REX Activities in KEM1 Approach, Encounter, and Cruise; and KEM2 Cruise

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The REX activities in Loads 18240 to 21361, are associated with four tasks:

1. 2014 MU_{69} (Arrokoth) Encounter Observations
2. Radio Path Characterization
3. Calibration Campaign for testing instrument response differences
4. Ecliptic Dust Radiometry test for second extended mission proposal

Each of the tasks was bookended with the REX Test Patterns, which use preset sequences with known response to compare with the REX output to test the performance of the REX process. Since the Test Patterns are run in concert with every REX event, they will not be further described in the four REX measurements to follow.

1. Arrokoth Encounter Observations (Load 18359), Lead-In (Load 18344), and Lead-Out (19003)

The following is the DataTrack listing of the REX data during the Arrokoth Encounter.

18344	KARX_1ab_TestPatt_2018_358	2018-358_19:04:33	S/C	407,984,193	407,984,318
18344	KARX_1ab_TestPatt_2018_358	2018-358_19:04:48	S/C	407,984,208	407,984,318

18359	KERX_MU69_CA03-TEMP_REX_2019001__RADIOMETRIC	2019-001_04:28:04	S/C	408,622,807	408,623,822
18359	KERX_MU69_CA03-TEMP_REX_2019001__RADIOMETRIC	2019-001_04:28:19	S/C	408,622,822	408,623,689

18359	KERX_M_CA08P_REX	2019-001_05:48:19	S/C	408,627,621	408,628,218
18359	KERX_M_CA08P_REX	2019-001_05:48:34	S/C	408,627,636	408,628,677

18359	KERX_EARTH_CA12-IONSPHR_REX_2019001	2019-001_06:05:44	S/C	408,628,674	408,630,748
18359	KERX_EARTH_CA12-IONSPHR_REX_2019001	2019-001_06:05:59	S/C	408,628,689	408,671,798

18359	KERX_X_CA08-TEMP-BKGD_REX_2019002	2019-002_03:18:39	S/C	408,705,044	408,709,585
18359	KERX_X_CA08-TEMP-BKGD_REX_2019002	2019-002_03:18:54	S/C	408,705,059	408,709,600
18359	KERX_X_CA03-TEMP-BKGD_REX_2019002	2019-002_04:34:27	S/C	408,709,594	408,710,820
18359	KERX_X_CA03-TEMP-BKGD_REX_2019002	2019-002_04:34:42	S/C	408,709,609	408,710,820

19003	KDRX_1ab_TestPatt_2019_004	2019-004_22:04:33	S/C	408,945,393	408,945,518
19003	KDRX_1ab_TestPatt_2019_004	2019-004_22:04:48	S/C	408,945,408	408,945,518

2. Radio Path Characterization (Loads 18240, 18287, 19017–19213, 19276 thru subsequent loads up thru load 21361)

Radio path characterization measurements with REX were nominally on a monthly cadence during most of the New Horizons extended mission. Due to operations constraints such as spacecraft hibernation and DSN scheduling, the monthly cadence has been irregular. The REX data are from uplinks in both polarizations (RCP and LCP) when possible (sometimes there were transmitter failures), and are recorded and processed as described for the solar conjunctions. The objective is to assess the uplink's frequency and amplitude stability, and to associate the standard deviation measure of the stability distributions with characteristics of the radio path such as multipath propagation. January 2022 was the last radio path characterization done and no future ones are currently planned.

The Radio Path Characterization was done on:

2018	2019	2020	2021	2022
		January 09	January 06	January 13
	February 02	February 11	February 15	
	March 21	March 10	March 15	
	April 19		April 15	
	May 07	May 19	May 20	
	June 12	June 26	June 15	
	July 10	July 29	July 13	
	August 08	August 21	August 11	
September 09		September 22	September 07	
October 20	October 19	October 20	October 09	
	November 14	November 18	November 21	
	December 21	December 20	December 12	

The following is the DataTrack listing of the REX data during the Radio Path Characterizations.

09/09/2018:

18240	KARX_1ab_TestPatt_2018_252	2018-252_09:42:30	S/C	398,792,070	398,792,372
18240	KARX_1ab_TestPatt_2018_252	2018-252_09:42:45	S/C	398,792,085	398,792,387
18240	KARX_3ab_Radio_Path_Characterization_2018_252	2018-252_09:47:34	S/C	398,792,374	398,792,568
18240	KARX_3ab_Radio_Path_Characterization_2018_252	2018-252_09:47:49	S/C	398,792,389	398,792,568

10/20/2018:

18287	KARX_1ab_TestPatt_2018_293	2018-293_07:36:17	S/C	402,326,897	402,327,199
18287	KARX_1ab_TestPatt_2018_293	2018-293_07:36:32	S/C	402,326,912	402,327,214
18287	KARX_3ab_Radio_Path_Characterization_2018_293	2018-293_07:41:21	S/C	402,327,201	402,327,390
18287	KARX_3ab_Radio_Path_Characterization_2018_293	2018-293_07:41:36	S/C	402,327,216	402,327,390

02/02/2019:

19017	KDRX_1ab_TestPatt_2019_033	2019-033_21:08:59	S/C	411,447,659	411,447,961
19017	KDRX_1ab_TestPatt_2019_033	2019-033_21:09:14	S/C	411,447,674	411,447,976
19017	KDRX_3ab_Radio_Path_Characterization_2019_033	2019-033_21:14:03	S/C	411,447,963	411,448,152
19017	KDRX_3ab_Radio_Path_Characterization_2019_033	2019-033_21:14:18	S/C	411,447,978	411,448,152

03/21/2019:

19073	KDRX_1ab_TestPatt_2019_080	2019-080_22:02:09	S/C	415,511,649	415,511,951
19073	KDRX_1ab_TestPatt_2019_080	2019-080_22:02:24	S/C	415,511,664	415,511,966
19073	KDRX_3ab_Radio_Path_Characterization_2019_080	2019-080_22:07:13	S/C	415,511,953	415,512,142
19073	KDRX_3ab_Radio_Path_Characterization_2019_080	2019-080_22:07:28	S/C	415,511,968	415,512,142

04/19/2019:

19108	KDRX_1ab_TestPatt_2019_109	2019-109_20:05:00	S/C	418,010,220	418,010,522
19108	KDRX_1ab_TestPatt_2019_109	2019-109_20:05:15	S/C	418,010,235	418,010,537
19108	KDRX_3ab_Radio_Path_Characterization_2019_109	2019-109_20:10:04	S/C	418,010,524	418,010,713
19108	KDRX_3ab_Radio_Path_Characterization_2019_109	2019-109_20:10:19	S/C	418,010,539	418,010,713

05/07/2019:

19108	KDRX_1ab_TestPatt_2019_127	2019-127_21:13:49	S/C	419,569,549	419,569,851
19108	KDRX_1ab_TestPatt_2019_127	2019-127_21:14:04	S/C	419,569,564	419,569,866
19108	KDRX_3ab_Radio_Path_Characterization_2019_127	2019-127_21:18:53	S/C	419,569,853	419,570,042
19108	KDRX_3ab_Radio_Path_Characterization_2019_127	2019-127_21:19:08	S/C	419,569,868	419,570,042

06/12/2019:

19150	KDRX_1ab_TestPatt_2019_163	2019-163_17:04:25	S/C	422,664,985	422,665,287
19150	KDRX_1ab_TestPatt_2019_163	2019-163_17:04:40	S/C	422,665,000	422,665,302
19150	KDRX_3ab_Radio_Path_Characterization_2019_163	2019-163_17:09:29	S/C	422,665,289	422,665,478
19150	KDRX_3ab_Radio_Path_Characterization_2019_163	2019-163_17:09:44	S/C	422,665,304	422,665,478

07/10/2019:

19171	KDRX_1ab_TestPatt_2019_191	2019-191_16:03:49	S/C	425,080,549	425,080,851
19171	KDRX_1ab_TestPatt_2019_191	2019-191_16:04:04	S/C	425,080,564	425,080,866
19171	KDRX_3ab_Radio_Path_Characterization_2019_191	2019-191_16:08:53	S/C	425,080,853	425,081,042
19171	KDRX_3ab_Radio_Path_Characterization_2019_191	2019-191_16:09:08	S/C	425,080,868	425,081,042

08/08/2019:

19213	KDRX_1ab_TestPatt_2019_220	2019-220_12:41:53	S/C	427,574,033	427,574,335
19213	KDRX_1ab_TestPatt_2019_220	2019-220_12:42:08	S/C	427,574,048	427,574,350
19213	KDRX_3ab_Radio_Path_Characterization_2019_220	2019-220_12:46:57	S/C	427,574,337	427,574,526
19213	KDRX_3ab_Radio_Path_Characterization_2019_220	2019-220_12:47:12	S/C	427,574,352	427,574,526

10/19/2019:

19276	K2RX_1ab_TestPatt_2019_292	2019-292_07:55:28	S/C	433,777,647	433,777,949
19276	K2RX_1ab_TestPatt_2019_292	2019-292_07:55:43	S/C	433,777,662	433,777,964
19276	K2RX_3ab_Radio_Path_Characterization_2019_292	2019-292_08:00:32	S/C	433,777,951	433,778,140
19276	K2RX_3ab_Radio_Path_Characterization_2019_292	2019-292_08:00:47	S/C	433,777,966	433,778,140

11/14/2019:

19297	K2RX_1ab_TestPatt_2019_318	2019-318_09:05:35	S/C	436,028,254	436,028,556
19297	K2RX_1ab_TestPatt_2019_318	2019-318_09:05:50	S/C	436,028,269	436,028,571
19297	K2RX_3ab_Radio_Path_Characterization_2019_318	2019-318_09:10:39	S/C	436,028,558	436,028,747
19297	K2RX_3ab_Radio_Path_Characterization_2019_318	2019-318_09:10:54	S/C	436,028,573	436,028,747

12/21/2019:

19339	K2RX_1ab_TestPatt_2019_355	2019-355_04:36:04	S/C	439,208,883	439,209,185
19339	K2RX_1ab_TestPatt_2019_355	2019-355_04:36:19	S/C	439,208,898	439,209,200
19339	K2RX_3ab_Radio_Path_Characterization_2019_355	2019-355_04:41:08	S/C	439,209,187	439,209,376
19339	K2RX_3ab_Radio_Path_Characterization_2019_355	2019-355_04:41:23	S/C	439,209,202	439,209,376

01/09/2020:

20006	K2RX_1ab_TestPatt_2020_009	2020-009_03:27:37	S/C	440,846,376	440,846,678
20006	K2RX_1ab_TestPatt_2020_009	2020-009_03:27:52	S/C	440,846,391	440,846,693
20006	K2RX_3ab_Radio_Path_Characterization_2020_009	2020-009_03:32:41	S/C	440,846,680	440,846,869
20006	K2RX_3ab_Radio_Path_Characterization_2020_009	2020-009_03:32:56	S/C	440,846,695	440,846,869

02/11/2020:

20041	K2RX_1ab_TestPatt_2020_042	2020-042_20:48:25	S/C	443,760,024	443,760,326
20041	K2RX_1ab_TestPatt_2020_042	2020-042_20:48:40	S/C	443,760,039	443,760,341
20041	K2RX_3ab_Radio_Path_Characterization_2020_042	2020-042_20:53:29	S/C	443,760,328	443,760,517
20041	K2RX_3ab_Radio_Path_Characterization_2020_042	2020-042_20:53:44	S/C	443,760,343	443,760,517

03/10/2020:

20062	K2RX_1ab_TestPatt_2020_070	2020-070_18:57:18	S/C	446,172,557	446,172,859
20062	K2RX_1ab_TestPatt_2020_070	2020-070_18:57:33	S/C	446,172,572	446,172,874
20062	K2RX_3ab_Radio_Path_Characterization_2020_070	2020-070_19:02:22	S/C	446,172,861	446,173,050
20062	K2RX_3ab_Radio_Path_Characterization_2020_070	2020-070_19:02:37	S/C	446,172,876	446,173,050

05/19/2020:

20140	K2RX_1ab_TestPatt_2020_140	2020-140_14:12:39	S/C	452,203,478	452,203,780
20140	K2RX_1ab_TestPatt_2020_140	2020-140_14:12:54	S/C	452,203,493	452,203,795
20140	K2RX_3ab_Radio_Path_Characterization_2020_140	2020-140_14:17:43	S/C	452,203,782	452,203,971
20140	K2RX_3ab_Radio_Path_Characterization_2020_140	2020-140_14:17:58	S/C	452,203,797	452,203,971

06/26/2020:

20168	K2RX_1ab_TestPatt_2020_178	2020-178_11:42:30	S/C	455,477,669	455,477,971
20168	K2RX_1ab_TestPatt_2020_178	2020-178_11:42:45	S/C	455,477,684	455,477,986
20168	K2RX_3ab_Radio_Path_Characterization_2020_178	2020-178_11:47:34	S/C	455,477,973	455,478,162
20168	K2RX_3ab_Radio_Path_Characterization_2020_178	2020-178_11:47:49	S/C	455,477,988	455,478,162

07/29/2020:

20202	K2RX_1ab_TestPatt_2020_211	2020-211_09:30:03	S/C	458,320,922	458,321,224
20202	K2RX_1ab_TestPatt_2020_211	2020-211_09:30:18	S/C	458,320,937	458,321,239
20202	K2RX_3ab_Radio_Path_Characterization_2020_211	2020-211_09:35:07	S/C	458,321,226	458,321,415
20202	K2RX_3ab_Radio_Path_Characterization_2020_211	2020-211_09:35:22	S/C	458,321,241	458,321,415

08/21/2020:

20223	K2RX_1ab_TestPatt_2020_234	2020-234_08:01:18	S/C	460,302,797	460,303,099
20223	K2RX_1ab_TestPatt_2020_234	2020-234_08:01:33	S/C	460,302,812	460,303,114
20223	K2RX_3ab_Radio_Path_Characterization_2020_234	2020-234_08:06:22	S/C	460,303,101	460,303,290
20223	K2RX_3ab_Radio_Path_Characterization_2020_234	2020-234_08:06:37	S/C	460,303,116	460,303,290

09/22/2020:

20257	K2RX_1ab_TestPatt_2020_266	2020-266_06:04:05	S/C	463,060,564	463,060,866
20257	K2RX_1ab_TestPatt_2020_266	2020-266_06:04:20	S/C	463,060,579	463,060,881
20257	K2RX_3ab_Radio_Path_Characterization_2020_266	2020-266_06:09:09	S/C	463,060,868	463,061,057
20257	K2RX_3ab_Radio_Path_Characterization_2020_266	2020-266_06:09:24	S/C	463,060,883	463,061,057

10/20/2020:

20293	K2RX_1ab_TestPatt_2020_294	2020-294_04:19:48	S/C	465,473,507	465,473,809
20293	K2RX_1ab_TestPatt_2020_294	2020-294_04:20:03	S/C	465,473,522	465,473,824
20293	K2RX_3ab_Radio_Path_Characterization_2020_294	2020-294_04:24:52	S/C	465,473,811	465,474,000
20293	K2RX_3ab_Radio_Path_Characterization_2020_294	2020-294_04:25:07	S/C	465,473,826	465,474,000

11/18/2020:

20314	K2RX_1ab_TestPatt_2020_323	2020-323_02:32:34	S/C	467,972,673	467,972,975
20314	K2RX_1ab_TestPatt_2020_323	2020-323_02:32:49	S/C	467,972,688	467,972,990
20314	K2RX_3ab_Radio_Path_Characterization_2020_323	2020-323_02:37:38	S/C	467,972,977	467,973,166
20314	K2RX_3ab_Radio_Path_Characterization_2020_323	2020-323_02:37:53	S/C	467,972,992	467,973,166

12/20/2020:

20335	K2RX_1ab_TestPatt_2020_355	2020-355_00:34:15	S/C	470,730,374	470,730,676
20335	K2RX_1ab_TestPatt_2020_355	2020-355_00:34:30	S/C	470,730,389	470,730,691
20335	K2RX_3ab_Radio_Path_Characterization_2020_355	2020-355_00:39:19	S/C	470,730,678	470,730,867
20335	K2RX_3ab_Radio_Path_Characterization_2020_355	2020-355_00:39:34	S/C	470,730,693	470,730,867

01/06/2021:

21004	K2RX_1ab_TestPatt_2021_006	2021-006_16:19:52	S/C	472,255,911	472,256,213
21004	K2RX_1ab_TestPatt_2021_006	2021-006_16:20:07	S/C	472,255,926	472,256,228
21004	K2RX_3ab_Radio_Path_Characterization_2021_006	2021-006_16:24:56	S/C	472,256,215	472,256,404
21004	K2RX_3ab_Radio_Path_Characterization_2021_006	2021-006_16:25:11	S/C	472,256,230	472,256,404

02/15/2021:

21025	K2RX_1ab_TestPatt_2021_046	2021-046_13:44:52	S/C	475,702,611	475,702,913
21025	K2RX_1ab_TestPatt_2021_046	2021-046_13:45:07	S/C	475,702,626	475,702,928
21025	K2RX_3ab_Radio_Path_Characterization_2021_046	2021-046_13:49:56	S/C	475,702,915	475,703,104
21025	K2RX_3ab_Radio_Path_Characterization_2021_046	2021-046_13:50:11	S/C	475,702,930	475,703,104

03/15/2021:

21067	K2RX_1ab_TestPatt_2021_074	2021-074_19:02:22	S/C	478,140,861	478,141,163
21067	K2RX_1ab_TestPatt_2021_074	2021-074_19:02:37	S/C	478,140,876	478,141,178
21067	K2RX_3ab_Radio_Path_Characterization_2021_074	2021-074_19:07:26	S/C	478,141,165	478,141,354
21067	K2RX_3ab_Radio_Path_Characterization_2021_074	2021-074_19:07:41	S/C	478,141,180	478,141,354

04/15/2021:

21088	K2RX_1ab_TestPatt_2021_105	2021-105_00:24:11	S/C	480,752,170	480,752,472
21088	K2RX_1ab_TestPatt_2021_105	2021-105_00:24:26	S/C	480,752,185	480,752,487
21088	K2RX_3ab_Radio_Path_Characterization_2021_105	2021-105_00:29:15	S/C	480,752,474	480,752,663
21088	K2RX_3ab_Radio_Path_Characterization_2021_105	2021-105_00:29:30	S/C	480,752,489	480,752,663

05/20/2021:

21137	K2RX_1ab_TestPatt_2021_140	2021-140_14:37:57	S/C	483,827,396	483,827,698
21137	K2RX_1ab_TestPatt_2021_140	2021-140_14:38:12	S/C	483,827,411	483,827,713
21137	K2RX_3ab_Radio_Path_Characterization_2021_140	2021-140_14:43:01	S/C	483,827,700	483,827,889
21137	K2RX_3ab_Radio_Path_Characterization_2021_140	2021-140_14:43:16	S/C	483,827,715	483,827,889

06/15/2021:

21158	K2RX_1ab_TestPatt_2021_166	2021-166_12:53:33	S/C	486,067,531	486,067,833
21158	K2RX_1ab_TestPatt_2021_166	2021-166_12:53:48	S/C	486,067,546	486,067,848
21158	K2RX_3ab_Radio_Path_Characterization_2021_166	2021-166_12:58:37	S/C	486,067,835	486,068,024
21158	K2RX_3ab_Radio_Path_Characterization_2021_166	2021-166_12:58:52	S/C	486,067,850	486,068,024

07/13/2021:

21179	K2RX_1ab_TestPatt_2021_194	2021-194_17:07:46	S/C	488,501,984	488,502,286
21179	K2RX_1ab_TestPatt_2021_194	2021-194_17:08:01	S/C	488,501,999	488,502,301
21179	K2RX_3ab_Radio_Path_Characterization_2021_194	2021-194_17:12:50	S/C	488,502,288	488,502,477
21179	K2RX_3ab_Radio_Path_Characterization_2021_194	2021-194_17:13:05	S/C	488,502,303	488,502,477

08/11/2021:

21221	K2RX_1ab_TestPatt_2021_223	2021-223_02:00:49	S/C	490,953,168	490,953,470
21221	K2RX_1ab_TestPatt_2021_223	2021-223_02:01:04	S/C	490,953,183	490,953,485
21221	K2RX_3ab_Radio_Path_Characterization_2021_223	2021-223_02:05:53	S/C	490,953,472	490,953,661
21221	K2RX_3ab_Radio_Path_Characterization_2021_223	2021-223_02:06:08	S/C	490,953,487	490,953,661

09/07/2021:

21242	K2RX_1ab_TestPatt_2021_250	2021-250_08:15:29	S/C	493,308,448	493,308,750
21242	K2RX_1ab_TestPatt_2021_250	2021-250_08:15:44	S/C	493,308,463	493,308,765
21242	K2RX_3ab_Radio_Path_Characterization_2021_250	2021-250_08:20:33	S/C	493,308,752	493,308,941
21242	K2RX_3ab_Radio_Path_Characterization_2021_250	2021-250_08:20:48	S/C	493,308,767	493,308,941

10/09/2021:

21277	K2RX_1ab_TestPatt_2021_282	2021-282_22:15:57	S/C	496,123,676	496,123,978
21277	K2RX_1ab_TestPatt_2021_282	2021-282_22:16:12	S/C	496,123,691	496,123,993
21277	K2RX_3ab_Radio_Path_Characterization_2021_282	2021-282_22:21:01	S/C	496,123,980	496,124,169
21277	K2RX_3ab_Radio_Path_Characterization_2021_282	2021-282_22:21:16	S/C	496,123,995	496,124,169

11/21/2021:

21319	K2RX_1ab_TestPatt_2021_325	2021-325_19:36:23	S/C	499,829,302	499,829,604
21319	K2RX_1ab_TestPatt_2021_325	2021-325_19:36:38	S/C	499,829,317	499,829,619
21319	K2RX_3ab_Radio_Path_Characterization_2021_325	2021-325_19:41:27	S/C	499,829,606	499,829,795
21319	K2RX_3ab_Radio_Path_Characterization_2021_325	2021-325_19:41:42	S/C	499,829,621	499,829,795

12/12/2021:

21341	K2RX_1ab_TestPatt_2021_346	2021-346_02:23:26	S/C	501,581,725	501,582,027
21341	K2RX_1ab_TestPatt_2021_346	2021-346_02:23:41	S/C	501,581,740	501,582,042
21341	K2RX_3ab_Radio_Path_Characterization_2021_346	2021-346_02:28:30	S/C	501,582,029	501,582,218
21341	K2RX_3ab_Radio_Path_Characterization_2021_346	2021-346_02:28:45	S/C	501,582,044	501,582,218

01/13/2022:

21361	K2RX_1ab_TestPatt_2022_013	2022-013_03:41:26	S/C	504,351,204	504,351,506
21361	K2RX_1ab_TestPatt_2022_013	2022-013_03:41:41	S/C	504,351,219	504,351,521
21361	K2RX_3ab_Radio_Path_Characterization_2022_013	2022-013_03:46:30	S/C	504,351,508	504,351,697
21361	K2RX_3ab_Radio_Path_Characterization_2022_013	2022-013_03:46:45	S/C	504,351,523	504,351,697

3. Calibration Campaign (Load 19234)

The calibration campaign for REX was run in concert with other *New Horizons* instruments in the 19234 load that began in late August 2019, and concluded in September 2019. Data were gathered to determine if instrument response had changed since the previous calibration event after the Pluto-Charon system flyby.

The following is the DataTrack listing of the REX data during the Radio Path Characterizations.

09/04/2017 and 09/09/2019:

19234	K2RX_1ab_TestPatt_2019_247a	2019-247_05:29:34	S/C	429,880,893	429,884,849
19234	K2RX_1ab_TestPatt_2019_247a	2019-247_05:29:49	S/C	429,880,908	429,884,864
19234	K2RX_11ab_Radiometric_2019_247	2019-247_06:35:32	S/C	429,884,854	429,886,202
19234	K2RX_11ab_Radiometric_2019_247	2019-247_06:35:47	S/C	429,884,869	429,886,217
19234	K2RX_11ab_Radiometric_2019_247	2019-247_06:58:05	S/C	429,886,207	429,889,535
19234	K2RX_11ab_Radiometric_2019_247	2019-247_06:58:20	S/C	429,886,222	429,889,550
19234	K2RX_11ab_Radiometric_2019_247	2019-247_07:53:38	S/C	429,889,540	429,890,888
19234	K2RX_11ab_Radiometric_2019_247	2019-247_07:53:53	S/C	429,889,555	429,890,903
19234	K2RX_11ab_Radiometric_2019_247	2019-247_08:16:11	S/C	429,890,893	429,895,085
19234	K2RX_11ab_Radiometric_2019_247	2019-247_08:16:26	S/C	429,890,908	429,895,100
19234	K2RX_11ab_Radiometric_2019_247	2019-247_09:26:08	S/C	429,895,090	429,896,438
19234	K2RX_11ab_Radiometric_2019_247	2019-247_09:26:23	S/C	429,895,105	429,896,453
19234	K2RX_11ab_Radiometric_2019_247	2019-247_09:48:41	S/C	429,896,443	429,900,671
19234	K2RX_11ab_Radiometric_2019_247	2019-247_09:48:56	S/C	429,896,458	429,900,686
19234	K2RX_11ab_Radiometric_2019_247	2019-247_10:59:14	S/C	429,900,676	429,902,024
19234	K2RX_11ab_Radiometric_2019_247	2019-247_10:59:29	S/C	429,900,691	429,902,039
19234	K2RX_11ab_Radiometric_2019_247	2019-247_11:21:47	S/C	429,902,029	429,905,658
19234	K2RX_11ab_Radiometric_2019_247	2019-247_11:22:02	S/C	429,902,044	429,905,674
19234	K2RX_REX18ab_HGASideLobe_2019_247	2019-247_12:22:21	S/C	429,905,662	429,908,669
19234	K2RX_REX18ab_HGASideLobe_2019_247	2019-247_12:22:37	S/C	429,905,677	429,908,684
19234	K2RX_20ab_CA08TempBkgd_2019_247	2019-247_13:12:32	S/C	429,908,680	429,911,543
19234	K2RX_20ab_CA08TempBkgd_2019_247	2019-247_13:12:47	S/C	429,908,695	429,911,558
19234	K2RX_Rex7_ColdSkyA_2019_247	2019-247_14:00:26	S/C	429,911,546	429,913,092
19234	K2RX_Rex7_ColdSkyA_2019_247	2019-247_14:00:41	S/C	429,911,561	429,913,107
19234	K2RX_Rex7_ColdSkyB_2019_247	2019-247_14:26:15	S/C	429,913,095	429,913,347
19234	K2RX_Rex7_ColdSkyB_2019_247	2019-247_14:26:30	S/C	429,913,110	429,913,347
19234	K2RX_1ab_TestPatt_2019_247b	2019-247_14:31:34	S/C	429,913,413	429,990,713
19234	K2RX_1ab_TestPatt_2019_247b	2019-247_14:31:49	S/C	429,913,428	429,916,434
19234	K2RX_1ab_TestPatt_2019_252	2019-252_14:57:16	S/C	430,346,955	430,347,257
19234	K2RX_1ab_TestPatt_2019_252	2019-252_14:57:31	S/C	430,346,970	430,347,272
19234	K2RX_3ab_Radio_Path_Characterization_2019_252	2019-252_15:02:20	S/C	430,347,259	430,347,448
19234	K2RX_3ab_Radio_Path_Characterization_2019_252	2019-252_15:02:35	S/C	430,347,274	430,347,448

4. Ecliptic Dust Radiometry test for second extended mission proposal and additional test (Loads 21263, 23212-23275)

In 2021, REX spacecraft software that handles REX data was modified to allow for thresholding: If events above a certain threshold were observed, that REX data frame containing the event and the surrounding frames were saved. The purpose was to be able to record interesting events while dramatically shrinking the data volume that needed to be returned to Earth. This thresholding was tested as an EMP / dust event detection for proof-of-concept for a second extended mission proposal during load 21263 in the RAM, anti-RAM, and perpendicular-to-RAM spacecraft orientations. The test was repeated in 2023 across several command loads.

The following is the DataTrack listing of the REX data during the Ecliptic Dust Radiometry test.

09/23/2021:

21263	K2RX_1ab_TestPatt_2021_266	2021-266_09:54:33	S/C	494,696,792	494,697,065
21263	K2RX_1ab_TestPatt_2021_266	2021-266_09:54:48	S/C	494,696,807	494,697,080
21263	K2RX_Rex22ab_EclipticDustRadiometry_2021_266	2021-266_09:59:08	S/C	494,697,149	494,713,270
21263	K2RX_Rex22ab_EclipticDustRadiometry_2021_266	2021-266_09:59:23	S/C	494,697,164	494,713,285
21263	K2RX_Rex22ab_EclipticDustRadiometry_2021_266	2021-266_14:29:13	S/C	494,713,354	494,731,275
21263	K2RX_Rex22ab_EclipticDustRadiometry_2021_266	2021-266_14:29:28	S/C	494,713,369	494,731,290
21263	K2RX_Rex22ab_EclipticDustRadiometry_2021_266	2021-266_19:29:18	S/C	494,731,359	494,747,480
21263	K2RX_Rex22ab_EclipticDustRadiometry_2021_266	2021-266_19:29:33	S/C	494,731,374	494,747,495
21263	K2RX_Rex22ab_EclipticDustRadiometry_2021_266	2021-266_23:59:23	S/C	494,747,564	494,838,981
21263	K2RX_Rex22ab_EclipticDustRadiometry_2021_266	2021-266_23:59:38	S/C	494,747,579	494,762,938
21263	K2RX_1ab_TestPatt_2021_271	2021-271_05:39:33	S/C	495,113,492	495,363,321
21263	K2RX_1ab_TestPatt_2021_271	2021-271_05:39:48	S/C	495,113,507	495,114,238

Beginning Test Pattern for 2023 Test (08/02/2023):

23212	K2RX_1ab_TestPatt_2023_214	2023-214_00:16:33	S/C	553,241,311	553,241,386
23212	K2RX_1ab_TestPatt_2023_214	2023-214_00:16:48	S/C	553,241,326	553,241,386

First set of tests for 2023 (08/05–08/2023):

23212	K2RX_Rex21ab_DustImpact_2023_217	2023-217_05:59:44	S/C	553,521,226	553,543,016
23212	K2RX_Rex21ab_DustImpact_2023_217	2023-217_05:59:59	S/C	553,521,241	553,543,016
23212	K2RX_Rex21ab_DustImpact_2023_217	2023-217_12:05:14	S/C	553,543,156	553,564,946
23212	K2RX_Rex21ab_DustImpact_2023_217	2023-217_12:05:29	S/C	553,543,171	553,564,946
23212	K2RX_Rex21ab_DustImpact_2023_217	2023-217_18:10:44	S/C	553,565,086	553,586,876
23212	K2RX_Rex21ab_DustImpact_2023_217	2023-217_18:10:59	S/C	553,565,101	553,586,876
23212	K2RX_Rex21ab_DustImpact_2023_217	2023-218_00:16:14	S/C	553,587,016	553,608,806
23212	K2RX_Rex21ab_DustImpact_2023_217	2023-218_00:16:29	S/C	553,587,031	553,608,806

23212	K2RX_Rex21ab_DustImpact_2023_217	2023-218_06:21:44	S/C	553,608,946	553,630,736
23212	K2RX_Rex21ab_DustImpact_2023_217	2023-218_06:21:59	S/C	553,608,961	553,630,736
23212	K2RX_Rex21ab_DustImpact_2023_217	2023-218_12:27:14	S/C	553,630,876	553,652,666
23212	K2RX_Rex21ab_DustImpact_2023_217	2023-218_12:27:29	S/C	553,630,891	553,652,666
23212	K2RX_Rex21ab_DustImpact_2023_217	2023-218_19:20:39	S/C	553,655,681	553,677,471
23212	K2RX_Rex21ab_DustImpact_2023_217	2023-218_19:20:54	S/C	553,655,696	553,677,471
23212	K2RX_Rex21ab_DustImpact_2023_217	2023-219_01:26:09	S/C	553,677,611	553,699,401
23212	K2RX_Rex21ab_DustImpact_2023_217	2023-219_01:26:24	S/C	553,677,626	553,699,401
23212	K2RX_Rex21ab_DustImpact_2023_217	2023-219_07:31:39	S/C	553,699,541	553,721,331
23212	K2RX_Rex21ab_DustImpact_2023_217	2023-219_07:31:54	S/C	553,699,556	553,721,331
23212	K2RX_Rex21ab_DustImpact_2023_217	2023-219_13:37:09	S/C	553,721,471	553,743,261
23212	K2RX_Rex21ab_DustImpact_2023_217	2023-219_13:37:24	S/C	553,721,486	553,743,261
23212	K2RX_Rex21ab_DustImpact_2023_217	2023-219_19:42:39	S/C	553,743,401	553,765,191
23212	K2RX_Rex21ab_DustImpact_2023_217	2023-219_19:42:54	S/C	553,743,416	553,765,191
23212	K2RX_Rex21ab_DustImpact_2023_217	2023-220_01:48:09	S/C	553,765,331	553,787,121
23212	K2RX_Rex21ab_DustImpact_2023_217	2023-220_01:48:24	S/C	553,765,346	553,787,121

Second set of tests for 2023 (09/17–22/2023):

23254	K2RX_Rex21ab_DustImpact_2023_260	2023-260_06:44:44	S/C	557,239,126	557,260,895
23254	K2RX_Rex21ab_DustImpact_2023_260	2023-260_06:44:59	S/C	557,239,141	557,260,895
23254	K2RX_Rex21ab_DustImpact_2023_260	2023-260_12:49:53	S/C	557,261,035	557,282,804
23254	K2RX_Rex21ab_DustImpact_2023_260	2023-260_12:50:08	S/C	557,261,050	557,282,804
23254	K2RX_Rex21ab_DustImpact_2023_260	2023-260_19:57:57	S/C	557,286,719	557,308,488
23254	K2RX_Rex21ab_DustImpact_2023_260	2023-260_19:58:12	S/C	557,286,734	557,308,488
23254	K2RX_Rex21ab_DustImpact_2023_260	2023-261_02:03:06	S/C	557,308,628	557,330,397
23254	K2RX_Rex21ab_DustImpact_2023_260	2023-261_02:03:21	S/C	557,308,643	557,330,397
23254	K2RX_Rex21ab_DustImpact_2023_263	2023-263_05:18:14	S/C	557,493,136	557,514,926
23254	K2RX_Rex21ab_DustImpact_2023_263	2023-263_05:18:29	S/C	557,493,151	557,514,926
23254	K2RX_Rex21ab_DustImpact_2023_263	2023-263_11:23:44	S/C	557,515,066	557,536,835
23254	K2RX_Rex21ab_DustImpact_2023_263	2023-263_11:23:59	S/C	557,515,081	557,536,835
23254	K2RX_Rex21ab_DustImpact_2023_263	2023-263_17:28:53	S/C	557,536,975	557,558,744
23254	K2RX_Rex21ab_DustImpact_2023_263	2023-263_17:29:08	S/C	557,536,990	557,558,744
23254	K2RX_Rex21ab_DustImpact_2023_263	2023-263_23:34:02	S/C	557,558,884	557,580,653
23254	K2RX_Rex21ab_DustImpact_2023_263	2023-263_23:34:17	S/C	557,558,899	557,580,653
23254	K2RX_Rex21ab_DustImpact_2023_263	2023-264_06:42:06	S/C	557,584,568	557,606,358
23254	K2RX_Rex21ab_DustImpact_2023_263	2023-264_06:42:21	S/C	557,584,583	557,606,358
23254	K2RX_Rex21ab_DustImpact_2023_263	2023-264_12:47:36	S/C	557,606,498	557,628,267
23254	K2RX_Rex21ab_DustImpact_2023_263	2023-264_12:47:51	S/C	557,606,513	557,628,267
23254	K2RX_Rex21ab_DustImpact_2023_263	2023-264_18:52:45	S/C	557,628,407	557,650,176
23254	K2RX_Rex21ab_DustImpact_2023_263	2023-264_18:53:00	S/C	557,628,422	557,650,176
23254	K2RX_Rex21ab_DustImpact_2023_263	2023-265_00:57:54	S/C	557,650,316	557,672,085
23254	K2RX_Rex21ab_DustImpact_2023_263	2023-265_00:58:09	S/C	557,650,331	557,672,085

Concluding Test Pattern for 2023 Test (10/05/2023):

23275	K2RX_1ab_TestPatt_2023_278	2023-278_15:34:33	S/C	558,825,991	558,826,066
23275	K2RX_1ab_TestPatt_2023_278	2023-278_15:34:48	S/C	558,826,006	558,826,066