54 to 56 Void

57 EGPRS Dual Transfer Mode

57.1 Reallocation of CS resources

57.1.1 Void

57.1.2 Void

57.1.3 Intra frequency reallocation of CS resources / DTM Assignment Command

57.1.3.1 Conformance requirements

In dual transfer mode an intracell change of channel can be requested by upper layers for changing the channel type, or decided by the RR sub layer, e.g. for an internal handover or for the reallocation of all the resources of the mobile station. The purpose is to modify completely the physical channel configuration of the mobile station without frequency redefinition or change in synchronization while staying in the same cell.

Upon receipt of the DTM ASSIGNMENT COMMAND message, the mobile station initiates a local end release of link layer connections, disconnects the physical channels, commands the switching to the assigned channel and initiates the establishment of lower layer connection (this includes the activation of the channel, their connection and the establishment of the main signalling link).

NOTE: This conformance requirement was taken from Rel-5 specifications, but it is also a requirement on R99 and Rel-4 MS.

References

3GPP TS 44.018, sub-clause 3.4.23.2

57.1.3.2 Test purpose

To verify that the MS can reallocate both the CS connection and PS resources to different timeslot(s) within the same frequency band, having received the DTM ASSIGNMENT COMMAND message.

57.1.3.3 Method of test

Initial Conditions

System Simulator:

1 cell, DTM supported.

Mobile Station:

The MS is in the active state (U10) of a call.

The MS is in GMM Ready state with a P-TMSI allocated and the PDP context 1 activated.

Specific PICS statements

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PIXIT statements

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Test Procedure

Once the MS is in DTM, the SS attempts to modify the resources of the MS. The SS allocates the MS a different timeslot configuration, in the same frequency band, on the current cell. The re-allocation of the MS resources is realised by the MS receiving a DTM ASSIGNMENT COMMAND from the SS. On receipt of the DTM ASSIGNMENT COMMAND message, the MS initiates a local end release of link layer connections, disconnects the physical channels. After the MS has switched to the assigned channel, the MS initiates the establishment of lower layer connection, the activation of the channel and the establishment of the main signalling link. The MS returns an ASSIGNMENT COMPLETE message on the new signalling link.

MS supporting DTM/EGPRS shall complete testing for k=1, and indicating support of single slot DTM/EGPRS shall complete testing for k=2.

Maximum Duration of Test

5 minutes

Expected Sequence

The test sequence is repeated for k = 1,2.

Step	Direction	Message	Comments
1	SS		MS in state U10, on Timeslot N (chosen arbitrarily), utilising a default TCH of cell and either: k=1, Channel Type = TCH/F; or k=2, Channel Type = TCH/H.
2	SS->MS	PACKET ASSIGNMENT	Assigning downlink resources on Timeslot N+1.
3	SS<->MS	{ Downlink data transfer }	Macro – Transmitting 2.000 octet of Data
4	SS->MS	DTM ASSIGNMENT COMMAND	This message is sent after approximately 1.000 octets have been successfully transmitted. See specific message contents.
5	MS->SS	ASSIGNMENT COMPLETE	
6	SS<->MS	{ Downlink data transfer }	Macro – Completion of the 2.000 octet transmission.
7	SS		Verify that the CS connection is still through connected on the new Timeslot.

Specific Message Contents

DTM ASSIGNMENT COMMAND (Step 4):

k=1:

As default message contents as defined in section 40.2.4.28 except:	
Description of the CS Channel	
- Timeslot number	(N + 4) MOD 8
- Channel Type	TCH/F
RR Packet Uplink Assignment IE	Not included
RR Packet Downlink Assignment IE	
- TIMESLOT_ALLOCATION	((N + 4)± 1)MOD 8
Additions for R99:	
EGPRS Window Size	64
LINK_QUALITY_MEASUREMENT_MODE	00

k=2:

As default message contents as defined in section 40.2.4.28 except:	
Description of the CS Channel	
- Timeslot number	(N + 4) mod 8
- Channel Type	TCH/H
RR Packet Uplink Assignment IE	Not included
RR Packet Downlink Assignment IE	
- TIMESLOT_ALLOCATION	(N + 4) MOD 8
Additions for R99:	
EGPRS Window Size	64
LINK_QUALITY_MEASUREMENT_MODE	00

57.1.4 Inter frequency reallocation of CS resources / DTM Assignment Command

57.1.4.1 Conformance requirements

In dual transfer mode an intracell change of channel can be requested by upper layers for changing the channel type, or decided by the RR sub layer, e.g. for an internal handover or for the reallocation of all the resources of the mobile station. The purpose is to modify completely the physical channel configuration of the mobile station without frequency redefinition or change in synchronization while staying in the same cell.

Upon receipt of the DTM ASSIGNMENT COMMAND message, the mobile station initiates a local end release of link layer connections, disconnects the physical channels, commands the switching to the assigned channel and initiates the establishment of lower layer connection (this includes the activation of the channel, their connection and the establishment of the main signalling link).

NOTE: This conformance requirement was taken from Rel-5 specifications, but it is also a requirement on R'99 and Rel-4 MS.

References

3GPP TS 44.018, sub-clause 3.4.23.2

57.1.4.2 Test purpose

To verify that the MS, can reallocate both the CS connection and PS resources to a different frequency band, having received the DTM ASSIGNMENT COMMAND message while in DTM.

57.1.4.3 Method of test

Initial Conditions

System Simulator:

1 cell, Cell A, with both TCH of cell activated and DTM supported. TCH2 allocated in a different frequency band and added to the Cell Channel Description in SI1.

Mobile Station:

The MS is in the active state (U10) of a call, on cell A, with a TMSI and P-TMSI allocated and the PDP context 1 activated but no allocated TBFs.

Specific PICS statements

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PIXIT statements

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Test Procedure

Once the MS is in DTM, the SS attempts to modify the resources of the MS. The MS is allocated a new timeslot, in a different frequency band. The re-allocation of the MS resources is realised by the MS receiving a DTM ASSIGNMENT

COMMAND from the SS. On receipt of the DTM ASSIGNMENT COMMAND message, the MS initiates a local end release of link layer connections and disconnects the physical channels. After the MS has switched to the assigned channel, the MS initiates the establishment of lower layer connection, the activation of the channel and the establishment of the main signalling link. The MS returns an ASSIGNMENT COMPLETE message on the new signalling link and continues transmitting on the uplink TBF.

MS supporting DTM/EGPRS shall complete testing for k=1 MSs indicating support of single slot DTM/EGPRS shall complete testing for k=2.

Maximum Duration of Test

5 minutes

Expected Sequence

The test sequence is repeated for k = 1,2.

Step	Direction	Message	Comments
1	SS		MS in state U10, on Timeslot N (chosen arbitrarily), utilising either: k=1, Channel Type = TCH/F; or k=2, Channel Type = TCH/H.
2	MS		Trigger the MS to initiate an uplink packet transfer containing 2.000 octets.
3	MS->SS	DTM REQUEST	
4	SS->MS	PACKET ASSIGNMENT	See specific message contents.
5	SS<->MS	{ Uplink data }	Macro – Transmitting 2.000 octets of data.
6	SS->MS	DTM ASSIGNMENT COMMAND	This message to be sent before the termination of the macro. The SS instructs the MS to utilise the first alternative TCH of Cell A in a different Band supported by the MS and see specific message contents for other changes to default message.
7	MS->SS	ASSIGNMENT COMPLETE	
8	SS<->MS	{ Uplink data transfer }	Macro – completion of 2.000 octets of data upload.
9	SS		Verify that the CS connection is still through connected on the new Timeslot.

Specific Message Contents

PACKET ASSIGNMENT (Step 4):

k=1:

Information Element	Value/remark
As default message contents as defined in section 40.2.4.31 except:	
RR Packet Uplink Assignment IE	
- TIMESLOT_ALLOCATION	(N ± 1) MOD 8
Additions for R99:	
EGPRS_MCS_MODE	MCS-1
RESEGMENT	0 Retransmitted RLC data blocks shall not be re-segmented
EGPRS Window Size	64
RR Packet Downlink Assignment IE	Not included

k=2:

Information Element	Value/remark
As default message contents as defined in section 40.2.4.31 except: RR Packet Uplink Assignment IE - TIMESLOT_ALLOCATION *Additions for R99:* EGPRS_MCS_MODE RESEGMENT EGPRS Window Size RR Packet Downlink Assignment IE	 N MCS-1 0 Retransmitted RLC data blocks shall not be re-segmented 64 Not included

DTM ASSIGNMENT COMMAND (Step 6):

As default message contents as defined in section 40.2.4.28 except:	
Description of the CS Channel	
- Timeslot number	N
- Channel Type	TCH/F
RR Packet Uplink Assignment IE	
- TIMESLOT_ALLOCATION	(N ± 1) MOD 8
Additions for R99:	
EGPRS_MCS_MODE	MCS-1
RESEGMENT	0 Retransmitted RLC data blocks shall not be re-segmented
EGPRS Window Size	64
RR Packet Downlink Assignment IE	Not included

For GSM 850 and PCS 1900 only:

SYSTEM INFORMATION TYPE 1:

As default message contents except:	
SI 1 Rest Octets	
- Band Indicator	H (ARFCN indicates 1900 band)

SYSTEM INFORMATION TYPE 6:

As default message contents except:	
SI 6 Rest Octets	
- Band Indicator	H (ARFCN indicates 1900 band)

57.2 Release of CS resources

57.2.1 Network originating CS release

57.2.1.1 Conformance requirements

When the MS is operating in DTM and RR connection release is requested by the network, the radio resources allocated on a PDCH are released, the MS returns to the PCCCH or CCCH configuration, packet idle mode. The MS shall abort the RR connection by initiating a normal release of the main signalling link, perform a local end release of all other signalling links, disconnecting all traffic channels and abort all the packet resources.

References

3GPP TS 04.18/44.018, sub-clauses 3.4.13.1, 3.4.13.3

57.2.1.2 Test purpose

To verify that after the network releases the CS connection, the PS resources are correctly re-established

57.2.1.3 Method of test

Initial Conditions

System Simulator:

1 cell, DTM supported.

Mobile Station:

The MS is in the active state (U10) of a call.
The MS is GPRS attached with a P-TMSI allocated and the PDP context 1 activated.

Specific PICS statements

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PIXIT statements

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Test Procedure

An MS, in dedicated mode, is triggered to initiate uplink data transfer. The MS sends a DTM REQUEST message to the SS requesting uplink resources. The SS assigns the required resources and waits until approximately half the uplink data has been passed to the SS before instructing the MS to release the CS resources. The SS initiates the signalling required to release the channel by sending a DISCONNECT message to the MS. The MS responds to the DISCONNECT message with a RELEASE message, to which the SS responds with a RELEASE COMPLETE and then a CHANNEL RELEASE message. Once the resources have been cleared the MS requests the establishment of an uplink TBF and completes the data transmission.

MS supporting DTM/EGPRS shall complete testing for k=1 and MSs indicating support of single slot DTM/EGPRS shall additionally complete testing for k=2.

Maximum Duration of Test

5 minutes

Expected Sequence

Step	Direction	Message	Comments
1	SS		MS in the active state (U10) of a call on Timeslot N. When: k=1, Channel Type=TCH/F; k=2, Channel Type=TCH/H.
2	MS		Trigger the MS to initiate an uplink packet transfer containing 10.000 octets.
3	MS->SS	DTM REQUEST	
4	SS->MS	PACKET ASSIGNMENT	See specific message contents
5	MS<->SS	{ Uplink data }	Macro
6	MS		The SS is triggers the release of the CS connection when approximately 5.000 octets have been sent.
7	SS->MS	DISCONNECT	
8	MS->SS	RELEASE	
9	SS->MS	RELEASE COMPLETE	
10	SS->MS	CHANNEL RELEASE	
11	MS<->SS	{ Uplink dynamic allocation two phase access }	Macro
12	MS<->SS	{ Completion of uplink RLC data block transfer }	Macro – Completion of the 10.000 octets transmission.

Specific Message Contents

PACKET ASSIGNMENT (Step 4):

k=1:

Information Element	Value/remark
As default message contents as defined in section 40.2.4.31 except:	
RR Packet Uplink Assignment IE	
- TIMESLOT_ALLOCATION	(N ± 1) MOD 8
Additions for R99:	
EGPRS_MCS_MODE	MCS-1
RESEGMENT	0 Retransmitted RLC data blocks shall not be re-segmented
EGPRS Window Size	64
RR Packet Downlink Assignment IE	Not included

k=2:

Information Element	Value/remark
As default message contents as defined in section 40.2.4.31 except:	
RR Packet Uplink Assignment IE	
- TIMESLOT_ALLOCATION	N
Additions for R99:	
EGPRS_MCS_MODE	MCS-1
RESEGMENT	0 Retransmitted RLC data blocks shall not be re-segmented
EGPRS Window Size	64
RR Packet Downlink Assignment IE	Not included

58 Void

58a Latency reductions

Default Initial conditions:

All default conditions, message contents and macros are defined in section 40 and section 50. If a mobile station indicates support of Reduced Latency, then an additional default initial condition used for Latred testcases in this clause is as follows. This condition is not necessary for a mobile station that does not support Reduced Latency but supports FANR only.

- Unless otherwise stated in the test case, the REDUCED_LATENCY_ACCESS bit in GPRS Cell Options is set to 1 to indicate latency reduction support by the simulator.

58a.1 FANR Fast Ack/Nack reporting

58a.1.1 Uplink TBF, SSN based PAN Format

58a.1.1.1 Conformance Requirements

1. If a mobile station indicates support of Reduced Latency (see 3GPP TS 24.008), it may be assigned TBFs with FANR activated (see sub-clause 9.1.14), either in BTTI configuration or in RTTI configuration. If a mobile station indicates support of FANR (see 3GPP TS 24.008) and it does not indicate support of Reduced Latency, it may be assigned TBFs with FANR activated (see sub-clause 9.1.14) in BTTI configuration only.

2. The Fast Ack/Nack reporting procedure (FANR) allows to piggy-back, within EGPRS RLC/MAC blocks for data transfer sent in one direction, the acknowledgement status of data blocks relative to a TBF in the opposite direction.

3. If an uplink TBF is established or reconfigured with FANR activated (see sub-clauses 11.2.29, 11.2.29a, 11.2.31, and 11.2.31a), the mobile station shall monitor for the presence of a PAN field for this TBF on all downlink PDCHs on which it shall monitor the USF for this TBF... The network may encode the PAN field according to the SSN-based encoding defined in subclause 9.1.8 or the time-based encoding defined in subclause 9.1.15. The specific encoding selected by the network is notified to the mobile station at TBF establishment/reconfiguration.

4. When the SSN-based encoding is used (see sub-clause 9.1.14.1), the Piggy-backed Ack/Nack (PAN) field consists of a beginning of window (BOW), a short starting sequence number (ShortSSN), a reported bitmap (RB) and a temporary flow identifier (TFI) fields. In the downlink direction, the TFI field shall always include a valid value.

5. If included in a PAN field, the TFI identifies the Temporary Block Flow (TBF) being acknowledged.

References

3GPP TS 44.060, subclause 5.2.1.

3GPP TS 44.060, subclause 9.1.14.1.

3GPP TS 44.060, subclause 10.3a.5

3GPP TS 44.060, subclause 10.4.10.

58a.1.1.2 Test Purposes

1. To verify that the mobile station can establish an uplink TBF with FANR activated using the SSN based format.

2. To verify that the mobile station correctly interprets the contents of PAN fields received in downlink data blocks on downlink PDCHs which it is monitoring for USF for the uplink TBF.

3. To verify that the mobile station only interprets the PAN fields addressed to it via TFI.

58a.1.1.3 Method of Test

Initial Conditions

System Simulator:

1 cell with EGPRS support, default setting, PBCCH not present.

Mobile Station:

The MS is EGPRS updated with a P-TMSI allocated, SPLIT PG CYCLE negotiated and the test PDP Context 2 activated.

Specific PICS Statements

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PIXIT Statements

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Test Procedure

The MS is triggered to transfer 440 octets of user data. An uplink TBF is established. During the uplink TBF the SS negatively acknowledges one of the MS's uplink RLC data blocks using a PAN field which addresses the MS via it's TFI included in the header of a downlink data block sent on the assigned PDTCH. It is checked that the MS re-transmits the negatively acknowledged uplink RLC data block. The re-transmitted uplink RLC data block is then positively acknowledged by the SS. During the uplink TBF the SS includes a PAN field in a downlink data block sent on the assigned PDTCH which would otherwise negatively acknowledge one of the MS's uplink RLC data blocks were it not for the fact that the TFI in the PAN field addresses another MS. It is checked that the MS does not re-transmit the uplink RLC data block. The uplink RLC data block is then positively acknowledged by the SS. The uplink TBF is completed during which it is checked that the MS does not repeat any of the previously positively acknowledged uplink RLC data blocks.

Maximum Duration of Test

10 minutes.

Expected Sequence

The test case is repeated for k =1 (RTTI, single UL/DL pair), 2 (BTTI plus FANR, single UL/DL slot) for all MSs indicating support of Reduced Latency.

The test case is repeated for k =2 (BTTI plus FANR, single UL/DL slot) only for all MSs indicating support of FANR.

Step	Direction	Message	Comments
1		{Uplink dynamic allocation two phase access}	n = 440 octets USF_GRANULRITY = 1 block Acknowledged Mode. See Specific Message Contents below.
2	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on downlink PACCH. USF assigned to the MS.
3	MS -> SS	EGPRS UPLINK DATA BLOCK	Received on assigned PDTCH. Does not contain PAN field. Contains RLC data block with:- BSN = BSN(n)
4	SS -> MS	EGPRS DOWLINK DATA BLOCK	Sent on assigned PDTCH. Contains PAN field (SSN based format) with:- TFI assigned to the MS. RB negatively acknowledging RLC data block with BSN = BSN(n).
5	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on downlink PACCH. USF assigned to the MS. IF MS supported Reduced Latency Capability THEN For k = 1 :- Sent on next but one RTTI block after Step 4. For k = 2:- Sent on next BTTI block after Step 4. ELSE IF MS supported FANR Capability THEN For k = 2 :- Sent on next BTTI block after Step 4.
6	MS -> SS	EGPRS UPLINK DATA BLOCK	Received on assigned PDTCH. Does not contain PAN field. Contains RLC data block with:- BSN = BSN(n)
7	SS -> MS	EGPRS DOWLINK DATA BLOCK	Sent on assigned PDTCH. Contains PAN field (SSN based format) with:- TFI assigned to the MS. RB positively acknowledging RLC data block with BSN = BSN(n).
8	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on downlink PACCH. USF assigned to the MS.
9	MS -> SS	EGPRS UPLINK DATA BLOCK	Received on assigned PDTCH. Does not contain PAN field. Contains RLC data block with :- BSN = BSN(n+1)

10	SS -> MS	EGPRS DOWLINK DATA BLOCK	Sent on assigned PDTCH. Contains PAN field (SSN based format) with :- TFI different to that assigned to the MS. RB negatively acknowledging RLC data block with BSN = BSN(n+1).
11	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on downlink PACCH. USF assigned to the MS. IF MS supported Reduced Latency Capability THEN For k = 1:- Sent on next but one RTTI block after Step 10. For k = 2:- Sent on next BTTI block after Step 10. ELSE IF MS supported FANR Capability THEN For k = 2 :- Sent on next BTTI block after Step 10.
12	MS -> SS	EGPRS UPLINK DATA BLOCK	Received on assigned PDTCH. Does not contain PAN field. Contains RLC data block with:- BSN = BSN(n+2)
13	SS -> MS	EGPRS DOWLINK DATA BLOCK	Sent on assigned PDTCH. Contains PAN field (SSN based format) with:- TFI assigned to the MS. RB acknowledging RLC data blocks with BSN = BSN(n+1) and BSN(n+2).
14		{Uplink TBF completion}	It is checked that BSN > BSN(n+2) for all received RLC data blocks.

Specific Message Contents

PACKET UPLINK ASSIGNMENT in Step 1:

EGPRS Channel Coding Command	Arbitrarily chosen from MCS-1..MCS4.
{ 0 | 1 -- *'1' indicates that FANR is activated*	1
{ 0 -- *SSN-based encoding is selected*	0
| 1 -- *Time-based encoding is selected*	
<REPORTED_TIMESLOTS_C1 : bit(8)>	Not present.
{0|1 <REPORTED_TIMESLOTS_C2 : bit(8)>}	Not present.
<TSH : bit (2)>}}	Not present.

58a.1.2 Uplink TBF, SSN based PAN Format, with Concurrent Downlink TBF

58a.1.2.1 Conformance Requirements

1. If a mobile station indicates support of Reduced Latency (see 3GPP TS 24.008), it may be assigned TBFs with FANR activated (see sub-clause 9.1.14), either in BTTI configuration or in RTTI configuration. If a mobile station indicates support of FANR (see 3GPP TS 24.008) and it does not indicate support of Reduced Latency, it may be assigned TBFs with FANR activated (see sub-clause 9.1.14) in BTTI configuration only. The network shall ensure that, if a mobile station is assigned a TBF with FANR activated, FANR shall be activated for all concurrent TBFs assigned to that mobile station.

2. If an uplink TBF is established or reconfigured with FANR activated (see sub-clauses 11.2.29, 11.2.29a, 11.2.31, and 11.2.31a), the mobile station shall monitor for the presence of a PAN field for this TBF on all downlink PDCHs on which it shall monitor the USF for this TBF... If the presence of a PAN field is indicated in the header of an EGPRS RLC/MAC block for data transfer received on these PDCHs, the mobile station shall decode the PAN field also in the blocks addressed to other mobile stations. The network may encode the PAN field according to the SSN-based encoding defined in subclause 9.1.8 or the time-based encoding defined in subclause 9.1.15. The specific encoding selected by the network is notified to the mobile station at TBF establishment/reconfiguration.

3. When the SSN-based encoding is used (see sub-clause 9.1.14.1), the Piggy-backed Ack/Nack (PAN) field consists of a beginning of window (BOW), a short starting sequence number (ShortSSN), a reported bitmap (RB) and a temporary flow identifier (TFI) fields. In the downlink direction, the TFI field shall always include a valid value.

4. If included in a PAN field, the TFI identifies the Temporary Block Flow (TBF) being acknowledged.

References

3GPP TS 44.060, subclause 5.2.1.

3GPP TS 44.060, subclause 9.1.14.1.

3GPP TS 44.060, subclause 10.3a.5

3GPP TS 44.060, subclause 10.4.10.

58a.1.2.2 Test Purposes

1. To verify that the mobile station can operate a downlink TBF with FANR activated whilst an uplink TBF with FANR activated using the SSN based format is in operation.

2. To verify that the mobile station interprets PAN fields addressed to it via TFI when received in downlink data blocks not belonging to the MS's concurrent downlink TBF.

3. To verify that the mobile station only interprets the PAN fields addressed to it via TFI when received in downlink data blocks belonging to the MS's concurrent downlink TBF.

58a.1.2.3 Method of Test

Initial Conditions

System Simulator:

1 cell with EGPRS support, default setting, PBCCH not present.

Mobile Station:

The MS is EGPRS updated with a P-TMSI allocated, SPLIT PG CYCLE negotiated and the test PDP Context 2 activated.

Specific PICS Statements

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PIXIT Statements

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Test Procedure

The MS is triggered to transfer 440 octets of user data. An uplink TBF is established. A concurrent downlink TBF is established. During the concurrent uplink and downlink TBFs, the SS negatively acknowledges one of the MS's uplink RLC data blocks using a PAN field which addresses the MS via it's TFI included in the header of a downlink data block addressed to another MS sent on the assigned PDTCH. It is checked that the MS re-transmits the negatively acknowledged uplink RLC data block. The re-transmitted uplink RLC data block is then positively acknowledged by the SS. During the concurrent uplink and downlink TBFs, the SS includes a PAN field in a downlink data block addressed to the MS sent on the assigned PDTCH which would otherwise negatively acknowledge one of the MS's uplink RLC data blocks were it not for the fact that the TFI in the PAN field addresses another MS. It is checked that the MS does not re-transmit the uplink RLC data block. The uplink RLC data block is then positively acknowledged by the SS. The downlink TBF is completed. The uplink TBF is completed during which it is checked that the MS does not repeat any of the previously positively acknowledged uplink RLC data blocks.

Maximum Duration of Test

10 minutes.

Expected Sequence

The test case is repeated for k =1 (RTTI, single UL/DL pair), 2 (BTTI plus FANR, single UL/DL slot) for all MSs indicating support of Reduced Latency.

The test case is repeated for k =2 (BTTI plus FANR, single UL/DL slot) only for all MSs indicating support of FANR.

Step	Direction	Message	Comments
1		{Uplink dynamic allocation two phase access}	n = 440 octets USF_GRANULRITY = 1 block Acknowledged Mode. See Specific Message Contents below.
2	SS -> MS	PACKET DOWNLINK ASSIGNMENT	Sent on downlink PACCH. A downlink TBF is assigned. See Specific Message Contents below.
3	SS -> MS	EGPRS DOWLINK DATA BLOCK	Sent on assigned PDTCH. TFI assigned to the MS. CES/P = 011 Does not contain PAN field. IF MS supported Reduced Latency Capability THEN For k = 1 :- Sent three RTTI blocks after Step 2. For k = 2 :- Sent two BTTI blocks after Step 2. ELSE IF MS supported FANR Capability THEN For k = 2:- Sent two BTTI blocks after Step 2.
4	MS -> SS	EGPRS UPLINK DATA BLOCK	Received on assigned PDTCH. Received in reserved block allocated by CES/P at Step 3. Contains PAN field which positively acknowledges the downlink data block sent at Step 3. Contains RLC data block with :- BSN = BSN(n)
5	SS -> MS	EGPRS DOWLINK DATA BLOCK	Sent on assigned PDTCH. CES/P = 000 TFI not assigned to the MS. Contains PAN field (SSN based format) with :- TFI assigned to the MS. RB negatively acknowledging RLC data block with BSN = BSN(n).

6	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on downlink PACCH. USF assigned to the MS IF MS supported Reduced Latency Capability THEN For k = 1:- Sent on next but one RTTI block after Step 5. For k = 2:- Sent on next BTTI block after Step 5. ELSE IF MS supported FANR Capability THEN For k = 2:- Sent on next BTTI block after Step 5.
7	MS -> SS	EGPRS UPLINK DATA BLOCK	Received on assigned PDTCH. Does not contain PAN field. Contains RLC data block with :- BSN = BSN(n)
8	SS -> MS	EGPRS DOWLINK DATA BLOCK	Sent on assigned PDTCH. CES/P = 000 TFI not assigned to the MS. Contains PAN field (SSN based format) with :- TFI assigned to the MS. RB positively acknowledging RLC data block with BSN = BSN(n).
9	SS -> MS	EGPRS DOWLINK DATA BLOCK	Sent on assigned PDTCH. TFI assigned to the MS. CES/P = 011 Does not contain PAN field.
10	MS -> SS	EGPRS UPLINK DATA BLOCK	Received on assigned PDTCH. Received in reserved block allocated by CES/P at Step 9. Contains PAN field which positively acknowledges the downlink data block sent at Step 9 Contains RLC data block with :- BSN = BSN(n+1)
11	SS -> MS	EGPRS DOWLINK DATA BLOCK	Sent on assigned PDTCH. CES/P = 011 TFI assigned to the MS. Contains PAN field (SSN based format) with :- TFI not assigned to the MS. RB negatively acknowledging RLC data block with BSN = BSN(n+1).
12	MS -> SS	EGPRS UPLINK DATA BLOCK	Received on assigned PDTCH. Received in reserved block allocated by CES/P at Step 11. Contains PAN field which positively acknowledges the downlink data block sent at Step 11. Contains RLC data block with :- BSN = BSN(n+2)
13	SS -> MS	EGPRS DOWLINK DATA BLOCK	Sent on assigned PDTCH. CES/P = 001 FBI = 1 TFI assigned to the MS. Contains PAN field (SSN based format) with :- TFI assigned to the MS. RB positively acknowledging RLC data blocks with BSN = BSN(n+1) and BSN (n+2).
14	MS -> SS	EGPRS PACKET DOWNLINK ACK/NACK	Received on uplink PACCH. Received in reserved block allocated by CES/P at Step 13. FAI = 1
15		{Uplink TBF completion}	It is checked that BSN > BSN(n+2) for all received RLC data blocks.

Specific Message Contents

PACKET UPLINK ASSIGNMENT in Step 1:

EGPRS Channel Coding Command	Arbitrarily chosen from MCS-1..MCS-4.
{ 0 | 1 -- *'1' indicates that FANR is activated*	1
{ 0 -- *SSN-based encoding is selected*	0
| 1 -- *Time-based encoding is selected*	
<REPORTED_TIMESLOTS_C1 : bit(8)>	Not present.
{0|1 <REPORTED_TIMESLOTS_C2 : bit(8)>}	Not present.
<TSH : bit (2)>}}	Not present.

PACKET DOWNLINK ASSIGNMENT in Step 2:

{ 0 | 1 -- '1' *indicates Fast Ack/Nack Reporting is activated*	1
< EVENT_BASED_FANR: bit (1) > }	0

58a.1.3 Uplink TBF, Time based PAN Format

58a.1.3.1 Conformance Requirements

1. If a mobile station indicates support of Reduced Latency (see 3GPP TS 24.008), it may be assigned TBFs with FANR activated (see sub-clause 9.1.14), either in BTTI configuration or in RTTI configuration. If a mobile station indicates support of FANR (see 3GPP TS 24.008) and it does not indicate support of Reduced Latency, it may be assigned TBFs with FANR activated (see sub-clause 9.1.14) in BTTI configuration only.

2. The Fast Ack/Nack reporting procedure (FANR) allows to piggy-back, within EGPRS RLC/MAC blocks for data transfer sent in one direction, the acknowledgement status of data blocks relative to a TBF in the opposite direction.

3. If an uplink TBF is established or reconfigured with FANR activated (see sub-clauses 11.2.29, 11.2.29a, 11.2.31, and 11.2.31a), the mobile station shall monitor for the presence of a PAN field for this TBF on all downlink PDCHs on which it shall monitor the USF for this TBF... The network may encode the PAN field according to the SSN-based encoding defined in subclause 9.1.8 or the time-based encoding defined in subclause 9.1.15. The specific encoding selected by the network is notified to the mobile station at TBF establishment/reconfiguration.

4. When the Time-based encoding is used (see sub-clause 9.1.14.1), the Piggy-backed Ack/Nack (PAN) field consists of a 20 bits reported bitmap, as described in sub-clause 9.1.15, plus 5 bits set to '0.

References

3GPP TS 44.060, subclause 5.2.1.

3GPP TS 44.060, subclause 9.1.14.1.

3GPP TS 44.060, subclause 10.3a.6

58a.1.3.2 Test Purposes

1. To verify that the mobile station can establish an uplink TBF with FANR activated using the time based format.

2. To verify that the mobile station correctly interprets the contents of PAN fields received in downlink data blocks on downlink PDCHs which it is monitoring for USF for the uplink TBF.

58a.1.3.3 Method of Test

Initial Conditions

System Simulator:

1 cell with EGPRS support, default setting, PBCCH not present.

Mobile Station:

The MS is EGPRS updated with a P-TMSI allocated, SPLIT PG CYCLE negotiated and the test PDP Context 2 activated.

Specific PICS Statements

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PIXIT Statements

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Test Procedure

The MS is triggered to transfer 1000 octets of user data. An uplink TBF is established using an EGPRS coding scheme that requires the transmission of two RLC data blocks per EGPRS uplink radio block. During the uplink TBF the SS negatively acknowledges both RLC data blocks containned within one uplink EGPRS data block sent by the MS using a PAN field in the time based format included in a downlink data block sent on the assigned PDTCH. It is checked that the MS re-transmits both negatively acknowledged RLC data blocks. The re-transmitted RLC data blocks are then positively acknowledged by the SS. During the uplink TBF the SS negatively acknowledges the first of two RLC data blocks containned within one uplink EGPRS data block sent by the MS using a PAN field in the time based format included in a downlink data block sent on the assigned PDTCH. It is checked that the MS re-transmits the negatively acknowledged RLC data block. The re-transmitted RLC data block is then positively acknowledged by the SS. During the uplink TBF the SS negatively acknowledges the second of two RLC data blocks containned within one uplink EGPRS data block sent by the MS using a PAN field in the time based format included in a downlink data block sent on the assigned PDTCH. It is checked that the MS re-transmits the negatively acknowledged RLC data block. The re-transmitted RLC data block is then positively acknowledged by the SS. The uplink TBF is completed during which it is checked that the MS does not repeat any of the previously positively acknowledged uplink RLC data blocks.

Maximum Duration of Test

10 minutes.

Expected Sequence

The test case is repeated for k =1 (RTTI, single UL/DL pair), 2 (BTTI plus FANR, single UL/DL slot) for all MSs indicating support of Reduced Latency.

The test case is repeated for k =2 (BTTI plus FANR, single UL/DL slot) only for all MSs indicating support of FANR.

Step	Direction	Message	Comments
1		{Uplink dynamic allocation two phase access}	n = 1000 octets USF_GRANULRITY = 1 block Acknowledged Mode. See Specific Message Contents below.
2	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on downlink PACCH. USF assigned to the MS.
3	MS -> SS	EGPRS UPLINK DATA BLOCK	Received on assigned PDTCH. Does not contain PAN field. Contains RLC data blocks with:- BSN = BSN(n) + BSN(n+1).
4	SS -> MS	EGPRS DOWLINK DATA BLOCK	Sent on assigned PDTCH. Contains PAN field (time based format) with:- Reported bitmap negatively acknowledging both RLC data blocks received in Step 3. Reported bitmap positively acknowledging all RLC data blocks from other MSs.
5	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on downlink PACCH. USF assigned to the M IF MS supported Reduced Latency Capability THEN S. For k = 1:- Sent on next but one RTTI block after Step 4. For k = 2:- Sent on next BTTI block after Step 4. ELSE IF MS supported FANR Capability THEN For k = 2:- Sent on next BTTI block after Step 4
6	MS -> SS	EGPRS UPLINK DATA BLOCK	Received on assigned PDTCH. Does not contain PAN field. Contains RLC data blocks with:- BSN = BSN(n) + BSN(n+1).
7	SS -> MS	EGPRS DOWLINK DATA BLOCK	Sent on assigned PDTCH. Contains PAN field (time based format) with:- Reported bitmap positively acknowledging both RLC data blocks received in Step 6. Reported bitmap negatively acknowledging all RLC data blocks from other MSs.
8	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on downlink PACCH. USF assigned to the MS.

9	MS -> SS	EGPRS UPLINK DATA BLOCK	Received on assigned PDTCH. Does not contain PAN field. Contains RLC data blocks with:- BSN = BSN(n+2) + BSN(n+3)
10	SS -> MS	EGPRS DOWLINK DATA BLOCK	Sent on assigned PDTCH. Contains PAN field (time based format) with:- Reported bitmap negatively acknowledging the first and positively acknowledging the second of the two RLC data blocks received in Step 9. Reported bitmap positively acknowledging all RLC data blocks from other MSs.
11	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on downlink PACCH. USF assigned to the MS IF MS supported Reduced Latency Capability THEN. For k = 1:- Sent on next but one RTTI block after Step10. For k = 2:- Sent on next BTTI block after Step 10 ELSE IF MS supported FANR Capability THEN For k = 2:- Sent on next BTTI block after Step 10.
12	MS -> SS	EGPRS UPLINK DATA BLOCK	Received on assigned PDTCH. Does not contain PAN field. Contains RLC data blocks with:- BSN = BSN(n+2) + BSN(n+4)
13	SS -> MS	EGPRS DOWLINK DATA BLOCK	Sent on assigned PDTCH. Contains PAN field (time based format) with:- Reported bitmap positively acknowledging both RLC data blocks received in Step 12. Reported bitmap negatively acknowledging all RLC data blocks from other MSs.
14	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on downlink PACCH. USF assigned to the MS.
15	MS -> SS	EGPRS UPLINK DATA BLOCK	Received on assigned PDTCH. Contains RLC data blocks with:- BSN = BSN(n+5) + BSN(n+6)
16	SS -> MS	EGPRS DOWLINK DATA BLOCK	Sent on assigned PDTCH. Contains PAN field (time based format) with:- Reported bitmap positively acknowledging the first and negatively acknowledging the second of the two RLC data blocks received in Step 15. Reported bitmap positively acknowledging all RLC data blocks from other MSs.
17	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on downlink PACCH. USF assigned to the MS. IF MS supported Reduced Latency Capability THEN For k = 1:- Sent on next but one RTTI block after Step16. For k = 2:- Sent on next BTTI block after Step 16. ELSE IF MS supported FANR Capability THEN For k = 2:- Sent on next BTTI block after Step 16.
18	MS -> SS	EGPRS UPLINK DATA BLOCK	Received on assigned PDTCH. Does not contain PAN field. Contains RLC data blocks with :- BSN = BSN(n+6) + BSN(n+7)
19	SS -> MS	EGPRS DOWLINK DATA BLOCK	Sent on assigned PDTCH. Contains PAN field (time based format) with :- Reported bitmap positively acknowledging both RLC data blocks received in Step 18. Reported bitmap negatively acknowledging all RLC data blocks from other MSs.
20		{Uplink TBF completion}	It is checked that BSN > BSN(n+7) for all received RLC data blocks.

Specific Message Contents

PACKET UPLINK ASSIGNMENT in Step 1:

EGPRS Channel Coding Command	0110 - MCS-7
{ 0 | 1 -- *'1' indicates that FANR is activated* { 0 -- *SSN-based encoding is selected* | 1 -- *Time-based encoding is selected* <REPORTED_TIMESLOTS_C1 : bit(8)> {0|1 <REPORTED_TIMESLOTS_C2 : bit(8)>} <TSH : bit (2)>}}	1 1 Timeslot(s) allocated to the MS. Not present. Chosen randomly from {00, 01, 10, 11}.

58a.1.4 Uplink TBF, Time based PAN Format, with Concurrent Downlink TBF

58a.1.4.1 Conformance Requirements

1. If a mobile station indicates support of Reduced Latency (see 3GPP TS 24.008), it may be assigned TBFs with FANR activated (see sub-clause 9.1.14), either in BTTI configuration or in RTTI configuration. If a mobile station indicates support of FANR (see 3GPP TS 24.008), it may be assigned TBFs with FANR activated (see sub-clause 9.1.14) in BTTI configuration only. The network shall ensure that, if a mobile station is assigned a TBF with FANR activated, FANR shall be activated for all concurrent TBFs assigned to that mobile station.

2. If an uplink TBF is established or reconfigured with FANR activated (see sub-clauses 11.2.29, 11.2.29a, 11.2.31, and 11.2.31a), the mobile station shall monitor for the presence of a PAN field for this TBF on all downlink PDCHs on which it shall monitor the USF for this TBF... If the presence of a PAN field is indicated in the header of an EGPRS RLC/MAC block for data transfer received on these PDCHs, the mobile station shall decode the PAN field also in the blocks addressed to other mobile stations. The network may encode the PAN field according to the SSN-based encoding defined in subclause 9.1.8 or the time-based encoding defined in subclause 9.1.15. The specific encoding selected by the network is notified to the mobile station at TBF establishment/reconfiguration.

3. When the Time-based encoding is used (see sub-clause 9.1.14.1), the Piggy-backed Ack/Nack (PAN) field consists of a 20 bits reported bitmap, as described in sub-clause 9.1.15, plus 5 bits set to '0.

References

3GPP TS 44.060, subclause 5.2.1.

3GPP TS 44.060, subclause 9.1.14.1.

3GPP TS 44.060, subclause 10.3a.6

58a.1.4.2 Test Purposes

1. To verify that the mobile station can operate a downlink TBF with FANR activated whilst an uplink TBF with FANR activated using the time based format is in operation.

2. To verify that the mobile station interprets PAN fields from downlink data blocks belonging to it's own and other MS's downlink TBFs.

58a.1.4.3 Method of Test

Initial Conditions

System Simulator:

1 cell with EGPRS support, default setting, PBCCH not present.

Mobile Station:

The MS is EGPRS updated with a P-TMSI allocated, SPLIT PG CYCLE negotiated and the test PDP Context 2 activated.

Specific PICS Statements

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PIXIT Statements

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Test Procedure

The MS is triggered to transfer 440 octets of user data. An uplink TBF is established. A concurrent downlink TBF is established. During the concurrent uplink and downlink TBFs, the SS negatively acknowledges one of the MS's uplink RLC data blocks using a PAN field included in a downlink data block addressed to another MS sent on the assigned PDTCH. It is checked that the MS re-transmits the negatively acknowledged uplink RLC data block. The re-transmitted uplink RLC data block is then positively acknowledged by the SS using a PAN field included in a downlink data block addressed to the MS. The downlink TBF is completed. The uplink TBF is completed during which it is checked that the MS does not repeat the previously positively acknowledged uplink RLC data block.

Maximum Duration of Test

10 minutes.

Expected Sequence

The test case is repeated for k =1 (RTTI, single UL/DL pair), 2 (BTTI plus FANR, single UL/DL slot) for all MSs indicating support of Reduced Latency.

The test case is repeated for k =2 (BTTI plus FANR, single UL/DL slot) only for all MSs indicating support of FANR.

Step	Direction	Message	Comments
1		{Uplink dynamic allocation two phase access}	n = 440 octets USF_GRANULRITY = 1 block Acknowledged Mode. See Specific Message Contents below.
2	SS -> MS	PACKET DOWNLINK ASSIGNMENT	Sent on downlink PACCH. A downlink TBF is assigned. See Specific Message Contents below.
3	SS -> MS	EGPRS DOWLINK DATA BLOCK	Sent on assigned PDTCH. TFI assigned to the MS. CES/P = 011 Does not contain PAN field. IF MS supported Reduced Latency Capability THEN For k = 1:- Sent three RTTI blocks after Step 2. For k = 2 :- Sent two BTTI blocks after Step 2. ELSE IF MS supported FANR Capability THEN For k = 2 :- Sent two BTTI blocks after Step 2
4	MS -> SS	EGPRS UPLINK DATA BLOCK	Received on assigned PDTCH. Received in reserved block allocated by CES/P at Step 3. Contains PAN field which positively acknowledges the downlink data block sent at Step 3. Contains RLC data block with :- BSN = BSN(n)
5	SS -> MS	EGPRS DOWLINK DATA BLOCK	Sent on assigned PDTCH. CES/P = 000 TFI not assigned to the MS. Contains PAN field (time based format) with :- Reported bitmap negatively acknowledging the RLC data block with BSN = BSN(n).
6	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on downlink PACCH. USF assigned to the MS. IF MS supported Reduced Latency Capability THEN For k = 1:- Sent on next but one RTTI block after Step 5. For k = 2:- Sent on next BTTI block after Step 5. ELSE IF MS supported FANR Capability THEN For k = 2:- Sent on next BTTI block after Step 5.
7	MS -> SS	EGPRS UPLINK DATA BLOCK	Received on assigned PDTCH. Does not contain PAN field. Contains RLC data block with :- BSN = BSN(n)
8	SS -> MS	EGPRS DOWLINK DATA BLOCK	Sent on assigned PDTCH. CES/P = 001 FBI = 1 TFI assigned to the MS. Contains PAN field (time based format) with :- Reported bitmap positively acknowledging the RLC data block with BSN = BSN(n).
9	MS -> SS	EGPRS PACKET DOWNLINK ACK/NACK	Received on uplink PACCH. Received in reserved block allocated by CES/P at Step 8. FAI = 1
10		{Uplink TBF completion}	It is checked that BSN > BSN(n) for all received RLC data blocks.

Specific Message Contents

PACKET UPLINK ASSIGNMENT in Step 1:

EGPRS Channel Coding Command	Arbitrarily chosen from MCS-1..MCS-4.

{ 0 | 1 -- *'1' indicates that FANR is activated* { 0 -- *SSN-based encoding is selected* | 1 -- *Time-based encoding is selected* <REPORTED_TIMESLOTS_C1 : bit(8)> {0|1 <REPORTED_TIMESLOTS_C2 : bit(8)>} <TSH : bit (2)>}}	1 1 Timeslot(s) allocated to the MS. Not present. Chosen randomly from {00, 01, 10, 11}.

PACKET DOWNLINK ASSIGNMENT in Step 2:

{ 0 | 1 -- '1' *indicates Fast Ack/Nack Reporting is activated* < EVENT_BASED_FANR: bit (1) > }	1 0

58a.1.5 Concurrent Uplink and Downlink TBFs, Discrimination of PAN Information from Different PDCH or PDCH Pairs

58a.1.5.1 Conformance Requirements

1. If an uplink TBF is established or reconfigured with FANR activated (see sub-clauses 11.2.29, 11.2.29a, 11.2.31, and 11.2.31a), the mobile station shall monitor for the presence of a PAN field for this TBF on all downlink PDCHs on which it shall monitor the USF for this TBF. The mobile station shall only attempt to decode a PAN field in a downlink EGPRS RLC/MAC block for data transfer if it is already required to check for a USF within that RLC/MAC block.

References

3GPP TS 44.060, subclause 9.1.14.1.

58a.1.5.2 Test Purposes

1. To verify that the mobile station only interprets PAN information received on a PDCH (BTTI configuration) or PDCH pairs (RTTI configuration) which it is required to monitor for USF for uplink TBF and ignores PAN information received on other downlink PDCH or PDCH pairs it may simultaneously be monitoring for downlink TBF.

58a.1.5.3 Method of Test

Initial Conditions

System Simulator:

1 cell with EGPRS support, default setting, PBCCH not present.

Mobile Station:

The MS is EGPRS updated with a P-TMSI allocated, SPLIT PG CYCLE negotiated and the test PDP Context 2 activated.

Specific PICS Statements

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PIXIT Statements

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Test Procedure

The MS is triggered to transfer 440 octets of user data. An uplink TBF in RTTI mode on a single PDCH pair is established if the MS indicates support of Reduced Latency. If the MS indicates support of FANR then an uplink TBF in BTTI mode on a single PDCH is established. A concurrent downlink TBF using two PDCH (BTTI mode) or two PDCH pairs (RTTI mode), one being the same as the slot or pair used for the uplink TBF, is established. During the concurrent uplink and downlink TBFs, the SS inserts a PAN field in the SSN based format into a downlink data block transmitted on the PDCH or PDCH pair not associated with the uplink TBF but which is associated with the downlink

TBF. The PAN field would otherwise negatively acknowledge one of the MS's uplink RLC data blocks and has the TFI set to the same value as assigned to the MS for it's uplink TBF. It is checked that the MS does not re-transmit the otherwise negatively acknowledged uplink RLC data block. The uplink RLC data block is then positively acknowledged by the SS using a PAN field in the SSN based format which addresses the MS via it's assigned uplink TFI sent on the PDCH or PDCH pair associated with the uplink TBF. The downlink TBF is completed. The uplink TBF is completed during which it is checked that the MS does not repeat any previously positively acknowledged uplink RLC data block.

Maximum Duration of Test

10 minutes.

Expected Sequence

Step	Direction	Message	Comments
1		{Uplink dynamic allocation two phase access}	n = 440 octets USF_GRANULRITY = 1 block Acknowledged Mode. See Specific Message Contents below.
2	SS -> MS	PACKET DOWNLINK ASSIGNMENT	Sent on downlink PACCH. A downlink TBF is assigned. See Specific Message Contents below.
3	SS -> MS	EGPRS DOWLINK DATA BLOCK	Sent on first assigned downlink PDTCH or PDTCH pair. TFI assigned to the MS. CES/P = 000 Does not contain PAN field. IF MS supported Reduced Latency Capability THEN Sent three RTTI blocks after Step 2. ELSE IF MS supported FANR Capability THEN Sent three BTTI blocks after Step 2.
4	SS -> MS	EGPRS DOWLINK DATA BLOCK	Sent on second assigned downlink PDTCH or PDTCH pair. TFI assigned to the MS. CES/P = 000 Does not contain PAN field. IF MS supported Reduced Latency Capability THENSent three RTTI blocks after Step 2. ELSE IF MS supported FANR Capability THEN Sent three BTTI blocks after Step 2.
5	SS -> MS	EGPRS DOWLINK DATA BLOCK	Sent on first assigned downlink PDTCH or PDTCH pair. TFI assigned to the MS. CES/P = 011 Does not contain PAN field.
6	MS -> SS	EGPRS UPLINK DATA BLOCK	Received on assigned uplink PDTCH or PDTCH pair. Received in reserved block allocated by CES/P at Step 5. Contains PAN field which positively acknowledges the downlink data blocks sent at Steps 3, 4 and 5. Contains RLC data block with :- BSN = BSN(n)
7	SS -> MS	EGPRS DOWLINK DATA BLOCK	Sent on first assigned downlink PDTCH or PDTCH pair. TFI assigned to the MS. CES/P = 011 Contains PAN field (SSN based format) with :- Reported bitmap positively acknowledging the RLC data block with BSN = BSN(n).
8	MS -> SS	EGPRS UPLINK DATA BLOCK	Received on assigned uplink PDTCH or PDTCH pair. Received in reserved block allocated by CES/P at Step 7. Contains PAN field which positively acknowledges the downlink data block sent at Step 7. Contains RLC data block with :- BSN = BSN(n+1)
9	SS -> MS	EGPRS DOWLINK DATA BLOCK	Sent on second assigned downlink PDTCH or PDTCH pair. TFI assigned to the MS. CES/P = 000 Contains PAN field (SSN based format) with :- Reported bitmap negatively acknowledging the RLC data block with BSN = BSN(n+1) and the same TFI value in the PAN field as assigned to the MSs uplink TBF.
10	SS -> MS	EGPRS DOWLINK DATA BLOCK	Sent on first assigned downlink PDTCH or PDTCH pair. CES/P = 011 Does not contain PAN field.
11	MS -> SS	EGPRS UPLINK DATA BLOCK	Received on assigned uplink PDTCH or PDTCH pair. Received in reserved block allocated by CES/P at Step 10. Contains PAN field which positively acknowledges the downlink data blocks sent at Steps 9 and 10. Contains RLC data block with :- BSN = BSN(n+2)

12	SS -> MS	EGPRS DOWLINK DATA BLOCK	Sent on first assigned downlink PDTCH or PDTCH pair. TFI assigned to the MS. CES/P = 001 FBI = 1 Contains PAN field (SSN based format) with :- Reported bitmap positively acknowledging the RLC data blocks with BSN = BSN(n+1) and (n+2).
13	MS -> SS	EGPRS PACKET DOWNLINK ACK/NACK	Received on uplink PACCH corresponding to first downlink PDCH or PDCH pair. Received in reserved block allocated by CES/P at Step 12. FAI = 1
14		{Uplink TBF completion}	It is checked that BSN > BSN(n+2) for all received RLC data blocks.

Specific Message Contents

PACKET UPLINK ASSIGNMENT in Step 1:

{0 -- BTTI Mode	1
|1 – RTTI Mode	
<RTTI_USF_MODE: bit(1)>	1
{00 – default single-carrier PDCH-pair configuration	10
|01 -- default dual-carrier PDCH-pair configuration	
|10 <DOWNLINK_PDCH_PAIRS_C1>	2 timeslots allocated to the MS.
{0|1 <DOWNLINK_PDCH_PAIRS_C2>}	Not present.
<UPLINK_PDCH_PAIRS_C1>	2 timeslots allocated to the MS.
{0|1 <UPLINK_PDCH_PAIRS_C2>}	Not present.
|11	
}}	
EGPRS Channel Coding Command	Arbitrarily chosen from MCS-1..MCS-4
{ 0 | 1 -- *'1' indicates that FANR is activated*	1
{ 0 -- *SSN-based encoding is selected*	0
| 1 -- *Time-based encoding is selected*	
<REPORTED_TIMESLOTS_C1 : bit(8)>	Not present.
{0|1 <REPORTED_TIMESLOTS_C2 : bit(8)>}	Not present.
<TSH : bit (2)>}}	Not present.

PACKET DOWNLINK ASSIGNMENT in Step 2:

{ 0 -- *BTTI mode*	1
< TIMESLOT_ALLOCATION_C1: bit (8) >	Not present.
{ 0 | 1 < TIMESLOT_ALLOCATION_C2: bit (8) > }	Not present.
| 1 -- *RTTI mode*	
{ 00 -- *default single-carrier PDCH-pair configuration*	10
| 01 -- *default dual-carrier PDCH-pair configuration*	
| 10 < DOWNLINK_PDCH_PAIRS_C1 : bit (8) >	4 timeslots, two being the same as those allocated for the uplink TBF.
{ 0 | 1 < DOWNLINK_PDCH_PAIRS_C2 : bit (8) > }	Not present.
< UPLINK_PDCH_PAIRS_C1 : bit (8) >	2 timeslots, the same as those allocated for the uplink TBF.
{ 0 | 1 < UPLINK_PDCH_PAIRS_C2 : bit (8) > }	Not present.
| 11 -- *Unchanged* }	
< RTTI_DOWNLINK_PDCH_PAIR_ASSIGNMENT: bit (n) > -- *n is total number of DL PDCH pairs*	2 PDCH pairs included in the assignment.
}	
{ 0 | 1 -- '1' *indicates Fast Ack/Nack Reporting is activated*	1
< EVENT_BASED_FANR: bit (1) > }	0

58a.1.6 Concurrent Uplink and Downlink TBFs, Mobile Coding and Puncturing Schemes

58a.1.6.1 Conformance requirements

1. The presence of the PAN field, is signalled by the PAN indicator bit in the RLC/MAC header. When this bit is set the receiver shall use the corresponding Puncturing Scheme variant of the CPS indicated in the RLC/MAC header to decode the RLC data field.
2. For an EGPRS TBF with FANR activated, a Radio Block for data transfer consists of one RLC/MAC header, one or two RLC data block(s) and, optionally, one PAN field. It is always carried by four normal bursts. The interleaving depends on the MCS used.
3. For a TBF with FANR activated, the network may poll the mobile station to trigger the FANR procedure. In case the mobile station has at least one concurrent TBF in the uplink, the mobile station transmits, in a reserved radio block which is allocated together with polling, a radio block for data transfer including a PAN field with ack/nack information.
4. If a mobile station indicates support of Reduced Latency (see 3GPP TS 24.008), it may be assigned TBFs with FANR activated, either in BTTI configuration or in RTTI configuration. If a mobile station indicates support of FANR (see 3GPP TS 24.008), it may be assigned TBFs with FANR activated (see sub-clause 9.1.14) in BTTI configuration only. The network shall ensure that, if a mobile station is assigned a TBF with FANR activated, FANR shall be activated for all concurrent TBFs assigned to that mobile station.
5. For a TBF with FANR activated, if the commanded MCS is MCS-9 (respectively MCS-4), the initial transmission of the RLC data block(s) shall be done with MCS-8 (respectively MCS-3) if a PAN field is included in the radio block.

References

3GPP TS 43.064, subclause 3.3.5.1, 6.5.4.3, 6.6.4.8.2

3GPP TS 44.060, subclause 5.2.1, 8.1.1

58a.1.6.2 Test purpose

1. To verify that mobile station uses the received PAN field correctly for different mobile coding and puncturing schemes.
2. To verify that the MS includes the PAN field in uplink data blocks coded using different commanded MCS when polled for PAN by the network.
3. To verify that initial transmission of RLC data block(s) by MS, when PAN field is included in the radio block, shall be done with MCS-8 (respectively MCS-3) when commanded MCS is MCS-9 (respectively MCS-4).

58a.1.6.3 Method of test

Initial Conditions

System Simulator:

1 cell with EGPRS support, default setting, PBCCH not present.

Mobile Station:

The MS is GPRS attached with a P-TMSI allocated and the test PDP context3 activated.

Specific PICS Statements

- EGPRS capable of 8PSK in Uplink, of all Multislot classes (TSPC_Type_EGPRS_8PSK_uplink)

PIXIT Statements

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Test Procedure

The SS initiates the establishment of a downlink EGPRS TBF, with FANR activated in the PACKET DOWNLINK ASSIGNMENT message. The MS is then triggered to transfer 5300 octets of user data, MCS-1 is used both for uplink and downlink.

After 3 uplink data blocks SS includes PAN field in the downlink data block. One uplink data block from MS is negatively acknowledged and two data blocks are positively acknowledged. MS re-transmits the negatively acknowledged data block. SS includes PAN field in the downlink data block and acknowledges the re-transmitted data block.

SS skips sending of two downlink data blocks and polls MS for acknowledgement of downlink data blocks sent. MS includes PAN field in the uplink data block and it is checked that the correct data blocks have been acknowledged.

SS re-transmits negatively acknowledged downlink data blocks and polls MS for acknowledgement of downlink data blocks sent. MS includes PAN field in the uplink data block and it is checked that the correct data blocks have been acknowledged.

Test procedure is repeated for all supported mobile coding schemes.

Maximum Duration of Test

15 minutes.

Expected Sequence

The test case is repeated for k =1 (RTTI, single UL/DL pair), 2 (BTTI plus FANR, single UL/DL slot) for all MSs indicating support of Reduced Latency.

The test case is repeated for k =2 (BTTI plus FANR, single UL/DL slot) only for all MSs indicating support of FANR.

Step	Direction	Message	Comments
1		{Downlink TBF establishment}	Acknowledged Mode, FANR activated. SS Commands MS to use mobile coding scheme MCS-1.
2	SS -> MS	EGPRS DOWNLINK DATA BLOCK	Sent on the assigned PDTCH. CES/P = 001
3	MS -> SS	EGPRS PACKET DOWNLINK ACK/NACK	Received on uplink PACCH of the assigned PDTCH. Received in reserved block allocated by CES/P at Step 2.
4	MS		The MS is triggered to send 5300 octets of user data.
5	SS <-> MS		Steps 2 and 3 are repeated until the reception of an EGPRS PACKET DOWNLINK ACK/NACK with Channel request Description IE included at Step 3.
6	SS -> MS	PACKET UPLINK ASSIGNMENT	Sent on downlink PACCH. The uplink TBF is assigned. MCS-1 commanded as used mobile coding scheme. See Specific Message Contents below.
7	SS -> MS	EGPRS DOWNLINK DATA BLOCK	Sent on the assigned PDTCH. USF assigned to the MS.
8	MS -> SS	EGPRS UPLINK DATA BLOCK	Received on assigned PDTCH. BSN = BSN(n) For MCS-7 to MCS-9: BSN=BSN(n), BSN(n+1) The SS checks that the PAN field is not included in the uplink data block header.
9	SS -> MS	EGPRS DOWNLINK DATA BLOCK	Sent on the assigned PDTCH. USF assigned to the MS.
10	MS -> SS	EGPRS UPLINK DATA BLOCK	Received on assigned PDTCH. BSN = BSN(n+1) For MCS-7 to MCS-9: BSN=BSN(n+2), BSN(n+3) SS checks that the PAN field is not included in the uplink data.
11	SS -> MS	EGPRS DOWNLINK DATA BLOCK	Sent on the assigned PDTCH. PAN field included. UPLINK DATA BLOCK BSN=BSN(n) in negatively acknowledged. USF assigned to the MS.
12	MS -> SS	EGPRS UPLINK DATA BLOCK	Received on assigned PDTCH. BSN = BSN(n) For MCS-7 to MCS-9: BSN=BSN(n), BSN(n+4) SS checks that PAN field is not included in the uplink data.
13	SS -> MS	EGPRS DOWNLINK DATA BLOCK	Sent on the assigned PDTCH. PAN field included. UPLINK DATA BLOCK BSN=BSN(n) in positively acknowledged. BSN = BSN (n). For MCS-7 to MCS-9: BSN=BSN(n), BSN(n+1) USF assigned to the MS.
14	MS -> SS	EGPRS UPLINK DATA BLOCK	Received on assigned PDTCH. SS checks that the PAN field is not included in the uplink data.
15	SS -> MS	EGPRS DOWNLINK DATA BLOCK	Sent on the assigned PDTCH. BSN=BSN (n+2). For MCS-7 to MCS-9: BSN=BSN(n+2), BSN(n+3) USF assigned to the MS.
16	MS -> SS	EGPRS UPLINK DATA BLOCK	Received on assigned PDTCH. SS checks that the PAN field is not included in the uplink data block header.
17	SS -> MS	EGPRS DOWNLINK DATA BLOCK	Sent on the assigned PDTCH. BSN=BSN (n+4) For MCS-7 to MCS-9: BSN=BSN(n+4), BSN(n+5) CES/P is set to 011. Polling the MS for PAN.

18	MS -> SS	EGPRS UPLINK DATA BLOCK	Received on assigned PDTCH. Contains the PAN field. The PAN field negatively acknowledges downlink data blocks with BSN = BSN(n+1) and (n+3) and positively acknowledges downlink data blocks with BSN = BSN(n), (n+2) and (n+4). Note: If MCS-9 (respectivitely MCS-4) is used for the uplink data transfer this data block is sent using MCS-8 (respectivitely MCS-3).
19	SS -> MS	EGPRS DOWNLINK DATA BLOCK	Sent on the assigned PDTCH. BSN=BSN (n+1). For MCS-7 to MCS-9: BSN=BSN(n+1), BSN(n+3) USF assigned to the MS.
20	MS -> SS	EGPRS UPLINK DATA BLOCK	Received on assigned PDTCH.
21	SS -> MS	EGPRS DOWNLINK DATA BLOCK	Sent on the assigned PDTCH. BSN=BSN (n+3). For MCS-7 to MCS-9: BSN=BSN(n+5), BSN(n+6) CES/P is set to 011. Polling the MS for PAN.
22	MS -> SS	EGPRS UPLINK DATA BLOCK	Received on assigned PDTCH. The PAN field positively acknowledges downlink data blocks with BSN = BSN(n+1) and BSN(n+3) For MCS-7 to MCS-9: The PAN field positively acknowledges downlink data blocks with BSN = BSN(n+1), BSN(n+3), BSN(n+5) and BSN(n+6) Note: If MCS-9 (respectivitely MCS-4) is used for the uplink data transfer this data block is sent using MCS-8 (respectivitely MCS-3).
23	SS -> MS	PACKET UPLINK ASSIGNMENT	Sent on downlink PACCH. SS Commands MS to use mobile coding scheme MCS-2. See Specific Message Contents below.
24	SS<>MS		Steps 7 to 22 are repeated using MCS-2 for downlink data blocks.
25	SS -> MS	PACKET UPLINK ASSIGNMENT	Sent on downlink PACCH. SS Commands MS to use mobile coding scheme MCS-3. See Specific Message Contents below.
26	SS<>MS		Steps 7 to 22 are repeated using MCS-3 for downlink data blocks.
27	SS -> MS	PACKET UPLINK ASSIGNMENT	Sent on downlink PACCH. SS Commands MS to use mobile coding scheme MCS-4. See Specific Message Contents below.
28	SS<>MS		Steps 7 to 22 are repeated using MCS-4 for downlink data blocks.
			Steps 29 to 38 are performed only for MSs supporting 8PSK in uplink (see PICS).
29	SS -> MS	PACKET UPLINK ASSIGNMENT	Sent on downlink PACCH. SS Commands MS to use mobile coding scheme MCS-5. See Specific Message Contents below.
30	SS<>MS		Steps 7 to 22 are repeated using MCS-5 for downlink data blocks.
31	SS -> MS	PACKET UPLINK ASSIGNMENT	Sent on downlink PACCH. SS Commands MS to use mobile coding scheme MCS-6. See Specific Message Contents below.
32	SS<>MS		Steps 7 to 22 are repeated using MCS-6 for downlink data blocks.
33	SS -> MS	PACKET UPLINK ASSIGNMENT	Sent on downlink PACCH. SS Commands MS to use mobile coding scheme MCS-7. See Specific Message Contents below.
34	SS<>MS		Steps 7 to 22 are repeated using MCS-7 for downlink data blocks.
35	SS -> MS	PACKET UPLINK ASSIGNMENT	Sent on downlink PACCH. SS Commands MS to use mobile coding scheme MCS-8. See Specific Message Contents below.
36	SS<>MS		Steps 7 to 22 are repeated using MCS-8 for downlink data blocks.

37	SS -> MS	PACKET UPLINK ASSIGNMENT	Sent on downlink PACCH. SS Commands MS to use mobile coding scheme MCS-9. See Specific Message Contents below.
38	SS<>MS		Steps 7 to 22 are repeated using MCS-9 for downlink data blocks.
39	SS -> MS	EGPRS DOWNLINK DATA BLOCK	Sent on assigned PDTCH. CES/P = 001 FBI = 1
40	MS -> SS	EGPRS PACKET DOWNLINK ACK/NACK	Received on uplink PACCH. Received in reserved block allocated by CES/P at Step 39. FAI = 1
41	SS	{Completion of uplink RLC data block transfer}	

Specific Message contents

PACKET DOWNLINK ASSIGNMENT in Step 1

{ 0 | 1 -- '1' indicates Fast Ack/Nack Reporting is activated	1
< EVENT_BASED_FANR: bit (1) > }	0

PACKET UPLINK ASSIGNMENT in Step 6

EGPRS Channel Coding Command	0000 - MCS-1
{ 0 | 1 -- '1' indicates that FANR is activated	1
{ 0 -- SSN-based encoding is selected	1
| 1 -- Time-based encoding is selected	
REPORTED TIMESLOTS C1	Timeslot(s) allocated to the MS.
REPORTED TIMESLOTS C2	Not present.
TSH	Chosen randomly from {00,01, 10, 11}.

PACKET UPLINK ASSIGNMENT in Step 23

EGPRS Channel Coding Command	0001 - MCS-2
{ 0 | 1 -- '1' indicates that FANR is activated	1
{ 0 -- SSN-based encoding is selected	1
| 1 -- Time-based encoding is selected	
REPORTED TIMESLOTS C1	Timeslot(s) allocated to the MS.
REPORTED TIMESLOTS C2	Not present.
TSH	Chosen randomly from {00,01, 10, 11}.

PACKET UPLINK ASSIGNMENT in Step 25

EGPRS Channel Coding Command	0010 - MCS-3
{ 0 | 1 -- '1' indicates that FANR is activated	1
{ 0 -- SSN-based encoding is selected	1
| 1 -- Time-based encoding is selected	
REPORTED TIMESLOTS C1	Timeslot(s) allocated to the MS.
REPORTED TIMESLOTS C2	Not present.
TSH	Chosen randomly from {00,01, 10, 11}.

PACKET UPLINK ASSIGNMENT in Step 27

EGPRS Channel Coding Command	0011 - MCS-4
{ 0 | 1 -- '1' indicates that FANR is activated	1
{ 0 -- SSN-based encoding is selected	1
| 1 -- Time-based encoding is selected	
REPORTED TIMESLOTS C1	Timeslot(s) allocated to the MS.
REPORTED TIMESLOTS C2	Not present.
TSH	Chosen randomly from {00,01, 10, 11}.

PACKET UPLINK ASSIGNMENT in Step 29

EGPRS Channel Coding Command	0100 - MCS-5
{ 0 | 1 -- '1' indicates that FANR is activated	1
{ 0 -- SSN-based encoding is selected	1
| 1 -- Time-based encoding is selected	
REPORTED TIMESLOTS C1	Timeslot(s) allocated to the MS.
REPORTED TIMESLOTS C2	Not present.
TSH	Chosen randomly from {00,01, 10, 11}.

PACKET UPLINK ASSIGNMENT in Step 31

EGPRS Channel Coding Command	0101 - MCS-6
{ 0 | 1 -- '1' indicates that FANR is activated	1
{ 0 -- SSN-based encoding is selected	1
| 1 -- Time-based encoding is selected	
REPORTED TIMESLOTS C1	Timeslot(s) allocated to the MS.
REPORTED TIMESLOTS C2	Not present.
TSH	Chosen randomly from {00,01, 10, 11}.

PACKET UPLINK ASSIGNMENT in Step 33

EGPRS Channel Coding Command	0110 - MCS-7
{ 0 | 1 -- '1' indicates that FANR is activated	1
{ 0 -- SSN-based encoding is selected	1
| 1 -- Time-based encoding is selected	
REPORTED TIMESLOTS C1	Timeslot(s) allocated to the MS.
REPORTED TIMESLOTS C2	Not present.
TSH	Chosen randomly from {00,01, 10, 11}.

PACKET UPLINK ASSIGNMENT in Step 35

EGPRS Channel Coding Command	0111 - MCS-8
{ 0 | 1 -- '1' indicates that FANR is activated	1
{ 0 -- SSN-based encoding is selected	1
| 1 -- Time-based encoding is selected	
REPORTED TIMESLOTS C1	Timeslot(s) allocated to the MS.
REPORTED TIMESLOTS C2	Not present.
TSH	Chosen randomly from {00,01, 10, 11}.

PACKET UPLINK ASSIGNMENT in Step 37

EGPRS Channel Coding Command	1000 - MCS-9
{ 0 | 1 -- '1' indicates that FANR is activated	1
{ 0 -- SSN-based encoding is selected	1
| 1 -- Time-based encoding is selected	
REPORTED TIMESLOTS C1	Timeslot(s) allocated to the MS.
REPORTED TIMESLOTS C2	Not present.
TSH	Chosen randomly from {00,01, 10, 11}.

58a.1.7 Concurrent Uplink and Downlink TBFs, Choice of MCS for Uplink Data Block Re-Transmission with PAN Field Present

58a.1.7.1 Conformance Requirements

1. For a TBF with FANR activated, if these rules require a retransmission in MCS-9 and a PAN field is included in an EGPRS RLC/MAC block for data transfer, the mobile station shall use MCS-6. If these rules require a retransmission in MCS-4, a PAN field is to be included in an EGPRS RLC/MAC block for data transfer and re-segmentation is allowed, the mobile station shall use MCS-1. If these rules require a retransmission in MCS-4 and re-segmentation is not allowed, the mobile station shall use MCS-4 and shall not include a PAN field in this retransmission.

References

3GPP TS 44.060, subclause 8.1.1.

58a.1.7.2 Test Purposes

1. To verify that the mobile station re-transmits a negatively acknowledged uplink data block using MCS-6 when the rules would otherwise require re-transmission using MCS-9, but a PAN field is to be included.

2. To verify that the mobile station re-transmits a negatively acknowledged uplink data block using MCS-1 when re-segmentation is allowed and the rules would otherwise require re-transmission using MCS-4, but a PAN field is to be included.

3. To verify that the mobile station re-transmits a negatively acknowledged uplink data block using MCS-4 without including the requested PAN field where the rules require re-transmission using MCS-4 and re-segmentation is not allowed.

58a.1.7.3 Method of Test

Initial Conditions

System Simulator:

1 cell with EGPRS support, default setting, PBCCH not present.

Mobile Station:

The MS is EGPRS updated with a P-TMSI allocated, SPLIT PG CYCLE negotiated and the test PDP Context 2 activated.

Specific PICS Statements

-

PIXIT Statements

-

Test Procedure

The MS is triggered to transfer 1000 octets of user data. An uplink TBF using MCS-9 on an RTTI configuration is established, if the MS indicates support of Reduced Latency. If the MS indicates support of FANR then an uplink TBF using MCS-9 on an BTTI configuration is established. A concurrent downlink TBF is established. During the concurrent uplink and downlink TBFs, the SS negatively acknowledges one of the MS's uplink RLC data blocks using a PAN field included in the header of a downlink data block. It is checked that the MS re-transmits the negatively acknowledged uplink RLC data block using MCS-6 and includes the requested PAN field in the uplink data block. The re-transmitted uplink RLC data block is then positively acknowledged by the SS. The commanded MCS is changed to MCS-4. During the concurrent uplink and downlink TBFs, the SS negatively acknowledges one of the MS's uplink RLC data blocks using a PAN field included in the header of a downlink data block. It is checked that the MS re-transmits the negatively acknowledged uplink RLC data block using MCS-1 and includes the requested PAN field in the case where re-segmentation is allowed or alternatively using MCS-4 without including the requested PAN field in the case where re-segmentation is not allowed. The re-transmitted uplink RLC data block is then positively acknowledged by the SS. The downlink TBF is completed. The uplink TBF is completed during which it is checked that the MS does not repeat any of the previously positively acknowledged uplink RLC data blocks.

Maximum Duration of Test

10 minutes.

Expected Sequence

The test case is repeated for k =1 (re-segmentation allowed), 2 (re-segmentation not allowed) for all MSs.

Step	Direction	Message	Comments
1		{Uplink dynamic allocation two phase access}	n = 1000 octets USF_GRANULRITY = 1 block Acknowledged Mode. See Specific Message Contents below.
2	SS -> MS	PACKET DOWNLINK ASSIGNMENT	Sent on downlink PACCH. A downlink TBF is assigned. See Specific Message Contents below.
3	SS -> MS	EGPRS DOWLINK DATA BLOCK	Sent on assigned PDTCH. Sent three RTTI blocks after Step 2. Does not contain PAN field. USF assigned to the MS. CES/P = 000 IF MS supported Reduced Latency Capability THEN Sent three RTTI blocks after Step 2. ELSE IF MS supported FANR Capability THEN Sent three BTTI blocks after Step 2.
4	MS -> SS	EGPRS UPLINK DATA BLOCK	Received on assigned PDTCH. IF MS supported Reduced Latency Capability THENReceived in next RTTI block after Step 3. ELSE IF MS supported FANR Capability THEN Received in next BTTI block after Step 3. MCS = MCS-9. Does not contain PAN field. Contains RLC data blocks with :- BSN = BSN(n) and BSN(n1)
5	SS -> MS	EGPRS DOWLINK DATA BLOCK	Sent on assigned PDTCH. CES/P = 011 Contains PAN field (SSN based format) with :- RB negatively acknowledging RLC data block with BSN = BSN(n+1). USF not assigned to the MS.
6	MS -> SS	EGPRS UPLINK DATA BLOCK	Received on assigned PDTCH. Received in reserved block allocated by CES/P at Step 5. MCS = MCS-6. Contains PAN field which positively acknowledges the downlink data blocks sent at Steps 3 and 5. Contains RLC data block with :- BSN = BSN(n+1)
7	SS -> MS	EGPRS DOWLINK DATA BLOCK	Sent on assigned PDTCH. USF assigned to the MS. CES/P = 000 Contains PAN field (SSN based format) with :- RB positively acknowledging RLC data block with BSN = BSN(n+1).
8	MS -> SS	EGPRS UPLINK DATA BLOCK	Received on assigned PDTCH. IF MS supported Reduced Latency Capability THEN Received in next RTTI block after Step 7. ELSE IF MS supported FANR Capability THEN Received in next BTTI block after Step 7. MCS = MCS-9. Does not contain PAN field. Contains RLC data blocks with :- BSN = BSN(n+2) and BSN(n+3)
9	SS -> MS	PACKET UPLINK ASSIGNMENT	Sent on downlink PACCH. See Specific Message Contents below.

10	SS -> MS	EGPRS DOWLINK DATA BLOCK	Sent on assigned PDTCH. IF MS supported Reduced Latency Capability THEN Sent four RTTI blocks after Step 9. ELSE IF MS supported FANR Capability THEN Sent four BTTI blocks after Step 9. Does not contain PAN field. USF assigned to the MS. CES/P = 000
11	MS -> SS	EGPRS UPLINK DATA BLOCK	Received on assigned PDTCH. IF MS supported Reduced Latency Capability THENReceived in next RTTI block after Step 10. ELSE IF MS supported FANR Capability THEN Received in next BTTI block after Step 10. MCS = MCS-4. Does not contain PAN field. Contains RLC data block with:- BSN = BSN(n+4)
12	SS -> MS	EGPRS DOWLINK DATA BLOCK	Sent on assigned PDTCH. CES/P = 011 Contains PAN field (SSN based format) with:- RB negatively acknowledging RLC data block with BSN = BSN(n+4). USF not assigned to the MS.
13	MS -> SS	EGPRS UPLINK DATA BLOCK	Received on assigned PDTCH. Received in reserved block allocated by CES/P at Step 12. *For k = 1:-* MCS = MCS-1. Contains PAN field which positively acknowledges the downlink data blocks sent at Steps 7, 10 and 12. Contains RLC data block with:- BSN = BSN(n+4) *For k = 2 :-* MCS = MCS-4. Does not contain PAN field. Contains RLC data block with:- BSN = BSN(n+4)
14	SS -> MS	EGPRS DOWLINK DATA BLOCK	Sent on assigned PDTCH. USF assigned to the MS. CES/P = 000 Contains PAN field (SSN based format) with:- RB positively acknowledging RLC data block with BSN = BSN(n+4).
15	MS -> SS	EGPRS UPLINK DATA BLOCK	Received on assigned PDTCH. IF MS supported Reduced Latency Capability THEN Received in next RTTI block after Step 14. ELSE IF MS supported FANR Capability THEN Received in next BTTI block after Step 14. MCS = MCS-4. Contains RLC data block with :- BSN = BSN(n+5)
16	SS -> MS	EGPRS DOWLINK DATA BLOCK	Sent on assigned PDTCH. CES/P = 001 FBI = 1 Contains PAN field (SSN based format) with :- RB positively acknowledging RLC data blocks with BSN = BSN(n+5)
17	MS -> SS	EGPRS PACKET DOWNLINK ACK/NACK	Received on uplink PACCH. Received in reserved block allocated by CES/P at Step 16. FAI = 1
18		{Uplink TBF completion}	It is checked that BSN > BSN(n+5) for all received RLC data blocks.

Specific Message Contents

PACKET UPLINK ASSIGNMENT in Step 1 and Step 9:

< **RESEGMENT** : bit (1) >	for k = 1 : 1 (re-segmentation allowed) for k = 2 : 0 (re-segmentation not allowed)
EGPRS Channel Coding Command	at Step 1 : MCS-9 at Step 9 : MCS-4
{ 0 | 1 -- *'1' indicates that FANR is activated*	1
{ 0 -- *SSN-based encoding is selected*	0
| 1 -- *Time-based encoding is selected*	
< **REPORTED_TIMESLOTS_C1** : bit(8)>	Not present.
{0|1 < **REPORTED_TIMESLOTS_C2** : bit(8)>}	Not present.
< **TSH** : bit (2)>}}	Not present.

PACKET DOWNLINK ASSIGNMENT in Step 2:

{ 0 | 1 -- '1' *indicates Fast Ack/Nack Reporting is activated*	1
< **EVENT_BASED_FANR** : bit (1) > }	0

58a.1.8 Uplink TBF, Handling of Erroneous PAN Fields,SSN Based Format

58a.1.8.1 Conformance Requirements

In the case of a PAN field, the bitmap shall be interpreted in the same way as for the case of PACKET UPLINK ACK/NACK, EGPRS PACKET DOWNLINK ACK/NACK or EGPRS PACKET DOWNLINK ACK/NACK TYPE 2 message with the following exceptions:

- if the processing of a PAN would cause an element of V(B) to be changed from ACKED or TENTATIVE_ACK to NACKED, the entire PAN field shall be ignored;
-
- if a PAN positively acknowledges a block which has not yet been transmitted (i.e. whose BSN is higher than or equal to V(S)) the entire PAN field shall be ignored;

References

3GPP TS 44.060, subclause 9.1.8.2.4.

58a.1.8.2 Test Purposes

1. To verify that the mobile station ignores the entire PAN field if a previously positively acknowledged data block is subsequently negatively acknowledged.
2. To verify that the mobile station ignores the entire PAN field if the PAN field positively acknowledges a data block which has yet to be transmitted.

58a.1.8.3 Method of Test

Initial Conditions

System Simulator:

1 cell with EGPRS support, default setting, PBCCH not present.

Mobile Station:

The MS is EGPRS updated with a P-TMSI allocated, SPLIT PG CYCLE negotiated and the test PDP Context 2 activated.

Specific PICS Statements

-

PIXIT Statements

-

Test Procedure

The MS is triggered to transfer 1000 octets of user data. An uplink TBF is established. During the uplink TBF, the SS negatively acknowledges one of the MS's uplink RLC data blocks that it has previously positively acknowledged using a PAN field included in the header of a downlink data block. It is checked that the MS does not re-transmit the erroneously negatively acknowledged uplink RLC data block. During the uplink TBF, the SS positively acknowledges an uplink RLC data block that has not yet been transmitted at the same time as negatively acknowledging a transmitted uplink data block which has not previously been positively or negatively acknowledged using a PAN field included in the header of a downlink data block. It is checked that the MS does not re-transmit the negatively acknowledged uplink RLC data block. The uplink TBF is completed during which it is checked that the MS does not repeat any of the previously positively acknowledged uplink RLC data blocks.

Maximum Duration of Test

10 minutes.

Expected Sequence

The test case is repeated for k =1 (RTTI, single UL/DL pair), 2 (BTTI plus FANR, single UL/DL slot) for all MSs indicating support of Reduced Latency.

The test case is repeated for k =2 (BTTI plus FANR, single UL/DL slot) only for all MSs indicating support of FANR.

Step	Direction	Message	Comments
1		{Uplink dynamic allocation two phase access}	n = 1000 octets USF_GRANULRITY = 1 block Acknowledged Mode. See Specific Message Contents below.
2	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on downlink PACCH. USF assigned to the MS. IF MS supported Reduced Latency Capability THEN For k = 1:- Sent three RTTI blocks after Step 1. For k = 2:- Sent two BTTI blocks after Step 1. ELSE IF MS supported FANR Capability THEN For k = 2:- Sent two BTTI blocks after Step 1.
3	MS -> SS	EGPRS UPLINK DATA BLOCK	Received on assigned PDTCH. Does not contain PAN field. Contains RLC data block with :- BSN = BSN(n)
4	SS -> MS	EGPRS DOWLINK DATA BLOCK	Sent on assigned PDTCH. USF not assigned to the MS. Contains PAN field (SSN based format) with :- RB positively acknowledging RLC data block with BSN = BSN(n).
5	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on downlink PACCH. USF assigned to the MS. IF MS supported Reduced Latency Capability THEN For k = 1:- Sent on next but one RTTI block after Step 4. For k = 2:- Sent on next BTTI block after Step 4. ELSE IF MS supported FANR Capability THEN For k = 2:- Sent on next BTTI block after Step 4.
6	MS -> SS	EGPRS UPLINK DATA BLOCK	Received on assigned PDTCH. Does not contain PAN field. Contains RLC data block with :- BSN = BSN(n+1)
7	SS -> MS	EGPRS DOWLINK DATA BLOCK	Sent on assigned PDTCH. USF not assigned to the MS. Contains PAN field (SSN based format) with :- RB negatively acknowledging RLC data block with BSN = BSN(n) and BSN(n+1).
8	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on downlink PACCH. USF assigned to the MS. IF MS supported Reduced Latency Capability THEN For k = 1:- Sent on next but one RTTI block after Step 7. For k = 2:- Sent on next BTTI block after Step 7. ELSE IF MS supported FANR Capability THEN For k = 2:- Sent on next BTTI block after Step 7.
9	MS -> SS	EGPRS UPLINK DATA BLOCK	Received on assigned PDTCH. Does not contain PAN field. Contains RLC data block with :- BSN = BSN(n+2)
10	SS -> MS	EGPRS DOWLINK DATA BLOCK	Sent on assigned PDTCH. USF not assigned to the MS. Contains PAN field (SSN based format) with :- RB positively acknowledging RLC data blocks with BSN = BSN(n+1) and BSN(n+2).

11	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on downlink PACCH. USF assigned to the MS. IF MS supported Reduced Latency Capability THEN For k = 1:- Sent on next but one RTTI block after Step 10. For k = 2:- Sent on next BTTI block after Step 10. ELSE IF MS supported FANR Capability THEN For k = 2:- Sent on next BTTI block after Step 10.
12	MS -> SS	EGPRS UPLINK DATA BLOCK	Received on assigned PDTCH. Does not contain PAN field. Contains RLC data block with :- BSN = BSN(n+3)
13	SS -> MS	EGPRS DOWLINK DATA BLOCK	Sent on assigned PDTCH. USF not assigned to the MS. Contains PAN field (SSN based format) with:- RB negatively acknowledging RLC data block with BSN = BSN(n+3). RB positively acknowledging RLC data block with BSN = BSN(n+4).
14	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on downlink PACCH. USF assigned to the MS. IF MS supported Reduced Latency Capability THEN For k = 1:- Sent on next but one RTTI block after Step 13. For k = 2:- Sent on next BTTI block after Step 13. ELSE IF MS supported FANR Capability THEN For k = 2:- Sent on next BTTI block after Step 13.
15	MS -> SS	EGPRS UPLINK DATA BLOCK	Received on assigned PDTCH. Does not contain PAN field. Contains RLC data block with :- BSN = BSN(n+4)
16	SS -> MS	EGPRS DOWLINK DATA BLOCK	Sent on assigned PDTCH. USF not assigned to the MS. Contains PAN field (SSN based format) with :- RB positively acknowledging RLC data blocks with BSN = BSN(n+3) and BSN(n+4).
17		{Uplink TBF completion}	It is checked that BSN > BSN(n+4) for all received RLC data blocks.

Specific Message Contents

PACKET UPLINK ASSIGNMENT in Step 1:

EGPRS Channel Coding Command	Arbitrarily chosen from MCS-1..MCS4.
{ 0 | 1 -- *'1' indicates that FANR is activated*	1
{ 0 -- *SSN-based encoding is selected*	0
| 1 -- *Time-based encoding is selected*	
< **REPORTED_TIMESLOTS_C1** : bit(8)>	Not present.
{0|1 < **REPORTED_TIMESLOTS_C2** : bit(8)>}	Not present.
< **TSH** : bit (2)>}}	Not present.

58a.1.9 Uplink TBF, Handling of Erroneous PAN Fields,Time Based Format

58a.1.9.1 Conformance Requirements

1. In the case of a PAN field, the bitmap shall be interpreted in the same way as for the case of PACKET UPLINK ACK/NACK, EGPRS PACKET DOWNLINK ACK/NACK or EGPRS PACKET DOWNLINK ACK/NACK TYPE 2 message with the following exceptions:

- if the processing of a PAN would cause an element of V(B) to be changed from ACKED or TENTATIVE_ACK to NACKED, the entire PAN field shall be ignored;

- if a PAN positively acknowledges a block which has not yet been transmitted (i.e. whose BSN is higher than or equal to V(S)) the entire PAN field shall be ignored;

- if a time-based PAN indicates a reserved value the entire PAN field shall be ignored

References

3GPP TS 44.060, subclause 9.1.8.2.4.

3GPP TS 44.060, subclause 9.1.15.2.

58a.1.9.2 Test Purposes

1. To verify that the mobile station ignores the entire PAN field if a previously positively acknowledged data block is subsequently negatively acknowledged.

2. To verify that the mobile station ignores the entire PAN field if the PAN field positively acknowledges a data block which has yet to be transmitted.

3. To verify that the mobile station ignores the entire PAN field if the time based PAN field indicates a reserved value.

58a.1.9.3 Method of Test

Initial Conditions

System Simulator:

1 cell with EGPRS support, default setting, PBCCH not present.

Mobile Station:

The MS is EGPRS updated with a P-TMSI allocated, SPLIT PG CYCLE negotiated and the test PDP Context 2 activated.

Specific PICS Statements

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PIXIT Statements

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Test Procedure

The MS is triggered to transfer 1000 octets of user data. An uplink TBF is established. During the uplink TBF, the SS negatively acknowledges one of the MS's uplink RLC data blocks that it has previously positively acknowledged using a PAN field included in the header of a downlink data block. It is checked that the MS does not re-transmit the erroneously negatively acknowledged uplink RLC data block. During the uplink TBF, the SS positively acknowledges an uplink RLC data block that has not yet been transmitted at the same time as negatively acknowledging a transmitted uplink data block which has not previously been positively or negatively acknowledged using a PAN field included in the header of a downlink data block. It is checked that the MS does not re-transmit the negatively acknowledged uplink RLC data block. During the uplink TBF, the SS negatively acknowledges one of the MS's uplink data blocks but also includes a reserved value later in the same PAN field. It is checked that the MS does not re-transmit the negatively acknowledged uplink RLC data block. The uplink TBF is completed during which it is checked that the MS does not repeat any of the previously positively acknowledged uplink RLC data blocks.

Maximum Duration of Test

10 minutes.

Expected Sequence

The test case is repeated for k =1 (RTTI, single UL/DL pair), 2 (BTTI plus FANR, single UL/DL slot) for all MSs indicating support of Reduced Latency.

The test case is repeated for k =2 (BTTI plus FANR, single UL/DL slot) only for all MSs indicating support of FANR.

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Step	Direction	Message	Comments
1		{Uplink dynamic allocation two phase access}	n = 1000 octets USF_GRANULRITY = 1 block Acknowledged Mode. See Specific Message Contents below.
2	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on downlink PACCH. USF assigned to the MS. IF MS supported Reduced Latency Capability THEN For k = 1:- Sent three RTTI blocks after Step 1. For k = 2:- Sent two BTTI blocks after Step 1. ELSE IF MS supported FANR Capability THEN For k = 2 :- Sent two BTTI blocks after Step 1.
3	MS -> SS	EGPRS UPLINK DATA BLOCK	Received on assigned PDTCH. Does not contain PAN field. Contains RLC data block with :- BSN = BSN(n)
4	SS -> MS	EGPRS DOWLINK DATA BLOCK	Sent on assigned PDTCH. USF not assigned to the MS. Contains PAN field (time based format) with :- Reported bitmap positively acknowledging RLC data block with BSN = BSN(n).
5	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on downlink PACCH. USF assigned to the MS. IF MS supported Reduced Latency Capability THEN For k = 1:- Sent on next but one RTTI block after Step 4. For k = 2:- Sent on next BTTI block after Step 4. ELSE IF MS supported FANR Capability THEN For k = 2 :- Sent on next BTTI block after Step 4.
6	MS -> SS	EGPRS UPLINK DATA BLOCK	Received on assigned PDTCH. Does not contain PAN field. Contains RLC data block with :- BSN = BSN(n+1)
7	SS -> MS	EGPRS DOWLINK DATA BLOCK	Sent on assigned PDTCH. USF not assigned to the MS. Contains PAN field (time based format) with :- Reported bitmap negatively acknowledging RLC data block with BSN = BSN(n) and BSN(n+1).

8	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on downlink PACCH. USF assigned to the MS. IF MS supported Reduced Latency Capability THEN For k = 1:- Sent on next but one RTTI block after Step 7. For k = 2:- Sent on next BTTI block after Step 7. ELSE IF MS supported FANR Capability THEN For k = 2:- Sent on next BTTI block after Step 7.
9	MS -> SS	EGPRS UPLINK DATA BLOCK	Received on assigned PDTCH. Does not contain PAN field. Contains RLC data block with :- BSN = BSN(n+2)
10	SS -> MS	EGPRS DOWLINK DATA BLOCK	Sent on assigned PDTCH. USF not assigned to the MS. Contains PAN field (time based format) with :- Reported bitmap positively acknowledging RLC data blocks with BSN = BSN(n+1) and BSN(n+2).
11	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on downlink PACCH. USF assigned to the MS. IF MS supported Reduced Latency Capability THEN For k = 1:- Sent on next but one RTTI block after Step 10. For k = 2:- Sent on next BTTI block after Step 10. ELSE IF MS supported FANR Capability THEN For k = 2:- Sent on next BTTI block after Step 10.
12	MS -> SS	EGPRS UPLINK DATA BLOCK	Received on assigned PDTCH. Does not contain PAN field. Contains RLC data block with :- BSN = BSN(n+3)
13	SS -> MS	EGPRS DOWLINK DATA BLOCK	Sent on assigned PDTCH. USF not assigned to the MS. Contains PAN field (time based format) with :- Reported bitmap negatively acknowledging RLC data block with BSN = BSN(n+3). Reported bitmap positively acknowledging RLC data block with BSN = BSN(n+4).
14	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on downlink PACCH. USF assigned to the MS. IF MS supported Reduced Latency Capability THEN For k = 1:- Sent on next but one RTTI block after Step 13. For k = 2:- Sent on next BTTI block after Step 13. ELSE IF MS supported FANR Capability THEN For k = 2:- Sent on next BTTI block after Step 13.
15	MS -> SS	EGPRS UPLINK DATA BLOCK	Received on assigned PDTCH. Does not contain PAN field. Contains RLC data block with:- BSN = BSN(n+4)
16	SS -> MS	EGPRS DOWLINK DATA BLOCK	Sent on assigned PDTCH. USF not assigned to the MS. Contains PAN field (time based format) with :- Reported bitmap positively acknowledging RLC data blocks with BSN = BSN(n+3) and BSN(n+4).

17	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on downlink PACCH. USF assigned to the MS. IF MS supported Reduced Latency Capability THEN For k = 1:- Sent on next but one RTTI block after Step 16. For k = 2:- Sent on next BTTI block after Step 16. ELSE IF MS supported FANR Capability THEN For k = 2 :- Sent on next BTTI block after Step 16.
18	MS -> SS	EGPRS UPLINK DATA BLOCK	Received on assigned PDTCH. Does not contain PAN field. Contains RLC data block with:- BSN = BSN(n+5)
19	SS -> MS	EGPRS DOWLINK DATA BLOCK	Sent on assigned PDTCH. USF not assigned to the MS. Contains PAN field (time based format) with:- Reported bitmap negatively acknowledging RLC data block with BSN = BSN(n+5) Reported bitmap also including the reserved value '011'.
20	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on downlink PACCH. USF assigned to the MS. IF MS supported Reduced Latency Capability THEN For k = 1:- Sent on next but one RTTI block after Step 19. For k = 2:- Sent on next BTTI block after Step 19. ELSE IF MS supported FANR Capability THEN For k = 2:- Sent on next BTTI block after Step 19.
21	MS -> SS	EGPRS UPLINK DATA BLOCK	Received on assigned PDTCH. Does not contain PAN field. Contains RLC data block with:- BSN = BSN(n+6)
22	SS -> MS	EGPRS DOWLINK DATA BLOCK	Sent on assigned PDTCH. USF not assigned to the MS. Contains PAN field (time based format) with:- Reported bitmap positively acknowledging RLC data blocks with BSN = BSN(n+5) and BSN(n+6).
23		{Uplink TBF completion}	It is checked that BSN > BSN(n+6) for all received RLC data blocks.

Specific Message Contents

PACKET UPLINK ASSIGNMENT in Step 1:

EGPRS Channel Coding Command	Arbitrarily chosen from MCS-1..MCS4.
{ 0 | 1 -- *'1' indicates that FANR is activated* { 0 -- *SSN-based encoding is selected* | 1 -- *Time-based encoding is selected* <REPORTED_TIMESLOTS_C1 : bit(8)> {0|1 <REPORTED_TIMESLOTS_C2 : bit(8)>} <TSH : bit (2)>}}	1 1 Timeslot(s) allocated to the MS. Not present. Chosen randomly from {00, 01, 10, 11}.

58a.1.10 Downlink TBF, with Concurrent Uplink TBF, Polled FANR

58a.1.10.1 Conformance Requirements

1. If the RLC endpoint transmitter is the network and the mobile station has at least one concurrent TBF in the uplink direction, the network may poll the mobile station to trigger the FANR procedure. In this case the mobile station shall answer in a reserved radio block period which is allocated with the polling as described in sub-clause 8.1.2.2.

References

3GPP TS 44.060, subclause 9.1.14.2

58a.1.10.2 Test purpose

1. To verify that the mobile station shall respond to polling for PAN by including a PAN field in a radio block belonging to a concurrent uplink TBF when a concurrent uplink TBF is established and uplink data is due to be sent.

58a.1.10.3 Method of test

Initial Conditions

System Simulator:

1 cell with EGPRS support, default setting, PBCCH not present.

Mobile Station:

The MS is EGPRS updated with a P-TMSI allocated, SPLIT PG CYCLE negotiated and the test PDP context2 activated.

Specific PICS Statements

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PIXIT Statements

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Test Procedure

The SS initiates the establishment of a downlink EGPRS TBF with FANR activated in the PACKET DOWNLINK ASSIGNMENT message. The MS is then triggered to transfer 440 octets of user data. The SS assigns an uplink TBF by sending a PACKET UPLINK ASSIGNMENT message. The SS sends a downlink data block addressed to the MS the header of which polls the MS for PAN but which has a BSN that is out of sequence by two BSNs with the last downlink data block addressing the MS. The SS verifies that the MS inserts a PAN field in the subsequently received uplink data block that indicates non-receipt of the downlink data blocks implied by the out of sequence BSNs.The downlink and the uplink data transfer is completed.

Maximum Duration of Test

10 minutes.

Expected Sequence

The test case is repeated for k =1 (RTTI, single UL/DL pair), 2 (BTTI plus FANR, single UL/DL slot) for all MSs indicating support of Reduced Latency.

The test case is repeated for k =2 (BTTI plus FANR, single UL/DL slot) only for all MSs indicating support of FANR.

Step	Direction	Message	Comments
1		{Downlink TBF establishment}	Acknowledged Mode. FANR Activated
2	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Sent on the assigned PDTCH. CES/P = 001.
3	MS -> SS	EGPRS PACKET DOWNLINK ACK/NACK	Received on uplink PACCH. Received in reserved block allocated by CES/P at Step 2.
4	MS		The MS is triggered to send 440 octets of user data.
5	MS <-> SS		Steps 2 and 3 are repeated until reception of EGPRS PACKET DOWNLINK ACK/NACK with Channel request Description IE included at Step 3.
6	SS -> MS	PACKET UPLINK ASSIGNMENT	Sent on downlink PACCH. An uplink TBF is assigned. USF_GRANULARITY = 1 block, TLLI_BLOCK_CHANNEL_CODING: arbitrarily chosen CHANNEL_CODING_COMMAND: arbitrarily chosen.
7	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Sent on the assigned PDTCH. BSN = BSN (n). USF assigned to the MS.
8	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on assigned PDTCH. The SS checks that the PAN field is not included in the uplink data block.
9	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Sent on the assigned PDTCH. BSN = BSN(n+3) CES/P = 011
10	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on assigned PDTCH. Received in reserved block allocated by CES/P at Step 9. The SS checks that the PAN field is included in the uplink data block and indicates non-receipt of the downlink data blocks with BSN = BSN(n+1) and BSN(n+2) and the receipt of data block BSN = BSN (n+3).
11	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Sent on the assigned PDTCH. BSN = BSN(n+1)
12	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Sent on the assigned PDTCH. BSN = BSN(n+2)
13	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Sent on the assigned PDTCH. BSN = BSN(n+4) FBI = 1 CES/P = 001
14	MS -> SS	EGPRS PACKET DOWNLINK ACK/NACK	Received on uplink PACCH. Received in reserved block allocated by CES/P at Step13. FAI = 1
15		{Completion of uplink RLC data block transfer}	

Specific Message contents

PACKET DOWNLINK ASSIGNMENT in Step 1

{ 0 | 1 -- '1' indicates Fast Ack/Nack Reporting is activated < EVENT_BASED_FANR: bit (0) > }	1 0

58a.1.11 Downlink TBF, with Concurrent Uplink TBF, Event Based FANR, Out of Sequence Condition

58a.1.11.1 Conformance requirements

1. The Fast Ack/Nack reporting procedure (FANR) refers to the possibility to include, in a radio block for data transfer sent in one direction, piggy-backed ack/nack information relative to a TBF with FANR activated in the other direction.

2. For a TBF with FANR activated, the network may poll the mobile station to trigger the FANR procedure. In case the mobile station has at least one concurrent TBF in the uplink, the mobile station transmits, in a reserved radio block which is allocated together with polling, a radio block for data transfer including a PAN field with ack/nack information. Additionally, if enabled at TBF establishment/reconfiguration, the mobile station may initiate the FANR procedure in an event-based manner. Whenever an out-of-sequence condition is detected, or the RLC/MAC header of a radio block for data transfer is correctly received but the RLC data part is corrupted, the mobile station piggy-backs a PAN field with ack/nack information in a radio block for data transfer sent in (one of) the mobile station's concurrent TBF(s) with FANR activated in the uplink.

References

3GPP TS 43.064, subclause 3.3.5.1

3GPP TS 43.064, subclause 6.6.4.8.2

58a.1.11.2 Test purpose

1. To verify that the mobile station establishes a downlink TBF with event-based FANR enabled.
2. To verify that the mobile station inserts a correctly encoded PAN field in response to the out of sequence condition in the header of an uplink data block belonging to its concurrent uplink TBF.

58a.1.11.3 Method of test

Initial Conditions

System Simulator:

1 cell with EGPRS support, default setting, PBCCH not present.

Mobile Station:

The MS is EGPRS updated with a P-TMSI allocated, SPLIT PG CYCLE negotiated and the test PDP context2 activated.

Specific PICS Statements

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PIXIT Statements

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Test Procedure

The SS initiates the establishment of a downlink EGPRS TBF with EVENT_BASED_FANR specified in the PACKET DOWNLINK ASSIGNMENT message. The MS is then triggered to transfer 440 octets of user data. The SS assigns an uplink TBF by sending a PACKET UPLINK ASSIGNMENT message. The SS sends a downlink data block which has a BSN that is out of sequence by two BSNs with the last downlink data block addressing the MS. The SS verifies that the MS inserts a PAN field in the subsequently received uplink data block that indicates non-receipt of the downlink data blocks implied by the out of sequence BSNs. Negatively acknowledged data blocks are retransmitted.The downlink and uplink data transfer is completed.

Maximum Duration of Test

10 minutes.

Expected Sequence

The test case is repeated for k =1 (RTTI, single UL/DL pair), 2 (BTTI plus FANR, single UL/DL slot) for all MSs indicating support of Reduced Latency.

The test case is repeated for k =2 (BTTI plus FANR, single UL/DL slot) only for all MSs indicating support of FANR.

Step	Direction	Message	Comments
1		{Downlink TBF establishment}	Acknowledged Mode, EVENT_BASED_FANR activated
2	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Sent on the assigned PDTCH. CES/P = 001
3	MS -> SS	EGPRS PACKET DOWNLINK ACK/NACK	Received on uplink PACCH. Received in reserved block allocated by CES/P at Step 2.
4	MS		The MS is triggered to send 440 octets of user data.
5	MS <-> SS		Steps 2 and 3 are repeated until the reception of an EGPRS PACKET DOWNLINK ACK/NACK with Channel request Description IE included at Step 3.
6	SS -> MS	PACKET UPLINK ASSIGNMENT	Sent on downlink PACCH. An uplink TBF is assigned. USF_GRANULARITY = 1 block, TLLI_BLOCK_CHANNEL_CODING: arbitrarily chosen CHANNEL_CODING_COMMAND: arbitrarily chosen.
7	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Sent on the assigned PDTCH. BSN = BSN (n). USF assigned to the MS.
8	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on assigned PDTCH. The SS checks that the PAN field is not included in the uplink data block.
9	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Sent on assigned PDTCH. BSN = BSN (n+3). USF assigned to the MS. IF MS supported Reduced Latency Capability THEN For k = 1: Sent on the next but one RTTI block from Step 8. For k = 2: Sent on next BTTI block from Step 8. ELSE IF MS supported FANR Capability THEN For k = 2 : Sent on next BTTI block from Step 8.
10	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on assigned PDTCH. The SS checks that the PAN field is included in the uplink data block and indicates non-receipt of the downlink data block BSN(n+1) and BSN(n+2) and the receipt of data block BSN = BSN (n+3).
11	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Sent on the assigned PDTCH. BSN = BSN(n+1)
12	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Sent on the assigned PDTCH. BSN = BSN(n+2)
13	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Sent on the assigned PDTCH. BSN = BSN(n+4) FBI = 1 CES/P = 001
14	MS -> SS	EGPRS PACKET DOWNLINK ACK/NACK	Received on uplink PACCH. Received in reserved block allocated by CES/P at Step13. FAI = 1
15		{Completion of uplink RLC data block transfer}	

Specific Message contents

PACKET DOWNLINK ASSIGNMENT in Step 1

{ 0 | 1 -- '1' indicates Fast Ack/Nack Reporting is activated	1
< EVENT_BASED_FANR: bit (0) > }	1

58a.1.12 Downlink TBF, with Concurrent Uplink TBF, Event Based FANR, Corrupted RLC Data Part with Event-based Fast Ack/Nack reporting

58a.1.12.1 Conformance requirements

1. The Fast Ack/Nack reporting procedure (FANR) refers to the possibility to include, in a radio block for data transfer sent in one direction, piggy-backed ack/nack information relative to a TBF with FANR activated in the other direction..
2. For a TBF with FANR activated... if enabled at TBF establishment/reconfiguration, the mobile station may initiate the FANR procedure in an event-based manner. Whenever an out-of-sequence condition is detected, or the RLC/MAC header of a radio block for data transfer is correctly received but the RLC data part is corrupted, the mobile station piggy-backs a PAN field with ack/nack information in a radio block for data transfer sent in (one of) the mobile station's concurrent TBF(s) with FANR activated in the uplink.
3. If the RLC endpoint receiver is the mobile station, event-based FANR is enabled for this TBF and the mobile station has at least one assigned TBF in the uplink direction, the mobile station shall insert one PAN field in an EGPRS RLC/MAC block for data transfer transmitted during a given radio block period for that uplink TBF if the state of any element in the receive state array V(N) is UNREPORTED

References

3GPP TS 43.064, subclause 3.3.5.1.

3GPP TS 43.064, subclause 6.6.4.8.2.

3GPP TS 44.060, subclause 9.1.14.3.

58a.1.12.2 Test purpose

1. To verify that the mobile station establishes a downlink TBF with event-based FANR enabled.
2. To verify that the mobile station inserts a sends correctly encoded PAN field into the header of an uplink data block belonging to it's concurrent uplink TBF while receiving upon receipt of an incorrect downlink RLC data block a downlink data block with correctly encoded RLC/MAC header but with corrupted RLC data part.

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58a.1.12.3 Method of test

Initial Conditions

System Simulator:

1 cell with EGPRS support, default setting, PBCCH not present.

Mobile Station:

The MS is EGPRS updated with a P-TMSI allocated, SPLIT PG CYCLE negotiated and the test PDP Context 2 activated.

Specific PICS Statements

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PIXIT Statements

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Test Procedure

The SS initiates the establishment of a downlink EGPRS TBF, with EVENT__BASED_FANR activated specified in the PACKET DOWNLINK ASSIGNMENT message. The MS is then triggered to transfer 440 octets of user data. The SS assigns an uplink TBF by sending a PACKET UPLINK ASSIGNMENT message. The SS sends a downlink data block with correctly encoded RLC/MAC header but with corrupted RLC data part. corrupt RLC data block and The SS verifies that the MS inserts a PAN field into the header of an uplink data block belonging to the concurrent uplink TBF which indicates non-receipt of the corrupted data block.in the UPLINK RLC DATA BLOCK correctly.

Maximum Duration of Test

10 minutes.

Expected Sequence

The test case is repeated for k=1 (RTTI, single UL/DL pair), 2 (BTTI plus FANR, single UL/DL slot) for all MSs. indicating support of Reduced Latency.

The test case is repeated for k =2 (BTTI plus FANR, single UL/DL slot) only for all MSs indicating support of FANR

Step	Direction	Message	Comments
1		{Downlink TBF establishment}	Acknowledged Mode, EVENT_BASED_FANR activated
2	SS -> MS	EGPRS DOWNLINK DATA BLOCK	Sent on the assigned PDTCH,. CES/P = 001
3	MS -> SS	EGPRS PACKET DOWNLINK ACK/NACK	Received on uplink PACCH of the assigned PDTCH. Received in reserved block allocated by CES/P at Step 2.
4	MS		The MS is triggered to send 440 octets of user data.
5	SS <-> MS		Steps 2 and 3 are repeated until the reception of an EGPRS PACKET DOWNLINK ACK/NACK with Channel request Description IE included at Step 3.
6	SS -> MS	PACKET UPLINK ASSIGNMENT	Sent on downlink PACCH. The An uplink TBF is assigned.
7	SS -> MS	EGPRS DOWNLINK DATA BLOCK	Sent on the assigned PDTCH,. USF assigned to the MS.
8	MS -> SS	EGPRS UPLINK DATA BLOCK	Received on assigned PDTCH. The SS checks that the PAN field is not included in the uplink data block header.
9	MSSS -> MS	EGPRS DOWNLINK DATA BLOCK	SS skip sending one DOWNLINK DATA BLOCK Sent on assigned PDTCH. Downlink data block with correctly encoded RLC/MAC header but with corrupted RLC data part.
10	SS -> MS	EGPRS DOWNLINK DATA BLOCK	Sent on assigned PDTCH. USF assigned to the MS. IF MS supported Reduced Latency Capability THEN For k = 1: Sent on the next but one RTTI block from Step 9. For k = 2: Sent on next BTTI block from Step 9. ELSE IF MS supported FANR Capability THEN For k = 2 : Sent on next BTTI block from Step 9.
11	MS -> SS	EGPRS UPLINK DATA BLOCK	Received on assigned PDTCH. The SS checks that the PAN field is included in the uplink data block header and indicates non-receipt of the downlink data block sent at Step 9.
12	SS -> MS	EGPRS DOWNLINK DATA BLOCK	Sent on assigned PDTCH. CES/P = 001 FBI = 1 One data block with FBI=1, ES/P set to 01 and a valid RRBP. Sent on downlink PDTCH.
13	MS -> SS	EGPRS PACKET DOWNLINK ACK/NACK	Received on the specified RRBP of the downlink PACCH Received on uplink PACCH. Received in reserved block allocated by CES/P at Step 12. FAI = 1
14	SS	{Completion of uplink RLC data block transfer}	

Specific Message contents

PACKET DOWNLINK ASSIGNMENT in Step 1

{ 0 | 1 -- '1' indicates Fast Ack/Nack Reporting is activated < EVENT_BASED_FANR: bit (1) > }	1 1

58a.1.13 Downlink TBF, with Concurrent Uplink TBF, Event Based and Polled FANR Combined

58a.1.13.1 Conformance requirements

Event-based FANR may be used together with Polled FANR (see sub-clause 9.1.14.2).

If the RLC endpoint receiver is the mobile station, event-based FANR is enabled for this TBF and the mobile station has at least one assigned TBF in the uplink direction, the mobile station shall insert one PAN field in an EGPRS RLC/MAC block for data transfer transmitted during a given radio block period for that uplink TBF if the state of any element in the receive state array V(N) is UNREPORTED. The mobile station may continue to insert PAN fields in subsequent EGPRS RLC/MAC data blocks sent in the same radio block period as long as there exists one or more elements in the receive state array V(N) whose state is UNREPORTED.

If event-based FANR is enabled and the network polls the mobile station, the mobile station shall transmit, in the reserved radio block period which is allocated with the polling, one of the messages as described in sub-clause 8.1.2.2.

References

3GPP TS 44.060, subclause 9.1.14.3

58a.1.13.2 Test purpose

1. To verify that the mobile station establishes a downlink TBF with event-based FANR enabled.
2. To verify that the mobile station inserts a correctly encoded PAN field in response to the out of sequence condition into the header of an uplink data block belonging to it's concurrent uplink TBF.
3. To verify that the mobile station shall respond to polling for PAN by including a PAN field in a radio block belonging to a concurrent uplink TBF when a concurrent uplink TBF is established.

58a.1.13.3 Method of test

Initial Conditions

System Simulator:

1 cell with EGPRS support, default setting, PBCCH not present.

Mobile Station:

The MS is EGPRS updated with a P-TMSI allocated, SPLIT PG CYCLE negotiated and the test PDP context2 activated.

Specific PICS Statements

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PIXIT Statements

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Test Procedure

The SS initiates the establishment of a downlink EGPRS TBF with EVENT_BASED_FANR specified in the PACKET DOWNLINK ASSIGNMENT message. The MS is then triggered to transfer 440 octets of user data. The SS assigns an uplink TBF by sending a PACKET UPLINK ASSIGNMENTmessage. The SS sends a downlink data block which has a

BSN that is out of sequence by two BSNs with the last downlink data block addressing the MS. The SS verifies that the MS inserts a PAN field in the subsequently received uplink data block that indicates non-receipt of the downlink data blocks implied by the out of sequence BSNs. The SS transmits the previously negatively acknowledged downlink data blocks and polls the MS for PAN. The SS checks that the MS acknowledges all of the transmitted data blocks. Donwlink and uplink data transfer is completed.

Maximum Duration of Test

10 minutes.

Expected Sequence

The test case is repeated for k =1 (RTTI, single UL/DL pair), 2 (BTTI plus FANR, single UL/DL slot) for all MSs indicating support of Reduced Latency.

The test case is repeated for k =2 (BTTI plus FANR, single UL/DL slot) only for all MSs indicating support of FANR.

Step	Direction	Message	Comments
1		{Downlink TBF establishment}	Acknowledged Mode, EVENT_BASED_FANR activated
2	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Sent on the assigned PDTCH. CES/P = 001
3	MS -> SS	EGPRS PACKET DOWNLINK ACK/NACK	Received on uplink PACCH. Received in reserved block allocated by CES/P at Step 2.
4	MS		The MS is triggered to send 440 octets of user data.
5	MS <-> SS		Steps 2 and 3 are repeated until reception of EGPRS PACKET DOWNLINK ACK/NACK with Channel request Description IE included at Step 3.
6	SS -> MS	PACKET UPLINK ASSIGNMENT	Sent on downlink PACCH. An uplink TBF is assigned. USF_GRANULARITY = 1 block, TLLI_BLOCK_CHANNEL_CODING: arbitrarily chosen CHANNEL_CODING_COMMAND: arbitrarily chosen.
7	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Sent on the assigned PDTCH. BSN = BSN (n). USF assigned to the MS.
8	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on assigned PDTCH. The SS checks that the PAN field is not included in the uplink data block.
9	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Sent on assigned PDTCH. BSN = BSN (n+3). USF assigned to the MS. IF MS supported Reduced Latency Capability THEN For k = 1: Sent on the next but one RTTI block from Step 8. For k = 2: Sent on next BTTI block from Step 8. ELSE IF MS supported FANR Capability THEN For k = 2: Sent on next BTTI block from Step 8.
10	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on assigned PDTCH. The SS checks that the PAN field is included in the uplink data block header and indicates non-receipt of the downlink data block BSN(n+1) and BSN(n+2)
11	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Sent on the assigned PDTCH. BSN = BSN(n+1)
12	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Sent on the assigned PDTCH. BSN = BSN(n+2) CES/P = 011
13	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on assigned PDTCH.Received in reserved block allocated by CES/P at Step 12. The SS checks that the PAN field is included in the uplink data block header and indicates receipt of the downlink data blocks with BSN = BSN(n+1) and BSN(n+2).
14	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Sent on the assigned PDTCH. BSN = BSN(n+4) FBI = 1 CES/P = 001
15	MS -> SS	EGPRS PACKET DOWNLINK ACK/NACK	Received on uplink PACCH. Received in reserved block allocated by CES/P at Step14. FAI = 1
16		{Completion of uplink RLC data block transfer}	

Specific Message contents

PACKET DOWNLINK ASSIGNMENT in Step 1

{ 0 | 1 -- '1' indicates Fast Ack/Nack Reporting is activated < EVENT_BASED_FANR: bit (0) > }	1 1

58a.1.14 Downlink TBF, with and without Concurrent Uplink TBF, CES/P Polling Response

58a.1.14.1 Conformance requirements

For EGPRS when FANR is activated or for EGPRS2, the Combined EGPRS Supplementary/Polling field describes the feedback request and specifies a single uplink block in which the mobile station shall transmit a PACKET CONTROL ACKNOWLEDGEMENT message, a PACCH block or (applicable only if FANR is activated) a radio block containing a PAN field to the network, see table 9.1.8.2.1.3. The single uplink block is defined by a delay relative to the first TDMA frame (N) of the downlink block containing the CES/P value. If ordered to send a EGPRS PACKET DOWNLINK ACK/NACK message or EGPRS PACKET DOWNLINK ACK/NACK TYPE 2 message, a mobile station with one or more downlink TBFs using EGPRS2 shall send the EGPRS PACKET DOWNLINK ACK/NACK TYPE 2 message. Otherwise, the mobile station shall send the EGPRS PACKET DOWNLINK ACK/NACK message.

The CES/P field is used to indicate what fields the next uplink radio block reserved by this field shall contain (see further clause 9). The single uplink block is defined by a delay relative to the first TDMA frame (N) of the downlink block containing the CES/P value. The procedures defined for transmission of a PACCH block to the network as described in sub-clause 10.4.5 shall apply.

References

3GPP TS 44.060, subclause 9.1.8.2.1

3GPP TS 44.060, subclause 10.4.4b

58a.1.14.2 Test purpose

1. To verify that the mobile station responds with the correct polling response when polled with CES/P values 001,010,011,100,101,110 and 111 during concurrent TBF is ongoing.
2. To verify that the mobile station responds with the correct polling response when polled with CES/P values 011 and 100 after the completion of the uplink TBF.

58a.1.14.3 Method of test

Initial Conditions

System Simulator:

1 cell with EGPRS support, default setting, PBCCH not present.

Mobile Station:

The MS is EGPRS updated with a P-TMSI allocated, SPLIT PG CYCLE negotiated and the test PDP context2 activated.

Specific PICS Statements

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PIXIT Statements

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Test Procedure

The SS initiates the establishment of a downlink EGPRS TBF with FANR activated in the PACKET DOWNLINK ASSIGNMENT message. The MS is then triggered to transfer 1000 octets of user data. The SS assigns an uplink TBF by sending a PACKET UPLINK ASSIGNMENT message. While the uplink TBF is ongoing, the SS polls the MS using the CES/P field in the header of the downlink data blocks for each of the CES/P values 001 to 111.It is checked that the MS sends the correct response (according to the table in 44.060 Section 10.4.4b) to the polling in the indicated reserved block.

Following completion of the uplink TBF, the SS polls the MS using the CES/P field in the header of the downlink data blocks for each of the CES/P values 011 and 100.It is checked that the MS sends the correct response (according to the table in 44.060 Section 10.4.4b) to the polling in the indicated reserved block. Downlink data transfer is completed.

Maximum Duration of Test

20 minutes.

Expected Sequence

The test case is repeated for k =1 (RTTI, single UL/DL pair), 2 (BTTI plus FANR, single UL/DL slot) for all MSs indicating support of Reduced Latency.

The test case is repeated for k =2 (BTTI plus FANR, single UL/DL slot) only for all MSs indicating support of FANR.

Step	Direction	Message	Comments
1		{Downlink TBF establishment}	Acknowledged Mode. FANR Activated.
2	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Sent on the assigned PDTCH. CES/P = 001
3	MS -> SS	EGPRS PACKET DOWNLINK ACK/NACK	Received on uplink PACCH. Received in reserved block allocated by CES/P = 001.
4	MS		The MS is triggered to send 1000 octets of user data.
5	MS <-> SS		Steps 2 and 3 are repeated until reception of EGPRS PACKET DOWNLINK ACK/NACK with Channel request Description IE included at Step 3.
6	SS -> MS	PACKET UPLINK ASSIGNMENT	Sent on downlink PACCH. An uplink TBF is assigned. USF_GRANULARITY = 1 block, TLLI_BLOCK_CHANNEL_CODING: arbitrarily chosen CHANNEL_CODING_COMMAND: arbitrarily chosen.
7	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on PACCH containing USF assigned to the MS.
8	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on assigned PDTCH. The SS checks that the PAN field is not included in the uplink data block.
9	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Sent on the assigned PDTCH. BSN = BSN (n). CES/P = 001
10	MS -> SS	EGPRS PACKET DOWNLINK ACK/NACK	EGPRS PACKET DOWNLINK ACK/NACK message containing FPB, and if there is enough room left in RLC/MAC block, channel quality report(s) shall be transmitted on the reserved block allocated by CES/P at Step9: IF MS supported Reduced Latency Capability THEN for k = 1 starting at FN = N+6 or N+7; for k = 2 starting at FN = N+8 or N+9 ELSE IF MS supported FANR Capability THEN for k = 2 starting at FN = N+8 or N+9 (where N is the frame number of the first TDMA frame of the downlink data block sent in Step 9).
11	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Sent on the assigned PDTCH. BSN = BSN (n+20). CES/P = 010.
12	MS -> SS	EGPRS PACKET DOWNLINK ACK/NACK	EGPRS PACKET DOWNLINK ACK/NACK message containing FPB, and if there is enough room left in RLC/MAC block, channel quality report(s) shall be transmitted on the reserved block allocated by CES/P at Step11: IF MS supported Reduced Latency Capability THEN for k = 1 starting at FN = N+8 or N+9; for k = 2 starting at FN = N+13 ELSE IF MS supported FANR Capability THEN for k = 2 starting at FN = N+13 (where N is the frame number of the first TDMA frame of the downlink data block sent in Step 11).
13	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Sent on the assigned PDTCH. BSN = BSN (n+30). CES/P = 011.
14	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH. Received in the block allocated by CES/P at Step 13: IF MS supported Reduced Latency Capability THEN for k = 1 starting at FN = N+6 or N+7; for k = 2 starting at FN = N+8 or N+9 ELSE IF MS supported FANR Capability THEN for k = 2 starting at FN = N+8 or N+9 (where N is the frame number of the first TDMA frame of the downlink data block sent in Step 13). PAN field included. PAN field negatively acknowledging blocks with BSN = BSN (n+21) to BSN (n+29).

Step	Direction	Message	Comments
15	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Sent on the assigned PDTCH. BSN = BSN (n+50). CES/P = 100.
16	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH. Received in the block allocated by CES/P at Step 14: IF MS supported Reduced Latency Capability THEN for k = 1 starting at FN = N+8 or N+9; for k = 2 starting at FN = N+13 ELSE IF MS supported FANR Capability THEN for k = 2 starting at FN = N+13 (where N is the frame number of the first TDMA frame of the downlink data block sent in Step 15). PAN field included. PAN field negatively acknowledging blocks with BSN = BSN (n+31) to BSN (n+49).
17	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Sent on the assigned PDTCH. Retransmitting the negatively acknowledged blocks.
18	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Step 17 is repeated till BSN (n+21) to BSN (n+29) is retransmitted. CES/P = 101 is set in data block : BSN = BSN (n+29)
19	MS -> SS	EGPRS PACKET DOWNLINK ACK/NACK	EGPRS PACKET DOWNLINK ACK/NACK message containing Measurement Report(s) and if there is enough room left in RLC/MAC block, NPB shall be transmitted on the reserved block allocated by CES/P at Step18 : IF MS supported Reduced Latency Capability THEN for k = 1 starting at FN = N+6 or N+7; for k = 2 starting at FN = N+8 or N+9 ELSE IF MS supported FANR Capability THEN for k = 2 starting at FN = N+8 or N+9 (where N is the frame number of the first TDMA frame of the downlink data block sent in Step17).
20	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Sent on the assigned PDTCH. Retransmitting the negatively acknowledged blocks.
21	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Step 20 is repeated till BSN (n+31) to BSN (n+39) is retransmitted. CES/P = 110 is set in data block : BSN = BSN (n+39)
22	MS -> SS	EGPRS PACKET DOWNLINK ACK/NACK	EGPRS PACKET DOWNLINK ACK/NACK message containing Measurement Report(s) and if there is enough room left in RLC/MAC block, NPB shall be transmitted on the reserved block allocated by CES/P at Step21 IF MS supported Reduced Latency Capability THEN: for k = 1 starting at FN = N+8 or N+9; for k = 2 starting at FN = N+13 ELSE IF MS supported FANR Capability THEN for k = 2 starting at FN = N+13 (where N is the frame number of the first TDMA frame of the downlink data block sent in Step 20).
23	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Sent on the assigned PDTCH. Retransmitting the negatively acknowledged blocks.
24	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Step 23 is repeated till BSN (n+41) to BSN (n+49) is retransmitted. CES/P = 111 is set in data block : BSN = BSN (n+49)
25	MS -> SS	EGPRS PACKET DOWNLINK ACK/NACK	EGPRS PACKET DOWNLINK ACK/NACK message containing NPB, and if there is enough room left in RLC/MAC block, channel quality report(s) shall be transmitted on the reserved block allocated by CES/P at Step 24: IF MS supported Reduced Latency Capability THEN: for k = 1 starting at FN = N+6 or N+7; for k = 2 starting at FN = N+8 or N+9 ELSE IF MS supported FANR Capability THEN for k = 2 starting at FN = N+8 or N+9 (where N is the frame number of the first TDMA frame of the downlink data block sent in Step 24).
26		{Completion of uplink RLC data block transfer}	

Step	Direction	Message	Comments
27	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Sent on the assigned PDTCH. BSN = BSN (n+70). CES/P = 011.
28	MS -> SS	EGPRS PACKET DOWNLINK ACK/NACK	Extended Ack/Nack bitmap type NPB(negatively acknowledging the blocks BSN(n+61) to BSN(n+69) missed by the SS)with measurement report included shall be transmitted on the allocated reserved block allocated by CES/P at Step 27: IF MS supported Reduced Latency Capability THEN: for k = 1 starting at FN = N+6 or N+7; for k = 2 starting at FN = N+8 or N+9 ELSE IF MS supported FANR Capability THEN for k = 2 starting at FN = N+8 or N+9 (where N is the frame number of the first TDMA frame of the downlink data block sent in Step 27).
29	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Sent on the assigned PDTCH. BSN = BSN (n+80). CES/P = 100.
30	MS -> SS	EGPRS PACKET DOWNLINK ACK/NACK	Extended Ack/Nack bitmap type NPB(negatively acknowledging the blocks BSN(n+71) to BSN(n+79) missed by the SS)with measurement report included shall be transmitted on the allocated reserved block allocated by CES/P at Step 29: IF MS supported Reduced Latency Capability THEN: for k = 1 starting at FN = N+8 or N+9; for k = 2 starting at FN = N+13 ELSE IF MS supported FANR Capability THEN for k = 2 starting at FN = N+13 (where N is the frame number of the first TDMA frame of the downlink data block sent in Step 29).
31	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Sent on the assigned PDTCH. Retransmitting the negatively acknowledged blocks.
32	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Step 31 is repeated till all the negatively acknowledged blocks are retransmitted and finally sending one data block with FBI=1, with CES/P = 001.
33	MS -> SS	EGPRS PACKET DOWNLINK ACK/NACK	Received on uplink PACCH. Received in reserved block allocated by CES/P = 001. FAI =1.

Specific Message contents

PACKET DOWNLINK ASSIGNMENT in Step 1

{ 0 | 1 -- '1' indicates Fast Ack/Nack Reporting is activated < EVENT_BASED_FANR: bit (0) > }	1 0

58a.1.15 Downlink TBF, with Concurrent Uplink TBF, Transmission of Other Messages in Response to Polling for PAN, PACKET CS REQUEST

58a.1.15.1 Conformance Requirements

1. The mobile station shall initiate the RR connection establishment by sending PACKET CS REQUEST messages on the PACCH. The mobile station is allowed to retransmit the PACKET CS REQUEST message once while timer T3196 is running. The second sending occurrence of this message shall take place at the first suitable opportunity at least 0.75 s after the first transmission of that message.

References

3GPP TS 44.060, subclause 8. 1. 2. 2.

3GPP TS 44.060, subclause 8.9.1.1.1

58a.1.15.2 Test purpose

2. To verify that the mobile station shall respond to polling for PAN by PACKET CS REQUEST in PACCH when a Mobile Originated call is initiated while downlink with concurrent uplink data transfer is on going.

58a.1.15.3 Method of test

Initial Conditions

System Simulator:

1 cell with EGPRS support, default setting, PBCCH not present.

Mobile Station:

The MS is EGPRS updated with a P-TMSI allocated, SPLIT PG CYCLE negotiated and the test PDP context2 activated.

Specific PICS Statements

- Support of Enhanced DTM CS (TSPC_Enhanced_DTM_CS)

PIXIT Statements

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Test Procedure

The SS initiates the establishment of a downlink EGPRS TBF with FANR activated in the PACKET DOWNLINK ASSIGNMENT message. The MS is then triggered to transfer 1000 octets of user data, MCS-1 is used. The SS assigns an uplink TBF by sending a PACKET UPLINK ASSIGNMENT message. The SS sends a downlink data block addressed to the MS the header of which polls the MS for PAN but which has a BSN that is out of sequence by two BSNs with the last downlink data block addressing the MS. The SS verifies that the MS inserts a PAN field in the subsequently received uplink data block that indicates non-receipt of the downlink data blocks implied by the out of sequence BSNs. The user is made to initiate the establishment of a mobile originated circuit switched call. The SS sends a downlink data block addressed to the MS the header of which polls the MS for PAN but which has a BSN that is out of sequence by two BSNs with the last downlink data block addressing the MS. The SS verifies that the MS sends PACKET CS REQUEST in the subsequently received uplink data block. The SS waits for 0.75 seconds. In the next subsequent downlink data block the MS is polled for PAN once again. The SS verifies that the MS inserts a PAN field in the subsequently received uplink data block that indicates non-receipt of the downlink data blocks implied by the out of sequence BSNs. In the next subsequent downlink data block the MS is polled once again for PAN. The SS verifies that the MS sends PACKET CS REQUEST in the subsequently received uplink data block. The SS responds with IMMEDIATE ASSIGNMENT REJECT encapsulated in the PACKET CS COMMAND. The downlink and the uplink data transfer is completed.

Maximum Duration of Test

10 minutes.

Expected Sequence

The test case is repeated for k =1 (RTTI, single UL/DL pair), 2 (BTTI plus FANR, single UL/DL slot) for all MSs indicating support of Reduced Latency.

The test case is repeated for k =2 (BTTI plus FANR, single UL/DL slot) only for all MSs indicating support of FANR.

Step	Direction	Message	Comments
1		{Downlink TBF establishment}	Acknowledged Mode. FANR Activated
2	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Sent on the assigned PDTCH. CES/P = 001.
3	MS -> SS	EGPRS PACKET DOWNLINK ACK/NACK	Received on uplink PACCH. Received in reserved block allocated by CES/P at Step 2.
4	MS		The MS is triggered to send 1000 octets of user data.
5	MS<->SS		Steps 2 and 3 are repeated until reception of EGPRS PACKET DOWNLINK ACK/NACK with Channel request Description IE included at Step 3.
6	SS -> MS	PACKET UPLINK ASSIGNMENT	Sent on downlink PACCH. An uplink TBF is assigned. USF_GRANULARITY = 1 block, TLLI_BLOCK_CHANNEL_CODING: arbitrarily chosen CHANNEL_CODING_COMMAND: MCS-1.
7	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Sent on the assigned PDTCH. BSN = BSN (n). USF assigned to the MS.
8	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on assigned PDTCH. The SS checks that the PAN field is not included in the uplink data block.
9	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Sent on the assigned PDTCH. BSN = BSN (n+3) CES/P = 011
10	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on assigned PDTCH. Received in reserved block allocated by CES/P at Step 9. The SS checks that the PAN field is included in the uplink data block and indicates non-receipt of the downlink data blocks with BSN = BSN(n+1) and BSN(n+2) and the receipt of data block BSN = BSN (n+3).
11	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Sent on the assigned PDTCH. BSN = BSN(n+1)
12	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Sent on the assigned PDTCH. BSN = BSN(n+2)
13			The user is made to trigger the establishment of a mobile originated speech call.
14	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Sent on the assigned PDTCH. BSN = BSN (n+6) CES/P = 011
15	MS -> SS	EGPRS UPLINK RLC DATA BLOCK OR PACKET CS REQUEST	Received on assigned PDTCH. Received in reserved block allocated by CES/P at Step14 The SS checks that the PAN field is included in the uplink data block and indicates non-receipt of the downlink data blocks with BSN = BSN(n+4) and BSN(n+5) and the receipt of the most recently sent downlink data block. Or Packet CS Request sent on uplink PACCH. Establishment Cause = Mobile Originated Call.
16	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Sent on the assigned PDTCH. CES/P = 011
17	MS<->SS		Steps 15 and 16 are repeated every 1.2 seconds, but not more than 12 times until reception of PACKET CS REQUEST at Step 15. BSN of downlink data blocks is incremented by one for each repetition. BSN of the last transmitted downlink data block is BSN = BSN (n+m).
18	SS		SS waits for 0.75 seconds.
19	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Sent on the assigned PDTCH. BSN = BSN (n+m+1) CES/P = 011
20	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on assigned PDTCH. Received in reserved block allocated by CES/P at Step 19.The SS checks that the PAN field is included in the uplink data block and indicates non-receipt of the downlink data blocks with BSN = BSN(n+4) and BSN(n+5) and the receipt of data block BSN = BSN(n+m) and BSN = BSN(n+m+1).

Step	Direction	Message	Comments
21	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Sent on the assigned PDTCH. BSN = BSN (n+m+2) CES/P = 011
22	MS -> SS	PACKET CS REQUEST	Received on uplink PACCH. Received in reserved block allocated by CES/P at Step21 Establishment Cause = Mobile Originated Speech Call
23	SS -> MS	PACKET CS COMMAND	Sent on downlink PACCH. Encapsulates an IMMEDIATE ASSIGNMENT REJECT message.
24	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Sent on the assigned PDTCH. BSN = BSN(n+4)
25	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Sent on the assigned PDTCH. BSN = BSN(n+5)
26	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Sent on the assigned PDTCH. BSN = BSN (n+m+3) FBI = 1 CES/P = 001
27	MS -> SS	EGPRS PACKET DOWNLINK ACK/NACK	Received on uplink PACCH. Received in reserved block allocated by CES/P at Step26 SS checks that the receipt of the downlink data blocks with BSN = BSN (n+4), BSN = BSN (n+5), BSN = BSN (n+m+2) and BSN = BSN (n+m+3) is indicated. FAI = 1
28		{Completion of uplink RLC data block transfer}	

Specific Message contents

PACKET DOWNLINK ASSIGNMENT in Step 1

{ 0 | 1 -- '1' indicates Fast Ack/Nack Reporting is activated < EVENT_BASED_FANR: bit (0) > }	1 0

58a.1.16 Downlink TBF, with Concurrent Uplink TBF, Transmission of Other Messages in Response to Polling for PAN, PACKET CELL CHANGE NOTIFICATION

58a.1.16.1 Conformance Requirements

Whenever the mobile station receives an RLC data block addressed to one of its TBFs and with a valid RRBP field or with a valid CES/P field in the RLC data block header (i.e. is polled), the mobile station shall transmit one of the following replies in the uplink radio block specified by the RRBP field or CES/P field , whatever the BSN value of the received RLC data block, according to the subsequent decreasing order of priority:

1) a (EGPRS) PACKET DOWNLINK ACK/NACK message or EGPRS PACKET DOWNLINK ACK/NACK TYPE 2 message containing a Final Ack Indicator;

2) a PACKET CS REQUEST message, if such a message is waiting to be transmitted;

3) a PACKET CELL CHANGE NOTIFICATION message, if such a message is waiting to be transmitted;

References

3GPP TS 44.060, subclause 8. 1. 2. 2.

3GPP TS 44.060, subclause 8.9.1.1.1

58a.1.16.2 Test purpose

3. To verify that the mobile station shall respond to polling for PAN by PACKET CELL CHANGE NOTIFICATION in PACCH when the RF level of the serving cell is lowered such that it reselects another cell while downlink with concurrent uplink data transfer is on going.

58a.1.16.3 Method of test

Initial Conditions

System Simulator:

2 cells (cell A, cell B), activated at power-on, EGPRS supported, default setting, PBCCH not present, CCN supported.

Cell A: RLA_C = -50 dBm

Cell B: RLA_C = -65 dBm

Mobile Station:

The MS is EGPRS updated with a P-TMSI allocated, SPLIT PG CYCLE negotiated and the test PDP context2 activated on CellA.

Specific PICS Statements

- GERAN Feature Package 1(TSPC_GERAN_FEATURE_PACKAGE_1)

PIXIT Statements

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Test Procedure

The SS initiates the establishment of a downlink EGPRS TBF with FANR activated in the PACKET DOWNLINK ASSIGNMENT message. The MS is then triggered to transfer 1000 octets of user data, MCS-1 is used. The SS assigns an uplink TBF by sending a PACKET UPLINK ASSIGNMENT message. The SS sends a downlink data block addressed to the MS the header of which polls the MS for PAN but which has a BSN that is out of sequence by two BSNs with the last downlink data block addressing the MS. The SS verifies that the MS inserts a PAN field in the subsequently received uplink data block that indicates non-receipt of the downlink data blocks implied by the out of sequence BSNs. The SS sends the data blocks that were negatively acknowledged. The RF level of the current serving CellA is lowered until the MS prefers cellB. The SS sends a downlink data block addressed to the MS the header of which polls the MS for PAN but which has a BSN that is out of sequence by two BSNs with the last downlink data block addressing the MS. The SS verifies that the MS sends PACKET CELL CHANGE NOTIFICATION in the subsequently received uplink data block. The SS waits for 0.3 seconds. In the next subsequent downlink data block the MS is polled for PAN once again. The SS verifies that the MS inserts a PAN field in the subsequently received uplink data block that indicates non-receipt of the downlink data blocks implied by the out of sequence BSNs. SS resends those data blocks that were negatively acknowledged in the previous poll results. In the next subsequent downlink data block the MS is polled once again for PAN. The SS verifies that the MS sends PACKET CELL CHANGE NOTIFICATION in the subsequently received uplink data block. The SS responds with PACKET CELL CHANGE ORDER message for CellB. Now MS send CHANNEL REQUEST in the CellB. SS responds with Immediate Assignment Reject. The MS sends PACKET CELL CHANGE FAILURE in the old CellA and completes the downlink and uplink data transfer.

Maximum Duration of Test

10 minutes.

Expected Sequence

The test case is repeated for k =1 (RTTI, single UL/DL pair), 2 (BTTI plus FANR, single UL/DL slot) for all MSs indicating support of Reduced Latency.

The test case is repeated for k =2 (BTTI plus FANR, single UL/DL slot) only for all MSs indicating support of FANR.

Step	Direction	Message	Comments
1		{Downlink TBF establishment}	Acknowledged Mode. FANR Activated
2	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Sent on the assigned PDTCH. CES/P = 001.
3	MS -> SS	EGPRS PACKET DOWNLINK ACK/NACK	Received on uplink PACCH. Received in reserved block allocated by CES/P at Step 2.
4	MS		The MS is triggered to send 1000 octets of user data.
5	MS<->SS		Steps 2 and 3 are repeated until reception of EGPRS PACKET DOWNLINK ACK/NACK with Channel request Description IE included at Step 3.
6	SS -> MS	PACKET UPLINK ASSIGNMENT	Sent on downlink PACCH. An uplink TBF is assigned. USF_GRANULARITY = 1 block, TLLI_BLOCK_CHANNEL_CODING: arbitrarily chosen CHANNEL_CODING_COMMAND: MCS-1.
7	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Sent on the assigned PDTCH. BSN = BSN (n). USF assigned to the MS.
8	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on assigned PDTCH. The SS checks that the PAN field is not included in the uplink data block.
9	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Sent on the assigned PDTCH. BSN = BSN (n+3) CES/P = 011
10	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on assigned PDTCH. Received in reserved block allocated by CES/P at Step 9. The SS checks that the PAN field is included in the uplink data block and indicates non-receipt of the downlink data blocks with BSN = BSN(n+1) and BSN(n+2) and the receipt of data block BSN = BSN (n+3).
11	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Sent on the assigned PDTCH. BSN = BSN(n+1)
12	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Sent on the assigned PDTCH. BSN = BSN(n+2)
13			The RF level of the current serving CellA is lowered until the MS prefers cellB.
14	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Sent on the assigned PDTCH. BSN = BSN (n+6) CES/P = 011
15	MS -> SS	EGPRS UPLINK RLC DATA BLOCK OR PACKET CELL CHANGE NOTIFICATION	Received on assigned PDTCH. Received in reserved block allocated by CES/P at Step14 The SS checks that the PAN field is included in the uplink data block and indicates non-receipt of the downlink data blocks with BSN = BSN(n+4) and BSN(n+5) and the receipt of the most recently sent downlink data block. Or Packet Cell Change Notification sent in the block indicated as reserved by the CES/P polling request.
16	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Sent on the assigned PDTCH. CES/P = 011
17	MS<->SS		Steps 15 and 16 are repeated until reception of PACKET CELL CHANGE NOTIFICATION at Step 15. BSN of downlink data blocks is incremented by one for each repetition. BSN of the last transmitted downlink data block is BSN = BSN (n+m).
18	SS		SS waits for 0.3 seconds.
19	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Sent on the assigned PDTCH. BSN = BSN (n+m+1) CES/P = 011

Step	Direction	Message	Comments
20	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on assigned PDTCH. Received in reserved block allocated by CES/P at Step 19.The SS checks that the PAN field is included in the uplink data block and indicates non-receipt of the downlink data blocks with BSN = BSN(n+4) and BSN(n+5) and the receipt of data block BSN = BSN(n+m) and BSN = BSN(n+m+1).
21	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Sent on the assigned PDTCH. BSN = BSN(n+4)
22	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Sent on the assigned PDTCH. BSN = BSN(n+5)
23	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Sent on the assigned PDTCH. BSN = BSN (n+m+2) CES/P = 011
24	MS -> SS	PACKET CELL CHANGE NOTIFICATION	Received on uplink PACCH. Packet Cell Change Notification sent in the block indicated as reserved by the CES/P at Step21.
25	SS -> MS	PACKET CELL CHANGE ORDER	Sent on the PACCH. Contains -BSIC + BCCH frequency -The network control order See specific message contents
26	MS -> SS	CHANNEL REQUEST	To the new CellB. 'Cell Update'
27	SS -> MS	IMMEDIATE ASSIGNMENT REJECT	Received from the new CellB.
28	MS -> SS	CHANNEL REQUEST	CHANNEL REQUEST with establishment cause = 'Single block packet access' on Cell A.
29	SS -> MS	IMMEDIATE ASSIGNMENT	Sent on the AGCH.
30	MS -> SS	PACKET CELL CHANGE FAILURE	Error cause:" Packet Access Reject on target cell " See specific message content
31	MS -> SS	CHANNEL REQUEST	CHANNEL REQUEST with establishment cause = 'Single block packet access'
32	SS -> MS	IMMEDIATE ASSIGNMENT	Sent on the AGCH.
33	MS->SS	PACKET RESOURCE REQUEST	Sent on the assigned block.
34	SS -> MS	PACKET UPLINK ASSIGNMENT	An uplink TBF is assigned. USF_GRANULARITY = 1 block, TLLI_BLOCK_CHANNEL_CODING: arbitrarily chosen CHANNEL_CODING_COMMAND: MCS-1.
35	SS->MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	USF assigned to the MS
36	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Sent on the assigned PDTCH.
37	SS -> MS	PACKET DOWNLINK ASSIGNMENT	Sent on PACCH.
38	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Sent on the assigned PDTCH.
39	SS		The RF power level of the CellA is also increased to -50dbm.
40	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Sent on the assigned PDTCH.
41	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Sent on the assigned PDTCH. CES/P = 001. FBI = 1.
42	MS -> SS	EGPRS PACKET DOWNLINK ACK/NACK	Received on uplink PACCH. Received in reserved block allocated by CES/P at Step41 SS checks for the receipt of all the downlink data blocks that were transmitted in the new cell. FAI = 1
43		{Completion of uplink RLC data block transfer}	

Specific Message contents

PACKET DOWNLINK ASSIGNMENT in Step 1:

{ 0 | 1 -- '1' indicates Fast Ack/Nack Reporting is activated < EVENT_BASED_FANR: bit (0) > }	1 0

PACKET CELL CHANGE ORDER in step 25:

Global TFI	TFI of the uplink TBF
IMMEDIATE_REL	1
ARFCN, BSIC	specified for cell B
NC Measurement parameters	
NETWORK_CONTROL_ORDER	10 (NC2)
NC_REPORTING_PERIOD_I	111 (61.44 sec)
NC_REPORTING_PERIOD_T	100 (7.68 sec)
NC_FREQUENCY_LIST	0 (not present)

PACKET CELL CHANGE FAILURE in step 30:

Packet Cell Change Failure message content:	
CAUSE	0010

58a.1.17 Downlink TBF, with and without Concurrent Uplink TBF, PAN Reaction Time, Polled PANR Polled Fast Ack/Nack reporting

58a.1.17.1 Conformance Requirements

1. The Fast Ack/Nack reporting procedure (FANR) refers to the possibility to include, in a radio block for data transfer sent in one direction, piggy-backed ack/nack information relative to a TBF with FANR activated in the other direction.

12. If the RLC endpoint transmitter is the network and the mobile station has at least one concurrent TBF in the uplink direction, the network may poll the mobile station to trigger the FANR procedure. In this case the mobile station shall answer in a reserved radio block period which is allocated with the polling as described in sub-clause 8.1.2.2.

23. In the case where the network polls (for a PAN) and the mobile station does not have any EGPRS RLC/MAC blocks for data transfer in the uplink direction or it does not have any TBF assigned in the uplink direction, the mobile station shall transmit a EGPRS PACKET DOWNLINK ACK/NACK, EGPRS PACKET DOWNLINK ACK/NACK TYPE 2 message containing NPB, see sub-clause 10.4.4b.

3. A mobile station that detects a missing/erroneous RLC data block for a downlink TBF with FANR activated (see 3GPP TS 44.060) shall be ready to send an uplink RLC/MAC block for data transfer with a PAN or an EGPRS PACKET DOWNLINK ACK/NACK or EGPRS PACKET DOWNLINK ACK/NACK TYPE 2 message (in the case that there is no uplink RLC data ready for transmission) reflecting the missing/erroneous block in the TDMA frame indicated in Table 6.11.5.2 where N = the last TDMA frame of the downlink block in which the MS detected the problem.

References

3GPP TS 43.064, subclause 3.3.5.1.

3GPP TS 44.060, subclause 9.1.14.2.

3GPP TS 45.010, subclause 6.11.5.

58a.1.17.2 Test purpose

1. To verify that the mobile station shall respond to polling (for a PAN) from the network by including a PAN field in a radio block belonging to a concurrent uplink TBF when a concurrent uplink TBF is established and uplink data is due to be sent.

2. To verify that the mobile station shall respond to polling for PAN by sending an EGPRS PACKET DOWNLINK ACK/NACK message containing NPB when no concurrent uplink TBF is established.

3. To verify that when responding to polling for PAN the MS adheres to the PAN reaction time requirement when a missing or erroneous data block has been detected.

58a.1.17.3 Method of test

Initial Conditions

System Simulator:

1 cell with EGPRS support, default setting, PBCCH present.

Mobile Station:

The MS is EGPRS updated with a P-TMSI allocated, SPLIT PG CYCLE negotiated and the test PDP Context 2 activated.

Specific PICS Statements

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PIXIT Statements

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Test Procedure

The SS initiates the establishment of a downlink EGPRS TBF, with FANR activated in the PACKET DOWNLINK ASSIGNMENT message. The MS is then triggered to transfer 440 octets of user data. The SS assigns an uplink TBF by sending a PACKET UPLINK ASSIGNMENT message. The SS sends a downlink data block addressed to the MS the header of which polls the MS for PAN but which has a BSN that is out of sequence by two BSNs with the last downlink data block addressing the MS. SS skips two DOWNLINK Data blocks. Then network Polls (for a PAN) the MS with CES/P in the EGPRS downlink data block. The SS verifies that the MS inserts a PAN field in the header of the subsequently received uplink data block that indicates non-receipt of the downlink data blocks implied by the out of sequence BSNs. The SS checks that the uplink data block is received within the specified PAN reaction time UPLINK RLC DATA BLOCK correctly. The Uplink data transfer is completed. SS skips one more DOWNLINK DATA BLOCKS. The network polls(for a PAN) and the MS respond in the EGPRS PACKET DOWNLINK ACK/NACK message with valid NPB. The SS sends a downlink data block addressed to the MS the header of which is correctly encoded and which polls the MS for PAN but which has a corrupted RLC data part. The SS verifies that the MS sends an EGPRS PACKET DOWNLINK ACK/NACK message that indicates non-receipt of the corrupted downlink data block. The SS checks that the EGPRS PACKET DOWNLINK ACK/NACK message is received within the specified PAN reaction time. The SS transmits the previously negatively acknowledged downlink data blocks. The SS transmits a final downlink data block addressing the MS which polls the MS for PAN. The SS checks that the MS acknowledges all of the transmitted data blocks.

Maximum Duration of Test

10 minutes.

Expected Sequence

The test case is repeated for k =1 (RTTI, single UL/DL pair), 2 (BTTI plus FANR, single UL/DL slot) for all MSs indicating support of Reduced Latency.

The test case is repeated for k =2 (BTTI plus FANR, single UL/DL slot) only for all MSs indicating support of FANR.

Step	Direction	Message	Comments
1		{Downlink TBF establishment}	Acknowledged Mode. FANR Activated
2	SS -> MS	EGPRS DOWNLINK DATA BLOCK	Sent on the assigned PDTCH,. with CES/P = 011.
3	MS -> SS	EGPRS PACKET DOWNLINK ACK/NACK	Received on uplink PACCH. of the assigned PDTCH Received in reserved block allocated by CES/P at Step 2.
4	MS		The MS is triggered to send 440 octets of user data.
5	MS <-> SS		Steps 2 and 3 are repeated until reception of EGPRS PACKET DOWNLINK ACK/NACK with Channel request Description IE included at Step 3.
6	SS -> MS	PACKET UPLINK ASSIGNMENT	Sent on downlink PACCH. An The uplink TBF is assigned.
7	SS -> MS	EGPRS DOWNLINK DATA BLOCK	Sent on the assigned PDTCH. BSN = BSN(n) USF assigned to the MS.
8	MS -> SS	EGPRS UPLINK DATA BLOCK	Received on assigned PDTCH. The SS checks that the PAN field is not included in the uplink data block header.
9	SS		SS skips DOWNLINK DATA BLOCKS BSN (n+1) , BSN(n+2)
10	SS -> MS	EGPRS DOWNLINK DATA BLOCK	Sent on the assigned PDTCH. BSN = BSN(n+3) CES/P =is set to 011.Polling the MS for PAN.
11	MS -> SS	EGPRS UPLINK DATA BLOCK	The EGPRS Uplink RLC/MAC header should be checked for the PAN field with the correct bit map for missing DOWNLINK BLOCKS BSN(n+1), BSN(n+2). Received on assigned PDTCH. Received in reserved block allocated by CES/P at Step 10 (equivalent to the PAN reaction time). The SS checks that the PAN field is included in the uplink data block header and indicates non-receipt of the downlink data blocks with BSN = BSN(n+1) and BSN(n+2).
12		{Completion of uplink RLC data block transfer}	
13	SS -> MS	EGPRS DOWNLINK DATA BLOCK	Sent on the assigned PDTCH. BSN = BSN(n+4) CES/P =is set to 011.Polling the MS for PAN. The RLC/MAC header is correctly encoded but the RLC data part is corrupted.
14	MS -> SS	EGPRS PACKET DOWNLINK ACK/NACK	Received on uplink PACCH. Received in reserved block allocated by CES/P at Step 13 (equivalent to the PAN reaction time). Contains NPB which indicates non-receipt of the downlink data block with BSN = BSN(n+4). With valid NPB (Next Partial Bitmap), negatively acknowledging the blocks missed by the SS in step 13.
15	SS -> MS	EGPRS DOWNLINK DATA BLOCK	Sent on the assigned PDTCH. BSN = BSN(n+1) Retransmitting all the negatively acknowledged blocks and finally sending one data block with FBI=1, with CES/P = 011
16	SS -> MS	EGPRS DOWNLINK DATA BLOCK	Sent on the assigned PDTCH. BSN = BSN(n+2)
17	SS -> MS	EGPRS DOWNLINK DATA BLOCK	Sent on the assigned PDTCH. BSN = BSN(n+4)
18	SS -> MS	EGPRS DOWNLINK DATA BLOCK	Sent on the assigned PDTCH. BSN = BSN(n+5) FBI = 1 CES/P = 011
19	MS -> SS	EGPRS PACKET DOWNLINK ACK/NACK	Received on PACCH Received on uplink PACCH. Received in reserved block allocated by CES/P at Step 18. FAI = 1

Specific Message contents

PACKET DOWNLINK ASSIGNMENT in Step 1

{ 0 | 1 -- '1' indicates Fast Ack/Nack Reporting is activated < EVENT_BASED_FANR: bit (0) > }	1 0

58a.1.18 Downlink TBF, with Concurrent Uplink TBF, PAN Reaction Time, Event Based FANR

58a.1.18.1 Conformance Requirements

1. If the RLC endpoint receiver is the mobile station, event-based FANR is enabled for this TBF and the mobile station has at least one assigned TBF in the uplink direction, the mobile station shall insert one PAN field in an EGPRS RLC/MAC block for data transfer transmitted during a given radio block period for that uplink TBF if the state of any element in the receive state array V(N) is UNREPORTED. The mobile station may continue to insert PAN fields in subsequent EGPRS RLC/MAC data blocks sent in the same radio block period as long as there exists one or more elements in the receive state array V(N) whose state is UNREPORTED.

2. A mobile station that detects a missing/erroneous RLC data block for a downlink TBF with FANR activated (see 3GPP TS 44.060) shall be ready to send an uplink RLC/MAC block for data transfer with a PAN or an EGPRS PACKET DOWNLINK ACK/NACK or EGPRS PACKET DOWNLINK ACK/NACK TYPE 2 message (in the case that there is no uplink RLC data ready for transmission) reflecting the missing/erroneous block in the TDMA frame indicated in Table 6.11.5.2 where N = the last TDMA frame of the downlink block in which the MS detected the problem.

References

3GPP TS 44.060, subclause 9.1.14.3.

3GPP TS 45.010, subclause 6.11.5.

58a.1.18.2 Test Purposes

1. To verify that when event based FANR is activated for a downlink TBF and a concurrent uplink TBF is established, the MS adheres to the PAN reaction time requirement when a missing or erroneous data block has been detected.

58a.1.18.3 Method of Test

Initial Conditions

System Simulator:

1 cell with EGPRS support, default setting.

Mobile Station:

The MS is EGPRS updated with a P-TMSI allocated, SPLIT PG CYCLE negotiated and the test PDP Context 2 activated.

Specific PICS Statements

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PIXIT Statements

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Test Procedure

The SS initiates the establishment of a downlink EGPRS TBF with Event Based FANR activated in the PACKET DOWNLINK ASSIGNMENT message. The MS is then triggered to transfer 440 octets of user data. The SS assigns an uplink TBF by sending a PACKET UPLINK ASSIGNMENT message. The SS sends a downlink data block addressed to the MS which has a BSN that is out of sequence by two BSNs with the last downlink data block addressing the MS. The SS grants the MS it's assigned USF in a subsequent downlink data block such that the resultant uplink data block occurs at the defined PAN reaction time. It is checked that the MS includes the PAN field in the uplink data block and that the PAN field indicates non-receipt of the missing data blocks. The SS sends the negatively acknowledged data blocks to the MS. The SS grants the MS it's assigned USF in a subsequent downlink data block such that the resultant uplink data block occurs at the defined PAN reaction time. It is checked that the PAN field is not included in the resultant uplink data block. The SS sends a downlink data block addressed to the MS the header of which is correctly encoded but which has a corrupted RLC data part. The SS grants the MS it's assigned USF in a subsequent downlink data block such that the resultant uplink data block occurs at the defined PAN reaction time. It is checked that the MS includes the PAN field in the uplink data block and that the PAN field indicates non-receipt of the corrupted data block. The SS sends the negatively acknowledged data block to the MS. The SS grants the MS it's assigned USF in a subsequent downlink data block such that the resultant uplink data block occurs at the defined PAN reaction time. It is checked that the PAN field is not included in the resultant uplink data block. The SS transmits a final downlink data block addressing the MS which polls the MS for EGPRS PACKET DOWNLINK ACK/NACK. The SS checks that the MS acknowledges all of the transmitted data blocks. The uplink TBF is completed.

Maximum Duration of Test

10 minutes.

Expected Sequence

The test case is repeated for k =1 (RTTI, single UL/DL pair), 2 (BTTI plus FANR, single UL/DL slot) for all MSs indicating support of Reduced Latency.

The test case is repeated for k =2 (BTTI plus FANR, single UL/DL slot) only for all MSs indicating support of FANR.

1		{Downlink TBF establishment}	Acknowledged Mode. FANR Activated See Specific Message Contents below.
2	SS -> MS	EGPRS DOWNLINK DATA BLOCK	Sent on the assigned PDTCH. CES/P = 011
3	MS -> SS	EGPRS PACKET DOWNLINK ACK/NACK	Received on uplink PACCH. Received in reserved block allocated by CES/P at Step 2.
4	MS		The MS is triggered to send 440 octets of user data.
5	MS <-> SS		Steps 2 and 3 are repeated until reception of EGPRS PACKET DOWNLINK ACK/NACK with Channel request Description IE included at Step 3.
6	SS -> MS	PACKET UPLINK ASSIGNMENT	Sent on downlink PACCH. An uplink TBF is assigned.
7	SS -> MS	EGPRS DOWNLINK DATA BLOCK	Sent on the assigned PDTCH. BSN = BSN(n) USF assigned to the MS. IF MS supported Reduced Latency Capability THEN For k = 1:- Sent three RTTI blocks after Step 6. For k = 2:- Sent two BTTI blocks after Step 6. ELSE IF MS supported FANR Capability THEN For k = 2:- Sent two BTTI blocks after Step 6.
8	MS -> SS	EGPRS UPLINK DATA BLOCK	Received on assigned PDTCH. The SS checks that the PAN field is not included in the uplink data block.
9	SS -> MS	EGPRS DOWNLINK DATA BLOCK	Sent on the assigned PDTCH. BSN = BSN(n+3) USF not assigned to the MS.
10	SS -> MS	EGPRS DOWNLINK DATA BLOCK	Sent on the assigned PDTCH. BSN = BSN(n+4) USF assigned to the MS. IF MS supported Reduced Latency Capability THEN For k = 1:- Sent two RTTI blocks after Step 9. For k = 2:- Sent one BTTI block after Step 9. ELSE IF MS supported FANR Capability THEN For k = 2:- Sent one BTTI block after Step 9.
11	MS -> SS	EGPRS UPLINK DATA BLOCK	Received on assigned PDTCH. The SS checks that the PAN field is included in the uplink data block and indicates non-receipt of the downlink data blocks with BSN = BSN(n+1) and BSN(n+2).
12	SS -> MS	EGPRS DOWNLINK DATA BLOCK	Sent on the assigned PDTCH. BSN = BSN(n+1) USF not assigned to the MS.
13	SS -> MS	EGPRS DOWNLINK DATA BLOCK	Sent on the assigned PDTCH. BSN = BSN(n+2) USF not assigned to the MS.
14	SS -> MS	EGPRS DOWNLINK DATA BLOCK	Sent on the assigned PDTCH. BSN = BSN(n+5) USF assigned to the MS. IF MS supported Reduced Latency Capability THEN For k = 1:- Sent two RTTI blocks after Step 13. For k = 2:- Sent one BTTI block after Step 13. ELSE IF MS supported FANR Capability THEN For k = 2:- Sent one BTTI block after Step 13.
15	MS -> SS	EGPRS UPLINK DATA BLOCK	Received on assigned PDTCH. The SS checks that the PAN field is not included in the uplink data block.

16	SS -> MS	EGPRS DOWNLINK DATA BLOCK	Sent on the assigned PDTCH. BSN = BSN(n+6) USF not assigned to the MS. The RLC/MAC header is correctly encoded but the RLC data part is corrupted.
17	SS -> MS	EGPRS DOWNLINK DATA BLOCK	Sent on the assigned PDTCH. BSN = BSN(n+7) USF assigned to the MS. IF MS supported Reduced Latency Capability THEN For k = 1:- Sent two RTTI blocks after Step 16. For k = 2:- Sent one BTTI block after Step 16. ELSE IF MS supported FANR Capability THEN For k = 2:- Sent one BTTI block after Step 16.
18	MS -> SS	EGPRS UPLINK DATA BLOCK	Received on assigned PDTCH. The SS checks that the PAN field is included in the uplink data block and indicates non-receipt of the downlink data block with BSN = BSN(n+6).
19	SS -> MS	EGPRS DOWNLINK DATA BLOCK	Sent on the assigned PDTCH. BSN = BSN(n+6) USF not assigned to the MS.
20	SS -> MS	EGPRS DOWNLINK DATA BLOCK	Sent on the assigned PDTCH. BSN = BSN(n+8) USF assigned to the MS. IF MS supported Reduced Latency Capability THEN For k = 1:- Sent two RTTI blocks after Step 19. For k = 2:- Sent one BTTI block after Step 19. ELSE IF MS supported FANR Capability THEN For k = 2:- Sent one BTTI block after Step 19.
21	MS -> SS	EGPRS UPLINK DATA BLOCK	Received on assigned PDTCH. The SS checks that the PAN field is not included in the uplink data block.
22	SS -> MS	EGPRS DOWNLINK DATA BLOCK	Sent on the assigned PDTCH. BSN = BSN(n+9) FBI = 1 CES/P = 001 USF not assigned to the MS.
23	MS -> SS	EGPRS PACKET DOWNLINK ACK/NACK	Received on uplink PACCH. Received in reserved block allocated by CES/P at Step 22. FAI = 1
24		{Completion of uplink RLC data block transfer}	

Specific Message contents

PACKET DOWNLINK ASSIGNMENT in Step 1

{ 0 | 1 -- '1' indicates Fast Ack/Nack Reporting is activated < EVENT_BASED_FANR: bit (0) > }	1 1

58a.1.19 Concurrent Uplink and Downlink TBFs, FANR/PAN, RLC Unacknowledged Mode

58a.1.19.1 Conformance Requirements

1. The Fast Ack/Nack reporting procedure (FANR) refers to the possibility to include, in a radio block for data transfer sent in one direction, piggy-backed ack/nack information relative to a TBF with FANR activated in the other direction.

2. FANR can be activated for a TBF operated in RLC unacknowledged mode.

References

3GPP TS 43.064, subclause 3.3.5.1.

3GPP TS 44.060, subclause 9.1.14.1.

58a.1.19.2 Test Purposes

1. To verify that the mobile station operates concurrent uplink and downlink TBFs with FANR enabled in RLC unacknowledged mode.

58a.1.19.3 Method of Test

Initial Conditions

System Simulator:

1 cell with EGPRS support, default setting.

Mobile Station:

The MS is EGPRS updated with a P-TMSI allocated, SPLIT PG CYCLE negotiated and the test PDP Context 3 activated.

Specific PICS Statements

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PIXIT Statements

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Test Procedure

The MS is triggered to transfer 1000 octets of user data. An uplink TBF with FANR on an RTTI configuration is established, if MS indicates support of Reduced Latency. If the MS indicates support of FANR, then an uplink TBF with FANR on an BTTI configuration is established. A concurrent downlink TBF with event based FANR is established. During the concurrent uplink and downlink TBFs, the SS includes the PAN field in a downlink data block which negatively acknowledges uplink data blocks sent by the MS. It is checked that the MS does not re-transmit the negatively acknowledged data blocks. All subsequent uplink data blocks are positively acknowledged by the SS by inserting PAN fields into downlink data blocks as appropriate. During the concurrent uplink and downlink TBFs, the SS omits transmission of selected downlink data blocks. Allowing for the PAN reaction time, it is checked that the MS does not include the PAN field requesting re-transmission of the missing data blocks in its subsequent uplink data blocks. During the concurrent uplink and downlink TBFs, the SS transmits downlink data blocks which have correctly encoded RLC/MAC headers but which have a corrupted RLC data part. Allowing for the PAN reaction time, it is checked that the MS does not include the PAN field requesting re-transmission of the corrupted data blocks in subsequent uplink data blocks. The downlink TBF is completed. The uplink TBF is completed.

Maximum Duration of Test

10 minutes.

Expected Sequence

Step	Direction	Message	Comments
1		{Uplink dynamic allocation two phase access}	n = 1000 octets USF_GRANULRITY = 1 block Un-acknowledged Mode. MCS chosen arbitrarily from MCS-1..4.
2	SS -> MS	PACKET DOWNLINK ASSIGNMENT	Sent on downlink PACCH. A downlink TBF is assigned. See Specific Message Contents below.
3	SS -> MS	EGPRS DOWLINK DATA BLOCK	Sent on assigned PDTCH. IF MS supported Reduced Latency Capability THEN Sent three RTTI blocks after Step 2. ELSE IF MS supported FANR Capability THEN Sent three BTTI blocks after Step 2. Does not contain PAN field. USF assigned to the MS.
4	MS -> SS	EGPRS UPLINK DATA BLOCK	Received on assigned PDTCH. Does not contain PAN field. Contains RLC data block with :- BSN = BSN(n)u
5	SS -> MS	EGPRS DOWNLINK DATA BLOCK	Sent on the assigned PDTCH. USF not assigned to the MS. Contains the PAN field which negatively acknowledges the data block received at Step 4.
6	SS -> MS	EGPRS DOWNLINK DATA BLOCK	Sent on the assigned PDTCH. Does not contain PAN field. USF assigned to the MS. IF MS supported Reduced Latency Capability THEN Send two RTTI blocks after Step 5. ELSE IF MS supported FANR Capability THEN Sent two BTTI blocks after Step 5.
7	MS -> SS	EGPRS UPLINK DATA BLOCK	Received on assigned PDTCH. Does not contain PAN field. Contains RLC data block with :- BSN = BSN(n +1)u
8	SS		The SS checks that all subsequent uplink data blocks have BSN > BSN(n+1)u
9	SS -> MS	EGPRS DOWNLINK DATA BLOCK	Sent on the assigned PDTCH. BSN = BSN(n)d USF not assigned to the MS. Contains the PAN field which positively acknowledges the data block received at Step 7.
10	SS -> MS	EGPRS DOWNLINK DATA BLOCK	Sent on the assigned PDTCH. BSN = BSN(n+3)d USF not assigned to the MS.
11	SS -> MS	EGPRS DOWNLINK DATA BLOCK	Sent on the assigned PDTCH. BSN = BSN(n+4)d USF assigned to the MS. IF MS supported Reduced Latency Capability THEN Sent two RTTI blocks after Step 10 ELSE IF MS supported FANR Capability THEN Sent two BTTI blocks after Step 10.
12	MS -> SS	EGPRS UPLINK DATA BLOCK	Received on assigned PDTCH. Does not contain PAN field.
13	SS -> MS	EGPRS DOWNLINK DATA BLOCK	Sent on the assigned PDTCH. BSN = BSN(n+5)d USF not assigned to the MS. The RLC/MAC header is correctly encoded but the RLC data part is corrupted.

14	SS -> MS	EGPRS DOWNLINK DATA BLOCK	Sent on the assigned PDTCH. BSN = BSN(n+6)d USF assigned to the MS. Contains the PAN field which positively acknowledges the data block received at Step 12. IF MS supported Reduced Latency Capability THEN Sent two RTTI blocks after Step 13 ELSE IF MS supported FANR Capability THEN Sent two BTTI blocks after Step 13.
15	MS -> SS	EGPRS UPLINK DATA BLOCK	Received on assigned PDTCH. Does not contain PAN field.
16	SS -> MS	EGPRS DOWNLINK DATA BLOCK	Sent on the assigned PDTCH. BSN = BSN(n+7)d FBI = 1 CES/P = 001 USF not assigned to the MS. Contains the PAN field which positively acknowledges the data block received at Step 15.
17	MS -> SS	PACKET CONTROL ACK	Received on uplink PACCH. Received in reserved block allocated by CES/P at Step 16.
18		{Completion of uplink RLC data block transfer}	

Specific Message Contents

PACKET DOWNLINK ASSIGNMENT in Step 2

RLC Mode { 0 | 1 -- '1' indicates Fast Ack/Nack Reporting is activated < EVENT_BASED_FANR: bit (0) > }	Un-acknowledged 1 1

58a.2 EGPRS test cases for RTTI Configuration

58a.2.1 Uplink RTTI TBF/ Default PDCH pair configuration/ Dynamic Allocation / BTTI USF Mode

58a.2.1.1 Conformance Requirements

1. Whenever the mobile station detects an assigned USF value on a monitored downlink PDCH or PDCH-pair, the mobile station shall transmit either a single RLC/MAC block or a sequence of four RLC/MAC blocks on the same PDCH or corresponding PDCH-pair for that TBF except if that TBF is running in extended uplink TBF mode, in which case the mobile station may transmit RLC/MAC block(s) for other TBFs assigned on the same PDCH or corresponding PDCH-pair (see sub-clause 9.3.1b.2). The time relation between an uplink block, which the mobile station shall use for transmission, and the occurrence of the USF value is defined in 3GPP TS 45.002. The number of RLC/MAC blocks to transmit is controlled by the USF_GRANULARITY parameter characterising the uplink TBF.

2. For an uplink TBF in RTTI configuration that receives the USFs in BTTI USF mode:

- An assigned USF received on the first PDCH of a monitored downlink PDCH-pair allocates resources for one or four uplink RTTI radio blocks in the first two TDMA frames of the following basic radio block period(s) on the corresponding uplink PDCH-pair, depending on the value of USF_GRANULARITY.
- An assigned USF received on the second PDCH of a monitored downlink PDCH-pair allocates resources for one or four uplink RTTI radio blocks in the second two TDMA frames of the following basic radio block period(s) on the corresponding uplink PDCH-pair, depending on the value of USF_GRANULARITY.

References

3GPP TS 44.060, subclause 8.1.1.1.

58a.2.1.2 Test Purposes

To verify:

1. The MS is able to operate in RTTI configuration when receiving the USF in BTTI USF mode.

2. When the mobile station receives an assigned USF on the first PDCH of the downlink PDCH-pair, it transmits uplink radio blocks in the first two TDMA frames of the following radio block period on the corresponding PDCH-pair.

3. When the mobile station receives an assigned USF on the second PDCH of the downlink PDCH-pair, it transmits uplink radio blocks in the last two TDMA frames of the following radio block period on the corresponding PDCH-pair.

58a.2.1.3 Method of test

Initial Conditions

System Simulator:

1 cell with EGPRS support, default setting, PBCCH not present.

Mobile Station:

The MS is GPRS attached with a P-TMSI allocated and the test PDP context3 activated.

Specific PICS Statements

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PIXIT Statements

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Test Procedure

The SS orders the MS to have two-phase access. In PACKET UPLINK ASSIGNMENT an RTTI TBF comprising corresponding uplink and downlink PDCH-pairs is assigned to the MS. (USF_GRANULARITY is set to 1 block.) The SS sends the assigned USF on one of the PDCH of the corresponding downlink PDCH-pair assigned to the MS and checks that one RLC/MAC data block is sent in the appropriate two TDMA frames of the next radio block period. The SS assigns the USF assigned to the MS again. The check is repeated. The procedure continues until the MS completes the packet data transfer.

Maximum Duration of Test

4 minutes

Expected Sequence

Step	Direction	Message	Comments
1		{Uplink dynamic allocation two phase access until the last UPLINK ASSIGNMENT MESSAGE}	
	SS-> MS	PACKET UPLINK ASSIGNMENT	Message escape for dual carrier, RTTI, BTTI with FANR activated, EGPRS2 RTTI Mode RTTI_USF_MODE= No (BTTI USF Mode) default single-carrier PDCH-pair configuration Dynamic Allocation 2 struct used – Allocation without Power Control Parameters EGPRS Channel coding command arbitrarily chosen between MCS 1 and MCS 4
2	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the corresponding downlink PDCH pair, the USF allocated to the MS on one block from the last radio block containing the uplink assignment.
3	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned corresponding uplink PDCH pair in RTTI configuration. Check that the coding as specified in EGPRS Channel coding command,
4	SS -> MS	PACKET UPLINK ACK/NACK	Sent on the PACCH, the USF not addressing the MS.
5	SS		Check that no RLC data blocks are transmitted from the MS in the next RTTI radio block to step 4.
6	SS -> MS	PACKET UPLINK ACK/NACK	Sent on a PDCH pair with any different time slot as the assigned corresponding PDCH pair, the USF assigned to the MS.
7	SS		Check that no RLC data block is transmitted from the MS on the next RTTI radio block to step 6
8	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH pair, the USF assigned to the MS.
9	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDCH pair in RTTI configuration. Check that the coding as specified in EGPRS Channel coding command
10		{Completion of uplink RLC data block transfer}	USF_GRANULARITY = 1 block

58a.2.2 Uplink RTTI TBF/ default PDCH pair configuration/Dynamic Allocation/ RTTI USF Mode

58a.2.2.1 Conformance Requirement

Whenever the mobile station detects an assigned USF value on a monitored downlink PDCH or PDCH-pair, the mobile station shall transmit either a single RLC/MAC block or a sequence of four RLC/MAC blocks on the same PDCH or corresponding PDCH-pair for that TBF except if that TBF is running in extended uplink TBF mode, in which case the mobile station may transmit RLC/MAC block(s) for other TBFs assigned on the same PDCH or corresponding PDCH-pair (see sub-clause 9.3.1b.2). The time relation between an uplink block, which the mobile station shall use for transmission, and the occurrence of the USF value is defined in 3GPP TS 45.002. The number of RLC/MAC blocks to transmit is controlled by the USF_GRANULARITY parameter characterising the uplink TBF.

For an uplink TBF in RTTI configuration that receives the USFs in RTTI USF mode:

- An assigned USF received on a monitored downlink PDCH-pair in the first reduced radio block period of a given basic radio block period allocates resources for one or four uplink RTTI radio blocks in the second reduced radio block period starting in the same basic radio block period and continuing with the second reduced radio block period in the following basic radio block periods on the corresponding uplink PDCH-pair, depending on the value of USF_GRANULARITY.

- An assigned USF received on a monitored downlink PDCH-pair in the second reduced radio block period of a given basic radio block period allocates resources for one or four uplink RTTI radio blocks in the first reduced radio block period starting in the next basic radio block period and continuing with the first reduced radio block period in the following basic radio block periods on the corresponding uplink PDCH-pair, depending on the value of USF_GRANULARITY.

On a downlink PDCH-pair assigned to a TBF in RTTI configuration with RTTI USF mode, downlink RLC/MAC control blocks shall always be encoded using either coding scheme CS-1 or coding scheme MCS-0; an MS can differentiate CS-1 blocks from MCS-0 blocks by examining the stealing bits.

References

3GPP TS 44.060, subclause 8.1.1.1 and 10.3.

58a.2.2.2 Test Purposes

To verify:

1. The MS is able to operate in RTTI configuration when receiving the USF in RTTI USF mode.
2. When the mobile station receives an assigned USF on a monitored downlink PDCH-pair in the first reduced radio block of a given basic radio block period, it transmits uplink RTTI radio blocks in the second reduced radio block period starting in the same basic radio block period and continuing with the second reduced radio block period in the following basic radio block period on the corresponding PDCH-pair depending on the value of USF_GRANULARITY.
3. When the mobile station receives an assigned USF on a monitored downlink PDCH-pair in the second reduced radio block period of a given basic radio block period it transmits uplink RTTI radio blocks in the first reduced radio block period starting in the next basic radio block period and continuing with the first reduced radio block period in the following basic radio block periods on the corresponding uplink PDCH-pair, depending on the value of USF_GRANULARITY.
4. MS is able to interpret both MCS-0 and CS-1 formatted downlink control blocks.

58a.2.2.3 Method of test

Initial Conditions

System Simulator:

1 cell, default setting.

Mobile Station:

The MS is GPRS attached with a P-TMSI allocated and test PDP Context 3 activated.

Specific PICS Statements

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PIXIT Statements

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Test Procedure

The MS is triggered to perform uplink packet transfer. In the PACKET UPLINK ASSIGNMENT message sent during the subsequent two phase access procedure, an RTTI mode TBF (using a single PDCH pair) using RTTI USF mode with USF GRANULARITY set to 1 block is allocated. The SS grants the MS the assigned USF in a reduced radio block period using a downlink control block encoded using CS-1 occurring in the first two TDMA frames of a given basic radio block period. The SS checks that the MS sends one uplink data block in the corresponding reduced uplink data block. The SS acknowledges the received data block. The SS grants the MS the assigned USF in a reduced radio block period using a downlink control block encoded using CS-1 occurring in the last two TDMA frames of a given basic radio block period. The SS checks that the MS sends one uplink data block in the corresponding reduced uplink data block. The SS acknowledges the received data block. The SS grants the MS the assigned USF in a reduced radio block period using a downlink control block encoded using MCS-0 occurring in the first two TDMA frames of a given basic radio block period. The SS checks that the MS sends one uplink data block in the corresponding reduced uplink data block. The SS acknowledges the received data block. The SS grants the MS the assigned USF in a reduced radio block period using a downlink control block encoded using MCS-0 occurring in the last two TDMA frames of a given basic radio block period. The SS checks that the MS sends one uplink data block in the corresponding reduced uplink data block. The SS acknowledges the received data block. Using a PACKET UPLINK ASSIGNMENT message, the SS re-assigns the MS the same PDTCH pair as before but changes the USF GRANULARITY to 4 blocks. The SS grants the MS the assigned USF in a reduced radio block period using a downlink control block encoded using CS-1 occurring in the first two TDMA frames of a given basic radio block period. The SS checks that the MS sends four uplink data blocks in the corresponding reduced uplink data blocks. The SS acknowledges the received data blocks. The SS grants the MS the assigned USF in a reduced radio block period using a downlink control block encoded using CS-1 occurring in the last two TDMA frames of a given basic radio block period. The SS checks that the MS sends four uplink data blocks in the corresponding reduced uplink data blocks. The SS acknowledges the received data blocks. The SS grants the MS the assigned USF in a reduced radio block period using a downlink control block encoded using MCS-0 occurring in the first two TDMA frames of a given basic radio block period. The SS checks that the MS sends four uplink data blocks in the corresponding reduced uplink data blocks. The SS acknowledges the received data blocks. The SS grants the MS the assigned USF in a reduced radio block period using a downlink control block encoded using MCS-0 occurring in the last two TDMA frames of a given basic radio block period. The SS checks that the MS sends four uplink data blocks in the corresponding reduced uplink data blocks. The SS acknowledges the received data blocks. The uplink data transfer is completed.

Maximum Duration of Test

6 minutes

Expected Sequence

Step	Direction	Message	Comments
1		{Uplink dynamic allocation two phase access until the last PACKET UPLINK ASSIGNMENT message}	n=1500 octets Assigns a single PDTCH pair. USF Mode = RTTI USF Mode. USF Granularity = 1 block EGPRS Channel coding command arbitrarily chosen between MCS 1 and MCS 4. RLC_DATA_BLOCKS_GRANTED = open-end
2	SS -> MS	PACKET UPLINK ASSIGNMENT	
3	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on downlink PACCH of PDCH pair. Sent on reduced radio block B(n)a. Control block format CS-1. USF assigned to the MS. First burst containing the control block Sent 5/6 frames (dependant on the occurrence of idle or PTCCH frames) after the last TDMA frame containing the assignment message at Step 2.
4	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on uplink PDTCH pair. Received on reduced radio block B(n)b. MCS as specified in Step 2.
5	SS -> MS	EGPRS DOWNLINK DATA BLOCK	Sent on downlink PDTCH pair. Contains the PAN field which acknowledges the radio block received in Step 4. USF not assigned to the MS.
6	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on downlink PACCH of PDCH pair. Sent on reduced radio block B(n)b. Control block format CS-1. USF assigned to the MS.
7	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on uplink PDTCH pair. Received on reduced radio block B(n+1)a. MCS as specified in Step 2.
8	SS -> MS	EGPRS DOWNLINK DATA BLOCK	Sent on downlink PDTCH pair. Contains the PAN field which acknowledges the radio block received in Step 7. USF not assigned to the MS.
9	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on downlink PACCH of PDCH pair. Sent on reduced radio block B(n)a. Control block format MCS-0. USF assigned to the MS.
10	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on uplink PDTCH pair. Received on reduced radio block B(n)b. MCS as specified in Step 2.
11	SS -> MS	EGPRS DOWNLINK DATA BLOCK	Sent on downlink PDTCH pair. Contains the PAN field which acknowledges the radio block received in Step 10. USF not assigned to the MS.
12	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on downlink PACCH of PDCH pair. Sent on reduced radio block B(n)b. Control block format MCS-0. USF assigned to the MS.
13	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on uplink PDTCH pair. Received on reduced radio block B(n+1)a. MCS as specified in Step 2.
14	SS -> MS	EGPRS DOWNLINK DATA BLOCK	Sent on downlink PDTCH pair. Contains the PAN field which acknowledges the radio block received in Step 13. USF not assigned to the MS.
15	SS -> MS	PACKET UPLINK ASSIGNMENT	Contents as in Step 2, except :- USF Granularity = 4 blocks

16	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on downlink PACCH of PDCH pair. Sent on reduced radio block B(n)a. Control block format CS-1. USF assigned to the MS. First burst containing the control block Sent 5/6 frames (dependant on the occurrence of idle or PTCCH frames) after the last TDMA frame containing the assignment message at Step 15.
17	MS -> SS	EGPRS UPLINK RLC DATA BLOCKs	Received on uplink PDTCH pair. Four blocks received on reduced radio blocks B(n)b, B(n+1)b, B(n+2)b, B(n+3)b. MCS as specified in Step 15.
18	SS -> MS	EGPRS DOWNLINK DATA BLOCK	Sent on downlink PDTCH pair. Contains the PAN field which acknowledges the radio blocks received in Step 17. USF not assigned to the MS.
19	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on downlink PACCH of PDCH pair. Sent on reduced radio block B(n)b. Control block format CS-1. USF assigned to the MS.
20	MS -> SS	EGPRS UPLINK RLC DATA BLOCKs	Received on uplink PDTCH pair. Four blocks received on reduced radio block B(n+1)a, B(n+2)a, B(n+3)a, B(n+4)a. MCS as specified in Step 15.
21	SS -> MS	EGPRS DOWNLINK DATA BLOCK	Sent on downlink PDTCH pair. Contains the PAN field which acknowledges the radio blocks received in Step 20. USF not assigned to the MS.
22	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on downlink PACCH of PDCH pair. Sent on reduced radio block B(n)a. Control block format MCS-0. USF assigned to the MS.
23	MS -> SS	EGPRS UPLINK RLC DATA BLOCKs	Received on uplink PDTCH pair. Four blocks received on reduced radio blocks B(n)b, B(n+1)b, B(n+2)b, B(n+3)b. MCS as specified in Step 15.
24	SS -> MS	EGPRS DOWNLINK DATA BLOCK	Sent on downlink PDTCH pair. Contains the PAN field which acknowledges the radio blocks received in Step 23. USF not assigned to the MS.
25	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on downlink PACCH of PDCH pair. Sent on reduced radio block B(n)b. Control block format MCS-0. USF assigned to the MS.
26	MS -> SS	EGPRS UPLINK RLC DATA BLOCKs	Received on uplink PDTCH pair. Four blocks received on reduced radio block B(n+1)a, B(n+2)a, B(n+3)a, B(n+4)a. MCS as specified in Step 15.
27	SS -> MS	EGPRS DOWNLINK DATA BLOCK	Sent on downlink PDTCH pair. Contains the PAN field which acknowledges the radio blocks received in Step 26. USF not assigned to the MS.
28		{Completion of uplink RLC data block transfer}	

Specific Message Contents

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58a.2.3 Uplink RTTI TBF/default PDCH pair configuration/Extended Dynamic Allocation /BTTI USF

58a.2.3.1 Conformance Requirements

The PACKET UPLINK ASSIGNMENT and MULTIPLE TBF UPLINK ASSIGNMENT messages assign to the mobile station a subset of 1 to N uplink PDCHs (when the uplink TBF operates in BTTI configuration) or uplink PDCH-pairs (when the uplink TBF operates in RTTI configuration), where N depends on the mobile station multislot class.

The following applies for an uplink TBF in RTTI configuration that receives USFs in BTTI USF mode:

- An assigned USF received on the first PDCH of a monitored downlink PDCH-pair allocates resources for one or four uplink RTTI radio blocks in the first two TDMA frames of the following basic radio block period(s) on the corresponding uplink PDCH-pair and all assigned uplink PDCH-pairs with higher numbered timeslots.
- An assigned USF received on the second PDCH of a monitored downlink PDCH-pair allocates resources for one or four uplink RTTI radio blocks in the second two TDMA frames of the following basic radio block period(s) on the corresponding uplink PDCH-pair and all assigned uplink PDCH-pairs with higher numbered timeslots.

References

3GPP TS 44.060, subclause 8.1.1.2.1

58a.2.3.2 Test Purposes

To verify:

1. When the mobile station receives an assigned USF on the first PDCH of the downlink PDCH-pair, it transmits uplink radio blocks in the first two TDMA frames of the following radio block period on the corresponding PDCH-pair and all assigned uplink PDCH-pairs with higher numbered timeslots.
2. When the mobile station receives an assigned USF on the second PDCH of the downlink PDCH-pair, it transmits uplink radio blocks in the last two TDMA frames of the following radio block period on the corresponding PDCH-pair and all assigned uplink PDCH-pairs with higher numbered timeslots.

58a.2.3.3 Method of test

Initial Conditions

System Simulator:

1 cell with EGPRS support, Extended dynamic allocation supported, PBCCH not present

Mobile Station:

The MS is EGPRS updated with a P-TMSI allocated and the test PDP context 2 activated.

Specific PICS Statements

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PIXIT Statements

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Test Procedure

The SS orders the MS to have two-phase access. In PACKET UPLINK ASSIGNMENT an RTTI TBF with EXTENDED DYNAMIC ALLOCATION comprising 2 uplink pairs is assigned to the MS. (USF_GRANURALITY is set to 1 block.)

The SS sends the assigned USF on the lowest PACCH it transmits on the following radio block in uplink the PDCH-pair and all PDCH-pairs with higher numbered timeslots assigned to the MS and checks that one RLC/MAC data block

The SS acknowledge the received data and USF not addressing MS, SS checks that no RLC data blocks received.

The SS sends the assigned USF on the highest PACCH for PDCH-pair2 it transmits on the following radio block in uplink the PDCH-pair and it is checked that the MS sends RLC/MAC data blocks in the next radio block period only on the highest assigned PDCH-pair.

Maximum Duration of Test

4 minutes

Expected Sequence

1		{Uplink dynamic allocation two phase access until the last UPLINK ASSIGNMENT MESSAGE}	
	SS-> MS	PACKET UPLINK ASSIGNMENT	- USF_1 on TN_1, - USF_2 on TN_2, - USF_3 on TN_3, - USF_4 on TN_4 See specific message contents
2	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the assigned PDCH pair1, containing the USF_1 allocated to the MS. Sent on reduced radio block B(n)a. One block from the last radio block containing the uplink assignment.
3	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the uplink PDCH pair1. Received on reduced radio block B(n+1)a Check that the coding as specified in EGPRS Channel coding command
4	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the uplink PDCH pair2. Received on reduced radio block B(n+1)a Check that the coding as specified in EGPRS Channel coding command,
5	SS -> MS	PACKET UPLINK ACK/NACK	Sent on the PACCH, the USF not addressing the MS.
6	SS		Check that no RLC data blocks are transmitted from the MS in the next RTTI radio block to step 5.
7	SS -> MS	PACKET UPLINK ACK/NACK	Sent on a PDCH pair with any different time slot as the assigned corresponding PDCH pairs, the USF assigned to the MS.
8	SS		Check that no RLC data block is transmitted from the MS on the next RTTI radio block to step 7
9	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the assigned PDCH pair2, containing the USF_4 allocated to the MS. Sent on reduced radio block B(n)a.
10	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the uplink PDCH pair2. Received on reduced radio block B(n+1)b Check that the coding as specified in EGPRS Channel coding command
11		{Completion of uplink RLC data block transfer}	USF_GRANULARITY = 1 block

Specific Message Contents

PACKET UPLINK ASSIGNMENT in Step 1:

<table>
<tr><td>Dynamic allocation</td><td>01</td></tr>
<tr><td>- Extended Dynamic Allocation</td><td>1 (Extended Dynamic allocation)</td></tr>
<tr><td>- {0|1<P0><PR_MODE>}</td><td>0</td></tr>
<tr><td>- USF_GRANULARITY</td><td>0, one block</td></tr>
<tr><td>- {0|1<UPLINK_TFI_ASSIGNMENT>}</td><td>1 (uplink TFI assignment)</td></tr>
<tr><td>- UPLINK_TFI_ASSIGNMENT</td><td>Arbitrarily chosen (default 00101)</td></tr>
<tr><td>- {0|1<RLC_DATA_BLOCKS_GRANTED>}</td><td>0 (no RLC_DATA_BLOCKS_GRANTED, open-ended TBF)</td></tr>
<tr><td>- {0|1<TBF_STARTING_TIME>}</td><td>0 (no starting time)</td></tr>
<tr><td>-</td><td>1 (Timeslot Allocation with Power Control Parameters) one slot arbitrarily chosen and the following USF_TNx and GAMMA_TNx shall be corresponding to the chosen value, default timeslot 2 assigned)</td></tr>
<tr><td>- ALPHA</td><td>0.5</td></tr>
<tr><td>- {0|1<USF_TN0><GAMMA_TN0>}</td><td>0 (timeslot 0 not assigned)</td></tr>
<tr><td>- {0|1<USF_TN1><GAMMA_TN1>}</td><td>0 (timeslot 1 not assigned)</td></tr>
<tr><td>- {0|1<USF_TN2><GAMMA_TN2>}</td><td>1 (timeslot 2 assigned)</td></tr>
<tr><td>- USF_TN2</td><td>Arbitrarily chosen (default 5)</td></tr>
<tr><td>- GAMMA_TN2</td><td>For GSM 700, T-GSM 810, GSM 850 and GSM 900, +8 dBm
For DCS 1 800, +6 dBm
For PCS 1 900, +6 dBm</td></tr>
<tr><td>- {0|1<USF_TN3><GAMMA_TN3>}</td><td>1 (timeslot 3 assigned)</td></tr>
<tr><td>- USF_TN3</td><td>Arbitrarily chosen (default 6) but it must be different than USF_TN2</td></tr>
<tr><td>- GAMMA_TN3</td><td>For GSM 700, T-GSM 810, GSM 850 and GSM 900, +8 dBm
For DCS 1 800, +6 dBm
For PCS 1 900, +6 dBm</td></tr>
<tr><td>- {0|1<USF_TN4><GAMMA_TN4>}</td><td>1 (timeslot 4 assigned),</td></tr>
<tr><td>- USF_TN4</td><td>Arbitrarily chosen (default 4) but it must be different to USF_TN2 and USF_TN3</td></tr>
<tr><td>- GAMMA_TN4</td><td>For GSM 700, T-GSM 810, GSM 850 and GSM 900, +8 dBm
For DCS 1 800, +6 dBm
For PCS 1 900, +6 dBm</td></tr>
<tr><td>- {0|1<USF_TN5><GAMMA_TN5>}</td><td>1 (timeslot 5 assigned),</td></tr>
<tr><td>- USF_TN5</td><td>Arbitrarily chosen (default 3) but it must be different to USF_TN2, USF_TN3 and USF_TN4</td></tr>
<tr><td>- GAMMA_TN5</td><td>For GSM 700, T-GSM 810, GSM 850 and GSM 900, +8 dBm
For DCS 1 800, +6 dBm
For PCS 1 900, +6 dBm</td></tr>
<tr><td>- {0|1<USF_TN6><GAMMA_TN6>}</td><td>0 (timeslot 6 not assigned)</td></tr>
<tr><td>- {0|1<USF_TN7><GAMMA_TN7>}</td><td>0 (timeslot 7 not assigned)</td></tr>
<tr><td>{0 -- BTTI Mode</td><td>1</td></tr>
<tr><td>|1 – RTTI Mode</td><td></td></tr>
<tr><td><RTTI_USF_MODE: bit(1)></td><td>0</td></tr>
<tr><td>{00 – default single-carrier PDCH-pair configuration</td><td>10</td></tr>
<tr><td>|01 -- default dual-carrier PDCH-pair configuration</td><td></td></tr>
<tr><td>|10 <DOWNLINK_PDCH_PAIRS_C1></td><td>2 timeslots allocated to the MS.</td></tr>
<tr><td>{0|1 <DOWNLINK_PDCH_PAIRS_C2>}</td><td>Not present.</td></tr>
<tr><td><UPLINK_PDCH_PAIRS_C1></td><td>4 timeslots allocated to the MS.</td></tr>
<tr><td>{0|1 <UPLINK_PDCH_PAIRS_C2>}</td><td>Not present.</td></tr>
<tr><td>|11</td><td></td></tr>
<tr><td>}}</td><td></td></tr>
<tr><td>EGPRS Channel Coding Command</td><td>Arbitrarily chosen from MCS-1..MCS-4</td></tr>
</table>

58a.2.4 Uplink RTTI TBF/default PDCH pair configuration/Extended Dynamic Allocation /RTTI USF

58a.2.4.1 Conformance Requirement

The PACKET UPLINK ASSIGNMENT and MULTIPLE TBF UPLINK ASSIGNMENT messages assign to the mobile station a subset of 1 to N uplink PDCHs (when the uplink TBF operates in BTTI configuration) or uplink PDCH-pairs (when the uplink TBF operates in RTTI configuration), where N depends on the mobile station multislot class.

The following applies for an uplink TBF in RTTI configuration that receives USFs in RTTI USF mode:

- An assigned USF received in the first reduced radio block period of a given basic radio block period on a monitored downlink PDCH-pair allocates resources for one or four uplink RTTI radio blocks in the second reduced radio block period starting in the same basic radio block period and continuing with the second reduced radio block period in the following basic radio block periods, depending on the USF granularity, on the corresponding uplink PDCH-pair and all assigned uplink PDCH-pairs with higher numbered timeslots.
- An assigned USF received in the second reduced radio block period of a given basic radio block period on a monitored downlink PDCH-pair allocates resources for one or four uplink RTTI radio blocks in the first reduced radio block period starting in the next basic radio block period and continuing with the first reduced radio block period in the following basic radio block periods, depending on the USF granularity, on the corresponding uplink PDCH-pair and all assigned uplink PDCH-pairs with higher numbered timeslots.

References

3GPP TS 44.060, subclause 8.1.1.2.1

58a.2.4.2 Test Purposes

To verify:

1. When the mobile station receives an assigned USF on a monitored downlink PDCH-pair in the first reduced radio block of a given basic radio block period, it transmits uplink PDCH-pair and all assigned PDCH-pairs with higher numbered timeslots in the second reduced radio block period starting in the same basic radio block period and continuing with the second reduced radio block period in the following basic radio block period on the corresponding PDCH-pair depending on the value of USF_GRANULARITY.
2. When the mobile station receives an assigned USF on a monitored downlink PDCH-pair in the second reduced radio block period of a given basic radio block period it transmits uplink PDCH-pair and all assigned PDCH-pairs with higher numbered timeslots in the first reduced radio block period starting in the next basic radio block period and continuing with the first reduced radio block period in the following basic radio block periods on the corresponding uplink PDCH-pair, depending on the value of USF_GRANULARITY.

58a.2.4.3 Method of test

Initial Conditions

System Simulator:

1 cell with EGPRS support, Extended dynamic allocation supported, PBCCH not present.

Mobile Station:

The MS is EGPRS updated with a P-TMSI allocated and the test PDP context 2 activated.

Specific PICS Statements

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PIXIT Statements

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Test Procedure

The MS is triggered to perform uplink packet transfer. In the PACKET UPLINK ASSIGNMENT message sent during the subsequent two phase access procedure, an RTTI mode TBF (using 2 uplink PDCH pairs) using RTTI USF mode with EXTENDED DYNAMIC ALLOCATION.

The SS sends the assigned USF on the lowest PACCH for the assigned PDCH-pairs. It is checked that the MS sends RLC/MAC data in correct reduced radio block on all assigned PDCH-pairs wit USF GRANULARITY set to 1 block

The SS sends the assigned USF on the highest PACCH for the assigned PDCH-pairs. It is checked that the MS sends RLC/MAC data in correct reduced radio block only on the highest assigned PDCH-pair with USF GRANULARITY set to 1 block

Above procedures is repeated with USF GRANULARITY set to 4 blocks.

Maximum Duration of Test

6 minutes

Expected Sequence

Step	Direction	Message	Comments
1		{Uplink dynamic allocation two phase access until the last PACKET UPLINK ASSIGNMENT message}	n=1500 octets USF Granularity = 1 block - USF_1 on TN_1, - USF_2 on TN_2, - USF_3 on TN_3, - USF_4 on TN_4 RLC_DATA_BLOCKS_GRANTED = open-end See specific message contents
	SS -> MS	PACKET UPLINK ASSIGNMENT	
2	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on downlink PACCH of PDCH pair1. Sent on reduced radio block B(n)a. USF_1 assigned to the MS. First burst containing the control block Sent 5/6 frames (dependant on the occurrence of idle or PTCCH frames) after the last TDMA frame containing the assignment message at Step 1.
3	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on uplink PDTCH pair1. Received on reduced radio block B(n)b. MCS as specified in Step 1.
4	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on uplink PDTCH pair2. Received on reduced radio block B(n)b. MCS as specified in Step 1.
5	SS -> MS	EGPRS DOWNLINK DATA BLOCK	Sent on downlink PDTCH pair. Contains the PAN field which acknowledges the radio block received in Step 3,4. USF not assigned to the MS.
6	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on downlink PACCH of PDCH pair. Sent on reduced radio block B(n)b. USF_1 assigned to the MS.
7	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on uplink PDTCH pair1. Received on reduced radio block B(n+1)a. MCS as specified in Step 1.
8	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on uplink PDTCH pair2. Received on reduced radio block B(n+1)a. MCS as specified in Step 1.
9	SS -> MS	EGPRS DOWNLINK DATA BLOCK	Sent on downlink PDTCH pair. Contains the PAN field which acknowledges the radio block received in Step 7,8. USF not assigned to the MS.
10	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on downlink PACCH of PDCH pair2. Sent on reduced radio block B(n)a. USF_3 assigned to the MS.
11	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on uplink PDTCH pair2. Received on reduced radio block B(n)b. MCS as specified in Step 1.
12	SS -> MS	EGPRS DOWNLINK DATA BLOCK	Sent on downlink PDTCH pair. Contains the PAN field which acknowledges the radio block received in Step 11. USF not assigned to the MS.
13	SS -> MS	PACKET UPLINK ASSIGNMENT	Contents as in Step 2, except: USF Granularity = 4 blocks
14	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on downlink PACCH of PDCH pair1. Sent on reduced radio block B(n)a. USF_1 assigned to the MS. First burst containing the control block Sent 5/6 frames (dependant on the occurrence of idle or PTCCH frames) after the last TDMA frame containing the assignment message at Step 13.
15	MS -> SS	EGPRS UPLINK RLC DATA BLOCKs	Received on uplink PDTCH pair1. Four blocks received on reduced radio blocks B(n)b, B(n+1)b, B(n+2)b, B(n+3)b. MCS as specified in Step 13.

16	MS -> SS	EGPRS UPLINK RLC DATA BLOCKs	Received on uplink PDTCH pair2. Four blocks received on reduced radio blocks B(n)b, B(n+1)b, B(n+2)b, B(n+3)b. MCS as specified in Step 13.
17	SS -> MS	EGPRS DOWNLINK DATA BLOCK	Sent on downlink PDTCH pair. Contains the PAN field which acknowledges the radio blocks received in Step 15,16. USF not assigned to the MS.
18	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on downlink PACCH of PDCH pair1. Sent on reduced radio block B(n)b. USF_1 assigned to the MS.
19	MS -> SS	EGPRS UPLINK RLC DATA BLOCKs	Received on uplink PDTCH pair1. Four blocks received on reduced radio block B(n+1)a, B(n+2)a, B(n+3)a, B(n+4)a. MCS as specified in Step 13.
20	MS -> SS	EGPRS UPLINK RLC DATA BLOCKs	Received on uplink PDTCH pair2. Four blocks received on reduced radio block B(n+1)a, B(n+2)a, B(n+3)a, B(n+4)a. MCS as specified in Step 13.
21	SS -> MS	EGPRS DOWNLINK DATA BLOCK	Sent on downlink PDTCH pair. Contains the PAN field which acknowledges the radio blocks received in Step 19,20. USF not assigned to the MS.
22	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on downlink PACCH of PDCH pair2. Sent on reduced radio block B(n)b. USF_3 assigned to the MS.
23	MS -> SS	EGPRS UPLINK RLC DATA BLOCKs	Received on uplink PDTCH pair2. Four blocks received on reduced radio block B(n+1)a, B(n+2)a, B(n+3)a, B(n+4)a. MCS as specified in Step 13.
24	SS -> MS	EGPRS DOWNLINK DATA BLOCK	Sent on downlink PDTCH pair. Contains the PAN field which acknowledges the radio blocks received in Step 23. USF not assigned to the MS.
25		{Completion of uplink RLC data block transfer}	

Specific Message Contents

PACKET UPLINK ASSIGNMENT in Step 1:

Dynamic allocation	01
- Extended Dynamic Allocation	1 (Extended Dynamic allocation)
- {0|1<P0><PR_MODE>}	0
- USF_GRANULARITY	0, one block
- {0|1<UPLINK_TFI_ASSIGNMENT>}	1 (uplink TFI assignment)
- UPLINK_TFI_ASSIGNMENT	Arbitrarily chosen (default 00101)
- {0|1<RLC_DATA_BLOCKS_GRANTED>}	0 (no RLC_DATA_BLOCKS_GRANTED, open-ended TBF)
- {0|1<TBF_STARTING_TIME>}	0 (no starting time)
-	1 (Timeslot Allocation with Power Control Parameters) one slot arbitrarily chosen and the following USF_TNx and GAMMA_TNx shall be corresponding to the chosen value, default timeslot 2 assigned)
- ALPHA	0.5
- {0|1<USF_TN0><GAMMA_TN0>}	0 (timeslot 0 not assigned)
- {0|1<USF_TN1><GAMMA_TN1>}	0 (timeslot 1 not assigned)
- {0|1<USF_TN2><GAMMA_TN2>}	1 (timeslot 2 assigned)
- USF_TN2	Arbitrarily chosen (default 5)
- GAMMA_TN2	For GSM 700, T-GSM 810, GSM 850 and GSM 900, +8 dBm For DCS 1 800, +6 dBm For PCS 1 900, +6 dBm
- {0|1<USF_TN3><GAMMA_TN3>}	1 (timeslot 3 assigned)
- USF_TN3	Arbitrarily chosen (default 6) but it must be different than USF_TN2
- GAMMA_TN3	For GSM 700, T-GSM 810, GSM 850 and GSM 900, +8 dBm For DCS 1 800, +6 dBm For PCS 1 900, +6 dBm
- {0|1<USF_TN4><GAMMA_TN4>}	1 (timeslot 4 assigned),
- USF_TN4	Arbitrarily chosen (default 4) but it must be different to USF_TN2 and USF_TN3
- GAMMA_TN4	For GSM 700, T-GSM 810, GSM 850 and GSM 900, +8 dBm For DCS 1 800, +6 dBm For PCS 1 900, +6 dBm
- {0|1<USF_TN5><GAMMA_TN5>}	1 (timeslot 5 assigned),
- USF_TN5	Arbitrarily chosen (default 3) but it must be different to USF_TN2, USF_TN3 and USF_TN4
- GAMMA_TN5	For GSM 700, T-GSM 810, GSM 850 and GSM 900, +8 dBm For DCS 1 800, +6 dBm For PCS 1 900, +6 dBm
- {0|1<USF_TN6><GAMMA_TN6>}	0 (timeslot 6 not assigned)
- {0|1<USF_TN7><GAMMA_TN7>}	0 (timeslot 7 not assigned)
{0 -- BTTI Mode	1
|1 – RTTI Mode	
<RTTI_USF_MODE: bit(1)>	1
{00 – default single-carrier PDCH-pair configuration	10
|01 -- default dual-carrier PDCH-pair configuration	
|10 <DOWNLINK_PDCH_PAIRS_C1>	2 timeslots allocated to the MS.
{0|1 <DOWNLINK_PDCH_PAIRS_C2>}	Not present.
<UPLINK_PDCH_PAIRS_C1>	4 timeslots allocated to the MS.
{0|1 <UPLINK_PDCH_PAIRS_C2>}	Not present.
|11	
}}	
EGPRS Channel Coding Command	Arbitrarily chosen from MCS-1..MCS-4

58a.2.5 Uplink RTTI TBF/Default PDCH pair configuration/Dynamic Allocation/USF Mode reconfiguration

58a.2.5.1 Conformance Requirement

The network may, at any time during uplink packet transfer, change the TTI configuration or USF mode (BTTI USF mode or RTTI USF mode) as well as the corresponding downlink PDCH-pairs of an already established uplink TBF by sending on the downlink PACCH, an uplink TBF assignment message (e.g. PACKET UPLINK ASSIGNMENT, MULTIPLE TBF UPLINK ASSIGNMENT, PACKET TIMESLOT RECONFIGURE, MULTIPLE TBF TIMESLOT RECONFIGURE or PACKET CS RELEASE INDICATION). The mobile station shall begin using the new parameters within the reaction time defined in 3GPP TS 45.010.

References

3GPP TS 44.060, subclause 8.1.1.

58a.2.5.2 Test Purposes

To verify:

1. When using BTTI USF mode, if the MS is granted the allocated USF in basic radio block period B(n) on the first of the two downlink timeslots corresponding to an uplink PDCH pair, the MS shall transmit an uplink radio block in reduced radio block period B(n+1)a occurring in the first two TDMA frames of basic radio block period B(n+1)on the uplink PDTCH pair

2. When using BTTI USF mode, if the MS is granted the allocated USF in basic radio block period B(n) on the second of the two downlink timeslots corresponding to an uplink PDCH pair, the MS shall transmit an uplink radio block in reduced radio block period B(n+1)b occurring in the last two TDMA frames of basic radio block period B(n+1) on the uplink PDTCH pair.

3. When using RTTI USF mode, if the MS is granted the allocated USF in reduced radio block period B(n)a occurring in the first two TDMA frames of basic radio block B(n) on the downlink timeslots corresponding to an uplink PDCH pair, the MS shall transmit an uplink radio block in reduced radio block period B(n)b occurring in the last two TDMA frames of basic radio block period B(n) on the uplink PDTCH pair.

4. When using RTTI USF mode, if the MS is granted the allocated USF in reduced radio block period B(n)b occurring in the last two TDMA frames of basic radio block B(n) on the downlink timeslots corresponding to an uplink PDCH pair, the MS shall transmit an uplink radio block in reduced radio block period B(n+1)a occurring in the first two TDMA frames of basic radio block period B(n+1) on the uplink PDTCH pair.

5. The MS is able to perform USF mode reconfiguration (from BTTI USF mode to RTTI USF mode and vice versa) during an ongoing uplink packet transfer and shall respond to the new parameters within the reaction time defined in 3GPP TS 45.0101

58a.2.5.3 Method of test

Initial Conditions

System Simulator:

1 cell, default setting.

Mobile Station:

The MS is GPRS attached with a P-TMSI allocated and the test PDP Context 3 activated.

Specific PICS Statements

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PIXIT Statements

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Test Procedure

The MS is triggered to perform uplink packet transfer. In the PACKET UPLINK ASSIGNMENT message sent during the subsequent two phase access procedure, an RTTI mode TBF (using a single PDCH pair) using BTTI USF mode (USF GRANULARITY set to 1 block) is allocated. The SS sends the assigned USF on the first of the two corresponding downlink PDCHs. The SS checks that the MS sends one uplink data block in the corresponding reduced uplink data block. The SS acknowledges the received data block. The SS sends the assigned USF on the second of the two corresponding downlink PDCHs. The SS checks that the MS sends one uplink data block in the corresponding reduced uplink data block. The SS acknowledges the received data block. The SS checks on each timeslot that the MS does not respond to USF grants using the USF allocated to the other timeslot. Using a PACKET UPLINK ASSIGNMENT message, the SS changes the USF mode (from BTTI mode to RTTI USF mode). The SS grants the MS the assigned USF in a reduced radio block period occurring in the first two TDMA frames of a given basic radio block period. The SS checks that the MS sends one uplink data block in the corresponding reduced uplink data block. The SS acknowledges the received data block. The SS grants the MS the assigned USF in a reduced radio block period occurring in the last two TDMA frames of a given basic radio block period. The SS checks that the MS sends one uplink data block in the corresponding reduced uplink data block. The SS acknowledges the received data block. The SS checks that the MS no longer responds to the USFs previously allocated in BTTI USF mode. Using a PACKET TIMESLOT RECONFIGURE message, the SS changes the USF mode (from RTTI mode to BTTI USF mode). The SS sends the assigned USF on the first of the two corresponding downlink PDCHs. The SS checks that the MS sends one uplink data block in the corresponding reduced uplink data block. The SS acknowledges the received data block. The SS sends the assigned USF on the second of the two corresponding downlink PDCHs. The SS checks that the MS sends one uplink data block in the corresponding reduced uplink data block. The SS acknowledges the received data block. The SS checks that the MS does not respond to USF grants using the USF previously allocated in RTTI USF mode. The uplink data transfer is completed.

Maximum Duration of Test

6 minutes

Expected Sequence

Step	Direction	Message	Comments
1		{Uplink dynamic allocation two phase access until the last PACKET UPLINK ASSIGNMENT message}	n=1500 octets Assigns a single PDTCH pair on TSm and TSm+1 with default corresponding downlink pair. USF Mode = BTTI USF Mode. Assigns USF1 (on TSm) and USF2 (on TSm+1). USF Granularity = 1 block EGPRS Channel coding command arbitrarily chosen between MCS 1 and MCS 4. RLC_DATA_BLOCKS_GRANTED = open-end
2	SS -> MS	PACKET UPLINK ASSIGNMENT	
3	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	One control block sent in BTTI mode on downlink PACCH of TSm with USF set to USF1. Sent in basic control block B(n). Control block format MCS-0. First burst containing the control block Sent 5/6 frames (dependant on the occurrence of idle or PTCCH frames) after the last TDMA frame containing the assignment message at Step 2.
4	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on uplink PDTCH pair. Received on reduced radio block B(n+1)a. MCS as specified in Step 2.
5	SS -> MS	EGRS DOWNLINK DATA BLOCKs	Two blocks sent on downlink PDTCH pair in RTTI mode. The first block contains the PAN field which acknowledges the radio block received in Step 4. USF on TSm = USF not assigned to the MS. USF on TSm+1 = USF1.
6	SS		Check that no radio block is transmitted by the MS in response to the USF grant in Step 5.
7	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCKs	Two control blocks sent in RTTI mode on the downlink PACCH of the PDCH pair in reduced radio blocks B(n)a and B(n)b such that the USF on TSm+1 in B(n) is set to USF2. Control block format MCS-0.
8	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on uplink PDTCH pair. Received on reduced radio block B(n+1)b. MCS as specified in Step 2.
9	SS -> MS	EGPRS DOWNLINK DATA BLOCKs	Two blocks sent on downlink PDTCH pair in RTTI mode. The first block contains the PAN field which acknowledges the radio block received in Step 8. USF on TSm = USF2. USF on TSm+1 = USF not assigned to the MS.
10	SS		Check that no radio block is transmitted by the MS in response to the USF grant in Step 9.
11	SS-> MS	PACKET UPLINK ASSIGNMENT	Message contents as per Step 2, except :- USF Mode = RTTI USF Mode. Assigns USF3.
12	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on downlink PACCH of PDCH pair. Sent on reduced radio block B(n)a. Control block format CS-1. USF = USF3. First burst containing the control block Sent 5/6 frames (dependant on the occurrence of idle or PTCCH frames) after the last TDMA frame containing the assignment message at Step 11. Note : Either CS-1 or MCS-0 may be used on downlink pairs supporting RTTI USF mode.
13	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on uplink PDTCH pair. Received on reduced radio block B(n)b. MCS as specified in Step 2.
14	SS -> MS	EGPRS DOWNLINK DATA BLOCK	Sent on downlink PDTCH pair. Contains the PAN field which acknowledges the radio block received in Step 13. USF = USF1.
15	SS		Check that no radio block is transmitted by the MS in response to the USF grant in Step 14.

16	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on downlink PACCH of PDCH pair. Sent on reduced radio block B(n)b. Control block format MCS-0. USF = USF3. Note : Either CS-1 or MCS-0 may be used on downlink pairs supporting RTTI USF mode.
17	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on uplink PDTCH pair. Received on reduced radio block B(n+1)a. MCS as specified in Step 2.
18	SS -> MS	EGRS DOWNLINK DATA BLOCK	Sent on downlink PDTCH pair. Contains the PAN field which acknowledges the radio block received in Step 17. USF = USF2.
19	SS		Check that no radio block is transmitted by the MS in response to the USF grant in Step 18.
20	SS -> MS	PACKET TIMESLOT RECONFIGURE	Assigns a single PDTCH pair on TSm and TSm+1 with default corresponding downlink pair. USF Mode = BTTI USF Mode. Assigns USF4 (on TSm) and USF5 (on TSm+1). USF Granularity = 1 block
21	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	One control block sent in BTTI mode on downlink PACCH of TSm with USF set to USF4. Sent in basic control block B(n). Control block format MCS-0. First burst containing the control block Sent 5/6 frames (dependant on the occurrence of idle or PTCCH frames) after the last TDMA frame containing the assignment message at Step 20.
22	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on uplink PDTCH pair. Received on reduced radio block B(n+1)a. MCS as specified in Step 2.
23	SS -> MS	EGPRS DOWNLINK DATA BLOCKs	Two blocks sent on downlink PDTCH pair in RTTI mode. The first block contains the PAN field which acknowledges the radio block received in Step 22. USF on TSm = USF not assigned to the MS. USF on TSm+1 = USF3.
24	SS		Check that no radio block is transmitted by the MS in response to the USF grant in Step 23.
25	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCKs	Two control blocks sent in RTTI mode on the downlink PACCH of the PDCH pair in reduced radio blocks B(n)a and B(n)b such that the USF on TSm+1 in B(n) is set to USF5. Control block format MCS-0.
26	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on uplink PDTCH pair. Received on reduced radio block B(n+1)b. MCS as specified in Step 2.
27	SS -> MS	EGPRS DOWNLINK DATA BLOCKs	Two blocks sent on downlink PDTCH pair in RTTI mode. The first block contains the PAN field which acknowledges the radio block received in Step 26. USF on TSm = USF3. USF on TSm+1 = USF not assigned to the MS.
28	SS		Check that no radio block is transmitted by the MS in response to the USF grant in Step 27.
29		{Completion of uplink RLC data block transfer}	

58a.2.6 Uplink RTTI TBF / One Phase Access Request by Reduced Latency MS / CCCH Case / Contention Resolution

58a.2.6.1 Conformance requirements

EGPRS TBF mode capable mobile stations shall monitor the GPRS Cell Options IE on the BCCH (SI13) for the cell's EGPRS capability and, if the mobile station is also Reduced Latency capable, the cell's Reduced Latency Access capability. In the GPRS Cell Options IE it is also indicated if the EGPRS PACKET CHANNEL REQUEST message is supported in the cell and if Reduced Latency Access is supported in the cell. The following table specifies which message and which establishment cause shall be used by an EGPRS mobile station when accessing an EGPRS capable cell depending on the purpose of the packet access procedure, and mobile station's and cell's capabilities; this table covers the case where PBCCH is not present in the cell (see 3GPP TS 44.060 for the case where PBCCH is present in the cell).

Table 3.5.2.1.2.1 [abridged]: EGPRS Packet Access Procedure

Purpose of the packet access procedure	EGPRS PACKET CHANNEL REQUEST supported in the cell	EGPRS PACKET CHANNEL REQUEST not supported in the cell
User data transfer – requested RLC mode = acknowledged (Reduced Latency supported by MS)	EGPRS PACKET CHANNEL REQUEST with access type = 'One Phase Access Request by Reduced Latency MS' (NOTE 2)	CHANNEL REQUEST with establishment cause = 'Single block packet access' for initiation of a two-phase access
NOTE 2: The One phase Access Request by Reduced Latency MS shall be used by the mobile station supporting reduced latency if Reduced Latency Access is supported by the network.		

In the case of an uplink EGPRS TBF assignment in RTTI configuration where an IMMEDIATE ASSIGNMENT message is sent in response to a one phase access with access type indicating "One Phase Access Request by Reduced Latency MS" as defined in 3GPP TS 44.060, the assigned timeslots of the uplink PDCH pair(s) and the corresponding downlink PDCH pair (as defined in 3GPP TS 44.060) associated with each assigned uplink PDCH pair are indicated by a combination of the TN given by the *Packet Channel Description* information element and information in the EGPRS Packet Uplink Assignment construction of the IA Rest Octets information element as described in sub-clause 10.5.2.16.

The contention resolution is successfully completed on the mobile station side when the mobile station receives a PACKET UPLINK ACK/NACK message addressing the mobile station with the TFI value associated with the uplink TBF and including the same TLLI value that the mobile station has included in the RLC header of the first RLC data blocks, or alternatively, in EGPRS TBF mode, a PACKET UPLINK ASSIGNMENT message addressing the mobile station with the TFI value associated with the uplink TBF and including the same TLLI value that the mobile station included in the RLC header of the first RLC data blocks. The mobile shall then stop timer T3166 and counter N3104.

Upon contention resolution during one phase access, the mobile station shall start transmitting RLC data blocks without the TLLI field as follows:

- For a TBF operating in RTTI configuration, no later than the next occurrence of block $B((x+2) \bmod 12)_b$ where block Bx_a is the radio block containing the contention resolution message or no later than the next occurrence of block $B((x+3) \bmod 12)_a$ where block Bx_b is the radio block containing the contention resolution message (see 3GPP TS 45.002 [10] for an explanation of RTTI radio block indexing applicable to the RTTI configuration).

Reference

3GPP TS 44.018 subclauses 3.5.2.1.2, 3.5.2.1.3.2

3GPP TS 44.060 subclause 7.1.2.3

3GPP TS 45.010 subclause 6.11.3

58a.2.6.2 Test purpose

1. To verify that the MS uses the Access Type "One Phase Access Request by Reduced Latency MS" when appropriate.
2. To verify that the MS is able to utilise a PDCH pair assigned via the IMMEDIATE ASSIGNMENT message.
3. To verify that the MS completes the one phase access contention resolution procedure upon receipt of a PACKET UPLINK ASSIGNMENT message containing it's TLLI.
4. To verify that the MS meets the contention resolution reaction time requirements for one phase access for a TBF operating in RTTI configuration.

58a.2.6.3 Method of test

Initial Conditions

System Simulator:

1 cell with EGPRS support, default setting, PBCCH not present.

Mobile Station:

The MS is EGPRS updated, with a P-TMSI allocated, SPLIT_PG_CYCLE negotiated and test PDP Context 2 activated.

Specific PICS Statements

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PIXIT Statements

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Test Procedure

The MS is triggered to initiate uplink data transfer. Following reception of the EGPRS PACKET CHANNEL REQUEST message, the SS assigns an uplink TBF in RTTI mode on a single PDTCH pair using an IMMEDIATE ASSIGNMENT message. The SS checks that the MS includes the TLLI in the initial uplink data blocks received on the assigned resources. The SS sends a PACKET UPLINK ASSIGNMENT message allocating the same uplink resources as in the previous IMMEDIATE ASSIGNMENT message, but including the contention resolution TLLI. The SS checks that the MS ceases to include the TLLI in the header of the subsequent uplink data blocks within the reaction time defined. The uplink TBF is completed.

Maximum Duration of Test

5 minutes.

Expected Sequence

Step	Direction	Message	Comments
1	MS		The MS is triggered to transfer 200 octets of user data.
2	MS -> SS	EGPRS PACKET CHANNEL REQUEST	Received on RACH. Access Type = “One phase Access Request by Reduced Latency MS”.
3	SS -> MS	IMMEDIATE ASSIGNMENT	Sent on AGCH. Assigns RTTI mode uplink TBF on a single PDTCH pair. MCS arbitrarily chosen from MCS-1..MCS-4.
4	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on PACCH. USF assigned to the MS.
5	MS -> SS	EGPRS UPLINK DATA BLOCK	Received on assigned PDTCH pair. Contains TLLI. MCS as assigned at Step 3.

6	SS<>MS		Steps 4 and 5 are repeated three times.
7	SS -> MS	PACKET UPLINK ASSIGNMENT	Sent on PACCH. Sent on next occurrence of RTTI block B0a following Step 6. Includes the contention resolution TLLI as received in Step 5. Assigns the same PDTCH pair as in Step 3.
8	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on PACCH. Sent on next occurrence of RTTI block B2a following Step 7. USF assigned to the MS.
9	MS -> SS	EGPRS UPLINK DATA BLOCK	Received on assigned PDTCH pair. Does not contain TLLI. MCS as assigned at Step 3.
10	SS<>MS		Steps 8 and 9 are repeated three times.
11	SS->MS	EGPRS DOWNLINK DATA BLOCK	Sent on corresponding downlink PDTCH pair. Contains the PAN field. PAN field acknowledges receipt of uplink data blocks received in Steps 5 and 9.
12		{Uplink TBF completion}	

Specific Message Contents

None.

58a.2.7 Concurrent RTTI TBF / Channel Quality Reporting

58a.2.7.1 Conformance requirements

In case of EGPRS the MS shall report the overall MEAN_BEP and CV_BEP for the modulations, GMSK and/or 8-PSK (i.e. GMSK_MEAN_BEP, GMSK_CV_BEP; and/or 8PSK_MEAN_BEP, 8PSK_CV_BEP respectively) for which it has received blocks on at least one allocated channel (timeslot or timeslot pair) since it last sent a measurement report to the network.

Additionally, in case of EGPRS, the MS shall report MEAN_BEP_TNx on a per timeslot basis in BTTI configuration, or on a per timeslot pair basis in RTTI configuration where TNx is the lower numbered timeslot of the timeslot pair according to what the network has ordered (see 3GPP TS 44.060).

In RTTI configuration, the mean bit error probability value calculated on per timeslot pair shall be reported on **MODULATION_1 _MEAN_BEP_TNx / MODULATION_2 _MEAN_BEP_TNx** where TNx is the lower numbered timeslot of each reported timeslot pair.

Reference

3GPP TS 45.008 subclauses 10.2.3.2

3GPP TS 44.060 subclauses 12.5a.3.2

58a.2.7.2 Test purpose

To verify that the MS is able to report the Channel Quality Report of the downlink RTTI Channels when operating in a RTTI configuration. The mean bit error probability value measured per RTTI channel basis shall be reported on GMSK_MEAN_BEP_TNx/8PSK_MEAN_BEP_TNx or MODULATION_1_MEAN_BEP_TNx/ MODULATION_1_MEAN_BEP_TNx where TNx is the lower numbered timeslot of each timeslot pair.

58a.2.7.3 Method of test

Initial Conditions

System Simulator:

1 cell with EGPRS support, default setting, PBCCH not present.

Mobile Station:

The MS is EGPRS updated, with a P-TMSI allocated, SPLIT_PG_CYCLE negotiated and test PDP Context 2 activated.

Specific PICS Statements

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PIXIT Statements

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Test Procedure

The MS is triggered to perform uplink packet transfer. An RTTI mode uplink TBF using RTTI USF mode on a single PDCH pair having contiguous timeslots is assigned. It is checked that the MS responds to USF grant on the corresponding downlink PDCH pair. A downlink RTTI mode TBF using a single PDCH pair having the same timeslots as the corresponding downlink PDCH pair of the uplink PDCH pair is assigned. It is checked that the MS responds to polling for PAN on the assigned downlink PDCH pair.

The assigned downlink resources are reassigned so that the downlink TBF uses a single PDCH pair on contiguous timeslots different to those used by the corresponding downlink PDCH pair of the uplink TBF. The assigned uplink resources (uplink PDCH pair and corresponding downlink PDCH pair) remain unchanged. The MS includes a Channel Quality Report IE in EGPRS PACKET DOWNLINK ACK/NACK message. It is checked that the MS responds to polling for downlink ack/nack on the new downlink PDCH pair. It is checked that the MS responds to USF grant on the downlink PDCH pair corresponding to the uplink PDCH pair. It is checked that the MS reports on the correct _TNx.

The assigned downlink resources are reassigned so that the downlink TBF uses a single PDCH pair on non-contiguous timeslots different to those used by the corresponding downlink PDCH pair of the uplink TBF. The assigned uplink resources (uplink PDCH pair and corresponding downlink PDCH pair) remain unchanged. The MS includes a Channel Quality Report IE in EGPRS PACKET DOWNLINK ACK/NACK message. It is checked that the MS responds to polling for downlink ack/nack on the new downlink PDCH pair. It is checked that the MS responds to USF grant on the downlink PDCH pair corresponding to the uplink PDCH pair. It is checked that the MS reports on the correct _TNx.

The uplink TBF is completed.

Maximum Duration of Test

5 minutes

Expected Sequence

Step	Direction	Message	Comments
1		{Uplink dynamic allocation two phase access}	n=1500 octets Macro performed up to but not including the final PACKET UPLINK ASSIGNMENT message.
2	SS -> MS	PACKET UPLINK ASSIGNMENT	Sent on downlink PACCH. Assigns a single uplink PDTCH pair on contiguous timeslots. The corresponding downlink PDTCH pair uses the sme timeslots as the assigned uplink pair. USF Mode = RTTI USF Mode. USF Granularity = 1 block EGPRS Channel coding command arbitrarily chosen between MCS 1 and MCS 4.
3	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on downlink PACCH of the corresponding downlink PDCH pair of the uplink PDCH pair assigned at Step 2. Sent three RTTI blocks after Step 2. USF assigned to the MS.
4	MS -> SS	EGPRS UPLINK DATA BLOCK	Received on uplink PDTCH pair assigned in Step 2. MCS as specified in Step 2.
5	SS->MS	PACKET DOWNLINK ASSIGNMENT	Sent on downlink PACCH of the corresponding downlink PDCH pair of the uplink lnk PDCH assigned at Step 2. Assigns a downlink TBF. Assigns a single downlink PDTCH pair on the same timeslots as in Step 2. The corresponding uplink PDTCH pair uses the same timeslots as the uplink pair assigned at Step 2.
6	SS -> MS	EGPRS DOWNLINK DATA BLOCK	Sent on downlink PDTCH pair assigned in Step 5. Sent three RTTI blocks after Step 5. Contains the PAN field which acknowledges the radio block received in Step 4. CES/P = 011
7	MS -> SS	EGPRS UPLINK DATA BLOCK	Received on uplink PDTCH pair assigned at Step 2. Received in reserved block allocated by CES/P at Step 6. MCS as specified in Step 2.
8	SS-> MS	PACKET TIMESLOT RECONFIGURE	Sent on downlink PACCH of the corresponding downlink PDCH pair of the uplink PDCH pair assigned at Step 2. Assigns the same uplink PDCH pair and corresponding downlink pair as in Step 2. Assigns a downlink PDCH pair on contiguous timeslots which are not the same as the assigned uplink PDCH pair.
9	SS-> MS	EGPRS DOWNLINK DATA BLOCK	Sent on downlink PDTCH pair assigned in Step 8. Sent three RTTI blocks after Step 8. CES/P = 001 Contains the PAN field which acknowledges the radio block received in Step 7.
10	MS-> SS	EGPRS PACKET DOWNLINK ACK/NACK	Received on the uplink PDCH pair corresponding to the downlink PDTCH pair assigned at Step 8. Acknowledges receipt of the downlink data block sent at Step 9. Includes a Channel Quality Report IE
11	SS-> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on corresponding downlink PDCH pair of the uplink PDCH pair assigned at Step 8. USF assigned to the MS
12	MS-> SS	EGPRS UPLINK DATA BLOCK	Received on the uplink PDTCH pair assigned in Step 8.
13	SS-> MS	PACKET TIMESLOT RECONFIGURE	Sent on downlink PACCH of the corresponding downlink PDCH pair of the uplink PDCH pair assigned at Step 8. Assigns the same uplink PDCH pair and corresponding downlink pair as in Step 8. Assigns a downlink PDCH pair on non-contiguous timeslots which are not the same as the assigned uplink PDCH pair.

14	SS-> MS	EGPRS DOWNLINK DATA BLOCK	Sent on downlink PDTCH pair assigned in Step 13. Sent three RTTI blocks after Step 13. CES/P = 001 Contains the PAN field which acknowledges the radio block received in Step 12.
15	MS-> SS	EGPRS PACKET DOWNLINK ACK/NACK	Received on the uplink PDCH pair corresponding to the downlink PDTCH pair assigned at Step 13. Acknowledges receipt of the downlink data block sent at Step 14. Includes a Channel Quality Report IE
16	SS-> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on corresponding downlink PDCH pair of the uplink PDCH pair assigned at Step 13. USF assigned to the MS
17	MS-> SS	EGPRS UPLINK DATA BLOCK	Received on the uplink PDTCH pair assigned in Step 13.
18		{Completion of uplink RLC data block transfer}	

Specific Message Contents

None.

58a.2.8 Downlink RTTI TBF / default PDCH pair configuration/CCCH case

58a.2.8.1 Conformance requirements

The network initiates the packet downlink assignment procedure by sending an IMMEDIATE ASSIGNMENT message in unacknowledged mode on the CCCH timeslot corresponding to CCCH group the mobile station belongs to.

On receipt of an IMMEDIATE ASSIGNMENT message or, in case of a two-message assignment, a matching pair of IMMEDIATE ASSIGNMENT messages, the mobile station stops monitoring downlink CCCH and switches to the assigned PDCH and starts listening for downlink RLC/MAC blocks identified by the assigned TFI; it starts timer T3190.

In case RTTI configuration is supported by the network and the mobile station and a downlink TBF operating in RTTI configuration is assigned, the following parameters shall be provided by the network in the assignment message (e.g. PACKET DOWNLINK ASSIGNMENT, MULTIPLE TBF DOWNLINK ASSIGNMENT, PACKET TIMESLOT RECONFIGURE, MULTIPLE TBF TIMESLOT RECONFIGURE or PACKET CS RELEASE INDICATION).

- a Temporary Flow Identity (TFI). The TFI applies to all radio blocks transferred in regards to the downlink Temporary Block Flow (TBF);

- one or more downlink PDCH-pairs to be used for the downlink transfer;

Reference

3GPP TS 44.018 subclauses 3.5.2.1.2

3GPP TS 44.060 subclause 8.1.2.

58a.2.8.2 Test purpose

To verify that the MS is able to operate in RTTI configuration when assigned a Downlink RTTI TBF with default PDCH pair configuration by a IMMEDIATE ASSIGNMENT.

58a.2.8.3 Method of test

Initial Conditions

System Simulator:

1 cell with EGPRS support, default setting, PBCCH not present.

Mobile Station:

The MS is EGPRS updated, with a P-TMSI allocated, SPLIT_PG_CYCLE negotiated and test PDP Context 2 activated.

Specific PICS Statements

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PIXIT Statements

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Test Procedure

The SS sends an IMMEDIATE ASSIGNMENT for downlink transfer on a PCH block corresponding to its paging group. The MS shall switch to the assigned PDCH pairs and exercise downlink transfer.

Maximum Duration of Test

5 minutes.

Expected Sequence

Step	Direction	Message	Comments
1	SS -> MS	IMMEDIATE ASSIGNMENT	Sent on a PCH block corresponding to the MS's paging group. Includes a packet downlink assignment with correct TLLI Assigns RTTI mode downlink TBF on a single PDTCH pair. MCS arbitrarily chosen from MCS-1. MCS-4.
2	SS-> MS	EGPRS DOWNLINK DATA BLOCK	Sent on downlink PDTCH pair assigned in Step 1. FBI = 1
3	MS-> SS	EGPRS PACKET DOWNLINK ACK/NACK	Received on the uplink PDCH pair corresponding to the downlink PDTCH pair assigned at Step1.
4		Completion of {Downlink data transfer}	SS completes downlink transfer of 200 octets of data.

Specific Message Contents

None.

58a.2.9 Concurrent RTTI TBFs / Explicit PDCH Pair Configuration

58a.2.9.1 Conformance Requirement

If the default single carrier PDCH pair configuration is indicated, then the assignment is for resources on a subset of the PDCH pairs comprising timeslots 0 and 1, 2 and 3, 4 and 5, and 6 and 7 in both the uplink and on the downlink. If the default dual carrier PDCH pair configuration is indicated, then the assignment is for resources on a subset of the PDCH pairs comprising timeslots 0 and 1, 2 and 3, 4 and 5, and 6 and 7 on both carriers in both the uplink and on the downlink. Otherwise, the assignment is for resources on a subset of the PDCH pairs as specified in the Downlink_PDCH_Pairs_C1, Downlink_PDCH_Pairs_C2, Uplink_PDCH_Pairs_C1 and Uplink_PDCH_Pairs_C2 bitmaps.

If the mobile station is currently in packet transfer mode with one or more RTTI TBFs ongoing, then the network may indicate in the assignment message that the PDCH pair configuration is 'Unchanged'. In this case, the PDCH pair configuration described in the most recently received assignment message (for this mobile station) previous to this message applies.

For an uplink PDCH pair using timeslots i and j, where j > i , the corresponding downlink PDCH pair is:

- the one using timeslots i and j; else, if no such PDCH pair is specified
- the one using timeslots i-1 and i; else, if no such PDCH pair is specified
- the one using timeslots i-2 and i; else, if no such PDCH pair is specified

- the one using timeslots i-3 and i if such a PDCH pair exists.

In case the uplink TBF operates in RTTI configuration then the network shall transmit all PACCH messages on the corresponding downlink PDCH-pair associated with the lowest numbered assigned uplink PDCH-pair. Additionally, for the concurrent TBF case, the network may transmit PACCH messages on any of the PDCH-pairs assigned that are common to the downlink and uplink PDCH-pair assignments.

References

3GPP TS 44.060, subclauses 7.1.3.6, 8.1.1.2.2

58a.2.9.2 Test Purposes

To verify that the MS can operate concurrent uplink and downlink TBFs where the PDCH pairs have been explicitly assigned using the Downlink_PDCH_Pairs_C1 and Uplink_PDCH_Pairs_C1 fields for the following PDCH pair configurations :-

1. The assigned downlink PDCH pair uses the same timeslots as the corresponding downlink pair of the uplink PDCH pair.
2. The assigned downlink PDCH pair uses different timeslots to those of the corresponding downlink pair of the uplink PDCH pair.
3. The assigned downlink PDCH pair uses different timeslots to those of the corresponding downlink pair of the uplink PDCH pair and the downlink PDCH pair timeslots are non-contiguous.
4. The assigned downlink PDCH pair uses different timeslots to those of the corresponding downlink pair of the uplink PDCH pair and the uplink PDCH pair timeslots are non-contiguous.

58a.2.9.3 Method of Test

Initial Conditions

System Simulator:

1 cell with EGPRS support, default setting, PBCCH not present.

Mobile Station:

The MS is EGPRS updated with a P-TMSI allocated, SPLIT_PG_CYCLE negotiated and the test PDP Context 2 activated.

Specific PICS Statements

-

PIXIT Statements

-

Test Procedure

The MS is triggered to perform uplink packet transfer. An RTTI mode uplink TBF using RTTI USF mode on a single PDCH pair having contiguous timeslots is assigned. It is checked that the MS responds to USF grant on the corresponding downlink PDCH pair. A downlink RTTI mode TBF using a single PDCH pair having the same timeslots as the corresponding downlink PDCH pair of the uplink PDCH pair is assigned. It is checked that the MS responds to polling for PAN on the assigned downlink PDCH pair. The assigned downlink resources are reassigned so that the downlink TBF uses a single PDCH pair on contiguous timeslots different to those used by the corresponding downlink PDCH pair of the uplink TBF. The assigned uplink resources (uplink PDCH pair and corresponding downlink PDCH pair) remain unchanged. It is checked that the MS responds to polling for downlink ack/nack on the new downlink PDCH pair. It is checked that the MS responds to USF grant on the downlink PDCH pair corresponding to the uplink PDCH pair. The assigned downlink resources are reassigned so that the downlink TBF uses a single PDCH pair on non-contiguous timeslots different to those used by the corresponding downlink PDCH pair of the uplink TBF. The assigned uplink resources (uplink PDCH pair and corresponding downlink PDCH pair) remain unchanged. It is checked that the MS responds to polling for downlink ack/nack on the new downlink PDCH pair. It is checked that the MS responds to USF grant on the downlink PDCH pair corresponding to the uplink PDCH pair. The assigned downlink resources are reassigned so that the downlink TBF uses a single PDCH pair on contiguous timeslots. At the same time the uplink resources are reassigned to use a single PDCH pair on non-contiguous timeslots that are different to those used by the corresponding uplink pair of the assigned downlink PDCH pair. It is checked that the MS responds to polling for downlink ack/nack on the new downlink PDCH pair at which time the downlink TBF is terminated. It is checked that the MS responds to USF grant on the downlink PDCH pair corresponding to the new uplink PDCH pair. The uplink TBF is completed.

Maximum Duration of Test

5 minutes

Expected Sequence

Step	Direction	Message	Comments
1		{Uplink dynamic allocation two phase access}	n=1500 octets Macro performed up to but not including the final PACKET UPLINK ASSIGNMENT message.
2	SS -> MS	PACKET UPLINK ASSIGNMENT	Sent on downlink PACCH. Assigns a single uplink PDTCH pair on contiguous timeslots. The corresponding downlink PDTCH pair uses the sme timeslots as the assigned uplink pair. USF Mode = RTTI USF Mode. USF Granularity = 1 block EGPRS Channel coding command arbitrarily chosen between MCS 1 and MCS 4.
3	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on downlink PACCH of the corresponding downlink PDCH pair of the uplink lnk PDCH assigned at Step 2. Sent three RTTI blocks after Step 2. Control block format CS-1. USF assigned to the MS.
4	MS -> SS	EGPRS UPLINK DATA BLOCK	Received on uplink PDTCH pair assigned in Step 2. MCS as specified in Step 2.
5	SS->MS	PACKET DOWNLINK ASSIGNMENT	Sent on downlink PACCH of the corresponding downlink PDCH pair of the uplink lnk PDCH assigned at Step 2. Assigns a downlink TBF. Assigns a single downlink PDTCH pair on the same timeslots as in Step 2. The corresponding uplink PDTCH pair uses the sme timeslots as the uplink pair assigned at Step 2.
6	SS -> MS	EGPRS DOWNLINK DATA BLOCK	Sent on downlink PDTCH pair assigned in Step 5. Sent three RTTI blocks after Step 5. Contains the PAN field which acknowledges the radio block received in Step 4. CES/P = 011
7	MS -> SS	EGPRS UPLINK DATA BLOCK	Received on uplink PDTCH pair assigned at Step 2. Received in reserved block allocated by CES/P at Step 6. MCS as specified in Step 2.
8	SS-> MS	PACKET TIMESLOT RECONFIGURE	Sent on downlink PACCH of the corresponding downlink PDCH pair of the uplink PDCH pair assigned at Step 2. Assigns the same uplink PDCH pair and corresponding downlink pair as in Step 2. Assigns a downlink PDCH pair on contiguous timeslots which are not the same as the assigned uplink PDCH pair.
9	SS-> MS	EGPRS DOWNLINK DATA BLOCK	Sent on downlink PDTCH pair assigned in Step 8. Sent three RTTI blocks after Step 8. CES/P = 001 Contains the PAN field which acknowledges the radio block received in Step 7.
10	MS-> SS	EGPRS PACKET DOWNLINK ACK/NACK	Received on the uplink PDCH pair corresponding to the downlink PDTCH pair assigned at Step 8. Acknowledges receipt of the downlink data block sent at Step 9.
11	SS-> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on corresponding downlink PDCH pair of the uplink PDCH pair assigned at Step 8. USF assigned to the MS
12	MS-> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the uplink PDTCH pair assigned in Step 8.
13	SS-> MS	PACKET TIMESLOT RECONFIGURE	Sent on downlink PACCH of the corresponding downlink PDCH pair of the uplink PDCH pair assigned at Step 8. Assigns the same uplink PDCH pair and corresponding downlink pair as in Step 8. Assigns a downlink PDCH pair on non-contiguous timeslots which are not the same as the assigned uplink PDCH pair.

14	SS-> MS	EGPRS DOWNLINK DATA BLOCK	Sent on downlink PDTCH pair assigned in Step 13. Sent three RTTI blocks after Step 13. CES/P = 001 Contains the PAN field which acknowledges the radio block received in Step 12.
15	MS-> SS	EGPRS PACKET DOWNLINK ACK/NACK	Received on the uplink PDCH pair corresponding to the downlink PDTCH pair assigned at Step 13. Acknowledges receipt of the downlink data block sent at Step 14.
16	SS-> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on corresponding downlink PDCH pair of the uplink PDCH pair assigned at Step 13. USF assigned to the MS
17	MS-> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the uplink PDTCH pair assigned in Step 13.
18	SS-> MS	PACKET TIMESLOT RECONFIGURE	Sent on downlink PACCH of the corresponding downlink PDCH pair of the uplink PDCH pair assigned at Step 13. Assigns a single uplink PDTCH pair on non-contiguous timeslots. Assigns a downlink PDCH pair on contiguous timeslots which are not the same as the assigned uplink PDCH pair.
19	SS-> MS	EGPRS DOWNLINK DATA BLOCK	Sent on downlink PDTCH pair assigned in Step 18. Sent three RTTI blocks after Step 19. CES/P = 001 FBI = 1 Contains the PAN field which acknowledges the radio block received in Step 17.
20	MS-> SS	EGPRS PACKET DOWNLINK ACK/NACK	Received on the uplink PDCH pair corresponding to the downlink PDTCH pair assigned at Step 18. FAI = 1
21	SS-> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on corresponding downlink PDCH pair of the uplink PDCH pair assigned at Step 18. USF assigned to the MS
22	MS-> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the uplink PDTCH pair assigned in Step 18.
23		{Completion of uplink RLC data block transfer}	

Specific Message Contents

None.

58a.2.10 Concurrent RTTI TBF / Change in TTI configuration

58a.2.10.1 Conformance requirements

The network may, at any time during uplink packet transfer, change the TTI configuration or USF mode (BTTI USF mode or RTTI USF mode) as well as the corresponding downlink PDCH-pairs of an already established uplink TBF by sending on the downlink PACCH, an uplink TBF assignment message (e.g. PACKET UPLINK ASSIGNMENT, MULTIPLE TBF UPLINK ASSIGNMENT, PACKET TIMESLOT RECONFIGURE, MULTIPLE TBF TIMESLOT RECONFIGURE or PACKET CS RELEASE INDICATION). The mobile station shall begin using the new parameters within the reaction time defined in 3GPP TS 45.010.

The network may, at any time during downlink packet transfer, change the TTI configuration of an already established downlink TBF by sending on the downlink PACCH a downlink TBF assignment message (e.g. PACKET DOWNLINK ASSIGNMENT, MULTIPLE TBF DOWNLINK ASSIGNMENT, PACKET TIMESLOT RECONFIGURE, MULTIPLE TBF TIMESLOT RECONFIGURE or PACKET CS RELEASE INDICATION). In case of a TTI configuration change the mobile station shall begin using the new TTI configuration within the reaction time defined in 3GPP TS 45.010.

An MS shall be ready to transmit and receive using a new assignment 9 frame periods after the last radio block containing the assignment message. A mobile station that receives an assignment message for a new or ongoing TBF with FANR activated (see 3GPP TS 44.060) shall be ready to transmit and receive using the new assignment in the TDMA frame indicated in Table 6.11.1.1 where N = the last TDMA frame of the downlink block containing the assignment message.

Table 6.11.1.1: Assignment Reaction Time for a TBF with FANR activated

Assignment message block format	Full-rate PDCH uplink block with TDMA frame number
BTTI	(N+5 or N+6) mod 2715648
RTTI	(N+5 or N+6) mod 2715648

References

3GPP TS 44.060 subclauses 8.1.1, 8.1.2

3GPP TS 45.010 subclauses 6.11.1

58a.2.10.2 Test purpose

To verify:

1. The MS is able operate in the new TTI configuration when the TTI configuration (BTTI to RTTI and vice-versa) of an ongoing RTTI or BTTI TBF is changed.
2. The MS is able to perform TTI mode reconfiguration during an ongoing uplink packet transfer and shall respond to the new parameters within the reaction time defined in 3GPP TS 45.010.

58a.2.10.3 Method of test

Initial Conditions

System Simulator:

1 cell with EGPRS support, default setting, PBCCH not present.

Mobile Station:

The MS is EGPRS updated, with a P-TMSI allocated, SPLIT_PG_CYCLE negotiated and test PDP Context 2 activated.

Specific PICS Statements

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PIXIT Statements

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Test Procedure

The MS is triggered to perform uplink packet transfer. A BTTI uplink TBF is established and in progress. After the MS sends an uplink data block the SS assigns a downlink TBF on the same timeslot as the uplink TBF. The SS sends a downlink data block with polling for acknowledgement and the assigned USF assigned to the MS for the MS, and indicates FBI=1 for the final data block. The MS sends an uplink data block and acknowledges the received downlink data block on the correct frame.

An RTTI mode uplink TBF using RTTI USF mode on a single PDCH pair having contiguous timeslots is assigned by a PACKET UPLINK ASSIGNMENT message (to change TTI configuration from BTTI to RTTI). It is checked that the MS responds to USF grant on the corresponding downlink PDCH pair. A downlink RTTI mode TBF using a single PDCH pair having the same timeslots as the corresponding downlink PDCH pair of the uplink PDCH pair is assigned. It is checked that the MS responds to polling for PAN on the assigned downlink PDCH pair.

The SS sends PACKET TIMESLOT RECONFIGURE (to change TTI configuration from RTTI to BTTI) assigning a new downlink PDCH replacing the previous PDCH-pair assignment. A downlink data block is sent, the assigned USF assigned to the MS and the MS is polled for acknowledgement. The MS sends an uplink data block and acknowledges the last received downlink data block on the correct frame.

The SS sends PACKET TIMESLOT RECONFIGURE (to change TTI configuration from BTTI to RTTI) assigning a new downlink PDCH-pair replacing the previous PDCH assignment. An RTTI mode uplink TBF using RTTI USF mode on a single PDCH pair having contiguous timeslots is assigned. A downlink RTTI mode TBF using a single PDCH pair having the same timeslots as the corresponding downlink PDCH pair of the uplink PDCH pair is assigned. It is checked that the MS responds to polling for downlink ack/nack on the newly assigned downlink PDCH pair corresponding to the new uplink PDCH pair. The uplink TBF is completed.

Maximum Duration of Test

5 minutes

Expected Sequence

Step	Direction	Message	Comments
1		{Uplink dynamic allocation two phase access}	n = 1500 octets, without starting time, USF_GRANULARITY = 1 block, BTTI configuration RLC_DATA_BLOCKS_GRANTED = open-end EGPRS CHANNEL CODING COMMAND: arbitrarily chosen.
2	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	The assigned USF assigned to the MS on 3 blocks from the last radio block containing the uplink assignment.
3	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	
4	SS -> MS	PACKET DOWNLINK ASSIGNMENT	Sent on the PACCH, assigning a downlink TBF, MAC mode = dynamic allocation, RLC mode = unacknowledged, single timeslot, TFI_2, no starting time.
5	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Containing RRBP= N+13 and USF assigned to the MS. FBI ='1' and ES/P set to 01. Sent on the downlink PDTCH on 3 blocks from the last radio block containing the downlink assignment.
6	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the uplink PDTCH assigned in step 1.
7	MS -> SS	PACKET CONTROL ACKNOWLEDGEMENT	Received on the frame number = N+13, N is the frame number of the first burst of the data block in step 5.
8	SS -> MS	PACKET UPLINK ACK/NACK	Containing USF assigned to the MS
9	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the uplink PDTCH assigned in step 1.
10	SS -> MS	PACKET UPLINK ASSIGNMENT	Sent on downlink PACCH. RTTI Configuration (Changing TTI configuration from BTTI to RTTI) Assigns a single uplink PDTCH pair on contiguous timeslots. The corresponding downlink PDTCH pair uses the same timeslots as the assigned uplink pair. USF Mode = RTTI USF Mode. USF Granularity = 1 block EGPRS Channel coding command arbitrarily chosen between MCS 1 and MCS 4.
11	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on downlink PACCH of the corresponding downlink PDCH pair of the uplink lnk PDCH assigned at Step 10 Control block format CS-1. USF assigned to the MS.
12	MS -> SS	EGPRS UPLINK DATA BLOCK	Received on uplink PDTCH pair assigned in Step 10 MCS as specified in Step 10
13	SS->MS	PACKET DOWNLINK ASSIGNMENT	Sent on downlink PACCH of the corresponding downlink PDCH pair of the uplink lnk PDCH assigned at Step 10. Assigns a downlink TBF. Assigns a single downlink PDTCH pair on the same timeslots as in Step 10. The corresponding uplink PDTCH pair uses the sme timeslots as the uplink pair assigned at Step 10.
14	SS -> MS	EGPRS DOWNLINK DATA BLOCK	Sent on downlink PDTCH pair assigned in Step 13. Contains the PAN field which acknowledges the radio block received in Step 12. CES/P = 011

Step	Direction	Message	Comments
15	SS		Check that radio block is transmitted by the MS in response to the USF grant in Step 14 within the reaction time.
16	MS -> SS	EGPRS UPLINK DATA BLOCK	Received on uplink PDTCH pair assigned at Step 10. Received in reserved block allocated by CES/P at Step 14. MCS as specified in Step 10.
17	SS -> MS	PACKET TIMESLOT RECONFIGURE	Sent on the PACCH of the PDCH assigned in step 1. BTTI Configuration (Changing TTI configuration from RTTI to BTTI) Assign a downlink TBF, MAC mode = dynamic allocation, RLC mode = unacknowledged, single slot, TFI2, no starting time.
18	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	FBI ='0' and ES/P field set to '01'. Sent on the downlink PDTCH assigned on 3 blocks from the last radio block containing the downlink assignment in step 17.
19	SS		Check that neither data blocks, nor control blocks are sent by MS.
20	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the uplink PDTCH assigned in step 1.
21	MS -> SS	EGPRS PACKET DOWNLINK ACK/NACK	Received on the block of the frame number of the first burst of the data block in step 18.
22	SS-> MS	PACKET TIMESLOT RECONFIGURE	Sent on downlink PACCH of the corresponding downlink PDCH pair of the uplink PDCH pair assigned at Step 10. Assigns a single uplink PDTCH pair on contiguous timeslots. Assigns a downlink PDCH pair on contiguous timeslots which are the same as the assigned uplink PDCH pair.
23	SS-> MS	EGPRS DOWNLINK DATA BLOCK	Sent on downlink PDTCH pair assigned in Step 13. CES/P = 001 FBI = 1 Contains the PAN field which acknowledges the radio block received in Step 20.
24	MS-> SS	EGPRS PACKET DOWNLINK ACK/NACK	Received on the uplink PDCH pair corresponding to the downlink PDTCH pair assigned at Step 22. FAI = 1
25	SS-> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on corresponding downlink PDCH pair of the uplink PDCH pair assigned at Step 22. USF assigned to the MS
26	MS-> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the uplink PDTCH pair assigned in Step 22.
27		{Completion of uplink RLC data block transfer}	

Specific Message Contents

None.

58a.2.11 Concurrent RTTI TBF / Downlink Dual Carrier configuration

58a.2.11.1 Conformance requirements

If the default dual carrier PDCH pair configuration is indicated, then the assignment is for resources on a subset of the PDCH pairs comprising timeslots 0 and 1, 2 and 3, 4 and 5, and 6 and 7 on both carriers in both the uplink and on the downlink. Otherwise, the assignment is for resources on a subset of the PDCH pairs as specified in the Downlink_PDCH_Pairs_C1, Downlink_PDCH_Pairs_C2, Uplink_PDCH_Pairs_C1 and Uplink_PDCH_Pairs_C2 bitmaps.

For the purposes of interpreting the RTTI_DOWNLINK_PDCH_PAIR_ASSIGNMENT_SC and RTTI_DOWNLINK_PDCH_PAIR_ASSIGNMENT_DC bitmaps and the repeated USF structures in the Dynamic Allocation 2 struct and Uplink TBF Assignment 2 struct, PDCH pairs are ordered starting with the PDCH pair on carrier 1 using the lowest numbered timeslots, followed by the PDCH pair on carrier 1 using the next lowest numbered timeslots and so on, followed by the PDCH pair on carrier 2 using the lowest numbered timeslots (if present), etc.

For an uplink PDCH pair using timeslots i and j, where j > i , the corresponding downlink PDCH pair is:

- the one using timeslots i and j; else, if no such PDCH pair is specified
- the one using timeslots i-1 and i; else, if no such PDCH pair is specified
- the one using timeslots i-2 and i; else, if no such PDCH pair is specified
- the one using timeslots i-3 and i if such a PDCH pair exists.

When a mobile station has resources assigned on only one carrier then, for the purposes of subsequent assignment messages, that carrier shall be considered carrier 1. A subsequent assignment message may assign resources on a second carrier, thereby establishing a Downlink Dual Carrier configuration; in this case, the assignment message shall provide frequency parameters for a second carrier (carrier 2) for use in a Downlink Dual Carrier configuration.

Downlink Dual Carrier enables downlink TBFs and uplink TBFs to use allocated resources on one or more assigned PDCHs on two different radio frequency channels. Uplink RLC/MAC blocks shall not be scheduled on both carriers of a downlink dual carrier configuration in the same radio block period. Downlink RLC/MAC blocks may be scheduled on both carriers of a downlink dual carrier configuration in the same radio block period.

The network may, at any time during uplink packet transfer, change the TTI configuration or USF mode (BTTI USF mode or RTTI USF mode) as well as the corresponding downlink PDCH-pairs of an already established uplink TBF by sending on the downlink PACCH, an uplink TBF assignment message (e.g. PACKET UPLINK ASSIGNMENT, MULTIPLE TBF UPLINK ASSIGNMENT, PACKET TIMESLOT RECONFIGURE, MULTIPLE TBF TIMESLOT RECONFIGURE or PACKET CS RELEASE INDICATION). The mobile station shall begin using the new parameters within the reaction time defined in 3GPP TS 45.010.

Reference

3GPP TS 44.060, subclause 7.1.3.6, 5.5.1.7, 5.9 and 8.1.1.

58a.2.11.2 Test purpose

To verify that:

- the MS is able to operate a RTTI TBF in Downlink Dual Carrier configuration

- the MS is able to change from concurrent RTTI in DLDC mode to Single Carrier BTTI mode and back to concurrent RTTI in DLDC mode

-PDCH pairs on each of the downlink are different from each other

-the PDCH pair Timeslots are non-contiguous.

58a.2.11.3 Method of test

Initial Conditions

System Simulator:

1 cell with EGPRS support, default setting, Downlink Dual Carrier configuration, PBCCH not present.

Mobile Station:

Support for Downlink Dual Carrier indicated in MS Radio Access Capabilities IE.

The MS is EGPRS updated, with a P-TMSI allocated, SPLIT_PG_CYCLE negotiated

Specific PICS Statements

-TSPC_Type_GPRS_Multislot_ClassX (where X = 1..45)

- TSPC_Type_Multislot_Capability_Reduction_for_Downlink_Dual_Carrier_of_0_or_1_Timeslots

- TSPC Type Multislot Capability Reduction for Downlink Dual Carrier of 2 or more Timeslots

PIXIT Statements

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Test Procedure

The MS is triggered to initiate uplink data transfer. Following reception of the EGPRS PACKET CHANNEL REQUEST message, the SS assigns an uplink TBF in RTTI mode on a single PDTCH pair using an IMMEDIATE ASSIGNMENT message. The MS is then made to transmit uplink RLC data blocks in EGPRS TBF RLC acknowledged mode. SS sends a PACKET DOWNLINK ASSIGNMENT message on its PACCH, instructing the MS for a Dual Carrier Downlink configuration. The SS sends RLC data blocks on Carrier 1 and Carrier 2 simultaneously. MS when polled acknowledges all data blocks send by SS. This is to setup Concurrent Downlink Dual Carrier TBF. The SS sends RLC data blocks on Carrier 1 and Carrier 2 simultaneously. The MS receives PACKET UPLINK ASSIGNMENT messages to establish one uplink TBFs with resources on both carrier 1 and carrier 2. MS when polled acknowledges all data blocks send by SS. The MS receives PACKET TIMESLOT RECONFIGURE message on its PACCH to establish single carrier in both downlink and uplink and change the configuration from RTTI to BTTI mode. Also the assigned downlink PDCH pairs are non-contiguous. The SS sends MS a PACKET DOWNLINK DUMMY CONTROL BLOCK in BTTI mode and assigns the USF. The MS sends an EGPRS UPLINK RLC DATA BLOCK to the SS.

The MS receives another PACKET TIMESLOT RECONFIGURE message to change the configuration back to Dual Carrier in BTTI mode. Repeat step 21 to step 28 until the completion of data transfer.

If the MS is of EGPRS multislot class 30-39, steps 30-31 should be executed after step 29.

Maximum Duration of Test

10 minutes

Expected Sequence

Step	Direction	Message	Comments
1	MS		The MS is triggered to transfer 10000 octets of user data.
2	MS -> SS	EGPRS PACKET CHANNEL REQUEST	Received on RACH. Access Type = "One phase Access Request by Reduced Latency MS".
3	SS -> MS	IMMEDIATE ASSIGNMENT	Sent on AGCH. Assigns RTTI mode uplink TBF on a single PDTCH pair. MCS arbitrarily chosen from MCS-1..MCS-4.
4	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on PACCH. USF assigned to the MS.
5	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on uplink PDTCH pair assigned in Step 3. SS verifies that the BSN starts from 0, and the correct MCS is used. MCS as specified in Step 3.
6	SS->MS	PACKET DOWNLINK ASSIGNMENT	Sent on PACCH of the PDTCH assigned in Step 3. Addressing the MS using the UL TFI assigned in Step 3. Two Carriers Assigned. USF Mode = RTTI USF Mode. Downlink TBF established.
7	SS		Wait for at least 3 block periods
8	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	On carrier 1 with next in sequence BSN (Start with BSN 0). USF Assigned
9	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	On carrier 2 with next in sequence BSN Send on same Radio Block as Data Block Send on carrier 1. CES/P=011
10	MS -> SS	EGPRS PACKET DOWNLINK ACK/NACK	Received on the corresponding PACCH. Received on reserved block by CES/P in step 9 the MS acknowledges RLC data blocks are received.
11	SS -> MS	PACKET UPLINK ASSIGNMENT	Addressed to the MS. Two Carriers Assigned. New PDTCH assigned for carrier2 and carrier 1 will use assigned PDTCH in step3 USF Mode = RTTI USF Mode.
12	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on downlink PACCH of the corresponding downlink PDCH pair of the uplink PDCH pair. USF assigned to the MS
13	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH on carrier 1 SS verifies that the correct BSN is received and the correct MCS is used.
14	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on downlink PACCH of the corresponding downlink PDCH pair of the uplink PDCH pair. USF assigned to the MS
15	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH on carrier 2 SS verifies that the correct BSN is received and the correct MCS is used.
16	SS -> MS	EGPRS PACKET UPLINK ACK/NACK	Received on the corresponding PACCH.
17	SS->MS	PACKET TIMESLOT RECONFIGURE	Change to single carrier in uplink and downlink. Change configuration to BTTI mode.
18	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	One control block sent in BTTI mode on downlink PACCH with USF.
19	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH SS verifies that the correct BSN is received and the correct MCS is used.
20	SS->MS	PACKET TIMESLOT RECONFIGURE	Sent on PACCH of the PDCH assigned. Two Carriers Assigned, Assigns BTTI mode. The assigned downlink PDCH pairs are non-contiguous
21	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	On carrier 1 with next in sequence BSN (Start with BSN 0). USF Assigned
22	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	On carrier 2 with next in sequence BSN Send on same Radio Block as Data Block Send on carrier 1. MS was polled for valid RRBP field.
23	MS -> SS	EGPRS PACKET DOWNLINK ACK/NACK	Received on the corresponding PACCH. The SS verifies that the MS acknowledges all the received RLC data blocks.
24	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on downlink PACCH of the corresponding downlink PDCH pair of the uplink lnk PDCH . USF assigned to the MS

25	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH on carrier1 SS verifies that the correct BSN is received and the correct MCS is used.
26	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on downlink PACCH of the corresponding downlink PDCH pair of the uplink lnk PDCH . USF assigned to the MS
27	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH on carrier2 SS verifies that the correct BSN is received and the correct MCS is used.
28	SS -> MS	EGPRS PACKET UPLINK ACK/NACK	Received on the corresponding PACCH.
29	SS		Repeat Steps 21-29 until end of data transfer
30	SS->MS	PACKET TIMESLOT RECONFIGURE	Sent on PACCH of the PDTCH assigned in Step 17. Reconfigure the timeslots if the MS is of the EGPRS multislot class 30-39. The assigned downlink PDCH pairs are non-contiguous This step is optional and shall only be executed if the MS is of EGPRS multislot class 30-39 with 4 downlink and 2 uplink timeslot configuration
31	SS		Repeat step 21 to step 28 until the completion of data transfer. This step is optional and shall only be executed if the MS is of EGPRS multislot class 30-39
		{Completion of uplink RLC data block transfer}	

Specific Message Contents

None.

58a.2.12 Concurrent RTTI TBF / Dual Transfer Mode

58a.2.12.1 Conformance requirements

The RR connection establishment procedure is initiated by the RR entity of the mobile station. Initiation is triggered by request from the MM sublayer to enter dual transfer mode. The request from the MM sublayer to establish the RR connection specifies an establishment cause.

While in dedicated mode, the establishment of an uplink packet resource may be initiated by the RR entity of the mobile station using the packet request procedure.

The mobile station initiates the establishment the packet resource by sending a DTM REQUEST message on the main DCCH.

On receipt of a DTM REQUEST message the network may allocate an uplink packet resource. The packet uplink resource is assigned to the mobile station in one of the DTM assignment messages:

- DTM ASSIGNMENT COMMAND; or
- PACKET ASSIGNMENT.

These messages are sent in acknowledged mode. The DTM ASSIGNMENT COMMAND message may be sent on the SDCCH and on the FACCH. The PACKET ASSIGNMENT message shall be sent only on FACCH.

When sending the DTM ASSIGNMENT COMMAND message on the network side, and when receiving it on the mobile station side, all transmission of signalling layer messages except for those RR messages needed for this procedure and for abnormal cases is suspended until resumption is indicated.

The PACKET ASSIGNMENT message is only used when the packet resource is a PDCH and no reallocation of the RR connection is needed.

The mobile station remains in dual transfer mode until the RR connection or all the packet resources are released.

Reference

3GPP TS 44.060 v9.0.0, subclause 8.9

3GPP TS 44.018, subclause 3.4.22, 3.4.23

All of the above requirements shall be met while maintaining Concurrent RTTI TBF.

58a.2.12.2 Test purpose

To verify that the MS is able to operate a RTTI TBF in Dual Transfer Mode with DTM Command message. The following parts are verified:

MS is in active state of a call and MS initiates the data.

MS is in active state of a call and the network initiates the data.

MS is in a packet transfer mode and user is made to initiate the establishment of a mobile originated circuit switched call.

58a.2.12.3 Method of test

Initial Conditions

System Simulator:

1 cell with EGPRS support, DTM supported, default setting, PBCCH not present.

Mobile Station:

The MS is in the active state (U10) of a call.

Support for Dual Transfer Mode indicated in MS Radio Access Capabilities IE.

The MS is EGPRS updated, with a P-TMSI allocated, SPLIT_PG_CYCLE negotiated and test PDP Context 1 activated.

Specific PICS Statements

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PIXIT Statements

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Test Procedure

This part tests the DTM ASSIGNMENT COMMAND message. Reallocation of the RR connection is needed while assigning the packet resources.

Once the MS is in state U10 utilising the default TCH of the cell, the MS is triggered to transfer 10000 octets of user data. MS send DTM REQUEST message indicating the supports for Reduced Latency Capability. SS send a DTM ASSIGNMENT COMMAND to the MS to change the channel configuration to a configuration with CS and packet connections when no timing adjustment is needed and reallocation of the CS timeslot is required. MS replies back with ASSIGNMENT COMPLETE message.

The MS starts to send RLC DATA BLOCKS to the SS on the assigned PDTCH. The network also starts to send RLC data blocks to the MS. The test procedure is complete when the SS successfully verifies both uplink and downlink transmission are working in parallel. Finally the CS connection is released.

Steps 12-20 tests the PACKET ASSIGNMENT COMMAND message. The packet resource is a PDCH and no reallocation of the RR connection is needed.

Steps 1-11 are repeated except that in this case the SS send a PACKET ASSIGNMENT to the MS upon receipt of the DTM request message from the MS. There is no ASSIGNMNET COMPLETE message sent back to the SS.

Next the MS is in a dedicated mode and the network initiates data transfer. Steps 21-28 tests the DTM ASSIGNMENT COMMAND message. Reallocation of the RR connection is needed while assigning the packet resources. In step 21 the MS in the active state (U10) of a call on Timeslot N. in step 22 the network initiates transfer of 10000 octets of data by sending a DTM ASSIGNMENT COMMAND message. The MS replies back with an ASSIGNMENT COMPLETE message. Concurrent TBF's is established and the data is transferred in both uplink and downlink. The SS verifies that both uplink and downlink data transmission is functioning correctly. The SS also verifies that the CS connection is still through connected. Finally the SS releases the CS connection.

In step 29 the MS is again triggered to transfer 10000 octets of user data. Steps 29-35 tests the PACKET ASSIGNMENT COMMAND message. The packet resource is a PDCH and no reallocation of the RR connection is needed.

Steps 36-57 correspond to the concurrent RTTI TBF establishment in the enhanced DTM CS establishment procedure.

The MS is brought into packet transfer mode for uplink TBF. The user is made to initiate the establishment of a mobile originated circuit switched call. The MS sends the PACKET CS REQUEST message on PACCH. The NW responds by sending an encapsulated DTM ASSIGNMENT COMMAND on the PACCH. Upon receipt of the PACKET CS COMMAND, the MS initiates the establishment of the CS connection. It is checked that the MS maintains the uplink TBF throughout the enhanced DTM CS establishment procedure.

Maximum Duration of Test

10 minutes

Expected Sequence

The test sequence is repeated for k = 1, 2

Step	Direction	Message	Comments
1	SS		MS in state U10, on Timeslot N (chosen arbitrarily), utilising a default TCH of cell and either: k=1, Channel Type = TCH/F; or k=2, Channel Type = TCH/H.
2	MS		The MS is triggered to transfer 10000 octets of user data.
3	MS->SS	DTM REQUEST	See Specific Message Contents, Reduced Latency Capability is indicated.
4	SS->MS	DTM ASSIGNMENT COMMAND	This message to be sent before the termination of the macro. RTTI mode is defined in the RR PACKET DOWNLINK ASSIGNMENT TYPE 2 value part of the DTM ASSIGNMENT COMMAND. See specific message contents.
5	SS<->MS	{Uplink data transfer}	Macro – Transmitting 2000 octets of data
6	MS->SS	ASSIGNMENT COMPLETE	
7	SS<->MS	{ Downlink data transfer }	Macro.
8	SS<->MS	{ Uplink data transfer }	Macro.
9	SS		Verify both uplink and downlink data transmission is functioning correctly. Completion of 10000 octets of data upload
10	SS		Verify that the CS connection is still through connected on the new time slot.
11	SS->MS	CHANNEL RELEASE	CS Release
12	SS		MS in the active state (U10) of a call on Timeslot N. When: k=1, Channel Type=TCH/F; k=2, Channel Type=TCH/H.
13	MS		Trigger the MS to initiate an uplink packet transfer containing 10000 octets.
14	MS->SS	DTM REQUEST	See Specific Message Contents, Reduced Latency Capability is indicated.
15	SS->MS	PACKET ASSIGNMENT	Sent on the FACH. Includes information on the Radio resources provided to the MS. RTTI mode is defined in the RR PACKET DOWNLINK ASSIGNMENT TYPE 2 value part of the PACKET ASSIGNMENT
16	SS<->MS	{ Downlink data transfer }	Macro
17	SS<->MS	{ Uplink data transfer }	Macro
18	SS		Verify both uplink and downlink data transmission is functioning correctly. Completion of 10000 octets of data upload.
19	SS		Verify that the CS connection is still through connected on the new time slot.
20	SS->MS	CHANNEL RELEASE	CS Release
21	SS		MS in the active state (U10) of a call on Timeslot N. When: k=1, Channel Type=TCH/F; k=2, Channel Type=TCH/H.
22	SS	DTM ASSIGNMENT COMMAND	Network initiates transfer of 10000 octets of data. See specific message contents.
23	MS->SS	ASSIGNMENT COMPLETE	
24	SS<->MS	{ Downlink data transfer }	Macro
25	SS<->MS	{ Uplink data transfer }	Macro
26	SS		Verify both uplink and downlink data transmission is functioning correctly. Completion of 10000 octets of data upload.
27	SS		Verify that the CS connection is still through connected on the new time slot.
28	SS	CHANNEL RELEASE	CS Release.
29	SS		MS in the active state (U10) of a call on Timeslot N. When: k=1, Channel Type=TCH/F; k=2, Channel Type=TCH/H.
30	SS	PACKET ASSIGNMENT COMMAND	Network initiates transfer of 10000 octets of data.
31	SS<->MS	{ Downlink data transfer }	Macro
32	SS<->MS	{ Uplink data transfer }	Macro

33	SS		Verify both uplink and downlink data transmission is functioning correctly. Completion of 10000 octets of data upload.
34	SS		Verify that the CS connection is still through connected on the new time slot.
35	SS	CHANNEL RELEASE	CS Release
36	MS		The MS is triggered to transfer 10000 octets of user data.
37	MS -> SS	EGPRS PACKET CHANNEL REQUEST	Received on RACH. Access Type = "One phase Access Request by Reduced Latency MS".
38	SS -> MS	IMMEDIATE ASSIGNMENT	Sent on AGCH. Assigns RTTI mode uplink TBF on a single PDTCH pair. MCS arbitrarily chosen from MCS-1..MCS-4.
39	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on PACCH. USF assigned to the MS.
40	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on uplink PDTCH pair assigned in Step 3. SS verifies that the BSN starts from 0, and the correct MCS is used. MCS as specified in Step 3.
41	SS<->MS	{ Uplink data }	Macro.
42			The user is made to trigger the establishment of a mobile originated speech call.
43	MS->SS	PACKET CS REQUEST	Sent on uplink PACCH. Establishment Cause = Mobile Originated Speech Call
44	SS->MS	PACKET CS COMMAND	Sent on downlink PACCH. Encapsulates a DTM ASSIGNMENT COMMAND.
45			It is checked that the MS continues to transmit uplink data during Steps 7 to 18 below.
46	MS->SS	CM SERVICE REQUEST	
47	MS ->SS	CLASSMARK CHANGE	
48	SS ->MS	AUTHENTICATION REQUEST	
49	MS ->SS	AUTHENTICATION RESPONSE	
50	SS ->MS	CIPHERING MODE COMMAND	
51	MS ->SS	CIPHERING MODE COMPLETE	
52	MS ->SS	SETUP	
53	SS ->MS	CALL PROCEEDING	
54	SS ->MS	ALERTING	
55	SS ->MS	CONNECT	
56	MS		The TCH shall be through connected in both directions.
57	MS ->SS	CONNECT ACKNOWLEDGE	

Specific Message Contents

Channel Request Description 2 value part of DTM REQUEST message (Step 3)

< Channel Request Description 2 value part > ::=
< **PACKET_ESTABLISHMENT_CAUSE** : bit(2) >
< **Channel Request Description :** Channel Request Description IE > *-- Defined in 3GPP TS 44.060*
{ 0 | 1 < **PFI** : bit (7) > }
< **Multiple TBF Capability** : bit > *-- Additions in Rel-6*
{ null | L *-- Receiver backward compatible with earlier version*
| H *-- Additions in Rel-7*
{ < **RLC Non-persistent Mode Capability** : bit >
< **Reduced Latency Capability** : 1 >
< **Uplink EGPRS2** : bit(2) >
< **Downlink EGPRS2** : bit(2) > }
}
< spare padding > ;

k=1;

As default message contents except: RR Packet Uplink Assignment IE - TIMESLOT_ALLOCATION RR Packet Downlink Assignment IE	 (N ± 1) MOD 8 Not included

k=2;

As default message contents except: RR Packet Uplink Assignment IE - TIMESLOT_ALLOCATION RR Packet Downlink Assignment IE	 N Not included

RR PACKET DOWNLINK ASSIGNMENT TYPE 2 value part of the DTM ASSIGNMENT COMMAND (Step 4) (STEP 22)

```
< RR Packet Downlink Assignment Type 2 value part > ::=
   < RLC_MODE : bit (1) >
   { 0 | 1  < P0_C1 : bit (4) >
          < PR_MODE_C1 : bit (1) > }
   { 0 | 1  < P0_C2 : bit (4) >
          < PR_MODE_C2 : bit (1) > }
   { 0 | 1 < Power Control Parameters C1 : Power Control Parameters IE > }
   { 0 | 1 < DOWNLINK_TFI_ASSIGNMENT : bit (5) > }
   < EGPRS Window Size : < EGPRS Window Size IE >>
   < LINK_QUALITY_MEASUREMENT_MODE : bit (2) >
   < FANR: bit (1) >
   { 0            -- BTTI mode
      { 1 < BTTI Multiple Downlink TBF Assignment : < BTTI Multiple Downlink TBF Assignment struct > > } ** 0
   | 1            -- RTTI mode
      < PDCH Pairs Description : < PDCH Pairs Description struct > >
      { 1 < RTTI Multiple Downlink TBF Assignment : < RTTI Multiple DL TBF Assignment struct > > } ** 0
   }
   { null | 0 bit** = < no string > -- Receiver backward compatible with earlier version
   | 1         -- Additions for REL-8
      { 0 | 1  { 1 < Measurement_Control_E-UTRAN : bit(1) >
                < E-UTRAN_FREQUENCY_INDEX : bit (3) >
                { 1 < E-UTRAN_FREQUENCY_INDEX : bit (3) > } ** 0
             } ** 0
      }
      { 0 | 1  { 1< Measurement_Control_UTRAN : bit(1) >
                < UTRAN_FREQUENCY_INDEX : bit (5) >
                { 1 < UTRAN_FREQUENCY_INDEX : bit (5) > } ** 0
             } ** 0
      }
   }
   < SPARE_BITS : bit ** > ;
```

58b Downlink Dual Carrier

58b.1 Downlink Dual Carrier Reconfiguration

58b.1.1 Single Carrier Uplink TBF with no Downlink TBF/ DLDC TBF established / No change in Uplink TBF

58b.1.1.1 Conformance requirement

If the network and mobile station both support Downlink Dual Carrier, the network may send a packet assignment message to a mobile station specifying packet resources for one or more TBFs on two carriers (referred to as carrier 1 and carrier 2) and thereby establish a Downlink Dual Carrier configuration. If this message is sent to a mobile station in packet idle mode, the assignment message shall include frequency parameters for both carriers.

When a mobile station has resources assigned on only one carrier then, for the purposes of subsequent assignment messages, that carrier shall be considered carrier 1. A subsequent assignment message may assign resources on a second carrier, thereby establishing a Downlink Dual Carrier configuration; in this case, the assignment message shall provide frequency parameters for a second carrier (carrier 2) for use in a Downlink Dual Carrier configuration.

In a Downlink Dual Carrier configuration, one or more PDCHs are assigned to a single mobile station on each of two different radio frequency channels. A mobile station with a Downlink Dual Carrier configuration shall not be allocated radio blocks on both radio frequency channels during any given radio block period.

3GPP TS 44.060; subclause 5.5.1.7, 8.1.1.1

58b.1.1.2 Test purpose

To verify that the MS:
- decodes correctly the Packet downlink Assignment that assigns dual downlink carrier
- is able to correctly receive data simultaneously on both the carriers assigned

58b.1.1.3 Method of test

Initial Conditions

System Simulator:

1 cell, EGPRS supported, Downlink Dual Carrier supported.

Mobile Station:

Support for Downlink Dual Carrier indicated in MS Radio Access Capabilities IE.

The MS is in the state "idle, GMM-registered" with a P-TMSI allocated, SPLIT PG CYCLE negotiated, and PDP context 2 activated.

Specific PICS Statements

The GPRS multislot class supported (TSPC_Type_GPRS_Multislot_ClassX, where X = 1..45)

Multislot Capability Reduction for Downlink Dual Carrier of 0 or 1 Timeslots (TSPC_Type_Multislot_Capability_Reduction_for_Downlink_Dual_Carrier_of_0_or_1_Timeslots)

Multislot Capability Reduction for Downlink Dual Carrier of 2 or more Timeslots (TSPC_Type_Multislot_Capability_Reduction_for_Downlink_Dual_Carrier_of_2_or_more_Timeslots)

PIXIT Statements

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Test Procedure

The EGPRS capable MS is made to transmit uplink RLC data blocks in EGPRS TBF RLC acknowledged mode. Then MS receives a PACKET DOWNLINK ASSIGNMENT message on its PACCH, instructing a Dual Carrier Downlink configuration. The SS sends RLC data blocks on Carrier 1 and Carrier 2 simultaneously. MS when polled acknowledges all data blocks send by SS.

Maximum Duration of Test

5 minutes.

Expected Sequence

Step	Direction	Message	Comments
1		{Uplink dynamic allocation two phase access}	N = 1000 octets USF_GRANULARITY = 1 block EGPRS Channel Coding Command: MCS-1
2	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned, containing USF assigned to the MS.
3	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH SS verifies that the BSN starts from 0, and the correct MCS is used.
4	SS -> MS	PACKET UPLINK ACK/NACK	SS acknowledges RLC data block received.
5	SS -> MS	PACKET DOWNLINK ASSIGNMENT	Sent on PACCH of the PDTCH assigned in Step 1. Addressing the MS using the UL TFI assigned in Step 1. Two Carriers Assigned. See specific message contents
6	SS		Wait for at least 3 block periods
7	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	On carrier 1 with next in sequence BSN (Start with BSN 0). USF Assigned. MCS-1
8	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	On carrier 2 with next in sequence BSN Send on same Radio Block as Data Block Send on Carrier 1. MCS-1
9	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH on carrier1 SS verifies that the correct BSN is received and the correct MCS is used.
10			Repeat Steps 7 to 9 10 Times
11	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	With next in sequence BSN. FBI bit set to '1' and valid RRBP field, sent on Carrier 1. MCS-1
12	MS -> SS	EGPRS DOWNLINK PACKET DOWNLINK ACK/NACK	In the uplink block specified by the RRBP field. Final Ack Indicator bit set to '1' .
13		{Completion of uplink RLC data block transfer}	

Specific Message Contents

PACKET DOWNLINK ASSIGNMENT message in step 5:

Information Element	value/ remark
MESSAGE_TYPE	000010
PAGE_MODE	00 Normal Paging
Persistence Level	0 (no Persistence Level Present)
Referenced Address	Referenced by UL TFI
1	Message Escape Sequence for dual carrier…
00	
RLC_MODE	0 Acknowledged mode
CONTROL_ACK	0
<Assignment Info>	Assignment Info Struct
0	BTTI Mode
TIMESLOT_ALLOCATION_C1	arbitrarily chosen (default timeslot 4)
1	Carrier 2 explicitly assigned
TIMESLOT_ALLOCATION_C2	arbitrarily chosen (default timeslot 4)
Packet Timing Advance	
{ 0|1< TIMING_ADVANCE_VALUE >	1 (timing advance value)
- TIMING_ADVANCE_VALUE }	30 bit periods
{ 0|1< TIMING_ADVANCE_INDEX > <TIMING_ADVANCE_TIMESLOT_NUMBER > }	0 (no timing advance index)
01	Legacy IEs Used
1< Frequency Parameters_C1>	Frequency Parameters_C1 Present
1< Frequency Parameters_C2>	Frequency Parameters_C2 Present
0	P0_C1 not present
{0|1<DOWNLINK_TFI_ASSIGNMENT>}	1 (assign downlink TFI)
- DOWNLINK_TFI_ASSIGNMENT	00001
{0|1<Power Control Parameters_C1>}	1 (Power Control Parameters present for Carrier1)
- ALPHA	0.5
- GAMMA for allocated timeslots	For DCS 1800 and PCS 1900: +6 dBm. For all other bands: +8 dBm (default timeslot 4)
{0|1<Power Control Parameters_C2>}	1 (Power Control Parameters present for Carrier2)
- ALPHA	0.5
- GAMMA for allocated timeslots	For DCS 1800 and PCS 1900: +6 dBm. For all other bands: +8 dBm (default timeslot 4)
0	EGPRS Window IE not present
0	Packet Extended Timing Advance not present
0	No PFI
0	No NPM transfer Time
0	Fast Ack/Nack Reporting not activated
Spare padding	Spare Padding

58b.1.2 Single Carrier concurrent TBF to DLDC TBF/ Uplink DLDC TBF (on both carrier 1 and carrier 2)/ Reconfigured back to single Carrier Concurrent TBF

58b.1.2.1 Conformance requirement

When a mobile station has resources assigned on only one carrier then, for the purposes of subsequent assignment messages, that carrier shall be considered carrier 1. A subsequent assignment message may assign resources on a second carrier, thereby establishing a Downlink Dual Carrier configuration; in this case, the assignment message shall provide frequency parameters for a second carrier (carrier 2) for use in a Downlink Dual Carrier configuration.

Downlink Dual Carrier enables downlink TBFs and uplink TBFs to use allocated resources on one or more assigned PDCHs on two different radio frequency channels. Uplink RLC/MAC blocks shall not be scheduled on both carriers of a downlink dual carrier configuration in the same radio block period. Downlink RLC/MAC blocks may be scheduled on both carriers of a downlink dual carrier configuration in the same radio block period.

If the network initially assigns a mobile station radio resources on only one carrier, it can extend this assignment to a downlink dual carrier configuration by sending a new single carrier assignment to the mobile station including assigned radio resources for the second carrier, without changing the resources already assigned for the initial carrier. Alternatively the network can include radio resources for two carriers in an initial or subsequent assignment message.

If the network and mobile station both support Downlink Dual Carrier, the network may send a downlink assignment message (e.g. PACKET DOWNLINK ASSIGNMENT, MULTIPLE TBF DOWNLINK ASSIGNMENT, PACKET TIMESLOT RECONFIGURE, MULTIPLE TBF TIMESLOT RECONFIGURE or PACKET CS RELEASE INDICATION) to a mobile station assigning one or more TBFs with packet resources on two carriers (referred to as carrier 1 and carrier 2) and thereby establish a Downlink Dual Carrier configuration.

If the assignment message contains the *Assignment Info* IE indicating an assignment type other than 'Dual Carrier assignment', then the packet resources specified in this message replace any existing assignment for the addressed TBFs on the carrier identified by the Carrier ID field. In this case, if the assignment message addresses TBFs that currently have packet resources assigned on the other carrier (i.e. the carrier not identified by the Carrier ID field) then these packet resources shall be treated as follows:

- these resources are implicitly released, if the ASSIGNMENT TYPE field (carried in the *Assignment Info IE*) indicates that the assignment is an 'Assignment on single carrier only';

- these resources are unchanged, if the ASSIGNMENT TYPE field indicates that the assignment is a 'Modification of existing assignment'.

If the assignment message contains the *Assignment Info* IE indicating an assignment type of 'Dual Carrier assignment', then the packet resources specified in this message replace any existing assignment for the addressed TBFs.

In the case of a mobile station with a Downlink Dual Carrier configuration where the continuous timing advance procedure is used there is no explicit indication of the carrier on which the PTCCH is allocated, and the mobile station shall consider the PTCCH allocation to be on carrier 1 (see sub-clause 5.5.1.7). If a mobile station with a Downlink Dual Carrier configuration receives an assignment message which results in the mobile station no longer being in a Downlink Dual Carrier configuration (but still in packet transfer mode), the mobile station shall consider the PTCCH allocation to be on the carrier on which packet resources are assigned
When the MS receives the updated value of TA from the BTS on the downlink PTCCH, it shall always use the last received TA value for the uplink transmission.
Within the packet resource assignments (see 3GPP TS 04.08 / 3GPP TS 24.008 and 3GPP TS 04.60) for uplink or downlink messages the MS gets the Timing Advance Index (TAI). The MS shall send access bursts on the subchannel defined by the TAI on the PTCCH using TA=0.

References

3GPP TS 44.060; subclause 5.5.1.7, 7.1.2.5, 5.9 and 8.1.1.1.3

3GPP TS 45.10, subclause 6.5.2.

58b.1.2.2 Test purpose

To verify that:

the MS is able to change from single carrier concurrent TBF to dual carrier configuration and operate downlink dual carrier downlink and uplink TBF.

- the MS is able to change from single carrier concurrent TBF to dual carrier configuration and operate downlink dual carrier downlink and uplink TBF.

- in Downlink Dual Carrier configuration where the continuous timing advance procedure is used there is no explicit indication of the carrier on which the PTCCH is allocated, and the mobile station shall consider the PTCCH allocation to be on carrier 1. To verify that the mobile station uses the continuous update timing advance mechanism and sends access bursts on the PTCCH slots as determined by the Timing Advance Index sent in the PACKET UPLINK ASSIGNMENT message.

- the MS is able to change from dual carrier to a single carrier assignment and continue to use the same Timing advance parameters if the values are not changed.

58b.1.2.3 Method of test

Initial Conditions

System Simulator:

1 cell, EGPRS supported, Downlink Dual Carrier supported.

Mobile Station:

Support for Downlink Dual Carrier indicated in MS Radio Access Capabilities IE.

The MS is in the state "idle, GMM-registered" with a P-TMSI allocated, SPLIT PG CYCLE negotiated, and PDP context 2 activated.

Specific PICS Statements

The GPRS multislot class supported (TSPC_Type_GPRS_Multislot_ClassX, where X = 1..45)

Multislot Capability Reduction for Downlink Dual Carrier of 0 or 1 Timeslots (TSPC_Type_Multislot_Capability_Reduction_for_Downlink_Dual_Carrier_of_0_or_1_Timeslots)

Multislot Capability Reduction for Downlink Dual Carrier of 2 or more Timeslots (TSPC_Type_Multislot_Capability_Reduction_for_Downlink_Dual_Carrier_of_2_or_more_Timeslots)

PIXIT Statements

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Test Procedure

The EGPRS capable MS is made to transmit uplink RLC data blocks in EGPRS TBF RLC acknowledged mode. The timing advance value is included in the PACKET UPLINK ASSIGNMENT. The MS receives a PACKET DOWNLINK ASSIGNMENT message on its PACCH with assignment type set to dual carrier assignment. This configures the MS in Dual Carrier Downlink configuration. The SS sends RLC data blocks on Carrier 1 and Carrier 2 simultaneously. The MS receives a PACKET UPLINK ASSIGNMENT with assignment type set to dual carrier assignment. The timing advance parameter values are assigned. Timing advanced Index is set to 2. Frequency parameters are specified separately. The SS sends PACKET UPLINK ACK/NACK on both carriers assigning USF. During uplink transfer the SS continues monitoring the access burst on PTCCH on carrier 1 such that (FN mod

(8*52)) = 64 (TAI =2).

The SS sends a PACKET TIMESLOT RECONFIGURE message assigning a single carrier assignment on carrier C1. The timing advance parameters are unchanged. The MS is polled to see if MS responds on C2. The uplink and downlink data transfer is initiated on both directions simultaneously. During uplink transfer the SS continues monitoring the access burst on PTCCH on carrier 1 such that (FN mod (8*52)) = 64 (TAI =2) same as before.

The SS sends a PACKET DOWNLINK ASSIGNMENT and a PACKET UPLINK ASSIGNMENT to re establish the concurrent dual carrier TBF. The SS sends a PACKET TIMESLOT RECONFIGURE message assigning a single carrier assignment on carrier C2. The timing advance parameters are unchanged. The MS is polled to see if MS responds on C1. The uplink and downlink data transfer is initiated on both directions simultaneously. During uplink transfer the SS continues monitoring the access burst on PTCCH on carrier 2 such that (FN mod (8*52)) = 64 (TAI =2) same as before as the timing advance parameter is unchanged.

The MS is configured back to dual carrier configuration mode as it has been done previously.(PACKET UPLINK and DONWLINK ASSIGNMENT). The SS sends a PACKET TIMESLOT RECONFIGURE message assigning a single carrier assignment on carrier C1. The timing advance parameters are changed to an arbitrarily chosen value. The MS is polled to see if MS responds on C2. The uplink and downlink data transfer is initiated on both directions simultaneously. The SS monitors the access burst on PTCCH on carrier 1SS shall verify that the access burst are sent in the correct idle slots as specified in 3GPP TS 05.02 table 6.

MS is reconfigured in dual carrier configuration mode. The SS sends PACKET TIMESLOT RECONFIGURE message assigning a single carrier assignment on carrier C1. New frequency and timeslot values are assigned and new timeslot allocations are assigned. The timing advance index is set to 0. The MS completes the uplink and downlink data transfer. During the uplink data transfer the SS monitors the access burst on PTCCH which are located on slots with numbers

FN, such that (FN mod (8*52)) = 12 for Timing Advance Index = 0 (3GPP TS 03.64 subclause 6.5.7.2 and 3GPP TS 05.02 table 6). The access burst contents shall be MESSAGE_TYPE = 011111 and CTRL_ACK = 11.

Maximum Duration of Test

10 minutes.

Expected Sequence

Step	Direction	Message	Comments
1		{Uplink dynamic allocation two phase access}	N = 10000 octets USF_GRANULARITY = 1 block EGPRS Channel Coding Command: MCS-1 Timing advance values included.
2	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned, containing USF assigned to the MS.
3	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH SS verifies that the BSN starts from 0, and the correct MCS is used.
4	SS -> MS	PACKET UPLINK ACK/NACK	SS acknowledges RLC data block received.
5	SS -> MS	PACKET DOWNLINK ASSIGNMENT	Sent on PACCH of the PDTCH assigned in Step 1. Addressing the MS using the UL TFI assigned in Step 1. Two Carriers Assigned. See specific message contents of sub-clause 58b.1.2. Timing advance values included. Including Timing Advance Index = 2 Assignment Type = Dual carrier Assignment
6	SS		Wait for at least 3 block periods
7	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	On carrier 1 with next in sequence BSN (Start with BSN 0). USF not Assigned to MS.
8	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	On carrier 2 with next in sequence BSN Send on same Radio Block as Data Block Send on Carrier 1 with MCS-1 with valid RRBP field. USF not Assigned to MS.
9	MS -> SS	PACKET DOWNLINK ACK/NACK	Sent on PACCH of the PDTCH assigned in Step 5. Addressing the MS using the UL TFI assigned in Step 1MS acknowledges the previously received RLC data Blocks. Sent on PACCH on the valid RRBP specified in step 10.
12	SS -> MS	PACKET UPLINK ASSIGNMENT	Two Carriers Assigned. New PDTCH assigned for carrier2 and carrier 1 will use assigned PDTCH in step1. See specific message contents 58b.1.2. Timing advance values included. Including Timing Advance Index = 2 Assignment Type = Dual carrier Assignment
11	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Sent on the PACCH of the PDCH assigned on carrier 1, containing USF assigned to the MS.
12	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH on carrier1 SS verifies that the correct BSN is received and the correct MCS is used.
13	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	On carrier 2 with next in sequence BSN and MCS-1. USF assigned to the MS.
14	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH on carrier2 SS verifies that the correct BSN is received and the correct MCS is used.
15	SS -> MS	PACKET UPLINK ACK/NACK	Sent on the PACCH, SS acknowledges all received RLC data Block
16			Repeat steps 11-15 10 times. During uplink transfer in the SS continues monitoring the access burst on PTCCH such that (FN mod (8*52)) = 64 (TAI =2). SS checks that timing advance from PTCCH allocation on carrier1 used for both carriers.
17	SS -> MS	PACKET TIMESLOT RECONFIGURE	Sent on PACCH of the PDTCH assigned in Step 10 .Addressing the MS using the UL TFI assigned in Step 1.: Assignment type = Single Carrier (C1) Assigned. See specific message contents section of this test case
18	SS		Wait for at least 3 block periods
19	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	On carrier 1 with next in sequence. USF not Assigned to MS
20	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	On carrier 1 with next in sequence BSN with MCS-1 with valid RRBP field. USF not Assigned to MS

21	MS -> SS	PACKET DOWNLINK ACK/NACK	MS acknowledges the previously received RLC data Blocks. Sent on PACCH on the valid RRBP specified in step 20
22	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Sent on the PACCH of the PDCH assigned on carrier 2, USF not assigned to the MS and with a valid RRBP field
23	SS		SS monitors that no EGPRS PACKET DOWNLINK ACK/NACK is sent on C2 from MS
24	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned on carrier 1, containing USF assigned to the MS.
25	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH on carrier1 SS verifies that the correct BSN is received and the correct MCS is used.
26	SS -> MS	PACKET UPLINK ACK/NACK	Sent on the PACCH, USF assigned to the MS.
27	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH on carrier2 SS verifies that the correct BSN is received and the correct MCS is used.
28	SS		Repeat steps 19 – 27 10 times. During uplink transfer in steps the SS continues monitoring the access burst on PTCCH such that (FN mod (8*52)) = 64 (TAI =2). SS checks the timing advance from PTCCH allocation is on carrier1.
29	SS -> MS	PACKET DOWNLINK ASSIGNMENT	Sent on PACCH of the PDTCH assigned in Step 17. Addressing the MS using the UL TFI assigned in Step 1 .Two Carriers Assigned. See specific message contents of sub-clause 58b.1.2. Timing advance values included. Including Timing Advance Index = 2: Assignment Type = Dual carrier Assignment
30	SS		Wait for at least 3 block periods
31	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	On carrier 1 with next in sequence BSN. USF not Assigned to MS.
32	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	On carrier 2 with next in sequence BSN Send on same Radio Block as Data Block Send on Carrier 1 with MCS-1 with valid RRBP field. USF not Assigned to MS.
33	MS -> SS	PACKET DOWNLINK ACK/NACK	MS acknowledges the previously received RLC data Blocks. Sent on PACCH on the valid RRBP specified in step 32.
34	SS -> MS	PACKET UPLINK ASSIGNMENT	Sent on PACCH of the PDTCH assigned in Step 29. Addressing the MS using the UL TFI assigned in Step 1 Two Carriers Assigned. New PDTCH assigned for carrier2 and carrier 1 will use assigned PDTCH in step29 See specific message contents 58b.1.2 Timing advance values included. Including Timing Advance Index = 2 Assignment Type = Dual carrier Assignment
35	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned on carrier 1, USF assigned to the MS.
36	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH on carrier1 SS verifies that the correct BSN is received and the correct MCS is used.
37	SS -> MS	PACKET UPLINK ACK/NACK	Sent on the PACCH, USF assigned to the MS.
38	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH on carrier2 SS verifies that the correct BSN is received and the correct MCS is used.
39	SS -> MS	PACKET UPLINK ACK/NACK	Sent on the PACCH,
40	SS -> MS	PACKET TIMESLOT RECONFIGURE	Sent on PACCH of the PDTCH assigned in Step 34. Addressing the MS using the UL TFI assigned. Assignment type = Single Carrier (C2) Assigned. See specific message contents section of this test
41	SS		Wait for at least 3 block periods
42	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	On carrier 2 with next in sequence BSN. USF not Assigned with MCS-1

43	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	On carrier 2 with next in sequence BSN with MCS-1 with valid RRBP field. USF not Assigned to the MS.
44	MS -> SS	PACKET DOWNLINK ACK/NACK	MS acknowledges the previously received RLC data Blocks. Sent on PACCH on the valid RRBP specified in step 43.
45	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Sent on the PACCH of the PDCH assigned on carrier 1, containing USF not assigned to the MS with a valid RRBP field
46	SS		SS monitors that no EGPRS PACKET DOWNLINK ACK/NACK is sent on C1 from MS
47	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned on carrier 2, containing USF assigned to the MS.
48	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH on carrier2 SS verifies that the correct BSN is received and the correct MCS is used.
49	SS -> MS	PACKET UPLINK ACK/NACK	Sent on the PACCH, USF assigned to the MS.
50	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH on carrier2 SS verifies that the correct BSN is received and the correct MCS is used.
51	SS		Repeat steps 42 – 50 10 times. During uplink transfer the SS continues monitoring the access burst on PTCCH such that (FN mod (8*52)) = 64 (TAI =2). SS checks the timing advance from PTCCH allocation is on carrier2. The SS makes sure that PTCCH slot and TA values from Carrier1 are still applied on Carrier2.
52	SS -> MS	PACKET DOWNLINK ASSIGNMENT	Sent on PACCH of the PDTCH assigned in Step 40 .Addressing the MS using the UL TFI assigned. Two Carriers Assigned. See specific message contents of sub-clause 58b.1.2. Timing advance values included. Including Timing Advance Index = 2 Assignment Type = Dual carrier Assignment
53	SS		Wait for at least 3 block periods
54	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	On carrier 1 with next in sequence BSN. USF not Assigned to the MS.
55	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	On carrier 2 with next in sequence BSN Send on same Radio Block as Data Block Send on Carrier 1 with MCS-1 with valid RRBP field USF not assigned to the MS.
56	MS -> SS	PACKET DOWNLINK ACK/NACK	MS acknowledges the previously received RLC data Blocks. Sent on PACCH on the valid RRBP specified in step 57.
57	SS -> MS	PACKET UPLINK ASSIGNMENT	Sent on PACCH of the PDTCH assigned in Step 52. Addressing the MS using the UL TFI assigned in Step 1. Two Carriers Assigned. New PDTCH assigned for carrier2 and carrier 1 will use assigned PDTCH in step 52 See specific message contents 58b.1.2 Timing advance values included. Including Timing Advance Index = 2 Assignment Type = Dual carrier Assignment
58	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned on carrier 1, containing USF assigned to the MS.
59	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH on carrier1 SS verifies that the correct BSN is received and the correct MCS is used.
60	SS -> MS	PACKET UPLINK ACK/NACK	Sent on the PACCH, USF assigned to the MS.
61	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH on carrier2 SS verifies that the correct BSN is received and the correct MCS is used.
62	SS -> MS	PACKET UPLINK ACK/NACK	Sent on the PACCH,

63	SS -> MS	PACKET TIMESLOT RECONFIGURE	Sent on PACCH of the PDTCH assigned in Step 57. Addressing the MS using the UL TFI assigned in step 1. Assignment type = Single Carrier (C1) Assigned. See specific message contents section of this test
64	SS		Wait for at least 3 block periods
65	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	On carrier 1 with next in sequence BSN with MCS-1 with valid RRBP field. USF not Assigned to the MS.
66	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	On carrier 1 with next in sequence BSN with MCS-1 with valid RRBP field. USF not Assigned to the MS.
67	MS -> SS	PACKET DOWNLINK ACK/NACK	MS acknowledges the previously received RLC data. Blocks. Sent on PACCH on the valid RRBP specified in step 66.
68	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Sent on the PACCH of the PDCH assigned on carrier 2, containing USF not assigned to the MS with a valid RRBP field
69	SS		SS monitors that no EGPRS PACKET DOWNLINK ACK/NACK is sent on C2 from MS
70	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned on carrier 1, containing USF assigned to the MS.
71	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH on carrier1 SS verifies that the correct BSN is received and the correct MCS is used.
72	SS -> MS	PACKET UPLINK ACK/NACK	Sent on the PACCH, USF assigned to the MS.
73	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH on carrier1 SS verifies that the correct BSN is received and the correct MCS is used.
74	SS		Repeat steps 66 - 73 10 times. During uplink transfer the SS continues monitoring the access burst on PTCCH and SS shall verify that the access burst are sent in the correct idle slots as specified in 3GPP TS 05.02 table 6.SS checks the timing advance from PTCCH allocation is on carrier1.
75	SS -> MS	PACKET DOWNLINK ASSIGNMENT	Sent on PACCH of the PDTCH assigned in Step 64 .Addressing the MS using the UL TFI. Two Carriers Assigned. See specific message contents of sub-clause 58b.1.2. Timing advance values included. Including Timing Advance Index = 2 Assignment Type = Dual carrier Assignment
76	SS		Wait for at least 3 block periods
77	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	On carrier 1 with next in sequence BSN. USF not assigned to the MS.
78	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	On carrier 2 with next in sequence BSN Send on same Radio Block as Data Block Send on Carrier 1 with MCS-1 with valid RRBP field
79	MS -> SS	PACKET DOWNLINK ACK/NACK	MS acknowledges the previously received RLC data Blocks. Sent on PACCH on the valid RRBP specified in step 78.
80	SS -> MS	PACKET UPLINK ASSIGNMENT	Addressed to the MS. Two Carriers Assigned. New PDTCH assigned for carrier2 and carrier 1 will use assigned PDTCH in step 1. See specific message contents 58b.1.2. Timing advance values included. Including Timing Advance Index = 2. Assignment Type = Dual carrier Assignment
81	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned on carrier 1, containing USF assigned to the MS.
82	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH on carrier1 SS verifies that the correct BSN is received and the correct MCS is used.
83	SS -> MS	PACKET UPLINK ACK/NACK	Sent on the PACCH, USF assigned to the MS.
84	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH on carrier2 SS verifies that the correct BSN is received and the correct MCS is used.

85	SS -> MS	PACKET UPLINK ACK/NACK	Sent on the PACCH,
86	SS -> MS	PACKET TIMESLOT RECONFIGURE	Legacy Rel 6 PDU. Sent on PACCH of the PDTCH assigned in Step 80. Addressing the MS using the UL TFI Timing Advance Index = 0. Assignment type = Single Carrier (C1) Assigned. New frequency parameters, New timeslots and new USF parameters specified. See specific message contents section of this test
87	SS		Wait for at least 3 block periods
88	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	On carrier 1 with next in sequence BSN. USF not Assigned.
89	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	On carrier 1 with next in sequence BSN with MCS-1 with valid RRBP field
90	MS -> SS	PACKET DOWNLINK ACK/NACK	MS acknowledges the previously received RLC data. Blocks. Sent on PACCH on the valid RRBP specified in step 89.
91	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Sent on the PACCH of the PDCH assigned on carrier 2, containing USF not assigned to the MS with a valid RRBP field.
92	SS		SS monitors that no EGPRS PACKET DOWNLINK ACK/NACK is sent on C2 from MS
93	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned on carrier 1, containing USF assigned to the MS.
94	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH on carrier1 SS verifies that the correct BSN is received and the correct MCS is used.
95	SS -> MS	PACKET UPLINK ACK/NACK	Sent on the PACCH, USF assigned to the MS.
96	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH on carrier1 SS verifies that the correct BSN is received and the correct MCS is used.
97		{Completion of Uplink and downlink data transfer}{ C98 completion of downlink and downlink data transfer }	
	SS		During the uplink data transfer (steps 96 to 99) the SS monitors the access burst on PTCCH which are located on slots with numbers FN, such that (FN mod (8*52)) = 12 for Timing Advance Index = 0 (3GPP TS 03.64 subclause 6.5.7.2 and 3GPP TS 05.02 table 6). The access burst contents shall be MESSAGE_TYPE = 011111 and CTRL_ACK = 11.

Specific Message Contents

PACKET DOWNLINK ASSIGNMENT message in step 5, 29, 52, 75:

Information Element	value/ remark
MESSAGE_TYPE	000010
PAGE_MODE	00 Normal Paging
Persistence Level	0 (no Persistence Level Present)
Referenced Address	Referenced by UL TFI
1	Message Escape Sequence for dual carrier…
00	
RLC_MODE	0 Acknowledged mode
CONTROL_ACK	0
<Assignment Info>	Assignment Info Struct
0	BTTI Mode
TIMESLOT_ALLOCATION_C1	arbitrarily chosen (default timeslot 4)
1	Carrier 2 explicitly assigned
TIMESLOT_ALLOCATION_C2	arbitrarily chosen (default timeslot 4)
Packet Timing Advance	
{ 0|1< TIMING_ADVANCE_VALUE >	1 (timing advance value)
- TIMING_ADVANCE_VALUE }	30 bit periods
{ 0|1< TIMING_ADVANCE_INDEX > <TIMING_ADVANCE_TIMESLOT_NUMBER > }	2 (timing advance index)
01	Legacy IEs Used
1< Frequency Parameters_C1>	Frequency Parameters_C1 Present
1< Frequency Parameters_C2>	Frequency Parameters_C2 Present
0	P0_C1 not present
{0|1<DOWNLINK_TFI_ASSIGNMENT>}	1 (assign downlink TFI)
- DOWNLINK_TFI_ASSIGNMENT	00001
{0|1<Power Control Parameters_C1>}	1 (Power Control Parameters present for Carrier1)
- ALPHA	0.5
- GAMMA for allocated timeslots	For DCS 1800 and PCS 1900: +6 dBm. For all other bands: +8 dBm (default timeslot 4)
{0|1<Power Control Parameters_C2>}	1 (Power Control Parameters present for Carrier2)
- ALPHA	0.5
- GAMMA for allocated timeslots	For DCS 1800 and PCS 1900: +6 dBmFor all other bands: +8 dBm (default timeslot 4)
0	EGPRS Window IE not present
0	Packet Extended Timing Advance not present
0	No PFI
0	No NPM transfer Time
0	Fast Ack/Nack Reporting not activated
Spare padding	Spare Padding

PACKET UPINK ASSIGNMENT message in step 10:

Information Element	value/ remark
MESSAGE_TYPE	001010
PAGE_MODE	00 Normal Paging
Persistence Level	0 No Persistence Level Present
GLOBAL_TFI	UL_TFI assigned in Step 1
- Resegment	0 Retransmitted RLC data blocks shall not be re-segmented
<Assignment Info>	Assignment Info struct
Assignment Type	10 (Dual carrier assignment)
Carrier ID	1 (carrier 2)
- EGPRS Window Size	Dependent upon test case (Default 64)
- {0|1 Access Technologies Request}	0 Access technology Request Info not present
- ARAC RETRANSMISSION REQUEST	0 retransmission of an ADDITIONAL MS RADIO ACCESS CAPABILITIES message is not requested
TLLI_BLOCK_CHANNEL_CODING	1
{0|1 BEP_PERIOD2}	0 BEP_PERIOD2 not present
Packet Timing Advance	
{ 0|1 < TIMING_ADVANCE_VALUE >	1 Timing Advance Value present
- TIMING_ADVANCE_VALUE }	30 bit periods
{ 0|1< TIMING_ADVANCE_INDEX > <TIMING_ADVANCE_TIMESLOT_NUMBER > }	0 (no timing advance index)
{ 0 | 1 < Packet Extended Timing Advance : bit (2) > }	0
{0 | 1 … }	0 (BTTI)
< Dynamic Allocation 2 struct > :	See below
EGPRS Modulation and Coding Scheme	Dependant upon test case (Default MCS_1)
{00 | 01…	01 (Legacy IEs Used)
0 | 1< Frequency Parameters_C1>	1 Frequency Parameters_C1 Present
0 | 1< Frequency Parameters_C2>	1 Frequency Parameters_C2 Present
}	P0_C1 not present
{ 0 | 1 < PFI : bit (7) > }	0 not present
{ 0 | 1 < RLC_MODE : bit (1) > }	0 not present
{ 0 | 1 < NPM Transfer Time : bit (5) > }	0 not present
{ 0 | 1 -- 1 indicates FANR is activated }	0 FANR not activated
< Uplink EGPRS Level: < EGPRS Level IE > >	00 (EGPRS)
{ 0 | 1 < Pulse Format: < Pulse Format IE > > }	0 not present
Dynamic Allocation 2 struct:	
EXTENDED_DYNAMIC_ALLOCATION	0 dynamic allocation only
{ 0 | 1 < P0 > …}	0 downlink power control is not used
USF_GRANULARITY	0 MS shall transmit only one RLC/MAC block
{ 0 | 1 < UPLINK_TFI_ASSIGNMENT >}	1 assign uplink TFI
- UPLINK_TFI_ASSIGNMENT	00000
{0 | 1 (with/without power control parameters)	0 allocation without power control parameters
N_USF	1100 (13 USFs signalled)
{ 0 | 1 < USF : bit (3) > } *(val(N_USF) + 1)	0 USF not assigned on C1 / TN0 0 USF not assigned on C1 / TN1 0 USF not assigned on C1 / TN2 0 USF not assigned on C1 / TN3 1 USF assigned on C1 / TN4
- USF	Arbitrarily chosen (default 000) 0 USF not assigned on C1 / TN5 0 USF not assigned on C1 / TN6 0 USF not assigned on C1 / TN7 0 USF not assigned on C2 / TN0 0 USF not assigned on C2 / TN1 0 USF not assigned on C2 / TN2 0 USF not assigned on C2 / TN3 1 USF assigned on C2 / TN4
- USF	Arbitrarily chosen (default 000) (note: it is allowed to truncate the list; no USFs assigned

	on remaining timeslots)

PACKET TIMESLOT RECONFIGURE message in step 17, 64

Information Element	value/ remark
MESSAGE_TYPE	0 00111
PAGE_MODE	00 Normal Paging
GLOBAL_TFI	UL_TFI assigned in Step 1
01	Message escape for Downlink Dual Carrier, BTTI using FANR, EGPRS 2, RTTI
EGPRS Channel Coding Command	0000 (MCS-1)
<RESEGMENT	1
Assignment Info	Assignment Info Struct
Assignment Type	10 (Assignment of Single carrier only)
Carrier ID	0 (carrier 1)
0|1 <DOWNLINK EGPRS Window Size>	0 (Not present)
0|1 <UPLINK EGPRS Window Size>	0 (Not present)
Global Packet Timing advance	
- {0|1 <TIMING_ADVANCE_VALUE>}	1 (timing advance value)
- TIMING_ADVANCE_VALUE	30 bit periods
0	BTTI mode
<TIMESLOT ALLOCATION_C1>	1
0 | 1 <TIMESLOT ALLOCATION_C2>	0
01	01 (Legacy IEs Used)
0 | 1< Frequency Parameters_C1>	1 Frequency Parameters_C1 Present
0 | 1< Frequency Parameters_C2>	0 Frequency Parameters_C2 Absent
TSC	arbitrarily chosen
0 | 1 < Uplink Control Timeslot C1>	0 (Not present)
0 | 1 < Uplink Control Timeslot C2>	0 (Not present)
0 | 1 < PFI of downlink TBF >	0 (Not present)

PACKET UPINK ASSIGNMENT message in step 34:

Information Element	value/ remark
MESSAGE_TYPE	001010
PAGE_MODE	00 Normal Paging
Persistence Level	0 No Persistence Level Present
GLOBAL_TFI	UL_TFI assigned in Step 1
- Resegment	0 Retransmitted RLC data blocks shall not be re-segmented
<Assignment Info>	Assignment Info struct
Assignment Type	10 (Dual carrier assignment)
Carrier ID	1 (carrier 2)
- EGPRS Window Size	Dependent upon test case (Default 64)
- {0|1 Access Technologies Request}	0 Access technology Request Info not present
- ARAC RETRANSMISSION REQUEST	0 retransmission of an ADDITIONAL MS RADIO ACCESS CAPABILITIES message is not requested
TLLI_BLOCK_CHANNEL_CODING	1
{0|1 BEP_PERIOD2}	0 BEP_PERIOD2 not present
Packet Timing Advance	
{ 0|1 < TIMING_ADVANCE_VALUE >	1 Timing Advance Value present
- TIMING_ADVANCE_VALUE }	30 bit periods
{ 0|1< TIMING_ADVANCE_INDEX > <TIMING_ADVANCE_TIMESLOT_NUMBER > }	0 (no timing advance index)
{ 0 | 1 < Packet Extended Timing Advance : bit (2) > }	0
{0 | 1 … }	0 (BTTI)
< Dynamic Allocation 2 struct > :	See below
EGPRS Modulation and Coding Scheme	Dependant upon test case (Default MCS_1)
{00 | 01…	01 (Legacy IEs Used)
0 | 1< Frequency Parameters_C1>	1 Frequency Parameters_C1 Present
0 | 1< Frequency Parameters_C2>	1 Frequency Parameters_C2 Present
}	P0_C1 not present
{ 0 | 1 < PFI : bit (7) > }	0 not present
{ 0 | 1 < RLC_MODE : bit (1) > }	0 not present
{ 0 | 1 < NPM Transfer Time : bit (5) > }	0 not present
{ 0 | 1 -- 1 indicates FANR is activated }	0 FANR not activated
< Uplink EGPRS Level: < EGPRS Level IE > >	00 (EGPRS)
{ 0 | 1 < Pulse Format: < Pulse Format IE > > }	0 not present
Dynamic Allocation 2 struct:	
EXTENDED_DYNAMIC_ALLOCATION	0 dynamic allocation only
{ 0 | 1 < P0 > …}	0 downlink power control is not used
USF_GRANULARITY	0 MS shall transmit only one RLC/MAC block
{ 0 | 1 < UPLINK_TFI_ASSIGNMENT >}	1 assign uplink TFI
- UPLINK_TFI_ASSIGNMENT	00000
{0 | 1 (with/without power control parameters)	0 allocation without power control parameters
N_USF	1011 (11 USFs signalled)
{ 0 | 1 < USF : bit (3) > } *(val(N_USF) + 1)	0 USF not assigned on C1 / TN0 0 USF not assigned on C1 / TN1 0 USF not assigned on C1 / TN2 1 USF assigned on C1 / TN3
	0 USF not assigned on C1 / TN4
- USF	Arbitrarily chosen (default 000)
	0 USF not assigned on C1 / TN5 0 USF not assigned on C1 / TN6 0 USF not assigned on C1 / TN7 0 USF not assigned on C2 / TN0 0 USF not assigned on C2 / TN1 0 USF not assigned on C2 / TN2 1 USF assigned on C2 / TN3
- USF	Arbitrarily chosen (default 000)
	(note: it is allowed to truncate the list; no USFs assigned

	on remaining timeslots)

PACKET TIMESLOT RECONFIGURE message in step 40:

Information Element	value/ remark
MESSAGE_TYPE	0 00111
PAGE_MODE	00 Normal Paging
GLOBAL_TFI	UL_TFI assigned in Step 1
01	Message escape for Downlink Dual Carrier, BTTI using FANR, EGPRS 2, RTTI
EGPRS Channel Coding Command	0000 (MCS-1)
<RESEGMENT	1
Assignment Info	Assignment Info Struct
Assignment Type	10 (Assignment of Single carrier only)
Carrier ID	1 (carrier 2)
0|1 <DOWNLINK EGPRS Window Size>	0 (Not present)
0|1 <UPLINK EGPRS Window Size>	0 (Not present)
Global Packet Timing advance	
- {0|1 <TIMING_ADVANCE_VALUE>}	1 (timing advance value)
- TIMING_ADVANCE_VALUE	30 bit periods
0	BTTI mode
<TIMESLOT ALLOCATION_C1>	1
0 | 1 <TIMESLOT ALLOCATION_C2>	0
01	01 (Legacy IEs Used)
0 | 1< Frequency Parameters_C1>	1 Frequency Parameters_C1 Present
0 | 1< Frequency Parameters_C2>	0 Frequency Parameters_C2 Absent
TSC	arbitrarily chosen
0 | 1 < Uplink Control Timeslot C1>	0 (Not present)
0 | 1 < Uplink Control Timeslot C2>	0 (Not present)
0 | 1 < PFI of downlink TBF >	0 (Not present)

PACKET UPINK ASSIGNMENT message in step 57:

Information Element	value/ remark
MESSAGE_TYPE	001010
PAGE_MODE	00 Normal Paging
Persistence Level	0 No Persistence Level Present
GLOBAL_TFI	UL_TFI assigned in Step 1
- {0|1 CONTENTION_RESOLUTION_TLLI}	0 not present
- Resegment	0 Retransmitted RLC data blocks shall not be re-segmented
<Assignment Info>	Assignment Info struct
Assignment Type	10 (Dual carrier assignment)
Carrier ID	1 (carrier 2)
- EGPRS Window Size	Dependent upon test case (Default 64)
- {0|1 Access Technologies Request}	0 Access technology Request Info not present
- ARAC RETRANSMISSION REQUEST	0 retransmission of an ADDITIONAL MS RADIO ACCESS CAPABILITIES message is not requested
TLLI_BLOCK_CHANNEL_CODING	1
{0|1 BEP_PERIOD2}	0 BEP_PERIOD2 not present
Packet Timing Advance	
{ 0|1 < TIMING_ADVANCE_VALUE >	1 Timing Advance Value present
- TIMING_ADVANCE_VALUE }	30 bit periods
{ 0|1< TIMING_ADVANCE_INDEX > <TIMING_ADVANCE_TIMESLOT_NUMBER > }	0 (no timing advance index)
{ 0 | 1 < Packet Extended Timing Advance : bit (2) > }	0
{0 | 1 … }	0 (BTTI)
< Dynamic Allocation 2 struct > :	See below
EGPRS Modulation and Coding Scheme	Dependant upon test case (Default MCS_1)
{00 | 01…	01 (Legacy IEs Used)
0 | 1< Frequency Parameters_C1>	1 Frequency Parameters_C1 Present
0 | 1< Frequency Parameters_C2>	1 Frequency Parameters_C2 Present
}	P0_C1 not present
{ 0 | 1 < PFI : bit (7) > }	0 not present
{ 0 | 1 < RLC_MODE : bit (1) > }	0 not present
{ 0 | 1 < NPM Transfer Time : bit (5) > }	0 not present
{ 0 | 1 -- 1 indicates FANR is activated }	0 FANR not activated
< Uplink EGPRS Level: < EGPRS Level IE > >	00 (EGPRS)
{ 0 | 1 < Pulse Format: < Pulse Format IE > > }	0 not present
Dynamic Allocation 2 struct:	
EXTENDED_DYNAMIC_ALLOCATION	0 dynamic allocation only
{ 0 | 1 < P0 > …}	0 downlink power control is not used
USF_GRANULARITY	0 MS shall transmit only one RLC/MAC block
{ 0 | 1 < UPLINK_TFI_ASSIGNMENT >}	1 assign uplink TFI
- UPLINK_TFI_ASSIGNMENT	00000
{0 | 1 (with/without power control parameters)	0 allocation without power control parameters
N_USF	1110 (14 USFs signalled)
{ 0 | 1 < USF : bit (3) > } *(val(N_USF) + 1)	0 USF not assigned on C1 / TN0 0 USF not assigned on C1 / TN1 0 USF not assigned on C1 / TN2 0 USF not assigned on C1 / TN3 0 USF not assigned on C1 / TN4
- USF	Arbitrarily chosen (default 000)
	1 USF assigned on C1 / TN5 0 USF not assigned on C1 / TN6 0 USF not assigned on C1 / TN7 0 USF not assigned on C2 / TN0 0 USF not assigned on C2 / TN1 0 USF not assigned on C2 / TN2 0 USF not assigned on C2 / TN3 0 USF not assigned on C2 / TN4 1 USF assigned on C2 / TN5

- USF	Arbitrarily chosen (default 000) (note: it is allowed to truncate the list; no USFs assigned on remaining timeslots)

PACKET UPINK ASSIGNMENT message in step 81:

<table>
<tr><th>Information Element</th><th>value/ remark</th></tr>
<tr><td>MESSAGE_TYPE</td><td>001010</td></tr>
<tr><td>PAGE_MODE</td><td>00 Normal Paging</td></tr>
<tr><td>Persistence Level</td><td>0 No Persistence Level Present</td></tr>
<tr><td>GLOBAL_TFI</td><td>UL_TFI assigned in Step 1</td></tr>
<tr><td>- Resegment</td><td>0 Retransmitted RLC data blocks shall not be re-segmented</td></tr>
<tr><td><Assignment Info></td><td>Assignment Info struct</td></tr>
<tr><td>Assignment Type</td><td>10 (Dual carrier assignment)</td></tr>
<tr><td>Carrier ID</td><td>1 (carrier 2)</td></tr>
<tr><td>- EGPRS Window Size</td><td>Dependent upon test case (Default 64)</td></tr>
<tr><td>- {0|1 Access Technologies Request}</td><td>0 Access technology Request Info not present</td></tr>
<tr><td>- ARAC RETRANSMISSION REQUEST</td><td>0 retransmission of an ADDITIONAL MS RADIO ACCESS CAPABILITIES message is not requested</td></tr>
<tr><td>TLLI_BLOCK_CHANNEL_CODING</td><td>1</td></tr>
<tr><td>{0|1 BEP_PERIOD2}</td><td>0 BEP_PERIOD2 not present</td></tr>
<tr><td>Packet Timing Advance</td><td></td></tr>
<tr><td>{ 0|1 < TIMING_ADVANCE_VALUE ></td><td>1 Timing Advance Value present</td></tr>
<tr><td>- TIMING_ADVANCE_VALUE }</td><td>30 bit periods</td></tr>
<tr><td>{ 0|1< TIMING_ADVANCE_INDEX >
<TIMING_ADVANCE_TIMESLOT_NUMBER > }</td><td>0 (no timing advance index)</td></tr>
<tr><td>{ 0 | 1 < Packet Extended Timing Advance : bit (2) > }</td><td>0</td></tr>
<tr><td>{0 | 1 … }</td><td>0 (BTTI)</td></tr>
<tr><td>< Dynamic Allocation 2 struct > :</td><td>See below</td></tr>
<tr><td>EGPRS Modulation and Coding Scheme</td><td>Dependant upon test case (Default MCS_1)</td></tr>
<tr><td>{00 | 01…</td><td>01 (Legacy IEs Used)</td></tr>
<tr><td>0 | 1< Frequency Parameters_C1></td><td>1 Frequency Parameters_C1 Present</td></tr>
<tr><td>0 | 1< Frequency Parameters_C2></td><td>1 Frequency Parameters_C2 Present</td></tr>
<tr><td>}</td><td>P0_C1 not present</td></tr>
<tr><td>{ 0 | 1 < PFI : bit (7) > }</td><td>0 not present</td></tr>
<tr><td>{ 0 | 1 < RLC_MODE : bit (1) > }</td><td>0 not present</td></tr>
<tr><td>{ 0 | 1 < NPM Transfer Time : bit (5) > }</td><td>0 not present</td></tr>
<tr><td>{ 0 | 1 -- 1 indicates FANR is activated
}</td><td>0 FANR not activated</td></tr>
<tr><td>< Uplink EGPRS Level: < EGPRS Level IE > ></td><td>00 (EGPRS)</td></tr>
<tr><td>{ 0 | 1 < Pulse Format: < Pulse Format IE > >
}</td><td>0 not present</td></tr>
<tr><td>Dynamic Allocation 2 struct:</td><td></td></tr>
<tr><td>EXTENDED_DYNAMIC_ALLOCATION</td><td>0 dynamic allocation only</td></tr>
<tr><td>{ 0 | 1 < P0 > …}</td><td>0 downlink power control is not used</td></tr>
<tr><td>USF_GRANULARITY</td><td>0 MS shall transmit only one RLC/MAC block</td></tr>
<tr><td>{ 0 | 1 < UPLINK_TFI_ASSIGNMENT >}</td><td>1 assign uplink TFI</td></tr>
<tr><td>- UPLINK_TFI_ASSIGNMENT</td><td>00000</td></tr>
<tr><td>{0 | 1 (with/without power control parameters)</td><td>0 allocation without power control parameters</td></tr>
<tr><td>N_USF</td><td>1011 (11 USFs signalled)</td></tr>
<tr><td>{ 0 | 1 < USF : bit (3) > } *(val(N_USF) + 1)</td><td>0 USF not assigned on C1 / TN0
0 USF not assigned on C1 / TN1
0 USF not assigned on C1 / TN2
0 USF not assigned on C1 / TN3
1 USF assigned on C1 / TN4</td></tr>
<tr><td>- USF</td><td>Arbitrarily chosen (default 000)
0 USF not assigned on C1 / TN5
0 USF not assigned on C1 / TN6
0 USF not assigned on C1 / TN7
0 USF not assigned on C2 / TN0
0 USF not assigned on C2 / TN1
0 USF not assigned on C2 / TN2
1 USF assigned on C2 / TN3</td></tr>
<tr><td>- USF</td><td>Arbitrarily chosen (default 000)
(note: it is allowed to truncate the list; no USFs assigned on remaining timeslots)</td></tr>
</table>

PACKET TIMESLOT RECONFIGURE message in step 88:

Information Element	value/ remark
MESSAGE_TYPE	0 00111
PAGE_MODE	00 Normal Paging
GLOBAL_TFI	UL_TFI assigned in Step 1
01	Message escape for Downlink Dual Carrier, BTTI using FANR, EGPRS 2, RTTI
EGPRS Channel Coding Command	0000 (MCS-1)
<RESEGMENT	1
Assignment Info	Assignment Info Struct
Assignment Type	10 (Assignment of Single carrier only)
Carrier ID	0 (carrier 1)
0|1 <DOWNLINK EGPRS Window Size>	0 (Not present)
0|1 <UPLINK EGPRS Window Size>	0 (Not present)
Global Packet Timing advance	
- {0|1 <TIMING_ADVANCE_VALUE>}	1 (timing advance value)
- TIMING_ADVANCE_VALUE	30 bit periods
0	BTTI mode
<TIMESLOT ALLOCATION_C1>	1
0 | 1 <TIMESLOT ALLOCATION_C2>	1(new time slot assignment)
01	01 (Legacy IEs Used)
0 | 1< Frequency Parameters_C1>	1 Frequency Parameters_C1 Present (new frequency assigned)
0 | 1< Frequency Parameters_C2>	0 Frequency Parameters_C2 Absent
TSC	arbitrarily chosen
N_TS	New TS and USF assigned
0 | 1 < Uplink Control Timeslot C1>	0 (Not present)
0 | 1 < Uplink Control Timeslot C2>	0 (Not present)
0 | 1 < PFI of downlink TBF >	0 (Not present)

58b.1.3 Single Carrier Concurrent TBF/Downlink TBF reconfigured to DLDC configuration / Uplink single carrier TBF reallocated to Carrier 2/Uplink modified to Dual Carrier

58b.1.3.1 Conformance requirement

If the network and mobile station both support Downlink Dual Carrier, the network may send a packet assignment message to a mobile station specifying packet resources for one or more TBFs on two carriers (referred to as carrier 1 and carrier 2) and thereby establish a Downlink Dual Carrier configuration. If this message is sent to a mobile station in packet idle mode, the assignment message shall include frequency parameters for both carriers.

When a mobile station has resources assigned on only one carrier then, for the purposes of subsequent assignment messages, that carrier shall be considered carrier 1. A subsequent assignment message may assign resources on a second carrier, thereby establishing a Downlink Dual Carrier configuration; in this case, the assignment message shall provide frequency parameters for a second carrier (carrier 2) for use in a Downlink Dual Carrier configuration.

If the assignment message contains the *Assignment Info* IE indicating an assignment type other than 'Dual Carrier assignment', then the packet resources specified in this message replace any existing assignment for the addressed TBFs on the carrier identified by the Carrier ID field. In this case, if the assignment message addresses TBFs that currently have packet resources assigned on the other carrier (i.e. the carrier not identified by the Carrier ID field) then these packet resources shall be treated as follows:

- these resources are implicitly released, if the ASSIGNMENT TYPE field (carried in the *Assignment Info IE*) indicates that the assignment is an ‘Assignment on single carrier only';
- these resources are unchanged, if the ASSIGNMENT TYPE field indicates that the assignment is a ‘Modification of existing assignment’.

If the assignment message contains the *Assignment Info* IE indicating an assignment type of 'Dual Carrier assignment', then the packet resources specified in this message replace any existing assignment for the addressed TBFs.

Subsequent assignment messages may be sent to a mobile station operating in a Downlink Dual Carrier configuration as described in sub-clause 8.1.1.1.3.

3GPP TS 44.060; subclause 5.5.1.7, 8.1.1.1.3 and 7.1.2.5

58b.1.3.2 Test purpose

To verify that:

- the MS can change from single carrier concurrent TBF to a DLDC TBF with the uplink reallocated to carrier 2.
- re-assignment with different Assignment type for downlink and uplink.

58b.1.3.3. Method of test

Initial Conditions

System Simulator:

1 cell, EGPRS supported, Downlink Dual Carrier supported.

Mobile Station:

Support for Downlink Dual Carrier indicated in MS Radio Access Capabilities IE.

The MS is in the state "idle, GMM-registered" with a P-TMSI allocated, SPLIT PG CYCLE negotiated, and PDP context 2 activated.

Specific PICS Statements

PIXIT Statements

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Test Procedure

The EGPRS capable MS is made to transmit uplink RLC data blocks. MS receives a PACKET DOWNLINK ASSIGNMENT message on its PACCH. MS receives another PACKET DOWNLINK ASSIGNMENT message on its PACCH with dual carrier assignment type. SS transmits downlink RLC data blocks for on both carriers. MS sends uplink data block on carrier 1. SS sends packet downlink assignment message (assignment type single carrier) to establish single carrier configuration on the downlink side on carrier 1. SS sends downlink blocks on carrier 1 and MS sends acknowledgment. MS receives a PACKET DOWNLINK ASSIGNMENT message on its PACCH with dual carrier assignment type. Frequency parameters for both carriers are specified. Carrier 1 is specified for all other parameters and this applies to both carriers. SS sends another PACKET DOWNLINK ASSIGNMENT message. All the parameters for carrier 1 and 2 are specified separately. SS sends a PACKET UPLINK ASSIGNMENT (assignment of single carrier only) message. Uplink TBF is reallocated to carrier 2. SS sends another PACKET UPLINK ASSIGNMENT (modification of existing assignment) message. Uplink TBF is reallocated to carrier 1. MS receives another PACKET UPLINK ASSIGNMENT (dual carrier assignment) message. Both carriers are assigned on uplink side. MS completes uplink data transfer.

After each assignment SS checks:

- that the MS is sending uplink data block only on the uplink assigned carrier
- that the MS answers to the polled downlink data block only on the downlink assigned carrier

Maximum Duration of Test

5 minutes.

Expected Sequence

Step	Direction	Message	Comments
1		{Uplink dynamic allocation two phase access}	N = 500 octets USF_GRANULARITY = 1 block EGPRS Channel Coding Command: MCS-1
2	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned, containing USF assigned to the MS.
3	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH SS verifies that the BSN starts from 0, and the correct MCS is used.
4	SS -> MS	PACKET DOWNLINK ASSIGNMENT	Sent on PACCH of the PDTCH assigned in Step 1. Addressing the MS using the UL TFI assigned in Step 1.
5	SS -> MS	PACKET DOWNLINK ASSIGNMENT	Sent on PACCH of the PDTCH addressing the MS assigned in step 1. Assignment type “Modification of existing assignment” Carrier 2 assigned.
6	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	On carrier 1 with next in sequence BSN (start with BSN 0) USF assigned to the MS. MCS-1. A valid RRBP is indicated.
7	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH on carrier1 SS verifies that the correct BSN is received and the correct MCS is used.
8	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	On carrier 2 with next in sequence BSN MCS-1. A valid RRBP is indicated.
9	MS->SS	EGPRS PACKET DOWNLINK ACK/NACK	In the uplink block specified by the RRBP field.
10	SS -> MS	PACKET DOWNLINK ASSIGNMENT	Sent on PACCH of the PDTCH addressing the MS assigned in step 1. Assignment type “Assignment of single carrier only” Carrier 1 assigned.
11	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	On carrier 1 with next in sequence BSN USF assigned to the MS. MCS-1. A valid RRBP is indicated.
12	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH on carrier1 SS verifies that the correct BSN is received and the correct MCS is used.
13	MS->SS	EGPRS PACKET DOWNLINK ACK/NACK	In the uplink block specified by the RRBP field.
14	SS -> MS	PACKET DOWNLINK ASSIGNMENT	Sent on PACCH of the PDTCH addressing the MS assigned in step 1. Assignment type “Dual Carrier assignment” Both Carriers assigned.
15	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	On carrier 1 with next in sequence BSN Send with MCS-1, USF assigned to MS in step 13.
16	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	On carrier 2 with next in sequence BSN Send on same Radio Block as Data Block Send on carrier 1 with MCS-1. A valid RRBP is indicated.
17	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on carrier 1.
18	MS->SS	EGPRS PACKET DOWNLINK ACK/NACK	In the uplink block specified by the RRBP field.
19	SS -> MS	PACKET UPLINK ASSIGNMENT	Addressed to the MS. Assignment type “Assignment of single carrier only” Carrier 2 assigned.
20	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned on carrier 2, containing USF assigned to the MS.
21	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH on carrier 2. SS verifies that the correct BSN is received and the correct MCS is used.
22	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned on carrier 1, containing USF assigned to the MS
23			SS checks that the MS does not answer
24	SS -> MS	PACKET UPLINK ASSIGNMENT	Addressed to the MS. Assignment type “Assignment of single carrier only” Carrier 1 is assigned.

25	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned on carrier 1,
26	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH on carrier 1. SS verifies that the correct BSN is received and the correct MCS is used.
27	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned on carrier 2, containing USF assigned to the MS.
28			SS checks that the MS does not answer
29	SS -> MS	PACKET UPLINK ASSIGNMENT	Addressed to the MS. Assignment type “Dual Carrier assignment ” Both Carriers are assigned.
30	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	On carrier 1 with next in sequence BSN Send with MCS-1. USF assigned to the MS. With next in sequence BSN. FBI bit set to '1' and valid RRBP field
31	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on carrier 1.
32	MS -> SS	EGPRS DOWNLINK PACKET DOWNLINK ACK/NACK	On carrier 1, in the uplink block specified by the RRBP field. Final Ack Indicator bit set to '1' .
33	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned on carrier 2, containing USF assigned to the MS.
34	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH on carrier 2. SS verifies that the correct BSN is received and the correct MCS is used.
35	SS-> MS	PACKET UPLINK ACK/NACK	SS acknowledges RLC data block received.
36		{Completion of uplink RLC data block transfer}	

Specific Message Contents

None.

58b.1.4 Single Carrier Uplink TBF with no Downlink TBF / DLDC TBF established / Uplink DLDC TBF (on both carrier 1 and carrier 2)/ Uplink TBF Reconfigured to Single Carrier TBF

58b.1.4.1 Conformance requirement

If the network and mobile station both support Downlink Dual Carrier, the network may send a packet assignment message to a mobile station specifying packet resources for one or more TBFs on two carriers (referred to as carrier 1 and carrier 2) and thereby establish a Downlink Dual Carrier configuration. If this message is sent to a mobile station in packet idle mode, the assignment message shall include frequency parameters for both carriers. If this message is sent to a mobile station which is in packet transfer mode (and is not in a Downlink Dual Carrier configuration) the assignment message shall either:

- provide new frequency parameters for both carriers, or

- provide frequency parameters for only one carrier (carrier 2) in which case the frequency parameters for carrier 1 remain unchanged.

When a mobile station has resources assigned on only one carrier then, for the purposes of subsequent assignment messages, that carrier shall be considered carrier 1. A subsequent assignment message may assign resources on a second carrier, thereby establishing a Downlink Dual Carrier configuration; in this case, the assignment message shall provide frequency parameters for a second carrier (carrier 2) for use in a Downlink Dual Carrier configuration.

When assigning resources on one carrier to a mobile station which is currently in a Downlink Dual Carrier configuration using a format of the message which does not include the Carrier ID field, the network shall always include frequency parameters;

If the assignment message contains the *Assignment Info* IE indicating an assignment type other than 'Dual Carrier assignment', then the packet resources specified in this message replace any existing assignment for the addressed TBFs on the carrier identified by the Carrier ID field. In this case, if the assignment message addresses TBFs that currently have packet resources assigned on the other carrier (i.e. the carrier not identified by the Carrier ID field) then these packet resources shall be treated as follows:

- these resources are implicitly released, if the ASSIGNMENT TYPE field (carried in the *Assignment Info IE*) indicates that the assignment is an ‘Assignment on single carrier only';
- these resources are unchanged, if the ASSIGNMENT TYPE field indicates that the assignment is a ‘Modification of existing assignment’.

If the assignment message contains the *Assignment Info* IE indicating an assignment type of 'Dual Carrier assignment', then the packet resources specified in this message replace any existing assignment for the addressed TBFs.

3GPP TS 44.060; subclause 5.5.1.7 and 8.1.1.1.3

58b.1.4.2 Test purpose

To verify that the MS:

-the MS can change from single carrier uplink TBF to (with no downlink TBF) to downlink dual carrier TBF with additional resources on new frequency and resources for uplink TBF being allocated on both carriers.

-the MS is able to change from dual carrier configuration in uplink and downlink direction and operate a single carrier TBF in uplink.

58b.1.4.3. Method of test

Initial Conditions

System Simulator:

1 cell, EGPRS supported, Downlink Dual Carrier supported.

Mobile Station:

Support for Downlink Dual Carrier indicated in MS Radio Access Capabilities IE.

The MS is in the state "idle, GMM-registered" with a P-TMSI allocated, SPLIT PG CYCLE negotiated, and PDP context 2 activated.

Specific PICS Statements

PIXIT Statements

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Test Procedure

The EGPRS capable MS is made to transmit uplink RLC data blocks in EGPRS TBF RLC acknowledged mode. MS receives a PACKET TIMESLOT RECONFIGURE (Assignment type “Dual Carrier assignment”) message on its PACCH, instructing a Dual Carrier configuration for both uplink and downlink. SS sends downlink data block simultaneously on both carriers and MS sends uplink data block.

SS sends another PACKET TIMESLOT RECONFIGURE (Assignment type “Dual Carrier assignment”) to change the USF and timeslot assignment on both carriers in both uplink and downlink direction. MS sends PACKET DOWNLINK DUMMY CONTROL BLOCK on USF not assigned to MS to verify MS does not response to old USF assignment. MS sends uplink data blocks on both carriers on newly assigned USF. The SS sends downlink RLC data blocks on carrier 1 and carrier 2 under new assignment.

MS then receives a PACKET UPLINK ASSIGNMENT message (with assignment type single carrier assignment) to establish single carrier operation on uplink side (carrier 1). MS should not send any data on carrier 2.

SS sends PACKET UPLINK ASSIGNMENT message (Assignment type “Dual Carrier assignment”) to change uplink side from single carrier to dual carrier. MS then receives a PACKET UPLINK ASSIGNMENT message (with assignment type single carrier assignment) to establish single carrier operation on uplink side (carrier 1). This is a legacy Rel-6 message. MS finishes uplink data transfer.

Maximum Duration of Test

8 minutes.

Expected Sequence

Step	Direction	Message	Comments
1		{Uplink dynamic allocation two phase access}	N = 4000 octets USF_GRANULARITY = 1 block EGPRS Channel Coding Command: MCS-1
2	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned, containing USF assigned to the MS.
3	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH SS verifies that the BSN starts from 0, and the correct MCS is used.
4	SS -> MS	PACKET UPLINK ACK/NACK	SS acknowledges RLC data block received.
5	SS -> MS	PACKET TIMESLOT RECONFIGURE	Sent on PACCH of the PDTCH assigned in Step 1. Assignment type “Dual Carrier assignment” Addressing the MS using the UL TFI assigned in Step 1. Two Carriers Assigned for both uplink and downlink. See specific message contents.
6	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	On carrier 1 with next in sequence BSN (start with BSN 0) USF assigned to the MS. MCS-1. A valid RRBP is indicated.
7	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	On carrier 2 with next in sequence BSN Send on same Radio Block as data block sent on carrier 1. USF assigned to the MS. MCS-1.
8	MS ->SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH on carrier 1 SS verifies that the correct BSN is received and the correct MCS is used.
9	MS->SS	EGPRS PACKET DOWNLINK ACK/NACK	In the uplink block specified by the RRBP field.
10	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned on carrier 1 containing USF assigned to the MS.
11	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH on carrier1 SS verifies that the correct BSN is received and the correct MCS is used.
12	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned on carrier 2, containing USF assigned to the MS.
13	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH on carrier2 SS verifies that the correct BSN is received and the correct MCS is used.
14	SS -> MS	PACKET TIMESLOT RECONFIGURE	Sent on PACCH of the PDTCH assigned in Step 1. Assignment type “Dual Carrier assignment” New assignment of timeslot and usf for both uplink and downlink. See specific message contents.
15	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned on carrier 1 containing USF assigned to the MS in step 5.
16	SS		SS should check MS does not send any data on carrier 1.
17	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned on carrier 1, USF assigned to the MS.
18	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH on carrier1 SS verifies that the correct BSN is received and the correct MCS is used.
19	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned on carrier 2, containing USF assigned to MS in step 5.
20	SS		SS should check MS does not send any data on carrier 2.
21	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned on carrier 2, USF assigned to the MS.
22	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH on carrier2 SS verifies that the correct BSN is received and the correct MCS is used.
23	SS -> MS	PACKET UPLINK ACK/NACK	SS acknowledges RLC data block received.
24	SS-> MS	EGPRS DOWNLINK RLC DATA BLOCK	On carrier 1 with next in sequence BSN MCS-1. A valid RRBP is indicated.
25	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	On carrier 2 with next in sequence BSN Send on same Radio Block as data block sent on carrier 1. MCS-1
26	MS->SS	EGPRS PACKET DOWNLINK ACK/NACK	In the uplink block specified by the RRBP field.

27	SS -> MS	PACKET UPLINK ASSIGNMENT	Addressed to the MS. Assignment type “Assignment of single carrier only” Carrier 1 assigned.
28	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned on carrier 1, containing USF assigned to the MS.
29	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH on carrier1 SS verifies that the correct BSN is received and the correct MCS is used.
31	SS		SS should check no data is send on USF on carrier 2 from MS
32	SS -> MS	PACKET UPLINK ASSIGNMENT	Addressed to the MS. Assignment type “Dual Carrier assignment” Both carrier 1 and 2 assigned.
33	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned on carrier 1, containing USF assigned to the MS.
34	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH on carrier1 SS verifies that the correct BSN is received and the correct MCS is used.
35	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned on carrier 2, containing USF assigned to the MS.
36	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH on carrier 2 SS verifies that the correct BSN is received and the correct MCS is used.
37	SS -> MS	PACKET UPLINK ASSIGNMENT	Addressed to the MS. Assignment type “Assignment of single carrier only” Carrier 1 assigned. Legacy Rel 6 message. See specific message contents.
38	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned on carrier 1, containing USF assigned to the MS.
39	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH on carrier1 SS verifies that the correct BSN is received and the correct MCS is used.
40	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	On carrier 1 with next in sequence BSN. A valid RRBP is indicated.
41	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	On carrier 2 with next in sequence BSN Send on same Radio Block as data block sent on carrier 1. MCS-1
42	MS->SS	EGPRS PACKET DOWNLINK ACK/NACK	In the uplink block specified by the RRBP field.
43	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned on carrier 1, containing USF assigned to the MS.
44	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH on carrier1 SS verifies that the correct BSN is received and the correct MCS is used.
45	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Sent on the PACCH of the PDCH assigned on carrier 1 with next in sequence BSN. FBI bit set to '1' and valid RRBP field, sent on Carrier 1. MCS-1
46	MS -> SS	EGPRS PACKET DOWNLINK ACK/NACK	Received on the assigned PDTCH on carrier1 In the uplink block specified by the RRBP field. Final Ack Indicator bit set to '1' .
47	SS-> MS	PACKET UPLINK ACK/NACK	SS acknowledges RLC data block received.
48		{Completion of uplink RLC data block transfer}	

Specific Message Contents

PACKET TIMESLOT RECONFIGURE message in step 5:

Information Element	value/ remark
MESSAGE_TYPE	0 00111
PAGE_MODE	00 Normal Paging
GLOBAL_TFI	DL_TFI assigned in Step 1
01	Message escape for Downlink Dual Carrier, BTTI using FANR, EGPRS 2, RTTI
EGPRS Channel Coding Command	0000 (MCS-1)
<**RESEGMENT**	1
Assignment Info	Assignment Info Struct
Assignment Type	10 (Dual Carrier Assignment)
Carrier ID	0 (carrier 1)
0|1 <DOWNLINK EGPRS Window Size>	0 (Not present)
0|1 <UPLINK EGPRS Window Size>	0 (Not present)
0	BTTI mode
<TIMESLOT ALLOCATION_C1>	1
0 | 1 <TIMESLOT ALLOCATION_C2>	1 (new assignment)
10	Optimized Dual Carrier frequency parameters used
Dual Carrier Frequency Parameters	Dual Carrier Frequency Parameters IE
TSC	arbitrarily chosen
0 | 1 < Uplink Control Timeslot C1>	0 (Not present)
0 | 1 < Uplink Control Timeslot C2>	0 (Not present)
0 | 1 < PFI of downlink TBF >	0 (Not present)
0 | 1 < UPLINK_RLC_MODE >	0 (Not present)
0 | 1 < NPM Transfer Time) >	0 (Not present)
0	Fast Ack/Nack Reporting not activated
< Uplink EGPRS Level>	00 (EGPRS)
< Downlink EGPRS Level >	00 (EGPRS)
0 | 1 < Pulse Format>	0 (Not present)
< padding bits >	

PACKET TIMESLOT RECONFIGURE message in step 14:

Information Element	value/ remark
MESSAGE_TYPE	0 00111
PAGE_MODE	00 Normal Paging
GLOBAL_TFI	DL_TFI assigned in Step 1
01	Message escape for Downlink Dual Carrier, BTTI using FANR, EGPRS 2, RTTI
EGPRS Channel Coding Command	0000 (MCS-1)
<**RESEGMENT**	1
Assignment Info	Assignment Info Struct
Assignment Type	10 (Dual Carrier Assignment)
Carrier ID	arbitrarily chosen
0|1 <DOWNLINK EGPRS Window Size>	0 (Not present)
0|1 <UPLINK EGPRS Window Size>	0 (Not present)
0	BTTI mode
<TIMESLOT ALLOCATION_C1>	Different from step 1
0 | 1 <TIMESLOT ALLOCATION_C2>	1 (new assignment)
10	Optimized Dual Carrier frequency parameters used
Dual Carrier Frequency Parameters	Dual Carrier Frequency Parameters IE
TSC	arbitrarily chosen
0 | 1 < Uplink Control Timeslot C1>	1 (present)
0 | 1 < Uplink Control Timeslot C2>	1 (present)
0 | 1 < PFI of downlink TBF >	0 (Not present)
0 | 1 < UPLINK_RLC_MODE >	0 (Not present)
0 | 1 < NPM Transfer Time) >	0 (Not present)
0	Fast Ack/Nack Reporting not activated
< Uplink EGPRS Level>	00 (EGPRS)
< Downlink EGPRS Level >	00 (EGPRS)
0 | 1 < Pulse Format>	0 (Not present)
< padding bits >	

PACKET UPLINK ASSIGNMENT message in step 27:

Information Element	value/ remark
MESSAGE_TYPE	001110
PAGE_MODE	Normal Paging
Referenced Address	
-	1 (not Global TFI)
-	1 (not TLLI)
-	1 (not TQI)
-	1 (Packet Request Reference)
- Packet Request Reference	information field sent in PACKET CHANNEL REQUEST and frame number in which PACKET CHANNEL REQUEST was received
CHANNEL_CODING_COMMAND	MCS-2 coding
TLLI_BLOCK_CHANNEL_CODING	MCS-1 coding
{L|H<UPLINK_TFI_ASSIGNMENT>}	H (assign an uplink TFI)
- UPLINK_TFI_ASSIGNMENT	0000110 (uplink TBF identifier)
Packet Timing Advance	
-	1 (timing advance value)
- TIMING_ADVANCE_VALUE	30 bit periods
-	0 (no timing advance index)
{L|H<Frequency Parameters>}	H (Frequency Parameters present)
- Frequency Parameters	
- TSC	5
-	00 (no hopping)
- ARFCN	For GSM 700, T-GSM 810: 460 For GSM 850: 150 For GSM 900: 30 For DCS 1 800: 650 For PCS 1 900: 650
{0|1<List of Reference Frequency lists>}	0 (no reference frequencies)
{0|1<Mobile Allocation list>}	0 (no MA)
	LL (Dynamic Allocation)
Dynamic Allocation	
-	H (Contention Resolution TLLI is present)
- CONTENTION_RESOLUTION_TLLI	As allocated to the MS
-	H (power control parameters)
- ALPHA	0.5
- GAMMA_TN0	0 (not present)
- GAMMA_TN1	0 (not present)
- GAMMA_TN2	1
- GAMMA_TN2	8 dBm (GSM 700), 8 dBm (T-GSM 810), 8 dBm (GSM 850), 8 dBm (GSM 900), 6 dBm (DCS 1 800), 6 dBm (PCS 1 900)
- GAMMA_TN3	0 (not present)
- GAMMA_TN4	0 (not present)
- GAMMA_TN5	0 (not present)
- GAMMA_TN6	0 (not present)
- GAMMA_TN7	0 (not present)

58b.1.5 Single Carrier Downlink TBF with No Uplink TBF/ Downlink reconfigured to DLDC TBF/ Uplink TBF established

58b.1.5.1 Conformance requirement

If the network and mobile station both support Downlink Dual Carrier, the network may send a packet assignment message to a mobile station specifying packet resources for one or more TBFs on two carriers (referred to as carrier 1 and carrier 2) and thereby establish a Downlink Dual Carrier configuration. If this message is sent to a mobile station in packet idle mode, the assignment message shall include frequency parameters for both carriers. If this message is sent to a mobile station which is in packet transfer mode (and is not in a Downlink Dual Carrier configuration) the assignment message shall either:

- provide new frequency parameters for both carriers, or

- provide frequency parameters for only one carrier (carrier 2) in which case the frequency parameters for carrier 1 remain unchanged.

In a Downlink Dual Carrier configuration, one or more PDCHs are assigned to a single mobile station on each of two different radio frequency channels. A mobile station with a Downlink Dual Carrier configuration shall not be allocated radio blocks on both radio frequency channels during any given radio block period.

3GPP TS 44.060; subclause 5.5.1.7 and 8.1.1.1

58b.1.5.2 Test purpose

To verify:

The MS is able to change from Single Carrier downlink TBF (no uplink TBF in process) to operate a DLDC TBF

- \- new (additional resources) frequency parameters can be allocated to both carriers
- \- when frequency parameters are allocated for only one carrier the other carrier remain unchanged.

58b.1.5.3. Method of test

Initial Conditions

System Simulator:

1 cell, EGPRS supported, Downlink Dual Carrier supported.

Mobile Station:

Support for Downlink Dual Carrier indicated in MS Radio Access Capabilities IE.

The MS is in the state "idle, GMM-registered" with a P-TMSI allocated, SPLIT PG CYCLE negotiated, and PDP context 2 activated.

Specific PICS Statements

PIXIT Statements

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Test Procedure

MS receives an IMMEDIATE ASSIGNMENT message on its PCH allocating resources for carrier 1. SS transmits downlink RLC data blocks. MS responds by sending a PACKET DOWNLINK ACK/NACK. An uplink data transfer is triggered, the MS insert the Channel Request Description in a PDAN and the SS sends a PACKET TIMESLOT RECONFIGURE message to the MS instructing a Dual Carrier Downlink configuration and single carrier on the uplink side (carrier 1). SS starts to send downlink data and MS sends uplink data blocks. SS sends ACK/NACK message to the MS. MS receives a PACKET DOWNLINK ASSIGNMENT message instructing a single carrier assignment for downlink side and brings back it to the initial state (step 1).

SS sends another PACKET TIMESLOT RECONFIGURE message to the MS instructing a dual carrier configuration on downlink side and single carrier on the uplink side (carrier 2). SS starts to send downlink data and MS sends uplink data blocks. SS sends ACK/NACK message to the MS. MS receives a PACKET DOWNLINK ASSIGNMENT message instructing a single carrier assignment for downlink side and brings back it to the initial state (step 1).

SS sends a PACKET TIMESLOT RECONFIGURE message to the MS instructing a dual carrier configuration on both downlink and uplink side. SS starts to send downlink data and MS sends uplink data blocks. SS completes sending downlink data blocks and the MS completes sending uplink data blocks..

Maximum Duration of Test

5 minutes.

Expected Sequence

Step	Direction	Message	Comments
1	SS -> MS	IMMEDIATE ASSIGNMENT	Sent on PCH triggers the MS to assigned PDTCH. Carrier C1 is assigned.
2	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Sent on assigned PDCH with MCS-1 assigned to the MS. A valid RRBP is indicated.
3	MS -> SS	EGPRS PACKET DOWNLINK ACK/NACK	In the uplink block specified by the RRBP field, MS acknowledges the previously received RLC data blocks.
4	MS		MS trigger an uplink data transfer of 1000 octets. Step 2 to 3 are repeated until the Channel Request Description is included into the PACKET DONWLINK ACK/NACK
5	SS -> MS	PACKET TIMESLOT RECONFIGURE	Sent on PACCH of the PDTCH addressing the MS assigned in step 1. Assignment type “Dual Carrier assignment” Two carriers assigned for downlink and carrier 1 is assigned in uplink side. See specific message contents.
6	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	On carrier 1 with next in sequence. USF Assigned with MCS-1. A valid RRBP is indicated.
7	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	On carrier 2 with next in sequence BSN Send on same Radio Block as Data Block Send on Carrier 1 with MCS-1.
8	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH on carrier 1. SS verifies that the correct BSN is received and the correct MCS is used.
9	MS -> SS	EGPRS PACKET DOWNLINK ACK/NACK	In the uplink block specified by the RRBP field, MS acknowledges receiving all the data blocks on carrier 1.
10	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned on carrier 2, containing USF assigned to MS.
11			SS should check MS does not send any data on carrier 2
12	SS -> MS	PACKET UPLINK ACK/NACK	SS acknowledges RLC data block received on carrier 2..
13	SS -> MS	PACKET DOWNLINK ASSIGNMENT	Sent on PACCH of the PDTCH addressing the MS assigned in step 1. Assignment type “Assignment of single carrier only” Carrier 1 is assigned in downlink side.
14	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Sent on assigned PDCH with MCS-1 assigned to the MS. A valid RRBP is indicated.
15	MS -> SS	EGPRS PACKET DOWNLINK ACK/NACK	MS acknowledges the previously received RLC data blocks.
16	SS -> MS	PACKET TIMESLOT RECONFIGURE	Sent on PACCH of the PDTCH addressing the MS assigned in step 1. Assignment type “Dual Carrier assignment” Two carriers assigned for downlink and carrier 2 is assigned in uplink side.
17	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	On carrier 1 with next in sequence BSN. USF Assigned with MCS-1.
18	SS		SS should check MS does not send any data on carrier 1.
19	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	On carrier 2 with next in sequence BSN with MCS-1. A valid RRBP is indicated. USF Assigned with MCS-1.
20	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH on carrier 2. SS verifies that the correct BSN is received and the correct MCS is used.
21	MS -> SS	EGPRS PACKET DOWNLINK ACK/NACK	In the uplink block specified by the RRBP field, MS acknowledges receiving all the data blocks on carrier 2.
22	SS -> MS	PACKET UPLINK ACK/NACK	SS acknowledges RLC data block received on carrier 2..
23	SS -> MS	PACKET DOWNLINK ASSIGNMENT	Sent on PACCH of the PDTCH addressing the MS assigned in step 1. Assignment type “Assignment of single carrier only” Carrier 1 is assigned in downlink side.
24	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Sent on assigned PDCH with MCS-1 assigned to the MS on carrier 1. A valid RRBP is indicated.
25	MS -> SS	EGPRS PACKET DOWNLINK ACK/NACK	In the uplink block specified by the RRBP field, MS acknowledges the previously received RLC data blocks in carrier 1.

26	SS -> MS	PACKET TIMESLOT RECONFIGURE	Assignment type "Dual Carrier assignment" Reconfigure downlink TBF from single carrier to DLDC configuration. Establish uplink TBF on carrier 1 and carrier 2. USF specified for both carriers.
27	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	On carrier 1 with next in sequence BSN with MCS-1. USF assigned to MS. A valid RRBP is indicated.
28	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH on carrier 1. SS verifies that the correct BSN is received and the correct MCS is used.
29	MS -> SS	EGPRS PACKET DOWNLINK ACK/NACK	In the uplink block specified by the RRBP field, MS acknowledges receiving all the data blocks on carrier 1 in step 27.
30	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	On carrier 2 with next in sequence BSN USF assigned to MS.
31	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH on carrier 2. SS verifies that the correct BSN is received and the correct MCS is used.
32	SS -> MS	PACKET UPLINK ACK/NACK	SS acknowledges RLC data block received on carrier 1.
33	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	On carrier 2 with next in sequence BSN with MCS-1. USF assigned to MS. A valid RRBP is indicated.
34	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH on carrier 2. SS verifies that the correct BSN is received and the correct MCS is used.
35	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	On carrier 1 with next in sequence BSN USF assigned to MS. FBI bit set to '1' and valid RRBP field
36	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH on carrier 1. SS verifies that the correct BSN is received and the correct MCS is used.
37	MS -> SS	EGPRS PACKET DOWNLINK ACK/NACK	In the uplink block specified by the RRBP field, MS acknowledges receiving all the data blocks on carrier 2. Acknowledges receipt of the downlink data block sent on step 31. In the uplink block specified by the RRBP field. Final Ack Indicator bit set to '1' .
38	SS -> MS	PACKET UPLINK ACK/NACK	SS acknowledges RLC data block received on carrier 2.
39		{Completion of uplink }	

Specific Message Contents

PACKET TIMESLOT RECONFIGURE message in step 4:

Information Element	value/ remark
MESSAGE_TYPE	0 00111
PAGE_MODE	00 Normal Paging
GLOBAL_TFI	DL_TFI assigned in Step 1
01	Message escape for Downlink Dual Carrier, BTTI using FANR, EGPRS 2, RTTI
EGPRS Channel Coding Command	0000 (MCS-1)
<RESEGMENT	1
Assignment Info	Assignment Info Struct
Assignment Type	10 (Dual Carrier Assignment)
Carrier ID	0 (carrier 1)
0|1 <DOWNLINK EGPRS Window Size>	0 (Not present)
0|1 <UPLINK EGPRS Window Size>	0 (Not present)
0	BTTI mode
<TIMESLOT ALLOCATION_C1>	1
0 | 1 <TIMESLOT ALLOCATION_C2>	1 (new assignment)
10	Optimized Dual Carrier frequency parameters used
Dual Carrier Frequency Parameters	Dual Carrier Frequency Parameters IE
TSC	arbitrarily chosen
0 | 1 < Uplink Control Timeslot C1>	0 (Not present)
0 | 1 < Uplink Control Timeslot C2>	0 (Not present)
0 | 1 < PFI of downlink TBF >	0 (Not present)
0 | 1 < UPLINK_RLC_MODE >	0 (Not present)
0 | 1 < NPM Transfer Time) >	0 (Not present)
0	Fast Ack/Nack Reporting not activated
< Uplink EGPRS Level>	00 (EGPRS)
< Downlink EGPRS Level >	00 (EGPRS)
0 | 1 < Pulse Format>	0 (Not present)
< padding bits >	

58b.2 Concurrent Downlink Dual Carrier TBF

58b.2.1 Concurrent Downlink Dual Carrier TBF/ Reconfigure Frequency Parameters

58b.2.1.1 Conformance requirement

Frequency parameters may be included in the packet assignment messages (i.e., PACKET DOWNLINK ASSIGNMENT, MULTIPLE TBF DOWNLINK ASSIGNMENT, PACKET UPLINK ASSIGNMENT, MULTIPLE TBF UPLINK ASSIGNMENT, PACKET TIMESLOT RECONFIGURE, MULTIPLE TBF TIMESLOT RECONFIGURE or PACKET CS RELEASE INDICATION messages) and define the radio frequency channels or set of radio frequency channels the mobile station is to use during the assigned TBF(s). The first assignment message, sent to the mobile station when it enters packet transfer mode or MAC-Shared state, shall include the frequency parameters. Subsequent assignment messages, sent to the mobile station during packet transfer mode or MAC-Shared state, may omit the frequency parameters. If a mobile station receives a subsequent assignment message, during packet transfer mode or MAC-Shared state, without the frequency parameters, the mobile station shall continue to use the previously assigned frequency parameters.

If the network and mobile station both support Downlink Dual Carrier, the network may send a packet assignment message to a mobile station specifying packet resources for one or more TBFs on two carriers (referred to as carrier 1 and carrier 2) and thereby establish a Downlink Dual Carrier configuration. If this message is sent to a mobile station in packet idle mode, the assignment message shall include frequency parameters for both carriers. If this message is sent to a mobile station which is in packet transfer mode (and is not in a Downlink Dual Carrier configuration) the assignment message shall either:

- provide new frequency parameters for both carriers, or

- provide frequency parameters for only one carrier (carrier 2) in which case the frequency parameters for carrier 1 remain unchanged.

Subsequent assignment messages sent to a mobile station in a Downlink Dual Carrier configuration may:

- include frequency parameters which correspond to the frequency parameters already in use for one or both carriers; or
- provide no new frequency parameters, in which case the existing parameters continue to apply; or
- provide new frequency parameters for both carriers; or
- provide new frequency parameters for only one carrier, in which case the frequency parameters for the other carrier remain unchanged.

When a mobile station has resources assigned on only one carrier then, for the purposes of subsequent assignment messages, that carrier shall be considered carrier 1. A subsequent assignment message may assign resources on a second carrier, thereby establishing a Downlink Dual Carrier configuration; in this case, the assignment message shall provide frequency parameters for a second carrier (carrier 2) for use in a Downlink Dual Carrier configuration.

An assignment message sent to a mobile station in packet transfer mode may specify frequency parameters for one or (in the case of a mobile station with a downlink dual carrier configuration) both carriers which are different from those currently in effect for that mobile station only in the following cases:

a) the assignment message is a PACKET TIMESLOT RECONFIGURE or MULTIPLE TBF TIMESLOT RECONFIGURE message.

b) the assignment message is a PACKET DOWNLINK ASSIGNMENT message (respectively PACKET UPLINK ASSIGNMENT message) being sent to a mobile station which has no ongoing uplink (respectively downlink) TBF(s).

c) the assignment message is a MULTIPLE TBF DOWNLINK ASSIGNMENT message (respectively MULTIPLE TBF UPLINK ASSIGNMENT message) being sent to a mobile station which is or, after this assignment, will be in a downlink dual carrier configuration and has no ongoing uplink (respectively downlink) TBF(s); in this case, the ongoing downlink (respectively uplink) TBFs are implicitly reassigned on the new frequency parameters with all other parameters for those TBFs unchanged.

d) the assignment message is a PACKET DOWNLINK ASSIGNMENT message (respectively PACKET UPLINK ASSIGNMENT message) sent to a mobile station with a downlink dual carrier configuration, where the frequency parameters for only one carrier are changed, and where no ongoing uplink (respectively downlink) TBF(s) had resources assigned on that carrier.

In cases c) and d) above, a format of the message which includes the Carrier ID field shall be used.

When assigning resources on one carrier to a mobile station which is currently in a Downlink Dual Carrier configuration using a format of the message which does not include the Carrier ID field, the network shall always include frequency parameters; if one or more TBFs which are ongoing are not explicitly addressed in the assignment message and will remain ongoing after the new assignment, the included frequency parameters shall be those in use for either carrier 1 or carrier 2.

The Frequency Parameters information element is defined in sub-clause 12.8 and the Dual Carrier Frequency Parameters information element is defined in sub-clause 12.8.2. The frequency parameters may use an ARFCN defining a non-hopping radio frequency channel, or use the indirect encoding, direct encoding 1 or direct encoding 2 defining a hopping radio frequency channel.

References

3GPP TS 44.060; subclause 5.5.1.7

58b.2.1.2 Test purpose

To verify that the MS is able to change and operate concurrent downlink dual carrier TBF on different frequency resources.

58b.2.1.3 Method of test

Initial Conditions

System Simulator:

1 cell, EGPRS supported, Downlink Dual Carrier supported.

Mobile Station:

Support for Downlink Dual Carrier indicated in MS Radio Access Capabilities IE.

The MS is in the state "idle, GMM-registered" with a P-TMSI allocated, SPLIT PG CYCLE negotiated, and PDP context 2 activated.

Specific PICS Statements

PIXIT Statements

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Test Procedure

The EGPRS capable MS is made to transmit uplink RLC data blocks in EGPRS TBF RLC acknowledged mode. Then MS receives a PACKET DOWNLINK ASSIGNMENT message on its PACCH, instructing a Dual Carrier Downlink configuration. The SS sends RLC data blocks on Carrier 1 and Carrier 2 simultaneously. MS when polled acknowledges all data blocks send by SS and sends uplink data block when it receives USF on Carrier 1. This is to setup Concurrent Downlink Dual Carrier TBF.

Then the SS sends a PACKET TIMESLOT RECONFIGURE message on the PACCH, instructing a modification of existing assignment for Carrier 1. A new frequency parameter is specified for Carrier 1. The SS then sends RLC data blocks on Carrier 1 and Carrier 2 simultaneously. MS when polled acknowledges all data blocks send by the SS and sends uplink data block when it receives USF on Carrier 1.

Next the SS sends a PACKET TIMESLOT RECONFIGURE message on the PACCH, instructing a modification of existing assignment for Carrier 2. A new frequency parameter is specified for Carrier 2. The SS then sends RLC data blocks on Carrier 1 and Carrier 2 simultaneously. MS when polled acknowledges all data blocks send by the SS and sends uplink data block when it receives USF on Carrier 1.

Next the SS sends a PACKET TIMESLOT RECONFIGURE message on the PACCH, instructing a Dual Carrier Assignment for both Carrier 1 and Carrier 2 using legacy IEs. New frequency parameters are specified for Carrier 1 and Carrier 2. The SS then sends RLC data blocks on Carrier 1 and Carrier 2 simultaneously. MS when polled acknowledges all data blocks send by the SS and sends uplink data block when it receives USF on Carrier 1.

Then the SS sends a PACKET TIMESLOT RECONFIGURE message on the PACCH, instructing a Dual Carrier Assignment for both Carrier 1 and Carrier 2 using dual carrier frequency parameters. New frequency parameters are specified for Carrier 1 and Carrier 2. The SS then sends RLC data blocks on Carrier 1 and Carrier 2 simultaneously. MS when polled acknowledges all data blocks send by the SS and sends uplink data block when it receives USF on Carrier 1.

Finally the SS sends a PACKET TIMESLOT RECONFIGURE message on the PACCH, instructing a Dual Carrier Assignment for both Carrier 1 only using legacy IEs. New frequency parameters are specified for Carrier 1. The SS then sends RLC data blocks on Carrier 1 and Carrier 2 simultaneously. MS when polled acknowledges all data blocks send by the SS and sends uplink data block when it receives USF on Carrier 1.

Maximum Duration of Test

10 minutes.

Expected Sequence

Step	Direction	Message	Comments
1		{Uplink dynamic allocation two phase access}	N = 1000 octets USF_GRANULARITY = 1 block EGPRS Channel Coding Command: MCS-1
2	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned, containing USF assigned to the MS.
3	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH SS verifies that the BSN starts from 0, and the correct MCS is used.
4	SS -> MS	PACKET UPLINK ACK/NACK	SS acknowledges RLC data block received.
5	SS -> MS	PACKET DOWNLINK ASSIGNMENT	Sent on PACCH of the PDTCH assigned in Step 1. Addressing the MS using the UL TFI assigned in Step 1. Two Carriers Assigned. See specific message contents
6	SS		Wait for at least 3 block periods
7	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	On carrier 1 with next in sequence BSN (Start with BSN 0). USF Assigned. MCS-1.
8	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	On carrier 2 with next in sequence BSN Send on same Radio Block as Data Block Send on Carrier 1. MCS-1.Valid RRBP field
9	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH on carrier1 SS verifies that the correct BSN is received and the correct MCS is used.
10	MS -> SS	EGPRS PACKET DOWNLINK ACK/NACK	Received on Carrier 2 In the uplink block specified by the RRBP field .Concurrent TBF established.
11	SS -> MS	PACKET TIMESLOT RECONFIGURE	Sent on PACCH of the PDTCH assigned in Step 1. New Frequency Parameters specified for carrier1. See specific message contents
12	SS		Wait for at least 3 block periods
13			Repeat step 7 to 10
14	SS -> MS	PACKET TIMESLOT RECONFIGURE	Sent on PACCH of the PDTCH assigned in Step 1. New Frequency Parameters specified for carrier2. See specific message contents
15	SS		Wait for at least 3 block periods
16			Repeat step 7 to 10
17	SS -> MS	PACKET TIMESLOT RECONFIGURE	Sent on PACCH of the PDTCH assigned in Step 1. New Frequency Parameters specified for carrier1 and carrier2 using legacy IEs. See specific message contents
18	SS		Wait for at least 3 block periods
19			Repeat step 7 to 10
20	SS -> MS	PACKET TIMESLOT RECONFIGURE	Sent on PACCH of the PDTCH assigned in Step 1. New Frequency Parameters specified for carrier1 and carrier2 using dual carrier assignment IEs. See specific message contents
21	SS		Wait for at least 3 block periods
22			Repeat step 7 to 10
23	SS -> MS	PACKET TIMESLOT RECONFIGURE	Sent on PACCH of the PDTCH assigned in Step 1. New Frequency Parameters specified for carrier1 only using legacy IEs. See specific message contents
24	SS		Wait for at least 3 block periods
25	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	On carrier 1 with next in sequence BSN (Start with BSN 0). USF Assigned. MCS-1.
26	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	On carrier 2 with next in sequence BSN Send on same Radio Block as Data Block Send on Carrier 1. MCS-1.Valid RRBP field. FBI=1
27	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH on carrier1 SS verifies that the correct BSN is received and the correct MCS is used.
28	MS -> SS	EGPRS PACKET DOWNLINK ACK/NACK	Received on Carrier 2 In the uplink block specified by the RRBP field FAI is set to 1.
29		{ Completion of uplink RLC data block transfer}	

Specific Message Contents

PACKET DOWNLINK ASSIGNMENT message in step 5:

Information Element	value/ remark
MESSAGE_TYPE	000010
PAGE_MODE	00 Normal Paging
Persistence Level	0 (no Persistence Level Present)
Referenced Address	Referenced by UL TFI
1	Message Escape Sequence for dual carrier…
00	
RLC_MODE	0 Acknowledged mode
CONTROL_ACK	0
Assignment Info	Assignment Info Struct
Assignment Type	10 (Dual Carrier Assignment)
Carrier ID	arbitrarily chosen
0	BTTI Mode
TIMESLOT_ALLOCATION_C1	arbitrarily chosen (default timeslot 4)
1	Carrier 2 explicitly assigned
TIMESLOT_ALLOCATION_C2	arbitrarily chosen (default timeslot 4)
Packet Timing Advance	
{ 0|1< TIMING_ADVANCE_VALUE >	1 (timing advance value)
- TIMING_ADVANCE_VALUE }	30 bit periods
{ 0|1< TIMING_ADVANCE_INDEX > <TIMING_ADVANCE_TIMESLOT_NUMBER > }	0 (no timing advance index)
01	Legacy IEs Used
1< Frequency Parameters_C1>	ARFCN=F1 (see note below)
1< Frequency Parameters_C2>	ARFCN=F2 (see note below)
0	P0_C1 not present
{0|1<DOWNLINK_TFI_ASSIGNMENT>}	1 (assign downlink TFI)
- DOWNLINK_TFI_ASSIGNMENT	00001
{0|1<Power Control Parameters_C1>}	1 (Power Control Parameters present for Carrier1)
- ALPHA	0.5
- GAMMA for allocated timeslots	For DCS 1800 and PCS 1900: +6 dBm. For all other bands: +8 dBm (default timeslot 4)
{0|1<Power Control Parameters_C2>}	1 (Power Control Parameters present for Carrier2)
- ALPHA	0.5
- GAMMA for allocated timeslots	For DCS 1800 and PCS 1900: +6 dBmFor all other bands: +8 dBm (default timeslot 4)
0|1 <EGPRS Window Size>	0 (Not present)
0|1 < Packet Extended Timing Advance>	0 (Not present)
0|1 <PFI>	0 (Not present)
0|1 <NPM transfer Time>	0 (Not present)
0	Fast Ack/Nack Reporting not activated
Downlink EGPRS Level	00 (EGPRS)
Spare padding	Spare Padding

PACKET TIMESLOT RECONFIGURE in Step 11

Information Element	value/ remark
MESSAGE_TYPE	0 00111
PAGE_MODE	00 Normal Paging
GLOBAL_TFI	DL_TFI assigned in Step 1
01	Message escape for Downlink Dual Carrier, BTTI using FANR, EGPRS 2, RTTI
EGPRS Channel Coding Command	0000 (MCS-1)
<**RESEGMENT**	1
Assignment Info	Assignment Info Struct
Assignment Type	01 (Modification of existing assignment)
Carrier ID	0 (Carrier 1)
0|1 <DOWNLINK EGPRS Window Size>	0 (Not present)
0|1 <UPLINK EGPRS Window Size>	0 (Not present)
0	BTTI mode
<TIMESLOT ALLOCATION_C1>	Same as assigned in Step 5
0 | 1 <TIMESLOT ALLOCATION_C2>	0 (Not present)
01	Legacy IEs Used
0 | 1 <Frequency Parameters C1>	1 (Present) , ARFCN=F3 (see note below)
0 | 1 <Frequency Parameters C2>	0 (Not present)
0 | 1 < Uplink Control Timeslot C1>	0 (Not present)
0 | 1 < Uplink Control Timeslot C2>	0 (Not present)
0 | 1 < PFI of downlink TBF >	0 (Not present)
0 | 1 < UPLINK_RLC_MODE >	0 (Not present)
0 | 1 < NPM Transfer Time) >	0 (Not present)
0	Fast Ack/Nack Reporting not activated
< Uplink EGPRS Level>	00 (EGPRS)
< Downlink EGPRS Level >	00 (EGPRS)
0 | 1 < Pulse Format>	0 (Not present)
< padding bits >	

PACKET TIMESLOT RECONFIGURE in Step 14

Information Element	value/ remark
MESSAGE_TYPE	0 00111
PAGE_MODE	00 Normal Paging
GLOBAL_TFI	DL_TFI assigned in Step 1
01	Message escape for Downlink Dual Carrier, BTTI using FANR, EGPRS 2, RTTI
EGPRS Channel Coding Command	0000 (MCS-1)
<**RESEGMENT**	1
Assignment Info	Assignment Info Struct
Assignment Type	01 (Modification of existing assignment)
Carrier ID	1 (Carrier 2)
0|1 <DOWNLINK EGPRS Window Size>	0 (Not present)
0|1 <UPLINK EGPRS Window Size>	0 (Not present)
0	BTTI mode
<TIMESLOT ALLOCATION_C1>	Same as assigned in Step 5
0 | 1 <TIMESLOT ALLOCATION_C2>	0 (Not present)
01	Legacy IEs Used
0 | 1 <Frequency Parameters C1>	1 (Present) ARFCN=F4 (see note below)
0 | 1 <Frequency Parameters C2>	0 (Not present)
0 | 1 < Uplink Control Timeslot C1>	0 (Not present)
0 | 1 < Uplink Control Timeslot C2>	0 (Not present)
0 | 1 < PFI of downlink TBF >	0 (Not present)
0 | 1 < UPLINK_RLC_MODE >	0 (Not present)
0 | 1 < NPM Transfer Time) >	0 (Not present)
0	Fast Ack/Nack Reporting not activated
< Uplink EGPRS Level>	00 (EGPRS)
< Downlink EGPRS Level >	00 (EGPRS)
0 | 1 < Pulse Format>	0 (Not present)
< padding bits >	

PACKET TIMESLOT RECONFIGURE in Step 17

Information Element	value/ remark
MESSAGE_TYPE	0 00111
PAGE_MODE	00 Normal Paging
GLOBAL_TFI	DL_TFI assigned in Step 1
01	Message escape for Downlink Dual Carrier, BTTI using FANR, EGPRS 2, RTTI
EGPRS Channel Coding Command	0000 (MCS-1)
<**RESEGMENT**	1
Assignment Info	Assignment Info Struct
Assignment Type	10 (Dual Carrier Assignment)
Carrier ID	arbitrarily chosen
0|1 <DOWNLINK EGPRS Window Size>	0 (Not present)
0|1 <UPLINK EGPRS Window Size>	0 (Not present)
0	BTTI mode
<TIMESLOT ALLOCATION_C1>	Same as assigned in Step 5
0 | 1 <TIMESLOT ALLOCATION_C2>	1 (Present), same as assigned in Step 5
01	Legacy IEs Used
0|1 <Frequency Parameters C1>	1 (Present) ARFCN=F5 (see note below)
0|1 <Frequency Parameters C2>	1 (Present) ARFCN=F6 (see note below)
0 | 1 < Uplink Control Timeslot C1>	0 (Not present)
0 | 1 < Uplink Control Timeslot C2>	0 (Not present)
0 | 1 < PFI of downlink TBF >	0 (Not present)
0 | 1 < UPLINK_RLC_MODE >	0 (Not present)
0 | 1 < NPM Transfer Time) >	0 (Not present)
0	Fast Ack/Nack Reporting not activated
< Uplink EGPRS Level>	00 (EGPRS)
< Downlink EGPRS Level >	00 (EGPRS)
0 | 1 < Pulse Format>	0 (Not present)
< padding bits >	

PACKET TIMESLOT RECONFIGURE in Step 20

Information Element	value/ remark
MESSAGE_TYPE	0 00111
PAGE_MODE	00 Normal Paging
GLOBAL_TFI	DL_TFI assigned in Step 1
01	Message escape for Downlink Dual Carrier, BTTI using FANR, EGPRS 2, RTTI
EGPRS Channel Coding Command	0000 (MCS-1)
<**RESEGMENT**	1
Assignment Info	Assignment Info Struct
Assignment Type	10 (Dual Carrier Assignment)
Carrier ID	arbitrarily chosen
0|1 <DOWNLINK EGPRS Window Size>	0 (Not present)
0|1 <UPLINK EGPRS Window Size>	0 (Not present)
0	BTTI mode
<TIMESLOT ALLOCATION_C1>	Same as assigned in Step 5
0 | 1 <TIMESLOT ALLOCATION_C2>	0 (Not present)
10	Optimized Dual Carrier frequency parameters used
Dual Carrier Frequency Parameters	Dual Carrier Frequency Parameters IE
TSC	arbitrarily chosen
00	
0|1 <ARFCN1>	1 (Present) ARFCN1=F7 and ARFCN2=F8 (see note below)
<ARFCN2>	
0 | 1 < Uplink Control Timeslot C1>	0 (Not present)
0 | 1 < Uplink Control Timeslot C2>	0 (Not present)
0 | 1 < PFI of downlink TBF >	0 (Not present)
0 | 1 < UPLINK_RLC_MODE >	0 (Not present)
0 | 1 < NPM Transfer Time) >	0 (Not present)
0	Fast Ack/Nack Reporting not activated
< Uplink EGPRS Level>	00 (EGPRS)
< Downlink EGPRS Level >	00 (EGPRS)
0 | 1 < Pulse Format>	0 (Not present)
< padding bits >	

PACKET TIMESLOT RECONFIGURE in Step 23

Information Element	value/ remark
MESSAGE_TYPE	0 00111
PAGE_MODE	00 Normal Paging
GLOBAL_TFI	DL_TFI assigned in Step 1
01	Message escape for Downlink Dual Carrier, BTTI using FANR, EGPRS 2, RTTI
EGPRS Channel Coding Command	0000 (MCS-1)
<**RESEGMENT**	1
Assignment Info	Assignment Info Struct
Assignment Type	10 (Dual Carrier Assignment)
Carrier ID	arbitrarily chosen
0|1 <DOWNLINK EGPRS Window Size>	0 (Not present)
0|1 <UPLINK EGPRS Window Size>	0 (Not present)
0	BTTI mode
<TIMESLOT ALLOCATION_C1>	Same as assigned in Step 5
0 | 1 <TIMESLOT ALLOCATION_C2>	1 (Present), same as assigned in Step 5
01	Legacy IEs Used
0|1 <Frequency Parameters C1>	1 (Present) ARFCN=F9 (see note below)
0|1 <Frequency Parameters C2>	0 (Not Present)
0 | 1 < Uplink Control Timeslot C1>	0 (Not present)
0 | 1 < Uplink Control Timeslot C2>	0 (Not present)
0 | 1 < PFI of downlink TBF >	0 (Not present)
0 | 1 < UPLINK_RLC_MODE >	0 (Not present)
0 | 1 < NPM Transfer Time) >	0 (Not present)
0	Fast Ack/Nack Reporting not activated
< Uplink EGPRS Level>	00 (EGPRS)
< Downlink EGPRS Level >	00 (EGPRS)
0 | 1 < Pulse Format>	0 (Not present)
< padding bits >	

NOTE: F1, F2, F3, F4, F5, F6, F7, F8 and F9 are nine different downlink ARFCNs in the same frequency band.

58b.2.2 Concurrent Downlink Dual Carrier TBF/ Change in Modulation and Coding Schemes

58b.2.2.1 Conformance requirement

In the case of a Downlink Dual Carrier configuration the commanded MCS shall apply to both of the carriers.

References

3GPP TS 44.060; subclause 8.1.1

58b.2.2.2 Test purpose

To verify that the MS is able to operate in different modulation and coding schemes while operating in a downlink dual carrier configuration on different carrier.

58b.2.2.3 Method of test

Initial Conditions

System Simulator:

1 cell, EGPRS supported, Downlink Dual Carrier supported.

Mobile Station:

Support for Downlink Dual Carrier indicated in MS Radio Access Capabilities IE.

The MS is in the state "idle, GMM-registered" with a P-TMSI allocated, SPLIT PG CYCLE negotiated, and PDP context 2 activated.

Specific PICS Statements

PIXIT Statements

-

Test Procedure

The downlink blocks on C1 will be cycled through all valid MCS combinations. The SS asks for an acknowledgement from the MS. The MS shall correctly acknowledge all the received data blocks.

The downlink blocks on C2 will be cycled through all valid MCS combinations. The SS asks for an acknowledgement from the MS. The MS shall correctly acknowledge all the received data blocks.

The downlink blocks on both carriers will be cycled through all valid MCS combinations. The SS asks for an acknowledgement from the MS. The MS shall correctly acknowledge all the received data blocks.

The MS will be ordered to cycle through different MCS in the UL direction. The SS verifies the correct MCS is used. The SS shall correctly acknowledge all the received data blocks.

Maximum Duration of Test

10 minutes.

Expected Sequence

Step	Direction	Message	Comments
1		{Uplink dynamic allocation two phase access}	N = 1000 octets USF_GRANULARITY = 1 block EGPRS Channel Coding Command: MCS-1
2	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned, containing USF assigned to the MS.
3	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH SS verifies that the BSN starts from 0, and the correct MCS is used.
4	SS -> MS	PACKET UPLINK ACK/NACK	SS acknowledges RLC data block received.
5	SS -> MS	PACKET DOWNLINK ASSIGNMENT	Sent on PACCH of the PDTCH assigned in Step 1. Addressing the MS using the UL TFI assigned in Step 1. Two Carriers Assigned. Downlink TBF established. See specific message content.
6	SS		Wait for at least 3 block periods
7	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	With MCS-1 on carrier 1 with next in sequence BSN (Start with BSN 0).
8	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	With MCS-1 on carrier 2 with next in sequence BSN Send on same Radio Block as Data Block Send on carrier 1. For the last repetition a valid RRBP field is sent.
9			Repeat step 7 and 8 using MCS-2 till MCS 9 on carrier 1 only in each iteration.
10	MS -> SS	EGPRS PACKET DOWNLINK ACK/NACK	Received on the corresponding PACCH. The SS verifies that the MS acknowledges all the received RLC data blocks.
11			Repeat step 7 and 8 using MCS-2 till MCS-9 on carrier 2 only in each iteration
12	MS -> SS	EGPRS PACKET DOWNLINK ACK/NACK	Received on the corresponding PACCH. The SS verifies that the MS acknowledges all the received RLC data blocks.
13			Repeat step 7 and 8 using MCS-1 till MCS-9 on both carrier 1 and carrier 2 in each iteration.
14	MS -> SS	EGPRS PACKET DOWNLINK ACK/NACK	Received on the corresponding PACCH. The SS verifies that the MS acknowledges all the received RLC data blocks.
15	SS -> MS	PACKET UPLINK ASSIGNMENT	Sent on the PACCH of the PDCH assigned. See specific message content.
16	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned on carrier 1, containing USF assigned to the MS.
17	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	SS verifies that the correct BSN is received and the correct MCS is used.
18	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned on carrier 2, containing USF assigned to the MS.
19	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	SS verifies that the correct BSN is received and the correct MCS is used.
20	SS -> MS	PACKET UPLINK ACK/NACK	SS acknowledges RLC data block received. MCS changed. See specific message content.
21			Repeat step 16 to 20 by using MCS-2 till MCS-9 on uplink carrier in each iteration
22		{Completion of uplink RLC data block transfer}	

Specific Message Contents

PACKET DOWNLINK ASSIGNMENT message in step 5:

Information Element	value/ remark
MESSAGE_TYPE	000010
PAGE_MODE	00 Normal Paging
Persistence Level	0 (no Persistence Level Present)
Referenced Address	Referenced by UL TFI
1	Message Escape Sequence for dual carrier…
00	
RLC_MODE	0 Acknowledged mode
CONTROL_ACK	0
<Assignment Info>	Assignment Info Struct
Assignment Type	10 (Dual carrier assignment)
Carrier ID	Arbitrarily chosen
0	BTTI Mode
TIMESLOT_ALLOCATION_C1	arbitrarily chosen (default timeslot 4)
1	Carrier 2 explicitly assigned
TIMESLOT_ALLOCATION_C2	arbitrarily chosen (default timeslot 4)
Packet Timing Advance	
{ 0|1< TIMING_ADVANCE_VALUE >	1 (timing advance value)
- TIMING_ADVANCE_VALUE }	30 bit periods
{ 0|1< TIMING_ADVANCE_INDEX > <TIMING_ADVANCE_TIMESLOT_NUMBER > }	0 (no timing advance index)
01	Legacy IEs Used
1< Frequency Parameters_C1>	Frequency Parameters_C1 Present
1< Frequency Parameters_C2>	Frequency Parameters_C2 Present
0	P0_C1 not present
{0|1<DOWNLINK_TFI_ASSIGNMENT>}	1 (assign downlink TFI)
- DOWNLINK_TFI_ASSIGNMENT	00001
{0|1<Power Control Parameters_C1>}	1 (Power Control Parameters present for Carrier1)
- ALPHA	0.5
- GAMMA for allocated timeslots	For DCS 1800 and PCS 1900: +6 dBm. For all other bands: +8 dBm (default timeslot 4)
{0|1<Power Control Parameters_C2>}	1 (Power Control Parameters present for Carrier2)
- ALPHA	0.5
- GAMMA for allocated timeslots	For DCS 1800 and PCS 1900: +6 dBmFor all other bands: +8 dBm (default timeslot 4)
0|1 <EGPRS Window Size>	0 (Not present)
0|1 < Packet Extended Timing Advance>	0 (Not present)
0|1 <PFI>	0 (Not present)
0|1 <NPM transfer Time>	0 (Not present)
0	Fast Ack/Nack Reporting not activated
Downlink EGPRS Level	00 (EGPRS)
Spare padding	Spare Padding

PACKET UPINK ASSIGNMENT message in step 15:

Information Element	value/ remark
MESSAGE_TYPE PAGE_MODE Persistence Level	001010 00 Normal Paging 0 (Not present)
Referenced Address struct 1 01	As received from the MS Escape for EGPRS contents Message Escape Sequence for dual carrier …
- {0|1 CONTENTION_RESOLUTION_TLLI} - Resegment	0 (Not present) 0 Retransmitted RLC data blocks shall not be re-segmented
<Assignment Info> Assignment Type Carrier ID	Assignment Info struct 10 (Dual carrier assignment) 0 (Carrier 1)
- EGPRS Window Size - {0|1 Access Technologies Request} - ARAC RETRANSMISSION REQUEST	0 (Not present) 0 Access technology Request Info not present 0 retransmission of an ADDITIONAL MS RADIO ACCESS CAPABILITIES message is not requested
TLLI_BLOCK_CHANNEL_CODING {0|1 BEP_PERIOD2} Packet Timing Advance { 0|1 < TIMING_ADVANCE_VALUE > - TIMING_ADVANCE_VALUE } { 0|1< TIMING_ADVANCE_INDEX > <TIMING_ADVANCE_TIMESLOT_NUMBER > } { 0 | 1 < Packet Extended Timing Advance : bit (2) > } {0 | 1 … }	1 0 BEP_PERIOD2 not present 1 Timing Advance Value present 30 bit periods 0 (no timing advance index) 0 0 (BTTI)
EGPRS Modulation and Coding Scheme {00 | 01… 0 | 1< Frequency Parameters_C1> 0 | 1< Frequency Parameters_C2> } { 0 | 1 < PFI : bit (7) > } { 0 | 1 < RLC_MODE : bit (1) > } { 0 | 1 < NPM Transfer Time : bit (5) > } { 0 | 1 -- 1 indicates FANR is activated } < Uplink EGPRS Level: < EGPRS Level IE > > { 0 | 1 < Pulse Format: < Pulse Format IE > > }	MCS-1 01 (Legacy IEs Used) 1 Frequency Parameters_C1 Present 1 Frequency Parameters_C2 Present P0_C1 not present 0 (Not present) 0 (Not present) 0 (Not present) 0 FANR not activated 00 (EGPRS) 0 (Not present)

PACKET UPINK ACK/NACK message in step 20:

Information Element	value/ remark
<PAGE_MODE> 00	00 Normal Paging
<Uplink TFI> 1	UL TFI assigned in step 15 Message escape bit used to define EGPRS message contents
<EGPRS Channel Coding Command>	Dependent upon test case. Start with MCS-2 and cycle through different MCS till MCS-9.

58b.2.3 Concurrent Downlink Dual Carrier TBF/ Frequency Hopping

58b.2.3.1 Conformance requirement

The Frequency Parameters information element is defined in sub-clause 12.8 and the Dual Carrier Frequency Parameters information element is defined in sub-clause 12.8.2. The frequency parameters may use an ARFCN defining a non-hopping radio frequency channel, or use the indirect encoding, direct encoding 1 or direct encoding 2 defining a hopping radio frequency channel.

The indirect encoding defines the assigned set of radio frequency channels by referencing information stored within the mobile station. Such information may be received on BCCH or BCCH (see sub-clauses 5.5.2.1, 11.2.19, 12.8 and 12.10a and 3GPP TS 44.160,), or be received in a previous assignment message using one of the direct encoding options. An MA_NUMBER identifies which of up to eight stored sets of frequency parameters is to be used. The MA_NUMBER shall use the following coding:

MA_NUMBER = 0-13 shall be used to reference a GPRS mobile allocation received in a PSI2 message;

MA_NUMBER = 14 shall be used to reference a GPRS mobile allocation received in a SI13 or PSI13 message;

MA_NUMBER = 15 shall be used to reference a GPRS mobile allocation received in a previous assignment message using the direct encoding.

The direct encoding defines the assigned set of radio frequency channels by using information contained within the assignment message. The direct encoding 1 references the cell allocation or reference frequency lists received on BCCH for the decoding of this information. The direct encoding 2 is self contained. When the direct encoding 1 or 2 is used, the mobile station shall store the received GPRS mobile allocation for possible later reference in an assignment message using the indirect encoding. Such reference shall be made using the MA_NUMBER = 15.

NOTE: If there is a GPRS mobile allocation associated with MA_NUMBER = 15, the association shall be kept unchanged if the mobile station receives a packet assignment using the indirect encoding (referencing any value of the MA_NUMBER), the frequency parameters are not included in the packet assignment (i.e., in packet transfer mode, dual transfer mode, MAC-Shared state or MAC-DTM state) or the mobile station establishes an RR connection (for A/Gb mode) or is allocated a DBPSCH (for Iu mode).

For the decoding of frequency parameters, the mobile station shall be able to store the following frequency information (see sub-clauses 11.2.19, 12.8 and 12.10a):

- four Reference Frequency Lists received in the PSI2 information and the corresponding RFL_NUMBERs for identification, each RFL having a contents length of up to 18 octets;
- a Cell Allocation received in the PSI2 information referencing up to four RFLs;
- seven GPRS Mobile Allocations received in the PSI2 or the SI13/PSI13 information and the corresponding MA_NUMBERs for identification, each GPRS Mobile Allocation information element having a length of up to 12 octets (96 bits); and
- one GPRS mobile allocation received in an assignment message using direct encoding 1 or 2, consisting of either a GPRS Mobile Allocation information element having a length of up to 12 octets (96 bits) or a MA Frequency List having a contents length of up to 18 octets.

References

3GPP TS 44.060; subclause 5.5.1.7

58b.2.3.2 Test purpose

To verify that the MS is able to operate a downlink dual carrier TBF with frequency hopping enabled on one or both carriers.

58b.2.3.3 Method of test

Initial Conditions

System Simulator:

1 cell, EGPRS supported, Downlink Dual Carrier supported,

- For GSM 900, CA in SI1includes the frequencies:

(8, 10, 15, 37, 39, 40, 45, 50)

- For DCS 1800 and PCS 1900, CA in SI1 includes the frequency:

(518, 520, 525, 530, 535, 540, 545, 550)

- For GSM 700, T-GSM810, CA in SI1 includes the frequency:

(455, 457, 465, 467, 475, 477, 485, 487)

- For GSM 850, CA in SI1includes the frequencies:

(145, 159, 160, 161, 162, 163, 164, 165)

System information 13 indicates MA Number with frequency hopping

Mobile Station:

Support for Downlink Dual Carrier indicated in MS Radio Access Capabilities IE.

The MS is in the state "idle, GMM-registered" with a P-TMSI allocated, SPLIT PG CYCLE negotiated, and PDP context 2 activated.

Specific PICS Statements

PIXIT Statements

-

Test Procedure

SI1, and SI13 message sent to MS to indicate frequency hopping parameters.

The SS send PACKET TIMESLOT RECONFIGURE message indicating Indirect Encoding in frequency parameters on Carrier 1 and 2. The SS shall start to transmit the downlink data to the MS on both carrier. To verify that the MS use the new assigned PDTCH parameter, the downlink data block on carrier 1 has the USF assigned to the MS and the downlink data block on carrier 2 is polled to MS to maintain the uplink TBF. This procedure is repeated on both Carrier 1 and Carrier 2.

The SS send PACKET DOWNLINK ASSIGNMENT message indicating Direct Encoding 1 in frequency parameters on Carrier 1 only using legacy Frequency Parameters IE. The SS shall start to transmit the downlink data to the MS. The MS and SS complete the downlink data transfer. The SS verifies that the MS use the last CA information received on BCCH to decode the Mobile Allocation. The SS assigns an USF The SS checks that the MS sent an uplink data block on carrier 1 and a packet downlink ack/nack with correct SS value in response to the polled.

The SS send PACKET TIMESLOT RECONFIGURE message indicating Direct Encoding 2 in frequency parameters on Carrier 1 only using legacy Frequency Parameters IE and no hopping on Carrier 2. The SS shall start to transmit the downlink data to the MS on both carriers. To verify that the MS use the new assigned PDTCH parameter, the downlink data block on carrier 1 has the USF assigned to the MS and the downlink data block on carrier 2 is polled. The SS checks that the MS sent an uplink data block on carrier 1 and a packet downlink ack/nack with correct SS value in response to the polled

The SS send PACKET TIMESLOT RECONFIGURE message indicating Direct Encoding 2 in frequency parameters on Carrier 1 and Carrier 2. The SS shall start to transmit the downlink data to the MS on both carrier . To verify that the MS use the new assigned PDTCH parameter, the downlink data block on carrier 1 has the USF assigned to the MS and the downlink data block on carrier 2 is polled. The SS checks that the MS sent an uplink data block on carrier 1 and a packet downlink ack/nack with correct SS value in response to the polled

The SS send PACKET TIMESLOT RECONFIGURE message indicating Indirect Encoding in frequency parameters on both Carrier 1 and Carrier 2 using Optimized Dual Carrier Frequency parameters. The SS shall start to transmit the downlink data to the MS on both carrier . To verify that the MS use the last CA information received on BCCH to decode the Mobile Allocation, the downlink data block on carrier 1 has the USF assigned to the MS and the downlink data block on carrier 2 is polled. The SS checks that the MS sent an uplink data block on carrier 1 and a packet downlink ack/nack with correct SS value in response to the polled

The SS send PACKET TIMESLOT RECONFIGURE message indicating Direct Encoding 1 in frequency parameters on both Carrier 1 and Carrier 2 using Optimized Dual Carrier Frequency parameters. The SS shall start to transmit the downlink data to the MS on both carrier . To verify that the MS use the new assigned PDTCH parameter, the downlink data block on carrier 1 has the USF assigned to the MS and the downlink data block on carrier 2 is polled. The SS checks that the MS sent an uplink data block on carrier 1 and a packet downlink ack/nack with correct SS value in response to the polled

The SS send PACKET TIMESLOT RECONFIGURE message indicating Direct Encoding 2 in frequency parameters on both Carrier 1 and Carrier 2 using Optimized Dual Carrier Frequency parameters. The SS shall start to transmit th e downlink data to the MS on both carrier . To verify that the MS use the new assigned PDTCH parameter, the downlink data block on carrier 1 has the USF assigned to the MS and the downlink data block on carrier 2 is polled. The SS checks that the MS sent an uplink data block on carrier 1 and a packet downlink ack/nack with correct SS value in response to the polled

Maximum Duration of Test

5 minutes.

Expected Sequence

Step	Direction	Message	Comments
1	SS		Change SI1, and SI13 message contents . See specific message contents.
2		{Uplink dynamic allocation two phase access}	N = 1000 octets USF_GRANULARITY = 1 block EGPRS Channel Coding Command: MCS-1
3	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned, containing USF assigned to the MS.
4	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH SS verifies that the BSN starts from 0, and the correct MCS is used.
5	SS -> MS	PACKET DOWNLINK ASSIGNMENT	Sent on PACCH of the PDTCH assigned in Step 2. Addressing the MS using the UL TFI assigned in Step 2. Two carriers assigned with no frequency hopping. Including the polling bit set and a valid RRBP field. See specific message contents
6	SS		Wait for at least 3 block periods
7	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	On carrier 1 with next in sequence BSN (Start with BSN 0). MCS-1. USF assigned to the MS
8	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	On carrier 2 with next in sequence BSN Send on same Radio Block as Data Block Send on Carrier 1. MCS-1.
9	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH on carrier 1. SS verifies that the correct BSN is received and the correct MCS is used.
10	MS -> SS	EGPRS PACKET DOWNLINK ACK/NACK	Received on the corresponding PACCH. The SS verifies that the MS acknowledges all the received RLC data blocks. Initial conditions reached. Concurrent TBF established.
11	SS -> MS	PACKET TIMESLOT RECONFIGURE	Sent on PACCH of the PDTCH assigned in Step 2. Addressing the MS using the UL TFI assigned in Step 2.Using legacy Frequency Parameters IE, Carrier 1 assigned with frequency hopping using Indirect Encoding. Carrier 2 with no frequency hopping. See specific message contents
12			Repeat step 6-10
13	SS -> MS	PACKET TIMESLOT RECONFIGURE	Sent on PACCH of the PDTCH assigned in Step 2. Addressing the MS using the UL TFI assigned in Step 2.Using legacy Frequency Parameters IE, two carriers assigned with frequency hopping using Indirect Encoding. See specific message contents
14			Repeat step 6-10
15	SS -> MS	PACKET TIMESLOT RECONFIGURE	Sent on PACCH of the PDTCH assigned in Step 2. Addressing the MS using the UL TFI assigned in Step 2. Using legacy Frequency Parameters IE, Carrier 1 assigned with frequency hopping using Direct Encoding 1. Carrier 2 with no frequency hopping. See specific message contents
16			Repeat step 6-10
17	SS -> MS	PACKET TIMESLOT RECONFIGURE	Sent on PACCH of the PDTCH assigned in Step 2. Addressing the MS using the UL TFI assigned in Step 2. Using legacy Frequency Parameters IE, two carriers assigned with frequency hopping using Direct Encoding 1. See specific message contents
18			Repeat step 6-10
19	SS -> MS	PACKET TIMESLOT RECONFIGURE	Sent on PACCH of the PDTCH assigned in Step 2. Addressing the MS using the UL TFI assigned in Step 2. Using legacy Frequency Parameters IE, Carrier 1 assigned with frequency hopping using Direct Encoding 2. Carrier 2 with no frequency hopping. See specific message contents
20			Repeat step 6-10

21	SS -> MS	PACKET TIMESLOT RECONFIGURE	Sent on PACCH of the PDTCH assigned in Step 2. Addressing the MS using the UL TFI assigned in Step 2. Using legacy Frequency Parameters IE, two carriers assigned with frequency hopping using Direct Encoding 2. See specific message contents
22			Repeat step 6-10
23	SS -> MS	PACKET TIMESLOT RECONFIGURE	Sent on PACCH of the PDTCH assigned in Step 2. Addressing the MS using the UL TFI assigned in Step 2. Using Dual Carrier Frequency Parameters IE, two carriers assigned with frequency hopping using Indirect Encoding. See specific message contents
24			Repeat step 6-10
25	SS -> MS	PACKET TIMESLOT RECONFIGURE	Sent on PACCH of the PDTCH assigned in Step 2. Addressing the MS using the UL TFI assigned in Step 2. Using Dual Carrier Frequency Parameters IE, two carriers assigned with frequency hopping using Direct Encoding 1. See specific message contents
26			Repeat step 6-10
27	SS -> MS	PACKET TIMESLOT RECONFIGURE	Sent on PACCH of the PDTCH assigned in Step 2. Addressing the MS using the UL TFI assigned in Step 2. Using Dual Carrier Frequency Parameters IE, two carriers assigned with frequency hopping using Direct Encoding 2. See specific message contents
28			Repeat step 6-10
29		{Completion of uplink RLC data block transfer}	

Specific Message Contents

As default messages contents, except:

SYSTEM INFORMATION Type 1 in step 1

- Cell Allocation ARFCN	For GSM 900: Channel Numbers (8, 10, 15, 37, 39, 40, 45, 50. For DCS1800 and PCS 1900: Channel Numbers (518, 520, 525, 530, 535, 540, 545, 550) For GSM 700, T-GSM 810: Channel Numbers (455, 457, 465, 467, 475, 477, 485, 487) For GSM 850: Channel Numbers (145, 159, 160, 161, 162, 163, 164, 165)

SYSTEM INFORMATION Type 13 in step 1

<GPRS Mobile Allocations>	GPRS Mobile Allocation IE
<GPRS Mobile Allocation IE>	
<HSN>	000001 Sequence 1
<RFL number list>	1 (Present)
<RFL_NUMBER>	0002 List 2
<MA LENGTH>	000111 8 bits
<MA BITMAP>	10101010 4 belonging
0	BCCH not present in cell

PACKET DOWNLINK ASSIGNMENT message in step 6:

Information Element	value/ remark
MESSAGE_TYPE	000010
PAGE_MODE	00 Normal Paging
Persistence Level	0 (no Persistence Level Present)
Referenced Address	Referenced by UL TFI
1	Message Escape Sequence for dual carrier…
00	
RLC_MODE	0 Acknowledged mode
CONTROL_ACK	0
<Assignment Info>	Assignment Info Struct
Assignment Type	10 (Dual carrier assignment)
Carrier ID	Arbitrarily chosen
0	BTTI Mode
TIMESLOT_ALLOCATION_C1	arbitrarily chosen (default timeslot 4)
1	Carrier 2 explicitly assigned
TIMESLOT_ALLOCATION_C2	arbitrarily chosen (default timeslot 4)
Packet Timing Advance	
{ 0|1< TIMING_ADVANCE_VALUE >	1 (timing advance value)
- TIMING_ADVANCE_VALUE }	30 bit periods
{ 0|1< TIMING_ADVANCE_INDEX > <TIMING_ADVANCE_TIMESLOT_NUMBER > }	0 (no timing advance index)
01	Legacy IEs Used
1< Frequency Parameters_C1>	Frequency Parameters_C1 Present
1< Frequency Parameters_C2>	Frequency Parameters_C2 Present
0	P0_C1 not present
{0|1<DOWNLINK_TFI_ASSIGNMENT>}	1 (assign downlink TFI)
- DOWNLINK_TFI_ASSIGNMENT	00001
{0|1<Power Control Parameters_C1>}	1 (Power Control Parameters present for Carrier1)
- ALPHA	0.5
- GAMMA for allocated timeslots	For DCS 1800 and PCS 1900: +6 dBm. For all other bands: +8 dBm (default timeslot 4)
{0|1<Power Control Parameters_C2>}	1 (Power Control Parameters present for Carrier2)
- ALPHA	0.5
- GAMMA for allocated timeslots	For DCS 1800 and PCS 1900: +6 dBmFor all other bands: +8 dBm (default timeslot 4)
0|1 <EGPRS Window Size>	0 (Not present)
0|1 < Packet Extended Timing Advance>	0 (Not present)
0|1 <PFI>	0 (Not present)
0|1 <NPM transfer Time>	0 (Not present)
0	Fast Ack/Nack Reporting not activated
Downlink EGPRS Level	00 (EGPRS)
Spare padding	Spare Padding

PACKET TIMESLOT RECONFIGURE in Step 11

Information Element	value/ remark
MESSAGE_TYPE	0 00111
PAGE_MODE	00 Normal Paging
GLOBAL_TFI	DL_TFI assigned in Step 6
01	Message escape for Downlink Dual Carrier, BTTI using FANR, EGPRS 2, RTTI
EGPRS Channel Coding Command	0000 (MCS-1)
<**RESEGMENT**	1
Assignment Info	Assignment Info Struct
Assignment Type	10 (Dual Carrier Assignment)
Carrier ID	arbitrarily chosen
0|1 <DOWNLINK EGPRS Window Size>	0 (Not present)
0|1 <UPLINK EGPRS Window Size>	0 (Not present)
0	BTTI mode
<TIMESLOT ALLOCATION_C1>	Arbitrarily chosen(default timeslot 4)
1	
<TIMESLOT ALLOCATION_C2>	Arbitrarily chosen(default timeslot 4)
01	Legacy IEs used
< Frequency Parameters C1>	1 (Present)
<Frequency Parameters IE>	
<TSC>	Arbitrarily chosen
01	Indirect encoding
< Indirect encoding>	
MAIO	Arbitrarily chosen
MA_NUMBER	1110
1 CHANGE_MARK_1	As assigned in step 1
0|1 CHANGE_MARK_2	0 (Not present)
< Frequency Parameters C2>	1 (Present)
<Frequency Parameters IE>	
<TSC>	Arbitrarily chosen
00 ARFCN	Arbitrarily chosen (ARFCN of C1 and C2 must be different in any given frame)
N_TS	Number of TS used in uplink
USF/GAMMA flag	As assigned in step 3
0 | 1 < Uplink Control Timeslot C1>	0 (Not present)
0 | 1 < Uplink Control Timeslot C2>	0 (Not present)
0 | 1 < PFI of downlink TBF >	0 (Not present)
0 | 1 < UPLINK_RLC_MODE >	0 (Not present)
0 | 1 < NPM Transfer Time) >	0 (Not present)
0	Fast Ack/Nack Reporting not activated
< Uplink EGPRS Level>	00 (EGPRS)
< Downlink EGPRS Level >	00 (EGPRS)
0 | 1 < Pulse Format>	0 (Not present)
< padding bits >	

PACKET TIMESLOT RECONFIGURE in Step 13

Information Element	value/ remark
MESSAGE_TYPE	0 00111
PAGE_MODE	00 Normal Paging
GLOBAL_TFI	DL_TFI assigned in Step 6
01	Message escape for Downlink Dual Carrier, BTTI using FANR, EGPRS 2, RTTI
EGPRS Channel Coding Command	0000 (MCS-1)
<**RESEGMENT**	1
Assignment Info	Assignment Info Struct
Assignment Type	10 (Dual Carrier Assignment)
Carrier ID	arbitrarily chosen
0|1 <DOWNLINK EGPRS Window Size>	0 (Not present)
0|1 <UPLINK EGPRS Window Size>	0 (Not present)
0	BTTI mode
<TIMESLOT ALLOCATION_C1>	Arbitrarily chosen(default timeslot 4)
1	
<TIMESLOT ALLOCATION_C2>	Arbitrarily chosen(default timeslot 4)
01	Legacy IEs used
< Frequency Parameters C1>	1 (Present)
<Frequency Parameters IE>	
<TSC>	Arbitrarily chosen
01	Indirect encoding
< Indirect encoding>	
MAIO	Arbitrarily chosen
MA_NUMBER	1110
1 CHANGE_MARK_1	As assigned in step 1
0|1 CHANGE_MARK_2	0 (Not present)
< Frequency Parameters C2>	1 (Present)
<Frequency Parameters IE>	
<TSC>	Arbitrarily chosen
01	Indirect encoding
< Indirect encoding>	
MAIO	Arbitrarily chosen
MA_NUMBER	1110
1 CHANGE_MARK_1	As assigned in step 1
0|1 CHANGE_MARK_2	0 (Not present)
N_TS	Number of TS used in uplink
USF/GAMMA flag	As assigned in step 3
0 | 1 < Uplink Control Timeslot C1>	0 (Not present)
0 | 1 < Uplink Control Timeslot C2>	0 (Not present)
0 | 1 < PFI of downlink TBF >	0 (Not present)
0 | 1 < UPLINK_RLC_MODE >	0 (Not present)
0 | 1 < NPM Transfer Time) >	0 (Not present)
0	Fast Ack/Nack Reporting not activated
< Uplink EGPRS Level>	00 (EGPRS)
< Downlink EGPRS Level >	00 (EGPRS)
0 | 1 < Pulse Format>	0 (Not present)
< padding bits >	

PACKET TIMESLOT RECONFIGURE in Step 15

Information Element	value/ remark
MESSAGE_TYPE	0 00111
PAGE_MODE	00 Normal Paging
GLOBAL_TFI	DL_TFI assigned in Step 6
01	Message escape for Downlink Dual Carrier, BTTI using FANR, EGPRS 2, RTTI
EGPRS Channel Coding Command	0000 (MCS-1)
<RESEGMENT	1
Assignment Info	Assignment Info Struct
Assignment Type	10 (Dual Carrier Assignment)
Carrier ID	arbitrarily chosen
0|1 <DOWNLINK EGPRS Window Size>	0 (Not present)
0|1 <UPLINK EGPRS Window Size>	0 (Not present)
0	BTTI mode
<TIMESLOT ALLOCATION_C1>	Arbitrarily chosen(default timeslot 4)
1	
<TIMESLOT ALLOCATION_C2>	Arbitrarily chosen(default timeslot 4)
01	Legacy IEs used
< Frequency Parameters C1>	1 (Present)
<Frequency Parameters IE>	
<TSC>	Arbitrarily chosen
10	Direct encoding 1
< Direct encoding 1>	
MAIO	Arbitrarily chosen
GPRS Mobile Allocation	As assigned in step 1
< Frequency Parameters C2>	1 (Present)
<Frequency Parameters IE>	
<TSC>	Arbitrarily chosen
00 ARFCN	Arbitrarily chosen (ARFCN of C1 and C2 must be different in any given frame)
N_TS	Number of TS used in uplink
USF/GAMMA flag	As assigned in step 3
0 | 1 < Uplink Control Timeslot C1>	0 (Not present)
0 | 1 < Uplink Control Timeslot C2>	0 (Not present)
0 | 1 < PFI of downlink TBF >	0 (Not present)
0 | 1 < UPLINK_RLC_MODE >	0 (Not present)
0 | 1 < NPM Transfer Time) >	0 (Not present)
0	Fast Ack/Nack Reporting not activated
< Uplink EGPRS Level>	00 (EGPRS)
< Downlink EGPRS Level >	00 (EGPRS)
0 | 1 < Pulse Format>	0 (Not present)
< padding bits >	

PACKET TIMESLOT RECONFIGURE in Step 17

Information Element	value/ remark
MESSAGE_TYPE	0 00111
PAGE_MODE	00 Normal Paging
GLOBAL_TFI	DL_TFI assigned in Step 6
01	Message escape for Downlink Dual Carrier, BTTI using FANR, EGPRS 2, RTTI
EGPRS Channel Coding Command	0000 (MCS-1)
<**RESEGMENT**	1
Assignment Info	Assignment Info Struct
Assignment Type	10 (Dual Carrier Assignment)
Carrier ID	arbitrarily chosen
0|1 <DOWNLINK EGPRS Window Size>	0 (Not present)
0|1 <UPLINK EGPRS Window Size>	0 (Not present)
0	BTTI mode
<TIMESLOT ALLOCATION_C1>	Arbitrarily chosen(default timeslot 4)
1	
<TIMESLOT ALLOCATION_C2>	Arbitrarily chosen(default timeslot 4)
01	Legacy IEs used
< Frequency Parameters C1>	1 (Present)
<Frequency Parameters IE>	
<TSC>	Arbitrarily chosen
10	Direct encoding 1
< Direct encoding 1>	
MAIO	Arbitrarily chosen
GPRS Mobile Allocation	As assigned in step 1
< Frequency Parameters C2>	1 (Present)
<Frequency Parameters IE>	
<TSC>	Arbitrarily chosen
10	Direct encoding 1
MAIO	Arbitrarily chosen
GPRS Mobile Allocation	As assigned in step 1
N_TS	Number of TS used in uplink
USF/GAMMA flag	As assigned in step 3
0 | 1 < Uplink Control Timeslot C1>	0 (Not present)
0 | 1 < Uplink Control Timeslot C2>	0 (Not present)
0 | 1 < PFI of downlink TBF >	0 (Not present)
0 | 1 < UPLINK_RLC_MODE >	0 (Not present)
0 | 1 < NPM Transfer Time) >	0 (Not present)
0	Fast Ack/Nack Reporting not activated
< Uplink EGPRS Level>	00 (EGPRS)
< Downlink EGPRS Level >	00 (EGPRS)
0 | 1 < Pulse Format>	0 (Not present)
< padding bits >	

PACKET TIMESLOT RECONFIGURE in Step 19

Information Element	value/ remark
MESSAGE_TYPE	0 00111
PAGE_MODE	00 Normal Paging
GLOBAL_TFI	DL_TFI assigned in Step 6
01	Message escape for Downlink Dual Carrier, BTTI using FANR, EGPRS 2, RTTI
EGPRS Channel Coding Command	0000 (MCS-1)
<RESEGMENT	1
Assignment Info	Assignment Info Struct
Assignment Type	10 (Dual Carrier Assignment)
Carrier ID	arbitrarily chosen
0|1 <DOWNLINK EGPRS Window Size>	0 (Not present)
0|1 <UPLINK EGPRS Window Size>	0 (Not present)
0	BTTI mode
<TIMESLOT ALLOCATION_C1>	Arbitrarily chosen(default timeslot 4)
1	
<TIMESLOT ALLOCATION_C2>	Arbitrarily chosen(default timeslot 4)
01	Legacy IEs used
< Frequency Parameters C1>	1 (Present)
<Frequency Parameters IE>	
<TSC>	Arbitrarily chosen
11	Direct encoding 2
< Direct encoding 2>	
MAIO	Arbitrarily chosen
HSN	000001 (Sequence 1)
Length of MA Frequency List contents	Length of frequency list chosen according to length of MA frequency list content
MA Frequency List content	For GSM900 in Range 128 (10, 30, 40, 50, 60, 70) For DCS 1800 and PCS 1900 in range 512 (520, 530, 540, 550, 560, 570, 580, 600, 610) For GSM700, T-GSM 810 range 512 (447, 462, 467, 475, 477, 480, 485, 492, 498, 504) For GSM 850, in Range 512 (137, 157, 167, 177, 187, 197, 207, 217, 227)
< Frequency Parameters C2>	1 (Present)
<Frequency Parameters IE>	
<TSC>	Arbitrarily chosen
00 ARFCN	Arbitrarily chosen (ARFCN of C1 and C2 must be different in any given frame)
N_TS	Number of TS used in uplink
USF/GAMMA flag	As assigned in step 3
0 | 1 < Uplink Control Timeslot C1>	0 (Not present)
0 | 1 < Uplink Control Timeslot C2>	0 (Not present)
0 | 1 < PFI of downlink TBF >	0 (Not present)
0 | 1 < UPLINK_RLC_MODE >	0 (Not present)
0 | 1 < NPM Transfer Time) >	0 (Not present)
0	Fast Ack/Nack Reporting not activated
< Uplink EGPRS Level>	00 (EGPRS)
< Downlink EGPRS Level >	00 (EGPRS)
0 | 1 < Pulse Format>	0 (Not present)
< padding bits >	

PACKET TIMESLOT RECONFIGURE in Step 21

Information Element	value/ remark
MESSAGE_TYPE	0 00111
PAGE_MODE	00 Normal Paging
GLOBAL_TFI	DL_TFI assigned in Step 6
01	Message escape for Downlink Dual Carrier, BTTI using FANR, EGPRS 2, RTTI
EGPRS Channel Coding Command	0000 (MCS-1)
<**RESEGMENT**	1
Assignment Info	Assignment Info Struct
Assignment Type	10 (Dual Carrier Assignment)
Carrier ID	arbitrarily chosen
0|1 <DOWNLINK EGPRS Window Size>	0 (Not present)
0|1 <UPLINK EGPRS Window Size>	0 (Not present)
0	BTTI mode
<TIMESLOT ALLOCATION_C1>	Arbitrarily chosen(default timeslot 4)
1	
<TIMESLOT ALLOCATION_C2>	Arbitrarily chosen(default timeslot 4)
01	Legacy IEs used
< Frequency Parameters C1>	1 (Present)
<Frequency Parameters IE>	
<TSC>	Arbitrarily chosen
11	Direct encoding 2
< Direct encoding 2>	
MAIO	Arbitrarily chosen
HSN	000001 (Sequence 1)
Length of MA Frequency List contents	Length of frequency list chosen according to length of MA frequency list content
MA Frequency List content	For GSM900 in Range 128 (10, 30, 40, 50, 60, 70) For DCS 1800 and PCS 1900 in range 512 (520, 530, 540, 550, 560, 570, 580, 600, 610) For GSM700, T-GSM 810 range 512 (447, 462, 467, 475, 477, 480, 485, 492, 498, 504) For GSM 850, in Range 512 (137, 157, 167, 177, 187, 197, 207, 217, 227)
< Frequency Parameters C2>	1 (Present)
<Frequency Parameters IE>	
<TSC>	Arbitrarily chosen
11	Direct encoding 2
< Direct encoding 2>	
MAIO	Arbitrarily chosen (ARFCN of C1 and C2 must be different in any given frame)
HSN	Arbitrarily chosen (ARFCN of C1 and C2 must be different in any given frame)
Length of MA Frequency List contents	Length of frequency list chosen according to length of MA frequency list content
MA Frequency List content	For GSM900 in Range 128 (10, 30, 40, 50, 60, 70) For DCS 1800 and PCS 1900 in range 512 (520, 530, 540, 550, 560, 570, 580, 600, 610) For GSM700, T-GSM 810 range 512 (447, 462, 467, 475, 477, 480, 485, 492, 498, 504) For GSM 850, in Range 512 (137, 157, 167, 177, 187, 197, 207, 217, 227)
N_TS	Number of TS used in uplink
USF/GAMMA flag	As assigned in step 3
0 | 1 < Uplink Control Timeslot C1>	0 (Not present)
0 | 1 < Uplink Control Timeslot C2>	0 (Not present)
0 | 1 < PFI of downlink TBF >	0 (Not present)
0 | 1 < UPLINK_RLC_MODE >	0 (Not present)
0 | 1 < NPM Transfer Time) >	0 (Not present)
0	Fast Ack/Nack Reporting not activated
< Uplink EGPRS Level>	00 (EGPRS)
< Downlink EGPRS Level >	00 (EGPRS)
0 | 1 < Pulse Format>	0 (Not present)

< padding bits >	

PACKET TIMESLOT RECONFIGURE in Step 23

Information Element	value/ remark
MESSAGE_TYPE	0 00111
PAGE_MODE	00 Normal Paging
GLOBAL_TFI	DL_TFI assigned in Step 6
01	Message escape for Downlink Dual Carrier, BTTI using FANR, EGPRS 2, RTTI
EGPRS Channel Coding Command	0000 (MCS-1)
<**RESEGMENT**	1
Assignment Info	Assignment Info Struct
Assignment Type	10 (Dual Carrier Assignment)
Carrier ID	arbitrarily chosen
0|1 <DOWNLINK EGPRS Window Size>	0 (Not present)
0|1 <UPLINK EGPRS Window Size>	0 (Not present)
0	BTTI mode
<TIMESLOT ALLOCATION_C1>	Arbitrarily chosen(default timeslot 4)
1	
<TIMESLOT ALLOCATION_C2>	Arbitrarily chosen(default timeslot 4)
10	Optimized Dual Carrier frequency parameters used
< Dual Carrier Frequency Parameters>	Dual Carrier Frequency Parameters IE
<TSC>	Arbitrarily chosen
01	Indirect encoding
< Dual Carrier Indirect encoding >	
1 MAIO1	Arbitrarily chosen
1 MAIO2	Arbitrarily chosen (ARFCN of C1 and C2 must be different in any given frame)
N_TS	Number of TS used in uplink
USF/GAMMA flag	As assigned in step 3
0 | 1 < Uplink Control Timeslot C1>	0 (Not present)
0 | 1 < Uplink Control Timeslot C2>	0 (Not present)
0 | 1 < PFI of downlink TBF >	0 (Not present)
0 | 1 < UPLINK_RLC_MODE >	0 (Not present)
0 | 1 < NPM Transfer Time) >	0 (Not present)
0	Fast Ack/Nack Reporting not activated
< Uplink EGPRS Level>	00 (EGPRS)
< Downlink EGPRS Level >	00 (EGPRS)
0 | 1 < Pulse Format>	0 (Not present)
< padding bits >	

PACKET TIMESLOT RECONFIGURE in Step 25

Information Element	value/ remark
MESSAGE_TYPE	0 00111
PAGE_MODE	00 Normal Paging
GLOBAL_TFI	DL_TFI assigned in Step 6
01	Message escape for Downlink Dual Carrier, BTTI using FANR, EGPRS 2, RTTI
EGPRS Channel Coding Command	0000 (MCS-1)
<**RESEGMENT**	1
Assignment Info	Assignment Info Struct
Assignment Type	10 (Dual Carrier Assignment)
Carrier ID	arbitrarily chosen
0|1 <DOWNLINK EGPRS Window Size>	0 (Not present)
0|1 <UPLINK EGPRS Window Size>	0 (Not present)
0	BTTI mode
<TIMESLOT ALLOCATION_C1>	Arbitrarily chosen(default timeslot 4)
1	
<TIMESLOT ALLOCATION_C2>	Arbitrarily chosen(default timeslot 4)
10	Optimized Dual Carrier frequency parameters used
< Dual Carrier Frequency Parameters>	Dual Carrier Frequency Parameters IE
<TSC>	Arbitrarily chosen
10	Direct encoding 1
< Dual Carrier Direct encoding 1 >	
1 MAIO1	Arbitrarily chosen
1 MAIO2	Arbitrarily chosen (ARFCN of C1 and C2 must be different in any given frame)
GPRS Mobile Allocation	As assigned in step 1
N_TS	Number of TS used in uplink
USF/GAMMA flag	As assigned in step 3
0 | 1 < Uplink Control Timeslot C1>	0 (Not present)
0 | 1 < Uplink Control Timeslot C2>	0 (Not present)
0 | 1 < PFI of downlink TBF >	0 (Not present)
0 | 1 < UPLINK_RLC_MODE >	0 (Not present)
0 | 1 < NPM Transfer Time) >	0 (Not present)
0	Fast Ack/Nack Reporting not activated
< Uplink EGPRS Level>	00 (EGPRS)
< Downlink EGPRS Level >	00 (EGPRS)
0 | 1 < Pulse Format>	0 (Not present)
< padding bits >	

PACKET TIMESLOT RECONFIGURE in Step 27

Information Element	value/ remark
MESSAGE_TYPE	0 00111
PAGE_MODE	00 Normal Paging
GLOBAL_TFI	DL_TFI assigned in Step 6
01	Message escape for Downlink Dual Carrier, BTTI using FANR, EGPRS 2, RTTI
EGPRS Channel Coding Command	0000 (MCS-1)
<**RESEGMENT**	1
Assignment Info	Assignment Info Struct
Assignment Type	10 (Dual Carrier Assignment)
Carrier ID	arbitrarily chosen
0|1 <DOWNLINK EGPRS Window Size>	0 (Not present)
0|1 <UPLINK EGPRS Window Size>	0 (Not present)
0	BTTI mode
<TIMESLOT ALLOCATION_C1>	Arbitrarily chosen(default timeslot 4)
1	
<TIMESLOT ALLOCATION_C2>	Arbitrarily chosen(default timeslot 4)
10	Optimized Dual Carrier frequency parameters used
< Dual Carrier Frequency Parameters>	Dual Carrier Frequency Parameters IE
<TSC>	Arbitrarily chosen
10	Direct encoding 2
< Dual Carrier Direct encoding 2 >	
1 MAIO1	Arbitrarily chosen
1 MAIO2	Arbitrarily chosen (ARFCN of C1 and C2 must be different in any given frame)
HSN	000001 (Sequence 1)
Length of MA Frequency List contents	Length of frequency list chosen according to length of MA frequency list content
MA Frequency List content	For GSM900 in Range 128 (10, 30, 40, 50, 60, 70) For DCS 1800 and PCS 1900 in range 512 (520, 530, 540, 550, 560, 570, 580, 600, 610) For GSM700, T-GSM 810 range 512 (447, 462, 467, 475, 477, 480, 485, 492, 498, 504) For GSM 850, in Range 512 (137, 157, 167, 177, 187, 197, 207, 217, 227)
GPRS Mobile Allocation	As assigned in step 1
N_TS	Number of TS used in uplink
USF/GAMMA flag	As assigned in step 3
0 | 1 < Uplink Control Timeslot C1>	0 (Not present)
0 | 1 < Uplink Control Timeslot C2>	0 (Not present)
0 | 1 < PFI of downlink TBF >	0 (Not present)
0 | 1 < UPLINK_RLC_MODE >	0 (Not present)
0 | 1 < NPM Transfer Time) >	0 (Not present)
0	Fast Ack/Nack Reporting not activated
< Uplink EGPRS Level>	00 (EGPRS)
< Downlink EGPRS Level >	00 (EGPRS)
0 | 1 < Pulse Format>	0 (Not present)
< padding bits >	

58b.2.4 Concurrent Downlink Dual Carrier TBF/ Downlink Dual Carrier Configuration / Channel Quality Reporting

58b.2.4.1 Conformance requirement

In a downlink dual carrier configuration, channel quality measurements shall be performed for each radio frequency channel independently. Depending on the amount of information requested by the network (e.g. whether or not per-timeslot information is required) the MS may not be able to include channel quality measurements for both radio frequency channels within the EGPRS PACKET DOWNLINK ACK/NACK message. In this case, the MS shall include channel quality measurements for the radio frequency channel on which the poll was received.

In a downlink dual carrier configuration the MS shall send channel quality reports for both carriers, if there is room in the message. If there is room for only one channel quality report, the MS shall include channel quality measurements for the radio frequency channel on which the poll was received.

References

3GPP TS 43.064, subclause 6.5.8.3.2

3GPP TS 44.060; subclause 9.1.8.2.1

58b.2.4.2 Test purpose

To verify that the MS performs Channel Quality Reporting in a Downlink Dual Carrier configuration.

58b.2.4.3 Method of test

Initial Conditions

System Simulator:

1 cell, EGPRS supported, Downlink Dual Carrier supported. PBCCH not present

Mobile Station:

Support for Downlink Dual Carrier indicated in MS Radio Access Capabilities IE.

The MS is in the state "idle, GMM-registered" with a P-TMSI allocated, SPLIT PG CYCLE negotiated, and PDP context 2 activated.

Specific PICS Statements

PIXIT Statements

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Test Procedure

The SS initiates the establishment of concurrent downlink dual carrier in BTTI mode. The MS is then triggered to transfer 500 octets of user data. The SS assigns an uplink TBF by sending a PACKET UPLINK ASSIGNMENT message.

While the uplink TBF is ongoing, a PACKET DOWNLINK ASSIGNMENT is sent to the MS to establish a concurrent downlink dual carrier TBF. The SS sends a RLC data blocks on downlink dual carriers that will correspond to a small RB size and poll for the First Partial Bitmap from the MS. The SS polls the MS using the ES/P field in the header of the last downlink data blocks for ES/P value = ‘11’ (EGPRS PACKET DOWNLINK ACK/NACK message containing Channel Quality Report and if there is enough room left in RLC/MAC block, NPB(s)). The SS checks if the EGPRS PACKET DOWNLINK ACK/NACK from MS includes a Channel Quality Report IE for Carrier 1 and Carrier 2.

Next the SS sends RLC data blocks on downlink dual carriers in odd BSN sequence number (bad blocks).and poll for the First Partial Bitmap from the MS pm Carrier 1. The SS polls the MS using the ES/P field in the header of the downlink data blocks for ES/P value = ‘01’ (EGPRS PACKET DOWNLINK ACK/NACK message containing FPB (First Partial Bitmap), and if there is enough room left in RLC/MAC block, channel quality report(s)). The SS checks if the EGPRS PACKET DOWNLINK ACK/NACK from MS includes a Channel Quality Report IE for Carrier 1 only.

Finally, the SS sends RLC data blocks on downlink dual carriers in odd BSN sequence number (bad blocks).and poll for the First Partial Bitmap from the MS pm Carrier 2. The SS polls the MS using the ES/P field in the header of the downlink data blocks for ES/P value = '10' (EGPRS PACKET DOWNLINK ACK/NACK message containing NPB (Next Partial Bitmap), and if there is enough room left in RLC/MAC block, channel quality report(s)). The SS checks if the EGPRS PACKET DOWNLINK ACK/NACK from MS includes a Channel Quality Report IE for Carrier 2 only.

Maximum Duration of Test

5 minutes.

Expected Sequence

Step	Direction	Message	Comments
1		{Uplink dynamic allocation two phase access}	N = 500 octets USF_GRANULARITY = 1 block EGPRS Channel Coding Command: MCS-1 EGPRS Window Size: Maximum value according to the number of Timeslots assigned for the TBF.
2	SS -> MS	PACKET UPLINK ASSIGNMENT	Sent on the PACCH of the PDCH assigned. See specific message content.
3	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on Carrier 1 of the PDCH assigned, containing USF assigned to the MS.
4	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on Carrier 1 SS verifies that the BSN starts from 0, and the correct MCS is used.
5	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on Carrier 2 of the PDCH assigned, containing USF assigned to the MS.
6	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on Carrier 2 SS verifies that the BSN the MCS are correct.
7	SS -> MS	PACKET DOWNLINK ASSIGNMENT	Sent on PACCH of the PDTCH assigned in Step 1. Addressing the MS using the UL TFI assigned in Step 1. Two Carriers Assigned. See specific message contents
8	SS		Wait for at least 3 block periods
9	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	On carrier 1 with next in sequence BSN (Start with BSN 0). USF Assigned. MCS-1.
10	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	On carrier 2 with next in sequence BSN Send on same Radio Block as Data Block Send on Carrier 1. MCS-1.
11	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH on carrier 1. SS verifies that the correct BSN is received and the correct MCS is used.
12	MS -> SS	EGPRS PACKET DOWNLINK ACK/NACK	Received on the corresponding PACCH. The SS verifies that the MS acknowledges all the received RLC data blocks. Initial conditions reached. Concurrent TBF established.
13	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on Carrier 2 of the PDCH assigned, containing USF assigned to the MS.
14	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on Carrier 2 SS verifies that the BSN the MCS are correct.
15	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	On carrier 1 with next in sequence BSN. USF Assigned. MCS-1.
16	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	On carrier 2 with next in sequence BSN Send on same Radio Block as Data Block Send on Carrier 1. MCS-1. MS was polled for NPB, ES/P='11' and a valid RRBP field sent in this block.
17	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH on carrier 1. SS verifies that the correct BSN is received and the correct MCS is used.
18	MS -> SS	EGPRS PACKET DOWNLINK ACK/NACK	Received on the corresponding PACCH. The SS verifies that the MS acknowledges all the received RLC data blocks. The EGPRS PACKET DOWNLINK ACK/NACK includes a Channel Quality Report IE on carrier 1 and on carrier 2.
19	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on Carrier 2 of the PDCH assigned, containing USF assigned to the MS.
20	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on Carrier 2 SS verifies that the BSN the MCS are correct.
21	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	On carrier 1 with next odd number in sequence BSN. USF Assigned. MCS-1. MS was polled for FPB, ES/P='01' and a valid RRBP field sent in this block.
22	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	On carrier 2 with next odd number in sequence BSN Send on same Radio Block as Data Block Send on Carrier 1. MCS-1.

23	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH on carrier 1. SS verifies that the correct BSN is received and the correct MCS is used.
24	MS -> SS	EGPRS PACKET DOWNLINK ACK/NACK	Received on the corresponding PACCH. The SS verifies that the MS does not acknowledge all the received RLC data blocks. The EGPRS PACKET DOWNLINK ACK/NACK includes a Channel Quality Report IE on carrier 1.
25	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on Carrier 2 of the PDCH assigned, containing USF assigned to the MS.
26	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on Carrier 2 SS verifies that the BSN the MCS are correct.
27	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	On carrier 1 with next odd number in sequence BSN. USF Assigned. MCS-1.
28	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	On carrier 2 with next odd number in sequence BSN Send on same Radio Block as Data Block Send on Carrier 1. MCS-1. MS was polled for NPB, ES/P='10' and a valid RRBP field sent in this block. 'FBI ' = 1
29	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH on carrier 1. SS verifies that the correct BSN is received and the correct MCS is used.
30	MS -> SS	EGPRS PACKET DOWNLINK ACK/NACK	Received on the corresponding PACCH. The SS verifies that the MS does not acknowledge all the received RLC data blocks. The EGPRS PACKET DOWNLINK ACK/NACK includes a Channel Quality Report IE on carrier 2. FAI=1
31		{Completion of uplink RLC data block transfer}	

Specific Message Contents

PACKET UPINK ASSIGNMENT message in step 2:

Information Element	value/ remark
MESSAGE_TYPE	001010
PAGE_MODE	00 Normal Paging
Persistence Level	0 (Not present)
Referenced Address struct	As received from the MS
1	Escape for EGPRS contents
01	Message Escape Sequence for dual carrier …
- {0|1 CONTENTION_RESOLUTION_TLLI}	0 (Not present)
- Resegment	0 Retransmitted RLC data blocks shall not be re-segmented
<Assignment Info>	Assignment Info struct
Assignment Type	10 (Dual carrier assignment)
Carrier ID	0 (Carrier 1)
- EGPRS Window Size	0 (Not present)
- {0|1 Access Technologies Request}	0 Access technology Request Info not present
- ARAC RETRANSMISSION REQUEST	0 retransmission of an ADDITIONAL MS RADIO ACCESS CAPABILITIES message is not requested
TLLI_BLOCK_CHANNEL_CODING	1
{0|1 BEP_PERIOD2}	0 BEP_PERIOD2 not present
Packet Timing Advance	
{ 0|1 < TIMING_ADVANCE_VALUE >	1 Timing Advance Value present
- TIMING_ADVANCE_VALUE }	30 bit periods
{ 0|1< TIMING_ADVANCE_INDEX > <TIMING_ADVANCE_TIMESLOT_NUMBER > }	0 (no timing advance index)
{ 0 | 1 < Packet Extended Timing Advance : bit (2) > }	0
{0 | 1 … }	0 (BTTI)
EGPRS Modulation and Coding Scheme	MCS-1
{00 | 01…	01 (Legacy IEs Used)
0 | 1< Frequency Parameters_C1>	1 Frequency Parameters_C1 Present
0 | 1< Frequency Parameters_C2>	1 Frequency Parameters_C2 Present
}	P0_C1 not present
{ 0 | 1 < PFI : bit (7) > }	0 (Not present)
{ 0 | 1 < RLC_MODE : bit (1) > }	0 (Not present)
{ 0 | 1 < NPM Transfer Time : bit (5) > }	0 (Not present)
{ 0 | 1 -- 1 indicates FANR is activated }	0 FANR not activated
< Uplink EGPRS Level: < EGPRS Level IE > >	00 (EGPRS)
{ 0 | 1 < Pulse Format: < Pulse Format IE > > }	0 (Not present)

PACKET DOWNLINK ASSIGNMENT message in step 5:

Information Element	value/ remark
MESSAGE_TYPE	000010
PAGE_MODE	00 Normal Paging
Persistence Level	0 (no Persistence Level Present)
Referenced Address	Referenced by UL TFI
1	Message Escape Sequence for dual carrier…
00	
RLC_MODE	0 Acknowledged mode
CONTROL_ACK	0
<Assignment Info>	Assignment Info Struct
Assignment Type	10 (Dual carrier assignment)
Carrier ID	Arbitrarily chosen
0	BTTI Mode
TIMESLOT_ALLOCATION_C1	arbitrarily chosen (default timeslot 4)
1	Carrier 2 explicitly assigned
TIMESLOT_ALLOCATION_C2	arbitrarily chosen (default timeslot 4)
Packet Timing Advance	
{ 0|1< TIMING_ADVANCE_VALUE >	1 (timing advance value)
- TIMING_ADVANCE_VALUE }	30 bit periods
{ 0|1< TIMING_ADVANCE_INDEX > <TIMING_ADVANCE_TIMESLOT_NUMBER > }	0 (no timing advance index)
01	Legacy IEs Used
1< Frequency Parameters_C1>	Frequency Parameters_C1 Present
1< Frequency Parameters_C2>	Frequency Parameters_C2 Present
0	P0_C1 not present
{0|1<DOWNLINK_TFI_ASSIGNMENT>}	1 (assign downlink TFI)
- DOWNLINK_TFI_ASSIGNMENT	00001
{0|1<Power Control Parameters_C1>}	1 (Power Control Parameters present for Carrier1)
- ALPHA	0.5
- GAMMA for allocated timeslots	For DCS 1800 and PCS 1900: +6 dBm. For all other bands: +8 dBm (default timeslot 4)
{0|1<Power Control Parameters_C2>}	1 (Power Control Parameters present for Carrier2)
- ALPHA	0.5
- GAMMA for allocated timeslots	For DCS 1800 and PCS 1900: +6 dBmFor all other bands: +8 dBm (default timeslot 4)
0|1 <EGPRS Window Size>	0 (Not present)
0|1 < Packet Extended Timing Advance>	0 (Not present)
0|1 <PFI>	0 (Not present)
0|1 <NPM transfer Time>	0 (Not present)
0	Fast Ack/Nack Reporting not activated
Downlink EGPRS Level	00 (EGPRS)
Spare padding	Spare Padding

58b.2.5 Concurrent Downlink Dual Carrier TBF / Downlink Dual Carrier Configuration in Dual Transfer Mode

58b.2.5.1 Conformance requirement

A mobile station in dual transfer mode in a Downlink Dual Carrier configuration shall respond in the uplink radio block on the timeslot or on the PDCH pair indicated by the RRBP field or by the CES/P field, on the uplink radio frequency channel where the dedicated resource is assigned regardless of which downlink radio frequency channel the poll was received on. The network shall not poll the mobile station in a manner which would require the mobile station to respond on the same timeslot as that on which the dedicated resource is assigned.

A mobile station in dual transfer mode in a Downlink Dual Carrier configuration shall respond in the uplink radio block on the timeslot or the PDCH pair indicated by the RRBP field (see sub-clause 10.4.5) on the uplink radio frequency channel where the dedicated resource is assigned regardless of which downlink radio frequency channel the poll was received on, unless this would prevent the transmission or reception of a TCH radio block on a dedicated resource.

References

3GPP TS 44.060; subclause 8.1.2.2 and 8.6

58b.2.5.2 Test purpose

To verify that:

The MS receives downlink data blocks on the time slots assigned on the two carriers in the DLDC configuration.

58b.2.5.3 Method of test

Initial Conditions

System Simulator:

1 cell, EGPRS supported, Downlink Dual Carrier supported and DTM supported.

Mobile Station:

Support for Downlink Dual Carrier indicated in MS Radio Access Capabilities IE.

Support for Downlink Dual carrier for DTM capability in MS Radio Access Capabilities IE.

Support of DTM is indicated in SI6 in dedicated mode and in SI13 in idle mode.

The MS is in the state "idle, GMM-registered" with a P-TMSI allocated, SPLIT PG CYCLE negotiated, and PDP context 2 activated.

Specific PICS Statements

PIXIT Statements

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Test Procedure

Once the MS is in DTM, the SS assigns uplink resources in the Packet Uplink assignment IE and downlink resources in the Packet downlink Assignment IE of the DTM Assignment Command message. SS assigns time slots on two carriers C1 and C2 and brings MS in DLDC configuration. The SS sends RLC data blocks on Carrier 1 and Carrier 2 simultaneously. MS when polled acknowledges all data blocks send by SS. SS makes sure that MS sends all the data blocks on the assigned timeslot.

Maximum Duration of Test

5 minutes.

Expected Sequence

Step	Direction	Message	Comments
1			MS in state U10, on Timeslot N (chosen arbitrarily), utilising either: k=1, Channel Type = TCH/F; or k=2, Channel Type = TCH/H.
2	MS		Trigger the MS to initiate an uplink packet transfer Containing 2kB of data.
3	MS->SS	DTM REQUEST	
4	SS->MS	DTM ASSIGNMENT COMMAND	NW sets Packet Downlink Assignment Type to 2 and Allocates 2 carriers with TIMESLOT_ALLOCATION_C1 and TIMESLOT_ALLOCATION_C2 arbitrarily chosen (default timeslot 4). Packet Uplink Assignment IE set to EGPRS_MCS_MODE : MCS -9 EGPRS Window Size : 192 TIMESLOT_ALLOCATION : 5
5	MS->SS	ASSIGNMENT COMPLETE	
6	SS -> MS	RLC DATA BLOCK	On carrier 1 with next in sequence BSN (Start with BSN 0). USF Assigned
7	SS -> MS	RLC DATA BLOCK	On carrier 2 with next in sequence BSN Sent on same Radio Block as Data Block send on Carrier 1. Valid RRBP field
8	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH on carrier1 SS verifies that the correct BSN is received and the correct MCS is used.
9	SS -> MS	EGPRS PACKET DOWNLINK ACK/NACK	Received on carrier 2 in the allocated uplink block.
10			Repeat Steps 6 to 9 to verify that both uplink and downlink data transmission is functioning correctly.

Specific Message Contents

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58b.2.6 Concurrent Downlink Dual Carrier TBF/ Extended Dynamic Allocation

58b.2.6.1 Conformance requirement

If a mobile station supports Downlink Dual Carrier, the PACKET UPLINK ASSIGNMENT or MULTIPLE TBF UPLINK ASSIGNMENT message may assign PDCHs (corresponding to any given uplink TBF) on more than one carrier frequency. If this occurs, the Extended Dynamic Allocation procedures shall operate independently on each of the two carriers.

Reference

3GPP TS 44.060; subclause 8.1.1.2.1

58b.2.6.2 Test purpose

To verify that:

The Extended Dynamic allocation procedures work independently on each of the two carriers for a MS configured in DLDC.

58b.2.6.3 Method of test

Initial Conditions

System Simulator:

1 cell, EGPRS supported, Downlink Dual Carrier supported, Extended Dynamic allocation supported.

Mobile Station:

Support for Downlink Dual Carrier indicated in MS Radio Access Capabilities IE.

The MS is in the state "idle, GMM-registered" with a P-TMSI allocated, SPLIT PG CYCLE negotiated, and PDP context 2 activated.

Specific PICS Statements

The GPRS multislot class supported (TSPC_Type_GPRS_Multislot_ClassX, where X = 1..45)

PIXIT Statements

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Test Procedure

The EGPRS capable MS is made to transmit uplink RLC data blocks in EGPRS TBF RLC acknowledged mode. MS receives a PACKET DOWNLINK ASSIGNMENT message on its PACCH, instructing a Dual Carrier Downlink configuration. MS receives an uplink assignment with assignment type set to Dual Carrier assignment and EXTENDED_DYNAMIC_ALLOCATION set to 1. MS is allocated USF on carrier 1. When the MS receives the assigned USF of the lowest assigned PDCH, it transmits RLC/MAC data block on the same and all higher PDCHs in the next TDMA frame. It is checked at the SS that the MS sends RLC/MAC data blocks in the next radio block period on all assigned PDTCH and that each data block contains the correct TFI without TLLI on Carrier 1. The MS is allocated USF on carrier 2. The MS transmits. RLC/MAC blocks on the TS on the same and all higher PDCHs in the next TDMA frame. The test is repeated till completion of data transfer to make sure that extended dynamic allocation works independently on each carrier.

Maximum Duration of Test

5 minutes.

Expected Sequence

Step	Direction	Message	Comments
1		{Uplink dynamic allocation two phase access}	N = 5000 octets ,without starting time, Up to 4 timeslots are assigned according to MS multislot class (TS 45.002 Annex B.1) : - USF_1 on TN_1, - USF_2 on TN_2, - USF_3 on TN_3, - USF_4 on TN_4 USF_GRANULARITY = 1 block EGPRS Channel Coding Command: MCS-1
2	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned, containing USF assigned to the MS.
3	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH SS verifies that the BSN starts from 0, and the correct MCS is used.
4	SS -> MS	PACKET UPLINK ACK/NACK	SS acknowledges RLC data block received.
5	SS -> MS	PACKET DOWNLINK ASSIGNMENT	Sent on PACCH of the PDTCH assigned in Step 1. Addressing the MS using the UL TFI assigned in Step 1. Two Carriers Assigned. See specific message contents
6	SS		Wait for at least 3 block periods
7	SS -> MS	PACKET UPLINK ASSIGNMENT	Sent on PACCH of the PDTCH assigned in Step 1 Addressing the MS using the TFI. Assignment type set to single Carrier Assignment and EXTENDED DYNAMIC ALLOCATION set to 1.
8	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned, containing USF1 assigned to the MS on carrier 1.
9	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH1 on carrier1 SS verifies that the correct BSN is received and the correct MCS is used.
10	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH2 on carrier1 SS verifies that the correct BSN is received and the correct MCS is used.
11	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH3 on carrier1 SS verifies that the correct BSN is received and the correct MCS is used.
12	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH4 on carrier1 SS verifies that the correct BSN is received and the correct MCS is used.
13	SS -> MS	PACKET UPLINK ACK/NACK	Sent on the PACCH of the PDCH assigned, containing USF2 assigned to the MS on carrier 1.
14	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH2 on carrier1 SS verifies that the correct BSN is received and the correct MCS is used.
15	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH3 on carrier1 SS verifies that the correct BSN is received and the correct MCS is used.

16	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH4 on carrier1 SS verifies that the correct BSN is received and the correct MCS is used.
17	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned, containing USF1 assigned to the MS on carrier 2
18	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH1 on carrier2 SS verifies that the correct BSN is received and the correct MCS is used.
19	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH2 on carrier2 SS verifies that the correct BSN is received and the correct MCS is used.
20	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH3 on carrier2 SS verifies that the correct BSN is received and the correct MCS is used.
21	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH4 on carrier2 SS verifies that the correct BSN is received and the correct MCS is used.
22	SS -> MS	PACKET UPLINK ACK/NACK	Sent on the PACCH of the PDCH assigned, containing USF3 assigned to the MS on carrier 2.
23	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH3 on carrier2 SS verifies that the correct BSN is received and the correct MCS is used.
24	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH4 on carrier2 SS verifies that the correct BSN is received and the correct MCS is used.
25	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	On carrier 1 with BSN = 0, send with MCS-1
26	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	On carrier 2 with next in sequence BSN Send with MCS-1 FBI=1 with valid RRBP field
27	MS -> SS	EGPRS PACKT DOWNLINK ACK/NACK	On carrier 2, in the uplink block specified by the RRBP field. Final Ack Indicator bit set to '1' .
28		{Completion of uplink RLC data block transfer in extended dynamic mode}	

Specific Message Contents

PACKET DOWNLINK ASSIGNMENT message in step 5:

Information Element	value/ remark
MESSAGE_TYPE	000010
PAGE_MODE	00 Normal Paging
Persistence Level	0 (no Persistence Level Present)
Referenced Address	Referenced by UL TFI
1	Message Escape Sequence for dual carrier…
00	
RLC_MODE	0 Acknowledged mode
CONTROL_ACK	0
<Assignment Info>	Assignment Info Struct
0	BTTI Mode
TIMESLOT_ALLOCATION_C1	arbitrarily chosen (default timeslot 4)
1	Carrier 2 explicitly assigned
TIMESLOT_ALLOCATION_C2	arbitrarily chosen (default timeslot 4)
Packet Timing Advance	
{ 0|1< TIMING_ADVANCE_VALUE >	1 (timing advance value)
- TIMING_ADVANCE_VALUE }	30 bit periods
{ 0|1< TIMING_ADVANCE_INDEX > <TIMING_ADVANCE_TIMESLOT_NUMBER > }	0 (no timing advance index)
01	Legacy IEs Used
1< Frequency Parameters_C1>	Frequency Parameters_C1 Present
1< Frequency Parameters_C2>	Frequency Parameters_C2 Present
0	P0_C1 not present
{0|1<DOWNLINK_TFI_ASSIGNMENT>}	1 (assign downlink TFI)
- DOWNLINK_TFI_ASSIGNMENT	00001
{0|1<Power Control Parameters_C1>}	1 (Power Control Parameters present for Carrier1)
- ALPHA	0.5
- GAMMA for allocated timeslots	For DCS 1800 and PCS 1900: +6 dBm. For all other bands: +8 dBm (default timeslot 4)
{0|1<Power Control Parameters_C2>}	1 (Power Control Parameters present for Carrier2)
- ALPHA	0.5
- GAMMA for allocated timeslots	For DCS 1800 and PCS 1900: +6 dBmFor all other bands: +8 dBm (default timeslot 4)
0	EGPRS Window IE not present
0	Packet Extended Timing Advance not present
0	No PFI
0	No NPM transfer Time
0	Fast Ack/Nack Reporting not activated
Spare padding	Spare Padding

58b.2.7 Concurrent Downlink Dual Carrier TBF / Downlink Dual Carrier Configuration/ Extended RLC/MAC control message segmentation

58b.2.7.1 Conformance requirement

A mobile station supporting Downlink Dual Carrier shall also support the extended RLC/MAC control message segmentation as defined in sub-clause 9.1.12a.

In the case of a Downlink Dual Carrier configuration, all segments belonging to each RLC/MAC control message shall be sent on PACCH blocks belonging to the same carrier.

The network may segment RLC/MAC control messages into one, two or up to nine RLC/MAC control blocks depending on the length of the RLC/MAC control message. Segmentation of an RLC/MAC control message into more than two RLC/MAC control blocks is referred to as extended RLC/MAC control message segmentation. Extended RLC/MAC control message segmentation shall not be used for an RLC/MAC control message that can be sent using one or two RLC/MAC control blocks. Unless explicitly stated otherwise, extended RLC/MAC control message segmentation shall not be used. If the contents of a control message do not fit an integer number of control blocks, filler octets shall be used to fill the remainder of the RLC/MAC control block. Only the last RLC/MAC control block containing elements of the control message shall contain filler octets.

Reference

3GPP TS 44.060; sub clause 5.9, 8.1.1.1.1 and 9.1.12a

58b.2.7.2 Test purpose

To verify that:

This MS is able to operate in a DLDC TBF with Extended RLC/MAC control message segmentation.

58b.2.7.3 Method of test

Initial Conditions

System Simulator:

1 cell, EGPRS supported, Downlink Dual Carrier supported, Extended RLC/MAC control message segmentation supported.

For GSM 900, CA in SI1includes the frequencies:

(10, 30, 50, 60, 70, 80, 90, 100, 110, 120)

For DCS 1800 and PCS 1900, CA in SI1 includes the frequency:

(520, 530, 540, 550, 560, 570, 580, 590, 600, 610)

For GSM 850, CA in SI1includes the frequencies:

(130, 140, 150, 160 170, 180, 190, 200, 230, 240)

Mobile Station:

Support for Downlink Dual Carrier indicated in MS Radio Access Capabilities IE.

The MS is in the state "idle, GMM-registered" with a P-TMSI allocated, SPLIT PG CYCLE negotiated, and PDP context 2 activated.

Specific PICS Statements

The GPRS multislot class supported (TSPC_Type_GPRS_Multislot_ClassX, where X = 1..45)

Multislot Capability Reduction for Downlink Dual Carrier of 0 or 1 Timeslots (TSPC_Type_Multislot_Capability_Reduction_for_Downlink_Dual_Carrier_of_0_or_1_Timeslots)

Multislot Capability Reduction for Downlink Dual Carrier of 2 or more Timeslots (TSPC_Type_Multislot_Capability_Reduction_for_Downlink_Dual_Carrier_of_2_or_more_Timeslots)

PIXIT Statements

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Test Procedure

The EGPRS capable MS is made to transmit uplink RLC data blocks in EGPRS TBF RLC acknowledged mode. Then MS receives a PACKET DOWNLINK ASSIGNMENT message on its PACCH, segmented in 3 blocks , instructing a Dual Carrier Downlink configuration. The MS must do a re assembly of the received block and switch to the assigned PDCH. The SS sends RLC data blocks on Carrier 1 and Carrier 2 simultaneously. MS when polled acknowledges all data blocks send by SS.

While the MS has a concurrent TBF established, the SS sends a PACKET DOWNLINK ASSIGNMENT that assigned a new TFI value. The PACKET DOWNLINK ASSIGNMENT is segmented in 3 RLC control block but the final segment with FSe bit and RBSNe set to 1. The SS sends RLC data blocks on Carrier 1 and Carrier 2 simultaneously with the new assigned TFI; the tester checks that the MS does not answer with an EGPRS PACKET DOWNLINK ACK/NACK.

The SS sends RLC data blocks on Carrier 1 and 2 with TFI assigned in step 5. MS when polled acknowledges all data blocks send by SS and complete the uplink data transfer.

Maximum Duration of Test

10 minutes.

Expected Sequence

Step	Direction	Message	Comments
1		{Uplink dynamic allocation two phase access}	N = 500 octets USF_GRANULARITY = 1 block EGPRS Channel Coding Command: MCS-1
2	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned, containing USF assigned to the MS.
3	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH SS verifies that the BSN starts from 0, and the correct MCS is used.
4	SS -> MS	PACKET DOWNLINK ASSIGNMENT	Segmented into 3 Extended segment control blocks. The segments are sent on the same PDCH with same RTI values. Assignment type = Dual carrier Assignment. The final segment contains RBSNe = 1 and FSe = 1.
5	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	On carrier 1 with next in sequence BSN (start with BSN 0) USF assigned to the MS. MCS-1. A valid RRBP is indicated. USF assigned to the MS
6	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	On carrier 2 with next in sequence BSN Send on same Radio Block as Data Block Send on carrier 2 with MCS-1. A valid RRBP is indicated.
7	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on carrier 1.
8	MS -> SS	PACKET DOWNLINK ACK/NACK	Received on carrier 2. In the uplink block specified by the RRBP field.
9	SS -> MS	PACKET DOWNLINK ASSIGNMENT	Segmented into 3 Extended segment control blocks. Only two segments are sent from SS, the RBSNe = 0 and FSe = 0. The segments are sent on the same PDCH with same RTI values. Assignment type = Dual carrier Assignment. Valid RRBP specified in each segment TFI value is different than in step 5
10	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	On carrier 1 with next in sequence BSN. TFI value assigned in step 10
11	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	On carrier 2 with next in sequence BSN Send on same Radio Block as Data Block Send on carrier 2 with MCS-1. A valid RRBP is indicated. TFI value assigned in step 10
12	SS		SS checks that the MS did not answer to the polled DOWNLINK RLC_DATA BLOCK.
13	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	On carrier 1 with next in sequence BSN (start with BSN 0) USF assigned to the MS. MCS-1. A valid RRBP is indicated. USF assigned to the MS TFI value assigned in step 5
14	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	On carrier 2 with next in sequence BSN Send on same Radio Block as Data Block Send on carrier 2 with MCS-1. A valid RRBP is indicated. TFI value assigned in step 5 FBI set to 1.
15	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on carrier 1.
16	MS -> SS	PACKET DOWNLINK ACK/NACK	Received on carrier 2. In the uplink block specified by the RRBP field. MS set the Final Ack Indicator to 1.
17		{Completion of uplink RLC data block transfer}	

Specific Message Contents

PACKET DOWNLINK ASSIGNMENT message in step 4:

Information Element	value/ remark
MESSAGE_TYPE	000010
PAGE_MODE	00 Normal Paging
Persistence Level	0 (no Persistence Level Present)
Referenced Address	Referenced by UL TFI
1	Message Escape Sequence for dual carrier…
00	
RLC_MODE	0 Acknowledged mode
CONTROL_ACK	0
<Assignment Info>	Assignment Info Struct
0	BTTI Mode
TIMESLOT_ALLOCATION_C1	arbitrarily chosen (default timeslot 4)
1	Carrier 2 explicitly assigned
TIMESLOT_ALLOCATION_C2	arbitrarily chosen (default timeslot 4)
Packet Timing Advance	
{ 0|1< TIMING_ADVANCE_VALUE >	1 (timing advance value)
- TIMING_ADVANCE_VALUE }	30 bit periods
{ 0|1< TIMING_ADVANCE_INDEX > <TIMING_ADVANCE_TIMESLOT_NUMBER > }	0 (no timing advance index)
01	Legacy IEs Used
1< Frequency Parameters_C1>	Frequency Parameters_C1 Present
<Frequencies Parameters IE>	
TSC	Arbitrarily chosen
11	Indirect Encoding 2
<Indirect Encoding 2>	
MAIO	Arbitrarily chosen
HSN	Arbitrarily chosen
Length of MA Frequency List contents	Length of frequency list chosen according to length of MA frequency list content
MA Frequency List content	For GSM900 in Bitmap format 0 (10, 50, 70, 90, 110) For DCS 1800 and PCS 1900 in variable bitmap format (520, 540, 560, 580, 600) For GSM850 in variable bitmap format (130, 150, 170, 190, 210)
1< Frequency Parameters_C2>	Frequency Parameters_C2 Present
<Frequencies Parameters IE>	
TSC	Arbitrarily chosen
11	Indirect Encoding 2
<Indirect Encoding 2>	
MAIO	Arbitrarily chosen
HSN	Arbitrarily chosen
Length of MA Frequency List contents	Length of frequency list chosen according to length of MA frequency list content
MA Frequency List content	For GSM900 in Bitmap format 0 (30, 60, 80, 100, 120) For DCS 1800 and PCS 1900 in variable bitmap format (530, 550, 570, 590, 610) For GSM850 in variable bitmap format (140, 160, 180, 200, 220)
0	P0_C1 not present
{0|1<DOWNLINK_TFI_ASSIGNMENT>}	1 (assign downlink TFI)
- DOWNLINK_TFI_ASSIGNMENT	00001
{0|1<Power Control Parameters_C1>}	1 (Power Control Parameters present for Carrier1)
- ALPHA	0.5
- GAMMA for allocated timeslots	For DCS 1800 and PCS 1900: +6 dBm. For all other bands: +8 dBm (default timeslot 4)
{0|1<Power Control Parameters_C2>}	1 (Power Control Parameters present for Carrier2)
- ALPHA	0.5
- GAMMA for allocated timeslots	For DCS 1800 and PCS 1900: +6 dBmFor all other bands: +8 dBm

	(default timeslot 4)
0	EGPRS Window IE not present
0	Packet Extended Timing Advance not present
0	No PFI
0	No NPM transfer Time
0	Fast Ack/Nack Reporting not activated
Spare padding	Spare Padding

PACKET DOWNLINK ASSIGNMENT message in step 9:

(same as PACKET DOWNLINK ASSIGNMENT in step 4)

Information Element	value/ remark
{0|1<DOWNLINK_TFI_ASSIGNMENT>}	1 (assign downlink TFI)
- DOWNLINK_TFI_ASSIGNMENT	00010

58b.2.8 Concurrent Downlink Dual Carrier TBF/ Dual Carrier Uplink TBF/ USF granularity 4

58b.2.8.1 Conformance requirement

In a Downlink Dual Carrier configuration, one or more PDCHs are assigned to a single mobile station on each of two different radio frequency channels. A mobile station with a Downlink Dual Carrier configuration shall not be allocated radio blocks on both radio frequency channels during any given radio block period.

The time relation between an uplink block, which the mobile station shall use for transmission, and the occurrence of the USF value is defined in 3GPP TS 45.002. The number of RLC/MAC blocks to transmit is controlled by the USF_GRANULARITY parameter characterising the uplink TBF.

3GPP TS 44.060; subclause 8.1.1.1

58b.2.8.2 Test purpose

To verify that the MS:

When USF_GRANULARITY is set to four blocks allocation, MS sends uplink data blocks as per the USF_GRANULARITY parameter.

58b.2.8.3 Method of test

Initial Conditions

System Simulator:

1 cell, EGPRS supported, Downlink Dual Carrier supported.

Mobile Station:

Support for Downlink Dual Carrier indicated in MS Radio Access Capabilities IE.

The MS is in the state "idle, GMM-registered" with a P-TMSI allocated, SPLIT PG CYCLE negotiated, and PDP context 2 activated.

Specific PICS Statements

The GPRS multislot class supported (TSPC_Type_GPRS_Multislot_ClassX, where X = 1..45)

Multislot Capability Reduction for Downlink Dual Carrier of 0 or 1 Timeslots (TSPC_Type_Multislot_Capability_Reduction_for_Downlink_Dual_Carrier_of_0_or_1_Timeslots)

Multislot Capability Reduction for Downlink Dual Carrier of 2 or more Timeslots (TSPC_Type_Multislot_Capability_Reduction_for_Downlink_Dual_Carrier_of_2_or_more_Timeslots)

PIXIT Statements

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Test Procedure

The EGPRS capable MS is made to transmit uplink RLC data blocks in EGPRS TBF RLC acknowledged mode. Then MS receives a PACKET DOWNLINK ASSIGNMENT message on its PACCH, instructing a Dual Carrier Downlink configuration. MS receives an Uplink Assignment with assignment type set to Dual Carrier assignment and USF_GRANULARITY set to 4 block allocation. MS is allocated USF on carrier 1. The MS transmits 4 RLC/MAC blocks as per USF_GRANULARITY parameter. The MS is allocated USF on carrier 2. The MS transmits 4 RLC/MAC blocks on carrier 2 as per USF_GRANULARITY parameter.

Maximum Duration of Test

5 minutes.

Expected Sequence

Step	Direction	Message	Comments
1		{Uplink dynamic allocation two phase access}	N = 1000 octets USF_GRANULARITY = 1 block EGPRS Channel Coding Command: MCS-1
2	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned, containing USF assigned to the MS.
3	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH SS verifies that the BSN starts from 0, and the correct MCS is used.
4	SS -> MS	PACKET UPLINK ACK/NACK	SS acknowledges RLC data block received.
5	SS -> MS	PACKET DOWNLINK ASSIGNMENT	Sent on PACCH of the PDTCH assigned in Step 1. Addressing the MS using the UL TFI assigned in Step 1. Two Carriers Assigned. See specific message contents
6	SS		Wait for at least 3 block periods
7	SS -> MS	UPLINK ASSIGNMENT	Sent on PACCH of the PDTCH assigned in Step 1 Addressing the MS using the TLLI. Assignment type set to Dual Carrier Assignment and USF_GRANULARITY set to 4 block allocation.
8	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned, containing USF assigned to the MS on carrier 1.
9	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH on carrier1 SS verifies that the correct BSN is received and the correct MCS is used.
10	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH on carrier1 SS verifies that the correct BSN is received and the correct MCS is used.
11	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH on carrier1 SS verifies that the correct BSN is received and the correct MCS is used.
12	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH on carrier1 SS verifies that the correct BSN is received and the correct MCS is used.
13	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned, containing USF assigned to the MS on carrier 2
14	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH on carrier2 SS verifies that the correct BSN is received and the correct MCS is used.
15	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH on carrier2 SS verifies that the correct BSN is received and the correct MCS is used.
16	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH on carrier2 SS verifies that the correct BSN is received and the correct MCS is used.
17	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH on carrier2 SS verifies that the correct BSN is received and the correct MCS is used.
18			Step 8 – 17 is repeated 10 times
19		{Completion of uplink RLC data block transfer}	

Specific Message Contents

PACKET DOWNLINK ASSIGNMENT message in step 5:

Information Element	value/ remark
MESSAGE_TYPE	000010
PAGE_MODE	00 Normal Paging
Persistence Level	0 (no Persistence Level Present)
Referenced Address	Referenced by UL TFI
1	Message Escape Sequence for dual carrier…
00	
RLC_MODE	0 Acknowledged mode
CONTROL_ACK	0
<Assignment Info>	Assignment Info Struct
0	BTTI Mode
TIMESLOT_ALLOCATION_C1	arbitrarily chosen (default timeslot 4)
1	Carrier 2 explicitly assigned
TIMESLOT_ALLOCATION_C2	arbitrarily chosen (default timeslot 4)
Packet Timing Advance	
{ 0|1< TIMING_ADVANCE_VALUE >	1 (timing advance value)
- TIMING_ADVANCE_VALUE }	30 bit periods
{ 0|1< TIMING_ADVANCE_INDEX > <TIMING_ADVANCE_TIMESLOT_NUMBER > }	0 (no timing advance index)
01	Legacy IEs Used
1< Frequency Parameters_C1>	Frequency Parameters_C1 Present
1< Frequency Parameters_C2>	Frequency Parameters_C2 Present
0	P0_C1 not present
{0|1<DOWNLINK_TFI_ASSIGNMENT>}	1 (assign downlink TFI)
- DOWNLINK_TFI_ASSIGNMENT	00001
{0|1<Power Control Parameters_C1>}	1 (Power Control Parameters present for Carrier1)
- ALPHA	0.5
- GAMMA for allocated timeslots	For DCS 1800 and PCS 1900: +6 dBm. For all other bands: +8 dBm (default timeslot 4)
{0|1<Power Control Parameters_C2>}	1 (Power Control Parameters present for Carrier2)
- ALPHA	0.5
- GAMMA for allocated timeslots	For DCS 1800 and PCS 1900: +6 dBmFor all other bands: +8 dBm (default timeslot 4)
0	EGPRS Window IE not present
0	Packet Extended Timing Advance not present
0	No PFI
0	No NPM transfer Time
0	Fast Ack/Nack Reporting not activated
Spare padding	Spare Padding

58b.3 DLDC Configuration / Abnormal Case

58b.3.1 DLDC Configuration / Abnormal Case / DLDC Assignment Multislot Class Violations

58b.3.1.1 Conformance requirement

During uplink transfer, the network may initiate the establishment of one or more downlink TBFs by sending a downlink assignment message (e.g. PACKET DOWNLINK ASSIGNMENT, MULTIPLE TBF DOWNLINK ASSIGNMENT, PACKET TIMESLOT RECONFIGURE, MULTIPLE TBF TIMESLOT RECONFIGURE, PACKET CS RELEASE INDICATION) to the mobile station on the PACCH.

If the information in the PACKET TIMESLOT RECONFIGURE or MULTIPLE TBF TIMESLOT RECONFIGURE message does not properly specify an uplink and downlink PDCH or violates the mobile station's multislot capabilities, the mobile station shall perform an abnormal release with access retry (see sub-clause 8.7.2 and 3GPP TS 44.160);

References

3GPP TS 44.060, subclause 8.1.1.1.3, and 8.1.1.1.3.1.

58b.3.1.2 Test purpose

To verify that the MS, in downlink TBF establishment during uplink transfer, performs an abnormal release with random access, when the information in the PACKET TIMESLOT RECONFIGURE message violates the mobile station's multislot capabilities with respect to the multislot class and the Multislot Capability Reduction for Downlink Dual Carrier field signalled by the mobile station, as defined in Table B.2 of Annex B.4 in 3GPP TS 45.002.

58b.3.1.3 Method of test

Initial Conditions

System Simulator:

1 cell, EGPRS supported, Downlink Dual Carrier supported.

Mobile Station:

Support for Downlink Dual Carrier indicated in MS Radio Access Capabilities IE.

The MS is in the state "idle, GMM-registered" with a P-TMSI allocated, SPLIT PG CYCLE negotiated, and PDP context 3 activated.

Specific PICS Statements

The GPRS multislot class supported (TSPC_Type_GPRS_Multislot_ClassX, where X = 1..45)

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Test Procedure

The EGPRS capable MS is made to transmit uplink RLC data blocks in EGPRS TBF RLC unacknowledged mode. The SS sends a PACKET TIMESLOT RECONFIGURE message, instructing a Downlink Dual Carrier configuration, but the TIMESLOT_ALLOCATION_C1 and TIMESLOT_ALLOCATION_C2 violate the mobile station's multislot capabilities. To verify that the MS did not consider the downlink dual carrier assignment, a polled downlink rlc data block is sent on carrier 1 and the SS checks that the MS does not acknowledged it. The procedure is repeated on Carrier 2. The MS starts a random access for uplink establishment and the MS complete the uplink data transfer.
The test procedure is repeated 2 times. The message contents of PACKET TIMESLOT RECONFIGURE are varied as defined below.

1st execution, TIMESLOT_ALLOCATION_C1 and TIMESLOT_ALLOCATION_C2 violate the MS maximum number of downlink timeslots and violate the transmission and reception timing constraints.

2nd execution, TIMESLOT_ALLOCATION_C1 and TIMESLOT_ALLOCATION_C2 don't violate the MS maximum number of downlink timeslots but violate the transmission and reception timing constraints.

Maximum Duration of Test

5 minutes.

Expected Sequence

The sequence is repeated 2 times.

Step	Direction	Message	Comments
1		{Uplink dynamic allocation two phase access}	n = 440 octets, without starting time, USF_GRANULARITY = 1 block, RLC_DATA_BLOCKS_GRANTED = open-end TLLI_BLOCK_CHANNEL_CODING: MCS1 EGPRS CHANNEL CODING COMMAND: MCS1
2	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned, containing USF assigned to the MS.
3	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH SS verifies that the BSN starts from 0, and the correct MCS is used.
4	SS -> MS	PACKET TIMESLOT RECONFIGURE	Sent on PACCH of the PDTCH assigned in Step 1. Addressing the MS using the UL TFI assigned in Step 1. Two Carriers Assigned.
5	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCKS	On carrier 1 with next in sequence BSN (Start with BSN 0). MCS-1 Valid RRBP field.
6	SS		Verify MS does not transmit on the PDCH allocated by the RRBP field.
7	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCKS	On carrier 2 with next in sequence BSN MCS-1Vallid RRBP field.
8	SS		Verify MS does not transmit on the PDCH allocated by the RRBP field.
9	MS -> SS	EGPRS PACKET CHANNEL REQUEST	Received on RACH. MS can send it during steps 5 to 8.
10	SS -> MS	IMMEDIATE ASSIGNMENT	Single block assignment, to force the MS making the two phase access procedure. Sent on AGCH.
11	MS -> SS	PACKET RESOURCE REQUEST	Two phase access procedure. Received on the single block assigned in step 6.
12	SS -> MS	PACKET UPLINK ASSIGNMENT	Open-ended uplink dynamic allocation, no starting time, USF_GRANULARITY = single block, the assigned USF different from that in step 1.
13	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned, containing USF assigned to the MS in step 1.
14	SS		Check that no RLC data block is received
15	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned, containing USF assigned to the MS in step 8.
16	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the correct radio block of the assigned PDTCH.
17		{Completion of uplink RLC data block transfer}	

Specific Message Contents

PACKET TIMESLOT RECONFIGURE message in step 4 (for 1st execution):

Information Element	value/ remark
PAGE_MODE	00 for Normal Paging
{ 0 < GLOBAL_TFI : < Global TFI IE > >	uplink TFI, same value as assigned in step 1
{ 01 *-- escape for Downlink Dual Carrier, BTTI using FANR, EGPRS2, RTTI*	01, Message Escape Sequence for dual carrier
{ < EGPRS Channel Coding Command : < EGPRS Modulation and Coding Scheme IE >>	MCS-1
< RESEGMENT : bit (1) >	0
< Assignment Info : Assignment Info struct >	ASSIGNMENT TYPE: 10 (Dual Carrier assignment) Carrier ID: 0 (Carrier 1)
{ 0 | 1 < DOWNLINK EGPRS Window Size : < EGPRS Window Size IE > > }	480
{ 0 | 1 < UPLINK EGPRS Window Size : < EGPRS Window Size IE > > }	192
< LINK_QUALITY_MEASUREMENT_MODE : bit (2) >	0 (None)
<GPRS2_LINK_QUALITY_MEASUREMENT_MODE : bit (1) >	0
< Global Packet Timing Advance : < Global Packet Timing Advance IE > >	30 bit periods
{ 0 | 1 < Packet Extended Timing Advance : bit (2) > }	0
< DOWNLINK_RLC_MODE : bit (1) >	Acknowledged
< CONTROL_ACK : bit (1) >	Does not establish new downlink TBF while T3192 running
{ 0 | 1 < DOWNLINK_TFI_ASSIGNMENT : bit (5) > }	arbitrarily chosen
{ 0 *-- BTTI mode*	0
< TIMESLOT_ALLOCATION_C1 : bit (8) >	assign timeslots 0-6
{ 0 | 1 < TIMESLOT_ALLOCATION_C2 : bit (8) > }	assign timeslots 0-5
{ 01 *-- Legacy IEs used*	01
{ 0 | 1 < Frequency Parameters C1 : < Frequency Parameters IE > > }	0
{ 0 | 1 < Frequency Parameters C2: < Frequency Parameters IE > > }	arbitrarily chosen, different from carrier 0 but within the same band
< Dynamic Allocation 2 : < Dynamic Allocation 2 struct > >	
< EXTENDED_DYNAMIC_ALLOCATION : bit (1) >	0
{ 0 | 1 < P0_C1 : bit (4) >	0
< USF_GRANULARITY : bit (1) >	0
{ 0 | 1 < UPLINK_TFI_ASSIGNMENT : bit (5) > }	same value as assigned in step 1
{ 0 -- Allocation without Power Control Parameters	0
< N_USF: bit (4) >	0
{ 0 | 1 < USF : bit (3) > }	USF for timeslot 0 is assigned with the same value as assigned in step 1
{ 0 | 1 < Uplink Control Timeslot C1 : bit (3) > }	0
{ 0 | 1 < Uplink Control Timeslot C2 : bit (3) > }	0
{ 0 | 1 < PFI of downlink TBF : bit (7) > }	0
{ 0 | 1 < UPLINK_RLC_MODE : bit (1) > }	0
{ 0 | 1 < NPM Transfer Time : bit (5) > }	0
{ 0 *-- Fast Ack/Nack Reporting is not activated for the downlink TBF;*	0
< Uplink EGPRS Level: < EGPRS Level IE > >	EGPRS
< Downlink EGPRS Level: < EGPRS Level IE > >	EGPRS
{ 0 | 1 < Pulse Format: < Pulse Format IE > > }	0
< padding bits >	

PACKET TIMESLOT RECONFIGURE message in step 4 (for 2st execution):

Information Element	value/ remark
PAGE_MODE	00 for Normal Paging
{ 0 < GLOBAL_TFI : < Global TFI IE > >	uplink TFI, same value as assigned in step 1
{ 01 *-- escape for Downlink Dual Carrier, BTTI using FANR, EGPRS2, RTTI*	01, Message Escape Sequence for dual carrier
{ < EGPRS Channel Coding Command : < EGPRS Modulation and Coding Scheme IE >>	MCS-1
< RESEGMENT : bit (1) >	0
< Assignment Info : Assignment Info struct >	ASSIGNMENT TYPE: 2 (Dual Carrier assignment) Carrier ID: 0
{ 0 | 1 < DOWNLINK EGPRS Window Size : < EGPRS Window Size IE > > }	480
{ 0 | 1 < UPLINK EGPRS Window Size : < EGPRS Window Size IE > > }	192
< LINK_QUALITY_MEASUREMENT_MODE : bit (2) >	0 (None)
<GPRS2_LINK_QUALITY_MEASUREMENT_MODE : bit (1) >	0
< Global Packet Timing Advance : < Global Packet Timing Advance IE > >	30 bit periods
{ 0 | 1 < Packet Extended Timing Advance : bit (2) > }	0
< DOWNLINK_RLC_MODE : bit (1) >	Acknowledged
< CONTROL_ACK : bit (1) >	Does not establish new downlink TBF while T3192 running
{ 0 | 1 < DOWNLINK_TFI_ASSIGNMENT : bit (5) > }	arbitrarily chosen
{ 0 *-- BTTI mode*	0
< TIMESLOT_ALLOCATION_C1 : bit (8) >	Timeslot 0, 1, 2 are assigned
{ 0 | 1 < TIMESLOT_ALLOCATION_C2 : bit (8) > }	Timeslot 0 is assigned
{ 01 *-- Legacy IEs used*	01
{ 0 | 1 < Frequency Parameters C1 : < Frequency Parameters IE > > }	0
{ 0 | 1 < Frequency Parameters C2: < Frequency Parameters IE > > }	arbitrarily chosen, different from carrier 0 but within the same band
< Dynamic Allocation 2 : < Dynamic Allocation 2 struct > >	
< EXTENDED_DYNAMIC_ALLOCATION : bit (1) >	0
{ 0 | 1 < P0_C1 : bit (4) >	0
< USF_GRANULARITY : bit (1) >	0
{ 0 | 1 < UPLINK_TFI_ASSIGNMENT : bit (5) > }	same value as assigned in step 1
{ 0 -- Allocation without Power Control Parameters	0
< N_USF: bit (4) >	0
{ 0 | 1 < USF : bit (3) > }	USF for timeslot 0 is assigned with the same value as assigned in step 1
{ 0 | 1 < Uplink Control Timeslot C1 : bit (3) > }	0
{ 0 | 1 < Uplink Control Timeslot C2 : bit (3) > }	0
{ 0 | 1 < PFI of downlink TBF : bit (7) > }	0
{ 0 | 1 < UPLINK_RLC_MODE : bit (1) > }	0
{ 0 | 1 < NPM Transfer Time : bit (5) > }	0
{ 0 *-- Fast Ack/Nack Reporting is not activated for the downlink TBF;*	0
< Uplink EGPRS Level: < EGPRS Level IE > >	EGPRS
< Downlink EGPRS Level: < EGPRS Level IE > >	EGPRS
{ 0 | 1 < Pulse Format: < Pulse Format IE > > }	0
< padding bits >	

58b.3.2 DLDC Configuration / Abnormal Case/ Frequencies not within same band/ Access Retry

58b.3.2.1 Conformance requirement

If a mobile which supports Downlink Dual Carrier receives a PACKET DOWNLINK ASSIGNMENT message, PACKET TIMESLOT RECONFIGURE message, MULTIPLE TBF DOWNLINK ASSIGNMENT message or a MULTIPLE TBF TIMESLOT RECONFIGURE message that assigns resources on two carriers and those two carriers are not within the same frequency band, the mobile station shall perform an abnormal release with access retry (see sub-clause 8.7.2 and 3GPP TS 44.160);

References

3GPP TS 44.060, subclause 8.1.1.1.3.1.

58b.3.2.2 Test purpose

Verify that a MS with ongoing uplink transfer performs an abnormal release with random access when it receives a PACKET DOWNLINK ASSIGNMENT message with a Dual Downlink Carrier configuration that has carrier 1 and carrier 2 assigned on two different bands.

58b.3.2.3 Method of test

Initial Conditions

System Simulator:

1 cell, EGPRS supported, Downlink Dual Carrier supported.

Mobile Station:

Support for Downlink Dual Carrier indicated in MS Radio Access Capabilities IE.

The MS is in the state "idle, GMM-registered" with a P-TMSI allocated, SPLIT PG CYCLE negotiated, and PDP context 2 activated.

Specific PICS Statements

PIXIT Statements

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Test Procedure

The EGPRS capable MS is made to transmit uplink RLC data blocks in EGPRS TBF RLC acknowledged mode. Transfer is allowed to continue such that BSN is greater than 0.

The SS sends a PACKET DOWNLINK ASSIGNMENT message with Dual Carrier Frequency Parameters defining non-hopping frequency parameters for both carriers. Carrier 1 is assigned the same TSC and ARFCN as used on the uplink TBF while Carrier 2 is assigned an ARFCN that lies in a different frequency band. Verify that the MS aborts the uplink TBF and starts a random access for uplink establishment.

The SS assigns a new uplink PDCH to the MS with the same TFI as used in the preceding uplink TBF. Verify that the MS sends RLC data blocks with BSN starting at 0.

The SS sends a PACKET TIMESLOT RECONFIGURE message with Dual Carrier Frequency Parameters defining non-hopping frequency parameters for both carriers. Carrier 1 is assigned the same TSC and ARFCN as used on the uplink TBF while Carrier 2 is assigned an ARFCN that lies in a different frequency band. Verify that the MS aborts the uplink TBF and starts a random access for uplink establishment.

The SS assigns a new uplink PDCH to the MS with the same TFI as used in the preceding uplink TBF. Verify that the MS sends RLC data blocks with BSN starting at 0.

Maximum Duration of Test

5 minutes.

Expected Sequence

Step	Direction	Message	Comments
1		{Uplink dynamic allocation two phase access}	n = 440 octets, without starting time, USF_GRANULARITY = 1 block, RLC_DATA_BLOCKS_GRANTED = open-end TLLI_BLOCK_CHANNEL_CODING: MCS1 EGPRS CHANNEL CODING COMMAND: MCS1.
2	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned, containing USF assigned to the MS.
3	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH. SS verifies that the BSN starts from 0, and the correct MCS is used. Steps 2-3 are repeated 5 times. SS verifies that the BSN is incremented successfully.
4	SS -> MS	PACKET DOWNLINK ASSIGNMENT	Sent on PACCH of the PDTCH assigned in Step 1 addressing the MS using the UL TFI assigned in Step 1. Two carriers are assigned. ARFCN2 in Frequency Parameters_C2 is in a different band (arbitrarily chosen).
5	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCKS	On carrier 1 with next in sequence BSN (Start with BSN 0). MCS-1 Valid RRBP field.
6	SS		Verify MS does not transmit on the PDCH allocated by the RRBP field.
7	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCKS	On carrier 2 with next in sequence BSN MCS-1Vallid RRBP field.
8	SS		Verify MS does not transmit on the PDCH allocated by the RRBP field.
9	MS -> SS	EGPRS PACKET CHANNEL REQUEST	Received on RACH. MS can send it during steps 5 to 8.
10	SS -> MS	IMMEDIATE ASSIGNMENT	Sent on AGCH. Single block assignment, to force the MS to make a two phase access procedure
11	MS -> SS	PACKET RESOURCE REQUEST	Received on the single block assigned in step 6. Two phase access procedure.
12	SS -> MS	PACKET UPLINK ASSIGNMENT	USF_GRANULARITY = 1 block, RLC_DATA_BLOCKS_GRANTED = open-end TLLI_BLOCK_CHANNEL_CODING: MCS1 EGPRS CHANNEL CODING COMMAND: MCS1.
13	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned, containing USF assigned to the MS in step 12.
14	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH. SS verifies that the BSN starts from 0. Steps 9-10 are repeated 5 times. SS verifies that the BSN is incremented successfully.
15	SS -> MS	PACKET TIMESLOT RECONFIGURE	Sent on PACCH of the PDTCH assigned in Step 8 addressing the MS using the UL TFI assigned in Step 8. Two carriers are assigned. ARFCN2 in Frequency Parameters_C2 is in a different band (arbitrarily chosen).
16	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCKS	On carrier 1 with next in sequence BSN (Start with BSN 0). MCS-1 Valid RRBP field.
17	SS		Verify MS does not transmit on the PDCH allocated by the RRBP field.
18	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCKS	On carrier 2 with next in sequence BSN MCS-1Vallid RRBP field.
19	SS		Verify MS does not transmit on the PDCH allocated by the RRBP field.
29	MS -> SS	EGPRS PACKET CHANNEL REQUEST	Received on RACH. MS can send it during steps 16 to 19.
21	SS -> MS	IMMEDIATE ASSIGNMENT	Sent on AGCH. Single block assignment, to force the MS to make a two phase access procedure.
24	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned, containing USF assigned to the MS in step 23.
25	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH. SS verifies that the BSN starts from 0.
26		{Completion of uplink RLC data block transfer}	

Specific Message Contents

PACKET DOWNLINK ASSIGNMENT message in step 4

Information Element	value/ remark
MESSAGE_TYPE	000010
PAGE_MODE	00 Normal Paging
Persistence Level	0 (no Persistence Level Present)
Referenced Address	Referenced by UL TFI
1	Message Escape Sequence for dual carrier…
00	
RLC_MODE	0 Acknowledged mode
CONTROL_ACK	0
<Assignment Info>	Assignment Info Struct
0	BTTI Mode
TIMESLOT_ALLOCATION_C1	arbitrarily chosen (default timeslot 4)
1	Carrier 2 explicitly assigned
TIMESLOT_ALLOCATION_C2	arbitrarily chosen (default timeslot 4)
Packet Timing Advance	
{ 0|1< TIMING_ADVANCE_VALUE >	1 (timing advance value)
- TIMING_ADVANCE_VALUE }	30 bit periods
{ 0|1< TIMING_ADVANCE_INDEX > <TIMING_ADVANCE_TIMESLOT_NUMBER > }	0 (no timing advance index)
01	Legacy IEs Used
1< Frequency Parameters_C1>	Frequency Parameters_C1 Present
1< Frequency Parameters_C2>	arbitrarily chosen, different from carrier 0 but in the different band
0	P0_C1 not present
{0|1<DOWNLINK_TFI_ASSIGNMENT>}	1 (assign downlink TFI)
- DOWNLINK_TFI_ASSIGNMENT	00001
{0|1<Power Control Parameters_C1>}	1 (Power Control Parameters present for Carrier1)
- ALPHA	0.5
- GAMMA for allocated timeslots	For DCS 1800 and PCS 1900: +6 dBm. For all other bands: +8 dBm (default timeslot 4)
{0|1<Power Control Parameters_C2>}	1 (Power Control Parameters present for Carrier2)
- ALPHA	0.5
- GAMMA for allocated timeslots	For DCS 1800 and PCS 1900: +6 dBmFor all other bands: +8 dBm (default timeslot 4)
0	EGPRS Window IE not present
0	Packet Extended Timing Advance not present
0	No PFI
0	No NPM transfer Time
0	Fast Ack/Nack Reporting not activated
Spare padding	Spare Padding

PACKET TIMESLOT RECONFIGURE message in step 11

Information Element	value/ remark
PAGE_MODE	00 for Normal Paging
{ 0 < GLOBAL_TFI : < Global TFI IE > >	uplink TFI, same value as assigned in step 1
{ 01 *-- escape for Downlink Dual Carrier, BTTI using FANR, EGPRS2, RTTI*	01, Message Escape Sequence for dual carrier
{ < EGPRS Channel Coding Command : < EGPRS Modulation and Coding Scheme IE >>	MCS-1
< RESEGMENT : bit (1) >	0
< Assignment Info : Assignment Info struct >	ASSIGNMENT TYPE: 10 (Dual Carrier assignment) Carrier ID: 0 (Carrier 1)
{ 0 | 1 < DOWNLINK EGPRS Window Size : < EGPRS Window Size IE > > }	480
{ 0 | 1 < UPLINK EGPRS Window Size : < EGPRS Window Size IE > > }	192
< LINK_QUALITY_MEASUREMENT_MODE : bit (2) >	0 (None)
<GPRS2_LINK_QUALITY_MEASUREMENT_MODE : bit (1) >	0
< Global Packet Timing Advance : < Global Packet Timing Advance IE > >	30 bit periods
{ 0 | 1 < Packet Extended Timing Advance : bit (2) > }	0
< DOWNLINK_RLC_MODE : bit (1) >	Acknowledged
< CONTROL_ACK : bit (1) >	Does not establish new downlink TBF while T3192 running
{ 0 | 1 < DOWNLINK_TFI_ASSIGNMENT : bit (5) > }	arbitrarily chosen
{ 0 *-- BTTI mode*	0
< TIMESLOT_ALLOCATION_C1 : bit (8) >	assign timeslots 0-6
{ 0 | 1 < TIMESLOT_ALLOCATION_C2 : bit (8) > }	assign timeslots 0-5
{ 01 *-- Legacy IEs used*	01
{ 0 | 1 < Frequency Parameters C1 : < Frequency Parameters IE > > }	0
{ 0 | 1 < Frequency Parameters C2: < Frequency Parameters IE > > }	arbitrarily chosen, different from carrier 0 but in the different band
< Dynamic Allocation 2 : < Dynamic Allocation 2 struct > >	
< EXTENDED_DYNAMIC_ALLOCATION : bit (1) >	0
{ 0 | 1 < P0_C1 : bit (4) >	0
< USF_GRANULARITY : bit (1) >	0
{ 0 | 1 < UPLINK_TFI_ASSIGNMENT : bit (5) > }	same value as assigned in step 1
{ 0 -- Allocation without Power Control Parameters	0
< N_USF: bit (4) >	0
{ 0 | 1 < USF : bit (3) > }	USF for timeslot 0 is assigned with the same value as assigned in step 1
{ 0 | 1 < Uplink Control Timeslot C1 : bit (3) > }	0
{ 0 | 1 < Uplink Control Timeslot C2 : bit (3) > }	0
{ 0 | 1 < PFI of downlink TBF : bit (7) > }	0
{ 0 | 1 < UPLINK_RLC_MODE : bit (1) > }	0
{ 0 | 1 < NPM Transfer Time : bit (5) > }	0
{ 0 *-- Fast Ack/Nack Reporting is not activated for the downlink TBF;*	0
< Uplink EGPRS Level: < EGPRS Level IE > >	EGPRS
< Downlink EGPRS Level: < EGPRS Level IE > >	EGPRS
{ 0 | 1 < Pulse Format: < Pulse Format IE > > }	0
< padding bits >	

58b.3.3 DLDC Configuration / Abnormal case/ DLDC Configuration Supported / UL Single Carrier TBF / Frequency violations

58b.3.3.1 Conformance requirement

If the mobile station does not support Downlink Dual Carrier but receives a PACKET DOWNLINK ASSIGNMENT or MULTIPLE TBF DOWNLINK ASSIGNMENT message specifying containing different frequency parameters than are those currently in effect for the uplink TBF (see sub-clause 5.5.1.7), the mobile station shall ignore the PACKET DOWNLINK ASSIGNMENT/ MULTIPLE TBF DOWNLINK ASSIGNMENT message and continue normal operation of the uplink TBF

If a failure in the PACKET DOWNLINK ASSIGNMENT, MULTIPLE TBF DOWNLINK ASSIGNMENT or PACKET CS RELEASE INDICATION message is due to any other reason (including the presence of frequency parameters which do not comply with the requirements specified in sub-clause 5.5.1.7), the mobile station shall abort the procedure and continue the normal operation of the ongoing uplink TBFs and ongoing downlink TBFs.

References

3GPP TS 44.060, subclause 8.1.1.1.3.1, 8.1.1.2.1.

58b.3.3.2 Test purpose

Verify that the MS, in downlink TBF establishment during uplink transfer, when frequency parameters for carrier 1 in that message are different from those used in the current uplink TBF, ignores the PACKET DOWNLINK ASSIGNMENT/ MULTIPLE TBF DOWNLINK ASSIGNMENT message and continues normal operation of the uplink TBF.

Verify that the MS, in downlink TBF establishment during uplink transfer, when frequency parameters for carrier 2 in that message are absent or invalid, ignores the PACKET DOWNLINK ASSIGNMENT/ MULTIPLE TBF DOWNLINK ASSIGNMENT message and continues normal operation of the uplink TBF.

58b.3.3.3 Method of test

Initial Conditions

System Simulator:

1 cell, EGPRS supported, Downlink Dual Carrier supported.

Mobile Station:

Support for Downlink Dual Carrier indicated in MS Radio Access Capabilities IE.

The MS is in the state "idle, GMM-registered" with a P-TMSI allocated, SPLIT PG CYCLE negotiated, and PDP context 2 activated.

Specific PICS Statements

PIXIT Statements

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Test Procedure

The EGPRS capable MS is made to transmit uplink RLC data blocks in EGPRS TBF RLC acknowledged mode.

The SS sends a PACKET DOWNLINK ASSIGNMENT message, instructing a Downlink Dual Carrier configuration, but the Frequency Parameters C1 field contains a different TSC than that used for the current uplink TBF. After 5 radio blocks, on the new downlink PDCH for carrier 1, SS sends a few RLC data blocks addressing the MS, with the last data block containing a valid RRBP field. Verify MS does not send Packet Downlink Ack/Nack. SS sends Packet Downlink Dummy Control Block with the assigned USF on the uplink PDCH. Verify MS sends one RLC data block with the correct BSN value.

The SS sends another PACKET DOWNLINK ASSIGNMENT message, instructing a Downlink Dual Carrier configuration, but the Frequency Parameters C1 field contains a different ARFCN than that used for the current uplink TBF. After 5 radio blocks, on the new downlink PDCH for carrier 1, SS sends a few RLC data blocks addressing the

MS, with the last data block containing a valid RRBP field. Verify MS does not send Packet Downlink Ack/Nack. SS sends Packet Downlink Dummy Control Block with the assigned USF on the uplink PDCH. Verify MS sends one RLC data block with the correct BSN value.

The SS sends another PACKET DOWNLINK ASSIGNMENT message, instructing a Downlink Dual Carrier configuration, but the Frequency Parameters C2 field doesn't exist. After 5 radio blocks, on the new downlink PDCH for carrier 1, SS sends a few RLC data blocks addressing the MS, with the last data block containing a valid RRBP field. Verify MS does not send Packet Downlink Ack/Nack. SS sends Packet Downlink Dummy Control Block with the assigned USF on the uplink PDCH. Verify MS sends one RLC data block with the correct BSN value.

The SS sends another PACKET DOWNLINK ASSIGNMENT message, instructing a Downlink Dual Carrier configuration, but the Frequency Parameters C1 field contains an unknown MA_NUMBER. After 5 radio blocks, on the new downlink PDCH for carrier 1, SS sends a few RLC data blocks addressing the MS, with the last data block containing a valid RRBP field. Verify MS does not send Packet Downlink Ack/Nack. SS sends Packet Downlink Dummy Control Block with the assigned USF on the uplink PDCH. Verify MS sends one RLC data block with the correct BSN value.

The SS sends another PACKET DOWNLINK ASSIGNMENT message, instructing a Downlink Dual Carrier configuration with all valid parameters. After 3 radio blocks, on the new downlink PDCH for carrier 1, SS sends a few RLC data blocks addressing the MS, with the last data block containing a valid RRBP field. Verify MS acknowledges the previously received RLC data blocks.

Complete the uplink data transfer.

Maximum Duration of Test

5 minutes.

Expected Sequence

Step	Direction	Message	Comments
1		{Uplink dynamic allocation two phase access}	n = 440 octets, without starting time, USF_GRANULARITY = 1 block, RLC_DATA_BLOCKS_GRANTED = open-end TLLI_BLOCK_CHANNEL_CODING: MCS1 EGPRS CHANNEL CODING COMMAND: MCS1
2	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned, containing USF assigned to the MS.
3	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH SS verifies that the BSN starts from 0, and the correct MCS is used. Step 2-3 may be repeated a few times.
4	SS -> MS	PACKET DOWNLINK ASSIGNMENT	Sent on PACCH of the PDTCH assigned in Step 1. Addressing the MS using the UL TFI assigned in Step 1. Two Carriers Assigned. Same as the default message contents below, but TSC in Parameters_C1 is different from TSC in Packet Uplink Assignment
5	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCKS	Sent on carrier 1, with next in sequence BSN (BSN=0), MCS-1. Valid RRBP field
6	SS		Verify MS does not transmit on the PDCH allocated by the RRBP field.
7	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned, containing USF assigned to the MS.
8	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH SS verifies that the BSN increment by 1 from step 3, and the correct MCS is used.
9	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCKS	Sent on carrier 2, with next in sequence BSN, MCS-1. Valid RRBP field
10	SS		Verify MS does not transmit on the PDCH allocated by the RRBP field.
11	SS -> MS	PACKET DOWNLINK ASSIGNMENT	Sent on PACCH of the PDTCH assigned in Step 1. Addressing the MS using the UL TFI assigned in Step 1. Two Carriers Assigned. Same as the default message contents below, but ARFCN in Parameters_C1 is different from ARFCN in Packet Uplink Assignment
12	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCKS	Sent on carrier 1, with next in sequence BSN, MCS-1. Valid RRBP field.
13	SS		Verify MS does not transmit on the PDCH allocated by the RRBP field.
14	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned, containing USF assigned to the MS.
16	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCKS	Sent on carrier 2, with next in sequence BSN, MCS-1. Valid RRBP field
17	SS		Verify MS does not transmit on the PDCH allocated by the RRBP field.
15	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH SS verifies that the BSN increment by 1 from step 8, and the correct MCS is used.
18	SS -> MS	PACKET DOWNLINK ASSIGNMENT	Sent on PACCH of the PDTCH assigned in Step 1. Addressing the MS using the UL TFI assigned in Step 1. Two Carriers Assigned. Same as the default message contents below, but Frequency_Parameters_C2 is absent.
19	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCKS	Sent on carrier 1, with next in sequence BSN, MCS-1. Valid RRBP field..
20	SS		Verify MS does not transmit on the PDCH allocated by the RRBP field.
21	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned, containing USF assigned to the MS.
22	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH SS verifies that the BSN increment by 1 from step 15, and the correct MCS is used.
23	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCKS	Sent on carrier 2, with next in sequence BSN, MCS-1. Valid RRBP field
24	SS		Verify MS does not transmit on the PDCH allocated by the RRBP field.

25	SS -> MS	PACKET DOWNLINK ASSIGNMENT	Sent on PACCH of the PDTCH assigned in Step 1. Addressing the MS using the UL TFI assigned in Step 1. Two Carriers Assigned. Same as the default message contents below, but Frequency_Parameters_C1 is defined as below, with an unknown MA_NUMBER 13.
26	SS -> MS	EGPRS DOWNLINKRLC DATA BLOCKS	Sent on carrier 1, with next in sequence BSN, MCS-1. Valid RRBP field.
27	SS		Verify MS does not transmit on the PDCH allocated by the RRBP field.
28	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned, containing USF assigned to the MS.
29	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH SS verifies that the BSN increment by 1 from step 22, and the correct MCS is used.
30	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCKS	Sent on carrier 2, with next in sequence BSN, MCS-1. Valid RRBP field
31	SS		Verify MS does not transmit on the PDCH allocated by the RRBP field.
32	SS -> MS	PACKET DOWNLINK ASSIGNMENT	Sent on PACCH of the PDTCH assigned in Step 1. Addressing the MS using the UL TFI assigned in Step 1. Two Carriers Assigned. See the default message contents below.
33	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCKS	Sent on carrier 1, with next in sequence BSN, MCS-1. Valid RRBP field..
34	MS -> SS	EGPRS PACKET DOWNLINK ACK/NACK	MS acknowledges the previously received RLC data block.
35	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned, containing USF assigned to the MS.
36	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH SS verifies that the BSN increment by 1 from step 29, and the correct MCS is used.
37	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCKS	Sent on carrier 2, with next in sequence BSN .MCS-1. Valid RRBP field. FBI=1
38	MS -> SS	EGPRS PACKET DOWNLINK ACK / NACK	On carrier 2, in the uplink block specified by the RRBP field. FAI=1
39		{Completion of uplink RLC data block transfer}	

Specific Message Contents

Default PACKET DOWNLINK ASSIGNMENT message

Information Element	value/ remark
MESSAGE_TYPE	000010
PAGE_MODE	00 Normal Paging
Persistence Level	0 (no Persistence Level Present)
Referenced Address	Referenced by UL TFI
1	Message Escape Sequence for dual carrier…
00	
RLC_MODE	0 Acknowledged mode
CONTROL_ACK	0
<Assignment Info>	Assignment Info Struct
- Assignment Type	10 (Dual Carrier assignment)
Carrier ID	Arbitrarily chosen
0	BTTI Mode
TIMESLOT_ALLOCATION_C1	arbitrarily chosen (default timeslot 4)
1	Carrier 2 explicitly assigned
TIMESLOT_ALLOCATION_C2	arbitrarily chosen (default timeslot 4)
Packet Timing Advance	
{ 0|1< TIMING_ADVANCE_VALUE >	1 (timing advance value)
- TIMING_ADVANCE_VALUE }	30 bit periods
{ 0|1< TIMING_ADVANCE_INDEX > <TIMING_ADVANCE_TIMESLOT_NUMBER > }	0 (no timing advance index)
01	Legacy IEs Used
1< Frequency Parameters_C1>	Frequency Parameters_C1 Present, same as those used for the current uplink TBF
1< Frequency Parameters_C2>	Frequency Parameters_C2 Present
0	P0_C1 not present
{0|1<DOWNLINK_TFI_ASSIGNMENT>}	1 (assign downlink TFI)
- DOWNLINK_TFI_ASSIGNMENT	00001
{0|1<Power Control Parameters_C1>}	1 (Power Control Parameters present for Carrier1)
- ALPHA	0.5
- GAMMA for allocated timeslots	For DCS 1800 and PCS 1900: +6 dBm. For all other bands: +8 dBm (default timeslot 4)
{0|1<Power Control Parameters_C2>}	1 (Power Control Parameters present for Carrier2)
- ALPHA	0.5
- GAMMA for allocated timeslots	For DCS 1800 and PCS 1900: +6 dBm. For all other bands: +8 dBm (default timeslot 4)
0	EGPRS Window IE not present
0	Packet Extended Timing Advance not present
0	No PFI
0	No NPM transfer Time
0	Fast Ack/Nack Reporting not activated
Spare padding	Spare Padding

PACKET DOWNLINK ASSIGNMENT message in step 19

Frequency Parameters IE	
-Indirect encoding struct	
-MAIO	arbitrarily chosen
-MA_NUMBER	13

58c EGPRS2

58c.1 Concurrent EGPRS2 TBF

58c.1.1a Concurrent EGPRS2A TBF using RTTI Latency reduction

58c.1.1a.1 Conformance Requirement

If a mobile station is assigned concurrent TBFs, these shall be in the same TBF mode.

A TBF in EGPRS mode operates using one of four groups of modulation and coding schemes:

- EGPRS-GMSK only (applicable to uplink TBFs only): this comprises MCS-1 to MCS-4
- EGPRS: this comprises MCS-1 to MCS-9
- EGPRS2-A: for uplink TBFs, this comprises MCS-1 to MCS-6 and UAS-7 to UAS-11; for downlink TBFs, this comprises MCS-1 to MCS-4, MCS-6 (only for retransmissions of blocks originally transmitted using EGPRS), MCS-7, MCS-8 and DAS-5 to DAS-12
- EGPRS2-B: for uplink TBFs, this comprises MCS-1 to MCS-4 and UBS-5 to UBS-12; for downlink TBFs, this comprises MCS-1 to MCS-4, MCS-6 to MCS-9, DAS-5, DAS-6, DAS-8, DAS-9, DAS-11 and DBS-5 to DBS-12.

The group of modulation and coding schemes to be used on a PDTCH associated with a TBF is indicated in the assignment message.

The use of the EGPRS2-A group for uplink or downlink is only supported by MSs which are capable of EGPRS2-A or EGPRS2-B in that direction.

If a mobile station indicates support of Reduced Latency (see 3GPP TS 24.008), it may be assigned TBFs with FANR activated (see sub-clause 9.1.14), either in BTTI configuration or in RTTI configuration. The network shall ensure that, if a mobile station is assigned a TBF with FANR activated, FANR shall be activated for all concurrent TBFs assigned to that mobile station.

References

3GPP TS 44.060, subclauses 5.2.1

GPRS, EGPRS and EGPRS2 capable mobile stations can be multiplexed dynamically on the same PDCH.

- For a mobile station supporting EGPRS2-A in the downlink, the network may use either GMSK, 8-PSK, 16-QAM or 32-QAM modulation with normal symbol rate, i.e. CS-1 to CS-4, MCS-0, MCS-1 to MCS-9 or DAS-5 to DAS-12 in those blocks.

References

3GPP TS 44.060, subclauses 5.2.4a

58c.1.1a.2 Test Purposes

To verify that the MS

- can operate concurrent uplink and downlink EGPRS2-A TBFs

- can operate with EGPRS2A TBF using RTTI

58c.1.1a.3 Method of Test

Initial Conditions

System Simulator:

1 cell with EGPRS support, default setting,

Mobile Station:

The MS is EGPRS updated with a P-TMSI allocated, SPLIT_PG_CYCLE negotiated and the test PDP Context 2 activated.

Specific PICS Statements

PIXIT Statements

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Test Procedure

An EGPRS2A MS receives a PACKET DOWNLINK ASSIGNMENT message on its PACCH allocating resources for carrier 1. SS transmits downlink RLC data blocks. MS responds by sending a PACKET DOWNLINK ACK/NACK. MS then triggered to perform uplink data transfer in EGPRS2A to establish a concurrent uplink TBF. MS sends uplink data blocks and SS acknowledges. SS then send a PACKET TIMSLOT RECONFIGURE message to MS and to change the TTI configuration to RTTI in RTTI USF mode. A new EGPRS2A channel coding scheme is chosen for downlink. MS sends and receives data in new RTTI configuration. The uplink data transfer is completed.

Maximum Duration of Test

5 minutes

Expected Sequence

Step	Direction	Message	Comments
1	SS -> MS	PACKET DOWNLINK ASSIGNMENT	Sent on PACCH triggers the MS to assigned PDTCH.
2	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Sent on assigned PDCH with DAS-5 assigned to the MS. A valid RRBP is indicated.
3	MS -> SS	EGPRS PACKET DOWNLINK ACK/NACK	In the uplink block specified by the RRBP field, MS acknowledges the previously received RLC data blocks.
4		{Uplink dynamic allocation two phase access}	n = 2000 octets, USF_GRANULARITY = 1 block EGPRS2 Channel Coding Command: UAS-11
5	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned, containing USF assigned to the MS.
6	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH
7	SS -> MS	PACKET UPLINK ACK/NACK	SS acknowledges receiving all RLC data blocks.
8	SS -> MS	PACKET TIMESLOT RECONFIGURE	Sent on downlink PACCH. RTTI Configuration (Changing TTI configuration from BTTI to RTTI) Assigns a single uplink PDTCH pair. The corresponding downlink PDTCH pair uses the same timeslots as the assigned uplink pair. USF Mode = RTTI USF Mode. USF Granularity = 1 block EGPRS2 uplink channel coding command arbitrarily chosen between UAS 7 to UAS-11. Assigns a single downlink PDTCH pair. EGPRS2 downlink channel coding chosen to be DAS-12.
9	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on downlink PACCH of the corresponding downlink PDCH pair of the uplink lnk PDCH assigned at Step 8 USF assigned to the MS.
10	MS -> SS	EGPRS UPLINK DATA BLOCK	Received on uplink PDTCH pair assigned in Step 8 UAS as specified in Step 8
11	SS -> MS	EGPRS DOWNLINK DATA BLOCK	Sent on downlink PDTCH pair assigned in Step 8. Contains the PAN field which acknowledges the radio block received in Step 10. CES/P = 011
12	MS -> SS	EGPRS UPLINK DATA BLOCK	Received on uplink PDTCH pair assigned in Step 8
13	MS-> SS	EGPRS PACKET DOWNLINK ACK/NACK	Received on the uplink PDCH pair corresponding to the downlink PDTCH pair assigned at Step 8.
14	SS-> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on corresponding downlink PDCH pair of the uplink PDCH pair assigned at Step 8. USF assigned to the MS
15	MS-> SS	EGPRS UPLINK DATA BLOCK	Received on the uplink PDTCH pair assigned in Step 8.
16		{Completion of uplink RLC data block transfer}	

Specific Message Contents

None.

58c.2.1a Acknowledged Mode/ Uplink TBF/ Countdown Value, in EGPRS2A

58c.2.1a.1 Conformance requirements

1. The mobile station shall send the Countdown Value (CV) in each uplink RLC data block to indicate to the network the absolute BSN (BSN') of the last RLC data block that will be sent in the uplink TBF.

2. When a radio block for EGPRS2-A data transfer consists of two RLC data blocks, the CV value of the RLC/MAC header refers to the second RLC data block.

References

3GPP TS 44.060, subclause 9.3.1.

58.2.1a.2 Test purpose

1. To verify that when a radio block for EGPRS2-A data transfer consists of two RLC data blocks, the CV value is calculated based on BSN of the second RLC data block.

58.2.1a.3 Method of test

Initial Conditions

System Simulator:

1 cell with EGPRS2-A support, default setting, PBCCH not present, BS_CV_MAX = 15.

Mobile Station:

The MS is EGPRS2-A updated with a P-TMSI allocated, SPLIT PG CYCLE negotiated and the test PDP context2 activated.

Specific PICS Statements

Support of QAM in uplink (TSPC_Type_EGPRS_16QAM_uplink)

PIXIT Statements

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Test Procedure

The MS is made to transmit uplink RLC data blocks in an acknowledged mode uplink EGPRS2-A TBF to transmit N octets to calculate TBC value. Uplink RLC data block transfer is completed.

The MS is made to transmit uplink RLC data blocks in an acknowledged mode uplink EGPRS2-A TBF to transmit TBC uplink RLC data blocks. EGPRS2-A Channel Coding Scheme is UAS-7. N is less than Window Size.

The SS assigns resources for the mobile station to transmit data blocks. Each time one radio block is assigned.

The SS observes the CV value in the uplink blocks. BSN' = Absolute BSN of the second RLC data block is calculated upon each radio block is received.

The SS verifies that when x=round((TBC-BSN'-1)/NTS*2) is greater than BS_CV_MAX, CV equals to 15, otherwise, CV=x.

UAS-8, UAS9, UAS10 and UAS-11 shall be applied.

Maximum Duration of Test

50 minutes.

Expected Sequence

Step	Direction	Message	Comments
1		{Uplink dynamic allocation two phase access}	N = 56*60 octets K=2 USF_GRANULARITY = 1 block EGPRS2-A Channel Coding Scheme: UAS-7 (Suppose timeslot capability is 1)
2	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned, containing USF assigned to the MS.
3	MS -> SS	EGPRS2-A UPLINK RLC DATA BLOCK	Received on the assigned PDTCH
4	SS	-	Repeat steps 2 and 3 until CV=14 When CV=14, Calculate BSN' = BSN of the second RLC block, Calculate TBC= CV * NTS*K+BSN'
5		{Completion of uplink RLC data block transfer}	
6		{Uplink dynamic allocation two phase access}	N = 56*60 octets K=2 USF_GRANULARITY = 1 block EGPRS2-A Channel Coding Scheme: UAS-7 (Suppose timeslot capability is 1)
7	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned, containing USF assigned to the MS.
8	MS -> SS	EGPRS2-A UPLINK RLC DATA BLOCK	Received on the assigned PDTCH
9	SS	-	Repeat steps 7 and 8 for TBC/2 times. Calculate BSN' = BSN of the second RLC bock. Calculate x=round((TBC-BSN'-1)/NTS*K). Verify that when x is greater than BS_CV_MAX: CV = 15. Otherwise: CV=x
10		{Completion of uplink RLC data block transfer}	
11			Repeat the procedure from step 1 to 10 for: UAS-8, N=64*60 octets, K=2 UAS-9, N=74*60 octets, K=2 UAS-10, N=56*60 octets, K=3 UAS-11, N=64*60 octets, K=3

58c.2.2a Acknowledged Mode/ Uplink TBF/ Retransmission/ Split RLC Data Block, in EGPRS2-A

58c.2.2a.1 Conformance requirements

1. In RLC acknowledged mode, each RLC endpoint transmitter shall have an associated acknowledge state array (V(B)).

2. The transmitter shall transmit the oldest RLC data block whose corresponding element in V(B) indexed relative to V(A) has the value NACKED. As each RLC data block is transmitted the corresponding element in V(B) is set to the value PENDING_ACK.

3. In EGPRS2-A uplink, depending on the modulation and coding one to three RLC data blocks are contained in one RLC/MAC block as follows:

- One RLC data block per RLC/MAC block: MCS-1, MCS-2, MCS-3, MCS-4, MCS-5 and MCS-6.

- Two RLC data blocks per RLC/MAC block: UAS-7, UAS-8 and UAS-9.

- Three RLC data blocks per RLC/MAC block: UAS-10 and UAS-11.

4. A re-segment bit is included within each PACKET UPLINK ACK/NACK, PACKET UPLINK ASSIGNMENT and PACKET TIMESLOT RECONFIGURE message. For initial transmissions of new RLC blocks the channel coding commanded is applied. The re-segment bit is used to set the ARQ mode to type I or type II (incremental redundancy) for uplink TBFs.

5. For retransmissions, setting the re-segment bit to 1 (type I ARQ) requires the mobile station to use an MCS within the same family as the initial transmission and the payload may be split.

6. If the RLC data block to be transmitted is split over two radio blocks, both radio blocks shall be transmitted

7. RLC data blocks initially transmitted with MCS4, MCS-5, MCS-6, UAS-7, UAS-8, UAS-9, UAS-10 or UAS-11, can optionally be retransmitted with MCS-1, MCS-2 and MCS-3 respectively, using two radio blocks. In this case, the split block field in the header shall be set to indicate that the RLC data block is split, and the order of the two parts.

References

3GPP TS 44.060, subclauses 8.1.1, 9.1.2, 9.1.3, 9.1.8, 9.1.3.2, 9.3.2.1, 10.0a.2, 10.3a.4, 10.4.1, 10.4.8b and 12.10e.

3GPP TS 44.004.

3GPP TS 45.003.

58c.2.2a.2 Test purpose

1. To verify that if the RLC data block to be transmitted is split over two radio blocks, both radio blocks shall be transmitted.

2. To verify the correct setting of the Split Block field in the block header.

3. To verify that the order of the retransmitted two parts of the data block is correct.

58c.2.2a.3 Method of test

Initial Conditions

System Simulator:

1 cell with EGPRS2-A support, default setting, PBCCH not present.

Mobile Station:

The MS is EGPRS2-A updated with a P-TMSI allocated, SPLIT PG CYCLE negotiated and the test PDP context2 activated.

Specific PICS Statements

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PIXIT Statements

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Test Procedure

The EGPRS2-A capable MS is made to transmit uplink RLC data blocks in EGPRS2-A TBF RLC acknowledged mode. The EGPRS2-A Channel Coding Command IE indicates UAS-7 in the Packet Uplink Assignment message.

After BS_CV_MAX block periods the SS sends a Packet Uplink Ack/Nack message to negatively acknowledge some RLC data blocks. In the message EGPRS2-A Channel Coding Command IE is set to MCS-1 and Re-segment IE should be set to '1'B.

The MS shall retransmit the NACKED RLC data blocks using MCS-1 in spitted radio blocks. Observe the uplink RLC data block header. Both of split blocks shall be received, the first one shall contain a SPB field equals to '10'B while the second shall be '11'B.

Maximum Duration of Test

8 minutes

Expected Sequence

Step	Direction	Message	Comments
1		{Uplink dynamic allocation two phase access}	N = 1500 octets USF_GRANULARITY = 1 block EGPRS2-A Channel Coding Command: UAS-7
2	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned, containing USF assigned to the MS.
3	MS -> SS	EGPRS2-A UPLINK RLC DATA BLOCK	Received on the assigned PDTCH SS verifies that the BSN starts from 0, and verifies the correct MCS is used.
4	-		Repeat steps 2 and 3 until the RLC data Block with BSN=8 is received.
5	-		Wait for BS_CV_MAX block periods.
6	SS -> MS	PACKET UPLINK ACK/NACK	SS acknowledges RLC data blocks from BSN 0 to 7 and negatively acknowledges last RLC data block (BSN = 8). USF not assigned to the MS EGPRS2-A Channel Coding Command is set to MCS-1. Resegment IE is set to '1'B.
7	-		Wait for 1 block period with no USF
8	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned, containing USF assigned to the MS.
A9 (optional step)	MS -> SS	EGPRS2-A UPLINK RLC DATA BLOCK	MS may transmit new data block if it has already been scheduled while Packet Uplink Ack/Nack is being processed.
B9(optional step)	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	USF assigned to the MS,
9	MS -> SS	EGPRS2-A UPLINK RLC DATA BLOCK	Received on the assigned PDTCH. BSN = 8, SPB = '10'B. SS verifies that the NACKED RLC data blocks are received and that the correct MCS is used.
10	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned, containing USF assigned to the MS.
11	MS -> SS	EGPRS2-A UPLINK RLC DATA BLOCK	Received on the assigned PDTCH. BSN = 8, SPB = '11'B. SS verifies that the NACKED RLC data blocks are received and that the correct MCS is used.
12		{Completion of uplink RLC data block transfer}	

58c.2 Uplink EGPRS2 TBF

58c.2.1 to 58c.2.4 Void

58c.2.4a Acknowledged Mode/ Uplink TBF/ Verification of new coding schemes for EGPRS2A

58c.2.4a.1 Conformance requirements

A TBF in EGPRS mode operates using one of four groups of modulation and coding schemes:

- EGPRS-GMSK only (applicable to uplink TBFs only): this comprises MCS-1 to MCS-4
- EGPRS: this comprises MCS-1 to MCS-9
- EGPRS2-A: for uplink TBFs, this comprises MCS-1 to MCS-6 and UAS-7 to UAS-11; for downlink TBFs, this comprises MCS-1 to MCS-4, MCS-6 (only for retransmissions of blocks originally transmitted using EGPRS), MCS-7, MCS-8 and DAS-5 to DAS-12
- EGPRS2-B: for uplink TBFs, this comprises MCS-1 to MCS-4 and UBS-5 to UBS-12; for downlink TBFs, this comprises MCS-1 to MCS-4, MCS-6 to MCS-9, DAS-5, DAS-6, DAS-8, DAS-9, DAS-11 and DBS-5 to DBS-12.

A RESEGMENT bit is included within each PACKET UPLINK ACK/NACK, PACKET UPLINK ASSIGNMENT, MULTIPLE TBF UPLINK ASSIGNMENT, PACKET TIMESLOT RECONFIGURE, MULTIPLE TBF TIMESLOT RECONFIGURE or PACKET CS RELEASE INDICATION messages. For initial transmissions of new RLC blocks the channel coding commanded is applied. The RESEGMENT bit is used to set the ARQ mode to type I or type II (incremental redundancy) for uplink TBFs. For retransmissions, setting the RESEGMENT bit to '1' (type I ARQ) requires the mobile station to use an MCS within the same family as the initial transmission and the payload may be split (refer to table 8.1.1.1). For retransmissions, setting the RESEGMENT bit to '0' (type II ARQ) requires the mobile station to use an MCS within the same family as the initial transmission without splitting the payload even if the network has commanded it to use MCS-1, MCS-2 or MCS-3 for subsequent RLC blocks (refer to table 8.1.1.2), see note. In RLC unacknowledged mode, RESEGMENT bit shall be ignored and default value 0 should be used.

References

3GPP TS 44.060, subclause 5.2.1 and 8.1.1

58c.2.4a.2 Test purpose

1. To verify that the mobile station uses the correct channel coding commanded by the Network for initial transmission.
2. To verify that correct channel coding command is used for retransmission.

58c.2.4a.3 Method of test

Initial Conditions

System Simulator:

1 cell with EGPRS support, default setting, PBCCH not present.

Mobile Station:

The MS is EGPRS updated with a P-TMSI allocated, SPLIT PG CYCLE negotiated and the test PDP context2 activated.

Specific PICS Statements

- Support of PSK in uplink (TSPC_Type_EGPRS_8PSK_uplink)
- Support of QAM in uplink (TSPC_Type_EGPRS_16QAM_uplink)

PIXIT Statements

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Test Procedure

The EGPRS capable MS is made to transmit uplink RLC data blocks in EGPRS TBF RLC acknowledged mode. The EGPRS Channel Coding Command IE is commanded in the Packet Uplink Assignment message. The resegment IE is set to 1.

The SS checks that the Uplink RLC Data Blocks are transmitted by the mobile using the channel coding scheme commanded by the SS.

The SS negatively acknowledges the received data blocks. The Coding scheme to be used by the mobile is commanded in the EGPRS Channel Coding Command IE.

The SS checks that the Uplink RLC data blocks are retransmitted using the channel coding scheme commanded by the SS.

Maximum Duration of Test

5 minutes.

Expected Sequence

MS supporting 'EGPRS capable of 8PSK and 16 QAM in Uplink, of all Multislot classes' should run the test for k=0, k=1, k=2, k=3, k=4.

Expected Sequence

Step	Direction	Message	Comments
			For K=0 MCS-A = UAS-11 MCS-B = MCS-6 MCS-C = MCS-3 For K=1 MCS-A = UAS-10 MCS-B = MCS-5 MCS-C = MCS-2 For K=2 MCS-A = UAS-9 MCS-B = MCS-6 MCS-C = MCS-3 For K=3 MCS-A = UAS-8 MCS-B = MCS-6 MCS-C = MCS-3 For K=4 MCS-A = UAS-7 MCS-B = MCS-5 MCS-C = MCS-2
1		{Uplink dynamic allocation two phase access}	N = 1000 octets USF_GRANULARITY = 1 block Resegment IE=1 EGPRS Channel Coding Command: MCS-A
2	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned, containing USF assigned to the MS.
3	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH SS verifies that the correct MCS MCS-A is used.
4	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned, containing USF assigned to the MS.
5	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH SS verifies that the correct MCS MCS-A is used.
6	SS -> MS	PACKET UPLINK ACK/NACK	Wait for BS_CV_MAX block periods before sending this message. SS acknowledges first RLC data block, and negatively acknowledges second RLC data block. USF not assigned to the MS Resegment IE=1 EGPRS Channel Coding Command: MCS-B
7			Wait for 6 blocks with no USF
8	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned, containing USF assigned to the MS.
9a (optional)	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH. The MS may send a new data block already in the transmit buffer using MCS-A
9b (optional)	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	If optional step 9a was received. Sent on the PACCH of the PDCH assigned, containing USF assigned to the MS.
9	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH SS verifies that the correct MCS MCS-B is used.
10	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned, containing USF assigned to the MS.
11	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH SS verifies that the correct MCS MCS-B is used.

Step	Direction	Message	Comments
12	SS -> MS	PACKET UPLINK ACK/NACK	Wait for BS_CV_MAX block periods before sending this message. SS negatively acknowledges the retransmitted RLC data block. EGPRS Channel Coding Command: MCS-C USF not assigned to the MS Resegment IE=1 Wait for 6 blocks with no USF
13	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned, containing USF assigned to the MS.
14a (optional)	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH. The MS may send a new data block already in the transmit buffer using MCS-B
14b (optional)	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	If optional step 14a was received. Sent on the PACCH of the PDCH assigned, containing USF assigned to the MS.
15	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH SS verifies that the correct MCS MCS-C is used.
16		{Completion of uplink RLC data block transfer}	

58c.2.5a Acknowledged Mode/ Uplink TBF/ Recalculation of CV on MCS change for EGPRS2A

58c.2.5a.1 Conformance requirements

1. The mobile station shall send the Countdown Value (CV) in each uplink RLC data block to indicate the current number of remaining RLC data blocks for the uplink TBF. The CV shall be calculated as follows:

$$\text{Let integer } x = round\left(\frac{TBC - BSN' - 1}{NTS \times K}\right).$$
$$\text{then, } CV = \begin{cases} x, & if\ x \le BS\_CV\_MAX, \\ 15, & otherwise. \end{cases}$$

where:

TBC = total number of RLC data blocks currently to be transmitted in the TBF.

BSN' = absolute block sequence number of the RLC data block, with range from 0 to (TBC - 1).

NTS = number of timeslots assigned to the uplink TBF in the assignment message, with range 1 to 8 when operating in BTTI configuration. In RTTI configuration this parameter shall be equal to the number of assigned uplink PDCH pairs, with the range 1 to 4.

K =2 when commanded MCS is MCS-7, MCS-8, MCS-9, UAS-7, UAS-8, UAS-9, UBS-7 or UBS-8
3 when commanded UAS-10, UAS-11, UBS-9 or UBS-10
4 when commanded UBS-11 or UBS-12 otherwise K=1

the function round() rounds upwards to the nearest integer.

BS_CV_MAX is a parameter broadcast in the system information,
the division operation is non-integer and results in zero only for (TBC - BSN' - 1) = 0.

The countdown procedure starts when RLC data blocks include CV values different from '15'. When the mobile station transmits the last RLC data block currently in the send buffer for the TBF (i.e. the RLC data block with BSN' = TBC - 1), the RLC data block shall have CV set to the value '0'.

When an EGPRS or EGPRS2 RLC/MAC block for data transfer consists of two or more RLC data blocks, a CV value is calculated for each block and the CV of the RLC/MAC header refers to the last RLC data block.

2. If the mobile station receives a change in the Channel Coding Command in a PACKET UPLINK ACK/NACK message during the countdown procedure, the mobile station shall act upon the new Channel Coding Command. The mobile station shall then recalculate the CV for any untransmitted RLC data block using the new RLC data block size.

In EGPRS TBF mode, a MS may choose an alternate MCS than the one commanded, for the initial transmission of the last RLC data blocks of the TBF under the following conditions:

- the alternate MCS is more robust than the commanded MCS;
- the alternate MCS has already been commanded by the network during the TBF or was available for selection by the MS during the TBF according to the MCS selection rules for retransmissions; and
- the TBF requires no more radio blocks for initial transmission of the RLC data blocks using the alternate MCS than would be required when using the commanded MCS.

References

3GPP TS 44.060, subclause 8.1.1, 9.3.1 and clause F.3.

58c.2.5a.2 Test purpose

To verify that the mobile station correctly recalculates the CV values when the MCS is changed during countdown procedure.

58c.2.5a.3 Method of test

Initial Conditions

System Simulator:

1 cell with EGPRS support, default setting, PBCCH not present, BS_CV_MAX = 15.

Mobile Station:

The MS is EGPRS updated with a P-TMSI allocated, SPLIT PG CYCLE negotiated and the test PDP context2 activated.

Specific PICS Statements

- Support of PSK in uplink (TSPC_Type_EGPRS_8PSK_uplink)
- Support of 16QAM in uplink (TSPC_Type_EGPRS_16QAM_uplink)

PIXIT Statements

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Test Procedure

The EGPRS capable MS is made to transmit uplink RLC data blocks in EGPRS TBF RLC acknowledged mode. UAS-10 is commanded. Total number of Data Blocks is taken to be a minimum of 20 blocks.

SS acknowledges all the Data Blocks upon reception.

SS monitors the CV of the data blocks sent.

SS sends a PACKET UL ACK/NACK message acknowledging the RLC data block with CV =14 or CV =13 and ordering a change of MCS to MCS-5.

The Mobile might send a new Data Block with UAS-10 which could have been stored in the Transmit buffer.

SS notes the BSN of the last RLC data block, received with UAS-10 as BSN2. SS verifies that CV=15 till BSN=BSN2+3*CV1-15, BSN2+3*CV1-16 or BSN=BSN2+3*CV1-17 (MS can select alternate MCS)

where CV1 = CV in the last radio block received with UAS-10

SS verifies that CV decreases progressively in further blocks.

Maximum Duration of Test

5 minutes.

Expected Sequence

Step	Direction	Message	Comments
1		{Uplink dynamic allocation two phase access}	N chosen to transmit minimum 20 blocks USF_GRANULARITY = 1 block EGPRS Channel Coding Command: UAS-10
2	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned, containing USF assigned to the MS.
3	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH. SS verifies that the BSN starts from 0, and the correct MCS is used.
4	SS -> MS	PACKET UPLINK ACK/NACK	Wait for BS_CV_MAX block periods before sending this message. SS Acknowledges the UL RLC Data Block USF assigned to the MS.
5	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH. SS verifies that the BSN values are in sequence, and the correct MCS is used.
6	-		Repeat steps 4 and 5 until CV = 14 or CV = 13. SS notes the BSN of the last RLC data block as BSN2, and the CV as CV1.
7	SS -> MS	PACKET UPLINK ACK/NACK	Wait for BS_CV_MAX block periods before sending this message. SS Acknowledges the UL RLC Data Block EGPRS CHANNEL CODING COMMAND: MCS-5
8	-		Wait for 6 blocks with no USF
9	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned, containing USF assigned to the MS.
Optional Step 10a	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	The MS may send a data block already in the buffer using coding scheme UAS-10. If received, the value of CV1 and BSN2 shall be updated by this radio block according to the rule in step 6, for further calculation.
Optional Step 10b	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned, containing USF assigned to the MS.
10	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH. SS verifies that coding scheme MCS-5 is used; BSN=BSN2+1 and CV = 15.
11	SS-> MS	PACKET UPLINK ACK/NACK	Wait for BS_CV_MAX block periods before sending this message. SS Acknowledges the UL RLC Data Block USF assigned to the MS.
12	-		Repeat steps 10 and 11 until BSN= BSN2+ 2*CV1 – 15; SS verifies that CV remains 15 until BSN= BSN2+ 3*CV1 – 17 CV may be 14 for BSN= BSN2+ 3*CV1 – 15, or CV may be 13 for BSN= BSN2+ 3*CV1 – 15, in case MS have 3*CV1-1 RLC data blocks, or 3*CV1-2 RLC data blocks, respectively, after sending the RLC data block of BSN2, or in case MS choose to use an alternate coding scheme to transmit the last block of the TBF. Else CV=15 for BSN= BSN2+ 3*CV1 – 15
13	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDCH. SS verifies that the BSN = BSN2+ 3*CV1 – 14 In case CV=14 was received for BSN= BSN2+ 3*CV1 – 15, CV=13 in the received Data block. In case CV=13 was received for BSN= BSN2+ 3*CV1 – 15, CV=12 in the received Data block. else CV=14 in the received Data Block.
14	SS-> MS	PACKET UPLINK ACK/NACK	Wait for BS_CV_MAX block periods before sending this message. SS Acknowledges the UL RLC Data Block USF assigned to the MS.

Step	Direction	Message	Comments
15	MS->SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDCH. SS verifies that BSN is incremented by 1 and CV is decremented by 1
16		[Completion of RLC Data Block Transfer]	

58c.2.6 Void

58c.2.7 Void

58c.2.7a EGPRS Acknowledged mode / Uplink TBF / Retransmission/ UAS or MCS Selection with Re-segmentation, in EGPRS2A

58c.2.7a.1 Conformance requirements

In EGPRS TBF mode, RLC data blocks that are transmitted for the first time shall be transmitted with the commanded MCS, except if the commanded mode is MCS-5-7, in which case the data block shall be transmitted with MCS-5, or if the commanded mode is MCS-6-9, in which case the data block shall be transmitted with MCS-6. In the case of a Downlink Dual Carrier configuration the commanded MCS shall apply to both of the carriers. In EGPRS TBF mode, a MS may choose an alternate MCS than the one commanded, for the initial transmission of the last RLC data blocks of the TBF under the following conditions:

- the alternate MCS is more robust than the commanded MCS;
- the alternate MCS has already been commanded by the network during the TBF or was available for selection by the MS during the TBF according to the MCS selection rules for retransmissions; and
- the TBF requires no more radio blocks for initial transmission of the RLC data blocks using the alternate MCS than would be required when using the commanded MCS.

For a TBF with FANR activated, if the commanded MCS is MCS-9 (respectively MCS-4), the initial transmission of the RLC data block(s) shall be done with MCS-8 (respectively MCS-3) if a PAN field is included in the radio block.

When EMST is used, the commanded MCS shall apply to the RLC entity on the TBF identified by the TFI included in the header of the RLC/MAC block.

A RESEGMENT bit is included within each PACKET UPLINK ACK/NACK, PACKET UPLINK ASSIGNMENT, MULTIPLE TBF UPLINK ASSIGNMENT, PACKET TIMESLOT RECONFIGURE, MULTIPLE TBF TIMESLOT RECONFIGURE or PACKET CS RELEASE INDICATION messages. For initial transmissions of new RLC blocks the channel coding commanded is applied. The RESEGMENT bit is used to set the ARQ mode to type I or type II (incremental redundancy) for uplink TBFs. For retransmissions, setting the RESEGMENT bit to '1' (type I ARQ) requires the mobile station to use an MCS within the same family as the initial transmission and the payload may be split (refer to table 8.1.1.1). For retransmissions, setting the RESEGMENT bit to '0' (type II ARQ) requires the mobile station to use an MCS within the same family as the initial transmission without splitting the payload even if the network has commanded it to use MCS-1, MCS-2 or MCS-3 for subsequent RLC blocks (refer to table 8.1.1.2), see note. In RLC unacknowledged mode, RESEGMENT bit shall be ignored and default value 0 should be used.

NOTE: This bit is particularly useful for networks with uplink IR capability since it allows combining on retransmissions.

Table 8.1.1.3: Choice of modulation and coding scheme for retransmissions with re-segmentation (EGPRS2-A)

Scheme used for Initial transmission	Scheme to use for retransmissions after switching to a different modulation and coding scheme (MCS or UAS)										
	UAS-11 Commanded	**UAS-10 Commanded**	**UAS-9 Commanded**	**UAS-8 Commanded**	**UAS-7 Commanded**	**MCS-6 Commanded**	**MCS-5 Commanded**	**MCS-4 Commanded**	**MCS-3 Commanded**	**MCS-2 Commanded**	**MCS-1 Commanded**
UAS-11	UAS-11	UAS-8	UAS-8	UAS-8	MCS-6 (pad)	MCS-6 (pad)	MCS-3 (pad)	MCS-3 (pad)	MCS-3 (pad)	MCS-3 (pad)	MCS-3 (pad)
UAS-10	UAS-10	UAS-10	UAS-7	UAS-7	UAS-7	MCS-5	MCS-5	MCS-2	MCS-2	MCS-2	MCS-2
UAS-9	UAS-9	UAS-9	UAS-9	MCS-6	MCS-6	MCS-6	MCS-3	MCS-3	MCS-3	MCS-3	MCS-3
UAS-8	UAS-11	UAS-8	UAS-8	UAS-8	MCS-6 (pad)	MCS-6 (pad)	MCS-3 (pad)	MCS-3 (pad)	MCS-3 (pad)	MCS-3 (pad)	MCS-3 (pad)
UAS-7	UAS-10	UAS-10	UAS-7	UAS-7	UAS-7	MCS-5	MCS-5	MCS-2	MCS-2	MCS-2	MCS-2
MCS-6	UAS-9	UAS-9	UAS-9	MCS-6	MCS-6	MCS-6	MCS-3	MCS-3	MCS-3	MCS-3	MCS-3
MCS-5	UAS-10	UAS-10	UAS-7	UAS-7	UAS-7	MCS-5	MCS-5	MCS-2	MCS-2	MCS-2	MCS-2
MCS-4	MCS-4	MCS-4	MCS-4	MCS-4	MCS-4	MCS-4	MCS-4	MCS-4	MCS-1	MCS-1	MCS-1
MCS-3	MCS-3	MCS-3	MCS-3	MCS-3	MCS-3	MCS-3	MCS-3	MCS-3	MCS-3	MCS-3	MCS-3
MCS-2	MCS-2	MCS-2	MCS-2	MCS-2	MCS-2	MCS-2	MCS-2	MCS-2	MCS-2	MCS-2	MCS-2
MCS-1	MCS-1	MCS-1	MCS-1	MCS-1	MCS-1	MCS-1	MCS-1	MCS-1	MCS-1	MCS-1	MCS-1

In EGPRS2, if these rules require a transmission (either original transmission or retransmission) in a modulation and coding scheme where there are fewer than the maximum number of RLC blocks that can be transmitted, the mobile station shall use the modulation and coding scheme specified in tables 8.1.1.7 and 8.1.1.8.

Table 8.1.1.7: Retransmissions with fewer RLC blocks (EGPRS2-A)

Modulation and Coding Scheme specified	Modulation/Coding scheme to be used (only 1 block can be transmitted)	Modulation/Coding scheme to be used (only 2 blocks can be transmitted)
UAS-7	MCS-5	n/a
UAS-8	MCS-6 (with padding)	n/a
UAS-9	MCS-6	n/a
UAS-10	MCS-5	UAS-7
UAS-11	MCS-6 (with padding)	UAS-8

References

3GPP TS 44.060, subclause 8.1.1.

3GPP TS 44.060, subclause 9.3.2.1.

3GPP TS 45.010, subclause 6.11.1.

58c.2.7a.2 Test purpose

1. To verify that the mobile station retransmits Nacked data blocks with the UAS or MCS commanded and according to TS 44.060 table 8.1.1.3.

58c.2.7a.3 Method of test

Initial Conditions

System Simulator:

1 cell with EGPRS2A support, default setting,

Mobile Station:

The MS is EGPRS2A updated with a P-TMSI allocated and the test PDP context2 activated.

Specific PICS Statements

-

PIXIT Statements

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Test Procedure

The EGPRS2A capable MS is made to transmit uplink RLC data blocks in EGPRS TBF RLC acknowledged mode. The EGPRS Channel Coding Command IE in the Packet Uplink Assignment message is set according to the execution counter K described as below.

After BS_CV_MAX block periods the SS sends a Packet Uplink Ack/Nack message to negatively acknowledge some RLC data blocks. In the message EGPRS Channel Coding Command IE is set to a different UAS or MCS and Resegment IE should be set to '0'.

The MS shall then retransmit the negatively acknowledged RLC data blocks using the UAS or MCS specified in table 8.1.1.3, 3GPP TS 44.060.

Test procedure is repeated for K = 1 to 7 with:

K = 1: UAS-11 to be used at step 1,

K = 2: UAS-10 to be used at step 1,

K = 3: UAS-9 to be used at step 1,

K = 4: UAS-8 to be used at step 1,

K = 5: UAS-7 to be used at step 1,

K = 6: MCS-6 to be used at step 1,

K = 7: MCS-5 to be used at step 1,

Maximum Duration of Test

30 minutes.

Expected Sequence

Step	Direction	Message	Comments
1		{Uplink dynamic allocation two phase access}	N = for K = 1: 4600 octets. (K = 2: 4250, K = 3: 3500, K = 4: 3000, K = 5: 2500, K = 6: 3500, K = 7: 2500.). USF_GRANULARITY = 1 block. Resegment bit = 1. EGPRS2A Channel Coding Command is set according to execution counter K (e.g., K = 1: UAS-11).
2	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned, USF assigned to the MS.
3	MS -> SS	EGPRS2A UPLINK RLC DATA BLOCK	Received on the assigned PDTCH.
4			Repeat steps 2 and 3 until received data block BSN = 30
5	SS -> MS	PACKET UPLINK ACK/NACK	Wait for BS_CV_MAX block periods before sending this message. SS acknowledges RLC data blocks with BSN 10 to 30 if K = 3, K = 4 ,K = 5, BSN 10 to 31 if K = 1, K = 2, K = 6, K =7. RBB set to 1 and negatively acknowledges the rest with RBB set to 0. USF not assigned to the MS. EGPRS CHANNEL_CODING_COMMAND: UAS-11.
6			Wait for 6 blocks with no USF.
7	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned, USF assigned to the MS.
A8(optional step)	MS -> SS	EGPRS2A UPLINK RLC DATA BLOCK	MS may transmit new in-sequence data block if it has already been scheduled while Packet Uplink Ack/Nack is being processed.
B8 (optional step)	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	USF assigned to the MS,
8	MS -> SS	EGPRS2A UPLINK RLC DATA BLOCK	Received on the assigned PDTCH. BSN = 0...9. The SS verifies that the NACKED data blocks are received using the correct MCS or UAS according to tables 8.1.1.3 and 8.1.1.7, 3GPP TS 44.060.
9	SS		Repeat steps 7 & 8 nine times.
10	SS -> MS	PACKET UPLINK ACK/NACK	Wait for BS_CV_MAX block periods before sending this message. SS acknowledges retransmitted RLC data blocks with BSN 0, RBB set to 1 and negatively acknowledges the rest with RBB set to 0USF not assigned to the MS. EGPRS CHANNEL_CODING_COMMAND: UAS-10.
11			Wait for 6 blocks with no USF.
12	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH, containing USF assigned to the MS.
A13(optional step)	MS -> SS	EGPRS2A UPLINK RLC DATA BLOCK	MS may transmit new in-sequence data block if it has already been scheduled while Packet Uplink Ack/Nack is being processed.
B13 (optional step)	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	USF assigned to the MS.
13	MS -> SS	EGPRS2A UPLINK RLC DATA BLOCK	Received on the assigned PDTCH. BSN = 1...9. The SS verifies that the NACKED data blocks are received using the correct MCS or UAS according to tables 8.1.1.3 and 8.1.1.7, 3GPP TS 44.060.
14			Repeat steps 12 & 13 eight times.

Step	Direction	Message	Comments
15	SS -> MS	PACKET UPLINK ACK/NACK	Wait for BS_CV_MAX block periods before sending this message. SS acknowledges retransmitted RLC data blocks with BSN = 1, RBB set to 1 and negatively acknowledges the rest with RBB set to 0. USF not assigned to the MS. EGPRS CHANNEL_CODING_COMMAND: UAS-9.
16			Wait for 6 blocks with no USF.
17	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH, containing USF assigned to the MS.
A18(optional step)	MS -> SS	EGPRS2A UPLINK RLC DATA BLOCK	MS may transmit new in-sequence data block if it has already been scheduled while Packet Uplink Ack/Nack is being processed.
B18 (optional step)	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	USF assigned to the MS.
18	MS -> SS	EGPRS2A UPLINK RLC DATA BLOCK	Received on the assigned PDTCH. BSN = 2...9. The SS verifies that the NACKED data blocks are received using the correct MCS or UAS according to tables 8.1.1.3 and 8.1.1.7, 3GPP TS 44.060. BSN = 2 and BSN = 3 are received in the same radio block.
19			Repeat steps 17 & 18 seven times.
20	SS -> MS	PACKET UPLINK ACK/NACK	Wait for BS_CV_MAX block periods before sending this message. SS acknowledges retransmitted RLC data blocks with BSN 2, RBB set to 1 and negatively acknowledges the rest with RBB set to 0. USF not assigned to the MS. EGPRS CHANNEL_CODING_COMMAND: UAS-8.
21			Wait for 6 blocks with no USF.
22	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH, containing USF assigned to the MS.
A23(optional step)	MS -> SS	EGPRS2A UPLINK RLC DATA BLOCK	MS may transmit new in-sequence data block if it has already been scheduled while Packet Uplink Ack/Nack is being processed.
B23 (optional step)	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	USF assigned to the MS.
23	MS -> SS	EGPRS2A UPLINK RLC DATA BLOCK	Received on the assigned PDTCH BSN = 3...9. The SS verifies that the NACKED data blocks are received using the correct MCS or UAS according to tables 8.1.1.3 and 8.1.1.7, 3GPP TS 44.060.
24			Repeat steps 22 & 23 six times.
25	SS -> MS	PACKET UPLINK ACK/NACK	Wait for BS_CV_MAX block periods before sending this message. SS acknowledges retransmitted RLC data blocks with BSN 3, RBB set to 1 and negatively acknowledges the rest with RBB set to 0. USF not assigned to the MS EGPRS CHANNEL_CODING_COMMAND: UAS-7.
26			Wait for 6 blocks with no USF.
27	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH, containing USF assigned to the MS.
A28(optional step)	MS -> SS	EGPRS2A UPLINK RLC DATA BLOCK	MS may transmit new in-sequence data block if it has already been scheduled while Packet Uplink Ack/Nack is being processed.

Step	Direction	Message	Comments
B28 (optional step)	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	USF assigned to the MS.
28	MS -> SS	EGPRS2A UPLINK RLC DATA BLOCK	Received on the assigned PDTCH BSN = 4...9.The SS verifies that the NACKED data blocks are received using the correct MCS or UAS according to tables 8.1.1.3 and 8.1.1.7, 3GPP TS 44.060.
29			Repeat steps 27 & 28 five times.
30	SS -> MS	PACKET UPLINK ACK/NACK	Wait for BS_CV_MAX block periods before sending this message. SS acknowledges retransmitted RLC data blocks with BSN 4, RBB set to 1 and negatively acknowledges the rest with RBB set to 0. USF not assigned to the MS. EGPRS CHANNEL_CODING_COMMAND: MCS-6.
31			Wait for 6 blocks with no USF.
32	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH, containing USF assigned to the MS.
A33(optional step)	MS -> SS	EGPRS2A UPLINK RLC DATA BLOCK	MS may transmit new in-sequence data block if it has already been scheduled while Packet Uplink Ack/Nack is being processed.
B33 (optional step)	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	USF assigned to the MS.
33	MS -> SS	EGPRS2A UPLINK RLC DATA BLOCK	Received on the assigned PDTCH BSN = 5...9. The SS verifies that the NACKED data blocks are received using the correct MCS or UAS according to tables 8.1.1.3 and 8.1.1.7, 3GPP TS 44.060.
34			Repeat steps 32 & 33 four times.
35	SS -> MS	PACKET UPLINK ACK/NACK	Wait for BS_CV_MAX block periods before sending this message. SS acknowledges retransmitted RLC data blocks with BSN 5, RBB set to 1 and negatively acknowledges the rest with RBB set to 0. USF not assigned to the MS. EGPRS CHANNEL_CODING_COMMAND: MCS-5
36			Wait for 6 blocks with no USF.
37	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH, containing USF assigned to the MS.
A38(optional step)	MS -> SS	EGPRS2A UPLINK RLC DATA BLOCK	MS may transmit new in-sequence data block if it has already been scheduled while Packet Uplink Ack/Nack is being processed.
B38 (optional step)	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	USF assigned to the MS.
38	MS -> SS	EGPRS2A UPLINK RLC DATA BLOCK	Received on the assigned PDTCH BSN = 6...9. The SS verifies that the NACKED data blocks are received using the correct MCS or UAS according to tables 8.1.1.3 and 8.1.1.7, 3GPP TS 44.060.
39			Repeat steps 37 & 38 three times.
40	SS -> MS	PACKET UPLINK ACK/NACK	Wait for BS_CV_MAX block periods before sending this message. SS acknowledges retransmitted RLC data blocks with BSN 6, RBB set to 1 and negatively acknowledges the rest with RBB set to 0. USF not assigned to the MS.

Step	Direction	Message	Comments
41		{ Completion of uplink RLC data block transfer}	
	-		Repeat the above procedure with K = 2...7.

58c.2.8 Void

58c.2.8a Acknowledged Mode/ Uplink TBF/ Link Adaptation Procedure for Initial Transmission in EGPRS2A

58c.2.8a.1 Conformance requirements

1. In EGPRS TBF mode, RLC data blocks that are transmitted for the first time shall be transmitted with the MCS commanded, except if the commanded mode is MCS-5-7, in which case the data block shall be transmitted with MCS-5, or if the commanded mode is MCS-6-9, in which case the data block shall be transmitted with MCS-6.
2. In EGPRS2, if these rules require a transmission (either original transmission or retransmission) in a modulation and coding scheme where there are fewer than the maximum number of RLC blocks that can be transmitted, the mobile station shall use the modulation and coding scheme specified in tables 8.1.1.7 and 8.1.1.8.

Table 8.1.1.7: Retransmissions with fewer RLC blocks (EGPRS2-A)

Modulation and Coding Scheme specified	Modulation/Coding scheme to be used (only 1 block can be transmitted)	Modulation/Coding scheme to be used (only 2 blocks can be transmitted)
UAS-7	MCS-5	n/a
UAS-8	MCS-6 (with padding)	n/a
UAS-9	MCS-6	n/a
UAS-10	MCS-5	UAS-7
UAS-11	MCS-6 (with padding)	UAS-8

References

3GPP TS 44.060, subclause 8.1.1

3GPP TS 44.060, subclause 9.3.2.1

3GPP TS 44.060, subclause 6.11.1

58c.2.8a.2 Test purpose

To verify the mobile station transmits data blocks with the correct MCS value in initial transmission.

58c.2.8a.3 Method of test

Initial Conditions

System Simulator:

1 cell with EGPRS support, default setting, PBCCH not present.

Mobile Station:

The MS is EGPRS updated with a P-TMSI allocated, SPLIT PG CYCLE negotiated and the test PDP context2 activated.

Specific PICS Statements

- Support of PSK in uplink (TSPC_Type_EGPRS_8PSK_uplink)
- Support of QAM in uplink (TSPC_Type_EGPRS_16QAM_uplink)

PIXIT Statements

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Test Procedure

The EGPRS capable MS is made to transmit uplink RLC data blocks in EGPRS TBF RLC acknowledged mode. The SS acknowledges the RLC data blocks transmitted by the MS and verifies that the correct MCS is used, as mentioned below.

Execution counter k	**Number of octets n**	**Commanded MCS to be used in step 1**	**Expected MCS to be used in step 4**
1	1000	UAS-11	UAS-11
2	1000	UAS-10	UAS-10
3	1000	UAS-9	UAS-9
4	1000	UAS-8	UAS-8
5	1000	UAS-7	UAS-7
6	1000	MCS-6	MCS-6
7	1000	MCS-5	MCS-5
8	1000	MCS-4	MCS-4
9	1000	MCS-3	MCS-3
10	1000	MCS-2	MCS-2
11	1000	MCS-1	MCS-1
12	$64<x\leq 128$	UAS-11	UAS-8
13	$56<x\leq 112$	UAS-10	UAS-7
14	5 (max 64)	UAS-11	MCS-6
15	5 (max 56)	UAS-10	MCS-5
16	5 (max 74)	UAS-9	MCS-6
17	5 (max 64)	UAS-8	MCS-6
18	5 (max 56)	UAS-7	MCS-5
Note: For k = 12, 13 the number of octets of data at the RLC Layer, x, must lie within the specified range. For k =14-18 the number of octets of data at the RLC Layer must not exceed the specified value.			

Maximum Duration of Test

5 minutes.

Expected Sequence

Step	Direction	Message	Comments
1		{ Uplink dynamic allocation two phase access}	n = number of octets according to execution counter k (e.g. k = 1: n = 1000) USF_GRANULARITY = 1 block Resegment bit = 1 EGPRS CHANNEL_CODING_COMMAND: according to execution counter k (e.g. k = 1: UAS-11) UPLINK EGPRS LEVEL = 01 Window size = 96
2	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned, USF assigned to the MS.
3	MS -> SS	UPLINK RLC DATA BLOCK	Received on the assigned PDTCH
4	SS -> MS	PACKET UPLINK ACK/NACK	Wait for BS_CV_MAX block periods before sending this message. SS acknowledges the first RLC data block, RBB set to 1. SS verifies that the expected modulation and coding scheme is used according to execution counter k (e.g. k=1: UAS-11) (Skip step 5-8 for k=12-18)
5	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned, USF assigned to the MS.
6	MS -> SS	UPLINK RLC DATA BLOCK	Received on the assigned PDTCH
7			Repeat steps 5 and 6 until all data blocks has been received
8	SS -> MS	PACKET UPLINK ACK/NACK	Wait for BS_CV_MAX block periods before sending this message. SS acknowledges all RLC data blocks, RBB set to 1.
9		{Completion of uplink RLC data block transfer}	

58c.2.9 Void

58c.2.9a Acknowledged Mode/ Uplink TBF/ Retransmission/ MCS or UAS Selection without Re-segmentation, in EGPRS2A

58c.2.9a.1 Conformance requirements

In EGPRS TBF mode, RLC data blocks that are transmitted for the first time shall be transmitted with the commanded MCS, except if the commanded mode is MCS-5-7, in which case the data block shall be transmitted with MCS-5, or if the commanded mode is MCS-6-9, in which case the data block shall be transmitted with MCS-6. In the case of a Downlink Dual Carrier configuration the commanded MCS shall apply to both of the carriers. In EGPRS TBF mode, a MS may choose an alternate MCS than the one commanded, for the initial transmission of the last RLC data blocks of the TBF under the following conditions:

- the alternate MCS is more robust than the commanded MCS;
- the alternate MCS has already been commanded by the network during the TBF or was available for selection by the MS during the TBF according to the MCS selection rules for retransmissions; and
- the TBF requires no more radio blocks for initial transmission of the RLC data blocks using the alternate MCS than would be required when using the commanded MCS.

For a TBF with FANR activated, if the commanded MCS is MCS-9 (respectively MCS-4), the initial transmission of the RLC data block(s) shall be done with MCS-8 (respectively MCS-3) if a PAN field is included in the radio block.

When EMST is used, the commanded MCS shall apply to the RLC entity on the TBF identified by the TFI included in the header of the RLC/MAC block.

A RESEGMENT bit is included within each PACKET UPLINK ACK/NACK, PACKET UPLINK ASSIGNMENT, MULTIPLE TBF UPLINK ASSIGNMENT, PACKET TIMESLOT RECONFIGURE, MULTIPLE TBF TIMESLOT RECONFIGURE or PACKET CS RELEASE INDICATION messages. For initial transmissions of new RLC blocks the channel coding commanded is applied. The RESEGMENT bit is used to set the ARQ mode to type I or type II (incremental redundancy) for uplink TBFs. For retransmissions, setting the RESEGMENT bit to '1' (type I ARQ) requires the mobile station to use an MCS within the same family as the initial transmission and the payload may be split (refer to table 8.1.1.1). For retransmissions, setting the RESEGMENT bit to '0' (type II ARQ) requires the mobile station to use an MCS within the same family as the initial transmission without splitting the payload even if the network has commanded it to use MCS-1, MCS-2 or MCS-3 for subsequent RLC blocks (refer to table 8.1.1.2), see note. In RLC unacknowledged mode, RESEGMENT bit shall be ignored and default value 0 should be used.

NOTE: This bit is particularly useful for networks with uplink IR capability since it allows combining on retransmissions.

Table 8.1.1.4: Choice of modulation and coding scheme for retransmissions without re-segmentation (EGPRS2-A)

Scheme used for Initial transmission	Scheme to use for retransmissions after switching to a different modulation and coding scheme (MCS or UAS)										
	UAS-11 Commanded	UAS-10 Commanded	UAS-9 Commanded	UAS-8 Commanded	UAS-7 Commanded	MCS-6 Commanded	MCS-5 Commanded	MCS-4 Commanded	MCS-3 Commanded	MCS-2 Commanded	MCS-1 Commanded
UAS-11	UAS-11	UAS-8	UAS-8	UAS-8	MCS-6 (pad)	MCS-6 (pad)	MCS-6 (pad)	MCS-6 (pad)	MCS-6 (pad)	MCS-6 (pad)	MCS-6 (pad)
UAS-10	UAS-10	UAS-10	UAS-7	UAS-7	UAS-7	MCS-5	MCS-5	MCS-5	MCS-5	MCS-5	MCS-5
UAS-9	UAS-9	UAS-9	UAS-9	MCS-6	MCS-6	MCS-6	MCS-6	MCS-6	MCS-6	MCS-6	MCS-6
UAS-8	UAS-11	UAS-8	UAS-8	UAS-8	MCS-6 (pad)	MCS-6 (pad)	MCS-6 (pad)	MCS-6 (pad)	MCS-6 (pad)	MCS-6 (pad)	MCS-6 (pad)
UAS-7	UAS-10	UAS-10	UAS-7	UAS-7	UAS-7	MCS-5	MCS-5	MCS-5	MCS-5	MCS-5	MCS-5
MCS-6	UAS-9	UAS-9	UAS-9	MCS-6	MCS-6	MCS-6	MCS-6	MCS-6	MCS-6	MCS-6	MCS-6
MCS-5	UAS-10	UAS-10	UAS-7	UAS-7	UAS-7	MCS-5	MCS-5	MCS-5	MCS-5	MCS-5	MCS-5
MCS-4	MCS-4	MCS-4	MCS-4	MCS-4	MCS-4	MCS-4	MCS-4	MCS-4	MCS-4	MCS-4	MCS-4
MCS-3	MCS-3	MCS-3	MCS-3	MCS-3	MCS-3	MCS-3	MCS-3	MCS-3	MCS-3	MCS-3	MCS-3
MCS-2	MCS-2	MCS-2	MCS-2	MCS-2	MCS-2	MCS-2	MCS-2	MCS-2	MCS-2	MCS-2	MCS-2
MCS-1	MCS-1	MCS-1	MCS-1	MCS-1	MCS-1	MCS-1	MCS-1	MCS-1	MCS-1	MCS-1	MCS-1

Table 8.1.1.7: Retransmissions with fewer RLC blocks (EGPRS2-A)

Modulation and Coding Scheme specified	Modulation/Coding scheme to be used (only 1 block can be transmitted)	Modulation/Coding scheme to be used (only 2 blocks can be transmitted)
UAS-7	MCS-5	n/a
UAS-8	MCS-6 (with padding)	n/a
UAS-9	MCS-6	n/a
UAS-10	MCS-5	UAS-7
UAS-11	MCS-6 (with padding)	UAS-8

References

3GPP TS 44.060, subclause 8.1.1.

58c.2.9a.2 Test purpose

1. To verify that if the re-segment bit is not set, the mobile station shall use a MCS or UAS within the same family as the initial MCS or UAS without splitting the payload for retransmission in accordance with subclause 8.1.1 table 8.1.1.4, 3GPP TS 44.060.

58c.2.9a.3 Method of test

Initial Conditions

System Simulator:

1 cell with EGPRS2A support, default settings

Mobile Station:

The MS is EGPRS2A updated with a P-TMSI allocated and the test PDP context2 activated.

Specific PICS Statements

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PIXIT Statements

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Test Procedure

The EGPRS2A capable MS is made to transmit uplink RLC data blocks in EGPRS TBF RLC acknowledged mode. The EGPRS Channel Coding Command IE in the Packet Uplink Assignment message is set according to the execution counter K described as below.

After BS_CV_MAX block periods the SS sends a Packet Uplink Ack/Nack message to negatively acknowledge some RLC data blocks. In the message EGPRS Channel Coding Command IE is set to a different MCS or UAS and Resegment IE should be set to '0'.

The MS shall then retransmit the negatively acknowledged RLC data blocks using the MCS or UAS specified in table 8.1.1.4, 3GPP TS 44.060.

Test procedure is repeated for K = 1 to 7 with:

K = 1: UAS-11 to be used at step 1,

K = 2: UAS-10 to be used at step 1,

K = 3: UAS-9 to be used at step 1,

K = 4: UAS-8 to be used at step 1,

K = 5: UAS-7 to be used at step 1,

K = 6: MCS-6 to be used at step 1,

K = 7: MCS-5 to be used at step 1,

Maximum Duration of Test

30 minutes.

Expected Sequence

Step	Direction	Message	Comments
1		{Uplink dynamic allocation two phase access}	N = for K = 1: 4600 octets. (K = 2: 4250, K = 3: 3500, K = 4: 3000, K = 5: 2500, K = 6: 3500, K = 7: 2500.) USF_GRANULARITY = 1 block. EGPRS Channel Coding Command is set according to execution counter K (e.g., K=1: UAS-11).
2	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned, containing USF assigned to the MS.
3	MS -> SS	EGPRS2A UPLINK RLC DATA BLOCK	Received on the assigned PDTCH. The SS verifies that the BSN starts from 0, and verifies the correct MCS or UAS is used.
4	-		Repeat steps 2 and 3 until RLC data block BSN = 31.
5	-		Wait for BS_CV_MAX block periods relative to the last received RLC data block.
6	SS -> MS	PACKET UPLINK ACK/NACK	The SS acknowledges RLC data blocks from BSN 10 to 31 with RBB set to 1 and negatively acknowledges RLC data blocks from BSN 1 to 9 with RBB set to 0, SSN = 1 (Note: This is NACK for BSN = 0). USF not assigned to the MS. EGPRS Channel Coding Command is set to UAS-11. Resegment IE is set to '0'.
7	-		Wait for 6 blocks with no USF.
8	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned, containing USF assigned to the MS.
A9 (optional step)	MS -> SS	EGPRS2A UPLINK RLC DATA BLOCK	MS may transmit new data block if it has already been scheduled while Packet Uplink Ack/Nack is being processed.
B9 (optional step)	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	USF assigned to the MS.
9	MS -> SS	EGPRS2A UPLINK RLC DATA BLOCK	Received on the assigned PDTCH. BSN = 0...9. The SS verifies that the NACKED data blocks are received using the correct MCS or UAS according to tables 8.1.1.4 and 8.1.1.7, 3GPP TS 44.060. If K = 1, 2, 4, 5 or 7 BSN = 0 and BSN = 1 are received in the same radio block. If K = 3 or 6 then BSN = 2 is also received in the same radio block.
10	-		Repeat steps 8 & 9 three times if K = 1, 2, 4, 5 or 7 and four times if K = 3 or 6.
11	SS -> MS	PACKET UPLINK ACK/NACK	Wait for BS_CV_MAX block periods before sending this message. The SS acknowledges RLC data block BSN = 0 with SSN = 2 and negatively acknowledges RLC data blocks from BSN 2 to 9 with RBB set to 0. For BSN > 9 RBB is set to 1. USF not assigned to the MS. EGPRS Channel Coding Command is set to UAS-10. Resegment IE is set to '0'.
12	-		Wait for 6 blocks with no USF.
13	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned, containing USF assigned to the MS.
A14 (optional step)	MS -> SS	EGPRS2A UPLINK RLC DATA BLOCK	MS may transmit new data block if it has already been scheduled while Packet Uplink Ack/Nack is being processed.
B14 (optional step)	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	USF assigned to the MS,

Step	Direction	Message	Comments
14	MS -> SS	EGPRS2A UPLINK RLC DATA BLOCK	Received on the assigned PDTCH. If K = 1, 3, 4 or 6 BSN = 1...8. For K = 2, 5 or 7 BSN = 1...9. The SS verifies that the NACKED data blocks are received using the correct MCS or UAS according to tables 8.1.1.4 and 8.1.1.7, 3GPP TS 44.060. If K = 1, 3, 4 or 6 BSN = 1 and BSN = 2 are received in the same radio block. If K = 2, 5 or 7 then BSN = 3 is also received in the same radio block.
15	-		Repeat steps 13 & 14 two times if K = 2, 5 or 7 and three times if K = 1, 3, 4 or 6.
16	SS -> MS	PACKET UPLINK ACK/NACK	Wait for BS_CV_MAX block periods before sending this message. The SS acknowledges RLC data block BSN = 1 with SSN = 3 and negatively acknowledges RLC data blocks from BSN 3 to 9 with RBB set to 0. For BSN > 9 RBB is set to 1. USF not assigned to the MS. EGPRS Channel Coding Command is set to UAS-9. Resegment IE is set to '0'.
17	-		Wait for 6 blocks with no USF.
18	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned, containing USF assigned to the MS.
A19 (optional step)	MS -> SS	EGPRS2A UPLINK RLC DATA BLOCK	For K = 1, 3, 4 or 6 the MS may retransmit a RLC data block with BSN = 9. For K = 2, 5 or 7 MS may transmit new data block if it has already been scheduled while Packet Uplink Ack/Nack is being processed.
B19 (optional step)	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	USF assigned to the MS.
19	MS -> SS	EGPRS2A UPLINK RLC DATA BLOCK	Received on the assigned PDTCH. If K = 1, 3, 4 or 6 BSN = 2...7. If K = 2, 5 or 7 BSN = 2...9. The SS verifies that the NACKED data blocks are received using the correct MCS or UAS according to tables 8.1.1.4 and 8.1.1.7, 3GPP TS 44.060. BSN = 2 and BSN = 3 are received in the same radio block.
20	-		Repeat steps 18 & 19 two times if K = 1, 3, 4 or 6 and three times if K = 2, 5 or 7.
21	SS -> MS	PACKET UPLINK ACK/NACK	Wait for BS_CV_MAX block periods before sending this message. The SS acknowledges RLC data block BSN 2 with SSN = 4 and negatively acknowledges RLC data blocks from BSN 3 to 9 with RBB set to 0. For BSN > 9 RBB is set to 1. USF not assigned to the MS. EGPRS Channel Coding Command is set to UAS-8. Resegment IE is set to '0'.
22	-		Wait for 6 blocks with no USF
23	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned, containing USF assigned to the MS.
A24 (optional step)	MS -> SS	EGPRS2A UPLINK RLC DATA BLOCK	For K = 1, 3, 4 or 6 the MS may retransmit a data block with BSN = 8. For K = 2, 5 or 7 the MS may transmit new data block if it has already been scheduled while Packet Uplink Ack/Nack is being processed.
B24 (optional step)	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	USF assigned to the MS,

Step	Direction	Message	Comments
24	MS -> SS	EGPRS2A UPLINK RLC DATA BLOCK	Received on the assigned PDTCH. If K = 1, 3, 4 or 6 and step A24 was performed, BSN = 3...7 and 9 will be received. If K = 2, 5 or 7 BSN = 3...9 will be received. The SS verifies that the NACKED data blocks are received using the correct MCS or UAS according to tables 8.1.1.4 and 8.1.1.7, 3GPP TS 44.060.
25	-		Repeat steps 23 & 24 two times if K = 1 or 4 and three times if K = 2, 5, or 7 and five times if K = 3 or 6.
26	SS -> MS	PACKET UPLINK ACK/NACK	Wait for BS_CV_MAX block periods before sending this message. The SS acknowledges RLC data block BSN 3 with SSN = 5 and negatively acknowledges RLC data blocks from BSN 4 to 9 with RBB set to 0. For BSN > 9 RBB is set to 1. USF not assigned to the MS. EGPRS Channel Coding Command is set to UAS-7. Resegment IE is set to '0'.
27	-		Wait for 6 blocks with no USF.
28	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned, containing USF assigned to the MS.
A29 (optional step)	MS -> SS	EGPRS2A UPLINK RLC DATA BLOCK	MS may transmit new data block if it has already been scheduled while Packet Uplink Ack/Nack is being processed.
B29 (optional step)	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	USF assigned to the MS.
29	MS -> SS	EGPRS2A UPLINK RLC DATA BLOCK	Received on the assigned PDTCH. BSN = 4...9. The SS verifies that the NACKED data blocks are received using the correct MCS or UAS according to tables 8.1.1.4 and 8.1.1.7, 3GPP TS 44.060.
30	-		Repeat steps 28 & 29 two times if K = 2, 5 or 7 and five times if K = 1, 3, 4 or 6.
31	SS -> MS	PACKET UPLINK ACK/NACK	Wait for BS_CV_MAX block periods before sending this message. The SS acknowledges RLC data block BSN 4 with SSN = 6 and negatively acknowledges RLC data blocks from BSN 5 to 9 with RBB set to 0. For BSN > 9 RBB is set to 1. USF not assigned to the MS. EGPRS Channel Coding Command is set to MCS-6. Resegment IE is set to '0'.
32	-		Wait for 6 blocks with no USF.
33	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned, containing USF assigned to the MS.
A34 (optional step)	MS -> SS	EGPRS2A UPLINK RLC DATA BLOCK	MS may transmit new data block if it has already been scheduled while Packet Uplink Ack/Nack is being processed.
B34 (optional step)	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	USF assigned to the MS.
34	MS -> SS	EGPRS2A UPLINK RLC DATA BLOCK	Received on the assigned PDTCH. BSN = 5...9. The SS verifies that the NACKED data blocks are received using the correct MCS or UAS according to tables 8.1.1.4 and 8.1.1.7, 3GPP TS 44.060.
35	-		Repeat steps 33 & 34 four times.

Step	Direction	Message	Comments
36	SS -> MS	PACKET UPLINK ACK/NACK	Wait for BS_CV_MAX block periods before sending this message. The SS acknowledges RLC data block BSN 5 with SSN = 7 and negatively acknowledges RLC data blocks from BSN 6 to 9 with RBB set to 0. For BSN > 9 RBB is set to 1. USF not assigned to the MS. EGPRS Channel Coding Command is set to MCS-5. Resegment IE is set to '0'.
37	-		Wait for 6 blocks with no USF.
38	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned, containing USF assigned to the MS.
A39 (optional step)	MS -> SS	EGPRS2A UPLINK RLC DATA BLOCK	MS may transmit new data block if it has already been scheduled while Packet Uplink Ack/Nack is being processed.
B39 (optional step)	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	USF assigned to the MS.
39	MS -> SS	EGPRS2A UPLINK RLC DATA BLOCK	Received on the assigned PDTCH. BSN = 6...9. The SS verifies that the NACKED data blocks are received using the correct MCS or UAS according to tables 8.1.1.4 and 8.1.1.7, 3GPP TS 44.060.
40	-		Repeat steps 38 & 39 three times.
41	SS -> MS	PACKET UPLINK ACK/NACK	Wait for BS_CV_MAX block periods before sending this message. The SS acknowledges RLC data block BSN 6 with SSN = 8 and negatively acknowledges RLC data blocks from BSN 7 to 9 with RBB set to 0. For BSN > 9 RBB is set to 1. USF not assigned to the MS.
42		{Completion of uplink RLC data block transfer}	
	-		Repeat the above procedure with K = 2...7.

58c.2.10 Void

58c.2.10a Acknowledged Mode/ Uplink TBF/ Initial Puncturing Scheme After MCS Switching, in EGPRS2A

58c.2.10a.1 Conformance requirements

1. RLC data blocks which are retransmitted using a new MCS shall at the first transmission after the MCS switch be sent with the puncturing scheme indicated in table 9.3.2.1.1, 3GPP TS 44.060 subclause 9.3.2.1.
2. The choice of modulation and coding scheme for retransmissions in EGPRS2-A with/without re-segmentation shall follow table 8.1.1.3 and table 8.1.1.4, 3GPP TS 44.060 subclause 8.1.1

References

3GPP TS 44.060, subclause 8.1.1, 9.3.2.1.

3GPP TS 45.005.

3GPP TS 45.009.

58c.2.10a.2 Test purpose

1. To verify the correct selection of PS scheme after MCS switch.

58c.2.10a.3 Method of test

Initial Conditions

System Simulator:

1 cell with EGPRS support, default setting

Mobile Station:

The MS is EGPRS updated with a P-TMSI allocated, SPLIT PG CYCLE negotiated and the test PDP context2 activated.

Specific PICS Statements

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PIXIT Statements

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Test Procedure

The MS is made to transmit uplink RLC data blocks in an acknowledged mode uplink EGPRS TBF. EGPRS Coding Command is set to indicate UAS-11.

The SS sends a PACKET UPLINK ACK/NACK message and NACK all blocks received. UAS-7 is commanded in the message.

The SS checks that the retransmitted blocks are received in MCS-6, PS1.

Repeat the above steps with different allowed MCS and PS combinations.

Maximum Duration of Test

5 minutes.

Expected Sequence

Step	Direction	Message	Comments
1		{Uplink dynamic allocation two phase access}	n = 2000 octets, USF_GRANULARITY = 1 block EGPRS Channel Coding Command: UAS-11
2	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned, containing USF assigned to the MS.
3	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH SS verifies that the correct Puncturing Scheme is received.
4	SS	-	Repeat steps 2-3 until RLC data block with BSN=5 is received.
5	SS -> MS	PACKET UPLINK ACK/NACK	Wait for BS_CV_MAX block periods before sending this message. SS negatively acknowledges all RLC data blocks. MCS Command is UAS-7, USF not assigned to the MS. Wait for 6 blocks with no USF
6	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned, containing USF assigned to the MS.
A7 (optional step)	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	MS may transmit new data block if it has already been scheduled while Packet Uplink Ack/Nack is being processed.
B7 (optional step)	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	USF assigned to the MS
7	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH SS verifies that modulation and coding scheme is MCS-6 (pad) and Puncturing Scheme is PS1 is received. BSN=0
8	SS		Repeat steps 9-10 until RLC data block with BSN=5 is received.
9	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Sent on the PACCH of the PDCH assigned, containing USF assigned to the MS.
10	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on the assigned PDTCH SS verifies that modulation and coding scheme is MCS-6 and Puncturing Scheme is PS1 is received.
11		{Completion of uplink RLC data block transfer}	
12	-		The above steps 1-11 are repeated for different MCS and PS combinations as per table 8.1.1.3, 8.1.1.4 of Subclause 8.1.1, table 9.3.2.1.1 of Subclause 9.3, 3GPP TS 44.060, i.e. UAS-10 switching to UAS-8, SS verifies MCS is UAS-7 in step 7 and step 10 UAS-9 switching to UAS-8, SS verifies MCS is MCS-6 in step 7 and step 10 UAS-7 switching to UAS-11, SS verifies MCS is UAS-10 in step 7 and step 10

58c.3 Downlink EGPRS2 TBF

58c.3.1 Void

58c.3.2 Void

58c.3.2a Acknowledged Mode/ Downlink TBF/ Split RLC Data Block, in EGPRS2A

58.3.2a.1 Conformance requirements

1. Each RLC endpoint receiver shall have an associated receive state array V(N). V(N) is an array of SNS elements indicating the receive status of WS RLC data blocks that are supposed to follow the block BSN=V(Q)-1. The array is indexed relative to the receive window state variable V(Q) modulo SNS. When an RLC data block is received with BSN within the receive window, the corresponding element in V(N) is set to the value RECEIVE

2. If the RLC data block is split over two radio blocks, the element shall be set to the value RECEIVED if and only if both radio blocks have been received.

3. The elements in V(N) shall be set to the value INVALID at the beginning of each TBF. During the TBF, an element in V(N) that falls outside the receive window, shall be set to the value INVALID.

References

3GPP TS 44.060, subclause 9.1.7

58.3.2a.2 Test purpose

To verify that in case an RLC data block is split over two radio blocks:

1. When an RLC data block is received with BSN within the active window i.e. such that [V(Q) <=BSN < V(Q) + WS] modulo SNS, the corresponding element in V(N) is set to the value RECEIVED (the RLC data block has passed FCS).

2. The corresponding V(N) element shall not be marked as RECEIVED if any of the two radio blocks is not received.

3. The corresponding V(N) element shall be marked as RECEIVED if both of the radio blocks are received.

58.3.2a.3 Method of test

Initial Conditions

System Simulator:

1 cell with EGPRS support, default setting,

Mobile Station:

The MS is EGPRS updated with a P-TMSI allocated, SPLIT PG CYCLE negotiated and the test PDP Context2 activated.

Specific PICS Statements

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PIXIT Statements

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Test Procedure

The SS establishes a downlink EGPRS TBF.

The SS sends a RLC data block n > N, n <WS using DAS-10. The SS sends the first part of a spitted RLC data block using DAS-7, with BSN=N (N< window size), SPB='10'B, and polls for the EGPRS PACKET DOWNLINK ACK/NACK message from the MS. The MS shall respond with an EGPRS PACKET DOWNLINK ACK/NACK message indicating the block BSN=N is not received.

The SS then sends the second part of the spitted RLC block with the same BSN=N (N<WS), SPB='11' using DAS-7, and polls for the EGPRS PACKET DOWNLIK ACK/NACK message from the MS. The MS shall respond with an EGPRS PACKET DOWNLINK ACK/NACK message with the BSN=N acknowledged.

Maximum Duration of Test

30 minutes.

Expected Sequence

Step	Direction	Message	Comments
1		{Downlink TBF establishment}	Acknowledged Mode EGPRS2 Window Size: arbitrarily chosen
2	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	With DAS-10, BSN=6, RRBP = '00'B
3	MS -> SS	EGPRS PACKET DOWNLINK ACK/NACK	The SS verifies that RBB is set to 0 for RLC data blocks with BSN = 0, 1, 2, 3, 4 and 5 and RBB is set to 1 for BSN=6.
4	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	With DAS-7, BSN starts from 0 ES/P = '00'B, SPB='10'B
5			Repeat step 4 until BSN = 3
6	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	With DAS-7 BSN = 5, ES/P = '01'B, RRBP = '00'B,SPB='11'B
7	MS -> SS	EGPRS PACKET DOWNLINK ACK/NACK	The SS verifies that the bits in RBB for BSN=0, 1, 2, 3, 4, 5 are set to '0'B.
8	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	With DAS-7 BSN = 4, SPB = '10'B, ES/P = '01'B, RRBP = '00'B
9	MS -> SS	EGPRS PACKET DOWNLINK ACK/NACK	The SS verifies that the bit for BSN=4 in RBB is set to '0'B.
10	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	With DAS-7 BSN = 4, SPB = '11'B, ES/P = '01'B, RRBP = '00'B
11	MS -> SS	EGPRS PACKET DOWNLINK ACK/NACK	The SS verifies that the bit for BSN=4 in RBB is set to '1'B.
			{Completion of downlink data transfer}

58c.3.3a Acknowledged Mode / Downlink TBF / Decoding of Coding Schemes, in EGPRS2-A

58c.3.3a.1 Conformance requirements

1. In EGPRS TBF mode, the transfer of RLC Data Blocks in the acknowledged RLC/MAC mode can be controlled by a selective type I ARQ mechanism, or by type II hybrid ARQ (Incremental Redundancy: IR) mechanism, coupled with the numbering of the RLC Data Blocks within one Temporary Block Flow.

2. According to the link quality, an initial Modulation and Coding Scheme (MCS) is selected for an RLC block (see note). For the retransmissions, the same or another MCS from the same family of MCSs can be selected.

3. The selection of MCS is controlled by the network.

4. In EGPRS header, the Coding and Puncturing Scheme indicator field is used to indicate the kind of channel coding and puncturing used for data blocks.(see 3GPP TS 05.03)

References

3GPP TS 44.060, subclauses 9.3.2.1 and 10.4.8.a.

58c.3.3a.2 Test purpose

To verify that the mobile station correctly decode RLC data blocks sent using different coding schemes (DAS-5 to DAS-12).

58c.3.3a.3 Method of test

Initial Conditions

System Simulator:

1 cell with EGPRS support, default setting,

Mobile Station:

The MS is EGPRS updated with a P-TMSI allocated, SPLIT PG CYCLE negotiated and the test PDP Context2 activated.

Specific PICS Statements

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PIXIT Statements

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Test Procedure

The SS establishes a downlink EGPRS2-A TBF setting EGPRS window size to 256, FANR disabled and in BTTI mode.

The SS establishes a Downlink EGPRS TBF.

The send SS sends a few RLC data blocks in different coding schemes and asks for an acknowledgement from the MS.

The MS shall correctly acknowledge all the received data blocks.

Maximum Duration of Test

10 minutes.

Expected Sequence

Step	Direction	Message	Comments
1		{Downlink TBF establishment}	Acknowledged Mode EGPRS Window Size: 256. BTTI configuration Mode, FANR disabled, EGPRS Level set to EGPRS2-A, EGPRS Window Size: arbitrarily chosen
2	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	With DAS-5, BSN=0, CES/P = '000'B
3			Repeat step 2 using DAS-6 till DAS-7. The BSNs of the data blocks shall be sequential. Repeat step 2 using DAS-8 till DAS-10. The BSNs of the data blocks shall be sequential. Repeat step 2 using DAS-11 till DAS-12. The BSNs of the data blocks shall be sequential. The last block transmitted should be DAS-12 with BSN=12, 13, and 14 for the last block transmitted. CES/P = '001'B and RRBP='00'B is set in the header of last RLC Data Block sent with BSN=12, 13, and 14.
4	MS -> SS	EGPRS PACKET DOWNLINK ACK/NACK	Received on the corresponding PACCH. The SS verifies that the MS acknowledges all the received RLC data blocks. SSN shall be equal to 16

Specific message contents

None.

58c.3.4a Acknowledged Mode / Downlink TBF / Retransmission / Padding in EGPRS2-A

58c.3.4a.1 Conformance requirements

According to the link quality, an initial Modulation and Coding Scheme (MCS) is selected for an RLC block (see note). For the retransmissions, the same or another MCS from the same family of MCSs may be selected. E.g. if MCS-7 is selected for the first transmission of an RLC block, any MCS of the family B may be used for the retransmissions. Further, RLC data blocks initially transmitted with MCS-4, MCS-5, MCS-6, MCS-7, MCS-8 or MCS-9, may be retransmitted with MCS-1, MCS-2 or MCS-3 as appropriate, by sending the different parts of the RLC data block in different radio blocks. In this case, the split block field in the header shall be set to indicate that the RLC data block is split, and the order of the two parts. For blocks initially transmitted with MCS-8 which are retransmitted using MCS-6 or MCS-3, padding of the first six octets shall be applied before each RLC data block, and the CPS field shall be set to indicate that this has been done (see an informative example in annex J).

References

3GPP TS 44.060, subclause 9.3.2.1

58c.3.4a.2 Test purpose

To verify that the MS correctly decodes the CPS field of EGPRS Downlink RLC Data Block header.

To verify that the MS correctly decodes a retransmitted data block this contains first six octets of padding.

58c.3.4a.3 Method of test

Initial Conditions

System Simulator:

1 cell with EGPRS support, default setting,

Mobile Station:

The MS is EGPRS updated with a P-TMSI allocated, SPLIT PG CYCLE negotiated and the test PDP context2 activated.

Specific PICS Statements

- EGPRS Multislotclass (TSPC_Type_EGPRS_Multislot_ClassX where X = 1...45)

PIXIT Statements

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Test Procedure

The SS initiates the establishment of a downlink EGPRS2-A TBF, setting window size to the largest value WS corresponding the number of timeslots assigned to TBF.

The SS sends two EGPRS2-A RLC radio blocks with BSN=0 BSN=1 and BSN=4 BSN=5 using DAS-9. In the last block FBI is set to 1 and the MS is polled for Acknowledgement.

The MS shall send a EGPRS Packet Downlink Ack/Nack type 2 message acknowledging BSNs 0,1,4 and 5 and negatively acknowledging BSN=2 and BSN=3. SS verifies that FAI is set to 0.

The SS sends EGPRS RLC data block with BSN=2 using DAS-6, setting first 6 octets of the data block to padding, and setting CPS field to indicate the same and polls the MS for acknowledgement.

The MS shall send EGPRS Packet Downlink Ack/Nack type 2 message acknowledging BSNs 0,1,2,4 and 5 and negatively acknowledging BSN=3. SS verifies that FAI is set to 0.

The SS sends first part of BSN=3 using MCS-3 with first six octets of the data block set to padding and polls the MS for acknowledgement. CPS is set correctly in the data block header to indicate that the block is first part of split block and that the data block is padded.

The MS shall send EGPRS Packet Downlink Ack/Nack message acknowledging BSNs 0,1,2,4 and 5 and negatively acknowledging BSN=3. SS verifies that FAI is set to 0.

The SS sends second part of BSN=3 using MCS-3 and polls the MS for acknowledgement. CPS is set correctly in the data block header to indicate that the block is second part of split block and that the data block is not padded.

The MS shall send EGPRS Packet Downlink Ack/Nack Type 2 message acknowledging BSNs 0 to 5. SS verifies that FAI is set to 1.

Maximum Duration of Test

5 minutes.

Expected Sequence

Step	Direction	Message	Comments
1		{Downlink TBF establishment}	Acknowledged Mode, EGPRS level = 01 EGPRS Window Size = Maximum for the MS according to the number of timeslots assigned to TBF.
2	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Using DAS-9 Sent on the assigned PDTCH, with BSN = 0 and BSN=1.
3	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Using DAS-9 Sent on the assigned PDTCH, with BSN = 4 and BSN=5. FBI is set to 1. MS is polled for FPB
4	MS -> SS	EGPRS PACKET DOWNLINK ACK/NACK TYPE2	Received on PACCH of the assigned PDTCH. SS verifies that BSN 0, 1, 4 and 5 are acknowledged, BSN 2 and 3 are not acknowledged and FAI=0
5	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Using DAS-6 Sent on the assigned PDTCH, with BSN = 2. First six octets of the data block shall be padding octets. CPS field shall indicate the same. MS is polled for FPB.
6	MS -> SS	EGPRS PACKET DOWNLINK ACK/NACK TYPE2	Received on PACCH of the assigned PDTCH. SS verifies that BSN 0, 1, 2, 4 and 5 are acknowledged, BSN 3 is not acknowledged and FAI=0
7	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Using MCS-3 Sent on the assigned PDTCH, with BSN = 3. First 6 octets of the data block shall be padding octets. CPS field shall indicate that the data block is first part of split block and the data block is padded. MS is polled for FPB.
8	MS -> SS	EGPRS PACKET DOWNLINK ACK/NACK TYPE2	Received on PACCH of the assigned PDTCH. SS verifies that BSN 0, 1, 2, 4 and 5 are acknowledged , BSN 3 is not acknowledged and FAI=0
9	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Using MCS-3 Sent on the assigned PDTCH, with BSN = 3. CPS field shall indicate that the data block is second part of split block and the data block is not padded. MS is polled for FPB.
10	MS -> SS	EGPRS PACKET DOWNLINK ACK/NACK TYPE2	Received on PACCH of the assigned PDTCH. SS verifies that BSN 0, 1, 2, 3, 4 and 5 are acknowledged and FAI=1

Specific message contents

None.

58c.3.5a Acknowledged Mode / Downlink TBF / First Partial Bitmap and Next Partial Bitmap in EGPRS2-A

58c.3.5a.1 Conformance requirements

1. In EGPRS downlink TBFs, an additional poll bit is added to the S/P field in every downlink RLC block so that the network can request the following:

- First Partial Bitmap (FPB) segment with SSN = (V(Q) + 1) mod 2048 where SSN denotes the Starting Sequence Number.
- Next Partial Bitmap (NPB) segment with SSN = (PBSN + 1) mod 2048 where PBSN denotes a Partial Bitmap Sequence Number variable stored at the receiver.

2. SSN is determined by the receiver as a function of ES/P, V(Q) and PBSN. The FPB and NPB are specific instances of the *EGPRS Ack/Nack Description Information Element* within the EGPRS PACKET DOWNLINK ACK/NACK message, EGPRS PACKET DOWNLINK ACK/NACK TYPE 2 message. The mobile station shall respond to ES/P field according to table 9.1.8.2.1.1 (non-MBMS). For a mobile station with one or more downlink TBFs using EGPRS2, the mobile station shall send the EGPRS PACKET DOWNLINK ACK/NACK TYPE 2 message. Otherwise, the mobile station shall send the EGPRS PACKET DOWNLINK ACK/NACK message.
3. Based on PBSN, V(Q) and the ES/P field set by the network, SSN and PBSN shall be determined according to table 9.1.8.2.2.1. For EGPRS2, SSN and PBSN shall be determined based on PBSN, V(Q) and CES/P fields according to table 9.1.8.2.2.2. For EGPRS2 the Combined EGPRS Supplementary/Polling field describes the feedback request and specifies a single uplink block in which the mobile station shall transmit a PACKET CONTROL ACKNOWLEDGEMENT message, a PACCH block see table 9.1.8.2.1.3. The single uplink block is defined by a delay relative to the first TDMA frame (N) of the downlink block containing the CES/P value. If ordered to send a EGPRS PACKET DOWNLINK ACK/NACK message or EGPRS PACKET DOWNLINK ACK/NACK TYPE 2 message, a mobile station with one or more downlink TBFs using EGPRS2 shall send the EGPRS PACKET DOWNLINK ACK/NACK TYPE 2 message. Otherwise, the mobile station shall send the EGPRS PACKET DOWNLINK ACK/NACK message.

References

3GPP TS 44.060, sub clause 9.1.8.2.

58c.3.5a.2 Test purpose

To verify the correct generation of SSN and RB in the First Partial Bitmap.

To verify the correct generation of SSN and RB in the Next Partial Bitmap.

58c.3.5a.3 Method of test

Initial Conditions

System Simulator:

1 cell with EGPRS support, default setting,

Mobile Station:

The MS is EGPRS updated with a P-TMSI allocated, SPLIT PG CYCLE negotiated and the test PDP Context2 activated.

Specific PICS Statements

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PIXIT Statements

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Test Procedure

The SS establishes a downlink EGPRS2-A TBF setting EGPRS window size to 256, FANR disabled and in BTTI mode.

The SS sends a series of RLC data blocks with BSN=0, 1...5, CES/P = '000'B using DAS-7 coding scheme.

The SS sends a RLC data block with BSN=21, CES/P = '001'B and using DAS7. MS responds back with EGPRS PACKET DOWNLINK ACK/NACK TYPE2 message with CQR and FPB within radio period (N+8 or N+9) mode 2715648.

The SS sends a RLC data block with BSN=32, CES/P = '010'B and using DAS-5. MS responds back with EGPRS PACKET DOWNLINK ACK/NACK TYPE2 message with CQR and FPB within radio period (N+13) mode 2715648.

The SS sends a RLC data block with BSN=22, CES/P = '011'B and using DAS-6. MS doesn’t responds back with EGPRS PACKET DOWNLINK ACK/NACK TYPE2 message.

The SS sends a RLC data block with BSN=24, CES/P = '100'B and using DAS-5. MS doesn’t responds back with EGPRS PACKET DOWNLINK ACK/NACK TYPE2 message.

The SS sends a RLC data block with BSN=26, CES/P = '101'B and using DAS-7. MS responds back with EGPRS PACKET DOWNLINK ACK/NACK TYPE2 message with CQR and NPB within radio period (N+8 or N+9) mode 2715648.

The SS sends a RLC data block with BSN=29, CES/P = '110'B and using DAS-5. MS responds back with EGPRS PACKET DOWNLINK ACK/NACK TYPE2 message with CQR and NPB within radio period (N+13) mode 2715648.

The SS sends a RLC data block with BSN=31, CES/P = '111'B and using DAS-5. MS responds back with EGPRS PACKET DOWNLINK ACK/NACK TYPE2 message with CQR and NPB within radio period (N+8 or N+9) mode 2715648.

The SS sends RLC data blocks with BSN=256, 116,241. CES/P = '000'B using DAS-5 coding scheme

The SS sends a RLC data block with BSN=237, CES/P = '111'B and using DAS-5. MS responds back with EGPRS PACKET DOWNLINK ACK/NACK TYPE2 message with no channel quality report and NPB within radio period (N+8 or N+9) mode 2715648.

Maximum Duration of Test

10 minutes.

Expected Sequence

Step	Direction	Message	Comments
1		{Downlink TBF establishment}	Acknowledged Mode EGPRS Window Size: 256. BTTI configuration Mode, FANR disabled, EGPRS Level set to EGPRS2-A,
2	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	With DAS-7,BSN = N, CES/P = '000'B
3			Repeat step 2 with N = 0..5
4	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	With DAS7,BSN = 21, CES/P = '001'B
5	MS -> SS	EGPRS PACKET DOWNLINK ACK/NACK TYPE2	The SS verifies that the EGPRS Ack/Nack description IE contains the correct SSN and RB in the message. Verify that BOW is set EGPRS PACKET DOWNLINK ACK/NACK TYPE 2 message contains Channel Quality Report(s) and if there is enough room left in RLC/MAC block, FPB within the radio period (N+8 or N+9) mode 2715648.
6	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	With DAS-5, BSN = 32, CES/P = '010'B using TFI allocated in step 1.
7	MS -> SS	EGPRS PACKET DOWNLINK ACK/NACK TYPE2	The SS verifies that the EGPRS Ack/Nack description IE contains the correct SSN and RB in the message indicating all the unacknowledged blocks. Verify that BOW is set EGPRS PACKET DOWNLINK ACK/NACK TYPE 2 message contains Channel Quality Report(s) and if there is enough room left in RLC/MAC block, FPB within the radio period (N+13) mode 2715648.
8	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	With DAS-6, BSN = 22, CES/P = '011'B, using TFI allocated in step 1.
9	SS		The SS verifies that MS does not send any EGPRS PACKET DOWNLINK ACK/NACk TYPE2 message.
10	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	With DAS-5, BSN = 24, CES/P = '100'B, using TFI allocated in step 1.
11	SS		The SS verifies that MS does not send any EGPRS PACKET DOWNLINK ACK/NACK TYPE2 message.
12	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	With DAS-7, BSN = 26, CES/P = '101'B, using TFI allocated in step 1.
13	MS -> SS	EGPRS PACKET DOWNLINK ACK/NACK TYPE2	The SS verifies that the EGPRS Ack/Nack description IE contains the correct SSN and RB in the message indicating all the unacknowledged blocks. Verify that BOW is set EGPRS PACKET DOWNLINK ACK/NACK TYPE 2 message contains Channel Quality Report(s) and if there is enough room left in RLC/MAC block, NPB within the radio period (N+8 or N+9) mode 2715648.
13	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	With DAS-5 BSN = 29, CES/P = '110'B, using TFI allocated in step 1.
14	MS -> SS	EGPRS PACKET DOWNLINK ACK/NACK TYPE2	The SS verifies that the EGPRS Ack/Nack description IE contains the correct SSN and RB in the message indicating all the unacknowledged blocks. Verify that BOW is set. EGPRS PACKET DOWNLINK ACK/NACK TYPE 2 message contains Channel Quality Report(s) and if there is enough room left in RLC/MAC block NPB within the radio period (N+13) mode 2715648.
15	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	With DAS-5 BSN = 31, CES/P = '111'B, using TFI allocated in step 1.
16	MS -> SS	EGPRS PACKET DOWNLINK ACK/NACK TYPE2	The SS verifies that the EGPRS Ack/Nack description IE contains the correct SSN and RB in the message indicating all the unacknowledged blocks. Verify that BOW is set. EGPRS PACKET DOWNLINK ACK/NACK TYPE 2 message contains Channel Quality Report(s) and if there is enough room left in RLC/MAC block NPB within the radio period (N+8 or N+9) mode 2715648.

Step	Direction	Message	Comments
17	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	With DAS-5 BSN = 256, CES/P = '000'B, using TFI allocated in step 1.
18	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	With DAS-5 BSN = 116, CES/P = '000'B, using TFI allocated in step 1.
19	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	With DAS-5 BSN = 241, CES/P = '000'B, using TFI allocated in step 1.
21	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	With DAS-5 BSN = 237, CES/P = '111'B, using TFI allocated in step 1.
22	MS -> SS	EGPRS PACKET DOWNLINK ACK/NACK TYPE2	The SS verifies that the EGPRS Ack/Nack description IE contains the correct SSN and RB in the message indicating all the unacknowledged blocks. Verify that BOW is set. EGPRS PACKET DOWNLINK ACK/NACK TYPE 2 message does not contains Channel Quality Report(s) NPB within the radio period (N+8 or N+9) mode 2715648.

Specific message contents

None.

58d EFTA

58d.1 Concurrent EFTA TBF

58d.1.1 EFTA / Extended Dynamic Allocation/Concurrent TBF

58d.1.1.1 Conformance Requirement

For a mobile station with an uplink TBF for which EFTA is used transmissions shall be performed on the uplink PDCHs or PDCH-pairs allocated by the USF as specified in Annex N. In case the mobile station also has one or more concurrent downlink TBF(s), but does not have enough RLC/MAC blocks ready for transmission to fully utilize the total number of allocated resources for uplink radio block transmission during the corresponding radio block period(s), then it shall immediately begin monitoring its assigned downlink PDCHs or PDCH-pairs after transmitting its last available RLC/MAC block taking into account the switching requirements of its multislot class (see 3GPP TS 45.002).

References

3GPP TS 44.060, subclause 8.1.1.2.1

A mobile station with an uplink TBF operating in BTTI configuration for which EFTA is used shall perform transmissions on a subset of the uplink PDCHs allocated by the USF. If the mobile station has P RLC/MAC blocks ready for transmission, then this subset is defined as the first P number of the allocated uplink PDCHs arranged according to the specific timeslot numbers order as specified in Table N.1 below. T_{ra} or T_{rb}, whichever is applicable, is the switching time from transmission to reception (see 3GPP TS 45.002).

Table N.1: Uplink timeslots transmission order for EFTA

Lowest Numbered Downlink Timeslot the MS Needs to Monitor	T_{ra} or T_{rb}, whichever is applicable		
	0	1	2
TN0	4,3,2,1,0,5,6,7	3,2,1,0,4,5,6,7	2,1,0,3,4,5,6,7
TN1	5,4,3,2,1,0,6,7	4,3,2,1,0,5,6,7	3,2,1,0,4,5,6,7
TN2	6,5,4,3,2,1,0,7	5,4,3,2,1,0,6,7	4,3,2,1,0,5,6,7
TN3	7,6,5,4,3,2,1,0	6,5,4,3,2,1,0,7	5,4,3,2,1,0,6,7
TN4	7,6,5,4,3,2,1,0	7,6,5,4,3,2,1,0	6,5,4,3,2,1,0,7
TN5	7,6,5,4,3,2,1,0	7,6,5,4,3,2,1,0	7,6,5,4,3,2,1,0
TN6	7,6,5,4,3,2,1,0	7,6,5,4,3,2,1,0	7,6,5,4,3,2,1,0
TN7	7,6,5,4,3,2,1,0	7,6,5,4,3,2,1,0	7,6,5,4,3,2,1,0

A mobile station with an uplink TBF operating in RTTI configuration for which EFTA is used shall perform transmissions on a subset of the uplink PDCH-pairs allocated by the USF in the same manner as specified above. For this case the specific timeslot number order shall be seen as indicating the lowest numbered timeslot of the uplink PDCH-pair.

NOTE: The above described rule determine the subset of the allocated uplink PDCHs or PDCH-pairs on which uplink transmissions shall be performed when EFTA is used. This procedure however, does not define which uplink PDCHs or PDCH-pairs that shall be allocated by the USF. Nor does the procedure define the individual ordering of any transmitted RLC/MAC blocks on these resources, which shall remain the same as for the case when EFTA is not used.

A mobile station with an uplink TBF for which EFTA is used shall perform the transmission of any uplink PACCH message allocated via the polling mechanism (see sub-clauses 10.4.4b and 10.4.5) on the first of the assigned uplink PDCHs or PDCH-pairs arranged according to the specific timeslot number order as described by Table N.1 above, regardless of which resources are allocated by the USF. The switching time T_{ra} or T_{rb} shall be interpreted according to its value at the time the poll was received.

References

3GPP TS 44.060, Annex N

References

3GPP TS 45.002, Annex B.1 and B.5

3GPP TS 45.002 Table 6.4.2.2.1

58d.1.1.2 Test Purposes

The test purpose is to verify that the EFTA capable MS indicating support for an Alternative EFTA Multislot Class supports as many downlink timeslots per TDMA frame as indicated with the multislot classes. Especially it's verified that the Sum parameter is not used in the conditions where Sum is not applicable according to TS 45.002 Annex B.5.

1. T_{tb}, the minimum number of slots allowed between the end of the previous transmit or receive TS and the next transmit TS when measurement is to be performed for type 1 MS.
2. T_{ra}, the minimum number of slots allowed between the previous transmit or receive TS and the next receive TS when measurement is to be performed for type 1 MS.
3. The maximum number of Rx and Tx supported.
4. Check that MS transmit according to 44.060 Table N.1.
5. MS shall if uplink data is ongoing then for these overlapping instances prioritize uplink radio block transmission over attempting to read downlink radio blocks.

58d.1.1.3 Method of Test

Initial Conditions

System Simulator:

1 cell with EGPRS support, default setting,

Mobile Station:

The MS is EGPRS updated with a P-TMSI allocated, PDP Context 2 activated.

Specific PICS Statements

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PIXIT Statements

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Test Procedure

Establish a concurrent uplink downlink TBF using max number of Tx and Rx timeslot according to multislot class and alternative EFTA multislot class, EDA used, USF_GRANULARITY=4 blocks, MCS-5.

Transmit on all downlink timeslots and check that all data is Ack'd correctly.

Transmit on all uplink timeslots while downlink transmission on all timeslot also is ongoing, check that the uplink always gets transmitted correctly and that only overlapping downlink data is Nacked.

Send 2 RLC blocks on uplink assign USF on lowest TN, while downlink transmission on all timeslots also is ongoing, check that uplink is transmitted according to 44.060 Table N.1.

Maximum Duration of Test

5 minutes

Expected Sequence

Step	Direction	Message	Comments
1	SS -> MS	{Downlink TBF establishment}	Acknowledged Mode. SS Commands MS to use mobile coding scheme MCS-5. Max number of timeslots are assigned according to MS multislot class (TS 45.002 Annex B.1) and Alternative EFTA multislot class (TS 45.002 Annex B.5): - TN_1 to TN_x
2	SS -> MS	30 RLC data blocks	SS sends data, last block is polling.
3	MS -> SS	EGPRS PACKET DOWNLINK ACK/NACK	Sent on PACCH. Check all blocks Acked ok.
4	SS -> MS	PACKET UPLINK ASSIGNMENT	Sent on downlink PACCH. The uplink TBF is assigned. MCS-5, EDA used, USF_GRANULARITY=4. Max number of timeslots are assigned according to MS multislot class (TS 45.002 Annex B.1) and Alternative EFTA multislot class (TS 45.002 Annex B.5): - TN_1 to TN_x
5	SS -> MS	30 RLC data blocks	SS sends data, last block is polling.
6	MS -> SS	EGPRS PACKET DOWNLINK ACK/NACK	Sent on PACCH. SS checks that all data blocks are Acked.
7	SS <-> MS	{Downlink data transfer},{Uplink data transfer}	2000 octets of data in downlink and SS checks that Acked/Nack is according to EFTA requirements: - Downlink packets are Nacked if simultaneous as uplink. - Downlink packets are Nacked related to T_{tb} and $T_{ra.}$ 1000 octets of data in uplink and SS checks that all data blocks are Acked. Downlink and uplink data transfers are simultaneous.
8	SS -> MS	30 RLC data blocks	SS sends data, last block is polling.
9	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Assigned USF on PACCH on lowest TN.
10	MS -> SS	2 RLC data blocks	Trigger 2 UL data blocks while SS sends data on all assigned downlink timeslots in step 9. SS checks that MS send the data according to TS 44.060 Table N.1.
11	MS -> SS	EGPRS PACKET DOWNLINK ACK/NACK	Sent on PACCH.
12	SS -> MS	PACKET UPLINK ACK/NACK	SS acknowledges receiving all RLC data blocks. Final Ack Indicator = '1' containing valid RRBP. Sent on the PACCH of the assigned PDCH.
13	MS -> SS	PACKET CONTROL ACKNOWLEDGEMENT	Received on the block specified by RRBP on PACCH of the assigned PDCH.

Specific Message Contents

None.

58d.1.2 EFTA / Acknowledge mode/ Concurrent TBF/ pre-emptive retransmission

58d.1.2.1 Conformance Requirement

When Enhanced Flexible Timeslot Assignment, EFTA, is used, and the applicable conditions for pre-emptive retransmission are true, the mobile station shall not prioritize uplink radio block transmission over attempting to read downlink radio blocks.

References

3GPP TS 44.060 subclause 9.1.3.2.1

For a mobile station with an uplink TBF for which EFTA is used transmissions shall be performed on the uplink PDCHs or PDCH-pairs allocated by the USF as specified in Annex N. In case the mobile station also has one or more concurrent downlink TBF(s), but does not have enough RLC/MAC blocks ready for transmission to fully utilize the total number of allocated resources for uplink radio block transmission during the corresponding radio block period(s), then it shall immediately begin monitoring its assigned downlink PDCHs or PDCH-pairs after transmitting its last available RLC/MAC block taking into account the switching requirements of its multislot class (see 3GPP TS 45.002).

References

3GPP TS 44.060, subclause 8.1.1.2.1

References

3GPP TS 45.002, Annex B.1 and B.5

3GPP TS 45.002 Table 6.4.2.2.1

58d.1.2.2 Test Purposes

The test purpose is to verify that the EFTA capable MS:

1. When the pre-emptive retransmission bit is set to ‘1’, is not retransmitting RLC data blocks whose corresponding element in V(B) is set to PENDING_ACK if not able to transmit one UL radio block and read all assigned DL timeslots in the same TTI.;
2. When the pre-emptive retransmission bit is set to ‘1’, is retransmitting RLC data blocks whose corresponding element in V(B) is set to PENDING_ACK if able to transmit one UL radio block and read all assigned DL timeslots in the same TTI.

58d.1.2.3 Method of Test

Initial Conditions

System Simulator:

1 cell with EGPRS support, default setting,

Mobile Station:

The MS is EGPRS updated with a P-TMSI allocated, PDP Context 2 activated.

Specific PICS Statements

TSPC_Type_EGPRS_Multislot_ClassX (where X = 40..45)

TSPC_EFTA_Alt_Multislot_Class_X (where X= 1..3)

PIXIT Statements

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Test Procedure

Establish a concurrent uplink downlink TBF using max number of Tx and Rx allowed timeslots according to multislot class and alternative EFTA multislot class for K=1 (DL with minimum 6 TS) and for K=2 (5 DL TS should be used), EDA used, USF_GRANULARITY=1 blocks, MCS-5.

Transmit on all downlink timeslots.

Send 30 RLC block on uplink while downlink transmission on all timeslot also is ongoing.15 RLC blocks neither acked nor nacked by SS.

Check if K=1 that MS not tries to resend RLC blocks while downlink ongoing.

Check if K=2 that MS resend RLC blocks while downlink ongoing.

Maximum Duration of Test

5 minutes

Expected Sequence

The test sequence is repeated for K = 1: DL using max number of TS allowed, minimum 6 TS, K=2: DL using 5 TS.

Step	Direction	Message	Comments
1	SS -> MS	{Downlink TBF establishment}	Acknowledged Mode. SS Commands MS to use mobile coding scheme MCS-5. timeslots are assigned for K=1: according to MS multislot class (TS 45.002 Annex B.1) and Alternative EFTA multislot class (TS 45.002 Annex B.5) for K=2: 5 TS is assigned: - TN_1 to TN_x
2	SS -> MS	PACKET UPLINK ASSIGNMENT	Sent on downlink PACCH. The uplink TBF is assigned. MCS-5, EDA used, USF_GRANULARITY=1 Max number of timeslots are assigned according to MS multislot class (TS 45.002 Annex B.1) and Alternative EFTA multislot class (TS 45.002 Annex B.5) : - TN_1 to TN_x
3	SS -> MS	{Downlink data transfer}	2000 octets of data in downlink. Downlink data transfer are simultaneous with steps 4 to step 6
4	MS -> SS	30 RLC data blocks	Trigger 30 UL data blocks while SS sends data on all assigned downlink timeslots in step 3. .
5	SS -> MS	PACKET UPLINK ACK/NACK	SS acknowledges 15 RLC data blocks, the other 15 RLC data blocks SS neither Ack nor Nack. PRE_EMPTIVE_TRANSMISSION bit in PUAN message set to '1'.
6a	SS		For K=1: SS checks that MS does not try to resend RLC blocks while downlink data transfer ongoing. Downlink transfer ends
6b	MS -> SS	15 RLC data blocks	For K=2 SS checks that MS resends outstanding Pending Ack blocks while downlink data transfer ongoing. Downlink transfer ends
7	SS -> MS	PACKET UPLINK ACK/NACK	SS sets Final Ack Indicator = '1' containing valid RRBP. Sent on the PACCH of the assigned PDCH.
8	MS -> SS	PACKET CONTROL ACKNOWLEDGEMENT	Received on the block specified by RRBP on PACCH of the assigned PDCH.

Specific Message Contents

None.

58d.1.3 EFTA / Concurrent TBF / PAN Polling

58d.1.3.1 Conformance Requirement

In case EFTA is used at the time the CES/P field is received, the mobile station shall transmit the uplink radio block according to the uplink radio block transmission order as described in Annex N regardless of the timeslot or PDCH pair where the block containing the CES/P field was received

References

3GPP TS 44.060, subclause 10.4.4b

A mobile station with an uplink TBF operating in BTTI configuration for which EFTA is used shall perform transmissions on a subset of the uplink PDCHs allocated by the USF. If the mobile station has P RLC/MAC blocks ready for transmission, then this subset is defined as the first P number of the allocated uplink PDCHs arranged according to the specific timeslot numbers order as specified in Table N.1 below. T_{ra} or T_{rb}, whichever is applicable, is the switching time from transmission to reception (see 3GPP TS 45.002).

Table N.1: Uplink timeslots transmission order for EFTA

Lowest Numbered Downlink Timeslot the MS Needs to Monitor	T_{ra} or T_{rb}, whichever is applicable		
	0	1	2
TN0	4,3,2,1,0,5,6,7	3,2,1,0,4,5,6,7	2,1,0,3,4,5,6,7
TN1	5,4,3,2,1,0,6,7	4,3,2,1,0,5,6,7	3,2,1,0,4,5,6,7
TN2	6,5,4,3,2,1,0,7	5,4,3,2,1,0,6,7	4,3,2,1,0,5,6,7
TN3	7,6,5,4,3,2,1,0	6,5,4,3,2,1,0,7	5,4,3,2,1,0,6,7
TN4	7,6,5,4,3,2,1,0	7,6,5,4,3,2,1,0	6,5,4,3,2,1,0,7
TN5	7,6,5,4,3,2,1,0	7,6,5,4,3,2,1,0	7,6,5,4,3,2,1,0
TN6	7,6,5,4,3,2,1,0	7,6,5,4,3,2,1,0	7,6,5,4,3,2,1,0
TN7	7,6,5,4,3,2,1,0	7,6,5,4,3,2,1,0	7,6,5,4,3,2,1,0

A mobile station with an uplink TBF operating in RTTI configuration for which EFTA is used shall perform transmissions on a subset of the uplink PDCH-pairs allocated by the USF in the same manner as specified above. For this case the specific timeslot number order shall be seen as indicating the lowest numbered timeslot of the uplink PDCH-pair.

NOTE: The above described rule determine the subset of the allocated uplink PDCHs or PDCH-pairs on which uplink transmissions shall be performed when EFTA is used. This procedure however, does not define which uplink PDCHs or PDCH-pairs that shall be allocated by the USF. Nor does the procedure define the individual ordering of any transmitted RLC/MAC blocks on these resources, which shall remain the same as for the case when EFTA is not used.

A mobile station with an uplink TBF for which EFTA is used shall perform the transmission of any uplink PACCH message allocated via the polling mechanism (see sub-clauses 10.4.4b and 10.4.5) on the first of the assigned uplink PDCHs or PDCH-pairs arranged according to the specific timeslot number order as described by Table N.1 above, regardless of which resources are allocated by the USF. The switching time T_{ra} or T_{rb} shall be interpreted according to its value at the time the poll was received.

References

3GPP TS 44.060, Annex N

For a mobile station with an uplink TBF for which EFTA is used transmissions shall be performed on the uplink PDCHs or PDCH-pairs allocated by the USF as specified in Annex N. In case the mobile station also has one or more concurrent downlink TBF(s), but does not have enough RLC/MAC blocks ready for transmission to fully utilize the total number of allocated resources for uplink radio block transmission during the corresponding radio block period(s), then it shall immediately begin monitoring its assigned downlink PDCHs or PDCH-pairs after transmitting its last available RLC/MAC block taking into account the switching requirements of its multislot class (see 3GPP TS 45.002).

References

3GPP TS 44.060, subclause 8.1.1.2.1

References

3GPP TS 45.002, Annex B.1 and B.5

3GPP TS 45.002 Table 6.4.2.2.1

58d.1.3.2 Test Purposes

The test purpose is to verify that the EFTA capable MS indicating support for an Alternative EFTA Multislot Class supports as many uplink and downlink timeslots per TDMA frame as indicated with the multislot classes. Especially it's verified that the Sum parameter is not used in the conditions where Sum is not applicable according to TS 45.002 Annex B.5.

1. The maximum number of Rx and Tx supported.
2. MS is polled for a Piggy-back Ack/Nack with CES/P field. Check that MS transmit response according to 44.060 Table N.1.

58d.1.3.3 Method of Test

Initial Conditions

System Simulator:

1 cell with EGPRS support, default setting,

Mobile Station:

The MS is EGPRS updated with a P-TMSI allocated, PDP Context 2 activated.

Specific PICS Statements

-

PIXIT Statements

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Test Procedure

Establish a concurrent uplink downlink TBF using max number of Tx and Rx timeslot according to multislot class and alternative EFTA multislot class, EDA used, USF_GRANULARITY=4 blocks, MCS-5, RTTI and FANR configuration used.

Transmit on all uplink timeslots while downlink transmission on all timeslot also is ongoing, check that the uplink always gets transmitted correctly and that only overlapping downlink data is Nacked.

MS is polled for a Piggy-back Ack/nack on lowest TN, while downlink transmission on all timeslot also is ongoing, check that uplink response is transmitted according to 44.060 Table N.1.

Maximum Duration of Test

5 minutes

Expected Sequence

Step	Direction	Message	Comments
1	SS -> MS	{Downlink TBF establishment}	Acknowledged Mode. SS Commands MS to use mobile coding scheme MCS-5. Max number of timeslots are assigned according to MS multislot class (TS 45.002 Annex B.1) and Alternative EFTA multislot class (TS 45.002 Annex B.5): - TN_1 to TN_x: RTTI and FANR activated.
2	SS -> MS	PACKET UPLINK ASSIGNMENT	Sent on downlink PACCH. The uplink TBF is assigned. MCS-5, EDA used, USF_GRANULARITY=1 Max number of timeslots are assigned according to MS multislot class (TS 45.002 Annex B.1) and Alternative EFTA multislot class (TS 45.002 Annex B.5) : - TN_1 to TN_x RTTI and FANR activated. BTTI USF.
3	SS <-> MS	{Downlink data transfer},{Uplink data transfer}	2000 octets of data in downlink and SS checks that Acked/Nack is according to EFTA requirements: - Downlink packets are Nacked if simultaneous as uplink. - Downlink packets are Nacked related to T_{tb} and $T_{ra.}$ 1000 octets of data in uplink and SS checks that all data blocks are Acked. Downlink and uplink data transfers are simultaneous and also simultaneous with steps 4 to step 7.
4	SS -> MS	EGPRS DOWNLINK DATA BLOCK	Sent on assigned PDTCH on lowest TN. TFI assigned to the MS. CES/P = 011 Does not contain PAN field.
5	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Assigned USF on PACCH on lowest TN.
6	MS -> SS	EGPRS UPLINK DATA BLOCK	Received on assigned PDTCH. Received in reserved block allocated by CES/P at Step 4. Contains PAN field
7	SS		SS checks MS sends the block including the PAN response according to TS 44.060 Table N.1. Downlink and uplink transfer ends
8	SS -> MS	PACKET UPLINK ACK/NACK	SS sets Final Ack Indicator = '1' containing valid RRBP. Sent on the PACCH of the assigned PDCH.
9	MS -> SS	PACKET CONTROL ACKNOWLEDGEMENT	Received on the block specified by RRBP on PACCH of the assigned PDCH.

Specific Message Contents

None.

58d.1.4 EFTA / Concurrent TBF / Polling

58d.1.4.1 Conformance Requirement

In case of a BTTI or an RTTI configuration when EFTA is used at the time the RRBP field is received, the mobile station shall transmit the uplink radio block according to the uplink radio block transmission order as described in Annex N regardless of the timeslot or PDCH-pair where the block containing the RRBP was received.

References

3GPP TS 44.060, subclause 10.4.5

A mobile station with an uplink TBF operating in BTTI configuration for which EFTA is used shall perform transmissions on a subset of the uplink PDCHs allocated by the USF. If the mobile station has P RLC/MAC blocks ready for transmission, then this subset is defined as the first P number of the allocated uplink PDCHs arranged according to the specific timeslot numbers order as specified in Table N.1 below. T_{ra} or T_{rb}, whichever is applicable, is the switching time from transmission to reception (see 3GPP TS 45.002).

Table N.1: Uplink timeslots transmission order for EFTA

Lowest Numbered Downlink Timeslot the MS Needs to Monitor	T_{ra} or T_{rb}, whichever is applicable		
	0	1	2
TN0	4,3,2,1,0,5,6,7	3,2,1,0,4,5,6,7	2,1,0,3,4,5,6,7
TN1	5,4,3,2,1,0,6,7	4,3,2,1,0,5,6,7	3,2,1,0,4,5,6,7
TN2	6,5,4,3,2,1,0,7	5,4,3,2,1,0,6,7	4,3,2,1,0,5,6,7
TN3	7,6,5,4,3,2,1,0	6,5,4,3,2,1,0,7	5,4,3,2,1,0,6,7
TN4	7,6,5,4,3,2,1,0	7,6,5,4,3,2,1,0	6,5,4,3,2,1,0,7
TN5	7,6,5,4,3,2,1,0	7,6,5,4,3,2,1,0	7,6,5,4,3,2,1,0
TN6	7,6,5,4,3,2,1,0	7,6,5,4,3,2,1,0	7,6,5,4,3,2,1,0
TN7	7,6,5,4,3,2,1,0	7,6,5,4,3,2,1,0	7,6,5,4,3,2,1,0

A mobile station with an uplink TBF operating in RTTI configuration for which EFTA is used shall perform transmissions on a subset of the uplink PDCH-pairs allocated by the USF in the same manner as specified above. For this case the specific timeslot number order shall be seen as indicating the lowest numbered timeslot of the uplink PDCH-pair.

NOTE: The above described rule determine the subset of the allocated uplink PDCHs or PDCH-pairs on which uplink transmissions shall be performed when EFTA is used. This procedure however, does not define which uplink PDCHs or PDCH-pairs that shall be allocated by the USF. Nor does the procedure define the individual ordering of any transmitted RLC/MAC blocks on these resources, which shall remain the same as for the case when EFTA is not used.

A mobile station with an uplink TBF for which EFTA is used shall perform the transmission of any uplink PACCH message allocated via the polling mechanism (see sub-clauses 10.4.4b and 10.4.5) on the first of the assigned uplink PDCHs or PDCH-pairs arranged according to the specific timeslot number order as described by Table N.1 above, regardless of which resources are allocated by the USF. The switching time T_{ra} or T_{rb} shall be interpreted according to its value at the time the poll was received.

References

3GPP TS 44.060, Annex N

References

3GPP TS 45.002, Annex B.1 and B.5

3GPP TS 45.002 Table 6.4.2.2.1

58d.1.4.2 Test Purposes

The test purpose is to verify that the EFTA capable MS:

1. Is not transmitting an EGPRS PACKET DOWNLINK ACK/NACK on the timeslot where the RRBP was received but instead according to the uplink radio block transmission order as described in TS 44.060 Annex N.

2. Is not transmitting a PACKET CONTROL ACKNOWLEDGEMENT on the timeslot where the RRBP was received but instead according to the uplink radio block transmission order as described in TS 44.060 Annex N.

58d.1.4.3 Method of Test

Initial Conditions

System Simulator:

1 cell with EGPRS support, default setting,

Mobile Station:

The MS is EGPRS updated with a P-TMSI allocated, PDP Context 2 activated.

Specific PICS Statements

-

PIXIT Statements

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Test Procedure

Establish a concurrent uplink downlink TBF using max number of Tx (max 4 Ts) and Rx timeslot according to multislot class and alternative EFTA multislot class minus 1 timeslot, EDA used, USF_GRANULARITY=4 blocks, MCS-5.

Transmit on downlink timeslots and check that polled Ack'd is transmitted according to TS 44.060 Annex N.

Transmit uplink timeslots SS sets FAI containing valid RRBP check that Packet Control Ack is transmitted according to TS 44.060 Annex N

Maximum Duration of Test

5 minutes

Expected Sequence

Step	Direction	Message	Comments
1	SS -> MS	{Downlink TBF establishment}	Acknowledged Mode. SS Commands MS to use mobile coding scheme MCS-5. Max number of timeslots minus 1 are assigned according to MS multislot class (TS 45.002 Annex B.1) and Alternative EFTA multislot class (TS 45.002 Annex B.5): - TN_1 to TN_x
2	SS -> MS	PACKET UPLINK ASSIGNMENT	Sent on downlink PACCH. The uplink TBF is assigned. MCS-5, EDA used, USF_GRANULARITY=1 Max number of timeslots are assigned according to MS multislot class (TS 45.002 Annex B.1) and Alternative EFTA multislot class (TS 45.002 Annex B.5) (limited to max 4 timeslots to use): - TN_1 to TN_x
3	SS -> MS	30 RLC data blocks	SS sends data, last block is polling. SS make sure the polling is done on a timeslot that will not be used in step 4
4	MS -> SS	EGPRS PACKET DOWNLINK ACK/NACK	Sent on PACCH. SS checks that message sent according to TS44.060 Table N.1.
5	MS -> SS	30 RLC data blocks	Trigger 30 UL data blocks.
6	SS -> MS	PACKET UPLINK ACK/NACK	SS sets Final Ack Indicator = '1' containing valid RRBP. Sent on the PACCH of the assigned PDCH. SS make sure RRBP is sent on a timeslot that will not be used in step 7
7	MS -> SS	PACKET CONTROL ACKNOWLEDGEMENT	Received on the block specified by RRBP on PACCH according to TS44.060 Table N.1.

Specific Message Contents

None.

58d.1.5 EFTA/Downlink TBF/8 TS

58d.1.5.1 Conformance Requirement

For a mobile station with an uplink TBF for which EFTA is used transmissions shall be performed on the uplink PDCHs or PDCH-pairs allocated by the USF as specified in Annex N. In case the mobile station also has one or more concurrent downlink TBF(s), but does not have enough RLC/MAC blocks ready for transmission to fully utilize the total number of allocated resources for uplink radio block transmission during the corresponding radio block period(s), then it shall immediately begin monitoring its assigned downlink PDCHs or PDCH-pairs after transmitting its last available RLC/MAC block taking into account the switching requirements of its multislot class (see 3GPP TS 45.002).

References

3GPP TS 44.060, subclause 8.1.1.1

A mobile station with an uplink TBF operating in BTTI configuration for which EFTA is used shall perform transmissions on a subset of the uplink PDCHs allocated by the USF. If the mobile station has P RLC/MAC blocks ready for transmission, then this subset is defined as the first P number of the allocated uplink PDCHs arranged according to the specific timeslot numbers order as specified in Table N.1 below. T_{ra} or T_{rb}, whichever is applicable, is the switching time from transmission to reception (see 3GPP TS 45.002).

Table N.1: Uplink timeslots transmission order for EFTA

Lowest Numbered Downlink Timeslot the MS Needs to Monitor	T_{ra} or T_{rb}, whichever is applicable		
	0	1	2
TN0	4,3,2,1,0,5,6,7	3,2,1,0,4,5,6,7	2,1,0,3,4,5,6,7
TN1	5,4,3,2,1,0,6,7	4,3,2,1,0,5,6,7	3,2,1,0,4,5,6,7
TN2	6,5,4,3,2,1,0,7	5,4,3,2,1,0,6,7	4,3,2,1,0,5,6,7
TN3	7,6,5,4,3,2,1,0	6,5,4,3,2,1,0,7	5,4,3,2,1,0,6,7
TN4	7,6,5,4,3,2,1,0	7,6,5,4,3,2,1,0	6,5,4,3,2,1,0,7
TN5	7,6,5,4,3,2,1,0	7,6,5,4,3,2,1,0	7,6,5,4,3,2,1,0
TN6	7,6,5,4,3,2,1,0	7,6,5,4,3,2,1,0	7,6,5,4,3,2,1,0
TN7	7,6,5,4,3,2,1,0	7,6,5,4,3,2,1,0	7,6,5,4,3,2,1,0

A mobile station with an uplink TBF operating in RTTI configuration for which EFTA is used shall perform transmissions on a subset of the uplink PDCH-pairs allocated by the USF in the same manner as specified above. For this case the specific timeslot number order shall be seen as indicating the lowest numbered timeslot of the uplink PDCH-pair.

NOTE: The above described rule determine the subset of the allocated uplink PDCHs or PDCH-pairs on which uplink transmissions shall be performed when EFTA is used. This procedure however, does not define which uplink PDCHs or PDCH-pairs that shall be allocated by the USF. Nor does the procedure define the individual ordering of any transmitted RLC/MAC blocks on these resources, which shall remain the same as for the case when EFTA is not used.

A mobile station with an uplink TBF for which EFTA is used shall perform the transmission of any uplink PACCH message allocated via the polling mechanism (see sub-clauses 10.4.4b and 10.4.5) on the first of the assigned uplink PDCHs or PDCH-pairs arranged according to the specific timeslot number order as described by Table N.1 above, regardless of which resources are allocated by the USF. The switching time T_{ra} or T_{rb} shall be interpreted according to its value at the time the poll was received.

References

3GPP TS 44.060, Annex N

References

3GPP TS 45.002, Annex B.1 and B.5

3GPP TS 45.002 Table 6.4.2.2.1

58d.1.5.2 Test Purposes

The test purpose is to verify that an EFTA capable MS indicating the support for alternative EFTA multislot class 3:

1. Is capable to receive and acknowledge correctly on a maximum of 8 timeslots while no frequency hopping is used.

2. Is capable to receive and acknowledge correctly on a maximum of 7 timeslots (if PICS TSPC_Fast_Downlink_Freq_Switch_Cap is supported then a maximum of 8 timeslots should be used instead) while frequency hopping is used.

58d.1.5.3 Method of Test

Initial Conditions

System Simulator:

1 cell with EGPRS support, default setting,

Mobile Station:

The MS is EGPRS updated with a P-TMSI allocated, PDP Context 2 activated.

Specific PICS Statements

TSPC_Fast_Downlink_Freq_Switch_Cap

PIXIT Statements

-

Test Procedure

Establish a downlink TBF using:

- K=1: 8 timeslots should be assigned for downlink using no frequency hopping
- K=2: 7 timeslots should be assigned for downlink using frequency hopping and TSPC_Fast_Downlink_Freq_Switch_Cap not supported
- K=3: 8 timeslots should be assigned for downlink using frequency hopping and TSPC_Fast_Downlink_Freq_Switch_Cap supported

Transmit on all downlink timeslots and check that all data is Ack'd correctly.

Maximum Duration of Test

5 minutes

Expected Sequence

The test sequence is repeated for K = 1, 2 and 3

Step	Direction	Message	Comments
1	SS -> MS	{Downlink TBF establishment}	Acknowledged Mode. SS Commands MS to use mobile coding scheme MCS-5. K=1: 8 timeslots assigned with no frequency hopping K=2: 7 timeslots assigned with frequency hopping K=3: 8 timeslots assigned with frequency hopping - TN_1 to TN_x
	SS -> MS	{Downlink data transfer}	2000 octets of data in downlink. and SS checks that Acked correctly.

Specific Message Contents

None.

58e DTR

58e.1 DTR with Uplink TBF / PACKET UPLINK ACK/NACK message with DTR information / Resumption to normal operation

58e.1.1 Conformance requirements

[3GPP TS 44.060, 8.1.8.2]

During an uplink TBF, the network may transmit the DTR information within a PACKET UPLINK ACK/NACK message. If DTR information is received in a PACKET UPLINK ACK/NACK message and an RLC data block in the same block period, the mobile station shall ignore the DTR information received in the RLC data block.

A mobile station not already in DTR mode shall enter DTR mode and start monitoring only the indicated PDCH or PDCH-pair (and if applicable, carrier) within the reaction time specified in 3GPP TS 45.010, when:

- DTR information was included in whichever of the following was the most recently received:
    i) any PACKET UPLINK ACK/NACK message (applicable if the mobile station has an ongoing uplink TBF) and

[3GPP TS 44.060, 8.1.8.3]

The mobile station shall exit DTR mode within the reaction time specified in 3GPP TS 45.010:

- when an RLC data block with BSN equal to V(S) is transmitted and the medium access mode is Dynamic Allocation;

References

3GPP TS 44.060, subclause 8.1.8

58e.1.2 Test purpose

1. To verify that MS enters DTR mode when PACKET UPLINK ACK/NACK message with DTR information is received during an uplink TBF.
2. To verify that MS resumes the RLC data block transfer on all the timeslots configured when a new LLC PDU is received from upper layers, after exiting the DTR mode.

58e.3 Method of test

Initial Conditions

System Simulator:

1 cell, NW_EXT_UTBF = 1, EXT_UTBF_NODATA = 1, BS_CV_MAX = 15

Mobile Station:

MS is in Packet Idle mode, GPRS attached with support of GERAN Feature Package 1 indicated in MS Radio Access Capabilities, and PDP context 2 established.

Specific PICS Statements

- DTR Supported (TSPC_DTR)

PIXIT Statements

-

Test Procedure

The MS is triggered to transfer user data. A TBF of dynamic allocation in acknowledged mode is assigned. SS assigns an USF to MS until MS has sent CV = 0. SS acknowledges all received data with Final Ack Indicator bit set to '0'. SS continues to assigns USF to MS. As the EXT_UTBF_NODATA = 1, MS refrains from transmitting the Packet Uplink Dummy Control Blocks. SS transmits PACKET UPLINK ACK/NACK message with DTR information. SS transmits PACKET POLLING REQUEST on PACCH on TN2. Verify that MS does not respond with PACKET CONTROL ACK, as the MS is in DTR mode and it shall not monitor TN2. Then MS is triggered to send more data. Verify that MS shall send data blocks with a recalculated CV on both TN1 and TN2. Then the uplink TBF is continued and completed.

Expected Sequence

Step	Direction	Message	Comments
1		{Uplink dynamic allocation two phase access}	n = 400 octets, without starting time, USF_GRANULARITY = 1 block, EGPRS channel coding command: MCS 1, RLC acknowledged mode (PDP context2), Two slots, USF1 on TN1 and USF2 on TN2 are assigned.
2	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	The USF1 assigned to the MS. Sent in TN1 on PACCH of PDCH assigned in step 1.
3	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	The USF2 assigned to the MS. Sent in TN2 on PACCH of PDCH assigned in step 1.
4	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on TN_1 on the PDTCH assigned in step 1.
5	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on TN_2 on the PDTCH assigned in step 1.
6			Repeat step 2 and 3 until CV=0
7	SS -> MS	PACKET UPLINK ACK/NACK	Final Ack Indication = 0. Sent on PACCH of the assigned PDCH. Acknowledge all data blocks received.
8	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	Received on TN_1 on the PDTCH assigned in step 1.
9	SS		Verify that MS does not transmit any data as EXT_UTBF_NODATA = 1
10	SS -> MS	PACKET UPLINK ACK/NACK	Sent on TN1 of the uplink PDTCH, with DTR information.
11	SS -> MS	PACKET POLLING REQUEST	Sent on TN2 of the uplink PDTCH, with a valid RRBP=N+13
12	SS		Verify that there is no PACKET CONTROL ACKNOWLEDGEMENT received, as the DTR is active for TN2.
13	MS		Trigger the MS to send 400 octets of data. Verify that UPLINK RLC DATA BLOCK is transmitted by the MS on both TN0 and TN1 and has recalculated the CV.
14	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	The USF1 assigned to the MS. Sent in TN1 on PACCH of PDCH assigned in step 1.
15	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	The USF2 assigned to the MS. Sent in TN2 on PACCH of PDCH assigned in step 1.
16	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on TN_1 on the PDTCH assigned in step 1.
17	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on TN_2 on the PDTCH assigned in step 1.
18			Repeat step 12 and 13 until CV=0
19	SS -> MS	PACKET UPLINK ACK/NACK	Final Ack Indication = 1 containing valid RRBP. Sent on PACCH of the assigned PDCH. Acknowledge all data blocks received.
20	MS -> SS	PACKET CONTROL ACKNOWLEDGEMENT	Received on the block specified by RRBP on PACCH of the assigned PDCH.

Specific Message Contents

PACKET UPLINK ACK/NACK (step 8):

Additions for Rel-10	1
- DTR Information	1
CI_DTR	0
TN_PDCH_pair_DTR	001
DTR Blks	00

58e.2 DTR with Downlink TBF / RLC data block with DTR information / Resumption to normal operation

58e.2.1 Conformance requirements

[3GPP TS 44.060, 8.1.8.2]

During a downlink TBF, the network may transmit the DTR information within downlink RLC data blocks of the TBF (see sub-clause10.3a.1).

A mobile station not already in DTR mode shall enter DTR mode and start monitoring only the indicated PDCH or PDCH-pair (and if applicable, carrier) within the reaction time specified in 3GPP TS 45.010, when:

- DTR information was included in whichever of the following was the most recently received:
  - ii) the RLC data block with BSN equal to V(Q) - 1 modulo SNS (applicable if the mobile station has an ongoing downlink TBF) and

[3GPP TS 44.060, 8.1.8.3]

The mobile station shall exit DTR mode within the reaction time specified in 3GPP TS 45.010:

- when an EGPRS RLC/MAC block for data transfer including BSN higher than V(R) modulo SNS is received;

References

3GPP TS 44.060, subclause 8.1.8

58e.2.2 Test purpose

1. To verify that MS enters DTR mode when RLC data block with LLC UI dummy command is received during a downlink TBF.
2. To verify that MS resumes the RLC data block transfer on all the configured timeslots, when an EGPRS RLC/MAC block for data transfer including BSN higher than V(R) modulo SNS is received.

58e.2.3 Method of test

Initial Conditions

System Simulator:

1 cell, NW_EXT_UTBF = 1, EXT_UTBF_NODATA = 1, BS_CV_MAX = 15

Mobile Station:

MS is in Packet Idle mode, GPRS attached with support of GERAN Feature Package 1 indicated in MS Radio Access Capabilities, and PDP context 2 established.

Specific PICS Statements

- DTR Supported (TSPC_DTR)

PIXIT Statements

-

Test Procedure

A downlink TBF is established and in progress. SS continues the downlink TBF when the supply of downlink data is exhausted, the RLC entity on the network side shall transmit a RLC data block with LLC UI dummy command with DTR information (as in specific message content). SS transmits PACKET POLLING REQUEST on PACCH on TN2. Verify that MS does not respond with PACKET CONTROL ACK, as the MS is in DTR mode and it shall not monitor TN2. EGPRS RLC/MAC block for data transfer including BSN higher than V(R) modulo SNS is transmitted by the SS. SS transmits PACKET POLLING REQUEST on PACCH on TN2. Verify that UE responds with PACKET CONTROL ACK and has exit the DTR mode. Then the downlink TBF is continued and completed.

Expected Sequence

Step	Direction	Message	Comments
1		{Downlink TBF establishment}	RLC mode: acknowledged, without starting time. Assigning the timeslots TN_1 and TN_2.
2	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Sent on TN1 of the downlink PDTCH.FBI=0. First RLC data block, is sent on the third block after the last radio block containing the downlink assignment.
3	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Sent on TN2 of the downlink PDTCH.FBI=0, ES/P field set to 01 and a valid RRBP.
4	MS -> SS	EGPRS PACKET DOWNLINK ACK/NACK	Received on the specified RRBP of downlink PACCH.
5			Repeat step 2 and 3 - 5 times
6	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Sent on TN1 of the downlink PDTCH.LLC UI dummy command, with DTR information
7	SS -> MS	PACKET POLLING REQUEST	Sent on TN_2 of the downlink PDTCH, with a valid RRBP=N+13.
8	SS		Verify that there is no PACKET CONTROL ACKNOWLEDGEMENT received, as the DTR is active for TN_2.
9	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Sent on TN1 of the downlink PDTCH.FBI=0. Including BSN higher than V(R) modulo SNS
10	SS -> MS	PACKET POLLING REQUEST	Sent on TN_2 of the downlink PDTCH, with a valid RRBP=N+13
11	MS -> SS	PACKET CONTROL ACKNOWLEDGEMENT	Verify that PACKET CONTROL ACKNOWLEDGEMENT is received, as the MS has exit the DTR mode.
12	SS	{Completion of downlink RLC data block transfer}	Macro

Specific Message Contents

EGPRS DOWNLINK RLC DATA BLOCK (step 6):

Information Element	value/ remark
DTR Blks	00
CI	0
TN_PDCH_pair_DTR	001

58e.3 DTR with Concurrent TBF / RLC data block with DTR information / Resumption to normal operation

58e.3.1 Conformance requirements

[3GPP TS 44.060, 8.1.8.2]

During a downlink TBF, the network may transmit the DTR information within downlink RLC data blocks of the TBF (see sub-clause10.3a.1). During an uplink TBF, the network may transmit the DTR information within a PACKET UPLINK ACK/NACK message. If DTR information is received in a PACKET UPLINK ACK/NACK message and an RLC data block in the same block period, the mobile station shall ignore the DTR information received in the RLC data block.

A mobile station not already in DTR mode shall enter DTR mode and start monitoring only the indicated PDCH or PDCH-pair (and if applicable, carrier) within the reaction time specified in 3GPP TS 45.010, when:

- DTR information was included in whichever of the following was the most recently received:

  ii) the RLC data block with BSN equal to V(Q) - 1 modulo SNS (applicable if the mobile station has an ongoing downlink TBF) and

- V(R) = V(Q), if the mobile station has an ongoing downlink TBF, and

- if the mobile station has an ongoing uplink TBF, the RLC data block with BSN = V(S) is not available and either:

  - V(A) = V(S), or

  - V(A) < V(S) mod SNS, the most recently received pre-emptive transmission bit is set to '0', and no element of V(B) has the value NACKED (for RLC acknowledged mode).

[3GPP TS 44.060, 8.1.8.3]

The mobile station shall exit DTR mode within the reaction time specified in 3GPP TS 45.010:

- when an RLC data block with BSN equal to V(S) is transmitted and the medium access mode is Dynamic Allocation;

References

3GPP TS 44.060, subclause 8.1.8

58e.3.2 Test purpose

1. To verify that MS enters DTR mode when RLC data block with LLC UI dummy command is received during a concurrent TBF.

2. To verify that MS resumes the RLC data block transfer on all the timeslots configured when a new LLC PDU is received from upper layers, after exiting the DTR mode.

58e.3.3 Method of test

Initial Conditions

System Simulator:

1 cell, NW_EXT_UTBF = 1, EXT_UTBF_NODATA = 1, BS_CV_MAX = 15

Mobile Station:

MS is in Packet Idle mode, GPRS attached with support of GERAN Feature Package 1 indicated in MS Radio Access Capabilities, and PDP context 2 established.

Specific PICS Statements

- DTR Supported (TSPC_DTR)

PIXIT Statements

-

Test Procedure

An uplink TBF is established and in progress. After the MS sends an uplink data block the SS assigns a downlink TBF on the same timeslot as the uplink TBF. Uplink and downlink data transfer are in progress until CV = 0. SS transmits a RLC data block with LLC UI dummy command with DTR information. SS transmits PACKET POLLING REQUEST on PACCH on TN2. Verify that MS does not respond with PACKET CONTROL ACK, as DTR is active for TN2.Then MS is triggered to send more data. Verify that MS shall send data blocks with a recalculated CV on both TN1 and TN2. Then the uplink TBF is continued and completed.

Expected Sequence

Step	Direction	Message	Comments
1		{Uplink dynamic allocation two phase access}	n = 440 octets, without starting time, USF_GRANULARITY = 1 block, TLLI_BLOCK_CHANNEL_CODING: MCS1 EGPRS CHANNEL CODING COMMAND: MCS1 Two uplink timeslots TN1 and TN2 assigned.
2	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	The USF_1 assigned to the MS. Sent in TN_1 on PACCH of PDCH assigned in step 1.
3	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	The USF_2 assigned to the MS. Sent in TN_2 on the same radio block as step 2, on PACCH of PDCH assigned in step 1.
4	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on TN_1 on the PDTCH assigned in step 1.
5	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on $TN_{2,}$ on the same radio block as step 4, on PDTCH assigned in step 1.
6	SS -> MS	PACKET DOWNLINK ASSIGNMENT	Sent on PACCH of PDCH assigned in step 1. Assign a downlink TBF, MAC mode = dynamic allocation, RLC mode = acknowledged mode, TFI_d, no starting time, assigning the timeslots TN_1 and TN_2.
7	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Sent on TN_1 of the downlink PDTCH, RRBP invalid, the assigned USF_1 addressing the MS.
8	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Sent on TN_2 of the downlink PDTCH, RRBP invalid, the assigned USF_2 addressing the MS.
9	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on TN_1 on the next radio block from step 7.
10	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on TN_2 on the next radio block from step 8.
11	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Sent on TN_1 of the downlink PDTCH, RRBP invalid, the assigned USF_1 addressing the MS.
12	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	Sent on TN_2 of the downlink PDTCH, with FBI= 0, ES/P set to 01 and a valid RRBP. Sent on downlink PDTCH.
13	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on TN_1.
14	MS -> SS	EGPRS PACKET DOWNLINK ACK/NACK	Received on the specified RRBP of the downlink PACCH.
15			Repeat step 7 to 14, until CV=0 in step 9, 10 or 13.
16	SS -> MS	PACKET UPLINK ACK/NACK	Final Ack Indication = 0. Sent on PACCH of the assigned PDCH. Acknowledge all data blocks received.
17	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	USF assigned to the MS
18	SS		Verify that MS does not transmit any data as EXT_UTBF_NODATA = 1
19	SS -> MS	EGPRS DOWNLINK RLC DATA BLOCK	LLC UI dummy command, with DTR information
20	SS -> MS	PACKET POLLING REQUEST	Sent on TN2 of the uplink PDTCH, with a valid RRBP=N+13
21	SS		Verify that there is no PACKET CONTROL ACKNOWLEDGEMENT received, as the DTR is active for TN2.
23	MS		The MS is triggered to send 440 octets of user data. Verify that UPLINK RLC DATA BLOCK is transmitted by the MS on both TN1 and TN2 and has recalculated the CV.
24	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	The USF assigned to the MS. Sent in TN1 on PACCH of PDCH assigned in step 1.
25	SS -> MS	PACKET DOWNLINK DUMMY CONTROL BLOCK	The USF assigned to the MS. Sent in TN2 on PACCH of PDCH assigned in step 1.(NOTE 1)
26	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on TN_1.
27	MS -> SS	EGPRS UPLINK RLC DATA BLOCK	Received on TN_2.
28			Repeat step 24 to 27 until CV=0
29	SS -> MS	PACKET UPLINK ACK/NACK	Final Ack Indication = 1 containing valid RRBP. Sent on PACCH of the assigned PDCH. Acknowledge all data blocks received.

Step	Direction	Message	Comments
30	MS -> SS	PACKET CONTROL ACKNOWLEDGEMENT	Received on the block specified by RRBP on PACCH of the assigned PDCH.

NOTE 1: The mobile stations shall be ready to receive on TN2 in step 25 in TDMA frame (N+9) mod 2715648 where N is the last TDMA frame of block sent in step 24 (3GPP TS 45.010).

Specific Message Contents

EGPRS DOWNLINK RLC DATA BLOCK (step 19):

Information Element	value/ remark
DTR Blks	00
CI	0
TN_PDCH_pair_DTR	001

59 Void

60 Inter-system hard handover from GSM to UTRAN

Clause 60 contains test procedures to be used for executing Inter-system Handover from GSM to UTRAN tests. Table 60-1 contains a summary of the different combinations of parameters being tested, together with a reference to the appropriate generic test procedure. If a test uses a parameter which the MS under test does not support, the test shall be skipped. Test cases in this clause are applicable only to the MS supporting both UTRAN and GSM. The test USIM shall support service 27 to carry out these test cases.

Table 60-1

From	To	State of call	Ref. subclause	Exec counter	Remark
GSM FR	UTRAN AMR (conversational/speech/ UL:12.2 DL:12.2 kbps/CS RAB + UL:3.4 DL3.4 kbps SRBS)	U10	60.1	1	call active state
GSM EFR	UTRAN AMR (conversational/speech/ UL:12.2 DL:12.2 kbps/CS RAB + UL:3.4 DL3.4 kbps SRBS)	U10	60.1	2	call active state
GSM AMR	UTRAN AMR (conversational/speech/ UL:12.2 DL:12.2 kbps/CS RAB + UL:3.4 DL3.4 kbps SRBS)	U10	60.1	3	call active state
GSM HR	UTRAN AMR (conversational/speech/ UL:12.2 DL:12.2 kbps/CS RAB + UL:3.4 DL3.4 kbps SRBS)	U10	60.1	4	call active state
GSM FR	UTRAN (TDD 1.28 Mcps) AMR (conversational/speech/ UL:12.2 DL:12.2 kbps/CS RAB + UL:3.4 DL3.4 kbps SRBS)	U10	60.1	5	call active state
GSM EFR	UTRAN (TDD 1.28 Mcps) AMR (conversational/speech/ UL:12.2 DL:12.2 kbps/CS RAB + UL:3.4 DL3.4 kbps SRBS)	U10	60.1	6	call active state
GSM AMR	UTRAN (TDD 1.28 Mcps) AMR (conversational/speech/ UL:12.2 DL:12.2 kbps/CS RAB + UL:3.4 DL3.4 kbps SRBS)	U10	60.1	7	call active state
GSM HR	UTRAN (TDD 1.28 Mcps) AMR (conversational/speech/ UL:12.2 DL:12.2 kbps/CS RAB + UL:3.4 DL3.4 kbps SRBS)	U10	60.1	8	call active state
GSM FR	UTRAN AMR (conversational/speech/ UL:12.2 DL:12.2 kbps/CS RAB + UL:3.4 DL3.4 kbps SRBS)	U10	60.1a	1	call active state; A5/3 applied in GSM, UEA2/UIA2 in UTRAN
GSM EFR	UTRAN AMR (conversational/speech/ UL:12.2 DL:12.2 kbps/CS RAB + UL:3.4 DL3.4 kbps SRBS)	U10	60.1a	2	call active state; A5/3 applied in GSM, UEA2/UIA2 in UTRAN
GSM AMR	UTRAN AMR (conversational/speech/ UL:12.2 DL:12.2 kbps/CS RAB + UL:3.4 DL3.4 kbps SRBS)	U10	60.1a	3	call active state; A5/3 applied in GSM, UEA2/UIA2 in UTRAN
GSM HR	UTRAN AMR (conversational/speech/ UL:12.2 DL:12.2 kbps/CS RAB + UL:3.4 DL3.4 kbps SRBS)	U10	60.1a	4	call active state; A5/3 applied in GSM, UEA2/UIA2 in UTRAN
GSM FR	UTRAN AMR (conversational/speech/ UL:12.2 DL:12.2 kbps/CS RAB + UL:3.4 DL3.4 kbps SRBS)	U10	60.1b	1	call active state; A5/4 applied in GSM, UEA2/UIA2 in UTRAN
GSM EFR	UTRAN AMR	U10	60.1b	2	call active

	(conversational/speech/ UL:12.2 DL:12.2 kbps/CS RAB + UL:3.4 DL3.4 kbps SRBS)				state; A5/4 applied in GSM, UEA2/UIA2 in UTRAN
GSM AMR	UTRAN AMR (conversational/speech/ UL:12.2 DL:12.2 kbps/CS RAB + UL:3.4 DL3.4 kbps SRBS)	U10	60.1b	3	call active state; A5/4 applied in GSM, UEA2/UIA2 in UTRAN
GSM HR	UTRAN AMR (conversational/speech/ UL:12.2 DL:12.2 kbps/CS RAB + UL:3.4 DL3.4 kbps SRBS)	U10	60.1b	4	call active state; A5/4 applied in GSM, UEA2/UIA2 in UTRAN
GSM 14.4 kbps CS data	UTRAN (Streaming/unknown/ UL:14.4 DL:14.4 kbps/CS RAB + UL:3.4 DL:3.4 kbps SRBS)	U10	60.2a	1	same data rate
GSM 14.4 kbps CS data	UTRAN (TDD 1.28 Mcps) (Streaming/unknown/ UL:14.4 DL:14.4 kbps/CS RAB + UL:3.4 DL:3.4 kbps SRBS)	U10	60.2a	2	same data rate
GSM 14.4 kbps HSCSD	UTRAN (Streaming/unknown/ UL:14.4 DL:14.4 kbps/CS RAB + UL:3.4 DL:3.4 kbps SRBS)	U10	60.2b	1	Same data rate
GSM 28.8 kbps CS data	UTRAN (Streaming/unknown/ UL:28.8 DL:28.8 kbps/CS RAB + UL:3.4 DL:3.4 kbps SRBS)	U10	60.2b	2	same data rate
GSM 57.6 kbps CS data	UTRAN (Streaming/unknown/ UL:57.6 DL:57.6 kbps/CS RAB + UL:3.4 DL:3.4 kbps SRBS)	U10	60.2 b	3	same data rate
GSM 14.4 kbps CS data	UTRAN (Streaming/unknown/ UL:28.8 DL:28.8 kbps/CS RAB + UL:3.4 DL:3.4 kbps SRBS)	U10	60.3a	1	data rate upgrading
GSM 14.4 kbps CS data	UTRAN (Streaming/unknown/ UL:57.6 DL:57.6 kbps/CS RAB + UL:3.4 DL:3.4 kbps SRBS)	U10	60.3a	2	data rate upgrading
GSM 14.4 kbps HSCSD	UTRAN (Streaming/unknown/ UL:28.8 DL:28.8 kbps/CS RAB + UL:3.4 DL:3.4 kbps SRBS)	U10	60.3b	1	Data rate upgrading
GSM 14.4 kbps HSCSD	UTRAN (Streaming/unknown/ UL:57.6 DL:57.6 kbps/CS RAB + UL:3.4 DL:3.4 kbps SRBS)	U10	60.3b	2	Data rate upgrading
GSM 28.8 kbps CS data	UTRAN (Streaming/unknown/ UL:57.6 DL:57.6 kbps/CS RAB + UL:3.4 DL:3.4 kbps SRBS)	U10	60.3b	3	data rate upgrading
GSM SDCCH	UTRAN (SDCCH/ UL:13.6 DL:13.6 kbps SRBS)	U1	60.4	1	during call establishment
GSM SDCCH	UTRAN (TDD 1.28 Mcps) (SDCCH/ UL:13.6 DL:13.6 kbps SRBS)	U1	60.4	2	during call establishment
GSM FR	UTRAN AMR (conversational/speech/ UL:12.2 DL:12.2 kbps/CS RAB + UL:3.4 DL3.4 kbps SRBS)	U10	60.5	1	blind handover
GSM FR	UTRAN AMR	U10	60.6	1	failure case

	(conversational/speech/ UL:12.2 DL:12.2 kbps/CS RAB + UL:3.4 DL3.4 kbps SRBS)				

60.1 Inter system handover to UTRAN/From GSM/Speech/Success

60.1.1 Definition

60.1.2 Conformance requirement

The MS shall be able to receive a INTERSYSTEM TO UTRAN HANDOVER COMMAND message from GSM and perform an inter-system handover.

If the MS succeeds to establish the connection to UTRAN, it shall transmit a HANDOVER TO UTRAN COMPLETE message on the uplink DCCH.

Reference(s)

3GPP TS 25.331 subclause 8.3.6.

3GPP TS 04.18 subclause 3.4.4a.

60.1.3 Test purpose

To test that MS supporting both GSM and UTRAN hands over to the indicated channel in the UTRAN target cell when it is in the speech call active state in the GSM serving cell and receives a INTERSYSTEM TO UTRAN HANDOVER COMMAND. It is also verified that the MS performs measurements on the target UTRAN cell before the handover.

60.1.4 Method of test

Initial conditions

System Simulator:

2 cells - Cell 1 is GPRS, Cell 2 is UTRAN (cell selection conditions in favour of the GPRS cell).

The present document subclause 40 shall be referenced for the default parameters of cell 1, and subclause 26.6.5.1 shall be referenced for cell allocation.

3GPP TS 34.108, subclause 6.1 shall be referenced for default parameters of Cell 2.

MS:

"idle, updated", channel released mode with TMSI allocated.

For MS supporting GPRS:

The MS is GPRS attached with a P-TMSI allocated, SPLIT PG CYCLE negotiated.

Specific PICS statements

- MS supports GSM FR (TSPC_AddInfo_Full_rate_version_1).
- MS supports GSM AMR (TSPC_AddInfo_Full_rate_version_3).
- MS supports GSM EFR (TSPC_AddInfo_Full_rate_version_2).
- MS supports GSM HR (TSPC_AddInfo_Half_rate_version_1).
- Support of UTRAN FDD (TSPC_Type_UTRAN FDD)
- Support of UTRAN TDD (TSPC_Type_UTRAN TDD)

PIXIT statements

-

Foreseen final state of the MS

The MS is in CC state U10 on cell 2.

Test Procedure

The SS brings the MS into the call active state (CC state U10) according to settings for execution counter M (with FR speech call for execution counter M = 1). The SS configures the UTRAN dedicated channel corresponding to the UTRAN FDD/TDD mode to default configuration 3. The SS sends a MEASUREMENT INFORMATION to trigger the MS to perform measurements on the UTRAN cell. The SS verifies that the MS includes the UTRAN cell in the MEASUREMENT REPORT and then sends INTERSYSTEM TO UTRAN HANDOVER COMMAND indicating the dedicated channel of the target cell to the MS through the GSM serving cell. After the MS receives the command it shall configure itself accordingly and switch to the dedicated channel of UTRAN cell. The SS checks whether the handover is performed by checking that the MS transmits HANDOVER TO UTRAN COMPLETE to the SS through DCCH of the UTRAN cell.

Depending on the PIXIT parameters, the above procedure is executed each time for different initial conditions:

For MS following procedures are executed:

- if the MS supports GSM FR, the procedure is executed for execution counter M = 1 (UTRAN_FDD);
- if the MS supports GSM EFR, the procedure is executed for execution counter M = 2 (UTRAN_FDD);
- if the MS supports GSM AMR, the procedure is executed for execution counter M = 3 (UTRAN_FDD);
- if the MS supports GSM HR, the procedure is executed for execution counter M = 4 (UTRAN_FDD);
- if the MS supports GSM FR, the procedure is executed for execution counter M = 5 (UTRAN_TDD);
- if the MS supports GSM EFR, the procedure is executed for execution counter M = 6 (UTRAN_TDD);
- if the MS supports GSM AMR, the procedure is executed for execution counter M = 7 (UTRAN_TDD);
- if the MS supports GSM HR, the procedure is executed for execution counter M = 8 (UTRAN_TDD).

Expected sequence

This sequence is performed for a maximum execution counter M = 1, 2, 3, 4, 5, 6, 7, 8 depending on the PIXIT parameters.

Step	Direction		Message	Comments
	MS	SS		

1	MS			The SS bring the MS into GSM U10 state in cell 1 and
				for M = 1 and 5: the MS is in GSM FR speech call;
				for M = 2 and 6: the MS is in GSM EFR speech call;
				for M = 3 and 7: the MS is in GSM AMR speech call;
				for M = 4 and 8: the MS is in GSM HR speech call.
				on a hopping traffic channel

2	SS			The SS configures the dedicated channel with the configuration: conversational/speech/UL:12.2 DL:12.2 kbps/CS RAB + UL:3.4 DL3.4 kbps SRBs in UTRAN cell.
3	←		MEASUREMENT INFORMATION	
4	→		MEASUREMENT REPORT	Including Measurement Results on the UTRAN cell in Step 4
5	←		INTERSYSTEM TO UTRAN HANDOVER COMMAND	Send on cell 1 (GSM cell)
6	MS			The MS accepts the handover command and configures its lower layers using the parameters contained in the INTERSYSTEM TO UTRAN HANDOVER COMMAND
7	SS			The SS waits for uplink physical channel in synchronization
8	→		HANDOVER TO UTRAN COMPLETE	The SS receives this message on DCCH of cell 2 (UTRAN cell). It implies that the down link physical channel has synchronised with UTRAN.

Specific message contents

MEASUREMENT INFORMATION (for M = 1,2,3,4)

Information Element	Value/remark
< **RR short PD** : bit >	0
< **Message type** : bit (5) >	'00101'B
< **Short layer 2 header** : bit (2) >	'00'B
< **BA_IND** : bit >	0
< **3G_BA_IND** : bit >	0
< **MP_CHANGE_MARK** : bit >	0
< **MI_INDEX** : bit (4) >	'0000'B
< **MI_COUNT** : bit (4) >	'0000'B
< **PWRC** : bit >	0
< **REPORT_TYPE** : bit >	1 (Measurement Reporting shall be used)
< **REPORTING_RATE** : bit >	0 (SACCH rate reporting)
< **INVALID_BSIC_REPORTING** : bit >	0 (Report on cells with invalid BSIC not allowed)
0 | 1 < **Real Time Difference Description >**	0
0 | 1 < **BSIC Description >**	0
0 | 1 < **REPORT PRIORITY Description >**	0
0 | 1 < **MEASUREMENT Parameters Description >**	0
0 | 1 < **extension length** >	0
0 | 1 < **3G Neighbour Cell Description >**	1
0 | 1 < **3G_Wait** : bit (3) >	0
0 | 1 < **Index_Start_3G** : bit (7) >	0
0 | 1 < **Absolute_Index_Start_EMR** : bit (7) >	0
0 | 1 < **UTRAN FDD Description >**	1
0 | 1 < **Bandwidth_FDD** : bit (3) >	0
1 < **Repeated UTRAN FDD Neighbour Cells >** ** 0	1
0 < **FDD-ARFCN** : bit (14) >	0 See TS 34.108, clause 6.1.5, table 6.1.1
< **FDD_Indic0** : bit >	0
< **NR_OF_FDD_CELLS** : bit (5) >	'00001'B
< **FDD_CELL_INFORMATION Field** >	10 bits Scrambling code according to TS 34.108, clause 6.1.4, Default settings for cell No.1
1 < **Repeated UTRAN FDD Neighbour Cells >** ** 0	0
0 | 1 < **UTRAN TDD Description >**	0
0 | 1 < **CDMA2000 Description >**	0
0 | 1 < **3G MEASUREMENT Parameters Description >**	
< **Qsearch_C :** bit (4) >	'0111'B (Always)
< **3G_SEARCH_PRIO**: bit (1) >	1
< **FDD_REP_QUANT** : bit (1) >	1 (Ec/No)
0 | 1 < **FDD_MULTIRAT_REPORTING** : bit (2) >	'1 01'B (Report on 1 UTRAN cell)
0 | 1 < **FDD_REPORTING_OFFSET** : bit (3) >	0
0 | 1 < **TDD_MULTIRAT_REPORTING** : bit (2) >	0
0 | 1 < **TDD_REPORTING_OFFSET** : bit (3) >	0
0 | 1 < **CDMA2000_MULTIRAT_REPORTING** : bit (2) >	0
0 | 1 < **CDMA2000_REPORTING_OFFSET** : bit (3) >	0

MEASUREMENT INFORMATION (for M = 5,6,7,8)

Information Element	Value/remark
< RR short PD : bit >	0
< Message type : bit (5) >	‘00101’B
< Short layer 2 header : bit (2) >	‘00’B
< BA_IND : bit >	0
< 3G_BA_IND : bit >	0
< MP_CHANGE_MARK : bit >	0
< MI_INDEX : bit (4) >	‘0000’B
< MI_COUNT : bit (4) >	‘0000’B
< PWRC : bit >	0
< REPORT_TYPE : bit >	1 (Measurement Reporting shall be used)
< REPORTING_RATE : bit >	0 (SACCH rate reporting)
< INVALID_BSIC_REPORTING : bit >	0 (Report on cells with invalid BSIC not allowed)
0 | 1 < Real Time Difference Description >	0
0 | 1 < BSIC Description >	0
0 | 1 < REPORT PRIORITY Description >	0
0 | 1 < MEASUREMENT Parameters Description >	0
0 | 1 < extension length >	0
0 | 1 < 3G Neighbour Cell Description >	1
0 | 1 < 3G_Wait : bit (3) >	0
0 | 1 < Index_Start_3G : bit (7) >	0
0 | 1 < Absolute_Index_Start_EMR : bit (7) >	0
0 | 1 < UTRAN FDD Description >	0
0 | 1 < UTRAN TDD Description >	1
0 | 1 < Bandwidth_TDD : bit (3) >	1 ‘001’B
1 < Repeated UTRAN TDD Neighbour Cells > ** 0	1
0 < TDD-ARFCN : bit (14) >	0 See TS 34.108, clause 6.1.6, table 6.1.6a
< TDD_Indic0 : bit >	0
< NR_OF_TDD_CELLS : bit (5) >	‘00001’B
< TDD_CELL_INFORMATION Field >	9 bits Scrambling code according to TS 34.108, clause 6.1.4, Default settings for cell No.1
1 < Repeated UTRAN TDD Neighbour Cells > ** 0	0
0 | 1 < CDMA2000 Description >	0
0 | 1 < 3G MEASUREMENT Parameters Description >	
< Qsearch_C : bit (4) >	‘0111’B (Always)
< 3G_SEARCH_PRIO: bit (1) >	1
< FDD_REP_QUANT : bit (1) >	1 (Ec/No)
0 | 1 < FDD_MULTIRAT_REPORTING : bit (2) >	0
0 | 1 < FDD_REPORTING_OFFSET : bit (3) >	0
0 | 1 < TDD_MULTIRAT_REPORTING : bit (2) >	1 ’01’B (Report on 1 UTRAN cell)
0 | 1 < TDD_REPORTING_OFFSET : bit (3) >	0
0 | 1 < CDMA2000_MULTIRAT_REPORTING : bit (2) >	0
0 | 1 < CDMA2000_REPORTING_OFFSET : bit (3) >	0

INTERSYSTEM TO UTRAN HANDOVER COMMAND

Information Element	Value/remark
RR management Protocol Discriminator	‘0110'B
Skip Indicator	‘0000'B
Inter System to UTRAN Handover Command Message Type	‘01100011'B
Length of Handover to UTRAN Command contents	Octet length of the "Handover to UTRAN Command value part"
Handover to UTRAN Command value part	PER encoded ASN.1 value of type "HandoverToUTRANCommand-r3-IEs", the content is presented in the next table.

Content of "HandoverToUTRANCommand-r3-IEs" (in tabular format) (for M = 1,2,3,4)

Information Element	Value/remark
New U-RNTI	
- SRNC Identity	'000000000001'B
- S-RNTI-2	Set to arbitrary value corresponding to DPCH Offset value currently stored in SS
Ciphering algorithm	The presence of this IE is dependent on PIXIT statements in TS 34.123-2. If ciphering is indicated to be active, use UEA1. Else, this IE is omitted.
CHOICE specification mode	Preconfiguration
CHOICE preconfiguration mode	Default configuration
- Default configuration mode	FDD
- Default configuration identity	3 (12.2 kbps speech + 3.4 kbps signalling)
- RAB Info	
- RAB identity	
- RAB identity (GSM-MAP)	'00000001'B
- CN domain identity	CS domain
- NAS Synchronisation Indicator	Not Present
- Uplink DPCH info	
- Uplink DPCH power control info	
- CHOICE mode	FDD
- DPCCH power offset	-78 dB (i.e. ASN.1 IE value of -20 (2 + (IE Value * 4)))
- PC Preamble	1 frame
- SRB delay	7 frames
- CHOICE mode	FDD
- Scrambling code type	long
- Reduced scrambling code number	0
- Spreading factor	64
- Downlink information common for all radio links	
- Downlink DPCH info common for all RL	
- Downlink DPCH power control information	
- CHOICE Mode	FDD
- DPC mode	Single TPC
- Downlinkinformation per radio link list	1
- Downlink information for each radio link	
- CHOICE mode	FDD
- Primary CPICH info	
- Primary scrambling code	See TS 34.108, clause titled "Default settings for cell No.1 (FDD)" in clause 6.1
- Downlink DPCH info for each radio link	
- CHOICE mode	FDD
- CHOICE mode	FDD
- Primary CPICH usage for channel	May be used
- Secondary scrambling code	1
- CHOICE Spreading factor	128
- Code number	0
- Scrambling code change	No code change
- TPC combination index	0
- Frequency info	
- UARFCN uplink(Nu)	Not Present Absence of this IE is equivalent to apply the default duplex distance defined for the operating frequency according to TS 25.101
- UARFCN downlink(Nd)	See TS 34.108, clause 6.1.5, table 6.1.1
Maximum allowed UL TX power	See TS 34.108, clause 6.1.5, table 6.1.1

Content of "HandoverToUTRANCommand-r4-IEs" (in tabular format) (for M = 5,6,7,8)

Information Element	Value/remark
New U-RNTI	
- SRNC Identity	‘000000000001'B
- S-RNTI-2	Set to arbitrary value corresponding to DPCH Offset value currently stored in SS
Ciphering algorithm	The presence of this IE is dependent on PIXIT statements in TS 34.123-2. If ciphering is indicated to be active, use UEA1. Else, this IE is omitted.
CHOICE specification mode	Preconfiguration
CHOICE preconfiguration mode	Default configuration
- Default configuration mode	TDD
- Default configuration identity	3 (12.2 kbps speech + 3.4 kbps signalling)
- RAB Info	
- RAB identity	
- RAB identity (GSM-MAP)	‘00000001'B
- CN domain identity	CS domain
- NAS Synchronisation Indicator	Not Present
- Choice TDD128	
- Uplink DPCH info	
- Uplink DPCH power control info	
- Uplink TargetSIR	20 (real value : (IE value * 0.5) – 11)
- UplinkTimingAdvanceControl	
-CHOICE enabled	
- Uplink SynchronisationParameters	
_- stepsize	1
- frequency	1
- SynchronisationParameters	
- Sync Uplink Code	01010101
- FPACH Info	FPACH Configuration Information
- Timeslot Number	0
- Channelisation Code	16/15
- Midamble shift and burst type	
- Choice default Midamble	
- Midamble Configuration	4 (MidambleK = 8)
- wt	4
- prxUpPCHdes	-80 (-120~-58 by step 1)
- SYNC Uplink Procedure	
- max SYNC ULTransmissions	2
- powerRampStep	2
- UplinkTimeslotsCodes	
- dynamicSFusage	No
- IndividualTimeslotInfo	
- TimeslotNum	TS1,TS2 or TS3
- tfci Existence	TRUE
- MidambleShiftAndBurstType	
- Choice default Midamble	
- midamble Configuration	4 (MidambleK = 8)
- modulation	QPSK
- SS TPC symbols	1
- additional SS-TPC symbols	Not present
- UL-TS-ChannelisationCodeList	SF8 code*1 or SF16 code*2 34.108 Clause6
-CHOICE nomoreTimeslot	
- Downlink information common for all radio links	
- Downlink DPCH info common for all RL	
- Downlink DPCH power control information	
- CHOICE Mode	TDD
- TPC StepSizeTDD	
- Downlinkinformation per radio link list	1
- Downlink information for each radio link	
- CHOICE mode	TDD
- Primary CPICH info	
- tstd-Indicator	FALSE
- CellParametersID	CellParamterID of cell 2
- sctd-Indicator	FALSE
- Downlink DPCH info for each radio link	
- IndividualTimeslotInfo	

- TimeslotNum	TS4, TS5 or TS6
- tfci-Existence	TRUE
- MidambleShiftAndBurstType	
- Choice default Midamble	
- Midamble Configuration	4 (MidambleK = 8)
- modulation	QPSK
- SS TPC Symbols	1
- additional SS TPC Symbols	Not present
- Downlink Timeslot ChannelisationCode	
- Choice bitmap	SF16 code*2 34.108 Clause6
- Choice nomoreTimeslot	
- Frequency info	
- UARFCN	UARFCN of cell 2
- PrimaryCCPCH TX Power	20 (6~43, ref TS34.108, clause 6.1.6, table6.1.6a)
Maximum allowed UL TX power	33dbm (ref TS34.108, clause 6.1.6, table6.1.6a)

60.1.5 Test requirement

At step 4 the MEASUREMENT REPORT should include details of the UTRAN cell. At step 8 a HANDOVER TO UTRAN COMPLETE command should be received on DCCH of the UTRAN cell.

60.1a Inter system handover to UTRAN/From GSM/Speech/Success with A5/3 and UEA2/UIA2 ciphering

60.1a.1 Definition

The A5/3 ciphering algorithm is applied in the GERAN cell. UEA2/UIA2 algorithms are applied in the UTRAN cell.

60.1a.2 Conformance requirement

Identical to 60.1.2

60.1a.3 Test purpose

Identical to 60.1.3 but the ciphering /integrity algorithms are defined in 60.1.1.

60.1a.4 Method of test

Identical to 60.1.4

Specific message contents

Similar to the specific message contents in 60.1 except the Rel-7 IE are used and the MS/UE capability to support A5/3 and UEA2/UIA2 is checked, instead.

60.1a.5 Test requirement

Identical to 60.1.5

60.1b Inter system handover to UTRAN/From GSM/Speech/Success with A5/4 and UEA2/UIA2 ciphering

60.1b.1 Definition

The A5/4 ciphering algorithm is applied in the GERAN cell. UEA2/UIA2 algorithms are applied in the UTRAN cell.

60.1b.2 Conformance requirement

Identical to 60.1.2

60.1b.3 Test purpose

Identical to 60.1.3 but the ciphering / integrity algorithms are defined in table 60-1.

60.1b.4 Method of test

Identical to 60.1.4

Specific message contents

Similar to the specific message contents in 60.1 except the Rel-9 IE are used and the MS/UE capability to support A5/4 and UEA2/UIA2 is checked, instead.

60.1b.5 Test requirement

Identical to 60.1.5

60.2a Inter system handover to UTRAN/From GSM/Data/Same data rate/Success

60.2a.1 Definition

60.2a.2 Conformance requirement

The MS shall be able to receive a INTER SYSTEM TO UTRAN HANDOVER COMMAND message from GSM and perform an inter-system handover.

If the MS succeeds to establish the connection to UTRAN, it shall transmit a HANDOVER TO UTRAN COMPLETE message on the uplink DCCH.

Reference(s)

3GPP TS 25.331 subclause 8.3.6.

3GPP TS 04.18 subclause 3.4.4a.

60.2a.3 Test purpose

To test that the MS hands over to the indicated UTRAN target cell and the data rate of the target channel is the same as the old channel when it is in the data call active state in the GSM serving cell and receives a INTER SYSTEM TO UTRAN HANDOVER COMMAND. It is also verified that the MS performs measurements on the target UTRAN cell before the handover.

60.2a.4 Method of test

Initial conditions

System Simulator:

2 cells - Cell 1 is GPRS, Cell 2 is UTRAN (cell selection conditions in favour of the GPRS cell).

The present document subclause 40 shall be referenced for the default parameters of Cell 1, and subclause 26.6.5.1 shall be referenced for cell allocation.

3GPP TS 34.108, subclause 6.1 shall be referenced for default parameters of Cell 2.

MS:

"idle, updated", channel released mode with TMSI allocated.

For MS supporting GPRS:

The MS is GPRS attached with a P-TMSI allocated, SPLIT PG CYCLE negotiated.

Specific PICS statements

- Support of UTRAN FDD (TSPC_Type_UTRAN FDD)

- Support of UTRAN TDD (TSPC_Type_UTRAN TDD)

PIXIT statements

-

Foreseen final state of the MS

The MS is in CC state U10 on cell 2.

Test Procedure

The SS brings the MS into the call active state (CC state U10) with a 14.4 kbps CS data call. The SS configures a dedicated channel corresponding to the UTRAN FDD/TDD mode (default configuration 7 - streaming/unknown/UL:14.4 DL:14.4 kbps/CS RAB + UL:3.4 DL3.4 kbps SRBS) in the UTRAN cell. The SS sends a MEASUREMENT INFORMATION to trigger the MS to perform measurements on the UTRAN cell. The SS verifies that the MS include the UTRAN cell in the MEASUREMENT REPORT and then sends INTER SYSTEM TO UTRAN HANDOVER COMMAND indicating the dedicated channel of the target cell to the MS through the GSM serving cell. After the MS receives the command it shall configure itself accordingly and switch to the dedicated channel of the UTRAN cell. The SS checks whether the handover is performed by checking that the MS transmits HANDOVER TO UTRAN COMPLETE to the SS through DCCH of the UTRAN cell.

For MS following procedures are executed:

- if the MS supports UTRAN_FDD the procedure is executed for execution counter M = 1;
- if the MS supports UTRAN_TDD the procedure is executed for execution counter M = 2.

Expected sequence

This sequence is performed for a maximum execution counter M = 1, 2 depending on the PIXIT parameters.

Step	Direction		Message	Comments
	MS	SS		
1	MS			The SS bring the MS into GSM U10 state in cell 1 - GSM 14.4 kbps CS data call on a hopping traffic channel.
2	SS			The SS configures a dedicated channel in the UTRAN cell with the configuration: streaming/unknown/UL:14.4 DL:14.4 kbps/CS RAB + UL:3.4 DL3.4 kbps SRBs.
3	←		MEASUREMENT INFORMATION	
4	→		MEASUREMENT REPORT	Including Measurement Results on the UTRAN cell in Step 4.
5	←		INTER SYSTEM TO UTRAN HANDOVER COMMAND	Send on cell 1 (GSM cell)
6	MS			The MS accepts the handover command and configures its lower layers using the parameters contained in the INTER SYSTEM TO UTRAN HANDOVER COMMAND
7	SS			The SS waits for uplink physical channel in synchronization
8	→		HANDOVER TO UTRAN COMPLETE	The SS receives this message on DCCH of cell 2 (UTRAN cell). It implies that the down link physical channel has synchronised with UTRAN.

Specific message contents

MEASUREMENT INFORMATION

Same as in 60.1 according UTRAN FDD/TDD mode.

INTER SYSTEM TO UTRAN HANDOVER COMMAND

For M = 1:

Same content as in 60.1 (UTRAN FDD mode) with the following exceptions in the content of the "HandoverToUTRANCommand-r3-IEs":

Information Element	Value/remark
CHOICE specification mode CHOICE preconfiguration mode - Default configuration identity	Preconfiguration Default configuration 7 (14.4 kbps streaming CS data + 3.4 kbps signalling)

For M = 2:

Same content as in 60.1 (according to UTRAN TDD mode) with the following exceptions in the content of the "HandoverToUTRANCommand-r4-IEs" for the configuration “Streaming / unknown / UL:14.4/DL:14.4 kbps / CS RAB + UL:3.4 DL:3.4 kbps SRBs for DCCH” defined in TS 34.108 [149] clause 6.11.5.4.1.15:

Information Element	Value/remark
New U-RNTI - SRNC Identity - S-RNTI-2	 '000000000001'B Set to arbitrary value corresponding to DPCH Offset value currently stored in SS
Ciphering algorithm	The presence of this IE is dependent on PIXIT statements in TS 34.123-2. If ciphering is indicated to be active, use UEA1. Else, this IE is omitted.
CHOICE specification mode CHOICE complete specification	Complete specification Default configuration
RB information elements	
Signalling RB information to setup list - Signalling RB information to setup - RB identity - CHOICE RLC info type - RLC info - CHOICE Uplink RLC mode - Transmission RLC discard - CHOICE Downlink RLC mode - RB mapping info - Information for each multiplexing option - RLC logical channel mapping indicator - Number of RLC logical channels - Uplink transport channel type - UL Transport channel identity - Logical channel identity - CHOICE RLC size list - MAC logical channel priority - Downlink RLC logical channel info - Number of RLC logical channels - Downlink transport channel type - DL DCH Transport channel identity - DL DSCH Transport channel identity - Logical channel identity - Signalling RB information to setup - RB identity - CHOICE RLC info type - RLC info - CHOICE Uplink RLC mode - Transmission RLC discard - SDU discard mode - MAX_DAT - Transmission window size - Timer_RST - Max_RST - Polling info - Timer_poll_prohibit - Timer_poll - Poll_PDU - Poll_SDU - Last transmission PDU poll - Last retransmission PDU poll - Poll_Window - Timer_poll_periodic - CHOICE Downlink RLC mode - In-sequence delivery - Receiving window size - Downlink RLC status info - Timer_status_prohibit - Timer_EPC - Missing PDU indicator - Timer_STATUS_periodic - RB mapping info - Information for each multiplexing option - RLC logical channel mapping indicator	 (UM DCCH for RRC) Not Present UM RLC Not Present UM RLC 1 RBMuxOption Not Present 1 DCH 5 1 Configured 1 1 DCH 10 Not Present 1 (AM DCCH for RRC) Not Present AM RLC No Discard 15 128 500 1 200 200 Not present 1 TRUE TRUE 99 Not Present AM RLC TRUE 128 200 Not Present TRUE Not Present 1 RBMuxOption Not Present

- Number of RLC logical channels	1
- Uplink transport channel type	DCH
- UL Transport channel identity	5
- Logical channel identity	2
- CHOICE RLC size list	Configure
- MAC logical channel priority	2
- Downlink RLC logical channel info	
- Number of RLC logical channels	1
- Downlink transport channel type	DCH
- DL DCH Transport channel identity	10
- DL DSCH Transport channel identity	Not Present
- Logical channel identity	2
Signalling RB information to setup	(AM DCCH for NAS_DT High priority)
- RB identity	Not Present
- CHOICE RLC info type	
- RLC info	
- CHOICE Uplink RLC mode	AM RLC
- Transmission RLC discard	
- SDU discard mode	No Discard
- MAX_DAT	15
- Transmission window size	128
- Timer_RST	500
- Max_RST	1
- Polling info	
- Timer_poll_prohibit	200
- Timer_poll	200
- Poll_PDU	Not present
- Poll_SDU	1
- Last transmission PDU poll	TRUE
- Last retransmission PDU poll	TRUE
- Poll_Windows	99
- Timer_poll_periodic	Not Present
- CHOICE Downlink RLC mode	AM RLC
- In-sequence delivery	TRUE
- Receiving window size	128
- Downlink RLC status info	
- Timer_status_prohibit	200
- Timer_EPC	Not Present
- Missing PDU indicator	TRUE
- Timer_STATUS_periodic	Not Present
- RB mapping info	
- Information for each multiplexing option	1 RBMuxOption
- RLC logical channel mapping indicator	Not Present
- Number of RLC logical channels	1
- Uplink transport channel type	DCH
- UL Transport channel identity	5
- Logical channel identity	3
- CHOICE RLC size list	Configured
- MAC logical channel priority	3
- Downlink RLC logical channel info	
- Number of RLC logical channels	1
- Downlink transport channel type	DCH
- DL DCH Transport channel identity	10
- DL DSCH Transport channel identity	Not Present
- Logical channel identity	3
- Signalling RB information to setup	(AM DCCH for NAS_DT Low priority)
- RB identity	Not Present
- CHOICE RLC info type	
- RLC info	
- CHOICE Uplink RLC mode	AM RLC
- Transmission RLC discard	
- SDU discard mode	No discard
- MAX_DAT	15
- Transmission window size	128
- Timer_RST	500
- Max_RST	1
- Polling info	
- Timer_poll_prohibit	200
- Timer_poll	200

- Poll_PDU - Poll_SDU - Last transmission PDU poll - Last retransmission PDU poll - Poll_Windows - Timer_poll_periodic - CHOICE Downlink RLC mode - In-sequence delivery - Receiving window size - Downlink RLC status info - Timer_status_prohibit - Timer_EPC - Missing PDU indicator - Timer_STATUS_periodic - RB mapping info - Information for each multiplexing option - RLC logical channel mapping indicator - Number of RLC logical channels - Uplink transport channel type - UL Transport channel identity - Logical channel identity - CHOICE RLC size list - MAC logical channel priority - Downlink RLC logical channel info - Number of RLC logical channels - Downlink transport channel type - DL DCH Transport channel identity - DL DSCH Transport channel identity - Logical channel identity	Not present 1 TRUE TRUE 99 Not Present AM RLC TRUE 128 200 Not Present TRUE Not Present 1 RBMuxOptions Not Present 1 DCH 5 4 Configured 4 1 DCH 10 Not Present 4
RAB information to setup list - RAB info - RAB identity - CHOICE RAB identity type - RAB identity - CN domain identity - NAS Synchronization Indicator - Re-establishment timer - RB information to setup list - RB information to setup - RB identity - PDCP info - CHOICE RLC info type - CHOICE Uplink RLC mode - Transmission RLC discard - Segmentation indication - CHOICE Downlink RLC mode - Segmentation indication - RB mapping info - Information for each multiplexing option - RLC logical channel mapping indicator - Number of uplink RLC logical channels - Uplink transport channel type - UL Transport channel identity - Logical channel identity - CHOICE *RLC size list* - MAC logical channel priority - Downlink RLC logical channel info - Number of downlink RLC logical channels - Downlink transport channel type - DL DCH Transport channel identity - DL DSCH Transport channel identity - Logical channel identity	 RAB identity (GSM-MAP) 0000 0001B The first/ leftmost bit of the bit string contains the most significant bit of the RAB identity. CS domain Not Present useT314 10 Not Present RLC info TM RLC Not Present FALSE TM RLC FALSE Not Present 1 DCH 1 Not Present Configured 8 1 DCH 6 Not Present Not Present
Uplink transport channels	
UL Transport channel information common for all	

transport channels	
- PRACH TFCS	Not Present
- CHOICE mode	TDD128
- Individual UL CCTrCH information	
- UL TFCS Identity	
- TFCS ID	1
- Shared Channel Indicator	FALSE
- UL TFCS	
- CHOICE TFCI signalling	Normal
- TFCI Field 1 Information	
- CHOICE TFCS representation	Complete reconfiguration
- TFCS complete reconfiguration information	
- CHOICE CTFC Size	Number of bits used must be enough to cover all combinations of CTFC from clause 6.11.5.4 Parameter Set.
- CTFC information	This IE is repeated for TFC numbers and reference to clause 6.11.5.4 Parameter Set
- CTFC	Reference to clause 6.11.5.4 Parameter Set
- Power offset information	
- CHOICE Gain Factors	Computed Gain Factors(The last TFC is set to Signalled Gain Factors)
- Reference TFC ID	0 Integer(0.. 3)
- CHOICE Gain Factors	Signalled Gain Factors(Not Present if the CHOICE Gain Factors is set to ComputedGain Factors)
- CHOICE mode	TDD
- Gain Factor β_d	15
- Reference TFC ID	0 Integer(0.. 3)
- CHOICE mode	TDD
- TFC subset	
- CHOICE Subset representation	Full transport format combination set
- TFC subset list	Not Present
Added or Reconfigured UL TrCH information	
- Uplink transport channel type	DCH
- UL Transport channel identity	5
- TFS	
- CHOICE Transport channel type	Dedicated transport channels
- Dynamic Transport format information	
- RLC Size	Reference to clause 6.11 Parameter Set
- Number of TBs and TTI List	(This IE is repeated for TF number.)
- Transmission Time Interval	Not Present
- Number of Transport blocks	Reference to clause 6.11 Parameter Set
- CHOICE Logical channel list	All
- Semi-static Transport Format information	
- Transmission time interval	Reference to clause 6.11 Parameter Set
- Type of channel coding	Reference to clause 6.11 Parameter Set
- Coding Rate	Reference to clause 6.11 Parameter Set
- Rate matching attribute	Reference to clause 6.11 Parameter Set
- CRC size	Reference to clause 6.11 Parameter Set
- Uplink transport channel type	DCH
- UL Transport channel identity	1
- TFS	
- CHOICE Transport channel type	Dedicated transport channels
- Dynamic Transport format information	
- RLC Size	Reference to clause 6.11 Parameter Set
- Number of TBs and TTI List	(This IE is repeated for TF number.)
- Transmission Time Interval	Not Present
- Number of Transport blocks	Reference to clause 6.11 Parameter Set
- CHOICE Logical channel list	All
- Semi-static Transport Format information	
- Transmission time interval	Reference to clause 6.11 Parameter Set
- Type of channel coding	Reference to clause 6.11 Parameter Set
- Coding Rate	Reference to clause 6.11 Parameter Set
- Rate matching attribute	Reference to clause 6.11 Parameter Set
- CRC size	Reference to clause 6.11 Parameter Set
Downlink transport channels	
DL Transport channel information common for all	

transport channel - SCCPCH TFCS - CHOICE mode - Individual DL CCTrCH information - DL TFCS Identity - TFCS ID - Shared Channel Indicator - CHOICE DL parameters - UL DCH TFCS Identity - TFCS ID - Shared Channel Indicator	 Not Present TDD 2 FALSE SameAsUL 1 FALSE
Added or Reconfigured TrCH information - Added or Reconfigured DL TrCH information - Downlink transport channel type - DL Transport channel identity - CHOICE DL parameters - Uplink transport channel type - UL TrCH identity - DCH quality target - BLER Quality value - Downlink transport channel type - DL Transport channel identity - CHOICE DL parameters - Uplink transport channel type - UL TrCH identity - DCH quality target - BLER Quality value	 DCH 10 Same as UL DCH 5 -20 (-2.0) DCH 6 Same as UL DCH 1 -20 (-2.0)
Uplink radio resources	
Uplink DPCH info - Uplink DPCH power control info - CHOICE mode - CHOICE TDD option - PRX$_{PDPCHdes}$ - CHOICE *UL OL PC info* - Broadcast UL OL PC info - Uplink Timing Advance Control -CHOICE enabled - Uplink SynchronisationParameters _- stepsize - frequency - SynchronisationParameters - Sync Uplink Code - FPACH Info - Timeslot Number - Channelisation Code - Midamble shift and burst type - Choice default Midamble - Midamble Configuration - wt - prxUpPCHdes - SYNC Uplink Procedure - max SYNC ULTransmissions - powerRampStep - UL CCTrCH List - TFCS ID - UL Target SIR - Time info - Activation time - Duration - Common timeslot info - 2nd interleaving mode - TFCI coding - Puncturing limit - Repetition period - Repetition length - Uplink DPCH timeslots and code	 TDD 1.28 Mcps TDD Integer (-120…-58 by step of 1) Null Not Present 1 1 01010101 FPACH Configuration Information 0 16/15 4 (MidambleK = 8) 4 -80 (-120~-58 by step 1) 2 2 1 20 (real value : (IE value * 0.5) – 11) (256+CFN-(CFN MOD 8 + 8))MOD 256 Infinite Default value is "Frame" Reference to clause 6 Parameter set Reference to clause 6 Parameter set 1

- UplinkTimeslotsCodes - dynamicSFusage - IndividualTimeslotInfo - TimeslotNum - tfci Existence - MidambleShiftAndBurstType - Choice default Midamble - midamble Configuration - modulation - SS TPC symbols - additional SS-TPC symbols - UL-TS-ChannelisationCodeList -CHOICE nomoreTimeslot - First timeslot Code List - channelisation codes - CHOICE more timeslots - UL CCTrCH List to Remove	 No TS1,TS2 or TS3 TRUE 4 (MidambleK = 8) QPSK 1 Not present SF8 code*1 or SF16 code*2 34.108 Clause6 Repeated (1,2) for each channelisation code assigned in the slot to meet the needs of clause 6 Parameter Set. (SF/ i) where i denotes an unassigned code matching the SF specified in clause 6 Parameter Set. No more timeslots Not present
Downlink radio resources	
Downlink information common for all radio links - Downlink information common for all radio links - Downlink DPCH info common for all RL - Downlink DPCH power control information - CHOICE Mode - TPC StepSizeTDD - Downlinkinformation per radio link list - Downlink information for each radio link - CHOICE mode - Primary CPICH info - tstd-Indicator - CellParametersID - sctd-Indicator	 TDD 1 TDD FALSE CellParamterID of cell 2 FALSE
Downlink DPCH info for each radio link - IndividualTimeslotInfo - TimeslotNum - tfci-Existence - MidambleShiftAndBurstType - Choice default Midamble - Midamble Configuration - modulation - SS TPC Symbols - additional SS TPC Symbols - Downlink Timeslot ChannelisationCode - Choice bitmap - Choice nomoreTimeslot - Frequency info - UARFCN - PrimaryCCPCH TX Power	 TS4, TS5 or TS6 TRUE 4 (MidambleK = 8) QPSK 1 Not present SF16 code*2 34.108 Clause6 UARFCN of cell 2 20 (6~43, ref TS34.108, clause 6.1.6, table6.1.6a)
Frequency info - UARFCN uplink(Nu) - UARFCN downlink(Nd)	 Not Present Absence of this IE is equivalent to apply the default duplex distance defined for the operating frequency according to TS 25.101 See TS 34.108, clause 6.1.5, table 6.1.1
Maximum allowed UL TX power	33dbm (ref TS34.108, clause 6.1.6, table6.1.6a)

60.2a.5 Test requirement

At step 4 the MEASUREMENT REPORT should include details of the UTRAN cell. At step 8 a HANDOVER TO UTRAN COMPLETE command should be received on DCCH of the UTRAN cell.

60.2b Inter system handover to UTRAN/From GSM/Data/Same data rate/Extended Rates/Success

60.2b.1 Definition

60.2b.2 Conformance requirement

The MS shall be able to receive a INTER SYSTEM TO UTRAN HANDOVER COMMAND message from GSM and perform an inter-system handover.

If the MS succeeds to establish the connection to UTRAN, it shall transmit a HANDOVER TO UTRAN COMPLETE message on the uplink DCCH.

Reference(s)

3GPP TS 25.331 subclause 8.3.6.

3GPP TS 04.18 subclause 3.4.4a.

60.2b.3 Test purpose

To test that the MS hands over to the indicated UTRAN target cell and the data rate of the target channel is the same as the old channel when it is in the data call active state in the GSM serving cell and receives a INTER SYSTEM TO UTRAN HANDOVER COMMAND. It is also verified that the MS performs measurements on the target UTRAN cell before the handover.

60.2b.4 Method of test

Initial conditions

System Simulator:

2 cells - Cell 1 is GSM, Cell 2 is UTRAN (cell selection conditions in favour of the GSM cell).

The present document subclause 26.6.5.1 or subclause 26.13.1.3 (for HSCSD) shall be referenced for the default parameters of Cell 1.

3GPP TS 34.108, subclause 6.1 shall be referenced for default parameters of Cell 2.

MS:

"idle, updated", channel released mode with TMSI allocated.

Specific PICS statements

- MS supports UTRAN Streaming/unknown/UL:14.4 DL:14,4 kbps/CS RAB + UL:3.4 DL:3,4 kbps SRBs.
- MS supports UTRAN Streaming/unknown/UL:28.8 DL:28,8 kbps/CS RAB + UL:3.4 DL:3,4 kbps SRBs.
- MS supports UTRAN Streaming/unknown/UL:57.6 DL:57,6 kbps/CS RAB + UL:3.4 DL:3,4 kbps SRBs.

PIXIT statements

-

Foreseen final state of the MS

The MS is in CC state U10 on cell 2.

Test Procedure

The SS brings the MS into the call active state (CC state U10) with a CS data call (14.4 kbps HSCSD for execution counter M = 1). The SS configures an appropriate dedicated channel(default configuration 7 - streaming/unknown/UL:14.4 DL:14.4 kbps/CS RAB + UL:3.4 DL3.4 kbps SRBS for M = 1) in the UTRAN cell. The SS sends a MEASUREMENT INFORMATION to trigger the MS to perform measurements on the UTRAN cell. The SS verifies that the MS include the UTRAN cell in the MEASUREMENT REPORT and then sends INTER SYSTEM

TO UTRAN HANDOVER COMMAND indicating the dedicated channel of the target cell to the MS through the GSM serving cell. After the MS receives the command it shall configure itself accordingly and switch to the dedicated channel of the UTRAN cell. The SS checks whether the handover is performed by checking that the MS transmits HANDOVER TO UTRAN COMPLETE to the SS through DCCH of the UTRAN cell.

Depending on the PIXIT parameters, the above procedure is executed maximum three times, each time for different initial conditions:

- if the MS supports GSM 14.4 kbps HSCSD and UTRAN streaming/unknown/UL:14.4 DL:14.4 kbps/CS RAB + UL:3.4 DL3.4 kbps SRBs, the procedure is executed for execution counter M = 1, using Default configuration 7;
- if the MS supports GSM 28.8 kbps CS data and UTRAN streaming/unknown/UL:28.8 DL:28.8 kbps/CS RAB + UL:3.4 DL3.4 kbps SRBs, the procedure is executed for execution counter M = 2, using Default configuration 8;
- if the MS supports GSM 57.6 kbps CS data and UTRAN streaming/unknown/UL:57.6 DL:57.6 kbps/CS RAB + UL:3.4 DL3.4 kbps SRBs, the procedure is executed for execution counter M = 3, using Default configuration 9.

Expected sequence

This sequence is performed for a maximum execution counter M = 1, 2, 3, depending on the PIXIT parameters.

Step	Direction		Message	Comments
	MS	SS		

1	MS			The SS bring the MS into GSM U10 state in cell 1 and
				for M = 1: the MS is in GSM 14.4 kbps HSCSD call;
				for M = 2: the MS is in GSM 28.8 kbps CS data call;
				for M = 3: the MS is in GSM 57.6 kbps CS data call;

2	SS			The SS configures a dedicated channel in the UTRAN cell with the configuration: For M = 1: (streaming/unknown/UL:14.4 DL:14.4 kbps/CS RAB + UL:3.4 DL3.4 kbps SRBs); For M = 2: (streaming/unknown/UL:28.8 DL:28.8 kbps/CS RAB + UL:3.4 DL3.4 kbps SRBs); For M = 3: (streaming/unknown/UL:57.6 DL:57.6 kbps/CS RAB + UL:3.4 DL3.4 kbps SRBs)
3	←		MEASUREMENT INFORMATION	
4	→		MEASUREMENT REPORT	Including Measurement Results on the UTRAN cell in Step 4 Received within 5 sec + 10% from Step 4.
5	←		INTER SYSTEM TO UTRAN HANDOVER COMMAND	Send on cell 1 (GSM cell)
6	MS			The MS accepts the handover command and configures its lower layers using the parameters contained in the INTER SYSTEM TO UTRAN HANDOVER COMMAND
7	SS			The SS waits for uplink physical channel in synchronization
8	→		HANDOVER TO UTRAN COMPLETE	The SS receives this message on DCCH of cell 2 (UTRAN cell). It implies that the down link physical channel has synchronised with UTRAN.

Specific message contents

MEASUREMENT INFORMATION

Same as in 60.1

For execution1 (M = 1):

INTER SYSTEM TO UTRAN HANDOVER COMMAND for FDD

Same content as in 60.1 with the following exceptions in the content of the "HandoverToUTRANCommand-r3-IEs":

Information Element	Value/remark
CHOICE specification mode	Preconfiguration
CHOICE preconfiguration mode	Default configuration
- Default configuration identity	7 (14.4 kbps streaming CS data + 3.4 kbps signalling)

INTER SYSTEM TO UTRAN HANDOVER COMMAND for TDD

Same content as in 60.2a M=2

For execution2 (M = 2):

INTER SYSTEM TO UTRAN HANDOVER COMMAND

Same content as in 60.1 with the following exceptions in the content of the "HandoverToUTRANCommand-r3-IEs":

Information Element	Value/remark
CHOICE specification mode	Preconfiguration
CHOICE preconfiguration mode	Default configuration
- Default configuration identity	8 (28.8 kbps streaming CS data + 3.4 kbps signalling)
- RAB Info	Same content as in 60.1
- Uplink DPCH info	Same content as in 60.1 except for:
- Spreading factor	32
- Downlink information per radio link	Same content as in 60.1 except for:
- Downlink information for each radio link	
- Downlink DPCH info for each RL	
- CHOICE Spreading factor	64

For execution3 (M = 3):

INTER SYSTEM TO UTRAN HANDOVER COMMAND

Same content as in 60.1 with the following exceptions in the content of the "HandoverToUTRANCommand-r3-IEs":

Information Element	Value/remark
CHOICE specification mode	Preconfiguration
CHOICE preconfiguration mode	Default configuration
- Default configuration identity	9 (57.6 kbps streaming CS data + 3.4 kbps signalling)
- RAB Info	Same content as in 60.1
- Uplink DPCH info	Same content as in 60.1 except for:
- Spreading factor	16
- Downlink information per radio link	Same content as in 60.1 except for:
- Downlink information for each radio link	
- Downlink DPCH info for each RL	
- CHOICE Spreading factor	32

60.2b.5 Test requirement

At step 5 the MEASUREMENT REPORT should include details of the UTRAN cell. At step 9 a HANDOVER TO UTRAN COMPLETE command should be received on DCCH of the UTRAN cell.

60.3a Inter system handover to UTRAN/From GSM/Data/Data rate upgrading/Success

60.3a.1 Definition

60.3a.2 Conformance requirement

The MS shall be able to receive a INTER SYSTEM TO UTRAN HANDOVER COMMAND message from GSM and perform an inter-system handover.

If the MS succeeds to establish the connection to UTRAN, it shall transmit a HANDOVER TO UTRAN COMPLETE message on the uplink DCCH.

Reference(s)

3GPP TS 25.331 subclause 8.3.6.

3GPP TS 04.18 subclause 3.4.4a.

60.3a.3 Test purpose

To test that the MS being in the data call active state hands over from the GSM serving cell to the indicated channel of a higher data rate in the UTRAN target cell after it receives a INTER SYSTEM TO UTRAN HANDOVER COMMAND. It is also verified that the MS performs measurements on the target UTRAN cell before the handover.

60.3a.4 Method of test

Initial conditions

System Simulator:

2 cells - Cell 1 is GPRS, Cell 2 is UTRAN (cell selection conditions in favour of the GPRS cell).

The present document subclause 40 shall be referenced for the default parameters of cell 1, and subclause 26.6.5.1 shall be referenced for cell allocation.

3GPP TS 34.108 subclause 6.1 shall be referenced for default parameters of Cell 2.

MS:

"idle, updated", channel released mode with TMSI allocated.

For MS supporting GPRS:

The MS is GPRS attached with a P-TMSI allocated, SPLIT PG CYCLE negotiated.

Specific PICS statements

- MS supports UTRAN Streaming/unknown/UL:28.8 DL:28.8 kbps/CS RAB + UL:3.4 DL:3.4 kbps SRBs.
- MS supports UTRAN Streaming/unknown/UL:57.6 DL:57.6 kbps/CS RAB + UL:3.4 DL:3.4 kbps SRBs.

PIXIT statements

-

Foreseen final state of the MS

The MS is in CC state U10 on cell 2.

Test Procedure

Then the SS brings the MS into the call active state (CC state U10) with a 14.4 kbps CS data call . The SS configures an appropriate dedicated channel in the UTRAN cell (default configuration 8 streaming/unknown/UL:28.8 DL:28.8 kbps/CS RAB + UL:3.4 DL3.4 kbps SRBS for M = 1). The SS sends a MEASUREMENT INFORMATION to trigger the MS to perform measurements on the UTRAN cell. The SS verifies that the MS include the UTRAN cell in the MEASUREMENT REPORTs and then sends INTER SYSTEM TO UTRAN HANDOVER COMMAND indicating the dedicated channel of the target cell to the MS through the GSM serving cell. After the MS receives the command it shall configure itself accordingly and switch to the new channel of the UTRAN cell. The SS checks whether the handover is performed by checking that the MS transmits HANDOVER TO UTRAN COMPLETE to the SS through DCCH of the UTRAN cell.

Depending on the PIXIT parameters, the above procedure is executed maximum two times, each time for different conditions:

- if the MS supports GSM 14.4 kbps CS data and UTRAN streaming/unknown/UL:28.8 DL:28.8 kbps/CS RAB + UL:3.4 DL3.4 kbps SRBs, the procedure is executed for execution counter M = 1, using Default configuration 8;
- if the MS supports GSM 14.4 kbps CS data and UTRAN streaming/unknown/UL:57.6 DL:57.6 kbps/CS RAB + UL:3.4 DL3.4 kbps SRBs, the procedure is executed for execution counter M = 2, using Default configuration 9;

Expected sequence

This sequence is performed for a maximum execution counter M = 1, 2 depending on the PIXIT parameters.

Step	Direction MS SS	Message	Comments
1	MS		The SS bring the MS into GSM U10 state in cell 1 and the MS is in GSM 14.4 kbps CS data call on a hopping traffic channel
2	SS		The SS configures a dedicated channel in the UTRAN cell with the configuration: For M = 1: (streaming/unknown/UL:28.8 DL:28.8 kbps/CS RAB + UL:3.4 DL3.4 kbps SRBs); For M = 2: (streaming/unknown/UL:57.6 DL:57.6 kbps/CS RAB + UL:3.4 DL3.4 kbps SRBs);
3	←	MEASUREMENT INFORMATION	
4	→	MEASUREMENT REPORT	Including Measurement Results on the UTRAN cell in Step 4
5	←	INTER SYSTEM TO UTRAN HANDOVER COMMAND	Send on cell 1 (GSM cell)
6	MS		The MS accepts the handover command and configures its lower layers using the parameters contained in the INTER SYSTEM TO UTRAN HANDOVER COMMAND
7	SS		The SS waits for uplink physical channel in synchronization
8	→	HANDOVER TO UTRAN COMPLETE	The SS receives this message on DCCH of cell 2 (UTRAN cell). It implies that the down link physical channel has synchronised with UTRAN.

Specific message contents

For execution1 (M = 1):

Same as the default message contents in subclause 60.2b for M = 2.

For execution2 (M = 2):

Same as the default message contents in subclause 60.2b for M = 3.

60.3a.5 Test requirement

At step 4 the MEASUREMENT REPORT should include details of the UTRAN cell. At step 8 a HANDOVER TO UTRAN COMPLETE command should be received on DCCH of the UTRAN cell.

60.3b Inter system handover to UTRAN/From GSM/Data/Data rate upgrading/Extended Rates/Success

60.3b.1 Definition

60.3b.2 Conformance requirement

The MS shall be able to receive a INTER SYSTEM TO UTRAN HANDOVER COMMAND message from GSM and perform an inter-system handover.

If the MS succeeds to establish the connection to UTRAN, it shall transmit a HANDOVER TO UTRAN COMPLETE message on the uplink DCCH.

Reference(s)

3GPP TS 25.331 subclause 8.3.6.

3GPP TS 04.18 subclause 3.4.4a.

60.3b.3 Test purpose

To test that the MS being in the data call active state hands over from the GSM serving cell to the indicated channel of a higher data rate in the UTRAN target cell after it receives a INTER SYSTEM TO UTRAN HANDOVER COMMAND. It is also verified that the MS performs measurements on the target UTRAN cell before the handover.

60.3b.4 Method of test

Initial conditions

System Simulator:

2 cells - Cell 1 is GSM, Cell 2 is UTRAN (cell selection conditions in favour of the GSM cell).

The present document subclause 26.6.5.1 or subclause 26.13.1.3 (for HSCSD) shall be referenced for the default parameters of cell 1.

3GPP TS 34.108 subclause 6.1 shall be referenced for default parameters of Cell 2.

MS:

"idle, updated", channel released mode with TMSI allocated.

Specific PICS statements

- MS supports UTRAN Streaming/unknown/UL:28.8 DL:28.8 kbps/CS RAB + UL:3.4 DL:3.4 kbps SRBs.
- MS supports UTRAN Streaming/unknown/UL:57.6 DL:57.6 kbps/CS RAB + UL:3.4 DL:3.4 kbps SRBs.

PIXIT statements

-

Foreseen final state of the MS

The MS is in CC state U10 on cell 2.

Test Procedure

Then the SS brings the MS into the call active state (CC state U10) with a CS data call (14.4 kbps HSCSD for execution counter M = 1). The SS configures an appropriate dedicated channel in the UTRAN cell (default configuration 4 streaming/unknown/UL:28.8 DL:28.8 kbps/CS RAB + UL:3.4 DL3.4 kbps SRBS for M = 1). The SS sends a MEASUREMENT INFORMATION to trigger the MS to perform measurements on the UTRAN cell. The SS verifies that the MS include the UTRAN cell in the MEASUREMENT REPORTs and then sends INTER SYSTEM TO UTRAN HANDOVER COMMAND indicating the dedicated channel of the target cell to the MS through the GSM serving cell. After the MS receives the command it shall configure itself accordingly and switch to the new channel of the UTRAN cell. The SS checks whether the handover is performed by checking that the MS transmits HANDOVER TO UTRAN COMPLETE to the SS through DCCH of the UTRAN cell.

Depending on the PIXIT parameters, the above procedure is executed maximum three times, each time for different conditions:

- if the MS supports GSM 14.4 kbps HSCSD and UTRAN streaming/unknown/UL:28.8 DL:28.8 kbps/CS RAB + UL:3.4 DL3.4 kbps SRBs, the procedure is executed for execution counter M = 1, using Default configuration 8;
- if the MS supports GSM 14.4 kbps HSCSD and UTRAN streaming/unknown/UL:57.6 DL:57.6 kbps/CS RAB + UL:3.4 DL3.4 kbps SRBs, the procedure is executed for execution counter M = 2, using Default configuration 9;
- if the MS supports GSM 28.8 kbps CS data and UTRAN streaming/unknown/UL:57.6 DL:57.6 kbps/CS RAB + UL:3.4 DL3.4 kbps SRBs, the procedure is executed for execution counter M = 3, using Default configuration 9.

Expected sequence

This sequence is performed for a maximum execution counter M = 1, 2, 3, depending on the PIXIT parameters.

Step	Direction		Message	Comments
	MS	SS		

1	MS			The SS bring the MS into GSM U10 state in cell 1 and
				for M = 1: the MS is in GSM 14.4 kbps HSCSD call;
				for M = 2: the MS is in GSM 14.4 kbps HSCSD call;
				for M = 3: the MS is in GSM 28.8 kbps CS data call;

2	SS			The SS configures a dedicated channel in the UTRAN cell with the configuration: For M = 1: (streaming/unknown/UL:28.8 DL:28.8 kbps/CS RAB + UL:3.4 DL3.4 kbps SRBs); For M = 2: (streaming/unknown/UL:57.6 DL:57.6 kbps/CS RAB + UL:3.4 DL3.4 kbps SRBs); For M = 3: (streaming/unknown/UL:57.6 DL:57.6 kbps/CS RAB + UL:3.4 DL3.4 kbps SRBs)
3	←		MEASUREMENT INFORMATION	
4	→		MEASUREMENT REPORT	Including Measurement Results on the UTRAN cell in Step 4 Received within 5 sec + 10% from Step 4.
5	←		INTER SYSTEM TO UTRAN HANDOVER COMMAND	Send on cell 1 (GSM cell)
6	MS			The MS accepts the handover command and configures its lower layers using the parameters contained in the INTER SYSTEM TO UTRAN HANDOVER COMMAND
7	SS			The SS waits for uplink physical channel in synchronization
8	→		HANDOVER TO UTRAN COMPLETE	The SS receives this message on DCCH of cell 2 (UTRAN cell). It implies that the down link physical channel has synchronised with UTRAN.

Specific message contents

For execution1 (M = 1):

Same as the default message contents in subclause 60.2b for M = 2.

For execution2 (M = 2):

Same as the default message contents in subclause 60.2b for M = 3.

For execution3 (M = 3):

Same as the default message contents in subclause 60.2b for M = 3.

60.3b.5 Test requirement

At step 5 the MEASUREMENT REPORT should include details of the UTRAN cell. At step 9 a HANDOVER TO UTRAN COMPLETE command should be received on DCCH of the UTRAN cell.

60.4 Inter system handover to UTRAN/From GSM/SDCCH/CC Establishment/Success

60.4.1 Definition

60.4.2 Conformance requirement

The MS shall be able to receive a INTER SYSTEM TO UTRAN HANDOVER COMMAND message from GSM and perform an inter-system handover.

If the MS succeeds to establish the connection to UTRAN, it shall transmit a HANDOVER TO UTRAN COMPLETE message on the uplink DCCH.

Reference(s)

3GPP TS 25.331 subclause 8.3.6.

3GPP TS 04.18 subclause 3.4.4a.

60.4.3 Test purpose

To test that the MS supporting both GSM and UTRAN handovers from the GSM serving cell to the indicated channel in UTRAN target cell when the MS is on SDCCH during call establishment phase and receives an INTER SYSTEM TO UTRAN HANDOVER COMMAND. It is also verified that the MS performs measurements on the target UTRAN cell before the handover.

60.4.4 Method of test

Initial conditions

System Simulator:

2 cells - Cell 1 is GPRS, Cell 2 is UTRAN (cell selection conditions in favour of the GPRS cell).

The present document subclause 40 shall be referenced for the default parameters of cell 1. Except for SI3 indicating SI2quater on BCCH norm, and SI2quater is broadcasted on BCCH of Cell 1, and subclause 26.6.5.1 shall be referenced for cell allocation..

3GPP TS 34.108, subclause 6.2 shall be referred to default parameters of Cell 2.

MS:

"idle, updated", channel released mode with TMSI allocated.

For MS supporting GPRS:

The MS is GPRS attached with a P-TMSI allocated, SPLIT PG CYCLE negotiated.

Specific PICS statements

- Support of UTRAN FDD (TSPC_Type_UTRAN FDD)
- Support of UTRAN TDD (TSPC_Type_UTRAN TDD)

PIXIT statements

-

Foreseen final state of the MS

The MS is in CC state U1 on cell 2.

Test Procedure

The UTRAN cell is set up corresponding to the UTRAN FDD/TDD mode. The MS reads SI2quater indicating presence of the UTRAN cell. The MS is triggered to make an MO speech call. After the SS received SETUP message it configures a dedicated channel corresponding to the default configuration 1 (UL:13.6 DL13.6 kbps SRBs) corresponding to the UTRAN FDD/TDD mode and then the SS sends INTER SYSTEM TO UTRAN HANDOVER COMMAND indicating the dedicated channel to the MS through the GSM serving cell. After the MS receives the command and it shall configure itself accordingly and switch to the new channel of UTRAN cell. The SS checks whether the handover is performed by checking that the MS transmits HANDOVER TO UTRAN COMPLETE to the SS through DCCH of the UTRAN cell.

For MS following procedures are executed:

- if the MS supports UTRAN_FDD the procedure is executed for execution counter M = 1;
- if the MS supports UTRAN_TDD the procedure is executed for execution counter M = 2.

Expected sequence

This sequence is performed for a maximum execution counter M = 1, 2 depending on the PIXIT parameters.

Step	Direction MS SS	Message	Comments
1	SS		The MS reads SI2quater indicating presence of the UTRAN cell.
3	→	SETUP	The SS brings the MS to GSM U1 state in Cell 1
4	SS		The SS configures a dedicated channel with the default configuration 1: UL:13.6 DL13.6 kbps SRBs in UTRAN cell.
5	→	MEASUREMENT REPORT	
6			Step 5 is repeated until the MEASUREMENT REPORT contains the measurement result on the UTRAN cell
7	←	INTER SYSTEM TO UTRAN HANDOVER COMMAND	Send on cell 1 (GSM cell)
8	MS		The MS accepts the handover command and configures its lower layers using the parameters contained in the INTER SYSTEM TO UTRAN HANDOVER COMMAND
9	SS		The SS waits for uplink physical channel in synchronization
10	→	HANDOVER TO UTRAN COMPLETE	The SS receives this message on DCCH of cell 2 (UTRAN cell). It implies that the down link physical channel has synchronised with UTRAN.

Specific message contents

SYSTEM INFORMATION TYPE 2QUATER (M = 1)

Information Element	Value/remark
< **RR management Protocol Discriminator** bit (4) >	‘0110'B
< **Skip Indicator** : bit (4) >	‘0000'B
< **Message type** : bit (8) >	‘0000 0111’B
< **SI2 quarter Rest Octets** >	
< **BA_IND** : bit >	0
< **3G_BA_IND** : bit >	0
< **MP_CHANGE_MARK** : bit >	0
< **SI2quater _INDEX** : bit (4) >	‘0000’B
< **SI2quater_COUNT** : bit (4) >	‘0000’B
0 | 1 < **Measurement_Parameters Description >**	0
0 | 1 < **GPRS_Real Time Difference Description >**	0
0 | 1 < **GPSR_BSIC Description >**	0
0 | 1 < **GPRS_REPORT PRIORITY Description >**	0
0 | 1 < **GPRS_Measurement_Parameters Description >**	0
0 | 1 < **NC Measurement Parameters >**	0
0 | 1 < **extension length** >	0
0 | 1 < **3G Neighbour Cell Description >**	1
0 | 1 < **Index_Start_3G** : bit (7) >	0
0 | 1 < **Absolute_Index_Start_EMR** : bit (7) >	0
0 | 1 < **UTRAN FDD Description >**	1
0 | 1 < **Bandwidth_FDD** : bit (3) >	0
1 < **Repeated UTRAN FDD Neighbour Cells >** ** 0	1
0 < **FDD-ARFCN** : bit (14) >	0 See TS 34.108, clause 6.1.5, table 6.1.1
< **FDD_Indic0** : bit >	0
< **NR_OF_FDD_CELLS** : bit (5) >	‘00001’B
< **FDD_CELL_INFORMATION Field >**	10 bits Scrambling code according to TS 34.108, clause 6.1.4, Default settings for cell No.1
1 < **Repeated UTRAN FDD Neighbour Cells >** ** 0	0
0 | 1 < **UTRAN TDD Description >**	0
0 | 1 < **3G MEASUREMENT Parameters Description >**	
< **Qsearch_I :** bit (4) >	‘0111’B (Always)
< **Qsearch_C_Initial :** bit (1) >	0
0 | 1 < **FDD_Qoffset** : bit (4) >	0
0 | 1 < **FDD_MULTIRAT_REPORTING** : bit (2) >	‘1 01’B (Report on 1 UTRAN cell)
0 | 1 < **FDD_REPORTING_OFFSET** : bit (3) >	0
0 | 1 < **TDD_MULTIRAT_REPORTING** : bit (2) >	0
0 | 1 < **TDD_REPORTING_OFFSET** : bit (3) >	0
0 | 1 < **CDMA2000_MULTIRAT_REPORTING** : bit (2) >	0
0 | 1 < **CDMA2000_REPORTING_OFFSET** : bit (3) >	0
0 | 1 < **GPRS_3G_MEASUREMENT Parameters Description >**	0

SYSTEM INFORMATION TYPE 2QUATER (M = 2)

Information Element	Value/remark
< RR management Protocol Discriminator bit (4) >	'0110'B
< Skip Indicator : bit (4) >	'0000'B
< Message type : bit (8) >	'0000 0111'B
< SI2 quater Rest Octets >	
< BA_IND : bit >	0
< 3G_BA_IND : bit >	0
< MP_CHANGE_MARK : bit >	0
< SI2quater _INDEX : bit (4) >	'0000'B
< SI2quater_COUNT : bit (4) >	'0000'B
0 | 1 < Measurement_Parameters Description >	0
0 | 1 < GPRS_Real Time Difference Description >	0
0 | 1 < GPSR_BSIC Description >	0
0 | 1 < GPRS_REPORT PRIORITY Description >	0
0 | 1 < GPRS_Measurement_Parameters Description >	0
0 | 1 < NC Measurement Parameters >	0
0 | 1 < extension length >	0
0 | 1 < 3G Neighbour Cell Description >	1
0 | 1 < Index_Start_3G : bit (7) >	0
0 | 1 < Absolute_Index_Start_EMR : bit (7) >	0
0 | 1 < UTRAN FDD Description >	0
0 | 1 < UTRAN TDD Description >	1
0 | 1 < Bandwidth_TDD : bit (3) >	1 '001'B
1 < Repeated UTRAN TDD Neighbour Cells > ** 0	1
0 < TDD-ARFCN : bit (14) >	0 See TS 34.108, clause 6.1.6, Table 6.1.6a
< TDD_Indic0 : bit >	0
< NR_OF_TDD_CELLS : bit (5) >	'00001'B
< TDD_CELL_INFORMATION Field >	9 bits Scrambling code according to TS 34.108, clause 6.1.4, Default settings for TDD cell No.1
1 < Repeated UTRAN TDD Neighbour Cells > ** 0	0
0 | 1 < 3G MEASUREMENT Parameters Description >	1
< Qsearch_I : bit (4) >	'0111'B (Always)
< Qsearch_C_Initial : bit (1) >	0
0 | 1 < FDD_Qoffset : bit (4) >	0
0 | 1 < TDD_Qoffset : bit (4) >	1 ' 1111'B (Reselect UTRAN TDD cell when above 60dB)
< TDD_MULTIRAT_REPORTING : bit (2) >	'01'B (Report on 1 UTRAN cell)
0 | 1 < GPRS_3G_MEASUREMENT Parameters Description >	0

INTER SYSTEM TO UTRAN HANDOVER COMMAND

For M = 1:

Same as the default message contents in subclause 60.1 for M = 1 with the following exceptions:

Information Element	Value/remark
CHOICE specification mode	Preconfiguration
CHOICE preconfiguration mode	Default configuration
- Default configuration identity	1 (13.6 kbps signalling)
RAB information list	Not Present

For M = 2:

Same as the default message contents in subclause 60.2a for M = 2 using the configuration defined in TS 34.108 [149] clause 6.10.2.4.1.2:

60.4.5 Test requirement

At step 5 the MEASUREMENT REPORT should include details of the UTRAN cell. At step 10 a HANDOVER TO UTRAN COMPLETE command should be received on DCCH of the UTRAN cell.

60.5 Inter system handover to UTRAN/From GSM/Speech/Blind HO/Success

60.5.1 Definition

60.5.2 Conformance requirement

The MS shall be able to receive a INTER SYSTEM TO UTRAN HANDOVER COMMAND message from GSM and perform an inter-system handover, even if no prior MS measurements have been performed on the target UTRAN cell and/or frequency.

If the MS succeeds to establish the connection to UTRAN, it shall transmit a HANDOVER TO UTRAN COMPLETE message on the uplink DCCH.

Reference(s)

3GPP TS 25.331 subclause 8.3.6.

3GPP TS 04.18 subclause 3.4.4a.

60.5.3 Test purpose

To test that the MS handovers from the GSM serving cell to the indicated channel of UTRAN target cell when it is in the speech call active state without any knowledge of the target system (blind handover) and receives an INTER SYSTEM TO UTRAN HANDOVER COMMAND.

60.5.4 Method of test

Initial conditions

2 cells - Cell 1 is GPRS, Cell 2 is UTRAN (cell conditions favour the GPRS cell).

The present document subclause 40 shall be referenced for the default parameters of cell 1, and subclause 26.6.5.1 shall be referenced for cell allocation.

3GPP TS 34.108 subclause 6.1 shall be referred to for default parameters of Cell 2.

MS:

"idle, updated", channel released mode with TMSI allocated.

For MS supporting GPRS:

The MS is GPRS attached with a P-TMSI allocated, SPLIT PG CYCLE negotiated.

Specific PICS statements

-

PIXIT statements

-

Foreseen final state of the MS

The MS is in CC state U10 on cell 2.

Test Procedure

No SYSTEM INFORMATION TYPE 2quarter or MEASUREMENT INFORMATION indicating presence of the UTRAN cell are broadcasted in the GSM cell. The SS brings the MS into the call active state (CC state U10) with FR speech. The SS configures a dedicated channel (conversationa/speech/UL:12.2 DL:12.2 kbps/CS RAB + UL:3.4 DL3.4 kbps SRBS), then sends INTER SYSTEM TO UTRAN HANDOVER COMMAND indicating the dedicated channel of the target cell to the MS through the GSM serving cell. After the MS receives the command it shall configure itself accordingly and switch to the dedicated channel of UTRAN cell. The SS checks whether the handover is performed by checking that the MS transmits HANDOVER TO UTRAN COMPLETE to the SS through DCCH of the UTRAN cell.

Expected sequence

Step	Direction		Message	Comments
	MS	SS		
1	MS			The SS bring the MS into GSM U10 state in cell 1, on a hopping traffic channel, and the MS has no pre-configuration information stored or received any information of presence of the UTRAN cell.
2	SS			The SS configures dedicated channel with the configuration: conversational/speech/UL:12.2 DL:12.2 kbps/CS RAB + UL:3.4 DL3.4 kbps SRBs in UTRAN cell.
3	←		INTER SYSTEM TO UTRAN HANDOVER COMMAND	Send on cell 1 (GSM cell)
4	MS			The MS accepts the handover command and configures its lower layers using the parameters contained in the INTER SYSTEM TO UTRAN HANDOVER COMMAND
5	SS			The SS waits for uplink physical channel in synchronization
6	→		HANDOVER TO UTRAN COMPLETE	The SS receives this message on DCCH of cell 2 (UTRAN cell). It implies that the down link physical channel has synchronised with UTRAN.

Specific message contents

INTER SYSTEM TO UTRAN HANDOVER COMMAND

Same as the specific message contents in subclause 60.1 for M = 1.

60.5.5 Test requirement

At step 6 the HANDOVER TO UTRAN COMPLETE shall be received on UTRAN cell.

60.6 Inter system handover to UTRAN/From GSM/Speech/Failure

60.6.1 Definition

60.6.2 Conformance requirement

The MS shall be able to receive a INTER SYSTEM TO UTRAN HANDOVER COMMAND message from GSM and perform an inter-system handover.

If the MS can not establish the connection to UTRAN, it shall reactivate the old channel and transmit a HANDOVER FAILURE message on the old channel.

Reference(s)

3GPP TS 25.331 subclause 8.3.6.

3GPP TS 04.18 subclause 3.4.4a.

60.6.3 Test purpose

To test that the MS reactivates the old channel and transmits HANDOVER FAILURE message to the network on the old channel in the GSM cell when it received INTER SYSTEM TO UTRAN HANDOVER COMMAND towards a non-existing UTRAN cell.

60.6.4 Method of test

Initial conditions

System Simulator:

2 cells - Cell 1 is GPRS, Cell 2 is UTRAN (cell selection conditions in favour of the GPRS cell).

The present document subclause 40 shall be referenced for the default parameters of cell 1, and subclause 26.6.5.1 shall be referenced for cell allocation.

3GPP TS 34.108, subclause 6.1 will be referenced for the default parameters of Cell 2.

MS:

"idle, updated", channel released mode with TMSI allocated.

For MS supporting GPRS:

The MS is GPRS attached with a P-TMSI allocated, SPLIT PG CYCLE negotiated.

Specific PICS statements

-

PIXIT statements

-

Foreseen final state of the MS

The MS is in CC state U10 on cell 1.

Test Procedure

The SS brings the MS into the call active state (CC state U10) with FR speech call. The SS does not configure a dedicated channel corresponding to the default configuration 3. The SS sends a MEASUREMENT INFORMATION to trigger the MS to perform measurements on the UTRAN cell. The SS verifies that the MS include the UTRAN cell in the MEASUREMENT REPORT and, then sends INTER SYSTEM TO UTRAN HANDOVER COMMAND indicating the dedicated channel of the target cell to the MS through the GSM serving cell. The MS will not be able to establish the connection to UTRAN dedicated channel. The SS checks that the handover is failed by checking that the MS returns to the old channel and transmits HANDOVER FAILURE to the SS through the old channel.

Expected sequence

Step	Direction		Message	Comments
	MS	SS		
1	MS			The SS brings the MS into GSM U10 state in cell 1 on a hopping traffic channel
2	SS			The SS configures the Physical channel of the UTRAN cell but here is no dedicated channel with the configuration: conversational/speech/UL:12.2 DL:12.2 kbps/CS RAB + UL:3.4 DL3.4 kbps SRBs in UTRAN cell.
3 4	← →		MEASUREMENT INFORMATION MEASUREMENT REPORT	 Including Measurement Results on the UTRAN cell in Step 4
5	←		INTER SYSTEM TO UTRAN HANDOVER COMMAND	Send on cell 1 (GSM cell)
6	MS			The MS accepts the handover command and configures its lower layers using the parameters contained in the INTER SYSTEM TO UTRAN HANDOVER COMMAND
7	MS			The MS fails to configure to the indicated RAB in Step 6 and fails to establish a connection to UTRAN cell
8	→		HANDOVER FAILURE	The SS receives this message on DCCH of cell 1 (old channel in GSM cell)

Specific message contents

Same as the specific message contents in subclause 60.1 for M = 1.

60.6.5 Test requirement

At step 8 the HANDOVER FAILURE shall be received on GSM cell.

60.7 Inter system handover to UTRAN/From GSM/Failure/Cause: Frequency not implemented

60.7.1 Definition

60.7.2 Conformance requirement

The MS shall be able to receive a HANDOVER TO UTRAN COMMAND message from GSM and perform an inter-system handover, even if no prior MS measurements have been performed on the target UTRAN cell and/or frequency.

The HANDOVER TO UTRAN COMMAND message instructs the mobile station to use frequency that it is not capable of, and then the MS shall return a HANDOVER FAILURE message with cause "frequency not implemented" (Reference 3GPP TS 04.18 subclause 3.4.4a.3).

Reference(s)

3GPP TS 25.331 subclause 8.3.6.

3GPP TS 04.18 subclause 3.4.4a.

60.7.3 Test purpose

To test that the MS reactivates the old channel and transmits HANDOVER FAILURE message to the network on the old channel in the GSM cell when it received HANDOVER TO UTRAN COMMAND and the handover to UTRAN failed because of frequency not implemented.

60.7.4 Method of test

Initial conditions

System Simulator:

2 cells - Cell 1 is GSM, Cell 2 is UTRAN. TS 51.010-1 subclause 26.6.5.1 shall be referenced for the default parameters of Cell 1.

MS:

CC State U10 in cell 1.

Specific PICS statements

-

PIXIT statements

-

Foreseen final state of the MS

The MS is in CC state U10 on cell 1.

Test Procedure:

The SS starts the GSM cell and UTRAN cell with the cell selection condition in favour of GSM cell. The MS selects the GSM cell.

SS brings the MS into the call active state (CC state U10) with FR speech call. The SS configures the dedicated channel corresponding to the default configuration (conversational/speech/uplink: 12.2 DL: 12.2 kbps/CS RAB + uplink: 3.4 DL3.4 kbps SRBS), then sends HANDOVER TO UTRAN COMMAND the MS through the GSM serving cell. The HANDOVER TO UTRAN COMMAND message instructs the mobile station to use frequency that it is not capable of, and then the MS shall return a HANDOVER FAILURE message with cause "frequency not implemented" (Reference 3GPP TS 04.18 subclause 3.4.4a.3) and continue the voice call on the old channel.

Expected sequence

Step	Direction		Message	Comments
	MS	SS		
1	SS			The SS starts GSM and UTRAN cells; the UTRAN cell broadcasts SIB16 containing pre-configuration information. MS camps on GSM cell and received SIB 16 from UTRAN cell.
2	MS			The SS brings the MS into GSM U10 state in cell 1.
3	SS			The SS configures dedicated channel with the configuration: conversational/speech/uplink:12.2 DL:12.2 kbps/CS RAB + uplink:3.4 DL3.4 kbps SRBs in UTRAN cell.
4	←		HANDOVER TO UTRAN COMMAND	Handover message is sent on cell 1 (GSM cell) with unsupported frequency.
5	MS			The MS fails to establish a connection to UTRAN cell
6	→		HANDOVER FAILURE	The SS receives this message on DCCH of cell 1 (old channel in GSM cell) with RR Cause "frequency not implemented".

Specific message contents

Same as the specific message contents in subclause 60.1 for M = 1 except that the INTER SYSTEM TO UTRAN HANDOVER COMMAND indicates a frequency not supported by the MS.

60.7.5 Test requirement

At step 7 the HANDOVER FAILURE shall be received on GSM cell.

60.8 Inter system handover to UTRAN/From GSM/Failure/Cause: UTRAN configuration unknown

60.8.1 Definition

60.8.2 Conformance requirement

The MS shall be able to receive a HANDOVER TO UTRAN COMMAND message from GSM and perform an inter-system handover, even if no prior MS measurements have been performed on the target UTRAN cell and/or frequency. The HANDOVER TO UTRAN COMMAND message instructs the mobile station to use preconfiguration that the mobile station has not read or instruct to use default reconfiguration not implemented by MS, then the MS shall return a HANDOVER FAILURE message with cause "UTRAN configuration unknown" (3GPP TS 04.18 subclause 3.4.4a.3).

Reference(s)

3GPP TS 25.331 subclause 8.3.6.

3GPP TS 04.18 subclause 3.4.4a.

60.8.3 Test purpose

To test that the MS reactivates the old channel and transmits HANDOVER FAILURE message to the network on the old channel in the GSM cell when it receives HANDOVER TO UTRAN COMMAND and the handover to UTRAN failed because of UTRAN configuration unknown.

60.8.4 Method of test

Initial conditions

System Simulator:

2 cells - Cell 1 is GSM, Cell 2 is UTRAN. TS 51.010-1section 26.6.5.1 shall be referenced for the default parameters of cell 1.

MS:

CC State U10 in cell.

Specific PICS statements

-

PIXIT statements

-

Foreseen final state of the MS

The MS is in CC state U10 on cell 1.

Test Procedure

The SS starts the GSM cell and UTRAN cell with the cell selection condition in favour of GSM cell, SIB16 is not broadcast in UTRAN cell and MS has no predefined configuration stored.

The MS selects the GSM cell. SS brings the MS into the call active state (CC state U10) with FR speech call. The SS configures a dedicated channel (conversational/speech/uplink: 12.2 DL: 12.2 kbps/CS RAB + uplink: 3.4 DL3.4 kbps

SRBS). The SS sends a HANDOVER TO UTRAN COMMAND message through the GSM cell that instructs the MS to use a preconfiguration that the mobile station has not read or instructed to use default configuration not implemented by MS. The MS shall return a HANDOVER FAILURE message with cause "UTRAN preconfiguration unknown" and continue the voice call on the old cell.

Expected sequence

Step	Direction		Message	Comments
	MS	SS		
1	SS			The SS starts GSM and UTRAN cells; SIB16 is not broadcast in the UTRAN cell.
2	MS			The SS brings the MS into GSM U10 state in cell 1and MS has not any pre-configuration stored.
3	SS			The SS configures dedicated channel with the configuration: conversational/speech/uplink:12.2 DL:12.2 kbps/CS RAB + uplink:3.4 DL3.4 kbps SRBs in UTRAN cell.
4	←		HANDOVER TO UTRAN COMMAND	Handover message is sent on cell 1 (GSM cell) with unknown preconfiguration.
5	MS			The MS fails to establish a connection to UTRAN cell
6	→		HANDOVER FAILURE	The SS receives this message on DCCH of cell 1 (old channel in GSM cell) with RR Cause "UTRAN configuration unknown".

Specific message contents

INTER SYSTEM TO UTRAN HANDOVER COMMAND

Information Element	Value/remark
RR management Protocol Discriminator	'0110'B
Skip Indicator	'0000'B
Inter System to UTRAN Handover Command Message Type	'01100011'B
Handover to UTRAN Command IEI	TBD
Length of Handover to UTRAN Command contents	Octet length of the "Handover to UTRAN Command value part"
Handover to UTRAN Command value part	PER encoded ASN.1 value of type "HandoverToUTRANCommand-v1-IEs", content is presented in the next table.

Content of "HandoverToUTRANCommand-r3-IEs"

Information Element	Value/remark
New U-RNTI	
- SRNC Identity	‘000000000001'B
- S-RNTI-2	1
Activation time	now
Ciphering algorithm	Standard UMTS Encryption Algorithm UEA1
CHOICE Specification mode	Preconfiguration
- Predefined configuration identity	1
- RAB Info	
- RAB identity	
- GSM-MAP RAB identity	‘00000001'B
- CN domain identity	CS domain
- CHOICE Mode specific info	FDD
- uplink DPCH info	
- uplink DPCH power control info	
- DPCCH power offset	-6dB
- PC Preamble	1 frame
- SRB delay	7 frames
- Scrambling code type	long
- Reduced scrambling code number	0
- Spreading factor	16
- DL common information post	
- DL DPCH info common	
- DL DPCH power control info	
- CHOICE Mode specific info	FDD
- DPC mode	Single TPC
- DL information perRL list	
- Primary CPICH info	
- Primary scrambling code	100
- DL DPCH info perRL	
- pCPICH usage for channelEst	May be used
- DL channelization code	
- Secondary scrambling code	1
- SF and code number	SF = 32, code number = 31
- Scrambling code change	No code change
- TPC combination index	0
- Frequency info	
- UARFCN uplink(Nu)	See PIXIT
- UARFCN downlink(Nd)	See PIXIT
Maximum allowed uplink TX power	33dBm

HANDOVER FAILURE message content

Information element	Value/remark
RR management Protocol Discriminator	‘0110'B
Skip Indicator	‘0000'B
Handover Failure Message Type	‘00101000'B
RR Cause	RR Cause (Refer : table 10.5.2.31.1/3GPP TS 04.18: *RR Cause* information element)

60.8.5 Test requirement

At step 7 the HANDOVER FAILURE shall be received on GSM cell.

60.9 Inter system handover to UTRAN/From GSM/Failure/Cause: Protocol Error

60.9.1 Definition

60.9.2 Conformance requirement

The MS shall be able to receive a HANDOVER TO UTRAN COMMAND message from GSM and perform an inter-system handover, even if no prior MS measurements have been performed on the target UTRAN cell and/or frequency. The HANDOVER TO UTRAN COMMAND message, which contains a protocol error causing the variable PROTOCOL_ERROR_REJECT to be set TRUE according to subclause 9 of 3GPP TS 25.331.

3GPP TS 04.18 subclause 8.5

When on receipt of a message,

- an "imperative message part" error; or
- a "missing mandatory IE" error

is diagnosed or when a message containing:

- a syntactically incorrect mandatory IE; or
- an IE unknown in the message, but encoded as "comprehension required" (see clause 3GPP TS 24.007); or
- an out of sequence IE encoded as "comprehension required" (see clause 3GPP TS 24.007)

is received,

- the mobile station shall proceed as follows:

  If the message is not one of the messages listed in clauses 8.5.1, 8.5.2, 8.5.3 the mobile station shall ignore the message except for the fact that, if an RR connection exists, it shall return a status message (RR STATUS) with cause # 96 "Invalid mandatory information".

Reference(s)

3GPP TS 25.331 subclause 8.3.6 and 9.

3GPP TS 04.18 subclause 3.4.4a and 8.5.

60.9.3 Test purpose

To test that the MS reactivates the old channel and transmits RR Status message to the network on the old channel in the GSM cell when it receives HANDOVER TO UTRAN COMMAND and the handover to UTRAN failed because of protocol error.

60.9.4 Method of test

Initial conditions

System Simulator:

2 cells - Cell 1 is GSM, Cell 2 is UTRAN. TS 51.010-1 section 26.6.5.1 shall be referenced for the default parameters of cell 1.

MS:

CC State U10 in cell 1.

Specific PICS statements

-

PIXIT statements

-

Foreseen final state of the MS

The MS is in CC state U10 on cell 1.

Test Procedure

The SS starts the GSM cell and UTRAN cell with the cell selection condition in favour of GSM cell. The MS selects the GSM cell. SS brings the MS into the call active state (CC state U10) with FR speech call. The SS configures the dedicated channel corresponding to the default configuration 3 (conversational/speech/uplink: 12.2 DL: 12.2 kbps/CS RAB + uplink: 3.4 DL3.4 kbps SRBS), then sends HANDOVER TO UTRAN COMMAND indicating the dedicated channel of the target cell to the MS through the GSM serving cell.

The SS sends a HANDOVER TO UTRAN COMMAND message, that contains a protocol error causing the variable PROTOCOL_ERROR_REJECT to be set TRUE according to 3GPP TS 25.331 subclause 9. Then the MS shall return an RR STATUS message on DCCH of cell 1 (old channel in GSM cell) with RR cause #96 “Invalid mandatory information”.

Expected sequence

Step	Direction		Message	Comments
	MS	SS		
1	SS			The SS starts GSM and UTRAN cells; The MS camps on GSM cell
2	MS			The SS brings the MS into GSM U10 state in cell 1
3	SS			The SS configures dedicated channel with the configuration: conversational/speech/uplink:12.2 DL:12.2 kbps/CS RAB + uplink:3.4 DL3.4 kbps SRBs in UTRAN cell.
4	←		HANDOVER TO UTRAN COMMAND	Handover message is sent on cell 1 (GSM cell) with missing mandatory IE.
5	→		RR STATUS	The SS receives this message on DCCH of cell 1 (old channel in GSM cell) with RR cause #96 "Invalid mandatory information".

Specific message contents

Same as the specific message contents in subclause 60.1 for M = 1 except that in the INTER SYSTEM TO UTRAN HANDOVER COMMAND a mandatory IE is missing causing a protocol error.

60.9.5 Test requirement

At step 5 the RR STATUS shall be received on GSM cell.

60.10 Inter system handover to UTRAN/From GSM/Integrity Protection Activation

60.10.1 Definition

60.10.2 Conformance requirement

The MS shall include the Security START values in INTER RAT HANDOVER INFO in the RR message UTRAN CLASSMARK CHANGE -definition and in the RRC message HANDOVER TO UTRAN COMPLETE.

If the MS succeeds to establish the connection to UTRAN after reception of an INTERSYSTEM TO UTRAN HANDOVER COMMAND, the NW may start Integrity protection using the previously received CS START value by sending a SECURITY MODE COMMAND message to the MS.

Reference(s)

3GPP TS 25.331 subclause 8.1.12 and 8.3.6.

3GPP TS 04.18 subclause 3.4.4a and 3.4.11.

60.10.3 Test purpose

To test that MS supporting both GSM and UTRAN applies the correct CS Security START value after a successful handover from GSM to UTRAN when Integrity protection is activated by the NW.

60.10.4 Method of test

Initial conditions

System Simulator:

2 cells - Cell 1 is GSM, Cell 2 is UTRAN.

The present document subclause 40 shall be referenced for the default parameters of cell 1, and subclause 26.6.5.1 shall be referenced for cell allocation.

3GPP TS 34.108, subclause 6.1 shall be referenced for default parameters of Cell 2.

Mobile Station:

"idle, updated", channel released mode with TMSI allocated.

For MS supporting GPRS:

The MS is GPRS attached with a P-TMSI allocated, SPLIT PG CYCLE negotiated.

Specific PICS statements

-

PIXIT statements

-

Foreseen final state of the MS

The MS is in CC state U10 on cell 2.

Test Procedure

The SS brings the MS into the call active state (CC state U10) with FR speech call.

The SS starts the UTRAN cell, configures the UTRAN dedicated channel corresponding to default handover configuration 3 and sends a MEASUREMENT INFORMATION to trigger the MS to perform measurements on the UTRAN cell.

The SS verifies that the MS includes the UTRAN cell in the MEASUREMENT REPORT. The SS then sends a CLASSMARK ENQUIRY requesting an UTRAN CLASSMARK CHANGE from the MS. The MS responds with a UTRAN CLASSMARK CHANGE and the SS verifies that the INTER RAT HANDOVER INFO includes a START value for the CS domain.

The SS sends an INTERSYSTEM TO UTRAN HANDOVER COMMAND indicating the dedicated channel of the target cell to the MS. After the MS receives the command, it shall switch to the dedicated channel of the UTRAN cell. The SS checks whether the handover is performed by checking that the MS transmits HANDOVER TO UTRAN COMPLETE to the SS through DCCH of the UTRAN cell. It is also verified that the START value for the CS domain in the HANDOVER TO UTRAN COMPLETE message is the same as the START value received in the INTER RAT HANDOVER INFO.

The SS attempts to activate Integrity protection by sending an Integrity protected SECURITY MODE COMMAND on the DCCH with an incorrect IE “Integrity check info”. It is verified that the MS does not respond with a SECURITY MODE COMPLETE message.

The SS retransmits the SECURITY MODE COMMAND on the DCCH with a correct IE Integrity Check Info and the MS responds with an Integrity protected SECURITY MODE COMPLETE. Both SS and MS shall use the START value for the CS domain for Integrity protection that the MS has indicated in UTRAN CLASSMARK CHANGE and HANDOVER TO UTRAN COMPLETE.

Expected sequence

Step	Direction		Message	Comments
	MS	SS		
1	MS – SS			The SS brings the MS into GSM U10 state in cell 1 on a hopping traffic channel
2	SS			The SS configures the UTRAN cell with a dedicated channel configuration: conversational/speech/UL:12.2 DL:12.2 kbps/CS RAB + UL:3.4 DL3.4 kbps SRBs in UTRAN cell (default handover configuration 3).
				The following messages are sent and received on the GSM cell
3	←		MEASUREMENT INFORMATION	
4	→		MEASUREMENT REPORT	Including Measurement Results on the UTRAN cell in Step 4.
5	←		CLASSMARK ENQUIRY	
6	→		UTRAN CLASSMARK CHANGE	Verify that the ue-SecurityInformation is present.
7	←		INTERSYSTEM TO UTRAN HANDOVER COMMAND	
8	MS			The MS accepts the handover command and configures its lower layers using the parameters contained in the INTERSYSTEM TO UTRAN HANDOVER COMMAND
9	SS			The SS waits for uplink physical channel in synchronization
				The following messages are sent and received on the UTRAN cell.
10	→		HANDOVER TO UTRAN COMPLETE	Received on DCCH of the UTRAN cell. Verify that the same CS-domain START-Value is indicated as in step 6.
11	←		SECURITY MODE COMMAND	Integrity protected with a different CS-domain START value than the indicated in step 6 is applied.
12	SS			Verify that no SECURITY MODE COMPLETE is sent by the MS for 5 sec.
13	←		SECURITY MODE COMMAND	Integrity protected with the CS-domain START value indicated in step 6 is applied.
14	→		SECURITY MODE COMPLETE	Verify that Integrity protection is applied using the CS-domain START value indicated in step 6.

Specific message contents

MEASUREMENT INFORMATION in Step 3

Same as in 60.1

CLASSMARK ENQUIRY message in Step 5

Information Element	Value/remark
Protocol Discriminator	RR management
Skip Indicator	'0000'B
Message Type	Classmark Enquiry
Classmark Enquiry Mask	
Classmark Enquiry Mask IEI	'00010000'B
Length of Classmark Enquiry Mask contents	'00000001'B
Classmark Enquiry Mask value part	'10001000'B Note
Note CLASSMARK CHANGE message is not requested; UTRAN CLASSMARK CHANGE message is requested; CDMA2000 CLASSMARK CHANGE message is not requested	

UTRAN CLASSMARK CHANGE message in step 6

Information Element	Value/remark

Protocol Discriminator
Skip Indicator
Message Type
UTRAN Classmark
  Length of UTRAN Classmark
  UTRAN Classmark value part
	RR management
	‘0000’B
	UTRAN ‘Classmark Change
	
	Length of INTER RAT HANDOVER INFO
	INTER RAT HANDOVER INFO

InterRATHandoverInfo
  PredefinedConfigurationStatusList
  ue-SecurityInformation
    start-CS
…
	RR management
	(Optional) Not checked
	Checked that the IE is present
	20 bits
	Rest of message not checked

INTER SYSTEM TO UTRAN HANDOVER COMMAND message in Step 7

Same content as in 60.1

HANDOVER TO UTRAN COMPLETE message in step 10

Information Element	Value/remark

UL-DCCH-Message
  IntegrityCheckInfo
  Message
    HandoverToUTRANComplete
      StartList
      [0]
        cn-DomainIdentity
        start-Value
      [1]
        cn-DomainIdentity
        start-Value
      …
	
	Not defined
	handoverToUTRANComplete
	
	cs –domain Checked that IE is present
	20 bits
	
	ps-domain Not checked
	20 bits
	-

SECURITY MODE COMMAND message AM, in step 11

Information Element	Value/remark
Message Type RRC transaction identifier Integrity check info - Message authentication code UE system specific security capability	 Arbitrarily selects an integer between 0 and 3 Set to MAC-I value computed by the SS using a different START value for the CS domain from the indicated in the INTER RAT HANDOVER INFO. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I.
- Inter-RAT UE security capability	
- CHOICE *system*	GSM
- GSM security capability	The indicated algorithms must be the same as the algorithms supported by the UE as indicated in the IE " Mobile station classmark 2 " in the LOCATION UPDATING REQUEST message.

SECURITY MODE COMMAND message AM, in step 13

Information Element	Value/remark
Message Type RRC transaction identifier Integrity check info - Message authentication code UE system specific security capability	 Arbitrarily selects an integer between 0 and 3 Set to MAC-I value computed by the SS using the indicated START value for the CS domain from the INTER RAT HANDOVER INFO. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I.
- Inter-RAT UE security capability	
- CHOICE *system*	GSM
- GSM security capability	The indicated algorithms must be the same as the algorithms supported by the UE as indicated in the IE " Mobile station classmark 2 " in the LOCATION UPDATING REQUEST message.

60.10.5 Test requirement

After step 14, the ongoing call shall continue on UTRAN cell with Integrity protection using the CS Security START value indicated in the UTRAN CLASSMARK CHANGE.

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