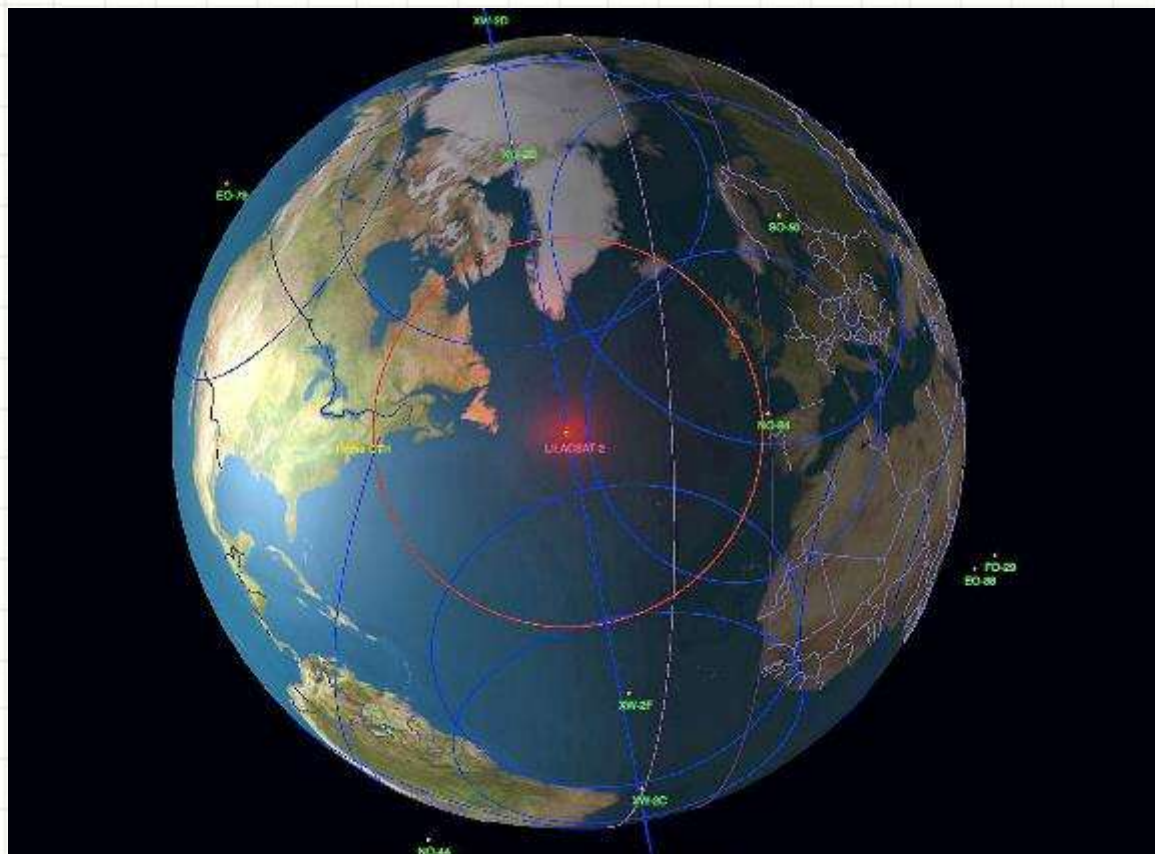




FIELD DAY 2019

SATELLITE HANDBOOK

JUNE 2019
FRED KEMMERER, AB1OC

Field Day 2019 Satellite Pass Summary

Day	Operating Slot	Begins At	Length Mins	Max Elev. Degrees	Satellite	Mode	Notes
Saturday	Pre FD	9:08:27 AM	10.5	41.3	XW-2A	Linear	
		10:08:26 AM	10.0	15.8	EO-88	Linear	Eclipse Only
		10:11:32 AM	10.0	19.2	ISS	FM	Possible FM Voice
		10:12:24 AM	10.2	16.6	AO-92	FM	
		10:49:03 AM	14.5	88.2	SO-50	FM	
	Sat Training	11:41:37 AM	10.9	32.2	EO-88	Linear	Eclipse Only
		11:45:43 AM	11.0	32.1	AO-92	FM	
		11:48:59 AM	10.1	20.2	ISS	FM	Possible FM Voice
		11:54:21 AM	13.2	41.7	AO-91	FM	
	Final Test	12:30:58 PM	12.9	18.1	SO-50	FM	
		12:33:32 PM	15.8	12.0	AO-7	Linear	
		1:16:24 PM	11.5	19.2	PO-101	FM	Possible FM Voice
		1:25:45 PM	10.8	61.4	ISS	FM	Possible FM Voice
		1:31:19 PM	12.4	29.4	AO-91	FM	
	2:00 PM	2:21:27 PM	21.5	48.2	AO-7	Linear	
		2:51:40 PM	12.4	37.4	PO-101	FM	Possible FM Voice
	3:00 PM	3:02:40 PM	9.7	17.5	ISS	FM	Possible FM Voice
	4:00 PM	4:14:18 PM	21.5	41.2	AO-7	Linear	
		4:40:02 PM	18.3	76.6	FO-29	Linear	
		4:43:20 PM	13.8	21.7	AO-85	FM	Sunlight Only - AB1OC Makes FM Contact for Satellite Bonus
	5:00 PM	5:08:37 PM	11.2	26.6	XW-2C	Linear	
		5:10:24 PM	10.9	23.3	XW-2E	Linear	
		5:22:33 PM	11.5	36.8	XW-2B	Linear	
		5:31:43 PM	10.7	15.1	AO-73	Linear	Eclipse Only
		5:39:28 PM	12.8	18.1	SO-50	FM	
	6:00 PM	6:22:33 PM	15.4	60.5	AO-85	FM	
		6:25:35 PM	16.0	21.3	FO-29	Linear	
		6:42:48 PM	11.0	22.0	XW-2C	Linear	
		6:44:14 PM	11.1	24.8	XW-2E	Linear	
		6:57:21 PM	10.4	15.9	XW-2B	Linear	
	7:00 PM	7:06:37 PM	12.5	49.5	AO-73	Linear	Eclipse Only
		7:19:47 PM	14.3	85.4	SO-50	FM	Backup AB1OC Makes FM Contact for Satellite Bonus
		7:39:33 PM	9.4	15.8	XW-2A	Linear	
	8:00 PM	8:05:21 PM	12.6	14.2	AO-85	FM	
	9:00 PM	9:11:26 PM	10.3	28.2	XW-2A	Linear	
	10:00 PM	10:18:21 PM	11.4	76.2	EO-88	Linear	Eclipse Only
		10:23:18 PM	11.6	71.2	AO-92	FM	
		10:55:29 PM	11.4	19.4	CAS-4A	Linear	
	11:00 PM	11:50:44 PM	12.4	38.2	CAS-4B	Linear	

Field Day 2019 Satellite Pass Summary

Operating				Max Elev.			
Day	Slot	Begins At	Length Mins	Degrees	Satellite	Mode	Notes
Sunday	Midnight	12:08:34 AM	10.9	16.1	PO-101	FM	Possible FM Voice
		12:34:31 AM	12.8	61.9	CAS-4A	Linear	
	1:00 AM	1:13:42 AM	12.5	21.9	AO-85	FM	
		1:19:42 AM	10.9	74.9	AO-91	FM	
		1:30:29 AM	12.9	87.6	CAS-4B	Linear	
		1:42:55 AM	12.6	48.1	PO-101	FM	Possible FM Voice
		2:14:36 AM	12.9	84.5	CAS-4A	Linear	
		2:50:47 AM	20.0	42.5	FO-29	Linear	
		2:54:08 AM	13.0	50.7	AO-85	FM	
	3:00 AM	3:10:43 AM	12.9	85.2	CAS-4B	Linear	
		3:54:48 AM	12.8	62.9	CAS-4A	Linear	
		4:14:06 AM	22.3	65.5	AO-7	Linear	
		4:35:30 AM	20.5	46.1	FO-29	Linear	
		4:50:55 AM	12.4	35.4	CAS-4B	Linear	
	5:00 AM	5:35:09 AM	11.5	19.9	CAS-4A	Linear	
		6:07:17 AM	20.5	32.2	AO-7	Linear	
		6:08:55 AM	9.0	12.2	ISS	FM	Possible FM Voice
		6:13:28 AM	11.3	32.7	XW-2C	Linear	
		6:14:21 AM	11.1	27.5	XW-2E	Linear	
		6:52:56 AM	12.7	28.7	AO-73	Linear	Eclipse Only
	7:00 AM	7:44:10 AM	10.9	85.2	ISS	FM	Possible FM Voice
		7:47:52 AM	10.3	17.8	XW-2C	Linear	
		7:48:31 AM	10.5	20.2	XW-2E	Linear	
		8:29:11 AM	12.5	28.3	AO-73	Linear	Eclipse Only
		8:31:08 AM	9.1	13.5	XW-2A	Linear	
	9:00 AM	9:21:30 AM	10.2	22.4	ISS	FM	Possible FM Voice
		9:34:32 AM	13.4	26.9	SO-50	FM	
	10:00 AM	10:03:16 AM	10.2	30.5	XW-2A	Linear	
		10:59:09 AM	9.9	18.1	ISS	FM	
11:00 AM	11:14:21 AM	14.3	43.3	SO-50	FM		
	11:18:32 AM	11.3	64.3	EO-88	Linear	Eclipse Only	
	11:24:33 AM	11.4	59.3	AO-92	FM	L-Band Uplink	
Noon	12:15:41 PM	13.5	70.0	AO-91	FM		
	12:36:02 PM	10.7	39.4	ISS	FM		
1:00 PM	1:23:32 PM	19.1	23.5	AO-7	Linear		
	1:25:13 PM	11.9	23.7	PO-101	FM	Possible FM Voice	
	1:53:50 PM	10.9	12.0	AO-91	FM		
2:00 PM	2:12:47 PM	10.4	30.0	ISS	FM	Possible FM Voice	
End							



PASS PREDICTION DETAILS - FM SATELLITES AND THE ISS

MacDoppler Predictions: **AO-85**

Kep Set: 716
 Times: Local Time
 Location: Hudson NH USA
 Latitude: 42.7624 Degrees
 Longitude: -71.4251 Degrees
 Elevation: 56.0 Meters
 Run on: 2019/06/16 07:05:04 EDT

	Date	Time	Azimuth	Elevation	Downlink	Uplink
Rise:	2019/06/22	16:43:20	173.5	0.0	145.98275	435.16180
Max:	2019/06/22	16:50:17	110.2	21.7	145.98002	435.16995
Set:	2019/06/22	16:57:05	47.4	0.0	145.97723	435.17825
Rise:	2019/06/22	18:22:33	222.7	0.0	145.98307	435.16084
Max:	2019/06/22	18:30:22	307.7	60.5	145.98001	435.16998
Set:	2019/06/22	18:37:54	31.6	0.0	145.97691	435.17921
Rise:	2019/06/22	20:05:21	270.1	0.0	145.98247	435.16264
Max:	2019/06/22	20:11:48	326.8	14.2	145.98008	435.16978
Set:	2019/06/22	20:18:00	23.9	0.0	145.97759	435.17720
Rise:	2019/06/23	01:13:42	334.0	0.0	145.98290	435.16135
Max:	2019/06/23	01:20:13	40.8	21.9	145.98014	435.16959
Set:	2019/06/23	01:26:09	108.6	0.0	145.97710	435.17864
Rise:	2019/06/23	02:54:08	321.7	0.0	145.98323	435.16037
Max:	2019/06/23	03:00:58	241.5	50.7	145.98007	435.16979
Set:	2019/06/23	03:07:05	161.5	0.0	145.97673	435.17975

MacDoppler Predictions: **AO-91**

Kep Set: 999
Times: Local Time
Location: Hudson NH USA
Latitude: 42.7624 Degrees
Longitude: -71.4251 Degrees
Elevation: 56.0 Meters
Run on: 2019/06/16 07:03:15 EDT

	Date	Time	Azimuth	Elevation	Downlink	Uplink
Rise:	2019/06/22	11:54:21	148.2	0.1	145.96323	435.24036
Max:	2019/06/22	12:01:19	71.6	41.7	145.96008	435.24976
Set:	2019/06/22	12:07:35	355.6	0.0	145.95672	435.25978
Rise:	2019/06/22	13:31:19	201.2	0.0	145.96292	435.24129
Max:	2019/06/22	13:37:46	265.5	20.4	145.96014	435.24959
Set:	2019/06/22	13:43:42	331.1	0.0	145.95712	435.25857
Rise:	2019/06/23	01:19:42	13.8	0.0	145.96353	435.23947
Max:	2019/06/23	01:25:16	105.0	74.9	145.95998	435.25007
Set:	2019/06/23	01:30:38	190.3	0.0	145.95646	435.26057
Rise:	2019/06/23	12:15:41	159.8	0.1	145.96331	435.24014
Max:	2019/06/23	12:22:48	74.0	70.0	145.96006	435.24981
Set:	2019/06/23	12:29:10	350.6	0.0	145.95663	435.26005
Rise:	2019/06/23	13:53:50	215.3	0.0	145.96259	435.24226
Max:	2019/06/23	13:59:29	268.7	12.0	145.96016	435.24952
Set:	2019/06/23	14:04:45	323.3	0.0	145.95753	435.25736

MacDoppler Predictions: **AO-92**

Kep Set: 999
Times: Local Time
Location: Hudson NH USA
Latitude: 42.7624 Degrees
Longitude: -71.4251 Degrees
Elevation: 56.0 Meters
Run on: 2019/06/16 07:02:11 EDT

	Date	Time	Azimuth	Elevation	Downlink	Uplink
Rise:	2019/06/22	10:12:24	29.8	0.0	145.88438	435.34111
Max:	2019/06/22	10:17:33	92.9	16.6	145.88142	435.34998
Set:	2019/06/22	10:22:36	155.5	0.0	145.87842	435.35889
Rise:	2019/06/22	11:45:43	2.3	0.0	145.88474	435.34004
Max:	2019/06/22	11:51:17	288.5	32.1	145.88139	435.35007
Set:	2019/06/22	11:56:45	215.3	0.0	145.87807	435.35994
Rise:	2019/06/22	22:23:18	171.2	0.0	145.88485	435.33696
Max:	2019/06/22	22:29:02	260.0	71.2	145.88136	435.35021
Set:	2019/06/22	22:34:52	346.1	0.0	145.87795	435.36028
Rise:	2019/06/23	11:24:33	8.0	0.0	145.88485	1267.3304
Max:	2019/06/23	11:30:20	283.2	59.3	145.88135	1267.3608
Set:	2019/06/23	11:35:59	202.2	0.0	145.87795	1267.3903

MacDoppler Predictions: **ISS**

Kep Set: 902
 Times: Local Time
 Location: Hudson NH USA
 Latitude: 42.7624 Degrees
 Longitude: -71.4251 Degrees
 Elevation: 56.0 Meters
 Run on: 2019/06/16 07:01:44 EDT

	Date	Time	Azimuth	Elevation	Downlink	Uplink
Rise:	2019/06/22	08:33:57	247.9	0.0	145.82832	145.82168
Max:	2019/06/22	08:39:19	332.7	51.6	145.82494	145.82506
Set:	2019/06/22	08:44:43	54.9	0.0	145.82168	145.82832
Rise:	2019/06/22	10:11:32	283.5	0.0	145.82802	145.82198
Max:	2019/06/22	10:16:32	351.3	19.2	145.82497	145.82503
Set:	2019/06/22	10:21:32	58.2	0.0	145.82198	145.82802
Rise:	2019/06/22	11:48:59	303.0	0.0	145.82804	145.82196
Max:	2019/06/22	11:54:02	11.6	20.2	145.82498	145.82502
Set:	2019/06/22	11:59:04	79.6	0.0	145.82196	145.82804
Rise:	2019/06/22	13:25:45	304.6	0.0	145.82834	145.82166
Max:	2019/06/22	13:31:12	33.0	61.4	145.82493	145.82507
Set:	2019/06/22	13:36:35	116.2	0.0	145.82166	145.82834
Rise:	2019/06/22	15:02:40	290.8	0.0	145.82802	145.82198
Max:	2019/06/22	15:07:32	226.8	17.5	145.82499	145.82501
Set:	2019/06/22	15:12:21	163.1	0.0	145.82199	145.82801
Rise:	2019/06/23	06:08:55	186.9	0.0	145.82778	145.82222
Max:	2019/06/23	06:13:23	130.0	12.2	145.82497	145.82503
Set:	2019/06/23	06:17:52	73.7	0.0	145.82220	145.82780
Rise:	2019/06/23	07:44:10	236.4	0.0	145.82836	145.82164
Max:	2019/06/23	07:49:34	334.0	85.2	145.82496	145.82504
Set:	2019/06/23	07:55:01	56.6	0.0	145.82164	145.82836
Rise:	2019/06/23	09:21:30	275.0	0.0	145.82810	145.82190
Max:	2019/06/23	09:26:36	345.6	22.4	145.82498	145.82502
Set:	2019/06/23	09:31:42	55.6	0.0	145.82191	145.82809
Rise:	2019/06/23	10:59:09	299.6	0.0	145.82799	145.82201
Max:	2019/06/23	11:04:07	6.3	18.1	145.82497	145.82503
Set:	2019/06/23	11:09:03	71.9	0.0	145.82201	145.82799
Rise:	2019/06/23	12:36:02	305.7	0.0	145.82827	145.82173
Max:	2019/06/23	12:41:24	26.2	39.4	145.82497	145.82503
Set:	2019/06/23	12:46:43	105.1	0.0	145.82172	145.82828
Rise:	2019/06/23	14:12:47	296.3	0.0	145.82824	145.82176
Max:	2019/06/23	14:18:00	222.0	30.0	145.82496	145.82504
Set:	2019/06/23	14:23:09	149.1	0.0	145.82177	145.82823

MacDoppler Predictions: **PO-101**

Kep Set: 999
 Times: Local Time
 Location: Hudson NH USA
 Latitude: 42.7624 Degrees
 Longitude: -71.4251 Degrees
 Elevation: 56.0 Meters
 Run on: 2019/06/16 07:24:27 EDT

	Date	Time	Azimuth	Elevation	Downlink	Uplink
Rise:	2019/06/22	13:16:24	28.4	0.0	435.86080	145.94705
Max:	2019/06/22	13:22:12	93.2	19.2	435.85203	145.94999
Set:	2019/06/22	13:27:54	157.4	0.0	435.84318	145.95295
Rise:	2019/06/22	14:51:40	4.2	0.0	435.86183	145.94671
Max:	2019/06/22	14:57:54	288.9	37.4	435.85198	145.95001
Set:	2019/06/22	15:04:03	214.1	0.0	435.84219	145.95329
Rise:	2019/06/23	00:08:34	122.9	0.0	435.86062	145.94711
Max:	2019/06/23	00:13:59	63.6	16.1	435.85189	145.95004
Set:	2019/06/23	00:19:27	4.9	0.0	435.84331	145.95291
Rise:	2019/06/23	01:42:55	179.5	0.1	435.86195	145.94667
Max:	2019/06/23	01:49:10	261.9	48.1	435.85181	145.95007
Set:	2019/06/23	01:55:31	342.1	0.0	435.84209	145.95332
Rise:	2019/06/23	13:25:13	25.7	0.1	435.86116	145.94693
Max:	2019/06/23	13:31:13	94.8	23.7	435.85202	145.94999
Set:	2019/06/23	13:37:07	163.2	0.0	435.84281	145.95308

MacDoppler Predictions: **SO-50**

Kep Set: 999
Times: Local Time
Location: Hudson NH USA
Latitude: 42.7624 Degrees
Longitude: -71.4251 Degrees
Elevation: 56.0 Meters
Run on: 2019/06/16 07:02:40 EDT

	Date	Time	Azimuth	Elevation	Downlink	Uplink
Rise:	2019/06/22	10:49:03	211.6	0.0	436.80455	145.84681
Max:	2019/06/22	10:56:13	104.3	88.2	436.79484	145.85005
Set:	2019/06/22	11:03:35	34.8	0.0	436.78550	145.85317
Rise:	2019/06/22	12:30:58	260.6	0.0	436.80300	145.84733
Max:	2019/06/22	12:37:23	323.4	18.1	436.79487	145.85004
Set:	2019/06/22	12:43:52	25.5	0.0	436.78701	145.85267
Rise:	2019/06/22	17:39:28	334.5	0.0	436.80306	145.84731
Max:	2019/06/22	17:45:57	37.1	18.1	436.79513	145.84996
Set:	2019/06/22	17:52:14	99.7	0.0	436.78695	145.85269
Rise:	2019/06/22	19:19:47	324.9	0.0	436.80455	145.84681
Max:	2019/06/22	19:27:07	227.1	85.4	436.79497	145.85001
Set:	2019/06/22	19:34:05	149.2	0.0	436.78538	145.85321
Rise:	2019/06/23	09:34:32	181.1	0.0	436.80384	145.84705
Max:	2019/06/23	09:41:10	112.0	26.9	436.79479	145.85007
Set:	2019/06/23	09:47:57	44.7	0.0	436.78612	145.85297
Rise:	2019/06/23	11:14:21	231.7	0.0	436.80424	145.84692
Max:	2019/06/23	11:21:26	311.5	43.3	436.79485	145.85005
Set:	2019/06/23	11:28:41	30.1	0.0	436.78582	145.85307



PASS PREDICTION DETAILS - LINEAR SATELLITES

MacDoppler Predictions: **AO-07**

Kep Set: 999
Times: Local Time
Location: Hudson NH USA
Latitude: 42.7624 Degrees
Longitude: -71.4251 Degrees
Elevation: 56.0 Meters
Run on: 2019/06/16 06:56:36 EDT

	Date	Time	Azimuth	Elevation	Downlink	Uplink
Rise:	2019/06/22	12:33:32	86.5	0.0	145.95199	432.14589
Max:	2019/06/22	12:41:26	39.4	12.0	145.94998	432.15187
Set:	2019/06/22	12:49:19	352.9	0.0	145.94798	432.15780
Rise:	2019/06/22	14:21:27	137.4	0.0	145.95279	432.14353
Max:	2019/06/22	14:32:08	61.5	48.2	145.94998	432.15187
Set:	2019/06/22	14:42:55	346.8	0.0	145.94720	432.16009
Rise:	2019/06/22	16:14:18	185.3	0.0	145.95271	432.14378
Max:	2019/06/22	16:24:57	261.1	41.2	145.94997	432.15188
Set:	2019/06/22	16:35:47	337.2	0.0	145.94732	432.15972
Rise:	2019/06/23	04:14:06	19.3	0.0	145.95282	432.14346
Max:	2019/06/23	04:25:20	105.6	65.5	145.94999	432.15183
Set:	2019/06/23	04:36:25	189.5	0.0	145.94716	432.16020
Rise:	2019/06/23	06:07:17	11.1	0.0	145.95264	432.14397
Max:	2019/06/23	06:17:31	304.2	32.2	145.95000	432.15180
Set:	2019/06/23	06:27:44	236.9	0.0	145.94738	432.15957
Rise:	2019/06/23	13:23:32	111.3	0.0	145.95246	432.14452
Max:	2019/06/23	13:33:05	50.4	23.5	145.94998	432.15187
Set:	2019/06/23	13:42:39	350.3	0.0	145.94752	432.15915

MacDoppler Predictions: **AO-73**

Kep Set: 999
Times: Local Time
Location: Hudson NH USA
Latitude: 42.7624 Degrees
Longitude: -71.4251 Degrees
Elevation: 56.0 Meters
Run on: 2019/06/16 06:58:19 EDT

	Date	Time	Azimuth	Elevation	Downlink	Uplink
Rise:	2019/06/22	08:10:48	4.9	0.1	145.96329	435.13319
Max:	2019/06/22	08:17:16	287.6	42.7	145.95997	435.14310
Set:	2019/06/22	08:23:48	211.2	0.0	145.95673	435.15276
Rise:	2019/06/22	17:31:43	121.6	0.0	145.96286	435.13448
Max:	2019/06/22	17:37:00	63.3	15.1	145.95995	435.14316
Set:	2019/06/22	17:42:23	5.9	0.0	145.95712	435.15161
Rise:	2019/06/22	19:06:37	179.2	0.1	145.96336	435.13299
Max:	2019/06/22	19:12:48	262.2	49.5	145.95993	435.14321
Set:	2019/06/22	19:19:09	342.8	0.0	145.95667	435.15295
Rise:	2019/06/23	06:52:56	23.2	0.0	145.96311	435.13374
Max:	2019/06/23	06:59:17	95.8	28.7	145.95997	435.14309
Set:	2019/06/23	07:05:39	167.2	0.0	145.95689	435.15228
Rise:	2019/06/23	08:29:11	0.8	0.0	145.96316	435.13358
Max:	2019/06/23	08:35:25	290.9	28.3	145.95997	435.14310
Set:	2019/06/23	08:41:42	221.7	0.0	145.95686	435.15237

MacDoppler Predictions: **CAS-4A**

Kep Set: 999
Times: Local Time
Location: Hudson NH USA
Latitude: 42.7624 Degrees
Longitude: -71.4251 Degrees
Elevation: 56.0 Meters
Run on: 2019/06/16 07:01:02 EDT

	Date	Time	Azimuth	Elevation	Downlink	Uplink
Rise:	2019/06/22	22:55:29	209.3	0.0	145.87289	435.21139
Max:	2019/06/22	23:01:10	145.2	19.4	145.86997	435.22010
Set:	2019/06/22	23:06:54	81.8	0.0	145.86710	435.22865
Rise:	2019/06/23	00:34:31	245.2	0.0	145.87322	435.21040
Max:	2019/06/23	00:40:52	160.8	61.9	145.86997	435.22010
Set:	2019/06/23	00:47:16	78.6	0.0	145.86678	435.22960
Rise:	2019/06/23	02:14:36	269.8	0.0	145.87323	435.21037
Max:	2019/06/23	02:21:03	10.1	84.5	145.86994	435.22017
Set:	2019/06/23	02:27:29	90.0	0.0	145.86677	435.22963
Rise:	2019/06/23	03:54:48	281.3	0.1	145.87322	435.21040
Max:	2019/06/23	04:01:12	197.0	62.9	145.86998	435.22005
Set:	2019/06/23	04:07:35	114.3	0.0	145.86678	435.22960
Rise:	2019/06/23	05:35:09	278.3	0.0	145.87291	435.21132
Max:	2019/06/23	05:40:55	214.0	19.9	145.87000	435.21999
Set:	2019/06/23	05:46:39	149.8	0.0	145.86710	435.22864

MacDoppler Predictions: **CAS-4B**

Kep Set: 999
Times: Local Time
Location: Hudson NH USA
Latitude: 42.7624 Degrees
Longitude: -71.4251 Degrees
Elevation: 56.0 Meters
Run on: 2019/06/16 06:57:14 EDT

	Date	Time	Azimuth	Elevation	Downlink	Uplink
Rise:	2019/06/22	23:50:44	230.2	0.0	145.92815	435.27061
Max:	2019/06/22	23:56:56	153.2	38.2	145.92495	435.28015
Set:	2019/06/23	00:03:10	78.2	0.0	145.92185	435.28939
Rise:	2019/06/23	01:30:29	260.0	0.0	145.92823	435.27036
Max:	2019/06/23	01:36:55	154.4	87.6	145.92496	435.28013
Set:	2019/06/23	01:43:22	83.1	0.0	145.92177	435.28963
Rise:	2019/06/23	03:10:43	277.7	0.0	145.92823	435.27036
Max:	2019/06/23	03:17:10	180.5	85.2	145.92496	435.28012
Set:	2019/06/23	03:23:35	101.7	0.0	145.92177	435.28964
Rise:	2019/06/23	04:50:55	281.6	0.0	145.92813	435.27067
Max:	2019/06/23	04:57:09	206.2	35.4	145.92497	435.28008
Set:	2019/06/23	05:03:18	132.2	0.0	145.92187	435.28932

MacDoppler Predictions: **EO-88**

Kep Set: 999
Times: Local Time
Location: Hudson NH USA
Latitude: 42.7624 Degrees
Longitude: -71.4251 Degrees
Elevation: 56.0 Meters
Run on: 2019/06/16 07:05:50 EDT

	Date	Time	Azimuth	Elevation	Downlink	Uplink
Rise:	2019/06/22	10:08:26	30.5	0.0	145.97796	435.02116
Max:	2019/06/22	10:13:28	92.7	15.8	145.97501	435.02996
Set:	2019/06/22	10:18:25	154.5	0.0	145.97204	435.03884
Rise:	2019/06/22	11:41:37	2.2	0.0	145.97835	435.02001
Max:	2019/06/22	11:47:07	288.0	32.2	145.97498	435.03006
Set:	2019/06/22	11:52:31	214.8	0.0	145.97165	435.03997
Rise:	2019/06/22	22:18:21	169.9	0.0	145.97847	435.01966
Max:	2019/06/22	22:24:02	261.2	76.2	145.97495	435.03016
Set:	2019/06/22	22:29:47	346.8	0.0	145.97154	435.04032
Rise:	2019/06/23	11:18:32	8.6	0.1	145.97847	435.01967
Max:	2019/06/23	11:24:14	282.8	64.3	145.97496	435.03011
Set:	2019/06/23	11:29:50	200.4	0.0	145.97153	435.04034

MacDoppler Predictions: **FO-29**

Kep Set: 999
Times: Local Time
Location: Hudson NH USA
Latitude: 42.7624 Degrees
Longitude: -71.4251 Degrees
Elevation: 56.0 Meters
Run on: 2019/06/16 07:04:18 EDT

	Date	Time	Azimuth	Elevation	Downlink	Uplink
Rise:	2019/06/22	16:40:02	13.9	0.0	435.85199	145.95399
Max:	2019/06/22	16:49:53	104.4	76.6	435.84334	145.95689
Set:	2019/06/22	16:58:17	190.5	0.0	435.83365	145.96013
Rise:	2019/06/22	18:25:35	3.0	0.0	435.85093	145.95435
Max:	2019/06/22	18:34:00	303.9	21.3	435.84363	145.95679
Set:	2019/06/22	18:41:34	242.6	0.0	435.83527	145.95959
Rise:	2019/06/23	02:50:47	138.7	0.0	435.85122	145.95425
Max:	2019/06/23	03:00:46	64.9	42.5	435.84291	145.95703
Set:	2019/06/23	03:10:48	352.7	0.0	435.83474	145.95977
Rise:	2019/06/23	04:35:30	185.6	0.0	435.85124	145.95424
Max:	2019/06/23	04:45:37	263.8	46.1	435.84288	145.95704
Set:	2019/06/23	04:56:00	341.9	0.0	435.83486	145.95972

MacDoppler Predictions: **XW-2A**

Kep Set: 999
 Times: Local Time
 Location: Hudson NH USA
 Latitude: 42.7624 Degrees
 Longitude: -71.4251 Degrees
 Elevation: 56.0 Meters
 Run on: 2019/06/16 07:00:30 EDT

	Date	Time	Azimuth	Elevation	Downlink	Uplink
Rise:	2019/06/22	09:08:27	18.7	0.0	145.67843	435.02977
Max:	2019/06/22	09:13:44	99.3	41.3	145.67499	435.04002
Set:	2019/06/22	09:18:56	178.8	0.0	145.67157	435.05026
Rise:	2019/06/22	19:39:33	128.4	0.0	145.67806	435.03087
Max:	2019/06/22	19:44:14	66.8	15.8	145.67496	435.04012
Set:	2019/06/22	19:48:55	6.3	0.0	145.67193	435.04918
Rise:	2019/06/22	21:11:26	189.5	0.0	145.67832	435.03010
Max:	2019/06/22	21:16:35	264.2	28.2	145.67494	435.04017
Set:	2019/06/22	21:21:45	337.2	0.0	145.67169	435.04989
Rise:	2019/06/23	08:31:08	32.6	0.0	145.67793	435.03126
Max:	2019/06/23	08:35:45	92.7	13.5	145.67500	435.04001
Set:	2019/06/23	08:40:16	152.0	0.0	145.67208	435.04873
Rise:	2019/06/23	10:03:16	1.7	0.0	145.67838	435.02990
Max:	2019/06/23	10:08:24	288.0	30.5	145.67499	435.04002
Set:	2019/06/23	10:13:28	214.6	0.0	145.67162	435.05008

MacDoppler Predictions: **XW-2B**

Kep Set: 999
Times: Local Time
Location: Hudson NH USA
Latitude: 42.7624 Degrees
Longitude: -71.4251 Degrees
Elevation: 56.0 Meters
Run on: 2019/06/16 06:59:56 EDT

	Date	Time	Azimuth	Elevation	Downlink	Uplink
Rise:	2019/06/22	17:22:33	147.4	0.0	145.74334	435.09003
Max:	2019/06/22	17:28:17	71.1	36.8	145.73996	435.10012
Set:	2019/06/22	17:34:03	356.4	0.0	145.73665	435.10999
Rise:	2019/06/22	18:57:21	206.4	0.0	145.74291	435.09131
Max:	2019/06/22	19:02:32	268.3	15.9	145.73996	435.10012
Set:	2019/06/22	19:07:45	329.4	0.0	145.73709	435.10867

MacDoppler Predictions: **XW-2C**

Kep Set: 999
 Times: Local Time
 Location: Hudson NH USA
 Latitude: 42.7624 Degrees
 Longitude: -71.4251 Degrees
 Elevation: 56.0 Meters
 Run on: 2019/06/16 06:57:43 EDT

	Date	Time	Azimuth	Elevation	Downlink	Uplink
Rise:	2019/06/22	08:01:56	351.3	0.0	145.80784	435.15151
Max:	2019/06/22	08:06:46	295.9	12.8	145.80502	435.15995
Set:	2019/06/22	08:11:32	240.4	0.0	145.80219	435.16840
Rise:	2019/06/22	17:08:37	139.4	0.0	145.80823	435.15035
Max:	2019/06/22	17:14:11	69.0	26.6	145.80496	435.16012
Set:	2019/06/22	17:19:46	359.8	0.0	145.80176	435.16968
Rise:	2019/06/22	18:42:48	197.6	0.0	145.80811	435.15071
Max:	2019/06/22	18:48:17	266.2	22.0	145.80496	435.16013
Set:	2019/06/22	18:53:48	333.9	0.0	145.80190	435.16926
Rise:	2019/06/23	06:13:28	21.3	0.0	145.80829	435.15018
Max:	2019/06/23	06:19:12	97.6	32.7	145.80499	435.16003
Set:	2019/06/23	06:24:48	172.5	0.0	145.80170	435.16985
Rise:	2019/06/23	07:47:52	355.5	0.0	145.80806	435.15086
Max:	2019/06/23	07:53:05	293.1	17.8	145.80500	435.16000
Set:	2019/06/23	07:58:12	231.1	0.0	145.80196	435.16908

MacDoppler Predictions: **XW-2F**

Kep Set: 999
Times: Local Time
Location: Hudson NH USA
Latitude: 42.7624 Degrees
Longitude: -71.4251 Degrees
Elevation: 56.0 Meters
Run on: 2019/06/16 06:58:54 EDT

	Date	Time	Azimuth	Elevation	Downlink	Uplink
Rise:	2019/06/22	08:04:06	352.4	0.0	145.99292	435.33129
Max:	2019/06/22	08:09:01	294.9	14.0	145.99001	435.33997
Set:	2019/06/22	08:13:51	237.6	0.0	145.98711	435.34863
Rise:	2019/06/22	17:10:24	136.2	0.0	145.99319	435.33050
Max:	2019/06/22	17:15:50	68.4	23.3	145.98998	435.34007
Set:	2019/06/22	17:21:17	1.3	0.0	145.98680	435.34953
Rise:	2019/06/22	18:44:14	194.4	0.0	145.99318	435.33051
Max:	2019/06/22	18:49:46	265.2	24.8	145.98997	435.34010
Set:	2019/06/22	18:55:21	335.5	0.0	145.98683	435.34947
Rise:	2019/06/23	06:14:21	23.2	0.0	145.99324	435.33034
Max:	2019/06/23	06:19:57	96.4	27.6	145.99000	435.34000
Set:	2019/06/23	06:25:26	168.6	0.0	145.98675	435.34969
Rise:	2019/06/23	07:48:31	357.0	0.0	145.99315	435.33062
Max:	2019/06/23	07:53:49	292.0	20.2	145.99000	435.34000
Set:	2019/06/23	07:59:01	227.4	0.0	145.98687	435.34933