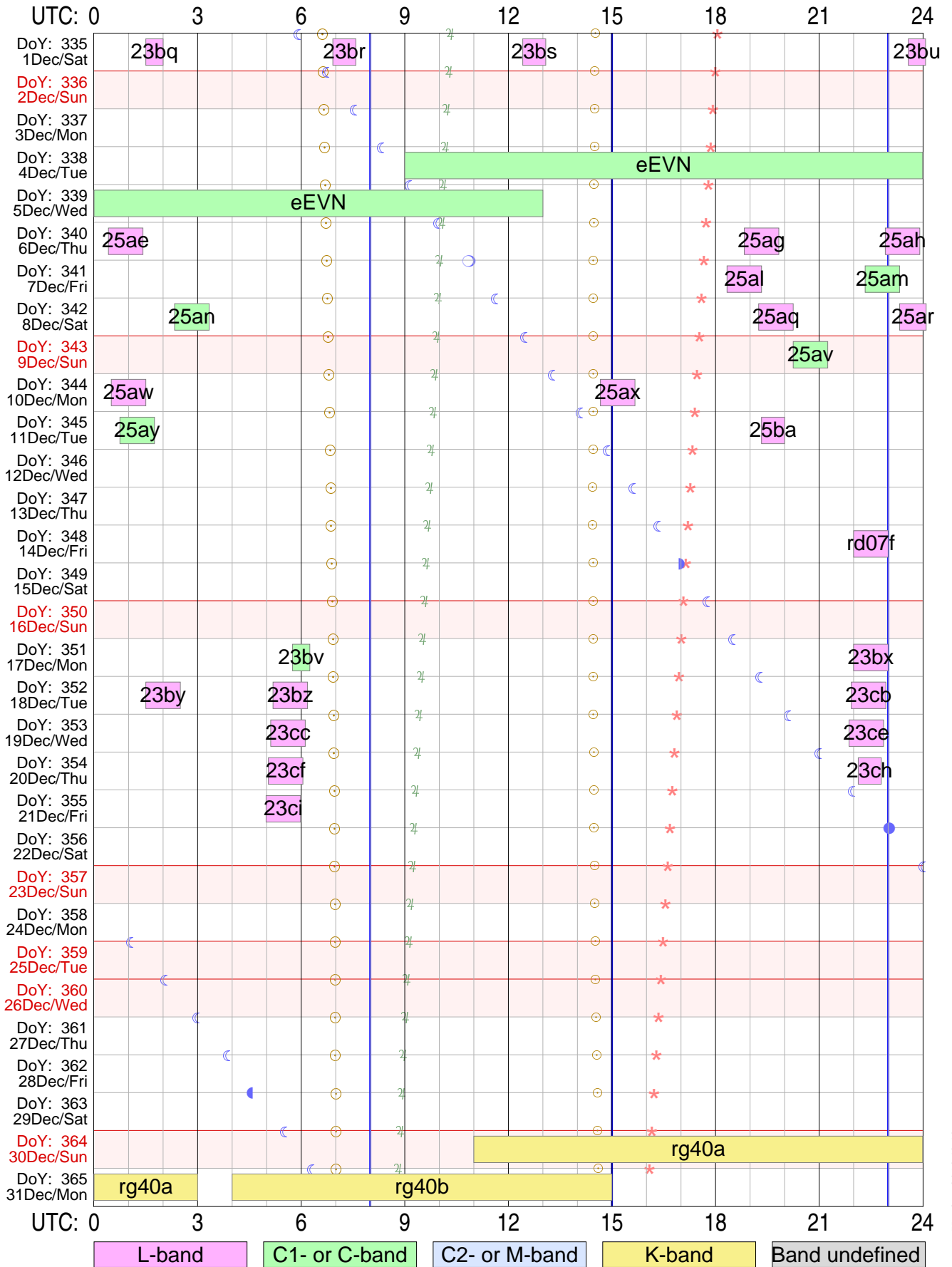


Tr VLBI plan for Dec 2018



Strona zostawiona celowo pusta

RadioAstron & EVN Experiments

Nov 2018

Uytownik ftp dla logw i schedulw RA: grt

ftp://webinet.asc.rssi.ru

Przykad dla log files: cd GRT_log_files/2014_09/2014_09_01_raks08ak

Przykad dla sched files: cd schedule/grtsched/RAKS/rk08ak

335	1	12	Sob	1	30	2	00	rk23bq	"L	"
335	1	12	Sob	6	55	7	35	rk23br	"L	"
335	1	12	Sob	12	25	13	05	rk23bs	"L	"
335	1	12	Sob	23	35	24	05	rk23bu	"L	"
340	6	12	Czw	0	25	1	25	rk25ae	"L	"
340	6	12	Czw	18	50	19	50	rk25ag	"L	"
340	6	12	Czw	22	55	23	55	rk25ah	"L	"
341	7	12	Pia	18	20	19	20	rk25al	"L	"
341	7	12	Pia	22	20	23	20	rk25am	"C	"
342	8	12	Sob	2	20	3	20	rk25an	"C	"
342	8	12	Sob	19	15	20	15	rk25aq	"L	"
342	8	12	Sob	23	20	24	20	rk25ar	"L	"
343	9	12	Nie	20	15	21	15	rk25av	"C	"
344	10	12	Pon	0	30	1	30	rk25aw	"L	"
344	10	12	Pon	14	40	15	40	rk25ax	"L	"
345	11	12	Wto	0	45	1	45	rk25ay	"C	"
345	11	12	Wto	19	20	20	00	rk25ba	"L	"
348	14	12	Pia	22	00	23	00	rd07f	"L	"
351	17	12	Pon	5	45	6	15	rk23bv	"C	"
351	17	12	Pon	22	00	23	00	rk23bx	"L	"
352	18	12	Wto	1	30	2	30	rk23by	"L	"
352	18	12	Wto	5	11	6	11	rk23bz	"L	"
352	18	12	Wto	21	56	22	56	rk23db	"L	"
353	19	12	Sro	5	07	6	07	rk23dc	"L	"
353	19	12	Sro	21	52	22	52	rk23de	"L	"
354	20	12	Czw	5	03	6	03	rk23df	"L	"
354	20	12	Czw	22	08	22	48	rk23dh	"L	"
355	21	12	Pia	4	59	5	59	rk23di	"L	"
364	30	12	Nie	11	00	24	00	rg40a	"K	"
365	31	12	Pon	0	00	3	00	rg40a	"K	"
365	31	12	Pon	4	00	15	00	rg40b	"K	"

Plik pdf tego dokumentu jest dost/epny w sieci pod adresem:

<http://paulo.astro.uni.torun.pl/~pw/VLBI/schedules/dec18.pdf>

rk23bqtr

RADIOASTRON AGN SCATTERING SUBSTRUCTURE

PI: *Mikhail Lisakov*

Address: ASC Lebedev Profsoyuznaya 84/32 117997 Moscow, Russia
Phone: +7-495-3332512 EMAIL: kirx@scan.sai.msu.ru
Fax: +7-495-3332378 Phone during observation: +7-903-6614865

Observing mode: C/L-band, dual-pol

Schedule for TORUN (Code Tr) Page 2

RadioAstron AGN scattering substructure

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.

Early: Seconds between end of slew and start. Dwell: On source seconds.

Disk: GBytes recorded to this point.

TPStart: Recording start time. Frequencies are LO sum (band edge).

SYNC: Time correlator is expected to sync up.

Start UT Source Start / Stop Early Disk TPStart
Stop UT LST EL AZ HA UP ParA Dwell GBytes SYNC

--- Sat 1 Dec 2018 Day 335 ---

----- L-band VLBI scans -----

Next scan frequencies: 1668.00 1668.00 1668.00 1668.00
Next BBC frequencies: 732.00 732.00 732.00 732.00
Next scan bandwidths: 16.00 16.00 16.00 16.00

01 30 00	1015+359	07 23 43	54.8	101.9	-2.9	-46.3	0	0	01 30 00
01 44 30	---	07 38 16	57.0	105.6	-2.7	-45.4	870	28	01 30 01
01 45 00	1015+359	07 38 46	57.0	105.7	-2.7	-45.3	24	28	01 45 00
02 00 00	---	07 53 48	59.2	109.8	-2.4	-44.0	900	57	01 45 01

SETUP FILE INFORMATION:

NOTE: If DOPPLER, FREQ, or BW were used, see the individual scans for the final BBC settings.

=====
Setup file: ra18cm2.set

Setup group: 6	Station: TORUN	Total bit rate: 256
Format: MKIV1:4	Bits per sample: 2	Sample rate: 32.000
Number of channels: 4	DBE type:	Speedup factor: 1.00

Disk used to record data.

```

1st LO=  2400.00  2400.00  2400.00  2400.00
Net SB=           L           L           U           U
IF SB =           L           L           L           L
Pol.  =          RCP          LCP          RCP          LCP
BBC   =           1           2           1           2
BBC SB=           U           U           L           L
IF    =           C           A           C           A

```

The following frequency sets based on these setups were used.

```

Frequency Set:  4  Setup file default.  Used with PCAL = 1MHz
LO sum=  1668.00  1668.00  1668.00  1668.00
BBC fr=   732.00   732.00   732.00   732.00
Bandwd=   16.00   16.00   16.00   16.00
Matching frequency sets:  4

```

Track assignments are:

```

track1=  2, 18,  3, 19
barrel=roll_off

```

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(J2000)	(Date)	Error (mas)
* FAKERA	11 57 21.769299	* 12 00 00.000000	12 00 47.915005	0.00
	85 16 41.77889	* 85 00 00.000000	84 53 28.25768	0.00
	fake circumpolar target for a TS to look at			
* 1015+359	10 15 16.226760	* 10 18 10.988103	10 19 15.762202	0.00
J1018+3542	35 57 41.35603	* 35 42 39.44084	35 36 50.97820	0.00
	./rk23bq_sources.radioastron			
	AGN, rfc_2013d, RA-A06-07			

EFFECT OF SOLAR CORONA

The solar corona can cause unstable phases for sources too close to the Sun. SCHED provides warnings at individual scans for distances less than 10 degrees. The distance from the Sun to each source in this schedule is:

Source	Sun distance (deg)
1015+359	104.2

Barry Clark estimates from predictions by Ketan Desai of IPM scattering sizes that the Sun will cause amplitude reductions on the longest VLBA baselines at a solar distance of $60 \text{ deg } F^{-0.6}$ where F is in GHz.

For common VLBI bands, this is:

1.6 GHz	45. deg
2.3 GHz	36. deg
5.0 GHz	23. deg
8.4 GHz	17. deg
15.0 GHz	12. deg
22.0 GHz	9. deg


```

1st LO= 2400.00 2400.00 2400.00 2400.00
Net SB=      L      L      U      U
IF SB =      L      L      L      L
Pol.  =      RCP     LCP     RCP     LCP
BBC   =      1      2      1      2
BBC SB=      U      U      L      L
IF    =      C      A      C      A

```

The following frequency sets based on these setups were used.

```

Frequency Set: 3 Setup file default. Used with PCAL = 1MHz
LO sum= 1668.00 1668.00 1668.00 1668.00
BBC fr= 732.00 732.00 732.00 732.00
Bandwd= 16.00 16.00 16.00 16.00
Matching frequency sets: 3

```

Track assignments are:

```

track1= 2, 18, 3, 19
barrel=roll_off

```

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(J2000)	(Date)	Error (mas)
* FAKERA	11 57 21.769299	* 12 00 00.000000	12 00 47.971270	0.00
	85 16 41.77889	* 85 00 00.000000	84 53 28.21762	0.00
	fake circumpolar target for a TS to look at			
* 1015+359	10 15 16.226760	* 10 18 10.988103	10 19 15.769840	0.00
J1018+3542	35 57 41.35603	* 35 42 39.44084	35 36 50.94982	0.00
	./rk23br_sources.radioastron			
	AGN, rfc_2013d, RA-A06-07			

EFFECT OF SOLAR CORONA

The solar corona can cause unstable phases for sources too close to the Sun. SCHED provides warnings at individual scans for distances less than 10 degrees. The distance from the Sun to each source in this schedule is:

Source	Sun distance (deg)
1015+359	104.5

Barry Clark estimates from predictions by Ketan Desai of IPM scattering sizes that the Sun will cause amplitude reductions on the longest VLBA baselines at a solar distance of $60 \text{ deg } F^{-0.6}$ where F is in GHz.

For common VLBI bands, this is:

1.6 GHz	45. deg
2.3 GHz	36. deg
5.0 GHz	23. deg
8.4 GHz	17. deg
15.0 GHz	12. deg
22.0 GHz	9. deg


```

1st LO= 2400.00 2400.00 2400.00 2400.00
Net SB=      L      L      U      U
IF SB =      L      L      L      L
Pol.  =      RCP     LCP     RCP     LCP
BBC   =      1      2      1      2
BBC SB=      U      U      L      L
IF    =      C      A      C      A

```

The following frequency sets based on these setups were used.

```

Frequency Set: 3 Setup file default. Used with PCAL = 1MHz
LO sum= 1668.00 1668.00 1668.00 1668.00
BBC fr= 732.00 732.00 732.00 732.00
Bandwd= 16.00 16.00 16.00 16.00
Matching frequency sets: 3

```

Track assignments are:

```

track1= 2, 18, 3, 19
barrel=roll_off

```

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(Date)	Error (mas)	
* FAKERA	11 57 21.769299	* 12 00 00.000000	12 00 48.023534	0.00
	85 16 41.77889	* 85 00 00.000000	84 53 28.18050	0.00
	fake circumpolar target for a TS to look at			
* 1015+359	10 15 16.226760	* 10 18 10.988103	10 19 15.776936	0.00
J1018+3542	35 57 41.35603	* 35 42 39.44084	35 36 50.92309	0.00
	./rk23bs_sources.radioastron			
	AGN, rfc_2013d, RA-A06-07			

EFFECT OF SOLAR CORONA

The solar corona can cause unstable phases for sources too close to the Sun. SCHED provides warnings at individual scans for distances less than 10 degrees. The distance from the Sun to each source in this schedule is:

Source	Sun distance (deg)
1015+359	104.7

Barry Clark estimates from predictions by Ketan Desai of IPM scattering sizes that the Sun will cause amplitude reductions on the longest VLBA baselines at a solar distance of $60 \text{ deg } F^{-0.6}$ where F is in GHz.

For common VLBI bands, this is:

1.6 GHz	45. deg
2.3 GHz	36. deg
5.0 GHz	23. deg
8.4 GHz	17. deg
15.0 GHz	12. deg
22.0 GHz	9. deg


```

1st LO=  2400.00  2400.00  2400.00  2400.00
Net SB=           L           L           U           U
IF SB =           L           L           L           L
Pol.  =          RCP          LCP          RCP          LCP
BBC   =           1           2           1           2
BBC SB=           U           U           L           L
IF    =           C           A           C           A

```

The following frequency sets based on these setups were used.

```

Frequency Set:  2  Setup file default.  Used with PCAL = 1MHz
LO sum=  1668.00  1668.00  1668.00  1668.00
BBC fr=   732.00  732.00  732.00  732.00
Bandwd=   16.00  16.00  16.00  16.00
Matching frequency sets:  2

```

Track assignments are:

```

track1=  2, 18,  3, 19
barrel=roll_off

```

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(J2000)	(Date)	Error (mas)
* FAKERA	11 57 21.769299	* 12 00 00.000000	12 00 48.136449	0.00
	85 16 41.77889	* 85 00 00.000000	84 53 28.10011	0.00
	fake circumpolar target for a TS to look at			
* 1015+359	10 15 16.226760	* 10 18 10.988103	10 19 15.792344	0.00
J1018+3542	35 57 41.35603	* 35 42 39.44084	35 36 50.86363	0.00
	./rk23bu_sources.radioastron			
	AGN, rfc_2013d, RA-A06-07			

EFFECT OF SOLAR CORONA

The solar corona can cause unstable phases for sources too close to the Sun. SCHED provides warnings at individual scans for distances less than 10 degrees. The distance from the Sun to each source in this schedule is:

Source	Sun distance (deg)
1015+359	105.1

Barry Clark estimates from predictions by Ketan Desai of IPM scattering sizes that the Sun will cause amplitude reductions on the longest VLBA baselines at a solar distance of $60 \text{ deg } F^{-0.6}$ where F is in GHz.

For common VLBI bands, this is:

1.6 GHz	45. deg
2.3 GHz	36. deg
5.0 GHz	23. deg
8.4 GHz	17. deg
15.0 GHz	12. deg
22.0 GHz	9. deg

rk25aetr

RADIOASTRON AGN OBSERVATIONS
PI: Leonid Gurvits

Address: Joint Institute for VLBI ERIC
Oude Hoogeveensedijk 4
7991 PD Dwingeloo, The Netherlands

Phone: +31 521 596 514
EMAIL: lgurvits@jive.eu
Fax:
Phone during observation: +31 521 596 500

Observing mode: C/L-band, dual-pol

Schedule for TORUN (Code Tr) Page 2

RadioAstron AGN observations

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.
Early: Seconds between end of slew and start. Dwell: On source seconds.
Disk: GBytes recorded to this point.
TPStart: Recording start time. Frequencies are LO sum (band edge).
SYNC: Time correlator is expected to sync up.

```
-----
Start UT  Source                Start / Stop          Early  Disk  TPStart
Stop UT                LST   EL   AZ   HA  UP   ParA Dwell  GBytes  SYNC
-----
```

--- Thu 6 Dec 2018 Day 340 ---

----- L-band VLBI scans -----

```
Next scan frequencies: 1668.00 1668.00 1668.00 1668.00
Next BBC frequencies:  732.00  732.00  732.00  732.00
Next scan bandwidths:  16.00   16.00   16.00   16.00
```

Start UT	Source	LST	EL	AZ	HA	UP	ParA	Early Dwell	Disk GBytes	TPStart SYNC
00 25 00	0235+164	06 38 16	31.4	255.4	4.0		37.4	0	0	00 25 00
00 44 30	---	06 57 49	28.5	259.7	4.3		38.1	1170	37	00 25 01
00 45 00	0235+164	06 58 19	28.4	259.8	4.3		38.1	24	37	00 45 00
01 04 30	---	07 17 52	25.5	263.9	4.6		38.6	1170	75	00 45 01
01 05 00	0235+164	07 18 22	25.4	264.0	4.6		38.6	24	75	01 05 00
01 25 00	---	07 38 25	22.4	268.2	5.0		38.8	1200	113	01 05 01

SETUP FILE INFORMATION:

NOTE: If DOPPLER, FREQ, or BW were used, see the individual scans for the final BBC settings.

==== Setup file: ra18cm2.set

Setup group: 7	Station: TORUN	Total bit rate: 256
Format: MKIV1:4	Bits per sample: 2	Sample rate: 32.000
Number of channels: 4	DBE type:	Speedup factor: 1.00

Disk used to record data.

1st LO=	2400.00	2400.00	2400.00	2400.00
Net SB=	L	L	U	U
IF SB =	L	L	L	L
Pol. =	RCP	LCP	RCP	LCP
BBC =	1	2	1	2
BBC SB=	U	U	L	L
IF =	C	A	C	A

The following frequency sets based on these setups were used.

Frequency Set: 5 Setup file default. Used with PCAL = 1MHz
 LO sum= 1668.00 1668.00 1668.00 1668.00
 BBC fr= 732.00 732.00 732.00 732.00
 Bandwd= 16.00 16.00 16.00 16.00
 Matching frequency sets: 5

Track assignments are:

track1= 2, 18, 3, 19
 barrel=roll_off

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(Date)	Error (mas)	
* FAKERA	11 57 21.769299	* 12 00 00.000000	12 00 49.020430	0.00
	85 16 41.77889	* 85 00 00.000000	84 53 27.39269	0.00
	fake circumpolar target for a TS to look at			
* 0235+164	02 35 52.630215	* 02 38 38.930107	02 39 42.148374	0.00
J0238+1636	16 24 04.01610	* 16 36 59.27452	16 41 48.24519	0.00
	./rk25ae_sources.radioastron AGN, rfc_2034d, RA-A06-08			

EFFECT OF SOLAR CORONA

The solar corona can cause unstable phases for sources too close to the Sun. SCHED provides warnings at individual scans for distances less than 10 degrees. The distance from the Sun to each source in this schedule is:

Source	Sun distance (deg)
0235+164	148.9

Barry Clark estimates from predictions by Ketan Desai of IPM scattering sizes that the Sun will cause amplitude reductions on the longest VLBA baselines at a solar distance of $60 \text{ deg } F^{-0.6}$ where F is in GHz.

For common VLBI bands, this is:

1.6 GHz	45. deg
2.3 GHz	36. deg
5.0 GHz	23. deg
8.4 GHz	17. deg
15.0 GHz	12. deg
22.0 GHz	9. deg

rk25agtr

RADIOASTRON AGN OBSERVATIONS

PI: Leonid Gurvits

Address: Joint Institute for VLBI in ERIC
Oude Hoogeveensedijk 4
7991 PD Dwingeloo, The Netherlands

Phone: +31 521 596 514
EMAIL: lgurvits@jive.eu
Fax:
Phone during observation: +31 521 596 500

Observing mode: C/L-band, dual-pol

Schedule for TORUN (Code Tr) Page 2

RadioAstron AGN observations

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.

Early: Seconds between end of slew and start. Dwell: On source seconds.

Disk: GBytes recorded to this point.

TPStart: Recording start time. Frequencies are L0 sum (band edge).

SYNC: Time correlator is expected to sync up.

Start UT	Source	Start / Stop					Early	Disk	TPStart	
Stop UT		LST	EL	AZ	HA	UP	ParA	Dwell	GBytes	SYNC

--- Thu 6 Dec 2018 Day 340 ---

----- L-band VLBI scans -----

Next scan frequencies:	1668.00	1668.00	1668.00	1668.00						
Next BBC frequencies:	732.00	732.00	732.00	732.00						
Next scan bandwidths:	16.00	16.00	16.00	16.00						
18 50 00	0235+164	01 06 17	49.3	144.4	-1.6		-21.4	0	0	18 50 00
19 09 30	---	01 25 50	50.8	151.3	-1.2		-17.5	1170	37	18 50 01
19 10 00	0235+164	01 26 20	50.9	151.5	-1.2		-17.4	24	37	19 10 00
19 29 30	---	01 45 54	52.1	158.7	-0.9		-13.1	1170	75	19 10 01
19 30 00	0235+164	01 46 24	52.1	158.9	-0.9		-13.0	24	75	19 30 00
19 50 00	---	02 06 27	53.0	166.7	-0.6		-8.3	1200	113	19 30 01

SETUP FILE INFORMATION:

NOTE: If DOPPLER, FREQ, or BW were used, see the individual scans for the final BBC settings.

==== Setup file: ra18cm2.set

Setup group:	8	Station:	TORUN	Total bit rate:	256
Format:	MKIV1:4	Bits per sample:	2	Sample rate:	32.000
Number of channels:	4	DBE type:		Speedup factor:	1.00

Disk used to record data.

1st LO=	2400.00	2400.00	2400.00	2400.00
Net SB=	L	L	U	U
IF SB =	L	L	L	L
Pol. =	RCP	LCP	RCP	LCP
BBC =	1	2	1	2
BBC SB=	U	U	L	L
IF =	C	A	C	A

The following frequency sets based on these setups were used.

Frequency Set: 7 Setup file default. Used with PCAL = 1MHz
 LO sum= 1668.00 1668.00 1668.00 1668.00
 BBC fr= 732.00 732.00 732.00 732.00
 Bandwd= 16.00 16.00 16.00 16.00
 Matching frequency sets: 7

Track assignments are:

track1= 2, 18, 3, 19
 barrel=roll_off

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(J2000)	(Date)	Error (mas)
* FAKERA	11 57 21.769299	* 12 00 00.000000	12 00 49.195835	0.00
	85 16 41.77889	* 85 00 00.000000	84 53 27.23894	0.00
	fake circumpolar target for a TS to look at			
* 0235+164	02 35 52.630215	* 02 38 38.930107	02 39 42.149828	0.00
J0238+1636	16 24 04.01610	* 16 36 59.27452	16 41 48.23530	0.00
	./rk25ag_sources.radioastron AGN, rfc_2034d, RA-A06-08			

EFFECT OF SOLAR CORONA

The solar corona can cause unstable phases for sources too close to the Sun. SCHED provides warnings at individual scans for distances less than 10 degrees. The distance from the Sun to each source in this schedule is:

Source	Sun distance (deg)
0235+164	148.1

Barry Clark estimates from predictions by Ketan Desai of IPM scattering sizes that the Sun will cause amplitude reductions on the longest VLBA baselines at a solar distance of $60 \text{ deg } F^{-0.6}$ where F is in GHz.

For common VLBI bands, this is:

1.6 GHz	45. deg
2.3 GHz	36. deg
5.0 GHz	23. deg
8.4 GHz	17. deg
15.0 GHz	12. deg
22.0 GHz	9. deg

rk25ahtr

RADIOASTRON AGN OBSERVATIONS
PI: Leonid Gurvits

Address: Joint Institute for VLBI in ERIC
Oude Hoogeveensedijk 4
7991 PD Dwingeloo, The Netherlands

Phone: +31 521 596 514
EMAIL: lgurvits@jive.eu
Fax:
Phone during observation: +31 521 596 500

Observing mode: C/L-band, dual-pol

Schedule for TORUN (Code Tr) Page 2

RadioAstron AGN observations

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.
Early: Seconds between end of slew and start. Dwell: On source seconds.
Disk: GBytes recorded to this point.
TPStart: Recording start time. Frequencies are LO sum (band edge).
SYNC: Time correlator is expected to sync up.

```
-----
Start UT  Source                Start / Stop      Early  Disk  TPStart
Stop UT                LST   EL   AZ   HA  UP   ParA  Dwell  GBytes  SYNC
-----
```

--- Thu 6 Dec 2018 Day 340 ---

----- L-band VLBI scans -----

Next scan frequencies:	1668.00	1668.00	1668.00	1668.00
Next BBC frequencies:	732.00	732.00	732.00	732.00
Next scan bandwidths:	16.00	16.00	16.00	16.00

22 55 00	0235+164	05 11 57	43.0	233.9	2.5	30.4	0	0	22 55 00
23 14 30	---	05 31 31	40.6	239.3	2.9	32.6	1170	37	22 55 01
23 15 00	0235+164	05 32 01	40.5	239.4	2.9	32.7	24	37	23 15 00
23 34 30	---	05 51 34	37.9	244.4	3.2	34.4	1170	75	23 15 01
23 35 00	0235+164	05 52 04	37.9	244.6	3.2	34.5	24	75	23 35 00
23 55 00	---	06 12 07	35.1	249.4	3.5	35.9	1200	113	23 35 01

SETUP FILE INFORMATION:

NOTE: If DOPPLER, FREQ, or BW were used, see the individual scans for the final BBC settings.

==== Setup file: ra18cm2.set

Setup group: 8	Station: TORUN	Total bit rate: 256
Format: MKIV1:4	Bits per sample: 2	Sample rate: 32.000
Number of channels: 4	DBE type:	Speedup factor: 1.00

Disk used to record data.


```

1st LO= 2400.00 2400.00 2400.00 2400.00
Net SB=      L      L      U      U
IF SB =      L      L      L      L
Pol.  =      RCP     LCP     RCP     LCP
BBC   =      1      2      1      2
BBC SB=      U      U      L      L
IF    =      C      A      C      A

```

The following frequency sets based on these setups were used.

```

Frequency Set: 7 Setup file default. Used with PCAL = 1MHz
LO sum= 1668.00 1668.00 1668.00 1668.00
BBC fr= 732.00 732.00 732.00 732.00
Bandwd= 16.00 16.00 16.00 16.00
Matching frequency sets: 7

```

Track assignments are:

```

track1= 2, 18, 3, 19
barrel=roll_off

```

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(J2000)	(Date)	Error (mas)
* FAKERA	11 57 21.769299	* 12 00 00.000000	12 00 49.231812	0.00
	85 16 41.77889	* 85 00 00.000000	84 53 27.20763	0.00
	fake circumpolar target for a TS to look at			
* 0235+164	02 35 52.630215	* 02 38 38.930107	02 39 42.150237	0.00
J0238+1636	16 24 04.01610	* 16 36 59.27452	16 41 48.23439	0.00
	./rk25ah_sources.radioastron			
	AGN, rfc_2034d, RA-A06-08			

EFFECT OF SOLAR CORONA

The solar corona can cause unstable phases for sources too close to the Sun. SCHED provides warnings at individual scans for distances less than 10 degrees. The distance from the Sun to each source in this schedule is:

Source	Sun distance (deg)
0235+164	147.9

Barry Clark estimates from predictions by Ketan Desai of IPM scattering sizes that the Sun will cause amplitude reductions on the longest VLBA baselines at a solar distance of $60 \text{ deg } F^{-0.6}$ where F is in GHz.

For common VLBI bands, this is:

1.6 GHz	45. deg
2.3 GHz	36. deg
5.0 GHz	23. deg
8.4 GHz	17. deg
15.0 GHz	12. deg
22.0 GHz	9. deg

rk25altr

RADIOASTRON AGN OBSERVATIONS

PI: Leonid Gurvits

Address: Joint Institute for VLBI in ERIC
Oude Hoogeveensedijk 4
7991 PD Dwingeloo, The Netherlands

Phone: +31 521 596 514
EMAIL: lgurvits@jive.eu
Fax:
Phone during observation: +31 521 596 500

Observing mode: C/L-band, dual-pol

Schedule for TORUN (Code Tr) Page 2

RadioAstron AGN observations

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.

Early: Seconds between end of slew and start. Dwell: On source seconds.

Disk: GBytes recorded to this point.

TPStart: Recording start time. Frequencies are LO sum (band edge).

SYNC: Time correlator is expected to sync up.

Start UT Source Start / Stop Early Disk TPStart
Stop UT LST EL AZ HA UP ParA Dwell GBytes SYNC

--- Fri 7 Dec 2018 Day 341 ---

----- L-band VLBI scans -----

Next scan frequencies:	1668.00	1668.00	1668.00	1668.00							
Next BBC frequencies:	732.00	732.00	732.00	732.00							
Next scan bandwidths:	16.00	16.00	16.00	16.00							
18 20 00	0235+164	00 40 09	46.8	135.8	-2.0		-25.9	0	0	18 20 00	
18 39 30	---	00 59 42	48.7	142.2	-1.7		-22.6	1170	37	18 20 01	
18 40 00	0235+164	01 00 12	48.7	142.4	-1.7		-22.5	24	37	18 40 00	
18 59 30	---	01 19 45	50.4	149.1	-1.3		-18.8	1170	75	18 40 01	
19 00 00	0235+164	01 20 15	50.4	149.3	-1.3		-18.7	24	75	19 00 00	
19 20 00	---	01 40 19	51.8	156.6	-1.0		-14.4	1200	113	19 00 01	

SETUP FILE INFORMATION:

NOTE: If DOPPLER, FREQ, or BW were used, see the individual scans for the final BBC settings.

==== Setup file: ra18cm2.set

Setup group: 7	Station: TORUN	Total bit rate: 256
Format: MKIV1:4	Bits per sample: 2	Sample rate: 32.000
Number of channels: 4	DBE type:	Speedup factor: 1.00

Disk used to record data.

```

1st LO= 2400.00 2400.00 2400.00 2400.00
Net SB=      L      L      U      U
IF SB =      L      L      L      L
Pol.  =      RCP     LCP     RCP     LCP
BBC   =      1      2      1      2
BBC SB=      U      U      L      L
IF    =      C      A      C      A

```

The following frequency sets based on these setups were used.

```

Frequency Set: 5 Setup file default. Used with PCAL = 1MHz
LO sum= 1668.00 1668.00 1668.00 1668.00
BBC fr= 732.00 732.00 732.00 732.00
Bandwd= 16.00 16.00 16.00 16.00
Matching frequency sets: 5

```

Track assignments are:

```

track1= 2, 18, 3, 19
barrel=roll_off

```

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(J2000)	(Date)	Error (mas)
* FAKERA	11 57 21.769299	* 12 00 00.000000	12 00 49.425885	0.00
	85 16 41.77889	* 85 00 00.000000	84 53 27.04184	0.00
	fake circumpolar target for a TS to look at			
* 0235+164	02 35 52.630215	* 02 38 38.930107	02 39 42.152805	0.00
J0238+1636	16 24 04.01610	* 16 36 59.27452	16 41 48.23529	0.00
	./rk25al_sources.radioastron			
	AGN, rfc_2034d, RA-A06-08			

EFFECT OF SOLAR CORONA

The solar corona can cause unstable phases for sources too close to the Sun. SCHED provides warnings at individual scans for distances less than 10 degrees. The distance from the Sun to each source in this schedule is:

Source	Sun distance (deg)
0235+164	147.1

Barry Clark estimates from predictions by Ketan Desai of IPM scattering sizes that the Sun will cause amplitude reductions on the longest VLBA baselines at a solar distance of $60 \text{ deg } F^{-0.6}$ where F is in GHz.

For common VLBI bands, this is:

1.6 GHz	45. deg
2.3 GHz	36. deg
5.0 GHz	23. deg
8.4 GHz	17. deg
15.0 GHz	12. deg
22.0 GHz	9. deg

rk25amtr

RADIOASTRON AGN OBSERVATIONS
PI: Leonid Gurvits

Address: Joint Institute for VLBI in ERIC
Oude Hoogeveensedijk 4
7991 PD Dwingeloo, The Netherlands

Phone: +31 521 596 514
EMAIL: lgurvits@jive.eu
Fax:
Phone during observation: +31 521 596 500

Observing mode: C/L-band, dual-pol

Schedule for TORUN (Code Tr) Page 2

RadioAstron AGN observations

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.
Early: Seconds between end of slew and start. Dwell: On source seconds.
Disk: GBytes recorded to this point.
TPStart: Recording start time. Frequencies are LO sum (band edge).
SYNC: Time correlator is expected to sync up.

```
-----
Start UT  Source          Start / Stop      Early  Disk  TPStart
Stop UT          LST    EL    AZ    HA  UP    ParA  Dwell  GBytes  SYNC
-----
```

--- Fri 7 Dec 2018 Day 341 ---

----- C-band VLBI scans -----

Next scan frequencies: 4836.00 4836.00 4836.00 4836.00
Next BBC frequencies: 736.00 736.00 736.00 736.00
Next scan bandwidths: 16.00 16.00 16.00 16.00

22 20 00	0235+164	04 40 48	46.6	224.6	2.0	26.1	0	0	22 20 00
22 39 30	---	05 00 21	44.4	230.6	2.3	29.0	1170	37	22 20 01
22 40 00	0235+164	05 00 51	44.4	230.7	2.4	29.0	24	37	22 40 00
22 59 30	---	05 20 25	42.0	236.3	2.7	31.4	1170	75	22 40 01
23 00 00	0235+164	05 20 55	41.9	236.4	2.7	31.5	24	75	23 00 00
23 20 00	---	05 40 58	39.4	241.7	3.0	33.5	1200	113	23 00 01

SETUP FILE INFORMATION:

NOTE: If DOPPLER, FREQ, or BW were used, see the individual scans for the final BBC settings.

==== Setup file: ra6cm2.set

Setup group: 3	Station: TORUN	Total bit rate: 256
Format: MKIV1:4	Bits per sample: 2	Sample rate: 32.000
Number of channels: 4	DBE type:	Speedup factor: 1.00

Disk used to record data.

```

1st LO=  4100.00  4100.00  4100.00  4100.00
Net SB=           L           L           U           U
IF SB =           U           U           U           U
Pol.  =          RCP          LCP          RCP          LCP
BBC   =           1           2           1           2
BBC SB=           L           L           U           U
IF    =           C           A           C           A

```

The following frequency sets based on these setups were used.

```

Frequency Set:  4  Setup file default.  Used with PCAL = 1MHz
LO sum=  4836.00  4836.00  4836.00  4836.00
BBC fr=   736.00   736.00   736.00   736.00
Bandwd=   16.00   16.00   16.00   16.00
Matching frequency sets:  4

```

Track assignments are:

```

track1=  2, 18,  3, 19
barrel=roll_off

```

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(J2000)	(Date)	Error (mas)
* FAKERA	11 57 21.769299	* 12 00 00.000000	12 00 49.466307	0.00
	85 16 41.77889	* 85 00 00.000000	84 53 27.00817	0.00
	fake circumpolar target for a TS to look at			
* 0235+164	02 35 52.630215	* 02 38 38.930107	02 39 42.153378	0.00
J0238+1636	16 24 04.01610	* 16 36 59.27452	16 41 48.23657	0.00
	./rk25am_sources.radioastron			
	AGN, rfc_2034d, RA-A06-08			

EFFECT OF SOLAR CORONA

The solar corona can cause unstable phases for sources too close to the Sun. SCHED provides warnings at individual scans for distances less than 10 degrees. The distance from the Sun to each source in this schedule is:

Source	Sun distance (deg)
0235+164	146.9

Barry Clark estimates from predictions by Ketan Desai of IPM scattering sizes that the Sun will cause amplitude reductions on the longest VLBA baselines at a solar distance of $60 \text{ deg } F^{-0.6}$ where F is in GHz.

For common VLBI bands, this is:

1.6 GHz	45. deg
2.3 GHz	36. deg
5.0 GHz	23. deg
8.4 GHz	17. deg
15.0 GHz	12. deg
22.0 GHz	9. deg

rk25antr

RADIOASTRON AGN OBSERVATIONS
PI: Leonid Gurvits

Address: Joint Institute for VLBI in ERIC
Oude Hoogeveensedijk 4
7991 PD Dwingeloo, The Netherlands

Phone: +31 521 596 514
EMAIL: lgurvits@jive.eu
Fax:
Phone during observation: +31 521 596 500

Observing mode: C/L-band, dual-pol

Schedule for TORUN (Code Tr) Page 2
RadioAstron AGN observations

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.
Early: Seconds between end of slew and start. Dwell: On source seconds.
Disk: GBytes recorded to this point.
TPStart: Recording start time. Frequencies are LO sum (band edge).
SYNC: Time correlator is expected to sync up.

```
-----
Start UT  Source          Start / Stop          Early   Disk   TPStart
Stop UT   LST      EL   AZ   HA   UP   ParA Dwell  GBytes  SYNC
-----
```

--- Sat 8 Dec 2018 Day 342 ---

----- C-band VLBI scans -----

Next scan frequencies: 4836.00 4836.00 4836.00 4836.00
Next BBC frequencies: 736.00 736.00 736.00 736.00
Next scan bandwidths: 16.00 16.00 16.00 16.00

Start UT	Source	LST	EL	AZ	HA	UP	ParA	Early Dwell	Disk GBytes	TPStart SYNC
02 20 00	0235+164	08 41 28	13.0	-79.4	6.0	38.0	0	0	0	02 20 00
02 37 00	---	08 58 30	10.5	-76.2	6.3	37.5	1020	33	33	02 20 01
02 37 30	0235+164	08 59 00	10.4	-76.1	6.3	37.5	24	33	33	02 37 30
02 54 30	---	09 16 03	8.0	-72.8	6.6	36.8	1020	65	65	02 37 31
02 55 00	0235+164	09 16 33	7.9	-72.7	6.6	36.8	24	65	65	02 55 00
03 04 30	---	09 26 05	6.6	-70.8	6.8	36.3	570	84	84	02 55 01
03 05 00	0235+164	09 26 35	6.5	-70.7	6.8	36.3	24	84	84	03 05 00
03 14 30	---	09 36 07	5.1	-68.9	6.9	35.8	570	102	102	03 05 01
03 15 00	0235+164	09 36 37	5.1	-68.8	6.9	35.8	24	102	102	03 15 00
03 20 00	---	09 41 37	4.4	-67.8	7.0	35.5	300	111	111	03 15 01

SETUP FILE INFORMATION:

NOTE: If DOPPLER, FREQ, or BW were used, see the individual scans for the final BBC settings.

==== Setup file: ra6cm2.set

Setup group: 2	Station: TORUN	Total bit rate: 256
Format: MKIV1:4	Bits per sample: 2	Sample rate: 32.000
Number of channels: 4	DBE type:	Speedup factor: 1.00

Disk used to record data.

```

1st LO=  4100.00  4100.00  4100.00  4100.00
Net SB=           L           L           U           U
IF SB =           U           U           U           U
Pol.  =           RCP          LCP          RCP          LCP
BBC   =           1           2           1           2
BBC SB=           L           L           U           U
IF    =           C           A           C           A

```

The following frequency sets based on these setups were used.

```

Frequency Set:  3  Setup file default.  Used with PCAL = 1MHz
LO sum=  4836.00  4836.00  4836.00  4836.00
BBC fr=   736.00   736.00   736.00   736.00
Bandwd=   16.00   16.00   16.00   16.00
Matching frequency sets:  3

```

Track assignments are:

```

track1=  2, 18,  3, 19
barrel=roll_off

```

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(J2000)	(Date)	Error (mas)
* FAKERA	11 57 21.769299	* 12 00 00.000000	12 00 49.506683	0.00
	85 16 41.77889	* 85 00 00.000000	84 53 26.97489	0.00
	fake circumpolar target for a TS to look at			
* 0235+164	02 35 52.630215	* 02 38 38.930107	02 39 42.153950	0.00
J0238+1636	16 24 04.01610	* 16 36 59.27452	16 41 48.23817	0.00
	./rk25an_sources.radioastron			
	AGN, rfc_2034d, RA-A06-08			

EFFECT OF SOLAR CORONA

The solar corona can cause unstable phases for sources too close to the Sun. SCHED provides warnings at individual scans for distances less than 10 degrees. The distance from the Sun to each source in this schedule is:

Source	Sun distance (deg)
0235+164	146.7

Barry Clark estimates from predictions by Ketan Desai of IPM scattering sizes that the Sun will cause amplitude reductions on the longest VLBA baselines at a solar distance of $60 \text{ deg } F^{-0.6}$ where F is in GHz.

For common VLBI bands, this is:

1.6 GHz	45. deg
2.3 GHz	36. deg
5.0 GHz	23. deg
8.4 GHz	17. deg
15.0 GHz	12. deg
22.0 GHz	9. deg

rk25aqtr

RADIOASTRON AGN OBSERVATIONS

PI: Leonid Gurvits

Address: Joint Institute for VLBI ERIC
Oude Hoogeveensedijk 4
7991 PD Dwingeloo, The Netherlands

Phone: +31 521 596 514
EMAIL: lgurvits@jive.eu
Fax:
Phone during observation: +31 521 596 500

Observing mode: C/L-band, dual-pol

Schedule for TORUN (Code Tr) Page 2

RadioAstron AGN observations

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.
Early: Seconds between end of slew and start. Dwell: On source seconds.
Disk: GBytes recorded to this point.
TPStart: Recording start time. Frequencies are L0 sum (band edge).
SYNC: Time correlator is expected to sync up.

Start UT Source Start / Stop Early Disk TPStart
Stop UT LST EL AZ HA UP ParA Dwell GBytes SYNC

--- Sat 8 Dec 2018 Day 342 ---

----- L-band VLBI scans -----

Next scan frequencies: 1668.00 1668.00 1668.00 1668.00
Next BBC frequencies: 732.00 732.00 732.00 732.00
Next scan bandwidths: 16.00 16.00 16.00 16.00

Table with columns: Start UT, Stop UT, Source, LST, EL, AZ, HA, UP, ParA, Dwell, GBytes, TPStart, SYNC. Contains observation data for source 0235+164.

SETUP FILE INFORMATION:

NOTE: If DOPPLER, FREQ, or BW were used, see the individual scans for the final BBC settings.

==== Setup file: ra18cm2.set

Setup group: 6 Station: TORUN Total bit rate: 256
Format: MKIV1:4 Bits per sample: 2 Sample rate: 32.000
Number of channels: 4 DBE type: Speedup factor: 1.00

Disk used to record data.

```

1st LO=  2400.00  2400.00  2400.00  2400.00
Net SB=      L      L      U      U
IF SB =      L      L      L      L
Pol.  =      RCP     LCP     RCP     LCP
BBC   =      1      2      1      2
BBC SB=      U      U      L      L
IF    =      C      A      C      A

```

The following frequency sets based on these setups were used.

```

Frequency Set:  4  Setup file default.  Used with PCAL = 1MHz
LO sum=  1668.00  1668.00  1668.00  1668.00
BBC fr=   732.00  732.00  732.00  732.00
Bandwd=   16.00  16.00  16.00  16.00
Matching frequency sets:  4

```

Track assignments are:

```

track1=  2, 18,  3, 19
barrel=roll_off

```

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(J2000)	(Date)	Error (mas)
* FAKERA	11 57 21.769299	* 12 00 00.000000	12 00 49.683880	0.00
	85 16 41.77889	* 85 00 00.000000	84 53 26.83345	0.00
	fake circumpolar target for a TS to look at			
* 0235+164	02 35 52.630215	* 02 38 38.930107	02 39 42.156351	0.00
J0238+1636	16 24 04.01610	* 16 36 59.27452	16 41 48.24832	0.00
	./rk25aq_sources.radioastron			
	AGN, rfc_2034d, RA-A06-08			

EFFECT OF SOLAR CORONA

The solar corona can cause unstable phases for sources too close to the Sun. SCHED provides warnings at individual scans for distances less than 10 degrees. The distance from the Sun to each source in this schedule is:

Source	Sun distance (deg)
0235+164	146.0

Barry Clark estimates from predictions by Ketan Desai of IPM scattering sizes that the Sun will cause amplitude reductions on the longest VLBA baselines at a solar distance of $60 \text{ deg } F^{-0.6}$ where F is in GHz.

For common VLBI bands, this is:

1.6 GHz	45. deg
2.3 GHz	36. deg
5.0 GHz	23. deg
8.4 GHz	17. deg
15.0 GHz	12. deg
22.0 GHz	9. deg

rk25artr

RADIOASTRON AGN OBSERVATIONS
PI: Leonid Gurvits

Address: Joint Institute for VLBI ERIC
Oude Hoogeveensedijk 4
7991 PD Dwingeloo, The Netherlands

Phone: +31 521 596 514
EMAIL: lgurvits@jive.eu
Fax:
Phone during observation: +31 521 596 500

Observing mode: C/L-band, dual-pol

Schedule for TORUN (Code Tr) Page 2

RadioAstron AGN observations

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.
Early: Seconds between end of slew and start. Dwell: On source seconds.
Disk: GBytes recorded to this point.
TPStart: Recording start time. Frequencies are LO sum (band edge).
SYNC: Time correlator is expected to sync up.

Start UT Source Start / Stop Early Disk TPStart
Stop UT LST EL AZ HA UP ParA Dwell GBytes SYNC

--- Sat 8 Dec 2018 Day 342 ---

----- L-band VLBI scans -----

Next scan frequencies: 1668.00 1668.00 1668.00 1668.00
Next BBC frequencies: 732.00 732.00 732.00 732.00
Next scan bandwidths: 16.00 16.00 16.00 16.00

23 20 00	0235+164	05 44 55	38.8	242.8	3.1		33.9	0	0	23 20 00
23 39 30	---	06 04 28	36.2	247.6	3.4		35.4	1170	37	23 20 01
23 40 00	0235+164	06 04 58	36.1	247.7	3.4		35.5	24	37	23 40 00
23 59 30	---	06 24 31	33.3	252.3	3.7		36.7	1170	75	23 40 01

--- Sun 9 Dec 2018 Day 343 ---

00 00 00	0235+164	06 25 01	33.3	252.4	3.8		36.7	24	75	00 00 00
00 20 00	---	06 45 04	30.4	257.0	4.1		37.6	1200	113	00 00 01

SETUP FILE INFORMATION:

NOTE: If DOPPLER, FREQ, or BW were used, see the individual scans for the final BBC settings.

=====
Setup file: ra18cm2.set

Setup group: 6	Station: TORUN	Total bit rate: 256
Format: MKIV1:4	Bits per sample: 2	Sample rate: 32.000
Number of channels: 4	DBE type:	Speedup factor: 1.00

Disk used to record data.

```

1st LO=  2400.00  2400.00  2400.00  2400.00
Net SB=      L      L      U      U
IF SB =      L      L      L      L
Pol.  =      RCP     LCP     RCP     LCP
BBC   =      1      2      1      2
BBC SB=      U      U      L      L
IF    =      C      A      C      A

```

The following frequency sets based on these setups were used.

```

Frequency Set:  4  Setup file default.  Used with PCAL = 1MHz
LO sum=  1668.00 1668.00 1668.00 1668.00
BBC fr=   732.00 732.00 732.00 732.00
Bandwd=   16.00 16.00 16.00 16.00
Matching frequency sets:  4

```

Track assignments are:

```

track1=  2, 18,  3, 19
barrel=roll_off

```

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(J2000)	(Date)	Error (mas)
* FAKERA	11 57 21.769299	* 12 00 00.000000	12 00 49.727550	0.00
	85 16 41.77889	* 85 00 00.000000	84 53 26.79984	0.00
	fake circumpolar target for a TS to look at			
* 0235+164	02 35 52.630215	* 02 38 38.930107	02 39 42.156889	0.00
J0238+1636	16 24 04.01610	* 16 36 59.27452	16 41 48.25145	0.00
	./rk25ar_sources.radioastron			
	AGN, rfc_2034d, RA-A06-08			

EFFECT OF SOLAR CORONA

The solar corona can cause unstable phases for sources too close to the Sun. SCHED provides warnings at individual scans for distances less than 10 degrees. The distance from the Sun to each source in this schedule is:

Source	Sun distance (deg)
0235+164	145.9

Barry Clark estimates from predictions by Ketan Desai of IPM scattering sizes that the Sun will cause amplitude reductions on the longest VLBA baselines at a solar distance of $60 \text{ deg } F^{-0.6}$ where F is in GHz.

For common VLBI bands, this is:

1.6 GHz	45. deg
2.3 GHz	36. deg
5.0 GHz	23. deg
8.4 GHz	17. deg
15.0 GHz	12. deg
22.0 GHz	9. deg

rk25avtr

RADIOASTRON AGN OBSERVATIONS
PI: Leonid Gurvits

Address: Joint Institute for VLBI ERIC
Oude Hoogeveensedijk 4
7991 PD Dwingeloo, The Netherlands

Phone: +31 521 596 514
EMAIL: lgurvits@jive.eu
Fax:
Phone during observation: +31 521 596 500

Observing mode: C/L-band, dual-pol

Schedule for TORUN (Code Tr) Page 2

RadioAstron AGN observations

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.
Early: Seconds between end of slew and start. Dwell: On source seconds.
Disk: GBytes recorded to this point.
TPStart: Recording start time. Frequencies are LO sum (band edge).
SYNC: Time correlator is expected to sync up.

Start UT Source Start / Stop Early Disk TPStart
Stop UT LST EL AZ HA UP ParA Dwell GBytes SYNC

--- Sun 9 Dec 2018 Day 343 ---

----- C-band VLBI scans -----

Next scan frequencies:	4836.00	4836.00	4836.00	4836.00							
Next BBC frequencies:	736.00	736.00	736.00	736.00							
Next scan bandwidths:	16.00	16.00	16.00	16.00							
20 15 00	0235+164	02 43 21	53.6	181.5	0.1		0.9	0	0	20 15 00	
20 34 30	---	03 02 54	53.3	189.3	0.4		5.8	1170	37	20 15 01	
20 35 00	0235+164	03 03 24	53.3	189.5	0.4		6.0	24	37	20 35 00	
20 54 30	---	03 22 57	52.6	197.2	0.7		10.7	1170	75	20 35 01	
20 55 00	0235+164	03 23 27	52.6	197.4	0.7		10.8	24	75	20 55 00	
21 15 00	---	03 43 31	51.5	205.0	1.1		15.4	1200	113	20 55 01	

SETUP FILE INFORMATION:

NOTE: If DOPPLER, FREQ, or BW were used, see the individual scans for the final BBC settings.

===== Setup file: ra6cm2.set

Setup group:	5	Station:	TORUN	Total bit rate:	256
Format:	MKIV1:4	Bits per sample:	2	Sample rate:	32.000
Number of channels:	4	DBE type:		Speedup factor:	1.00

Disk used to record data.

```

1st LO=  4100.00  4100.00  4100.00  4100.00
Net SB=           L           L           U           U
IF SB =           U           U           U           U
Pol.  =          RCP          LCP          RCP          LCP
BBC   =           1           2           1           2
BBC SB=           L           L           U           U
IF    =           C           A           C           A

```

The following frequency sets based on these setups were used.

```

Frequency Set:  6  Setup file default.  Used with PCAL = 1MHz
LO sum=  4836.00  4836.00  4836.00  4836.00
BBC fr=   736.00  736.00  736.00  736.00
Bandwd=   16.00  16.00  16.00  16.00
Matching frequency sets:  6

```

Track assignments are:

```

track1=  2, 18,  3, 19
barrel=roll_off

```

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(J2000)	(Date)	Error (mas)
* FAKERA	11 57 21.769299	* 12 00 00.000000	12 00 49.956909	0.00
	85 16 41.77889	* 85 00 00.000000	84 53 26.63199	0.00
	fake circumpolar target for a TS to look at			
* 0235+164	02 35 52.630215	* 02 38 38.930107	02 39 42.159136	0.00
J0238+1636	16 24 04.01610	* 16 36 59.27452	16 41 48.27025	0.00
	./rk25av_sources.radioastron			
	AGN, rfc_2034d, RA-A06-08			

EFFECT OF SOLAR CORONA

The solar corona can cause unstable phases for sources too close to the Sun. SCHED provides warnings at individual scans for distances less than 10 degrees. The distance from the Sun to each source in this schedule is:

```

Source      Sun distance (deg)
0235+164    145.0

```

Barry Clark estimates from predictions by Ketan Desai of IPM scattering sizes that the Sun will cause amplitude reductions on the longest VLBA baselines at a solar distance of $60 \text{ deg } F^{-0.6}$ where F is in GHz.

For common VLBI bands, this is:

```

1.6 GHz      45. deg
2.3 GHz      36. deg
5.0 GHz      23. deg
8.4 GHz      17. deg
15.0 GHz     12. deg
22.0 GHz      9. deg

```

rk25awtr

RADIOASTRON AGN OBSERVATIONS
PI: Leonid Gurvits

Address: Joint Institute for VLBI ERIC
Oude Hoogeveensedijk 4
7991 PD Dwingeloo, The Netherlands

Phone: +31 521 596 514
EMAIL: lgurvits@jive.eu
Fax:
Phone during observation: +31 521 596 500

Observing mode: C/L-band, dual-pol

Schedule for TORUN (Code Tr) Page 2

RadioAstron AGN observations

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.
Early: Seconds between end of slew and start. Dwell: On source seconds.
Disk: GBytes recorded to this point.
TPStart: Recording start time. Frequencies are LO sum (band edge).
SYNC: Time correlator is expected to sync up.

Start UT	Source	Start / Stop				Early	Disk	TPStart		
Stop UT		LST	EL	AZ	HA	UP	ParA	Dwell	GBytes	SYNC

--- Mon 10 Dec 2018 Day 344 ---

----- L-band VLBI scans -----

Next scan frequencies: 1668.00 1668.00 1668.00 1668.00
Next BBC frequencies: 732.00 732.00 732.00 732.00
Next scan bandwidths: 16.00 16.00 16.00 16.00

00 30 00	0235+164	06 59 03	28.3	260.0	4.3		38.1	0	0	00 30 00
00 49 30	---	07 18 36	25.4	264.1	4.6		38.6	1170	37	00 30 01
00 50 00	0235+164	07 19 06	25.3	264.2	4.7		38.6	24	37	00 50 00
01 09 30	---	07 38 39	22.4	268.2	5.0		38.8	1170	75	00 50 01
01 10 00	0235+164	07 39 09	22.3	268.3	5.0		38.8	24	75	01 10 00
01 30 00	---	07 59 12	19.3	272.3	5.3		38.8	1200	113	01 10 01

SETUP FILE INFORMATION:

NOTE: If DOPPLER, FREQ, or BW were used, see the individual scans for the final BBC settings.

==== Setup file: ra18cm2.set

Setup group: 9	Station: TORUN	Total bit rate: 256
Format: MKIV1:4	Bits per sample: 2	Sample rate: 32.000
Number of channels: 4	DBE type:	Speedup factor: 1.00

Disk used to record data.

1st LO=	2400.00	2400.00	2400.00	2400.00
Net SB=	L	L	U	U
IF SB =	L	L	L	L
Pol. =	RCP	LCP	RCP	LCP
BBC =	1	2	1	2
BBC SB=	U	U	L	L
IF =	C	A	C	A

The following frequency sets based on these setups were used.

Frequency Set: 7 Setup file default. Used with PCAL = 1MHz
 LO sum= 1668.00 1668.00 1668.00 1668.00
 BBC fr= 732.00 732.00 732.00 732.00
 Bandwd= 16.00 16.00 16.00 16.00
 Matching frequency sets: 7

Track assignments are:

track1= 2, 18, 3, 19
 barrel=roll_off

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(J2000)	(Date)	Error (mas)
* FAKERA	11 57 21.769299	* 12 00 00.000000	12 00 50.000920	0.00
	85 16 41.77889	* 85 00 00.000000	84 53 26.60150	0.00
	fake circumpolar target for a TS to look at			
* 0235+164	02 35 52.630215	* 02 38 38.930107	02 39 42.159433	0.00
J0238+1636	16 24 04.01610	* 16 36 59.27452	16 41 48.27411	0.00
	./rk25aw_sources.radioastron AGN, rfc_2034d, RA-A06-08			

EFFECT OF SOLAR CORONA

The solar corona can cause unstable phases for sources too close to the Sun. SCHED provides warnings at individual scans for distances less than 10 degrees. The distance from the Sun to each source in this schedule is:

Source	Sun distance (deg)
0235+164	144.8

Barry Clark estimates from predictions by Ketan Desai of IPM scattering sizes that the Sun will cause amplitude reductions on the longest VLBA baselines at a solar distance of $60 \text{ deg } F^{-0.6}$ where F is in GHz.

For common VLBI bands, this is:

1.6 GHz	45. deg
2.3 GHz	36. deg
5.0 GHz	23. deg
8.4 GHz	17. deg
15.0 GHz	12. deg
22.0 GHz	9. deg

rk25axtr

RADIOASTRON AGN OBSERVATIONS
PI: Leonid Gurvits

Address: Joint Institute for VLBI ERIC
Oude Hoogeveensedijk 4
7991 PD Dwingeloo, The Netherlands

Phone: +31 521 596 514
EMAIL: lgurvits@jive.eu
Fax:
Phone during observation: +31 521 596 500

Observing mode: C/L-band, dual-pol

Schedule for TORUN (Code Tr) Page 2

RadioAstron AGN observations

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.
Early: Seconds between end of slew and start. Dwell: On source seconds.
Disk: GBytes recorded to this point.
TPStart: Recording start time. Frequencies are LO sum (band edge).
SYNC: Time correlator is expected to sync up.

Start UT	Source	Start / Stop					Early	Disk	TPStart	
Stop UT		LST	EL	AZ	HA	UP	ParA	Dwell	GBytes	SYNC

--- Mon 10 Dec 2018 Day 344 ---

----- L-band VLBI scans -----

Next scan frequencies:	1668.00	1668.00	1668.00	1668.00						
Next BBC frequencies:	732.00	732.00	732.00	732.00						
Next scan bandwidths:	16.00	16.00	16.00	16.00						
14 40 00	0235+164	21 11 22	18.0	86.0	-5.5		-38.7	0	0	14 40 00
14 44 30	---	21 15 53	18.7	86.8	-5.4		-38.8	270	9	14 40 01
14 45 00	0235+164	21 16 23	18.7	86.9	-5.4		-38.8	24	9	14 45 00
14 59 30	---	21 30 55	20.9	89.8	-5.1		-38.8	870	36	14 45 01
15 00 00	0235+164	21 31 26	21.0	89.9	-5.1		-38.8	24	36	15 00 00
15 24 30	---	21 56 00	24.7	94.9	-4.7		-38.7	1470	84	15 00 01
15 25 00	0235+164	21 56 30	24.8	95.0	-4.7		-38.6	24	84	15 25 00
15 40 00	---	22 11 32	27.0	98.1	-4.5		-38.4	900	112	15 25 01

SETUP FILE INFORMATION:

NOTE: If DOPPLER, FREQ, or BW were used, see the individual scans for the final BBC settings.

==== Setup file: ra18cm2.set

Setup group: 11	Station: TORUN	Total bit rate: 256
Format: MKIV1:4	Bits per sample: 2	Sample rate: 32.000
Number of channels: 4	DBE type:	Speedup factor: 1.00

Disk used to record data.

```

1st LO=  2400.00  2400.00  2400.00  2400.00
Net SB=           L           L           U           U
IF SB =           L           L           L           L
Pol.  =          RCP          LCP          RCP          LCP
BBC   =           1           2           1           2
BBC SB=           U           U           L           L
IF    =           C           A           C           A

```

The following frequency sets based on these setups were used.

```

Frequency Set:  8  Setup file default.  Used with PCAL = 1MHz
LO sum=  1668.00  1668.00  1668.00  1668.00
BBC fr=   732.00  732.00  732.00  732.00
Bandwd=   16.00  16.00  16.00  16.00
Matching frequency sets:  8

```

Track assignments are:

```

track1=  2, 18,  3, 19
barrel=roll_off

```

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(J2000)	(Date)	Error (mas)
* FAKERA	11 57 21.769299	* 12 00 00.000000	12 00 50.162812	0.00
	85 16 41.77889	* 85 00 00.000000	84 53 26.49409	0.00
	fake circumpolar target for a TS to look at			
* 0235+164	02 35 52.630215	* 02 38 38.930107	02 39 42.160081	0.00
J0238+1636	16 24 04.01610	* 16 36 59.27452	16 41 48.28830	0.00
	./rk25ax_sources.radioastron			
	AGN, rfc_2034d, RA-A06-08			

EFFECT OF SOLAR CORONA

The solar corona can cause unstable phases for sources too close to the Sun. SCHED provides warnings at individual scans for distances less than 10 degrees. The distance from the Sun to each source in this schedule is:

Source	Sun distance (deg)
0235+164	144.2

Barry Clark estimates from predictions by Ketan Desai of IPM scattering sizes that the Sun will cause amplitude reductions on the longest VLBA baselines at a solar distance of $60 \text{ deg } F^{-0.6}$ where F is in GHz.

For common VLBI bands, this is:

1.6 GHz	45. deg
2.3 GHz	36. deg
5.0 GHz	23. deg
8.4 GHz	17. deg
15.0 GHz	12. deg
22.0 GHz	9. deg

rk25aytr

RADIOASTRON AGN OBSERVATIONS

PI: Leonid Gurvits

Address: Joint Institute for VLBI ERIC
Oude Hoogeveensedijk 4
7991 PD Dwingeloo, The Netherlands

Phone: +31 521 596 514
EMAIL: lgurvits@jive.eu
Fax:
Phone during observation: +31 521 596 500

Observing mode: C/L-band, dual-pol

Schedule for TORUN (Code Tr) Page 2

RadioAstron AGN observations

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.

Early: Seconds between end of slew and start. Dwell: On source seconds.

Disk: GBytes recorded to this point.

TPStart: Recording start time. Frequencies are L0 sum (band edge).

SYNC: Time correlator is expected to sync up.

Start UT	Source	Start / Stop					Early	Disk	TPStart	
Stop UT		LST	EL	AZ	HA	UP	ParA	Dwell	GBytes	SYNC

--- Tue 11 Dec 2018 Day 345 ---

----- C-band VLBI scans -----

Next scan frequencies: 4836.00 4836.00 4836.00 4836.00
Next BBC frequencies: 736.00 736.00 736.00 736.00
Next scan bandwidths: 16.00 16.00 16.00 16.00

00 45 00	0235+164	07 18 02	25.5	264.0	4.6		38.6	0	0	00 45 00
01 04 30	---	07 37 35	22.6	268.0	5.0		38.8	1170	37	00 45 01
01 05 00	0235+164	07 38 05	22.5	268.1	5.0		38.8	24	37	01 05 00
01 24 30	---	07 57 38	19.6	272.0	5.3		38.8	1170	75	01 05 01
01 25 00	0235+164	07 58 08	19.5	272.1	5.3		38.8	24	75	01 25 00
01 45 00	---	08 18 11	16.5	276.0	5.6		38.6	1200	113	01 25 01

SETUP FILE INFORMATION:

NOTE: If DOPPLER, FREQ, or BW were used, see the individual scans for the final BBC settings.

==== Setup file: ra6cm2.set

Setup group: 4	Station: TORUN	Total bit rate: 256
Format: MKIV1:4	Bits per sample: 2	Sample rate: 32.000
Number of channels: 4	DBE type:	Speedup factor: 1.00

Disk used to record data.

```

1st LO=  4100.00  4100.00  4100.00  4100.00
Net SB=           L           L           U           U
IF SB =           U           U           U           U
Pol.  =          RCP          LCP          RCP          LCP
BBC   =           1           2           1           2
BBC SB=           L           L           U           U
IF    =           C           A           C           A

```

The following frequency sets based on these setups were used.

```

Frequency Set:  5  Setup file default.  Used with PCAL = 1MHz
LO sum=  4836.00  4836.00  4836.00  4836.00
BBC fr=   736.00   736.00   736.00   736.00
Bandwd=   16.00   16.00   16.00   16.00
Matching frequency sets:  5

```

Track assignments are:

```

track1=  2, 18,  3, 19
barrel=roll_off

```

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(J2000)	(Date)	Error (mas)
* FAKERA	11 57 21.769299	* 12 00 00.000000	12 00 50.278343	0.00
	85 16 41.77889	* 85 00 00.000000	84 53 26.42202	0.00
	fake circumpolar target for a TS to look at			
* 0235+164	02 35 52.630215	* 02 38 38.930107	02 39 42.160086	0.00
J0238+1636	16 24 04.01610	* 16 36 59.27452	16 41 48.29797	0.00
	./rk25ay_sources.radioastron			
	AGN, rfc_2034d, RA-A06-08			

EFFECT OF SOLAR CORONA

The solar corona can cause unstable phases for sources too close to the Sun. SCHED provides warnings at individual scans for distances less than 10 degrees. The distance from the Sun to each source in this schedule is:

Source	Sun distance (deg)
0235+164	143.8

Barry Clark estimates from predictions by Ketan Desai of IPM scattering sizes that the Sun will cause amplitude reductions on the longest VLBA baselines at a solar distance of $60 \text{ deg } F^{-0.6}$ where F is in GHz.

For common VLBI bands, this is:

1.6 GHz	45. deg
2.3 GHz	36. deg
5.0 GHz	23. deg
8.4 GHz	17. deg
15.0 GHz	12. deg
22.0 GHz	9. deg

rk25batr

RADIOASTRON AGN OBSERVATIONS
PI: Leonid Gurvits

Address: Joint Institute for VLBI ERIC
Oude Hoogeveensedijk 4
7991 PD Dwingeloo, The Netherlands

Phone: +31 521 596 514
EMAIL: lgurvits@jive.eu
Fax:
Phone during observation: +31 521 596 500

Observing mode: C/L-band, dual-pol

Schedule for TORUN (Code Tr) Page 2

RadioAstron AGN observations

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.
Early: Seconds between end of slew and start. Dwell: On source seconds.
Disk: GBytes recorded to this point.
TPStart: Recording start time. Frequencies are LO sum (band edge).
SYNC: Time correlator is expected to sync up.

Start UT Source Start / Stop Early Disk TPStart
Stop UT LST EL AZ HA UP ParA Dwell GBytes SYNC

--- Tue 11 Dec 2018 Day 345 ---

----- L-band VLBI scans -----

Next scan frequencies: 1668.00 1668.00 1668.00 1668.00
Next BBC frequencies: 732.00 732.00 732.00 732.00
Next scan bandwidths: 16.00 16.00 16.00 16.00

19 20 00	0235+164	01 56 05	52.6	162.6	-0.7	-10.8	0	0	19 20 00
19 39 30	---	02 15 38	53.3	170.3	-0.4	-6.0	1170	37	19 20 01
19 40 00	0235+164	02 16 08	53.3	170.5	-0.4	-5.9	24	37	19 40 00
20 00 00	---	02 36 11	53.6	178.6	-0.1	-0.9	1200	76	19 40 01

SETUP FILE INFORMATION:

NOTE: If DOPPLER, FREQ, or BW were used, see the individual scans for the final BBC settings.

==== Setup file: ra18cm2.set

Setup group: 8	Station: TORUN	Total bit rate: 256
Format: MKIV1:4	Bits per sample: 2	Sample rate: 32.000
Number of channels: 4	DBE type:	Speedup factor: 1.00

Disk used to record data.

1st LO=	2400.00	2400.00	2400.00	2400.00
Net SB=	L	L	U	U
IF SB =	L	L	L	L
Pol. =	RCP	LCP	RCP	LCP
BBC =	1	2	1	2
BBC SB=	U	U	L	L
IF =	C	A	C	A

The following frequency sets based on these setups were used.

Frequency Set: 7 Setup file default. Used with PCAL = 1MHz
 LO sum= 1668.00 1668.00 1668.00 1668.00
 BBC fr= 732.00 732.00 732.00 732.00
 Bandwd= 16.00 16.00 16.00 16.00
 Matching frequency sets: 7

Track assignments are:

track1= 2, 18, 3, 19
 barrel=roll_off

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(J2000)	(Date)	Error (mas)
* FAKERA	11 57 21.769299	* 12 00 00.000000	12 00 50.499439	0.00
	85 16 41.77889	* 85 00 00.000000	84 53 26.29443	0.00
	fake circumpolar target for a TS to look at			
* 0235+164	02 35 52.630215	* 02 38 38.930107	02 39 42.158945	0.00
J0238+1636	16 24 04.01610	* 16 36 59.27452	16 41 48.31403	0.00
	./rk25ba_sources.radioastron			
	AGN, rfc_2034d, RA-A06-08			

EFFECT OF SOLAR CORONA

The solar corona can cause unstable phases for sources too close to the Sun. SCHED provides warnings at individual scans for distances less than 10 degrees. The distance from the Sun to each source in this schedule is:

Source	Sun distance (deg)
0235+164	143.0

Barry Clark estimates from predictions by Ketan Desai of IPM scattering sizes that the Sun will cause amplitude reductions on the longest VLBA baselines at a solar distance of $60 \text{ deg } F^{-0.6}$ where F is in GHz.

For common VLBI bands, this is:

1.6 GHz	45. deg
2.3 GHz	36. deg
5.0 GHz	23. deg
8.4 GHz	17. deg
15.0 GHz	12. deg
22.0 GHz	9. deg

1st LO=	2400.00	2400.00	2400.00	2400.00
Net SB=	L	L	U	U
IF SB =	L	L	L	L
Pol. =	RCP	LCP	RCP	LCP
BBC =	1	2	1	2
BBC SB=	U	U	L	L
IF =	C	A	C	A

The following frequency sets based on these setups were used.

Frequency Set: 6 Setup file default. Used with PCAL = 1MHz
 LO sum= 1668.00 1668.00 1668.00 1668.00
 BBC fr= 732.00 732.00 732.00 732.00
 Bandwd= 16.00 16.00 16.00 16.00
 Matching frequency sets: 6

Track assignments are:

track1= 2, 18, 3, 19
 barrel=roll_off

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(Date)	Error (mas)
* FAKERA	11 57 21.769299 * 12 00 00.000000	12 00 51.367868	0.00
	85 16 41.77889 * 85 00 00.000000	84 53 25.90935	0.00
	fake circumpolar target for a TS to look at		
* 0134+329	01 34 49.826590 * 01 37 41.299646	01 38 46.441286	0.00
J0137+3309	32 54 20.20189 * 33 09 35.07607	33 15 23.47509	0.00
3C48	./rd07f_sources.radioastron CSS QSO, r4844 position by Petrov		

EFFECT OF SOLAR CORONA

The solar corona can cause unstable phases for sources too close to the Sun. SCHED provides warnings at individual scans for distances less than 10 degrees. The distance from the Sun to each source in this schedule is:

Source	Sun distance (deg)
0134+329	128.9

Barry Clark estimates from predictions by Ketan Desai of IPM scattering sizes that the Sun will cause amplitude reductions on the longest VLBA baselines at a solar distance of $60 \text{deg } F^{-0.6}$ where F is in GHz.

For common VLBI bands, this is:

1.6 GHz	45. deg
2.3 GHz	36. deg
5.0 GHz	23. deg
8.4 GHz	17. deg
15.0 GHz	12. deg
22.0 GHz	9. deg


```

1st LO=  4100.00  4100.00  4100.00  4100.00
Net SB=           L           L           U           U
IF SB =           U           U           U           U
Pol.  =          RCP          LCP          RCP          LCP
BBC   =           1           2           1           2
BBC SB=           L           L           U           U
IF    =           C           A           C           A

```

The following frequency sets based on these setups were used.

```

Frequency Set:  2  Setup file default.  Used with PCAL = 1MHz
LO sum=  4836.00  4836.00  4836.00  4836.00
BBC fr=   736.00   736.00   736.00   736.00
Bandwd=   16.00   16.00   16.00   16.00
Matching frequency sets:  2

```

Track assignments are:

```

track1=  2, 18,  3, 19
barrel=roll_off

```

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(J2000)	(Date)	Error (mas)
* FAKERA	11 57 21.769299	* 12 00 00.000000	12 00 51.975164	0.00
	85 16 41.77889	* 85 00 00.000000	84 53 25.71329	0.00
	fake circumpolar target for a TS to look at			
* 0736+017	07 36 42.512339	* 07 39 18.033897	07 40 17.205479	0.00
J0739+0137	01 44 00.18080	* 01 37 04.61773	01 34 23.00275	0.00
	./rk23bv_sources.radioastron			
	AGN, rfc_2013d, RA-A06-07			

EFFECT OF SOLAR CORONA

The solar corona can cause unstable phases for sources too close to the Sun. SCHED provides warnings at individual scans for distances less than 10 degrees. The distance from the Sun to each source in this schedule is:

Source	Sun distance (deg)
0736+017	143.5

Barry Clark estimates from predictions by Ketan Desai of IPM scattering sizes that the Sun will cause amplitude reductions on the longest VLBA baselines at a solar distance of $60 \text{ deg } F^{-0.6}$ where F is in GHz.

For common VLBI bands, this is:

1.6 GHz	45. deg
2.3 GHz	36. deg
5.0 GHz	23. deg
8.4 GHz	17. deg
15.0 GHz	12. deg
22.0 GHz	9. deg


```

1st LO=  2400.00  2400.00  2400.00  2400.00
Net SB=      L      L      U      U
IF SB =      L      L      L      L
Pol.  =      RCP     LCP     RCP     LCP
BBC   =      1      2      1      2
BBC SB=      U      U      L      L
IF    =      C      A      C      A

```

The following frequency sets based on these setups were used.

```

Frequency Set:  7  Setup file default.  Used with PCAL = 1MHz
LO sum=  1668.00  1668.00  1668.00  1668.00
BBC fr=   732.00  732.00  732.00  732.00
Bandwd=   16.00  16.00  16.00  16.00
Matching frequency sets:  7

```

Track assignments are:

```

track1=  2, 18,  3, 19
barrel=roll_off

```

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(J2000)	(Date)	Error (mas)
* FAKERA	11 57 21.769299	* 12 00 00.000000	12 00 52.141132	0.00
	85 16 41.77889	* 85 00 00.000000	84 53 25.66072	0.00
	fake circumpolar target for a TS to look at			
* 0736+017	07 36 42.512339	* 07 39 18.033897	07 40 17.216849	0.00
J0739+0137	01 44 00.18080	* 01 37 04.61773	01 34 22.89069	0.00
	./rk23bx_sources.radioastron			
	AGN, rfc_2013d, RA-A06-07			

EFFECT OF SOLAR CORONA

The solar corona can cause unstable phases for sources too close to the Sun. SCHED provides warnings at individual scans for distances less than 10 degrees. The distance from the Sun to each source in this schedule is:

Source	Sun distance (deg)
0736+017	144.1

Barry Clark estimates from predictions by Ketan Desai of IPM scattering sizes that the Sun will cause amplitude reductions on the longest VLBA baselines at a solar distance of $60 \text{ deg } F^{-0.6}$ where F is in GHz.

For common VLBI bands, this is:

1.6 GHz	45. deg
2.3 GHz	36. deg
5.0 GHz	23. deg
8.4 GHz	17. deg
15.0 GHz	12. deg
22.0 GHz	9. deg


```

1st LO= 2400.00 2400.00 2400.00 2400.00
Net SB=      L      L      U      U
IF SB =      L      L      L      L
Pol.  =      RCP     LCP     RCP     LCP
BBC   =      1      2      1      2
BBC SB=      U      U      L      L
IF    =      C      A      C      A

```

The following frequency sets based on these setups were used.

```

Frequency Set: 6 Setup file default. Used with PCAL = 1MHz
LO sum= 1668.00 1668.00 1668.00 1668.00
BBC fr= 732.00 732.00 732.00 732.00
Bandwd= 16.00 16.00 16.00 16.00
Matching frequency sets: 6

```

Track assignments are:

```

track1= 2, 18, 3, 19
barrel=roll_off

```

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(J2000)	(Date)	Error (mas)
* FAKERA	11 57 21.769299	* 12 00 00.000000	12 00 52.176104	0.00
	85 16 41.77889	* 85 00 00.000000	84 53 25.64928	0.00
	fake circumpolar target for a TS to look at			
* 0736+017	07 36 42.512339	* 07 39 18.033897	07 40 17.219349	0.00
J0739+0137	01 44 00.18080	* 01 37 04.61773	01 34 22.86562	0.00
	./rk23by_sources.radioastron			
	AGN, rfc_2013d, RA-A06-07			

EFFECT OF SOLAR CORONA

The solar corona can cause unstable phases for sources too close to the Sun. SCHED provides warnings at individual scans for distances less than 10 degrees. The distance from the Sun to each source in this schedule is:

Source	Sun distance (deg)
0736+017	144.2

Barry Clark estimates from predictions by Ketan Desai of IPM scattering sizes that the Sun will cause amplitude reductions on the longest VLBA baselines at a solar distance of $60 \text{ deg } F^{-0.6}$ where F is in GHz.

For common VLBI bands, this is:

1.6 GHz	45. deg
2.3 GHz	36. deg
5.0 GHz	23. deg
8.4 GHz	17. deg
15.0 GHz	12. deg
22.0 GHz	9. deg

1st LO=	2400.00	2400.00	2400.00	2400.00
Net SB=	L	L	U	U
IF SB =	L	L	L	L
Pol. =	RCP	LCP	RCP	LCP
BBC =	1	2	1	2
BBC SB=	U	U	L	L
IF =	C	A	C	A

The following frequency sets based on these setups were used.

Frequency Set: 4 Setup file default. Used with PCAL = 1MHz
 LO sum= 1668.00 1668.00 1668.00 1668.00
 BBC fr= 732.00 732.00 732.00 732.00
 Bandwd= 16.00 16.00 16.00 16.00
 Matching frequency sets: 4

Track assignments are:

track1= 2, 18, 3, 19
 barrel=roll_off

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(J2000)	(Date)	Error (mas)
* FAKERA	11 57 21.769299	* 12 00 00.000000	12 00 52.212703	0.00
	85 16 41.77889	* 85 00 00.000000	84 53 25.63711	0.00
	fake circumpolar target for a TS to look at			
* 0736+017	07 36 42.512339	* 07 39 18.033897	07 40 17.222013	0.00
J0739+0137	01 44 00.18080	* 01 37 04.61773	01 34 22.83881	0.00
	./rk23bz_sources.radioastron			
	AGN, rfc_2013d, RA-A06-07			

EFFECT OF SOLAR CORONA

The solar corona can cause unstable phases for sources too close to the Sun. SCHED provides warnings at individual scans for distances less than 10 degrees. The distance from the Sun to each source in this schedule is:

Source	Sun distance (deg)
0736+017	144.3

Barry Clark estimates from predictions by Ketan Desai of IPM scattering sizes that the Sun will cause amplitude reductions on the longest VLBA baselines at a solar distance of $60 \text{ deg } F^{-0.6}$ where F is in GHz.

For common VLBI bands, this is:

1.6 GHz	45. deg
2.3 GHz	36. deg
5.0 GHz	23. deg
8.4 GHz	17. deg
15.0 GHz	12. deg
22.0 GHz	9. deg


```

1st LO=  2400.00  2400.00  2400.00  2400.00
Net SB=           L           L           U           U
IF SB =           L           L           L           L
Pol.  =          RCP          LCP          RCP          LCP
BBC   =           1           2           1           2
BBC SB=           U           U           L           L
IF    =           C           A           C           A

```

The following frequency sets based on these setups were used.

```

Frequency Set:  8  Setup file default.  Used with PCAL = 1MHz
LO sum=  1668.00  1668.00  1668.00  1668.00
BBC fr=   732.00  732.00  732.00  732.00
Bandwd=   16.00  16.00  16.00  16.00
Matching frequency sets:  8

```

Track assignments are:

```

track1=  2, 18,  3, 19
barrel=roll_off

```

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(J2000)	(Date)	Error (mas)
* FAKERA	11 57 21.769299	* 12 00 00.000000	12 00 52.376915	0.00
	85 16 41.77889	* 85 00 00.000000	84 53 25.57945	0.00
	fake circumpolar target for a TS to look at			
* 0736+017	07 36 42.512339	* 07 39 18.033897	07 40 17.234666	0.00
J0739+0137	01 44 00.18080	* 01 37 04.61773	01 34 22.71167	0.00
	./rk23cb_sources.radioastron			
	AGN, rfc_2013d, RA-A06-07			

EFFECT OF SOLAR CORONA

The solar corona can cause unstable phases for sources too close to the Sun. SCHED provides warnings at individual scans for distances less than 10 degrees. The distance from the Sun to each source in this schedule is:

```

Source          Sun distance (deg)
0736+017        144.9

```

Barry Clark estimates from predictions by Ketan Desai of IPM scattering sizes that the Sun will cause amplitude reductions on the longest VLBA baselines at a solar distance of $60 \text{ deg } F^{-0.6}$ where F is in GHz.

For common VLBI bands, this is:

```

1.6 GHz        45. deg
2.3 GHz        36. deg
5.0 GHz        23. deg
8.4 GHz        17. deg
15.0 GHz       12. deg
22.0 GHz        9. deg

```

rk23ctr

RADIOASTRON AGN SCATTERING SUBSTRUCTURE

PI: *Mikhail Lisakov*

Address: ASC Lebedev Profsoyuznaya 84/32 117997 Moscow, Russia
Phone: +7-495-3332512 EMAIL: kirx@scan.sai.msu.ru
Fax: +7-495-3332378 Phone during observation: +7-903-6614865

Observing mode: C/L-band, dual-pol

Schedule for TORUN (Code Tr) Page 2

RadioAstron AGN scattering substructure

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.
Early: Seconds between end of slew and start. Dwell: On source seconds.
Disk: GBytes recorded to this point.
TPStart: Recording start time. Frequencies are LO sum (band edge).
SYNC: Time correlator is expected to sync up.

Start UT Source Start / Stop Early Disk TPStart
Stop UT LST EL AZ HA UP ParA Dwell GBytes SYNC

--- Wed 19 Dec 2018 Day 353 ---

----- L-band VLBI scans -----

Next scan frequencies:	1668.00	1668.00	1668.00	1668.00							
Next BBC frequencies:	732.00	732.00	732.00	732.00							
Next scan bandwidths:	16.00	16.00	16.00	16.00							
05 07 00	0736+017	12 12 17	14.3	253.0	4.5	35.1	0	0	05 07 00		
05 21 30	---	12 26 49	12.2	256.1	4.8	35.7	870	28	05 07 01		
05 22 00	0736+017	12 27 20	12.1	256.2	4.8	35.7	24	28	05 22 00		
05 36 30	---	12 41 52	10.0	259.2	5.0	36.2	870	56	05 22 01		
05 37 00	0736+017	12 42 22	9.9	259.3	5.0	36.2	24	56	05 37 00		
05 51 30	---	12 56 54	7.8	262.2	5.3	36.5	870	84	05 37 01		
05 52 00	0736+017	12 57 25	7.7	262.3	5.3	36.5	24	84	05 52 00		
06 07 00	---	13 12 27	5.4	265.4	5.5	36.8	900	112	05 52 01		

SETUP FILE INFORMATION:

NOTE: If DOPPLER, FREQ, or BW were used, see the individual scans for the final BBC settings.

=====
Setup file: ra18cm2.set

Setup group: 8	Station: TORUN	Total bit rate: 256
Format: MKIV1:4	Bits per sample: 2	Sample rate: 32.000
Number of channels: 4	DBE type:	Speedup factor: 1.00

Disk used to record data.

```

1st LO=  2400.00  2400.00  2400.00  2400.00
Net SB=           L           L           U           U
IF SB =           L           L           L           L
Pol.  =          RCP          LCP          RCP          LCP
BBC   =           1           2           1           2
BBC SB=           U           U           L           L
IF    =           C           A           C           A

```

The following frequency sets based on these setups were used.

```

Frequency Set:  6  Setup file default.  Used with PCAL = 1MHz
LO sum=  1668.00  1668.00  1668.00  1668.00
BBC fr=   732.00  732.00  732.00  732.00
Bandwd=   16.00  16.00  16.00  16.00
Matching frequency sets:  6

```

Track assignments are:

```

track1=  2, 18,  3, 19
barrel=roll_off

```

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(J2000)	(Date)	Error (mas)
* FAKERA	11 57 21.769299	* 12 00 00.000000	12 00 52.445701	0.00
	85 16 41.77889	* 85 00 00.000000	84 53 25.55348	0.00
	fake circumpolar target for a TS to look at			
* 0736+017	07 36 42.512339	* 07 39 18.033897	07 40 17.240354	0.00
J0739+0137	01 44 00.18080	* 01 37 04.61773	01 34 22.65530	0.00
	./rk23cc_sources.radioastron			
	AGN, rfc_2013d, RA-A06-07			

EFFECT OF SOLAR CORONA

The solar corona can cause unstable phases for sources too close to the Sun. SCHED provides warnings at individual scans for distances less than 10 degrees. The distance from the Sun to each source in this schedule is:

Source	Sun distance (deg)
0736+017	145.1

Barry Clark estimates from predictions by Ketan Desai of IPM scattering sizes that the Sun will cause amplitude reductions on the longest VLBA baselines at a solar distance of $60 \text{ deg } F^{-0.6}$ where F is in GHz.

For common VLBI bands, this is:

1.6 GHz	45. deg
2.3 GHz	36. deg
5.0 GHz	23. deg
8.4 GHz	17. deg
15.0 GHz	12. deg
22.0 GHz	9. deg

rk23cetr

RADIOASTRON AGN SCATTERING SUBSTRUCTURE
PI: *Mikhail Lisakov*

Address: ASC Lebedev Profsoyuznaya 84/32 117997 Moscow, Russia
Phone: +7-495-3332512 EMAIL: kirx@scan.sai.msu.ru
Fax: +7-495-3332378 Phone during observation: +7-903-6614865

Observing mode: C/L-band, dual-pol

Schedule for TORUN (Code Tr) Page 2

RadioAstron AGN scattering substructure

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.
Early: Seconds between end of slew and start. Dwell: On source seconds.
Disk: GBytes recorded to this point.
TPStart: Recording start time. Frequencies are LO sum (band edge).
SYNC: Time correlator is expected to sync up.

```
-----
```

Start UT	Source	Start / Stop					Early	Disk	TPStart	
Stop UT		LST	EL	AZ	HA	UP	ParA	Dwell	GBytes	SYNC

```
-----
```

--- Wed 19 Dec 2018 Day 353 ---

----- L-band VLBI scans -----

Next scan frequencies: 1668.00 1668.00 1668.00 1668.00
Next BBC frequencies: 732.00 732.00 732.00 732.00
Next scan bandwidths: 16.00 16.00 16.00 16.00

21 52 00	0736+017	05 00 02	28.8	132.8	-2.7	-26.2	0	0	21 52 00
22 11 30	---	05 19 35	30.8	137.9	-2.3	-23.8	1170	37	21 52 01
22 12 00	0736+017	05 20 05	30.9	138.0	-2.3	-23.7	24	37	22 12 00
22 31 30	---	05 39 39	32.7	143.3	-2.0	-21.0	1170	75	22 12 01
22 32 00	0736+017	05 40 09	32.8	143.5	-2.0	-20.9	24	75	22 32 00
22 52 00	---	06 00 12	34.5	149.1	-1.7	-17.9	1200	113	22 32 01

SETUP FILE INFORMATION:

NOTE: If DOPPLER, FREQ, or BW were used, see the individual scans for the final BBC settings.

===== Setup file: ra18cm2.set

Setup group: 9 Station: TORUN Total bit rate: 256
Format: MKIV1:4 Bits per sample: 2 Sample rate: 32.000
Number of channels: 4 DBE type: Speedup factor: 1.00

Disk used to record data.

```

1st LO=  2400.00  2400.00  2400.00  2400.00
Net SB=           L           L           U           U
IF SB =           L           L           L           L
Pol.  =          RCP          LCP          RCP          LCP
BBC   =           1           2           1           2
BBC SB=           U           U           L           L
IF    =           C           A           C           A

```

The following frequency sets based on these setups were used.

```

Frequency Set:  8  Setup file default.  Used with PCAL = 1MHz
LO sum=  1668.00  1668.00  1668.00  1668.00
BBC fr=   732.00   732.00   732.00   732.00
Bandwd=   16.00   16.00   16.00   16.00
Matching frequency sets:  8

```

Track assignments are:

```

track1=  2, 18,  3, 19
barrel=roll_off

```

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(J2000)	(Date)	Error (mas)
* FAKERA	11 57 21.769299	* 12 00 00.000000	12 00 52.608068	0.00
	85 16 41.77889	* 85 00 00.000000	84 53 25.48709	0.00
	fake circumpolar target for a TS to look at			
* 0736+017	07 36 42.512339	* 07 39 18.033897	07 40 17.254790	0.00
J0739+0137	01 44 00.18080	* 01 37 04.61773	01 34 22.51660	0.00
	./rk23ce_sources.radioastron			
	AGN, rfc_2013d, RA-A06-07			

EFFECT OF SOLAR CORONA

The solar corona can cause unstable phases for sources too close to the Sun. SCHED provides warnings at individual scans for distances less than 10 degrees. The distance from the Sun to each source in this schedule is:

Source	Sun distance (deg)
0736+017	145.7

Barry Clark estimates from predictions by Ketan Desai of IPM scattering sizes that the Sun will cause amplitude reductions on the longest VLBA baselines at a solar distance of $60 \text{ deg } F^{-0.6}$ where F is in GHz.

For common VLBI bands, this is:

1.6 GHz	45. deg
2.3 GHz	36. deg
5.0 GHz	23. deg
8.4 GHz	17. deg
15.0 GHz	12. deg
22.0 GHz	9. deg


```

1st LO= 2400.00 2400.00 2400.00 2400.00
Net SB=      L      L      U      U
IF SB =      L      L      L      L
Pol.  =      RCP     LCP     RCP     LCP
BBC   =      1      2      1      2
BBC SB=      U      U      L      L
IF    =      C      A      C      A

```

The following frequency sets based on these setups were used.

```

Frequency Set: 5 Setup file default. Used with PCAL = 1MHz
LO sum= 1668.00 1668.00 1668.00 1668.00
BBC fr= 732.00 732.00 732.00 732.00
Bandwd= 16.00 16.00 16.00 16.00
Matching frequency sets: 5

```

Track assignments are:

```

track1= 2, 18, 3, 19
barrel=roll_off

```

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(J2000)	(Date)	Error (mas)
* FAKERA	11 57 21.769299	* 12 00 00.000000	12 00 52.676719	0.00
	85 16 41.77889	* 85 00 00.000000	84 53 25.45679	0.00
	fake circumpolar target for a TS to look at			
* 0736+017	07 36 42.512339	* 07 39 18.033897	07 40 17.261320	0.00
J0739+0137	01 44 00.18080	* 01 37 04.61773	01 34 22.45638	0.00
	./rk23cf_sources.radioastron			
	AGN, rfc_2013d, RA-A06-07			

EFFECT OF SOLAR CORONA

The solar corona can cause unstable phases for sources too close to the Sun. SCHED provides warnings at individual scans for distances less than 10 degrees. The distance from the Sun to each source in this schedule is:

Source	Sun distance (deg)
0736+017	145.9

Barry Clark estimates from predictions by Ketan Desai of IPM scattering sizes that the Sun will cause amplitude reductions on the longest VLBA baselines at a solar distance of $60 \text{ deg } F^{-0.6}$ where F is in GHz.

For common VLBI bands, this is:

1.6 GHz	45. deg
2.3 GHz	36. deg
5.0 GHz	23. deg
8.4 GHz	17. deg
15.0 GHz	12. deg
22.0 GHz	9. deg

rk23chtr

RADIOASTRON AGN SCATTERING SUBSTRUCTURE

PI: *Mikhail Lisakov*

Address: ASC Lebedev Profsoyuznaya 84/32 117997 Moscow, Russia
 Phone: +7-495-3332512 EMAIL: kirx@scan.sai.msu.ru
 Fax: +7-495-3332378 Phone during observation: +7-903-6614865

Observing mode: C/L-band, dual-pol

Schedule for TORUN (Code Tr) Page 2

RadioAstron AGN scattering substructure

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.
 Early: Seconds between end of slew and start. Dwell: On source seconds.
 Disk: GBytes recorded to this point.
 TPStart: Recording start time. Frequencies are LO sum (band edge).
 SYNC: Time correlator is expected to sync up.

```
-----
Start UT  Source              Start / Stop              Early  Disk  TPStart
Stop UT   LST      EL  AZ  HA  UP  ParA Dwell  GBytes  SYNC
-----
```

--- Thu 20 Dec 2018 Day 354 ---

----- L-band VLBI scans -----

```
Next scan frequencies: 1668.00 1668.00 1668.00 1668.00
Next BBC frequencies:  732.00  732.00  732.00  732.00
Next scan bandwidths:  16.00   16.00   16.00   16.00
```

```
22 08 00  0736+017    05 20 01  30.9 138.0 -2.3   -23.7    0    0  22 08 00
22 27 30  ---          05 39 35  32.7 143.3 -2.0   -21.0  1170   37  22 08 01

22 28 00  0736+017    05 40 05  32.8 143.5 -2.0   -21.0   24   37  22 28 00
22 48 00  ---          06 00 08  34.5 149.1 -1.7   -18.0  1200   76  22 28 01
```

SETUP FILE INFORMATION:

NOTE: If DOPPLER, FREQ, or BW were used, see the individual scans for the final BBC settings.

===== Setup file: ra18cm2.set

```
Setup group:    7                      Station: TORUN                      Total bit rate:  256
Format: MKIV1:4                      Bits per sample: 2                      Sample rate: 32.000
Number of channels: 4                      DBE type:                      Speedup factor:  1.00
```

Disk used to record data.

```

1st LO= 2400.00 2400.00 2400.00 2400.00
Net SB=      L      L      U      U
IF SB =      L      L      L      L
Pol.  =      RCP     LCP     RCP     LCP
BBC   =      1      2      1      2
BBC SB=      U      U      L      L
IF    =      C      A      C      A

```

The following frequency sets based on these setups were used.

```

Frequency Set: 5 Setup file default. Used with PCAL = 1MHz
LO sum= 1668.00 1668.00 1668.00 1668.00
BBC fr= 732.00 732.00 732.00 732.00
Bandwd= 16.00 16.00 16.00 16.00
Matching frequency sets: 5

```

Track assignments are:

```

track1= 2, 18, 3, 19
barrel=roll_off

```

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(J2000)	(Date)	Error (mas)
* FAKERA	11 57 21.769299	* 12 00 00.000000	12 00 52.844802	0.00
	85 16 41.77889	* 85 00 00.000000	84 53 25.37752	0.00
	fake circumpolar target for a TS to look at			
* 0736+017	07 36 42.512339	* 07 39 18.033897	07 40 17.278253	0.00
J0739+0137	01 44 00.18080	* 01 37 04.61773	01 34 22.30841	0.00
	./rk23ch_sources.radioastron			
	AGN, rfc_2013d, RA-A06-07			

EFFECT OF SOLAR CORONA

The solar corona can cause unstable phases for sources too close to the Sun. SCHED provides warnings at individual scans for distances less than 10 degrees. The distance from the Sun to each source in this schedule is:

Source	Sun distance (deg)
0736+017	146.5

Barry Clark estimates from predictions by Ketan Desai of IPM scattering sizes that the Sun will cause amplitude reductions on the longest VLBA baselines at a solar distance of $60 \text{ deg } F^{-0.6}$ where F is in GHz.

For common VLBI bands, this is:

1.6 GHz	45. deg
2.3 GHz	36. deg
5.0 GHz	23. deg
8.4 GHz	17. deg
15.0 GHz	12. deg
22.0 GHz	9. deg


```

1st LO=  2400.00  2400.00  2400.00  2400.00
Net SB=      L      L      U      U
IF SB =      L      L      L      L
Pol.  =      RCP     LCP     RCP     LCP
BBC   =      1      2      1      2
BBC SB=      U      U      L      L
IF    =      C      A      C      A

```

The following frequency sets based on these setups were used.

```

Frequency Set:  5  Setup file default.  Used with PCAL = 1MHz
LO sum=  1668.00 1668.00 1668.00 1668.00
BBC fr=   732.00 732.00 732.00 732.00
Bandwd=   16.00 16.00 16.00 16.00
Matching frequency sets:  5

```

Track assignments are:

```

track1=  2, 18,  3, 19
barrel=roll_off

```

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(J2000)	(Date)	Error (mas)
* FAKERA	11 57 21.769299	* 12 00 00.000000	12 00 52.909868	0.00
	85 16 41.77889	* 85 00 00.000000	84 53 25.34525	0.00
	fake circumpolar target for a TS to look at			
* 0736+017	07 36 42.512339	* 07 39 18.033897	07 40 17.285095	0.00
J0739+0137	01 44 00.18080	* 01 37 04.61773	01 34 22.25199	0.00
	./rk23ci_sources.radioastron			
	AGN, rfc_2013d, RA-A06-07			

EFFECT OF SOLAR CORONA

The solar corona can cause unstable phases for sources too close to the Sun. SCHED provides warnings at individual scans for distances less than 10 degrees. The distance from the Sun to each source in this schedule is:

Source	Sun distance (deg)
0736+017	146.8

Barry Clark estimates from predictions by Ketan Desai of IPM scattering sizes that the Sun will cause amplitude reductions on the longest VLBA baselines at a solar distance of $60 \text{ deg } F^{-0.6}$ where F is in GHz.

For common VLBI bands, this is:

1.6 GHz	45. deg
2.3 GHz	36. deg
5.0 GHz	23. deg
8.4 GHz	17. deg
15.0 GHz	12. deg
22.0 GHz	9. deg

RADIOASTRON VISIBILITY TRACKING OF H2O MASER SPOTS

PI: Alexey Alakoz Hiroshi Imai

Address: ASC Lebedev Profsoyuznaya 84/32 117997 Moscow, Russia
 Observing mode: K-band dual-pol

Schedule for TORUN (Code Tr) Page 2

RadioAstron visibility tracking of H2O maser spots

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.

Early: Seconds between end of slew and start. Dwell: On source seconds.

Disk: GBytes recorded to this point.

TPStart: Recording start time. Frequencies are L0 sum (band edge).

SYNC: Time correlator is expected to sync up.

```
-----
Start UT  Source          Start / Stop          Early  Disk  TPStart
Stop UT          LST      EL  AZ  HA  UP  ParA  Dwell  GBytes  SYNC
-----
--- Sun 30 Dec 2018 Day 364 ---
----- K-band VLBI scans. Space segment 01: target source W3IRS5 -----
Next scan frequencies: 22228.00 22228.00 22228.00 22228.00
Next BBC frequencies:   728.00   728.00   728.00   728.00
Next scan bandwidths:  16.00   16.00   16.00   16.00

11 00 00 W3IRS5_H2O  18 49 37 36.3 31.8 -7.6   -42.7   0     0   11 00 00
11 21 20 ---          19 11 01 38.0 34.0 -7.3   -46.1 1280   41   11 00 01

11 21 50 W3IRS5_H2O  19 11 31 38.1 34.1 -7.3   -46.2   24    41   11 21 50
11 43 10 ---          19 32 54 39.9 36.3 -6.9   -49.6 1280   82   11 21 51

11 43 40 W3IRS5_H2O  19 33 24 40.0 36.3 -6.9   -49.6   24    82   11 43 40
12 05 00 ---          19 54 48 41.9 38.4 -6.5   -53.0 1280  123   11 43 41

----- K-band VLBI scans. Ground segment 02 : Delay/D-term cal. NRA0150 scan 1 -----
12 06 00 NRA0150  19 55 48 25.2 36.4 -8.1   -34.5  -17   123  12 06 00
12 20 00 ---          20 09 50 26.5 38.4 -7.9   -36.4  823   150  12 06 01

----- K-band VLBI scans. Space segment 02: space-ground FF source 0716+714 -----
12 22 00 0716+714  20 11 51 34.7  4.6-11.2   -8.7   37    150  12 22 00
12 35 00 ---          20 24 53 34.9  5.9-11.0  -11.1  780   175  12 22 01

----- K-band VLBI scans. Ground segment 02 : Phase-ref. scans on W3IRS5 -----
12 37 00 0241+622  20 26 53 43.3 39.1 -6.3   -55.3   39    175  12 37 00
12 38 00 ---          20 27 53 43.4 39.2 -6.3   -55.5   60    177  12 37 01

12 38 00 W3IRS5_H2O  20 27 53 45.1 41.4 -6.0   -58.3  -20    177  No stop
12 39 00 ---          20 28 53 45.2 41.5 -6.0   -58.4   40    179  12 38 01

12 39 00 0241+622  20 28 53 43.5 39.3 -6.3   -55.6  -20    179  No stop
12 40 00 ---          20 29 54 43.6 39.4 -6.3   -55.8   40    181  12 39 01

12 40 00 W3IRS5_H2O  20 29 54 45.3 41.5 -6.0   -58.6  -20    181  No stop
12 41 00 ---          20 30 54 45.4 41.6 -5.9   -58.7   40    183  12 40 01

12 41 00 0241+622  20 30 54 43.7 39.5 -6.3   -56.0  -20    183  No stop
12 42 00 ---          20 31 54 43.8 39.6 -6.2   -56.1   40    185  12 41 01
-----
```

Schedule for TORUN (Code Tr)

Page 3

RadioAstron visibility tracking of H2O maser spots

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.

Early: Seconds between end of slew and start. Dwell: On source seconds.

Disk: GBytes recorded to this point.

TPStart: Recording start time. Frequencies are L0 sum (band edge).

SYNC: Time correlator is expected to sync up.

Start UT	Source	Start / Stop					Early	Disk	TPStart	
Stop UT		LST	EL	AZ	HA	UP	ParA	Dwell	GBytes	SYNC
---	Sun 30 Dec 2018	Day 364	---							
12 42 00	W3IRS5_H2O	20 31 54	45.5	41.7	-5.9		-58.9	-20	185	No stop
12 43 00	---	20 32 54	45.6	41.8	-5.9		-59.1	40	187	12 42 01
12 43 00	0241+622	20 32 54	43.9	39.7	-6.2		-56.3	-20	187	No stop
12 44 00	---	20 33 54	44.0	39.8	-6.2		-56.4	40	188	12 43 01
12 44 00	W3IRS5_H2O	20 33 54	45.7	41.9	-5.9		-59.2	-20	188	No stop
12 45 00	---	20 34 54	45.8	42.0	-5.9		-59.4	40	190	12 44 01
12 45 00	0241+622	20 34 54	44.1	39.9	-6.2		-56.6	-20	190	No stop
12 46 00	---	20 35 55	44.2	39.9	-6.2		-56.8	40	192	12 45 01
12 46 00	W3IRS5_H2O	20 35 55	45.9	42.1	-5.9		-59.5	-20	192	No stop
12 47 00	---	20 36 55	46.0	42.1	-5.8		-59.7	40	194	12 46 01
12 47 30	0241+622	20 37 25	44.3	40.1	-6.2		-57.0	10	194	12 47 30
12 48 00	---	20 37 55	44.4	40.1	-6.1		-57.1	30	195	12 47 31
12 48 00	W3IRS5_H2O	20 37 55	46.1	42.2	-5.8		-59.9	-20	195	No stop
12 49 00	---	20 38 55	46.2	42.3	-5.8		-60.0	40	197	12 48 01
12 49 00	0241+622	20 38 55	44.5	40.2	-6.1		-57.2	-20	197	No stop
12 50 00	---	20 39 55	44.6	40.3	-6.1		-57.4	40	199	12 49 01
12 50 00	W3IRS5_H2O	20 39 55	46.3	42.4	-5.8		-60.2	-20	199	No stop
12 51 00	---	20 40 55	46.4	42.5	-5.8		-60.3	40	201	12 50 01
12 51 00	0241+622	20 40 55	44.7	40.4	-6.1		-57.6	-20	201	No stop
12 52 00	---	20 41 56	44.8	40.5	-6.1		-57.7	40	203	12 51 01
12 52 00	W3IRS5_H2O	20 41 56	46.5	42.6	-5.8		-60.5	-20	203	No stop
12 53 00	---	20 42 56	46.6	42.6	-5.7		-60.7	40	205	12 52 01
12 53 00	0241+622	20 42 56	44.9	40.6	-6.1		-57.9	-20	205	No stop
12 54 00	---	20 43 56	45.0	40.6	-6.0		-58.0	40	207	12 53 01
12 54 00	W3IRS5_H2O	20 43 56	46.7	42.7	-5.7		-60.8	-20	207	No stop
12 55 00	---	20 44 56	46.8	42.8	-5.7		-61.0	40	209	12 54 01
12 55 00	0241+622	20 44 56	45.1	40.7	-6.0		-58.2	-20	209	No stop
12 56 00	---	20 45 56	45.1	40.8	-6.0		-58.4	40	211	12 55 01
12 56 00	W3IRS5_H2O	20 45 56	46.9	42.9	-5.7		-61.2	-20	211	No stop
12 57 00	---	20 46 56	47.0	43.0	-5.7		-61.3	40	212	12 56 01
12 57 30	0241+622	20 47 27	45.3	40.9	-6.0		-58.6	10	212	12 57 30
12 58 00	---	20 47 57	45.3	41.0	-6.0		-58.7	30	213	12 57 31

Schedule for TORUN (Code Tr)

Page 4

RadioAstron visibility tracking of H2O maser spots

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.

Early: Seconds between end of slew and start. Dwell: On source seconds.

Disk: GBytes recorded to this point.

TPStart: Recording start time. Frequencies are L0 sum (band edge).

SYNC: Time correlator is expected to sync up.

Start UT	Source	Start / Stop					Early	Disk	TPStart	
Stop UT		LST	EL	AZ	HA	UP	ParA	Dwell	GBytes	SYNC

--- Sun 30 Dec 2018 Day 364 ---										
12 58 00	W3IRS5_H2O	20 47 57	47.1	43.1	-5.7		-61.5	-20	213	No stop
12 59 00	---	20 48 57	47.2	43.1	-5.6		-61.6	40	215	12 58 01
----- K-band VLBI scans. Ground segment 02 : Phase-ref. scans on W3IRS5 in parallel to GBT/Eff p										
13 00 00	0241+622	20 49 57	45.5	41.2	-5.9		-59.0	40	215	13 00 00
13 01 00	---	20 50 57	45.6	41.2	-5.9		-59.2	60	217	13 00 01
13 01 00	W3IRS5_H2O	20 50 57	47.4	43.3	-5.6		-62.0	-20	217	No stop
13 02 00	---	20 51 57	47.5	43.4	-5.6		-62.1	40	219	13 01 01
13 02 00	0241+622	20 51 57	45.7	41.3	-5.9		-59.3	-20	219	No stop
13 03 00	---	20 52 57	45.8	41.4	-5.9		-59.5	40	221	13 02 01
13 03 00	W3IRS5_H2O	20 52 57	47.6	43.5	-5.6		-62.3	-21	221	No stop
13 04 00	---	20 53 58	47.7	43.5	-5.6		-62.5	39	223	13 03 01
13 04 00	0241+622	20 53 58	45.9	41.5	-5.9		-59.7	-20	223	No stop
13 05 00	---	20 54 58	46.0	41.6	-5.9		-59.8	40	225	13 04 01
13 05 00	W3IRS5_H2O	20 54 58	47.8	43.6	-5.5		-62.6	-21	225	No stop
13 06 00	---	20 55 58	47.9	43.7	-5.5		-62.8	39	227	13 05 01
13 06 00	0241+622	20 55 58	46.1	41.7	-5.8		-60.0	-20	227	No stop
13 07 00	---	20 56 58	46.2	41.7	-5.8		-60.1	40	229	13 06 01
13 07 00	W3IRS5_H2O	20 56 58	48.0	43.8	-5.5		-62.9	-21	229	No stop
13 08 00	---	20 57 58	48.1	43.9	-5.5		-63.1	39	231	13 07 01
13 08 00	0241+622	20 57 58	46.3	41.8	-5.8		-60.3	-20	231	No stop
13 09 00	---	20 58 58	46.4	41.9	-5.8		-60.5	40	233	13 08 01
13 09 00	W3IRS5_H2O	20 58 58	48.2	43.9	-5.5		-63.3	-21	233	No stop
13 10 00	---	20 59 59	48.4	44.0	-5.5		-63.4	39	235	13 09 01
----- K-band VLBI scans. Ground segment 02 : Phase-ref. scans on W3IRS5 +GBT/EFLSBERG -----										
13 10 30	0241+622	21 00 29	46.6	42.0	-5.8		-60.7	10	235	13 10 30
13 11 00	---	21 00 59	46.6	42.1	-5.8		-60.8	30	236	13 10 31
13 11 00	W3IRS5_H2O	21 00 59	48.5	44.1	-5.4		-63.6	-21	236	No stop
13 12 00	---	21 01 59	48.6	44.2	-5.4		-63.8	39	237	13 11 01
13 12 00	0241+622	21 01 59	46.7	42.2	-5.7		-61.0	-20	237	No stop
13 13 00	---	21 02 59	46.8	42.2	-5.7		-61.1	40	239	13 12 01

Schedule for TORUN (Code Tr)

Page 5

RadioAstron visibility tracking of H2O maser spots

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.

Early: Seconds between end of slew and start. Dwell: On source seconds.

Disk: GBytes recorded to this point.

TPStart: Recording start time. Frequencies are L0 sum (band edge).

SYNC: Time correlator is expected to sync up.

```

-----
Start UT  Source          Start / Stop          Early  Disk  TPStart
Stop UT   LST      EL  AZ  HA  UP  ParA  Dwell  GBytes  SYNC
-----

```

--- Sun 30 Dec 2018 Day 364 ---

13 13 00	W3IRS5_H20	21 02 59	48.7	44.3	-5.4	-63.9	-21	239	No stop
13 14 00	---	21 03 59	48.8	44.3	-5.4	-64.1	39	241	13 13 01
13 14 00	0241+622	21 03 59	46.9	42.3	-5.7	-61.3	-20	241	No stop
13 15 00	---	21 04 59	47.0	42.4	-5.7	-61.5	40	243	13 14 01
13 15 00	W3IRS5_H20	21 04 59	48.9	44.4	-5.4	-64.2	-21	243	No stop
13 16 00	---	21 06 00	49.0	44.5	-5.4	-64.4	39	245	13 15 01
13 16 00	0241+622	21 06 00	47.2	42.5	-5.7	-61.6	-21	245	No stop
13 17 00	---	21 07 00	47.3	42.6	-5.7	-61.8	39	247	13 16 01
13 17 00	W3IRS5_H20	21 07 00	49.1	44.6	-5.3	-64.6	-21	247	No stop
13 18 00	---	21 08 00	49.2	44.6	-5.3	-64.7	39	249	13 17 01
13 18 00	0241+622	21 08 00	47.4	42.6	-5.6	-61.9	-21	249	No stop
13 19 00	---	21 09 00	47.5	42.7	-5.6	-62.1	39	251	13 18 01
13 19 00	W3IRS5_H20	21 09 00	49.3	44.7	-5.3	-64.9	-21	251	No stop
13 20 00	---	21 10 00	49.4	44.8	-5.3	-65.1	39	253	13 19 01

----- K-band VLBI scans. Ground segment 02 : Delay/D-term cal. NRA0150 scan 2 -----

13 20 00	NRA0150	21 10 00	32.6	46.7	-6.8	-44.0	-77	253	No stop
13 30 00	---	21 20 02	33.7	48.1	-6.7	-45.2	523	272	13 20 01

----- K-band VLBI scans. Ground segment 02 : Phase-ref. scans on W3IRS5 /all stations -----

13 30 30	0241+622	21 20 32	48.6	43.6	-5.4	-64.0	-40	272	13 30 30
13 31 30	---	21 21 32	48.7	43.7	-5.4	-64.2	20	274	13 30 31
13 31 30	W3IRS5_H20	21 21 32	50.6	45.6	-5.1	-67.0	-21	274	No stop
13 32 30	---	21 22 32	50.7	45.7	-5.1	-67.1	39	276	13 31 31
13 32 30	0241+622	21 22 32	48.8	43.8	-5.4	-64.3	-21	276	No stop
13 33 30	---	21 23 32	49.0	43.9	-5.4	-64.5	39	278	13 32 31
13 33 30	W3IRS5_H20	21 23 32	50.9	45.8	-5.1	-67.3	-21	278	No stop
13 34 30	---	21 24 33	51.0	45.9	-5.0	-67.5	39	280	13 33 31
13 34 30	0241+622	21 24 33	49.1	43.9	-5.4	-64.7	-21	280	No stop
13 35 30	---	21 25 33	49.2	44.0	-5.3	-64.8	39	282	13 34 31
13 35 30	W3IRS5_H20	21 25 33	51.1	45.9	-5.0	-67.6	-21	282	No stop
13 36 30	---	21 26 33	51.2	46.0	-5.0	-67.8	39	284	13 35 31

Schedule for TORUN (Code Tr)

Page 6

RadioAstron visibility tracking of H2O maser spots

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Early: Seconds between end of slew and start. Dwell: On source seconds.

Disk: GBytes recorded to this point.

TPStart: Recording start time. Frequencies are L0 sum (band edge).

SYNC: Time correlator is expected to sync up.

Start UT	Source	Start / Stop					Early	Disk	TPStart	
Stop UT		LST	EL	AZ	HA	UP	ParA	Dwell	GBytes	SYNC

--- Sun 30 Dec 2018 Day 364 ---										
13 36 30	0241+622	21 26 33	49.3	44.1	-5.3		-65.0	-21	284	No stop
13 37 30	---	21 27 33	49.4	44.2	-5.3		-65.2	39	286	13 36 31
13 37 30	W3IRS5_H2O	21 27 33	51.3	46.1	-5.0		-68.0	-21	286	No stop
13 38 30	---	21 28 33	51.4	46.1	-5.0		-68.1	39	287	13 37 31
13 38 30	0241+622	21 28 33	49.5	44.2	-5.3		-65.3	-21	287	No stop
13 39 30	---	21 29 33	49.6	44.3	-5.3		-65.5	39	289	13 38 31
13 39 30	W3IRS5_H2O	21 29 33	51.5	46.2	-5.0		-68.3	-21	289	No stop
13 40 30	---	21 30 34	51.6	46.3	-4.9		-68.5	39	291	13 39 31
13 41 00	0241+622	21 31 04	49.7	44.4	-5.3		-65.7	9	291	13 41 00
13 42 00	---	21 32 04	49.8	44.5	-5.2		-65.9	60	293	13 41 01
13 42 00	W3IRS5_H2O	21 32 04	51.8	46.4	-4.9		-68.7	-21	293	No stop
13 43 00	---	21 33 04	51.9	46.5	-4.9		-68.9	39	295	13 42 01
----- K-band VLBI scans. Ground segment 02 : 3C48 with EVN+KVN -----										
13 43 00	3C48	21 33 04	42.7	89.3	-4.1		-45.9	-101	295	No stop
13 53 00	---	21 43 06	44.2	91.3	-3.9		-45.9	499	314	13 43 01
----- K-band VLBI scans. Ground segment 02 : Phase-ref. scans on W3IRS5 /all stations -----										
13 55 00	0241+622	21 45 06	51.2	45.4	-5.0		-68.1	13	314	13 55 00
13 56 00	---	21 46 06	51.3	45.5	-5.0		-68.2	60	316	13 55 01
13 56 00	W3IRS5_H2O	21 46 06	53.3	47.3	-4.7		-71.1	-21	316	No stop
13 57 00	---	21 47 06	53.4	47.4	-4.7		-71.3	39	318	13 56 01
13 57 00	0241+622	21 47 06	51.4	45.5	-5.0		-68.4	-21	318	No stop
13 58 00	---	21 48 06	51.5	45.6	-5.0		-68.6	39	320	13 57 01
13 58 00	W3IRS5_H2O	21 48 06	53.5	47.4	-4.7		-71.4	-21	320	No stop
13 59 00	---	21 49 07	53.6	47.5	-4.6		-71.6	39	322	13 58 01
13 59 00	0241+622	21 49 07	51.7	45.7	-5.0		-68.8	-21	322	No stop
14 00 00	---	21 50 07	51.8	45.8	-4.9		-68.9	39	324	13 59 01
14 00 00	W3IRS5_H2O	21 50 07	53.8	47.6	-4.6		-71.8	-21	324	No stop
14 01 00	---	21 51 07	53.9	47.6	-4.6		-71.9	39	326	14 00 01
14 01 00	0241+622	21 51 07	51.9	45.8	-4.9		-69.1	-21	326	No stop
14 02 00	---	21 52 07	52.0	45.9	-4.9		-69.3	39	328	14 01 01

Schedule for TORUN (Code Tr)

Page 7

RadioAstron visibility tracking of H2O maser spots

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.

Early: Seconds between end of slew and start. Dwell: On source seconds.

Disk: GBytes recorded to this point.

TPStart: Recording start time. Frequencies are L0 sum (band edge).

SYNC: Time correlator is expected to sync up.

Start UT	Source	Start / Stop					Early	Disk	TPStart	
Stop UT		LST	EL	AZ	HA	UP	ParA	Dwell	GBytes	SYNC

--- Sun 30 Dec 2018 Day 364 ---										
14 02 00	W3IRS5_H20	21 52 07	54.0	47.7	-4.6		-72.1	-21	328	No stop
14 03 00	---	21 53 07	54.1	47.7	-4.6		-72.3	39	330	14 02 01
14 03 30	0241+622	21 53 37	52.1	46.0	-4.9		-69.5	9	330	14 03 30
14 04 30	---	21 54 38	52.3	46.1	-4.9		-69.7	60	332	14 03 31
14 04 30	W3IRS5_H20	21 54 38	54.3	47.8	-4.5		-72.5	-21	332	No stop
14 05 30	---	21 55 38	54.4	47.9	-4.5		-72.7	39	334	14 04 31
14 05 30	0241+622	21 55 38	52.4	46.1	-4.8		-69.9	-21	334	No stop
14 06 30	---	21 56 38	52.5	46.2	-4.8		-70.0	39	336	14 05 31
14 06 30	W3IRS5_H20	21 56 38	54.5	48.0	-4.5		-72.9	-21	336	No stop
14 07 30	---	21 57 38	54.6	48.0	-4.5		-73.1	39	337	14 06 31
14 07 30	0241+622	21 57 38	52.6	46.2	-4.8		-70.2	-21	337	No stop
14 08 30	---	21 58 38	52.7	46.3	-4.8		-70.4	39	339	14 07 31
14 08 30	W3IRS5_H20	21 58 38	54.7	48.1	-4.5		-73.2	-22	339	No stop
14 09 30	---	21 59 38	54.8	48.1	-4.5		-73.4	38	341	14 08 31
14 09 30	0241+622	21 59 38	52.8	46.4	-4.8		-70.5	-21	341	No stop
14 10 30	---	22 00 39	52.9	46.4	-4.8		-70.7	39	343	14 09 31
14 10 30	W3IRS5_H20	22 00 39	54.9	48.2	-4.4		-73.6	-22	343	No stop
14 11 30	---	22 01 39	55.0	48.2	-4.4		-73.8	38	345	14 10 31
14 11 30	0241+622	22 01 39	53.0	46.5	-4.7		-70.9	-21	345	No stop
14 12 30	---	22 02 39	53.1	46.6	-4.7		-71.1	39	347	14 11 31
14 12 30	W3IRS5_H20	22 02 39	55.2	48.3	-4.4		-73.9	-22	347	No stop
14 13 30	---	22 03 39	55.3	48.4	-4.4		-74.1	38	349	14 12 31
14 14 00	0241+622	22 04 09	53.3	46.7	-4.7		-71.3	9	349	14 14 00
14 15 00	---	22 05 09	53.4	46.7	-4.7		-71.5	60	351	14 14 01
14 15 00	W3IRS5_H20	22 05 09	55.4	48.4	-4.4		-74.4	-22	351	No stop
14 16 00	---	22 06 09	55.5	48.5	-4.3		-74.5	38	353	14 15 01
14 16 00	0241+622	22 06 09	53.5	46.8	-4.7		-71.7	-21	353	No stop
14 17 00	---	22 07 10	53.6	46.8	-4.7		-71.8	39	355	14 16 01
14 17 00	W3IRS5_H20	22 07 10	55.7	48.6	-4.3		-74.7	-22	355	No stop
14 18 00	---	22 08 10	55.8	48.6	-4.3		-74.9	38	357	14 17 01

Schedule for TORUN (Code Tr)

Page 8

RadioAstron visibility tracking of H2O maser spots

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.

Early: Seconds between end of slew and start. Dwell: On source seconds.

Disk: GBytes recorded to this point.

TPStart: Recording start time. Frequencies are L0 sum (band edge).

SYNC: Time correlator is expected to sync up.

Start UT	Source	Start / Stop					Early	Disk	TPStart	
Stop UT		LST	EL	AZ	HA	UP	ParA	Dwell	GBytes	SYNC

--- Sun 30 Dec 2018 Day 364 ---										
14 18 00	0241+622	22 08 10	53.7	46.9	-4.6		-72.0	-21	357	No stop
14 19 00	---	22 09 10	53.8	47.0	-4.6		-72.2	39	359	14 18 01
14 19 00	W3IRS5_H2O	22 09 10	55.9	48.7	-4.3		-75.1	-22	359	No stop
14 20 00	---	22 10 10	56.0	48.7	-4.3		-75.3	38	361	14 19 01
14 20 00	0241+622	22 10 10	53.9	47.0	-4.6		-72.4	-21	361	No stop
14 21 00	---	22 11 10	54.1	47.1	-4.6		-72.5	39	362	14 20 01
14 21 00	W3IRS5_H2O	22 11 10	56.1	48.8	-4.3		-75.4	-22	362	No stop
14 22 00	---	22 12 10	56.2	48.8	-4.2		-75.6	38	364	14 21 01
14 22 00	0241+622	22 12 10	54.2	47.1	-4.6		-72.7	-21	364	No stop
14 23 00	---	22 13 11	54.3	47.2	-4.6		-72.9	39	366	14 22 01
14 23 00	W3IRS5_H2O	22 13 11	56.3	48.9	-4.2		-75.8	-22	366	No stop
14 24 00	---	22 14 11	56.5	48.9	-4.2		-76.0	38	368	14 23 01
----- K-band VLBI scans. Ground segment 02 : Delay/D-term cal. NRA0150 scan 3 -----										
14 24 00	NRA0150	22 14 11	40.0	55.1	-5.8		-51.5	-75	368	No stop
14 34 00	---	22 24 12	41.3	56.4	-5.6		-52.7	525	387	14 24 01
----- K-band VLBI scans. Ground segment 02 : Phase-ref. scans on W3IRS5 /all stations -----										
14 34 30	0241+622	22 24 42	55.6	47.8	-4.4		-74.9	-38	387	14 34 30
14 35 30	---	22 25 43	55.7	47.9	-4.3		-75.1	22	389	14 34 31
14 35 30	W3IRS5_H2O	22 25 43	57.8	49.5	-4.0		-78.1	-22	389	No stop
14 36 30	---	22 26 43	57.9	49.5	-4.0		-78.2	38	391	14 35 31
14 36 30	0241+622	22 26 43	55.8	47.9	-4.3		-75.3	-22	391	No stop
14 37 30	---	22 27 43	55.9	48.0	-4.3		-75.5	38	393	14 36 31
14 37 30	W3IRS5_H2O	22 27 43	58.0	49.6	-4.0		-78.4	-22	393	No stop
14 38 30	---	22 28 43	58.1	49.6	-4.0		-78.6	38	395	14 37 31
14 38 30	0241+622	22 28 43	56.0	48.0	-4.3		-75.6	-22	395	No stop
14 39 30	---	22 29 43	56.1	48.1	-4.3		-75.8	38	397	14 38 31
14 39 30	W3IRS5_H2O	22 29 43	58.2	49.7	-4.0		-78.8	-22	397	No stop
14 40 30	---	22 30 43	58.3	49.7	-3.9		-79.0	38	399	14 39 31
14 40 30	0241+622	22 30 43	56.2	48.1	-4.3		-76.0	-22	399	No stop
14 41 30	---	22 31 44	56.3	48.2	-4.2		-76.2	38	401	14 40 31

Schedule for TORUN (Code Tr)

Page 9

RadioAstron visibility tracking of H2O maser spots

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.

Early: Seconds between end of slew and start. Dwell: On source seconds.

Disk: GBytes recorded to this point.

TPStart: Recording start time. Frequencies are L0 sum (band edge).

SYNC: Time correlator is expected to sync up.

Start UT	Source	Start / Stop					Early	Disk	TPStart	
Stop UT		LST	EL	AZ	HA	UP	ParA	Dwell	GBytes	SYNC

--- Sun 30 Dec 2018 Day 364 ---										
14 41 30	W3IRS5_H2O	22 31 44	58.4	49.7	-3.9		-79.2	-22	401	No stop
14 42 30	---	22 32 44	58.6	49.8	-3.9		-79.3	38	403	14 41 31
14 43 00	0241+622	22 33 14	56.5	48.3	-4.2		-76.5	8	403	14 43 00
14 43 30	---	22 33 44	56.6	48.3	-4.2		-76.5	30	404	14 43 01
14 43 30	W3IRS5_H2O	22 33 44	58.7	49.8	-3.9		-79.5	-22	404	No stop
14 44 30	---	22 34 44	58.8	49.9	-3.9		-79.7	38	406	14 43 31
14 44 30	0241+622	22 34 44	56.7	48.3	-4.2		-76.7	-22	406	No stop
14 45 30	---	22 35 44	56.8	48.4	-4.2		-76.9	38	408	14 44 31
14 45 30	W3IRS5_H2O	22 35 44	58.9	49.9	-3.9		-79.9	-22	408	No stop
14 46 30	---	22 36 44	59.0	50.0	-3.8		-80.1	38	410	14 45 31
14 46 30	0241+622	22 36 44	56.9	48.4	-4.2		-77.1	-22	410	No stop
14 47 30	---	22 37 45	57.0	48.5	-4.1		-77.3	38	412	14 46 31
14 47 30	W3IRS5_H2O	22 37 45	59.1	50.0	-3.8		-80.3	-22	412	No stop
14 48 30	---	22 38 45	59.3	50.0	-3.8		-80.5	38	413	14 47 31
----- Ground-only scan on 0716+714 -----										
14 50 00	0716+714	22 40 15	39.1	18.2	-8.7		-35.8	1	413	14 50 00
14 58 00	---	22 48 16	39.5	18.9	-8.6		-37.3	480	429	14 50 01
----- K-band VLBI scans. Ground segment 02 : Phase-ref. scans on W3IRS5 in parallel to GBT/Eff p										
15 00 00	0241+622	22 50 17	58.4	49.0	-3.9		-79.6	36	429	15 00 00
15 01 00	---	22 51 17	58.5	49.1	-3.9		-79.8	60	431	15 00 01
15 01 00	W3IRS5_H2O	22 51 17	60.7	50.5	-3.6		-82.9	-22	431	No stop
15 02 00	---	22 52 17	60.8	50.5	-3.6		-83.1	38	433	15 01 01
15 02 30	0241+622	22 52 47	58.7	49.1	-3.9		-80.1	8	433	15 02 30
15 03 00	---	22 53 17	58.8	49.1	-3.9		-80.2	30	434	15 02 31
15 03 00	W3IRS5_H2O	22 53 17	60.9	50.5	-3.6		-83.3	-22	434	No stop
15 04 00	---	22 54 17	61.0	50.5	-3.5		-83.5	38	436	15 03 01
15 04 00	0241+622	22 54 17	58.9	49.2	-3.9		-80.4	-22	436	No stop
15 05 00	---	22 55 17	59.0	49.2	-3.9		-80.5	38	437	15 04 01
15 05 00	W3IRS5_H2O	22 55 17	61.2	50.6	-3.5		-83.7	-22	437	No stop
15 06 00	---	22 56 18	61.3	50.6	-3.5		-83.9	38	439	15 05 01

Schedule for TORUN (Code Tr)

Page 10

RadioAstron visibility tracking of H2O maser spots

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.

Early: Seconds between end of slew and start. Dwell: On source seconds.

Disk: GBytes recorded to this point.

TPStart: Recording start time. Frequencies are L0 sum (band edge).

SYNC: Time correlator is expected to sync up.

Start UT	Source	Start / Stop					Early	Disk	TPStart	
Stop UT		LST	EL	AZ	HA	UP	ParA	Dwell	GBytes	SYNC

--- Sun 30 Dec 2018 Day 364 ---										
15 06 00	0241+622	22 56 18	59.1	49.3	-3.8		-80.7	-22	439	No stop
15 07 00	---	22 57 18	59.2	49.3	-3.8		-80.9	38	441	15 06 01
15 07 00	W3IRS5_H2O	22 57 18	61.4	50.6	-3.5		-84.1	-22	441	No stop
15 08 00	---	22 58 18	61.5	50.6	-3.5		-84.3	38	443	15 07 01
15 08 00	0241+622	22 58 18	59.3	49.3	-3.8		-81.1	-22	443	No stop
15 09 00	---	22 59 18	59.5	49.4	-3.8		-81.3	38	445	15 08 01
15 09 00	W3IRS5_H2O	22 59 18	61.6	50.7	-3.5		-84.5	-22	445	No stop
15 10 00	---	23 00 18	61.7	50.7	-3.4		-84.7	38	447	15 09 01
----- K-band VLBI scans. Ground segment 02 : Phase-ref. scans on W3IRS5 +GBT/EFLSBERG -----										
15 10 30	0241+622	23 00 48	59.6	49.4	-3.8		-81.6	8	447	15 10 30
15 11 30	---	23 01 49	59.7	49.4	-3.7		-81.8	60	449	15 10 31
15 11 30	W3IRS5_H2O	23 01 49	61.9	50.7	-3.4		-85.0	-22	449	No stop
15 12 30	---	23 02 49	62.0	50.7	-3.4		-85.2	38	451	15 11 31
15 13 00	0241+622	23 03 19	59.9	49.5	-3.7		-82.1	8	451	15 13 00
15 13 30	---	23 03 49	60.0	49.5	-3.7		-82.2	30	452	15 13 01
15 13 30	W3IRS5_H2O	23 03 49	62.2	50.8	-3.4		-85.4	-22	452	No stop
15 14 30	---	23 04 49	62.3	50.8	-3.4		-85.6	38	454	15 13 31
15 14 30	0241+622	23 04 49	60.1	49.5	-3.7		-82.4	-22	454	No stop
15 15 30	---	23 05 49	60.2	49.6	-3.7		-82.6	38	456	15 14 31
15 15 30	W3IRS5_H2O	23 05 49	62.4	50.8	-3.4		-85.8	-22	456	No stop
15 16 30	---	23 06 49	62.5	50.8	-3.3		-86.0	38	458	15 15 31
15 16 30	0241+622	23 06 49	60.3	49.6	-3.7		-82.8	-22	458	No stop
15 17 30	---	23 07 50	60.4	49.6	-3.6		-83.0	38	460	15 16 31
15 17 30	W3IRS5_H2O	23 07 50	62.6	50.8	-3.3		-86.2	-22	460	No stop
15 18 30	---	23 08 50	62.7	50.9	-3.3		-86.4	38	462	15 17 31
15 18 30	0241+622	23 08 50	60.5	49.7	-3.6		-83.2	-22	462	No stop
15 19 30	---	23 09 50	60.7	49.7	-3.6		-83.4	38	463	15 18 31
15 19 30	W3IRS5_H2O	23 09 50	62.9	50.9	-3.3		-86.6	-22	463	No stop
15 20 30	---	23 10 50	63.0	50.9	-3.3		-86.8	38	465	15 19 31

Schedule for TORUN (Code Tr)

Page 11

RadioAstron visibility tracking of H2O maser spots

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.

Early: Seconds between end of slew and start. Dwell: On source seconds.

Disk: GBytes recorded to this point.

TPStart: Recording start time. Frequencies are L0 sum (band edge).

SYNC: Time correlator is expected to sync up.

```
-----
Start UT  Source          Start / Stop          Early  Disk  TPStart
Stop UT   LST      EL  AZ  HA  UP  ParA Dwell  GBytes  SYNC
-----
```

--- Sun 30 Dec 2018 Day 364 ---

----- K-band VLBI scans. Ground segment 02 : Delay/D-term cal. NRA0150 scan 4 -----

```
15 20 30  NRA0150      23 10 50  47.3  62.2 -4.8    -57.6  -72    465  No stop
15 30 30  ---          23 20 52  48.6  63.5 -4.7    -58.7   528    485  15 20 31
```

----- K-band VLBI scans. Ground segment 02 : Phase-ref. scans on W3IRS5 /all stations -----

```
15 31 00  0241+622      23 21 22  62.0  50.0 -3.4    -85.7  -34    485  15 31 00
15 32 00  ---          23 22 22  62.1  50.0 -3.4    -85.9   26    487  15 31 01

15 32 00  W3IRS5_H2O     23 22 22  64.3  51.0 -3.1    -89.3  -22    487  No stop
15 33 00  ---          23 23 22  64.4  51.0 -3.1    -89.5   38    488  15 32 01

15 33 00  0241+622      23 23 22  62.2  50.0 -3.4    -86.1  -22    488  No stop
15 34 00  ---          23 24 22  62.3  50.0 -3.4    -86.3   38    490  15 33 01

15 34 00  W3IRS5_H2O     23 24 22  64.6  51.0 -3.0    -89.7  -22    490  No stop
15 35 00  ---          23 25 22  64.7  51.0 -3.0    -89.9   38    492  15 34 01

15 35 00  0241+622      23 25 22  62.4  50.0 -3.4    -86.5  -22    492  No stop
15 36 00  ---          23 26 23  62.6  50.0 -3.3    -86.7   38    494  15 35 01

15 36 00  W3IRS5_H2O     23 26 23  64.8  51.0 -3.0    -90.2  -22    494  No stop
15 37 00  ---          23 27 23  64.9  51.0 -3.0    -90.4   38    496  15 36 01

15 37 00  0241+622      23 27 23  62.7  50.0 -3.3    -86.9  -22    496  No stop
15 38 00  ---          23 28 23  62.8  50.1 -3.3    -87.2   38    498  15 37 01

15 38 00  W3IRS5_H2O     23 28 23  65.0  51.0 -3.0    -90.6  -22    498  No stop
15 39 00  ---          23 29 23  65.1  51.0 -3.0    -90.8   38    500  15 38 01

15 39 00  0241+622      23 29 23  62.9  50.1 -3.3    -87.4  -22    500  No stop
15 40 00  ---          23 30 23  63.0  50.1 -3.3    -87.6   38    502  15 39 01

15 40 00  W3IRS5_H2O     23 30 23  65.3  51.0 -2.9    -91.1  -22    502  No stop
15 41 00  ---          23 31 23  65.4  51.0 -2.9    -91.3   38    504  15 40 01

15 41 30  0241+622      23 31 53  63.2  50.1 -3.2    -87.9   8     504  15 41 30
15 42 30  ---          23 32 54  63.3  50.1 -3.2    -88.1  60     506  15 41 31

15 42 30  W3IRS5_H2O     23 32 54  65.5  51.0 -2.9    -91.6  -22    506  No stop
15 43 30  ---          23 33 54  65.7  51.0 -2.9    -91.9   38    508  15 42 31

15 43 30  0241+622      23 33 54  63.4  50.1 -3.2    -88.3  -22    508  No stop
15 44 30  ---          23 34 54  63.5  50.1 -3.2    -88.5   38    510  15 43 31
```

Schedule for TORUN (Code Tr)

Page 12

RadioAstron visibility tracking of H2O maser spots

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.

Early: Seconds between end of slew and start. Dwell: On source seconds.

Disk: GBytes recorded to this point.

TPStart: Recording start time. Frequencies are L0 sum (band edge).

SYNC: Time correlator is expected to sync up.

Start UT	Source	Start / Stop					Early	Disk	TPStart		
Stop UT		LST	EL	AZ	HA	UP	ParA	Dwell	GBytes	SYNC	

---	Sun 30 Dec 2018	Day 364					---				
15 44 30	W3IRS5_H2O	23 34 54	65.8	50.9	-2.9		-92.1	-22	510	No stop	
15 45 30	---	23 35 54	65.9	50.9	-2.9		-92.3	38	512	15 44 31	
15 45 30	0241+622	23 35 54	63.6	50.1	-3.2		-88.8	-22	512	No stop	
15 46 30	---	23 36 54	63.8	50.1	-3.2		-89.0	38	513	15 45 31	
15 46 30	W3IRS5_H2O	23 36 54	66.0	50.9	-2.8		-92.5	-22	513	No stop	
15 47 30	---	23 37 54	66.1	50.9	-2.8		-92.8	38	515	15 46 31	
15 47 30	0241+622	23 37 54	63.9	50.1	-3.1		-89.2	-22	515	No stop	
15 48 30	---	23 38 55	64.0	50.1	-3.1		-89.4	38	517	15 47 31	
15 48 30	W3IRS5_H2O	23 38 55	66.2	50.9	-2.8		-93.0	-22	517	No stop	
15 49 30	---	23 39 55	66.4	50.9	-2.8		-93.3	38	519	15 48 31	
15 49 30	0241+622	23 39 55	64.1	50.1	-3.1		-89.6	-22	519	No stop	
15 50 30	---	23 40 55	64.2	50.1	-3.1		-89.9	38	521	15 49 31	
15 50 30	W3IRS5_H2O	23 40 55	66.5	50.9	-2.8		-93.5	-22	521	No stop	
15 51 30	---	23 41 55	66.6	50.8	-2.8		-93.7	38	523	15 50 31	
15 52 00	0241+622	23 42 25	64.4	50.1	-3.1		-90.2	8	523	15 52 00	
15 53 00	---	23 43 25	64.5	50.1	-3.1		-90.4	60	525	15 52 01	
15 53 00	W3IRS5_H2O	23 43 25	66.8	50.8	-2.7		-94.1	-22	525	No stop	
15 54 00	---	23 44 26	66.9	50.8	-2.7		-94.3	38	527	15 53 01	
15 54 00	0241+622	23 44 26	64.6	50.1	-3.0		-90.6	-22	527	No stop	
15 55 00	---	23 45 26	64.7	50.1	-3.0		-90.9	38	529	15 54 01	
15 55 00	W3IRS5_H2O	23 45 26	67.0	50.8	-2.7		-94.6	-22	529	No stop	
15 56 00	---	23 46 26	67.1	50.7	-2.7		-94.8	38	531	15 55 01	
15 56 00	0241+622	23 46 26	64.9	50.1	-3.0		-91.1	-22	531	No stop	
15 57 00	---	23 47 26	65.0	50.1	-3.0		-91.3	38	533	15 56 01	
15 57 00	W3IRS5_H2O	23 47 26	67.2	50.7	-2.7		-95.1	-22	533	No stop	
15 58 00	---	23 48 26	67.4	50.7	-2.6		-95.3	38	535	15 57 01	
15 58 30	0241+622	23 48 56	65.2	50.1	-3.0		-91.7	8	535	15 58 30	
15 59 00	---	23 49 26	65.2	50.1	-3.0		-91.8	30	536	15 58 31	
15 59 00	W3IRS5_H2O	23 49 26	67.5	50.7	-2.6		-95.6	-22	536	No stop	
16 00 00	---	23 50 26	67.6	50.6	-2.6		-95.8	38	537	15 59 01	

Schedule for TORUN (Code Tr)

Page 13

RadioAstron visibility tracking of H2O maser spots

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.

Early: Seconds between end of slew and start. Dwell: On source seconds.

Disk: GBytes recorded to this point.

TPStart: Recording start time. Frequencies are L0 sum (band edge).

SYNC: Time correlator is expected to sync up.

Start UT	Source	Start / Stop					Early	Disk	TPStart	
Stop UT		LST	EL	AZ	HA	UP	ParA	Dwell	GBytes	SYNC

--- Sun 30 Dec 2018 Day 364 ---										
16 00 00	0241+622	23 50 26	65.3	50.1	-2.9		-92.0	-22	537	No stop
16 01 00	---	23 51 27	65.4	50.1	-2.9		-92.2	38	539	16 00 01
16 01 00	W3IRS5_H2O	23 51 27	67.7	50.6	-2.6		-96.1	-22	539	No stop
16 02 00	---	23 52 27	67.8	50.6	-2.6		-96.3	38	541	16 01 01
16 02 00	0241+622	23 52 27	65.6	50.1	-2.9		-92.5	-22	541	No stop
16 03 00	---	23 53 27	65.7	50.1	-2.9		-92.7	38	543	16 02 01
16 03 00	W3IRS5_H2O	23 53 27	67.9	50.5	-2.6		-96.6	-23	543	No stop
16 04 00	---	23 54 27	68.1	50.5	-2.5		-96.8	37	545	16 03 01
16 04 00	0241+622	23 54 27	65.8	50.1	-2.9		-92.9	-22	545	No stop
16 05 00	---	23 55 27	65.9	50.0	-2.9		-93.2	38	547	16 04 01
16 05 00	W3IRS5_H2O	23 55 27	68.2	50.5	-2.5		-97.1	-23	547	No stop
16 06 00	---	23 56 27	68.3	50.4	-2.5		-97.3	37	549	16 05 01
----- K-band VLBI scans. Ground segment 02 : Phase-ref. scans on W3IRS5 +GBT/EFLSBERG -----										
16 06 00	0241+622	23 56 27	66.0	50.0	-2.8		-93.4	-22	549	No stop
16 07 00	---	23 57 28	66.1	50.0	-2.8		-93.7	38	551	16 06 01
16 07 00	W3IRS5_H2O	23 57 28	68.4	50.4	-2.5		-97.6	-23	551	No stop
16 08 00	---	23 58 28	68.5	50.3	-2.5		-97.9	37	553	16 07 01
16 08 30	0241+622	23 58 58	66.3	50.0	-2.8		-94.0	8	553	16 08 30
16 09 00	---	23 59 28	66.4	50.0	-2.8		-94.1	30	554	16 08 31
16 09 00	W3IRS5_H2O	23 59 28	68.6	50.3	-2.5		-98.1	-23	554	No stop
16 10 00	---	00 00 28	68.7	50.2	-2.4		-98.4	37	556	16 09 01
16 10 00	0241+622	00 00 28	66.5	49.9	-2.8		-94.4	-22	556	No stop
16 11 00	---	00 01 28	66.6	49.9	-2.8		-94.6	38	558	16 10 01
16 11 00	W3IRS5_H2O	00 01 28	68.9	50.2	-2.4		-98.7	-23	558	No stop
16 12 00	---	00 02 28	69.0	50.1	-2.4		-98.9	37	560	16 11 01
16 12 00	0241+622	00 02 28	66.7	49.9	-2.7		-94.9	-22	560	No stop
16 13 00	---	00 03 29	66.8	49.9	-2.7		-95.1	38	562	16 12 01
16 13 00	W3IRS5_H2O	00 03 29	69.1	50.1	-2.4		-99.2	-23	562	No stop
16 14 00	---	00 04 29	69.2	50.0	-2.4		-99.5	37	563	16 13 01

Schedule for TORUN (Code Tr)

Page 14

RadioAstron visibility tracking of H2O maser spots

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.

Early: Seconds between end of slew and start. Dwell: On source seconds.

Disk: GBytes recorded to this point.

TPStart: Recording start time. Frequencies are L0 sum (band edge).

SYNC: Time correlator is expected to sync up.

Start UT	Source	Start / Stop					Early	Disk	TPStart	
Stop UT		LST	EL	AZ	HA	UP	ParA	Dwell	GBytes	SYNC

--- Sun 30 Dec 2018 Day 364 ---										
16 14 00	0241+622	00 04 29	66.9	49.8	-2.7		-95.4	-22	563	No stop
16 15 00	---	00 05 29	67.1	49.8	-2.7		-95.6	38	565	16 14 01
16 15 00	W3IRS5_H2O	00 05 29	69.3	50.0	-2.4		-99.7	-23	565	No stop
16 16 00	---	00 06 29	69.4	49.9	-2.3		-100.0	37	567	16 15 01

----- K-band VLBI scans. Ground segment 02 : Delay/D-term cal. NRA0150 scan 5 -----										
16 16 00	NRA0150	00 06 29	54.9	69.1	-3.9		-63.1	-68	567	No stop
16 26 00	---	00 16 31	56.3	70.4	-3.7		-64.0	532	587	16 16 01

----- K-band VLBI scans. Ground segment 02 : Phase-ref. scans on W3IRS5 /all stations -----										
16 26 00	0241+622	00 16 31	68.3	49.4	-2.5		-98.4	-59	587	No stop
16 27 00	---	00 17 31	68.4	49.4	-2.5		-98.7	1	588	16 26 01
16 27 00	W3IRS5_H2O	00 17 31	70.7	49.2	-2.2		-103.2	-23	588	No stop
16 28 00	---	00 18 31	70.8	49.1	-2.1		-103.5	37	590	16 27 01
16 28 30	0241+622	00 19 01	68.6	49.3	-2.5		-99.1	8	590	16 28 30
16 29 00	---	00 19 31	68.7	49.3	-2.4		-99.2	30	591	16 28 31
16 29 00	W3IRS5_H2O	00 19 31	70.9	49.0	-2.1		-103.8	-23	591	No stop
16 30 00	---	00 20 31	71.0	48.9	-2.1		-104.1	37	593	16 29 01
16 30 00	0241+622	00 20 31	68.8	49.2	-2.4		-99.5	-22	593	No stop
16 31 00	---	00 21 32	68.9	49.2	-2.4		-99.8	38	595	16 30 01
16 31 00	W3IRS5_H2O	00 21 32	71.2	48.8	-2.1		-104.4	-23	595	No stop
16 32 00	---	00 22 32	71.3	48.7	-2.1		-104.7	37	597	16 31 01
16 32 00	0241+622	00 22 32	69.0	49.1	-2.4		-100.1	-22	597	No stop
16 33 00	---	00 23 32	69.1	49.0	-2.4		-100.3	38	599	16 32 01
16 33 00	W3IRS5_H2O	00 23 32	71.4	48.6	-2.1		-105.0	-23	599	No stop
16 34 00	---	00 24 32	71.5	48.5	-2.0		-105.3	37	601	16 33 01
16 34 00	0241+622	00 24 32	69.2	49.0	-2.4		-100.6	-22	601	No stop
16 35 00	---	00 25 32	69.3	48.9	-2.3		-100.9	38	603	16 34 01
16 35 00	W3IRS5_H2O	00 25 32	71.6	48.4	-2.0		-105.6	-23	603	No stop
16 36 00	---	00 26 32	71.7	48.3	-2.0		-105.9	37	605	16 35 01
16 36 30	0241+622	00 27 02	69.5	48.8	-2.3		-101.3	8	605	16 36 30
16 37 00	---	00 27 33	69.6	48.8	-2.3		-101.4	30	606	16 36 31

Schedule for TORUN (Code Tr)

Page 15

RadioAstron visibility tracking of H2O maser spots

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.

Early: Seconds between end of slew and start. Dwell: On source seconds.

Disk: GBytes recorded to this point.

TPStart: Recording start time. Frequencies are L0 sum (band edge).

SYNC: Time correlator is expected to sync up.

Start UT	Source	Start / Stop					Early	Disk	TPStart	
Stop UT		LST	EL	AZ	HA	UP	ParA	Dwell	GBytes	SYNC

--- Sun 30 Dec 2018 Day 364 ---										
16 37 00	W3IRS5_H2O	00 27 33	71.8	48.2	-2.0		-106.3	-23	606	No stop
16 38 00	---	00 28 33	71.9	48.1	-2.0		-106.6	37	608	16 37 01
16 38 00	0241+622	00 28 33	69.7	48.7	-2.3		-101.7	-22	608	No stop
16 39 00	---	00 29 33	69.8	48.7	-2.3		-102.0	38	610	16 38 01
16 39 00	W3IRS5_H2O	00 29 33	72.1	48.0	-2.0		-106.9	-22	610	No stop
16 40 00	---	00 30 33	72.2	47.9	-1.9		-107.2	38	612	16 39 01
16 40 00	0241+622	00 30 33	69.9	48.6	-2.3		-102.3	-22	612	No stop
16 41 00	---	00 31 33	70.0	48.5	-2.2		-102.6	38	613	16 40 01
16 41 00	W3IRS5_H2O	00 31 33	72.3	47.8	-1.9		-107.6	-22	613	No stop
16 42 00	---	00 32 33	72.4	47.7	-1.9		-107.9	38	615	16 41 01
16 42 00	0241+622	00 32 33	70.1	48.4	-2.2		-102.9	-22	615	No stop
16 43 00	---	00 33 34	70.2	48.4	-2.2		-103.2	38	617	16 42 01
16 43 00	W3IRS5_H2O	00 33 34	72.5	47.6	-1.9		-108.2	-22	617	No stop
16 44 00	---	00 34 34	72.6	47.4	-1.9		-108.6	38	619	16 43 01
16 44 00	0241+622	00 34 34	70.4	48.3	-2.2		-103.5	-22	619	No stop
16 45 00	---	00 35 34	70.5	48.2	-2.2		-103.8	38	621	16 44 01
16 45 30	0241+622	00 36 04	70.5	48.2	-2.2		-103.9	24	621	16 45 30
16 46 00	---	00 36 34	70.6	48.1	-2.2		-104.1	30	622	16 45 31
16 46 00	W3IRS5_H2O	00 36 34	72.8	47.2	-1.8		-109.3	-22	622	No stop
16 47 00	---	00 37 34	72.9	47.1	-1.8		-109.6	38	624	16 46 01
16 47 00	0241+622	00 37 34	70.7	48.0	-2.1		-104.4	-22	624	No stop
16 48 00	---	00 38 34	70.8	48.0	-2.1		-104.7	38	626	16 47 01
----- Ground-only scan on 0716+714 -----										
16 50 00	0716+714	00 40 35	46.1	27.0	-6.7		-58.3	14	626	16 50 00
16 58 00	---	00 48 36	46.7	27.5	-6.6		-59.9	480	641	16 50 01
----- K-band VLBI scans. Ground segment 02 : Phase-ref. scans on W3IRS5 in parallel to GBT/Eff p										
17 00 00	0241+622	00 50 36	72.1	46.7	-1.9		-108.5	11	641	17 00 00
17 01 00	---	00 51 37	72.2	46.6	-1.9		-108.9	60	643	17 00 01
17 01 00	W3IRS5_H2O	00 51 37	74.5	44.8	-1.6		-114.8	-22	643	No stop
17 02 00	---	00 52 37	74.6	44.7	-1.6		-115.2	38	645	17 01 01

Schedule for TORUN (Code Tr)

Page 16

RadioAstron visibility tracking of H2O maser spots

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.

Early: Seconds between end of slew and start. Dwell: On source seconds.

Disk: GBytes recorded to this point.

TPStart: Recording start time. Frequencies are L0 sum (band edge).

SYNC: Time correlator is expected to sync up.

Start UT	Source	Start / Stop					Early	Disk	TPStart	
Stop UT		LST	EL	AZ	HA	UP	ParA	Dwell	GBytes	SYNC

--- Sun 30 Dec 2018 Day 364 ---										
17 02 30	0241+622	00 53 07	72.4	46.4	-1.9		-109.4	8	645	17 02 30
17 03 00	---	00 53 37	72.5	46.3	-1.9		-109.6	30	646	17 02 31
17 03 00	W3IRS5_H2O	00 53 37	74.7	44.5	-1.6		-115.6	-22	646	No stop
17 04 00	---	00 54 37	74.8	44.3	-1.5		-116.0	38	648	17 03 01
17 04 00	0241+622	00 54 37	72.6	46.2	-1.9		-109.9	-22	648	No stop
17 05 00	---	00 55 37	72.7	46.1	-1.8		-110.3	38	650	17 04 01
17 05 00	W3IRS5_H2O	00 55 37	74.9	44.1	-1.5		-116.5	-22	650	No stop
17 06 00	---	00 56 37	75.0	43.9	-1.5		-116.9	38	652	17 05 01
17 06 00	0241+622	00 56 37	72.8	45.9	-1.8		-110.6	-22	652	No stop
17 07 00	---	00 57 38	72.9	45.8	-1.8		-111.0	38	654	17 06 01
17 07 00	W3IRS5_H2O	00 57 38	75.1	43.7	-1.5		-117.3	-22	654	No stop
17 08 00	---	00 58 38	75.2	43.5	-1.5		-117.7	38	656	17 07 01
17 08 00	0241+622	00 58 38	73.0	45.7	-1.8		-111.3	-22	656	No stop
17 09 00	---	00 59 38	73.1	45.5	-1.8		-111.7	38	658	17 08 01
17 09 00	W3IRS5_H2O	00 59 38	75.3	43.2	-1.5		-118.2	-22	658	No stop
17 10 00	---	01 00 38	75.4	43.0	-1.4		-118.6	38	660	17 09 01
----- K-band VLBI scans. Ground segment 02 : Phase-ref. scans on W3IRS5 +GBT/EFLSBERG -----										
17 10 30	0241+622	01 01 08	73.3	45.3	-1.8		-112.2	8	660	17 10 30
17 11 30	---	01 02 08	73.4	45.1	-1.7		-112.6	60	662	17 10 31
17 11 30	W3IRS5_H2O	01 02 08	75.6	42.7	-1.4		-119.2	-22	662	No stop
17 12 30	---	01 03 08	75.7	42.5	-1.4		-119.7	38	663	17 11 31
17 12 30	0241+622	01 03 08	73.5	45.0	-1.7		-113.0	-22	663	No stop
17 13 30	---	01 04 09	73.6	44.8	-1.7		-113.4	38	665	17 12 31
17 13 30	W3IRS5_H2O	01 04 09	75.8	42.2	-1.4		-120.1	-22	665	No stop
17 14 30	---	01 05 09	75.9	42.0	-1.4		-120.6	38	667	17 13 31
17 14 30	0241+622	01 05 09	73.7	44.6	-1.7		-113.7	-22	667	No stop
17 15 30	---	01 06 09	73.8	44.5	-1.7		-114.1	38	669	17 14 31
17 15 30	W3IRS5_H2O	01 06 09	76.0	41.7	-1.3		-121.1	-22	669	No stop
17 16 30	---	01 07 09	76.1	41.5	-1.3		-121.5	38	671	17 15 31

Schedule for TORUN (Code Tr)

Page 17

RadioAstron visibility tracking of H2O maser spots

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.

Early: Seconds between end of slew and start. Dwell: On source seconds.

Disk: GBytes recorded to this point.

TPStart: Recording start time. Frequencies are L0 sum (band edge).

SYNC: Time correlator is expected to sync up.

Start UT	Source	Start / Stop					Early	Disk	TPStart	
Stop UT		LST	EL	AZ	HA	UP	ParA	Dwell	GBytes	SYNC

--- Sun 30 Dec 2018 Day 364 ---										
17 16 30	0241+622	01 07 09	73.9	44.3	-1.7		-114.5	-22	671	No stop
17 17 30	---	01 08 09	74.0	44.1	-1.6		-114.9	38	673	17 16 31
17 17 30	W3IRS5_H2O	01 08 09	76.2	41.2	-1.3		-122.0	-22	673	No stop
17 18 30	---	01 09 09	76.3	41.0	-1.3		-122.5	38	675	17 17 31
17 18 30	0241+622	01 09 09	74.1	44.0	-1.6		-115.3	-22	675	No stop
17 19 30	---	01 10 10	74.2	43.8	-1.6		-115.7	38	677	17 18 31
17 19 30	W3IRS5_H2O	01 10 10	76.4	40.7	-1.3		-123.0	-22	677	No stop
17 20 30	---	01 11 10	76.5	40.4	-1.3		-123.4	38	679	17 19 31
----- K-band VLBI scans. Ground segment 02 : Delay/D-term cal. 3C84, scan 1 -----										
17 20 30	3C84	01 11 10	65.5	104.8	-2.2		-50.9	-145	679	No stop
17 30 30	---	01 21 11	66.9	107.8	-2.0		-49.9	455	698	17 20 31
17 33 00	0241+622	01 23 42	75.6	40.9	-1.4		-121.5	1	698	17 33 00
17 34 00	---	01 24 42	75.7	40.7	-1.4		-121.9	60	700	17 33 01
17 34 00	W3IRS5_H2O	01 24 42	77.7	36.2	-1.0		-130.6	-24	700	No stop
17 35 00	---	01 25 42	77.8	35.8	-1.0		-131.2	36	702	17 34 01
17 35 00	0241+622	01 25 42	75.8	40.4	-1.3		-122.4	-24	702	No stop
17 36 00	---	01 26 42	75.9	40.2	-1.3		-122.9	36	704	17 35 01
17 36 00	W3IRS5_H2O	01 26 42	77.9	35.4	-1.0		-131.7	-25	704	No stop
17 37 00	---	01 27 42	78.0	35.1	-1.0		-132.3	35	706	17 36 01
17 37 00	0241+622	01 27 42	76.0	39.9	-1.3		-123.3	-24	706	No stop
17 38 00	---	01 28 43	76.1	39.6	-1.3		-123.8	36	708	17 37 01
17 38 00	W3IRS5_H2O	01 28 43	78.1	34.7	-1.0		-132.9	-25	708	No stop
17 39 00	---	01 29 43	78.2	34.3	-1.0		-133.5	35	710	17 38 01
17 39 00	0241+622	01 29 43	76.2	39.4	-1.3		-124.3	-25	710	No stop
17 40 00	---	01 30 43	76.3	39.1	-1.3		-124.8	35	712	17 39 01
17 40 00	W3IRS5_H2O	01 30 43	78.2	33.9	-0.9		-134.1	-26	712	No stop
17 41 00	---	01 31 43	78.3	33.5	-0.9		-134.7	34	713	17 40 01
17 41 30	0241+622	01 32 13	76.4	38.7	-1.2		-125.5	5	713	17 41 30
17 42 00	---	01 32 43	76.5	38.5	-1.2		-125.8	30	714	17 41 31

Schedule for TORUN (Code Tr)

Page 18

RadioAstron visibility tracking of H2O maser spots

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.

Early: Seconds between end of slew and start. Dwell: On source seconds.

Disk: GBytes recorded to this point.

TPStart: Recording start time. Frequencies are L0 sum (band edge).

SYNC: Time correlator is expected to sync up.

Start UT	Source	Start / Stop					Early	Disk	TPStart	
Stop UT		LST	EL	AZ	HA	UP	ParA	Dwell	GBytes	SYNC

--- Sun 30 Dec 2018 Day 364 ---										
17 42 00	W3IRS5_H2O	01 32 43	78.4	33.1	-0.9		-135.4	-26	714	No stop
17 43 00	---	01 33 43	78.5	32.7	-0.9		-136.0	34	716	17 42 01
17 43 00	0241+622	01 33 43	76.6	38.2	-1.2		-126.3	-26	716	No stop
17 44 00	---	01 34 44	76.6	37.9	-1.2		-126.8	34	718	17 43 01
17 44 00	W3IRS5_H2O	01 34 44	78.6	32.2	-0.9		-136.6	-27	718	No stop
17 45 00	---	01 35 44	78.6	31.8	-0.9		-137.3	33	720	17 44 01
17 45 00	0241+622	01 35 44	76.7	37.6	-1.2		-127.3	-26	720	No stop
17 46 00	---	01 36 44	76.8	37.3	-1.2		-127.8	34	722	17 45 01
17 46 00	W3IRS5_H2O	01 36 44	78.7	31.4	-0.8		-137.9	-27	722	No stop
17 47 00	---	01 37 44	78.8	30.9	-0.8		-138.6	33	724	17 46 01
17 47 00	0241+622	01 37 44	76.9	37.0	-1.1		-128.4	-27	724	No stop
17 48 00	---	01 38 44	77.0	36.7	-1.1		-128.9	33	726	17 47 01
17 48 00	W3IRS5_H2O	01 38 44	78.9	30.5	-0.8		-139.3	-28	726	No stop
17 49 00	---	01 39 44	79.0	30.0	-0.8		-139.9	32	728	17 48 01
----- K-band VLBI scans. Space segment 03: target source W3IRS5 -----										
17 50 00	W3IRS5_H2O	01 40 45	79.0	29.5	-0.8		-140.6	53	728	17 50 00
18 12 15	---	02 03 03	80.4	17.0	-0.4		-157.9	1335	771	17 50 01
18 12 45	W3IRS5_H2O	02 03 33	80.4	16.7	-0.4		-158.3	23	771	18 12 45
18 35 00	---	02 25 52	80.9	0.9	-0.0		-178.8	1335	813	18 12 46
----- K-band VLBI scans. Ground segment 02 : Delay/D-term cal. 3C84, scan 2 -----										
18 37 00	3C84	02 27 52	75.4	136.9	-0.9		-33.3	-170	813	18 37 00
18 47 00	---	02 37 54	76.4	143.5	-0.7		-28.5	430	833	18 37 01
----- K-band VLBI scans. Space segment 04: space-ground observations 0716+714 -----										
18 52 00	0716+714	02 42 55	55.3	32.0	-4.7		-83.5	62	833	18 52 00
19 05 00	---	02 55 57	56.4	32.2	-4.5		-86.4	780	858	18 52 01
----- K-band VLBI scans. Ground segment 04 : Phase-ref. scans on W3IRS5 in parallel to GBT/Eff p										
19 06 00	0241+622	02 56 57	80.4	-7.3	0.2		170.5	-44	858	19 06 00
19 07 00	---	02 57 57	80.4	-8.0	0.2		169.6	16	860	19 06 01

Schedule for TORUN (Code Tr)

Page 19

RadioAstron visibility tracking of H2O maser spots

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.

Early: Seconds between end of slew and start. Dwell: On source seconds.

Disk: GBytes recorded to this point.

TPStart: Recording start time. Frequencies are L0 sum (band edge).

SYNC: Time correlator is expected to sync up.

Start UT	Source	Start / Stop					Early	Disk	TPStart	
Stop UT		LST	EL	AZ	HA	UP	ParA	Dwell	GBytes	SYNC

--- Sun 30 Dec 2018 Day 364 ---										
19 07 00	W3IRS5_H2O	02 57 57	80.0	-21.2	0.5		152.3	-42	860	No stop
19 08 00	---	02 58 57	80.0	-21.8	0.5		151.5	18	862	19 07 01
19 08 30	0241+622	02 59 27	80.4	-9.0	0.2		168.3	-10	862	19 08 30
19 09 00	---	02 59 58	80.4	-9.3	0.2		167.8	20	862	19 08 31
19 09 00	W3IRS5_H2O	02 59 58	79.9	-22.4	0.5		150.7	-42	862	No stop
19 10 00	---	03 00 58	79.9	-23.0	0.6		149.9	18	864	19 09 01
19 10 00	0241+622	03 00 58	80.4	-10.0	0.2		166.9	-40	864	No stop
19 11 00	---	03 01 58	80.3	-10.7	0.3		166.0	20	866	19 10 01
19 11 00	W3IRS5_H2O	03 01 58	79.8	-23.5	0.6		149.1	-41	866	No stop
19 12 00	---	03 02 58	79.7	-24.1	0.6		148.3	19	868	19 11 01
19 12 00	0241+622	03 02 58	80.3	-11.3	0.3		165.2	-40	868	No stop
19 13 00	---	03 03 58	80.3	-12.0	0.3		164.3	20	870	19 12 01
19 13 00	W3IRS5_H2O	03 03 58	79.7	-24.6	0.6		147.6	-41	870	No stop
19 14 00	---	03 04 58	79.6	-25.2	0.6		146.8	19	872	19 13 01
19 14 00	0241+622	03 04 58	80.2	-12.7	0.3		163.4	-39	872	No stop
19 15 00	---	03 05 59	80.2	-13.3	0.3		162.6	21	874	19 14 01
19 15 00	W3IRS5_H2O	03 05 59	79.6	-25.7	0.6		146.0	-40	874	No stop
19 16 00	---	03 06 59	79.5	-26.3	0.7		145.3	20	876	19 15 01
----- K-band VLBI scans. Ground segment 04 : Phase-ref. scans on W3IRS5 +GBT/EFLSBERG -----										
19 16 30	0241+622	03 07 29	80.1	-14.3	0.3		161.3	-9	876	19 16 30
19 17 30	---	03 08 29	80.1	-14.9	0.4		160.4	51	878	19 16 31
19 17 30	W3IRS5_H2O	03 08 29	79.4	-27.0	0.7		144.2	-40	878	No stop
19 18 30	---	03 09 29	79.3	-27.5	0.7		143.5	20	880	19 17 31
----- K-band VLBI scans. Ground segment 04 : Delay/D-term cal. 3C84, scan 3 -----										
19 26 30	3C84	03 17 30	78.5	176.7	-0.1		-2.7	58	880	19 26 30
19 36 30	---	03 27 32	78.4	186.0	0.1		4.8	600	899	19 26 31
19 41 00	0241+622	03 32 03	78.8	332.0	0.8		142.4	-36	899	19 41 00
19 42 00	---	03 33 03	78.7	331.6	0.8		141.7	24	901	19 41 01
19 42 00	W3IRS5_H2O	03 33 03	77.4	322.6	1.1		128.6	-33	901	No stop
19 43 00	---	03 34 03	77.3	322.3	1.1		128.1	27	903	19 42 01

Schedule for TORUN (Code Tr)

Page 20

RadioAstron visibility tracking of H2O maser spots

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.

Early: Seconds between end of slew and start. Dwell: On source seconds.

Disk: GBytes recorded to this point.

TPStart: Recording start time. Frequencies are L0 sum (band edge).

SYNC: Time correlator is expected to sync up.

Start UT	Source	Start / Stop					Early	Disk	TPStart	
Stop UT		LST	EL	AZ	HA	UP	ParA	Dwell	GBytes	SYNC

--- Sun 30 Dec 2018 Day 364 ---										
19 43 00	0241+622	03 34 03	78.7	331.1	0.8		141.0	-32	903	No stop
19 44 00	---	03 35 03	78.6	330.7	0.8		140.3	28	905	19 43 01
19 44 00	W3IRS5_H2O	03 35 03	77.2	322.0	1.1		127.6	-33	905	No stop
19 45 00	---	03 36 03	77.1	321.7	1.1		127.0	27	907	19 44 01
19 45 00	0241+622	03 36 03	78.5	330.2	0.8		139.7	-32	907	No stop
19 46 00	---	03 37 04	78.4	329.8	0.8		139.0	28	909	19 45 01
19 46 00	W3IRS5_H2O	03 37 04	77.0	321.3	1.2		126.5	-32	909	No stop
19 47 00	---	03 38 04	76.9	321.0	1.2		126.0	28	911	19 46 01
19 47 30	0241+622	03 38 34	78.3	329.1	0.9		138.1	-1	911	19 47 30
19 48 30	---	03 39 34	78.2	328.7	0.9		137.4	59	912	19 47 31
19 48 30	W3IRS5_H2O	03 39 34	76.8	320.6	1.2		125.2	-32	912	No stop
19 49 30	---	03 40 34	76.7	320.3	1.2		124.7	28	914	19 48 31
19 49 30	0241+622	03 40 34	78.2	328.3	0.9		136.8	-31	914	No stop
19 50 30	---	03 41 34	78.1	327.9	0.9		136.2	29	916	19 49 31
19 50 30	W3IRS5_H2O	03 41 34	76.6	320.0	1.2		124.2	-31	916	No stop
19 51 30	---	03 42 35	76.5	319.7	1.3		123.7	29	918	19 50 31
19 51 30	0241+622	03 42 35	78.0	327.5	0.9		135.6	-30	918	No stop
19 52 30	---	03 43 35	77.9	327.1	1.0		135.0	30	920	19 51 31
19 52 30	W3IRS5_H2O	03 43 35	76.4	319.4	1.3		123.2	-31	920	No stop
19 53 30	---	03 44 35	76.3	319.2	1.3		122.7	29	922	19 52 31
19 53 30	0241+622	03 44 35	77.8	326.7	1.0		134.4	-30	922	No stop
19 54 30	---	03 45 35	77.8	326.3	1.0		133.8	30	924	19 53 31
19 54 30	W3IRS5_H2O	03 45 35	76.2	318.9	1.3		122.3	-30	924	No stop
19 55 30	---	03 46 35	76.1	318.7	1.3		121.8	30	926	19 54 31
19 55 30	0241+622	03 46 35	77.7	326.0	1.0		133.2	-29	926	No stop
19 56 30	---	03 47 35	77.6	325.6	1.0		132.6	31	928	19 55 31
19 56 30	W3IRS5_H2O	03 47 35	76.0	318.4	1.3		121.3	-30	928	No stop
19 57 30	---	03 48 36	75.9	318.2	1.4		120.8	30	930	19 56 31
19 58 00	0241+622	03 49 06	77.5	325.0	1.0		131.7	1	930	19 58 00
19 59 00	---	03 50 06	77.4	324.7	1.1		131.2	60	932	19 58 01

Schedule for TORUN (Code Tr)

Page 21

RadioAstron visibility tracking of H2O maser spots

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.

Early: Seconds between end of slew and start. Dwell: On source seconds.

Disk: GBytes recorded to this point.

TPStart: Recording start time. Frequencies are L0 sum (band edge).

SYNC: Time correlator is expected to sync up.

Start UT	Source	Start / Stop		Early	Disk	TPStart		
Stop UT		LST	EL AZ HA UP	ParA Dwell	GBytes	SYNC		
--- Sun 30 Dec 2018 Day 364 ---								
19 59 00	W3IRS5_H2O	03 50 06	75.8 317.8	1.4	120.2	-29	932	No stop
20 00 00	---	03 51 06	75.7 317.6	1.4	119.7	31	934	19 59 01
20 00 00	0241+622	03 51 06	77.3 324.4	1.1	130.6	-28	934	No stop
20 01 00	---	03 52 06	77.2 324.0	1.1	130.1	32	936	20 00 01
20 01 00	W3IRS5_H2O	03 52 06	75.6 317.3	1.4	119.3	-29	936	No stop
20 02 00	---	03 53 06	75.5 317.1	1.4	118.8	31	937	20 01 01
20 02 00	0241+622	03 53 06	77.1 323.7	1.1	129.5	-28	937	No stop
20 03 00	---	03 54 06	77.0 323.4	1.1	129.0	32	939	20 02 01
20 03 00	W3IRS5_H2O	03 54 06	75.4 316.9	1.4	118.4	-28	939	No stop
20 04 00	---	03 55 07	75.3 316.7	1.5	118.0	32	941	20 03 01
20 04 00	0241+622	03 55 07	76.9 323.0	1.1	128.4	-28	941	No stop
20 05 00	---	03 56 07	76.8 322.7	1.2	127.9	32	943	20 04 01
20 05 00	W3IRS5_H2O	03 56 07	75.1 316.4	1.5	117.5	-28	943	No stop
20 06 00	---	03 57 07	75.0 316.2	1.5	117.1	32	945	20 05 01
20 06 00	0241+622	03 57 07	76.7 322.4	1.2	127.4	-27	945	No stop
20 07 00	---	03 58 07	76.7 322.1	1.2	126.9	33	947	20 06 01
20 07 00	W3IRS5_H2O	03 58 07	74.9 316.0	1.5	116.7	-27	947	No stop
20 08 00	---	03 59 07	74.8 315.8	1.5	116.3	33	949	20 07 01
20 08 30	0241+622	03 59 37	76.5 321.7	1.2	126.1	3	949	20 08 30
20 09 30	---	04 00 37	76.4 321.4	1.2	125.6	60	951	20 08 31
20 09 30	W3IRS5_H2O	04 00 37	74.7 315.5	1.6	115.7	-27	951	No stop
20 10 30	---	04 01 38	74.6 315.3	1.6	115.2	33	953	20 09 31
20 10 30	0241+622	04 01 38	76.3 321.1	1.3	125.1	-26	953	No stop
20 11 30	---	04 02 38	76.2 320.8	1.3	124.6	34	955	20 10 31
20 11 30	W3IRS5_H2O	04 02 38	74.5 315.2	1.6	114.8	-26	955	No stop
20 12 30	---	04 03 38	74.4 315.0	1.6	114.5	34	957	20 11 31
20 12 30	0241+622	04 03 38	76.1 320.5	1.3	124.1	-26	957	No stop
20 13 30	---	04 04 38	76.0 320.3	1.3	123.6	34	959	20 12 31
20 13 30	W3IRS5_H2O	04 04 38	74.3 314.8	1.6	114.1	-26	959	No stop
20 14 30	---	04 05 38	74.1 314.6	1.6	113.7	34	961	20 13 31

Schedule for TORUN (Code Tr)

Page 22

RadioAstron visibility tracking of H2O maser spots

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.

Early: Seconds between end of slew and start. Dwell: On source seconds.

Disk: GBytes recorded to this point.

TPStart: Recording start time. Frequencies are L0 sum (band edge).

SYNC: Time correlator is expected to sync up.

Start UT	Source	Start / Stop					Early	Disk	TPStart	
Stop UT		LST	EL	AZ	HA	UP	ParA	Dwell	GBytes	SYNC

--- Sun 30 Dec 2018 Day 364 ---										
20 14 30	0241+622	04 05 38	75.9	320.0	1.3		123.2	-26	961	No stop
20 15 30	---	04 06 38	75.8	319.7	1.3		122.7	34	962	20 14 31
20 15 30	W3IRS5_H2O	04 06 38	74.0	314.5	1.7		113.3	-26	962	No stop
20 16 30	---	04 07 39	73.9	314.3	1.7		112.9	34	964	20 15 31
20 16 30	0241+622	04 07 39	75.8	319.5	1.4		122.2	-25	964	No stop
20 17 30	---	04 08 39	75.7	319.2	1.4		121.8	35	966	20 16 31
20 17 30	W3IRS5_H2O	04 08 39	73.8	314.1	1.7		112.5	-25	966	No stop
20 18 30	---	04 09 39	73.7	314.0	1.7		112.2	35	968	20 17 31
20 18 33	0241+622	04 09 42	75.6	319.0	1.4		121.3	-22	968	20 18 33
20 19 33	---	04 10 42	75.5	318.8	1.4		120.8	38	970	20 18 34
20 19 33	W3IRS5_H2O	04 10 42	73.6	313.8	1.7		111.8	-25	970	No stop
20 20 33	---	04 11 42	73.5	313.7	1.7		111.4	35	972	20 19 34
20 20 33	0241+622	04 11 42	75.4	318.5	1.4		120.4	-25	972	No stop
20 21 33	---	04 12 42	75.3	318.3	1.4		119.9	35	974	20 20 34
20 21 33	W3IRS5_H2O	04 12 42	73.4	313.5	1.8		111.0	-25	974	No stop
20 22 33	---	04 13 43	73.3	313.4	1.8		110.7	35	976	20 21 34
20 22 33	0241+622	04 13 43	75.2	318.1	1.5		119.5	-24	976	No stop
20 23 33	---	04 14 43	75.1	317.8	1.5		119.1	36	978	20 22 34
20 23 33	W3IRS5_H2O	04 14 43	73.2	313.2	1.8		110.3	-24	978	No stop
20 24 33	---	04 15 43	73.1	313.1	1.8		110.0	36	980	20 23 34
20 24 33	0241+622	04 15 43	75.0	317.6	1.5		118.6	-24	980	No stop
20 25 33	---	04 16 43	74.8	317.4	1.5		118.2	36	982	20 24 34
20 25 33	W3IRS5_H2O	04 16 43	72.9	312.9	1.8		109.6	-24	982	No stop
20 26 33	---	04 17 43	72.8	312.8	1.8		109.3	36	984	20 25 34
----- K-band VLBI scans. Ground segment 02 : Delay/D-term cal. 3C84, scan 4 -----										
20 31 33	3C84	04 22 44	74.5	228.2	1.0		36.7	113	984	20 31 33
20 41 33	---	04 32 46	73.3	233.5	1.2		40.2	600	1003	20 31 34
----- Ground-only scan on 0716+714 -----										
20 47 00	0716+714	04 38 14	64.4	389.4	-2.8		-113.1	0	1003	20 47 00
20 57 00	---	04 48 15	65.1	388.6	-2.6		-116.2	600	1022	20 47 01

Schedule for TORUN (Code Tr)

Page 23

RadioAstron visibility tracking of H2O maser spots

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.

Early: Seconds between end of slew and start. Dwell: On source seconds.

Disk: GBytes recorded to this point.

TPStart: Recording start time. Frequencies are L0 sum (band edge).

SYNC: Time correlator is expected to sync up.

```
-----
Start UT  Source          Start / Stop          Early  Disk  TPStart
Stop UT   LST      EL  AZ  HA  UP  ParA  Dwell  GBytes  SYNC
-----
```

--- Sun 30 Dec 2018 Day 364 ---

----- K-band VLBI scans. Ground segment 03 : Phase-ref. scans on W3IRS5 without VLA/GBT/Effelsberg

```
21 00 00 0241+622    04 51 16  71.2 312.3  2.1    105.7   13   1022  21 00 00
21 01 00 ---          04 52 16  71.0 312.2  2.1    105.4   60   1024  21 00 01

21 01 00 W3IRS5_H2O  04 52 16  68.9 309.8  2.4     98.8  -22   1024  No stop
21 02 00 ---          04 53 16  68.8 309.8  2.4     98.5   38   1026  21 01 01

21 02 30 0241+622    04 53 46  70.9 312.1  2.1    104.9    8   1026  21 02 30
21 03 30 ---          04 54 46  70.8 312.0  2.1    104.6   60   1028  21 02 31

21 03 30 W3IRS5_H2O  04 54 46  68.6 309.7  2.5     98.1  -22   1028  No stop
21 04 30 ---          04 55 47  68.5 309.7  2.5     97.9   38   1030  21 03 31
```

----- K-band VLBI scans. Ground segment 04 : Phase-ref. scans on W3IRS5 without GBT/Effelsberg

```
21 05 00 0241+622    04 56 17  70.6 311.9  2.2    104.1    8   1030  21 05 00
21 06 00 ---          04 57 17  70.5 311.8  2.2    103.8   60   1032  21 05 01

21 06 00 W3IRS5_H2O  04 57 17  68.3 309.6  2.5     97.5  -22   1032  No stop
21 07 00 ---          04 58 17  68.2 309.6  2.5     97.2   38   1034  21 06 01

21 07 00 0241+622    04 58 17  70.4 311.7  2.2    103.5  -22   1034  No stop
21 08 00 ---          04 59 17  70.3 311.6  2.2    103.2   38   1036  21 07 01

21 08 00 W3IRS5_H2O  04 59 17  68.1 309.5  2.5     97.0  -22   1036  No stop
21 09 00 ---          05 00 17  68.0 309.5  2.6     96.7   38   1037  21 08 01

21 09 00 0241+622    05 00 17  70.1 311.6  2.2    102.9  -22   1037  No stop
21 10 00 ---          05 01 17  70.0 311.5  2.2    102.6   38   1039  21 09 01

21 10 00 W3IRS5_H2O  05 01 17  67.9 309.5  2.6     96.5  -22   1039  No stop
21 11 00 ---          05 02 18  67.8 309.4  2.6     96.2   38   1041  21 10 01

21 11 00 0241+622    05 02 18  69.9 311.4  2.3    102.3  -22   1041  No stop
21 12 00 ---          05 03 18  69.8 311.3  2.3    102.1   38   1043  21 11 01

21 12 00 W3IRS5_H2O  05 03 18  67.7 309.4  2.6     95.9  -22   1043  No stop
21 13 00 ---          05 04 18  67.5 309.4  2.6     95.7   38   1045  21 12 01

21 13 00 0241+622    05 04 18  69.7 311.3  2.3    101.8  -22   1045  No stop
21 14 00 ---          05 05 18  69.6 311.2  2.3    101.5   38   1047  21 13 01

21 14 00 W3IRS5_H2O  05 05 18  67.4 309.3  2.6     95.4  -22   1047  No stop
21 15 00 ---          05 06 18  67.3 309.3  2.7     95.2   38   1049  21 14 01
```

Schedule for TORUN (Code Tr)

Page 24

RadioAstron visibility tracking of H2O maser spots

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.

Early: Seconds between end of slew and start. Dwell: On source seconds.

Disk: GBytes recorded to this point.

TPStart: Recording start time. Frequencies are L0 sum (band edge).

SYNC: Time correlator is expected to sync up.

Start UT	Source	Start / Stop					Early	Disk	TPStart	
Stop UT		LST	EL	AZ	HA	UP	ParA	Dwell	GBytes	SYNC

--- Sun 30 Dec 2018 Day 364 ---										
21 17 30	0241+622	05 08 49	69.2	311.0	2.4		100.5	128	1049	21 17 30
21 18 30	---	05 09 49	69.1	310.9	2.4		100.2	60	1051	21 17 31
21 18 30	W3IRS5_H2O	05 09 49	66.9	309.2	2.7		94.3	-22	1051	No stop
21 19 30	---	05 10 49	66.8	309.2	2.7		94.1	38	1053	21 18 31
21 19 30	0241+622	05 10 49	69.0	310.9	2.4		99.9	-22	1053	No stop
21 20 30	---	05 11 49	68.8	310.8	2.4		99.7	38	1055	21 19 31
21 20 30	W3IRS5_H2O	05 11 49	66.7	309.2	2.7		93.9	-22	1055	No stop
21 21 30	---	05 12 49	66.5	309.1	2.8		93.6	38	1057	21 20 31
21 21 30	0241+622	05 12 49	68.7	310.8	2.4		99.4	-22	1057	No stop
21 22 30	---	05 13 49	68.6	310.7	2.5		99.1	38	1059	21 21 31
21 22 30	W3IRS5_H2O	05 13 49	66.4	309.1	2.8		93.4	-22	1059	No stop
21 23 30	---	05 14 50	66.3	309.1	2.8		93.1	38	1061	21 22 31
21 23 30	0241+622	05 14 50	68.5	310.7	2.5		98.9	-22	1061	No stop
21 24 30	---	05 15 50	68.4	310.6	2.5		98.6	38	1063	21 23 31
21 24 30	W3IRS5_H2O	05 15 50	66.2	309.1	2.8		92.9	-22	1063	No stop
21 25 30	---	05 16 50	66.1	309.1	2.8		92.7	38	1064	21 24 31
----- K-band VLBI scans. Ground segment 04 : Phase-ref. scans on W3IRS5 -----										
21 28 00	0241+622	05 19 20	68.0	310.5	2.5		97.7	128	1064	21 28 00
21 29 00	---	05 20 21	67.9	310.4	2.6		97.4	60	1066	21 28 01
21 29 00	W3IRS5_H2O	05 20 21	65.7	309.0	2.9		91.9	-22	1066	No stop
21 30 00	---	05 21 21	65.5	309.0	2.9		91.6	38	1068	21 29 01
21 30 00	0241+622	05 21 21	67.8	310.4	2.6		97.2	-22	1068	No stop
21 31 00	---	05 22 21	67.6	310.3	2.6		96.9	38	1070	21 30 01
21 31 00	W3IRS5_H2O	05 22 21	65.4	309.0	2.9		91.4	-22	1070	No stop
21 32 00	---	05 23 21	65.3	309.0	2.9		91.2	38	1072	21 31 01
21 32 00	0241+622	05 23 21	67.5	310.3	2.6		96.6	-22	1072	No stop
21 33 00	---	05 24 21	67.4	310.3	2.6		96.4	38	1074	21 32 01
21 33 00	W3IRS5_H2O	05 24 21	65.2	309.0	3.0		91.0	-22	1074	No stop
21 34 00	---	05 25 21	65.1	309.0	3.0		90.7	38	1076	21 33 01

Schedule for TORUN (Code Tr)

Page 25

RadioAstron visibility tracking of H2O maser spots

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.

Early: Seconds between end of slew and start. Dwell: On source seconds.

Disk: GBytes recorded to this point.

TPStart: Recording start time. Frequencies are L0 sum (band edge).

SYNC: Time correlator is expected to sync up.

```
-----
Start UT  Source          Start / Stop          Early  Disk  TPStart
Stop UT   LST      EL  AZ  HA  UP  ParA  Dwell  GBytes  SYNC
-----
```

--- Sun 30 Dec 2018 Day 364 ---

```
21 34 00  0241+622    05 25 21  67.3 310.2  2.6    96.1  -22   1076  No stop
21 35 00  ---          05 26 22  67.2 310.2  2.7    95.9   38   1078  21 34 01

21 35 00  W3IRS5_H20   05 26 22  65.0 309.0  3.0    90.5  -22   1078  No stop
21 36 00  ---          05 27 22  64.8 309.0  3.0    90.3   38   1080  21 35 01
```

----- K-band VLBI scans. Ground segment 04 : Phase-ref. scans on W3IRS5 without VLA -----

```
21 36 00  0241+622    05 27 22  67.1 310.2  2.7    95.6  -22   1080  No stop
21 37 00  ---          05 28 22  67.0 310.2  2.7    95.4   38   1082  21 36 01

21 37 00  W3IRS5_H20   05 28 22  64.7 309.0  3.0    90.1  -22   1082  No stop
21 38 00  ---          05 29 22  64.6 309.0  3.0    89.8   38   1084  21 37 01

21 38 00  0241+622    05 29 22  66.8 310.1  2.7    95.1  -22   1084  No stop
21 39 00  ---          05 30 22  66.7 310.1  2.7    94.9   38   1086  21 38 01
```

----- K-band VLBI scans. Ground segment 04 : Delay/D-term cal. 3C84 scan 5 -----

```
21 40 50  3C84         05 32 12  65.3 255.6  2.2    51.0  -14   1086  21 40 50
21 49 50  ---          05 41 14  64.0 258.0  2.3    51.7  526   1103  21 40 51
```

----- K-band VLBI scans. Ground segment 04 : Phase-ref. scans on W3IRS5 -----

```
21 52 30  0241+622    05 43 54  65.2 309.9  3.0    91.7   41   1103  21 52 30
21 53 30  ---          05 44 55  65.1 309.9  3.0    91.5   60   1105  21 52 31

21 53 30  W3IRS5_H20   05 44 55  62.8 309.1  3.3    86.5  -22   1105  No stop
21 54 30  ---          05 45 55  62.7 309.2  3.3    86.3   38   1107  21 53 31

21 54 30  0241+622    05 45 55  64.9 309.9  3.0    91.2  -22   1107  No stop
21 55 30  ---          05 46 55  64.8 309.9  3.0    91.0   38   1109  21 54 31

21 55 30  W3IRS5_H20   05 46 55  62.6 309.2  3.3    86.1  -22   1109  No stop
21 56 30  ---          05 47 55  62.5 309.2  3.3    85.9   38   1111  21 55 31

21 56 30  0241+622    05 47 55  64.7 309.9  3.0    90.8  -22   1111  No stop
21 57 30  ---          05 48 55  64.6 309.9  3.0    90.6   38   1113  21 56 31

21 57 30  W3IRS5_H20   05 48 55  62.3 309.2  3.4    85.7  -22   1113  No stop
21 58 30  ---          05 49 55  62.2 309.2  3.4    85.5   38   1114  21 57 31

21 58 45  0241+622    05 50 10  64.4 309.9  3.1    90.3   -7   1114  21 58 45
21 59 45  ---          05 51 11  64.3 309.9  3.1    90.1   53   1116  21 58 46
```

Schedule for TORUN (Code Tr)

Page 26

RadioAstron visibility tracking of H2O maser spots

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.

Early: Seconds between end of slew and start. Dwell: On source seconds.

Disk: GBytes recorded to this point.

TPStart: Recording start time. Frequencies are L0 sum (band edge).

SYNC: Time correlator is expected to sync up.

Start UT	Source	Start / Stop					Early	Disk	TPStart	
Stop UT		LST	EL	AZ	HA	UP	ParA	Dwell	GBytes	SYNC

--- Sun 30 Dec 2018 Day 364 ---										
21 59 45	W3IRS5_H2O	05 51 11	62.1	309.3	3.4		85.2	-22	1116	No stop
22 00 45	---	05 52 11	62.0	309.3	3.4		85.0	38	1118	21 59 46
22 00 45	0241+622	05 52 11	64.2	309.9	3.1		89.8	-22	1118	No stop
22 01 45	---	05 53 11	64.1	309.9	3.1		89.6	38	1120	22 00 46
22 01 45	W3IRS5_H2O	05 53 11	61.8	309.3	3.4		84.8	-22	1120	No stop
22 02 45	---	05 54 11	61.7	309.3	3.5		84.6	38	1122	22 01 46
----- K-band VLBI scans. Ground segment 04 : Phase-ref. scans on W3IRS5 -----										
22 03 00	0241+622	05 54 26	64.0	309.9	3.1		89.3	-7	1122	22 03 00
22 04 00	---	05 55 26	63.8	309.9	3.1		89.1	53	1124	22 03 01
22 04 00	W3IRS5_H2O	05 55 26	61.6	309.3	3.5		84.4	-22	1124	No stop
22 05 00	---	05 56 26	61.5	309.4	3.5		84.2	38	1126	22 04 01
22 05 00	0241+622	05 56 26	63.7	309.9	3.2		88.9	-22	1126	No stop
22 06 00	---	05 57 27	63.6	309.9	3.2		88.7	38	1128	22 05 01
22 06 00	W3IRS5_H2O	05 57 27	61.3	309.4	3.5		84.0	-22	1128	No stop
22 07 00	---	05 58 27	61.2	309.4	3.5		83.8	38	1130	22 06 01
22 07 00	0241+622	05 58 27	63.5	309.9	3.2		88.5	-22	1130	No stop
22 08 00	---	05 59 27	63.4	309.9	3.2		88.2	38	1132	22 07 01
22 08 00	W3IRS5_H2O	05 59 27	61.1	309.4	3.5		83.6	-22	1132	No stop
22 09 00	---	06 00 27	61.0	309.5	3.6		83.4	38	1134	22 08 01
22 09 00	0241+622	06 00 27	63.3	309.9	3.2		88.0	-22	1134	No stop
22 10 00	---	06 01 27	63.1	309.9	3.2		87.8	38	1136	22 09 01
22 10 00	W3IRS5_H2O	06 01 27	60.9	309.5	3.6		83.2	-23	1136	No stop
22 11 00	---	06 02 27	60.8	309.5	3.6		83.0	37	1138	22 10 01
22 12 45	0241+622	06 04 13	62.8	309.9	3.3		87.2	83	1138	22 12 45
22 13 45	---	06 05 13	62.7	309.9	3.3		87.0	60	1139	22 12 46
22 13 45	W3IRS5_H2O	06 05 13	60.4	309.6	3.6		82.4	-23	1139	No stop
22 14 45	---	06 06 13	60.3	309.6	3.7		82.3	37	1141	22 13 46
22 14 45	0241+622	06 06 13	62.6	310.0	3.3		86.8	-22	1141	No stop
22 15 45	---	06 07 13	62.5	310.0	3.3		86.6	38	1143	22 14 46

Schedule for TORUN (Code Tr)

Page 27

RadioAstron visibility tracking of H2O maser spots

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.

Early: Seconds between end of slew and start. Dwell: On source seconds.

Disk: GBytes recorded to this point.

TPStart: Recording start time. Frequencies are L0 sum (band edge).

SYNC: Time correlator is expected to sync up.

Start UT	Source	Start / Stop					Early	Disk	TPStart	
Stop UT		LST	EL	AZ	HA	UP	ParA	Dwell	GBytes	SYNC

--- Sun 30 Dec 2018 Day 364 ---										
22 15 45	W3IRS5_H2O	06 07 13	60.2	309.7	3.7		82.1	-23	1143	No stop
22 16 45	---	06 08 13	60.1	309.7	3.7		81.9	37	1145	22 15 46
22 16 45	0241+622	06 08 13	62.4	310.0	3.4		86.4	-22	1145	No stop
22 17 45	---	06 09 14	62.3	310.0	3.4		86.2	38	1147	22 16 46
22 17 45	W3IRS5_H2O	06 09 14	60.0	309.7	3.7		81.7	-23	1147	No stop
22 18 45	---	06 10 14	59.9	309.8	3.7		81.5	37	1149	22 17 46
22 18 45	0241+622	06 10 14	62.1	310.0	3.4		86.0	-22	1149	No stop
22 19 45	---	06 11 14	62.0	310.0	3.4		85.8	38	1151	22 18 46
22 19 45	W3IRS5_H2O	06 11 14	59.8	309.8	3.7		81.3	-23	1151	No stop
22 20 45	---	06 12 14	59.6	309.9	3.8		81.1	37	1153	22 19 46
22 20 45	0241+622	06 12 14	61.9	310.1	3.4		85.6	-22	1153	No stop
22 21 45	---	06 13 14	61.8	310.1	3.4		85.4	38	1155	22 20 46
22 21 45	W3IRS5_H2O	06 13 14	59.5	309.9	3.8		80.9	-23	1155	No stop
22 22 45	---	06 14 14	59.4	309.9	3.8		80.7	37	1157	22 21 46
22 23 45	0241+622	06 15 15	61.6	310.1	3.5		84.9	38	1157	22 23 45
22 24 45	---	06 16 15	61.4	310.1	3.5		84.7	60	1159	22 23 46
----- K-band VLBI scans. Ground segment 04 : Phase-ref. scans on W3IRS5 -----										
22 25 15	0241+622	06 16 45	61.4	310.2	3.5		84.6	24	1159	22 25 15
22 26 15	---	06 17 45	61.3	310.2	3.5		84.4	60	1161	22 25 16
22 26 15	W3IRS5_H2O	06 17 45	59.0	310.1	3.8		80.1	-23	1161	No stop
22 27 15	---	06 18 45	58.9	310.1	3.9		79.9	37	1163	22 26 16
22 27 15	0241+622	06 18 45	61.2	310.2	3.5		84.2	-22	1163	No stop
22 28 15	---	06 19 45	61.0	310.2	3.6		84.0	38	1164	22 27 16
22 28 15	W3IRS5_H2O	06 19 45	58.8	310.1	3.9		79.7	-23	1164	No stop
22 29 15	---	06 20 45	58.7	310.2	3.9		79.5	37	1166	22 28 16
22 29 15	0241+622	06 20 45	60.9	310.2	3.6		83.8	-22	1166	No stop
22 30 15	---	06 21 46	60.8	310.3	3.6		83.6	38	1168	22 29 16
22 30 15	W3IRS5_H2O	06 21 46	58.5	310.2	3.9		79.3	-23	1168	No stop
22 31 15	---	06 22 46	58.4	310.3	3.9		79.1	37	1170	22 30 16

Schedule for TORUN (Code Tr)

Page 28

RadioAstron visibility tracking of H2O maser spots

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.

Early: Seconds between end of slew and start. Dwell: On source seconds.

Disk: GBytes recorded to this point.

TPStart: Recording start time. Frequencies are L0 sum (band edge).

SYNC: Time correlator is expected to sync up.

```
-----
Start UT  Source          Start / Stop          Early  Disk  TPStart
Stop UT   LST      EL  AZ  HA  UP  ParA  Dwell  GBytes  SYNC
-----
```

--- Sun 30 Dec 2018 Day 364 ---

----- K-band VLBI scans. Ground segment 04 : Delay/D-term cal. 3C84, scan 6 -----

```
22 34 30  3C84          06 26 01  57.3 268.4  3.1    53.4   96   1170  22 34 30
22 44 30  ---          06 36 03  55.8 270.4  3.2    53.4  600   1189  22 34 31
```

----- Ground-only scan 0716+714 -----

```
22 52 00  0716+714      06 43 34  71.2 370.1 -0.7   -160.8  234   1189  22 52 00
22 58 00  ---          06 49 35  71.4 368.7 -0.6   -163.6  360   1201  22 52 01

23 00 00  0241+622      06 51 35  57.4 311.3  4.1    77.9   -10   1201  23 00 00
23 01 00  ---          06 52 36  57.3 311.4  4.1    77.8    50   1203  23 00 01

23 01 00  W3IRS5_H20   06 52 36  55.0 311.7  4.4    73.8   -22   1203  No stop
23 02 00  ---          06 53 36  54.9 311.8  4.4    73.6    38   1205  23 01 01

23 02 00  0241+622      06 53 36  57.2 311.4  4.1    77.6   -22   1205  No stop
23 03 00  ---          06 54 36  57.1 311.5  4.1    77.4    38   1207  23 02 01

23 03 00  W3IRS5_H20   06 54 36  54.8 311.9  4.5    73.4   -22   1207  No stop
23 04 00  ---          06 55 36  54.7 311.9  4.5    73.2    38   1209  23 03 01
```

----- K-band VLBI scans. Ground segment 04 : Phase-ref. scans on W3IRS5 without GBT/Effelsberg -----

```
23 04 30  0241+622      06 56 06  56.9 311.6  4.2    77.1    8   1209  23 04 30
23 05 30  ---          06 57 06  56.8 311.6  4.2    76.9   60   1211  23 04 31

23 05 30  W3IRS5_H20   06 57 06  54.5 312.0  4.5    73.0   -22   1211  No stop
23 06 30  ---          06 58 07  54.4 312.1  4.5    72.8   38   1213  23 05 31

23 06 30  0241+622      06 58 07  56.7 311.6  4.2    76.7   -22   1213  No stop
23 07 30  ---          06 59 07  56.6 311.7  4.2    76.6   38   1214  23 06 31

23 07 30  W3IRS5_H20   06 59 07  54.3 312.1  4.5    72.6   -22   1214  No stop
23 08 30  ---          07 00 07  54.2 312.2  4.5    72.5   38   1216  23 07 31

23 08 30  0241+622      07 00 07  56.5 311.7  4.2    76.4   -22   1216  No stop
23 09 30  ---          07 01 07  56.3 311.8  4.2    76.2   38   1218  23 08 31

23 09 30  W3IRS5_H20   07 01 07  54.1 312.2  4.6    72.3   -22   1218  No stop
23 10 30  ---          07 02 07  54.0 312.3  4.6    72.1   38   1220  23 09 31
```

Schedule for TORUN (Code Tr)

Page 29

RadioAstron visibility tracking of H2O maser spots

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.

Early: Seconds between end of slew and start. Dwell: On source seconds.

Disk: GBytes recorded to this point.

TPStart: Recording start time. Frequencies are L0 sum (band edge).

SYNC: Time correlator is expected to sync up.

```
-----
Start UT  Source          Start / Stop          Early  Disk  TPStart
Stop UT   LST      EL  AZ  HA  UP  ParA  Dwell  GBytes  SYNC
-----
```

--- Sun 30 Dec 2018 Day 364 ---

----- K-band VLBI scans. Ground segment 04 : Phase-ref. scans on W3IRS5 with GBT/Effelsberg -----

Start UT	Source	LST	EL	AZ	HA	UP	ParA	Early Dwell	Disk GBytes	TPStart SYNC
23 11 45	0241+622	07 03 22	56.1	311.9	4.3		75.8	53	1220	23 11 45
23 12 45	---	07 04 23	56.0	312.0	4.3		75.6	60	1222	23 11 46
23 12 45	W3IRS5_H2O	07 04 23	53.7	312.4	4.6		71.7	-22	1222	No stop
23 13 45	---	07 05 23	53.6	312.5	4.6		71.6	38	1224	23 12 46
23 14 15	0241+622	07 05 53	55.8	312.0	4.3		75.3	8	1224	23 14 15
23 15 15	---	07 06 53	55.7	312.1	4.3		75.2	60	1226	23 14 16
23 15 15	W3IRS5_H2O	07 06 53	53.5	312.6	4.7		71.3	-22	1226	No stop
23 16 15	---	07 07 53	53.3	312.7	4.7		71.1	38	1228	23 15 16
23 16 15	0241+622	07 07 53	55.6	312.1	4.4		75.0	-22	1228	No stop
23 17 15	---	07 08 53	55.5	312.2	4.4		74.8	38	1230	23 16 16
23 17 15	W3IRS5_H2O	07 08 53	53.2	312.7	4.7		71.0	-22	1230	No stop
23 18 15	---	07 09 53	53.1	312.8	4.7		70.8	38	1232	23 17 16
23 18 15	0241+622	07 09 53	55.4	312.2	4.4		74.6	-22	1232	No stop
23 19 15	---	07 10 54	55.3	312.3	4.4		74.5	38	1234	23 18 16
23 19 15	W3IRS5_H2O	07 10 54	53.0	312.9	4.7		70.6	-22	1234	No stop
23 20 15	---	07 11 54	52.9	312.9	4.7		70.4	38	1236	23 19 16
23 20 15	0241+622	07 11 54	55.1	312.4	4.4		74.3	-22	1236	No stop
23 21 15	---	07 12 54	55.0	312.4	4.4		74.1	38	1238	23 20 16
23 21 15	W3IRS5_H2O	07 12 54	52.8	313.0	4.8		70.3	-22	1238	No stop
23 22 15	---	07 13 54	52.7	313.1	4.8		70.1	38	1239	23 21 16
23 22 15	0241+622	07 13 54	54.9	312.5	4.5		73.9	-22	1239	No stop
23 23 15	---	07 14 54	54.8	312.5	4.5		73.7	38	1241	23 22 16
23 23 15	W3IRS5_H2O	07 14 54	52.6	313.1	4.8		69.9	-22	1241	No stop
23 24 15	---	07 15 54	52.5	313.2	4.8		69.8	38	1243	23 23 16

----- K-band VLBI scans. Ground segment 04 : DA193, scan 1 -----

23 27 00	0552+398	07 18 40	70.8	234.6	1.4		39.6	-7	1243	23 27 00
23 35 00	---	07 26 41	69.8	238.0	1.5		41.5	473	1259	23 27 01
23 37 00	W3IRS5_H2O	07 28 42	51.1	314.1	5.0		67.6	-47	1259	23 37 00
23 38 00	---	07 29 42	51.0	314.1	5.0		67.5	13	1261	23 37 01

Schedule for TORUN (Code Tr)

Page 30

RadioAstron visibility tracking of H2O maser spots

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.

Early: Seconds between end of slew and start. Dwell: On source seconds.

Disk: GBytes recorded to this point.

TPStart: Recording start time. Frequencies are L0 sum (band edge).

SYNC: Time correlator is expected to sync up.

```
-----
Start UT  Source          Start / Stop          Early  Disk  TPStart
Stop UT   LST      EL  AZ  HA  UP  ParA  Dwell  GBytes  SYNC
-----
```

--- Sun 30 Dec 2018 Day 364 ---

```
23 38 00  0241+622    07 29 42  53.2 313.4  4.7      71.2  -22    1261  No stop
23 39 00  ---          07 30 42  53.1 313.5  4.7      71.0   38    1263  23 38 01

23 39 00  W3IRS5_H20   07 30 42  50.9 314.2  5.1      67.3  -22    1263  No stop
23 40 00  ---          07 31 42  50.7 314.3  5.1      67.1   38    1264  23 39 01
```

----- All stations: 3C48 -----

```
23 41 30  3C48          07 33 12  26.8 290.5  5.9      42.3  -14    1264  23 41 30
23 51 30  ---          07 43 14  25.4 292.3  6.1      41.6  586    1284  23 41 31

23 53 00  0241+622    07 44 44  51.6 314.4  5.0      68.6  -22    1284  23 53 00
23 54 00  ---          07 45 44  51.5 314.4  5.0      68.4   38    1286  23 53 01

23 54 00  W3IRS5_H20   07 45 44  49.3 315.3  5.3      64.8  -22    1286  No stop
23 55 00  ---          07 46 45  49.1 315.4  5.3      64.7   38    1288  23 54 01

23 55 00  0241+622    07 46 45  51.3 314.5  5.0      68.3  -22    1288  No stop
23 56 00  ---          07 47 45  51.2 314.6  5.0      68.1   38    1289  23 55 01

23 56 00  W3IRS5_H20   07 47 45  49.0 315.5  5.3      64.5  -22    1289  No stop
23 57 00  ---          07 48 45  48.9 315.5  5.4      64.3   38    1291  23 56 01

23 57 00  0241+622    07 48 45  51.1 314.6  5.0      67.9  -22    1291  No stop
23 58 00  ---          07 49 45  51.0 314.7  5.1      67.8   38    1293  23 57 01
```

--- Start: Sun 30 Dec 2018 Day 364 -- Stop: Mon 31 Dec 2018 Day 365 ---

----- K-band VLBI scans. Space segment 05: target source W3IRS5 -----

```
23 59 00  W3IRS5_H20   07 50 45  48.7 315.7  5.4      64.0   38    1293  23 59 00
00 07 50  ---          07 59 37  47.8 316.4  5.5      62.6  530    1310  23 59 01

00 09 20  W3IRS5_H20   08 01 07  47.6 316.5  5.6      62.3   84    1310  00 09 20
00 18 10  ---          08 09 58  46.7 317.2  5.7      60.9  530    1327  00 09 21

00 19 40  W3IRS5_H20   08 11 29  46.6 317.4  5.7      60.7   84    1327  00 19 40
00 28 30  ---          08 20 20  45.7 318.1  5.9      59.2  530    1344  00 19 41

00 30 00  W3IRS5_H20   08 21 50  45.5 318.2  5.9      59.0   84    1344  00 30 00
00 39 00  ---          08 30 52  44.6 319.0  6.1      57.6  540    1362  00 30 01

00 40 00  W3IRS5_H20   08 31 52  44.5 319.1  6.1      57.4   54    1362  00 40 00
00 43 00  ---          08 34 52  44.3 319.4  6.1      56.9  180    1367  00 40 01
```

Schedule for TORUN (Code Tr)

Page 31

RadioAstron visibility tracking of H2O maser spots

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.

Early: Seconds between end of slew and start. Dwell: On source seconds.

Disk: GBytes recorded to this point.

TPStart: Recording start time. Frequencies are L0 sum (band edge).

SYNC: Time correlator is expected to sync up.

Start UT	Source	Start / Stop					Early	Disk	TPStart	
Stop UT		LST	EL	AZ	HA	UP	ParA	Dwell	GBytes	SYNC

--- Mon 31 Dec 2018 Day 365 ---

----- K-band VLBI scans. Ground segment 05 : DA193, scan 2 -----

00 44 50	0552+398	08 36 43	59.9	260.1	2.7		50.4	-23	1367	00 44 50
00 50 50	---	08 42 44	59.1	261.5	2.8		50.6	337	1379	00 44 51
00 50 50	W3IRS5_H2O	08 42 44	43.5	320.1	6.3		55.7	-132	1379	No stop
00 53 50	---	08 45 44	43.2	320.4	6.3		55.2	48	1385	00 50 51

----- K-band VLBI scans. Space segment 06: 0716+714 -----

00 56 00	0716+714	08 47 55	69.6	340.8	1.4		142.0	17	1385	00 56 00
01 09 00	---	09 00 57	68.9	338.6	1.6		136.8	780	1410	00 56 01

----- K-band VLBI scans. Ground segment 07 : Phase-ref. scans on W3IRS5 without GBT/Effelsberg -----

01 10 00	0241+622	09 01 57	43.7	320.5	6.3		56.0	-49	1410	01 10 00
01 11 00	---	09 02 57	43.6	320.6	6.3		55.8	11	1412	01 10 01
01 11 00	W3IRS5_H2O	09 02 57	41.6	322.0	6.6		52.5	-22	1412	No stop
01 12 00	---	09 03 57	41.5	322.1	6.6		52.3	38	1413	01 11 01
01 12 00	0241+622	09 03 57	43.5	320.7	6.3		55.7	-21	1413	No stop
01 13 00	---	09 04 57	43.4	320.8	6.3		55.5	39	1415	01 12 01
01 13 00	W3IRS5_H2O	09 04 57	41.4	322.2	6.6		52.1	-22	1415	No stop
01 14 00	---	09 05 58	41.3	322.2	6.6		52.0	38	1417	01 13 01

----- K-band VLBI scans. Ground segment 07 : Phase-ref. scans on W3IRS5 without GBT/Effelsberg -----

01 14 30	0241+622	09 06 28	43.3	320.9	6.3		55.2	9	1417	01 14 30
01 15 30	---	09 07 28	43.2	321.0	6.3		55.1	60	1419	01 14 31
01 15 30	W3IRS5_H2O	09 07 28	41.2	322.4	6.7		51.7	-22	1419	No stop
01 16 30	---	09 08 28	41.1	322.5	6.7		51.6	38	1421	01 15 31
01 16 30	0241+622	09 08 28	43.1	321.1	6.4		54.9	-21	1421	No stop
01 17 30	---	09 09 28	43.0	321.2	6.4		54.8	39	1423	01 16 31
01 17 30	W3IRS5_H2O	09 09 28	41.0	322.6	6.7		51.4	-21	1423	No stop
01 18 30	---	09 10 28	40.9	322.7	6.7		51.3	39	1425	01 17 31
01 18 30	0241+622	09 10 28	42.9	321.3	6.4		54.6	-21	1425	No stop
01 19 30	---	09 11 28	42.8	321.3	6.4		54.4	39	1427	01 18 31

Schedule for TORUN (Code Tr)

Page 32

RadioAstron visibility tracking of H2O maser spots

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.

Early: Seconds between end of slew and start. Dwell: On source seconds.

Disk: GBytes recorded to this point.

TPStart: Recording start time. Frequencies are L0 sum (band edge).

SYNC: Time correlator is expected to sync up.

```
-----
Start UT  Source          Start / Stop          Early  Disk  TPStart
Stop UT   LST      EL  AZ  HA  UP  ParA  Dwell  GBytes  SYNC
-----
```

--- Mon 31 Dec 2018 Day 365 ---

```
01 19 30  W3IRS5_H2O  09 11 28  40.8 322.8  6.7      51.1  -21   1427  No stop
01 20 30  ---          09 12 29  40.7 322.9  6.8      51.0   39   1429  01 19 31
```

----- K-band VLBI scans. Ground segment 07 : Phase-ref. scans on W3IRS5 with GBT/Effelsberg -----

```
01 20 30  0241+622    09 12 29  42.7 321.4  6.4      54.3  -21   1429  No stop
01 21 30  ---          09 13 29  42.6 321.5  6.4      54.1   39   1431  01 20 31
```

```
01 21 30  W3IRS5_H2O  09 13 29  40.6 323.0  6.8      50.8  -21   1431  No stop
01 22 30  ---          09 14 29  40.5 323.1  6.8      50.6   39   1433  01 21 31
```

```
01 24 15  0241+622    09 16 14  42.4 321.8  6.5      53.7   84   1433  01 24 15
01 25 15  ---          09 17 14  42.3 321.9  6.5      53.5   60   1435  01 24 16
```

```
01 25 15  W3IRS5_H2O  09 17 14  40.3 323.3  6.8      50.2  -21   1435  No stop
01 26 15  ---          09 18 15  40.2 323.4  6.9      50.0   39   1437  01 25 16
```

```
01 26 15  0241+622    09 18 15  42.2 322.0  6.5      53.4  -21   1437  No stop
01 27 15  ---          09 19 15  42.1 322.1  6.5      53.2   39   1438  01 26 16
```

```
01 27 15  W3IRS5_H2O  09 19 15  40.1 323.5  6.9      49.9  -21   1438  No stop
01 28 15  ---          09 20 15  40.0 323.6  6.9      49.7   39   1440  01 27 16
```

```
01 28 15  0241+622    09 20 15  42.0 322.2  6.6      53.0  -21   1440  No stop
01 29 15  ---          09 21 15  41.9 322.3  6.6      52.9   39   1442  01 28 16
```

```
01 29 15  W3IRS5_H2O  09 21 15  39.9 323.7  6.9      49.6  -21   1442  No stop
01 30 15  ---          09 22 15  39.8 323.8  6.9      49.4   39   1444  01 29 16
```

```
01 30 15  0241+622    09 22 15  41.8 322.3  6.6      52.7  -21   1444  No stop
01 31 15  ---          09 23 15  41.7 322.4  6.6      52.6   39   1446  01 30 16
```

```
01 31 15  W3IRS5_H2O  09 23 15  39.7 323.9  6.9      49.3  -21   1446  No stop
01 32 15  ---          09 24 16  39.7 324.0  7.0      49.1   39   1448  01 31 16
```

```
01 32 15  0241+622    09 24 16  41.6 322.5  6.6      52.4  -21   1448  No stop
01 33 15  ---          09 25 16  41.5 322.6  6.6      52.2   39   1450  01 32 16
```

```
01 33 15  W3IRS5_H2O  09 25 16  39.6 324.1  7.0      48.9  -21   1450  No stop
01 34 15  ---          09 26 16  39.5 324.2  7.0      48.8   39   1452  01 33 16
```

----- K-band VLBI scans. Ground segment 07 : Phase-ref. scans on W3IRS5 with GBT/Effelsberg -----

```
01 36 00  0241+622    09 28 01  41.3 322.9  6.7      51.8   84   1452  01 36 00
01 37 00  ---          09 29 01  41.2 323.0  6.7      51.6   60   1454  01 36 01
```

Schedule for TORUN (Code Tr)

Page 33

RadioAstron visibility tracking of H2O maser spots

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.

Early: Seconds between end of slew and start. Dwell: On source seconds.

Disk: GBytes recorded to this point.

TPStart: Recording start time. Frequencies are L0 sum (band edge).

SYNC: Time correlator is expected to sync up.

Start UT	Source	Start / Stop					Early	Disk	TPStart	
Stop UT		LST	EL	AZ	HA	UP	ParA	Dwell	GBytes	SYNC

--- Mon 31 Dec 2018 Day 365 ---										
01 37 00	W3IRS5_H20	09 29 01	39.2	324.5	7.0		48.3	-21	1454	No stop
01 38 00	---	09 30 01	39.1	324.6	7.0		48.2	39	1456	01 37 01
01 38 00	0241+622	09 30 01	41.1	323.1	6.7		51.5	-21	1456	No stop
01 39 00	---	09 31 02	41.0	323.2	6.7		51.3	39	1458	01 38 01
01 39 00	W3IRS5_H20	09 31 02	39.1	324.7	7.1		48.0	-21	1458	No stop
01 40 00	---	09 32 02	39.0	324.8	7.1		47.9	39	1460	01 39 01
01 40 00	0241+622	09 32 02	40.9	323.3	6.8		51.2	-21	1460	No stop
01 41 00	---	09 33 02	40.8	323.4	6.8		51.0	39	1462	01 40 01
01 41 00	W3IRS5_H20	09 33 02	38.9	324.9	7.1		47.7	-21	1462	No stop
01 42 00	---	09 34 02	38.8	325.0	7.1		47.6	39	1463	01 41 01
01 42 00	0241+622	09 34 02	40.7	323.5	6.8		50.9	-21	1463	No stop
01 43 00	---	09 35 02	40.6	323.6	6.8		50.7	39	1465	01 42 01
01 43 00	W3IRS5_H20	09 35 02	38.7	325.1	7.1		47.4	-21	1465	No stop
01 44 00	---	09 36 02	38.6	325.2	7.1		47.2	39	1467	01 43 01
01 44 00	0241+622	09 36 02	40.6	323.7	6.8		50.5	-21	1467	No stop
01 45 00	---	09 37 03	40.5	323.8	6.8		50.4	39	1469	01 44 01
01 45 00	W3IRS5_H20	09 37 03	38.5	325.3	7.2		47.1	-21	1469	No stop
01 46 00	---	09 38 03	38.5	325.4	7.2		46.9	39	1471	01 45 01
01 46 00	0241+622	09 38 03	40.4	323.9	6.9		50.2	-21	1471	No stop
01 47 00	---	09 39 03	40.3	323.9	6.9		50.1	39	1473	01 46 01
01 47 00	W3IRS5_H20	09 39 03	38.4	325.5	7.2		46.8	-21	1473	No stop
01 48 00	---	09 40 03	38.3	325.6	7.2		46.6	39	1475	01 47 01
01 48 00	0241+622	09 40 03	40.2	324.0	6.9		49.9	-21	1475	No stop
01 49 00	---	09 41 03	40.1	324.1	6.9		49.7	39	1477	01 48 01
----- K-band VLBI scans. Ground segment 07 : DA193 scan 3 -----										
01 51 00	0552+398	09 43 04	50.0	274.1	3.8		51.2	5	1477	01 51 00
01 59 00	---	09 51 05	48.8	275.6	3.9		51.1	480	1492	01 51 01
----- K-band VLBI scans. Ground segment 07 : Phase-ref. scans on W3IRS5 with GBT/Effelsberg -----										
02 00 30	0241+622	09 52 35	39.1	325.3	7.1		47.9	-24	1492	02 00 30
02 01 30	---	09 53 35	39.0	325.4	7.1		47.7	36	1494	02 00 31

Schedule for TORUN (Code Tr)

Page 34

RadioAstron visibility tracking of H2O maser spots

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.

Early: Seconds between end of slew and start. Dwell: On source seconds.

Disk: GBytes recorded to this point.

TPStart: Recording start time. Frequencies are L0 sum (band edge).

SYNC: Time correlator is expected to sync up.

```
-----
```

Start UT	Source	Start / Stop					Early	Disk	TPStart	
Stop UT		LST	EL	AZ	HA	UP	ParA	Dwell	GBytes	SYNC

--- Mon 31 Dec 2018 Day 365 ---										
02 01 30	W3IRS5_H2O	09 53 35	37.2	327.0	7.4		44.5	-21	1494	No stop
02 02 30	---	09 54 35	37.1	327.1	7.5		44.3	39	1496	02 01 31
02 02 30	0241+622	09 54 35	38.9	325.5	7.1		47.6	-21	1496	No stop
02 03 30	---	09 55 36	38.9	325.6	7.2		47.4	39	1498	02 02 31
02 03 30	W3IRS5_H2O	09 55 36	37.0	327.2	7.5		44.2	-21	1498	No stop
02 04 30	---	09 56 36	36.9	327.3	7.5		44.0	39	1500	02 03 31
----- K-band VLBI scans. Ground segment 07 : Phase-ref. scans on W3IRS5 with GBT/Effelsberg -----										
02 04 30	0241+622	09 56 36	38.8	325.7	7.2		47.3	-21	1500	No stop
02 05 30	---	09 57 36	38.7	325.8	7.2		47.1	39	1502	02 04 31
02 05 30	W3IRS5_H2O	09 57 36	36.8	327.4	7.5		43.8	-21	1502	No stop
02 06 30	---	09 58 36	36.8	327.5	7.5		43.7	39	1504	02 05 31
02 06 30	0241+622	09 58 36	38.6	325.9	7.2		46.9	-21	1504	No stop
02 07 30	---	09 59 36	38.5	326.0	7.2		46.8	39	1506	02 06 31
02 07 30	W3IRS5_H2O	09 59 36	36.7	327.7	7.5		43.5	-21	1506	No stop
02 08 30	---	10 00 36	36.6	327.8	7.6		43.4	39	1508	02 07 31
02 08 30	0241+622	10 00 36	38.4	326.1	7.2		46.6	-21	1508	No stop
02 09 30	---	10 01 37	38.4	326.2	7.3		46.5	39	1510	02 08 31
02 09 30	W3IRS5_H2O	10 01 37	36.5	327.9	7.6		43.2	-21	1510	No stop
02 10 30	---	10 02 37	36.4	328.0	7.6		43.0	39	1512	02 09 31
02 10 30	0241+622	10 02 37	38.3	326.3	7.3		46.3	-21	1512	No stop
02 11 30	---	10 03 37	38.2	326.4	7.3		46.1	39	1513	02 10 31
02 11 30	W3IRS5_H2O	10 03 37	36.4	328.1	7.6		42.9	-21	1513	No stop
02 12 30	---	10 04 37	36.3	328.2	7.6		42.7	39	1515	02 11 31
02 12 30	0241+622	10 04 37	38.1	326.5	7.3		46.0	-21	1515	No stop
02 13 30	---	10 05 37	38.0	326.6	7.3		45.8	39	1517	02 12 31
02 13 30	W3IRS5_H2O	10 05 37	36.2	328.3	7.6		42.6	-21	1517	No stop
02 14 30	---	10 06 37	36.1	328.4	7.7		42.4	39	1519	02 13 31
02 14 30	0241+622	10 06 37	37.9	326.7	7.3		45.7	-20	1519	No stop
02 15 30	---	10 07 38	37.9	326.8	7.4		45.5	40	1521	02 14 31

Schedule for TORUN (Code Tr)

Page 35

RadioAstron visibility tracking of H2O maser spots

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.

Early: Seconds between end of slew and start. Dwell: On source seconds.

Disk: GBytes recorded to this point.

TPStart: Recording start time. Frequencies are L0 sum (band edge).

SYNC: Time correlator is expected to sync up.

Start UT	Source	Start / Stop					Early	Disk	TPStart	
Stop UT		LST	EL	AZ	HA	UP	ParA	Dwell	GBytes	SYNC

--- Mon 31 Dec 2018 Day 365 ---										
02 15 30	W3IRS5_H2O	10 07 38	36.0	328.5	7.7		42.2	-21	1521	No stop
02 16 30	---	10 08 38	36.0	328.6	7.7		42.1	39	1523	02 15 31
02 16 30	0241+622	10 08 38	37.8	326.9	7.4		45.3	-20	1523	No stop
02 17 30	---	10 09 38	37.7	327.0	7.4		45.2	40	1525	02 16 31
02 17 30	W3IRS5_H2O	10 09 38	35.9	328.7	7.7		41.9	-21	1525	No stop
02 18 30	---	10 10 38	35.8	328.8	7.7		41.8	39	1527	02 17 31
02 18 30	0241+622	10 10 38	37.6	327.1	7.4		45.0	-20	1527	No stop
02 19 30	---	10 11 38	37.5	327.2	7.4		44.9	40	1529	02 18 31
02 19 30	W3IRS5_H2O	10 11 38	35.7	328.9	7.7		41.6	-21	1529	No stop
02 20 30	---	10 12 38	35.6	329.0	7.8		41.5	39	1531	02 19 31
----- K-band VLBI scans. Ground segment 07 : DA193, scan 4 -----										
02 22 30	0552+398	10 14 39	45.3	279.8	4.3		50.4	6	1531	02 22 30
02 32 30	---	10 24 40	43.8	281.5	4.5		50.0	600	1550	02 22 31
02 33 30	W3IRS5_H2O	10 25 41	34.7	330.5	8.0		39.4	-53	1550	02 33 30
02 34 30	---	10 26 41	34.6	330.6	8.0		39.2	7	1552	02 33 31
02 34 30	0241+622	10 26 41	36.3	328.8	7.7		42.5	-20	1552	No stop
02 35 30	---	10 27 41	36.3	328.9	7.7		42.3	40	1554	02 34 31
02 35 30	W3IRS5_H2O	10 27 41	34.5	330.7	8.0		39.1	-20	1554	No stop
02 36 30	---	10 28 41	34.4	330.8	8.0		38.9	40	1556	02 35 31
----- K-band VLBI scans. Ground segment 07 : Phase-ref. scans on W3IRS5 with GBT/Effelsberg -----										
02 37 45	0241+622	10 29 56	36.1	329.1	7.7		42.0	55	1556	02 37 45
02 38 45	---	10 30 56	36.0	329.2	7.7		41.8	60	1558	02 37 46
02 38 45	W3IRS5_H2O	10 30 56	34.3	331.0	8.1		38.5	-20	1558	No stop
02 39 45	---	10 31 57	34.2	331.1	8.1		38.4	40	1560	02 38 46
02 39 45	0241+622	10 31 57	35.9	329.3	7.8		41.6	-20	1560	No stop
02 40 45	---	10 32 57	35.8	329.4	7.8		41.5	40	1562	02 39 46
02 40 45	W3IRS5_H2O	10 32 57	34.1	331.3	8.1		38.2	-20	1562	No stop
02 41 45	---	10 33 57	34.1	331.4	8.1		38.1	40	1563	02 40 46
02 41 45	0241+622	10 33 57	35.8	329.5	7.8		41.3	-20	1563	No stop
02 42 45	---	10 34 57	35.7	329.7	7.8		41.2	40	1565	02 41 46

Schedule for TORUN (Code Tr)

Page 36

RadioAstron visibility tracking of H2O maser spots

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.

Early: Seconds between end of slew and start. Dwell: On source seconds.

Disk: GBytes recorded to this point.

TPStart: Recording start time. Frequencies are L0 sum (band edge).

SYNC: Time correlator is expected to sync up.

```
-----
Start UT  Source          Start / Stop          Early  Disk  TPStart
Stop UT          LST      EL    AZ    HA  UP  ParA  Dwell  GBytes  SYNC
-----
```

--- Mon 31 Dec 2018 Day 365 ---

----- K-band VLBI scans. Ground segment 07 : Phase-ref. scans on W3IRS5 with GBT/Effelsberg -----

```
02 42 45  W3IRS5_H20    10 34 57  34.0 331.5  8.1      37.9  -20    1565  No stop
02 43 45  ---                10 35 57  33.9 331.6  8.1      37.8   40    1567  02 42 46

02 43 45  0241+622         10 35 57  35.6 329.8  7.8      41.0  -20    1567  No stop
02 44 45  ---                10 36 57  35.5 329.9  7.8      40.8   40    1569  02 43 46
```

----- K-band VLBI scans. Ground segment 07 : Phase-ref. scans on W3IRS5 with GBT/Effelsberg -----

```
02 44 45  0241+622         10 36 57  35.5 329.9  7.8      40.8   -5    1569  No stop
02 45 45  ---                10 37 58  35.5 330.0  7.9      40.7   55    1571  02 44 46

02 45 45  W3IRS5_H20    10 37 58  33.8 331.8  8.2      37.4  -20    1571  No stop
02 46 45  ---                10 38 58  33.7 331.9  8.2      37.3   40    1573  02 45 46

02 46 45  0241+622         10 38 58  35.4 330.1  7.9      40.5  -20    1573  No stop
02 47 45  ---                10 39 58  35.3 330.2  7.9      40.4   40    1575  02 46 46

02 50 00  0518+165        10 42 13  19.2 272.4  5.3      38.8    4    1575  02 50 00
03 00 00  ---                10 52 15  17.7 274.3  5.5      38.7   60    1594  02 50 01
```

SETUP FILE INFORMATION:

NOTE: If DOPPLER, FREQ, or BW were used, see the individual scans for the final BBC settings.

===== Setup file: ra1cm2.set

```
Setup group: 19          Station: TORUN          Total bit rate: 256
Format: MARK5B          Bits per sample: 2     Sample rate: 32.000
Number of channels: 4   DBE type: DBBC_DDC    Speedup factor: 1.00
```

Disk used to record data.

```

1st LO= 21500.00 21500.00 21500.00 21500.00
Net SB=      U      U      L      L
IF SB =      U      U      U      U
Pol.  =      RCP     LCP     RCP     LCP
BBC   =      1      5      1      5
BBC SB=      U      U      L      L
IF    =      A1     B1     A1     B1

```

The following frequency sets based on these setups were used.

```

Frequency Set:  5  Setup file default.  Used with PCAL = off
LO sum= 22228.00 22228.00 22228.00 22228.00
BBC fr=  728.00  728.00  728.00  728.00
Bandwd=  16.00  16.00  16.00  16.00
Matching frequency sets:  5

```

Track assignments are:

```

track1=  2,  4,  6,  8
barrel=roll_off

```

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(J2000)	(Date)	Error (mas)
* FAKERA	11 57 21.769299	* 12 00 00.000000	12 00 55.507293	0.00
	85 16 41.77889	* 85 00 00.000000	84 53 24.69683	0.00
	fake circumpolar target for a TS to look at			
* 0241+622	02 41 00.673424	* 02 44 57.696744	02 46 29.056178	0.33
J0244+6228	62 15 27.54311	* 62 28 06.51562	62 32 59.13195	0.14
	rfc_2018c Petrov and Kovalev, in preparation 874 observations			
3C138	05 18 16.514082	* 05 21 09.885964	05 22 16.133039	0.12
* 0518+165	16 35 26.83410	* 16 38 22.05157	16 39 20.31716	0.12
	rfc_2018c Petrov and Kovalev, in preparation 412 observations. No flux informat			
* W3IRS5_H2O	02 21 53.326396	* 02 25 40.785000	02 27 08.349616	0.00
	61 52 21.52150	* 62 05 52.56000	62 11 06.09706	0.00
	./ga042_sources.radioastron H2O maser; positions from proposal, RA-A02-08			
* 0716+714	07 16 13.029739	* 07 21 53.448474	07 24 03.933519	0.00
J0721+7120	71 26 15.17406	* 71 20 36.36340	71 18 14.48302	0.00
	./ga042_sources.radioastron AGN, rfc_2013d Petrov, 2013, unpublished 42370 observations, RA-A04-07, RA-A03-0			
0316+413	03 16 29.567283	* 03 19 48.160114	03 21 04.051607	0.00
J0319+4130	41 19 51.91847	* 41 30 42.10559	41 34 48.08248	0.00
* 3C84	./ga042_sources.radioastron AGN, rfc_2013d Petrov, 2013, unpublished 15448 observations, RA-A04-04, RA-A03-0			
0355+508	03 55 45.261370	* 03 59 29.747271	04 00 55.884074	0.00
J0359+5057	50 49 20.28584	* 50 57 50.16179	51 01 02.26361	0.00
* NRA0150	./ga042_sources.radioastron AGN, rfc_2013d Petrov, 2013, unpublished 19270 observations, RA-A03-04, RA-A02-1			
* 0552+398	05 52 01.407174	* 05 55 30.805616	05 56 50.898153	0.00
J0555+3948	39 48 21.94579	* 39 48 49.16494	39 48 51.81108	0.00

./ga042_sources.radioastron
AGN, rfc_2013d Petrov, 2013, unpublished 392026 observations, RA-A03-04, RA-A02-

0134+329	01 34 49.826374	* 01 37 41.299440	01 38 46.241861	0.00
J0137+3309	32 54 20.25881	* 33 09 35.13299	33 15 23.83881	0.00

* 3C48
./ga042_sources.radioastron
WSRT calibrator, rfc_2013d Petrov, 2013, unpublished 140 observations

RADIOASTRON VISIBILITY TRACKING OF H2O MASER SPOTS

PI: Alexey Alakoz Hiroshi Imai

Address: ASC Lebedev Profsoyuznaya 84/32 117997 Moscow, Russia
 Observing mode: K-band dual-pol

Schedule for TORUN (Code Tr) Page 2

RadioAstron visibility tracking of H2O maser spots

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.

Early: Seconds between end of slew and start. Dwell: On source seconds.

Disk: GBytes recorded to this point.

TPStart: Recording start time. Frequencies are L0 sum (band edge).

SYNC: Time correlator is expected to sync up.

Start UT	Source	Start / Stop				Early	Disk	TPStart		
Stop UT		LST	EL	AZ	HA	UP	ParA	Dwell	GBytes	SYNC

--- Mon 31 Dec 2018 Day 365 ---										
----- K-band VLBI scans. Ground segment 01 : Phase-ref. scans on W3IRS5 -----										
Next scan frequencies: 22228.00 22228.00 22228.00 22228.00										
Next BBC frequencies: 728.00 728.00 728.00 728.00										
Next scan bandwidths: 16.00 16.00 16.00 16.00										
04 00 00	0241+622	11 52 25	30.6	-21.6	9.1		28.7	0	0	04 00 00
04 01 00	---	11 53 25	30.5	-21.5	9.1		28.5	60	2	04 00 01
04 01 00	W3IRS5	11 53 25	29.2	-19.4	9.4		25.3	-18	2	No stop
04 02 00	---	11 54 25	29.1	-19.3	9.5		25.1	42	4	04 01 01
04 02 00	0241+622	11 54 25	30.5	-21.4	9.1		28.4	-18	4	No stop
04 03 00	---	11 55 25	30.4	-21.3	9.1		28.2	42	6	04 02 01
04 03 00	W3IRS5	11 55 25	29.1	-19.2	9.5		25.0	-18	6	No stop
04 04 00	---	11 56 25	29.0	-19.0	9.5		24.8	42	8	04 03 01
04 04 00	0241+622	11 56 25	30.4	-21.2	9.2		28.1	-18	8	No stop
04 05 00	---	11 57 26	30.3	-21.0	9.2		27.9	42	10	04 04 01
04 05 00	W3IRS5	11 57 26	29.0	-18.9	9.5		24.7	-18	10	No stop
04 06 00	---	11 58 26	28.9	-18.8	9.5		24.5	42	12	04 05 01
04 06 00	0241+622	11 58 26	30.3	-20.9	9.2		27.7	-18	12	No stop
04 07 00	---	11 59 26	30.2	-20.8	9.2		27.6	42	13	04 06 01
04 07 00	W3IRS5	11 59 26	28.9	-18.7	9.5		24.3	-18	13	No stop
04 08 00	---	12 00 26	28.9	-18.6	9.6		24.2	42	15	04 07 01
04 08 00	0241+622	12 00 26	30.2	-20.7	9.2		27.4	-18	15	No stop
04 09 00	---	12 01 26	30.1	-20.6	9.2		27.2	42	17	04 08 01
04 09 00	W3IRS5	12 01 26	28.8	-18.4	9.6		24.0	-18	17	No stop
04 10 00	---	12 02 26	28.8	-18.3	9.6		23.8	42	19	04 09 01
----- K-band VLBI scans. Ground segment 01 : delay calibrator 0212+735, scan 1 -----										
04 10 30	0212+735	12 02 56	39.1	-11.5	9.7		25.7	-23	19	04 10 30
04 20 00	---	12 12 28	38.8	-10.8	9.9		23.9	547	37	04 10 31
04 20 30	0241+622	12 12 58	29.5	-19.2	9.4		25.4	-19	37	04 20 30
04 21 00	---	12 13 28	29.5	-19.1	9.4		25.3	11	38	04 20 31

Schedule for TORUN (Code Tr)

Page 3

RadioAstron visibility tracking of H2O maser spots

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.

Early: Seconds between end of slew and start. Dwell: On source seconds.

Disk: GBytes recorded to this point.

TPStart: Recording start time. Frequencies are L0 sum (band edge).

SYNC: Time correlator is expected to sync up.

Start UT	Source	Start / Stop					Early	Disk	TPStart		
Stop UT		LST	EL	AZ	HA	UP	ParA	Dwell	GBytes	SYNC	

---	Mon 31 Dec 2018	Day 365					---				
04 21 00	W3IRS5	12 13 28	28.3	-17.0	9.8		22.1	-18	38	No stop	
04 22 00	---	12 14 28	28.2	-16.8	9.8		21.9	42	40	04 21 01	
04 22 00	0241+622	12 14 28	29.4	-19.0	9.5		25.1	-18	40	No stop	
04 23 00	---	12 15 29	29.4	-18.9	9.5		25.0	42	42	04 22 01	
04 23 00	W3IRS5	12 15 29	28.2	-16.7	9.8		21.7	-18	42	No stop	
04 24 00	---	12 16 29	28.1	-16.6	9.8		21.6	42	44	04 23 01	
04 24 00	0241+622	12 16 29	29.3	-18.8	9.5		24.8	-18	44	No stop	
04 25 00	---	12 17 29	29.3	-18.7	9.5		24.6	42	46	04 24 01	
04 25 00	W3IRS5	12 17 29	28.1	-16.5	9.8		21.4	-18	46	No stop	
04 26 00	---	12 18 29	28.0	-16.3	9.9		21.2	42	48	04 25 01	
04 26 00	0241+622	12 18 29	29.2	-18.5	9.5		24.5	-18	48	No stop	
04 27 00	---	12 19 29	29.2	-18.4	9.6		24.3	42	50	04 26 01	
04 27 00	W3IRS5	12 19 29	28.0	-16.2	9.9		21.1	-18	50	No stop	
04 28 00	---	12 20 29	28.0	-16.1	9.9		20.9	42	52	04 27 01	
04 28 00	0241+622	12 20 29	29.1	-18.3	9.6		24.1	-18	52	No stop	
04 29 00	---	12 21 30	29.1	-18.2	9.6		24.0	42	54	04 28 01	
04 29 00	W3IRS5	12 21 30	27.9	-16.0	9.9		20.7	-18	54	No stop	
04 30 00	---	12 22 30	27.9	-15.9	9.9		20.6	42	56	04 29 01	
----- K-band VLBI scans. Ground segment 01 : 0716+714 scan 1 -----											
04 30 00	0716+714	12 22 30	54.0	-31.7	5.0		79.7	-111	56	No stop	
04 40 00	---	12 32 31	53.2	-31.4	5.1		77.5	489	75	04 30 01	
----- K-band VLBI scans. Ground segment 01 : 3C345 scan 1 -----											
04 40 00	3C345	12 32 31	46.3	81.4	-4.2		-50.6	-242	75	No stop	
04 50 00	---	12 42 33	47.8	83.2	-4.0		-50.9	358	94	04 40 01	
04 53 00	W3IRS5	12 45 33	27.0	-13.0	10.3		16.8	-27	94	04 53 00	
04 54 00	---	12 46 34	27.0	-12.9	10.3		16.6	33	96	04 53 01	
04 54 00	0241+622	12 46 34	28.0	-15.1	10.0		19.9	-18	96	No stop	
04 55 00	---	12 47 34	28.0	-15.0	10.0		19.7	42	98	04 54 01	
04 55 00	W3IRS5	12 47 34	26.9	-12.7	10.3		16.5	-19	98	No stop	
04 56 00	---	12 48 34	26.9	-12.6	10.4		16.3	41	100	04 55 01	
04 56 00	0241+622	12 48 34	27.9	-14.9	10.0		19.5	-18	100	No stop	
04 57 00	---	12 49 34	27.9	-14.8	10.1		19.4	42	102	04 56 01	

Schedule for TORUN (Code Tr)

Page 4

RadioAstron visibility tracking of H2O maser spots

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.

Early: Seconds between end of slew and start. Dwell: On source seconds.

Disk: GBytes recorded to this point.

TPStart: Recording start time. Frequencies are L0 sum (band edge).

SYNC: Time correlator is expected to sync up.

Start UT	Source	Start / Stop					Early	Disk	TPStart	
Stop UT		LST	EL	AZ	HA	UP	ParA	Dwell	GBytes	SYNC

--- Mon 31 Dec 2018 Day 365 ---										
04 57 00	W3IRS5	12 49 34	26.9	-12.5	10.4		16.1	-19	102	No stop
04 58 00	---	12 50 34	26.8	-12.4	10.4		16.0	41	104	04 57 01
04 58 00	0241+622	12 50 34	27.9	-14.6	10.1		19.2	-18	104	No stop
04 59 00	---	12 51 34	27.8	-14.5	10.1		19.0	42	106	04 58 01
04 59 00	W3IRS5	12 51 34	26.8	-12.2	10.4		15.8	-19	106	No stop
05 00 00	---	12 52 35	26.8	-12.1	10.4		15.6	41	108	04 59 01
05 00 30	0241+622	12 53 05	27.8	-14.3	10.1		18.8	12	108	05 00 30
05 01 00	---	12 53 35	27.8	-14.3	10.1		18.7	30	108	05 00 31
05 01 00	W3IRS5	12 53 35	26.7	-12.0	10.4		15.5	-19	108	No stop
05 02 00	---	12 54 35	26.7	-11.8	10.5		15.3	41	110	05 01 01
05 02 00	0241+622	12 54 35	27.7	-14.1	10.1		18.6	-18	110	No stop
05 03 00	---	12 55 35	27.7	-14.0	10.2		18.4	42	112	05 02 01
05 03 00	W3IRS5	12 55 35	26.7	-11.7	10.5		15.2	-19	112	No stop
05 04 00	---	12 56 35	26.7	-11.6	10.5		15.0	41	114	05 03 01
05 04 00	0241+622	12 56 35	27.6	-13.9	10.2		18.2	-18	114	No stop
05 05 00	---	12 57 35	27.6	-13.8	10.2		18.1	42	116	05 04 01
05 05 00	W3IRS5	12 57 35	26.6	-11.5	10.5		14.8	-19	116	No stop
05 06 00	---	12 58 36	26.6	-11.3	10.5		14.7	41	118	05 05 01
05 06 00	0241+622	12 58 36	27.6	-13.6	10.2		17.9	-18	118	No stop
05 07 00	---	12 59 36	27.5	-13.5	10.2		17.7	42	120	05 06 01
05 07 00	W3IRS5	12 59 36	26.6	-11.2	10.5		14.5	-19	120	No stop
05 08 00	---	13 00 36	26.5	-11.1	10.6		14.3	41	122	05 07 01
05 08 00	0241+622	13 00 36	27.5	-13.4	10.2		17.6	-19	122	No stop
05 09 00	---	13 01 36	27.5	-13.3	10.3		17.4	41	124	05 08 01
05 09 00	W3IRS5	13 01 36	26.5	-11.0	10.6		14.2	-19	124	No stop
05 10 00	---	13 02 36	26.5	-10.8	10.6		14.0	41	126	05 09 01
05 10 00	0241+622	13 02 36	27.4	-13.1	10.3		17.2	-19	126	No stop
05 11 00	---	13 03 36	27.4	-13.0	10.3		17.1	41	128	05 10 01
05 11 00	W3IRS5	13 03 36	26.5	-10.7	10.6		13.8	-19	128	No stop
05 12 00	---	13 04 37	26.4	-10.6	10.6		13.7	41	130	05 11 01

Schedule for TORUN (Code Tr)

Page 5

RadioAstron visibility tracking of H2O maser spots

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.

Early: Seconds between end of slew and start. Dwell: On source seconds.

Disk: GBytes recorded to this point.

TPStart: Recording start time. Frequencies are L0 sum (band edge).

SYNC: Time correlator is expected to sync up.

Start UT	Source	Start / Stop					Early	Disk	TPStart	
Stop UT		LST	EL	AZ	HA	UP	ParA	Dwell	GBytes	SYNC

--- Mon 31 Dec 2018 Day 365 ---										
05 12 00	0241+622	13 04 37	27.4	-12.9	10.3		16.9	-19	130	No stop
05 13 00	---	13 05 37	27.3	-12.8	10.3		16.7	41	132	05 12 01
05 13 00	W3IRS5	13 05 37	26.4	-10.5	10.6		13.5	-19	132	No stop
05 14 00	---	13 06 37	26.4	-10.3	10.7		13.3	41	133	05 13 01
05 14 00	0241+622	13 06 37	27.3	-12.6	10.3		16.6	-19	133	No stop
05 15 00	---	13 07 37	27.3	-12.5	10.4		16.4	41	135	05 14 01
05 15 00	W3IRS5	13 07 37	26.3	-10.2	10.7		13.2	-19	135	No stop
05 16 00	---	13 08 37	26.3	-10.1	10.7		13.0	41	137	05 15 01
05 16 00	0241+622	13 08 37	27.2	-12.4	10.4		16.2	-19	137	No stop
05 17 00	---	13 09 37	27.2	-12.3	10.4		16.1	41	139	05 16 01
05 17 00	W3IRS5	13 09 37	26.3	-9.9	10.7		12.8	-19	139	No stop
05 18 00	---	13 10 38	26.3	-9.8	10.7		12.7	41	141	05 17 01
05 18 00	0241+622	13 10 38	27.2	-12.1	10.4		15.9	-19	141	No stop
05 19 00	---	13 11 38	27.1	-12.0	10.4		15.7	41	143	05 18 01
----- K-band VLBI scans. Ground segment 01 : delay calibrator 0212+735, scan 2 -----										
05 19 30	0212+735	13 12 08	37.5	-5.8	10.9		12.6	-23	143	05 19 30
05 29 00	---	13 21 39	37.4	-5.0	11.0		10.8	547	161	05 19 31
----- K-band VLBI scans. Ground segment 01 : Phase-ref. scans on W3IRS5 during GBT pointing scan -----										
05 30 00	W3IRS5	13 22 40	26.0	-8.3	10.9		10.7	3	161	05 30 00
05 31 00	---	13 23 40	26.0	-8.2	10.9		10.5	60	163	05 30 01
05 31 00	0241+622	13 23 40	26.8	-10.5	10.6		13.8	-19	163	No stop
05 32 00	---	13 24 40	26.8	-10.4	10.6		13.6	41	165	05 31 01
05 32 00	W3IRS5	13 24 40	25.9	-8.0	11.0		10.4	-19	165	No stop
05 33 00	---	13 25 40	25.9	-7.9	11.0		10.2	41	167	05 32 01
05 33 00	0241+622	13 25 40	26.7	-10.3	10.7		13.4	-19	167	No stop
05 34 00	---	13 26 40	26.7	-10.1	10.7		13.3	41	169	05 33 01
05 34 00	W3IRS5	13 26 40	25.9	-7.8	11.0		10.0	-19	169	No stop
05 35 00	---	13 27 40	25.9	-7.6	11.0		9.9	41	171	05 34 01
05 35 00	0241+622	13 27 40	26.7	-10.0	10.7		13.1	-19	171	No stop
05 36 00	---	13 28 41	26.7	-9.9	10.7		12.9	41	173	05 35 01

Schedule for TORUN (Code Tr)

Page 6

RadioAstron visibility tracking of H2O maser spots

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.
 Early: Seconds between end of slew and start. Dwell: On source seconds.

Disk: GBytes recorded to this point.

TPStart: Recording start time. Frequencies are L0 sum (band edge).

SYNC: Time correlator is expected to sync up.

```

-----
Start UT  Source          Start / Stop          Early  Disk  TPStart
Stop UT          LST    EL    AZ    HA  UP  ParA  Dwell  GBytes  SYNC
-----
--- Mon 31 Dec 2018  Day 365 ---

05 36 00  W3IRS5          13 28 41  25.9 -7.5 11.0      9.7  -19   173  No stop
05 37 00  ---              13 29 41  25.8 -7.4 11.0      9.5   41   175  05 36 01

05 37 00  0241+622       13 29 41  26.6 -9.8 10.7     12.8 -19   175  No stop
05 38 00  ---              13 30 41  26.6 -9.6 10.7     12.6  41   177  05 37 01

05 38 00  W3IRS5          13 30 41  25.8 -7.3 11.1      9.4  -19   177  No stop
05 39 00  ---              13 31 41  25.8 -7.1 11.1      9.2   41   179  05 38 01

----- K-band VLBI scans. Space segment 01: target source W3IRS5 -----

05 40 00  W3IRS5          13 32 41  25.8 -7.0 11.1      9.0   54   179  05 40 00
05 54 45  ---              13 47 29  25.5 -5.1 11.3      6.6  885   207  05 40 01

05 55 15  W3IRS5          13 47 59  25.5 -5.0 11.3      6.5   24   207  05 55 15
06 10 00  ---              14 02 46  25.4 -3.1 11.6      4.0  885   235  05 55 16

----- K-band VLBI scans. Ground segment 02 : delay calibrator 0212+735, scan 2 -----

06 12 00  0212+735       14 04 46  37.0 -1.3 11.8      2.7   62   235  06 12 00
06 25 00  ---              14 17 49  37.0 -0.1 12.0      0.3  780   260  06 12 01

----- K-band VLBI scans. Space segment 02: space-ground calibrator 0716+714 -----

06 27 00  0716+714       14 19 49  45.3 -26.3  6.9     56.0   53   260  06 27 00
06 40 00  ---              14 32 51  44.5 -25.4  7.1     53.5  780   285  06 27 01

----- K-band VLBI scans. Ground segment 03 : 3C345 scan 2 -----

06 41 00  3C345          14 33 51  64.3 108.1 -2.2    -48.0 -224   285  06 41 00
06 51 00  ---              14 43 53  65.7 111.2 -2.0    -46.8  376   304  06 41 01

06 54 00  W3IRS5          14 46 53  25.3  2.5-11.7    -3.3  -52   304  06 54 00
06 55 00  ---              14 47 54  25.4  2.7-11.7    -3.4    8   306  06 54 01

06 55 00  0241+622       14 47 54  25.6  0.2-12.0    -0.2  -19   306  No stop
06 56 00  ---              14 48 54  25.6  0.3-12.0    -0.4   41   308  06 55 01

06 56 00  W3IRS5          14 48 54  25.4  2.8-11.6    -3.6  -19   308  No stop
06 57 00  ---              14 49 54  25.4  2.9-11.6    -3.8   41   310  06 56 01

06 57 00  0241+622       14 49 54  25.6  0.4-11.9    -0.6  -19   310  No stop
06 58 00  ---              14 50 54  25.6  0.6-11.9    -0.7   41   312  06 57 01

```

Schedule for TORUN (Code Tr)

Page 7

RadioAstron visibility tracking of H2O maser spots

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.

Early: Seconds between end of slew and start. Dwell: On source seconds.

Disk: GBytes recorded to this point.

TPStart: Recording start time. Frequencies are L0 sum (band edge).

SYNC: Time correlator is expected to sync up.

Start UT	Source	Start / Stop					Early	Disk	TPStart	
Stop UT		LST	EL	AZ	HA	UP	ParA	Dwell	GBytes	SYNC

--- Mon 31 Dec 2018 Day 365 ---										
06 58 00	W3IRS5	14 50 54	25.4	3.1-11.6			-3.9	-19	312	No stop
06 59 00	---	14 51 54	25.4	3.2-11.6			-4.1	41	314	06 58 01
06 59 00	0241+622	14 51 54	25.7	0.7-11.9			-0.9	-19	314	No stop
07 00 00	---	14 52 54	25.7	0.8-11.9			-1.1	41	316	06 59 01
07 00 00	W3IRS5	14 52 54	25.4	3.3-11.6			-4.3	-19	316	No stop
07 01 00	---	14 53 55	25.4	3.5-11.6			-4.4	41	318	07 00 01
07 01 30	0241+622	14 54 25	25.7	1.0-11.9			-1.3	11	318	07 01 30
07 02 00	---	14 54 55	25.7	1.1-11.9			-1.4	30	319	07 01 31
07 02 00	W3IRS5	14 54 55	25.4	3.6-11.5			-4.6	-19	319	No stop
07 03 00	---	14 55 55	25.4	3.7-11.5			-4.8	41	321	07 02 01
07 03 00	0241+622	14 55 55	25.7	1.2-11.8			-1.6	-19	321	No stop
07 04 00	---	14 56 55	25.7	1.3-11.8			-1.7	41	323	07 03 01
07 04 00	W3IRS5	14 56 55	25.4	3.8-11.5			-4.9	-19	323	No stop
07 05 00	---	14 57 55	25.4	4.0-11.5			-5.1	41	324	07 04 01
07 05 00	0241+622	14 57 55	25.7	1.5-11.8			-1.9	-19	324	No stop
07 06 00	---	14 58 55	25.7	1.6-11.8			-2.1	41	326	07 05 01
07 06 00	W3IRS5	14 58 55	25.5	4.1-11.5			-5.3	-19	326	No stop
07 07 00	---	14 59 55	25.5	4.2-11.5			-5.4	41	328	07 06 01
07 07 00	0241+622	14 59 55	25.7	1.7-11.8			-2.2	-19	328	No stop
07 08 00	---	15 00 56	25.7	1.8-11.8			-2.4	41	330	07 07 01
07 08 00	W3IRS5	15 00 56	25.5	4.4-11.4			-5.6	-19	330	No stop
07 09 00	---	15 01 56	25.5	4.5-11.4			-5.8	41	332	07 08 01
07 09 00	0241+622	15 01 56	25.7	2.0-11.7			-2.6	-19	332	No stop
07 10 00	---	15 02 56	25.7	2.1-11.7			-2.7	41	334	07 09 01
07 10 00	W3IRS5	15 02 56	25.5	4.6-11.4			-5.9	-19	334	No stop
07 11 00	---	15 03 56	25.5	4.7-11.4			-6.1	41	336	07 10 01
07 11 30	0241+622	15 04 26	25.7	2.3-11.7			-3.0	11	336	07 11 30
07 12 00	---	15 04 56	25.7	2.4-11.7			-3.1	30	337	07 11 31
07 12 00	W3IRS5	15 04 56	25.5	4.9-11.4			-6.3	-19	337	No stop
07 13 00	---	15 05 56	25.5	5.0-11.4			-6.4	41	339	07 12 01

Schedule for TORUN (Code Tr)

Page 8

RadioAstron visibility tracking of H2O maser spots

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.

Early: Seconds between end of slew and start. Dwell: On source seconds.

Disk: GBytes recorded to this point.

TPStart: Recording start time. Frequencies are L0 sum (band edge).

SYNC: Time correlator is expected to sync up.

Start UT	Source	Start / Stop					Early	Disk	TPStart	
Stop UT		LST	EL	AZ	HA	UP	ParA	Dwell	GBytes	SYNC

--- Mon 31 Dec 2018 Day 365 ---										
07 13 00	0241+622	15 05 56	25.7	2.5-11.7			-3.2	-19	339	No stop
07 14 00	---	15 06 57	25.7	2.6-11.7			-3.4	41	341	07 13 01
07 14 00	W3IRS5	15 06 57	25.5	5.1-11.3			-6.6	-19	341	No stop
07 15 00	---	15 07 57	25.6	5.3-11.3			-6.8	41	343	07 14 01
07 15 00	0241+622	15 07 57	25.7	2.7-11.6			-3.6	-19	343	No stop
07 16 00	---	15 08 57	25.7	2.9-11.6			-3.7	41	345	07 15 01
07 16 00	W3IRS5	15 08 57	25.6	5.4-11.3			-6.9	-19	345	No stop
07 17 00	---	15 09 57	25.6	5.5-11.3			-7.1	41	347	07 16 01
07 17 00	0241+622	15 09 57	25.7	3.0-11.6			-3.9	-19	347	No stop
07 18 00	---	15 10 57	25.7	3.1-11.6			-4.1	41	348	07 17 01
07 18 00	W3IRS5	15 10 57	25.6	5.6-11.3			-7.3	-19	348	No stop
07 19 00	---	15 11 57	25.6	5.8-11.3			-7.4	41	350	07 18 01
07 19 00	0241+622	15 11 57	25.8	3.3-11.6			-4.2	-19	350	No stop
07 20 00	---	15 12 58	25.8	3.4-11.6			-4.4	41	352	07 19 01
07 20 00	W3IRS5	15 12 58	25.6	5.9-11.2			-7.6	-19	352	No stop
07 21 00	---	15 13 58	25.7	6.0-11.2			-7.8	41	354	07 20 01
07 21 00	0241+622	15 13 58	25.8	3.5-11.5			-4.6	-19	354	No stop
07 22 00	---	15 14 58	25.8	3.6-11.5			-4.7	41	356	07 21 01
07 22 00	W3IRS5	15 14 58	25.7	6.2-11.2			-7.9	-19	356	No stop
07 23 00	---	15 15 58	25.7	6.3-11.2			-8.1	41	358	07 22 01
07 23 00	0241+622	15 15 58	25.8	3.8-11.5			-4.9	-19	358	No stop
07 24 00	---	15 16 58	25.8	3.9-11.5			-5.1	41	360	07 23 01
07 24 00	W3IRS5	15 16 58	25.7	6.4-11.2			-8.3	-19	360	No stop
07 25 00	---	15 17 58	25.7	6.5-11.2			-8.4	41	362	07 24 01
07 25 00	0241+622	15 17 58	25.8	4.0-11.5			-5.2	-19	362	No stop
07 26 00	---	15 18 59	25.8	4.1-11.5			-5.4	41	364	07 25 01
07 26 00	W3IRS5	15 18 59	25.7	6.7-11.1			-8.6	-19	364	No stop
07 27 00	---	15 19 59	25.8	6.8-11.1			-8.8	41	366	07 26 01
07 27 00	0241+622	15 19 59	25.8	4.3-11.4			-5.6	-19	366	No stop
07 28 00	---	15 20 59	25.8	4.4-11.4			-5.7	41	368	07 27 01

Schedule for TORUN (Code Tr)

Page 9

RadioAstron visibility tracking of H2O maser spots

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.

Early: Seconds between end of slew and start. Dwell: On source seconds.

Disk: GBytes recorded to this point.

TPStart: Recording start time. Frequencies are L0 sum (band edge).

SYNC: Time correlator is expected to sync up.

```
-----
Start UT  Source          Start / Stop          Early  Disk  TPStart
Stop UT   LST      EL  AZ  HA  UP  ParA  Dwell  GBytes  SYNC
-----
```

--- Mon 31 Dec 2018 Day 365 ---

```
07 28 00  W3IRS5          15 20 59  25.8  6.9-11.1  -8.9  -19    368  No stop
07 29 00  ---                15 21 59  25.8  7.1-11.1  -9.1   41    370  07 28 01
```

----- K-band VLBI scans. Ground segment 03: Phase-ref. scans on W3IRS5 during GBT pointing scan

```
07 30 00  W3IRS5          15 22 59  25.8  7.2-11.1  -9.3   54    370  07 30 00
07 31 00  ---                15 23 59  25.8  7.3-11.1  -9.4   60    372  07 30 01
```

```
07 31 00  0241+622        15 23 59  25.9  4.8-11.4  -6.2  -19    372  No stop
07 32 00  ---                15 25 00  25.9  4.9-11.4  -6.4   41    373  07 31 01
```

```
07 32 00  W3IRS5          15 25 00  25.8  7.4-11.0  -9.6  -19    373  No stop
07 33 00  ---                15 26 00  25.9  7.6-11.0  -9.8   41    375  07 32 01
```

```
07 33 00  0241+622        15 26 00  25.9  5.0-11.3  -6.6  -19    375  No stop
07 34 00  ---                15 27 00  25.9  5.2-11.3  -6.7   41    377  07 33 01
```

```
07 34 00  W3IRS5          15 27 00  25.9  7.7-11.0  -9.9  -19    377  No stop
07 35 00  ---                15 28 00  25.9  7.8-11.0 -10.1   41    379  07 34 01
```

```
07 35 00  0241+622        15 28 00  25.9  5.3-11.3  -6.9  -19    379  No stop
07 36 00  ---                15 29 00  25.9  5.4-11.3  -7.1   41    381  07 35 01
```

```
07 36 00  W3IRS5          15 29 00  25.9  8.0-11.0 -10.3  -19    381  No stop
07 37 00  ---                15 30 00  25.9  8.1-11.0 -10.4   41    383  07 36 01
```

```
07 37 00  0241+622        15 30 00  26.0  5.6-11.3  -7.2  -19    383  No stop
07 38 00  ---                15 31 01  26.0  5.7-11.3  -7.4   41    385  07 37 01
```

```
07 38 00  W3IRS5          15 31 01  26.0  8.2-10.9 -10.6  -19    385  No stop
07 39 00  ---                15 32 01  26.0  8.3-10.9 -10.8   41    387  07 38 01
```

----- K-band VLBI scans. Ground segment 03 : delay calibrator 0212+735, scan 3 -----

```
07 39 00  0212+735        15 32 01  37.6  6.3-10.8 -13.7  -58    387  No stop
07 49 00  ---                15 42 02  37.8  7.1-10.6 -15.6  542    406  07 39 01
```

----- K-band VLBI scans. Ground segment 03 : Phase-ref. scans on W3IRS5 -----

```
07 49 30  0241+622        15 42 32  26.2  7.1-11.1  -9.3  -27    406  07 49 30
07 50 00  ---                15 43 03  26.2  7.2-11.1  -9.4   3    407  07 49 31
```

```
07 50 00  W3IRS5          15 43 03  26.2  9.7-10.7 -12.6  -19    407  No stop
07 51 00  ---                15 44 03  26.3  9.9-10.7 -12.7   41    409  07 50 01
```

Schedule for TORUN (Code Tr)

Page 10

RadioAstron visibility tracking of H2O maser spots

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.

Early: Seconds between end of slew and start. Dwell: On source seconds.

Disk: GBytes recorded to this point.

TPStart: Recording start time. Frequencies are L0 sum (band edge).

SYNC: Time correlator is expected to sync up.

Start UT	Source	Start / Stop					Early	Disk	TPStart	
Stop UT		LST	EL	AZ	HA	UP	ParA	Dwell	GBytes	SYNC

--- Mon 31 Dec 2018 Day 365 ---										
07 51 00	0241+622	15 44 03	26.2	7.3-11.0			-9.6	-19	409	No stop
07 52 00	---	15 45 03	26.2	7.5-11.0			-9.7	41	411	07 51 01
07 52 00	W3IRS5	15 45 03	26.3	10.0-10.7			-12.9	-19	411	No stop
07 53 00	---	15 46 03	26.3	10.1-10.7			-13.1	41	413	07 52 01
07 53 00	0241+622	15 46 03	26.2	7.6-11.0			-9.9	-19	413	No stop
07 54 00	---	15 47 03	26.3	7.7-11.0			-10.1	41	415	07 53 01
07 54 00	W3IRS5	15 47 03	26.4	10.2-10.7			-13.2	-19	415	No stop
07 55 00	---	15 48 03	26.4	10.4-10.7			-13.4	41	417	07 54 01
07 55 00	0241+622	15 48 03	26.3	7.8-11.0			-10.2	-19	417	No stop
07 56 00	---	15 49 04	26.3	8.0-11.0			-10.4	41	419	07 55 01
07 56 00	W3IRS5	15 49 04	26.4	10.5-10.6			-13.6	-19	419	No stop
07 57 00	---	15 50 04	26.4	10.6-10.6			-13.7	41	420	07 56 01
07 57 00	0241+622	15 50 04	26.3	8.1-10.9			-10.6	-19	420	No stop
07 58 00	---	15 51 04	26.3	8.2-10.9			-10.7	41	422	07 57 01
07 58 00	W3IRS5	15 51 04	26.5	10.8-10.6			-13.9	-19	422	No stop
07 59 00	---	15 52 04	26.5	10.9-10.6			-14.1	41	424	07 58 01
07 59 30	0241+622	15 52 34	26.4	8.4-10.9			-11.0	11	424	07 59 30
08 00 00	---	15 53 04	26.4	8.5-10.9			-11.1	30	425	07 59 31
08 00 00	W3IRS5	15 53 04	26.5	11.0-10.6			-14.2	-19	425	No stop
08 01 00	---	15 54 04	26.5	11.1-10.6			-14.4	41	427	08 00 01
08 01 00	0241+622	15 54 04	26.4	8.6-10.9			-11.2	-19	427	No stop
08 02 00	---	15 55 05	26.4	8.7-10.9			-11.4	41	429	08 01 01
08 02 00	W3IRS5	15 55 05	26.6	11.3-10.5			-14.6	-19	429	No stop
08 03 00	---	15 56 05	26.6	11.4-10.5			-14.7	41	431	08 02 01
08 03 00	0241+622	15 56 05	26.5	8.9-10.8			-11.6	-19	431	No stop
08 04 00	---	15 57 05	26.5	9.0-10.8			-11.7	41	433	08 03 01
08 04 00	W3IRS5	15 57 05	26.6	11.5-10.5			-14.9	-19	433	No stop
08 05 00	---	15 58 05	26.7	11.6-10.5			-15.1	41	435	08 04 01
08 05 00	0241+622	15 58 05	26.5	9.1-10.8			-11.9	-19	435	No stop
08 06 00	---	15 59 05	26.5	9.2-10.8			-12.1	41	437	08 05 01

Schedule for TORUN (Code Tr)

Page 11

RadioAstron visibility tracking of H2O maser spots

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.

Early: Seconds between end of slew and start. Dwell: On source seconds.

Disk: GBytes recorded to this point.

TPStart: Recording start time. Frequencies are L0 sum (band edge).

SYNC: Time correlator is expected to sync up.

Start UT	Source	Start / Stop					Early	Disk	TPStart	
Stop UT		LST	EL	AZ	HA	UP	ParA	Dwell	GBytes	SYNC

--- Mon 31 Dec 2018 Day 365 ---										
08 06 00	W3IRS5	15 59 05	26.7	11.8-10.5			-15.2	-19	437	No stop
08 07 00	---	16 00 05	26.7	11.9-10.5			-15.4	41	439	08 06 01
08 07 00	0241+622	16 00 05	26.5	9.4-10.8			-12.2	-19	439	No stop
08 08 00	---	16 01 06	26.6	9.5-10.8			-12.4	41	441	08 07 01
08 08 00	W3IRS5	16 01 06	26.8	12.0-10.4			-15.5	-19	441	No stop
08 09 00	---	16 02 06	26.8	12.1-10.4			-15.7	41	443	08 08 01
08 09 30	0241+622	16 02 36	26.6	9.7-10.7			-12.6	11	443	08 09 30
08 10 00	---	16 03 06	26.6	9.7-10.7			-12.7	30	444	08 09 31
08 10 00	W3IRS5	16 03 06	26.8	12.3-10.4			-15.9	-19	444	No stop
08 11 00	---	16 04 06	26.9	12.4-10.4			-16.0	41	445	08 10 01
08 11 00	0241+622	16 04 06	26.6	9.9-10.7			-12.9	-19	445	No stop
08 12 00	---	16 05 06	26.7	10.0-10.7			-13.1	41	447	08 11 01
08 12 00	W3IRS5	16 05 06	26.9	12.5-10.4			-16.2	-19	447	No stop
08 13 00	---	16 06 06	26.9	12.7-10.4			-16.4	41	449	08 12 01
08 13 00	0241+622	16 06 06	26.7	10.1-10.7			-13.2	-19	449	No stop
08 14 00	---	16 07 06	26.7	10.2-10.7			-13.4	41	451	08 13 01
08 14 00	W3IRS5	16 07 06	27.0	12.8-10.3			-16.5	-19	451	No stop
08 15 00	---	16 08 07	27.0	12.9-10.3			-16.7	41	453	08 14 01
08 15 00	0241+622	16 08 07	26.8	10.4-10.6			-13.6	-19	453	No stop
08 16 00	---	16 09 07	26.8	10.5-10.6			-13.7	41	455	08 15 01
08 16 00	W3IRS5	16 09 07	27.0	13.0-10.3			-16.9	-19	455	No stop
08 17 00	---	16 10 07	27.1	13.2-10.3			-17.0	41	457	08 16 01
08 17 00	0241+622	16 10 07	26.8	10.6-10.6			-13.9	-19	457	No stop
08 18 00	---	16 11 07	26.8	10.7-10.6			-14.1	41	459	08 17 01
08 18 00	W3IRS5	16 11 07	27.1	13.3-10.3			-17.2	-19	459	No stop
08 19 00	---	16 12 07	27.1	13.4-10.3			-17.4	41	461	08 18 01
----- K-band VLBI scans. Ground segment 03 : 0716+714 scan 3 -----										
08 19 00	0716+714	16 12 07	38.9	-17.8	8.8		35.0	-77	461	No stop
08 27 00	---	16 20 09	38.6	-17.2	8.9		33.5	403	476	08 19 01

Schedule for TORUN (Code Tr)

Page 12

RadioAstron visibility tracking of H2O maser spots

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.

Early: Seconds between end of slew and start. Dwell: On source seconds.

Disk: GBytes recorded to this point.

TPStart: Recording start time. Frequencies are L0 sum (band edge).

SYNC: Time correlator is expected to sync up.

```
-----
Start UT  Source          Start / Stop          Early  Disk  TPStart
Stop UT   LST      EL  AZ  HA  UP  ParA  Dwell  GBytes  SYNC
-----
```

--- Mon 31 Dec 2018 Day 365 ---

----- K-band VLBI scans. Ground segment 03 : 3C345 scan 3 -----

```
08 29 00  3C345      16 22 09  76.2 162.5 -0.4    -13.6 -261    476  08 29 00
08 39 00  ---          16 32 11  76.5 170.5 -0.2     -7.4  339    495  08 29 01
```

----- K-band VLBI scans. Ground segment 03 : Phase-ref. scans on W3IRS5 -----

```
08 39 30  W3IRS5      16 32 41  27.9  16.0 -9.9  W  -20.7 -293    495  08 39 30
08 40 00  ---          16 33 11  27.9  16.0 -9.9  W  -20.8   0    496  08 39 31
```

```
08 40 00  0241+622     16 33 11  27.5  13.5-10.2  -17.7 -19    496  No stop
08 41 00  ---          16 34 11  27.6  13.6-10.2  -17.9  41    498  08 40 01
```

```
08 41 00  W3IRS5      16 34 11  28.0  16.1 -9.9    -21.0 -19    498  No stop
08 42 00  ---          16 35 11  28.0  16.3 -9.9    -21.1  41    500  08 41 01
```

```
08 42 00  0241+622     16 35 11  27.6  13.7-10.2  -18.0 -19    500  No stop
08 43 00  ---          16 36 11  27.6  13.9-10.2  -18.2  41    502  08 42 01
```

```
08 43 00  W3IRS5      16 36 11  28.1  16.4 -9.8    -21.3 -19    502  No stop
08 44 00  ---          16 37 11  28.1  16.5 -9.8    -21.5  41    504  08 43 01
```

```
08 44 00  0241+622     16 37 11  27.7  14.0-10.2  -18.4 -19    504  No stop
08 45 00  ---          16 38 12  27.7  14.1-10.1  -18.5  41    506  08 44 01
```

```
08 45 00  W3IRS5      16 38 12  28.1  16.6 -9.8    -21.6 -19    506  No stop
08 46 00  ---          16 39 12  28.2  16.8 -9.8    -21.8  41    508  08 45 01
```

```
08 46 00  0241+622     16 39 12  27.7  14.2-10.1  -18.7 -19    508  No stop
08 47 00  ---          16 40 12  27.8  14.4-10.1  -18.9  41    510  08 46 01
```

```
08 47 00  W3IRS5      16 40 12  28.2  16.9 -9.8    -22.0 -19    510  No stop
08 48 00  ---          16 41 12  28.3  17.0 -9.8    -22.1  41    512  08 47 01
```

----- K-band VLBI scans. Ground segment 03 : delay calibrator 0212+735, scan 4 -----

```
08 48 00  0212+735     16 41 12  39.3  12.0 -9.6    -26.7 -55    512  No stop
08 59 00  ---          16 52 14  39.6  12.9 -9.5    -28.8 605    533  08 48 01
```

----- K-band VLBI scans. Ground segment 03 : Phase-ref. scans on W3IRS5 during GBT pointing scan -----

```
09 00 00  0241+622     16 53 14  28.3  16.0 -9.9    -21.0   4    533  09 00 00
09 01 00  ---          16 54 14  28.3  16.1 -9.9    -21.2  60    535  09 00 01
```

Schedule for TORUN (Code Tr)

Page 13

RadioAstron visibility tracking of H2O maser spots

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.

Early: Seconds between end of slew and start. Dwell: On source seconds.

Disk: GBytes recorded to this point.

TPStart: Recording start time. Frequencies are L0 sum (band edge).

SYNC: Time correlator is expected to sync up.

Start UT	Source	Start / Stop					Early	Disk	TPStart	
Stop UT		LST	EL	AZ	HA	UP	ParA	Dwell	GBytes	SYNC

--- Mon 31 Dec 2018 Day 365 ---										
09 01 00	W3IRS5	16 54 14	28.9	18.6	-9.5		-24.2	-19	535	No stop
09 02 00	---	16 55 14	28.9	18.7	-9.5		-24.4	41	537	09 01 01
09 02 00	0241+622	16 55 14	28.4	16.2	-9.9		-21.3	-19	537	No stop
09 03 00	---	16 56 15	28.4	16.3	-9.8		-21.5	41	539	09 02 01
09 03 00	W3IRS5	16 56 15	29.0	18.8	-9.5		-24.6	-19	539	No stop
09 04 00	---	16 57 15	29.0	19.0	-9.5		-24.7	41	540	09 03 01
09 04 00	0241+622	16 57 15	28.5	16.5	-9.8		-21.6	-19	540	No stop
09 05 00	---	16 58 15	28.5	16.6	-9.8		-21.8	41	542	09 04 01
09 05 00	W3IRS5	16 58 15	29.1	19.1	-9.5		-24.9	-19	542	No stop
09 06 00	---	16 59 15	29.1	19.2	-9.5		-25.1	41	544	09 05 01
09 06 00	0241+622	16 59 15	28.6	16.7	-9.8		-22.0	-19	544	No stop
09 07 00	---	17 00 15	28.6	16.8	-9.8		-22.1	41	546	09 06 01
09 07 00	W3IRS5	17 00 15	29.2	19.3	-9.4		-25.2	-19	546	No stop
09 08 00	---	17 01 15	29.2	19.5	-9.4		-25.4	41	548	09 07 01
09 08 00	0241+622	17 01 15	28.6	16.9	-9.8		-22.3	-19	548	No stop
09 09 00	---	17 02 16	28.7	17.1	-9.7		-22.5	41	550	09 08 01
09 09 00	W3IRS5	17 02 16	29.3	19.6	-9.4		-25.5	-19	550	No stop
09 10 00	---	17 03 16	29.3	19.7	-9.4		-25.7	41	552	09 09 01
----- K-band VLBI scans. Ground segment 03 : Phase-ref. scans on W3IRS5 -----										
09 10 30	0241+622	17 03 46	28.8	17.2	-9.7		-22.7	11	552	09 10 30
09 11 00	---	17 04 16	28.8	17.3	-9.7		-22.8	30	553	09 10 31
09 11 00	W3IRS5	17 04 16	29.4	19.8	-9.4		-25.9	-19	553	No stop
09 12 00	---	17 05 16	29.4	19.9	-9.4		-26.0	41	555	09 11 01
09 12 00	0241+622	17 05 16	28.8	17.4	-9.7		-23.0	-19	555	No stop
09 13 00	---	17 06 16	28.9	17.5	-9.7		-23.1	41	557	09 12 01
09 13 00	W3IRS5	17 06 16	29.5	20.1	-9.3		-26.2	-19	557	No stop
09 14 00	---	17 07 16	29.5	20.2	-9.3		-26.4	41	559	09 13 01
09 14 00	0241+622	17 07 16	28.9	17.7	-9.7		-23.3	-19	559	No stop
09 15 00	---	17 08 17	29.0	17.8	-9.6		-23.5	41	561	09 14 01

Schedule for TORUN (Code Tr)

Page 14

RadioAstron visibility tracking of H2O maser spots

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.

Early: Seconds between end of slew and start. Dwell: On source seconds.

Disk: GBytes recorded to this point.

TPStart: Recording start time. Frequencies are L0 sum (band edge).

SYNC: Time correlator is expected to sync up.

Start UT	Source	Start / Stop					Early	Disk	TPStart	
Stop UT		LST	EL	AZ	HA	UP	ParA	Dwell	GBytes	SYNC

--- Mon 31 Dec 2018 Day 365 ---										
09 15 00	W3IRS5	17 08 17	29.6	20.3	-9.3		-26.5	-19	561	No stop
09 16 00	---	17 09 17	29.6	20.4	-9.3		-26.7	41	563	09 15 01
09 16 00	0241+622	17 09 17	29.0	17.9	-9.6		-23.6	-19	563	No stop
09 17 00	---	17 10 17	29.0	18.0	-9.6		-23.8	41	564	09 16 01
09 17 00	W3IRS5	17 10 17	29.7	20.5	-9.3		-26.8	-19	564	No stop
09 18 00	---	17 11 17	29.7	20.7	-9.3		-27.0	41	566	09 17 01
09 18 00	0241+622	17 11 17	29.1	18.2	-9.6		-23.9	-19	566	No stop
09 19 00	---	17 12 17	29.1	18.3	-9.6		-24.1	41	568	09 18 01
09 19 00	W3IRS5	17 12 17	29.8	20.8	-9.2		-27.2	-19	568	No stop
09 20 00	---	17 13 17	29.8	20.9	-9.2		-27.3	41	570	09 19 01
09 20 30	0241+622	17 13 47	29.2	18.5	-9.5		-24.4	11	570	09 20 30
09 21 00	---	17 14 18	29.2	18.5	-9.5		-24.4	30	571	09 20 31
09 21 00	W3IRS5	17 14 18	29.9	21.0	-9.2		-27.5	-19	571	No stop
09 22 00	---	17 15 18	29.9	21.1	-9.2		-27.6	41	573	09 21 01
09 22 00	0241+622	17 15 18	29.3	18.6	-9.5		-24.6	-19	573	No stop
09 23 00	---	17 16 18	29.3	18.8	-9.5		-24.8	41	575	09 22 01
09 23 00	W3IRS5	17 16 18	30.0	21.3	-9.2		-27.8	-19	575	No stop
09 24 00	---	17 17 18	30.1	21.4	-9.2		-28.0	41	577	09 23 01
09 24 00	0241+622	17 17 18	29.4	18.9	-9.5		-24.9	-19	577	No stop
09 25 00	---	17 18 18	29.4	19.0	-9.5		-25.1	41	579	09 24 01
09 25 00	W3IRS5	17 18 18	30.1	21.5	-9.1		-28.1	-19	579	No stop
09 26 00	---	17 19 18	30.2	21.6	-9.1		-28.3	41	581	09 25 01
09 26 00	0241+622	17 19 18	29.5	19.1	-9.5		-25.3	-19	581	No stop
09 27 00	---	17 20 18	29.5	19.2	-9.4		-25.4	41	583	09 26 01
09 27 00	W3IRS5	17 20 18	30.2	21.7	-9.1		-28.5	-19	583	No stop
09 28 00	---	17 21 19	30.3	21.9	-9.1		-28.6	41	585	09 27 01
09 28 00	0241+622	17 21 19	29.6	19.4	-9.4		-25.6	-19	585	No stop
09 29 00	---	17 22 19	29.6	19.5	-9.4		-25.7	41	587	09 28 01
09 29 00	W3IRS5	17 22 19	30.3	22.0	-9.1		-28.8	-19	587	No stop
09 30 00	---	17 23 19	30.4	22.1	-9.1		-28.9	41	588	09 29 01

Schedule for TORUN (Code Tr)

Page 15

RadioAstron visibility tracking of H2O maser spots

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.

Early: Seconds between end of slew and start. Dwell: On source seconds.

Disk: GBytes recorded to this point.

TPStart: Recording start time. Frequencies are L0 sum (band edge).

SYNC: Time correlator is expected to sync up.

```
-----
Start UT  Source          Start / Stop          Early  Disk  TPStart
Stop UT          LST    EL    AZ    HA  UP  ParA  Dwell  GBytes  SYNC
-----
```

--- Mon 31 Dec 2018 Day 365 ---

----- K-band VLBI scans. Ground segment 03 : 0716+714 scan 4 -----

```
09 32 00  0716+714    17 25 19  36.2 -11.3 10.0    21.6   38    588  09 32 00
09 39 00  ---          17 32 20  36.0 -10.7 10.1    20.3  420    602  09 32 01
```

----- K-band VLBI scans. Ground segment 03 : 3C345 scan 4 -----

```
09 43 00  3C345          17 36 21  73.9 219.3  0.9    29.7 -240    602  09 43 00
09 53 00  ---          17 46 23  72.9 225.1  1.0    33.6  360    621  09 43 01
```

----- K-band VLBI scans. Ground segment 03 : delay calibrator 0212+735, scan 5 -----

```
09 58 30  0212+735    17 51 54  42.0 377.3 -8.5    -40.2   10    621  09 58 30
10 04 00  ---          17 57 25  42.2 377.7 -8.4    -41.3  330    632  09 58 31
```

----- K-band VLBI scans. Ground segment 03 : Phase-ref. scans on W3IRS5 -----

```
10 04 30  0241+622    17 57 55  31.6 383.7 -8.8    -31.5  -24    632  10 04 30
10 05 00  ---          17 58 25  31.6 383.7 -8.8    -31.6    6    633  10 04 31
```

```
10 05 00  W3IRS5        17 58 25  32.5 386.2 -8.5    -34.6  -19    633  No stop
10 06 00  ---          17 59 25  32.6 386.3 -8.5    -34.7   41    635  10 05 01
```

```
10 06 00  0241+622    17 59 25  31.7 383.8 -8.8    -31.8  -19    635  No stop
10 07 00  ---          18 00 25  31.7 383.9 -8.8    -31.9   41    636  10 06 01
```

```
10 07 00  W3IRS5        18 00 25  32.7 386.4 -8.4    -34.9  -19    636  No stop
10 08 00  ---          18 01 25  32.7 386.5 -8.4    -35.1   41    638  10 07 01
```

```
10 08 00  0241+622    18 01 25  31.8 384.1 -8.8    -32.1  -19    638  No stop
10 09 00  ---          18 02 25  31.9 384.2 -8.7    -32.2   41    640  10 08 01
```

```
10 09 00  W3IRS5        18 02 25  32.8 386.6 -8.4    -35.2  -19    640  No stop
10 10 00  ---          18 03 26  32.9 386.7 -8.4    -35.4   41    642  10 09 01
```

```
10 10 00  0241+622    18 03 26  31.9 384.3 -8.7    -32.4  -19    642  No stop
10 11 00  ---          18 04 26  32.0 384.4 -8.7    -32.6   41    644  10 10 01
```

```
10 11 00  W3IRS5        18 04 26  32.9 386.9 -8.4    -35.5  -19    644  No stop
10 12 00  ---          18 05 26  33.0 387.0 -8.4    -35.7   41    646  10 11 01
```

```
10 12 00  0241+622    18 05 26  32.1 384.5 -8.7    -32.7  -19    646  No stop
10 13 00  ---          18 06 26  32.1 384.6 -8.7    -32.9   41    648  10 12 01
```

Schedule for TORUN (Code Tr)

Page 16

RadioAstron visibility tracking of H2O maser spots

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.

Early: Seconds between end of slew and start. Dwell: On source seconds.

Disk: GBytes recorded to this point.

TPStart: Recording start time. Frequencies are L0 sum (band edge).

SYNC: Time correlator is expected to sync up.

```
-----
```

Start UT	Source	Start / Stop					Early	Disk	TPStart	
Stop UT		LST	EL	AZ	HA	UP	ParA	Dwell	GBytes	SYNC

--- Mon 31 Dec 2018 Day 365 ---										
10 13 00	W3IRS5	18 06 26	33.1	387.1	-8.3		-35.9	-19	648	No stop
10 14 00	---	18 07 26	33.1	387.2	-8.3		-36.0	41	650	10 13 01
----- K-band VLBI scans. Space segment 03: target source W3IRS5 -----										
10 15 00	W3IRS5	18 08 26	33.2	387.3	-8.3		-36.2	54	650	10 15 00
10 29 45	---	18 23 14	34.3	389.0	-8.1		-38.5	885	678	10 15 01
10 30 15	W3IRS5	18 23 44	34.3	389.0	-8.1		-38.6	24	678	10 30 15
10 45 00	---	18 38 31	35.4	390.6	-7.8		-41.0	885	707	10 30 16
----- K-band VLBI scans. Ground segment 04 : Phase-ref. scans on W3IRS5 -----										
10 46 00	0241+622	18 39 31	34.3	388.3	-8.1		-38.2	41	707	10 46 00
10 47 00	---	18 40 32	34.4	388.5	-8.1		-38.4	60	708	10 46 01
10 47 00	W3IRS5	18 40 32	35.6	390.8	-7.8		-41.3	-19	708	No stop
10 48 00	---	18 41 32	35.6	390.9	-7.8		-41.4	41	710	10 47 01
10 48 00	0241+622	18 41 32	34.5	388.6	-8.1		-38.5	-19	710	No stop
10 49 00	---	18 42 32	34.5	388.7	-8.1		-38.7	41	712	10 48 01
10 49 00	W3IRS5	18 42 32	35.7	391.1	-7.7		-41.6	-19	712	No stop
10 50 00	---	18 43 32	35.8	391.2	-7.7		-41.8	41	714	10 49 01
----- K-band VLBI scans. Ground segment 04 : delay calibrator 0212+735, scan 6 -----										
10 50 30	0212+735	18 44 02	44.5	380.8	-7.6		-50.4	-17	714	10 50 30
10 58 00	---	18 51 33	44.9	381.3	-7.5		-51.9	433	729	10 50 31
10 58 30	0241+622	18 52 04	35.2	389.7	-7.9		-40.2	-20	729	10 58 30
10 59 00	---	18 52 34	35.3	389.8	-7.9		-40.3	10	730	10 58 31
10 59 00	W3IRS5	18 52 34	36.5	392.1	-7.6		-43.2	-19	730	No stop
11 00 00	---	18 53 34	36.6	392.2	-7.6		-43.3	41	732	10 59 01
11 00 00	0241+622	18 53 34	35.4	389.9	-7.9		-40.4	-19	732	No stop
11 01 00	---	18 54 34	35.4	390.0	-7.9		-40.6	41	733	11 00 01
11 01 00	W3IRS5	18 54 34	36.7	392.3	-7.5		-43.5	-19	733	No stop
11 02 00	---	18 55 34	36.7	392.4	-7.5		-43.7	41	735	11 01 01
11 02 00	0241+622	18 55 34	35.5	390.1	-7.8		-40.8	-19	735	No stop
11 03 00	---	18 56 34	35.6	390.2	-7.8		-40.9	41	737	11 02 01

Schedule for TORUN (Code Tr)

Page 17

RadioAstron visibility tracking of H2O maser spots

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.

Early: Seconds between end of slew and start. Dwell: On source seconds.

Disk: GBytes recorded to this point.

TPStart: Recording start time. Frequencies are L0 sum (band edge).

SYNC: Time correlator is expected to sync up.

Start UT	Source	Start / Stop					Early	Disk	TPStart	
Stop UT		LST	EL	AZ	HA	UP	ParA	Dwell	GBytes	SYNC

--- Mon 31 Dec 2018 Day 365 ---										
11 03 00	W3IRS5	18 56 34	36.8	392.5	-7.5		-43.8	-19	737	No stop
11 04 00	---	18 57 34	36.9	392.7	-7.5		-44.0	41	739	11 03 01
11 04 00	0241+622	18 57 34	35.7	390.3	-7.8		-41.1	-19	739	No stop
11 05 00	---	18 58 35	35.7	390.4	-7.8		-41.2	41	741	11 04 01
11 05 00	W3IRS5	18 58 35	37.0	392.8	-7.5		-44.1	-19	741	No stop
11 06 00	---	18 59 35	37.1	392.9	-7.5		-44.3	41	743	11 05 01
11 06 00	0241+622	18 59 35	35.8	390.5	-7.8		-41.4	-19	743	No stop
11 07 00	---	19 00 35	35.9	390.6	-7.8		-41.6	41	745	11 06 01
11 07 00	W3IRS5	19 00 35	37.2	393.0	-7.4		-44.5	-19	745	No stop
11 08 00	---	19 01 35	37.2	393.1	-7.4		-44.6	41	747	11 07 01
11 08 30	0241+622	19 02 05	36.0	390.8	-7.7		-41.8	11	747	11 08 30
11 09 00	---	19 02 35	36.0	390.8	-7.7		-41.9	30	748	11 08 31
11 09 00	W3IRS5	19 02 35	37.3	393.2	-7.4		-44.8	-19	748	No stop
11 10 00	---	19 03 35	37.4	393.3	-7.4		-44.9	41	750	11 09 01
11 10 00	0241+622	19 03 35	36.1	390.9	-7.7		-42.0	-19	750	No stop
11 11 00	---	19 04 36	36.2	391.0	-7.7		-42.2	41	752	11 10 01
11 11 00	W3IRS5	19 04 36	37.5	393.4	-7.4		-45.1	-19	752	No stop
11 12 00	---	19 05 36	37.6	393.5	-7.4		-45.2	41	754	11 11 01
11 12 00	0241+622	19 05 36	36.3	391.2	-7.7		-42.4	-19	754	No stop
11 13 00	---	19 06 36	36.4	391.3	-7.7		-42.5	41	756	11 12 01
11 13 00	W3IRS5	19 06 36	37.6	393.6	-7.3		-45.4	-19	756	No stop
11 14 00	---	19 07 36	37.7	393.7	-7.3		-45.6	41	757	11 13 01
11 14 00	0241+622	19 07 36	36.4	391.4	-7.6		-42.7	-19	757	No stop
11 15 00	---	19 08 36	36.5	391.5	-7.6		-42.8	41	759	11 14 01
11 15 00	W3IRS5	19 08 36	37.8	393.8	-7.3		-45.7	-19	759	No stop
11 16 00	---	19 09 36	37.9	393.9	-7.3		-45.9	41	761	11 15 01
11 16 00	0241+622	19 09 36	36.6	391.6	-7.6		-43.0	-19	761	No stop
11 17 00	---	19 10 37	36.7	391.7	-7.6		-43.2	41	763	11 16 01
11 17 00	W3IRS5	19 10 37	38.0	394.0	-7.3		-46.0	-19	763	No stop
11 18 00	---	19 11 37	38.1	394.1	-7.3		-46.2	41	765	11 17 01

Schedule for TORUN (Code Tr)

Page 18

RadioAstron visibility tracking of H2O maser spots

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.

Early: Seconds between end of slew and start. Dwell: On source seconds.

Disk: GBytes recorded to this point.

TPStart: Recording start time. Frequencies are L0 sum (band edge).

SYNC: Time correlator is expected to sync up.

Start UT	Source	Start / Stop					Early	Disk	TPStart	
Stop UT		LST	EL	AZ	HA	UP	ParA	Dwell	GBytes	SYNC

--- Mon 31 Dec 2018 Day 365 ---										
11 18 30	0241+622	19 12 07	36.8	391.8	-7.6		-43.4	11	765	11 18 30
11 19 00	---	19 12 37	36.8	391.9	-7.6		-43.5	30	766	11 18 31
11 19 00	W3IRS5	19 12 37	38.2	394.2	-7.2		-46.4	-19	766	No stop
11 20 00	---	19 13 37	38.2	394.3	-7.2		-46.5	41	768	11 19 01
11 20 00	0241+622	19 13 37	36.9	392.0	-7.5		-43.6	-19	768	No stop
11 21 00	---	19 14 37	37.0	392.1	-7.5		-43.8	41	770	11 20 01
11 21 00	W3IRS5	19 14 37	38.3	394.4	-7.2		-46.7	-19	770	No stop
11 22 00	---	19 15 37	38.4	394.5	-7.2		-46.8	41	772	11 21 01
11 22 00	0241+622	19 15 37	37.1	392.2	-7.5		-44.0	-19	772	No stop
11 23 00	---	19 16 38	37.1	392.3	-7.5		-44.1	41	774	11 22 01
11 23 00	W3IRS5	19 16 38	38.5	394.6	-7.2		-47.0	-19	774	No stop
11 24 00	---	19 17 38	38.6	394.7	-7.2		-47.1	41	776	11 23 01
11 24 00	0241+622	19 17 38	37.2	392.4	-7.5		-44.3	-19	776	No stop
11 25 00	---	19 18 38	37.3	392.5	-7.5		-44.4	41	778	11 24 01
11 25 00	W3IRS5	19 18 38	38.7	394.8	-7.1		-47.3	-19	778	No stop
11 26 00	---	19 19 38	38.7	394.9	-7.1		-47.5	41	780	11 25 01
11 26 00	0241+622	19 19 38	37.4	392.6	-7.4		-44.6	-19	780	No stop
11 27 00	---	19 20 38	37.5	392.7	-7.4		-44.8	41	781	11 26 01
11 27 00	W3IRS5	19 20 38	38.8	395.0	-7.1		-47.6	-19	781	No stop
11 28 00	---	19 21 38	38.9	395.1	-7.1		-47.8	41	783	11 27 01
11 28 30	0241+622	19 22 08	37.6	392.9	-7.4		-45.0	11	783	11 28 30
11 29 00	---	19 22 39	37.6	392.9	-7.4		-45.1	30	784	11 28 31
11 29 00	W3IRS5	19 22 39	39.0	395.2	-7.1		-47.9	-19	784	No stop
11 30 00	---	19 23 39	39.1	395.3	-7.1		-48.1	41	786	11 29 01
11 30 00	0241+622	19 23 39	37.7	393.0	-7.4		-45.2	-19	786	No stop
11 31 00	---	19 24 39	37.8	393.1	-7.4		-45.4	41	788	11 30 01
11 31 00	W3IRS5	19 24 39	39.2	395.4	-7.0		-48.2	-19	788	No stop
11 32 00	---	19 25 39	39.3	395.5	-7.0		-48.4	41	790	11 31 01
11 32 00	0241+622	19 25 39	37.9	393.2	-7.3		-45.6	-19	790	No stop
11 33 00	---	19 26 39	38.0	393.3	-7.3		-45.7	41	792	11 32 01

Schedule for TORUN (Code Tr)

Page 19

RadioAstron visibility tracking of H2O maser spots

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.

Early: Seconds between end of slew and start. Dwell: On source seconds.

Disk: GBytes recorded to this point.

TPStart: Recording start time. Frequencies are L0 sum (band edge).

SYNC: Time correlator is expected to sync up.

Start UT	Source	Start / Stop					Early	Disk	TPStart	
Stop UT		LST	EL	AZ	HA	UP	ParA	Dwell	GBytes	SYNC

--- Mon 31 Dec 2018 Day 365 ---										
11 33 00	W3IRS5	19 26 39	39.4	395.6	-7.0		-48.6	-19	792	No stop
11 34 00	---	19 27 39	39.4	395.7	-7.0		-48.7	41	794	11 33 01
11 34 00	0241+622	19 27 39	38.0	393.4	-7.3		-45.9	-19	794	No stop
11 35 00	---	19 28 40	38.1	393.5	-7.3		-46.0	41	796	11 34 01
11 35 00	W3IRS5	19 28 40	39.5	395.8	-7.0		-48.9	-19	796	No stop
11 36 00	---	19 29 40	39.6	395.9	-7.0		-49.0	41	798	11 35 01
11 36 00	0241+622	19 29 40	38.2	393.6	-7.3		-46.2	-19	798	No stop
11 37 00	---	19 30 40	38.3	393.7	-7.3		-46.4	41	800	11 36 01
11 37 00	W3IRS5	19 30 40	39.7	396.0	-6.9		-49.2	-19	800	No stop
11 38 00	---	19 31 40	39.8	396.1	-6.9		-49.4	41	802	11 37 01
11 38 30	0241+622	19 32 10	38.4	393.9	-7.2		-46.6	11	802	11 38 30
11 39 00	---	19 32 40	38.5	393.9	-7.2		-46.7	30	803	11 38 31
11 39 00	W3IRS5	19 32 40	39.9	396.2	-6.9		-49.5	-19	803	No stop
11 40 00	---	19 33 40	40.0	396.3	-6.9		-49.7	41	804	11 39 01
11 40 00	0241+622	19 33 40	38.5	394.0	-7.2		-46.8	-19	804	No stop
11 41 00	---	19 34 41	38.6	394.2	-7.2		-47.0	41	806	11 40 01
11 41 00	W3IRS5	19 34 41	40.1	396.4	-6.9		-49.8	-19	806	No stop
11 42 00	---	19 35 41	40.2	396.5	-6.9		-50.0	41	808	11 41 01
11 42 00	0241+622	19 35 41	38.7	394.3	-7.2		-47.2	-19	808	No stop
11 43 00	---	19 36 41	38.8	394.4	-7.2		-47.3	41	810	11 42 01
11 43 00	W3IRS5	19 36 41	40.2	396.6	-6.8		-50.1	-19	810	No stop
11 44 00	---	19 37 41	40.3	396.7	-6.8		-50.3	41	812	11 43 01
11 44 00	0241+622	19 37 41	38.9	394.5	-7.1		-47.5	-19	812	No stop
11 45 00	---	19 38 41	39.0	394.6	-7.1		-47.6	41	814	11 44 01
11 45 00	W3IRS5	19 38 41	40.4	396.8	-6.8		-50.5	-19	814	No stop
11 46 00	---	19 39 41	40.5	396.9	-6.8		-50.6	41	816	11 45 01
11 46 00	0241+622	19 39 41	39.1	394.7	-7.1		-47.8	-19	816	No stop
11 47 00	---	19 40 41	39.1	394.8	-7.1		-47.9	41	818	11 46 01
11 47 00	W3IRS5	19 40 41	40.6	397.0	-6.8		-50.8	-19	818	No stop
11 48 00	---	19 41 42	40.7	397.1	-6.8		-50.9	41	820	11 47 01

Schedule for TORUN (Code Tr)

Page 20

RadioAstron visibility tracking of H2O maser spots

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.

Early: Seconds between end of slew and start. Dwell: On source seconds.

Disk: GBytes recorded to this point.

TPStart: Recording start time. Frequencies are L0 sum (band edge).

SYNC: Time correlator is expected to sync up.

```
-----
Start UT  Source          Start / Stop          Early  Disk  TPStart
Stop UT   LST      EL  AZ  HA  UP  ParA Dwell  GBytes  SYNC
-----
```

--- Mon 31 Dec 2018 Day 365 ---

----- K-band VLBI scans. Ground segment 04 : delay calibrator 0212+735, scan 7 -----

```
11 48 30 0212+735    19 42 12 47.9 384.0 -6.6    -62.0  -11    820  11 48 30
11 56 00 ---          19 49 43 48.3 384.4 -6.5    -63.6  439    834  11 48 31
```

----- K-band VLBI scans. Ground segment 04: 0716+714 scan 5 -----

```
11 56 00 0716+714    19 49 43 34.5 362.5-11.6    -4.7  -66    834  No stop
12 06 00 ---          19 59 45 34.6 363.5-11.4    -6.5  534    853  11 56 01
```

----- K-band VLBI scans. Ground segment 04 : 3C345 scan 5 -----

```
12 08 00 3C345        20 01 45 54.2 268.6  3.3    51.4  -84    853  12 08 00
12 18 00 ---          20 11 47 52.7 270.6  3.5    51.4  516    873  12 08 01
```

----- K-band VLBI scans. Ground segment 04: Phase-ref. scans on W3IRS5 -----

```
12 18 30 0241+622    20 12 17 41.9 397.8 -6.6  W  -53.0 -240    873  12 18 30
12 19 00 ---          20 12 47 42.0 397.8 -6.6  W  -53.1   0    874  12 18 31
```

```
12 19 00 W3IRS5         20 12 47 43.6 400.0 -6.2    -55.9 -20    874  No stop
12 20 00 ---          20 13 47 43.7 400.1 -6.2    -56.0  40    876  12 19 01
```

```
12 20 00 0241+622    20 13 47 42.1 397.9 -6.5    -53.2 -20    876  No stop
12 21 00 ---          20 14 47 42.2 398.0 -6.5    -53.4  40    877  12 20 01
```

```
12 21 00 W3IRS5         20 14 47 43.8 400.2 -6.2    -56.2 -20    877  No stop
12 22 00 ---          20 15 47 43.9 400.3 -6.2    -56.3  40    879  12 21 01
```

```
12 22 00 0241+622    20 15 47 42.3 398.1 -6.5    -53.5 -20    879  No stop
12 23 00 ---          20 16 47 42.4 398.2 -6.5    -53.7  40    881  12 22 01
```

```
12 23 00 W3IRS5         20 16 47 44.0 400.4 -6.2    -56.5 -20    881  No stop
12 24 00 ---          20 17 48 44.1 400.5 -6.2    -56.7  40    883  12 23 01
```

```
12 24 00 0241+622    20 17 48 42.5 398.3 -6.5    -53.9 -20    883  No stop
12 25 00 ---          20 18 48 42.6 398.4 -6.5    -54.0  40    885  12 24 01
```

```
12 25 00 W3IRS5         20 18 48 44.2 400.6 -6.1    -56.8 -20    885  No stop
12 26 00 ---          20 19 48 44.3 400.7 -6.1    -57.0  40    887  12 25 01
```

```
12 26 00 0241+622    20 19 48 42.6 398.5 -6.4    -54.2 -20    887  No stop
12 27 00 ---          20 20 48 42.7 398.6 -6.4    -54.3  40    889  12 26 01
```

Schedule for TORUN (Code Tr)

Page 21

RadioAstron visibility tracking of H2O maser spots

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.

Early: Seconds between end of slew and start. Dwell: On source seconds.

Disk: GBytes recorded to this point.

TPStart: Recording start time. Frequencies are L0 sum (band edge).

SYNC: Time correlator is expected to sync up.

Start UT	Source	Start / Stop					Early	Disk	TPStart	
Stop UT		LST	EL	AZ	HA	UP	ParA	Dwell	GBytes	SYNC

--- Mon 31 Dec 2018 Day 365 ---										
12 27 00	W3IRS5	20 20 48	44.4	400.7	-6.1		-57.1	-20	889	No stop
12 28 00	---	20 21 48	44.5	400.8	-6.1		-57.3	40	891	12 27 01
12 28 30	0241+622	20 22 18	42.9	398.7	-6.4		-54.6	10	891	12 28 30
12 29 00	---	20 22 48	42.9	398.8	-6.4		-54.7	30	892	12 28 31
12 29 00	W3IRS5	20 22 48	44.6	400.9	-6.1		-57.5	-20	892	No stop
12 30 00	---	20 23 49	44.7	401.0	-6.1		-57.6	40	894	12 29 01
12 30 00	0241+622	20 23 49	43.0	398.9	-6.4		-54.8	-20	894	No stop
12 31 00	---	20 24 49	43.1	399.0	-6.4		-55.0	40	896	12 30 01
12 31 00	W3IRS5	20 24 49	44.8	401.1	-6.0		-57.8	-20	896	No stop
12 32 00	---	20 25 49	44.9	401.2	-6.0		-57.9	40	898	12 31 01
12 32 00	0241+622	20 25 49	43.2	399.0	-6.3		-55.1	-20	898	No stop
12 33 00	---	20 26 49	43.3	399.1	-6.3		-55.3	40	900	12 32 01
12 33 00	W3IRS5	20 26 49	45.0	401.3	-6.0		-58.1	-20	900	No stop
12 34 00	---	20 27 49	45.1	401.4	-6.0		-58.3	40	901	12 33 01
12 34 00	0241+622	20 27 49	43.4	399.2	-6.3		-55.5	-20	901	No stop
12 35 00	---	20 28 49	43.5	399.3	-6.3		-55.6	40	903	12 34 01
12 35 00	W3IRS5	20 28 49	45.2	401.4	-6.0		-58.4	-20	903	No stop
12 36 00	---	20 29 50	45.3	401.5	-6.0		-58.6	40	905	12 35 01
12 36 00	0241+622	20 29 50	43.6	399.4	-6.3		-55.8	-20	905	No stop
12 37 00	---	20 30 50	43.7	399.5	-6.3		-55.9	40	907	12 36 01
12 37 00	W3IRS5	20 30 50	45.4	401.6	-5.9		-58.7	-20	907	No stop
12 38 00	---	20 31 50	45.5	401.7	-5.9		-58.9	40	909	12 37 01
12 38 30	0241+622	20 32 20	43.8	399.6	-6.2		-56.2	10	909	12 38 30
12 39 00	---	20 32 50	43.9	399.7	-6.2		-56.3	30	910	12 38 31
12 39 00	W3IRS5	20 32 50	45.6	401.8	-5.9		-59.1	-20	910	No stop
12 40 00	---	20 33 50	45.7	401.9	-5.9		-59.2	40	912	12 39 01
12 40 00	0241+622	20 33 50	44.0	399.8	-6.2		-56.4	-20	912	No stop
12 41 00	---	20 34 50	44.1	399.8	-6.2		-56.6	40	914	12 40 01
12 41 00	W3IRS5	20 34 50	45.8	402.0	-5.9		-59.4	-20	914	No stop
12 42 00	---	20 35 51	45.9	402.1	-5.9		-59.5	40	916	12 41 01

Schedule for TORUN (Code Tr)

Page 22

RadioAstron visibility tracking of H2O maser spots

UP: D => Below limits; H => Below horizon mask; W => still slewing at end; blank => Up.

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Disk: GBytes recorded to this point.

TPStart: Recording start time. Frequencies are L0 sum (band edge).

SYNC: Time correlator is expected to sync up.

Start UT	Source	Start / Stop					Early	Disk	TPStart	
Stop UT		LST	EL	AZ	HA	UP	ParA	Dwell	GBytes	SYNC

--- Mon 31 Dec 2018 Day 365 ---										
12 42 00	0241+622	20 35 51	44.2	399.9	-6.2		-56.7	-20	916	No stop
12 43 00	---	20 36 51	44.3	400.0	-6.2		-56.9	40	918	12 42 01
12 43 00	W3IRS5	20 36 51	46.0	402.1	-5.8		-59.7	-20	918	No stop
12 44 00	---	20 37 51	46.1	402.2	-5.8		-59.9	40	920	12 43 01
12 44 00	0241+622	20 37 51	44.4	400.1	-6.1		-57.1	-20	920	No stop
12 45 00	---	20 38 51	44.5	400.2	-6.1		-57.2	40	922	12 44 01
12 45 00	W3IRS5	20 38 51	46.2	402.3	-5.8		-60.0	-20	922	No stop
12 46 00	---	20 39 51	46.3	402.4	-5.8		-60.2	40	924	12 45 01
12 46 00	0241+622	20 39 51	44.6	400.3	-6.1		-57.4	-20	924	No stop
12 47 00	---	20 40 51	44.7	400.4	-6.1		-57.5	40	925	12 46 01
12 47 00	W3IRS5	20 40 51	46.4	402.5	-5.8		-60.3	-20	925	No stop
12 48 00	---	20 41 52	46.5	402.6	-5.8		-60.5	40	927	12 47 01
12 48 30	0241+622	20 42 22	44.8	400.5	-6.1		-57.8	10	927	12 48 30
12 49 00	---	20 42 52	44.8	400.6	-6.1		-57.9	30	928	12 48 31
12 49 00	W3IRS5	20 42 52	46.6	402.6	-5.7		-60.7	-20	928	No stop
12 50 00	---	20 43 52	46.7	402.7	-5.7		-60.8	40	930	12 49 01
12 50 00	0241+622	20 43 52	44.9	400.6	-6.0		-58.0	-20	930	No stop
12 51 00	---	20 44 52	45.0	400.7	-6.0		-58.2	40	932	12 50 01
12 51 00	W3IRS5	20 44 52	46.8	402.8	-5.7		-61.0	-20	932	No stop
12 52 00	---	20 45 52	46.9	402.9	-5.7		-61.1	40	934	12 51 01
12 52 00	0241+622	20 45 52	45.1	400.8	-6.0		-58.4	-20	934	No stop
12 53 00	---	20 46 52	45.2	400.9	-6.0		-58.5	40	936	12 52 01
12 53 00	W3IRS5	20 46 52	47.0	403.0	-5.7		-61.3	-20	936	No stop
12 54 00	---	20 47 52	47.1	403.1	-5.7		-61.5	40	938	12 53 01
12 54 00	0241+622	20 47 52	45.3	401.0	-6.0		-58.7	-20	938	No stop
12 55 00	---	20 48 53	45.4	401.1	-6.0		-58.8	40	940	12 54 01
12 55 00	W3IRS5	20 48 53	47.2	403.1	-5.6		-61.6	-20	940	No stop
12 56 00	---	20 49 53	47.3	403.2	-5.6		-61.8	40	942	12 55 01
12 56 00	0241+622	20 49 53	45.5	401.2	-5.9		-59.0	-20	942	No stop
12 57 00	---	20 50 53	45.6	401.2	-5.9		-59.2	40	944	12 56 01

Schedule for TORUN (Code Tr)

Page 23

RadioAstron visibility tracking of H2O maser spots

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Disk: GBytes recorded to this point.

TPStart: Recording start time. Frequencies are L0 sum (band edge).

SYNC: Time correlator is expected to sync up.

Start UT	Source	Start / Stop					Early	Disk	TPStart	
Stop UT		LST	EL	AZ	HA	UP	ParA	Dwell	GBytes	SYNC

--- Mon 31 Dec 2018 Day 365 ---										
12 57 00	W3IRS5	20 50 53	47.4	403.3	-5.6		-62.0	-20	944	No stop
12 58 00	---	20 51 53	47.5	403.4	-5.6		-62.1	40	946	12 57 01
----- K-band VLBI scans. Ground segment 04 : delay calibrator 0212+735, scan 8 -----										
12 58 30	0212+735	20 52 23	52.4	386.7	-5.4		-76.9	-18	946	12 58 30
13 08 00	---	21 01 55	53.0	386.9	-5.3		-79.0	552	964	12 58 31
13 08 30	0241+622	21 02 25	46.8	402.2	-5.7		-61.0	-16	964	13 08 30
13 09 00	---	21 02 55	46.8	402.2	-5.7		-61.1	14	965	13 08 31
13 09 00	W3IRS5	21 02 55	48.7	404.3	-5.4		-63.9	-21	965	No stop
13 10 00	---	21 03 55	48.8	404.3	-5.4		-64.1	39	967	13 09 01
13 10 00	0241+622	21 03 55	46.9	402.3	-5.7		-61.3	-20	967	No stop
13 11 00	---	21 04 55	47.0	402.4	-5.7		-61.4	40	969	13 10 01
13 11 00	W3IRS5	21 04 55	48.9	404.4	-5.4		-64.2	-21	969	No stop
13 12 00	---	21 05 55	49.0	404.5	-5.4		-64.4	39	971	13 11 01
13 12 00	0241+622	21 05 55	47.1	402.5	-5.7		-61.6	-21	971	No stop
13 13 00	---	21 06 56	47.2	402.6	-5.7		-61.8	39	972	13 12 01
13 13 00	W3IRS5	21 06 56	49.1	404.6	-5.3		-64.6	-21	972	No stop
13 14 00	---	21 07 56	49.2	404.6	-5.3		-64.7	39	974	13 13 01
13 14 00	0241+622	21 07 56	47.3	402.6	-5.6		-61.9	-21	974	No stop
13 15 00	---	21 08 56	47.4	402.7	-5.6		-62.1	39	976	13 14 01
13 15 00	W3IRS5	21 08 56	49.3	404.7	-5.3		-64.9	-21	976	No stop
13 16 00	---	21 09 56	49.4	404.8	-5.3		-65.0	39	978	13 15 01
13 16 00	0241+622	21 09 56	47.6	402.8	-5.6		-62.3	-21	978	No stop
13 17 00	---	21 10 56	47.7	402.9	-5.6		-62.4	39	980	13 16 01
13 17 00	W3IRS5	21 10 56	49.5	404.9	-5.3		-65.2	-21	980	No stop
13 18 00	---	21 11 56	49.6	404.9	-5.3		-65.4	39	982	13 17 01
13 18 30	0241+622	21 12 27	47.8	403.0	-5.6		-62.7	9	982	13 18 30
13 19 00	---	21 12 57	47.9	403.0	-5.6		-62.7	30	983	13 18 31
13 19 00	W3IRS5	21 12 57	49.7	405.0	-5.2		-65.5	-21	983	No stop
13 20 00	---	21 13 57	49.8	405.1	-5.2		-65.7	39	985	13 19 01

Schedule for TORUN (Code Tr)

Page 24

RadioAstron visibility tracking of H2O maser spots

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Disk: GBytes recorded to this point.

TPStart: Recording start time. Frequencies are L0 sum (band edge).

SYNC: Time correlator is expected to sync up.

Start UT	Source	Start / Stop					Early	Disk	TPStart	
Stop UT		LST	EL	AZ	HA	UP	ParA	Dwell	GBytes	SYNC

--- Mon 31 Dec 2018 Day 365 ---										
13 20 00	0241+622	21 13 57	48.0	403.1	-5.5		-62.9	-21	985	No stop
13 21 00	---	21 14 57	48.1	403.2	-5.5		-63.1	39	987	13 20 01
13 21 00	W3IRS5	21 14 57	49.9	405.2	-5.2		-65.9	-21	987	No stop
13 22 00	---	21 15 57	50.0	405.2	-5.2		-66.0	39	989	13 21 01
13 22 00	0241+622	21 15 57	48.2	403.3	-5.5		-63.2	-21	989	No stop
13 23 00	---	21 16 57	48.3	403.4	-5.5		-63.4	39	991	13 22 01
13 23 00	W3IRS5	21 16 57	50.1	405.3	-5.2		-66.2	-21	991	No stop
13 24 00	---	21 17 57	50.3	405.4	-5.2		-66.4	39	993	13 23 01
13 24 00	0241+622	21 17 57	48.4	403.4	-5.5		-63.6	-21	993	No stop
13 25 00	---	21 18 58	48.5	403.5	-5.5		-63.7	39	995	13 24 01
13 25 00	W3IRS5	21 18 58	50.4	405.5	-5.1		-66.5	-21	995	No stop
13 26 00	---	21 19 58	50.5	405.5	-5.1		-66.7	39	996	13 25 01
13 26 00	0241+622	21 19 58	48.6	403.6	-5.4		-63.9	-21	996	No stop
13 27 00	---	21 20 58	48.7	403.7	-5.4		-64.1	39	998	13 26 01
13 27 00	W3IRS5	21 20 58	50.6	405.6	-5.1		-66.9	-21	998	No stop
13 28 00	---	21 21 58	50.7	405.7	-5.1		-67.0	39	1000	13 27 01
13 28 30	0241+622	21 22 28	48.8	403.8	-5.4		-64.3	9	1000	13 28 30
13 29 00	---	21 22 58	48.9	403.8	-5.4		-64.4	30	1001	13 28 31
13 29 00	W3IRS5	21 22 58	50.8	405.8	-5.1		-67.2	-21	1001	No stop
13 30 00	---	21 23 58	50.9	405.8	-5.1		-67.4	39	1003	13 29 01
13 30 00	0241+622	21 23 58	49.0	403.9	-5.4		-64.6	-21	1003	No stop
13 31 00	---	21 24 59	49.1	404.0	-5.4		-64.7	39	1005	13 30 01
13 31 00	W3IRS5	21 24 59	51.0	405.9	-5.0		-67.5	-21	1005	No stop
13 32 00	---	21 25 59	51.1	406.0	-5.0		-67.7	39	1007	13 31 01
13 32 00	0241+622	21 25 59	49.2	404.0	-5.3		-64.9	-21	1007	No stop
13 33 00	---	21 26 59	49.3	404.1	-5.3		-65.1	39	1009	13 32 01
13 33 00	W3IRS5	21 26 59	51.2	406.0	-5.0		-67.9	-21	1009	No stop
13 34 00	---	21 27 59	51.3	406.1	-5.0		-68.0	39	1011	13 33 01
13 34 00	0241+622	21 27 59	49.4	404.2	-5.3		-65.2	-21	1011	No stop
13 35 00	---	21 28 59	49.5	404.3	-5.3		-65.4	39	1013	13 34 01

Schedule for TORUN (Code Tr)

Page 25

RadioAstron visibility tracking of H2O maser spots

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TPStart: Recording start time. Frequencies are L0 sum (band edge).

SYNC: Time correlator is expected to sync up.

Start UT	Source	Start / Stop					Early	Disk	TPStart	
Stop UT		LST	EL	AZ	HA	UP	ParA	Dwell	GBytes	SYNC

--- Mon 31 Dec 2018 Day 365 ---										
13 35 00	W3IRS5	21 28 59	51.4	406.2	-5.0		-68.2	-21	1013	No stop
13 36 00	---	21 29 59	51.5	406.2	-5.0		-68.4	39	1015	13 35 01
13 36 00	0241+622	21 29 59	49.6	404.3	-5.3		-65.6	-21	1015	No stop
13 37 00	---	21 31 00	49.7	404.4	-5.3		-65.7	39	1017	13 36 01
13 37 00	W3IRS5	21 31 00	51.7	406.3	-4.9		-68.5	-21	1017	No stop
13 38 00	---	21 32 00	51.8	406.4	-4.9		-68.7	39	1019	13 37 01
13 38 30	0241+622	21 32 30	49.9	404.5	-5.2		-66.0	9	1019	13 38 30
13 39 00	---	21 33 00	49.9	404.6	-5.2		-66.1	30	1020	13 38 31
13 39 00	W3IRS5	21 33 00	51.9	406.5	-4.9		-68.9	-21	1020	No stop
13 40 00	---	21 34 00	52.0	406.5	-4.9		-69.0	39	1021	13 39 01
13 40 00	0241+622	21 34 00	50.0	404.6	-5.2		-66.2	-21	1021	No stop
13 41 00	---	21 35 00	50.2	404.7	-5.2		-66.4	39	1023	13 40 01
13 41 00	W3IRS5	21 35 00	52.1	406.6	-4.9		-69.2	-21	1023	No stop
13 42 00	---	21 36 00	52.2	406.7	-4.9		-69.4	39	1025	13 41 01
13 42 00	0241+622	21 36 00	50.3	404.8	-5.2		-66.6	-21	1025	No stop
13 43 00	---	21 37 01	50.4	404.8	-5.2		-66.7	39	1027	13 42 01
13 43 00	W3IRS5	21 37 01	52.3	406.7	-4.8		-69.5	-21	1027	No stop
13 44 00	---	21 38 01	52.4	406.8	-4.8		-69.7	39	1029	13 43 01
13 44 00	0241+622	21 38 01	50.5	404.9	-5.1		-66.9	-21	1029	No stop
13 45 00	---	21 39 01	50.6	405.0	-5.1		-67.1	39	1031	13 44 01
13 45 00	W3IRS5	21 39 01	52.5	406.9	-4.8		-69.9	-21	1031	No stop
13 46 00	---	21 40 01	52.6	406.9	-4.8		-70.0	39	1033	13 45 01
13 46 00	0241+622	21 40 01	50.7	405.1	-5.1		-67.2	-21	1033	No stop
13 47 00	---	21 41 01	50.8	405.1	-5.1		-67.4	39	1035	13 46 01
13 47 00	W3IRS5	21 41 01	52.8	407.0	-4.8		-70.2	-21	1035	No stop
13 48 00	---	21 42 01	52.9	407.1	-4.8		-70.4	39	1037	13 47 01
13 48 30	0241+622	21 42 31	51.0	405.2	-5.1		-67.6	9	1037	13 48 30
13 49 00	---	21 43 02	51.0	405.3	-5.1		-67.7	30	1038	13 48 31
13 49 00	W3IRS5	21 43 02	53.0	407.1	-4.7		-70.6	-21	1038	No stop
13 50 00	---	21 44 02	53.1	407.2	-4.7		-70.7	39	1040	13 49 01

Schedule for TORUN (Code Tr)

Page 26

RadioAstron visibility tracking of H2O maser spots

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SYNC: Time correlator is expected to sync up.

Start UT	Source	Start / Stop					Early	Disk	TPStart	
Stop UT		LST	EL	AZ	HA	UP	ParA	Dwell	GBytes	SYNC

--- Mon 31 Dec 2018 Day 365 ---										
13 50 00	0241+622	21 44 02	51.1	405.3	-5.0		-67.9	-21	1040	No stop
13 51 00	---	21 45 02	51.2	405.4	-5.0		-68.1	39	1042	13 50 01
13 51 00	W3IRS5	21 45 02	53.2	407.2	-4.7		-70.9	-21	1042	No stop
13 52 00	---	21 46 02	53.3	407.3	-4.7		-71.1	39	1044	13 51 01
13 52 00	0241+622	21 46 02	51.3	405.5	-5.0		-68.2	-21	1044	No stop
13 53 00	---	21 47 02	51.4	405.5	-5.0		-68.4	39	1045	13 52 01
13 53 00	W3IRS5	21 47 02	53.4	407.4	-4.7		-71.2	-21	1045	No stop
13 54 00	---	21 48 02	53.5	407.4	-4.7		-71.4	39	1047	13 53 01
13 54 00	0241+622	21 48 02	51.5	405.6	-5.0		-68.6	-21	1047	No stop
13 55 00	---	21 49 03	51.6	405.7	-5.0		-68.7	39	1049	13 54 01
13 55 00	W3IRS5	21 49 03	53.6	407.5	-4.6		-71.6	-21	1049	No stop
13 56 00	---	21 50 03	53.7	407.6	-4.6		-71.8	39	1051	13 55 01
13 56 00	0241+622	21 50 03	51.8	405.7	-4.9		-68.9	-21	1051	No stop
13 57 00	---	21 51 03	51.9	405.8	-4.9		-69.1	39	1053	13 56 01
13 57 00	W3IRS5	21 51 03	53.9	407.6	-4.6		-71.9	-21	1053	No stop
13 58 00	---	21 52 03	54.0	407.7	-4.6		-72.1	39	1055	13 57 01
----- K-band VLBI scans. Ground segment 04 : delay calibrator 0212+735, scan 9 -----										
13 58 30	0212+735	21 52 33	56.5	387.5	-4.4		-90.7	-25	1055	13 58 30
14 06 00	---	22 00 04	57.0	387.4	-4.3		-92.5	425	1069	13 58 31
----- K-band VLBI scans. Ground segment 04: 0716+714 scan 6 -----										
14 06 00	0716+714	22 00 04	37.4	374.7	-9.4		-28.4	-87	1069	No stop
14 16 00	---	22 10 06	37.8	375.6	-9.2		-30.3	513	1089	14 06 01
----- K-band VLBI scans. Ground segment 04 : 3C345 scan 6 -----										
14 18 00	3C345	22 12 06	35.1	291.5	5.5		46.6	-63	1089	14 18 00
14 28 00	---	22 22 08	33.7	293.1	5.6		45.9	537	1108	14 18 01
----- K-band VLBI scans. Space segment 01: target source W3IRS5 -----										
14 30 00	W3IRS5	22 24 08	57.6	409.4	-4.1		-77.8	-128	1108	14 30 00
14 44 45	---	22 38 56	59.3	410.0	-3.8		-80.5	757	1136	14 30 01

Schedule for TORUN (Code Tr)

Page 27

RadioAstron visibility tracking of H2O maser spots

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TPStart: Recording start time. Frequencies are L0 sum (band edge).

SYNC: Time correlator is expected to sync up.

```
-----
Start UT  Source          Start / Stop          Early   Disk   TPStart
Stop UT          LST      EL   AZ   HA  UP   ParA Dwell  GBytes  SYNC
-----
```

--- Mon 31 Dec 2018 Day 365 ---

```
14 45 15 W3IRS5          22 39 26 59.3 410.1 -3.8      -80.6   24    1136   14 45 15
15 00 00 ---           22 54 13 61.0 410.5 -3.5      -83.5  885    1164   14 45 16
```

SETUP FILE INFORMATION:

NOTE: If DOPPLER, FREQ, or BW were used, see the individual scans for the final BBC settings.

==== Setup file: ra1cm2.set

Matching groups in ./rg40b_freq.dat:

tr1cm

```
Setup group:      4          Station: TORUN          Total bit rate:   256
Format: MKIV1:4   Bits per sample: 2     Sample rate: 32.000
Number of channels: 4    DBE type:              Speedup factor:   1.00
```

Disk used to record data.

```

1st LO= 21500.00 21500.00 21500.00 21500.00
Net SB=          L          L          U          U
IF SB =          U          U          U          U
Pol.  =          RCP         LCP         RCP         LCP
BBC   =           1          2          1          2
BBC SB=          L          L          U          U
IF    =           C          A          C          A

```

The following frequency sets based on these setups were used.

```

Frequency Set:  4  Setup file default.  Used with PCAL = off
LO sum= 22228.00 22228.00 22228.00 22228.00
BBC fr=  728.00  728.00  728.00  728.00
Bandwd=  16.00  16.00  16.00  16.00
Matching frequency sets:  4

```

Track assignments are:

```

track1=  2, 18,  3, 19
barrel=roll_off

```

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(J2000)	(Date)	Error (mas)
* FAKERA	11 57 21.769299	* 12 00 00.000000	12 00 55.680308	0.00
	85 16 41.77889	* 85 00 00.000000	84 53 24.69601	0.00
	fake circumpolar target for a TS to look at			
* 0241+622	02 41 00.673424	* 02 44 57.696744	02 46 29.035134	0.33
J0244+6228	62 15 27.54311	* 62 28 06.51562	62 32 59.21333	0.14
	rfc_2018c Petrov and Kovalev, in preparation 874 observations			
W3IRS5_H2O	02 21 53.326396	* 02 25 40.785000	02 27 08.327267	0.00
* W3IRS5	61 52 21.52150	* 62 05 52.56000	62 11 06.16432	0.00
	./rg40b_sources.radioastron H2O maser; positions from proposal, RA-A02-08			
* 0716+714	07 16 13.029739	* 07 21 53.448474	07 24 03.952828	0.00
J0721+7120	71 26 15.17406	* 71 20 36.36340	71 18 14.65144	0.00
	./rg40b_sources.radioastron AGN, rfc_2013d Petrov, 2013, unpublished 42370 observations, RA-A04-07, RA-A03-0			
1641+399	16 41 17.606226	* 16 42 58.809963	16 43 34.964040	0.00
J1642+3948	39 54 10.81479	* 39 48 36.99385	39 46 31.11655	0.00
* 3C345	./rg40b_sources.radioastron AGN, rfc_2013d Petrov, 2013, unpublished 51938 observations, RA-A04-07, RA-A03-0			
* 0212+735	02 12 49.921893	* 02 17 30.813373	02 19 20.447143	0.00
J0217+7349	73 35 40.08547	* 73 49 32.62180	73 54 55.93283	0.00
	./rg40b_sources.radioastron AGN, rfc_2013d Petrov, 2013, unpublished 48731 observations, RA-A03-04, RA-A02-1			

Contents

Graphical Plan of Experiments in Dec 2018	1
Experiment Listing	3
rk23bqtr – RadioAstron AGN scattering substructure	4
rk23brtr – RadioAstron AGN scattering substructure	6
rk23bstr – RadioAstron AGN scattering substructure	8
rk23butr – RadioAstron AGN scattering substructure	10
rk25aetr – RadioAstron AGN observations	12
rk25agtr – RadioAstron AGN observations	14
rk25ahtr – RadioAstron AGN observations	16
rk25altr – RadioAstron AGN observations	18
rk25amtr – RadioAstron AGN observations	20
rk25antr – RadioAstron AGN observations	22
rk25aqtr – RadioAstron AGN observations	25
rk25artr – RadioAstron AGN observations	27
rk25avtr – RadioAstron AGN observations	29
rk25awtr – RadioAstron AGN observations	31
rk25axtr – RadioAstron AGN observations	33
rk25aytr – RadioAstron AGN observations	35
rk25batr – RadioAstron AGN observations	37
rd07ftr – RadioAstron AGN observations	39
rk23bvtr – RadioAstron AGN scattering substructure	41
rk23bxtr – RadioAstron AGN scattering substructure	43
rk23bytr – RadioAstron AGN scattering substructure	45
rk23bztr – RadioAstron AGN scattering substructure	47
rk23cbtr – RadioAstron AGN scattering substructure	49
rk23cctr – RadioAstron AGN scattering substructure	51
rk23cetr – RadioAstron AGN scattering substructure	53
rk23cftr – RadioAstron AGN scattering substructure	55
rk23chtr – RadioAstron AGN scattering substructure	57
rk23citr – RadioAstron AGN scattering substructure	59
ga042tr – RadioAstron visibility tracking of H2O maser spots	61
rg40btr – RadioAstron visibility tracking of H2O maser spots	98