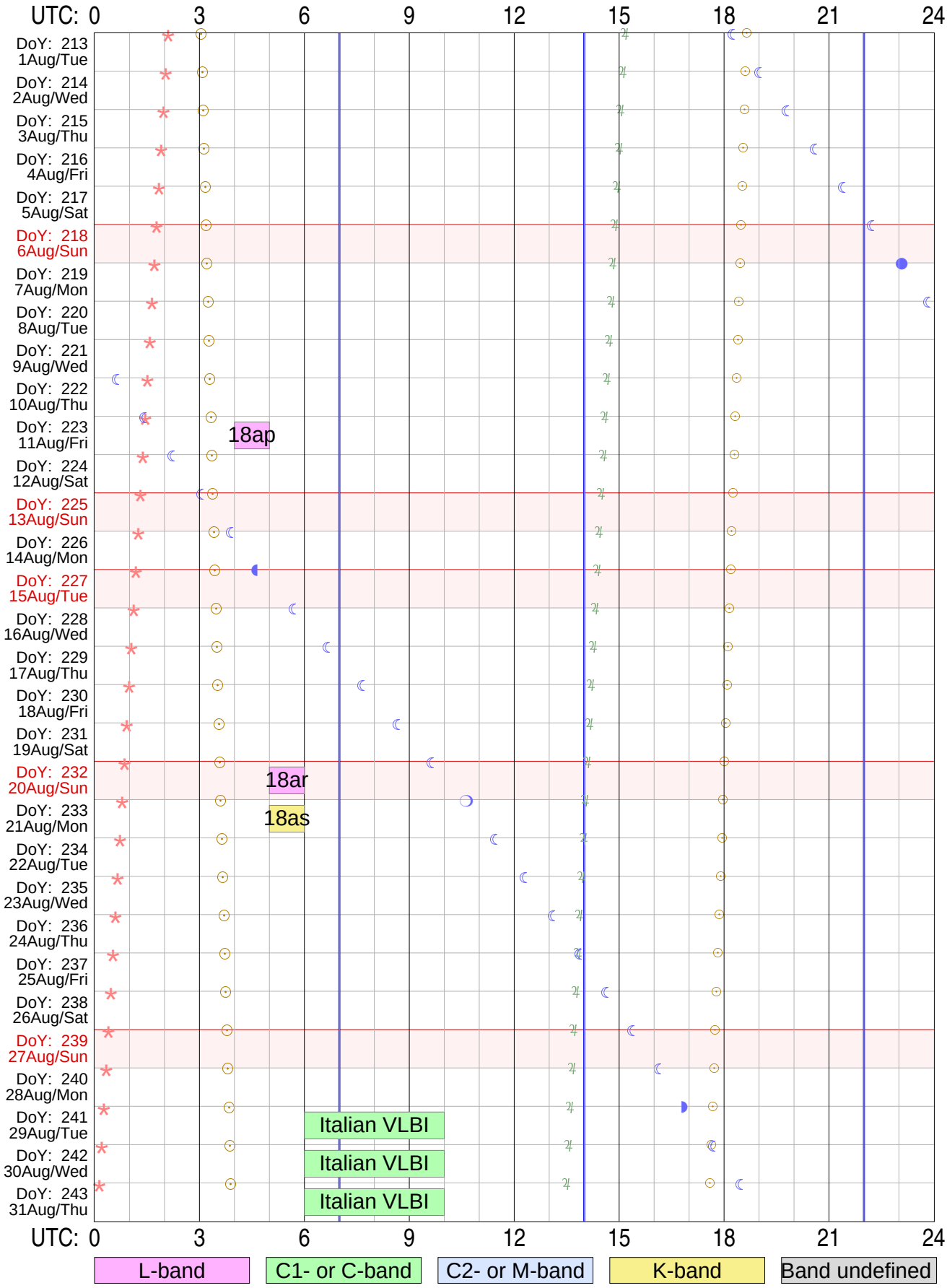
Tr VLBI plan for Aug 2017



Version: 2017.07.28

Sky events at Tr: ⊙ Sunrise & sunset ☽●☾ Transit of Moon ♃ Transit of Jupiter ✶ Transit of Aries (0h ST)

Vertical lines in blue mark operator shift times at Tr *Total observing time: 15.0 hours in 4 experiments scheduled*

Initial characters 'rk' are omitted from RA experiment names!

Strona zostawiona celowo pusta

RadioAstron & EVN Experiments
Aug 2017

Uytkownik 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`

```
Year = 2017, 2nd line is: Year  Date   UTstart UTstop Exper.  xxComment
Nr  D  M <=Dur Exper. name                      Comment
 1 11.08  1.0 |18ap                           |L
 2 20.08  1.0 |18ar                           |L
 3 21.08  1.0 |18as                           |K
 4 29.08  4.0 |Italian VLBI                   |C
```

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

`http://paulo.astro.uni.torun.pl/~pw/VLBI/schedules/aug17.pdf`

rk18aptr

RadioAstron AGN Monitoring

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

Schedule for TORUN (Code Tr) Page 2
RadioAstron AGN Monitoring
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 / Stop UT	Source	LST	EL	AZ	HA	UP	ParA	Early Dwell	Disk GBytes	TPStart SYNC
--- Fri 11 Aug 2017 Day 223 ---										
---------- 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					
04 00 00	0234+285	02 33 31	65.8	177.1	-0.1		-2.0	0	0	04 00 00
04 12 15	---	02 45 48	65.7	183.7	0.1		2.5	735	24	04 00 01
04 12 45	0234+285	02 46 18	65.7	183.9	0.1		2.7	23	24	04 12 45
04 25 00	---	02 58 35	65.5	190.4	0.3		7.1	735	47	04 12 46
---------- L-band VLBI scans, 5 min gap is to change RA observing mode ----------										
04 30 00	0234+285	03 03 36	65.4	193.1	0.4		8.9	292	47	04 30 00
04 44 45	---	03 18 24	64.7	200.6	0.7		13.9	885	75	04 30 01
04 45 15	0234+285	03 18 54	64.7	200.8	0.7		14.1	23	75	04 45 15
05 00 00	---	03 33 41	63.8	208.0	0.9		18.8	885	104	04 45 16

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 37.054022	0.00
	85 16 41.77889	* 85 00 00.00000	84 54 24.45109	0.00
	fake circumpolar target for a TS to look at			
* 0234+285	02 34 55.589591	* 02 37 52.405678	02 38 54.560806	0.00
J0237+2848	28 35 11.40774	* 28 48 08.98999	28 52 29.52704	0.00
	./rk18ap_sources.radioastron			
	AGN, rfc_2013d Petrov, 2013, unpublished 57147 observations, RA-AO4-07, RA-AO3-0			

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)
  0234+285            92.3

 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 60deg 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
```

rk18artr

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

RadioAstron AGN Monitoring

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 / Stop UT	Source	LST	EL	AZ	HA	UP	ParA	Early Dwell	Disk GBytes	TPStart SYNC
--- Sun 20 Aug 2017 Day 232 ---										
---------- 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 00 00	2209+236	04 09 10	19.5	-75.7	5.9		39.6	0	0	05 00 00
05 19 30	---	04 28 43	16.7	-72.1	6.3		38.7	1170	37	05 00 01
05 20 00	2209+236	04 29 13	16.7	-72.0	6.3		38.7	24	37	05 20 00
05 39 30	---	04 48 47	13.9	-68.4	6.6		37.7	1170	75	05 20 01
05 40 00	2209+236	04 49 17	13.8	-68.3	6.6		37.6	24	75	05 40 00
06 00 00	---	05 09 20	11.1	-64.5	6.9		36.4	1200	113	05 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: 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:   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 35.900534	0.00
	85 16 41.77889	* 85 00 00.00000	84 54 21.56583	0.00
	fake circumpolar target for a TS to look at			
* 2209+236	22 09 45.687917	* 22 12 05.966312	22 12 56.521226	0.00
J2212+2355	23 40 49.85180	* 23 55 40.54374	24 01 01.08675	0.00
	./rk18ar_sources.radioastron			
	AGN, MASIV, rfc_2013d Petrov, 2013, unpublished 17068 observations, RA-AO3-04, R			

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)
2209+236	143.4

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 60deg 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

rk18astr

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

Schedule for TORUN (Code Tr) Page 2
RadioAstron AGN Monitoring
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 / Stop UT	Source	LST	EL	AZ	HA	UP	ParA	Early Dwell	Disk GBytes	TPStart SYNC
--- Mon 21 Aug 2017 Day 233 ---										
---------- K-band VLBI scans ----------										
Next scan frequencies:		22236.00	22236.00	22236.00	22236.00					
Next BBC frequencies:		736.00	736.00	736.00	736.00					
Next scan bandwidths:		16.00	16.00	16.00	16.00					
05 00 00	0235+164	04 13 07	49.3	215.6	1.6		21.4	0	0	05 00 00
05 14 30	---	04 27 39	47.9	220.5	1.8		24.0	870	28	05 00 01
05 15 00	0235+164	04 28 09	47.9	220.6	1.8		24.1	24	28	05 15 00
05 29 30	---	04 42 41	46.4	225.3	2.1		26.4	870	56	05 15 01
05 30 00	0235+164	04 43 12	46.3	225.4	2.1		26.5	24	56	05 30 00
05 44 30	---	04 57 44	44.7	229.8	2.3		28.6	870	84	05 30 01
05 45 00	0235+164	04 58 14	44.7	230.0	2.3		28.7	24	84	05 45 00
06 00 00	---	05 13 16	42.9	234.3	2.6		30.6	900	112	05 45 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
Matching groups in ./rk18as_freq.dat:
tr1cm

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=  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:   7  Setup file default.  Used with PCAL = 1MHz
 LO sum=   22236.00  22236.00  22236.00  22236.00
 BBC fr=     736.00    736.00    736.00    736.00
 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 35.828709	0.00
	85 16 41.77889	* 85 00 00.00000	84 54 21.22480	0.00
	fake circumpolar target for a TS to look at			
* 0235+164	02 35 52.630215	* 02 38 38.930107	02 39 37.567526	0.00
J0238+1636	16 24 04.01610	* 16 36 59.27452	16 41 24.88149	0.00
	./rk18as_sources.radioastron			
	AGN, IDV, rfc_2013d Petrov, 2013, unpublished 65224 observations, RA-AO4-07, RA-			

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	105.7

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 60deg 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

fus07tr

HUNTING THE UNIDENTIFIED GAMMA-RAY SOURCES

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Address: INAF IRA

Observing mode: 6cm Continuum C-dual-1024-16-2-2
Schedule for TORUN (Code Tr) Page 2
Hunting the unidentified gamma-ray sources
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 / Stop UT	Source	LST	EL	AZ	HA	UP	ParA	Early Dwell	Disk GBytes	TPStart SYNC
--- Tue 29 Aug 2017 Day 241 ---										
Next scan frequencies:		4778.49	4778.49	4778.49	4778.49		4850.49	4850.49	4850.49	4850.49
		4922.49	4922.49	4922.49	4922.49		4994.49	4994.49	4994.49	4994.49
Next BBC frequencies:		578.49	578.49	578.49	578.49		650.49	650.49	650.49	650.49
		722.49	722.49	722.49	722.49		794.49	794.49	794.49	794.49
Next scan bandwidths:		16.00	16.00	16.00	16.00		16.00	16.00	16.00	16.00
		16.00	16.00	16.00	16.00		16.00	16.00	16.00	16.00
06 00 00	0716+714	05 44 49	68.8	21.8	-1.6		-136.0	0	0	06 00 00
06 10 00	---	05 54 51	69.3	20.1	-1.5		-139.9	600	77	06 00 01
06 10 30	0716+714	05 55 21	69.4	20.0	-1.5		-140.1	24	77	06 10 30
06 20 00	---	06 04 52	69.8	18.3	-1.3		-144.0	570	150	06 10 31
06 20 30	0716+714	06 05 22	69.8	18.2	-1.3		-144.2	24	150	06 20 30
06 30 00	---	06 14 54	70.3	16.3	-1.1		-148.2	570	223	06 20 31
06 30 30	0716+714	06 15 24	70.3	16.2	-1.1		-148.4	24	223	06 30 30
06 40 00	---	06 24 55	70.7	14.2	-1.0		-152.6	570	296	06 30 31
06 40 30	0716+714	06 25 26	70.7	14.1	-1.0		-152.8	24	296	06 40 30
06 50 00	---	06 34 57	71.0	12.0	-0.8		-157.0	570	369	06 40 31
06 50 30	0716+714	06 35 27	71.0	11.9	-0.8		-157.2	24	369	06 50 30
07 00 00	---	06 44 59	71.3	9.7	-0.6		-161.6	570	442	06 50 31
07 00 30	0716+714	06 45 29	71.3	9.6	-0.6		-161.8	24	442	07 00 30
07 10 00	---	06 55 00	71.5	7.3	-0.5		-166.3	570	515	07 00 31
07 10 30	0716+714	06 55 30	71.5	7.2	-0.5		-166.5	24	515	07 10 30
07 20 00	---	07 05 02	71.7	4.8	-0.3		-171.0	570	588	07 10 31
07 20 30	0716+714	07 05 32	71.7	4.7	-0.3		-171.2	24	588	07 20 30
07 30 00	---	07 15 04	71.8	2.2	-0.1		-175.8	570	662	07 20 31
07 30 30	0716+714	07 15 34	71.8	2.1	-0.1		-176.0	24	662	07 30 30
07 40 00	---	07 25 05	71.8	-0.3	0.0		179.4	570	735	07 30 31
07 40 30	0716+714	07 25 35	71.8	-0.5	0.0		179.1	24	735	07 40 30
07 50 00	---	07 35 07	71.7	-2.9	0.2		174.6	570	808	07 40 31
07 50 30	0716+714	07 35 37	71.7	-3.0	0.2		174.3	24	808	07 50 30
08 00 00	---	07 45 09	71.6	-5.4	0.4		169.8	570	881	07 50 31
08 00 30	0716+714	07 45 39	71.6	-5.6	0.4		169.6	24	881	08 00 30
08 10 00	---	07 55 10	71.5	-7.9	0.5		165.1	570	954	08 00 31

Schedule for TORUN (Code Tr) Page 3

Hunting the unidentified gamma-ray sources

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 / Stop UT	Source	Start / Stop LST	EL	AZ	HA	UP	ParA	Early Dwell	Disk GBytes	TPStart SYNC
--- Tue 29 Aug 2017 Day 241 ---										
08 10 30	0716+714	07 55 40	71.5	-8.0	0.5		164.8	24	954	08 10 30
08 20 00	---	08 05 12	71.2	-10.3	0.7		160.4	570	1027	08 10 31
08 20 30	0716+714	08 05 42	71.2	-10.4	0.7		160.2	24	1027	08 20 30
08 30 00	---	08 15 14	70.9	-12.6	0.9		155.9	570	1100	08 20 31
08 30 30	0716+714	08 15 44	70.9	-12.7	0.9		155.6	24	1100	08 30 30
08 40 00	---	08 25 15	70.6	-14.8	1.0		151.4	570	1173	08 30 31
08 40 30	0716+714	08 25 45	70.6	-14.9	1.0		151.2	24	1173	08 40 30
08 50 00	---	08 35 17	70.2	-16.8	1.2		147.1	570	1246	08 40 31
08 50 30	0716+714	08 35 47	70.1	-16.9	1.2		146.9	24	1246	08 50 30
09 00 00	---	08 45 18	69.7	-18.8	1.4		142.9	570	1319	08 50 31
09 00 30	0716+714	08 45 49	69.7	-18.9	1.4		142.7	24	1319	09 00 30
09 10 00	---	08 55 20	69.2	-20.5	1.5		138.9	570	1392	09 00 31
09 10 30	0716+714	08 55 50	69.2	-20.6	1.5		138.7	24	1392	09 10 30
09 20 00	---	09 05 22	68.6	-22.2	1.7		135.0	570	1465	09 10 31
09 20 30	0716+714	09 05 52	68.6	-22.3	1.7		134.8	24	1465	09 20 30
09 30 00	---	09 15 23	68.1	-23.7	1.9		131.3	570	1538	09 20 31
09 30 30	0716+714	09 15 53	68.0	-23.7	1.9		131.1	24	1538	09 30 30
09 40 00	---	09 25 25	67.4	-25.0	2.0		127.6	570	1612	09 30 31
09 40 30	0716+714	09 25 55	67.4	-25.1	2.0		127.5	24	1612	09 40 30
09 50 00	---	09 35 27	66.8	-26.2	2.2		124.1	570	1685	09 40 31
09 50 30	0716+714	09 35 57	66.8	-26.3	2.2		124.0	24	1685	09 50 30
10 00 00	---	09 45 28	66.1	-27.3	2.4		120.8	570	1758	09 50 31

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

======== Setup file: c1024.eofus

Setup group: 2	Station: TORUN	Total bit rate: 1024
Format: MARK5B	Bits per sample: 2	Sample rate: 32.000
Number of channels: 16	DBE type: DBBC_DDC	Speedup factor: 1.00

Disk used to record data.

1st LO=	4200.00	4200.00	4200.00	4200.00	4200.00	4200.00	4200.00	4200.00
	4200.00	4200.00	4200.00	4200.00	4200.00	4200.00	4200.00	4200.00
Net SB=	L	L	U	U	L	L	U	U
	L	L	U	U	L	L	U	U
IF SB =	U	U	U	U	U	U	U	U
	U	U	U	U	U	U	U	U
Pol. =	RCP	LCP	RCP	LCP	RCP	LCP	RCP	LCP
	RCP	LCP	RCP	LCP	RCP	LCP	RCP	LCP
BBC =	1	5	1	5	2	6	2	6
	3	7	3	7	4	8	4	8
BBC SB=	L	L	U	U	L	L	U	U
	L	L	U	U	L	L	U	U
IF =	A1	B1	A1	B1	A1	B1	A1	B1
	A1	B1	A1	B1	A1	B1	A1	B1

The following frequency sets based on these setups were used.

Frequency Set: 3 Setup file default. Used with PCAL = off

LO sum=	4778.49	4778.49	4778.49	4778.49	4850.49	4850.49	4850.49	4850.49
	4922.49	4922.49	4922.49	4922.49	4994.49	4994.49	4994.49	4994.49
BBC fr=	578.49	578.49	578.49	578.49	650.49	650.49	650.49	650.49
	722.49	722.49	722.49	722.49	794.49	794.49	794.49	794.49
Bandwd=	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00
	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00

Matching frequency sets: 3

Track assignments are:
track1= 18, 26, 2, 10, 20, 28, 4, 12, 22, 30, 6, 14, 24, 32, 8, 16
barrel=roll_off

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(J2000)	(Date)	Error (mas)
* 0716+714	07 16 13.029731	* 07 21 53.448466	07 23 48.405293	0.01
J0721+7120	71 26 15.17408	* 71 20 36.36342	71 18 15.84110	0.00
J0721+71	/Users/mgirolet/sched/catalogs/sources.gsfc			
	GSFC 2015a astro solution, unpublished 63527 observations.			

fus08tr

HUNTING THE UNIDENTIFIED GAMMA-RAY SOURCES

PI: *Marcello Giroletti*

Address: INAF IRA

Observing mode: 6cm Continuum C-dual-1024-16-2-2
Schedule for TORUN (Code Tr) Page 2
Hunting the unidentified gamma-ray sources
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 / Stop UT	Source	Start / Stop LST	EL	AZ	HA	UP	ParA	Early Dwell	Disk GBytes	TPStart SYNC
--- Wed 30 Aug 2017 Day 242 ---										
Next scan frequencies:		4778.49	4778.49	4778.49	4778.49	4850.49	4850.49	4850.49	4850.49	
		4922.49	4922.49	4922.49	4922.49	4994.49	4994.49	4994.49	4994.49	
Next BBC frequencies:		578.49	578.49	578.49	578.49	650.49	650.49	650.49	650.49	
		722.49	722.49	722.49	722.49	794.49	794.49	794.49	794.49	
Next scan bandwidths:		16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	
		16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	
06 00 00	0642+449	05 48 45	77.3	124.7	-1.0		-44.1	0	0	06 00 00
06 09 00	---	05 57 47	78.4	130.3	-0.8		-40.2	540	69	06 00 01
06 10 55	0730+504	05 59 42	75.0	91.0	-1.6		-70.1	21	69	06 10 55
06 19 55	---	06 08 44	76.4	93.0	-1.4		-69.9	540	138	06 10 56
06 21 45	0738+313	06 10 34	62.5	133.8	-1.5		-30.4	14	138	06 21 45
06 30 45	---	06 19 36	63.4	137.5	-1.4		-28.3	540	208	06 21 46
06 31 35	0745+241	06 20 26	56.3	141.3	-1.5		-24.3	9	208	06 31 35
06 40 35	---	06 29 27	57.2	144.7	-1.3		-22.3	540	277	06 31 36
06 41 40	0748+126	06 30 32	46.3	150.6	-1.4		-17.6	10	277	06 41 40
06 50 40	---	06 39 34	46.9	153.7	-1.2		-15.8	540	346	06 41 41
06 53 10	0804+499	06 42 04	76.0	94.8	-1.5		-68.0	17	346	06 53 10
07 02 10	---	06 51 06	77.3	97.2	-1.3		-67.3	540	415	06 53 11
07 03 20	0814+425	06 52 16	71.9	117.8	-1.5		-45.9	14	415	07 03 20
07 12 20	---	07 01 17	73.1	121.7	-1.3		-43.7	540	485	07 03 21
07 12 55	0821+394	07 01 52	70.0	125.5	-1.4		-39.1	9	485	07 12 55
07 21 55	---	07 10 54	71.1	129.7	-1.3		-36.6	540	554	07 12 56
07 23 05	0827+243	07 12 04	57.3	144.7	-1.3		-22.3	5	554	07 23 05
07 32 05	---	07 21 06	58.1	148.3	-1.2		-20.2	540	623	07 23 06
07 33 10	0838+133	07 22 11	47.0	150.9	-1.3		-17.4	10	623	07 33 10
07 42 10	---	07 31 12	47.7	154.0	-1.2		-15.7	540	692	07 33 11
07 42 55	0851+202	07 31 57	53.2	145.9	-1.4		-21.0	10	692	07 42 55
07 51 55	---	07 40 59	53.9	149.2	-1.2		-19.1	540	762	07 42 56
07 53 35	0917+449	07 42 39	71.7	107.5	-1.7		-53.6	2	762	07 53 35
08 03 35	---	07 52 41	73.1	111.1	-1.5		-51.9	600	838	07 53 36
08 04 45	0955+476	07 53 51	69.3	93.4	-2.1		-62.2	19	838	08 04 45
08 14 45	---	08 03 53	70.8	95.8	-1.9		-61.8	600	915	08 04 46

Schedule for TORUN (Code Tr) Page 3

Hunting the unidentified gamma-ray sources

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 / Stop UT	Source	Start / Stop LST	EL	AZ	HA	UP	ParA	Early Dwell	Disk GBytes	TPStart SYNC
--- Wed 30 Aug 2017 Day 242 ---										
08 16 20	0923+392	08 05 28	70.0	126.7	-1.4		-38.3	19	915	08 16 20
08 26 20	---	08 15 30	71.2	131.4	-1.2		-35.4	600	992	08 16 21
08 27 15	0945+408	08 16 25	69.8	119.0	-1.6		-43.8	15	992	08 27 15
08 37 15	---	08 26 26	71.1	123.1	-1.4		-41.4	600	1069	08 27 16
08 38 20	1030+415	08 27 31	65.7	106.5	-2.1		-49.9	17	1069	08 38 20
08 48 20	---	08 37 33	67.1	109.6	-1.9		-48.7	600	1146	08 38 21
08 50 00	1150+497	08 39 13	59.9	77.0	-3.3		-64.1	20	1146	08 50 00
09 00 00	---	08 49 15	61.3	78.4	-3.1		-64.7	600	1223	08 50 01
09 02 35	0954+658	08 51 50	75.0	28.0	-1.1		-137.2	40	1223	09 02 35
09 12 35	---	09 01 52	75.6	24.8	-1.0		-142.6	600	1300	09 02 36
09 13 35	0917+624	09 02 52	80.5	14.3	-0.3		-161.4	25	1300	09 13 35
09 23 35	---	09 12 54	80.8	7.3	-0.2		-170.5	600	1377	09 13 36
09 25 15	1150+812	09 14 34	59.6	11.6	-2.7		-130.5	7	1377	09 25 15
09 35 15	---	09 24 36	59.9	11.1	-2.5		-133.4	600	1454	09 25 16
09 39 35	0529+483	09 28 57	53.7	-73.1	3.9		59.9	76	1454	09 39 35
09 49 35	---	09 38 58	52.2	-71.7	4.1		59.1	600	1531	09 39 36
09 49 55	0529+483	09 39 18	52.2	-71.7	4.1		59.1	14	1531	09 49 55
09 59 55	---	09 49 20	50.8	-70.3	4.2		58.3	600	1608	09 49 56

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

======== Setup file: c1024.eofus

Setup group: 2 Station: TORUN Total bit rate: 1024
Format: MARK5B Bits per sample: 2 Sample rate: 32.000
Number of channels: 16 DBE type: DBBC_DDC Speedup factor: 1.00

Disk used to record data.

1st LO=	4200.00	4200.00	4200.00	4200.00	4200.00	4200.00	4200.00	4200.00
	4200.00	4200.00	4200.00	4200.00	4200.00	4200.00	4200.00	4200.00
Net SB=	L	L	U	U	L	L	U	U
	L	L	U	U	L	L	U	U
IF SB =	U	U	U	U	U	U	U	U
	U	U	U	U	U	U	U	U
Pol. =	RCP	LCP	RCP	LCP	RCP	LCP	RCP	LCP
	RCP	LCP	RCP	LCP	RCP	LCP	RCP	LCP
BBC =	1	5	1	5	2	6	2	6
	3	7	3	7	4	8	4	8
BBC SB=	L	L	U	U	L	L	U	U
	L	L	U	U	L	L	U	U
IF =	A1	B1	A1	B1	A1	B1	A1	B1
	A1	B1	A1	B1	A1	B1	A1	B1

The following frequency sets based on these setups were used.

Frequency Set: 3 Setup file default. Used with PCAL = off

LO sum=	4778.49	4778.49	4778.49	4778.49	4850.49	4850.49	4850.49	4850.49
	4922.49	4922.49	4922.49	4922.49	4994.49	4994.49	4994.49	4994.49
BBC fr=	578.49	578.49	578.49	578.49	650.49	650.49	650.49	650.49
	722.49	722.49	722.49	722.49	794.49	794.49	794.49	794.49
Bandwd=	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00
	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00

Matching frequency sets: 3

Track assignments are:
track1= 18, 26, 2, 10, 20, 28, 4, 12, 22, 30, 6, 14, 24, 32, 8, 16
barrel=roll_off

POSITIONS OF SOURCES USED IN RECORDING SCANS

Source	Source position (RA/Dec) (B1950)	(J2000)	(Date)	Error (mas)
* 0529+483	05 29 27.565378	* 05 33 15.865787	05 34 35.166730	0.00
J0533+4822	48 20 47.97040	* 48 22 52.80772	48 23 17.00780	0.00
	/Users/mgirolet/sched/catalogs/sources.gsfc			
	GSFC 2015a astro solution, unpublished 32858 observations.			
* 0642+449	06 42 53.021447	* 06 46 32.025995	06 47 47.320390	0.00
J0646+4451	44 54 30.82738	* 44 51 16.59013	44 49 52.62848	0.00
J0646+44	/Users/mgirolet/sched/catalogs/sources.gsfc			
	GSFC 2015a astro solution, unpublished 135439 observations.			
* 0730+504	07 30 04.386228	* 07 33 52.520572	07 35 10.340043	0.08
J0733+5022	50 28 40.45227	* 50 22 09.06222	50 19 37.23113	0.08
	/Users/mgirolet/sched/catalogs/sources.gsfc			
	GSFC 2015a astro solution, unpublished 434 observations.			
* 0738+313	07 38 00.178556	* 07 41 10.703306	07 42 15.925018	0.11
J0741+3112	31 19 02.05912	* 31 12 00.22911	31 09 23.55123	0.60
J0741+31	/Users/mgirolet/sched/catalogs/sources.gsfc			
	GSFC 2015a astro solution, unpublished 6229 observations.			
* 0745+241	07 45 35.725325	* 07 48 36.109278	07 49 37.874814	0.01
J0748+2400	24 07 55.48905	* 24 00 24.10998	23 57 39.40294	0.02
J0748+24	/Users/mgirolet/sched/catalogs/sources.gsfc			
	GSFC 2015a astro solution, unpublished 3476 observations.			

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* 0748+126          07 48 05.060495   * 07 50 52.045733     07 51 49.265443       0.00
  J0750+1231        12 38 45.47758    * 12 31 04.82825      12 28 19.87804        0.00
  J0750+12          /Users/mgirolet/sched/catalogs/sources.gsfc
                    GSFC 2015a astro solution, unpublished  32130 observations.

* 0804+499          08 04 58.395743   * 08 08 39.666284     08 09 54.802938       0.00
  J0808+4950        49 59 23.07811    * 49 50 36.53041      49 47 20.20821        0.00
  J0808+49          /Users/mgirolet/sched/catalogs/sources.gsfc
                    GSFC 2015a astro solution, unpublished  89744 observations.

* 0814+425          08 14 51.669850   * 08 18 15.999611     08 19 25.494709       0.01
  J0818+4222        42 32 07.73241    * 42 22 45.41491      42 19 19.17891        0.01
  J0818+42          /Users/mgirolet/sched/catalogs/sources.gsfc
                    GSFC 2015a astro solution, unpublished   9210 observations.

* 0821+394          08 21 37.310230   * 08 24 55.483855     08 26 02.902929       0.01
  J0824+3916        39 26 28.25690    * 39 16 41.90404      39 13 08.49913        0.01
  J0824+39          /Users/mgirolet/sched/catalogs/sources.gsfc
  J0824+391A        GSFC 2015a astro solution, unpublished   2327 observations.

* 0827+243          08 27 54.398593   * 08 30 52.086192     08 31 52.713080       0.01
  J0830+2410        24 21 07.66374    * 24 10 59.82033      24 07 22.64429        0.01
  J0830+24          /Users/mgirolet/sched/catalogs/sources.gsfc
                    GSFC 2015a astro solution, unpublished   6490 observations.

* 0838+133          08 38 01.723586   * 08 40 47.588416     08 41 44.226056       0.05
  J0840+1312        13 23 05.68020    * 13 12 23.56409      13 08 37.08737        0.10
  J0840+13          /Users/mgirolet/sched/catalogs/sources.gsfc
                    GSFC 2015a astro solution, unpublished    126 observations.

  OJ287             08 51 57.250615   * 08 54 48.874926     08 55 47.375969       0.00
  J0854+2006        20 17 58.41743    * 20 06 30.64088      20 02 27.70930        0.00
* 0851+202          /Users/mgirolet/sched/catalogs/sources.gsfc
  J0854+20          GSFC 2015a astro solution, unpublished 216540 observations.

* 0917+449          09 17 41.919218   * 09 20 58.458481     09 22 04.809690       0.02
  J0920+4441        44 54 39.62460    * 44 41 53.98511      44 37 21.57134        0.02
  J0920+44          /Users/mgirolet/sched/catalogs/sources.gsfc
                    GSFC 2015a astro solution, unpublished   2190 observations.

* 0917+624          09 17 40.306854   * 09 21 36.231067     09 22 54.790711       0.02
  J0921+6215        62 28 38.64015    * 62 15 52.18037      62 11 16.36425        0.01
  J0921+62          /Users/mgirolet/sched/catalogs/sources.gsfc
                    GSFC 2015a astro solution, unpublished   7302 observations.

  4C39.25           09 23 55.319215   * 09 27 03.013936     09 28 06.513532       0.30
  J0927+3902        39 15 23.56645    * 39 02 20.85186      38 57 43.95476        0.16
* 0923+392          /Users/mgirolet/sched/catalogs/sources.gsfc
  J0927+39          GSFC 2015a astro solution, unpublished 245753 observations.

* 0945+408          09 45 50.078215   * 09 48 55.338148     09 49 57.863063       0.02
  J0948+4039        40 53 43.38100    * 40 39 44.58699      40 34 49.83184        0.02
  J0948+40          /Users/mgirolet/sched/catalogs/sources.gsfc
                    GSFC 2015a astro solution, unpublished   1671 observations.

* 0955+476          09 55 08.528426   * 09 58 19.671641     09 59 23.878131       0.00
  J0958+4725        47 39 28.28176    * 47 25 07.84245      47 20 05.53953        0.00
  J0958+47          /Users/mgirolet/sched/catalogs/sources.gsfc
                    GSFC 2015a astro solution, unpublished 175314 observations.

* 0954+658          09 54 57.847923   * 09 58 47.245104     10 00 02.780802       0.02
  J0958+6533        65 48 15.53888    * 65 33 54.81807      65 28 49.81719        0.01
  J0958+65          /Users/mgirolet/sched/catalogs/sources.gsfc
```

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                  GSFC 2015a astro solution, unpublished  13811 observations.

* 1030+415        10 30 07.800854   * 10 33 03.707873     10 34 02.891595       0.01
  J1033+4116      41 31 34.51921    * 41 16 06.23295      41 10 44.33340        0.01
  J1033+41        /Users/mgirolet/sched/catalogs/sources.gsfc
                  GSFC 2015a astro solution, unpublished   4867 observations.

* 1150+812        11 50 23.482357   * 11 53 12.499197     11 53 59.951168       0.07
  J1153+8058      81 15 10.31175    * 80 58 29.15458      80 52 47.33069        0.01
  J1153+80        /Users/mgirolet/sched/catalogs/sources.gsfc
                  GSFC 2015a astro solution, unpublished   5321 observations.

* 1150+497        11 50 47.999852   * 11 53 24.466635     11 54 16.567899       0.03
  J1153+4931      49 47 50.09415    * 49 31 08.83018      49 25 29.06377        0.03
  J1153+49        /Users/mgirolet/sched/catalogs/sources.gsfc
                  GSFC 2015a astro solution, unpublished   1602 observations.
```

fus09tr

HUNTING THE UNIDENTIFIED GAMMA-RAY SOURCES

PI: *Marcello Giroletti*

Address: INAF IRA

Observing mode: 6cm Continuum C-dual-1024-16-2-2
Schedule for TORUN (Code Tr) Page 2
Hunting the unidentified gamma-ray sources
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 / Stop UT	Source	Start LST	Start EL	Start AZ	Start HA	Start UP	Start ParA	Early Dwell	Disk GBytes	TPStart SYNC
--- Thu 31 Aug 2017 Day 243 ---										
Next scan frequencies:		4778.49	4778.49	4778.49	4778.49	4850.49	4850.49	4850.49	4850.49	
		4922.49	4922.49	4922.49	4922.49	4994.49	4994.49	4994.49	4994.49	
Next BBC frequencies:		578.49	578.49	578.49	578.49	650.49	650.49	650.49	650.49	
		722.49	722.49	722.49	722.49	794.49	794.49	794.49	794.49	
Next scan bandwidths:		16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	
		16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	
06 00 00	0642+449	05 52 42	77.8	127.0	-0.9		-42.5	0	0	06 00 00
06 09 00	---	06 01 43	78.8	133.1	-0.8		-38.2	540	69	06 00 01
06 10 55	0730+504	06 03 39	75.6	91.9	-1.5		-70.1	17	69	06 10 55
06 19 55	---	06 12 40	77.0	94.0	-1.4		-69.8	540	138	06 10 56
06 21 45	0738+313	06 14 31	62.9	135.4	-1.5		-29.5	12	138	06 21 45
06 30 45	---	06 23 32	63.8	139.2	-1.3		-27.3	540	208	06 21 46
06 31 35	0745+241	06 24 22	56.7	142.8	-1.4		-23.4	9	208	06 31 35
06 40 35	---	06 33 24	57.5	146.3	-1.3		-21.4	540	277	06 31 36
06 41 40	0748+126	06 34 29	46.5	152.0	-1.3		-16.8	10	277	06 41 40
06 50 40	---	06 43 30	47.2	155.1	-1.1		-15.0	540	346	06 41 41
06 53 10	0804+499	06 46 01	76.6	95.8	-1.4		-67.7	16	346	06 53 10
07 02 10	---	06 55 02	77.9	98.3	-1.2		-67.0	540	415	06 53 11
07 03 20	0814+425	06 56 12	72.4	119.5	-1.4		-45.0	13	415	07 03 20
07 12 20	---	07 05 14	73.6	123.6	-1.2		-42.6	540	485	07 03 21
07 12 55	0821+394	07 05 49	70.5	127.3	-1.3		-38.1	9	485	07 12 55
07 21 55	---	07 14 50	71.5	131.6	-1.2		-35.4	540	554	07 12 56
07 23 05	0827+243	07 16 01	57.7	146.3	-1.3		-21.4	4	554	07 23 05
07 32 05	---	07 25 02	58.4	149.9	-1.1		-19.2	540	623	07 23 06
07 33 10	0838+133	07 26 07	47.3	152.3	-1.3		-16.7	9	623	07 33 10
07 42 10	---	07 35 09	47.9	155.4	-1.1		-14.9	540	692	07 33 11
07 42 55	0851+202	07 35 54	53.5	147.3	-1.3		-20.2	10	692	07 42 55
07 51 55	---	07 44 55	54.2	150.7	-1.2		-18.2	540	762	07 42 56
07 53 35	0917+449	07 46 36	72.3	108.9	-1.6		-53.0	1	762	07 53 35
07 56 35	---	07 49 36	72.7	110.0	-1.5		-52.5	180	785	07 53 36
08 00 00	0716+714	07 53 02	71.5	-7.4	0.5		166.1	-45	785	08 00 00
08 10 00	---	08 03 03	71.3	-9.8	0.7		161.4	555	862	08 00 01

Schedule for TORUN (Code Tr) Page 3

Hunting the unidentified gamma-ray sources

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 / Stop UT	Source	Start / Stop LST	EL	AZ	HA	UP	ParA	Early Dwell	Disk GBytes	TPStart SYNC
--- Thu 31 Aug 2017 Day 243 ---										
08 10 30	0716+714	08 03 33	71.3	-9.9	0.7		161.2	24	862	08 10 30
08 20 00	---	08 13 05	71.0	-12.1	0.8		156.8	570	935	08 10 31
08 20 30	0716+714	08 13 35	71.0	-12.2	0.8		156.6	24	935	08 20 30
08 30 00	---	08 23 07	70.7	-14.3	1.0		152.4	570	1008	08 20 31
08 30 30	0716+714	08 23 37	70.6	-14.4	1.0		152.2	24	1008	08 30 30
08 40 00	---	08 33 08	70.3	-16.4	1.2		148.0	570	1081	08 30 31
08 40 30	0716+714	08 33 38	70.2	-16.5	1.2		147.8	24	1081	08 40 30
08 50 00	---	08 43 10	69.8	-18.4	1.3		143.8	570	1154	08 40 31
08 50 30	0716+714	08 43 40	69.8	-18.5	1.3		143.6	24	1154	08 50 30
09 00 00	---	08 53 12	69.3	-20.2	1.5		139.8	570	1227	08 50 31
09 00 30	0716+714	08 53 42	69.3	-20.3	1.5		139.6	24	1227	09 00 30
09 10 00	---	09 03 13	68.8	-21.8	1.7		135.8	570	1300	09 00 31
09 10 30	0716+714	09 03 43	68.7	-21.9	1.7		135.6	24	1300	09 10 30
09 20 00	---	09 13 15	68.2	-23.4	1.8		132.0	570	1373	09 10 31
09 20 30	0716+714	09 13 45	68.2	-23.4	1.8		131.9	24	1373	09 20 30
09 30 00	---	09 23 17	67.6	-24.7	2.0		128.4	570	1446	09 20 31
09 30 30	0716+714	09 23 47	67.5	-24.8	2.0		128.2	24	1446	09 30 30
09 40 00	---	09 33 18	66.9	-26.0	2.2		124.9	570	1519	09 30 31
09 40 30	0716+714	09 33 48	66.9	-26.0	2.2		124.7	24	1519	09 40 30
09 50 00	---	09 43 20	66.3	-27.1	2.3		121.5	570	1592	09 40 31
09 50 30	0716+714	09 43 50	66.2	-27.1	2.3		121.3	24	1592	09 50 30
10 00 00	---	09 53 21	65.6	-28.1	2.5		118.2	570	1665	09 50 31

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

======== Setup file: c1024.eofus

Setup group: 2 Station: TORUN Total bit rate: 1024
Format: MARK5B Bits per sample: 2 Sample rate: 32.000
Number of channels: 16 DBE type: DBBC_DDC Speedup factor: 1.00

Disk used to record data.

```
  1st LO=   4200.00   4200.00   4200.00   4200.00   4200.00   4200.00   4200.00   4200.00
            4200.00   4200.00   4200.00   4200.00   4200.00   4200.00   4200.00   4200.00
  Net SB=         L         L         U         U         L         L         U         U
                  L         L         U         U         L         L         U         U
  IF SB =         U         U         U         U         U         U         U         U
                  U         U         U         U         U         U         U         U
  Pol.  =       RCP       LCP       RCP       LCP       RCP       LCP       RCP       LCP
                RCP       LCP       RCP       LCP       RCP       LCP       RCP       LCP
  BBC   =         1         5         1         5         2         6         2         6
                  3         7         3         7         4         8         4         8
  BBC SB=         L         L         U         U         L         L         U         U
                  L         L         U         U         L         L         U         U
  IF    =        A1        B1        A1        B1        A1        B1        A1        B1
                 A1        B1        A1        B1        A1        B1        A1        B1

 The following frequency sets based on these setups were used.

  Frequency Set:   3  Setup file default.  Used with PCAL = off
  LO sum=   4778.49  4778.49  4778.49  4778.49  4850.49  4850.49  4850.49  4850.49
            4922.49  4922.49  4922.49  4922.49  4994.49  4994.49  4994.49  4994.49
  BBC fr=    578.49   578.49   578.49   578.49   650.49   650.49   650.49   650.49
             722.49   722.49   722.49   722.49   794.49   794.49   794.49   794.49
  Bandwd=     16.00    16.00    16.00    16.00    16.00    16.00    16.00    16.00
              16.00    16.00    16.00    16.00    16.00    16.00    16.00    16.00
   Matching frequency sets:   3

  Track assignments are:
   track1=  18, 26,  2, 10, 20, 28,  4, 12, 22, 30,  6, 14, 24, 32,  8, 16
   barrel=roll_off



POSITIONS OF SOURCES USED IN RECORDING SCANS

  Source                          Source position (RA/Dec)                          Error
                        (B1950)             (J2000)             (Date)              (mas)

* 0642+449           06 42 53.021447   * 06 46 32.025995     06 47 47.360705        0.00
  J0646+4451         44 54 30.82738    * 44 51 16.59013      44 49 52.52913         0.00
  J0646+44           /Users/mgirolet/sched/catalogs/sources.gsfc
                     GSFC 2015a astro solution, unpublished 135439 observations.

* 0716+714           07 16 13.029731   * 07 21 53.448466     07 23 48.549457        0.01
  J0721+7120         71 26 15.17408    * 71 20 36.36342      71 18 15.40321         0.00
  J0721+71           /Users/mgirolet/sched/catalogs/sources.gsfc
                     GSFC 2015a astro solution, unpublished  63527 observations.

* 0730+504           07 30 04.386228   * 07 33 52.520572     07 35 10.379422        0.08
  J0733+5022         50 28 40.45227    * 50 22 09.06222      50 19 37.06149         0.08
                     /Users/mgirolet/sched/catalogs/sources.gsfc
                     GSFC 2015a astro solution, unpublished    434 observations.

* 0738+313           07 38 00.178556   * 07 41 10.703306     07 42 15.955014        0.11
  J0741+3112         31 19 02.05912    * 31 12 00.22911      31 09 23.44744         0.60
  J0741+31           /Users/mgirolet/sched/catalogs/sources.gsfc
                     GSFC 2015a astro solution, unpublished   6229 observations.

* 0745+241           07 45 35.725325   * 07 48 36.109278     07 49 37.902430        0.01
  J0748+2400         24 07 55.48905    * 24 00 24.10998      23 57 39.32470         0.02
  J0748+24           /Users/mgirolet/sched/catalogs/sources.gsfc
                     GSFC 2015a astro solution, unpublished   3476 observations.
```

```
* 0748+126          07 48 05.060495   * 07 50 52.045733     07 51 49.290987       0.00
  J0750+1231        12 38 45.47758    * 12 31 04.82825      12 28 19.85035        0.00
  J0750+12          /Users/mgirolet/sched/catalogs/sources.gsfc
                    GSFC 2015a astro solution, unpublished  32130 observations.

* 0804+499          08 04 58.395743   * 08 08 39.666284     08 09 54.837655       0.00
  J0808+4950        49 59 23.07811    * 49 50 36.53041      49 47 20.00581        0.00
  J0808+49          /Users/mgirolet/sched/catalogs/sources.gsfc
                    GSFC 2015a astro solution, unpublished  89744 observations.

* 0814+425          08 14 51.669850   * 08 18 15.999611     08 19 25.524652       0.01
  J0818+4222        42 32 07.73241    * 42 22 45.41491      42 19 18.99818        0.01
  J0818+42          /Users/mgirolet/sched/catalogs/sources.gsfc
                    GSFC 2015a astro solution, unpublished   9210 observations.

* 0821+394          08 21 37.310230   * 08 24 55.483855     08 26 02.930990       0.01
  J0824+3916        39 26 28.25690    * 39 16 41.90404      39 13 08.32676        0.01
  J0824+39          /Users/mgirolet/sched/catalogs/sources.gsfc
  J0824+391A        GSFC 2015a astro solution, unpublished   2327 observations.

* 0827+243          08 27 54.398593   * 08 30 52.086192     08 31 52.736908       0.01
  J0830+2410        24 21 07.66374    * 24 10 59.82033      24 07 22.53994        0.01
  J0830+24          /Users/mgirolet/sched/catalogs/sources.gsfc
                    GSFC 2015a astro solution, unpublished   6490 observations.

* 0838+133          08 38 01.723586   * 08 40 47.588416     08 41 44.247461       0.05
  J0840+1312        13 23 05.68020    * 13 12 23.56409      13 08 37.03536        0.10
  J0840+13          /Users/mgirolet/sched/catalogs/sources.gsfc
                    GSFC 2015a astro solution, unpublished    126 observations.

  OJ287             08 51 57.250615   * 08 54 48.874926     08 55 47.396850       0.00
  J0854+2006        20 17 58.41743    * 20 06 30.64088      20 02 27.61452        0.00
* 0851+202          /Users/mgirolet/sched/catalogs/sources.gsfc
  J0854+20          GSFC 2015a astro solution, unpublished 216540 observations.

* 0917+449          09 17 41.919218   * 09 20 58.458481     09 22 04.832128       0.02
  J0920+4441        44 54 39.62460    * 44 41 53.98511      44 37 21.33833        0.02
  J0920+44          /Users/mgirolet/sched/catalogs/sources.gsfc
                    GSFC 2015a astro solution, unpublished   2190 observations.
```

Contents