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Precise equatorial coordinates of double and multiple systems: an astronomical support to the Hipparcos mission

R. Pannunzio, R. Morbidelli, G. Massone, M.G. Lattanzi*, M. Sarasso and G. Chiumiento

Osservatorio Astronomico di Torino, 10025 Pino Torinese (TO), Italy

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Abstract. — In this work we report on the determination of precise positions of 623 double and multiple stars (126 of which are newly discovered systems) obtained from the measurement of 39 plates taken at both the European Southern Observatory (ESO) and the Astronomical Observatory of Torino (AOT) during the period 1984-87. Those positions will be used to update the *Catalogue de Composantes d'étoiles Doubles et Multiples (CCDM)* and, consequently, the Input Catalogue of the Hipparcos mission, as the CCDM, established on the basis of the Index (1976,5), is the reference source for the known double and multiple stars that appear on the Hipparcos list. Several visual doubles on the list presented here are within those included in the final observing program of the Hipparcos astrometric mission.

Key words: double stars — multiple systems — Hipparcos mission

1. Introduction.

The space astrometry mission Hipparcos started back in the late summer of 1989. The main goal of this mission is the accurate determination of position, parallax and proper motion of about 120 000 stars with blue magnitude brighter than 13.

About 14 000 of the program stars are known double and multiple systems. Observations of these stars (as well as the other stars in the program) and their subsequent successful reduction require that the absolute position of each component be known at the 1 arcsec level (per coordinate). This astrometric necessity imposed by the Hipparcos mission, along with the unsatisfactory precision of most of the exsisting data, has called for new observation campaigns leading to the creation of a new catalogue of double and multiple stars. This is the CCDM catalogue, established on the basis of the Index (1976,5) (upgrade of the Index Catalogue of Jeffers and van den Bos, 1963) and completed at the Royal Observatory, Belgium. This catalogue has been the main source list of double and multiple star positions while preparing the Input Catalogue for the Hipparcos mission (Turon 1989).

Given the improved nature of the positions listed in the CCDM, this catalogue will also be quite useful during the reduction of the Hipparcos data taken on double and multiple systems. As good provisional data are needed for the successful extraction of the astrometric parameters of non-single stars, the CCDM will serve as the main data base for the retrieval of those preliminary data.

The main goal of this work is to provide positions of a set of double and multiple stars listed in the CCDM to the accuracy required for their possible inclusion in the Hipparcos Input Catalogue.

2. Instrumentation, observations, and data reduction.

All the results reported in this paper refer to two sets of observations carried out at the European Southern Observatory (ESO) and at the Astronomical Observatory of Torino (AOT). More precisely, 27 plates were exposed using the 386/3994 mm astrograph (GPO) of the ESO Observatory at La Silla (Chile) over the period 1984–87, while 12 plates were obtained at the AOT during the period 1985–87 with the 380/6875 mm photographic refractor. Kodak IIa-O spectroscopic plates (16 cm on a side) were usually used at both Observatories. The number of exposures on each plate are usually 3 for the AOT plates and 1 for the ESO plates. Each image was measured twice with either a semi-automatic or a manual Ascorecord measuring machine (both machines are available at the AOT).

The equatorial coordinates of the reference stars were selected from the AGK3 catalogue (Heckmann and Dieckvoss 1975) when the declination of the targets was above

* *Present address:* Space Telescope Science Institute, Baltimore MD 21218, USA

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−2°, while the SAO catalogue was used for declinations below this value.

All the plates used in this study were reduced via a least squares adjustment to a standard 6-constant plate model (Eichhorn 1974). The derived equatorial coordinates, in the B1950.0 system (as defined by the AGK3 or the SAO catalogues), were reduced to the J2000.0 system using the procedure of Aoki *et al.* (1983). The polar coordinates of the binary and multiple stars (ρ and θ) have been derived from the computed equatorial coordinates of each component in the systems. Consequently, the orientations of these systems refer to the North Pole of the J2000.0 system.

126 new systems have been discovered and measured. These new systems are named as AOT followed by a progressive number in Table 1.

We have also derived magnitude estimates for those new systems (for the others we always used the CCDM values). As both the ESO and the AOT plates used blue sensitive emulsions and were taken without any filter, those magnitudes are in the photographic (mpg) system. We found four GPO plates partially overlapped with four Southern Selected Areas (Brun & Vehremberg 1980). The magnitudes of the double and multiple stars found on these four plates were then visually estimated using the stars in the Selected Areas compilation as comparisons. For the other ESO plates, the magnitudes were estimated by comparison with the previous four plates, after taking into account the difference in exposure time.

As for the Torino plates, no comparison stars from any Selected Areas field were available. The estimates were made using a M 44 (Praesepe) blue plate, exposed through the same instrument, and developed and processed following the same procedure used for the present plates. This plate thus sets the magnitude scale for the estimation of the unknown magnitudes. The magnitude zero–point was fixed using those AGK3 or SAO stars available on the plates.

Some internal check were made to avoid large plate to plate systematic errors. No differences greater than 0.2–0.3 mag were found.

3. Results.

In Table 1 the equatorial positions of 623 components of double and multiple stars or the photocenters of the unresolved systems. There are 20 components of multiple systems with entries in the CCDM but without position in Table 1 as they were either not visible on the plates or unmeasurable, and 25 couples of multiple systems of which the polar coordinates are given while the absolute position is the same of the preceding entry.

More precisely, the columns of Table 1 are as follows:

1: Index number (based on the position at the reference epoch 1900.0) according to the CCDM designation.
2: Name of the discoverer; binaries with the designation AOT are new systems not previously catalogued.
3: Binary component according to the CCDM designation (A = main component, B = the secondary one, C = the third one, and so on). When 2 letters shifted to the right appear in this column (e.g. AB, BC, etc...), it means that the 2 components are so closed that only the photocenter was measured. When 2 letters shifted to the left appear, it means that the listed absolute position is that of the secondary component (letter), while the position relative to the primary is that of the couple.
4: Magnitude of the components as given in the CCDM catalogue. For the newly discovered systems (AOT designation) a magnitude estimate is provided (see section 2 above).
5: Epoch of observation without the initial 2 digits.
6: Right Ascension referred to the J2000.0 equinox.
7: Declination, as before.
8: Position angle referred to the J2000.0 North Pole (in degrees).
9: Angular separation (in arcsec).
10: DM number (Durchmusterungen Catalogues BD and CD). For some of the newly discovered systems the DM number (BD or CD) has been computed and inserted here.
11: ADS number.
12: Number of the plate containing the system and Observatory where that plate was taken, 1: AOT, 2: ESO.
13: Component without positions: NM = Not Measured, NS = Not Seen.

4. Discussion.

Given the requirements imposed by the Hipparcos mission recalled in the Introduction, we will discuss here the accuracy of the results reported in Table 1. The assessment is based on the statistics of the (O-C) residuals of the reference stars (used during the plate reductions) both in Right Ascension and Declination.

In Table 2 we report the results for all the 39 plates used in this study. They have been divided into four different groups according to the Observatory of origin (AOT or ESO) and to the reference catalogue used with them (SAO or AGK3).

Then, Table 2 shows the following plate groups:

a) 10 AOT plates reduced with the AGK3,
b) 2 AOT plates reduced with the SAO,
c) 25 ESO plates reduced with the SAO,
d) 2 ESO plates reduced with the AGK3.

The columns of the table have the following meaning:

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TABLE 2.

1	2	3	4	5	6	7
				"	"	"
945	(1)	AGK3	18	0.35	0.20	0.40
946	(1)	AGK3	13	0.34	0.27	0.43
947	(1)	AGK3	10	0.41	0.41	0.58
948	(1)	AGK3	9	0.66	0.43	0.79
949	(1)	AGK3	12	0.36	0.25	0.44
950	(1)	AGK3	13	0.27	0.59	0.65
955	(1)	AGK3	12	0.45	0.28	0.53
996	(1)	AGK3	8	0.50	0.50	0.71
1000	(1)	AGK3	9	0.38	0.66	0.76
1003	(1)	AGK3	6	0.52	0.48	0.71
Weighted mean - group a				0.40	0.38	0.57
				"	"	"
1001	(1)	SAO	8	0.72	1.11	1.32
1002	(1)	SAO	6	0.85	0.65	1.07
Weighted mean - group b				0.78	0.91	1.21
				"	"	"
7676	(2)	SAO	16	1.02	0.56	1.16
7682	(2)	SAO	12	1.27	1.65	2.08
11131	(2)	SAO	14	0.73	0.95	1.20
11134	(2)	SAO	11	0.53	0.75	0.92
11138	(2)	SAO	13	0.58	0.54	0.79
11143	(2)	SAO	15	1.10	0.71	1.31
11149	(2)	SAO	10	0.62	0.25	0.67
11151	(2)	SAO	12	0.99	0.85	1.30
11157	(2)	SAO	9	0.74	0.72	1.03
11158	(2)	SAO	13	0.88	0.91	1.27
11160	(2)	SAO	16	0.72	0.92	1.17
11171	(2)	SAO	13	0.80	0.46	0.92
11174	(2)	SAO	13	0.72	1.00	1.23
11175	(2)	SAO	17	0.74	0.68	1.00
11177	(2)	SAO	8	1.25	0.83	1.50
11199	(2)	SAO	7	0.43	0.77	0.88
11209	(2)	SAO	7	0.98	1.07	1.45
11210	(2)	SAO	8	0.73	0.59	0.94
11222	(2)	SAO	11	0.68	1.00	1.21
11224	(2)	SAO	8	0.53	0.78	0.94
11234	(2)	SAO	9	0.65	0.45	0.79
11239	(2)	SAO	9	0.74	0.46	0.87
11272	(2)	SAO	7	0.58	0.89	1.06
11273	(2)	SAO	9	0.85	0.58	1.03
11274	(2)	SAO	9	0.73	1.06	1.29
Weighted mean - group c				0.80	0.78	1.13
				"	"	"
11176	(2)	AGK3	17	0.63	0.61	0.88
11211	(2)	AGK3	18	0.54	0.52	0.75
Weighted mean - group d				0.58	0.56	0.81

1: Plate number.

2: Observatory Identification number (1): AOT, (2) :ESO.

3: Reference Catalogue used.

4: Number of reference stars used in the plate solution.

5: Mean error of unit weight in Right Ascension as computed from (O-C) residuals (arcsec).

6: The same as column 5 for Declination (arcsec).

7: Total mean error of unit weight computed as the square root of the sum of the squares of the values in columns 5 and 6 (arcsec).

Under each group of plates, separated by a dashed line, we give the weighted mean values of the data reported in Columns 5, 6 and 7. As weights, we have used the number of reference stars in column 4.

The average results in Table 2 indicate good agreement between Right Ascension and Declination. Also, the precision of the positions of group *a* is twice as good as that of group *c*. This is not surprising as the AGK3 is much a better catalogue than the SAO, and it seems to indicate that the different scale of the two telescopes used does not play any significant role as the error budget for the ESO plates is dominated by the SAO errors. Evidence that this is indeed the case can be inferred by comparing set *a* to set *d* and set *b* to set *c*. Although statistics is poor for the two smaller groups and caution must be paied in deriving any conclusive argument, it appears that the increased error of group *d* as compared to group *a* is almost entirely accounted for by the more favourable scale of the AOT refractor The same effect does not show when comparing the corresponding groups *b* and *c*.

As very similar machines were used to measure the plates and the same plate model adopted during the reductions, the fact that the average precision of sets *a* and *d* scales nicely with the different plate scale indicates that the GPO astrograph and the AOT refractor have quite similar astrometric properties.

Further evidence of the dominant role of the SAO catalogue in determining the final precision of most of the ESO plates is given in Fig. 1.

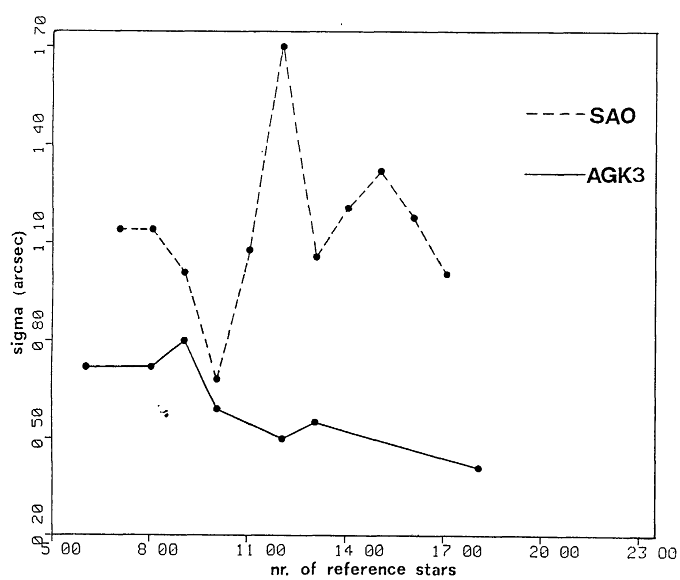

FIGURE 1. Number of reference stars against standard deviation for the SAO and AGK3 stars

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Here the total (positional) error of unit weight (column 7 in Table 2) is plot versus the number of reference stars used in the plate reductions (average values are used when two or more plates were reduced with the given number of reference stars) and for both the AGK3 and the SAO catalogues. The AGK3 curve clearly shows that the overall precision is improving with the number of reference stars as expected. Also, this curve appears to approach the value of 0.5 arcsec, which is quite consistent with an estimation of the AGK3 total precision at the mean epoch of our plates (1986.2) as derived using the data in de Vegt and Zacharias (1987). The SAO curve shows indeed a very different case. There is no evident benefit in using larger numbers of SAO stars, which seems to indicate the presence of inconsistences in the reference catalogue itself. This would not be too much of a surprise given that the SAO catalogue is a compilation resulting from the merging of many different (and inhomogeneous) source catalogues (SAO staff 1966). From the introduction to the SAO catalogue we expected a total (position) error of about 0.6 arcsec at the epoch of the plates. From Fig. 1, we infer a much diffrent value of about 1.2 arcsec, which is in fair agreement with the findings presented in Table 2 of Taff *et al.* (1990).

The previous analysis supports the interpretation that the AGK3 or SAO catalogue errors at the epoch of the plates contribute most of the unit weight errors listed in Table 2. Thus, the precision (at least relative) of the positions given in this work is well within the requirement imposed by the Hipparcos mission for their acceptance in the CCDM catalogue and, consequently, in the Hipparcos Input Catalogue.

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TABLE 1.

1	2	3	4	5	6	7	8	9	10	11	12	13
					h m s	° ′ ″	°	″				
01151S1720		A	11.0	87.88	01 19 59.763	−16 48 09.73					1001 1	
01151S1720	AOT 1	B	12.8	87.88	01 19 58.330	−16 47 50.70	312.74	28.029			1001 1	
01166S1700	HU 417	AB	10.0 13.2	87.88	01 21 31.643	−16 28 58.27			−17 239	1100	1001 1	
01175S1723		A	11.2	87.88	01 22 21.649	−16 51 38.31					1001 1	
01175S1723	AOT 2	B	13.5	87.88	01 22 21.642	−16 51 54.66	180.36	16.355			1001 1	
01188S1702		A	10.5	87.88	01 23 41.065	−16 31 03.11					1001 1	
01188S1702	AOT 3	B	13.3	87.88	01 23 40.439	−16 31 09.82	233.31	11.229			1001 1	
01467S1714		A	9.0	87.88	01 51 28.478	−16 44 24.41			−17 330		1002 1	
01467S1714	AOT 4	B	13.3	87.88	01 51 28.921	−16 44 32.42	141.55	10.227			1002 1	
01483S1713	BU 183	AB	8.9 9.9	87.88	01 53 07.956	−16 43 57.81			−17 340	1505	1002 1	
02155S0847		A	9.5	87.59	02 20 23.256	−08 19 11.59			−08 426		11210 2	
02155S0847	AOT 5	B	12.9	87.59	02 20 23.543	−08 19 25.67	163.13	14.703			11210 2	
02177S0756		A	12.6	87.59	02 22 40.682	−07 28 43.31					11210 2	
02177S0756	AOT 6	B	14.4	87.59	02 22 40.389	−07 29 00.77	194.02	17.996			11210 2	
02184S0817		AB	9.3 9.7	87.59	02 23 17.496	−07 49 04.75			−08 435	1821	11210 2	
02184S0817	HO 313	C	13.4	87.59	02 23 18.628	−07 49 01.38	78.67	17.154		1821	11210 2	
02191S0819		A	9.6	87.59	02 24 01.013	−07 51 46.28			−08 438	1828	11210 2	
02191S0819	HO 314	B	11.4	87.59	02 24 00.831	−07 51 50.95	210.01	5.391	−08 438	1828	11210 2	
02191S0819	HO 314	C	12.0	87.59					−08 438	1828	11210 2	NM

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TABLE 1 (*continued*)

03174N2350		A	10.4		87.87	03 23 13.645	+24 11 55.40			+23 449		996	1	
03174N2350	KU	B	10.7		87.87	03 23 13.611	+24 11 27.82	180.97	27.586			996	1	
03183N2326	WOR 4	AB	10.7	12.0	87.87	03 24 6.320	+23 47 08.22					996	1	
03186N2300		A	9.2		87.87	03 24 26.701	+23 20 50.81					996	1	
03186N2300	POU 276	B	12.8		87.87	03 24 27.256	+23 20 59.20	42.30	11.346			996	1	
03332N4301		A	13.4		87.88	03 40 00.566	+43 20 58.34					1003	1	
03332N4301	AOT 7	B	14.2		87.88	03 40 00.046	+43 20 55.48	243.26	6.353			1003	1	
03349N4320		A	12.0		87.88	03 41 42.997	+43 39 50.90					1003	1	
03349N4320	AOT 8	B	12.9		87.88	03 41 43.982	+43 39 50.15	94.04	10.711			1003	1	
03351N4312		A	7.9		87.88	03 41 54.937	+43 30 52.40			+43 791	2688	1003	1	
03351N4312	A 1707	B	14.4		87.88	03 41 54.600	+43 31 02.99	340.94	11.212		2688	1003	1	
03351N4312	A 1707	C	10.1		87.88	03 41 58.374	+43 29 59.03	144.98	65.168		2688	1003	1	
03351N4312	A 1707	CD	14.3		87.88	03 41 58.803	+43 29 57.72	105.74	4.853		2688	1003	1	
03359N4317		A	12.2		87.88	03 42 47.346	+43 36 38.50					1003	1	
03359N4317	AOT 9	B	12.9		87.88	03 42 46.869	+43 36 36.66	250.49	5.498			1003	1	
04172S3534		A	12.5		84.96	04 20 54.242	−35 19 34.46			−35 1667		7682	2	
04172S3534	AOT 10	B	12.7		84.96	04 20 53.343	−35 19 43.13	231.74	14.002			7682	2	
04193S3455		A	11.7		84.96	04 23 01.474	−34 41 30.25					7682	2	
04193S3455	AOT 11	B	13.0		84.96	04 23 02.030	−34 41 25.09	53.05	8.585			7682	2	
04195S3547		A	6.3		84.96	04 23 07.776	−35 32 42.98			−35 1687		7682	2	
04195S3547	I 384	B	13.3		84.96	04 23 07.524	−35 33 00.41	190.02	17.697			7682	2	
04206S3506		A	12.8		84.96	04 24 20.396	−34 52 40.71			−35 1696		7682	2	
04206S3506	AOT 12	B	12.9		84.96	04 24 19.561	−34 52 36.86	290.57	10.970			7682	2	
04211S3400	ALD 24	AB	11.0	13.0	84.96	04 24 50.887	−33 46 12.36			−34 1674		7682	2	
04211S3400	AOT 13	C	13.1		84.96	04 24 51.382	−33 46 12.20	88.53	6.181			7682	2	
04212S3459		A	6.6		84.96	04 24 56.509	−34 45 25.64			−35 1704		7682	2	
04212S3459	I 59	BC	10.0	11.0	84.96	04 24 55.404	−34 45 55.91	204.22	33.190			7682	2	
04225S3456	PRO	AB	10.0	10.2	84.96	04 26 11.558	−34 42 11.04			−34 1688		7682	2	
04247S2525	B 69	AB	7.8	12.8	87.63	04 28 54.135	−25 11 42.44			−25 1903	3257	11272	2	
04247S2525	STN 8	C	9.3		87.63	04 28 54.041	−25 11 34.90	350.36	7.651		3257	11272	2	
04264S2551		A	10.4		87.63	04 30 32.596	−25 38 12.96			−25 1914		11272	2	
04264S2551	AOT 14	B	12.2		87.63	04 30 32.684	−25 38 07.54	12.31	5.544			11272	2	
04268S2512		A	8.5		87.63	04 30 59.599	−24 58 48.33			−25 1919	3282	11272	2	
04268S2512	SEE 37	B	12.0		87.63	04 31 00.087	−24 58 37.37	31.20	12.807		3282	11272	2	
04272S2557		A	10.6		87.63	04 31 21.982	−25 44 20.21			−26 1716		11272	2	
04272S2557	AOT 15	B	12.0		87.63	04 31 22.900	−25 44 17.02	75.53	12.805			11272	2	
04285S2525	RST2348	AB	8.3	9.6	87.63	04 32 37.677	−25 12 18.29			−25 1941		11272	2	
04490N0804		A	11.2		87.87	04 54 24.783	+08 13 18.96					1000	1	
04490N0804	AOT 16	B	13.6		87.87	04 54 24.356	+08 13 32.48	334.84	14.943			1000	1	
04495N0826	STT 90	AB	7.0	9.0	87.87	04 54 56.385	+08 36 00.14			+08 799	3517	1000	1	
04495N0826	STT 90	C	12.0		87.87						3517	1000	1	NS
04505N0815		A	11.3		87.87	04 55 54.072	+08 24 17.21			+08 801		1000	1	
04505N0815	AOT 17	B	12.0		87.87	04 55 55.344	+08 23 45.64	149.12	36.787			1000	1	
04515N0826		A	12.1		87.87	04 56 57.884	+08 35 09.39					1000	1	
04515N0826	AOT 18	B	13.0		87.87	04 56 57.686	+08 35 13.62	325.17	5.151			1000	1	
05464S0637	RST4287	AB	10.4	12.0	87.60	05 51 15.444	−06 34 00.46			−06 1333		11234	2	
05464S0637	AOT 19	C	11.0		87.60	05 51 15.223	−06 34 04.58	218.60	5.277			11234	2	
05468S0730		A	9.0		87.60	05 51 29.934	−07 29 07.16					11234	2	
05468S0730	HJ 32	B	12.0		87.60	05 51 29.816	−07 29 35.49	183.54	28.385			11234	2	
05471S0720		A	8.0		87.60	05 51 57.279	−07 18 35.61			−07 1192	4462	11234	2	
05471S0720	BU 95	B	12.0		87.60	05 51 56.407	−07 18 29.09	296.69	14.526	−07 1192	4462	11234	2	
05471S0720	BU 95	C	11.8		87.60					−07 1192	4462	11234	2	NM
05472S0715		A	9.9		87.60	05 52 2.445	−07 14 54.85					11234	2	
05472S0715	J 1913	B	11.0		87.60	05 52 1.946	−07 14 53.18	282.66	7.615			11234	2	
05474S0652		A	8.0		87.60	05 52 13.392	−06 50 51.42			−06 1337		11234	2	
05474S0652	AOT 20	B	12.2		87.60	05 52 12.428	−06 50 59.08	241.92	16.264			11234	2	
05478S0706		A	11.7		87.60	05 52 37.083	−07 04 57.21					11234	2	
05478S0706	AOT 21	B	13.5		87.60	05 52 36.452	−07 05 12.23	212.04	17.712			11234	2	
05486S0626	A 501	AB	9.3	11.2	87.60	05 53 30.707	−06 24 48.97			−06 1343	4485	11234	2	
05499S0713		A	12.5		87.60	05 54 41.943	−07 11 36.16					11234	2	
05499S0713	AOT 22	B	12.7		87.60	05 54 41.805	−07 11 46.66	191.07	10.697			11234	2	
05502S0701	J 1915	A	10.0		87.60					−07 1213		11234	2	NM
05502S0701	J 1915	BC	10.7	11.1	87.60	05 54 59.165	−07 00 38.30			−07 1213		11234	2	
05510S0739		A	7.5		87.60	05 55 47.251	−07 38 08.38			−07 1222		11234	2	
05510S0739	AOT 23	B	12.5		87.60	05 55 46.555	−07 37 59.11	311.86	13.898			11234	2	
05521S0701		A	11.0		87.60	05 56 52.990	−07 00 27.78					11234	2	
05521S0701	HJ 33	B	11.5		87.60	05 56 53.025	−07 00 34.81	175.76	7.048			11234	2	
05521S0701	AOT 24	C	12.2		87.60	05 56 52.822	−07 00 37.80	194.02	10.320			11234	2	
05521S0701		BC			87.60	05 56 52.822	−07 00 37.80	225.36	4.247			11234	2	
05529S0740		A	8.5		87.60	05 57 43.587	−07 39 33.84			−07 1232	4547	11234	2	
05529S0740	STF 823	B	9.2		87.60	05 57 43.450	−07 39 26.12	345.26	7.981		4547	11234	2	
05534S2033	RST4793	AB	9.6	9.6	87.63	05 57 41.328	−20 32 19.85			−20 1239		11273	2	
05541S2039	HDO 80	AB	9.4		87.63	05 58 24.032	−20 38 43.55			−20 1241		11273	2	
05543S3156		A	12.2		84.96	05 58 04.025	−31 55 26.88					7676	2	
05543S3156	AOT 25	B	13.0		84.96	05 58 05.489	−31 55 33.00	108.19	19.606			7676	2	
05545S3107		A	10.3		84.96	05 58 15.763	−31 06 49.20			−31 2877		7676	2	
05545S3107	AOT 26	B	11.9		84.96	05 58 17.582	−31 07 16.48	139.44	35.914			7676	2	

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TABLE 1 (*continued*)

05546S3203	JSP 87	AB	10.6	13.7	84.96	05 58 17.324	−32 02 47.14			−32 2681		7676 2	
05550S2035		A	8.9		87.63	05 59 18.415	−20 34 30.08			−20 1246		11273 2	
05550S2035	ARA 855	B	12.1		87.63	05 59 17.298	−20 34 24.07	290.95	16.798			11273 2	
05550S2035	AOT 27	C	13.9		87.63	05 59 15.843	−20 34 20.10	285.44	37.472			11273 2	
05550S2035		BC			87.63	05 59 15.843	−20 34 20.10	280.99	20.815			11273 2	
05552S2115		A	10.7		87.63	05 59 24.743	−21 14 10.76					11273 2	
05552S2115	AOT 28	B	14.0		87.63	05 59 25.810	−21 14 06.39	73.65	15.542			11273 2	
05561S3103		A	11.5		84.96	05 59 50.311	−31 02 45.62			−31 2891		7676 2	
05561S3103	AOT 29	B	12.0		84.96	05 59 50.585	−31 03 10.19	171.84	24.825			7676 2	
05566S2100		A	8.2		87.63	06 00 51.899	−21 00 12.76			−21 1324	4602	11273 2	
05566S2100	HJ 3821	B	9.4		87.63	06 00 51.144	−21 00 28.00	214.78	18.547		4602	11273 2	
05566S2100	I	C	12.5		87.63	06 00 53.237	−21 00 11.84	87.19	18.749		4602	11273 2	
05566S2100		BC			87.63	06 00 53.237	−21 00 11.84	61.14	33.461		4602	11273 2	
05566S2050		A	12.1		87.63	06 00 49.686	−20 49 31.30					11273 2	
05566S2050	ARA 856	B	12.3		87.63	06 00 49.941	−20 49 26.30	35.90	6.100			11273 2	
05575S2117		A	11.8		87.63	06 01 44.874	−21 16 58.57					11273 2	
05575S2117	AOT 30	B	13.3		87.63	06 01 44.100	−21 17 18.16	208.93	22.384			11273 2	
05576S3110		A	11.9		84.96	06 01 20.692	−31 09 53.16			−31 2912		7676 2	
05576S3110	AOT 31	B	12.8		84.96	06 01 22.173	−31 09 55.03	95.62	19.105			7676 2	
05578S3124		A	9.5		84.96	06 01 36.331	−31 23 47.74			−31 2917		7676 2	
05578S3124	B 1499	B	11.3		84.96	06 01 35.529	−31 23 44.10	289.51	10.895			7676 2	
05578S3124		C	12.4		84.96	06 01 35.265	−31 23 44.23	284.44	14.089			7676 2	
05578S3124		BC			84.96	06 01 35.265	−31 23 44.23	267.89	3.376			7676 2	
05579S3133		A	10.2		84.96	06 01 37.039	−31 32 40.28			−31 2918		7676 2	
05579S3133	AOT 32	B	11.2		84.96	06 01 36.379	−31 33 00.10	203.06	21.538			7676 2	
05582S2110		A	11.9		87.63	06 02 27.017	−21 10 29.83					11273 2	
05582S2110	AOT 33	B	12.3		87.63	06 02 27.618	−21 10 34.70	120.08	9.713			11273 2	
05586S2148	SEE 58	AB	9.2	11.2	87.63	06 02 50.899	−21 48 16.49			−21 1335	4637	11273 2	
05592S2140		A	8.0		87.63	06 03 27.412	−21 40 34.00			−21 1337		11273 2	
05592S2140	AOT 34	B	12.2		87.63	06 03 28.390	−21 40 22.71	50.37	17.702			11273 2	
05598S2117	RST2410	AB	10.4	10.4	87.63	06 04 06.024	−21 17 19.16			−21 1340		11273 2	
06481S1332		A	10.2		87.63	06 52 39.749	−13 38 21.92			−13 1698		11274 2	
06481S1332	GAL 271	B	12.0		87.63	06 52 39.048	−13 38 24.56	255.51	10.542			11274 2	
06492S1354		A	7.5		87.63	06 53 50.076	−14 01 27.99			−13 1712		11274 2	
06492S1354	GAL	B	12.0		87.63	06 53 50.366	−14 01 42.33	163.62	14.949			11274 2	
06497S1404		A	10.5		87.63	06 54 15.853	−14 11 39.17					11274 2	
06497S1404	AOT 35	B	11.5		87.63	06 54 14.983	−14 11 47.48	236.72	15.141			11274 2	
06498S1407	STF 990	AB	9.4	10.0	87.63	06 54 20.041	−14 14 32.76			−14 1633	5569	11274 2	
06498S1407	AOT 36	C	13.0		87.63	06 54 19.395	−14 14 03.08	342.46	31.131			11274 2	
06505S1339		A	11.0		87.63	06 55 04.659	−13 46 24.31					11274 2	
06505S1339	AOT 37	B	12.2		87.63	06 55 05.258	−13 46 25.95	100.66	8.888			11274 2	
06511S1352		A	8.5		87.63	06 55 37.403	−13 58 44.34			−13 1732	5600	11274 2	
06511S1352	GAL 278	B	11.0		87.63	06 55 37.947	−13 58 46.87	107.72	8.305		5600	11274 2	
06513S1403		A	10.6		87.63	06 55 49.442	−14 10 56.66			−13 1736		11274 2	
06513S1403	BRT1855	B	11.1		87.63	06 55 49.525	−14 10 52.28	15.40	4.551			11274 2	
06517S1418		A	9.0		87.63	06 56 17.491	−14 25 32.95					11274 2	
06517S1418	AOT 38	B	11.7		87.63	06 56 17.297	−14 25 14.67	351.23	18.499			11274 2	
06529S1413		A	10.7		87.63	06 57 27.767	−14 20 56.00					11274 2	
06529S1413	BRT1856	B	12.6		87.63	06 57 27.834	−14 21 00.01	166.34	4.132			11274 2	
06531S1410	A 3041	AB	9.3	11.1	87.63	06 57 41.016	−14 17 53.72			−14 1661	5632	11274 2	
06533S1337		A	11.0		87.63	06 57 55.236	−13 45 35.61					11274 2	
06533S1337	GAL 280	B	12.0		87.63	06 57 55.065	−13 45 43.06	198.50	7.856			11274 2	
06542S1344	RST3478	AB	9.5	11.7	87.63	06 58 45.859	−13 51 53.54			−13 1755		11274 2	
06543S1415	BRT1857	AB	12.0	12.1	87.63	06 58 54.530	−14 23 03.87					11274 2	
06545S1355		A	9.2		87.63	06 59 02.190	−14 2 57.06			−13 1761		11274 2	
06545S1355	AOT 39	B	13.5		87.63	06 59 02.882	−14 2 47.25	45.73	14.053			11274 2	
06547S1314		A	12.0		87.63	06 59 17.389	−13 22 11.83					11274 2	
06547S1314	BRT1858	B	12.1		87.63	06 59 17.371	−13 22 06.85	176.97	4.989			11274 2	
06548S1338		A	11.0		87.63	06 59 24.620	−13 46 51.48				5663	11274 2	
06548S1338	GAL 284	B	11.5		87.63	06 59 24.923	−13 46 49.62	67.17	4.780		5663	11274 2	
12223S5318	FIN 199	AB	10.0	10.2	87.58	12 27 44.524	−53 51 15.78			−53 5152		11131 2	
12223S5318	AOT 40	C	13.6		87.58	12 27 46.080	−53 51 04.76	51.34	17.635			11131 2	
12223S5318	AOT 41	D	13.8		87.58	12 27 45.969	−53 50 42.92	21.26	35.253			11131 2	
12224S5242		A	13.0		87.58	12 27 50.106	−53 14 43.05					11131 2	
12224S5242	AOT 42	B	13.3		87.58	12 27 49.594	−53 14 35.71	327.93	8.661			11131 2	
12235S5138	RST 595	AB	8.8	11.8	87.58	12 28 55.815	−52 10 41.89			−51 6713		11131 2	
12245S5229		A	11.2		87.58	12 29 56.978	−53 02 01.41					11131 2	
12245S5229	AOT 43	B	13.9		87.58	12 29 57.854	−53 01 58.04	66.93	8.595			11131 2	
12250S5209		A	11.0		87.58	12 30 29.976	−52 42 09.10					11131 2	
12250S5209	AOT 44	B	11.4		87.58	12 30 29.298	−52 42 06.36	293.93	6.742			11131 2	
12255S5238		A	9.7		87.58	12 31 02.811	−53 11 35.49			−52 5649		11131 2	
12255S5238	HJ 4526	B	9.9		87.58	12 31 01.045	−53 11 38.88	257.93	16.229	−52 5648		11131 2	
12255S5238	HJ 4526	C	10.3		87.58					−52 5650		11131 2	NM
12255S5238	B	D	13.1		87.58							11131 2	NS
12259S5218	B 1213	AB	10.1	12.1	87.58	12 31 22.792	−52 51 29.38			−52 5654		11131 2	
12287S5218		A	10.6		87.58	12 34 13.818	−52 50 57.35					11131 2	
12287S5218	AOT 45	B	11.8		87.58	12 34 12.472	−52 50 46.80	310.88	16.119			11131 2	

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TABLE 1 (*continued*)

12291S5257		A	11.7		87.58	12 34 35.291	-53 30 25.46					11131 2	
12291S5257	AOT 46	B	12.0		87.58	12 34 36.455	-53 30 22.49	74.02	10.802			11131 2	
12294S5253		A	12.7		87.58	12 34 57.842	-53 25 59.96					11131 2	
12294S5253	AOT 47	B	13.1		87.58	12 34 57.337	-53 25 58.48	288.12	4.744			11131 2	
12301S5256	RST1679	AB	10.2	10.8	87.58	12 35 39.735	-53 29 19.76			-52 5705		11131 2	
12305S5139		A	10.0		87.58	12 36 01.157	-52 12 02.20			-51 6822		11131 2	
12305S5139	HJ 4531	C	10.5		87.58	12 36 00.508	-52 12 17.00	21.98	15.960			11131 2	
12305S5139	DAW	B	12.7		87.58	12 36 00.997	-52 12 14.30	58.97	5.244			11131 2	
12305S5139		CB			87.58	12 36 00.997	-52 12 14.30	186.97	12.187			11131 2	
12327S5217		A	11.3		87.58	12 38 18.036	-52 49 50.99					11131 2	
12327S5217	AOT 48	B	13.8		87.58	12 38 18.227	-52 50 21.90	176.79	30.956			11131 2	
12554S0531		A	10.0		87.59	13 00 32.730	-06 04 26.74				8733	11149 2	
12554S0531	HJ 1224	B	10.5		87.59	13 00 31.873	-06 04 22.28	289.20	13.537		8733	11149 2	
12576S0559	BU 927	AB	9.3	11.3	87.59	13 02 48.059	-06 31 18.19			-05 3616	8750	11149 2	
12582S0553	BU 928	AB	8.7	9.6	87.59	13 03 22.629	-06 25 58.31			-05 3619	8755	11149 2	
12582S0553	BU 928	C			87.59					-05 3619	8755	11149 2	NM
12583S0543		A	13.9		87.59	13 03 30.127	-06 15 32.75					11149 2	
12583S0543	AOT 49	B	14.8		87.59	13 03 29.418	-06 15 47.36	215.89	18.030			11149 2	
12583S0617		A	12.5		87.59	13 03 32.364	-06 49 09.52					11149 2	
12583S0617	AOT 50	B	12.6		87.59	13 03 31.412	-06 49 13.38	254.74	14.687			11149 2	
12594S0541		A	13.0		87.59	13 04 30.779	-06 13 09.47					11149 2	
12594S0541	LDS 431	B	14.5		87.59	13 04 31.345	-06 12 56.38	32.82	15.569			11149 2	
13017S0547		A	11.4		87.59	13 06 52.765	-06 19 16.13			-05 3631		11149 2	
13017S0547	AOT 51	B	12.5		87.59	13 06 52.775	-06 19 25.53	179.13	9.403			11149 2	
14118S2722		A	9.8		87.59	14 17 34.057	-27 49 43.87			-27 9732	9203	11177 2	
14118S2722	HWE 31	B	10.2		87.59	14 17 33.648	-27 49 45.56	72.65	5.681		9203	11177 2	
14124S2703	HWE 33	AC	9.8	9.4	87.59	14 18 12.345	-27 31 17.48			-26 10215	9207	11177 2	
14124S2703	SEE 502	B	10.0		87.59						9207	11177 2	NS
14127S2717		A	11.8		87.59	14 18 28.482	-27 44 47.37			-27 9742		11177 2	
14127S2717	AOT 52	B	13.4		87.59	14 18 27.834	-27 44 56.07	224.67	12.231			11177 2	
14453S1537		A	2.9		87.59	14 50 52.807	-16 02 27.55			-15 3966		11151 2	
14453S1537	SHJ 186	B	5.3		87.59	14 50 41.299	-15 59 47.12	314.04	230.777	-15 3965		11151 2	
14453S1537	AOT 53	C	13.2		87.59	14 50 34.785	-16 00 48.98	290.78	277.867			11151 2	
14453S1537		BC			87.59	14 50 34.785	-16 00 48.98	236.63	112.467			11151 2	
14457S1634		A	9.3		87.59	14 51 18.148	-16 59 35.79			-16 3949	9409	11151 2	
14457S1634	HU 1270	BC	10.0	10.5	87.59	14 51 18.114	-16 59 06.38	359.05	29.414	-16 3949	9409	11151 2	
14463S1550		A	10.2		87.59	14 51 54.240	-16 14 26.44			-15 3972		11151 2	
14463S1550	AOT 54	B	14.1		87.59	14 51 54.998	-16 14 53.57	158.06	29.244			11151 2	
14481S1606	BU 118	AB	8.9	9.8	87.59	14 53 41.514	-16 30 45.29			-15 3978	9424	11151 2	
14481S1606	FOX	C	10.3		87.59	14 53 44.017	-16 29 31.21	25.92	82.366		9424	11151 2	
14485S1526		A	12.2		87.59	14 54 02.568	-15 50 42.54					11151 2	
14485S1526	AOT 55	B	14.0		87.59	14 54 00.310	-15 51 00.64	240.95	37.277			11151 2	
14571S0644	BRT 552	AB	10.5	11.3	87.59	15 02 21.385	-07 07 22.10					11199 2	
14577S0639	RST3905	AB	10.9	10.9	87.59	15 02 58.713	-07 02 16.25			-06 4122		11199 2	
14583S0711		A	8.2		87.59	15 03 36.926	-07 34 18.03			-06 4124		11199 2	
14583S0711	B	B	11.5		87.59	15 03 37.539	-07 33 39.29	13.24	39.798			11199 2	
14588S0630	HO 391	AB	7.8	10.8	87.59	15 04 07.148	-06 53 14.68			-06 4125	9492	11199 2	
14588S0630	HO 391	C	12.2		87.59	15 04 05.639	-06 52 54.54	311.88	30.168		9492	11199 2	
15002S0638	BU 119	AB	8.0	8.5	87.59	15 05 31.046	-07 00 48.81			-06 4130	9497	11199 2	
15002S0638	BU 119	C			87.59	15 05 35.788	-07 00 59.45	98.57	71.397		9497	11199 2	
15016S0632		A	12.5		87.59	15 06 53.280	-06 55 02.33					11199 2	
15015S0632	AOT 56	B	13.2		87.59	15 06 51.248	-06 55 07.19	260.89	30.639			11199 2	
15016S0632	AOT 57	C	12.5		87.59	15 06 52.480	-06 55 04.21	261.03	12.054			11199 2	
15016S0632		BC			87.59	15 06 52.480	-06 55 04.21	80.80	18.585			11199 2	
15036S0612	A 81	AB	9.1	9.6	87.59	15 08 55.174	-06 34 37.13			-06 4141	9516	11199 2	
15247S1152		A	11.5		87.62	15 30 9.095	-12 12 27.94			-11 3954		11239 2	
15247S1152	AOT 58	B	12.2		87.59	15 30 8.414	-12 12 53.18	201.59	27.143			11239 2	
15250S1320		A	8.7		87.59	15 30 32.167	-13 41 02.78			-13 4180		11239 2	
15250S1320	AOT 59	B	13.3		87.59	15 30 31.756	-13 40 57.61	310.84	7.918			11239 2	
15251S1157		A	9.8		87.59	15 30 38.021	-12 17 17.95			-11 3957		11239 2	
15251S1157	AOT 60	B	11.1		87.59	15 30 37.868	-12 16 38.73	356.72	39.288			11239 2	
15253S1215		A	11.9		87.62	15 30 47.763	-12 35 28.00					11239 2	
15253S1215	AOT 61	B	12.2		87.62	15 30 47.099	-12 35 33.41	240.85	11.123			11239 2	
15258S1239	BU 33	AB	7.7	10.0	87.62	15 31 19.557	-12 59 07.23			-12 4268	9680	11239 2	
15258S1239	BU 33	C	10.8		87.62						9680	11239 2	NM
15258S1239	BU 34	D	10.5		87.62						9680	11239 2	NM
15258S1239	DOO	E	11.9		87.62	15 31 18.519	-12 58 52.16	134.79	21.380		9680	11239 2	
15260S1242		A	10.9		87.62	15 31 31.735	-13 02 12.51			-12 4269		11239 2	
15260S1242	AOT 62	B	10.9		87.62	15 31 31.394	-13 02 16.40	231.99	6.323			11239 2	
15277S1241	RST3922	AB	7.6	12.8	87.62	15 33 15.223	-13 00 46.27			-12 4278		11239 2	
15295S1319		A	11.1		87.62	15 35 03.937	-13 38 56.27					11239 2	
15295S1319	AOT 63	B	11.3		87.62	15 35 05.276	-13 39 14.98	133.79	27.037			11239 2	
15295S1320	HU 151	AB	8.9	13.3	87.62	15 35 04.901	-13 40 20.64			-13 4200	9699	11239 2	
16019S2722		A	9.5		87.58	16 08 04.415	-27 38 27.15			-27 10795		11134 2	
16019S2722	GLP 6	B	9.8		87.58	16 08 01.039	-27 38 17.53	282.10	45.886	-27 10794		11134 2	
16035S2738		A	7.9		87.58	16 09 40.709	-27 53 40.73			-27 10817		11134 2	
16035S2738	GLP 4	B	10.3		87.58	16 09 36.962	-27 53 18.23	294.37	54.535	-27 10816		11134 2	

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TABLE 1 (*continued*)

16036S2751		A	10.3		87.58	16 09 46.525	−28 07 14.29			−27 10818		11134 2	
16036S2751	HJ 4834	B	10.4		87.58	16 09 46.851	−28 06 56.86	13.89	17.959			11134 2	
16055S2642	B 305	AB	8.1	12.3	87.58	16 11 33.688	−26 57 38.35			−26 11248	9946	11134 2	
16057S2718		A	8.4		87.58	16 11 50.721	−27 33 10.23			−27 10836	9948	11134 2	
16057S2718	BU 40	B	10.1		87.58	16 11 50.652	−27 33 04.82	350.35	5.495		9948	11134 2	
16057S2718	BU 40	C	9.8		87.58					−27 10838	9948	11134 2	NM
16061S2809	HJ 4839	AB	5.9	7.9	87.58	16 12 16.215	−28 25 02.91			−28 11962	9953	11134 2	
16073S2709	B 306	AB	8.4	13.0	87.58	16 13 28.039	−27 24 13.33			−27 10856	9965	11134 2	
16073S2743		A	11.0		87.58	16 13 26.043	−27 57 55.44			−27 10854		11134 2	
16073S2743	AOT 64	B	12.4		87.58	16 13 26.657	−27 58 06.27	143.09	13.549			11134 2	
16078S2800	RST1883	AB	8.3	9.8	87.58	16 13 58.197	−28 15 09.88			−27 10858		11134 2	
16139S4830		A	11.0		87.59	16 21 28.501	−48 44 30.37					11171 2	
16139S4830	VOU 62	B	13.5		87.59	16 21 28.405	−48 44 22.58	352.99	7.842			11171 2	
16144S4850	RST 839	AB	10.8	10.8	87.59	16 21 35.433	−49 03 46.80			−48 10742		11171 2	
16144S4850	AOT 65	C	14.1		87.59	16 21 35.040	−49 03 31.23	346.07	16.042			11171 2	
16143S4921		A	12.2		87.59	16 21 45.918	−49 35 02.91			−49 10572		11171 2	
16143S4921	AOT 66	B	12.4		87.59	16 21 45.882	−49 34 51.58	358.22	11.331			11171 2	
16158S4824	I 563	AB	8.1	9.3	87.59	16 23 09.328	−48 38 26.64			−48 10769		11171 2	
16159S4906		A	11.5		87.59	16 23 23.060	−49 19 59.16			−49 10612		11171 2	
16159S4906	AOT 67	B	14.1		87.59	16 23 23.003	−49 19 47.27	357.30	11.901			11171 2	
16172S4759		A	8.6		87.59	16 24 36.084	−48 13 17.99			−47 10717		11171 2	
16172S4759	HJ 4846	B	9.4		87.59	16 24 36.755	−48 13 26.63	142.19	10.939			11171 2	
16179S4855	COO 197	AB	8.0	8.2	87.59	16 25 17.908	−49 8 51.93			−48 10809		11171 2	
16179S4855	COO 197	C	12.0		87.59	16 25 19.583	−49 8 51.87	89.78	16.436			11171 2	
16198S4834		A	7.5		87.59	16 27 12.252	−48 47 16.40			−48 10836		11171 2	
16198S4834	B 2386	B	13.0		87.59	16 27 13.469	−48 47 19.26	103.41	12.361			11171 2	
16205S4905		A	10.8		87.59	16 28 00.732	−49 18 42.62			−49 10690		11171 2	
16205S4905	CPO	B	11.3		87.59	16 28 00.705	−49 18 38.07	356.73	4.554			11171 2	
16209S4917	RST 852	AB	9.7	11.8	87.59	16 28 23.740	−49 30 51.24			−49 10694		11171 2	
16209S4917	HLN	C	12.7		87.59	16 28 24.640	−49 30 44.02	50.49	11.354			11171 2	
16226S4842		A	8.3		87.59	16 30 02.716	−48 54 52.41			−48 10878		11171 2	
16226S4842	CPO	B	11.5		87.59	16 30 03.381	−48 55 06.86	155.60	15.871			11171 2	
16228S4912	RST 853	AB	10.7	11.7	87.59	16 30 16.135	−49 25 12.11			−49 10721		11171 2	
16228S4914	RST 854	AB	9.4	12.8	87.59	16 30 19.504	−49 27 22.33			−49 10723		11171 2	
16228S4752	CPO	AB	9.8	11.8	87.59	16 30 11.709	−48 05 03.47			−47 10807		11171 2	
17587S1936		A	10.0		87.59	18 04 39.537	−19 36 22.60			−19 4825		11174 2	
17587S1936	HJ 2817	B	10.5		87.59	18 04 38.614	−19 36 21.99	272.66	13.062			11174 2	
17596S1906		A	12.9		87.59	18 05 26.420	−19 05 34.94					11174 2	
17596S1906	ARA 727	B	13.2		87.59	18 05 26.696	−19 05 26.00	23.62	9.761			11174 2	
18004S1941		A	9.7		87.59	18 06 16.173	−19 40 36.35					11174 2	
18004S1941	J 1619	B	9.7		87.59	18 06 16.262	−19 40 29.82	190.89	6.653			11174 2	
18008S1900		A	7.8		87.59	18 06 42.773	−18 59 02.68			−18 4789		11174 2	
18008S1900	HJ 592	B	11.3		87.59	18 06 41.560	−18 59 35.06	207.98	36.661			11174 2	
18010S1923	A 2258	AB	9.9	10.0	87.59	18 06 56.435	−19 22 50.26			−19 4842	11065	11174 2	
18013S1855	STN 41	A	9.4		87.59	18 07 14.040	−18 53 59.02			−18 4794	11066	11174 2	
18013S1855	A 2259	BC	10.0	10.5	87.59	18 07 12.862	−18 54 18.46	220.71	25.642	−18 4794	11066	11174 2	
18018S1914		A	11.1		87.59	18 07 39.974	−19 13 06.94					11174 2	
18018S1914	ARA 729	B	11.4		87.59	18 07 39.686	−19 12 54.47	341.90	13.129			11174 2	
18019S1853		A	12.9		87.59	18 07 45.319	−18 52 02.26					11174 2	
18019S1853	ARA 451	B	13.0		87.59	18 07 45.303	−18 52 09.95	181.67	7.693			11174 2	
18022S1925		A	12.4		87.59	18 08 07.635	−19 24 38.22					11174 2	
18022S1925	ARA 730	B	12.8		87.59	18 08 07.192	−19 24 27.30	330.17	12.591			11174 2	
18022S1925	AOT 68	C	13.2		87.59	18 08 06.442	−19 24 21.65	314.46	23.651			11174 2	
18022S1925		BC			87.59	18 08 06.442	−19 24 21.65	298.00	12.024			11174 2	
18023S1848		A	11.7		87.59	18 08 11.601	−18 47 06.54					11174 2	
18023S1848	ARA 452	B	13.2		87.59	18 08 10.703	−18 47 07.97	263.60	12.833			11174 2	
18025S1857	I 625	AB	9.9	10.4	87.59	18 08 20.963	−18 55 50.36			−18 4798	11087	11174 2	
18025S1857	AOT 69	C	12.9		87.59	18 08 22.096	−18 55 50.67	91.11	16.074			11174 2	
18025S1857	AOT 70	D	13.3		87.59	18 08 19.716	−18 55 40.64	298.78	20.182			11174 2	
18025S1857		CD			87.59	18 08 19.716	−18 55 40.64	286.54	35.218			11174 2	
18028S1757		A	11.7		87.59	18 08 39.946	−17 56 00.36					11174 2	
18028S1757	ARA 266	B	13.2		87.59	18 08 40.620	−17 56 07.21	125.48	11.816			11174 2	
18030S1828		A	11.1		87.59	18 08 52.165	−18 26 55.06					11174 2	
18030S1828	ARA 453	B	12.9		87.59	18 08 52.664	−18 26 50.19	55.57	8.617			11174 2	
18030S1902		A	13.0		87.59	18 08 55.496	−19 01 00.36					11174 2	
18030S1902	ARA 731	B	13.2		87.59	18 08 55.175	−19 01 05.01	224.42	6.504			11174 2	
18031S1816		A	12.9		87.59	18 08 57.758	−18 14 51.90					11174 2	
18031S1816	ARA 454	B	13.0		87.59	18 08 57.965	−18 15 06.31	348.43	14.709			11174 2	
18031S1826		A	10.6		87.59	18 09 02.880	−18 24 29.36			−18 4805		11174 2	
18031S1826	HJ 2819	B	11.9		87.59	18 09 04.356	−18 24 38.17	112.75	22.767			11174 2	
18034S1828		A	13.0		87.59	18 09 14.940	−18 26 35.66					11174 2	
18034S1828	ARA 455	B	13.2		87.59	18 09 15.756	−18 26 36.92	96.18	11.693			11174 2	
18035S1823		A	12.0		87.59	18 09 20.644	−18 22 22.51					11174 2	
18035S1823	FEN 26	B	12.8		87.59	18 09 20.893	−18 22 18.93	44.82	5.040			11174 2	
18049S1625		A	11.8		87.59	18 10 41.255	−16 23 20.61					11175 2	
18049S1625	FEN 27	B	12.0		87.59	18 10 41.133	−16 23 24.62	23.59	4.372			11175 2	
18056S1808		A	12.0		87.59	18 11 28.346	−18 06 49.55					11174 2	

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TABLE 1 (*continued*)

18056S1808	ARA 457	B	12.8		87.59	18 11 28.390	−18 06 35.44	2.55	14.115			11174	2	
18059S1826		A	10.2		87.59	18 11 46.723	−18 22 52.31			−18 4826	11136	11174	2	
18059S1826	HJ 2820	B	11.4		87.59	18 11 46.281	−18 22 51.21	279.97	6.384		11136	11174	2	
18059S1826	HJ 2820	C	11.5		87.59	18 11 47.605	−18 22 50.06	79.81	12.763	−18 4286	11136	11174	2	
18059S1826		BC			87.59	18 11 47.605	−18 22 50.06	86.50	18.885		11136	11174	2	
18061S1542	HO 429	AB	8.1	12.0	87.59	18 11 50.979	−15 40 47.74			−15 4856	11140	11175	2	
18066S1549		A	11.0		87.59	18 12 20.575	−15 48 12.73					11175	2	
18066S1549	BRT 586	B	11.2		87.59	18 12 20.229	−15 48 13.85	77.35	5.108			11175	2	
18067S1524	LV 7	AB	8.0	11.6	87.59	18 12 28.510	−15 22 23.73			−15 4864	11146	11175	2	
18067S1524	LV 7	C	11.6		87.59						11146	11175	2	NM
18067S1524	AOT 71	D	14.0		87.59	18 12 29.096	−15 22 40.28	152.90	18.588			11175	2	
18070S1619		A	10.2		87.59	18 12 48.547	−16 17 46.56			−16 4755	11151	11175	2	
18070S1619	HJ 2821	B	10.6		87.59	18 12 47.974	−16 17 45.17	279.53	8.367		11151	11175	2	
18073S1538		A	9.8		87.59	18 13 03.559	−15 35 50.48					11175	2	
18073S1538	J 2200	B	10.5		87.59	18 13 03.207	−15 35 56.41	220.63	7.812			11175	2	
18078S1537	BU 131	AB	7.3	9.3	87.59	18 13 35.531	−15 35 54.04			−15 4874	11166	11175	2	
18078S1537		C	11.5		87.59	18 13 34.947	−15 35 50.00	295.58	9.349		11166	11175	2	
18078S1537		D	12.0		87.59						11166	11175	2	NM
18085S1633		A	9.3		87.59	18 14 20.876	−16 32 11.81					11175	2	
18085S1633	J 1648	B	11.8		87.59	18 14 21.311	−16 32 11.88	90.63	6.260			11175	2	
18096S1624		A	9.7		87.59	18 15 25.462	−16 22 56.92					11175	2	
18096S1624	J 1649	B	10.8		87.59	18 15 25.373	−16 22 53.60	338.83	3.559			11175	2	
18099S1604		A	10.8		87.59	18 15 37.765	−16 01 42.63					11175	2	
18099S1604	AOT 72	B	13.2		87.59	18 15 37.652	−16 01 34.09	349.17	8.687			11175	2	
18101S1556	RST4005	AB	9.9	11.7	87.59	18 15 50.639	−15 53 58.88			−15 4897		11175	2	
18102S1507		A	9.3		87.59	18 15 57.033	−15 06 17.00			−15 4895		11175	2	
18102S1507	J 2202	B	11.0		87.59	18 15 57.034	−15 06 25.34	179.83	8.332			11175	2	
18106S1508		A	9.3		87.59	18 16 18.810	−15 07 19.43					11175	2	
18106S1508	J 2203	B	12.0		87.59	18 16 19.788	−15 07 19.20	89.08	14.153			11175	2	
18106S1508	J 2203	C	13.0		87.59							11175	2	NS
18109S1453		A	11.7		87.59	18 16 34.136	−14 51 02.81					11175	2	
18109S1453	BRT 587	B	11.8		87.59	18 16 34.070	−14 51 00.54	337.22	2.463			11175	2	
18120S1614		A	10.4		87.59	18 17 44.410	−16 11 29.90			−16 4798		11175	2	
18120S1614	ARA 102	B	12.5		87.59	18 17 45.135	−16 11 30.36	92.50	10.458			11175	2	
18380S0125		A	12.2		87.59	18 43 10.984	−01 19 30.96					11176	2	
18380S0125	AOT 73	B	12.7		87.59	18 43 10.519	−01 19 21.79	322.79	11.524			11176	2	
18386S0020	A 858	AB	9.0	14.0	87.59	18 43 43.482	−00 14 10.84			−00 3539	11613	11176	2	
18386S0020	AOT 74	C	13.8		87.59	18 43 42.009	−00 13 57.71	300.75	25.697			11176	2	
18388S0019	A 859	AB	8.5	8.9	87.59	18 43 53.675	−00 13 27.08			−00 3540	11614	11176	2	
18395S0106		A	9.5		87.59	18 44 39.618	−00 59 44.24			−01 3556		11176	2	
18395S0106	HJ 5501	B	10.8		87.59	18 44 39.761	−00 59 22.31	5.59	22.035			11176	2	
18400N3912		A	6.6		85.48	18 43 16.600	+39 18 00.55			+39 3505		945	1	
18400N3912	BUP	B	10.4		85.48	18 43 15.554	+39 17 00.72	191.47	61.050	+39 3504		945	1	
18405S0113		A	9.5		87.59	18 45 41.212	−01 06 50.69					11176	2	
18405S0113	BAL 582	B	11.0		87.59	18 45 40.729	−01 06 40.97	323.25	12.123			11176	2	
18413S0104		A	6.1		87.59	18 46 28.645	−00 57 41.27			−01 3559	11667	11176	2	
18413S0104	STF2379	B	7.9		87.59	18 46 29.403	−00 57 48.63	122.93	13.542		11667	11176	2	
18413S0104	STF2379	C	11.3		87.59	18 46 29.486	−00 58 01.82	148.45	24.116		11667	11176	2	
18413S0104		BC			87.59	18 46 29.486	−00 58 01.82	174.57	13.249		11667	11176	2	
18414S0155	RST5125	AB	10.7	11.0	87.59	18 46 34.542	−01 48 50.19			−01 3560		11176	2	
18418N3907		A	8.4		85.48	18 45 10.016	+39 13 32.44			+39 3517	11655	945	1	
18418N3907	STF2392	B	10.4		85.48	18 45 09.817	+39 13 35.27	320.83	3.657		11655	945	1	
18418N3907	STF2392	C	9.6		85.48	18 45 10.264	+39 13 09.22	172.92	23.396	+39 3517	11655	945	1	
18418N3907		BC			85.48	18 45 10.264	+39 13 09.22	168.73	26.565		11655	945	1	
18418N3813		A	7.7		85.48	18 45 10.874	+38 18 54.79			+38 3280	11656	945	1	
18418N3813	STF2393	B	10.4		85.48	18 45 11.433	+38 19 10.09	23.26	16.657		11656	945	1	
18418N3813	STF2393	C	11.3		85.48	18 44 57.567	+38 20 29.14	301.07	182.841		11656	945	1	
18418N3813		BC			85.48	18 44 57.567	+38 20 29.14	295.85	181.321		11656	945	1	
18432N3815	HU 1191	AB	8.6	9.1	85.48	18 46 34.604	+38 21 04.32			+38 3292	11680	945	1	
18432N3846		A	10.3		85.48	18 46 37.281	+38 52 24.17			+38 3294	11679	945	1	
18432N3846	ES 2021	B	11.2		85.48	18 46 35.574	+38 52 18.09	253.04	20.843		11679	945	1	
18432N3846	ES 2021	C	12.4		85.48	18 46 35.362	+38 52 19.24	257.57	22.944		11679	945	1	
18432N3846		BC			85.48	18 46 35.362	+38 52 19.24	294.83	2.722		11679	945	1	
18432S0122		A	10.4		87.59	18 48 20.601	−01 14 46.29					11176	2	
18432S0122	BAL 584	B	11.0		87.59	18 48 20.119	−01 14 55.75	217.38	11.902			11176	2	
18436S0127		A	9.8		87.59	18 48 47.830	−01 20 40.25					11176	2	
18436S0127	BAL 585	B	10.1		87.59	18 48 47.983	−01 20 44.31	150.50	4.669			11176	2	
18446N3851		A	10.0		85.48	18 47 59.811	+38 57 57.35					945	1	
18446N3851	ES 2572	B	11.5		85.48	18 48 00.295	+38 58 00.06	64.42	6.256			945	1	
18537N1206		A	9.6		85.48	18 58 13.840	+12 13 38.84					946	1	
18537N1206	J 2537	B	11.9		85.48	18 58 13.886	+12 13 42.59	9.99	3.814			946	1	
18540N1233		A	8.8		85.48	18 58 38.296	+12 41 32.79			+12 3742	11892	946	1	
18540N1233	AG	B	9.6		85.48	18 58 38.032	+12 41 29.02	225.71	5.396		11892	946	1	
18541N1209		A	10.6		85.48	18 58 40.099	+12 16 02.78			+12 3743		946	1	
18541N1209	J 2581	B	13.2		85.48	18 58 39.702	+12 16 08.20	312.93	7.958			946	1	
18553N1244		A	7.4		85.48	18 59 58.782	+12 53 24.91			+12 3750	11916	946	1	
18553N1244	STF2426	B	8.8		85.48	18 59 57.638	+12 53 21.84	259.59	17.001		11916	946	1	

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TABLE 1 (continued)

18553N1244	STF2426	C	13.3		85.48						11916	946	1	NS
18556N1255		A	9.4		85.48	19 00 13.021	+13 02 51.14			+12 3751	11919	946	1	
18556N1255	HU 677	B	10.1		85.48	19 00 13.159	+13 02 53.12	45.76	2.829		11919	946	1	
18559N1205		A	8.0		85.48	19 00 34.364	+12 13 33.76			+12 3754	11926	946	1	
18559N1205	HU 678	B	10.5		85.48	19 00 34.414	+12 13 37.01	12.60	3.332		11926	946	1	
18566N1245		A	10.0		85.48	19 01 13.830	+12 53 51.26				11940	946	1	
18566N1245	J 1279	B	10.0		85.48	19 01 13.863	+12 53 48.65	169.33	2.658		11940	946	1	
18572N1224		A	6.7		85.48	19 01 48.608	+12 32 28.12			+12 3770	11952	946	1	
18572N1224	STF2432	B	9.2		85.48	19 01 49.611	+12 32 28.47	88.64	14.681		11952	946	1	
18572N1224	STF2432	C	13.1		85.48						11952	946	1	NS
18580N1247	OL	AB	10.5	11.2	85.48	19 02 31.066	+12 57 03.45					946	1	
19012N2659		A	10.6		85.56	19 05 11.986	+27 07 25.96			+26 3443		948	1	
19012N2659	HJ 1365	B	12.1		85.56	19 05 11.115	+27 07 41.49	323.18	19.404			948	1	
19016N2708	HO 95	AB	8.8	8.8	85.56	19 05 39.176	+27 17 07.03			+27 3241	12032	948	1	
19026N2637	COU 722	AB	9.5	11.0	85.56	19 06 38.233	+26 46 00.38			+26 3451		948	1	
19030N2736		A	9.7		85.56	19 06 52.380	+27 45 09.99			+27 3247	12052	948	1	
19030N2736	STF2458	B	10.2		85.56	19 06 51.774	+27 45 02.29	226.27	11.132		12052	948	1	
19030N2736	STF2458	C	8.7		85.56	19 06 57.123	+27 45 43.26	62.15	71.210	+27 3248	12052	948	1	
19030N2736		BC			85.56	19 06 57.123	+27 45 43.26	60.02	81.975		12052	948	1	
19035N2719		A	10.0		85.56	19 07 25.773	+27 28 38.27				12062	948	1	
19035N2719	J 1205	B	10.2		85.56	19 07 25.608	+27 28 40.76	318.60	3.314		12062	948	1	
19042N2656	HO 98	AB	8.8	8.8	85.56	19 08 16.182	+27 05 39.69			+26 3458	12079	948	1	
19042N2656	HO 98	C	12.2		85.56	19 08 18.235	+27 05 30.53	108.48	28.903		12079	948	1	
19050N2729	L	AB	8.7	9.7	85.56	19 09 02.389	+27 38 41.83			+27 3257	12097	948	1	
19052N2646	HO 444	AB	8.8	10.4	85.56	19 09 13.713	+26 56 07.36			+26 3462	12102	948	1	
19062N2741		A	10.4		85.56	19 10 09.884	+27 50 33.60			+27 3261	12122	948	1	
19062N2741	ES 481	B	14.1		85.56						12122	948	1	NS
19062N2741	AOT 75	C	13.1		85.56	19 10 05.712	+27 50 50.01	286.52	57.714			948	1	
19115N2710		A	10.7		85.56	19 15 30.666	+27 20 57.60				12230	949	1	
19115N2710	BRT	B	12.4		85.56	19 15 30.887	+27 21 00.08	49.90	3.851		12230	949	1	
19119N2717	STT 371	AB	7.0	7.1	85.56	19 15 56.991	+27 27 21.13			+27 3313	12239	949	1	
19119N2717	STT 371	C	8.6		85.56	19 15 53.467	+27 27 20.18	268.83	46.924		12239	949	1	
19121N2719		A	12.3		85.56	19 16 04.560	+27 28 10.76					949	1	
19121N2719	HLM 21	B	12.5		85.56	19 16 05.430	+27 28 07.36	106.35	12.062			949	1	
19130N2701		A	10.8		85.56	19 17 05.060	+27 12 27.19					949	1	
19130N2701	ELS 5	B	11.0		85.56	19 17 05.731	+27 12 23.31	113.45	9.755			949	1	
19132N2651		A	11.9		85.56	19 17 17.779	+27 01 39.38				12273	949	1	
19132N2651	BRT	B	12.7		85.56	19 17 18.102	+27 01 41.91	59.65	5.006		12273	949	1	
19134N2627	A 267	AB	9.8	10.2	85.56	19 17 31.080	+26 37 33.72			+26 3511	12286	949	1	
19134N2627	A 267	C	14.0		85.56	19 17 31.726	+26 37 32.27	99.54	8.773		12286	949	1	
19337N1701		A	6.7		85.48	19 38 09.719	+17 14 35.83			+16 3925	12711	947	1	
19337N1701	J 138	B	13.4		85.48	19 38 10.698	+17 14 16.65	143.82	23.768		12711	947	1	
19337N1701	J 138	C	11.4		85.48	19 38 11.756	+17 14 11.17	130.19	38.210		12711	947	1	
19337N1701		BC			85.48	19 38 11.756	+17 14 11.17	109.87	16.114		12711	947	1	
19340N1702		A	7.4		85.48	19 38 27.499	+17 15 26.10			+16 3928	12723	947	1	
19340N1702	BU	B	11.0		85.48	19 38 27.118	+17 15 37.14	333.70	12.315		12723	947	1	
19356N1747		A	4.4		85.48	19 40 05.754	+18 00 49.79			+17 4042	12766	947	1	
19356N1747	J 121	B	13.2		85.48	19 40 05.787	+18 00 18.98	179.14	30.818		12766	947	1	
19356N1747	J 121	C	14.9		85.48						12766	947	1	NS
19376S0832		A	7.0		87.58	19 43 03.322	−08 18 25.91			−08 5078		11138	2	
19376S0832	STF4045	B	7.3		87.58	19 43 6.978	−08 19 45.71	145.78	96.502	−08 5079		11138	2	
19377S0951		A	12.7		87.58	19 43 10.864	−09 37 10.92					11138	2	
19377S0951	AOT 76	B	13.2		87.58	19 43 11.852	−09 37 16.36	110.40	15.587			11138	2	
19381S0918	HO 579	AB	9.3	10.3	87.58	19 43 34.138	−09 04 01.02			−09 5219	12823	11138	2	
19381S0918		C	9.9		87.58	19 43 36.020	−09 04 58.03	153.94	63.456	−09 5221	12823	11138	2	
19383S0915		A	11.7		87.58	19 43 45.880	−09 00 46.63			−09 5222		11138	2	
19383S0915	AOT 77	B	13.4		87.58	19 43 45.135	−09 00 54.82	233.44	13.753			11138	2	
19384S0959	RST4640	AB	10.3	10.3	87.58	19 43 50.306	−09 44 52.62			−10 5167		11138	2	
19391S1012		A	10.2		87.58	19 44 39.037	−09 59 05.63					11138	2	
19391S1012	BRT1952	B	10.8		87.58	19 44 39.013	−09 59 02.44	353.62	3.213			11138	2	
19393S0839		A	12.6		87.58	19 44 42.243	−08 24 41.29					11138	2	
19393S0839	AOT 78	B	12.7		87.58	19 44 41.112	−08 24 45.46	256.08	17.296			11138	2	
19398S0903		A	10.2		87.58	19 45 16.683	−08 48 59.14			−09 5232		11138	2	
19398S0903	AOT 79	B	13.1		87.58	19 45 16.509	−08 48 43.99	350.32	15.370			11138	2	
19417S0824	A 108	AB	8.5	8.9	87.58	19 47 08.056	−08 09 09.87			−08 5103	12911	11138	2	
19428N3800		A	8.9		85.56	19 46 20.200	+38 14 55.22			+37 3603		950	1	
19428N3800	SEI 680	B	11.3		85.56	19 46 20.127	+38 14 27.17	181.76	28.068			950	1	
19439N3810		A	5.7		85.56	19 47 27.748	+38 24 26.74			+38 3758	12944	950	1	
19439N3810	HJ 601	B	12.7		85.56	19 47 25.889	+38 24 15.28	242.33	24.672		12944	950	1	
19442N3830		A	12.6		85.56	19 47 43.939	+38 44 26.15					950	1	
19442N3830	ALI 901	B	13.1		85.56	19 47 44.929	+38 44 17.64	126.32	14.379			950	1	
19442N3818	A 1405	AB	9.7	10.4	85.56	19 47 46.501	+38 33 19.76			+38 3761	12950	950	1	
19446N3803		A	10.5		85.56	19 48 08.694	+38 17 45.06					950	1	
19446N3803	SEI 685	B	11.0		85.56	19 48 07.082	+38 17 30.83	233.13	23.718			950	1	
19458N3842		A	10.0		85.56	19 49 17.186	+38 57 26.87					950	1	
19458N3842	MLB 876	B	10.5		85.56	19 49 17.421	+38 57 30.61	36.27	4.629			950	1	
19458N3751		A	12.7		85.56	19 49 25.774	+38 05 51.11					950	1	

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TABLE 1 (*continued*)

19458N3751	ALI 634	B	13.3		85.56	19 49 26.118	+38 05 54.07	53.89	5.021			950	1	
19459N3828		A	6.2		85.56	19 49 27.506	+38 42 36.76			+38 3772	12992	950	1	
19459N3828	ES 84	B	11.1		85.56	19 49 27.814	+38 42 26.14	161.24	11.217		12992	950	1	
19459N3828	ES 84	C	11.2		85.56	19 49 29.427	+38 42 34.72	95.19	22.574		12992	950	1	
19459N3828		BC			85.56	19 49 29.427	+38 42 34.72	65.56	20.733		12992	950	1	
19465N3817		A	10.5		85.56	19 50 06.812	+38 32 39.97					950	1	
19465N3817	MLB 766	B	10.6		85.56	19 50 06.714	+38 32 46.37	349.79	6.500			950	1	
19470N3828		A	5.4		85.56	19 50 34.000	+38 43 18.98			+38 3780	13014	950	1	
19470N3828	HJ 603	B	10.4		85.56	19 50 38.426	+38 42 57.99	112.06	55.889		13014	950	1	
19470N3828	HJ 603	C	11.1		85.56	19 50 38.831	+38 43 18.45	90.54	56.540		13014	950	1	
19470N3828		BC			85.56	19 50 38.831	+38 43 18.45	13.05	20.995		13014	950	1	
19474N3855	A 1406	AB	9.2	11.8	85.56	19 50 56.888	+39 10 11.07			+38 3784	13021	950	1	
19477N3814		A	11.8		85.56	19 51 15.699	+38 29 43.22					950	1	
19477N3814	ALI 903	B	12.8		85.56	19 51 15.405	+38 29 34.96	202.70	8.945			950	1	
19482N3800		A	11.9		85.56	19 51 45.813	+38 15 51.08					950	1	
19482N3800	ALI 904	B	12.6		85.56	19 51 46.699	+38 15 47.67	108.08	10.977			950	1	
20264S4136		A	13.6		87.59	20 33 03.648	−41 16 10.90					11157	2	
20264S4136	BRT1111	B	13.9		87.59	20 33 03.757	−41 16 15.02	163.42	4.299			11157	2	
20277S4241	DON 988	AB	10.1	11.5	87.59	20 34 25.620	−42 20 10.66			−42 14972		11157	2	
20277S4241		C	9.7		87.59	20 34 23.536	−42 20 11.21	88.64	23.117	−42 14974		11157	2	
20280S4304		A	11.7		87.59	20 34 45.091	−42 43 35.67			−43 14063		11157	2	
20280S4304	AOT 80	B	14.2		87.59	20 34 44.151	−42 43 40.06	247.04	11.250			11157	2	
20283S4246		A	11.6		87.59	20 35 03.189	−42 25 47.70			−42 14978		11157	2	
20283S4246	AOT 81	B	13.9		87.59	20 35 02.957	−42 26 01.96	190.19	14.491			11157	2	
20287S4301		A	11.7		87.59	20 35 29.558	−42 40 45.29			−43 14072		11157	2	
20287S4301	AOT 82	B	14.0		87.59	20 35 29.445	−42 40 49.02	198.50	3.937			11157	2	
20289S4304		A	12.1		87.59	20 35 37.798	−42 43 24.04			−43 14073		11157	2	
20289S4304	AOT 83	B	12.4		87.59	20 35 38.485	−42 43 27.12	112.12	8.172			11157	2	
20293S4208		A	12.3		87.59	20 35 58.762	−41 47 06.49			−42 14985		11157	2	
20293S4208	AOT 84	B	12.5		87.59	20 35 59.903	−41 47 20.55	137.79	18.996			11157	2	
20302S2008		A	12.9		87.59	20 36 01.034	−19 47 36.79					11209	2	
20302S2008	AOT 85	B	14.1		87.59	20 36 00.474	−19 47 41.47	239.39	9.178			11209	2	
20303S4229		A	13.2		87.59	20 36 59.584	−42 08 07.87					11157	2	
20303S4229	AOT 86	B	14.0		87.59	20 36 59.147	−42 08 02.51	317.83	7.238			11157	2	
20307S4223		A	9.7		87.59	20 37 23.771	−42 02 17.87			−42 14995		11157	2	
20307S4223	CPO 89	B	12.5		87.59	20 37 22.341	−42 02 13.66	284.80	16.472			11157	2	
20312S1955		A	13.2		87.59	20 36 55.037	−19 34 18.61					11209	2	
20312S1955	AOT 87	B	13.5		87.59	20 36 56.291	−19 34 36.21	134.79	24.981			11209	2	
20322S4314		A	10.8		87.59	20 38 54.232	−42 53 3.88			−43 14106		11157	2	
20322S4314	AOT 88	B	14.3		87.59	20 38 55.336	−42 52 54.76	53.11	15.182			11157	2	
20329S1910		A	11.6		87.59	20 38 38.860	−18 48 30.07					11209	2	
20329S1910	AOT 89	B	14.3		87.59	20 38 39.346	−18 48 40.77	147.18	12.734			11209	2	
20336S1848	LEO 48	AB	10.7	11.6	87.59	20 39 16.465	−18 26 58.91			−18 5735		11209	2	
20337S1909		A	13.8		87.59	20 39 23.213	−18 48 21.42					11209	2	
20337S1909	AOT 90	B	14.0		87.59	20 39 24.544	−18 48 26.97	106.37	19.706			11209	2	
20341S1848	RST3265	AB	11.1	11.1	87.59	20 39 48.857	−18 27 06.90			−18 5736		11209	2	
20341S1848	HJ 2983	C	11.7		87.59	20 39 48.941	−18 27 22.87	175.73	16.014			11209	2	
20341S1939		A	13.3		87.59	20 39 51.615	−19 17 59.49					11209	2	
20341S1939	AOT 91	B	14.1		87.59	20 39 51.351	−19 18 17.02	192.05	17.921			11209	2	
20343S2001		A	13.9		87.59	20 40 01.423	−19 39 53.59					11209	2	
20343S2001	AOT 92	B	14.6		87.59	20 40 00.170	−19 39 51.32	277.29	17.857			11209	2	
20351S1922		A	13.0		87.59	20 40 49.587	−19 01 11.34				14137	11209	2	
20351S1922	BAR	B	13.6		87.59	20 40 49.279	−19 01 11.34	269.98	4.371		14137	11209	2	
20352S1852		A	13.8		87.59	20 40 56.306	−18 30 45.86					11209	2	
20352S1852	AOT 93	B	14.0		87.59	20 40 57.080	−18 31 01.75	145.29	19.328			11209	2	
20359S1949	RST3266	AB	10.5	11.4	87.59	20 41 36.955	−19 27 28.65			−19 5891		11209	2	
20373S2003		A	12.4		87.59	20 43 00.776	−19 41 10.48					11209	2	
20373S2003	ARA1214	B	13.0		87.59	20 43 00.970	−19 41 06.69	35.90	4.681			11209	2	
20374S1940		A	13.4		87.59	20 43 07.958	−19 18 37.79					11209	2	
20374S1940	AOT 94	B	13.5		87.59	20 43 08.395	−19 18 46.38	144.20	10.590			11209	2	
20377S1950	HLD 40	CD	9.6	10.6	87.59	20 43 16.783	−19 29 32.97			−20 6014	14188	11209	2	
20377S1950	HLD 40	AB	9.3	9.8	87.59	20 43 26.708	−19 28 57.41			−19 5901	14188	11209	2	
20378S1928	HU 270	AB	9.8	10.3	87.59	20 43 30.516	−19 06 52.05			−19 5902	14191	11209	2	
20378S1928	B	C	14.0		87.59						14191	11209	2	NS
20378S1928	AOT 95	D	12.2		87.59	20 43 32.688	−19 07 15.20	126.95	38.512			11209	2	
20563S1056		A	11.2		87.59	21 01 41.848	−10 32 18.62			−11 5500		11158	2	
20563S1056	AOT 96	B	13.5		87.59	21 01 42.544	−10 32 21.42	105.27	10.643			11158	2	
20569S1003		A	9.1		87.59	21 02 20.836	−09 40 32.23			−10 5575		11158	2	
20569S1003	HJ 929	B	10.0		87.59	21 02 20.790	−09 40 08.42	358.36	23.823			11158	2	
20572S1036		A	13.6		87.59	21 02 39.528	−10 12 13.36					11158	2	
20572S1036	AOT 97	B	14.1		87.59	21 02 39.592	−10 12 00.26	4.08	13.140			11158	2	
20575S1013		A	13.5		87.59	21 02 56.919	−09 49 47.14					11158	2	
20575S1013	AOT 98	B	13.7		87.59	21 02 55.880	−09 49 45.03	277.81	15.500			11158	2	
20578S0958		A	13.5		87.59	21 03 09.317	−09 34 44.55					11158	2	
20578S0958	AOT 99	B	14.2		87.59	21 03 09.745	−09 34 48.69	123.19	7.569			11158	2	
20580S1024		A	11.1		87.59	21 03 23.784	−09 59 49.31					11158	2	
20580S1024	AOT 100	B	14.1		87.59	21 03 24.590	−10 00 06.31	145.01	20.747			11158	2	

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TABLE 1 (*continued*)

20582S1036		A	13.4		87.59	21 03 36.977	−10 12 07.55					11158	2
20582S1036	AOT 101	B	14.5		87.59	21 03 37.629	−10 12 18.62	138.97	14.668			11158	2
20588S0935		A	11.2		87.59	21 04 09.591	− 9 10 54.67					11158	2
20588S0935	AOT 102	B	13.8		87.59	21 04 10.476	− 9 11 01.05	115.97	14.580			11158	2
20596S1044		A	12.1		87.59	21 05 02.513	−10 19 39.85					11158	2
20596S1044	AOT 103	B	14.2		87.59	21 05 01.490	−10 19 55.38	224.19	21.649			11158	2
20598S1028		A	10.0		87.59	21 05 14.126	−10 04 26.67			−10 5592		11158	2
20598S1028	AOT 104	B	11.1		87.59	21 05 14.152	−10 04 34.31	177.08	7.649			11158	2
21308N0014		A	9.2		87.59	21 35 55.563	+00 40 51.88			+00 4751		11211	2
21308N0014	HJ 3039	B	9.9		87.59	21 35 55.907	+00 40 41.65	153.21	11.452			11211	2
21314N0004		A	10.5		87.59	21 36 27.799	+00 31 20.07			−00 4239	15124	11211	2
21314N0004	J 163	B	11.2		87.59	21 36 27.540	+00 31 22.84	305.41	4.766		15124	11211	2
21324S0050		A	6.4		87.59	21 37 33.854	−00 23 26.09			−01 4180	15142	11211	2
21324S0050	STF2809	B	8.8		87.59	21 37 34.420	−00 23 55.34	163.82	30.450		15142	11211	2
21331S0047		A	9.0		87.59	21 38 17.698	−00 20 15.35			−00 4244		11211	2
21331S0047	STF2811	B	11.1		87.59	21 38 15.637	−00 20 14.34	271.88	30.923			11211	2
21344S0030	BU 1212	AB	7.3	7.8	87.59	21 39 31.393	−00 03 03.66			−00 4245	15176	11211	2
21344S0030	BU 1212	C	10.9		87.59	21 39 31.781	−00 03 40.01	170.89	36.814		15176	11211	2
21353N0007		A	10.0		87.59	21 40 19.019	+00 34 40.79					11211	2
21353N0007	SMA	B	11.0		87.59	21 40 19.278	+00 34 38.44	121.20	4.543			11211	2
21352S0025		A	12.3		87.59	21 40 21.651	+00 02 37.62					11211	2
21352S0025	AOT 105	B	14.2		87.59	21 40 22.156	+00 02 20.38	156.29	18.820			11211	2
21354S0045		A	11.8		87.59	21 40 34.118	−00 18 11.22					11211	2
21354S0045	AOT 106	B	13.2		87.59	21 40 35.222	−00 18 8.93	82.12	16.723			11211	2
21358S0102		A	11.0		87.59	21 41 01.640	−00 34 38.66					11211	2
21358S0102	J 1408	B	11.1		87.59	21 41 01.605	−00 34 32.06	355.35	6.616			11211	2
21366S0103		A	9.9		87.59	21 41 45.284	−00 35 49.30					11211	2
21366S0103	J 1409	B	10.4		87.59	21 41 45.127	−00 35 46.28	322.06	3.825			11211	2
21374N0000		A	8.9		87.59	21 42 26.768	+00 26 44.79			−00 4251		11211	2
21374N0000	STF2817	B	9.2		87.59	21 42 27.491	+00 26 21.07	155.45	26.081			11211	2
21374N0000	AOT 107	C	14.7		87.59	21 42 27.627	+00 26 10.87	159.20	36.285			11211	2
21374N0000		BC			87.59	21 42 27.627	+00 26 10.87	168.66	10.401			11211	2
21373N0010		A	10.0		87.59	21 42 28.566	+00 38 11.80					11211	2
21373N0010	SMA	B	10.2		87.59	21 42 27.792	+00 38 22.36	312.31	15.691			11211	2
21373N0010	SMA	C	10.5		87.59	21 42 29.760	+00 38 08.36	100.86	18.243			11211	2
21373N0010		BC			87.59	21 42 29.760	+00 38 08.36	115.37	32.671			11211	2
21469N1921		A	5.8		85.68	21 51 34.247	+19 49 36.24			+19 4797	15383	955	1
21469N1921	HJ 947	B	9.1		85.68	21 51 35.506	+19 49 33.20	99.70	18.023		15383	955	1
21469N1921	HJ 947	C	11.1		85.68	21 51 32.964	+19 49 52.67	312.22	24.448		15383	955	1
21469N1921		BC			85.68	21 51 32.964	+19 49 52.67	298.49	40.812		15383	955	1
21470N1850		A	6.9		85.68	21 51 40.179	+19 18 24.40			+18 4874	15386	955	1
21470N1850	STF2834	B	10.2		85.68	21 51 39.867	+19 18 27.50	305.10	5.391		15386	955	1
21470N1850	BU	C	12.5		85.68	21 51 41.952	+19 18 11.28	117.60	28.325		15386	955	1
21470N1850		BC			85.68	21 51 41.952	+19 18 11.28	118.80	33.677		15386	955	1
21496N1915		A	6.5		85.68	21 54 17.485	+19 43 05.72			+19 4814	15431	955	1
21496N1915	STF2841	BC	8.8	9.0	85.68	21 54 18.959	+19 42 58.04	110.24	22.190		15431	955	1
21504N1840		A	11.5		85.68	21 55 05.016	+19 08 56.16			+18 4886	15439	955	1
21504N1840	J 2	B	11.5		85.68	21 55 05.169	+19 08 59.10	36.37	3.645		15439	955	1
22181S5012		A	11.8		87.58	22 24 22.541	−49 41 08.74			−50 13662		11143	2
22181S5012	AOT 108	B	13.3		87.58	22 24 23.392	−49 41 11.11	106.00	8.591			11143	2
22200S4949		A	11.6		87.58	22 26 12.424	−49 18 04.59			−49 13843		11143	2
22200S4949	AOT 109	B	12.2		87.58	22 26 10.926	−49 17 57.40	296.15	16.322			11143	2
22211S5035	HU 1639	AB	9.8	10.4	87.58	22 27 19.145	−50 04 20.42			−50 13679		11143	2
22226S4946	RST1133	AB	11.3	11.3	87.58	22 28 46.577	−49 15 54.38			−49 13860		11143	2
22226S4946	LDS 786	C	12.9		87.58	22 28 48.493	−49 16 15.08	137.82	27.933			11143	2
22229S4915		A	13.5		87.58	22 29 02.136	−48 44 05.22					11143	2
22229S4915	AOT 110	B	14.3		87.58	22 29 00.706	−48 44 11.58	245.79	15.502			11143	2
22238S4923		A	13.4		87.58	22 29 55.189	−48 52 09.91					11143	2
22238S4923	AOT 111	B	13.6		87.58	22 29 53.377	−48 52 13.91	257.38	18.318			11143	2
22238S1027		A	9.1		87.60	22 29 02.439	−09 56 06.94			−10 5923		11222	2
22238S1027	STF2907	B	10.1		87.60	22 29 03.393	−09 56 40.20	157.04	36.118	−10 5924		11222	2
22238S1027		C			87.60	22 28 59.758	−09 56 38.35	231.59	50.552			11222	2
22238S1027		BC			87.60	22 28 59.758	−09 56 38.35	271.97	53.730			11222	2
22249S4956		A	6.8		87.58	22 31 00.582	−49 25 57.33			−50 13701		11143	2
22249S4956	HDO 299	B	12.0		87.58	22 31 00.228	−49 25 37.47	350.14	20.160			11143	2
22271S1127		AP	8.7	16.6	87.60	22 32 26.667	−10 56 26.96			−11 5858		11222	2
22271S1127	STF2914	B	12.3		87.60	22 32 25.380	−10 56 37.24	241.53	21.565			11222	2
22271S1127	STF2914	C	12.3		87.60	22 32 24.794	−10 56 40.52	243.81	30.734			11222	2
22271S1127		BC			87.60	22 32 24.794	−10 56 40.52	249.13	9.226			11222	2
22273S4955	RST1136	AB	11.3	11.4	87.58	22 33 28.345	−49 24 46.60			−50 13714		11143	2
22273S1117		A	14.3		87.60	22 32 34.322	−10 46 05.17					11222	2
22273S1117	AOT 112	B	14.8		87.60	22 32 35.050	−10 46 21.14	146.11	19.238			11222	2
22274S1119		A	10.4		87.60	22 32 40.448	−10 48 23.31					11222	2
22274S1119	AOT 113	B	15.0		87.60	22 32 40.910	−10 48 46.63	163.72	24.302			11222	2
22279S1104		A	14.1		87.60	22 33 10.724	−10 33 03.89					11222	2
22279S1104	AOT 114	B	15.0		87.60	22 33 10.727	−10 33 21.15	179.85	17.259			11222	2
22292S1149	RST4106	AB	10.7	10.8	87.60	22 34 27.437	−11 17 29.97			−12 6300		11222	2

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TABLE 1 (*continued*)

22296S1153		A	11.0		87.60	22 34 56.038	−11 21 50.30					11222	2	
22296S1153	AOT 115	B	14.1		87.60	22 34 56.043	−11 21 44.01	0.63	6.290			11222	2	
22298S1053		A	13.3		87.60	22 35 04.091	−10 22 30.11					11222	2	
22298S1053	AOT 116	B	14.2		87.60	22 35 04.392	−10 22 45.29	163.69	15.820			11222	2	
22300S1153		A	12.4		87.60	22 35 19.661	−11 21 53.84					11222	2	
22300S1153	AOT 117	B	12.5		87.60	22 35 19.727	−11 21 47.14	8.17	6.768			11222	2	
22303S1159		A	11.5		87.60	22 35 34.608	−11 28 25.10					11222	2	
22303S1159	AOT 118	B	12.1		87.60	22 35 35.410	−11 28 34.57	128.80	15.112			11222	2	
22313S1105		A	12.1		87.60	22 36 32.643	−10 33 45.55					11222	2	
22313S1105	AOT 119	B	14.2		87.60	22 36 31.726	−10 33 43.71	277.75	13.653			11222	2	
22506S0821		A	9.0		87.60	22 55 49.536	−07 49 21.62			−08 5980		11224	2	
22506S0821	GIC	B	16.4		87.60							11224	2	NS
22537S0845		A	8.8		87.60	22 58 59.676	−08 12 48.60			−08 5991		11224	2	
22537S0845	STF2962	B	11.3		87.60	22 58 59.150	−08 13 07.43	202.53	20.385			11224	2	
22540S0902		A	9.5		87.60	22 59 13.711	−08 29 32.93			−09 6096		11224	2	
22540S0902	AOT 120	B	11.5		87.60	22 59 13.007	−08 29 43.14	225.65	14.607			11224	2	
22562S0906		A	11.6		87.60	23 01 25.675	−08 33 34.62			−09 6102		11224	2	
22562S0906	AOT 121	B	12.2		87.60	23 01 24.331	−08 33 44.27	244.18	22.147			11224	2	
23213S2217	SEE 485	AB	6.6	12.0	87.59	23 26 35.337	−21 44 26.11			−22 6128	16753	11160	2	
23239S2349		A	11.5		87.59	23 29 12.458	−23 16 20.24			−23 17920		11160	2	
23239S2349	AOT 122	B	12.3		87.59	23 29 11.224	−23 16 21.31	266.40	17.037			11160	2	
23248S2313	SEE 486	AB	8.3	9.8	87.59	23 30 04.699	−22 39 31.87			−23 17927	16793	11160	2	
23248S2313		C	13.0		87.59	23 30 05.525	−22 39 51.47	149.74	22.690		16793	11160	2	
23252S2304	AOT 123	C	13.6		87.59	23 30 27.084	−22 30 58.54					11160	2	
23252S2304		A	13.6		87.59	23 30 28.744	−22 30 34.88	44.18	32.999			11160	2	
23252S2304	ARA2289	B	13.7		87.59	23 30 29.750	−22 30 35.09	57.59	43.749			11160	2	
23252S2304		AB			87.59	23 30 29.750	−22 30 35.09	270.90	13.941			11160	2	
23271S2337		A	14.1		87.59	23 32 18.582	−23 03 27.38					11160	2	
23271S2337	AOT 124	B	14.9		87.59	23 32 18.208	−23 03 14.88	337.57	13.518			11160	2	
23277S2245		A	13.1		87.59	23 32 56.938	−22 12 07.12					11160	2	
23277S2245	AOT 125	B	14.2		87.59	23 32 58.687	−22 12 20.24	118.38	27.611			11160	2	
23285S2340		A	13.0		87.59	23 33 45.135	−23 07 05.69			−23 17949		11160	2	
23285S2340	AOT 126	B	13.8		87.59	23 33 44.443	−23 06 59.12	304.51	11.589			11160	2	

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