



## 10562 - Validating a dark galaxy

Cycle: 14, Proposal Category: GO

(Availability Mode: SUPPORTED)

### INVESTIGATORS

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### VISITS

<i>Visit</i>	<i>Targets</i>	<i>Configurations</i>	<i>Orbits Used</i>	<i>Last Orbit Planner Run</i>	<i>OP Current with Visit?</i>
01	(1) GAL-121753+144650	ACS/WFC	3	20-Jun-2005 11:36:03.0	yes
02	(1) GAL-121753+144650	ACS/WFC	3	20-Jun-2005 11:36:08.0	yes
03	(1) GAL-121753+144650	ACS/WFC	3	20-Jun-2005 11:36:12.0	yes

9 Total Orbits Used

### ABSTRACT

VIRGOHI21 is an object detected in the Virgo Cluster HI survey of Davies et al (2004), with a velocity width typical of a disc galaxy (220 km/s) but which does not appear to have an optical counterpart down to a surface brightness level of 27.5 B mag/sq. arcsec.

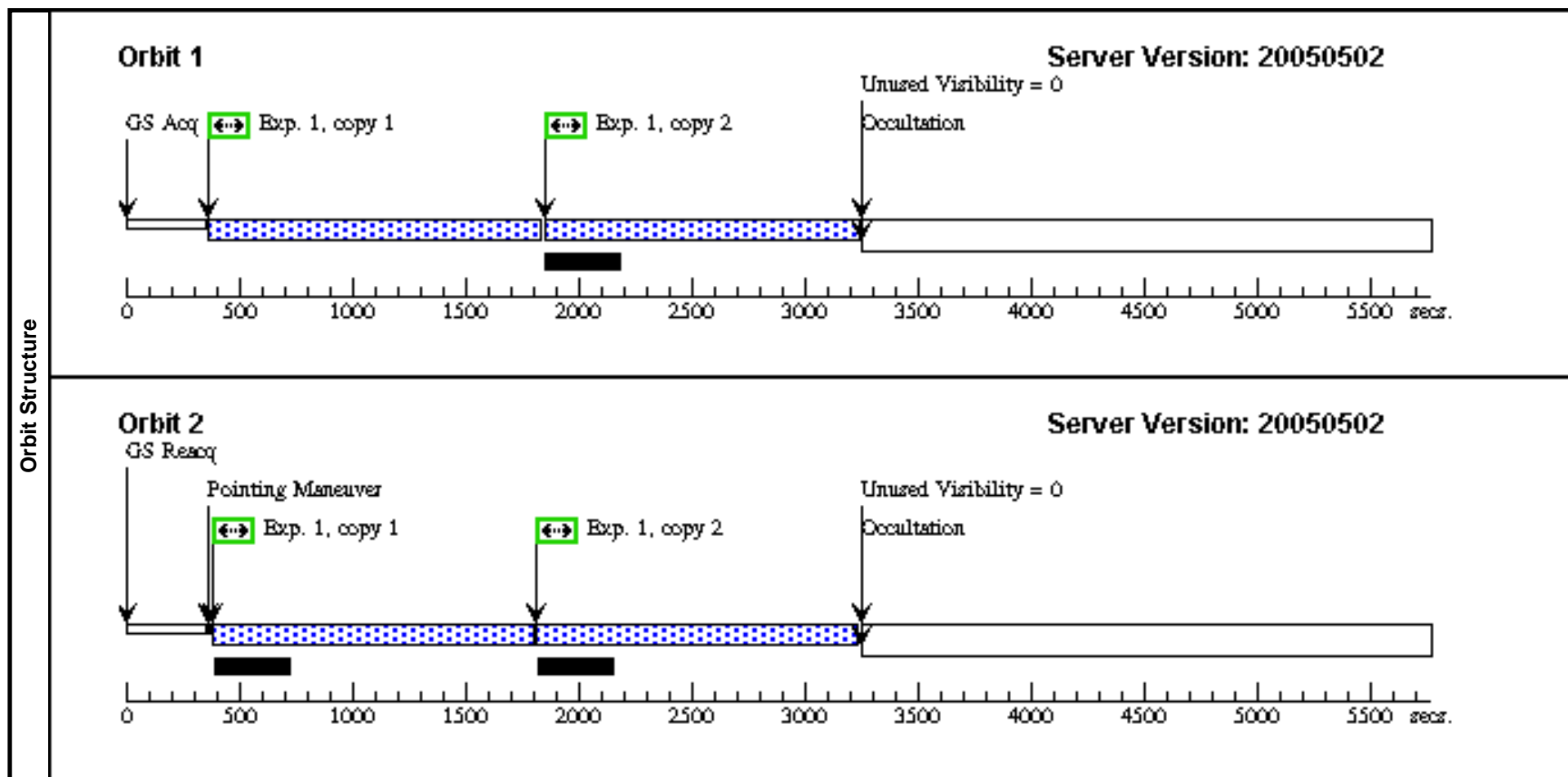
Altogether, it is the best ever candidate for a Dark Galaxy. We propose to image this object with the ACS through the F814W filter for 9 orbits to see if this object contains a population of individually very faint stars which would be missed by ground-based telescopes.

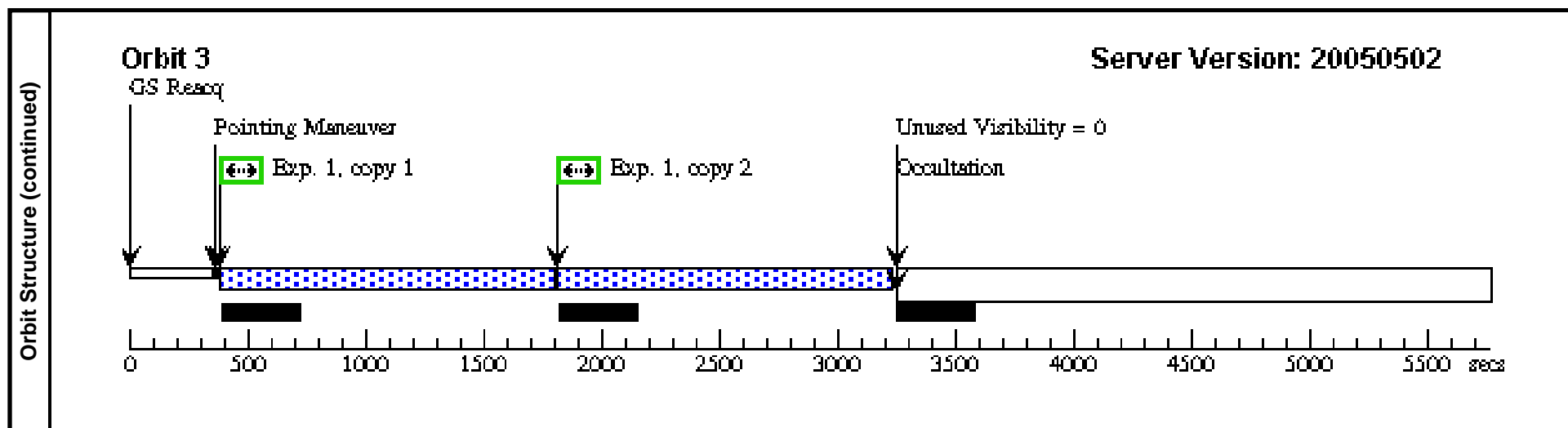
### **OBSERVING DESCRIPTION**

We wish to obtain I (F814W) ACS images of the best candidate Dark Galaxy, VIRGOHI 21, ever discovered to establish whether or not there are Red Giant Branch stars at its position. Assuming it is in the Virgo Cluster with a distance modulus close to 31 there could be as many as 6 RGB stars per square arcsec without conflicting with ground based observations and the tip of the RGB would be close to 27.0 in I. We have now imaged the HI source at 21-cm with Westerbork and want to centre the image on 12 17 53, +14 46 50 (J2000) close to the greatest mass and column-density, and where there is what appears to be a faint background galaxy ( $B \sim 20$ ) within 2.5 arcseconds of a 21st magnitude star. Since our aims are very close the aims of the IZw18 (proposal 9400) observations by Izotov and Thuan we have closely modelled our observations, and our Phase II proposal, on theirs. We have 9 orbits, to be split in 3 visits, and subsplit in 2 for CR removal, with each orbital exposure slightly offset to permit drizzling and hence avoid crowding and to go as deep as possible. All images to have the same orientation. Total observations to be spread over no more than 60 days.

# Proposal 10562 - Visit 01 - Validating a dark galaxy

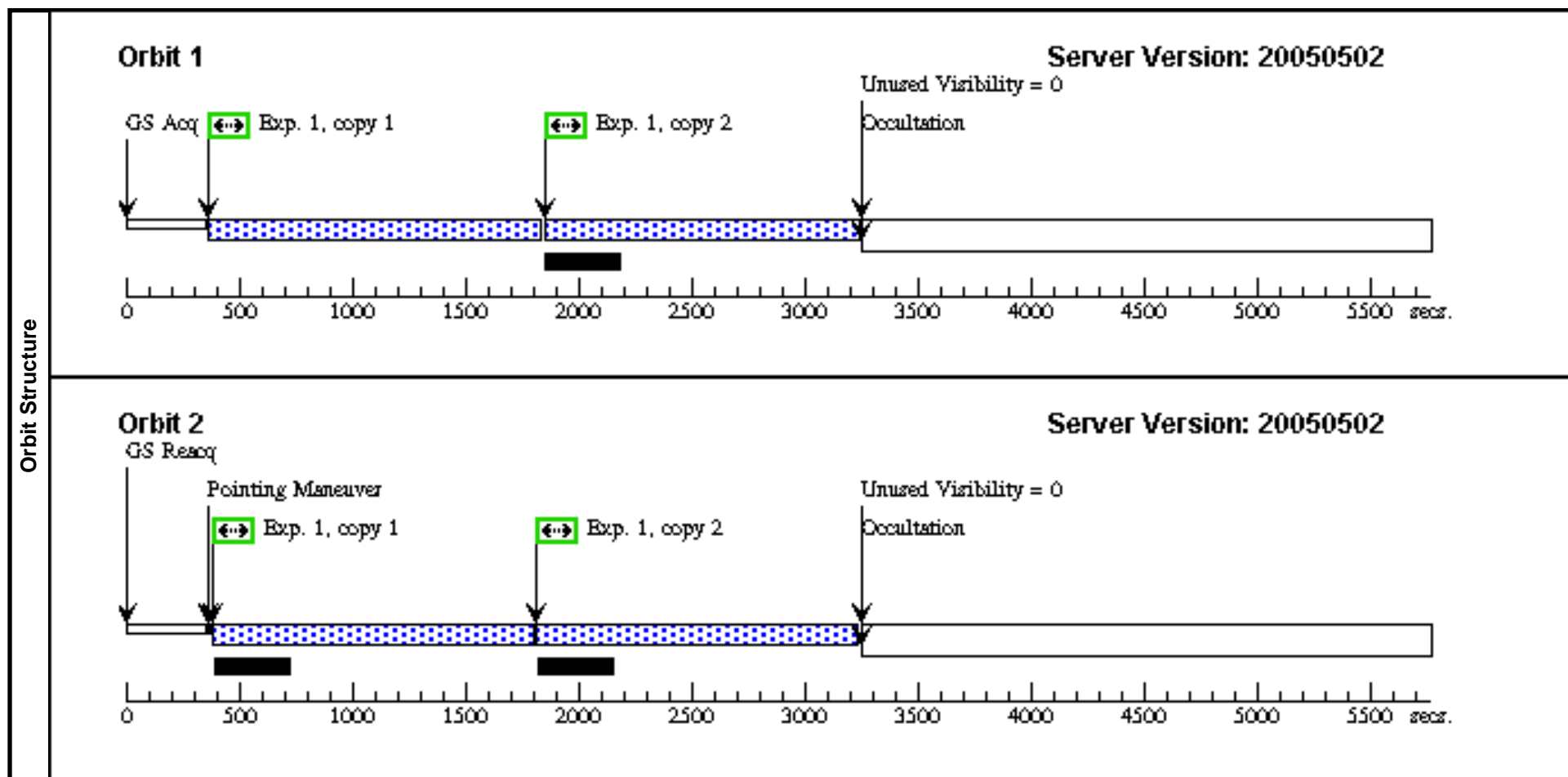
Visit	<b>Proposal 10562, Visit 01</b> <span style="float: right;">Mon Jun 20 15:36:14 GMT 2005</span>									
	<b>Diagnostic Status: No Diagnostics</b> Scientific Instruments: ACS/WFC Special Requirements: GROUP 01,02,03 WITHIN 60.0D									
Patterns	#	Primary Pattern			Secondary Pattern				Exposures	
	(1)	Pattern Type=ACS-WFC-DITHER- LINE Purpose=DITHER Number Of Points=3 Point Spacing=0.16 Line Spacing=			Coordinate Frame=POS-TARG Pattern Orientation=47.2 Angle Between Sides= Center Pattern=false				(1)	
Fixed Targets	#	Name	Target Coordinates		Targ. Coord. Corrections		Fluxes		Miscellaneous	
	(1)	GAL-121753+144650 Alt Name1: VIRGOHI21	RA: 12 17 53.0000 (184.4708333d) Dec: +14 46 50.00 (14.78056d) Equinox: J2000 Plate Id: 0590		Radial Velocity: 2000.0 km/sec		V=26.0+/-0.5		Coordinate Source: IMAGE_TIED_TO_GSC_FRAME	
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1		(1) GAL-121753+144650	ACS/WFC, ACCUM, WFC	F814W	CR-SPLIT=NO; GAIN=1	POS TARG 0,0	Pattern 1-1 (1)	2500.0 Secs X 2	
									[==>1265.0 Secs (Pattern 1, Copy 1)]	[1]
									[==>1265.0 Secs (Pattern 1, Copy 2)]	
									[==>1296.0 Secs (Pattern 2, Copy 1)]	[2]
									[==>1296.0 Secs (Pattern 2, Copy 2)]	
									[==>1296.0 Secs (Pattern 3, Copy 1)]	[3]
									[==>1296.0 Secs (Pattern 3, Copy 2)]	

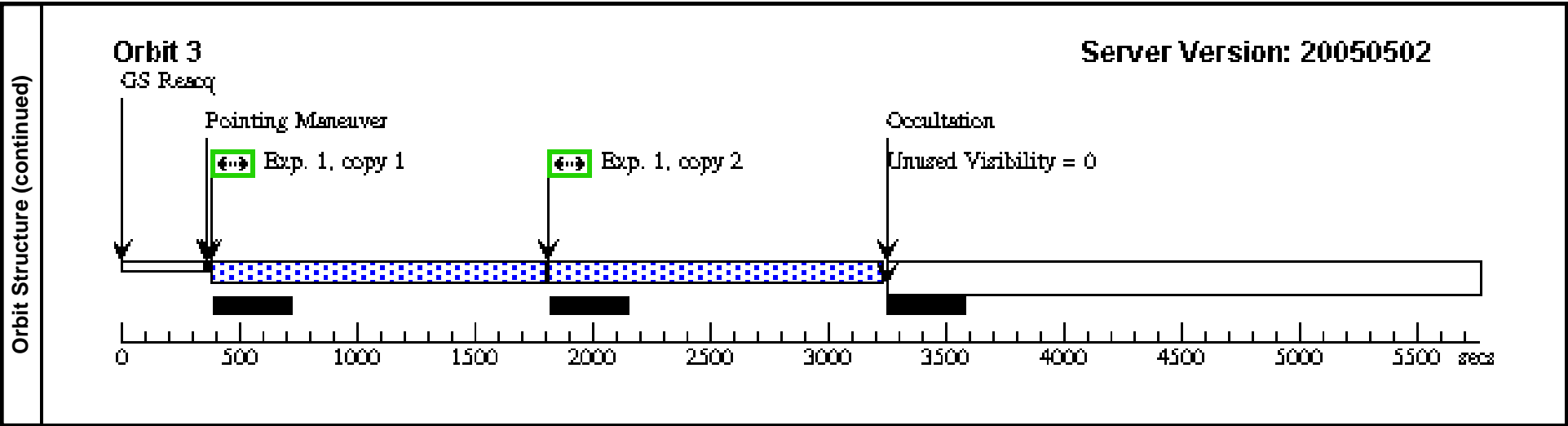




# Proposal 10562 - Visit 02 - Validating a dark galaxy

Visit	<b>Proposal 10562, Visit 02</b> <span style="float: right;">Mon Jun 20 15:36:16 GMT 2005</span>									
	<b>Diagnostic Status: No Diagnostics</b> Scientific Instruments: ACS/WFC Special Requirements: SAME ORIENT AS 01; AFTER 01 BY 0 D TO 60 D; GROUP 02,01,03 WITHIN 60.0D									
Patterns	#	Primary Pattern			Secondary Pattern				Exposures	
	(1)	Pattern Type=ACS-WFC-DITHER- LINE Purpose=DITHER Number Of Points=3 Point Spacing=0.16 Line Spacing=			Coordinate Frame=POS-TARG Pattern Orientation=47.2 Angle Between Sides= Center Pattern=false				(1)	
Fixed Targets	#	Name	Target Coordinates		Targ. Coord. Corrections		Fluxes		Miscellaneous	
	(1)	GAL-121753+144650 Alt Name1: VIRGOHI21	RA: 12 17 53.0000 (184.4708333d) Dec: +14 46 50.00 (14.78056d) Equinox: J2000 Plate Id: 0590		Radial Velocity: 2000.0 km/sec		V=26.0+/-0.5		Coordinate Source: IMAGE_TIED_TO_GSC_FRAME	
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	
	1		(1) GAL-121753+144650	ACS/WFC, ACCUM, WFC	F814W	CR-SPLIT=NO; GAIN=1	POS TARG 0,0	Pattern 1-1 (1)	2500.0 Secs X 2	
									[==>1265.0 Secs (Pattern 1, Copy 1)]	[1]
									[==>1265.0 Secs (Pattern 1, Copy 2)]	
									[==>1296.0 Secs (Pattern 2, Copy 1)]	[2]
									[==>1296.0 Secs (Pattern 2, Copy 2)]	
									[==>1296.0 Secs (Pattern 3, Copy 1)]	[3]
									[==>1296.0 Secs (Pattern 3, Copy 2)]	







# Proposal 10562 - Visit 03 - Validating a dark galaxy

Visit	<b>Proposal 10562, Visit 03</b> <span style="float: right;">Mon Jun 20 15:36:18 GMT 2005</span>									
	<b>Diagnostic Status: No Diagnostics</b> Scientific Instruments: ACS/WFC Special Requirements: SAME ORIENT AS 01; AFTER 01 BY 0 D TO 60 D; GROUP 03,01,02 WITHIN 60.0D									
Patterns	#	Primary Pattern			Secondary Pattern				Exposures	
	(1)	Pattern Type=ACS-WFC-DITHER- LINE Purpose=DITHER Number Of Points=3 Point Spacing=0.16 Line Spacing=			Coordinate Frame=POS-TARG Pattern Orientation=47.2 Angle Between Sides= Center Pattern=false				(1)	
Fixed Targets	#	Name	Target Coordinates		Targ. Coord. Corrections		Fluxes		Miscellaneous	
	(1)	GAL-121753+144650 Alt Name1: VIRGOHI21	RA: 12 17 53.0000 (184.4708333d) Dec: +14 46 50.00 (14.78056d) Equinox: J2000 Plate Id: 0590		Radial Velocity: 2000.0 km/sec		V=26.0+/-0.5		Coordinate Source: IMAGE_TIED_TO_GSC_FRAME	
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	
	1		(1) GAL-121753+144650	ACS/WFC, ACCUM, WFC	F814W	CR-SPLIT=NO; GAIN=1	POS TARG 0,0	Pattern 1-1 (1)	2500.0 Secs X 2	
									[==>1265.0 Secs (Pattern 1, Copy 1)]	[1]
									[==>1265.0 Secs (Pattern 1, Copy 2)]	
									[==>1296.0 Secs (Pattern 2, Copy 1)]	[2]
									[==>1296.0 Secs (Pattern 2, Copy 2)]	
									[==>1296.0 Secs (Pattern 3, Copy 1)]	[3]
									[==>1296.0 Secs (Pattern 3, Copy 2)]	

