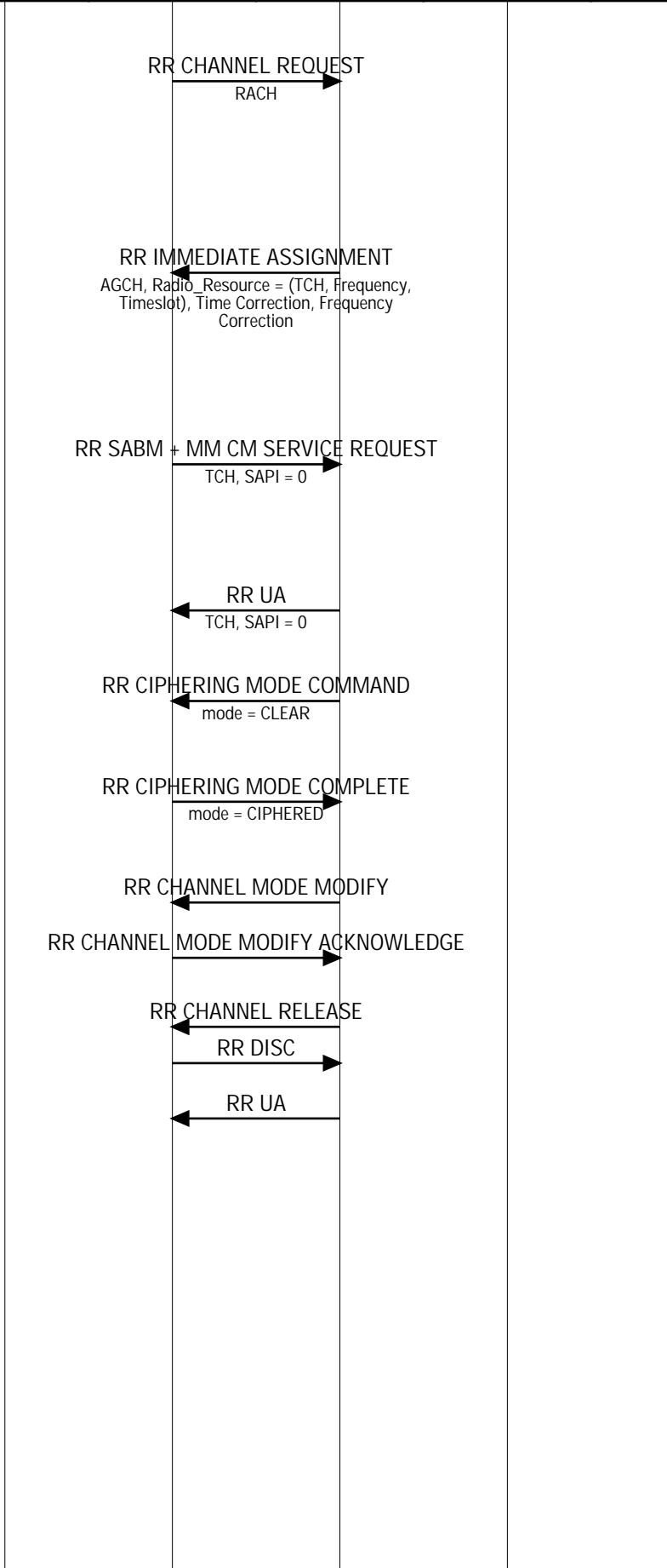


<RR> Interfaces (GSM Originating Call)					
Cell		Mobile Network		Fixed Network	EventHelix.com/EventStudio 2.5 15-Oct-04 20:10 (Page 1)
Mobile Station		Base Stations	NSS	PSTN	
User	Mobile	BSS	MSC VLR	PSTN	



LEG: GSM Mobile Originated Call

RR connection establishment is triggered by sending the Channel Request message. This message requests the Base Station System (BSS) for allocation for radio resources for the RR connection setup. The mobile now waits for an assignment on the Access Grant Channel (AGCH). At this point the mobile is listening to the AGCH for a reply.

The BSS transmits the radio resource assignment to the Mobile via the AGCH channel. The message also contains the time and frequency corrections. The time corrections allow the mobile to time its transmissions so that they reach the BSS only in the specified slot. The frequency corrections correct for the Doppler shift caused by the mobile's motion.

This is the first message that is sent after tuning to the channel. The Mobile initiates a LAPm connection with the BSC by sending a Set Asynchronous Balanced Mode (SABM) message. The service request message meant for the MSC is also sent in this message.

The BSS replies with Unnumbered Acknowledge (UA) to complete the LAPm setup handshake

LEG: Initiate Authentication Procedure

The BSS sends the CIPHERING MODE COMMAND to the mobile. The mobile will be able to receive this message as the transmission from the BSS is still in clear.

Ciphering has already been enabled, so this message is transmitted with ciphering. The BSS will receive this message as it is already expecting ciphered data in the receive direction.

The BSS notifies the Mobile about the changeover to voice mode.

Mobile acknowledges.

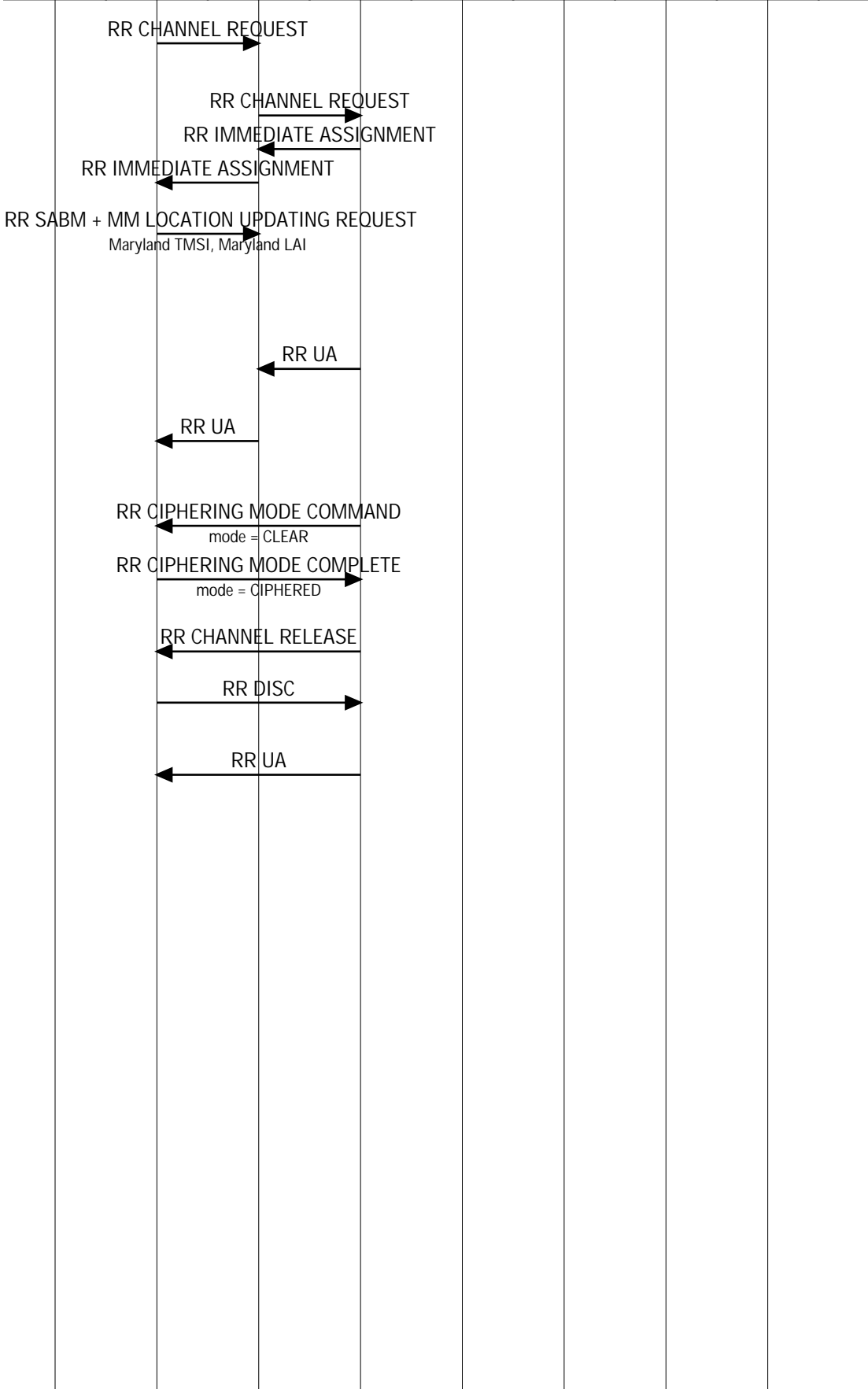
LEG: Mobile initiates call release

The BSS initiates RR release with the mobile.

The mobile sends a disconnect message to release the LAPm connection.

The BSS replies with an Unnumbered Acknowledge message.

<RR> Interfaces (GSM Location Update)									
Highway		Virginia			GSM	Maryland			EventHelix.com/EventStudio 2.5
GSM Mobiles		Virginia Location Area	Virginia GSM Equipment		GSM Databases	Maryland Location Area		Maryland GSM Equipment	
Other GSM Mobile	GSM Mobile	Vienna Cell	Virginia BSC	Virginia MSC VLR	HLR	Rockville Cell	Bethesda Cell	Maryland MSC VLR	15-Oct-04 20:10 (Page 2)



The mobile establishes a RR connection to send the location update to the network.

A radio channel has been assigned to the GSM mobile.

The mobile tunes to the assigned radio channel and sends the SABM to initiate the radio connection. The location update is also piggybacked on the message.

The RR connection setup is completed by responding with UA for the received SABM.

LEG: Inter MSC-VLR location update

The BSC sends the CIPHERING MODE COMMAND to the mobile.

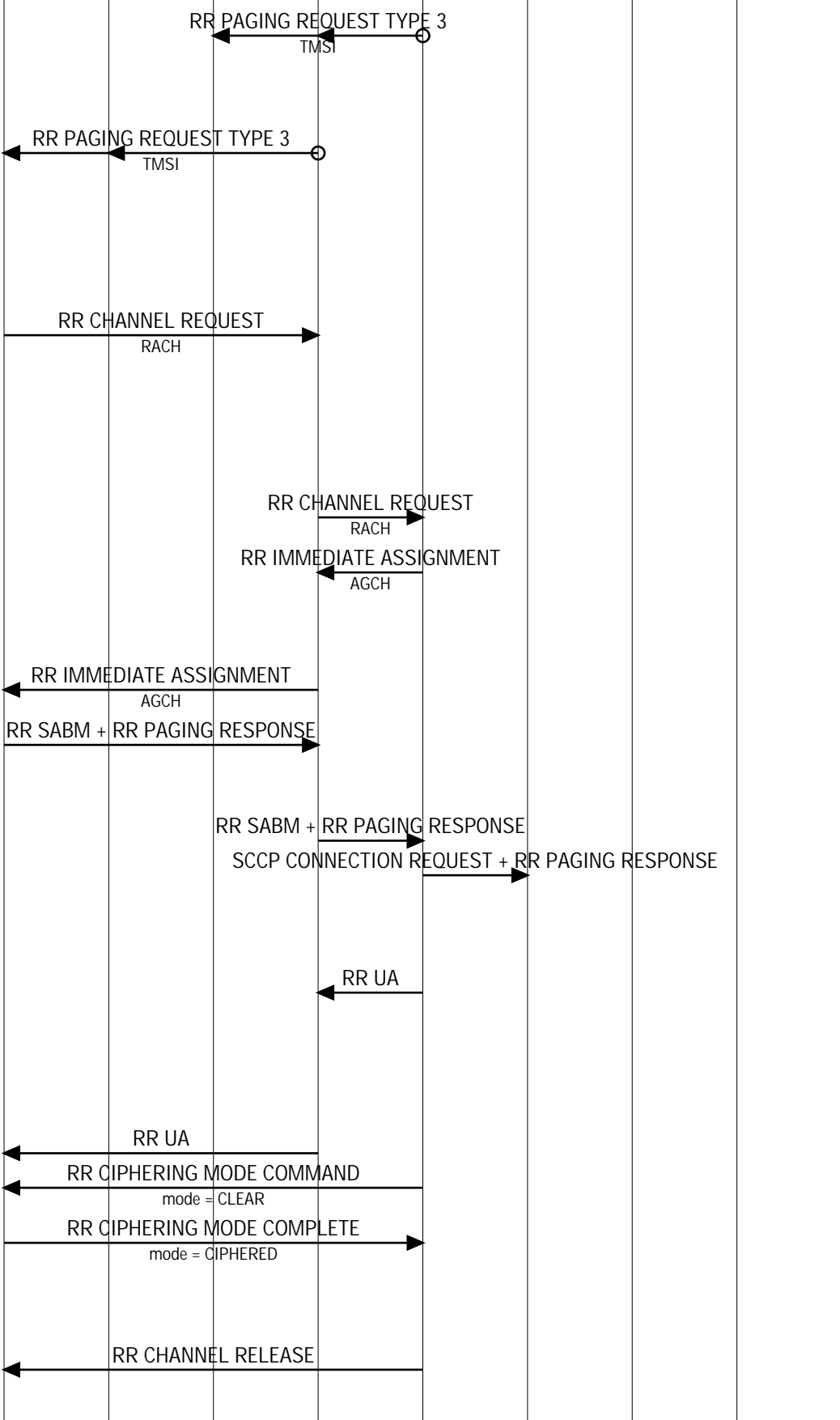
Ciphering has already been enabled, so this message is transmitted with ciphering.

The BSC initiates RR release with the mobile.

The mobile sends a disconnect message to release the LAPm connection.

The BSC replies with an Unnumbered Acknowledge message.

<RR> Interfaces (GSM Terminating Call)										
Highway		Maryland				GSM		Fixed Network	EventHelix.com/EventStudio 2.5	
GSM Mobiles		Maryland Location Area		Maryland GSM Equipment		GSM Common Equipment		PSTN		
GSM Mobile	Other GSM Mobile	Rockville Cell	Bethesda Cell	Maryland BSC	Maryland MSC VLR	HLR	GMSC	PSTN	15-Oct-04 20:10 (Page 3)	



The Maryland BSC receives the page message. The BSC will send the Page message to all the cells that serve the subscriber's location area.

All cells in the location area will broadcast the Page message on the Paging Channel (PCH). All mobile phones listen to this channel every few seconds. The mobile is located in the Bethesda cell. It receives this page message.

The mobile finds that the TMSI specified in the page message matches its own TMSI. The mobile decides to respond to the page. An RR connection establishment is initiated by sending a channel request to the network.

The network assigns a channel to the terminal and sends the assignment and time/frequency corrections in the immediate assignment message.

The mobile tunes to the assigned channel and transmits the page response and the SABM to initiate the RR session.

The BSC sends a SCCP connection request to the MSC VLR. The page response message is piggy backed with the request.

The BSC acknowledges the SABM to establish the RR connection. Note that UA messages are used in the entire session for acknowledging packets. They will be omitted here for clarity.

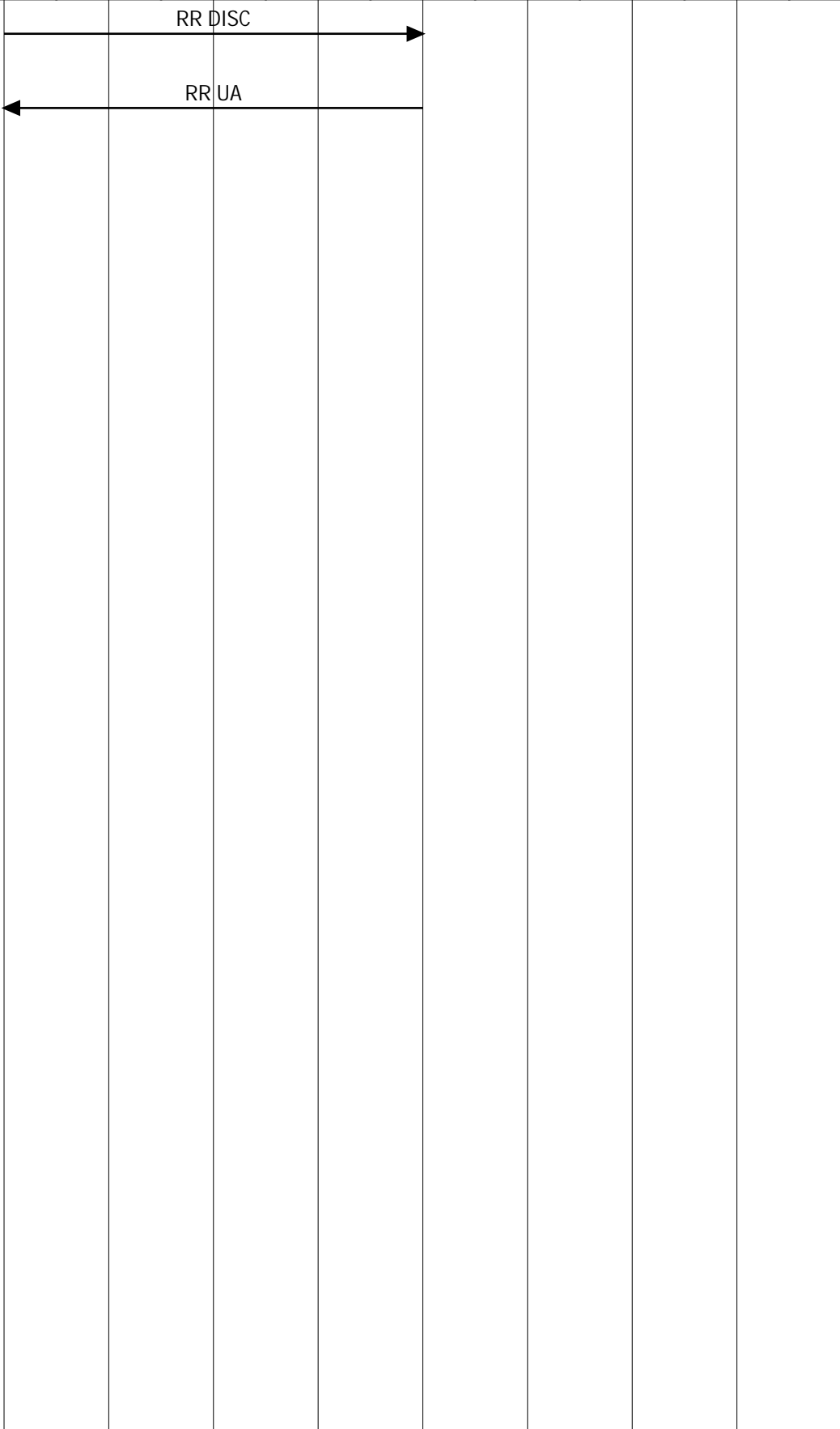
The BSC sends the CIPHERING MODE COMMAND to the mobile.

Ciphering has already been enabled, so this message is transmitted with ciphering.

LEG: Mobile initiates call release

The BSC initiates RR release with the mobile.

<RR> Interfaces (GSM Terminating Call)										
Highway		Maryland				GSM		Fixed Network	EventHelix.com/EventStudio 2.5	
GSM Mobiles		Maryland Location Area		Maryland GSM Equipment		GSM Common Equipment		PSTN		
GSM Mobile	Other GSM Mobile	Rockville Cell	Bethesda Cell	Maryland BSC	Maryland MSC VLR	HLR	GMSC	PSTN	15-Oct-04 20:10 (Page 4)	



The mobile sends a disconnect message to release the LAPm connection.
 The BSC replies with an Unnumbered Acknowledge message.