Timing Special Requirements

Program, Obs(.Exposure_Spec)	Comment
Rules and Conventions	
630 7	<date> must be geocentric date expressed in UT
630 10	heliocentric Julian Date allowed for PHASE/PERIOD/ZERO-PHASE
630 7	only necessary precision need be used ex 2020-Dec-14
953 2 (10-AUG-19)	4-digit years are mandatory
Days default can change if desired	<duration> units should be selected
953 3	users may also use day-of-year format ex 2018.237
953 3 (19.201) 953 4 (2019.100.3)	day-of-year must use 4-digit year and 3-digit integer day
953 6	observation level special requirement applies to ALL visits in that observation
953 3	BETWEEN minimum window 5 minutes (300 seconds)
953 5	PHASE range of PHASE/PERIOD minimum window 5 minutes
953 4 (max 599 sec) 953 5 (max 599, min empty)	AFTER <observation> BY minimum window 10 minutes (600 seconds)
removed PR 78786	windows less than 3600 seconds will incur Direct scheduling overhead
Supported Formats for Timing Special Requirements	
{} are example argument_1, argument_2, argument_3, argument_4, argument_5	
630 7	AFTER <date> DB: After <02-MAR-2020:00:00:00}
630 11, 12	AFTER <observation> [BY <duration1> TO <duration2>] DB: link_requirements table After Observation {12} {11} {14 Days} {28 Days} {ExclusiveInstr=FALSE}
608 7,8	above with [EXCLUSIVE USE OF INSTRUMENT] DB: link_requirements table After Observation {8} {7} {} {} {ExclusiveInstr=TRUE}
630 8	BEFORE <date> DB: Before <10-OCT-2020:00:00:00}
630 9	BETWEEN <start-date> AND <end-date> DB: Between {01-AUG-2019:00:00:00}{31-AUG-2019:00:00:00}
630 12,13	GROUP OBSERVATIONS <observation list> [WITHIN <duration>] DB: link_requirements table Group Observations {12,13} {19 Days} {Nonint=FALSE} {ExclusiveInstr=FALSE}
312 1,2	GROUP OBSERVATIONS [NON-INTERRUPTIBLE] DB: link_requirements table Group Observations {1,2} {} {Nonint=TRUE} {ExclusiveInstr=FALSE}

647 17,18	GROUP OBSERVATIONS [EXCLUSIVE USE OF INSTRUMENT] DB: link_requirements table Group Observations {17,18} {} {Nonint=TRUE} {ExclusiveInstr=TRUE}
600 11,12	SEQUENCE OBSERVATIONS <observation list> [WITHIN <duration>] DB: link_requirements table Sequence Observations {11,12} {14 Days} {Nonint=FALSE} {ExclusiveInstr=FALSE}
608 1,2,3	SEQUENCE OBSERVATIONS [NON-INTERRUPTIBLE] DB: link_requirements table Sequence Observations {1,2,3} {} {Nonint=True} {ExclusiveInstr=FALSE}
647 18,19	SEQUENCE OBSERVATIONS [EXCLUSIVE USE OF INSTRUMENT] DB: link_requirements table Sequence Observations {18,19} {} {Nonint=True} {ExclusiveInstr=TRUE}
647 1	GROUP VISITS WITHIN <duration> DB: Group Visits {53.0 Days} {Nonint=FALSE} {ExclusiveInstr=FALSE}
647 20	GROUP VISITS WITHIN [NON-INTERRUPTIBLE] DB: Group Visits {} {Nonint=TRUE} {ExclusiveInstr=TRUE}
647 20	GROUP VISITS WITHIN [EXCLUSIVE USE OF INSTRUMENT] DB: Group Visits {} {Nonint=TRUE} {ExclusiveInstr=TRUE}
953 1	SEQUENCE VISITS WITHIN <duration> DB: Sequence Visits {53.0 Days} {Nonint=FALSE} {ExclusiveInstr=FALSE}
647 21	SEQUENCE VISITS WITHIN [NON-INTERRUPTIBLE] DB: Sequence Visits {} {NonInt=TRUE} {ExclusiveInstr=TRUE}
647 21	SEQUENCE VISITS WITHIN [EXCLUSIVE USE OF INSTRUMENT] DB: Sequence Visits {} {NonInt=TRUE} {ExclusiveInstr=TRUE}
630 10	PHASE <number1> TO <number2> with PERIOD <duration> and ZERO-PHASE (HJD) <date> DB: Phase {3.3 Hours} {2452386} {0.2} {0.8} Phase 0.2 to 0.8 with period 3.3 Hours and zero-phase 2452386 HJD
630 20	TIME SERIES OBSERVATION DB: Time Series Observation
AFTER <date>	
630 7	all visits in the observation must start after <date>
AFTER <observation> [BY <duration1> TO <duration2>]	
647 22, 23	all visits in this observation must all start after visits in <observation>
removed PR 78786	if <duration2>-<duration1> less than 3600 seconds will incur Direct scheduling overhead
647 30, 31	<duration1> not specified -> 0
647 32, 33	<duration2> not specified -> infinity
953 31	diagnostic if AFTER OBSERVATION BY between 2 different instruments when EXCLUSIVE USE OF INSTRUMENT specified

647 22, 23	when AFTER used APT will make GROUP VISITS req into SEQ VISITS GUI has "Visits are sequenced because this observation is part of an After link". Not editable.
for next link requirements look in the visit_linkspec table	
647 22, 23	link between 1st visit in 1st obs and last visit in 2nd obs
647 22, 23	link between last visit in 1st obs and 1st visit in 2nd obs
647 24,25 and 26,27	if either has only 1 visit need both links
647 28, 29	if both have only 1 visit only need first link
BEFORE <date>	
630 8	all visits in the observation must start before <date>
BETWEEN <start-date> AND <end-date>	
647 22 (do end within)	all visits must start but not necessarily end between the dates
removed PR 78786	if <end-date>-<start-date> less than 3600 seconds will incur Direct scheduling overhead
647 22	multiple BETWEENs may be specified on an observation
953 31	multiple BETWEENs may not overlap
953 3	BEFORE, AFTER, and BETWEEN mutually exclusive
GROUP/SEQUENCE OBSERVATIONS	
656 1,6,7,8,10 check VP window staggered start times	SEQUENCE all visits in observation list ordered according to their observation number
656 1,6,7,8,10	visits start in order, visits from obs1 have to be done before visits from obs2 begin…
648 5	observation has implicit GROUP VISITS WITHIN 53 DAYS duration can be shortened
953 32	<duration> must not exceed 50 days
312 1,2 GROUP OBS 647 18,19 SEQ OBS 647 20 GROUP VIS	can select NON-INTERRUPTIBLE instead of using a WITHIN
indirectly by below	WITHIN <duration> specified all visits must start within
953 35,36	if time interval shorter than minimum execution interval visits will be unschedulable
can't check in APT	NON-INTERRUPTIBLE all visits must execute without interruption
953 33,34	total duration of NON-INTERRUPTIBLE group must be < 24 hours
953 2,32 (GROUP) 953 9,10 (SEQ)	diagnostic if GROUP/SEQ between observations using different instruments when EXCLUSIVE USE OF INSTRUMENT specified
PHASE <number1> TO <number2> with PERIOD <duration> and ZERO-PHASE <date>	
953 31	<number1> should be between 0 and 1
953 31	<number2> should be between 0 and 1
removed PR 78786	phase ranges less than 3600 seconds between <start-date> and <end-date> will incur Direct scheduling overhead

953 31 max range in diag is current Julian day	Julian Dates must be entered in form Dnnnnnnn.nnn, example JD2444123.4 - only required precision need be provided Error (Form): Zero phase (HJD): 245023 is too small. The legal range is 2415385.5 to 2458367.0.
648 6	PHASE on multi-visit obs will be applied to each visit
953 31	PHASE may only be used for external observations
TIME SERIES OBSERVATION	
953 7	must have NO PARALLEL
allowed templates	
953 7	MIRI Imaging, may be added
953 8, 953 9	MIRI LRS SLITLESSPRISM automatically added, may be removed
953 19, 953 24	MIRI MRS, added automatically, can be removed
953 10, 953 11	NIRCam Time Series automatically added, can't be removed
953 12, 953 13	NIRCam Grism Time Series automatically added, can't be removed
953 14, 953 15	NIRSpec BOTS series automatically added, can't be removed
953 16, 953 17	NIRISS SOSS automatically added, may be removed
617 14	APT gives warning for longer exposures times instead of error
not allowed templates	
953 18	MIRI LRS FULL
953 20	MIRI Coronagraphy
953 21	NIRCam Imaging
953 22	NIRCam Coronagraphic Imaging
953 23	NIRCam WFSS
953 25	NIRSpec FSS
953 26	NIRSpec IFU
953 27	NIRSpec MOS
953 28	NIRISS Imaging
953 29	NIRISS WFSS
953 30	NIRISS AMI