

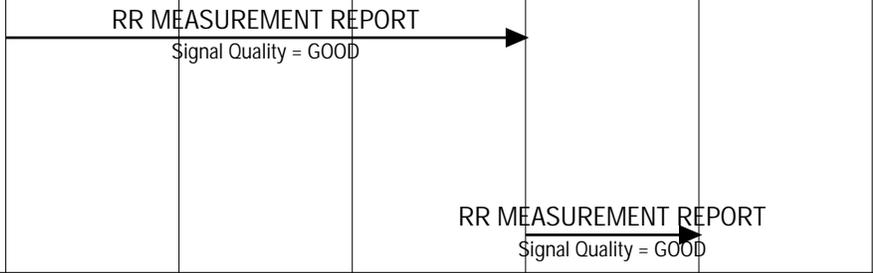
Inter BSC - Intra MSC Handover Call Flow (GSM Inter BSC - Intra MSC Handover Call Flow)						
Highway	GSM Coverage				GSM Equipment	EventHelix.com/EventStudio 2.5
GSM Mobile	Bethesda		Rockville		MSC VLRs	
Mobile	Bethesda Cell	Bethesda BSC	Rockville Cell	Rockville BSC	Maryland MSC VLR	04-Dec-04 11:46 (Page 1)

How does a GSM mobile phone maintain a call even when moving from one cell to another?

The calls are maintained by handing over a call from one cell to another. This call flow covers a simple case of call handover in GSM. Here a user has an active call and is moving from the Rockville Cell to the Bethesda Cell. As the user moves, the call will be handed over by the Rockville Cell to the Bethesda Cell.

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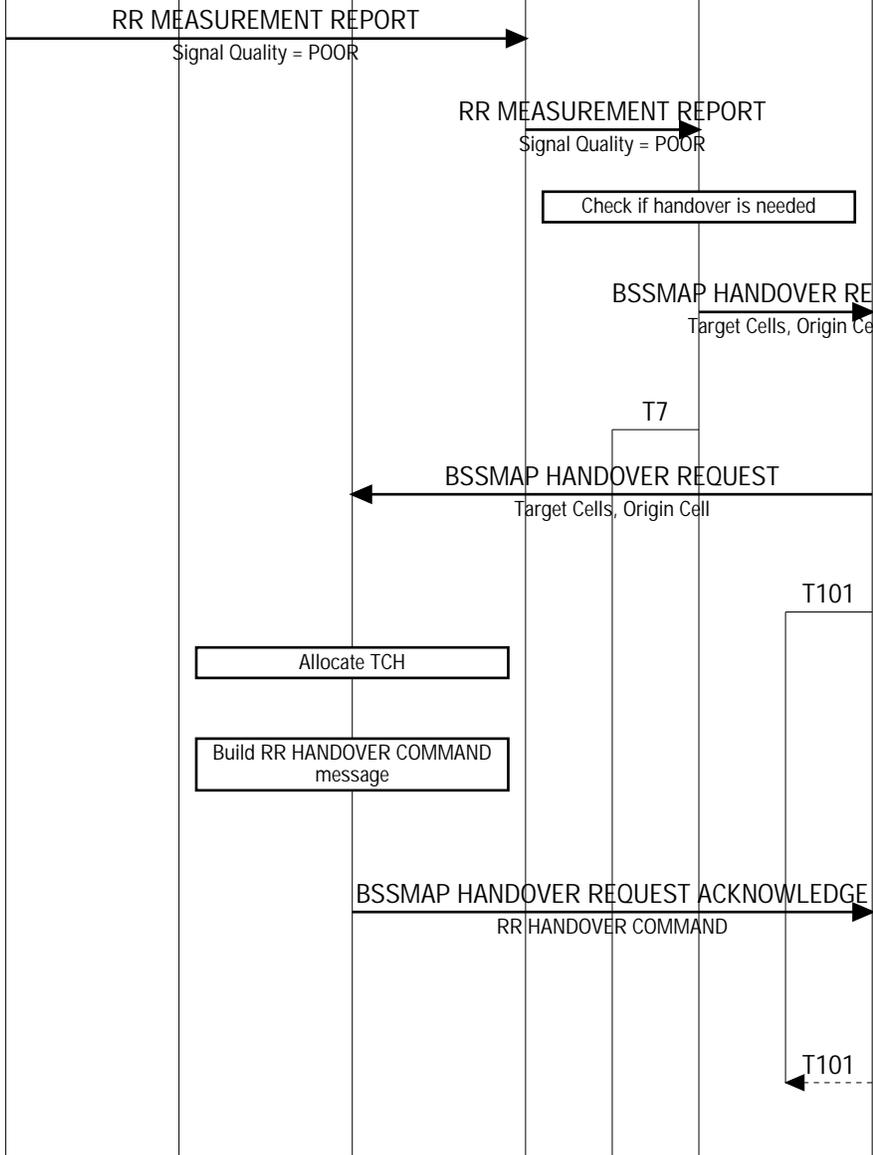
The GSM Mobile has an active call in the Rockville Cell.



When a call is active, the mobile periodically reports the signal quality to the network via the Measurement Report message. This message is sent in every SACCH frame with a periodicity of 480 ms. The measurement report also includes the signal quality measurements for neighboring cells.

The mobile is reporting good signal quality, so no further action is taken.

The user reaches the boundary between the Rocville Cell and Bethesda cell.



The mobile is at the edge of the Rockville cell and it reports that it is seeing a much weaker signal from the Rockville cell.

The Rockville BSC decides to initiate a handover as the mobile will be better served by another cell.

The BSC analyses the measurement reports to determine that the mobile will be best served by the Bethesda Cell.

The BSC decides to request a handover. A list of target cells is provided to the MSC. The Bethesda Cell is included in the list of target cells.

The T7 timer is started to wait for the handover command from the MSC.

The MSC passes on the handover request to the Bethesda BSC. (The Rockville BSC identified this BSC as a target cell for handover.)

The MSC-VLR starts a timer to await the response from the Bethesda BSC.

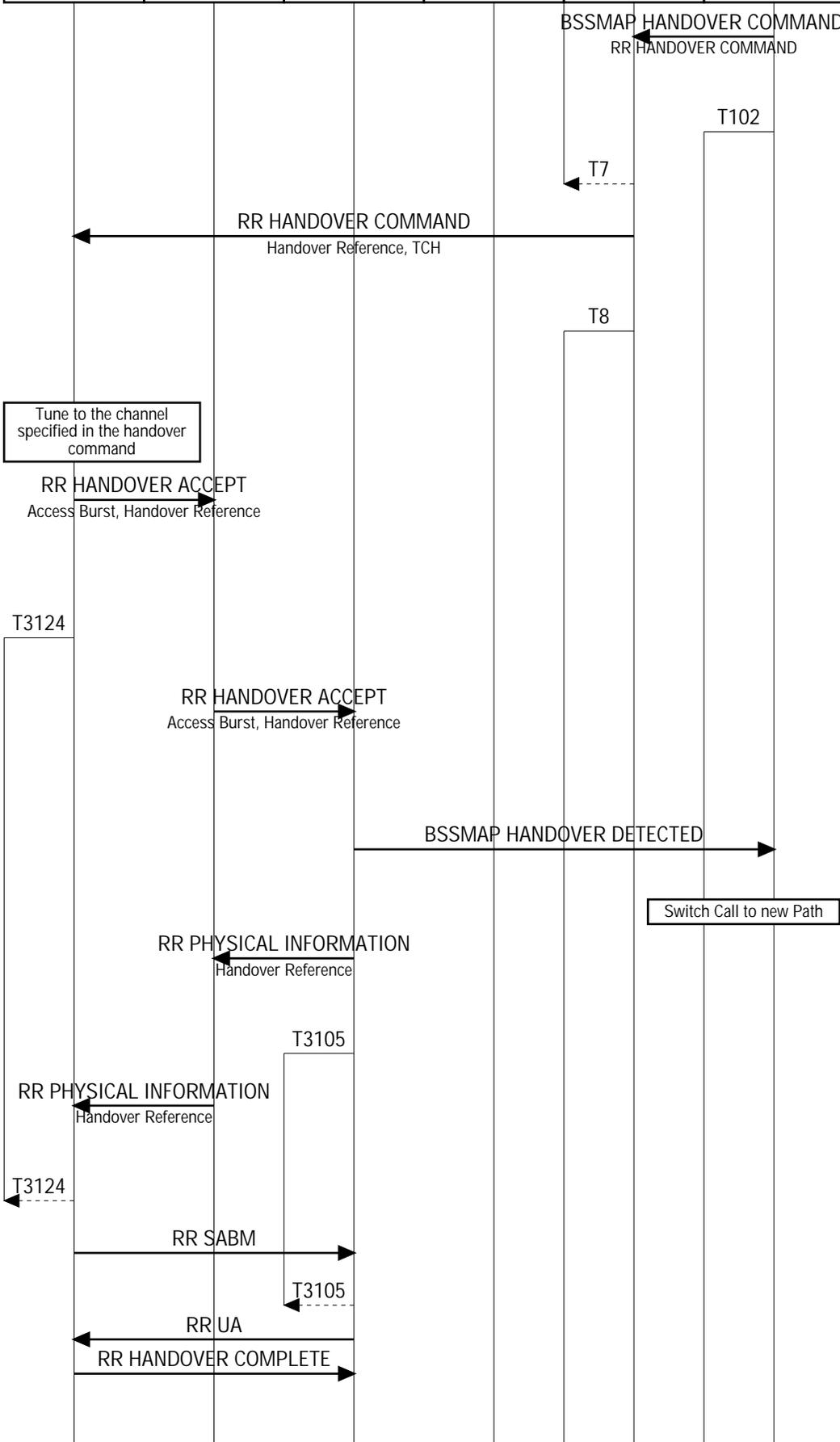
The handover request is treated as a new call. A traffic channel (TCH) is allocated for the call that will be handed-in.

At this point the Bethesda BSC prepares the handover command that needs to be sent to the mobile. This message contains all the information the mobile will need to handover to this cell.

The Bethesda BSC includes the RR HANDOVER COMMAND message as a payload in the HANDOVER REQUEST ACK that is sent back to the MSC. The RR HANDOVER COMMAND will be delivered to the mobile via the Rockville BSC.

The MSC has heard back from the destination BSC, thus the T101 timer is stopped.

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The MSC delivers the handover command to the Rockville BSC. This command encapsulates the RR HANDOVER COMMAND from the destination BSC.

T102 is started to track the completion of the handover.

The handover command has been received. So the T7 timer can now be stopped.

The Rockville BSC extracts the RR HANDOVER COMMAND message from the BSSMAP message and sends it to the mobile.

T8 is started to await the clear of this call from the MSC. If the handover to the target cell is successful, the MSC will initiate a resource release to the source BSC.

The extracts the destination channel information from the message and tunes to the assigned channel.

After tuning to the assigned channel, the mobile starts sending the handover accept message. Note that this message is sent as an access burst as the mobile is not completely synchronized to send normal bursts.

The T3124 timer is started to await the PHYSICAL INFORMATION message from the network.

The BSC receives the HANDOVER ACCEPT from the terminal. The actual call is identified using the handover reference. (The handover reference was send in the encapsulated HANDOVER COMMAND message.)

The BSC informs the MSC that the handover has been detected. At this point the MSC can switch the voice path.

The MSC switches the voice path.

The BSC sends the PHYSICAL INFORMATION message to the mobile. This message contains a time and frequency correction.

T3105 is started to await the receipt of the SABM for the signaling connection.

The mobile applies the received corrections and can now send TCH bursts on the channel. TCH bursts contain the speech from the user.

T3124 is stopped as PHYSICAL INFORMATION message has been received.

Mobile sends a SABM to establish the signaling connection.

Receipt of SABM stops the T3105 timer.

The BSC replies with a UA message.

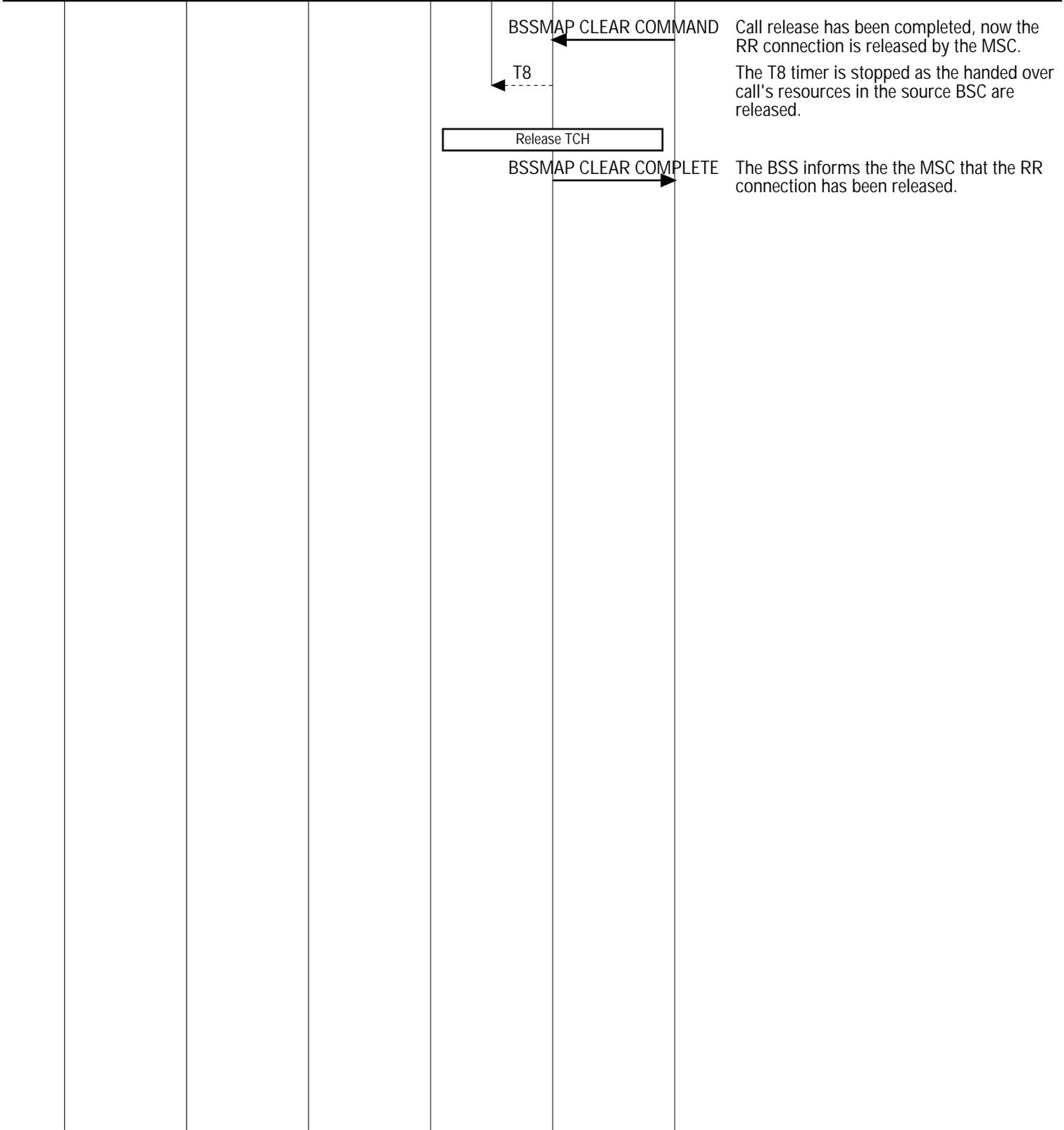
The mobile uses the signaling connection to indicate that the handover has been completed.

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The BSC forwards the handover completion event to the MSC.
Handover has been completed, so T102 is stopped.

Release call resources in Rockville BSC.



Call release has been completed, now the RR connection is released by the MSC.
The T8 timer is stopped as the handed over call's resources in the source BSC are released.
The BSS informs the the MSC that the RR connection has been released.