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A QUANTITATIVE EVALUATION OF POTENTIAL RADIO IDENTIFICATIONS FOR 3EG EGRET SOURCES

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ABSTRACT

The method of Mattox et al. for identifying EGRET sources with 5 GHz radio sources has been applied to the 3EG EGRET catalog of Hartman et al. Complete results are tabulated. We tabulate separately 46 EGRET sources with radio identifications which we expect to have a high probability of being correct. We suggest that these sources are appropriate for most studies of the properties of γ-ray blazars as a class. All but one of these 46 sources were classified by Hartman et al. as high-confidence identifications; and the additional source was classified by Hartman et al. as a plausible identification. We also tabulate separately 37 additional "plausible identifications of EGRET sources with radio sources." These less secure possibilities include the remaining 21 "high-confidence identifications" of Hartman et al., three of the 27 "lower confidence potential blazar identifications" of Hartman et al., and an additional 15 plausible identifications which have not been suggested previously. Many of these sources require new radio and optical observations to establish them as blazars. We suggest that the 23 "lower-confidence potential blazar identifications" of Hartman et al. which we do not find plausible should not be used in studies of the properties of the EGRET blazars. For this analysis, we have made elliptical fits to the 95% confidence contours of the position uncertainty regions of the 3EG sources which are tabulated in an Appendix.

Subject headings: galaxies: active — gamma rays: observations — quasars: general

On-line material: machine-readable tables

1. INTRODUCTION

The Energetic Gamma Ray Experiment Telescope (EGRET) aboard the *Compton Gamma Ray Observatory* was sensitive in the energy range 30 MeV to 30 GeV (Thompson et al. 1993). Mattox et al. (1997) demonstrated statistically that EGRET definitely detected the γ-ray emission of some members of the blazar class of AGN, as claimed previously (e.g., von Montigny et al. 1995). By blazars, we mean objects classified as BL Lacertae type objects, high-polarization quasars (HPQ), and OVV quasars. One characteristic of blazars is strong, compact, flat-spectrum ($\alpha \gtrsim -0.5$, where $S(\nu) \propto \nu^{\alpha}$) radio emission. Therefore, source catalogs based on high-frequency radio surveys provide an appropriate means to identify γ-ray blazars.

Unfortunately, the locations of EGRET sources are not well determined because of the wide point spread function of the EGRET instrument. The half-angle of a cone which contains 68% of the EGRET events from a point source at a specific energy is well fitted by $\theta_{68} = 5.^{\circ}85[E_{\gamma}/100\ \mathrm{MeV}]^{-0.534}$ (Mattox et al. 1996). The localization expected for a source is approximately $\theta = \theta_{\mathrm{PSF}}/\sqrt{N}$, where N is the number of γ-rays detected from the source (Thompson 1986). For low-flux EGRET sources, the 95% confidence position region can be as large as $\sim$5 square degrees. Therefore, a careful analysis of potential EGRET identifications is in order.

Mattox et al. (1997) provide a complete analysis of potential 5 GHz radio counterparts for all sources in the 2EG EGRET catalog (Thompson et al. 1995), and its supplement (Thompson et al. 1996), for Galactic latitude $|b| > 3°$, listing 42 blazars with a "high probability of being correct."

A new EGRET source catalog has been recently published, the 3EG catalog (Hartman et al. 1999, hereafter H-3EG). This catalog uses additional EGRET exposure in addition to modifications in the analysis. A substantial number of new sources are in the 3EG catalog. Error regions are smaller for some sources. Unlike previous EGRET catalogs, subthreshold EGRET sources (sources with insufficient statistical significance to be listed in the 3EG catalog) were modeled during likelihood analysis. Therefore, results differ substantially for many weak EGRET sources. A number of 2EG sources are consequently below the required significance threshold for inclusion in the 3EG catalog. Also, the estimated position and position uncertainty regions have changed substantially for some EGRET sources.

The 2EG catalog provided elliptical fits to the 95% confidence contours of sources, but the 3EG catalog provides only a radius corresponding to the area within a 95% confidence contour (although contour maps are provided in the 3EG preprint, and on the Web). Since these regions often have substantial ellipticity (Mattox et al. 1996), we have generated elliptical fits to the 95% confidence contours for the 3EG sources. The process is described, and the fits tabulated in the Appendix of this paper. These elliptical fits provide for reliable automated analysis of potential identifications of the EGRET sources.

In § 2, we provide a complete analysis of potential 5 GHz radio counterparts for the 3EG sources located at $|b| > 3°$ using the method of Mattox et al. (1997). Our results are described in § 3, and we conclude in § 4.

2. THE POTENTIAL IDENTIFICATION OF 3EG SOURCES WITH RADIO SOURCES

We analyze the probability of the identification of extra-

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TABLE 1

COMPLETE EGRET IDENTIFICATION RESULTS

3EG Name (1)	3EG ID (2)	Counterpart (3)	Other Name (4)	S_5 (mJy) (5)	α (6)	r_0 (arcmin) (7)	η (8)	r (arcmin) (9)	r_{95} (arcmin) (10)	Contour (%) (11)	LR (12)	$p(id\|r)$ (13)
J0010+7309......		B0014+7252		40		44.5	0.85E−05	33.7	14.9	>99.999	0.11E−04	0.9E−10
J0038−0949......		J0039−0942	B0036−0959	216		109.9	.0004	8.1	30.1	20	32.2	0.013
J0118+0248......	a B0119+041	B0119+0406	B0119+041	1241	0.2	583.2	.022	108.7	81.7	99.5	0.8	0.017
		B0115+0242		621	−0.7	178.2	.0046	9.7	85.6	3.79	12.5	0.055
		B0111+0206		635	0.2	329.8	.0049	67.8	85.6	84.7	7.1	0.034
J0130−1758......	a B0130−171	J0132−1654	B0130−171	746	−0.5	236.3	.0070	68.4	63.0	97.1	1.3	0.009
J0159−3603......		J0156−3616	B0154−3630	445	−0.7	147.0	.0022	35.1	45.3	83.5	5.5	0.012
		J0159−3604	B0157−3619	281	−0.6	123.5	.0008	3.0	44.6	1.3	22.7	0.017
J0204+1458......	A B0202+149	B0202+1459	B0202+149	2714	−0.4	789.7	.10	19.2	55.7	29.9	423	0.98
		B0202+1430		360	0.8	343.0	.0013	14.1	54.3	18.2	97.9	0.12
J0210−5055......	A B0208−512	J0210−5101	B0208−512	3198	−0.2	943.9	.13	7.2	7.9	91.8	3538	0.998
J0215+1123......		B0214+1050		439	−0.9	139.8	.0021	29.1	66.6	43.6	7.8	0.016
J0222+4253......	A 3C 66A	B0219+428	3C 66A	1098	0.	443.8	.017	6.8	16.2	41.2	1325	0.96
		B0220+4245[a]		2942	−0.8	675.5	.11	6.9	18.5	34.5	2633	0.997
J0237+1635......	A B0235+164	B0235+1624	B0235+164	1955	−0.1	701.7	.056	18.8	20.3	92.4	273.5	0.94
J0239+2815......	a B0234+285	B0234+2835	B0234+285	3356	0.3	1635	.136	40.9	30.7	99.5	41.1	0.87
J0253−0345......		J0256−0453	B0254−0506	135		82.3	0.14E−03	69.0	83.9	86.9	0.77	0.1E−03
		J0257−0400	B0255−0411	139		82.3	0.15E−03	56.3	61.8	91.7	0.71	0.1E−03
J0323+5122......		B0318+5115		249	−0.8	95.4	.0006	10.4	34.4	24.0	17.8	0.01
J0329+2149......		B0322+2213		702	0.2	354.4	.0061	47.1	54.6	89.3	13.8	0.078
J0340−0201......	A CTA 26	J0339−0146	CTA 26	3014	0.3	1199.7	.12	16.0	31.2	54.7	2013	0.996
		J0339-0133	B0336−0143	446	0.0	225.8	.0022	31.3	31.2	95.2	7.7	0.017
J0348+3510......		B0345+3344A		762		255.3	0.74E−02	72.3	41.6	99.988	0.15E−01	0.1E−03
		B0345+3455		87	−0.6	56.9	0.51E−04	7.0	46.6	6.5	4.2	0.2E−03
J0348−5708......		J0347−5724	B0346−5733	96	−0.8	51.8	0.64E−04	8.8	41.7	12.4	4.2	0.3E−03
J0404+0700......		B0403+0629B		210		109.9	.0004	33.1	52.3	69.8	4.4	0.0017
		B0404+0734		191	0.0	138.1	.0003	38.8	56.9	75.2	4.7	0.0015
		B0406+0632		256	0.4	224.3	.0006	57.6	62.0	92.5	3.1	0.0019
		B0408+0700		595	−0.8	178.2	.0042	76.9	69.1	97.6	0.6	0.0025
J0407+1710......		B0404+1743		213	−0.8	90.0	0.40E−03	40.3	45.2	90.8	1.3	0.5E−03
J0412−1853......	A B0414−189	J0416−1851	B0414−189	770	−0.7	215.7	.0075	47.8	97.1	51.6	7.5	0.054
		J0409−1757	B0406−1804	861	−0.7	236.3	.0097	78.6	74.7	96.4	1.2	0.012
J0416+3650......	a B0415+379	B0415+3754	B0415+379	6637	−0.6	1634.9	.20	76.5	39.8	99.998	0.1	0.019
J0422−0102......	A B0420−014	B0420−0126	B0420−014	6992	1.1	4325.4	.20	21.9	31.9	75.5	13500	0.9997
J0423+1707......		B0422+1749		303	−0.8	114.5	0.90E−03	63.1	52.5	98.7	0.25	0.2E−03
J0426+1333......		B0424+1405		165	−0.7	75.2	0.22E−03	37.2	35.1	96.6	0.61	0.1E−03
J0429+0337......		B0432+0427		345	−1.0	112.4	0.12E−02	73.3	56.3	99.4	0.11	0.1E−03
		B0432+0328		173	−1.1	65.9	0.25E−03	54.9	64.0	89.0	0.70	0.2E−03
J0433+2908......	A B0430+2859	B0430+2859		477		172.6	.0025	2.1	9.5	13.3	859	0.69
J0435+6137......		B0438+6113		762	−0.6	242.2	.0074	73.8	73.0	95.3	1.7	0.012
J0439+1555......		B0437+1432		346	−0.9	116.1	0.12E−02	76.3	56.4	99.6	0.81E−01	1.0E−04
		B0438+1543		32		44.5	0.51E−05	30.1	50.6	65.3	1.3	0.7E−05
		B0439+1537		58	−0.8	37.9	0.20E−04	51.1	50.3	95.5	0.47	0.9E−05
		B0440+1646		132	−1.3	56.7	0.13E−03	79.2	59.4	99.5	0.93E−01	0.1E−04
		B0441+1713		54	−0.8	35.8	0.17E−04	113	59.6	99.998	0.47	0.8E−05

TABLE 1—*Continued*

3EG Name (1)	3EG ID (2)	Counterpart (3)	Other Name (4)	S_5 (mJy) (5)	α (6)	r_0 (arcmin) (7)	η (8)	r (arcmin) (9)	r_{95} (arcmin) (10)	Contour (%) (11)	LR (12)	p(id|r) (13)
J0439+1105......		B0435+1042		90		60.9	0.55E−04	21.8	51.5	41.7	2.8	0.15E−03
		B0435+1035		101		68.4	0.72E−04	27.2	49.2	59.9	2.7	0.19E−03
		B0436+1138		127	−0.7	62.3	0.12E−03	39.2	46.5	88.1	0.95	0.12E−03
		B0437+1128		217	−1.0	81.4	0.42E−03	36.3	52.2	76.7	2.1	0.87E−03
		B0441+1036		392	−0.4	162.1	0.16E−02	84.7	60.5	99.7	0.79E−01	0.13E−03
J0442−0033......	A NRAO 190	B0440−0022	NRAO 190	1613	0.1	644.8	.038	20.4	25.4	85.5	281.2	0.92
J0450+1105......	A B0446+112	B0446+1116	B0446+112	668	−0.1	264.2	.0055	28.1	38.8	79.3	29.1	0.14
J0456−2338......	A B0454−234	J0457−2324	B0454−234	1863	0.1	711.1	.051	8.1	66.8	4.3	326	0.95
J0458−4635......	A B0454−463	J0455−4616	B0454−463	1653	−0.6	477.7	.040	20.0	85.0	15.3	80.4	0.77
		J0451−4653	B0450−4658	541	−0.4	206.2	.0034	67.4	85.0	84.8	3.0	0.01
J0459+0544......	A B0459+060	B0459+0604	B0459+060	918	−0.1	354.4	.011	40.9	49.4	87.2	20.0	0.18
		B0456+0603		554	−0.6	189.9	.0036	31.4	59.2	57.0	13.6	0.05
		B0502+0455		984	0.3	477.7	.013	90.1	75.9	98.6	1.8	0.02
J0459+3352......		B0500+3358		518	−0.5	186.5	.0031	73.6	94.7	83.7	2.2	0.007
J0500+2529......		B0459+2511		2202	−0.7	536.5	.070	42.5	37.5	97.9	13.0	0.49
J0500−0159......	A B0458−020	J0501−0159	B0458−020	3317	1.0	4325.4	.134	15.6	48.1	27.1	17700	0.9996
J0510+5545......		B0510+5558		276	0.0	172.2	.0007	34.6	30.1	98.1	2.0	0.001
J0512−6150......	a B0506−612	J0506−6109	B0506−612	1211	−0.8	336.7	0.21E−01	59.7	34.7	99.986	0.42E−01	0.9E−03
		J0516−6207	B0516−6210	564	0.7	434.7	.0037	34.6	35.8	93.9	27.0	0.09
J0520+2556......		B0512+2455		1378		434.7	.027	61.9	46.9	99.5	1.4	0.04
J0521+2147......		B0518+2110		471	−0.1	209.6	.0025	31.4	24.2	99.4	1.5	0.004
J0530+1323......	A B0528+134	B0528+1330	B0528+134	2978	0.3	1199.7	.116	8.9	13.4	73.2	6470.7	0.9988
J0530−3626......	a B0521−365	J0522−3628	B0521−365	8180	−0.7	1634.9	0.20	82.8	35.7	>99.999	0.61E−03	0.1E−03
		J0529−3555	B0527−3557	329		137.3	.0011	21.2	55.4	35.6	12.2	0.0130
J0531−2940......	a B0537−286	J0539−2839	B0537−286	1232	0.9	967.2	0.21E−01	122.7	55.4	>99.999	0.37E−03	0.8E−05
		J0531−3032	B0529−3034	358	−0.1	176.4	.0013	60.0	56.0	96.8	1.1	0.001
J0533+4751......		B0529+4820		616	0.2	312.2	.0045	31.2	72.6	42.5	32.2	0.13
J0533−6916......	LMC[b]	J0536−6909	B0537−6910	1552		477.7	.035	13.2	29.0	46.3	436.5	0.94
		J0538−6905	B0539−6907	19763	−0.7	1934.4	.2000	23.3	29.0	85.5	1939	0.998
		J0539−6944	B0540−6946	2176	−0.6	588.6	.068	41.6	34.4	98.8	11.0	0.45
J0534+2200......	Crab PSR	B0531+2159	Crab PSR	321870		1934.4	.20	3.4	3.3	96.1	40100	0.9999
J0540−4402......	A B0537−441	J0538−4405	B0537−441	4805	0.4	2162.7	.185	14.7	19.2	83.1	6470	0.9993
J0542−0655......	a B0539−057	J0541−0541	B0539−057	1100	0.9	901.9	.0167	76.9	49.1	99.9	0.7	0.01
J0546+3948......		B0542+4042		173	−0.9	70.3	0.25E−03	59.4	40.0	99.87	0.25E−01	0.6E−05
		B0543+4028		111		73.1	0.89E−04	45.1	39.7	97.9	0.31	0.28E−04
		B0545+3945		54		44.5	0.17E−04	24.8	36.4	75.2	1.5	0.26E−04
J0556+0409......		B0552+0329		126	−0.7	62.3	0.12E−03	44.6	24.7	99.994	0.18E−02	0.22E−06
		B0555+0431		53	−0.7	35.8	0.16E−04	37.3	24.9	99.89	0.21E−01	0.35E−06
J0613+4201......		B0609+4123		264	−0.3	135.8	0.65E−03	40.5	27.5	99.85	0.12	0.8E−04
		B0612+4131		178	−1.1	70.4	0.26E−03	37.2	33.5	97.5	0.43	0.1E−03
		B0614+4209		120		73.1	0.11E−03	43.5	35.9	98.8	0.22	0.2E−04
J0616−0720......		J0613−0655	B0611−0654	87		60.9	0.51E−04	51.2	50.0	95.7	0.39	0.20E−04
		J0615−0644	B0613−0643	43		44.5	0.10E−04	29.5	60.7	50.7	1.2	0.12E−04
		J0619−0731	B0616−0729	58		46.9	0.20E−04	39.2	55.0	78.2	0.95	0.19E−04

TABLE 1—*Continued*

3EG Name (1)	3EG ID (2)	Counterpart (3)	Other Name (4)	S_5 (mJy) (5)	α (6)	r_0 (arcmin) (7)	η (8)	r (arcmin) (9)	r_{95} (arcmin) (10)	Contour (%) (11)	*LR* (12)	$p(id\|r)$ (13)
J0616−3310......		J0615−3356	B0613−3355	230		116.3	0.48E−03	44.6	38.2	98.3	0.53	0.2E−03
J0617+2238......		B0615+2249		59		46.9	0.21E−04	26.2	7.7	>99.999	0.13E−12	0.3E−17
J0622−1139......	A B0616−116	J0619−1140	B0616−116	517	0.3	305.9	.0030	44.9	60.4	80.9	15.0	0.04
J0628+1847......		B0624+1833		105	−0.4	72.7	0.78E−04	26.5	30.7	89.3	2.1	0.2E−03
		B0628+1911		496	−0.8	158.5	0.28E−02	45.6	34.3	99.6	0.34	0.9E−03
J0702−6212......		J0657−6139	B0656−6135	325	−0.6	130.5	.0011	35.7	68.4	55.8	5.2	0.005
J0706−3837......		J0710−3850	B0709−3845	444		172.6	.0022	44.9	53.5	87.9	4.0	0.009
J0721+7120......	A B0716+714	B0716+7126	B0716+714	810	0.0	326.0	.0084	1.6	20.8	1.8	722	0.86
J0724−4713......		J0726−4728	B0725−4722	593		211.3	.0042	29.7	58.6	53.9	18.4	0.07
J0725−5140......		J0719−5228	B0718−5223	298		130.1	0.86E−03	65.6	54.6	98.7	0.29	0.2E−03
		J0724−5235	B0723−5230	233		116.3	0.49E−03	49.3	53.7	92.0	1.3	0.7E−03
J0737+1721......	A B0735+178	B0735+1749	B0735+178	2146	0.1	776.9	.067	23.7	40.0	65.0	396.3	0.97
J0743+5447......	A B0738+5451	B0738+5451		272	0.0	163.4	.0007	3.5	29.5	4.1	88.3	0.06
J0747−3412......		J0747−3311	B0745−3303	905	0.0	350.8	.011	62.7	42.4	99.86	0.3	0.003
		J0749−3435	B0747−3428	191		104.1	.0003	26.9	44.8	66.2	5.9	0.002
J0808+4844......	a B0804+499 or 0809+483	B0803+4850		388	−0.6	147.7	.0016	23.1	45.2	54.3	15.0	0.02
		B0810+4822	B0809+483	4411	−0.9	1081.4	.18	54.9	47.5	98.2	28.5	0.86
		B0804+4959	B0804+499	1229	0.3	611.7	.021	66.4	40.5	99.97	0.2	0.005
J0808+5114......	a B0803+5126	B0803+5126		237	0.3	194.4	.0005	23.9	62.3	35.8	19.0	0.01
J0808−5344......		J0808−5428	B0806−5419	91		60.9	0.56E−04	47.2	42.0	97.7	0.26	0.1E−04
		J0811−5421	B0810−5411	173		93.2	0.25E−03	48.7	35.2	99.7	0.89E−01	0.2E−04
J0812−0646......		J0812−0549	B0809−0540	519	−0.7	158.5	0.31E−02	59.6	45.9	99.4	0.26	0.8E−03
		J0814−0618	B0811−0608	132		82.3	0.13E−03	36.3	40.9	90.6	1.4	0.2E−03
J0821−5814......		J0820−5705	B0819−5655	756	−0.5	236.3	.0072	65.2	62.4	96.2	1.8	0.01
J0824−4610......		J0828−4539	B0826−4530	332		145.9	.0011	45.0	45.5	94.7	1.8	0.002
		J0828−4542	B0826−4531	383		155.2	.0015	46.4	46.3	95.1	1.8	0.003
		J0829−4544	B0827−4534	311		137.3	.0010	48.9	46.8	96.2	1.1	0.001
J0828+0508......	A B0829+046	B0829+0440	B0829+046	2105	0.7	1248.6	.064	63.4	77.8	86.3	105.9	0.88
J0828−4954......		J0825−5010	B0823−5000	3070	−0.8	731.1	.121	30.0	29.2	95.8	78.8	0.91
J0829+2413......	A B0827+243	B0827+2421	B0827+243	670	0.0	281.6	.0055	11.1	40.3	20.4	117	0.39
J0845+7049......	A B0836+710	B0836+7104	B0836+710	2436	−0.4	711.1	.084	16.2	36.1	45.3	637	0.98
J0852−1216......	A PMN J0850−1213	J0850−1213	PMN J0850−1213	834		276.3	.0090	38.9	52.8	80.3	16.4	0.13
J0853+1941......	A OJ 287	B0851+2017	OJ 287	2617	0.1	922.2	.095	29.6	52.1	62.0	357	0.97
J0903−3531......		J0901−3505	B0859−3452	79		56.7	0.41E−04	30.2	34.9	89.4	1.1	0.5E−04
		J0903−3453	B0901−3441	92		64.8	0.58E−04	35.0	37.1	93.1	0.85	0.5E−04
		J0904−3514	B0902−3503	81		56.7	0.43E−04	24.4	34.5	77.7	2.2	0.9E−04
		J0907−3535	B0905−3523	575		198.7	0.39E−02	57.5	33.0	99.99	0.13E−01	0.5E−04
J0910+6556......		B0903+6656		195		104.1	0.33E−03	44.8	57.2	84.1	1.9	0.6E−03
		B0911+6611		220	−1.0	81.4	.0004	29.3	48.7	66.2	3.2	0.001
		B0913+6542		239		116.3	0.52E−03	56.0	54.0	96.0	0.70	0.4E−03
J0917+4427......	a B0917+449	B0917+4454	B0917+449	1003	0.2	486.6	.014	41.1	26.1	99.94	0.6	0.009
J0952+5501......	A B0954+556	B0954+5537	B0954+556	2260	−0.2	683.9	.073	46.1	47.1	94.4	35.7	0.74
J0958+6533......	A B0954+658	B0954+6548	B0954+658	1419	0.6	848.3	.0290	1.7	18.4	2.6	6240	0.995
J1009+4855......	a B1011+496	B1011+4941	B1011+496	283	−0.2	149.2	0.77E−03	61.6	48.8	99.2	0.28	0.2E−03

TABLE 1—*Continued*

3EG Name (1)	3EG ID (2)	Counterpart (3)	Other Name (4)	S_5 (mJy) (5)	α (6)	r_0 (arcmin) (7)	η (8)	r (arcmin) (9)	r_{95} (arcmin) (10)	Contour (%) (11)	*LR* (12)	$p(id\|r)$ (13)
J1045−7630......		J1057−7724	B1056−7708	431	−0.4	171.5	0.20E−02	72.2	61.6	98.4	0.45	0.91E−03
J1052+5718......	a B1055+567	B1055+5644	B1055+567	256	0.3	206.7	0.61E−03	67.1	65.2	95.8	1.4	0.8E−03
J1104+3809......	A Mrk 421	B1101+3828	Mrk 421	712	−0.1	281.6	.0063	1.5	13.9	3.5	1180	0.88
J1133+0033......		B1130+0050		352	−0.2	165.5	.0013	8.7	64.5	5.3	18.8	0.023
		B1130+0056		342	−0.1	176.4	.0012	2.2	50.0	0.6	37.2	0.0422
J1134−1530......	a B1127−145	J1130−1449	B1127−145	4209	−0.6	1248.6	0.17	80.1	36.8	>99.999	0.24E−02	0.5E−03
J1200+2847......	A B1156+295	B1156+2931	B1156+295	1542	−0.1	553.8	.035	31.9	35.5	91.2	64.6	0.70
J1212+2304......		B1206+2326		166	−1.1	65.9	0.22E−03	52.8	51.9	95.5	0.41	0.93E−04
		B1207+2237		111	−0.8	58.4	0.89E−04	59.5	50.4	98.5	0.17	0.16E−04
		B1210+2414		64	−1.3	34.6	0.25E−04	56.9	54.5	96.2	0.69	0.17E−04
J1219−1520......		J1218−1439	B1215−1422	154	−0.7	70.6	0.19E−03	44.7	49.0	91.7	0.77	0.2E−03
J1222+2315......		B1219+2327		106	−0.9	51.1	0.80E−04	13.8	47.6	22.2	2.9	0.23E−03
		B1221+2256		96	−0.2	76.4	0.64E−04	31.3	60.3	55.5	2.5	0.16E−03
J1222+2841......	A 1219+285	B1219+2830	1219+285	968	−0.	380.8	.013	33.9	20.2	99.98	0.2	0.003
J1224+2118......	A B1222+216	B1222+2139	B1222+216	1261	−0.4	399.9	.023	8.8	19.1	47.0	698	0.94
J1227+4302......		B1222+4352		231	−0.4	122.4	.0005	36.8	70.9	55.5	4.4	0.002
		B1224+4357		158	−0.1	109.4	0.20E−03	35.1	64.3	59.2	3.9	0.8E−03
J1229+0210......	A 3C 273	B1226+0219	3C 273	44940	−0.1	1934.4	.2000	8.0	18.6	43.0	18600	0.9998
J1230−0247......	A B1229−021	J1231−0224	B1229−021	1020	−0.3	354.4	.014	22.4	36.7	67.0	92.3	0.57
J1234−1318......		J1231−1236	B1229−1220	211		109.9	0.39E−03	50.3	44.0	98.0	0.46	0.2E−03
J1235+0233......		B1226+0219		44940	−0.1	1934.4	.2000	95.0	45.2	>99.999	0.0	0.002
		B1231+0255		151	−0.3	98.2	.0002	18.0	42.6	41.5	9.6	0.002
J1236+0457......	a B1237+0459	B1237+0459		375	0.4	283.4	.0015	63.8	54.1	98.4	1.3	0.002
J1246−0651......	A B1243−072	PKS 1243−072		1100	0.5	675.5	.017	37.0	64.5	62.7	123	0.68
J1249−8330......		J1224−8312	B1221−8255	797	0.5	477.7	.0081	43.5	39.0	97.6	10.8	0.08
J1255−0549......	A 3C 279	J1256−0547	3C 279	11192	−0.1	1934.4	.20	3.8	4.1	91.7	54000	0.99999
J1300−4406......		J1302−4447	B1259−4430	498	−0.9	150.7	.0028	38.5	46.4	87.3	4.3	0.01
J1308+8744......		No Candidate[c]										
J1310−0517......		J1308−0459	B1306−0444	128		78.1	0.12E−03	26.2	45.3	63.3	3.7	0.45E−03
		J1310−0452	B1307−0436	123		78.1	0.11E−03	24.0	49.1	51.1	4.1	0.46E−03
		J1312−0424	B1310−0408	368	0.6	304.3	0.14E−02	66.5	47.5	99.7	0.37	0.51E−03
J1314−3431......	a B1313−333	J1316−3339	B1313−333	1093	0.2	486.6	0.16E−01	52.3	29.2	99.993	0.56E−01	0.9E−03
		J1316−3429	B1313−3413	117		73.1	0.10E−03	26.8	29.5	91.6	1.8	0.2E−03
J1316−5244......		J1315−5334	B1312−5318	424		164.1	.0019	32.6	63.9	54.2	9.4	0.02
J1323+2200......	a B1324+224	B1324+2226	B1324+224	840	1.0	753.0	0.92E−02	51.9	25.9	99.999	0.15E−01	0.14E−03
		B1318+2231		385	0.6	304.3	.0016	32.7	28.3	98.2	6.3	0.0097
		B1319+2203		155	−0.3	98.2	0.19E−03	22.2	26.1	88.5	5.1	0.99E−03
		B1321+2229		102	−0.9	51.1	0.73E−04	17.0	26.0	72.3	3.6	0.26E−03
J1324−4314......	Cen A[d]	J1321−4342	B1318−4326	1983	−0.8	492.9	.057	48.7	30.0	99.96	0.3	0.018
		J1325−4257	B1322−4242	66077		1934.4	.20	19.6	27.9	77.1	3290	0.9988
		J1325−4302	B1322−4246	62837		1934.4	.20	14.1	27.9	53.4	6730	0.9994
		J1326−4240	B1323−4225	2055		611.7	.061	41.3	28.1	99.8	2.2	0.13
		J1327−4239	B1324−4223	2098		644.8	.064	44.6	28.2	99.9	0.9	0.06

TABLE 1—*Continued*

3EG Name (1)	3EG ID (2)	Counterpart (3)	Other Name (4)	S_5 (mJy) (5)	α (6)	r_0 (arcmin) (7)	η (8)	r (arcmin) (9)	r_{95} (arcmin) (10)	Contour (%) (11)	*LR* (12)	$p(id\|r)$ (13)
J1329+1708......	A B1331+170	B1331+1704	B1331+170	708	0.7	492.9	.0062	71.9	82.1	90.0	11.1	0.06
J1329−4602......		J1330−4611	B1327−4556	193		104.1	.0003	11.9	56.9	12.4	8.9	0.0028
		J1331−4622	B1328−4606	111		73.1	0.89E−04	22.9	58.6	36.7	3.3	0.29E−03
		J1333−4555	B1330−4539	147		87.9	0.17E−03	34.7	44.7	83.7	2.2	0.38E−03
J1337+5029......		B1329+5023		353	−0.9	116.1	0.13E−02	63.4	43.0	99.85	0.43E−01	0.55E−04
		B1340+5125		120	−0.1	90.9	0.11E−03	61.0	45.9	99.5	0.93E−01	0.99E−05
J1339−1419......	A B1334−127	J1337−1257	B1334−127	2838	0.6	1634.9	.107	69.6	67.5	95.9	72.6	0.90
J1347+2932......		B1346+2847		211	−1.3	78.8	0.39E−03	54.4	58.4	92.6	0.65	0.26E−03
		B1346+2953		213	−1.0	81.4	.0004	23.9	51.8	47.1	4.3	0.0017
J1409−0745......	A B1406−076	PKS 1406−076	B1406−076	1080	0.2	486.6	.016	12.7	15.4	87.1	387	0.86
J1424+3734......		B1417+3835		860	0.2	408.7	.0097	68.5	52.7	99.4	1.2	0.0111
J1429−4217......	A B1424−418	J1427−4206	B1424−418	2597	0.0	922	.093	22.7	46.3	51.4	580	0.98
J1447−3936......		J1448−4009	B1445−3957	126		78.1	0.12E−03	32.3	52.9	67.4	2.5	0.30E−03
		J1448−4026	B1445−4013	170	−0.1	115.9	0.24E−03	46.7	54.2	89.2	1.7	0.41E−03
		J1454−4012	B1451−4000	993	0.6	572.9	0.13E−01	86.0	49.8	99.987	0.52E−01	0.70E−03
J1457−1903......		J1454−1925	B1451−1913	346	−0.9	116.1	.0012	46.5	43.7	96.7	0.8	0.0010
		J1459−1917	B1456−1904	93		64.8	0.59E−04	28.1	42.3	73.4	2.3	0.13E−03
J1500−3509......		J1457−3538	B1454−3526	566	0.5	385.3	.0037	67.2	75.4	90.7	7.5	0.027
J1504−1537......	a B1504−166	J1507−1652	B1504−166	2840	0.4	1367.8	0.11	85.4	41.2	>99.999	0.81E−02	0.98E−03
		J1503−1519	B1501−1508	122		78.1	0.11E−03	18.2	39.9	46.5	6.5	0.72E−03
		J1503−1529	B1500−1517	124		78.1	0.12E−03	12.4	43.7	21.5	7.7	0.89E−03
J1512−0849......	A B1510−089	PKS 1510−089	B1510−089	3000	0.0	1019.5	.117	27.7	54.2	54.5	484	0.98
J1517−2538......	a B1514−241	J1517−2422	B1514−241	2013	0.0	764.6	.059	72.5	48.1	99.89	0.8	0.05
		J1517−2618	B1514−2607	195		104.1	0.33E−03	44.7	46.9	93.5	1.2	0.38E−03
J1527−2358......		J1517−2422	B1514−2411	2013	0.0	764.6	.059	138.7	83.3	99.98	0.1	0.0040
		J1530−2427	B1527−2417	147		87.9	0.17E−03	48.5	80.4	66.4	1.6	0.28E−03
J1600−0351......		J1555−0326	B1552−0318	315	−0.7	114.5	0.98E−03	82.7	53.1	99.93	0.16E−01	0.16E−04
		J1600−0422	B1557−0413	81		56.7	0.43E−04	25.7	50.9	53.4	2.1	0.92E−04
J1605+1553......	A B1604+159	B1604+1559	B1604+159	497	−0.2	210.8	.0028	23.2	44.2	56.1	30.3	0.078
		B1601+1602		269		123.3	.0007	30.0	45.3	73.3	6.3	0.004
J1607−1101......		J1605−0926	B1602−0918	998	−1.3	236.3	.014	89.8	80.6	97.6	0.7	0.0097
		J1605−1139	B1602−1131	371		155.2	.0014	55.1	71.1	83.5	2.7	0.0038
J1608+1055......	A B1606+106	B1606+1037	B1606+106	1688	0.0	644.8	.0416	25.9	40.3	70.9	224	0.91
J1612−2618......		J1616−2516	B1613−2508	271		123.3	0.69E−03	82.9	99.1	87.7	0.90	0.62E−03
		J1625−2527	B1622−2520	3449	0.7	1934.4	.1400	178.5	92.6	99.999	0.0	0.0031
J1614+3424......	A B1611+343	B1611+3420	B1611+343	2483	−0.1	776.9	.087	14.1	18.9	80.9	965	0.989
J1616−2221......		J1613−2134	B1610−2126	378	−1.0	120.5	.0015	54.7	57.3	93.5	1.1	0.0016
		J1614−2150	B1611−2142	152		87.9	0.18E−03	36.0	55.5	71.8	2.5	0.46E−03
J1621+8203......		No Candidate[c]										
J1625−2955......	A B1622−297	PKS 1622−297	B1622−297	1920	0.1	764.6	.0540	7.8	13.4	63.7	3550	0.995
J1626−2519......	A B1622−253	J1625−2527	B1622−253	3449	0.7	1934.4	.14	8.2	18.4	45.3	18200	0.9997
J1627−2419......	[e]	J1625−2527	B1622−2520	3449	0.7	1934.4	.14	70.4	46.9	99.88	6.0	0.50
J1631−1018......		J1632−1052	B1630−1045	225		109.9	0.45E−03	46.5	40.7	98.0	0.52	0.23E−03

TABLE 1—*Continued*

3EG Name (1)	3EG ID (2)	Counterpart (3)	Other Name (4)	S_5 (mJy) (5)	α (6)	r_0 (arcmin) (7)	η (8)	r (arcmin) (9)	r_{95} (arcmin) (10)	Contour (%) (11)	*LR* (12)	$p(id\|r)$ (13)
J1631−4033......		J1631−4015[f]	B1628−4008	663								
		J1636−4101	B1633−4055	1462		477.7	.0310	58.9	62.5	93.0	12.4	0.28
J1633−3216......		J1636−3035	B1633−3029	74		53.6	0.35E−04	111.8	57.7	99.999	0.26E−02	0.90E−07
J1634−1434......		J1628−1415	B1625−1409	376	−0.1	188.4	0.15E−02	67.3	55.1	98.87	0.45	0.66E−03
		J1634−1440	B1632−1434	156		87.9	0.20E−03	25.7	59.9	42.4	4.0	0.79E−03
J1635+3813......	A B1633+382	B1633+3814	B1633+382	3198	0.4	1441.8	.128	8.3	13.2	69.5	10900	0.9994
J1635−1751......		J1635−1815	B1632−1809	123		78.1	0.11E−03	18.0	66.7	19.7	3.5	0.39E−03
		J1638−1649	B1635−1643	215		109.9	0.41E−03	79.3	70.8	97.7	0.28	0.12E−03
J1638−2749......		J1637−2746	B1634−2740	56		44.5	0.18E−04	7.7	44.3	8.6	2.8	0.53E−04
		J1638−2803	B1635−2757	58		46.9	0.20E−04	13.7	34.8	37.2	3.7	0.74E−04
		J1641−2728	B1638−2723	204		104.1	0.36E−03	42.1	29.1	99.8	0.85E−01	0.31E−04
J1638−5155......		J1639−5132	B1635−5127	92		64.8	0.58E−04	28.7	41.4	76.3	2.1	0.12E−03
		J1639−5150	B1635−5144	61		46.9	0.23E−04	11.6	45.0	18.2	2.8	0.64E−04
J1646−0704......		J1642−0621	B1639−0615	1197		350.8	.020	62.1	52.0	98.6	2.0	0.039
		J1647−0715	B1644−0709	386	−0.8	130.9	.0016	31.4	60.2	55.9	6.6	0.01
J1649−1611......		J1649−1627	B1646−1622	98		64.8	0.67E−04	17.6	33.2	57.0	5.3	0.35E−03
		J1650−1610	B1647−1605	109		68.4	0.86E−04	2.4	45.6	0.8	6.7	0.57E−03
J1652−0223......		J1652−0311	B1650−0307	111	0.4	166.7	0.89E−04	46.5	52.7	90.4	3.1	0.28E−03
		B1654−0202		592	−0.2	237.0	0.41E−02	87.0	52.8	99.97	0.20E−01	0.83E−04
J1653−2133......		J1655−2222	B1652−2217	115		73.1	0.97E−04	50.4	63.5	84.9	0.97	0.93E−04
		J1657−2004	B1654−2000	215		109.9	0.41E−03	98.7	78.3	99.2	0.11	0.46E−04
		J1658−2011	B1655−2006	238		116.3	0.51E−03	96.9	79.0	98.9	0.14	0.74E−04
J1659−6251......		J1703−6212	B1658−6208	616		211.3	.0045	47.3	48.3	94.3	3.4	0.015
J1704−4732......		J1701−4730	B1657−4726	56		44.5	0.18E−04	32.5	41.8	83.6	0.95	0.18E−04
		J1704−4702	B1700−4658	48		44.5	0.13E−04	29.0	35.9	85.8	1.0	0.13E−04
J1709−0828......		J1713−0817	B1710−0813	621		211.3	.0046	60.0	71.3	88.1	3.4	0.016
J1717−2737......		J1712−2809	B1709−2806	1642		520.7	.039	67.5	42.6	99.95	0.2	0.0098
		J1716−2722	B1712−2718	85		60.9	0.48E−04	21.6	32.4	73.6	3.2	0.15E−03
		J1721−2711	B1718−2708	328		137.3	0.11E−02	56.6	41.4	99.6	0.14	0.16E−03
J1719−0430......		J1716−0452	B1713−0448	659		222.2	0.53E−02	48.3	26.7	99.995	0.12E−01	0.62E−04
		J1719−0453	B1716−0450	54		44.5	0.17E−04	23.7	27.5	89.2	1.1	0.19E−04
J1720−7820......	a B1716−771	J1723−7713	B1716−771	235	0.6	225.8	0.50E−03	58.9	43.5	99.6	0.35	0.17E−03
		J1730−7811	B1722−7808	377	−0.5	155.2	.0015	30.6	44.6	75.7	9.2	0.013
		J1702−7741	B1655−7737	1152	−0.4	359.2	.018	62.9	45.4	99.7	0.6	0.011
J1726−0807......		J1725−0801	B1723−0758	56		44.5	0.18E−04	10.5	51.7	11.6	2.1	0.39E−04
		J1726−0807	B1723−0805	46		44.5	0.12E−04	2.7	54.5	0.7	2.0	0.23E−04
		J1727−0854	B1724−0852	140		82.3	0.15E−03	48.5	39.7	98.8	0.21	0.32E−04
J1727+0429......	A B1725+044	B1725+0429	B1725+044	789	0.3	408.7	.0080	14.5	53.5	19.9	140	0.53
J1733+6017......		B1722+6108		318	0.4	249.3	.0010	78.2	75.5	96.0	1.4	0.0014
		B1724+6058		258	0.1	163.4	.0006	60.5	75.3	85.7	2.3	0.0014
J1733−1313......	A NRAO 530	J1733−1304	NRAO 530	6991	0.8	2497.3	.20	13.7	16.5	87.5	8600	0.9995
J1735−1500......		J1738−1502	B1735−1501	268		123.3	.0007	31.8	43.8	79.4	5.2	0.0035
J1738+5203......	A B1739+522	B1739+5213	B1739+522	1134	−0.4	359.2	.018	27.4	65.7	40.7	53.5	0.49

TABLE 1—*Continued*

3EG Name (1)	3EG ID (2)	Counterpart (3)	Other Name (4)	S_5 (mJy) (5)	α (6)	r_0 (arcmin) (7)	η (8)	r (arcmin) (9)	r_{95} (arcmin) (10)	Contour (%) (11)	LR (12)	$p(id\|r)$ (13)
J1741−2050......		J1739−2054	B1736−2052	135		82.3	0.14E−03	31.6	47.4	73.6	2.8	0.39E−03
		J1742−2037	B1739−2035	133		82.3	.0001	18.8	32.5	63.3	7.4	0.001
J1741−2312......		J1740−2304	B1737−2303	46		44.5	0.12E−04	15.8	36.8	42.4	2.9	0.34E−04
J1744−0310......	A B1741−038	J1743−0350	B1741−038	2369	0.3	1019.5	.080	35.7	45.7	84.0	239	0.95
J1744−3934......		J1745−3921	B1741−3919	59		46.9	0.21E−04	9.8	30.5	26.8	5.4	0.11E−03
		J1745−3928	B1741−3926	65		50.3	0.26E−04	9.7	35.9	19.6	4.9	0.13E−03
		J1745−3929	B1742−3928	78		56.7	0.40E−04	14.7	34.2	42.7	5.1	0.20E−03
		J1746−3926	B1742−3925	73		53.6	0.34E−04	17.3	31.6	59.4	3.9	0.13E−03
J1746−1001......		J1744−1011	B1741−1010	85		60.9	0.48E−04	29.6	45.9	71.3	1.9	0.92E−04
		J1747−0959	B1744−0958	61		46.9	0.23E−04	15.6	40.2	36.3	2.9	0.65E−04
J1757−0711......		J1758−0710	B1755−0709	80		56.7	0.42E−04	12.6	40.3	25.5	4.6	0.19E−03
		J1759−0709	B1756−0709	92		64.8	0.58E−04	21.0	41.0	54.4	3.8	0.22E−03
J1800−0146......		J1801−0131	B1759−0131	106		68.4	0.80E−04	14.6	56.4	18.3	3.8	0.30E−03
		J1802−0207	B1800−0207	523	−1.1	145.9	.0031	36.1	37.5	93.8	3.0	0.0092
J1800−3955......	A B1759−396	J1802−3940	B1759−396	1950		611.7	.056	29.2	62.9	47.5	149	0.90
J1806−5005......	a PMN J1808−5011	J1808−5011	PMN J1808−5011	425		164.1	.0019	26.3	64.4	39.4	12.1	0.023
		J1802−4925	B1758−4925	530	0.0	255.8	.0032	51.2	52.9	93.9	4.4	0.014
J1810−1032......		J1808−1041	B1806−1041	48		44.5	0.13E−04	18.8	39.7	49.0	2.3	0.30E−04
		J1810−1054	B1807−1055	49		44.5	0.14E−04	22.3	30.5	79.8	1.7	0.23E−04
		J1810−1102	B1807−1103	103		68.4	0.75E−04	30.2	30.4	94.9	0.95	0.71E−04
J1813−6419......		J1819−6345	B1814−6346	4506	−0.8	1199.7	.18	59.2	44.2	99.5	10.4	0.69
J1822+1641......		B1819+1558		441	−0.2	196.4	.0021	51.3	40.3	99.2	0.6	0.0013
		B1820+1758		772	−0.6	242.2	0.76E−02	69.0	40.6	99.98	0.20E−01	0.15E−03
J1824+3441......		B1825+3429		335	−0.3	159.0	.0011	24.0	46.7	54.9	16.1	0.018
		B1821+3407		194	−0.8	84.6	.0003	27.0	47.4	62.3	4.0	0.0013
J1825+2854......		B1829+2905		1311	−0.6	369.5	.0245	77.2	69.1	97.6	2.1	0.050
J1825−7926......		J1832−7953	B1823−7955	105		68.4	0.78E−04	28.7	57.1	53.0	2.4	0.19E−03
J1828+0142......		B1823+0147		999		299.2	.013	44.9	34.7	99.3	1.5	0.020
J1832−2110......	A B1830−210	J1833−2103	B1830−210	7920	−0.3	1765.9	.20	23.2	31.2	81.0	1830	0.9978
		J1832−2039	B1829−2041	968		299.2	.013	33.4	29.2	98.0	6.4	0.075
J1834−2803......		J1832−2800	B1829−2802	59		46.9	0.21E−04	24.9	29.3	88.5	1.2	0.24E−04
J1835+5918......		B1834+5904		102		68.4	0.73E−04	12.7	9.7	99.5	0.84	0.62E−04
		B1832+5909		38		44.5	0.76E−05	15.7	8.5	99.997	0.32E−02	0.25E−07
		B1834+5937		127	−0.8	62.3	0.12E−03	20.5	9.6	>99.999	0.19E−03	0.23E−07
J1836−4933......		J1839−5009	B1835−5012	135		82.3	0.14E−03	36.9	39.7	92.5	1.2	0.17E−03
		J1843−4836	B1839−4839	1325	−0.7	372.3	0.25E−01	77.6	37.7	>99.999	0.95E−03	0.24E−04
J1847−3219......		J1850−3235	B1846−3238	85		60.9	0.48E−04	27.2	48.7	60.9	2.2	0.11E−03
		J1850−3310	B1847−3314	146		87.9	0.17E−03	57.7	44.6	99.3	0.12	0.20E−04
J1850+5903......		B1852+5842		124	−1.0	55.6	0.12E−03	31.5	48.7	71.5	1.5	0.18E−03
		B1844+5750		155	−0.9	65.9	0.19E−03	65.7	59.9	97.3	0.26	0.51E−04
J1850−2652......		J1848−2718	B1845−2721	215		109.9	.0004	23.2	72.9	26	5.3	0.0021
		J1849−2638	B1846−2641	148		87.9	0.17E−03	23.2	50.1	47.4	5.2	0.90E−03

TABLE 1—*Continued*

3EG Name (1)	3EG ID (2)	Counterpart (3)	Other Name (4)	S_5 (mJy) (5)	α (6)	r_0 (arcmin) (7)	η (8)	r (arcmin) (9)	r_{95} (arcmin) (10)	Contour (%) (11)	LR (12)	$p(id\|r)$ (13)
J1858−2137......		J1852−2150	B1849−2153	150		87.9	0.18E−03	57.7	59.6	94.0	0.60	0.11E−03
		J1855−2154	B1852−2159	70		53.6	0.31E−04	19.2	52.8	32.6	2.4	0.73E−04
		J1857−2149	B1854−2153	70		53.6	0.31E−04	16.5	56.0	22.9	2.3	0.72E−04
J1904−1124......		J1905−1153	B1902−1157	197		104.1	.0003	30.8	36.8	87.8	3.2	0.0011
		J1906−1114	B1903−1119	126		78.1	0.12E−03	30.4	24.5	99.0	0.35	0.41E−04
J1911−2000......	A B1908−201	J1911−2006	B1908−201	2053	0.	764.6	.061	10.8	29.4	33.6	1350	0.989
J1921−2015......	a B1920−211	J1923−2104	B1920−211	2885		832.4	.11	57.1	37.2	99.91	1.3	0.14
J1935−4022......	A B1933−400	J1937−3957	B1933−400	1129	−0.3	377.9	.018	25.2	38.2	73.0	79.6	0.59
		J1933−3940	B1930−3946	1097	−0.6	332.7	.017	29.7	57.8	54.7	45.4	0.43
J1937−1529......	A B1936−155	J1939−1525	B1936−155	800	−1.0	202.6	.0082	34.5	54.4	70.2	12.8	0.096
		J1941−1524	B1938−1531	2401	−0.9	558.4	.082	59.7	50.8	98.4	5.8	0.34
J1940−0121......		B1938−0112		363	−0.7	122.6	.0014	20.3	54.0	34.4	10.4	0.014
J1949−3456......		J1947−3542	B1944−3549	155		87.9	0.19E−03	40.3	44.8	91.2	1.3	0.24E−03
		J1951−3412	B1948−3420	230	0.4	209.8	0.48E−03	65.6	42.4	99.93	0.61E−01	0.29E−04
J1955−1414......		J1952−1417	B1950−1425	84		60.9	0.47E−04	43.0	40.2	96.7	0.37	0.17E−04
		J1959−1432	B1956−1440	198		104.1	0.34E−03	55.1	41.4	99.5	0.12	0.42E−04
J1958−4443......		J2000−4520	B1956−4529	108		68.4	0.84E−04	43.3	79.9	58.5	1.4	0.11E−03
		J2007−4434	B2004−4443	471	−0.9	139.8	0.25E−02	101.3	73.9	99.6	0.64E−01	0.16E−03
J1959+6342......		B2005+6416		738	1.2	637.8	.0068	49.7	56.5	90.2	37.9	0.21
J2006−2321......		J2005−2310	B2002−2318	260		123.3	.0006	11.4	38.3	23.5	24.1	0.015
		J2007−2335	B2004−2344	141		82.3	0.15E−03	21.3	38.5	60.2	5.8	0.90E−03
J2020−1545......		J2016−1538	B2014−1547	80		56.7	0.42E−04	46.8	50.9	92.0	0.58	0.25E−04
		J2019−1532	B2016−1541	52		44.5	0.16E−04	21.3	62.7	29.2	1.3	0.21E−04
		J2020−1519	B2017−1529	91		60.9	0.56E−04	32.5	57.1	62.3	1.7	0.97E−04
J2022+4317......		B2024+4429		32		44.5	0.51E−05	112.0	47.5	>99.999	0.82E−04	0.42E−09
J2025−0744......	A B2022−077	J2025−0735	B2022−077	879	−0.4	282.2	.01	9.6	32.6	23.1	173	0.64
J2034−3110......		J2037−3042	B2034−3053	157	−0.9	65.9	0.20E−03	40.0	63.5	69.6	1.4	0.28E−03
		J2039−3156	B2036−3207	317	0.5	268.3	.0010	65.7	59.1	97.6	1.6	0.0016
J2036+1132......	A B2032+107	B2032+1045	B2032+107	867	0.1	350.8	.0098	53.4	53.7	94.9	6.7	0.063
J2046+0933......		B2047+0951		491	0.5	359.2	.0027	63.1	72.8	89.6	7.9	0.021
J2055−4716......	A B2052−474	J2056−4714	B2052−474	2026	−0.7	492.9	.060	16.6	52.2	26.0	198	0.93
J2100+6012......	a B2105+598	B2105+5952	B2105+598	297	−0.3	142.8	0.86E−03	36.9	23.1	99.96	0.56E−01	0.48E−04
		B2101+6003		225	−0.3	121.7	.0005	12.8	20.6	68.8	33	0.015
J2158−3023......	A B2155−304	J2158−3013	B2155−304	407	0.3	273.0	.0018	15.5	36.0	42.5	99.6	0.15
J2202+4217......	A BL LAC	B2200+4202	BL LAC	3571	−0.2	1049.1	.146	4.8	55.2	2.2	1060	0.994
J2206+6602......	a B2206+650	B2206+6505	B2206+650	344	−0.5	145.9	.0012	42.9	58.5	80.1	4.0	0.0048
J2209+2401......	A B2209+236	B2209+2340	B2209+236	1194	0.7	731.1	.020	28.6	57.2	52.8	231.6	0.83
J2219−7941......		J2226−8110	B2220−8126	145		87.9	0.16E−03	64.0	73.1	89.9	0.74	0.12E−03
		J2229−7907	B2224−7922	168		93.2	0.23E−03	66.5	68.2	94.2	0.54	0.12E−03
J2227+6122......		B2226+6122[g]		494	−0.1							
J2232+1147......	A CTA 102	B2230+1128	CTA 102	3765	−0.5	1199.7	.1543	5.7	32.0	9.1	3834.4	0.9986
J2241−6736......		J2240−6833	B2236−6848	103		68.4	0.75E−04	41.4	72.1	62.8	1.4	0.11E−03
		J2241−6839	B2237−6855	151		87.9	0.18E−03	48.2	74.0	72.0	1.6	0.29E−03

TABLE 1—*Continued*

3EG Name (1)	3EG ID (2)	Counterpart (3)	Other Name (4)	S_5 (mJy) (5)	α (6)	r_0 (arcmin) (7)	η (8)	r (arcmin) (9)	r_{95} (arcmin) (10)	Contour (%) (11)	*LR* (12)	$p(id\|r)$ (13)
J2243+1509......		B2239+1511		110	−0.9	54.5	0.87E−04	19.2	60.8	26.0	2.0	0.18E−03
		B2241+1616		311	−0.8	114.5	0.95E−03	71.0	63.6	97.6	0.34	0.32E−03
J2248+1745......		B2251+1552		15859	0.1	2162.7	.20	121.9	67.2	99.995	0.2	0.039
J2251−1341......		J2246−1206	B2243−1222	2661	0.0	922.2	0.97E−01	121.7	59.6	>99.999	0.26E−02	0.28E−03
		J2249−1251	B2247−1307	314	−0.6	130.5	0.97E−03	54.8	54.6	95.1	1.0	0.97E−03
		J2253−1412	B2251−1427	148	−0.8	70.6	0.17E−03	45.1	59.2	82.5	1.1	0.19E−03
J2254+1601......	A 3C 454.3	B2251+1552	3C 454.3	15859	0.1	2162.7	.20	6.9	16.4	41.2	30500	0.9999
J2255+1943......	a B2250+1926	B2250+1926		355	0.4	262.8	.0013	87.4	155.0	61.4	3.7	0.0048
		B2246+2051		760	0.1	326.0	.0073	98.3	140.1	77	4.1	0.029
J2255−5012......		J2254−5002	B2251−5017	96		64.8	0.64E−04	16.3	59.5	20.2	3.0	0.19E−03
		J2254−5025	B2251−5041	188	−0.4	104.2	.0003	31.0	52.3	65.3	4.5	0.0014
J2314+4426......		B2309+4527		594	0.5	403.3	0.42E−02	96.2	55.1	99.989	0.18E−01	0.77E−04
		B2311+4501		129	−0.6	73.1	0.13E−03	64.0	52.7	98.8	0.15	0.19E−04
		B2316+4331		80	−0.8	45.5	0.42E−04	48.5	50.5	93.7	0.48	0.20E−04
J2321−0328......	A B2320−035	J2323−0317	B2320−035	797	−0.2	286.5	.0081	22.8	73.4	25.2	34.4	0.22
		J2325−0344	B2322−0401	524	−0.9	150.7	.0031	48.1	75.5	70.5	3.9	0.012
J2352+3752......	a B2346+385	B2346+3832	B2346+385	636	0.5	418.2	.0049	60.1	52.9	97.9	4.0	0.019
J2358+4604......	A B2351+456	B2351+4536	B2351+456	1149	−0.4	359.2	.0184	41.8	46.1	91.5	15.7	0.23
J2359+2041......	A B2356+196	B2356+1938	B2356+196	704	0.2	354.4	.0061	53.9	63.5	88.5	11.0	0.064

NOTES.—Table 1 is also available in machine-readable form in the electronic edition of the *Astrophysical Journal Supplement*. Col. (1): The J2000 γ-ray position name from the 3EG EGRET catalog (H-EG3). Col. (2): The blazar identification given (for some sources) by H-EG3. An "A" preceding the source name indicates that H-EG3 designated this as a high-confidence AGN identification. An "a" preceding the source name indicates that H-EG3 designated this as a "lower confidence potential" AGN identification. Col. (3): Position names of potential radio counterparts. Col. (4): An alternative or more common name for some potential radio counterpart. This column is also used in some cases to identify the radio source indicated by H-EG3. Col. (5): The 4.85 GHz flux density from the survey catalog. Col. (6): The radio spectral index from the radio survey flux densities if available ($S(\nu) \propto \nu^{\alpha}$). Col. (7): The characteristic angle (in arcmin) between potentially confusing radio sources which are at least as bright and flat as this radio source (eq. [3] of Mattox et al. 1997). Col. (8): The a priori probability that the radio source is a γ-ray source (eq. [6]). Col. (9): The angle between the EGRET position estimate and the radio position (in arcmin). Col. (10): The radius of the 95% confidence contour in the direction of the radio source in arcmin (eq. [5] of Mattox et al. 1997). Col. (11): The EGRET position confidence contour at the radio position (eq. [6] of Mattox et al. 1997); it ranges from 0% at the EGRET position estimate to 100% far away. Col. (12): The likelihood ratio (eq. [5]) indicating the strength of the indication for the identification. Col. (13): The a posteriori probability that the identification is correct as determined with eq. (4).

[a] B0220+4245 is an extended radio source, making it an unlikely counterpart.

[b] The poor resolution of the single dish PMN survey does not provide for definitive results for radio sources near the LMC.

[c] EGRET sources J1308+8744 and J1621+8203 lie outside of a 5 GHz survey region.

[d] The Cen A region is not resolved in the single dish PMN survey. Therefore, this study is not useful for judging the claim that EGRET source J1324−4314 is Cen A.

[e] EGRET source J1627−2419 is indicated by H-3EG as a possible artifact due to improper modeling of diffuse γ-ray emission of the ρ Oph cloud.

[f] Radio source J1631−4015 corresponds to a planetary nebula.

[g] Radio source B2226+6122 corresponds to a Galactic H II region.

solar 3EG sources at a Galactic latitude $|b| > 3°$ with radio sources. This latitude limit is required because the single dish surveys are source confused near the Galactic plane. Identified pulsars were excluded from this analysis (although a high confidence identification of the Crab pulsar is retained in Table 1 for demonstrative purposes). The elliptical fits to the 95% confidence position contours tabulated in the Appendix were used.

As Mattox et al. (1997), the radio catalog of Becker, White, & Edwards (1991) has been used for the 4.85 GHz Greenbank survey (declination range $0° < \delta < 75°$). In addition, the White & Becker (1992) catalog of sources from the 1.4 GHz GB survey was used to obtain an $\alpha_{1.4-4.85}$ spectral index for the 22384 sources found in both catalogs out of the 53522 sources cataloged at 4.85 GHz.

The PMN catalogs (Wright et al. 1994, Griffith et al. 1994, 1995) were used for the declination range $-87.^{\circ}5 < \delta < 10°$. Spectral indices are provided for the $\sim 10\%$ of the PMN sources which were detected in the Parkes 2.7 GHz survey (Bolton, Wright, & Savage 1979).

We retain the original position names of both catalogs. The GB source names are prefixed with "B" because the position names are based on B1950 celestial coordinates. The PMN source names are prefixed with "J" corresponding to J2000 celestial coordinates. We use the GB survey in the region where the surveys overlap, $0° < \delta < 10°$. The regions near some Parkes sources (e.g., PKS 1243−072 and PKS 1622−297) were apparently not included in the PMN survey. For these sources, the Parkes catalog was used. The PMN and GB 4.85 GHz catalogs have thresholds at ~ 30 mJy which vary somewhat with position.

We calculate the probability of identification as Mattox et al. (1997). We summarize the method here. This analysis considers two possibilities for a specific radio source, it could be a random confusing source, or it could be the γ-ray source. The probability for a confusing source radio source to be located at an angle less than r from the EGRET position estimate is

$$p(r\,|\,c) = 1 - e^{-r^2/r_0^2} , \qquad (1)$$

where r_0 is the characteristic angle between radio sources of interest. The corresponding differential probability is

$$dp(r\,|\,c) = 2\,\frac{r}{r_0^2}\,e^{-r^2/r_0^2}\,dr . \qquad (2)$$

If it is not a confusing source, the differential probability for the γ-ray position to be found at angle r from the radio source is

$$dp(r\,|\,id) = 6\,\frac{r}{\Psi^2}\,e^{-3r^2/\Psi^2}dr , \qquad (3)$$

where Ψ is the angle of the 95% position confidence contour (Mattox et al. 1996) in the direction of the radio source. Bayes's theorem allows the observed angle between the radio source and the EGRET position estimate, r, to be used with an a priori probability of the radio source being a γ-ray source, η, and the expected distributions of r under the two possible hypotheses to obtain $p(id\,|\,r)$, the a posteriori probability that a radio source is the correct identification of an EGRET source:

$$p(id\,|\,r) = \frac{[\eta/(1-\eta)]LR}{[\eta/(1-\eta)]LR + 1} , \qquad (4)$$

where the likelihood ratio, LR, is defined to be

$$LR \equiv \frac{dp(r\,|\,id)}{dp(r\,|\,c)} = 3\,\frac{r_0^2}{\Psi^2}\,e^{-r^2(3/\Psi^2 - 1/r_0^2)} . \qquad (5)$$

Mattox et al. (1997) developed the following a priori probability for EGRET's detection of radio sources which is consistent with radio source detections using the 2EG EGRET catalog,

$$\eta(S_5) = 0.2(1 - e^{-0.07(S_5/\mathrm{Jy})^{2.3}}) , \qquad (6)$$

where S_5 is the 5 GHz flux density of the radio source. We expect that this a priori probability is also appropriate for use with the 3EG catalog.

3. RESULTS

Table 1 includes all radio sources with $p(id\,|\,r) > 0.01$, which is the minimum probability we suggest for standard consideration of a potential identification. If no counterpart is indicated at this probability or above, the minimum a posteriori probability was lowered for each EGRET source to obtain at least one radio source. Multiple potential identifications are included in Table 1 if radio sources were found with $p(id\,|\,r)$ within a factor of ~ 10 of each other.

Radio sources appearing in Table 1 with very low values of $p(id\,|\,r)$ (e.g., $p(id\,|\,r) \ll 0.001$), are very unlikely to be EGRET identifications. They are included to indicate the lack of a more probable radio identification. For example, the relatively well located EGRET source, 3EG J1835+5918, has no viable 5 GHz radio identification. For the purpose of illustration, Table 1 includes the GB sources with the 3 highest values of $p(id\,|\,r)$ for identification with 3EG J1835+5918. The highest probability is for 100 mJy source B1834+5904. It is calculated to be at the 99.5% probability contour ($12.'7$ from the EGRET position while the 95% contour is only $9.'7$ from the EGRET position in the direction of this radio source). The consequent $p(id\,|\,r)$ is only 0.00006.

The results in Table 1 are substantially different from those of Mattox et al. (1997) for some sources because of changes in the shapes and positions of the EGRET position error regions. For example, the identification of B0234+285 is now less strongly indicated because it is now located on the 99% confidence contour rather than the 98% confidence contour due to reduced position uncertainty.

3.1. *Limitations of This Analysis*

Mattox et al. (1997) point out that this technique for EGRET source identification is subject to substantial systematic error from a number of potential sources. Therefore, the probabilities of correct identification derived here are subject to substantial uncertainty. The likelihood ratio, LR, can be affected by a number of errors. That is: discrepancies between the actual likelihood contours and our elliptical fits (as apparent in Fig. 1*b*); the likelihood surface can differ from a paraboloid which is assumed in deriving equation (3); the EGRET likelihood positions are potentially affected by EGRET source confusion and error in the model of the Galactic diffuse γ-ray emission. The a priori probability, η, is subject to error in the chosen analytical representation, and also in the assumption that it is independent of EGRET exposure and radio spectral index. Also, both LR and η are affected by the fact that both the radio flux densities and spectral indices of blazars extracted

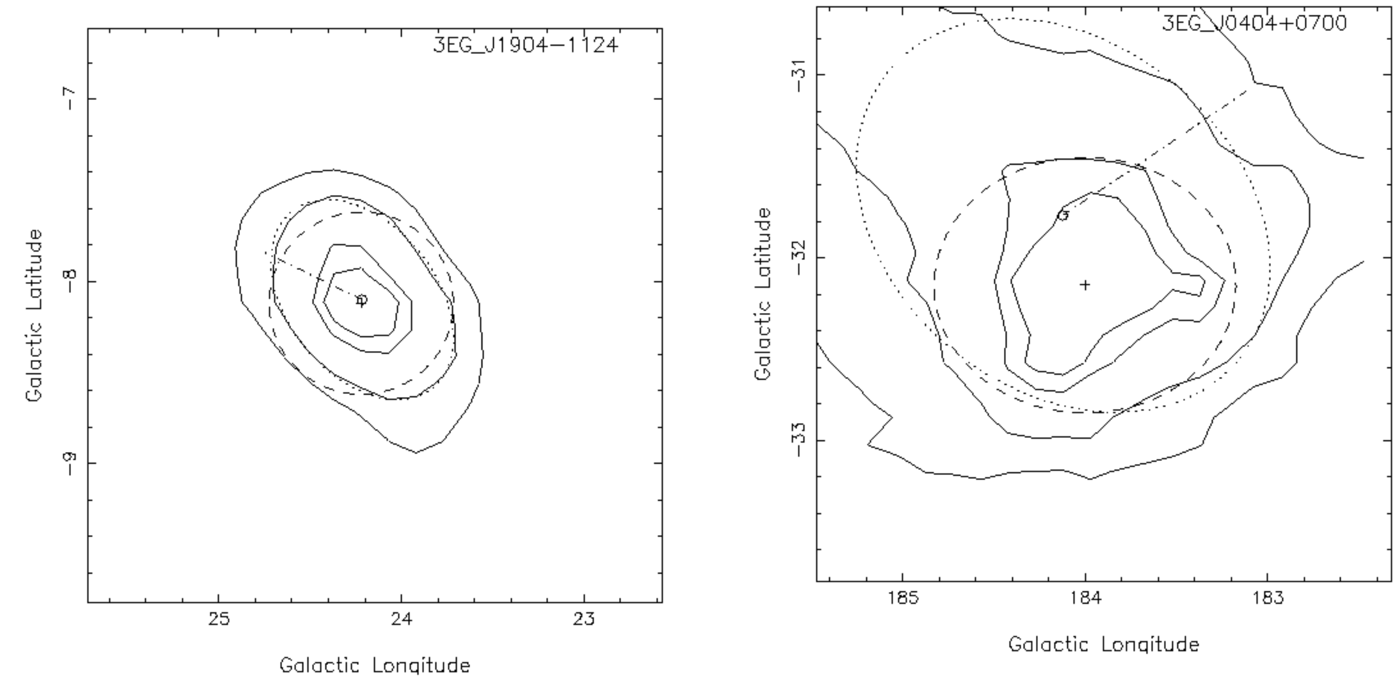

FIG. 1.—Two examples of elliptical fits. Our positions are shown with small circles. The positions of H-3EG are shown with crosses, and the dashed circles are drawn at the 95% confidence radii of H-3EG. Our elliptical fits are shown with dotted lines. The north meridian direction is indicated by the dot-dashed line. The text describes the availability of similar figures for additional 3EG sources.

from surveys can be inaccurate because of source variability.

From these considerations, we estimate that both LR and η are uncertain by a factor of 2 (with 68% confidence). Combining these errors quadratically (and realizing that $\eta \leq 0.2$ for all sources) implies that the term $[\eta/(1-\eta)]LR$ in equation (4) is uncertain by a factor of $\sim 2\sqrt{2}$ with 68% confidence, and uncertain by a factor of 5 with $\sim$90% confidence. This implies (as stated by Mattox et al. 1997), with $\sim$90% confidence, that a derived value $p(id\,|\,r) = 0.9$ implies an actual value in the range $0.5 < p(id\,|\,r) < 0.98$; and $p(id\,|\,r) = 0.99$ implies a value in the range $0.95 < p(id\,|\,r) < 0.998$, etc. Similarly, with $\sim$90% confidence, a derived value $p(id\,|\,r) = 0.1$ implies an actual value in the range $0.02 < p(id\,|\,r) < 0.5$; and $p(id\,|\,r) = 0.01$ implies a value in the range $0.002 < p(id\,|\,r) < 0.05$, etc. Finally, a derived value $p(id\,|\,r) = 0.5$ implies an actual value in the range $0.17 < p(id\,|\,r) < 0.83$ with $\sim$90% confidence. We think that it is still worthwhile to approach this problem quantitatively since we find values of $[\eta/(1-\eta)]LR$ which span many orders of magnitude.

3.2. *EGRET Blazar Identifications with a High Probability of Being Correct*

Table 2 contains the 46 EGRET blazar identifications which we find to have a high probability of being correct. To be included in Table 2, $p(id\,|\,r)$ was required to be at least 70% unless there was additional evidence indicating a correct identification. PKS 2155−304 was included because of a γ-ray flare which coincided with a flare at longer wavelengths (Vestrand Stacey, & Sreekumar 1995). B0827+343 and B1739+522 were included because of the substantial VLBI flux density at 2.29 GHz which Mattox et al. (1997) found to indicate an enhanced probability of being a γ-ray blazar.

All of the radio sources in Table 2 are confirmed blazars except B1908−201 which is near the Galactic plane in the Southern Hemisphere and has not been studied extensively. All of the sources in Table 2 were indicated as a high-confidence AGN identifications by H-3EG, except B0234+285, which they indicate to be a plausible identifications.

3.3. *Plausible EGRET Identifications*

Table 3 includes another 37 potential blazar identifications of EGRET sources. To be included in Table 3, the identification was considered to be insufficiently secure for inclusion in Table 2, but $p(id\,|\,r)$ was in excess of $\sim$4%. Radio source B2002−2310 has been included with $p(id\,|\,r) = 0.015$ because Wallace et al. (2000) report significant variability of the γ-ray flux of the corresponding EGRET source, 3EG J2006−2321, between $\sim$2 day intervals. The γ-ray variability suggests that this source is a blazar, and a corresponding radio source is expected. This substantially increases the probability that B2002−2310 is the correct identification. We find it to be an order of magnitude more probable as the identification of this EGRET source than any other radio source.

Two pairs of the radio sources in Table 3 (B1930−397 and B1933−400; B1936−155 and B1938−155) are each potential identifications for the same EGRET sources. Radio source B0847−1202 (J0850−1213) in Table 3 has additional support for being a blazar—Bloom et al. (1997) report a flux of 1.5 Jy at 22 GHz and a nearly flat spectrum up to 230 GHz. Also, Halpern & Eracleous (1997) report optical variability for this source.

4. CONCLUSIONS

Table 2 lists the 46 EGRET blazar identifications which we find to have a high probability of being correct. Addi-

TABLE 2

EGRET IDENTIFICATIONS WITH A HIGH PROBABILITY OF BEING CORRECT

Name[a]	M_v[b]	S_5 (mJy)	α[c]	$S_{\rm VLBI}$ (mJy)	$p(id \mid r)$[d]	γ-ray flux[e]	z	Notes[f]
0202+149......	22.1	2714	−0.4	600 ± 100	0.98	0.26 ± 0.06	0.405	NRAO 91
0208−512......	16.9	3198	−0.2	2230 ± 110	0.998	1.10 ± 0.07	1.003	
0219+428......	15.5	1098	0.	270 ± 50	0.96	0.25 ± 0.06	0.444	3C 66A
0234+285......	18.9	3356	0.3	1600 ± 100	0.87	0.30 ± 0.14	1.213	OD +258
0235+164......	19.0	1955	−0.1	1800 ± 200	0.94	0.82 ± 0.09	0.94	OD 160
0336−019......	18.4	3014	0.3	1400 ± 100	0.996	4 ± 1	0.852	CTA 26
0420−014......	17.7	6992	1.1	610 ± 50	0.9997	0.50 ± 0.10	0.915	OA 129
0440−003......	19.2	1084	0.6	820 ± 40	0.91	0.92 ± 0.12	0.844	NRAO 190
0454−234......	18.5	1863	0.1	1100 ± 80	0.95	0.15 ± 0.04	1.009	OF −292
0454−463......	17.4	1656	−0.6	...	0.77	0.23 ± 0.07	0.858	
0458−020......	18.4	3317	1.0	920 ± 80	0.99996	0.31 ± 0.09	2.286	OA 141
0528+134......	20.0	2978	0.3	500 ± 80	0.999	2.95 ± 0.33	2.06	OG 147
0537−441......	15.5	4805	0.4	2030 ± 90	0.9993	0.36 ± 0.09	0.894	
0716+714......	15.5	810	0.0	600 ± 50	0.86	0.24 ± 0.04	...	
0735+178......	14.9	2146	0.1	600 ± 100	0.97	0.30 ± 0.12	0.424	OI 158
0827+243......	17.3	670	0.0	800 ± 100	0.36	0.26 ± 0.06	0.939	OJ 248
0829+046......	16.5	2105	0.7	500 ± 100	0.88	0.20 ± 0.06	0.180	OJ 49
0836+710......	16.5	2436	−0.4	370 ± 30	0.98	0.45 ± 0.11	2.172	
0851+202......	14.0	2617	0.1	1030 ± 60	0.97	0.16 ± 0.07	0.306	OJ 287
0954+556......	17.7	2260	−0.2	<100	0.74	0.11 ± 0.04	0.909	OK 591
0954+658......	16.7	1419	0.6	430 ± 30	0.995	0.14 ± 0.04	0.368	
1101+384......	13.3	712	−0.1	320 ± 40	0.88	0.23 ± 0.08	0.030	Mrk 421
1156+295......	14.4	1542	−0.1	430 ± 50	0.70	2.29 ± 0.55	0.729	OM 295
1222+216......	17.5	1261	−0.4	330 ± 40	0.94	0.83 ± 0.20	0.435	ON 238
1226+023......	12.9	44940	−0.1	1510 ± 70	0.9998	0.24 ± 0.05	0.1583	3C 273
1253−055......	17.8	11192	−0.1	3700 ± 300	0.99999	4.5 ± 0.6	0.536	3C 279
1334−127......	17.2	2838	0.6	1060 ± 90	0.90	0.2 ± 0.1	0.539	
1406−076......	18.4	1080	0.2	640 ± 50	0.86	1.44 ± 0.26	1.494	OQ −10
1424−418......	17.7	2597	0.0	370 ± 40	0.98	0.55 ± 0.17	1.522	
1510−089......	16.5	3000	0.0	2300 ± 130	0.98	0.48 ± 0.18	0.360	OR −17
1606+106......	18.5	1688	0.0	490 ± 50	0.91	0.60 ± 0.13	1.226	OS 111
1611+343......	17.5	2483	−0.1	1200 ± 100	0.99	0.55 ± 0.13	1.401	OS 319
1622−253......	21.9	3449	0.7	150 ± 20	0.9997	0.43 ± 0.07	0.786	
1622−297......	20.5	1920	0.1	2000 ± 200	0.995	17 ± 3	0.815	
1633+382......	18.0	3198	0.4	1300 ± 100	0.9994	1.8 ± 0.3	1.814	OS 356
1730−130......	18.5	6991	0.8	1420 ± 60	0.9995	1.37 ± 0.43	0.902	NRAO 530
1739+522......	18.5	1134	−0.4	650 ± 70	0.49	0.54 ± 0.11	1.375	OT 566
1741−038......	18.6	2369	0.3	154 ± 7	0.95	0.5 ± 0.2	1.054	OT −68
1830−210......	22.	7920	−0.3	...	0.998	0.70 ± 0.19	>0.885	Grav. Lensed
1908−201......	...	2053	0.	460 ± 50	0.99	0.29 ± 0.10	...	
2052−474......	19.1	2026	0.	380 ± 40	0.93	0.25 ± 0.08	1.489	
2155−304......	14.0	407	0.3	144 ± 8	0.15	0.30 ± 0.08	0.116	
2200+420......	14.5	3571	−0.2	720 ± 60	0.995	0.40 ± 0.12	0.0686	BL Lac
2209+236......	19.0	1194	0.7	550 ± 50	0.83	0.13 ± 0.04	1.489	
2230+114......	17.3	3765	−0.5	600 ± 100	0.999	0.27 ± 0.04	1.037	CTA 102
2251+158......	16.1	15859	0.1	3400 ± 300	0.9999	1.32 ± 0.21	0.859	3C 454.3

NOTE.—Table 2 is also available in machine-readable form in the electronic edition of the *Astrophysical Journal Supplement*.

[a] Radio source name is based on the B1950 position.

[b] Optical magnitude is from NED.

[c] Radio spectral index ($S(\nu) \propto \nu^{\alpha}$).

[d] The a posteriori probability of a correct identification (eq. [10] of Mattox et al. 1997).

[e] γ-ray flux in units 10^{-6} cm^{-2} s^{-1} ($E > 100$ MeV).

[f] Notes include other names for some sources.

tional radio and optical studies are warranted to ascertain the blazar properties of one of these: B1908−201. Table 2 includes all but three of the 42 sources derived by Mattox et al. (1997) by the same process from the 2EG catalog. One of these (B1219+285) is in Table 3. Two (B0521−365 and B1127−145) are no longer viable identifications (see Table 1) because of a substantial change in the EGRET position.

Of the 66 "high confidence AGN identifications" of H-3EG, 45 are included in Table 2 with a "high probability of correct identifications." We find the additional 20 "high confidence AGN identifications" of H-3EG to be plausible AGN identifications which are included in Table 3. One "A" identification of H-3EG is in our Table 3, i.e., B1219+285 which is BL Lac object W Comae. The position of the 3EG catalog results in $p(id \mid r) = 0.003$. However, the $E > 1$ GeV position of Lamb & Macomb (1997) is better for this identification, using their position result, we find $p(id \mid r) = 0.04$.

Of the 27 "lower confidence potential" AGN identifications of H-3EG, one (B0234+285) is found to be robust,

TABLE 3

PLAUSIBLE EGRET IDENTIFICATIONS

Name[a]	M_v[b]	J2000	Position	S_5 (mJy)	α[c]	$p(id\|r)$[d]	Notes[e]
0115+027	17.5	01 18 18.489	+02 58 05.97	621	−0.7	0.055	Opt.var. QSO
0322+222	...	03 25 36.81	+22 24 00.4	702	0.2	0.078	RadioS
0414−189	18.5	04 16 36.5444	−18 51 08.339	770	−0.7	0.054	QSO A
0430+2859	...	04 33 37.83	+29 05 55.5	477	0.	0.69	AGN A
0446+112	20.0	04 49 07.6711	+11 21 28.597	668	−0.1	0.14	QSO A
0459+060	19.5	05 02 15.4459	+06 09 07.494	918	−0.1	0.18	QSO A
0459+252	20.	05 02 58.550	+25 16 24.70	2202	−0.7	0.49	Radio Galaxy
0516−6210	21.0	05 16 44.9262	−62 07 05.388	564	0.7	0.091	QSO
0529+4820	...	05 33 15.87	+48 22 52.8	616	0.2	0.13	RadioS
0616−116	...	06 19 03.97	−11 40 54.7	517	0.3	0.044	RadioS A
0725−4722	...	07 26 25	−47 28 46	593	...	0.07	RadioS
0738+5451	17.7	07 42 39.7925	+54 44 24.662	272	0.0	0.06	RadioS A
0809+483	17.8	08 13 36.033	+48 13 02.56	4411	−0.9	0.86	Opt.var. a
0823−500	...	08 25 26.8691	−50 10 38.487	3070	−0.8	0.92	RadioS
0847−1202	18	08 50 09.60	−12 13 34.0	834	...	0.13	Opt.var. QSO A
1219+285	16.5	12 21 31.690	+28 13 58.50	968	0.	0.003[f]	Opt.var A
1221−829	...	12 24 54.384	−83 13 10.11	797	0.5	0.08	RadioS
1229−021	17.65	12 32 00.013	−02 24 05.27	1020	−0.3	0.57	QSO A
1243−072	18.	12 46 04.2320	−07 30 46.573	1100	0.5	0.68	QSO A
1331+1704	16.71	13 33 35.7838	+16 49 04.033	708	0.7	0.06	blazar A
1514−241	15.1	15 17 41.8131	−24 22 19.475	2013	0.0	0.05	BLLAC a
1604+159	18.7	16 07 06.557	+15 51 34.06	497	−0.2	0.08	blazar A
1633−409	...	16 36 56	−41 01 58	1462	...	0.28	RadioS
1725+044	16.99	17 28 24.9527	+04 27 04.913	789	0.3	0.53	QSO A
1759−396	...	18 02 43.00	−39 40 06.8	1950	0.	0.90	RadioS A
1814−637	18.0	18 19 35.0023	−63 45 48.189	4506	−0.8	0.70	Sy2?
1829+2905	20.2	18 31 14.859	+29 07 10.02	1311	−0.6	0.05	QSO
1920−211	...	19 23 32.1898	−21 04 33.332	2885	...	0.14	RadioS a
1930−397[g]	...	19 33 23.93	−39 40 11.6	1097	−0.6	0.43	GPair
1933−400[g]	18.0	19 37 16.2173	−39 58 01.552	1129	−0.3	0.59	blazar A
1936−155[h]	19.4	19 39 26.6	−15 25 43	800	−1.0	0.096	HPQ A
1938−155[h]	20.0	19 41 15.068	−15 24 31.30	2401	−0.9	0.34	QSO
2005+6416	19.0	20 06 17.6946	+64 24 45.418	738	1.2	0.21	QSO
2002−2318	...	20 05 56.5	−23 10 28	260	...	0.02	RadioS
2022−077	18.5	20 25 40.65	−07 35 52.1	879	−0.4	0.64	blazar A
2032+107	18.6	20 35 22.3340	+10 56 06.785	867	0.1	0.06	BLLAC A
2320−035	18.6	23 23 31.9537	−03 17 05.023	797	−0.2	0.22	QSO A
2351+456	20.6	23 54 21.6802	+45 53 04.236	1149	−0.4	0.23	QSO A
2356+196	18.	23 58 46.0859	+19 55 20.313	704	0.2	0.06	QSO A

NOTE.—Table 3 is also available in machine-readable form in the electronic edition of the *Astrophysical Journal Supplement*. Units of right ascension are hours, minutes, and seconds, and units of declination are degrees, arcminutes, and arcseconds.

[a] Radio source name based on the B1950 position.

[b] Optical magnitude from NED if available.

[c] Radio spectral index, $S(\nu) \propto \nu^{\alpha}$.

[d] The a posteriori probability of a correct identification (eq. [4]).

[e] Notes indicate the "Morphological Type" given for each source by NED. An appended "A" indicates that H-EG3 designated this source as a high-confidence EGRET identification; an appended "a" indicates that H-EG3 designated this source as a "lower confidence potential" EGRET identification.

[f] The high confidence identification of 1219+285 by H-3EG is based on the $E > 1$ GeV position of Lamb & Macomb (1997). Using their position result, we find $p(id|r) = 0.04$ for 1219+285.

[g] Both 1930−397 and 1933−400 are potential identifications of 3EG J1935−4022.

[h] Both 1936−155 and 1938−155 are potential identifications of 3EG J1937−1529.

and three are found to be plausible. Many of the additional 23 "lower confidence potential" AGN identifications of H-3EG are found to be unlikely with $p(id|r) < 0.001$ (see Table 1). We therefore suggest that it is inappropriate to include all of these sources in studies of the properties of γ-ray blazars as a class. Their inclusion has the potential to conceal or distort possible properties of this class.

An additional 15 new potential identifications are listed in Table 3 as plausible identifications which were not indicated by H-3EG. Observations at longer wavelengths are needed for many of these sources to determine if they belong to the blazar class. If so, the probability of EGRET identification is enhanced.

This research has made extensive use of the NASA/IPAC Extragalactic Database (NED) which is operated by the Jet Propulsion Laboratory, California Institute of Technology, under contract with the National Aeronautics and Space Administration. J. Mattox acknowledges support from NASA grant NAG5-3384.

APPENDIX

ELLIPTICAL FITS FOR THE 3EG POSITION UNCERTAINTY REGIONS

Elliptical fits for the 95% confidence contours of the 3EG sources have been derived from maps of the positional dependence of likelihood, as described by Mattox et al. (1996). For most of the 3EG sources, we have used the likelihood maps generated by H-3EG which are shown in their preprint and are available at ftp://gamma.gsfc.nasa.gov/pub/THIRD_CATALOG/. For source 3EG 2255+1943 we generated a new likelihood map since the map of H-EG3 included only the southern part of the 95% contour. Our elliptical fits are in Table 4.

Our tabulated positions are normally the mean positions for the region enclosed by the 95% confidence contour. These positions are subsequently used as the center of the fit ellipse. The semimajor axis, semiminor axis, and position angle of the semimajor axis of the ellipse result from a least-squares fit to interpolated positions of the 95% confidence contour. The least-squares fit is accomplished via the singular value decomposition routine of Press et al. (1992). Figure 1 shows a good elliptical fit in comparison to actual likelihood contours for source 3EG J1904−1124.

Our tabulated positions generally differ from the positions of H-3EG by less than 25% of the mean radius of the 95% confidence contour. However, the positions of H-3EG are a likelihood weighted mean position. If the 68% contour is not centered in the 95% contour, there can be substantial difference between our positions and those of H-EG3. For example, Figure 1 shows that the 68% contour of 3EG J0404−0700 is not centered in the 95% contour leading to a 24′ position difference from H-EG3. Sources where this occurs are noted in Table 4 by footnotes.

For a number of 3EG sources (primarily those with low likelihood test statistic, *TS*), the position uncertainty regions are not well defined. Sometimes the 95% confidence contour does not close in a reasonable way, e.g., 3EG J0404−0700 shown in Figure 1. For such cases, H-3EG generated a position uncertainty radius by multiplying the 68% confidence radius by the factor of 1.62 expected for the 95% radius when the log of likelihood is parabolic (eq. [7] of Mattox et al. 1997). We find that this estimate is generally much smaller than the actual 95% confidence contours of such sources. Therefore, the 95% confidence radii indicated in Table 4 of H-3EG with an asterisk are substantially underestimated. For sources with ill-defined 95% confidence contours, we have manually adjusted the ellipse center and other parameters to visually fit the portion of the 95% contour which appears to be reasonable, see Figure 1*b* for an example of such a fit. These sources are indicated by footnotes in Table 4 and described below.

The rms deviation of the elliptical fit is usually less than 20% of the mean radius of the 95% confidence contour. Exceptions are indicated by a footnote in Table 4, and described below. The elliptical fit for these deviant sources should be used only with caution. Figures similar to those in Figure 1 are available for sources described below at ftp://astro.fmarion.edu/pub/mattox/outgoing/3EG/. The elliptical fits are generally quite good. The auxiliary figure for EGRET source 3EG J0546+3948 illustrates the minimum quality of elliptical fit we tolerated without footnoting in Table 4, and in the text below. Only 37 of 271 sources have worse fits. The quality of the elliptical fits is considered adequate for the identification work in this paper.

A1. DESCRIPTION OF SOURCES WHERE THE ELLIPTICAL FIT IS COMPROMISED

3EG J0245+1758.—The 95% contour does not close at the western end in a reasonable way (probably due to a subthreshold source).

3EG J0329+2149.—95% contour does not close at the northwestern end in a reasonable way (probably due to a subthreshold source). Also, the 68% contour is not centered in the 95% contour leading to a 18′ position difference from H-EG3.

3EG J0348−5708.—The elliptical fit was done with the map of H-EG3 which does not contain the far eastern end of the 95% contour. Also, the 68% contour is not centered in the 95% contour leading to a 15′ position difference from H-EG3.

3EG J0404+0700.—The 95% contour does not close at the eastern end in a reasonable way (probably due to a subthreshold source). Also, the 68% contour is not centered in the 95% contour leading to a 24′ position difference from H-EG3.

3EG J0426+1333.—The 95% contour does not close at the northwest end in a reasonable way (probably due to a subthreshold source).

3EG J0429+0337.—The 95% contour is not fitted well at the eastern end. Also, the 68% contour is not centered in the 95% contour leading to a 29′ position difference from H-EG3.

3EG J0435+6137.—The 95% contour is not regular at the western end. We find an additional source indicated at $l = 146.09$, $b = 8.10$ which causes the island of 95% contour in the west. The actual 95% position confidence region is much larger than indicated by H-EG3's scaling of the 68% contour by 1.62. A 17′ position difference from H-EG3.

3EG J0458−4635.—The 95% contour is not fitted well.

3EG J0459+3352.—A source confused region—the 95% contour encloses three probability islands! The elliptical fit is shown in the auxiliary figure for this source.

3EG J0500+2529.—The 95% contour does not close at the northeastern end in a reasonable way (probably due to a subthreshold source).

3EG J0510+5545.—The 95% confidence contour encloses two probability islands which are each enclosed by isolated 68% confidence contours. This causes a high ellipticity for the fit to the 95% contour.

3EG J0533+4751.—The 95% contour does not close at the southern end in a reasonable way (probably due to a subthreshold source or discrepancy in the diffuse Galactic model).

3EG J0827−4247.—Considered a likely artifact by H-EG3, the 95% contour contains two major concentrations of probability.

TABLE 4

ELLIPTICAL FITS TO THE 95% CONFIDENCE POSITION CONTOURS OF ALL 3EG EGRET SOURCES

3EG Name (1)	α (2)	δ (3)	l (4)	b (5)	a (6)	b (7)	φ (8)
J0010+7309......	2.40	73.19	119.87	10.56	15.2	13.0	77.
J0038−0949......	9.73	−9.83	112.64	−72.46	40.9	30.0	105.
J0118+0248......	19.44	2.90	135.88	−59.31	87.4	54.8	53.
J0130−1758......	22.67	−17.94	169.53	−77.11	63.4	54.0	14.
J0159−3603......	29.89	−36.12	249.03	−72.97	51.8	42.2	25.
J0204+1458......	31.15	14.93	148.03	−44.35	57.1	47.4	171.
J0210−5055......	32.59	−50.92	276.07	−61.90	8.5	7.6	95.
J0215+1123......	34.02	11.48	153.72	−46.27	78.9	50.6	1.
J0222+4253......	35.69	42.92	140.20	−16.87	19.8	16.2	85.
J0229+6151......	37.38	61.89	134.21	1.19	31.6	28.1	126.
J0237+1635......	39.34	16.67	156.39	−39.22	24.1	20.2	2.
J0239+2815......	39.94	28.26	150.17	−28.82	32.8	24.3	118.
J0241+6103......	40.38	61.07	135.85	0.99	12.3	9.0	103.
J0245+1758......	41.21	17.97	157.47	−37.18	86.7	46.4	67.[a]
J0253−0345......	43.49	−4.00	179.99	−52.73	84.0	53.1	139.
J0323+5122......	50.80	51.42	145.56	−4.66	34.6	32.2	113.
J0329+2149......	52.13	21.98	164.56	−27.92	54.6	35.3	121.[a,b]
J0340−0201......	55.02	−2.00	188.37	−42.47	31.2	31.0	155.
J0348+3510......	57.12	35.09	159.18	−15.03	51.5	37.5	126.
J0348−5708......	57.09	−57.38	269.68	−46.70	49.7	41.7	174.[a,b]
J0404+0700......	61.52	7.16	184.12	−31.77	69.4	52.0	85.[a,b]
J0407+1710......	61.76	17.19	175.58	−25.10	47.8	37.6	35.
J0412−1853......	63.30	−18.83	213.91	−43.13	112.0	72.3	62.
J0416+3650......	64.04	36.83	162.22	−9.97	44.6	32.5	167.
J0422−0102......	65.73	−0.97	194.86	−33.02	35.4	31.7	61.
J0423+1707......	65.98	16.94	178.68	−22.21	52.7	38.7	15.[b]
J0426+1333......	66.54	13.68	181.80	−23.85	43.	35.	115.[a]
J0429+0337......	67.90	3.74	191.64	−28.63	71.6	40.8	80.[a,b]
J0433+2908......	68.40	29.13	170.49	−12.59	11.3	9.5	70.
J0435+6137......	68.34	61.64	146.30	9.30	73.	73.	0.[a]
J0439+1555......	69.82	15.89	182.02	−19.99	60.9	49.9	24.
J0439+1105......	69.67	11.09	186.05	−22.98	63.9	45.9	85.
J0442−0033......	70.56	−0.61	197.45	−28.71	33.5	23.8	78.
J0450+1105......	72.68	11.11	187.89	−20.55	39.1	36.6	104.
J0456−2338......	74.14	−23.49	223.76	−35.02	67.4	46.7	44.
J0458−4635......	74.42	−46.37	252.10	−38.50	85.	85.	0.[a]
J0459+0544......	75.03	5.72	194.07	−21.59	79.3	43.7	107.
J0459+3352......	74.56	33.74	170.30	−5.60	110.	45.	60.[a]
J0500+2529......	75.04	25.57	177.10	−10.25	48	30	155.[a]
J0500−0159......	75.07	−1.86	201.21	−25.43	52.8	38.0	148.
J0510+5545......	77.57	55.89	153.86	9.46	62.1	29.7	176.[a]
J0512−6150......	78.03	−61.92	271.36	−35.33	36.0	33.8	92.
J0516+2320......	79.13	23.35	181.13	−8.51	21.9	19.5	85.
J0520+2556......	80.05	25.40	179.90	−6.67	62	44	5.[b]
J0521+2147......	80.34	21.74	183.11	−8.50	30.8	23.9	93.
J0530+1323......	82.74	13.39	191.49	−11.08	13.4	11.9	4.
J0530−3626......	82.45	−36.27	240.73	−31.33	56.2	35.2	3.[b]
J0531−2940......	82.86	−29.54	233.28	−29.32	79.1	51.2	124.
J0533+4751......	83.31	47.86	162.61	7.95	87.	40.	20.[a]
J0533−6916......	83.67	−69.23	279.67	−32.01	35.9	29.0	162.
J0534+2200......	83.58	22.01	184.54	−5.83	3.4	2.3	67.
J0540−4402......	85.05	−44.06	250.10	−30.84	19.2	16.2	80.
J0542+2610......	85.35	26.15	181.88	−2.26	70.	63.	134.[b]
J0542−0655......	85.47	−6.98	211.29	−18.63	119.7	46.3	66.
J0546+3948......	86.60	39.74	170.83	5.74	42.6	35.1	148.
J0556+0409......	89.05	4.13	202.83	−10.31	31.7	24.7	128.
J0613+4201......	93.58	42.00	171.38	11.45	39.4	27.4	105.
J0616−0720......	94.24	−7.15	215.44	−10.90	62.7	46.5	162.
J0616−3310......	94.18	−33.26	240.45	−21.25	41.9	33.3	61.
J0617+2238......	94.30	22.63	188.99	3.05	7.8	7.1	41.
J0622−1139......	95.52	−11.63	220.12	−11.73	60.4	44.2	84.
J0628+1847......	97.15	18.85	193.60	3.64	39.8	29.3	107.
J0631+0642......	97.91	6.70	204.72	−1.32	33.0	23.1	29.

TABLE 4—*Continued*

3EG Name (1)	α (2)	δ (3)	l (4)	b (5)	a (6)	b (7)	ϕ (8)
J0633+1751......	98.49	17.86	195.06	4.32	2.2	1.6	45.
J0634+0521......	98.66	5.47	206.15	−1.22	50.8	30.2	42.
J0702−6212......	105.17	−62.07	272.45	−22.71	68.7	56.0	126.
J0706−3837......	106.83	−38.49	249.47	−13.63	60.5	47.3	159.
J0721+7120......	110.41	71.37	143.95	28.00	22.1	14.2	164.
J0724−4713......	110.89	−47.38	259.08	−14.55	60.7	52.9	73.
J0725−5140......	111.18	−51.78	263.33	−16.18	54.9	53.7	80.
J0737+1721......	114.49	17.32	202.20	17.88	44.3	39.6	115.
J0743+5447......	115.75	54.71	163.08	29.14	36.1	28.4	10.
J0747−3412......	116.99	−34.22	249.39	−4.40	45.1	38.6	137.
J0808+4844......	122.26	48.74	170.48	32.53	47.9	39.1	114.
J0808+5114......	122.25	51.54	167.16	32.74	65.8	46.8	31.[b]
J0808−5344......	122.04	−53.69	268.18	−11.21	64.5	35.1	49.
J0812−0646......	123.17	−6.80	228.68	14.64	46.6	39.4	154.
J0821−5814......	125.54	−58.16	273.10	−11.91	95.5	58.6	56.
J0824−4610......	126.26	−46.16	263.30	−4.82	46.8	28.1	59.
J0827−4247......	126.87	−42.72	260.73	−2.48	71.4	30.1	140.[a]
J0828+0508......	127.10	5.14	219.64	23.88	84.2	59.1	103.
J0828−4954......	127.12	−50.06	266.83	−6.59	39.9	25.9	23.
J0829+2413......	127.52	24.18	199.96	31.70	44.7	30.5	63.
J0834−4511......	128.73	−45.20	263.52	−2.86	1.3	0.9	65.
J0841−4356......	130.48	−43.97	263.31	−1.12	31.7	29.4	91.
J0845+7049......	130.96	70.72	143.68	34.67	55.1	34.2	66.[b]
J0848−4429......	132.33	−44.46	264.51	−0.40	41.7	30.8	34.
J0852−1216......	133.19	−12.10	238.94	20.11	64.4	52.0	151.
J0853+1941......	133.45	19.68	207.21	35.45	59.0	50.3	148.
J0859−4257......	134.86	−42.98	264.56	1.96	43.0	33.7	128.
J0903−3531......	135.78	−35.47	259.35	7.43	37.2	33.0	6.
J0910+6556......	137.71	66.09	148.10	38.54	57.4	46.2	159.
J0917+4427......	139.34	44.46	176.10	44.19	48.8	24.2	6.
J0952+5501......	148.19	55.05	159.46	47.42	50.8	41.2	98.
J0958+6533......	149.63	65.56	145.77	43.11	22.6	18.3	160.
J1009+4855......	152.50	48.84	166.93	52.15	67.2	47.8	161.
J1013−5915......	153.33	−59.23	283.91	−2.32	59.2	32.2	92.
J1014−5705......	153.69	−57.13	282.88	−0.49	45.9	35.1	104.
J1027−5817......	156.86	−58.26	284.92	−0.52	16.	11.	120.[a]
J1045−7630......	161.12	−76.46	295.59	−15.43	78.7	43.8	173.
J1048−5840......	162.13	−58.69	287.53	0.46	11.8	8.7	171.
J1052+5718......	163.30	57.30	149.42	53.31	80.	65.	40.[a]
J1058−5234......	164.73	−52.57	286.16	6.60	15.9	13.4	141.
J1102−6103......	165.66	−61.06	290.15	−0.92	41.9	30.6	102.
J1104+3809......	166.13	38.19	179.87	65.05	14.7	11.3	170.
J1133+0033......	173.29	0.67	264.31	57.55	74.8	49.3	15.
J1134−1530......	173.67	−15.57	277.09	43.41	37.5	33.3	146.
J1200+2847......	180.18	28.79	201.55	78.69	42.0	35.2	73.
J1212+2304......	183.21	23.01	236.05	80.34	55.6	50.1	153.
J1219−1520......	184.87	−15.33	291.63	46.84	55.9	40.2	8.
J1222+2315......	185.77	23.14	243.27	82.45	61.5	39.6	147.[b]
J1222+2841......	185.74	28.70	197.26	83.52	20.3	14.0	41.
J1224+2118......	186.10	21.29	254.95	81.52	19.1	16.3	59.
J1227+4302......	186.74	43.10	138.63	73.27	72.3	48.3	153.
J1229+0210......	187.24	2.18	289.81	64.48	20.9	18.4	88.
J1230−0247......	187.66	−2.54	292.52	59.91	67.2	36.7	162.[b]
J1234−1318......	188.39	−13.34	296.26	49.30	47.7	43.7	78.
J1235+0233......	188.80	2.50	293.27	65.07	58.	42.	16.[a]
J1236+0457......	188.83	4.86	292.44	67.41	68.1	50.9	38.
J1246−0651......	191.77	−6.95	301.00	55.91	78.6	32.3	6.
J1249−8330......	191.75	−83.56	302.80	−20.69	44.1	34.6	161.
J1255−0549......	193.98	−5.81	304.98	57.04	6.3	4.0	0.
J1300−4406......	195.18	−44.22	304.68	18.62	54.9	46.3	69.
J1308+8744......	193.51	87.73	122.90	29.40	63.5	44.0	63.
J1308−6112......	197.16	−60.97	305.01	1.70	58.	47.	11.[a]
J1310−0517......	197.51	−5.27	311.52	57.29	49.1	44.1	7.
J1314−3431......	198.49	−34.40	308.21	28.24	41.5	26.2	155.
J1316−5244......	198.96	−53.05	306.65	9.65	76.4	38.5	34.[b]

TABLE 4—*Continued*

3EG Name (1)	α (2)	δ (3)	l (4)	b (5)	a (6)	b (7)	φ (8)
J1323+2200......	200.84	22.05	359.63	81.15	31.2	25.7	157.
J1324−4314......	201.24	−43.26	309.38	19.19	35.1	27.9	109.
J1329+1708......	202.25	17.31	346.35	76.90	88.6	59.8	93.[a]
J1329−4602......	202.52	−46.03	309.91	16.32	67.0	44.0	2.
J1337+5029......	204.50	50.43	105.18	65.06	46.2	39.7	33.
J1339−1419......	204.76	−14.07	320.05	47.21	87.6	52.2	21.[b]
J1347+2932......	206.82	29.42	46.77	77.50	62.0	51.5	133.
J1409−0745......	212.40	−7.75	334.20	50.32	19.4	15.3	148.
J1410−6147......	212.78	−61.77	312.21	−0.34	22.1	19.6	171.
J1420−6038......	215.17	−60.68	313.65	0.32	18.8	17.7	141.
J1424+3734......	216.09	37.68	67.15	67.82	59.8	46.6	169.
J1429−4217......	217.40	−42.32	321.66	16.96	47.4	42.5	151.
J1447−3936......	221.89	−39.68	326.04	17.92	55.2	49.6	9.
J1457−1903......	224.37	−19.17	339.75	34.54	49.8	42.3	10.
J1500−3509......	225.66	−35.31	331.05	20.30	80.	70.	112.[a]
J1504−1537......	226.05	−15.62	343.90	36.47	45.7	38.8	101.[b]
J1512−0849......	228.14	−8.64	351.63	40.52	62.8	43.4	26.[b]
J1517−2538......	229.27	−25.57	339.75	26.70	65.1	46.7	77.
J1527−2358......	231.93	−23.98	342.98	26.49	88.7	80.3	29.
J1600−0351......	240.16	−3.96	6.16	34.79	53.3	50.8	95.
J1605+1553......	241.40	15.73	29.02	43.69	49.7	44.1	171.[b]
J1607−1101......	241.81	−10.88	360.97	29.20	81.0	68.1	154.
J1608+1055......	242.10	10.91	23.48	41.06	40.4	35.6	176.
J1612−2618......	243.30	−26.36	349.44	17.79	103.1	62.5	50.
J1614+3424......	243.56	34.42	55.46	46.28	19.3	16.3	11.
J1616−2221......	243.95	−22.27	353.02	20.15	62.	31.	154.[a]
J1621+8203......	246.36	82.03	115.40	31.67	58.3	44.6	105.
J1625−2955......	246.39	−29.92	348.69	13.36	13.4	10.0	62.
J1626−2519......	246.51	−25.33	352.28	16.36	20.6	17.2	73.
J1627−2419......	246.97	−24.39	353.31	16.67	46.9	32.1	24.
J1631−1018......	247.67	−10.30	5.48	25.03	48.7	38.6	78.
J1631−4033......	248.02	−40.67	341.61	5.07	66.3	41.8	128.
J1633−3216......	248.33	−32.34	348.00	10.50	61.3	38.8	162.[a]
J1634−1434......	248.33	−14.46	2.30	22.00	60.	40.	123.[a]
J1635+3813......	248.94	38.23	61.23	42.25	13.3	12.1	28.
J1635−1751......	248.83	−17.96	359.66	19.46	70.9	59.7	25.
J1638−2749......	249.62	−27.83	352.22	12.62	49.4	28.4	134.
J1638−5155......	249.60	−51.99	333.98	−3.37	46.7	33.6	55.
J1639−4702......	249.76	−46.97	337.80	−0.09	40.3	26.6	35.
J1646−0704......	251.26	−7.08	10.63	23.99	72.5	48.9	71.[a,b]
J1649−1611......	252.51	−16.17	3.42	17.75	45.9	33.1	94.
J1652−0223......	252.82	−2.51	15.78	25.16	60.3	48.9	24.[a,b]
J1653−2133......	253.59	−21.55	359.57	13.72	79.0	55.1	35.
J1655−4554......	253.90	−45.83	340.51	−1.54	55.9	27.9	74.
J1659−6251......	255.25	−62.94	327.33	−12.62	74.8	48.3	111.[a]
J1704−4732......	256.05	−47.52	340.09	−3.74	42.8	35.1	73.
J1709−0828......	257.28	−8.48	12.86	18.23	73.1	49.8	66.
J1710−4439......	257.56	−44.66	343.01	−2.87	6.1	3.8	125.
J1714−3857......	258.64	−38.88	348.16	−0.12	33.1	26.3	21.[b]
J1717−2737......	259.34	−27.59	357.72	5.94	45.5	32.4	37.
J1718−3313......	259.61	−33.33	353.14	2.46	40.9	26.8	36.
J1719−0430......	259.83	−4.50	17.82	18.14	27.7	24.8	28.
J1720−7820......	260.09	−78.20	314.68	−22.08	45.4	43.1	124.
J1726−0807......	261.63	−8.12	15.53	14.76	54.6	37.8	104.
J1727+0429......	261.93	4.28	27.04	20.55	61.5	35.7	20.[b]
J1733+6017......	262.96	60.43	89.30	33.10	80.	70.	160.[a]
J1733−1313......	263.45	−13.21	12.01	10.58	17.5	15.9	77.
J1734−3232......	263.55	−32.48	355.69	0.19	37.7	23.2	163.
J1735−1500......	264.00	−15.00	10.75	9.20	47.3	42.8	36.
J1736−2908......	264.18	−29.19	358.76	1.51	46.0	27.2	29.
J1738+5203......	264.45	52.04	79.34	32.16	77.7	32.7	86.
J1741−2050......	265.47	−20.91	6.41	4.92	47.6	30.5	86.
J1741−2312......	265.44	−23.24	4.40	3.72	39.2	27.0	148.
J1744−0310......	265.72	−3.31	21.92	13.62	68.5	44.6	79.[b]
J1744−3011......	266.25	−30.20	358.85	−0.54	21.2	17.3	103.

TABLE 4—*Continued*

3EG Name (1)	α (2)	δ (3)	l (4)	b (5)	a (6)	b (7)	ϕ (8)
J1744−3934	266.15	−39.38	350.95	−5.26	53.2	30.4	172.[b]
J1746−1001	266.62	−9.95	16.47	9.58	50.6	39.6	26.
J1746−2851	266.53	−28.85	360.14	−0.05	9.5	5.3	17.
J1757−0711	269.52	−7.33	20.21	8.36	41.3	39.2	81.[b]
J1800−0146	270.27	−1.72	25.57	10.38	56.6	37.3	36.
J1800−2338	270.14	−23.66	6.25	−0.20	21.6	17.3	38.
J1800−3955	270.05	−39.63	352.26	−7.98	72.3	51.1	130.[b]
J1806−5005	271.40	−50.07	343.28	−13.66	65.4	44.1	98.
J1809−2328	272.49	−23.48	7.46	−1.99	9.9	8.7	153.
J1810−1032	272.51	−10.54	18.81	4.23	40.	30.	70.[a]
J1812−1316	273.13	−13.28	16.70	2.38	23.6	20.3	105.
J1813−6419	273.25	−64.44	329.91	−20.32	47.2	34.1	23.
J1822+1641	275.51	16.85	44.96	13.96	51.4	40.1	80.[b]
J1823−1314	275.85	−13.24	17.98	0.07	20.0	14.0	80.[b]
J1824+3441	276.26	34.51	62.32	20.03	52.1	46.0	157.[b]
J1824−1514	276.14	−15.21	16.38	−1.10	34.2	29.3	16.
J1825+2854	276.34	29.21	57.10	18.10	100.	63.	36.[a]
J1825−7926	276.36	−79.51	314.49	−25.47	57.2	38.0	143.
J1826−1302	276.50	−13.10	18.41	−0.42	32.9	23.1	177.
J1828+0142	277.36	1.84	32.06	5.74	37.8	29.4	56.[b]
J1832−2110	278.04	−21.22	11.87	−5.47	31.3	28.3	54.
J1834−2803	278.56	−27.98	5.98	−8.92	35.1	28.8	159.
J1835+5918	278.85	59.32	88.74	25.08	9.7	7.8	13.
J1836−4933	279.51	−49.58	345.90	−18.27	40.8	37.7	126.
J1837−0423	279.44	−4.40	27.46	1.02	36.7	25.7	15.
J1837−0606	279.26	−6.16	25.81	0.38	13.8	9.1	31.[b]
J1847−3219	282.04	−32.42	3.17	−13.52	50.5	42.3	87.[a]
J1850+5903	282.35	58.86	88.69	23.23	69.2	40.4	53.[b]
J1850−2652	282.51	−27.03	8.38	−11.67	74.5	45.8	54.[b]
J1856+0114	284.13	1.26	34.63	−0.56	13.4	9.8	48.
J1858−2137	284.18	−21.66	14.00	−10.80	60.	50.	90.[a]
J1903+0550	285.89	5.74	39.42	−0.07	67.5	22.6	53.
J1904−1124	286.19	−11.41	24.22	−8.10	37.1	24.4	154.
J1911−2000	287.92	−19.99	17.05	−13.28	36.6	28.9	151.
J1921−2015	290.35	−20.27	17.74	−15.47	40.2	37.2	67.
J1928+1733	292.31	17.50	52.75	−0.13	60.5	35.0	127.[b]
J1935−4022	293.78	−40.05	358.96	−24.99	80.7	38.2	171.[b]
J1937−1529	294.29	−15.26	24.09	−16.87	69.7	42.7	145.[b]
J1940−0121	295.11	−1.31	37.40	−11.49	58.0	38.1	29.
J1949−3456	297.23	−35.11	5.05	−26.29	47.1	27.1	15.[b]
J1955−1414	298.97	−14.33	26.95	−20.61	63.3	39.9	174.
J1958+2909	299.63	29.12	66.17	−0.14	42.8	25.7	16.
J1958−4443	299.62	−44.73	354.86	−30.21	87.1	61.6	124.
J1959+6342	300.27	63.81	96.81	16.96	57.6	34.9	35.[b]
J2006−2321	301.62	−23.31	18.89	−26.32	42.7	37.6	25.
J2016+3657	304.14	36.87	74.73	0.87	40.8	26.3	151.
J2020+4017	305.25	40.31	78.05	2.09	10.5	9.0	99.
J2020−1545	305.01	−15.87	27.93	−26.58	62.7	46.3	159.
J2021+3716	305.33	37.25	75.58	0.30	21.1	15.4	125.
J2022+4317	305.49	42.97	80.35	3.45	50.	40.	0.[b]
J2025−0744	306.36	−7.75	36.72	−24.40	34.4	19.9	7.
J2027+3429	306.74	34.55	74.02	−2.19	61.3	34.3	159.[b]
J2033+4118	308.41	41.32	80.27	0.73	18.7	15.0	67.
J2034−3110	308.90	−31.16	12.32	−34.77	70.6	54.4	84.[a]
J2035+4441	308.82	44.63	83.11	2.47	35.6	28.4	21.
J2036+1132	309.16	11.76	56.30	−17.04	68.	40.	55.[a]
J2046+0933	311.74	9.25	55.58	−20.55	85.	65.	175.[a]
J2055−4716	313.70	−47.38	352.43	−40.13	52.2	39.1	60.
J2100+6012	315.47	60.06	97.74	8.96	44.9	19.2	142.[b]
J2158−3023	329.76	−30.47	17.33	−52.31	44.1	35.9	85.
J2202+4217	330.57	42.29	92.54	−10.38	78.1	50.8	40.
J2206+6602	331.87	66.04	107.32	8.27	58.6	44.7	180.
J2209+2401	332.53	24.08	81.96	−25.68	58.9	45.3	92.
J2219−7941	335.00	−80.15	310.27	−34.72	74.8	50.6	177.[a]
J2227+6122	336.83	61.39	106.55	3.19	30.1	24.7	29.

TABLE 4—*Continued*

3EG Name (1)	α (2)	δ (3)	l (4)	b (5)	a (6)	b (7)	φ (8)
J2232+1147......	338.09	11.80	77.44	−38.49	32.0	28.1	136.
J2241−6736......	340.08	−67.86	319.64	−44.78	77.	63.	150.[a,b]
J2243+1509......	340.83	15.37	82.90	−37.35	64.0	60.1	170.
J2248+1745......	342.23	17.78	86.00	−36.15	68.0	46.6	152.
J2251−1341......	342.86	−13.71	52.51	−58.96	59.8	36.4	138.
J2254+1601......	343.51	16.04	86.06	−38.29	17.3	16.4	89.
J2255+1943......	344.00	21.00	89.85	−34.35	160.	140.	0.[a]
J2255−5012......	344.14	−50.10	338.80	−58.26	64.3	52.2	140.[a]
J2314+4426......	348.82	44.25	105.32	−15.31	55.5	39.2	151.[b]
J2321−0328......	350.54	−3.46	77.04	−58.14	75.6	72.5	120.
J2352+3752......	358.07	38.00	110.27	−23.41	63.7	49.1	19.
J2358+4604......	359.55	46.09	113.38	−15.80	46.7	35.8	62.
J2359+2041......	360.11	20.73	107.17	−40.58	66.7	56.8	58.

NOTES.—Table 4 is also available in machine-readable form in the electronic edition of the *Astrophysical Journal Supplement*. Cols. (2)–(3): Celestial coordinates in degrees with a J2000 epoch. Cols. (4)–(5): Galactic coordinates in degrees. Col. (6): Length of the semimajor axis of the ellipse in arcminutes. Col. (7): Length of the semiminor axis of the ellipse in arcminutes. Col. (8): Position angle of the semimajor axis in degrees.

[a] A poor elliptical fit, a fit to a compromised map, or an anomalous error region. The elliptical fits should only be used with caution for these sources.

[b] The 68% contour is not centered in the 95% contour, causing an offset from the position of H-3EG.

3EG J1027−5817.—The 95% contour does not close at the northwestern end in a reasonable way (probably due to a subthreshold source, or discrepancy in the diffuse Galactic model).

3EG J1052+5718.—The map of H-EG3 is too small to fit the 95% contour with confidence—and attempts to fit a larger region yielded a result which was not consistent with H-EG3. The auxiliary figure for this source shows our fit to the map of H-EG3.

3EG J1235+0233.—The 95% contour does not close at the southern end in a reasonable way (probably due to a subthreshold source).

3EG J1308−6112.—95% contour does not close at the northern end in a reasonable way (probably due to a subthreshold source, or discrepancy in the diffuse Galactic model).

3EG J1329+1708.—The 95% contour does not close at the western end in a reasonable way (probably due to a subthreshold source).

3EG J1500−3509.—The 95% contour does not close at the eastern end in a reasonable way (probably due to a subthreshold source).

3EG J1616−2221.—The 95% contour does not close at the northern end in a reasonable way (probably due to a subthreshold source).

3EG J1633−3216.—The 95% contour is not fitted well.

3EG J1634−1434.—The 95% contour extends in an unreasonable way to the west (probably due to a subthreshold source).

3EG J1646−0704.—The 95% contour does not close at the southwestern end in a reasonable way (probably due to a subthreshold source). Also, the 68% contour is not centered in the 95% contour leading to a 22′ position difference from H-EG3.

3EG J1652−0223.—95% contour does not close at the southwestern end in a reasonable way (probably due to a subthreshold source). Also, the 68% contour is not centered in the 95% contour leading to a 13′ position difference from H-EG3.

3EG J1659−6251.—95% contour does not close at the eastern end in a reasonable way (probably due to a subthreshold source).

3EG J1733+6017.—The map of H-EG3 does not contain the complete northern edge of the 95% contour.

3EG J1810−1032.—The 95% contour is extended in the west direction (probably due to subthreshold sources, or discrepancy in the diffuse Galactic model).

3EG J1825+2854.—The elliptical fit to the 95% contour was derived from the map of H-EG3 which does not include the entire 95% contour. Also, the 68% contour is not centered in the 95% contour, a 18′ position difference from H-EG3.

3EG J1847−3219.—95% contour does not close at the eastern end in a reasonable way (probably due to a subthreshold source, or discrepancy in the diffuse Galactic model).

3EG J1858−2137.—The 95% contour does not close in the north, and the 68% contour is not centered in the 95% contour, a 26′ position difference from H-EG3. The H-EG3 specification of θ_{95} is much too small.

3EG J2034−3110.—95% contour is not fitted well and does not close at the eastern end in a reasonable way.

3EG J2036+1132.—The 95% contour does not close at the northeastern end in a reasonable way (probably due to a subthreshold source).

3EG J2046+0933.—The 95% contour does not close at the northeastern end and in the south in a reasonable way (probably due to a subthreshold source).

3EG J2219 − 7941.—The 95% contour does not close at the southern end in a reasonable way. The elliptical fit relies on a visual extrapolation of the northern portion of the 95% contour.

3EG J2241 − 6736.—The elliptical fit to the 95% contour was derived from the map of H-EG3 which does not include the entire 95% contour. Also, the 68% contour is not centered in the 95% contour, a 18′ position difference from H-EG3.

3EG J2255 + 1943.—The map provided by H-EG3 has only the southern part of the 95% contour. The auxiliary figure for this source shows an elliptical fit to a larger likelihood map which we have made. A 76′ position difference from H-EG3.

3EG J2255 − 5012.—The 95% contour does not close at the northwestern end in a reasonable way (probably due to a subthreshold source).

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