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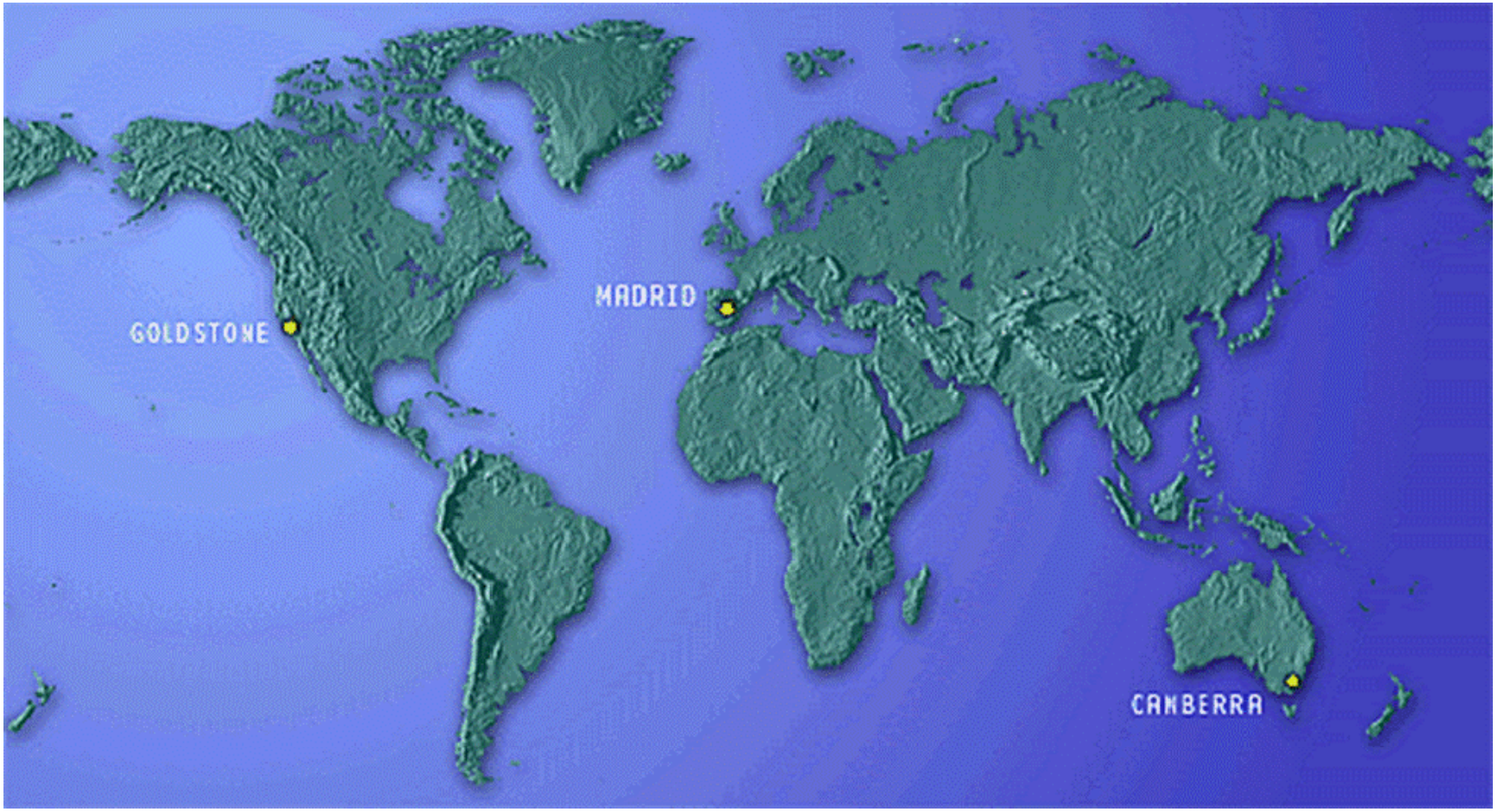
DSN Antenna Downtime
Status and Forecast



Resource Allocation Planning Service

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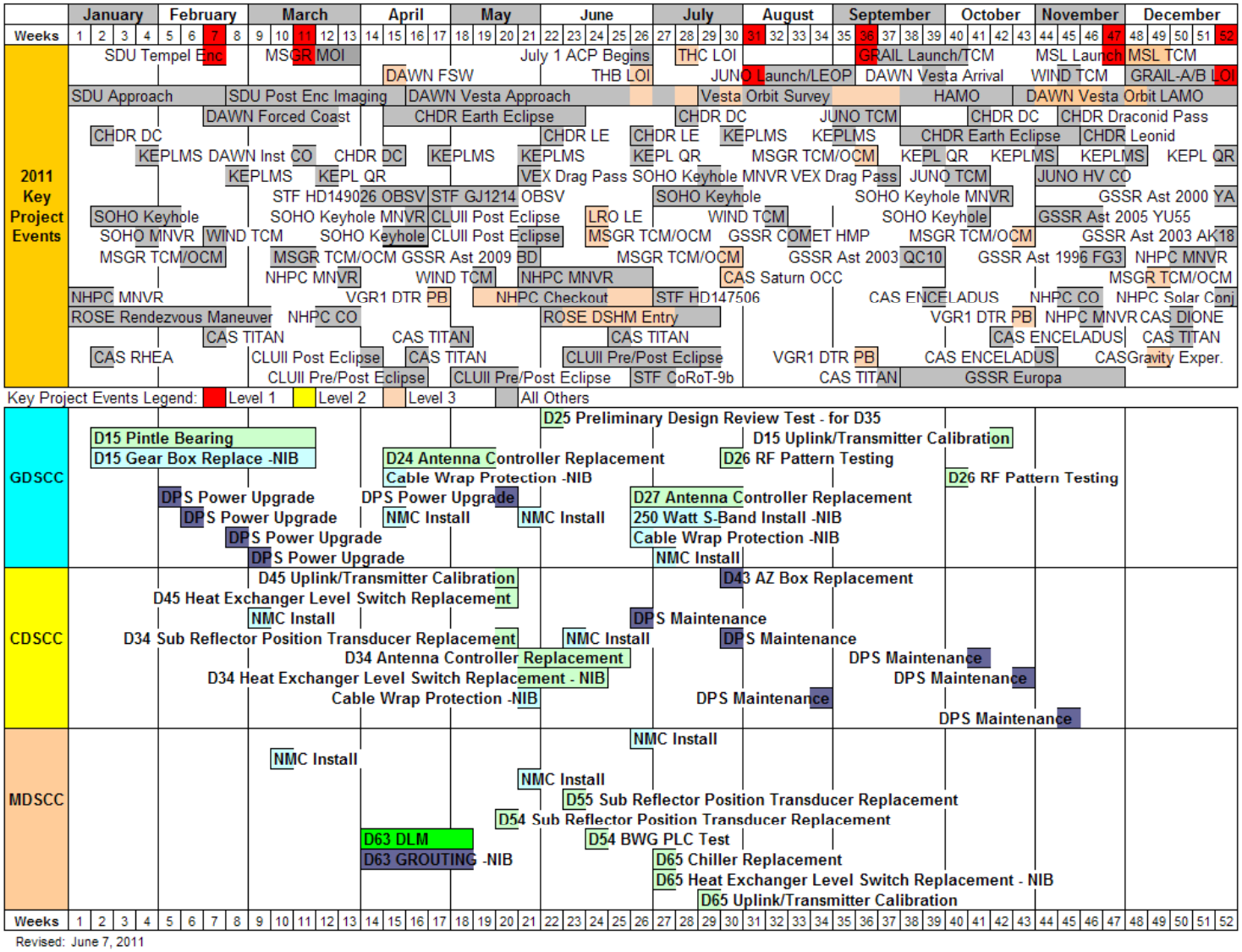
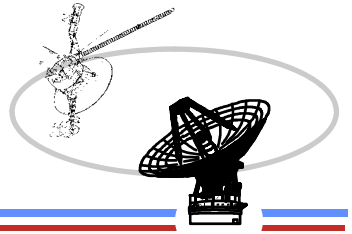
- 2011 -

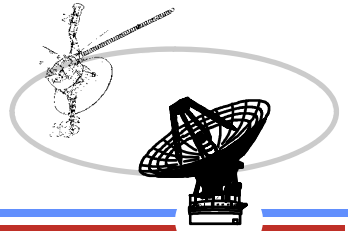


Revised: June 7, 2011



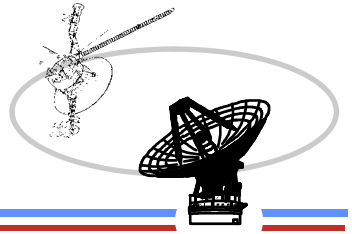
DSN Downtime 2011

2011							
Site	Details	Start	End	Duration (Days)	Weeks	Start DOY	End DOY
DSS 34	Heat Exchange Level Switch Replacement - NIB	05/23/2011 03:05	06/19/2011 02:00	27	21 - 24	143	170
DSS 34	Antenna Controller Replacement	05/23/2011 03:05	06/20/2011 17:55	29	21 - 25	143	171
DSS 55	Sub Reflector Position Transducer Replacement	06/07/2011 00:00	06/09/2011 23:59	3	23 - 23	158	160
DSS 54	BWG PLC Test	06/15/2011 16:40	06/16/2011 15:30	1	24 - 24	166	167
DSS 27	Cable Wrap Protection - NIB	06/27/2011 17:15	07/01/2011 00:00	3	26 - 26	178	182
DSS 27	250 Watt S-Band Install - NIB	06/27/2011 17:15	07/24/2011 00:00	26	26 - 29	178	205
DSS 27	Antenna Controller Replacement	06/27/2011 17:15	07/26/2011 11:30	29	26 - 30	178	207
SPC 40	DPS Maintenance	06/30/2011 01:00	06/30/2011 10:50	0	26 - 26	181	181
SPC 60	NMC Installation	07/03/2011 21:20	07/04/2011 01:20	0	26 - 26	184	185
DSS 65	Chiller Replacement	07/04/2011 01:20	07/04/2011 00:00	0	27 - 27	185	185
DSS 65	Chiller Replacement	07/05/2011 00:00	07/05/2011 15:25	1	27 - 27	186	186
DSS 65	Heat Exchanger - NIB	07/05/2011 00:00	07/05/2011 15:25	1	27 - 27	186	186
DSS 65	Chiller Replacement	07/06/2011 00:00	07/06/2011 15:10	1	27 - 27	187	187
DSS 65	Heat Exchanger - NIB	07/06/2011 00:00	07/06/2011 15:10	1	27 - 27	187	187
DSS 65	Chiller Replacement	07/07/2011 05:00	07/07/2011 17:00	0	27 - 27	188	188
DSS 65	Heat Exchanger - NIB	07/07/2011 05:00	07/07/2011 17:00	0	27 - 27	188	188
SPC 10	NMC Installation	07/10/2011 02:30	07/10/2011 05:30	0	27 - 27	191	191



DSN Downtime 2011 (Continued)

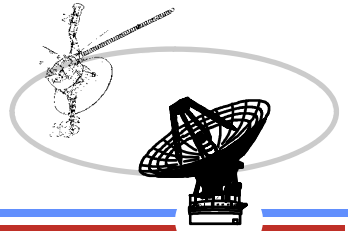
2011							
DSS 65	Uplink/Transmitter Cal	07/20/2011 05:35	07/20/2011 19:35	1	29 - 29	201	201
DSS 65	Uplink/Transmitter Cal	07/21/2011 07:35	07/21/2011 14:35	0	29 - 29	202	202
SPC 40	DPS Maintenance	07/25/2011 19:00	07/26/2011 03:00	0	30 - 30	206	207
DSS 43	AZ Box Replacement	07/25/2011 22:00	07/28/2011 18:25	3	30 - 30	206	209
DSS 26	RF Pattern Testing	07/26/2011 15:15	07/27/2011 03:35	1	30 - 30	207	208
DSS 26	RF Pattern Testing	07/29/2011 13:00	07/29/2011 23:00	0	30 - 30	210	210
SPC 40	DPS Maintenance	08/25/2011 01:00	08/25/2011 13:00	0	34 - 34	237	237
DSS 26	RF Pattern Testing	10/03/2011 00:00	10/06/2011 00:00	3	40 - 40	276	279
SPC 40	DPS Maintenance	10/13/2011 20:00	10/14/2011 08:00	0	41 - 41	286	287
DSS 15	Uplink/Transmitter Cal	10/17/2011 05:00	10/19/2011 17:00	2	42 - 42	290	292
SPC 40	DPS Maintenance	10/24/2011 20:00	10/25/2011 08:00	0	43 - 43	297	298
SPC 40	DPS Maintenance	11/10/2011 20:00	11/11/2011 08:00	0	45 - 45	314	315



Antenna Downtime Status and Forecast

The following are downtimes for 2011

- Goldstone Complex Wide DPS Power Upgrade Downtime
  - Completed May 17 week 20
    - Additional downtimes needed will be worked in with DSS maintenance
- NMC 2 – 4 hour Complex Wide Downtime
  - Additional time has been scheduled at all complexes
    - Goldstone NMC Task
      - Additional time is scheduled for July 10, week 27, DOY 191/0230-0530 for Automation Assembly
    - Canberra NMC Task
      - Completed May 29, week 21
      - Completed June 07, week 23
    - Madrid NMC Task
      - Completed May 28, week 21
      - Scheduled July 03, week 26, DOY 185/2120 – 0120
- DSS-63 downtime for Depot Level Maintenance was completed May 08, week 18
  - Grouting was scheduled NIB

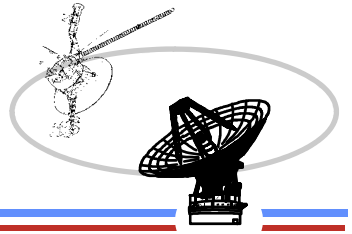


Antenna Downtime Status and Forecast

Downtimes for 2011 (continued)

- HEF Uplink and Transmitter Calibration downtime is requested on each antenna for 36 hours in 2011
  - DSS-45 was completed in week 20.
    - Downtime for Heat Exchanger Replacement was completed in week 20
  - DSS-65 is scheduled for week 29 July 20 and 21
    - DOY 201/0535 – 1935
    - DOY 202/0735 – 1435
  - DSS-15 is scheduled for week 42 October 17 – 19, DOY 290/0500 – 292/1700

- Canberra request six 8 – 12 hour blocks of Complex Wide DSCC Power Substation (DPS) Maintenance Downtime for April – November
  - Scheduled for weeks listed
    - June 30, week 26, DOY 181/0100 – 1050
    - July 25, week 30, DOY 206/1900 – 207/0300
    - August 25, week 34, DOY 237/0100 – 1300
    - October 13, week 41, DOY 286/2000 – 287/0800
    - October 24, week 43, DOY 297/2000 – 298/0800
    - November 10, week 45, DOY 314/2000 – 315/0800
  - There is a possibility that downtimes may be affected by GRAIL if the launch slips into week 40.



Antenna Downtime Status and Forecast

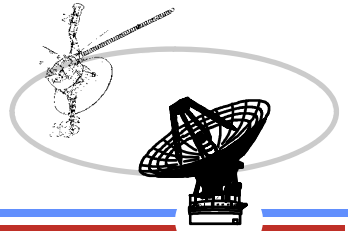
Downtimes for 2011 (continued)

- BWG Antenna Controller Replacement is requested starting in April
  - DSS-24 was completed in week 19
  - DSS-34 is scheduled for completion June 20, week 25, DOY 171/1755
    - Heat Exchanger Replacement is scheduled NIB ending in week 24
  - DSS-27 is scheduled for June 27 – July 25, weeks 26 – 30, DOY 177/1715 – 207/1130
    - 250 Watt S-Band Installation is scheduled NIB
    - Downtime will begin after THB LOI support on DOY 178. Additional time has been added, but more time is being requested to complete the task

  Note: Cable wrap protection for each BWG requires 3 days and will be NIB

  Additional Antenna Controller Replacements are proposed for 2012

- Sub Reflector Position Transducer Replacement is scheduled for May and June
  - DSS-34 was completed, week 20
  - DSS 54 was completed, week 20
  - DSS 55 is scheduled for completion June 09, week 23, DOY 160/0000

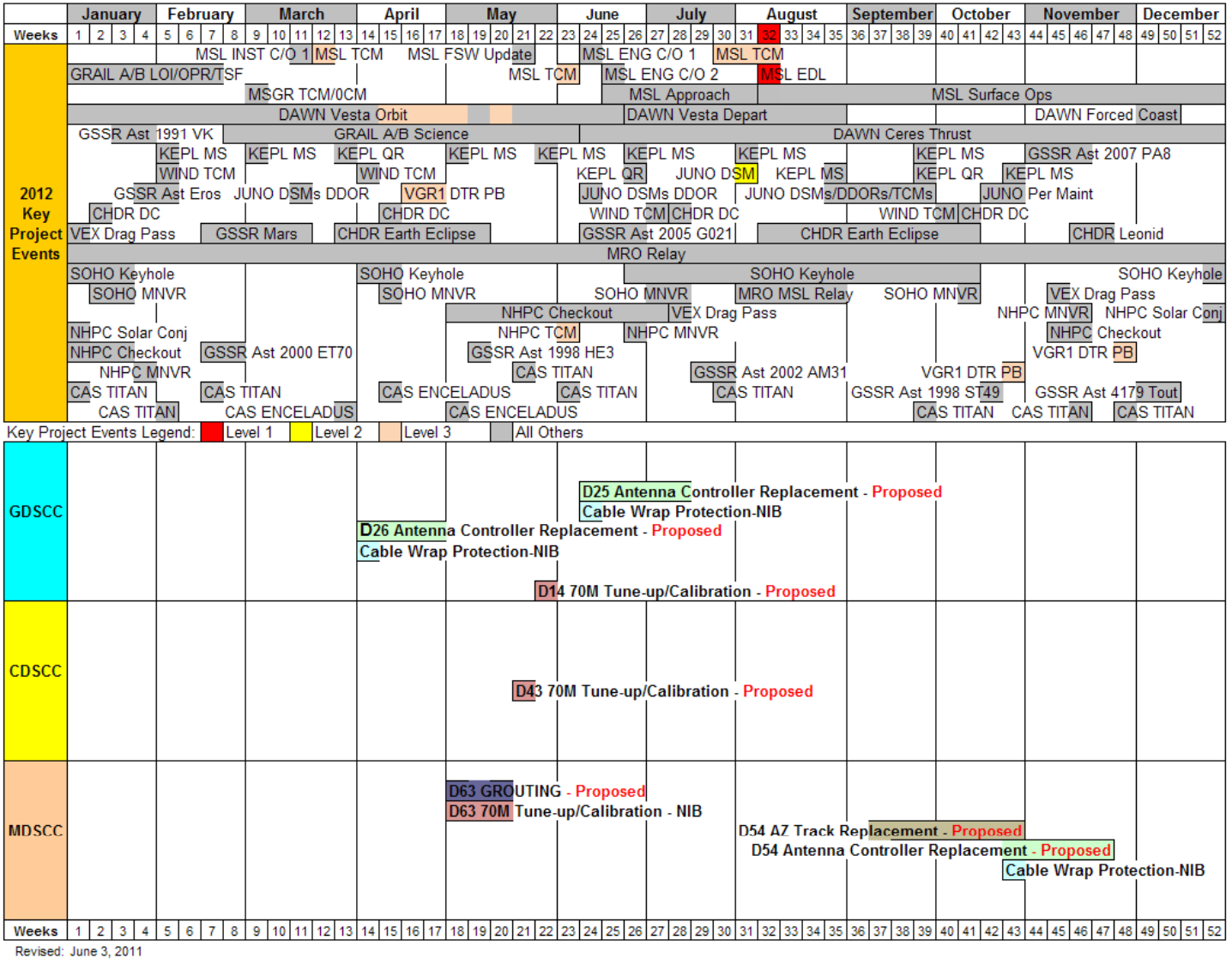


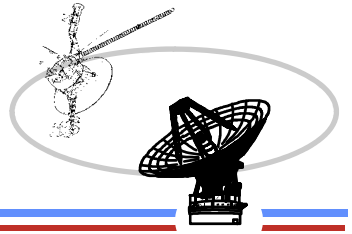
Downtimes for 2011 (continued)

- DSS-25 downtime for DSS-35 design review baseline testing was completed in week 22
- DSS-54 PLC test is requested in FY 2011
  - DSS-54 is scheduled for June 15 – 16, week 24, DOY 166/ 1640 – 167/1530
- DSS-65 Chiller replacement is scheduled for July, week 27
  - Four blocks are scheduled for July 04 – 07
    - July 04, DOY 185/0120 – 0000
    - July 05, DOY 186/0000 – 1525
    - July 06, DOY 187/0000 – 1510
    - July 07, DOY 188/0500 – 1700
  - Additional time is being requested by MDSCC to ensure the task is completed properly.
  - Heat Exchanger Replacement is scheduled NIB
- DSS-43 Elevation Databox Replacement for 72 hours is scheduled for July, week 30
  - This has been scheduled for July 25 – 29, DOY 206/2200 – 209/1825
- DSS-26 RF Pattern Testing is requested for July and September
  - Two blocks are scheduled for July, week 30.
    - DOY 207/1515 – 208/0335
    - DOY 210/1300 – 2300
  - One 72 block is scheduled in October, week 40, DOY 276/0000 – 279/0000

Resource Allocation Planning Service

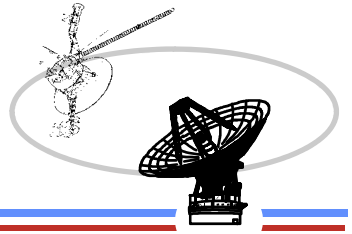
- 2012 -





DSN Downtime 2012

2012							
Site	Details	Start	End	Duration (Days)	Weeks	Start DOY	End DOY
DSS 26	Cable Wrap Protection - NIB	04/02/2012 13:00	04/05/2012 05:00	3	14 - 14	93	96
DSS 26	Antenna Controller Replacement - Proposed	04/02/2012 13:00	04/29/2012 01:00	26	14 - 17	93	120
DSS 63	70m Tune-up/Calibration - NIB	04/30/2012 06:00	05/20/2012 17:00	20	18 - 20	121	141
DSS 63	Grouting - Proposed	04/30/2012 06:00	05/20/2012 17:00	20	18 - 20	121	141
DSS 43	70m Tune-up/Calibration - Proposed	05/21/2012 19:00	05/25/2012 07:00	4	21 - 21	142	146
DSS 14	70m Tune-up/Calibration - Proposed	05/28/2012 14:00	06/02/2012 01:00	4	22 - 22	149	154
DSS 25	Cable Wrap Protection - NIB	06/11/2012 00:00	06/14/2012 00:00	3	24 - 24	163	166
DSS 25	Antenna Controller Replacement - Proposed	06/11/2012 00:00	07/15/2012 00:00	34	24 - 28	163	197
DSS 54	AZ Track Replacement - Proposed	09/10/2012 00:00	10/28/2012 00:00	48	37 - 43	254	302
DSS 54	Cable Wrap Protection - NIB	10/22/2012 00:00	10/25/2012 00:00	3	43 - 43	296	299
DSS 54	Antenna Controller Replacement - Proposed	10/22/2012 00:00	11/25/2012 00:00	34	43 - 47	296	330



Antenna Downtime Status and Forecast

The following are downtimes for 2012 – 2014

- BWG Antenna Controller Replacement for 2012 – 2013
  - DSS-26 is proposed for April 02 – 29, weeks 14 – 17, 2012, DOY 093/1300 – 120/0100 – Analysis is completed
  - DSS-25 is proposed for June 11 – July 15, weeks 24 – 28, 2012
  - DSS-54 is proposed for October 22 – November 25, weeks 43 – 47, 2012
  - DSS-55 is proposed for January 14 – February 17, 2013, weeks 03 – 07, 2013

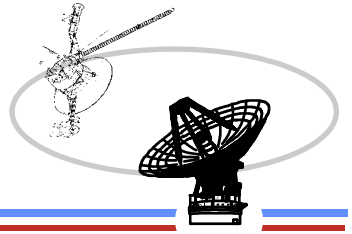
  Note: Cable Wrap Protection for each BWG ACR requires 3 days and will be NIB

- DSS-63 downtime for Grouting is requested once per year
  - Proposed for May 7 – 27 , weeks 18 – 20, 2012, DOY 121/0600 – 141/1700 – Analysis is completed
    - Tune-up/Calibration is requested NIB to grouting
    - Downtime was backed up 1 week due to Cassini requirements
  - Grouting is also proposed for September 2 – 17, weeks 36 – 38, 2013

  Note: Stand alone Grouting requires 15 days

- DSS-43 downtime for Tune-up/Calibration is requested for 2012
  - Tune-up/Calibration is proposed for May 21 – 25, week 21
    - Downtime was reevaluated and moved to week 21 due to a Cassini Ring Occultation in week 26,DOY 180

- DSS-14 downtime for Tune-up/Calibration is requested for 2012
  - Tune-up/Calibration is proposed for May 28 – June 01, week 22



Antenna Downtime Status and Forecast

The following are downtimes for 2012 – 2014 (continued)

- AZ Track Replacement is requested for DSS-54, 24 and 26 beginning in the fall of 2012. The following sequence is proposed
  - DSS-54 is proposed for September 10 – October 28, weeks 37 – 43, 2012,
  - DSS-24 is proposed for April 22 – June 30, weeks 17 – 26, 2013
  - DSS-26 is proposed for March 31 – June 8, weeks 14 – 23, 2014
    - 80 kW Facility Preparation will be scheduled NIB March 31 – May 18, weeks14 – 20

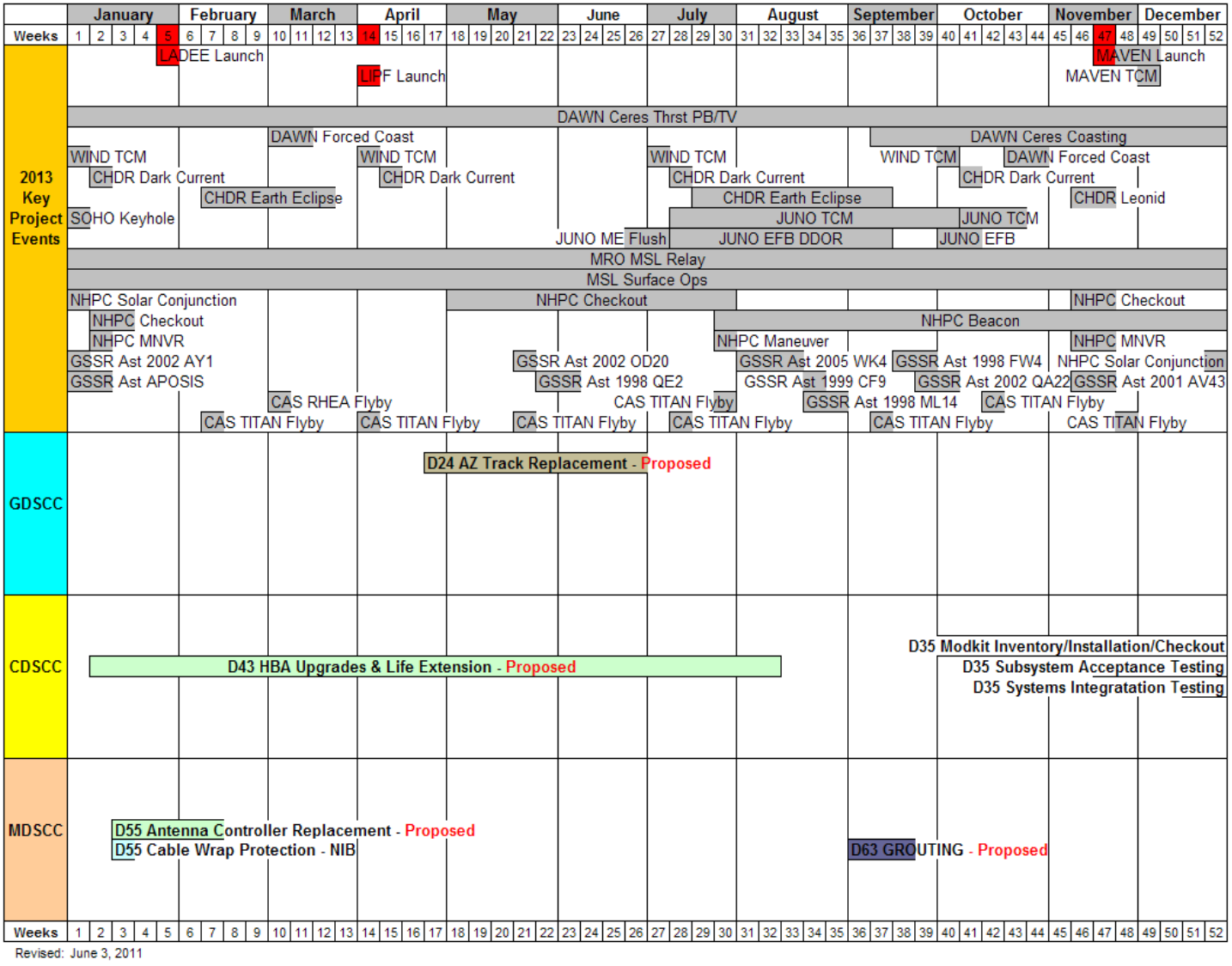
- DSS-43 HBA Upgrade Downtime is proposed for 2013
  - Proposed for January 7 – August 11, weeks 02 – 32
    - ZDD will be scheduled prior to return to service

  NOTE: This downtime is currently under review

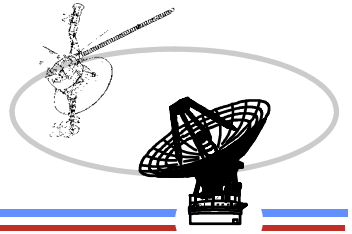
- DSS-63 HBA Upgrade Downtime is proposed for 2014
  - Proposed for March 10 – October 5, weeks 11– 40
    - ZDD will be scheduled prior to return to service

Resource Allocation Planning Service

- 2013 -



Revised: June 3, 2011



DSN Downtime 2013

2013							
Site	Details	Start	End	Duration (Days)	Weeks	Start DOY	End DOY
DSS 43	HBA Upgrades and Life Extension - Proposed	01/07/2013 00:00	08/11/2013 00:00	216	02 - 32	7	223
DSS 55	Cable Wrap Protection - NIB	01/14/2013 00:00	01/17/2013 00:00	3	03 - 03	14	17
DSS 55	Antenna Controller Replacement - Proposed	01/14/2013 00:00	02/17/2013 00:00	34	03 - 07	14	48
DSS 24	AZ Track Replacement - Proposed	04/22/2013 00:00	06/30/2013 00:00	69	17 - 26	112	181
DSS 63	Grouting - Proposed	09/02/2013 00:00	09/17/2013 00:00	15	36 - 38	245	260

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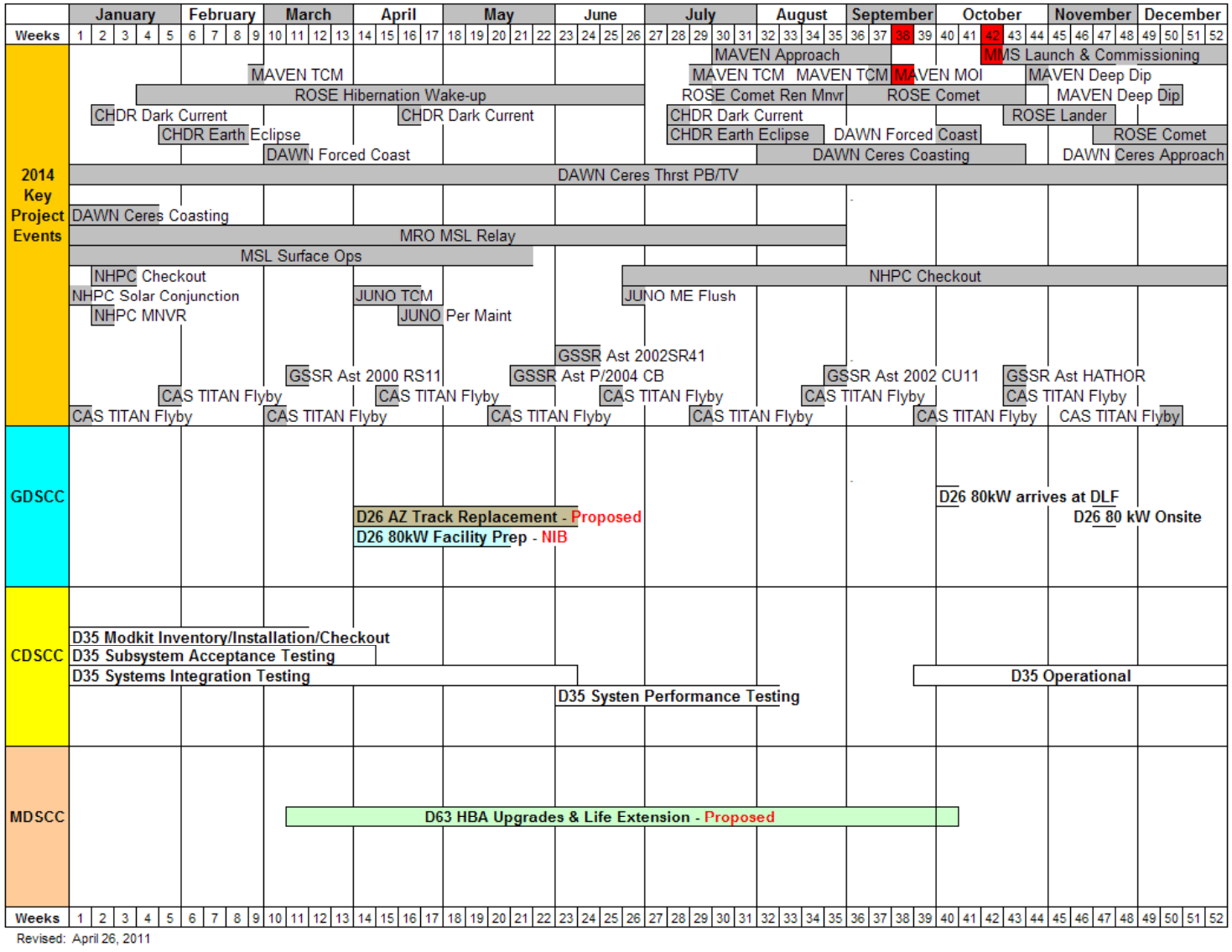
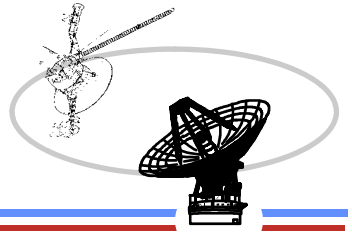
- 2014 -



Revised: April 26, 2011



DSN Downtime 2014

2014							
Site	Details	Start	End	Duration (Days)	Weeks	Start DOY	End DOY
DSS 63	HBA Upgrades and Life Extension - Proposed	03/10/2014 00:00	10/05/2014 00:00	209	11 - 40	69	278
DSS 26	80 kW Facility Prep - NIB	03/31/2014 00:00	05/18/2014 00:00	48	14 - 20	90	138
DSS 26	AZ Track Replacement - Proposed	03/31/2014 00:00	06/08/2014 00:00	69	14 - 23	90	159

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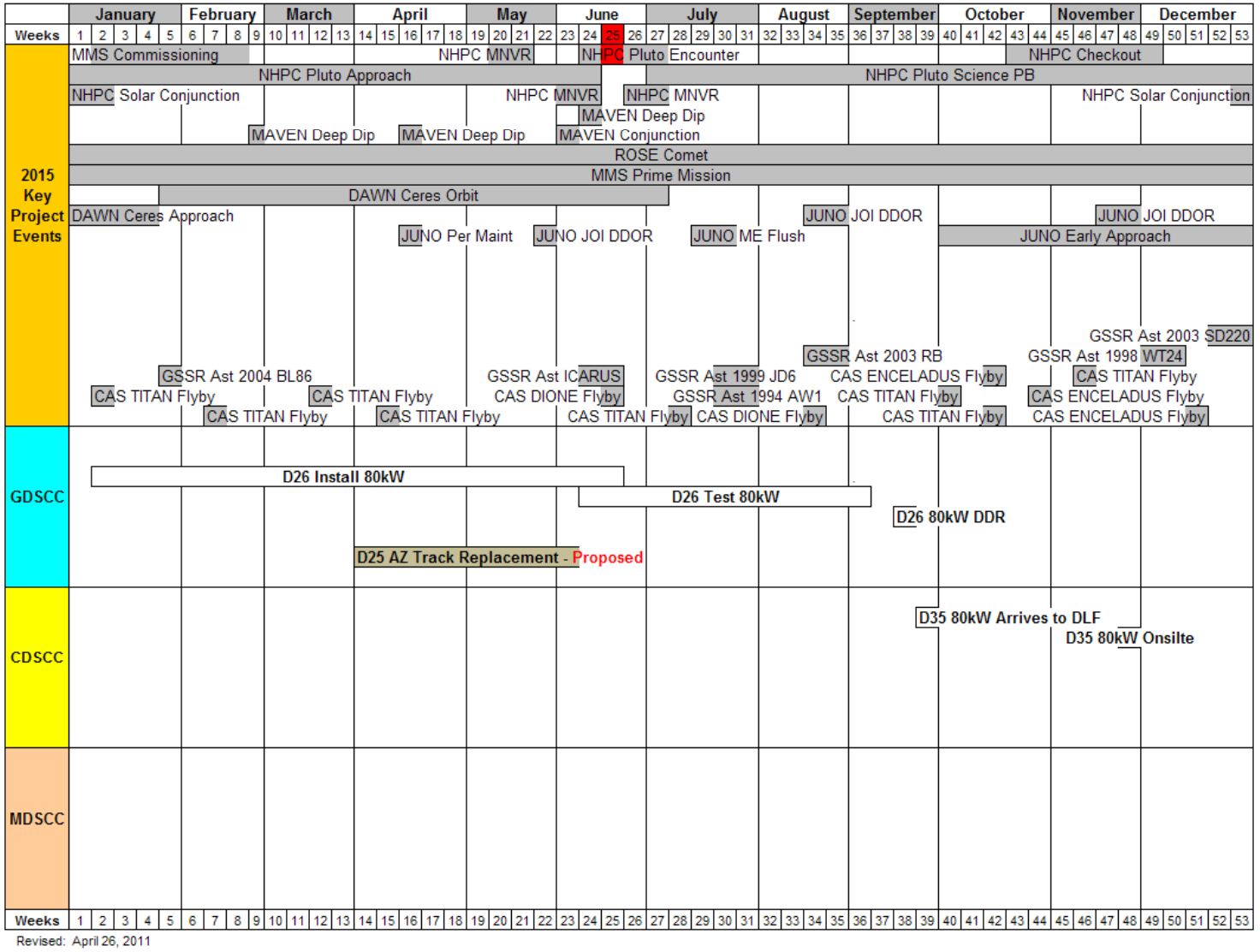
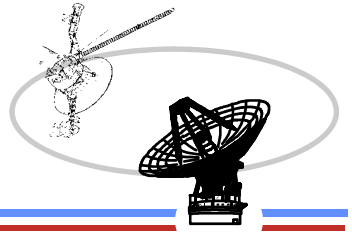
- 2015 -

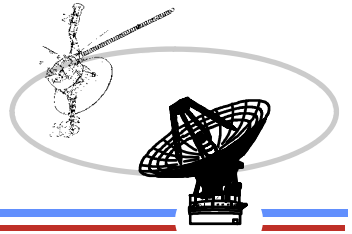


Revised: April 26, 2011



DSN Downtime 2015

2015							
Site	Details	Start	End	Duration (Days)	Weeks	Start DOY	End DOY
DSS 25	AZ Track Replacement - Proposed	03/31/2015 00:00	06/07/2015 00:00	68	14 - 23	90	158



Antenna Downtime Status and Forecast

The following are downtimes for 2015 – 2016

- AZ Track Replacement is requested for DSS-25 and 55
  - DSS-25 is proposed for March 31 – June 7, weeks 14 – 23, 2015
  - DSS-55 is proposed for February 1 – April 10, weeks 05 – 14, 2016
    - 80 kW Facility Preparation is scheduled NIB for February 1 – March 20, weeks 05 – 11

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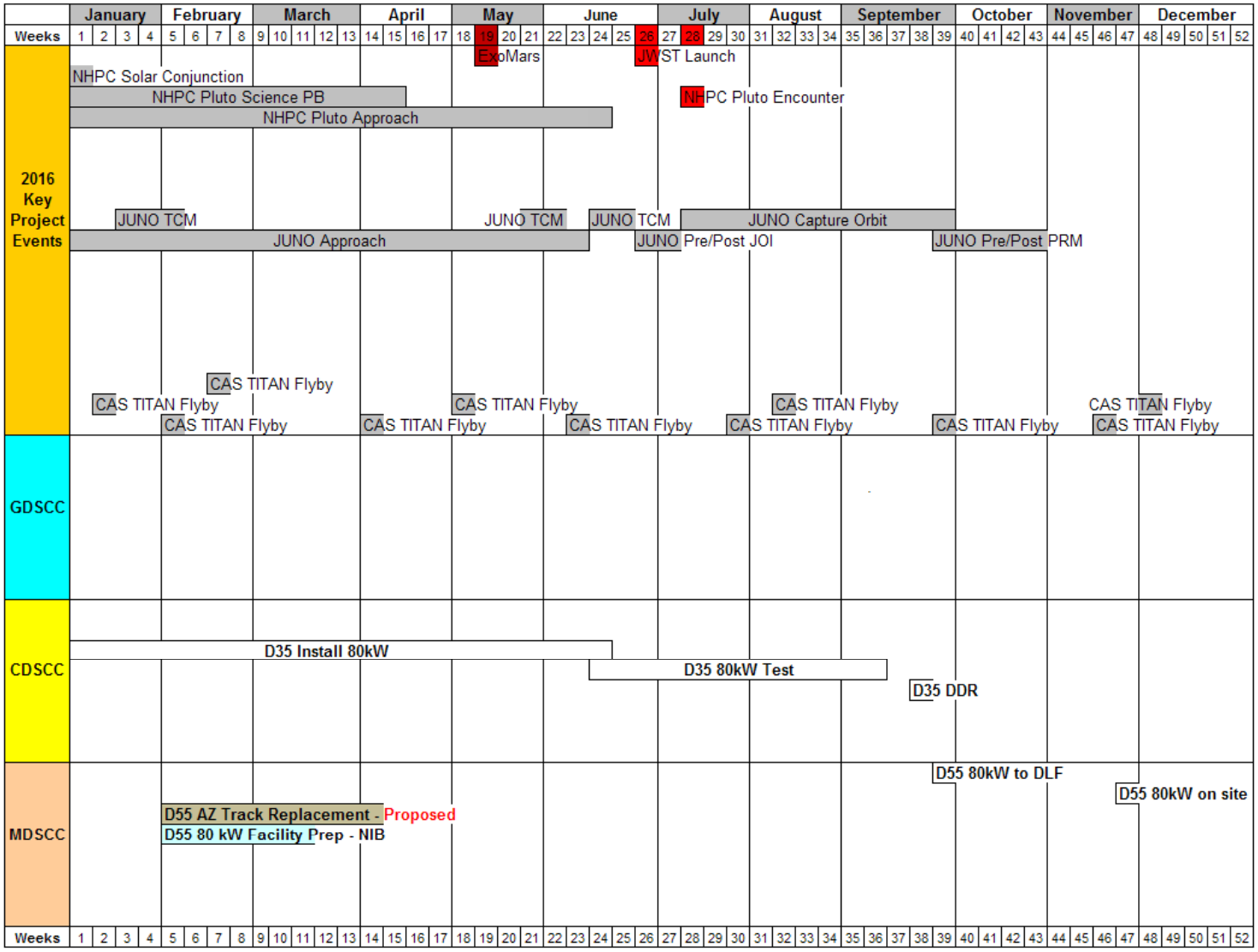
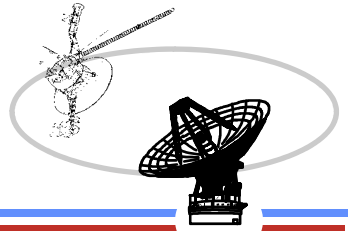
- 2016 -



Revised: April 26, 2011



DSN Downtime 2016

2016							
Site	Details	Start	End	Duration (Days)	Weeks	Start DOY	End DOY
DSS 55	80 kW Facility Prep - NIB	02/01/2016 00:00	03/20/2016 00:00	48	05 - 11	32	80
DSS 55	AZ Track Replacement - Proposed	02/01/2016 00:00	04/10/2016 00:00	69	05 - 14	32	101

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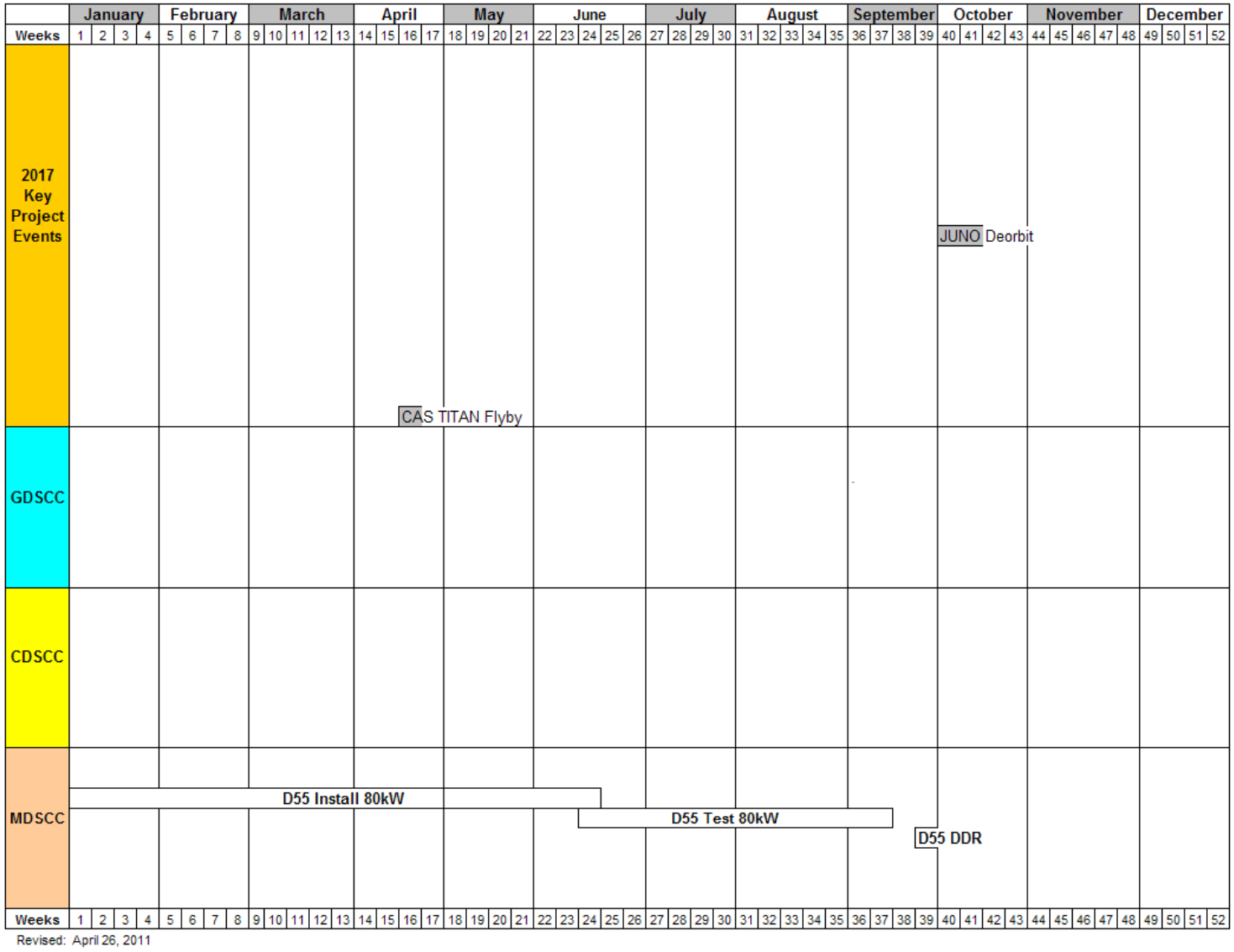
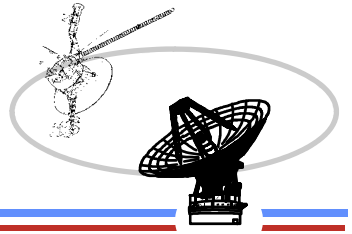
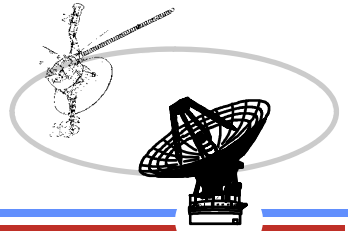
- 2017 -





Future assets new/upgrades

- DSS-35 Installation and Operational 2013 – 2014
  - Modkit Installation October 1, 2013 – March 14, 2014 weeks 40 – 11
  - Acceptance Testing November 22, 2013 – April 4, 2014, weeks 47 – 14
  - System Integration Testing December 17, 2013 – June 2, 2014 weeks 51 – 23
  - Operations Systems Performance Testing June 2, 2014 – August 15, 2014, weeks 23 – 33
  - Operational September 26, 2014
- DSS-26 80kW Installation 2014 – 2015
  - 80kW arrive at DLF October, 2014, week 40
  - 80kW arrive on-site November, 2014, week 47
  - 80kW install January – June, 2015, weeks 02 – 25
  - 80 kW test June – September, 2015, weeks 24 – 36
  - DDR September, 2015, week 38
- DSS-35 80kW Installation 2016 – A placeholder has been set awaiting dates
- DSS-36 Installation and Operational 2016 – A placeholder has been set awaiting dates
- DSS-55 80kW Installation 2016 – 2017
  - 80kW Facility Prep – February 2016, weeks 05 – 10
  - 80kW at DLF September, 2016, week 39
  - 80kW on-site November, 2016, week 47
  - 80kW install January – June, 2017, weeks 01 – 24
  - 80kW test June – September, 2017, weeks 24 – 37
  - DDR September, 2017, week 39



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Antenna Downtime Status and Forecast

Complex	Station	Subnet	S-Band Down	S-Band Up	X-Band Down	X-Band Up	Ka-Band Down	Ka-Band Up	Ka 2	X-Band ACQ AID	80kW
10	DSS-27	34HSB	✔	✔	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10	DSS-24	34B1	✔	✔	✔	✔	N/A	N/A	✔	✔	N/A
40	DSS-34	34B1	✔	✔	✔	✔	✔	N/A	✔	✔	N/A
60	DSS-54	34B1	✔	✔	✔	✔	✔	N/A	✔	✔	N/A
10	DSS-25	34B2	N/A	N/A	✔	✔	✔	12/12/10	N/A	N/A	N/A
10	DSS-26	34B2	N/A	N/A	✔	✔	✔	N/A	N/A	N/A	10/01/15
40	DSS-35*	34B2	N/A	N/A	11/01/14	11/01/14	11/01/14	N/A	N/A	N/A	11/01/16
40	DSS-36*	34B2	N/A	N/A	11/01/16	11/01/16	11/01/16	N/A	N/A	N/A	N/A
60	DSS-55	34B2	N/A	N/A	✔	✔	✔	N/A	N/A	N/A	10/01/17
10	DSS-15	34HEF	✔	N/A	✔	✔	N/A	N/A	N/A	N/A	N/A
40	DSS-45	34HEF	✔	✔	✔	✔	N/A	N/A	N/A	N/A	N/A
60	DSS-65	34HEF	✔	✔	✔	✔	N/A	N/A	N/A	N/A	N/A
10	DSS-14	70M	✔	✔	✔	✔	N/A	N/A	N/A	N/A	N/A
40	DSS-43	70M	✔	✔	✔	✔	N/A	N/A	N/A	N/A	N/A
60	DSS-63	70M	✔	✔	✔	✔	N/A	N/A	N/A	N/A	N/A

N/A = Capability Not Planned

xx/xx/xx = Capability Date Recently Changed

As of: 6/28/2010

✔ ✔ ✔ = Capability Recently Exists

✔ = Capability Exists

* = To Be Commissioned