WFC3 Acceptance Testing

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Summary

A detailed acceptance test for WFC3 has been performed. A verification test shows that BOT is giving the correct answers. Exposure expansion, pointing adjustments, actual duration usage, and visualization are all functioning properly, and BOT can handle error conditions gracefully and provides meaningful feedback to the users.

Two issues with the Aladin display have been found – a slight misalignment of the BOT overlay with the DSS image, and a broken link in the Aladin spreadsheet; both of these are known issues with PRs previously filed. None of these issues is severe enough to warrant a delay in the release of the tool for WFC3 usage.

There are several issues for the WFC3 team to resolve, and these are listed at the end of the document.

Introduction

For this test, the following targets and exposures were used:

Target: DQ-HER – 18h 07m 30.17s, +45^{o} 51' 31.90" (IR detector)
ST-LMI – 11h 05m 40.0s, +25^{o} 06' 20.0" (UVIS detector)

Exposure: WFC3/IR, MULTI-ACCUM, F105W, IR, NSAMP=9,
SAMP-SEQ=SPARS100 (exp time = 804.698)
WFC3/UVIS, ACCUM, F200LP, UVIS, 1000s

When appropriate, modifications to the exposure (e.g. POS TARG) are detailed below.

This target/exposure was used to perform the following:

Test	Definition
Verification	Comparison with manual calculations
New features	Exposure expansion, pointing adjustment, actual duration, visualization
Exception Handling	Bad exposure, unsupported exposure, network query, cancel operations

For each test, both the tabular and graphic output products are included for ease of comparison with future test results; note that "dummy" values are presently in the look-

up tables, so the status of an object (safe or health) will likely change when real values are used.

Verification Test

Since WFC3 has never been in BOT before, a thorough verification of the instrument was performed. This check involved manually determined the count rate/total counts for GSC2 objects (spectral type and V magnitude) and 2MASS objects (J or H magnitude), and comparing with the results from BOT. Nine distinct tests were performed, and these are detailed below. Note that some basic items (such as conversion of B-V to spectral type) are identical across all instruments, and these items were not explicitly checked for WFC3; however, most (if not all) were implicitly verified during testing.

Note that the default mode for the WFC3/IR detector is to use the 2MASS survey and not the GSC2. For testing purposes, it is helpful to be able to disable 2MASS, and this can be accomplished by adding the following to the apt command: -P bot.catalog="GSC2".

Conversion of MULTI-ACCUM parameters to exposure time (IR only)

For each SAMP-SEQ, one value of NSAMP and all five apertures were selected and the exposures processed by BOT. The exposures time determined by the tool were in exact agreement with the values listed in the Phase II Proposal Instructions (Version 15.1, dated 8/22/06). The following exposures were processed:

SAMP-SEQ	NSAMP	Aperture	Exp. Time	SAMP-SEQ	NSAMP	Aperture	Exp. Time
RAPID	8	IR	35.759	STEP50	11	IRSUB128-FIX	259.171
		IRSUB512	13.094			IRSUB64-FIX	256.320
		IRSUB256-FIX	5.418	STEP100	7	IR	104.705
		IRSUB128	2.559			IRSUB512	84.874
		IRSUB64-FIX	0.486			IRSUB256	78.157
SPARS10	9	IR	84.703			IRSUB128	75.656
		IRSUB512-FIX	59.206			IRSUB64	73.842
		IRSUB256-FIX	50.569	STEP200	1	IR-FIX	4.470
		IRSUB128-FIX	47.354			IRSUB512-FIX	1.637
		IRSUB64	45.021			IRSUB256-FIX	0.677
SPARS25	4	IR	79.556			IRSUB128-FIX	0.320
		IRSUB512-FIX	68.224			IRSUB64-FIX	0.061
		IRSUB256	64.385	STEP400	9	IR	404.763
		IRSUB128-	62.956			IRSUB512	379.266

		FIX					
		IRSUB64	61.920			IRSUB256	370.630
SPARS50	10	IR	454.727			IRSUB128	367.414
		IRSUB512-FIX	426.937			IRSUB64	365.082
		IRSUB256-FIX	416.801	MIF600	10	IR-FIX	578.071
		IRSUB128-FIX	413.228			IRSUB512-FIX	549.741
		IRSUB64	410.637			IRSUB256-FIX	540.145
SPARS100	5	IR-FIX	404.584			IRSUB128-FIX	536.572
		IRSUB512	390.419			IRSUB64-FIX	533.981
		IRSUB256	385.621	MIF900	4	IR	17.869
		IRSUB128-FIX	383.834			IRSUB512	6.547
		IRSUB64-FIX	382.538			IRSUB256	2.709
SPARS200	6	IR-FIX	1004.616			IRSUB128	1.280
		IRSUB512-FIX	987.618			IRSUB64	0.243
		IRSUB256-FIX	981.860	MIF1200	8	IR-FIX	602.448
		IRSUB128	979.717			IRSUB512-FIX	579.784
		IRSUB64	978.162			IRSUB256-FIX	572.107
STEP25	8	IR-FIX	104.734			IRSUB128-FIX	569.249
		IRSUB512	82.070			IRSUB64-FIX	567.176
		IRSUB256	74.393	MIF1500	6	IR	26.819
		IRSUB128	71.535			IRSUB512	9.821
		IRSUB64	69.462			IRSUB256	4.063
STEP50	11	IR-FIX	304.820			IRSUB128	1.919
		IRSUB512-FIX	273.657			IRSUB64	0.365
		IRSUB256-FIX	263.101				

Inferred F magnitude when only GSC2 J present (IR only)

For those cases with the IR detector that 2MASS data is not available, we fall back and use the GSC2 catalog. For objects that have only a J magnitude, we perform a search over a large (10') area and determine the faintest F magnitude detected. We then assume that the F magnitude of the star in question has that faintest F magnitude (under the assumption that if it were brighter, it would have been reported). The following objects have only a J magnitude in the GSC2 catalog, and have been assigned an inferred F magnitude of 20.50 by BOT:

GSC2 Name	RA	Dec	J
SAQ4035733	18 26 33.75	-64 56 57.01	22.32
SAQ4035776	18 26 22.02	-64 56 21.39	20.91
SAQ4035746	18 26 11.37	-64 56 44.38	22.11
SAQ4035752	18 26 22.98	-64 56 35.16	22.41

Assumed spectral type of M2V and V magnitude derivation when only GSC2 F present (IR only)

For those cases with the IR detector that 2MASS data is not available, we fall back and use the GSC2 catalog. For objects that have only an F magnitude, we make the worst case assumption that the object is an M2V star. We also assume the object has the J-F color of an M2V star so that a V magnitude can be calculated using the standard equations. The following objects were used to confirm this functionality:

GSC2 Name	RA	Dec	F	Assumed J-F	Derived V	Assumed Sp. Type
N2A0174196	19 11 41.63	04 58 05.14	18.36	2.22 (North)	19.44	M2V
SAQ4006598	18 26 18.51	-64 56 18.16	19.83	2.08 (South)	20.84	M2V

Use of the contamination flag (cc_flg) with 2MASS data (IR only)

Some objects in 2MASS suffer from contamination, and these objects are not to be processed by BOT. The cc_flg value is checked, and any magnitudes for which the flag is not "0" are disregarded. The follow objects were used to verify the use of the cc_flg:

OBJECT ID	J	H	K	cc_flg	BOT Result
19113793+0459248	---	14.31	13.99	c00	J missing
19113987+0459256	15.83	---	14.22	0c0	H missing
19113982+0459397	16.13	15.23	---	00c	K missing
19113800+0459095	15.82	---	---	0cc	H+K missing
19114393+0459021	---	14.83	---	0c0	J+K missing
19113906+0459253	---	---	14.17	cc0	J+H missing
19114427+0458539				ccc	J+H+K missing

Verification of GSC2 count rate table access (UVIS and IR)

To verify that BOT was properly accessing the count rate lookup tables, each filter was processed using a defined (BOT-TARGET-GSC2) target with V being 15 (the base value used in deriving the count rate table) and various spectral types.

Since the BOT presently has place-holder values for the standard count rates, the values are not shown in the table. To determine the standard (V=15) count rates, the following algorithm was used:

Item	Value	Counts
Detector	UVIS	1000
	IR	2000
Limit	Not Used	0
Spectral Type	O	10
	B	20
	A	30
	F	40
	G	50
	K	60
	M	70
Sub-type	0	0
	1	1
	2	2
	4	4
	5	5
Central Wavelength	xxxx	0.xxxx

IR

The following shows that the results from BOT match the predicted values.

WFC3_Filter	Sp Type	Count rate	Exp Time	Mag	Scaling	Predicted counts	BOT counts	BOT/Predicted
F098M	B5V	2025.098	0.96	15	1	1944.1	1944.1	1.00
F110W	A1V	2031.11	0.96	15	1	1949.9	1949.9	1.00
F125W	A5V	2035.125	0.96	15	1	1953.7	1953.7	1.00
F132N	F5V	2045.132	0.96	15	1	1963.3	1963.3	1.00
F153M	G5V	2055.153	0.96	15	1	1972.9	1972.9	1.00
F164N	K0V	2060.164	0.96	15	1	1977.8	1977.8	1.00

UVIS

The following shows that the results from BOT match the predicted values.

WFC3_Filter	Sp Type	Count rate	Exp Time	Mag	Scaling	Predicted counts	BOT counts	BOT/Predicted
F200LP	B5V	1025.2	50	15	1	51260	51260	1.00
F395N	A1V	1031.395	50	15	1	51570	51570	1.00
F502N	A5V	1035.502	50	15	1	51775	51775	1.00
F600LP	F5V	1045.6	50	15	1	52280	52280	1.00
F763M	G5V	1055.763	50	15	1	52788	52788	1.00
F953N	K0V	1060.953	50	15	1	53048	53048	1.00

Verification of 2MASS count rate table access (IR only)

To verify that BOT was properly accessing the count rate lookup tables, each filter was processed using a defined (BOT-TARGET-2MASS) target with J (or H) being 15 (the base value used in deriving the count rate table). The 2MASS count rate table is:

Filter	Rate for 2MASS mag = 15	Band
F098M	2010 e-/s	J
F105W	3186 e-/s	J
F110W	4723 e-/s	J
F125W	1627 e-/s	J
F126N	77 e-/s	J
F127M	386 e-/s	J
F128N	86 e-/s	J
F130N	89 e-/s	J
F132N	87 e-/s	J
F139M	387 e-/s	J
F153M	253 e-/s	H
F160W	1039 e-/s	H
F164N	71 e-/s	H
F167N	68 e-/s	H

The following shows that the results from BOT match the predicted values.

WFC3_Filter	Lookup table	Band	Exp Time	Mag	Scaling	Predicted counts	BOT counts	BOT/Predicted
F098M	2010	J	0.96	15	1	1929.6	1929.6	1.00
F105W	3186	J	0.96	15	1	3058.56	3058.6	1.00
F110W	4723	J	0.96	15	1	4534.08	4534.1	1.00
F125W	1627	J	0.96	15	1	1561.92	1561.9	1.00
F126N	77	J	0.96	15	1	73.92	73.92	1.00
F127M	386	J	0.96	15	1	370.56	370.56	1.00
F128N	86	J	0.96	15	1	82.56	82.56	1.00
F130N	89	J	0.96	15	1	85.44	85.44	1.00
F132N	87	J	0.96	15	1	83.52	83.52	1.00
F139M	387	J	0.96	15	1	371.52	371.52	1.00
F153M	253	H	0.96	15	1	242.88	242.88	1.00
F160W	1039	H	0.96	15	1	997.44	997.44	1.00
F164N	71	H	0.96	15	1	68.16	68.16	1.00
F167N	68	H	0.96	15	1	65.28	65.28	1.00

Scaling of count rate table values to observed magnitude (2MASS only)

After determining the count rate for the filter used from the lookup table, the value must be scaled to the true magnitude of the target. For each of the base magnitudes (J and H), four values were processed, and the following table shows that the count rates are being properly scaled.

WFC3_Filter	Lookup table	Band	Exp Time	Mag	Scaling	Predicted counts	BOT counts	BOT/Predicted
F105W	3186	J	0.96	10	100	305856	305860	1.00
F110W	4723	J	0.96	12.5	10	45340.8	45341	1.00
F126N	77	J	0.96	17.5	0.1	7.392	7.392	1.00
F127M	386	J	0.96	20	0.01	3.7056	3.7056	1.00
F153M	253	H	0.96	10	100	24288	24288	1.00
F160W	1039	H	0.96	12.5	10	9974.4	9974.4	1.00
F167N	68	H	0.96	17.5	0.1	6.528	6.528	1.00
F167N	68	H	0.96	20	0.01	0.6528	0.6528	1.00

Verification of trigger values (UVIS and IR)

For each detector, there are 3 levels of saturation (minimal, moderate, and extreme) that are checked. One exposure with 6 defined targets was run, with the count rates just below and just above the trigger values, to verify that the triggers were properly set. The triggers are the following:

Detector	Minimal	Moderate	Extreme
IR	>75,001	>750,001	>7,500,001
UVIS	>75,001	>750,001	>7,500,001

IR – 2MASS

The table below shows the targets that were processed. In each case, the appropriate warnings were triggered at the expected count rate values; note that a value of SAMP-SEQ=STEP50 and NSAMP=3 were used to derive the exposure time of 0.96s.

WFC3_Filter	Lookup table	Band	Exp Time	Mag	Scaling	Predicted counts	Trigger
F098M	2010	J	0.96	11.027	38.83	74931.99	none
F098M	2010	J	0.96	11.026	38.87	75001.04	Minimal
F098M	2010	J	0.96	8.53	387.26	747252.35	Minimal
F098M	2010	J	0.96	8.52	390.84	754166.59	Moderate
F098M	2010	J	0.96	6.03	3872.58	7472523.52	Moderate
F098M	2010	J	0.96	6.02	3908.41	7541665.93	Extreme

IR – GSC2

The table below shows the targets that were processed. In each case, the appropriate warnings were triggered at the expected count rate values.

Detector	Sp Type	Count rate	Exp Time	Mag	Scaling	Predicted counts	Trigger
2000	B5V	2025.098	0.96	11.04	38.371	74596.3	Safe
2000	B5V	2025.098	0.96	11.03	38.726	75286.5	Minimal
2000	B5V	2025.098	0.96	8.54	383.71	745963.0	Minimal
2000	B5V	2025.098	0.96	8.53	387.26	752865.3	Moderate
2000	B5V	2025.098	0.96	6.04	3837.1	7459629.8	Moderate
2000	B5V	2025.098	0.96	6.03	3872.6	7528652.9	Extreme

UVIS

The table below shows the targets that were processed. In each case, the appropriate warnings were triggered at the expected count rate values.

WFC3_Filter	Detector	Sp Type	Count rate	Exp Time	Mag	Scaling	Predicted counts	Trigger
F200LP	1000	B5V	1025.2	50	14.59	1.4588	74778.8	Safe
F200LP	1000	B5V	1025.2	50	14.58	1.4723	75470.7	Minimal
F200LP	1000	B5V	1025.2	50	12.09	14.588	747788.2	Minimal
F200LP	1000	B5V	1025.2	50	12.08	14.723	754707.4	Moderate
F200LP	1000	B5V	1025.2	50	9.59	145.88	7477881.9	Moderate
F200LP	1000	B5V	1025.2	50	9.58	147.23	7547073.9	Extreme

Use of GSC2 when no 2MASS data available (IR only)

When there is no 2MASS data, BOT should fall back to using the GSC2 catalog. The field centered at $23^h\ 59^m\ 52.04^s$, $-00^o\ 00'\ 45.3''$ has no 2MASS data within the standard search area, and when processed does report GSC2 results.

Regression Test

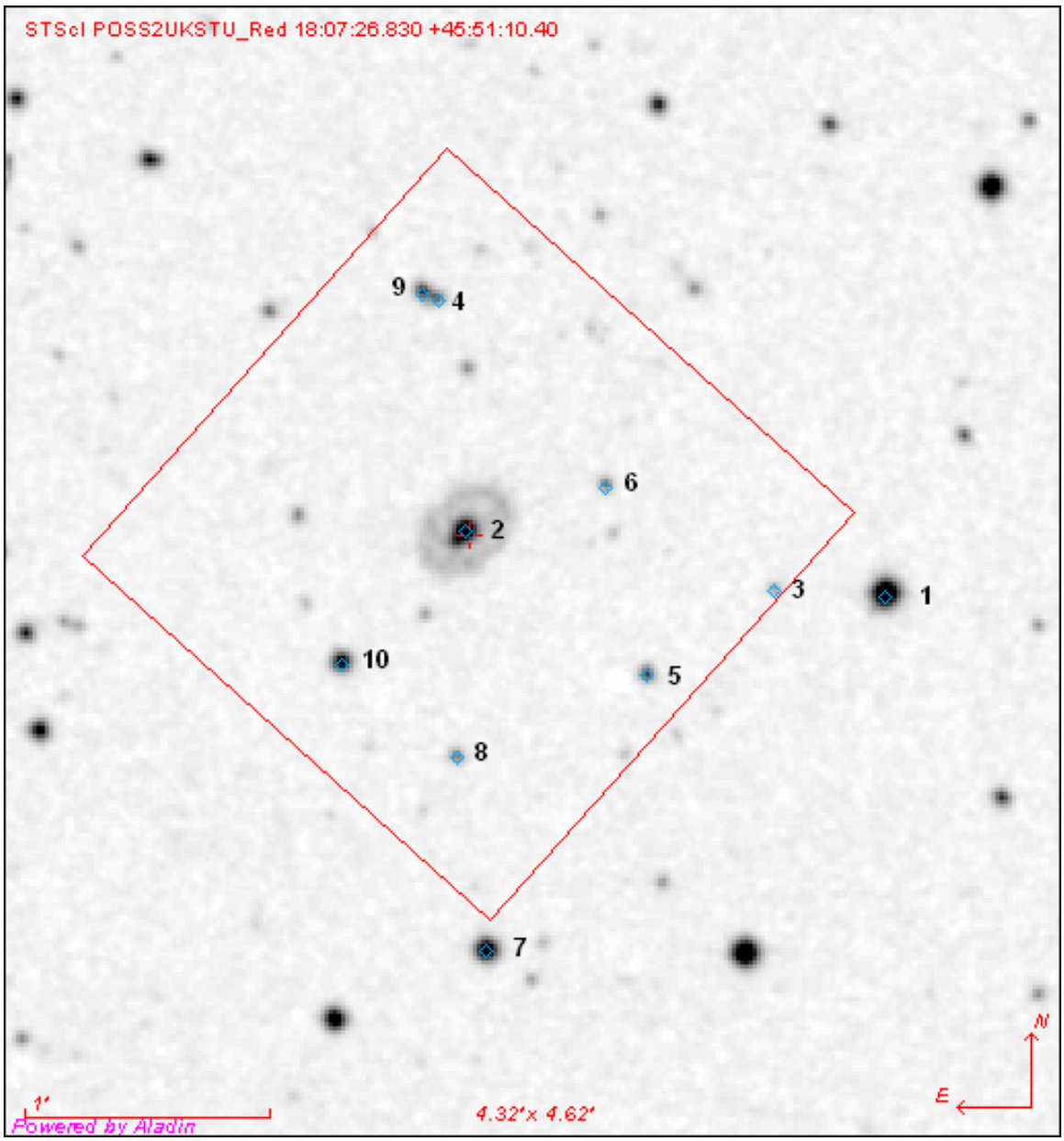
Since WFC2 is new to BOT, it is not possible to perform a regression test at this time. However, a basic exposure for each detector was processed in BOT to serve as comparison for future regression testing.

IR detector

The test exposure was run through the BOT/Aladin interface, with a search radius of 105". The 10 objects detected (all science concerns: 2 Extreme, 6 Moderate, and 2 Minimal) were:

Name	OBJECT ID	RA	Dec	J	H	K	Reason
1	18072042+4551145	18 07 20.4293	+45 51 14.52	12.26	11.71	11.55	Extreme Saturation (Exceeded)
2	18073024+4551325	18 07 30.2482	+45 51 32.60	13.6	13.28	13.08	Extreme Saturation (Exceeded)
3	18072303+4551163	18 07 23.0376	+45 51 16.37	16.68	16.01	15.89	Minimal Saturation (Exceeded)
4	18073077+4552292	18 07 30.7726	+45 52 29.22	16.71	16.34	16.04	Minimal Saturation (Exceeded)
5	18072606+4550566	18 07 26.0686	+45 50 56.66	14.27	13.69	13.41	Moderate Saturation (Exceeded)
6	18072693+4551425	18 07 26.9318	+45 51 42.60	16.18	15.27	15.34	Moderate Saturation (Exceeded)
7	18072998+4549497	18 07 29.9827	+45 49 49.74	13.9	13.62	13.54	Moderate Saturation (Exceeded)
8	18073056+4550372	18 07 30.5604	+45 50 37.23	16.08	15.52	15.41	Moderate Saturation (Exceeded)
9	18073115+4552311	18 07 31.1508	+45 52 31.11	16.06	15.84	15.52	Moderate Saturation (Exceeded)
10	18073322+4551008	18 07 33.2213	+45 51 0.82	15.16	14.77	14.82	Moderate Saturation (Exceeded)

The field map, showing the objects found, is given below.

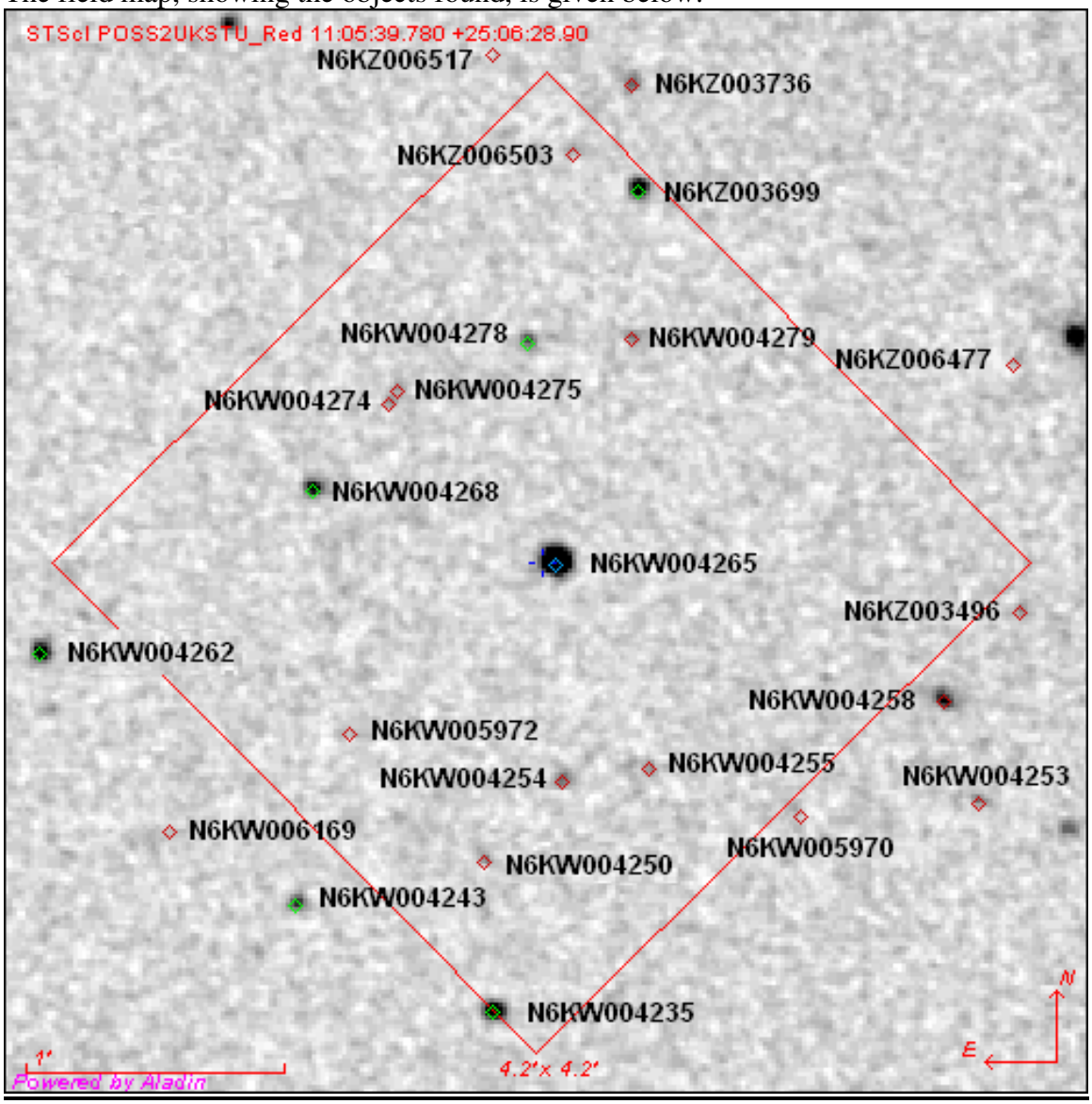


UVIS detector

The test exposure was run through the BOT/Aladin interface, with a search radius of 124.1". The 23 objects detected were:

OBJECT ID	RA	Dec	Fpg	Jpg	V	B-V	Type
N6KW004235	11 05 40.7843	+25 04 44.51	17.41	19.53	18.43	1.1	K0V
N6KW004243	11 05 44.1756	+25 05 9.29	18.82	20.66	19.68	0.88	K0V
N6KW004250	11 05 40.9538	+25 05 19.72	20.02	---	---	---	not a star
N6KW004253	11 05 32.4993	+25 05 33.95	19.6	21.99	---	---	not a star
N6KW004254	11 05 39.6307	+25 05 38.20	19.26	21.58	---	---	not a star
N6KW004255	11 05 38.1544	+25 05 41.17	20.08	22.08	---	---	not a star
N6KW004258	11 05 33.1199	+25 05 57.30	18.04	20.56	---	---	not a star
N6KW004262	11 05 48.5804	+25 06 7.11	17.74	20.05	18.88	1.23	K4V
N6KW004265	11 05 39.7765	+25 06 28.87	15.09	18.02	16.66	1.67	M2V
N6KW004268	11 05 43.9362	+25 06 45.50	18.16	20.53	19.33	1.26	K4V
N6KW004274	11 05 42.6300	+25 07 5.87	19.97	21.64	---	---	not a star
N6KW004275	11 05 42.4946	+25 07 8.70	20.16	---	---	---	not a star
N6KW004278	11 05 40.2699	+25 07 20.00	19.01	20.34	19.62	0.52	F5V
N6KW004279	11 05 38.4904	+25 07 21.10	19.52	21.69	---	---	not a star
N6KW005970	11 05 35.5505	+25 05 30.46	---	22.11	---	---	no color info
N6KW005972	11 05 43.2659	+25 05 49.08	---	22.02	---	---	not a star
N6KW006169	11 05 46.3480	+25 05 26.12	---	---	---	---	no color info
N6KZ003496	11 05 31.8129	+25 06 18.16	20	---	---	---	not a star
N6KZ003699	11 05 38.3947	+25 07 55.55	17.74	20.13	18.92	1.29	K4V
N6KZ003736	11 05 38.5161	+25 08 19.91	19.12	20.93	---	---	not a star
N6KZ006477	11 05 31.9730	+25 07 15.35	---	21.95	---	---	not a star
N6KZ006503	11 05 39.4953	+25 08 4.00	---	21.66	---	---	no color info
N6KZ006517	11 05 40.8736	+25 08 26.92	---	21.93	---	---	not a star

The field map, showing the objects found, is given below.



Issue

There appears to be a slight misalignment between the BOT overlay and the DSS image, which is 0.2" in both RA and Dec. The RA offset is consistent (the BOT overlay is always east of the star), while the Dec offset is sometimes north and sometimes south. This discrepancy is small enough (0.2 pixels) to be of no concern, but is covered under APT-VTT PR 56217.

New Features

Exposure Expansion

For the WFC3/IR, there are two ways for exposures to be expanded – number of iterations greater than 1 and the use of a pattern. For WFC3/UVIS, there are three ways

for the exposures to be expanded – CR-SPLIT, number of iterations greater than 1 and the use of a pattern. The pattern case is detailed in the Pointing Adjustment section below. For the CR-SPLIT case, the default value (2) was used, and two identical sub-exposures were generated and BOT processing was performed on both with identical results. For the number of iterations test, a value of 3 was used, and three identical sub-exposures were generated, and BOT processing was performed on all three sub-exposures with identical results.

Pointing Adjustment

There are 3 different types of pointing adjustments valid for the WFC3 – POS TARG, PATTERN, and use as a PARALLEL instrument.

POS TARG

For this test, the standard exposures were modified by adding a POS TARG of X=-20" and Y=-20". The direction of the POS TARG is important in this test, and in order to be able to simply predict the size of the POS TARG motion, the motion must be in the same direction as the "Search Radius Vector" which is defined as the point from the fiducial to the outermost corner of the Aperture. A selection in a different direction makes the calculation of the motion vector more complicated.

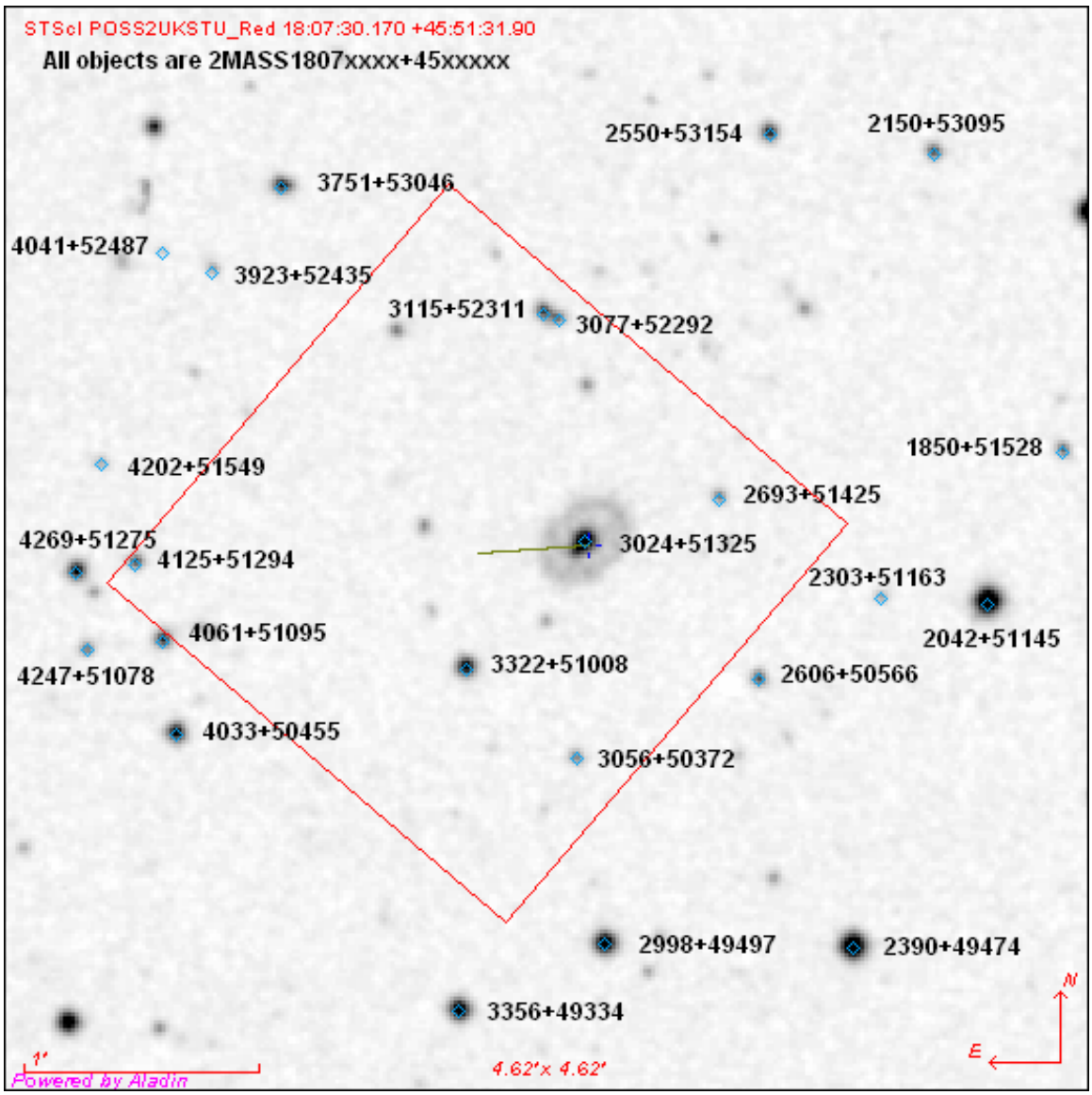
IR detector

The test exposure was run through the new BOT/Aladin interface, using an expanded search radius of 133.3", which resulted in a circle being analyzed to support any possible ORIENT value. Based on the size of the POS TARG, this increase in search radius is exactly what was predicted (i.e. SQRT(20*20 + 20*20) = 28, which when added to the standard 105.0" yields 133.0").

The 24 objects detected (all science concerns: 4 Extreme, 14 Moderate, and 6 Minimal) were:

OBJECT ID	RA	Dec	J	H	K	Reason
18072042+4551145	18 07 20.4293	+45 51 14.52	12.26	11.71	11.55	Extreme Saturation (Exceeded)
18072390+4549474	18 07 23.9035	+45 49 47.44	13.03	12.7	12.65	Extreme Saturation (Exceeded)
18073024+4551325	18 07 30.2482	+45 51 32.60	13.6	13.28	13.08	Extreme Saturation (Exceeded)
18074269+4551275	18 07 42.6974	+45 51 27.58	13.46	12.82	12.59	Extreme Saturation (Exceeded)
18071850+4551528	18 07 18.5066	+45 51 52.85	16.56	16.06	15.97	Minimal Saturation (Exceeded)
18072303+4551163	18 07 23.0376	+45 51 16.37	16.68	16.01	15.89	Minimal Saturation (Exceeded)
18073077+4552292	18 07 30.7726	+45 52 29.22	16.71	16.34	16.04	Minimal Saturation (Exceeded)
18073923+4552435	18 07 39.2388	+45 52 43.58	16.75	16.25	16.22	Minimal Saturation (Exceeded)
18074202+4551549	18 07 42.0259	+45 51 54.90	16.41	15.67	15.62	Minimal Saturation (Exceeded)
18074247+4551078	18 07 42.4742	+45 51 7.82	16.46	15.93	15.91	Minimal Saturation (Exceeded)
18072150+4553095	18 07 21.5030	+45 53 9.56	15.91	15.5	15.36	Moderate Saturation (Exceeded)
18072550+4553154	18 07 25.5094	+45 53 15.46	14.91	14.34	14.24	Moderate Saturation (Exceeded)
18072606+4550566	18 07 26.0686	+45 50 56.66	14.27	13.69	13.41	Moderate Saturation (Exceeded)
18072693+4551425	18 07 26.9318	+45 51 42.60	16.18	15.27	15.34	Moderate Saturation (Exceeded)
18072998+4549497	18 07 29.9827	+45 49 49.74	13.9	13.62	13.54	Moderate Saturation (Exceeded)
18073056+4550372	18 07 30.5604	+45 50 37.23	16.08	15.52	15.41	Moderate Saturation (Exceeded)
18073115+4552311	18 07 31.1508	+45 52 31.11	16.06	15.84	15.52	Moderate Saturation (Exceeded)
18073322+4551008	18 07 33.2213	+45 51 0.82	15.16	14.77	14.82	Moderate Saturation (Exceeded)
18073356+4549334	18 07 33.5659	+45 49 33.49	14.03	13.66	13.46	Moderate Saturation (Exceeded)
18073751+4553046	18 07 37.5166	+45 53 4.62	15.36	14.88	14.85	Moderate Saturation (Exceeded)
18074033+4550455	18 07 40.3387	+45 50 45.56	14.86	14.58	14.49	Moderate Saturation (Exceeded)
18074041+4552487	18 07 40.4122	+45 52 48.72	16.24	15.52	15.68	Moderate Saturation (Exceeded)
18074061+4551095	18 07 40.6183	+45 51 9.53	15.18	14.43	14.44	Moderate Saturation (Exceeded)
18074125+4551294	18 07 41.2596	+45 51 29.41	16.27	15.75	15.6	Moderate Saturation (Exceeded)

The field map, showing the objects found, is given below.



The objects are all in the area that is expected.

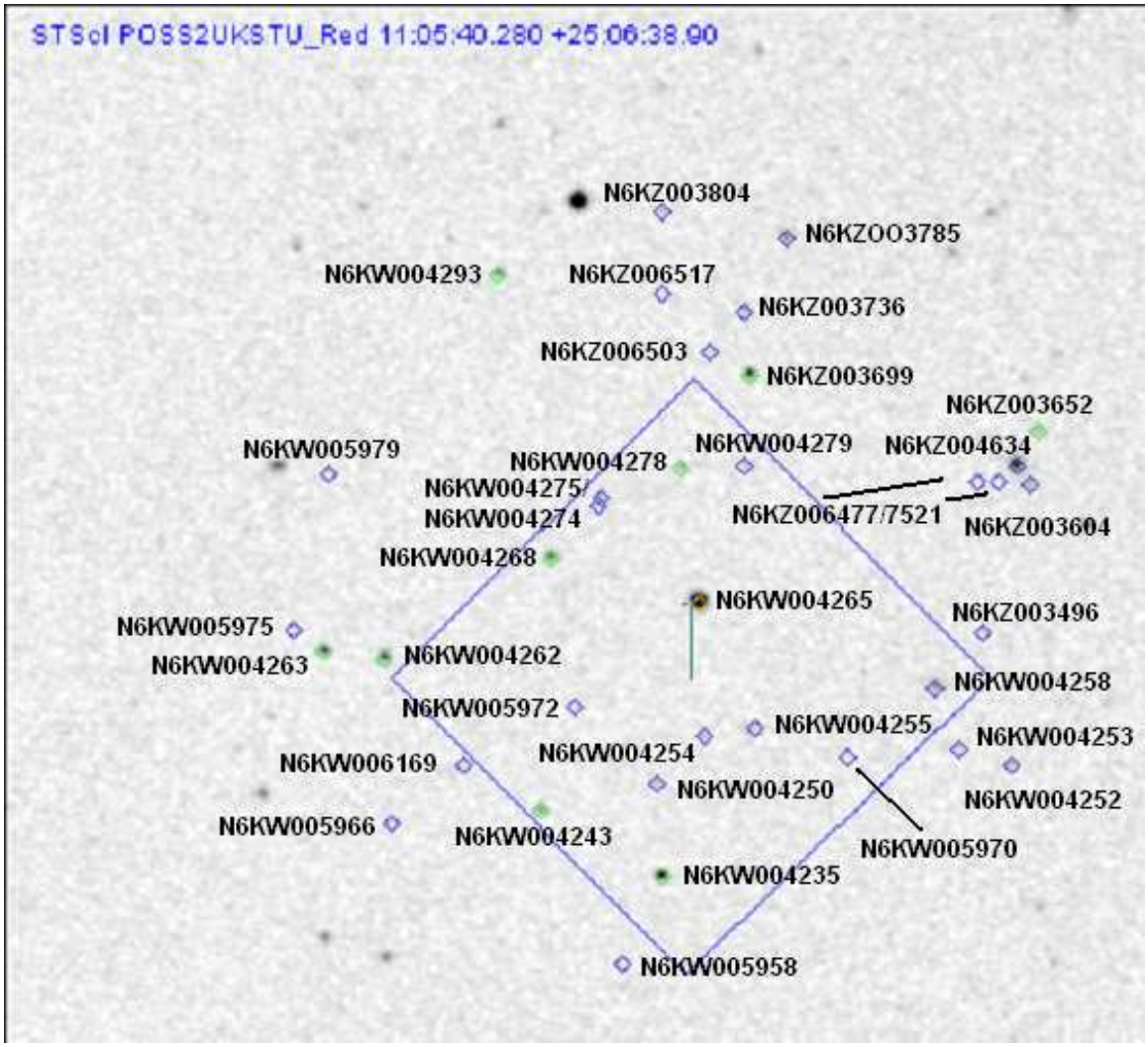
UVIS detector

The test exposure was run through the new BOT/Aladin interface, using an expanded search radius of 152.3”, which resulted in a circle being analyzed to support any possible ORIENT value. Based on the size of the POS TARG, this increase in search radius is exactly what was predicted (i.e. SQRT(20*20 + 20*20) = 28, which when added to the standard 124.1” yields 152.1”).

The 36 objects detected were:

OBJECT ID	RA	Dec	Fpg	Jpg	V	B-V	Type
N6KW004235	11 05 40.7843	+25 04 44.51	17.41	19.53	18.43	1.1	K0V
N6KW004243	11 05 44.1756	+25 05 9.29	18.82	20.66	19.68	0.88	K0V
N6KW004250	11 05 40.9538	+25 05 19.72	20.02	---	---	---	not a star
N6KW004252	11 05 30.9720	+25 05 27.52	19.01	20.97	---	---	not a star
N6KW004253	11 05 32.4993	+25 05 33.95	19.6	21.99	---	---	not a star
N6KW004254	11 05 39.6307	+25 05 38.20	19.26	21.58	---	---	not a star
N6KW004255	11 05 38.1544	+25 05 41.17	20.08	22.08	---	---	not a star
N6KW004258	11 05 33.1199	+25 05 57.30	18.04	20.56	---	---	not a star
N6KW004262	11 05 48.5804	+25 06 7.11	17.74	20.05	18.88	1.23	K4V
N6KW004263	11 05 50.2755	+25 06 9.34	18.08	20.47	19.26	1.28	K4V
N6KW004265	11 05 39.7765	+25 06 28.87	15.09	18.02	16.66	1.67	M2V
N6KW004268	11 05 43.9362	+25 06 45.50	18.16	20.53	19.33	1.26	K4V
N6KW004274	11 05 42.6300	+25 07 5.87	19.97	21.64	---	---	not a star
N6KW004275	11 05 42.4946	+25 07 8.70	20.16	---	---	---	not a star
N6KW004278	11 05 40.2699	+25 07 20.00	19.01	20.34	19.62	0.52	F5V
N6KW004279	11 05 38.4904	+25 07 21.10	19.52	21.69	---	---	not a star
N6KW004293	11 05 45.4273	+25 08 33.24	18.61	21.33	20.02	1.47	K4V
N6KW005958	11 05 41.8663	+25 04 10.94	---	21.97	---	---	no color info
N6KW005966	11 05 48.3270	+25 05 4.59	---	21.75	---	---	not a star
N6KW005970	11 05 35.5505	+25 05 30.46	---	22.11	---	---	no color info
N6KW005972	11 05 43.2659	+25 05 49.08	---	22.02	---	---	not a star
N6KW005975	11 05 51.1091	+25 06 17.22	---	21.56	---	---	not a star
N6KW005979	11 05 50.1839	+25 07 17.31	---	22.19	---	---	not a star
N6KW006169	11 05 46.3480	+25 05 26.12	---	---	---	---	no color info
N6KZ003496	11 05 31.8129	+25 06 18.16	20	---	---	---	not a star
N6KZ003604	11 05 30.4812	+25 07 14.29	18.86	20.41	---	---	not a star
N6KZ003634	11 05 30.8943	+25 07 21.54	16.78	18.45	---	---	not a star
N6KZ003652	11 05 30.2831	+25 07 34.40	19.18	20.54	19.8	0.53	F5V
N6KZ003699	11 05 38.3947	+25 07 55.55	17.74	20.13	18.92	1.29	K4V
N6KZ003736	11 05 38.5161	+25 08 19.91	19.12	20.93	---	---	not a star
N6KZ003785	11 05 37.3998	+25 08 47.78	18.16	20.83	---	---	not a star
N6KZ003804	11 05 40.8581	+25 08 57.61	19.52	21.04	---	---	not a star
N6KZ006477	11 05 31.9730	+25 07 15.35	---	21.95	---	---	not a star
N6KZ006503	11 05 39.4953	+25 08 4.00	---	21.66	---	---	no color info
N6KZ006517	11 05 40.8736	+25 08 26.92	---	21.93	---	---	not a star
N6KZ007521	11 05 31.3672	+25 07 16.09	---	---	---	---	no color info

The field map, showing the objects found, is given below.



The objects are all in the area that is expected.

Pattern

IR Detector

For this test, the standard exposure was modified by putting it in a PATTERN (a WFC3-IR-DITHER-LINE with 3 points with a 10” spacing at an orientation of 225^{o}). The orientation was aligned closely with the "Search Radius Vector”.

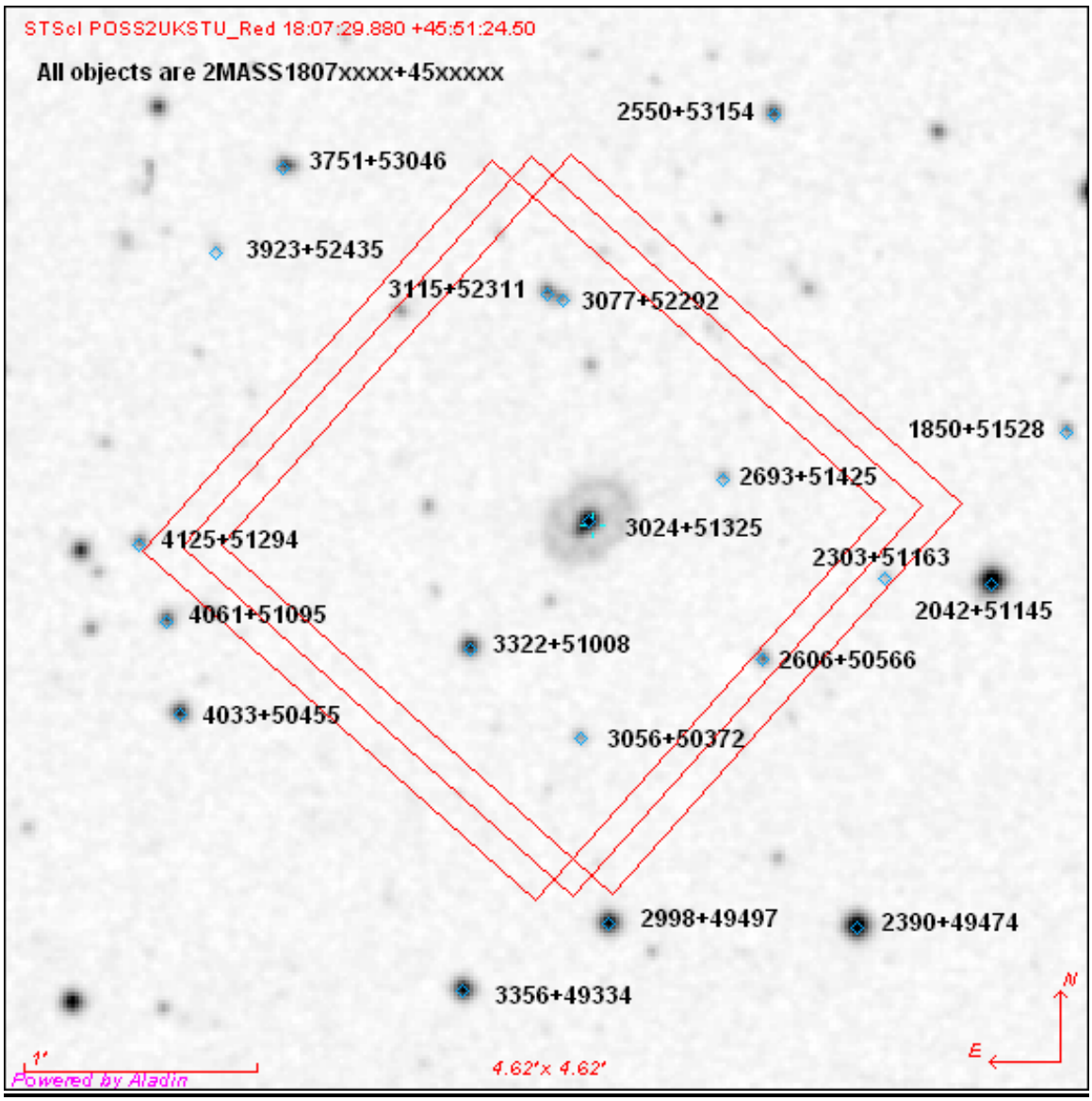
The test exposure was run through the new BOT/Aladin interface, which used different radii for its searches – one for the initial pointing (with the standard 105” search radius), one for the second pattern exposure (with the search radius increased to 115”), and one

for the final pattern exposure (with a search radius of 125). The expanded search radii were exactly as predicted.

The 19 objects detected (all science concerns: 3 Extreme, 12 Moderate, and 4 Minimal) were:

OBJECT ID	RA	Dec	J	H	K	Reason
18072042+4551145	18 07 20.4293	+45 51 14.52	12.26	11.71	11.55	Extreme Saturation (Exceeded)
18072390+4549474	18 07 23.9035	+45 49 47.44	13.03	12.7	12.65	Extreme Saturation (Exceeded)
18073024+4551325	18 07 30.2482	+45 51 32.60	13.6	13.28	13.08	Extreme Saturation (Exceeded)
18071850+4551528	18 07 18.5066	+45 51 52.85	16.56	16.06	15.97	Minimal Saturation (Exceeded)
18072303+4551163	18 07 23.0376	+45 51 16.37	16.68	16.01	15.89	Minimal Saturation (Exceeded)
18073077+4552292	18 07 30.7726	+45 52 29.22	16.71	16.34	16.04	Minimal Saturation (Exceeded)
18073923+4552435	18 07 39.2388	+45 52 43.58	16.75	16.25	16.22	Minimal Saturation (Exceeded)
18072550+4553154	18 07 25.5094	+45 53 15.46	14.91	14.34	14.24	Moderate Saturation (Exceeded)
18072606+4550566	18 07 26.0686	+45 50 56.66	14.27	13.69	13.41	Moderate Saturation (Exceeded)
18072693+4551425	18 07 26.9318	+45 51 42.60	16.18	15.27	15.34	Moderate Saturation (Exceeded)
18072998+4549497	18 07 29.9827	+45 49 49.74	13.9	13.62	13.54	Moderate Saturation (Exceeded)
18073056+4550372	18 07 30.5604	+45 50 37.23	16.08	15.52	15.41	Moderate Saturation (Exceeded)
18073115+4552311	18 07 31.1508	+45 52 31.11	16.06	15.84	15.52	Moderate Saturation (Exceeded)
18073322+4551008	18 07 33.2213	+45 51 0.82	15.16	14.77	14.82	Moderate Saturation (Exceeded)
18073356+4549334	18 07 33.5659	+45 49 33.49	14.03	13.66	13.46	Moderate Saturation (Exceeded)
18073751+4553046	18 07 37.5166	+45 53 4.62	15.36	14.88	14.85	Moderate Saturation (Exceeded)
18074033+4550455	18 07 40.3387	+45 50 45.56	14.86	14.58	14.49	Moderate Saturation (Exceeded)
18074061+4551095	18 07 40.6183	+45 51 9.53	15.18	14.43	14.44	Moderate Saturation (Exceeded)
18074125+4551294	18 07 41.2596	+45 51 29.41	16.27	15.75	15.6	Moderate Saturation (Exceeded)

The field map, showing the objects found, is given below.



The objects are all in the area that is expected.

UVIS Detector

For this test, the standard exposure was modified by putting it in a PATTERN (a WFC3-IR-DITHER-LINE with 3 points with a 10” spacing at an orientation of 225^{o}). The orientation was aligned closely with the "Search Radius Vector”.

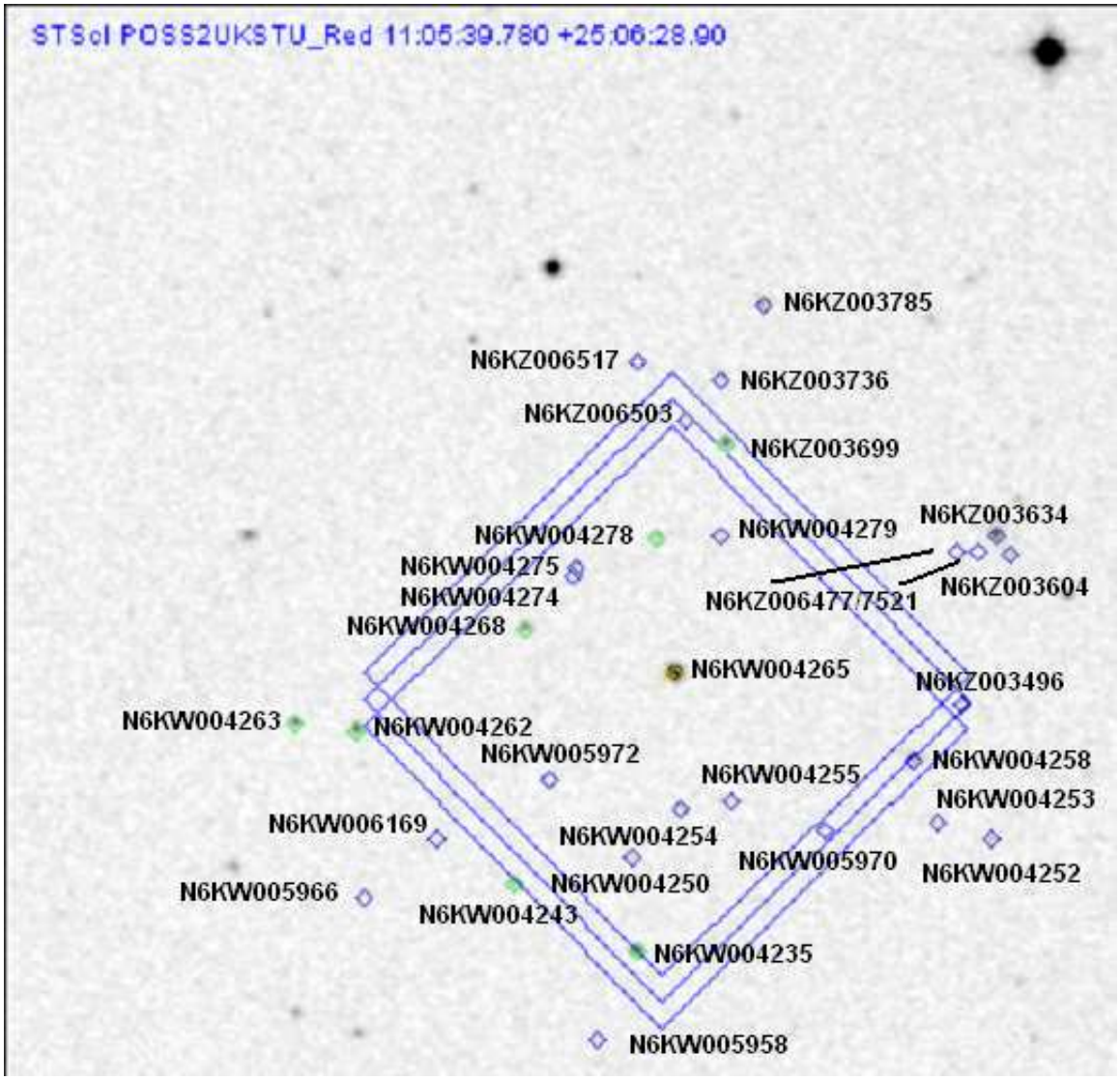
The test exposure was run through the new BOT/Aladin interface, which used different radii for its searches – one for the initial pointing (with the standard 124.1” search radius), one for the second pattern exposure (with the search radius increased to 134.1”),

and one for the final pattern exposure (with a search radius of 135.1). The expanded search radii were exactly as predicted.

The 30 objects detected were:

OBJECT ID	RA	Dec	Fpg	Jpg	V	B-V	Type
N6KW004235	11 05 40.7843	+25 04 44.51	17.41	19.53	18.43	1.1	K0V
N6KW004243	11 05 44.1756	+25 05 9.29	18.82	20.66	19.68	0.88	K0V
N6KW004250	11 05 40.9538	+25 05 19.72	20.02	---	---	---	not a star
N6KW004252	11 05 30.9720	+25 05 27.52	19.01	20.97	---	---	not a star
N6KW004253	11 05 32.4993	+25 05 33.95	19.6	21.99	---	---	not a star
N6KW004254	11 05 39.6307	+25 05 38.20	19.26	21.58	---	---	not a star
N6KW004255	11 05 38.1544	+25 05 41.17	20.08	22.08	---	---	not a star
N6KW004258	11 05 33.1199	+25 05 57.30	18.04	20.56	---	---	not a star
N6KW004262	11 05 48.5804	+25 06 7.11	17.74	20.05	18.88	1.23	K4V
N6KW004263	11 05 50.2755	+25 06 9.34	18.08	20.47	19.26	1.28	K4V
N6KW004265	11 05 39.7765	+25 06 28.87	15.09	18.02	16.66	1.67	M2V
N6KW004268	11 05 43.9362	+25 06 45.50	18.16	20.53	19.33	1.26	K4V
N6KW004274	11 05 42.6300	+25 07 5.87	19.97	21.64	---	---	not a star
N6KW004275	11 05 42.4946	+25 07 8.70	20.16	---	---	---	not a star
N6KW004278	11 05 40.2699	+25 07 20.00	19.01	20.34	19.62	0.52	F5V
N6KW004279	11 05 38.4904	+25 07 21.10	19.52	21.69	---	---	not a star
N6KW005958	11 05 41.8663	+25 04 10.94	---	21.97	---	---	no color info
N6KW005966	11 05 48.3270	+25 05 4.59	---	21.75	---	---	not a star
N6KW005970	11 05 35.5505	+25 05 30.46	---	22.11	---	---	no color info
N6KW005972	11 05 43.2659	+25 05 49.08	---	22.02	---	---	not a star
N6KW006169	11 05 46.3480	+25 05 26.12	---	---	---	---	no color info
N6KZ003496	11 05 31.8129	+25 06 18.16	20	---	---	---	not a star
N6KZ003604	11 05 30.4812	+25 07 14.29	18.86	20.41	---	---	not a star
N6KZ003699	11 05 38.3947	+25 07 55.55	17.74	20.13	18.92	1.29	K4V
N6KZ003736	11 05 38.5161	+25 08 19.91	19.12	20.93	---	---	not a star
N6KZ003785	11 05 37.3998	+25 08 47.78	18.16	20.83	---	---	not a star
N6KZ006477	11 05 31.9730	+25 07 15.35	---	21.95	---	---	not a star
N6KZ006503	11 05 39.4953	+25 08 4.00	---	21.66	---	---	no color info
N6KZ006517	11 05 40.8736	+25 08 26.92	---	21.93	---	---	not a star
N6KZ007521	11 05 31.3672	+25 07 16.09	---	---	---	---	no color info

The field map, showing the objects found, is given below.



The objects are all in the area that is expected.

Parallel

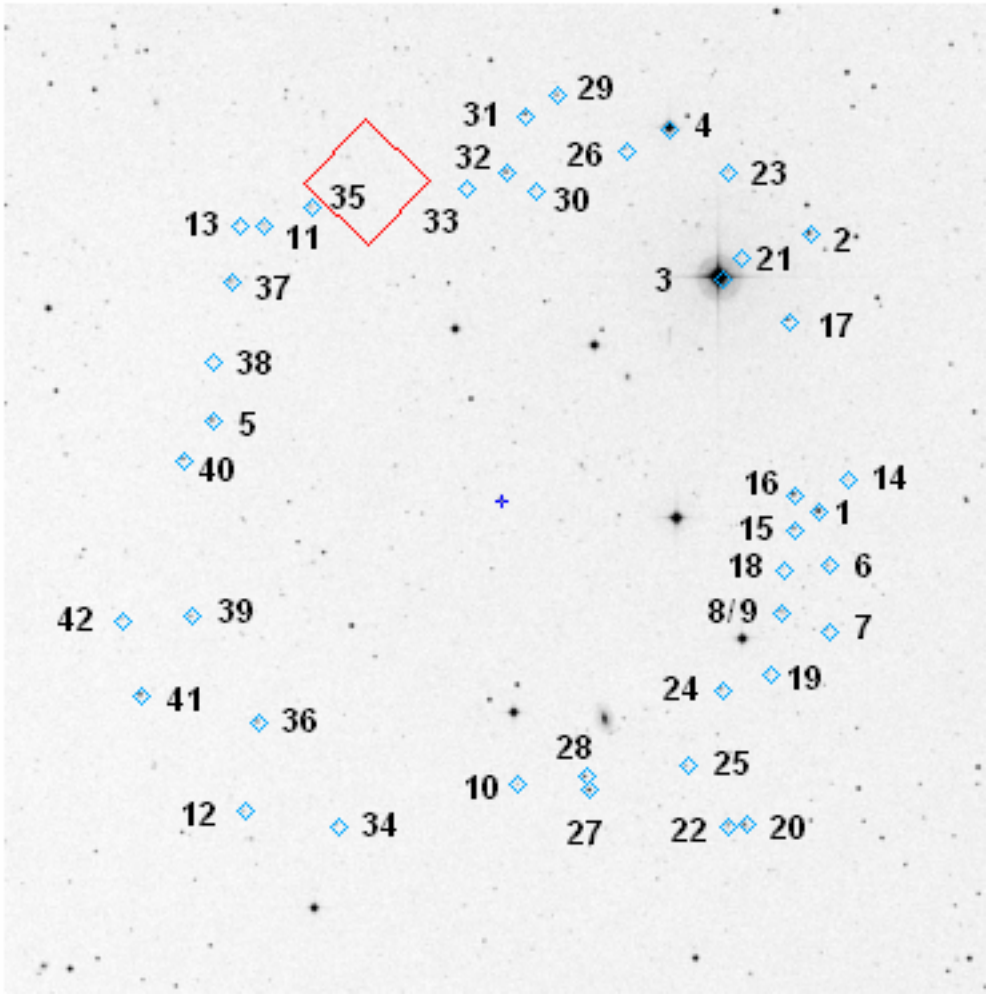
IR Detector

For this test, the standard exposure was modified making it be a coordinated parallel observation with an ACS/HRC prime exposure (and prime target ST LMi: 11:05:40, +25:06:29). The test exposure was run through the new BOT/Aladin interface. The search radius used by BOT was 10.34'. The separation between the HRC and WFC3/IR is 8.7', and after adding 1.75' for the standard search radius, the approximate search radius BOT should have used is 10.5', in agreement with the calculated value.

The 42 objects detected (all science concerns: 5 Extreme, 29 Moderate, and 8 Minimal) were:

Number	OBJECT ID	RA	Dec	J	H	K	Reason
1	11050447+2506143	11 05 4.4753	+25 06 14.32	12.66	12.22	12.15	Extreme Saturation (Exceeded)
2	11050564+2513134	11 05 5.6470	+25 13 13.44	13.32	12.85	12.78	Extreme Saturation (Exceeded)
3	11051545+2512070	11 05 15.4562	+25 12 7.01	6.47	6.18	6.15	Extreme Saturation (Exceeded)
4	11052131+2515520	11 05 21.3101	+25 15 52.10	8.86	8.3	8.12	Extreme Saturation (Exceeded)
5	11061206+2508264	11 06 12.0617	+25 08 26.41	13.42	12.82	12.57	Extreme Saturation (Exceeded)
6	11050334+2504531	11 05 3.3458	+25 04 53.18	16.49	15.83	17.21	Minimal Saturation (Exceeded)
7	11050342+2503148	11 05 3.4246	+25 03 14.86	16.69	15.92	15.23	Minimal Saturation (Exceeded)
8	11050867+2503427	11 05 8.6777	+25 03 42.72	16.41	14.77	14.88	Minimal Saturation (Exceeded)
9	11050869+2503433	11 05 8.6926	+25 03 43.30	16.45	14.8	15.12	Minimal Saturation (Exceeded)
10	11053780+2459195	11 05 37.8082	+24 59 19.57	16.4	15.84	15.69	Minimal Saturation (Exceeded)
11	11060647+2513223	11 06 6.4750	+25 13 22.35	16.49	15.86	15.45	Minimal Saturation (Exceeded)
12	11060829+2458371	11 06 8.2982	+24 58 37.17	16.61	15.78	15.18	Minimal Saturation (Exceeded)
13	11060934+2513221	11 06 9.3410	+25 13 22.13	16.53	15.55	15.77	Minimal Saturation (Exceeded)
14	11050124+2507021	11 05 1.2439	+25 07 2.10	15.99	15.16	15.02	Moderate Saturation (Exceeded)
15	11050717+2505475	11 05 7.1782	+25 05 47.55	14.88	14.33	14.13	Moderate Saturation (Exceeded)
16	11050723+2506395	11 05 7.2372	+25 06 39.55	14.01	13.63	13.52	Moderate Saturation (Exceeded)
17	11050793+2511026	11 05 7.9342	+25 11 2.70	14.75	14.13	14.03	Moderate Saturation (Exceeded)
18	11050832+2504465	11 05 8.3244	+25 04 46.59	15.96	15.45	15.22	Moderate Saturation (Exceeded)
19	11050984+2502083	11 05 9.8400	+25 02 8.38	15.82	15.43	15.07	Moderate Saturation (Exceeded)
20	11051252+2458212	11 05 12.5258	+24 58 21.21	15.4	14.83	14.21	Moderate Saturation (Exceeded)
21	11051333+2512364	11 05 13.3320	+25 12 36.46	15.99	15.47	15.17	Moderate Saturation (Exceeded)
22	11051436+2458200	11 05 14.3638	+24 58 20.09	15.79	15.07	14.47	Moderate Saturation (Exceeded)
23	11051472+2514458	11 05 14.7209	+25 14 45.82	15.77	15.19	14.99	Moderate Saturation (Exceeded)
24	11051519+2501449	11 05 15.1944	+25 01 44.95	14.35	13.64	13.47	Moderate Saturation (Exceeded)
25	11051906+2459491	11 05 19.0673	+24 59 49.16	14.64	14.14	13.78	Moderate Saturation (Exceeded)
26	11052612+2515188	11 05 26.1259	+25 15 18.88	15.87	15.29	15.22	Moderate Saturation (Exceeded)
27	11052979+2459122	11 05 29.7982	+24 59 12.23	14.06	13.68	13.6	Moderate Saturation (Exceeded)
28	11053027+2459324	11 05 30.2758	+24 59 32.46	14.82	14.22	13.96	Moderate Saturation (Exceeded)
29	11053385+2516401	11 05 33.8573	+25 16 40.16	15.52	14.96	15.03	Moderate Saturation (Exceeded)
30	11053632+2514159	11 05 36.3214	+25 14 15.98	15.54	15	14.89	Moderate Saturation (Exceeded)
31	11053736+2516108	11 05 37.3687	+25 16 10.88	14.77	14.54	14.44	Moderate Saturation (Exceeded)
32	11053946+2514430	11 05 39.4668	+25 14 43.02	14.71	14.57	14.36	Moderate Saturation (Exceeded)
33	11054387+2514218	11 05 43.8778	+25 14 21.86	15.17	14.66	14.29	Moderate Saturation (Exceeded)
34	11055791+2458170	11 05 57.9127	+24 58 17.01	15.37	14.8	14.45	Moderate Saturation (Exceeded)
35	11060122+2513495	11 06 1.2218	+25 13 49.59	16.06	15.62	14.89	Moderate Saturation (Exceeded)
36	11060676+2500516	11 06 6.7622	+25 00 51.68	14.07	13.44	13.26	Moderate Saturation (Exceeded)
37	11061011+2511565	11 06 10.1124	+25 11 56.52	15.66	14.88	14.42	Moderate Saturation (Exceeded)
38	11061202+2509562	11 06 12.0223	+25 09 56.24	16.17	15.86	15.24	Moderate Saturation (Exceeded)
39	11061424+2503304	11 06 14.2454	+25 03 30.46	14.09	13.44	13.21	Moderate Saturation (Exceeded)
40	11061525+2507272	11 06 15.2527	+25 07 27.27	15.34	15.17	15.03	Moderate Saturation (Exceeded)
41	11061981+2501314	11 06 19.8187	+25 01 31.47	14.05	13.59	13.5	Moderate Saturation (Exceeded)
42	11062211+2503241	11 06 22.1105	+25 03 24.18	16.04	15.53	15.3	Moderate Saturation (Exceeded)

The field map, showing the objects found, is given below.



The objects are all in the area that is expected.

UVIS Detector

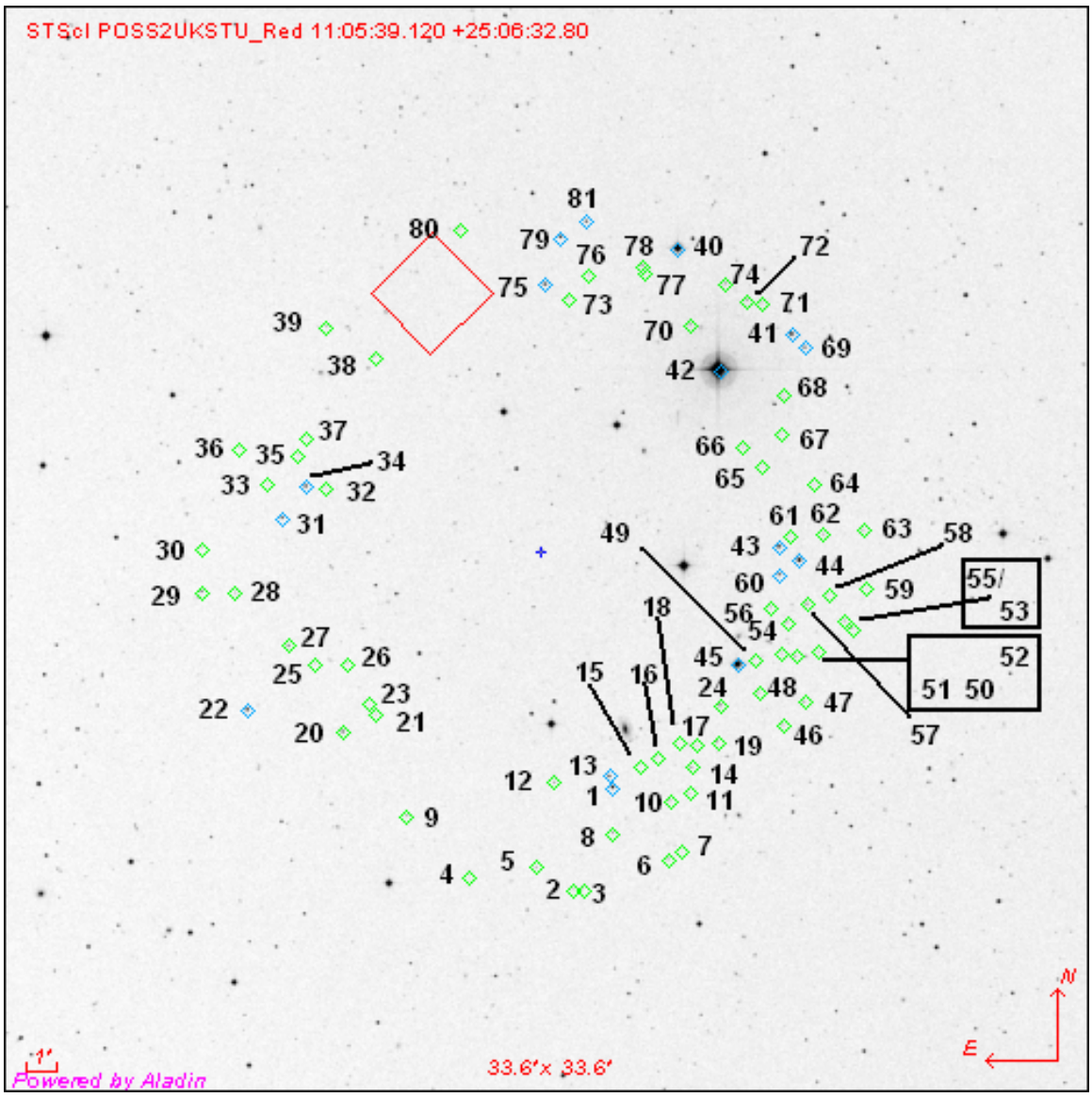
For this test, the standard exposure was modified making it be a coordinated parallel observation with an ACS/HRC prime exposure. The test exposure was run through the new BOT/Aladin interface. The search radius used by BOT was 10.6'. The separation between the HRC and WFC3/UVIS is 8.7', and after adding 2.07' for the standard search radius, the approximate search radius BOT should have used is 10.77', in good agreement with the calculated value.

The 81 objects detected were:

Number	OBJECT ID	RA	Dec	Fpg	Jpg	V	B-V	Type
1	N6KW000003	11 05 29.8267	+24 59 11.86	14.87	15.94	15.36	0.39	F0V
2	N6KW004052	11 05 35.1594	+24 56 1.22	19.12	21.55	20.33	1.23	K4V
3	N6KW004053	11 05 33.8273	+24 56 1.04	18.95	21.39	20.17	1.26	K4V
4	N6KW004061	11 05 49.3640	+24 56 24.05	19.65	21.17	20.35	0.58	F5V
5	N6KW004064	11 05 40.2144	+24 56 42.22	18.16	20.35	19.22	1.14	K0V
6	N6KW004069	11 05 22.1793	+24 56 58.05	17.84	18.92	18.33	0.39	F0V
7	N6KW004074	11 05 20.3389	+24 57 13.10	19.82	21.63	20.67	0.71	G5V
8	N6KW004091	11 05 29.7735	+24 57 46.84	17.82	19.3	18.5	0.66	G2V
9	N6KW004102	11 05 57.9366	+24 58 16.81	17.91	20.48	19.21	1.4	K4V
10	N6KW004113	11 05 21.9912	+24 58 47.18	18.16	19.64	18.84	0.66	G2V
11	N6KW004120	11 05 19.2937	+24 59 0.77	18.84	22.09	20.67	1.69	M2V
12	N6KW004124	11 05 37.8121	+24 59 19.72	17.94	20.29	19.09	1.25	K4V
13	N6KW004129	11 05 30.2954	+24 59 32.25	16.04	17.82	16.87	0.88	K0V
14	N6KW004133	11 05 19.0527	+24 59 49.24	17.6	20.33	19.01	1.52	M2V
15	N6KW004135	11 05 26.0514	+24 59 50.95	19.77	21.71	20.68	0.81	G5V
16	N6KW004144	11 05 23.8532	+25 00 7.38	19.06	20.46	19.7	0.57	F5V
17	N6KW004152	11 05 18.4024	+25 00 30.40	19.39	21.06	20.16	0.72	G5V
18	N6KW004155	11 05 20.7211	+25 00 33.46	20.19	21.72	20.9	0.44	F5V
19	N6KW004157	11 05 15.5828	+25 00 36.32	17.52	18.91	18.16	0.6	F5V
20	N6KW004166	11 06 6.7813	+25 00 51.76	16.17	18.53	17.34	1.28	K4V
21	N6KW004176	11 06 2.2840	+25 01 23.51	18.99	21.9	20.54	1.49	M2V
22	N6KW004179	11 06 19.8483	+25 01 31.48	15.13	16.28	15.66	0.44	F5V
23	N6KW004182	11 06 3.0946	+25 01 43.48	19.9	21.83	20.81	0.73	G5V
24	N6KW004183	11 05 15.1991	+25 01 44.80	16.61	18.83	17.69	1.18	K4V
25	N6KW004200	11 06 10.6124	+25 02 56.79	19.13	20.41	19.72	0.49	F5V
26	N6KW004201	11 06 6.2955	+25 02 57.13	18.73	21.12	19.91	1.25	K4V
27	N6KW004216	11 06 14.2817	+25 03 30.55	16.87	19.01	17.9	1.12	K0V
28	N6KW004245	11 06 21.6519	+25 05 7.62	18.47	21.14	19.84	1.45	K4V
29	N6KW004246	11 06 26.2357	+25 05 9.36	16.8	17.8	17.26	0.34	F0V
30	N6KW004266	11 06 26.2747	+25 06 29.91	18.88	21.52	20.23	1.38	K4V
31	N6KW004282	11 06 15.2611	+25 07 27.21	16.14	16.96	16.52	0.22	A5V
32	N6KW004289	11 06 9.3716	+25 08 22.77	19.17	21.45	20.29	1.13	K0V
33	N6KW004291	11 06 17.3192	+25 08 28.88	19.35	20.49	19.87	0.38	F0V
34	N6KW004292	11 06 12.0657	+25 08 26.30	15.49	17.92	16.7	1.33	K4V
35	N6KW004301	11 06 13.0965	+25 09 23.40	19.16	21.34	20.21	1.07	K0V
36	N6KW004302	11 06 21.2090	+25 09 34.78	19.25	21.61	20.41	1.16	K4V
37	N6KW004304	11 06 12.0187	+25 09 56.06	19.41	22.16	20.84	1.27	K4V
38	N6KW004325	11 06 2.7291	+25 12 27.04	18.68	19.26	18.96	0.03	A1V
39	N6KW004331	11 06 9.3587	+25 13 22.29	18.15	20.54	19.33	1.28	K4V
40	N6KZ000018	11 05 21.3197	+25 15 52.16	---	---	11.18	0.67	G5V
41	N6KZ000027	11 05 5.6647	+25 13 13.47	14.4	15.62	14.96	0.49	F5V
42	N6KZ000032	11 05 15.4750	+25 12 6.85	---	---	7.62	0.55	F5V
43	N6KZ000055	11 05 7.2476	+25 06 39.48	14.83	15.92	15.33	0.4	F0V
44	N6KZ000058	11 05 4.4631	+25 06 14.50	13.64	15.12	14.32	0.67	G5V
45	N6KZ000073	11 05 12.8524	+25 03 1.00	---	---	11.22	0.51	F5V
46	N6KZ002978	11 05 6.6125	+25 01 8.64	18.23	19.4	18.77	0.44	F5V
47	N6KZ003062	11 05 3.6825	+25 01 51.91	17.94	18.73	18.31	0.19	A5V
48	N6KZ003090	11 05 9.8852	+25 02 8.34	18.15	20.59	19.37	1.31	K4V
49	N6KZ003191	11 05 10.4856	+25 03 9.70	19.48	21.48	20.43	0.9	K0V
50	N6KZ003203	11 05 4.9096	+25 03 15.85	18.14	20.07	19.05	0.97	K0V

Number	OBJECT ID	RA	Dec	Fpg	Jpg	V	B-V	Type
51	N6KZ003211	11 05 6.8523	+25 03 21.09	18.7	19.66	19.14	0.29	A5V
52	N6KZ003222	11 05 1.7425	+25 03 24.80	18.69	20.02	19.3	0.54	F5V
53	N6KZ003278	11 04 57.2354	+25 04 8.34	18.14	19.14	18.6	0.33	F0V
54	N6KZ003289	11 05 6.0890	+25 04 18.21	17.99	19.45	18.66	0.65	G2V
55	N6KZ003292	11 04 58.2749	+25 04 22.21	18	19.71	18.79	0.82	G5V
56	N6KZ003335	11 05 8.3575	+25 04 46.45	18.53	21.05	19.8	1.35	K4V
57	N6KZ003350	11 05 3.3775	+25 04 53.23	17.17	18.42	17.74	0.51	F5V
58	N6KZ003381	11 05 0.4204	+25 05 11.06	19.26	20.07	19.64	0.15	A5V
59	N6KZ003399	11 04 55.2337	+25 05 22.80	19.82	21.96	20.85	0.86	K0V
60	N6KZ003434	11 05 7.1872	+25 05 47.53	16.2	18.07	17.08	0.94	K0V
61	N6KZ003569	11 05 5.8049	+25 06 58.93	19.06	20.67	19.8	0.71	G5V
62	N6KZ003577	11 05 1.2503	+25 07 2.32	18.22	20.89	19.59	1.46	K4V
63	N6KZ003585	11 04 55.7627	+25 07 10.10	18.41	20.33	19.32	0.95	K0V
64	N6KZ003757	11 05 2.5737	+25 08 35.14	19.71	21.51	20.55	0.73	G5V
65	N6KZ003820	11 05 9.6943	+25 09 6.57	19.44	21.02	20.17	0.66	G5V
66	N6KZ003881	11 05 12.2830	+25 09 43.11	19.06	20.23	19.6	0.42	F0V
67	N6KZ003927	11 05 7.0751	+25 10 7.40	19.19	21.94	20.62	1.34	K4V
68	N6KZ004076	11 05 6.8166	+25 11 20.31	18.74	20.27	19.45	0.67	G5V
69	N6KZ004309	11 05 3.8424	+25 12 48.70	16.32	17.4	16.82	0.39	F0V
70	N6KZ004416	11 05 19.5486	+25 13 29.52	17.51	18.03	17.76	0.01	B5V
71	N6KZ004491	11 05 9.8489	+25 14 9.55	18.34	20.21	19.22	0.92	K0V
72	N6KZ004500	11 05 11.8037	+25 14 16.12	17.58	18.62	18.06	0.36	F0V
73	N6KZ004501	11 05 36.3131	+25 14 16.25	18.45	20.9	19.67	1.3	K4V
74	N6KZ004541	11 05 14.7409	+25 14 45.99	17.65	19.95	18.77	1.22	K4V
75	N6KZ004543	11 05 39.4857	+25 14 43.27	15.39	16.76	16.02	0.6	F5V
76	N6KZ004557	11 05 33.4967	+25 15 0.44	18.87	20.24	19.5	0.57	F5V
77	N6KZ004562	11 05 25.7883	+25 15 6.96	19.96	21.26	20.56	0.36	F0V
78	N6KZ004595	11 05 26.1775	+25 15 18.98	17.49	19.98	18.74	1.36	K4V
79	N6KZ004690	11 05 37.3901	+25 16 11.21	15.52	16.73	16.08	0.49	F5V
80	N6KZ004710	11 05 51.2484	+25 16 23.19	18.47	20.82	19.63	1.24	K4V
81	N6KZ004746	11 05 33.8750	+25 16 40.19	16.26	17.36	16.76	0.41	F0V

The field map, showing the objects found, is given below.



The objects are all in the area that is expected.

Actual Duration

There are three ways in which the WFC3/UVIS can use actual durations – a CR-SPLIT exposure, a pattern exposure, and a number of iterations greater than 1 exposure; note that the WFC3/IR detector cannot have an actual duration. For this test, the third piece of a CR-SPLIT will have the actual duration set to 500s, the second piece of the pattern will have the actual duration set to 500s, and the second of three exposures in a number of iterations=3 will have the actual duration set to 500s.

CR-SPLIT

An examination of the BOT details shows that the revised exposure time for the third piece of the pattern was indeed detected by the tool, and the total counts were properly adjusted for the different exposure time.

Number of iterations
An examination of the BOT details shows that the revised exposure time for the second sub-exposure was indeed detected by the tool, and the total counts were properly adjusted for the different exposure time.

Pattern
An examination of the BOT details shows that the revised exposure time for the second piece of the pattern was indeed detected by the tool, and the total counts were properly adjusted for the different exposure time.

Visualization

There are many aspects to this test, all of which have already been verified by the previous ACS/SBC and ACS/HRC testing

Issue
Aladin spreadsheet name link to an external html page with more details fails for the GSC2; this is covered with APT-VTT PR 56234.

Exception Handling

There are four types of exception handling to be tested; Network Query Error and Cancel Ongoing Operations have been verified in the ACS/SBC testing, and Bad Exposures has been verified in the ACS/HRC testing.

Unsupported Exposures

For the UVIS detector, the quad filters and the grism (G280) are not supported, while for the IR detector, the 2 grisms (G102 and G141) are not supported. BOT properly lists these type of exposures as not supported.

Open issues for the WFC3 team

Based on the testing done to date, the following are open issues for the WFC3 team to respond to:

1) For the IR detector (and the UVIS), we check for 3 different saturation levels (minimum, moderate, and extreme), and report the results of each check (i.e. each object shows 3 results). For each object, should we only show the worst case (e.g. if an object shows minimum and moderate saturation, only show moderate)? This is detailed in OPR 56982.

2) For the case where there is no 2MASS data, we fall back to using the GSC2. There are many faint objects that are listed as "not a star" in the GSC2 catalog, and therefore appear as "Unknown" in the BOT results (since the tool does not know how to process them). Most of these objects are in fact stars, and are listed that way due to the low S/N in their PSFs. For the UV detectors, we consider these objects as stars for processing to eliminate the large number of "Unknown" objects (since there are all faint, they are undoubtedly not a health-and-safety concern). Should we do the same for WFC3/IR? The same issue holds for the UVIS detector.

3) For the WFC3/UVIS detector, we use the same triggers as for the WFFC3/IR detector (3 levels of saturation at 75,000, 750,000, and 7,500,000). Is the correct? Are there other triggers (e.g. blooming) as there are for other CCD detectors (WFPC2 has 5 checks)?

4) For 2MASS objects, we check the cc_flg (contamination flag) to determine if a given magnitude should be used. For those cases where the object is contaminated, the tool ignores the magnitude. This leads to objects appearing in the results table with no valid 2MASS data, and the object is therefore classified as "Unknown". Should we continue to show these objects (what would the user do with them?), or should they be deleted from the output?

5) Prior to the release of the tool for the public, we need to review the count rate tables for both detectors and catalog (2MASS and GSC2; the latter presently has dummy values for testing).