inclusion of a 5 ms reverse traffic frame received in the first 5 ms sub-interval of the 20 ms interval, and bit 0 indicates the inclusion of a 5 ms reverse traffic frame received in the fourth 5 ms sub-interval of the 20 ms interval. If no 5 ms traffic frames are included, bits 3 through 0 are coded to '0'.

There are up to four instances of the Reverse Traffic Channel Quality octet, corresponding to each included traffic frame as indicated by the Air Interval Content Mask field, starting with bit 4. Reverse Traffic Channel Quality consists of the following two fields:

Frame Quality Indicator (FQI):

If the traffic frame contains Reverse Link Information, then the BTS shall set the FQI (Frame Quality Indicator) field to '1' if the Reverse Traffic Frame CRC passes, and '0' if the CRC fails.

If there is no reverse traffic frame[8], the BTS shall (using an implementation specific algorithm) set the FQI field to '1' if it can determine that a reverse traffic frame CRC would have passed, and '0' otherwise.

Reverse Link Quality:

If the reverse traffic frame contains Reverse Link Information, then the BTS shall set the Reverse Link Quality field to the Inverted Re-Encoded Symbol Error Rate or equivalent metric. The Inverted Re-Encoded SER is the binary value of:

$127 - \lfloor (\text{Min}[\text{Re-Encoded Symbol Error Rate} \times \alpha, 255]) / 2 \rfloor$

where the value of α is used to normalize the number of symbols to the 1x repetition rate as listed in the IS-2000 Frame Content element (refer to [2], Code Symbol Repetition).

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8 There is no Reverse Traffic Frame when only a reverse pilot channel exists. For example, this occurs during call setup before the BTS has acquired the reverse traffic channel, within SCH bursts when there is no data to send, or when the DCCH is in DTX mode.

The Inverted Re-Encoded Symbol Error Rate is the number of errors found when comparing the received symbols at the input of the channel decoder and the re-encoded symbols at the output of the channel decoder. The Inverted Re-Encoded Symbol Error Rate computation shall include the erasure indicator bit (E), if applicable; the information bits; the frame quality indicator (F), if applicable; and the encoder tail bits (T), if applicable.

If there is no reverse traffic frame[9], or if a frame erasure is detected by the BTS, the Reverse Link Quality field shall be set to '000 0000'.

[9] There is no Reverse Traffic Frame when only a reverse pilot channel exists. For example, this occurs during call setup before the BTS has acquired the reverse traffic channel, and it occurs when the DCCH is in DTX mode.

4.2.51 SCH Reverse Air Interval Control

This element contains control information for the CDMA Supplemental Channel frames flowing in the BTS to SDU direction.

4.2.51 SCH Reverse Air Interval Control

7	6	5	4	3	2	1	0	Octet
Soft Handoff Leg #				FSN				1
Scaling		Packet Arrival Time Error						2
IS-2000 Frame Content								3
Reserved							EIB	4
FQI	Reverse Link Quality							5

Soft Handoff Leg #:

This field is used to carry the soft handoff leg number as indicated by the source BS on the A3-Connect Ack message. The target BS shall set this field to the value contained in the Soft Handoff Leg # field in the A3 Connect Ack Information element of the A3-Connect Ack message.

Frame Sequence Number (FSN):

The BTS shall set this field to CDMA System Time in frames, modulo 64 (refer to Section 1.2 of [1]~[6]) corresponding to the receive time of the air interface frame in the reverse direction.

When Idle frames are sent on the forward link for purposes of obtaining PATE for an upcoming SCH data burst, the FSN of the reverse Idle SCH frame should be ignored. The timing of the reverse SCH Idle frame may be asynchronous to future demodulated reverse SCH data timing.

Frame Quality Indicator (FQI):

If the traffic frame contains Reverse Link Information, then the BTS shall set the FQI (Frame Quality Indicator) field to '1' if the Reverse Traffic Frame CRC passes. Otherwise, the BTS shall set this field to '0' if the CRC fails or if there is no Reverse Link Information[10].

Reverse Link Quality:

If the reverse traffic frame contains Reverse Link Information, then the BTS shall set this field to the Inverted Re-Encoded Symbol Error Rate (SER) or equivalent metric. The Inverted Re-Encoded SER is the binary value of:

$127 - \lfloor (\text{Min}[\text{Re-Encoded Symbol Error Rate} \times \alpha, 255]) / 2 \rfloor$

where the value of α is used to normalize the number of symbols to the 1x repetition rate as listed in the *IS-2000* Frame Content element. (refer to [2]).

The Inverted Re-Encoded Symbol Error Rate is the number of errors found when comparing the received symbols at the input of the channel decoder and the re-encoded symbols at the output of the channel

[10] There is no Reverse Link Information when only a reverse pilot channel exists. For example, this occurs during call setup before the BTS has acquired the reverse traffic channel, and it occurs when the SCH is in DTX mode.

decoder. The Inverted Re-Encoded Symbol Error Rate computation shall include the erasure indicator bit (E), if applicable; the information bits; the frame quality indicator (F), if applicable; and the encoder tail bits (T), if applicable.

If there is no reverse traffic frame[11] detected by the BTS, the Reverse Link Quality field shall be set to '000 0000'.

If a frame erasure is detected by the BTS and the channel element has lost finger lock, then Reverse Link Quality field may (optionally) be set to '000 0001' to indicate that the MS is not acquired. If the lost finger lock option is not asserted, then the Reverse Link Quality field shall be set to '000 0000' for all erasures.

Scaling:

The BTS shall set this field to the time scale for the PATE field. Values are indicated in Table 4.2.51-1. This field shall be set to '11' if no A3-*IS-2000* SCH Forward message was received.

Table 4.2.51-1 Reverse Layer 3 *IS-2000* SCH Data - Time Scale for the PATE

Field Value	Time Units	PATE Range
00	0.125 ms	±3.875 ms
01	1.0 ms	± 31.0 ms
10	1.25 ms	±38.75 ms
11	5.0 ms	±155 ms

Packet Arrival Timer Error (PATE):

The BTS shall set this field to the time difference between the time at which the A3-*IS-2000* SCH Forward message arrives at the BTS minus the expected arrival time in units specified by the Scaling field. This value is expressed in 2's complement format. It has a value in the range ±31 time units, as determined by the Scaling field. This field shall be set to '00 0000' if no A3-*IS-2000* SCH Forward message was received.

IS-2000 Frame Content:

This field indicates the frame content type for the 20 ms air traffic frame, with the specific values taken from Table 4.2.15-5.

EIB (Erasure Indicator Bit):

When FPC_MODE is not equal to '101' or '110', then the BTS shall set this field to '0'. When FPC_MODE is equal to '101' or '110', then the BTS shall set this field to '1' if the EIB relating to the SCH received from the MS is '1'; otherwise, the BTS shall set this field to '0'. Furthermore, FPC_MODE equal to '101' or '110' implies that a Reverse Layer 3 SCH Data frame is generated at least once per 20 ms to convey EIB status.

[11] There is no Reverse Traffic Frame when only a reverse pilot channel exists. For example, this occurs when the SCH is in DTX mode.

4.2.52 Forward 20 ms Data

This element contains the 20 ms Forward Traffic Frame that the BTS is to send to the MS. This element may contain a 20 ms traffic frame for either an FCH or a DCCH physical channel.

4.2.52 Forward 20 ms Data

7	6	5	4	3	2	1	0	Octet
(MSB)	Forward Link Information + Layer 3 Fill							1
								…
							(LSB)	n

Forward Link Information:

The SDU shall set this field to the Forward Link Information that the BTS is to send to the MS. The SDU shall include the number of Information Bits from Table 4.2.15-2, Table 4.2.15-3, or Table 4.2.15-4, corresponding to the data rate of the Forward Link frame. The SDU shall set the Information Bits to the information bits supplied by the Multiplex Option Sublayer. The bit order shall be as specified in [1].

Layer 3 Fill:

The SDU shall include the number of Layer 3 Fill bits from Table 4.2.15-2, Table 4.2.15-3, or Table 4.2.15-4 corresponding to the data rate of the Traffic Channel frame. The Layer 3 Fill bits shall be set to ‘0’. The fill bits are added at the end of the frame in the lower order bit positions after the Forward Link Information.

4.2.53 Reverse 20 ms Data

This element contains the 20 ms Reverse Traffic Frame that the BTS received from the MS. This element may contain a 20 ms traffic frame for either an FCH or a DCCH physical channel.

4.2.53 Reverse 20 ms Data

7	6	5	4	3	2	1	0	Octet
(MSB)	Reverse Link Information + Layer 3 Fill							1
								…
							(LSB)	n

Reverse Link Information:

The BTS shall set this field to the Reverse Link Information that the BTS received from the MS. The BTS shall include the number of Information bits from Table 4.2.15-2, Table 4.2.15-3, or Table 4.2.15-5, corresponding to the data rate of the Reverse Link frame. The BTS shall set the Information Bits to the information bits received from the MS which correspond to the Multiplex Sublayer in use (refer to [1]~[6]). The BTS shall use the bit order specified in [1]~[6].

Layer 3 Fill:

The SDU shall include the number of Layer 3 Fill bits from Table 4.2.15-2, Table 4.2.15-3, or Table 4.2.15-4 corresponding to the data rate of the Traffic Channel frame. The Layer 3 Fill bits shall be set to '0'. The fill bits are added at the end of the frame in the lower order bit positions after the Reverse Link Information.

4.2.54 Forward 5 ms Data

This information element is used to support 5 ms signaling messages. This element contains a Forward 5 ms message that the BTS is to send to the MS.

4.2.54 Forward 5 ms Data

7	6	5	4	3	2	1	0	Octet
(MSB)	Forward Link Information							1
								2
							(LSB)	3

Forward Link Information:

The SDU shall set this field to the 5 ms Message Forward Link Information that the BTS is to send to the MS. The SDU shall set the Information Bits to the information bits supplied by the Multiplex Option Sublayer. The bit order shall be as specified in [1].

4.2.55 Reverse 5 ms Data

This information element is used to support 5 ms signaling messages. This element contains a Reverse 5 ms message that the BTS received from the MS.

4.2.55 Reverse 5 ms Data

7	6	5	4	3	2	1	0	Octet
(MSB)	Reverse Link Information							1
								2
							(LSB)	3

Reverse Link Information:

The BTS shall set this field to the 5 ms Message Reverse Link Information that the BTS received from the MS. The BTS shall set the Information Bits to the information bits received from the MS which correspond to the Multiplex Sublayer in use (refer to [1]~[6]). The BTS shall use the bit order specified in [1]~[6].

4.2.56 Cell Commitment Info List

This element uniquely identifies cells and is of variable length containing the following fields:

4.2.56 Cell Commitment Info List

7	6	5	4	3	2	1	0	Octet
A3/A7 Element Identifier								1
Length								2
Cell Identification Discriminator = [07H]								3
Cell Commitment Info 1 {								
Cell Identification 1								4-8
Count of Physical Channels			Committed	Physical Channel 1				9
Reserved			Committed	Physical Channel 2				10
Reserved			Committed	Physical Channel 3				11
Reserved			Committed	Physical Channel 4				12
Length of Neighbor List 1								13
Neighbor List 1 - first octet								14
Neighbor List 1 - second octet								15
…								…
Neighbor List 1 - last octet								j
} Cell Commitment Info 1								
…								…
Cell Commitment Info n {								
Cell Identification n								k - k+4
Reserved			Committed	Physical Channel 1				k+5
Reserved			Committed	Physical Channel 2				k+6
Reserved			Committed	Physical Channel 3				k+7
Reserved			Committed	Physical Channel 4				k+8
Length of Neighbor List n								k+9
Neighbor List n - first octet								k+10
Neighbor List n - second octet								k+11
…								…
Neighbor List n - last octet								l
} Cell Commitment Info n								

Length:

This field indicates the number of octets in this element following the Length field.

Cell Identification Discriminator:

This field is coded per section 4.2.5. It applies to all Cell Identification fields present in this element, except those in the Neighbor List(s).

There shall be one instance of the Cell Commitment Info (the following set of fields) for each cell in the Cell Identifier List of the corresponding A7-Handoff Request message.

Cell Identification:

This field is coded as per the equivalent octets described in section 4.2.5, and shall uniquely identify one cell. Only one cell can be indicated per replication.

Count of Physical Channels:

The number of physical channels represented in this element. The value shall be the same as the Count of Physical Channels in the corresponding A7-Handoff Request message. If the value is 1H, then Physical Channel 2, Physical Channel 3, and Physical Channel 4 shall be coded as '0000'. If the value is 02H, then Physical Channel 3 and Physical Channel 4 shall be coded as '0000'. If the value is 03H, then Physical Channel 4 shall be coded as '0000'. Also, the corresponding Committed field(s) shall be set to '0' and ignored.

Committed:

This field indicates whether the requested cell has been committed for the physical channel indicated in associated octet. This field is set to '1' if the target BS has added the indicated cell for the indicated physical channel; otherwise it is set to '0'.

Physical Channel Type:

This field contains the binary value used to indicate a type of physical channel. The physical channels shall be the same as in the Physical Channel Info element in the corresponding A7-Handoff Request message. Valid values are shown as follows.

Value (hex)	**Physical Channel Type**
0H	*IS-95* Fundamental Channel *TIA/EIA/IS-95*
1H	Fundamental Channel (FCH) *TIA/EIA/IS-2000*
2H	Supplemental Channel (SCH_0) *TIA/EIA/IS-2000*
3H	Dedicated Control Channel (DCCH) *TIA/EIA/IS-2000*
4H	Supplemental Channel (SCH_1) *TIA/EIA/IS-2000*
All other values reserved	

Length of Neighbor List:

This field is a binary value indicating the number of octets in the Neighbor List following the Length of Neighbor List field. The length shall be set to '0' if the cell is uncommitted for all Physical Channels.

Neighbor List:

This field is formatted exactly the same as the Neighbor List element from octet 3 to the end. It contains information on the neighbor cells of the target BS indicated in the Cell Identification field. This list may be used by the source BS to update the MS neighbor list.

4.2.57 Extended Neighbor List

This element contains a list of the target BS neighbor cells. This list may be used by the source BS to update the MS neighbor list. This IE is applicable to all Band Classes except Band Class 0. Neighbor List is used for Band Class 0.

4.2.57 Extended Neighbor List

7	6	5	4	3	2	1	0	Octet
A3/A7 Element Identifier								1
Length								2
Number of Neighbors								3
Neighbor Record length								4
PILOT_PN 1							(LSB)	5
PILOT_ PN 1 (MSB)	Short Cell Identification Discriminator 1 = [07H]							6
Cell Identification 1								Var. (m)
BS ID (high octet)								m+7
BS ID (Low Octet)								m+8
Neighbor Type								m+9
Band Class					ARFCN (high bits)			m+10
ARFCN (low bits)								m+11
…								…
PILOT_PN n							(LSB)	k
PILOT_ PN n (MSB)	Short Cell Identification Discriminator n = [07H]							k+1
Cell Identification n								Var. (m)
BS ID (high octet)								m+k+2
BS ID (Low Octet)								m+k+3
Neighbor Type								m+k+4
Band Class					ARFCN(high bits)			m+k+5
ARFCN (low bits)								m+k+6

Length:

This field indicates the number of octets in this element following the Length field.

Number of Neighbors:

This field contains the number of neighboring cells included in this element.

Neighbor Record length:

This field represents the size of the neighbor record.

There is one instance of the next three fields for each cell in the neighbor list.

PILOT PN Code:

The PILOT PN Code is one of the 511 unique values for the pilot PN sequence offset index. The offsets are in increments of 64 PN chips.

Short Cell Identification Discriminator:

This field is identical to Cell Identification Discriminator field specified in section 4.2.5 except that only the least significant seven bits of the eight bits of the Cell Identification Discriminator value are used.

Cell Identification:

This field is identical to Cell Identification field specified in section 4.2.5.

BS ID:

This field contains the identification of the BS to which the cell is subtending.

Neighbor Type:

This field indicates the type of the neighbor. '00H' indicates *TIA/EIA/IS-95A* or *TIA/EIA/IS-95B* CDMA. '01H' indicates *TIA/EIA/IS-2000* CDMA. '02H' indicates that *TIA/EIA/IS-95A*, *TIA/EIA/IS-95B*, and *TIA/EIA/IS-2000* are all supported. All others values are reserved.

Band Class:

This field represents the band class of the neighbor cell. It shall be coded as in 4.2.25.

ARFCN:

This field represents the radio frequency of the cell. It shall be coded as in 4.2.59.

4.2.58 A7 Burst Retry Delay List

This element contains a list of Burst Retry Delays that can be correlated to a list of uncommitted cells. Each Burst Retry Delay specifies the minimum time in seconds that the source BS should wait before sending another A7-Burst Request message for a corresponding cell for a given call instance / session.

4.2.58 A7 Burst Retry Delay List

7	6	5	4	3	2	1	0	Octet
A3/A7 Element Identifier								1
Length								2
Reserved				Burst Retry Delay 1				3
…								…
Reserved				Burst Retry Delay n				n

Length

This field indicates the number of octets in this element following the Length field.

Burst Retry Delay:

This field contains the burst retry delay. The target BS shall set the Burst Retry Delay field in the range of 0 through 10 corresponding to 0 s (seconds) to 50 s in 5 s increments. The value ‘0’ indicates that the source BS may send another A7-Burst Request message at any time.

4.2.59 *IS-95* Channel Identity

This element specifies identity information for one or more *TIA/EIA-95* radio channels.

4.2.59 *IS-95* Channel Identity

7	6	5	4	3	2	1	0	Octet
A7 Element Identifier								1
Length								2
Hard Handoff	Number of Channels to Add			Frame Offset				3
Walsh Code Channel Index								n
Pilot PN Code (low part)								n+1
Pilot PN Code (high part)	Power Combined	Freq. included	Reserved		ARFCN (high part)			n+2
ARFCN (low part)								n+3

Length is the number of octets that follow this octet. The length of this element is variable because more than one target cell may be requested in a *TIA/EIA-95* handoff. Therefore, this element provides the flexibility to specify multiple *TIA/EIA-95* channels that the target BS can accommodate.

In this version of the standard the Hard Handoff field shall be set to '0'.

In this version of the standard the Number of Channels field shall be set to '001'.

The Frame Offset field contains the number of 1.25 ms intervals relative to system time that the forward and reverse traffic channels are delayed by the source. If this element is returned to the source with the hard handoff indicator bit set, this field contains the frame offset delay required by the target.

The following four octets may be included multiple times:

The Walsh Code Channel Index (octet n) specifies one of 64 possible Walsh Codes used to channelize the downlink RF bit stream in a *TIA/EIA-95* call.

Octets n+1 and n+2 contain the Pilot PN Code. The Pilot PN Code is one of 511 unique values for the Pilot Channel offset. The offsets are in increments of 64 PN chips.

The Power Combined field is a flag that, when set to '1', indicates diversity combining of the power control sub-channel of this *TIA/EIA-95* code channel with the previous *TIA/EIA-95* code channel listed in this element. In other words, if this is the second replication of octets n through n+3, then the power control sub-channel of this *TIA/EIA-95* code channel is diversity combined with power control sub-channel of the previous replication of octets n through n+3. The first occurrence of this field in the *IS-95* Channel Identity element is set to zero.

Frequency Included is a flag indicating whether the frequency assignment is included. A '0' indicates no frequency assignment is present, a '1' indicates a frequency assignment is present and is specified in the ARFCN field of this element. For code channel

assignments that are on the same *TIA/EIA-95* channel frequency, this field shall be set to '0'.

The ARFCN (Absolute RF Channel Number) in octets n+2 and n+3 identifies the *TIA/EIA-IS-95* frequency being used in the current mobile connection. This ARFCN has a range of 0-2047 to accommodate the various frequency bands. The frequency bands are shown as follows for clarification. When the Frequency Included flag is set to zero, the ARFCN field shall be set to all binary zeros.

The Frequency Bands reserved for *TIA/EIA-95* signaling system in the North American cellular band class are covered with the following channel numbering scheme:

- A band allocation of 311 channels and numbered for TIA/EIA-95 as 1-311.
- B band allocation of 289 channels and numbered for TIA/EIA-95 as 356-644.
- A' band allocation of 6 channels and numbered for TIA/EIA-95 as 689-694.
- B' band allocation of 39 channels and numbered for TIA/EIA-95 as 739-777.
- A'' band allocation of 11 channels and numbered for TIA/EIA-95 as 1013-1023.

The Frequency Bands reserved in the North American PCS band class are covered with the following channel numbering scheme:

- A-F band allocation of channels numbered from 25-1175.

4.2.60 Extended Handoff Direction Parameters

This information element is included in this version of the standard because it is used to define fields in the A3 Connect Information information element. Refer to section 4.2.37.

4.2.60 Extended Handoff Direction Parameters

7	6	5	4	3	2	1	0	Octet
A3/A7 Element Identifier								1
Length								2
Search Window A Size (Srch_Win_A)				Search Window N Size (Srch_Win_N)				3
Search Window R Size (Srch_Win_R)				Add Pilot Threshold (T_Add) high order bits				4
T_Add low order bits		Drop Pilot Threshold (T_Drop)						5
Compare Threshold (T_Comp)				Drop Timer Value (T_TDrop)				6
Neighbor Max Age (Nghbor_Max_AGE)				Reserved				7
Reserved		SOFT_SLOPE						8
Reserved		ADD_INTERCEPT						9
Reserved		DROP_INTERCEPT						10
Target BS P_REV								11

For coding of the parameters listed in this element, refer to [1]~[6].

4.2.61 Rescue Request Info

The Rescue Request Info element is used to indicate to the target BS that a rescue channel is required for a call. The information element is coded as follows:

4.2.61 Rescue Request Info

7	6	5	4	3	2	1	0	Octet
A3/A7 Element Identifier								1
Length								2
Reserved							Transmit Flag	3

Length:

This field indicates the number of octets in this element following the Length field.

Transmit Flag:

The transmit flag indicates to the target BS when to start transmitting traffic frames to the MS:

0 – Do not transmit until MS is acquired

1 – Begin to transmit immediately.

4.2.62 A3 Traffic IP Address

This information element is used to identify a particular address between a BTS and a source BS/SDU.

4.2.62 A3 Traffic IP Address

7	6	5	4	3	2	1	0	Octet
A3/A7 Element Identifier								1
Length								2
Address Type								3
(MSB)	Address							4
								5
								6
							(LSB)	7
(MSB)	Port							8
							(LSB)	9

Length:

This field indicates the number of octets in this element following the Length field.

Address Type:

This field indicates the type and format of the A3 Traffic IP Address as given in Table 4.2.62-1. In this version of the standard only Internet Protocol IPv4 is supported.

Table 4.2.62-1 A3 Traffic IP Address Type and Format

Type	Format of the A3 IP Address	Length of the A3 IP Address
1	Internet Protocol IPv4	4 octets
2	Internet Protocol IPv6	16 octets
All other values reserved		

IP Address:

This field contains the IP address of the A3 User Traffic. This field has a length and format that depends on the Type field.

Port:

This field contains the port address (e.g. the UDP port number).

4.2.63 Cell Pilot Increment List

This element contains a list of Pilot Increments for the cells associated with either Cell Identifier List or Cell Commitment Info List IE in the target neighbor BSs.

4.2.63 Cell Pilot Increment List

7	6	5	4	3	2	1	0	Octet
A3/A7 Element Identifier								1
Length								2
Number of Pilot Increments								3
Pilot Increment 2				Pilot Increment 1				4
Pilot Increment 4				Pilot Increment 3				n
…				…				n+1
Pilot Increment n+1 or Reserved if odd number of Pilot Increments				Pilot Increment n				n+2

Length:

This field indicates the number of octets in this element following the Length field.

Number of Pilot Increments:

This field contains the number of pilot increments included in this element.

Pilot Increment:

This field specifies the Pilot PN sequence offset index increment. Refer to [5].

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5.0 Timer Definitions

5.1 Timer Values

Table 5.1-1 Timer Values and Ranges Sorted by Name

Timer Name	Default Value (seconds)	Range of Values (seconds)	Granularity (seconds)	Section Reference
T_{acm}	0.5	0 - 1.0	0.1	5.2.10
T_{bstreq}	0.1	0 – 1.0	0.1	5.2.1
T_{bstcom}	0.1	0 – 1.0	0.1	5.2.2
$T_{chanstat}$	0.5	0 – 1.0	0.1	5.2.8
T_{conn3}	0.5	0 – 1.0	0.1	5.2.3
$T_{discon3}$	0.5	0 – 1.0	0.1	5.2.4
T_{drptgt}	5	1 – 10	1	5.2.5
T_{tgtrmv}	5	1 – 10	1	5.2.7
T_{horeq}	1	0 - 5	0.1	5.2.6
T_{pcm}	1	0 - 2	0.1	5.2.11
$T_{physical}$	1	0 – 10	1	5.2.9
T_2	60	0 – 255	1	5.12
T_4	60	0 – 255	1	5.13

5.2 A3/A7 Timer Definitions

5.2.1 T_{bstreq}

The T_{bstreq} timer is used by the source BS to wait for the A7-Burst Response message from the target BS. This timer is started when the A7-Burst Request message is sent and stopped when A7-Burst Response messages have been received for all cells in the corresponding A7-Burst Request message.

5.2.2 T_{bstcom}

The T_{bstcom} timer is used by the target BS to wait for the A7-Burst Commit message from the source BS. This timer is started when the A7-Burst Response message is sent and stopped when A7-Burst Commit or the A7-Burst Response message has been received.

5.2.3 T_{conn3}

The T_{conn3} timer is used by the target BS to wait for the A3-Connect Ack message. This timer is started when the A3-Connect message is sent and stopped when the A3-Connect Ack message is received.

5.2.4 $T_{discon3}$

The $T_{discon3}$ timer is used by the target BS to wait for the A3-Remove Ack message. This timer is started when the A3-Remove message is sent and stopped when the A3-Remove Ack message is received.

5.2.5 T_{drptgt}

The T_{drptgt} timer is used by the source BS to wait for the A7-Drop Target Ack message. This timer is started when the A7-Drop Target message is sent and stopped when the A7-Drop Target Ack message is received.

5.2.6 T_{horeq}

The T_{horeq} timer is used by the source BS to wait for the A7-Handoff Request Ack message. This timer is started when the A7-Handoff Request message is sent and stopped when the A7-Handoff Request Ack message is received.

5.2.7 T_{tgtrmv}

The T_{tgtrmv} timer is used by the target BS to wait for the A7-Target Removal Response message. This timer is started when the A7-Target Removal message is sent and stopped when the A7-Target Removal Response message is received.

5.2.8 $T_{chanstat}$

The $T_{chanstat}$ timer is used by the source BS/SDU to wait for the A3-Traffic Channel Status messages for all new cells on an A3 connection. This timer is started when the A3-Connect Ack message indicating that A3-Traffic Channel Status messages are requested is sent and stopped when A3-Traffic Channel Status message(s) have been received for all new cells on the A3 connection.

5.2.9 $T_{physical}$

The $T_{physical}$ timer is used by the source BS/SDU to wait for the A3-Physical Transition Directive Ack message for an A3 connection. This timer is started when the A3-Physical Transition Directive message is sent and stopped when A3-Physical Transition Directive Ack message has been received.

5.2.10 T_{acm}

This is a target BS timer. The timer is started when an A7-Access Channel Message Transfer message is sent and stopped when an A7-Access Channel Message Transfer Ack message is received.

5.2.11 T_{pcm}

This is a source BS timer. The timer is started when an A7-Paging Channel Message Transfer message is sent and stopped when an A7-Paging Channel Message Transfer Ack message is received.

5.2.12 T_2

Timer T_2 represents the A7-Reset guard period in the BS that receives the A7-Reset message. To avoid a "deadlock" situation during an A7-Reset procedure, timer T_2 (second BS) should always be less than timer T_4 (first BS).

5.2.13 T_4

The first BS starts this timer when the A7-Reset message is sent and stops it when the A7-Reset Acknowledge message is received. If timer T_4 expires without receiving a A7-Reset Acknowledge message, the first BS repeats the A7-Reset procedure. To avoid a "deadlock" situation during a first BS triggered global reset procedure, timer T_2 (second BS) should always be less than timer T_4 (first BS).

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