

APPENDIX G - EXAMPLES OF RLS GNSS RECEIVER TIMING

The operation of the RLS GNSS Receiver is defined in section 4.5.9.2 of this document. A set of examples of RLS operation are provided in Table G.1, which cover a range of conditions to clarify the interpretation of the M_{offset} timing, and are summarized below:

- 1) UTC + M_{offset} of 59 minutes - No RLM received;
- 2) No UTC + M_{offset} of 1 minute - UTC acquired at 2:34 - RLM received at 4:07;
- 3) UTC + M_{offset} of 17 minutes - No RLM received;
- 4) UTC + M_{offset} of 20 minutes - RLM received at 2:29; and
- 5) UTC + M_{offset} of 11 minutes - RLM received at 0:45.

These examples are provided to ensure a common understanding of the expected functioning of the M_{offset} capability and are intended to be used as the basis for the development test scenarios. The above five examples are believed to cover all of the timing scenarios that can exist, between the activation of the RLS GNSS Receiver and various values of M_{offset} , and specifically cover the following situations:

- UTC acquired soon after beacon activated;
- UTC not acquired until sometime after the beacon is activated;
- no RLM received within the 6-hour RLS operational timeframe;
- GNSS timing changes between the M_{offset} timing and the regular GNSS receiver timing;
- correct occurrence of the first M_{offset} GNSS Receiver timing versus beacon activation time; and
- ideal functioning of the RLS system.

Table G.1: Example Scenarios for RLS GNSS Timing

Description of GNSS and Beacon Operation	Beacon RLM Attempt	Example 1	Example 2
		UTC + M_{offset} 59 minutes, No RLM received	No UTC + M_{offset} 1 minutes, UTC acquired at 2:34, RLM received at 4:07
Time at which Beacon is Activated		0:00	0:17
Time of first RLM Request transmission	1	0:01	0:18
GNSS Receiver first 30 minute on period		0:30	0:47*
GNSS Receiver next turns on at	2	0:59	1:02
GNSS Receiver next turns off at		1:14	1:05
GNSS Receiver next turns on at	3	1:59	1:17
GNSS Receiver next turns off at		2:14	1:20
GNSS Receiver next turns on at	4	2:59	1:32
GNSS Receiver next turns off at		3:14	1:35
GNSS Receiver next turns on at	5	3:59	1:47
GNSS Receiver next turns off at		4:14	2:02
GNSS Receiver next turns on at	6	4:59	2:32
GNSS Receiver next turns off at		5:14	2:34 [†]
GNSS Receiver next turns on at	7	5:59	3:01
GNSS Receiver next turns off at		6:00 [‡]	3:16
GNSS Receiver next turns on at	8		4:01
GNSS Receiver next turns off at			4:07 [§]
GNSS Receiver reverts to non-RLS operation		6:00	4:07

Note that interleaved with the GNSS Receiver timings, the GNSS receiver also turns on in accordance with section 4.5.5.2, as well in Examples 1, 3 and 4, but these GNSS 'on' periods are omitted for clarity in the tables.

* Timing reverts to schedule per document C/S T.018, section 4.5.5.2.

[†] UTC acquired, back to RLS schedule

[‡] Last 'on' period, 1-minute duration, as 6 hours have elapsed from beacon turn-on.

[§] With no UTC reference, receiver reverts to document C/S T.018 section 4.5.5.2 timing, until UTC is obtained.

Table G.1 (Continued): Example Scenarios for RLS GNSS Timing

Description of GNSS and Beacon Operation	Beacon RLM Attempt	Example 3	Example 4	Example 5
		UTC + M_{offset} 17 minutes, No RLM received	UTC + M_{offset} 20 minutes, RLM received at 2:29	UTC + M_{offset} 11 minutes, RLM received at 0:45
Time at which Beacon is Activated		0:58	0:14	0:40
Time of first RLM Request transmission	1	0:59	0:15	0:41
GNSS Receiver first 30 minute on period		1:28	0:44	0:45*
GNSS Receiver next turns on at	2	2:17	1:20	
GNSS Receiver next turns off at		2:32	1:35	
GNSS Receiver next turns on at	3	3:17	2:20	
GNSS Receiver next turns off at		3:32	2:29 [†]	
GNSS Receiver next turns on at	4	4:17		
GNSS Receiver next turns off at		4:32		
GNSS Receiver next turns on at	5	5:17		
GNSS Receiver next turns off at		5:32		
GNSS Receiver next turns on at	6	6:17		
GNSS Receiver next turns off at		6:32		
GNSS Receiver next turns on at	7	‡		
GNSS Receiver next turns off at				
GNSS Receiver reverts to non-RLS operation		6:32	2:29	0:45

– END OF APPENDIX G –

* GNSS only ‘on’ for 4 min until RLM received, M_{offset} never needed.

† GNSS only ‘on’ for 9 min, until RLM received.

‡ 6 hours up at 6:58, so no seventh attempt is initiated for this case.