

# SEISMOLOGICAL BULLETIN

## IGC SUPPLEMENT SOUTH POLE - BYRD

OCTOBER-DECEMBER, 1959

MSI - 226A

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U. S. DEPARTMENT OF COMMERCE

Luther H. Hodges, Secretary

COAST AND GEODETIC SURVEY—WASHINGTON

H. Arnold Karo, Director

FOR OFFICIAL DISTRIBUTION



## IGC SUPPLEMENT

October - December  
1959

The instrumental results tabulated in this supplement are from the following seismographic stations.

<u>Station</u>	<u>Latitude</u>	<u>Longitude</u>	<u>Foundation</u>	<u>Elevation</u>	<u>Instruments</u>	<u>Components</u>	<u>T<sub>0</sub></u> <u>(Sec.)</u>	<u>T<sub>g</sub></u> <u>(Sec.)</u>	<u>Time Scale</u>
South Pole (SPA) In Charge: W.S. Jacobs	90° S.	0°	1995 meters of ice.	2800 meters.	Benioff Paper. Wilson-Lamison (120° E.-60° W.) Horizontal Film.	Z	1.6	0.5	60mm/min.
							5.6	0.48	15mm/min.
Byrd (BYR) In Charge: L.E. Davis	80°01'S.	119°31'W.	2570 meters of ice.	1515 meters.	Benioff. Wilson-Lamison with G.E. Galvo. Wilson Lamison with G.E. Galvo.	Z	1.2	0.5	60mm/min.
						N	6.2	3.5	30mm/min.
						E	7.2	3.5	30mm/min.

These stations were first established by the Coast and Geodetic Survey for the IGY to provide additional control for locating teleseismic epicenters in regions inadequately covered by previously existing stations and to provide data for studies in regional seismicity, crustal structure and other pertinent earth science problems.



Date and Station	Phase (GCT)	Date and Station	Phase (GCT)	Date and Station	Phase (GCT)	Date and Station	Phase (GCT)
Oct. 1 BYR	iP 03 17 43	SPA	eP 00 52 28	SPA	eP 09 24 13	Oct. 7 BYR	eP' 08 50 01
SPA	eP 03 18 16	Oct. 3 SPA	eP 01 29 53	Oct. 5 BYR	eP 10 08 37	i 50 10	ePP 53 01
Oct. 1 SPA	i(P) 05 53 03 i 53 30	Oct. 3 SPA	iP 02 49 21 i 49 55 e 50 51	Oct. 5 BYR	e(P') 11 53 23	SPA	eP' 08 49 52 ePP 52 10 ePKS 53 17
Oct. 1 SPA	e(P) 05 56 53 i 57 30	Oct. 3 SPA	e(P) 03 12 23	Oct. 5 SPA	eP' 11 53 27	Oct. 7 BYR	eP 11 47 11
Oct. 1 SPA	e(P) 09 55 10 e 55 34	Oct. 3 BYR	eP 05 05 22	Oct. 5 BYR	eP 15 53 50 e 54 07	SPA	eP 11 48 06
Oct. 1 BYR	iP 19 04 57	Oct. 3 SPA	e(P) 10 28 01	Oct. 5 SPA	eP 15 53 31 i 53 50	Oct. 7 SPA	eP 20 24 12
Oct. 1 BYR	eP 19 08 29	Oct. 3 SPA	iP 12 16 47	Oct. 5 BYR	eP 16 24 38	Oct. 7 SPA	eP 22 34 10
Oct. 2 SPA	e(P) 01 01 54	Oct. 3 SPA	eP 12 30 30	Oct. 5 BYR	ePP 20 56 24	Oct. 7 SPA	eP 23 07 38
Oct. 2 SPA	eP 01 25 57 e 26 18	Oct. 3 BYR	eP 21 54 08	Oct. 5 SPA	eP' 20 53 19 ePP 56 40	Oct. 8 BYR	iP 00 14 33 e 14 48
Oct. 2 BYR	eP 04 27 53	Oct. 3 BYR	eP 23 24 25	Oct. 6 BYR	eP 05 57 45 e 58 32 ePP 06 01 33	SPA	iP 00 14 51
SPA	eP 04 28 15	Oct. 3 SPA	eP 23 24 34 e(PcP) 26 33	Oct. 6 SPA	eP 05 57 22 iPP 06 00 56	Oct. 8 SPA	iP' 02 54 47 i 55 02
Oct. 2 BYR	eP 11 34 35	Oct. 4 BYR	eP 00 47 38	Oct. 6 SPA	eP 06 52 32	Oct. 8 SPA	eP 12 06 37
Oct. 2 BYR	iP 15 28 16 i 28 36	Oct. 4 SPA	iP 00 48 21	Oct. 6 BYR	eP 11 04 53	Oct. 8 BYR	eP 12 19 20
SPA	iP 15 29 06 e 29 21	Oct. 4 BYR	eP 11 02 30 iP 02 59 eS 03 13	Oct. 6 BYR	eP 12 50 31	SPA	eP 12 18 57
Oct. 2 SPA	i(P) 16 10 45	Oct. 4 SPA	eP 11 03 13 epP 03 43 isP 04 00	Oct. 6 SPA	eP 12 51 04	Oct. 8 SPA	eP 13 30 10
Oct. 2 BYR	eP 17 55 11	Oct. 4 BYR	eP 12 49 06	Oct. 6 BYR	eP 13 53 01 i 53 13	Oct. 8 BYR	eP' 14 33 57
Oct. 2 SPA	eP 19 38 34	Oct. 4 SPA	eP 14 11 09	Oct. 6 SPA	e(P) 13 52 38	Oct. 8 SPA	eP' 14 33 37
Oct. 2 BYR	eP 19 46 15 e 48 05	Oct. 4 BYR	eP 19 34 20	Oct. 6 BYR	iP 15 23 08	Oct. 8 BYR	eP 16 27 44
SPA	eP 19 45 27	Oct. 4 BYR	eP 22 28 48 e 28 54	Oct. 6 SPA	eP 15 22 39 e 24 19	Oct. 8 SPA	eP 21 26 32
Oct. 2 SPA	i(P) 21 47 49 e 49 23	Oct. 4 BYR	eP 22 29 36 i 29 44	Oct. 6 BYR	eP 19 15 30 e 15 40	Oct. 9 BYR	iP 01 28 55 e 32 20
Oct. 2 SPA	iP 22 10 28 i 11 06	Oct. 5 BYR	eP 01 18 34	Oct. 6 SPA	eP 19 16 06	Oct. 9 BYR	eP 01 38 10
Oct. 3 BYR	eP 00 52 49	Oct. 5 BYR	e(P) 09 24 01	Oct. 7 SPA	eP 00 58 09	Oct. 9 SPA	iP 11 47 36



## SEISMOLOGICAL BULLETIN

Date and Station	Phase (GCT)	Date and Station	Phase (GCT)	Date and Station	Phase (GCT)	Date and Station	Phase (GCT)
Oct. 9 SPA	iP h m s 14 04 21	Oct. 12 SPA	eP h m s 10 25 38	Oct. 15 BYR	eP h m s 06 29 00	Oct. 16 SPA	eP' h m s 08 33 05
Oct. 9 SPA	e(P) 17 15 38	Oct. 12 SPA	e(P) 12 27 07		e 29 03	Oct. 16 BYR	eP 09 06 04
Oct. 9 SPA	eP 22 21 26	Oct. 12 BYR	eP 13 18 35		ePP 32 53	Oct. 16 BYR	eP 11 01 23
Oct. 10 SPA	iP 01 24 35		e 18 52	SPA	eP 06 28 34	Oct. 16 SPA	eP 11 00 25
Oct. 11 SPA	e(P) 03 06 30	Oct. 12 SPA	eP 13 18 14		i 29 46	Oct. 16 BYR	eP 16 28 46
Oct. 11 SPA	e(P) 06 51 37	Oct. 12 BYR	iP 19 34 16	Oct. 15 BYR	eP 07 33 17	Oct. 16 SPA	eP 16 28 23
Oct. 11 SPA	eP' 09 53 00		i 34 29		e(S) 39 16	Oct. 16 BYR	eP 16 28 46
Oct. 11 BYR	eP 10 06 05	Oct. 13 BYR	eP 02 43 12	Oct. 15 BYR	eP 07 42 19	Oct. 17 BYR	eP 01 28 03
Oct. 11 SPA	eP 10 06 06		e 43 24		ePKS 08 03 08	Oct. 17 SPA	eP 01 28 55
Oct. 11 BYR	eP 11 02 58	Oct. 13 BYR	eP 21 03 59	Oct. 15 BYR	eP 10 40 04	Oct. 17 SPA	eP 03 57 33
Oct. 11 SPA	e(P) 11 03 20	Oct. 13 SPA	eP 21 04 41	Oct. 15 BYR	iP 14 00 53	Oct. 17 BYR	eP 08 40 35
Oct. 11 BYR	eP 12 12 56		e 05 00		i 01 03	Oct. 17 BYR	i 40 49
Oct. 11 SPA	e(P) 12 13 22	Oct. 14 BYR	eP 01 23 57		ePP 02 10	Oct. 17 SPA	iPP 41 01
Oct. 11 SPA	iP 18 00 45	Oct. 14 BYR	iP 07 32 08		e(S) 07 10	Oct. 17 SPA	iPcP 44 04
Oct. 11 SPA	e 01 03		e 07 32 13	Oct. 15 SPA	eP 15 26 25	Oct. 17 SPA	eP 11 04 59
Oct. 11 BYR	eP 20 13 13	Oct. 14 BYR	eP' 08 20 22			Oct. 17 SPA	e(P) 15 40 14
Oct. 11 SPA	eP 20 13 48		e 08 20 30	Oct. 15 BYR	eP 19 25 41	Oct. 17 SPA	eP' 20 47 24
Oct. 11 BYR	eP 20 15 49	Oct. 14 BYR	iP 11 07 18		i 26 49	Oct. 18 SPA	eP 03 34 24
Oct. 11 SPA	eP 20 15 25		e 20 38	Oct. 15 SPA	eP' 20 53 12	Oct. 18 BYR	e(P') 06 03 03
Oct. 12 SPA	eP' 01 57 47	Oct. 14 SPA	iP 11 06 36			Oct. 18 SPA	eP 10 39 01
Oct. 12 BYR	eP 03 35 42		iPcP 07 14	Oct. 16 BYR	eP 01 24 23	Oct. 18 SPA	i 39 22
Oct. 12 SPA	iP 03 35 05	Oct. 14 BYR	eP 11 54 46		ipP 24 51	Oct. 18 SPA	iP 11 04 28
Oct. 12 BYR	e 35 42		eP 11 55 08	Oct. 16 BYR	esP 25 03	Oct. 18 SPA	eP 12 27 28
Oct. 12 BYR	eP 03 54 15	Oct. 14 SPA	iP 15 25 10		iPcP 25 27	Oct. 18 SPA	eP 17 25 49
Oct. 12 BYR	ipP 54 45	Oct. 14 BYR	eP 17 59 58	Oct. 16 SPA	eP 01 25 05	Oct. 18 BYR	eP' 17 25 49
Oct. 12 BYR	isP 54 58		eP 20 45 14		ipP 25 33	Oct. 18 BYR	i 25 53
Oct. 12 BYR	e 55 18	Oct. 14 BYR	eP 20 45 44	Oct. 16 BYR	esP 25 51	Oct. 18 SPA	i 26 23
Oct. 12 BYR	e 55 23		eP 20 45 44	Oct. 16 BYR	e(P) 03 20 35	Oct. 18 SPA	eP' 17 25 47
Oct. 12 SPA	eP 03 54 53	Oct. 15 BYR	eP 04 35 25			Oct. 18 SPA	i 26 19
Oct. 12 SPA	ePcP 55 13	Oct. 15 SPA	eP 04 35 19				
Oct. 12 SPA	epP 55 23						



Date and Station	Phase (GCT)	Date and Station	Phase (GCT)	Date and Station	Phase (GCT)	Date and Station	Phase (GCT)
Oct. 18 SPA	eP h m s 19 25 30	Oct. 20 BYR	e(P) h m s 02 49 04	Oct. 23 BYR	eP h m s 06 28 16 ePcP 28 44	SPA	eP h m s 19 45 38
Oct. 18 SPA	e(P') 20 01 18	Oct. 20 SPA	eP 05 39 16	SPA	eP 06 28 54	Oct. 27 SPA	eP' 06 31 35
Oct. 18 BYR	eP 23 38 11 i 38 23 epP 38 48	Oct. 20 BYR	eP' 08 19 58	Oct. 23 BYR	eP 17 58 36	Oct. 27 BYR	eP' 07 11 51 ipP' 12 24 isP' 12 40 iPP 13 31 i 15 28 i 15 56 e 23 03
SPA	eP 23 37 34	Oct. 20 SPA	eP 12 53 22	SPA	eP 18 00 01 i 00 10	SPA	eP' 07 12 02 ePP 14 44
Oct. 19 BYR	eP 01 35 05 i 35 21	Oct. 20 BYR	eP 13 35 51	Oct. 24 BYR	eP 03 08 18	Oct. 27 SPA	eP 09 21 15
SPA	eP 01 35 39 i 35 44 ePcP 36 26	SPA	eP 13 36 07	Oct. 24 BYR	eP 12 11 54	Oct. 27 SPA	eP 09 21 15
Oct. 19 BYR	eP 02 23 06 ePcP 23 57	Oct. 20 SPA	eP 18 30 33	Oct. 24 BYR	e(P) 17 29 34	Oct. 27 BYR	eP' 13 38 10 e 38 20
SPA	eP 02 23 39 i 24 34	Oct. 20 BYR	eP 21 49 39 i 49 55	Oct. 25 BYR	eP' 00 00 02 i 00 10 i 00 21	Oct. 28 BYR	eP 08 26 28 i 26 39 i 26 52
Oct. 19 BYR	eP' 03 06 04 i 06 27 e 06 33	SPA	eP 21 49 42	Oct. 25 SPA	eP 01 59 22	SPA	eP 08 26 33
SPA	e(P') 03 06 07	Oct. 20 SPA	eP 22 30 32	Oct. 25 BYR	eP 05 04 25 e 05 49	Oct. 28 BYR	eP 09 32 16
Oct. 19 BYR	eP 04 45 29	Oct. 21 BYR	eP 01 17 25 i 17 57	Oct. 25 SPA	eP 05 05 05	SPA	eP 09 32 45 i 33 50
SPA	eP 04 46 01	Oct. 21 BYR	eP 06 12 52 i 13 17 e(PP) 16 39	Oct. 25 BYR	e(P) 06 54 16	Oct. 28 BYR	eP 09 45 14 e 45 38
Oct. 19 BYR	eP 08 37 24 eS 45 21	SPA	eP 06 13 01 e 13 56	Oct. 25 SPA	e(P) 17 34 07	Oct. 29 BYR	iP 10 54 41 i 55 10
Oct. 19 BYR	eP 09 25 10	Oct. 21 BYR	iP 06 14 07 i 14 40	Oct. 25 BYR	eP 18 43 03 e 44 48	Oct. 29 BYR	iP' 14 29 38 i 29 55
SPA	eP 09 25 46 i 25 59	Oct. 21 BYR	e(P) 21 03 57	SPA	eP 18 43 40	SPA	iP' 14 30 10
Oct. 19 BYR	eP 14 02 17	Oct. 21 BYR	iP 22 03 04	Oct. 26 BYR	eP' 07 54 15 ePP 56 18	Oct. 29 BYR	eP' 14 48 35 i 48 43 ipP' 50 21
SPA	eP 14 02 46 epP 04 47	Oct. 22 BYR	eP 04 59 39 i 59 46	SPA	eP' 07 54 13 e 54 25	Oct. 29 BYR	eP 22 11 28 ePP 13 09
Oct. 19 BYR	eP 14 40 37 e 40 43	SPA	eP 04 58 50 e 58 56	Oct. 26 BYR	eP' 10 48 13 i 48 25 epP' 48 55 esP' 49 15	SPA	eP 22 10 40
SPA	eP 14 41 11	Oct. 22 BYR	iP 05 06 21 i 06 28	SPA	eP' 10 48 19	Oct. 30 BYR	eP' 04 20 21 i 20 31
Oct. 19 BYR	eP 16 02 44 i 03 23 iPP 03 41 iPcP 05 10 eL 08 33	SPA	eP 05 05 52 e 05 59	Oct. 23 BYR	eP 03 55 59	SPA	eP' 04 20 28
SPA	eP 16 02 30	Oct. 23 BYR	iP 04 29 04	SPA	eP 03 56 01		



Date and Station	Phase (GCT)	Date and Station	Phase (GCT)	Date and Station	Phase (GCT)	Date and Station	Phase (GCT)
Oct. 30 BYR	iP i 05 32 38 33 55	Nov. 2 BYR	eP' 09 02 34	Nov. 4 BYR	eP 10 27 38	SPA	eP 01 23 55
SPA	eP e 05 33 47 34 32	SPA	eP' e 09 02 33 03 17	Nov. 4 BYR	e(P) 17 24 22	Nov. 6 BYR	e(P) 01 51 24
Oct. 30 BYR	eP i 06 37 35 38 57	Nov. 2 BYR	eP' 13 34 26	SPA	eP 17 25 01	Nov. 6 BYR	eP 02 21 38
Oct. 30 BYR	eP e 07 15 54 16 19	Nov. 2 SPA	e(P) e 13 50 29 50 47 51 06	Nov. 4 BYR	eP 17 55 47	Nov. 6 BYR	eP 05 15 45
SPA	eP 07 16 51	Nov. 2 BYR	e(P) 17 59 32	Nov. 4 BYR	eP e 18 32 50 34 33	Nov. 6 BYR	eP i 11 53 23 54 02
Oct. 30 BYR	eP ipP isP 11 22 46 22 59 23 06	Nov. 2 BYR	eP 19 24 07	SPA	eP e 18 33 19 35 03	SPA	eP iPP 11 53 59 55 43
SPA	iP ipP isP 11 22 49 23 02 23 11	Nov. 2 BYR	eP epP e 20 16 02 16 14 17 18	Nov. 4 BYR	eP 19 18 59	Nov. 6 BYR	eP e 12 37 06 37 32
Oct. 30 BYR	eP e(PP) 11 34 04 35 02	Nov. 2 BYR	eP epP e 20 16 02 16 14 17 18	Nov. 4 BYR	eP 22 03 54	SPA	eP e 12 37 15 37 39
SPA	eP e(PP) 11 33 46 34 31	Nov. 2 BYR	eP eS 20 16 02 26 09	Nov. 5 SPA	eP e 04 57 54 58 16	Nov. 7 SPA	eP' 02 51 11
Oct. 30 BYR	eP 14 08 44	SPA	eP ipP i 20 16 02 16 14 17 17	Nov. 5 BYR	eP ipP 05 57 53 58 09	Nov. 7 BYR	eP 08 29 47
SPA	eP e 14 09 19 09 45	Nov. 2 BYR	eP 22 03 26	SPA	eP 05 57 54	SPA	eP 08 30 02
Oct. 30 BYR	eP i 21 47 29 47 54	SPA	eP 22 04 00	Nov. 5 BYR	e(P) 11 13 06	Nov. 7 SPA	e(P) 15 30 42
SPA	e(P) 21 48 00	Nov. 3 BYR	eP 00 45 59	SPA	eP 11 12 18	Nov. 7 BYR	eP 22 26 34
Oct. 31 BYR	eP 03 03 59	SPA	eP 00 45 40	Nov. 5 BYR	iP iPcP ipP 12 01 49 02 04 02 14	SPA	eP 22 27 09
Oct. 31 BYR	iP epP i eP'P' 04 37 32 39 25 41 57 05 05 40	Nov. 3 BYR	eP 06 07 50	Nov. 5 BYR	iP 12 01 49	Nov. 7 BYR	eP 23 46 54
SPA	eP e 04 38 02 46 58	Nov. 3 BYR	eP 09 15 20	Nov. 5 BYR	eP 17 49 55	Nov. 8 BYR	e(P) 02 27 56
Oct. 31 SPA	e(P) 11 15 20	SPA	eP i 09 15 52 16 07	Nov. 5 BYR	eP' 15 18 08	Nov. 8 BYR	eP 11 16 01
Oct. 31 SPA	eP 13 12 10	Nov. 3 BYR	eP epP eS 09 52 48 57 19 10 03 11	Nov. 5 BYR	iP e(sP) ePKKP 17 50 23 51 35 18 09 01	Nov. 8 BYR	eP' i iPP 14 14 02 14 17 16 56
Oct. 31 BYR	eP epP 18 43 45 44 19	Nov. 3 BYR	eP'P' 18 39	Nov. 5 BYR	iP 17 50 23	SPA	eP' ePP e 14 14 13 16 42 26 20
SPA	eP epP 18 44 20 44 49	SPA	iP e eS 09 52 13 57 47 10 02 07 03 53	Nov. 5 BYR	e(sP) 17 50 23	Nov. 8 BYR	eP epP esP 14 39 32 39 53 40 05
		Nov. 4 SPA	eP 10 27 08	Nov. 6 BYR	eP 01 19 45	Nov. 8 BYR	e(P) 16 47 58
		Nov. 3 BYR	eP 16 02 08	Nov. 6 BYR	iP 01 23 50	SPA	e(P) 16 48 59
		Nov. 3 BYR	e(P) 17 30 29				



Date and Station	Phase (GCT)	Date and Station	Phase (GCT)	Date and Station	Phase (GCT)	Date and Station	Phase (GCT)
Nov. 9	h m s	Nov. 12	h m s	Nov. 16	h m s	Nov. 19	h m s
BYR eP	04 24 32	BYR eP	20 42 05	BYR iP	01 08 04	BYR eP	11 21 11
ePP	25 30	i(PcP)	42 28	ipP	08 28	ipP	21 40
i(PPP)	26 09	SPA eP	20 42 19	SPA eP	01 08 49	isP	21 55
ePcP	27 20	Nov. 13		ipP	09 15	ePP	25 06
eL	32 38	BYR eP	03 10 03	isP	09 26	epPP	25 30
SPA eP	04 25 56	Nov. 13		eS	16 35	esPP	25 52
Nov. 9		Nov. 13		Nov. 16		is	31 29
BYR eP	18 17 49	BYR eP	10 15 47	BYR eP	05 42 57	SPA iP	11 21 06
SPA e(P)	18 17 16	SPA eP	10 16 15	Nov. 16		ipP	21 24
Nov. 9		Nov. 13		BYR eP	10 34 27	i	22 06
BYR e(P)	19 38 20	BYR eP	18 05 34	ePP	38 01	i(PP)	24 04
Nov. 9		Nov. 14		SPA eP	10 34 23	eS	31 26
BYR eP	19 57 30	BYR eP	01 51 31	ePP	37 54	Nov. 19	
SPA eP	19 58 03	Nov. 14		Nov. 16		BYR e(P)	18 10 04
Nov. 9		Nov. 14		SPA i(P)	15 39 46	Nov. 20	
BYR eP	20 43 52	BYR eP	04 49 33	Nov. 17		SPA e(P')	00 13 12
e	43 16	Nov. 14		BYR eP	02 45 33	Nov. 20	
Nov. 10		Nov. 14		SPA i(P)	02 44 40	BYR eP	00 30 13
BYR e(P)	00 37 54	BYR eP	10 46 45	Nov. 17		i	30 29
SPA e(P)	00 37 53	Nov. 14		BYR eP	02 45 33	SPA eP	00 31 46
Nov. 10		Nov. 14		Nov. 17		Nov. 20	
BYR eP	06 19 20	SPA eP	11 59 12	BYR eP	11 35 29	SPA eP	07 44 28
Nov. 10		Nov. 14		Nov. 17		Nov. 20	
BYR iP	08 20 40	Nov. 14		BYR eP	15 29 44	BYR eP	08 58 32
epP	21 28	Nov. 14		Nov. 17		Nov. 20	
SPA eP	08 20 41	BYR e(P)	20 32 07	BYR eP	17 36 17	BYR e(P)	10 11 55
Nov. 10		SPA eP	20 32 17	SPA eP	17 36 06	i	12 20
BYR eP	09 48 53	Nov. 14		Nov. 17		Nov. 20	
Nov. 10		BYR eP	23 19 56	BYR eP	23 20 36	BYR eP	11 09 32
SPA eP	10 13 39	SPA eP	23 20 18	SPA eP	23 21 00	e	10 21
Nov. 10		Nov. 15		i	21 15	SPA eP	11 09 32
BYR eP	10 13 28	BYR e(P)	00 39 45	i	21 28	Nov. 20	
Nov. 10		e	40 19	Nov. 18		BYR eP	15 57 56
BYR eP	16 53 09	Nov. 15		BYR e(P)	05 37 21	SPA eP	15 28 30
e	54 37	BYR e(P)	02 27 28	SPA eP	05 37 57	i	28 54
SPA eP	16 53 13	Nov. 15		ePcP	38 29	Nov. 20	
Nov. 10		BYR eP'	10 44 31	Nov. 18		BYR eP	16 43 30
BYR eP	17 08 29	e	44 42	SPA e(P)	18 46 47	Nov. 20	
Nov. 12		ePP	45 19	Nov. 18		BYR eP	19 42 49
BYR eP	05 41 04	e	45 39	SPA eP	20 49 56	SPA eP	19 42 45
Nov. 12		e	47 28	Nov. 18		Nov. 21	
SPA eP	05 41 28	SPA eP'	10 44 18	BYR eP	20 54 01	SPA eP	10 43 40
Nov. 12		e	46 21	Nov. 19		Nov. 21	
BYR eP	06 00 40	e	56 31	SPA eP'	04 54 25	BYR eP	12 25 26
Nov. 12		Nov. 15		e	55 30	Nov. 22	
BYR eP	09 27 19	BYR eP'	17 28 05	Nov. 19		BYR eP	05 46 55
Nov. 12		i(PP)	30 46	BYR eP	05 36 05	SPA eP	05 47 11
BYR eP	09 27 19	e	33 06	e	36 31		
Nov. 12		e	34 03	SPA eP	05 36 40		
BYR eP	09 27 19	e	37 03	e	36 53		
Nov. 12		e	40 26	e	37 44		
BYR eP	17 30 21	SPA eP	17 27 49				
		e	29 54				



Date and Station	Phase (GCT)	Date and Station	Phase (GCT)	Date and Station	Phase (GCT)	Date and Station	Phase (GCT)
Nov. 22 BYR	eP h m s 13 00 52	SPA	iP h m s 16 26 04	Nov. 25 SPA	e(P) h m s 04 35 27	SPA	eP h m s 07 51 32
SPA	iP i 13 00 41 00 55	Nov. 23 BYR	eP 18 16 26	Nov. 25 BYR	eP 05 33 37	Nov. 26 BYR	iP 09 44 18
Nov. 22 BYR	eP 15 47 25	SPA	eP 18 17 01	Nov. 25 BYR	e(P) 08 10 22	SPA	iP 09 44 17
SPA	eP 15 47 48	Nov. 23 BYR	eP 19 22 47	Nov. 25 SPA	e(P) 08 19 39	Nov. 26 SPA	eP 10 19 51
Nov. 22 BYR	eP 16 07 14	SPA	eP 19 23 21	Nov. 25 SPA	e(P) 09 38 37	Nov. 26 BYR	iP 16 16 27
SPA	eP 16 07 39	Nov. 23 BYR	e(P) 19 44 21	Nov. 25 SPA	eP 11 36 36 e 36 50	SPA	eP e 16 17 03 17 23
Nov. 22 BYR	eP 16 28 07	Nov. 23 BYR	eP 20 48 53	Nov. 25 SPA	eP 15 43 46	Nov. 26 BYR	eP 16 47 32
Nov. 22 BYR	eP iPP e ePcP eS eL 16 32 11 32 41 33 03 36 02 36 36 38 30	Nov. 23 BYR	eP' 21 24 10	Nov. 25 BYR	eP 15 44 21	SPA	eP 16 47 50
SPA	iP i iPP e 16 33 38 34 05 34 50 45 49	SPA	eP' 21 24 01	Nov. 25 SPA	eP 17 44 56	Nov. 26 BYR	iP 16 53 07
Nov. 22 BYR	eP epP eS eP'P' 19 44 20 46 07 52 18 20 12 56	Nov. 23 BYR	eP 23 22 44	Nov. 25 BYR	eP 17 44 56	SPA	eP 16 53 44
SPA	iP i iPP e 19 44 50 45 10 46 39 50 44 53 13 20 12 47 12 56	SPA	eP 23 24 03	SPA	eP 17 45 34	Nov. 26 BYR	eP ePP eS 23 22 37 25 51 33 05
Nov. 22 BYR	eP epP eS eP'P' 19 44 20 46 07 52 18 20 12 56	Nov. 24 BYR	eP 01 16 12	Nov. 25 SPA	eP 19 17 48	SPA	eP 23 22 00 i iPP e(S) 22 11 25 23 32 09
SPA	iP iPcP epP e iS eP'P' e 19 44 50 45 10 46 39 50 44 53 13 20 12 47 12 56	SPA	eP 01 17 37	Nov. 25 BYR	iP 20 11 23	Nov. 27 BYR	eP' 00 41 46
Nov. 22 BYR	eP 22 16 47	Nov. 24 SPA	e(P) 01 23 35	Nov. 25 SPA	eP 22 39 22	Nov. 27 BYR	eP' 00 45 48
Nov. 22 BYR	eP 22 53 48	Nov. 24 BYR	eP 09 37 48 e 38 13	Nov. 26 BYR	iP 00 52 24	Nov. 27 BYR	eP 06 02 59
SPA	eP i 22 54 07 54 22	Nov. 24 SPA	eP 09 38 25	Nov. 26 BYR	eP 00 54 02	Nov. 27 BYR	eP 06 19 35
Nov. 23 BYR	eP 09 05 17	Nov. 24 BYR	eP 12 51 13	Nov. 26 BYR	eP 06 06 49 e 07 22 iS 12 46	Nov. 27 BYR	iP 07 48 06
Nov. 23 BYR	eP 14 55 02	Nov. 24 SPA	e(P) 16 00 13	Nov. 26 BYR	eP 07 19 38 eS 30 00 ePKKP 36 36 eP'P' 44 56	SPA	eP epP 10 52 47 53 50
SPA	eP 14 54 44	Nov. 24 BYR	eP 16 00 18	Nov. 26 BYR	eP 07 19 38 eS 30 00 ePKKP 36 36 eP'P' 44 56	Nov. 27 BYR	eP 13 47 31
Nov. 23 BYR	eP 15 36 37 i 37 10	Nov. 24 BYR	eP 19 42 55 i 43 45	Nov. 26 BYR	eP 07 18 54 i 19 25 eS 29 08 ePKKP 37 08 eP'P' 45 08 eSKPP' 48 29	SPA	eP i 13 47 35 47 44
SPA	eP 15 37 15	SPA	eP 19 42 34 i 43 13	Nov. 26 BYR	eP 07 51 00	Nov. 27 BYR	eP 17 06 18
Nov. 23 BYR	eP 16 25 41	Nov. 24 BYR	iP 21 50 21	Nov. 26 BYR	eP 07 51 00		
		Nov. 25 SPA	e(P) 03 44 19				



Date and Station	Phase (GCT)	Date and Station	Phase (GCT)	Date and Station	Phase (GCT)	Date and Station	Phase (GCT)
SPA	eP 17 07 01	Nov. 29 BYR	eP 18 42 22	Dec. 1 BYR	eP' 12 58 07	SPA	eP 09 46 59
Nov. 27 BYR	iP 19 04 40	Nov. 29 SPA	e(P) 18 54 17	Dec. 1 BYR	iP 13 49 13		e 49 07
SPA	eP 19 04 02	Nov. 29 BYR	eP 19 23 00	Dec. 1 BYR	eP 15 05 36	Dec. 2 BYR	eP 12 11 00
Nov. 28 BYR	eP 00 25 53		eS 27 31		ePP 06 52	Dec. 2 BYR	eP 20 10 44
	iPcP 27 02		eL 29 21		ePcP 08 50		e 11 28
SPA	eP 00 26 25	Nov. 29 BYR	eP 20 43 48		e 09 50	Dec. 2 BYR	e(P') 23 12 11
	i 26 49	Nov. 29 BYR	eP 21 46 05	SPA	iP 15 05 32	Dec. 3 BYR	eP 02 02 06
	iPcP 27 23	Nov. 29 BYR	iP 23 15 47		i 05 38		e(S) 08 23
Nov. 28 BYR	eP 02 56 39	Nov. 29 BYR	iP 23 15 47		i 05 55	Dec. 3 SPA	e(P') 12 58 04
SPA	eP 02 57 02	Nov. 30 BYR	eP 03 37 19	Dec. 1 BYR	eP 15 47 08	Dec. 3 BYR	eP 13 27 29
	i 57 14	Nov. 30 BYR	eP 07 43 51		e 47 37	Dec. 3 BYR	eP 19 42 08
Nov. 28 BYR	eP' 03 39 22	SPA	eP 07 44 00		epP 47 49		e 43 05
Nov. 28 SPA	eP 10 05 30	Nov. 30 BYR	eP 07 53 31	SPA	eP 15 48 00	Dec. 4 BYR	eP 00 25 45
Nov. 28 SPA	eP 11 14 19	SPA	e(P) 07 52 32	Dec. 1 BYR	eP 18 46 21	SPA	eP 00 25 24
Nov. 28 BYR	iP 12 44 24	Nov. 30 BYR	eP 08 22 04	Dec. 1 BYR	eP 19 07 19	Dec. 4 BYR	eP 01 17 12
	i 44 37	SPA	eP 08 21 05		epP 07 48	SPA	eP 01 17 45
	iPcP 45 39	Nov. 30 BYR	eP' 11 32 30	Dec. 2 BYR	e(P) 04 28 10	Dec. 4 SPA	eP 09 20 02
	ePP 46 24		i 33 29	Dec. 2 BYR	eP' 04 37 56	Dec. 4 BYR	e(P) 07 12 07
	eS 52 10		i 33 45		i 38 02	SPA	iP 07 12 23
	eL 13 00 41	Nov. 30 BYR	iPKS 36 55	Dec. 2 BYR	eP 06 11 16	Dec. 4 SPA	eP 09 33 46
	eP'P' 14 17	Nov. 30 BYR	eP 14 36 01		eP 07 14 28		epP 35 40
SPA	eP 12 45 13	Nov. 30 BYR	eP' 15 38 00	Dec. 2 BYR	eP 07 43 01	SPA	eP 09 34 16
	i 45 21	SPA	eP' 15 38 18		e 43 12		epP 36 14
	i 46 19	Nov. 30 BYR	i 38 26	Dec. 2 BYR	eP 07 43 01	Dec. 4 SPA	eP 15 34 35
	eP'P' 13 14 21	Dec. 1 BYR	eP 06 11 47		e 43 12	Dec. 4 SPA	eP 18 18 44
Nov. 28 BYR	eP 16 16 38		e 11 55	Dec. 2 BYR	eP' 08 02 53	Dec. 4 SPA	eP 19 57 44
Nov. 28 BYR	eP 21 30 02	Dec. 1 SPA	e(P) 09 32 58		eP 09 47 22	Dec. 4 SPA	eP 20 21 12
Nov. 28 BYR	eP 22 51 52		e 33 58	Dec. 2 BYR	eP 09 47 22	Dec. 5 SPA	eP 02 35 58
	e 52 38	Dec. 1 BYR	eP 09 56 21		e 47 43		
	e 56 46	Dec. 1 BYR	eP 09 56 21		ePP 51 12		
SPA	eP 22 51 08	Dec. 1 BYR	eP 11 32 00		ePPP 53 15		
	i 51 45	Dec. 1 BYR	e(P) 11 32 00		e 57 57		
Nov. 29 BYR	eP 04 02 58	Dec. 1 BYR	e(P) 11 32 00		eS 58 44		
Nov. 29 BYR	eP 05 56 26	Dec. 1 BYR	e(P) 11 32 00		e(PS) 59 42		
	i 57 11	Dec. 1 BYR	e(P) 11 32 00		eSS 10 03 15		
	e 59 16	Dec. 1 BYR	e(P) 11 32 00		ePKKP 04 08		
Nov. 29 BYR	eP 09 09 12	Dec. 1 BYR	e(P) 11 32 00		eSSS 08 00		
					e 13 09		



Date and Station	Phase (GCT)	Date and Station	Phase (GCT)	Date and Station	Phase (GCT)	Date and Station	Phase (GCT)
Dec. 5 SPA	eP' h m s 08 33 00	Dec. 8 SPA	e(P) h m s 05 53 22 i 53 26	Dec. 9 BYR	eP h m s 21 41 33	Dec. 11 BYR	iP h m s 15 00 08
Dec. 5 BYR	e(P') 09 14 20	Dec. 8 BYR	eP 08 14 44	Dec. 10 BYR	iP 00 42 56	Dec. 12 BYR	e(P) 02 02 56
Dec. 5 BYR	iP 11 19 23	Dec. 8 SPA	eP 08 15 56	Dec. 10 SPA	eP 00 42 23 i 42 26	Dec. 12 SPA	eP 02 03 27 e(P) 02 10 50 e 10 59
Dec. 5 SPA	iP 11 19 04	Dec. 8 SPA	e(P') 13 09 42	Dec. 10 BYR	eP 03 03 02 e(S) 09 13	Dec. 12 BYR	e(P) 04 25 12
Dec. 5 SPA	eP 19 05 53	Dec. 8 BYR	eP' 13 53 32	Dec. 10 SPA	e(P) 03 03 02 e 03 28	Dec. 12 SPA	eP 07 59 59
Dec. 6 SPA	iP 04 58 33	Dec. 8 SPA	eP' 13 53 12 ePP 55 35 e(SKP) 56 34	Dec. 10 BYR	eP 14 31 10	Dec. 12 SPA	eP 09 37 39
Dec. 6 SPA	eP 15 55 38	Dec. 8 BYR	eP 17 21 58	Dec. 10 SPA	eP 14 44 10	Dec. 12 BYR	iP 13 18 09
Dec. 7 BYR	e(P) 01 24 31	Dec. 8 SPA	eP 17 22 44	Dec. 10 BYR	eP 19 48 36	Dec. 12 SPA	iP 13 18 48 ePcP 19 22
Dec. 7 SPA	e(P) 02 38 32	Dec. 8 BYR	eP 23 46 43	Dec. 10 SPA	iP 19 49 06	Dec. 12 BYR	eP 17 32 09
Dec. 7 BYR	eP 03 11 43 epP 13 44	Dec. 9 BYR	eP 02 21 39	Dec. 10 BYR	eP 20 03 38	Dec. 12 BYR	e(P) 17 45 22
Dec. 7 SPA	eP 03 20 45	Dec. 9 SPA	e(P) 08 37 40 e 37 59	Dec. 10 SPA	eP 20 03 55	Dec. 12 SPA	eP 17 45 58
Dec. 7 BYR	eP' 05 34 23 e(pP') 34 52	Dec. 9 BYR	eP 08 45 31 e 46 29	Dec. 10 SPA	e(P) 22 10 32	Dec. 12 SPA	eP 21 22 09
Dec. 7 BYR	eP 07 33 53	Dec. 9 SPA	eP 08 46 46 e 47 41 e 47 49	Dec. 10 SPA	eP 22 20 45	Dec. 12 SPA	eP 22 16 09
Dec. 7 SPA	eP 07 35 06	Dec. 9 BYR	e(P) 10 59 13	Dec. 10 SPA	e(P) 22 25 23	Dec. 12 BYR	e(P) 23 15 01
Dec. 7 BYR	eP 07 58 58 e(S) 08 03 01	Dec. 9 BYR	eP 11 04 55	Dec. 10 SPA	eP 22 54 05	Dec. 13 SPA	e(P) 04 34 15
Dec. 7 SPA	eP 08 00 09	Dec. 9 SPA	eP 11 04 35	Dec. 11 BYR	eP 00 44 38 e 44 47 ePP 48 16 ePKKP 01 02 19	Dec. 13 BYR	eP 05 52 21
Dec. 7 BYR	eP 09 03 04	Dec. 9 SPA	eP 12 58 15	Dec. 11 BYR	eP 01 48 56 e 58 54 e(L) 02 05 03	Dec. 13 SPA	eP 05 51 44
Dec. 7 SPA	eP 17 04 33	Dec. 9 BYR	iP 14 14 47 e(pP) 16 21	Dec. 11 BYR	eP 02 42 26	Dec. 13 SPA	e(P) 06 36 10
Dec. 8 SPA	eP 03 16 59	Dec. 9 SPA	iP 14 15 18 e(pP) 16 56	Dec. 11 BYR	eP 03 52 24	Dec. 13 SPA	eP 07 21 04
Dec. 8 BYR	eP' 03 19 06	Dec. 9 SPA	eP 14 43 06	Dec. 11 BYR	e(P) 09 49 42	Dec. 13 SPA	e(P) 07 25 26 i 25 42 i 25 54
Dec. 8 SPA	eP' 03 19 04	Dec. 9 BYR	e(P) 14 55 37	Dec. 11 BYR	e(P) 10 17 34	Dec. 13 SPA	e(P) 07 45 18 e 45 50
Dec. 8 BYR	eP 03 32 43	Dec. 9 SPA	eP 14 55 36	Dec. 11 BYR	eP 10 33 23		
Dec. 8 BYR	eP 04 43 27	Dec. 9 BYR	e(P) 16 47 08				
Dec. 8 SPA	eP 04 43 03 i 43 11 e 43 39 e 44 25	Dec. 9 SPA	eP 16 46 45				



Date and Station	Phase (GCT)	Date and Station	Phase (GCT)	Date and Station	Phase (GCT)	Date and Station	Phase (GCT)
Dec. 13 SPA	e(P) i 07 48 42 48 53	Dec. 14 SPA	eP e i i 22 28 48 29 13 29 21 29 34	Dec. 17 SPA	eP 09 58 43	Dec. 19 SPA	iP 09 42 27
Dec. 13 SPA	iP e 09 51 04 51 23	Dec. 14 BYR	iP 23 28 31	Dec. 17 BYR	e(P) 13 40 32	Dec. 19 BYR	e(P) 10 46 38
Dec. 13 SPA	eP 10 39 33	Dec. 14 SPA	iP 23 28 11	Dec. 17 SPA	eP 13 40 08	Dec. 19 SPA	eP 10 46 08
Dec. 13 SPA	eP 15 49 57	Dec. 15 BYR	iP i(PP) ePcP e(L) 12 22 24 23 22 25 10 28 50	Dec. 17 SPA	eP e 16 58 21 58 32	Dec. 19 SPA	e(P) i 12 52 51 53 03
Dec. 13 BYR	eP 17 47 01	Dec. 15 BYR	eP 19 50 26	Dec. 17 SPA	iP e e 18 01 36 01 49 02 19	Dec. 19 SPA	eP 17 53 30
Dec. 13 SPA	eP 17 47 37	Dec. 16 SPA	eP 11 35 09	Dec. 18 BYR	e(P) 05 22 19	Dec. 19 SPA	eP 18 12 59
Dec. 13 BYR	e(P) 19 18 13	Dec. 16 SPA	eP 11 35 09	Dec. 18 SPA	eP e 08 47 46 47 53	Dec. 19 SPA	eP 18 54 27
Dec. 13 SPA	eP 19 18 30	Dec. 16 BYR	e(P') 11 40 58	Dec. 18 BYR	eP 09 03 05	Dec. 19 SPA	eP 21 26 34
Dec. 14 SPA	eP 00 29 35	Dec. 16 SPA	iP' e i 11 40 36 41 03 41 13	Dec. 18 BYR	eP 09 25 07	Dec. 19 SPA	eP 22 25 08
Dec. 14 BYR	iP 06 49 06	Dec. 16 SPA	eP 15 31 36	Dec. 18 SPA	eP 09 25 35	Dec. 20 SPA	iP 01 32 12
Dec. 14 SPA	eP i 08 16 37 17 03	Dec. 16 BYR	iP 16 55 29	Dec. 18 BYR	e(P) 10 05 26	Dec. 20 SPA	iP 01 32 12
Dec. 14 SPA	eP i 13 07 00 07 22	Dec. 16 SPA	iP 16 55 59	Dec. 18 SPA	eP 09 40 29	Dec. 20 BYR	e(P) 08 14 58
Dec. 14 SPA	eP 13 37 40	Dec. 16 SPA	eP 17 26 34	Dec. 18 BYR	e(P) 10 05 26	Dec. 20 SPA	eP 08 15 31 15 37 16 44
Dec. 14 BYR	eP e epP e 18 11 01 11 34 11 49 16 01	Dec. 17 BYR	eP' 02 49 47	Dec. 18 SPA	eP 10 05 57	Dec. 20 SPA	eP 13 07 22
Dec. 14 SPA	iP i ipP i ePP epPP e e i e(SKs) 18 11 41 12 02 12 27 13 35 15 31 16 24 19 37 20 26 21 03 21 58	Dec. 17 BYR	eP 03 00 18	Dec. 18 BYR	e(P) e(pP) 10 07 09 09 07	Dec. 20 BYR	e(P) 13 35 54
Dec. 14 SPA	eP 21 38 08	Dec. 17 SPA	iP 03 06 03	Dec. 18 SPA	eP epP i e 10 07 39 09 39 09 44 22 15	Dec. 20 SPA	eP 13 36 30
Dec. 14 BYR	eP e 22 02 31 02 37	Dec. 17 BYR	e(P) 06 00 13	Dec. 18 BYR	e(P') e 16 44 02 47 40	Dec. 20 BYR	e(P) 14 27 45
Dec. 14 SPA	eP ePP 22 02 16 05 50	Dec. 17 SPA	e(P) 06 00 49	Dec. 18 SPA	eP' e 16 44 18 48 01	Dec. 20 SPA	eP 15 09 08
Dec. 14 BYR	eP' e e(PP) 22 20 05 20 13 23 41	Dec. 17 SPA	eP e 08 06 22 06 59	Dec. 18 SPA	iP 19 09 28	Dec. 20 SPA	eP 17 20 04
		Dec. 17 BYR	iP 07 52 07	Dec. 18 SPA	iP 20 22 52	Dec. 20 SPA	eP 21 05 06
		Dec. 17 SPA	eP 07 52 44	Dec. 19 SPA	e(P) 06 10 10	Dec. 21 BYR	eP 10 30 25
		Dec. 17 SPA	eP 08 10 30	Dec. 19 BYR	e(P) 09 19 53	Dec. 21 BYR	iP 11 24 08
		Dec. 17 SPA	eP 08 27 27 27 36	Dec. 19 SPA	iP 09 20 22		
		Dec. 17 SPA	eP 09 16 15				



Date and Station	Phase (GCT)	Date and Station	Phase (GCT)	Date and Station	Phase (GCT)	Date and Station	Phase (GCT)
Dec. 21 BYR	eP' 11 38 49	Dec. 23 SPA	eP' 09 48 02	Dec. 25 BYR	eP 10 58 00	Dec. 27 BYR	eP' 16 12 30
Dec. 21 BYR	iP 12 36 36	Dec. 23 BYR	eP 14 08 54	Dec. 25 SPA	eP 10 57 45 i 58 06 i 58 37	Dec. 27 SPA	eP' 16 12 33 i 13 23 e 14 00
Dec. 21 BYR	e(P) 12 39 15	Dec. 23 SPA	iP 14 09 30 i 09 41	Dec. 25 BYR	eP 16 07 51	Dec. 27 BYR	e(P') 19 48 15
Dec. 22 BYR	eP 01 49 18	Dec. 24 BYR	e(P) 01 15 00	Dec. 25 SPA	eP 16 07 23	Dec. 27 SPA	iP' 19 47 40 i 48 17 i 48 28 i 48 35
Dec. 22 SPA	eP 03 11 48 i 12 23	Dec. 24 SPA	i(P) 02 16 10 i 16 20	Dec. 26 BYR	e(P) 08 57 48	Dec. 27 SPA	iP' 21 16 14
Dec. 22 BYR	eP 03 29 04	Dec. 24 BYR	eP 07 26 44	Dec. 26 BYR	eP 12 19 42 e 21 15	Dec. 28 BYR	eP 02 00 24
Dec. 22 SPA	eP 04 15 29	Dec. 24 SPA	eP 07 25 34 e 26 26 e 30 00	Dec. 26 SPA	iP 12 18 36 i 18 57 e(PcP) 19 47	Dec. 28 SPA	eP' 02 02 51 i 03 07
Dec. 22 BYR	e(P) 04 30 48	Dec. 24 BYR	eP 09 24 13	Dec. 26 SPA	eP 15 36 30	Dec. 28 BYR	eP' 07 39 56
Dec. 22 BYR	iP 11 37 53	Dec. 24 SPA	eP 09 24 50 ePcP 25 25	Dec. 26 BYR	e(P) 16 25 06	Dec. 28 SPA	eP' 07 40 00 i 40 19 i 40 36 i 41 24
Dec. 22 SPA	iP 11 37 38	Dec. 24 BYR	eP 13 01 48	Dec. 26 SPA	iP 16 25 42 i 25 52	Dec. 28 BYR	iP 10 13 23 ipP 13 49
Dec. 22 BYR	eP' 17 39 25	Dec. 24 SPA	eP 13 02 28	Dec. 26 BYR	iP 17 07 08	Dec. 28 SPA	iP 10 14 02 ipP 14 29 i 15 27
Dec. 22 SPA	eP' 17 39 24	Dec. 24 BYR	e(P) 18 50 34	Dec. 26 SPA	iP 17 08 00 e 08 16	Dec. 28 BYR	eP 11 56 57
Dec. 22 BYR	eP 20 35 00	Dec. 24 SPA	eP 18 51 09	Dec. 26 BYR	eP' 18 38 24	Dec. 28 SPA	eP 13 40 36
Dec. 22 SPA	iP 20 35 04	Dec. 25 BYR	e(P') 01 19 49	Dec. 26 SPA	eP' 18 38 55 i 39 01 i 40 25	Dec. 28 BYR	eP' 13 23 51
Dec. 23 BYR	e(P) 02 47 49	Dec. 25 BYR	eP 03 58 48	Dec. 26 BYR	e(P') 22 21 50	Dec. 28 SPA	eP' 13 23 57
Dec. 23 SPA	e(P) 02 46 14	Dec. 25 SPA	iP 03 59 25 iPcP 59 56	Dec. 27 BYR	e(P') 05 07 14	Dec. 28 SPA	eP 16 35 21
Dec. 23 BYR	e(P') 04 08 15 e(PP) 11 49	Dec. 25 BYR	eP 05 46 59	Dec. 27 BYR	e(P') 05 21 23	Dec. 29 BYR	eP 07 17 28
Dec. 23 SPA	iP' 04 08 41 i 09 03 e 09 40 e(PP) 12 39	Dec. 25 SPA	eP 05 47 34 i 47 44	Dec. 27 SPA	eP' 12 14 30 e 14 49	Dec. 29 SPA	eP 07 17 07 e 17 23
Dec. 23 SPA	eP 04 27 33	Dec. 25 BYR	eP 07 20 04	Dec. 27 BYR	e(P') 12 08 24	Dec. 29 BYR	eP 14 46 34
Dec. 23 SPA	e(P) 04 29 23	Dec. 25 SPA	iP 07 20 01 i 20 17	Dec. 27 BYR	e(P') 12 14 18	Dec. 29 BYR	eP 17 25 13
Dec. 23 BYR	e(P) 04 40 51	Dec. 25 SPA	eP 08 39 33 i 39 43	Dec. 27 SPA	iP 12 48 36 e 49 16 iPP 50 35 ePPP 51 34 e 52 14 eS 56 15 e 56 34 e 57 27	Dec. 29 SPA	eP 17 25 49 iPcP 26 16
Dec. 23 SPA	eP 04 41 28 i 41 41 iPcP 42 19	Dec. 25 BYR	iP 10 28 39				
Dec. 23 BYR	e(P) 06 35 44	Dec. 25 SPA	iP 10 29 19 e 31 21 iPP 31 59 ePPP 32 50				
Dec. 23 SPA	eP 06 36 11						



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Dec. 29 SPA	eP h m s 17 54 00	Dec. 31 SPA	eP i h m s 05 56 28 56 34		h m s		h m s
Dec. 29 SPA	eP 18 19 25	Dec. 31 BYR	eP 10 42 19				
Dec. 29 SPA	eP 20 32 59	Dec. 31 SPA	eP e 10 42 11 42 56				
Dec. 29 BYR	iP 20 48 40	Dec. 31 BYR	iP 16 58 49				
SPA	iP ePP 20 48 55 53 20	Dec. 31 SPA	eP 17 00 02				
Dec. 29 SPA	iP 21 04 13	Dec. 31 BYR	iP 19 21 14				
Dec. 29 BYR	eP 21 40 02	Dec. 31 SPA	eP 19 21 52				
SPA	iP i e 21 39 37 39 52 40 14	Dec. 31 SPA	eP 19 27 38				
Dec. 30 BYR	eP e(PP) 00 06 53 08 22	Dec. 31 SPA	eP 20 45 20				
SPA	eP iPcP 00 07 20 08 33	Dec. 31 SPA	eP 21 12 12				
Dec. 30 SPA	eP 00 15 39						
Dec. 30 SPA	eP 02 46 37						
Dec. 30 SPA	iP 03 26 01						
Dec. 30 SPA	i(P) 04 01 44						
Dec. 30 BYR	eP 07 45 05						
SPA	eP 07 45 43						
Dec. 30 SPA	i(P) 09 53 27						
Dec. 30 SPA	eP e 11 05 26 08 35						
Dec. 30 BYR	iP 14 08 39						
SPA	eP i(pP) e 14 08 04 08 31 09 24						
Dec. 30 SPA	eP 15 41 49						
Dec. 30 SPA	eP ePcP 23 39 52 40 45						