NATIONAL TRANSPORTATION SAFETY BOARD
Office of Research and Engineering
Washington, DC

January 31, 2001

Recorded Radar Study

Specialist's Report of Investigation
By Alice Y. Park

DCA00MA030

A. ACCIDENT

Location:	Burbank, CA.
Date:	03/05/2000
Time:	18:11 PST
Aircraft:	Boeing 737-300, N668SW

B. GROUP

Not Applicable

C. SUMMARY

On Sunday, March 5, 2000, about 1811 local time (PST), a Southwest Airlines flight 1455, Boeing 737-300, tail number N668SW, impacted a blast fence at the end of Burbank Airport's runway 08 and came to rest while performing a visual approach and landing on runway 08.

The purpose of this radar study is to examine the visual approaches of the accident aircraft and 70 others to runway 08 at Burbank Airport, CA.

D. DETAILS OF INVESTIGATION

1. Continuous Data Recording (CDR) Data

Recorded radar data for the accident flight and radar data from June 13, 2000, 14:00 (UTC) to June 14, 2000, 02:45 (UTC), within the area of

between 200 to 360 sector-degrees (west of airport), altitude of 8,000 feet and below, and the range of 0-25 nm from the antenna was obtained from the Federal Aviation Administration (FAA) Southern California (SOCL) TRACON. The acquired data was processed and converted from range/azimuth data to latitude, longitude and x/y position data relative to the runway 08 threshold.

Burbank Airport utilized Airport Surveillance Radar (ASR) to track aircraft and maintain traffic separation in the vicinity of the airport. The ASR-9 antenna at Burbank airport has a theoretical 60 nautical miles limit for primary and tracking data, and beacon has an effective range of approximately 55 nautical miles. The rotation of the antenna was about 1 revolution per 4.5 +/- 10 % seconds. According to FAA, the overall accuracy of the ASR-9 radar has been measured to be 1/8 NM in range and 4 ACPs in azimuth. The system records tracking data in time, range, azimuth and altitude format.

The CDR data from June 13, 2000, 14:00 (UTC) to June 14, 2000, 02:45 (UTC) contained a total of 91 aircraft within the area of between 200 to 360 sector-degrees (west of airport), altitude of 8,000 feet and below, and the range of 0-25 nm from the radar antenna location. Based on aircraft ID information, small general aviation aircraft were removed from the calculations due to their difference of operating characteristics. For the remaining 70, the CDR data, in range, azimuth and altitude, was processed into latitude, longitude and x/y position data. The processed data was displayed in figure 1 to 10 for further analysis.

The CDR data was processed using NTSB software to obtain average vertical and ground speed passing the BUDDE outer marker, and ground speed at 500 feet AGL (Air Ground Level) at Van Nuys VOR/DME. Table 1 provides CDR data and the processed data with beacon code and type for each of the 70 aircraft. The original CDR data and the processed data for all 70 aircraft are placed in CD-ROM and are located in public docket.

The FAA provided the position (N34°12'14.8", W118°21'44") and magnetic variation (14°E) of the facility.

2. Ground Tack

CDR data was provided from FAA SOCL TRACON. The range and azimuth information found in the CDR data were processed into latitude and longitude values and x/y coordinates corresponding to east and north, respectively. Table 2 provides the CDR data of the accident aircraft with

the converted east and north coordinates of the radar returns, and the ground speed and vertical speed calculated from the CDR data.

The radar data was plotted using the runway 08 threshold as origin. Figure 1 displays overhead view of all 70 aircraft with the accident aircraft. In addition, the position of runway 08, Van Nuys VOR/DME and BUDDE outer marker are displayed on the plot for reference. These position data were obtained from the FAA as shown in table 3

3. Altitude and Distance Profile

Figure 2 and Figure 3 show profile view of the 70 aircraft and profile view of the accident aircraft, respectively. Glide slopes of degree 3 to 6 are displayed for reference. Figure 9 shows the altitude of each aircraft at passing BUDDE outer marker.

4. Vertical Speed and Ground Speed Profile

Average vertical and ground speed of each aircraft at passing BUDDE outer marker were calculated and plotted in figure 7 and 8. Figure 5 and 6 display ground speed and vertical speed of all 70 aircraft at 500 feet AGL at Van Nuys VOR/DME. Figure 10 displays vertical speed vs. the true east-west distance relative to runway 08 threshold with the vertical speed of the accident aircraft. All these calculations are provided in table 1.

Alice Y. Park
Electrical Engineer
Radar Specialist
Vehicle Performance Division

List of Tables and Figures

Table 1.

BCN	ID	AVG_VS (ft/m)	AVG_ GS(kts)	VS @500 ft (ft/m)	GS @500 ft (kts)	ALT @ VOR (ft)
1504	MD80	-909.18	180.34	-656.19	143.41	2900
1537	C750	-913.63	171.09	-646.76	131.33	3200
1774	B733	-521.05	173.55	-655.93	134.06	2900
2640	B735	-777.25	172.91	-649.54	118.87	3100
3221	B735	-780.43	203.57	-1314.72	132.90	2900
3226	B733	-1180.96	208.77	-666.22	124.02	2800
3250	B733	-526.06	159.96	-635.51	131.57	2900
3270	B733	-1047.09	175.82	-649.54	132.90	2700
3310	B735	-1173.91	165.88	-652.19	131.40	2700
4763	WW24	-914.31	196.66	-1044.23	137.76	3300
4773	B733	-911.48	155.42	-658.53	130.76	2800
0203	PA32	0	110.20	-1744.68	100.43	3000
0714	A320	-785.34	138.52	-649.54	129.08	2600
1517	B733	-1045.41	195.01	-1313.29	128.18	3300
1757	B735	-519.79	173.83	-652.72	121.96	2800
1767	B733	-129.77	190.53	-978.01	135.72	2900
1777	B733	-385.41	176.72	-872.34	127.73	3000
3241	B735	-519.07	179.63	-654.14	132.52	2800
3443	GLF3	0	180.98	-652.72	149.88	2900
3635	C560	-649.98	205.37	-596.00	117.08	2900
4111	B735	-1043.95	210.12	-654.14	124.10	2800
4604	PA32	-519.25	87.91	-655.21	91.83	2800
4776	B733	-650.92	122.49	-653.43	116.28	2700
5175	B733	-390.18	180.03	-648.83	129.05	2800
5345	B733	-1044.37	162.12	-653.07	127.52	2700
6313	C650	-1044.26	189.58	-980.14	133.93	2600
6315	B735	-1047.54	181.04	-652.72	133.87	2600
6341	B735	-1169.61	160.53	-661.71	125.70	2800
6376	GLF3	-1040.55	189.44	-875.52	155.11	2800
0203	PA32	-131.64	142.32	-1324.88	95.45	3000
0244	PA32	-654.95	117.93	-649.30	101.00	2700
0261	C414	-909.80	173.71	-754.70	127.93	3200
0676	B735	-391.29	150.59	-655.21	132.13	2800

BCN	TYPE	AVG _VS (ft/m)	AVG GS (kts)	VS @500 ft (ft/m)	GS at 500 ft (kts)	ALT @ VOR (ft)
1714	B735	-648.13	193.75	-653.43	127.94	3000
1726	B733	-780.97	183.10	-658.08	133.32	2600
2676	B733	-1176.71	185.26	-439.36	131.67	2800
3202	B733	-130.04	233.47	-1295.33	144.05	3000
3271	B733	-260.88	179.13	-649.89	125.29	3000
3333	B737	-651.54	201.00	-980.14	128.05	3000
3360	B733	-906.57	217.90	-816.82	135.21	3100
3615	B733	-915.77	166.55	-649.39	126.32	2900
4745	B733	-391.02	207.35	-649.19	137.10	2900
4762	C560	0	207.25	-1312.57	140.38	2900
5253	BE20	-775.50	149.17	-537.46	121.76	2800
6643	MD80	-780.71	218.75	-979.61	131.94	3100
7205	B752	-785.09	225.39	-649.19	128.70	2700
7246	B735	-782.71	138.62	-866.05	127.25	2700
1711	B733	-388.77	189.01	-979.07	131.69	3000
3365	GLF3	-520.91	188.22	-974.30	155.43	2800
4636	B733	-1034.33	210.89	-978.54	133.62	3000
6636	B734	-1164.04	211.35	-985.50	134.81	3100
0212	PA28	-652.67	119.16	-520.31	86.54	2800
0243	C310	-522.26	131.69	-89-69.18	129.95	2800
0245	M020	0	142.47	-659.27	90.39	3000
1554	B734	-649.85	180.92	-864.18	131.89	2900
1772	B733	-913.21	191.34	-651.88	120.10	3100
1777	B733	-911.48	212.45	-649.89	126.98	2600
3305	B733	-1295.80	204.58	-652.72	127.45	2600
3361	B733	-655.26	188.11	-648.13	134.38	2900
3632	B733	-913.48	196.38	-653.43	132.03	2800
3657	B735	-780.81	200.58	-979.61	121.72	2800
4625	PA32	0	143.14	-1304.72	98.58	3400
4737	BE99	-393.28	200.86	-1300.48	100.90	2900
4760	LJ35	-1039.58	194.65	-1316.17	133.75	2900
6337	B733	-904.96	187.58	-651.65	127.33	2700
6674	BE30	-1044.84	180.63	-650.24	115.15	2600
7053	GLF4	-1300.33	242.88	-879.37	149.52	6400
7201	BE90	-128.52	189.27	-1251.66	115.61	3200

BCN	TYPE	AVG_VS (ft/m)	AVG GS (kts)	VS @500 ft (kts)	GS @500 ft (kts)	ALT @ VOR (ft)
7227	B733	-387.22	203.32	-979.61	127.60	2900
7360	C310	-913.22	187.27	-1297.67	118.51	3200

Table2

HH	MM	SS	RNG	ACP	E_NM	N_NM	V_SPD	G_SPD
02	01	42.23	22.09	3979	2.17	22.38	0.00	239.73
02	01	46.87	21.94	3971	1.89	22.25	0.00	252.93
02	01	51.36	21.80	3962	1.58	22.13	0.00	259.57
02	01	56.02	21.67	3953	1.27	22.01	0.00	249.69
02	02	00.71	21.55	3944	0.97	21.90	0.00	254.11
02	02	05.01	21.45	3935	0.67	21.81	0.00	245.54
02	02	09.83	21.36	3926	0.37	21.72	0.00	249.62
02	02	14.25	21.30	3916	0.05	21.66	0.00	265.24
02	02	18.87	21.23	3906	-0.28	21.58	0.00	241.14
02	02	23.69	21.17	3897	-0.57	21.51	0.00	228.16
02	02	28.23	21.13	3888	-0.86	21.46	0.00	276.25
02	02	32.62	21.09	3876	-1.24	21.39	0.00	266.49
02	02	37.47	21.05	3867	-1.53	21.33	0.00	238.03
02	02	41.96	21.02	3857	-1.85	21.27	0.00	277.62
02	02	46.71	20.98	3845	-2.23	21.18	0.00	264.75
02	02	51.20	20.95	3836	-2.51	21.12	0.00	242.15
02	02	55.83	20.92	3826	-2.82	21.04	0.00	251.11
02	03	00.44	20.89	3816	-3.14	20.96	0.00	266.19
02	03	04.95	20.88	3805	-3.48	20.89	0.00	265.67
02	03	09.56	20.86	3795	-3.79	20.81	0.00	250.06
02	03	14.18	20.84	3785	-4.10	20.72	0.00	263.76
02	03	18.73	20.84	3774	-4.44	20.64	0.00	276.37
02	03	23.34	20.84	3763	-4.79	20.56	0.00	246.90
02	03	28.06	20.86	3754	-5.07	20.51	0.00	290.90
02	03	32.46	20.88	3740	-5.51	20.41	0.00	275.28
02	03	37.28	20.89	3732	-5.75	20.34	0.00	247.06
02	03	41.81	20.91	3720	-6.13	20.25	0.00	265.77
02	03	46.43	20.94	3711	-6.41	20.18	0.00	253.28
02	03	50.93	20.92	3700	-6.74	20.05	0.00	278.97
02	03	55.56	20.89	3689	-7.06	19.90	-648.83	265.03
02	04	00.18	20.81	3679	-7.33	19.71	-1,282.41	255.99
02	04	04.92	20.70	3669	-7.58	19.48	-1,299.06	263.06
02	04	09.42	20.58	3659	-7.82	19.25	-1,333.71	264.53
02	04	13.92	20.42	3650	-8.02	18.99	-1,313.28	250.82
02	04	18.56	20.23	3642	-8.17	18.71	-1,311.84	248.34
02	04	23.07	20.03	3634	-8.31	18.43	-1,952.82	271.03
02	04	27.78	19.81	3624	-8.48	18.09	-1,946.49	259.16
02	04	32.32	19.61	3617	-8.58	17.82	-1,300.47	262.53
02	04	37.01	19.41	3606	-8.78	17.49	-1,933.95	270.08
02	04	41.63	19.20	3598	-8.89	17.19	-1,946.49	251.87
02	04	46.26	19.00	3589	-9.02	16.89	-1,296.26	254.15
02	04	50.89	18.81	3580	-9.15	16.60	-1,969.92	264.91
02	04	55.40	18.61	3570	-9.30	16.28	-1,989.51	275.05
02	04	59.94	18.42	3560	-9.44	15.97	-1,296.26	264.71

02	05	04.66	18.23	3550	-9.57	15.66	-1,286.54	258.76
02	05	09.27	18.05	3540	-9.71	15.35	-1,301.88	255.80
02	05	13.88	17.88	3530	-9.84	15.06	-1,316.16	267.97
02	05	18.39	17.69	3519	-9.97	14.73	-656.64	256.58
02	05	23.02	17.52	3510	-10.07	14.45	655.92	245.68
02	05	27.54	17.33	3500	-10.17	14.13	649.53	258.19
02	05	32.26	17.09	3491	-10.21	13.80	0.00	261.39
02	05	36.66	16.84	3483	-10.22	13.47	0.00	251.94
02	05	41.41	16.58	3476	-10.19	13.16	0.00	254.21
02	05	46.02	16.30	3468	-10.17	12.82	0.00	257.83
02	05	50.63	16.02	3462	-10.10	12.51	0.00	257.88
02	05	55.14	15.73	3455	-10.04	12.17	0.00	264.63
02	05	59.76	15.44	3448	-9.97	11.85	-650.24	272.18
02	06	04.37	15.16	3438	-9.96	11.48	-649.53	269.28
02	06	09.00	14.89	3430	-9.90	11.16	0.00	252.14
02	06	13.62	14.61	3423	-9.82	10.85	-649.53	255.80
02	06	18.24	14.34	3414	-9.78	10.51	-1,299.07	263.97
02	06	22.86	14.06	3405	-9.72	10.18	-1,311.84	258.54
02	06	27.39	13.81	3396	-9.67	9.87	-1,330.75	259.23
02	06	31.88	13.55	3386	-9.62	9.54	-1,300.47	262.64
02	06	36.62	13.28	3376	-9.56	9.20	-1,919.52	251.88
02	06	41.26	13.02	3367	-9.49	8.89	-1,974.24	265.73
02	06	45.74	12.77	3354	-9.46	8.54	-1,329.28	268.28
02	06	50.29	12.52	3344	-9.39	8.23	-649.53	259.89
02	06	54.98	12.27	3331	-9.35	7.88	-644.65	260.51
02	06	59.60	12.02	3320	-9.27	7.56	-649.53	257.24
02	07	04.22	11.78	3307	-9.22	7.23	648.13	250.71
02	07	08.86	11.56	3295	-9.16	6.93	663.17	251.18
02	07	13.27	11.33	3282	-9.10	6.61	0.00	248.74
02	07	18.09	11.11	3269	-9.04	6.30	0.00	244.83
02	07	22.62	10.91	3254	-9.0	5.98	0.00	255.69
02	07	27.12	10.69	3240	-8.93	5.67	0.00	251.02
02	07	31.63	10.50	3225	-8.88	5.37	0.00	243.55
02	07	36.48	10.30	3209	-8.82	5.05	0.00	253.69
02	07	40.87	10.11	3192	-8.77	4.72	0.00	259.04
02	07	45.51	09.92	3175	-8.71	4.41	0.00	247.88
02	07	50.21	09.75	3157	-8.66	4.09	-643.96	245.90
02	07	54.83	09.58	3139	-8.60	3.78	-657.36	250.81
02	07	59.34	09.42	3120	-8.54	3.47	-664.64	249.58
02	08	03.86	09.28	3101	-8.50	3.16	-1,313.28	244.83
02	08	08.48	09.14	3081	-8.44	2.85	-1,972.08	247.08
02	08	12.99	09.00	3061	-8.38	2.55	-1,969.92	248.97
02	08	17.62	08.89	3039	-8.34	2.23	-1,974.24	258.47
02	08	22.11	08.77	3016	-8.28	1.90	-1,948.60	252.34
02	08	26.86	08.66	2994	-8.22	1.59	-1,923.62	243.73
02	08	31.47	08.56	2971	-8.16	1.28	-1,993.92	252.47
02	08	35.89	08.47	2948	-8.10	.97	-1,316.16	260.39

02	08	40.59	08.34	2923	-7.98	.64	-1,931.88	255.85
02	08	45.21	08.19	2901	-7.84	.36	-1,950.72	252.57
02	08	49.82	08.00	2879	-7.64	.09	-1,297.67	266.70
02	08	54.46	07.75	2858	-7.38	-.15	-663.17	276.88
02	08	58.87	07.48	2840	-7.09	-.34	-663.91	266.50
02	09	03.50	07.19	2826	-6.79	-.46	-638.48	249.41
02	09	08.27	06.88	2817	-6.47	-.52	0.00	254.10
02	09	12.84	06.55	2811	-6.13	-.54	-653.78	259.93
02	09	17.45	06.22	2811	-5.81	-.49	-1,300.48	257.70
02	09	22.07	05.89	2814	-5.48	-.42	-658.08	253.91
02	09	26.57	05.58	2818	-5.18	-.35	-658.08	254.49
02	09	31.19	05.25	2823	-4.86	-.26	-648.13	251.24
02	09	35.83	04.94	2829	-4.56	-.18	648.83	239.67
02	09	40.44	04.64	2834	-4.26	-.11	642.58	233.65
02	09	45.17	04.34	2841	-3.97	-.04	0.00	232.96
02	09	49.69	04.05	2849	-3.68	.04	-645.34	224.06
02	09	54.47	03.77	2857	-3.41	.11	-649.54	217.03
02	09	58.93	03.50	2864	-3.14	.17	-662.44	219.70
02	10	03.53	03.22	2867	-2.86	.20	-1,927.74	212.18
02	10	08.27	02.95	2862	-2.59	.19	-2,629.44	211.89
02	10	12.66	02.69	2848	-2.33	.15	-1,998.35	211.94
02	10	17.28	02.44	2827	-2.07	.09	-2,600.96	208.31
02	10	21.89	02.19	2798	-1.81	.02	-3,279.62	209.09
02	10	26.43	01.95	2766	-1.55	-.04	-2,623.70	209.05
02	10	31.04	01.69	2738	-1.28	-.05	-2,600.96	213.91
02	10	35.66	01.42	2713	-1.0	-.04	-2,540.41	203.61
02	10	40.49	01.17	2685	-0.75	-.01	-1,974.25	208.52
02	10	44.78	00.91	2641	-0.48	.02	-2,020.78	208.98
02	10	49.40	00.69	2553	-0.23	.02	-1,993.93	201.62
02	10	53.81	00.48	2385	0.03	.04	-1,389.29	194.27
02	10	58.04	00.38	2095	0.23	.03	-1,418.85	176.78

Table 3

BURBANK-GLENDALE-PASADEN ARPT-ID: KBUR RWY: 08 LCTN: BURBANK ST:CA REG:WP FIFO:SAC OWN:F

*** AFIS DATA * * * ***

	BUR	GLA	N34-11-52.27	GS-OFF	L1	GS-LC-DIS	-2235
	90.94	GLO	W118-21-54.30	GS-OM-DIS	38108	LC-OFF	
	109.50	GS-ANG	3.00	GS-TH-DIS	1227	LC-FCB	90.94
	E15	GS-WID	0.70	TH-HGT	727	LC-BCB	270.95
	I	GS-HGT	723	RE-HGT	695	LC-WID	5.00
		RWY-LDG-LGTH	6034				

*** * * AIRPORT DATA * * * ***

ARP-LAT	N34-12-02.20
ARP-LON	W118-21-30.60
FIELD-ELEV	777.9
TH-LAT	N34-11-52.47
TH-LON	W118-22-08.90
TH-ELEV	727.3
RE-LAT	N34-11-51.49
RE-LON	W118-20-57.08
RE-ELEV	695.3
RWY-LGTH/WIDTH	6034/150
DSPLCD-TH-DIST	
DSPLCD-TH-LAT	
DSPLCD-TH-LON	
DSPLCD-TH-ELEV	
RWY-LDG-LGTH	6034
TDZ-ELEV	727.3

*** * * LOCALIZER * *** (DFL CODE - ILS/L)

ANT LAT	N34-11-52.62	XMTR	SINGLE	LOC-RE	-7042 /	-1.159	LCW-TAIL	NO
ANT LON	W118-22-20.91	EQUIP-TYPE	WILCOX	LOC-TH	-1008 /	-.166	LCW-FT-TH	-88
ELEV	728.3	STBY-POWER	G	LOC-IM	0 /		DATE-COMM	11/22/83
ANT-TYPE	LP	ESV	Y	LOC-MM	1629 /	.268	DATE-RECON	
DUAL-FREQ	NO	RESTRICTED	Y	LOC-OM	35873 /	5.904	SURVEY-ACCY	8
US-DIST:	FC 14000/25.0	BC		LOC-FAF	0 /		VOICE	NONE
CLRNC-CVG:	FC 90/35 150/35	BC		MON-AL-WID	W5.85	N4.15	REC TYPE	
CKPT-DESC:	FC BUDDE OM/INT			BC				

*** * * GLIDE SLOPE * * *** (DFL CODE - ILS/G)

ELEV	725.2	XMTR	SINGLE	DIS-TH-PT-C	763.2 /	.126	GS-ANT-OFF	L302
ANT-TYPE	NR	EQUIP-TYPE	WILCOX	GS-TH	1227 /	.202	MON-AL-ANG	H3.30 / L2.78
CL-ELEV-ABM	723.0	FREQ	332.60	GS-IM	0 /		DATE-COMM	07/25/90
RDH	60.0	ESV	N	GS-MM	3864 /	.636	DATE-RECON	
ELEV-FOR-CALC	REF	RESTRICTED	N	GS-OM	38108 /	6.272	SURVEY-ACCY	8
AFIS-CORDS	AIMING PT	GPI-TH	1145.0	GS-FAF	0 /		STBY-POWER	G
ANT: LAT	N34-11-55.26	RPI-TH	1227.0	AIM-PT: LAT	N34-11-52.27			
LON	W118-21-54.24			LON	W118-21-54.30			

DECISION-HEIGHTS:

DH	DIST/RALT	
(100)	0	0
(150)	0	0
(200)	0	0

PERFORMANCE-CLASS I / A /

	* FAF *	OUTER-MARKER	* MIDDLE-MARKER *	INNER-MARKER *
LAT		N34-11-58.54	N34-11-52.87	
LON		W118-29-27.91	W118-22-40.29	
ELEV		751.5	729.6	
DIST-TH	/	36881 /6.070	2637 / .434	
DIST-DIR-CL		L24	R3	
DATE-COMM		05/18/82	10/28/81	
DATE-RECON				
NAME/USE		BUDDE	VINEE	
SURVEY-ACCY		8	8	
TAPELINE		1997.2	202.5	
EARTH-CURVE		34.7	0.4	
MSL-ALTITUDE		2754.9	925.9	
DFL CODE		ILS/MO	ILS/LM	

GENERAL DATA:

YR/MVAR	1980/E15
ICAO	K
BC-STATUS	
MON-CAT	1
REM-MON	ATCT
NFPO-PROCEDURES	120

ASSOC-FACS

NDBC/N BURUR / 253.00 LMM

APL A V Y

PROCEDURES DATA:

PSEUDO-GS-LAT	N00-00-00.00
PSEUDO-GS-LON	W000-00-00.00
PSEUDO-TH-LAT	N00-00-00.00
PSEUDO-TH-LON	W000-00-00.00
PSEUDO-GS-TO-TH	0
LOC-CROSSES-C/L	0

RESTRICTION:

Cmpnt	Qual	Svc Date	Distance Beyond	Distance Within	Altitude Above	Altitude Below	Remark
LOC	FRON	08/06/71					UNUSABLE LMM INBOUND.

ESV:

LOC ESV: 25NM/14000.

SIAPS:

Description	Amdt	Publ	Rmt	Description	Amdt	Publ	Rmt
ILS RWY 8	35	Y	N	LOC RWY 8	2	Y	N
LDA-C (KVNY)	2B	Y	N				

REMARKS:

11/05/99 LOCALIZER IS IN FRONT OF AER. ON AFIS FACILITY DATA PAGE, CHANGE LO C-DIST TO '0', AND FC ALN FROM 1.4NM TO 0.4 NM.

11/05/99 LOCALIZER COURSE WIDTH AND CLEARANCE COMPARIBILITY VERIFIED UP TO 5,000' MSL.

11/05/99 AUTO-COUPLED APPROACHES NOT AUTHORIZED BELOW 974' MSL/0.60 NM TO AER 08/06/71.

11/05/99 OM WIDTH, 3,567' / MM WIDTH, 1,018'. 03/16/94.

THE LDA-C APPROACH IS INTO VAN NUYS, CA. REPORT Z1, Z2, & Z3 STRUCTURE MEASURED FROM THE OUTER MARKER (MAP).

COMM IAW 8240.47, 7/25/90. ARDH = 59.0 REF ELEV ADJUSTED BY A FACTOR OF 2.5 FT FOR VERTICAL DATUM CHANGE ON ANA SURVEY DATED 06/18/99.

LOC REFERENCE MOD BAL FOR CENTERLINE 17UA/90 HZ.

ANA SURVEY, 06/18/99

VERTICAL DATUM: NAVD88

VAN NUYS ST CA REG WP FIFO SAC OWN F ICAO K CLASS L VOICE RECORDED ATIS
1975/E15 MONITOR-CAT 1 MONITOR-LCTN FSS FIFO-PROCEDURES 120
ZLA

* * * AFIS DATA * * *

IDENT	VNY	HGT	812.6
FREQ	113.10	MVAR	1975/E15
TYPE	VDME	TLA	N34-13-26.44
LAT	N34-13-24.46	TLO	W118-29-30.15
LON	W118-29-30.00		

* * * VOR * * * (DFL CODE - VDME/V)

ELEV	812.6	EQUIP-TYPE	2ND-GEN
DOPPLER	Y	STBY-POWER	G
XMTR	SINGLE	SURVEY-ACCY	8
RESTRICTED	Y		
DATE-COMM	02/12/66		
ESV	N		

GRND-CKPT/RAD/DIST / 155 / 1.1
INS-RAD/DIST/ALT 255 / ST 22 STP 15 / 5100
INS-RAD-ALGN TX1 -0.3
LAST-DATE-MONITOR-CHECKED 01/17/96
ALIGN ORBIT DIR/DIST/ALT/DATE
T1 CCW / 10 / 7500 / 01/17/96

* * * DME * * * (DFL CODE - VDME/D)

ELEV	812.6	EQUIP-TYPE	2ND-GEN
CHAN	78X	STBY-POWER	
XMTR	SINGLE	SURVEY-ACCY	8
RESTRICTED	Y		
DATE-COMM	02/12/66		
ESV	N		

GRND-CKPT/RAD/DIST
INS-RAD/DIST/ALT
INS-RAD-ALGN
LAST-DATE-MONITOR-CHECKED
ALIGN ORBIT DIR/DIST/ALT/DATE

* * * SIAPS * * *

Airport Name	Description	Amdt	Publ	Rmt
BURBANK-GLENDALE-PASADENA	VOR OR GPS RWY 8	10	Y	N
VAN NUYS	VOR OR GPS-A	3A	Y	Y
VAN NUYS	VOR/DME OR GPS-B	2A	Y	Y
WHITEMAN	VOR OR GPS-A	1	Y	N

* * * RECEIVER CHECKPOINTS * * *

TYPE	AIRPORT	RAD	DIST	ALT	DESCRIPTION
DME / G	VAN NUYS	142	0.4		RUNUP AREA RWY 16L
VOR / G	VAN NUYS	142	0.4		RUNUP AREA RWY 16L
DME / G	VAN NUYS	155	1.1		MIDFIELD EAST SIDE OF ARPT
VOR / G	VAN NUYS	155	1.1		MIDFIELD EAST SIDE OF ARPT
DME / G	VAN NUYS	159	1.6		EAST RUNUP AREA RWY 34L
VOR / G	VAN NUYS	159	1.6		EAST RUNUP AREA RWY 34L
DME / G	VAN NUYS	161	1.6		WEST RUNUP AREA RWY 34L
VOR / G	VAN NUYS	161	1.6		WEST RUNUP AREA RWY 34L
DME / G	VAN NUYS	169	0.5		INTXN TWYS G3 & 3G
VOR / G	VAN NUYS	169	0.5		INTXN TWYS G3 & 3G

* * * RESTRICTIONS * * *

Cmpnt	Qual	Svc Date	From	To	Byd	Below	Remark
DME		03/05/71	350	010	15	6100	
DME		03/05/71	030	050	25	8600	
DME		03/05/71	010	030	20	6700	
DME		05/22/92	094	096	35	5000	
DME		03/05/71	330	350	25	5500	
VOR		03/05/71	330	350	25	5500	
VOR		03/05/71	350	010	15	6100	
VOR		03/05/71	030	050	25	8600	
VOR		03/05/71	010	030	20	6700	

* * * ESVS * * *

REMARKS:

01/05/99 ANA SURVEY DATED 06/18/99. VOR AND DME NOT COLOCATED.
01/05/99 VERTICAL DATUM: NAVD88

Datum: NAD83 CTRY: US

LCTN: FILLMORE ST:CA REG:WP FIFO:SAC OWN:F

FILLMORE ST CA REG WP FIFO SAC OWN F ICAO K CLASS L VOICE RECORDED TWEB
VAR 1980/E15 MONITOR-CAT 1 MONITOR-LCTN FSS FIFO-PROCEDURES 120
ARTC ZLA

• • • AFIS DATA • • •

IDENT	FIM	HGT	2200
FREQ	112.50	MVAR	1980/E15
TYPE	VORTAC	TLA	N34-21-24.10
LAT	N34-21-24.10	TLO	W116-52-52.65
LON	W116-52-52.65		

• • • VOR • • • (DFL CODE - VTAC/V)

ELEV	2200.0	EQUIP-TYPE	2ND-GEN
DOPPLER	N	STBY-POWER	G
KMTR	SINGLE	SURVEY-ACCY	6
RESTRICTED	Y		
DATE-COMM	09/16/54		
ESV	Y		

GRND-CKPT/RAD/DIST
INS-RAD/DIST/ALT 224 / ST 25 STP 20 / 15500
INS-RAD-ALGN TX1 -0.3
LAST-DATE-MONITOR-CHECKED 09/12/74
ALIGN ORBIT DIR/DIST/ALT/DATE
T1 CCW / 15 / 12000 / 04/10/97

• • • TACAN • • • (DFL CODE - VTAC/T)

ELEV	2200.0	EQUIP-TYPE	2ND-GEN
CHAN	72X	STBY-POWER	G
KMTR	SINGLE	SURVEY-ACCY	6
RESTRICTED	Y		
DATE-COMM	05/04/60		
ESV	Y		

GRND-CKPT/RAD/DIST
INS-RAD/DIST/ALT 224 / ST 25 STP 20 / 15500
INS-RAD-ALGN TX1 -0.7
LAST-DATE-MONITOR-CHECKED 05/24/77
ALIGN ORBIT DIR/DIST/ALT/DATE
T1 CCW / 15 / 12000 / 04/10/97

• • • SIAPS • • •

Airport Name	Description	Amdt	Publ	Rmt
POINT MUGU NAS	TACAN OR VDME RWY 0	NAVY	Y	N

• • • RECEIVER CHECKPOINTS • • •

• • • RESTRICTIONS • • •

Cmpnt	Qual	Svc Date	From	To	Byd	Below	Remark
TACAN	DME	04/10/97	280	315	21	14000	
TACAN	DME	04/10/97	315	360	25	14000	
TACAN	DME	04/10/97	280	315	20	11000	
TACAN	AZIMUT	04/10/97	280	310	20	14000	
TACAN	AZIMUT	04/10/97	310	360	25	14000	
VOR		04/10/97	280	315	20	11000	
VOR		04/10/97	280	315	21	14000	
VOR		04/10/97	315	360	25	14000	

• • • ESVS • • •

TACAN 11/19/90	060R/62NM/8000
VOR 11/19/90	060R/62NM/8000
TACAN 08/05/86	310R/45NM/18000
VOR 08/05/86	310R/45NM/18000

REMARKS:
11/05/99 VERTICAL DATUM: NGVD29

Overhead View Of Radar Data @ Burbank, CA, 6/13/00 with N668SW
(June 13, 14:00 - June 14, 02:45 (UTC))

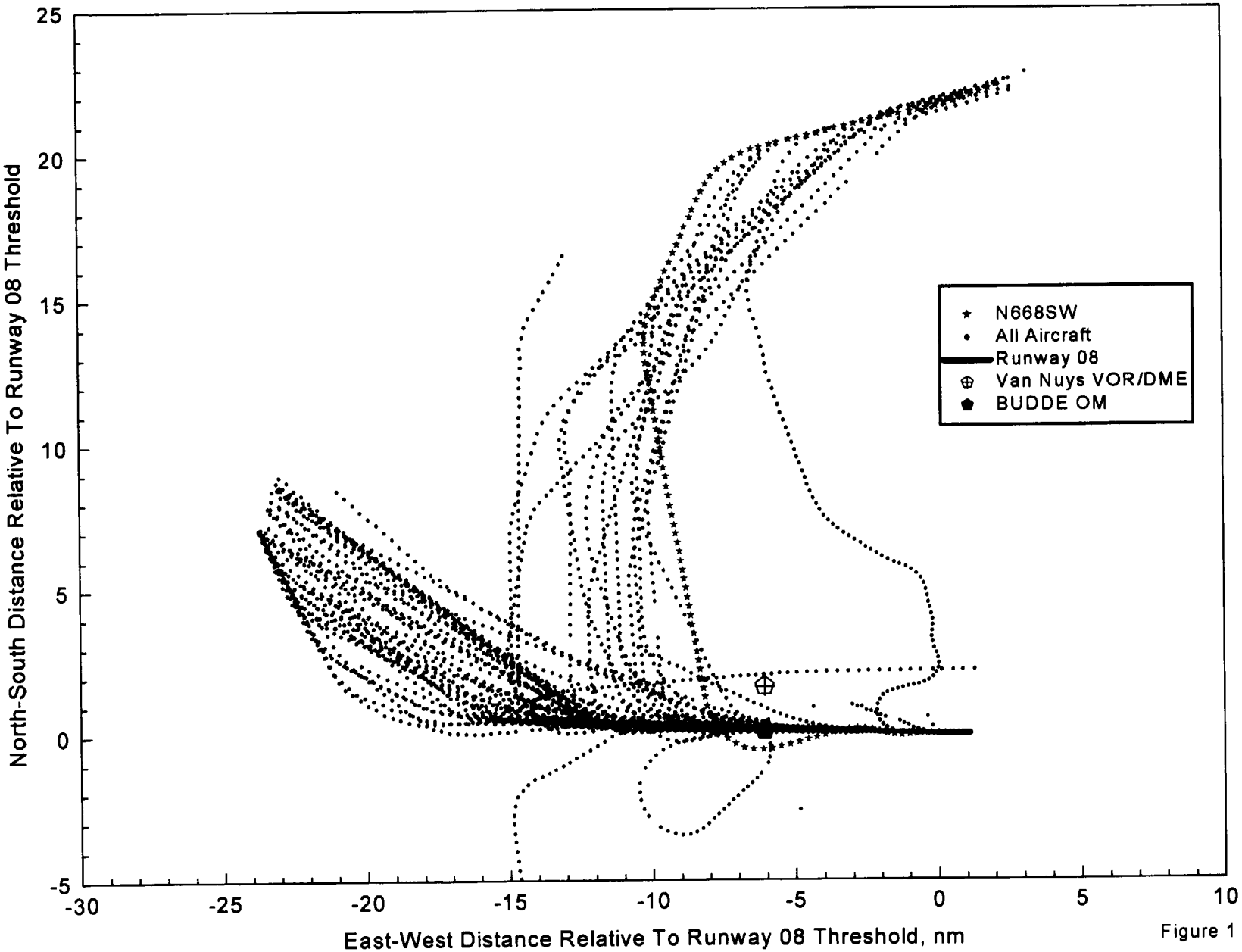

Figure 1

Side View Of Radar Data @ Burbank, CA, 6/13/00 with N668SW

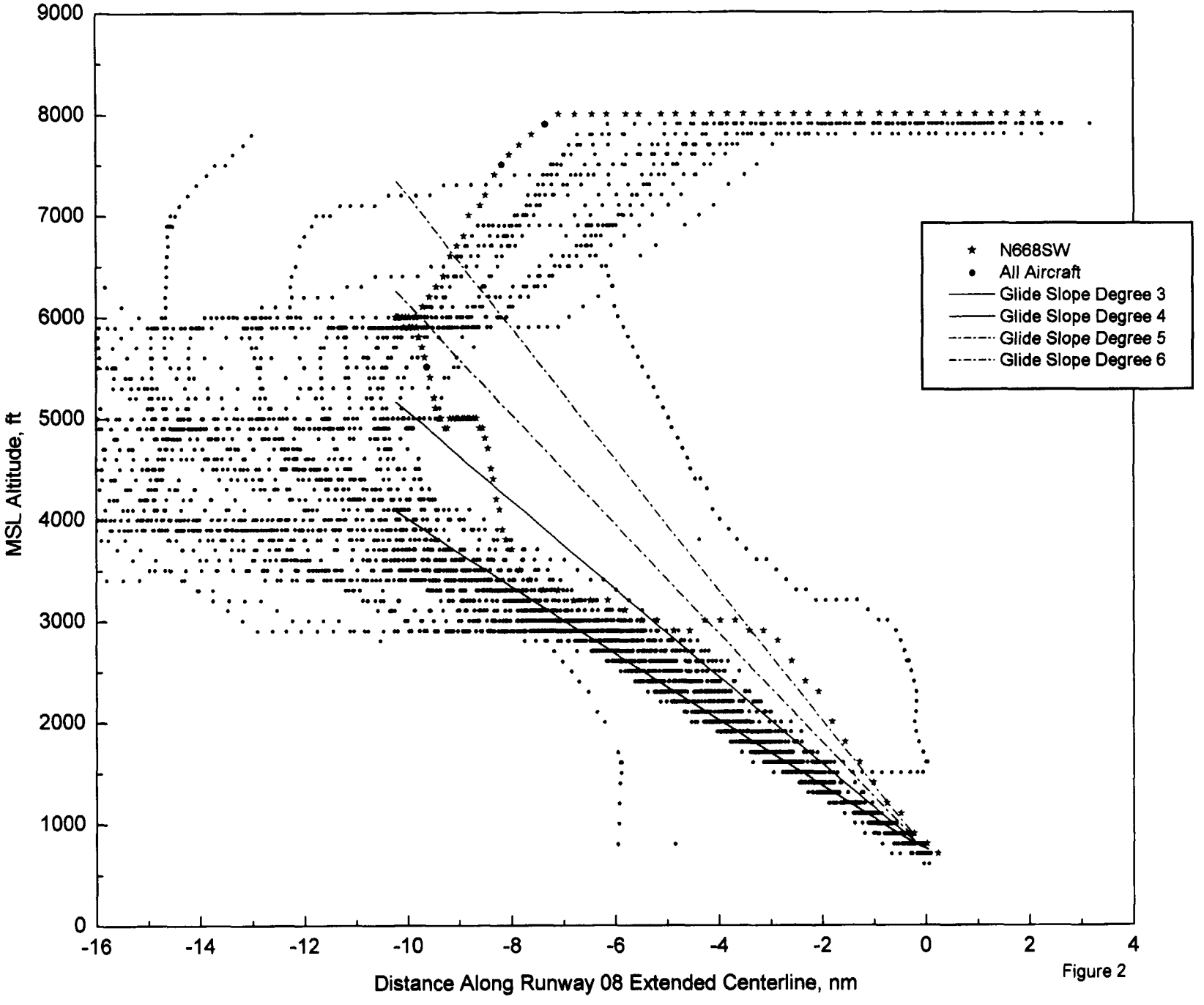

Figure 2

Side View Of Radar Data, N668SW @ Burbank, CA, 6/13/00

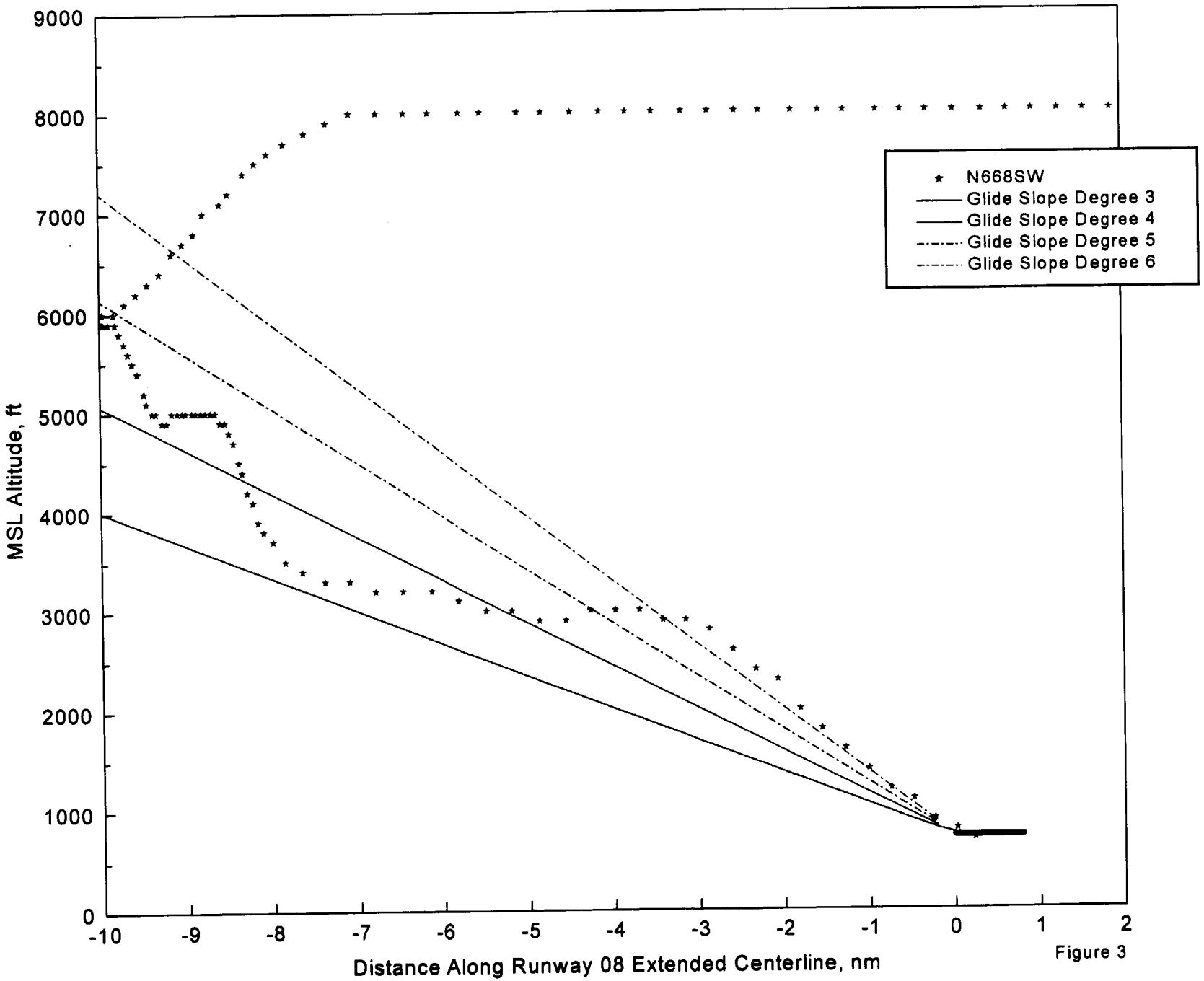

Figure 3

Side View Of Radar Data @ Burbank, CA, 6/13/00 with N668SW

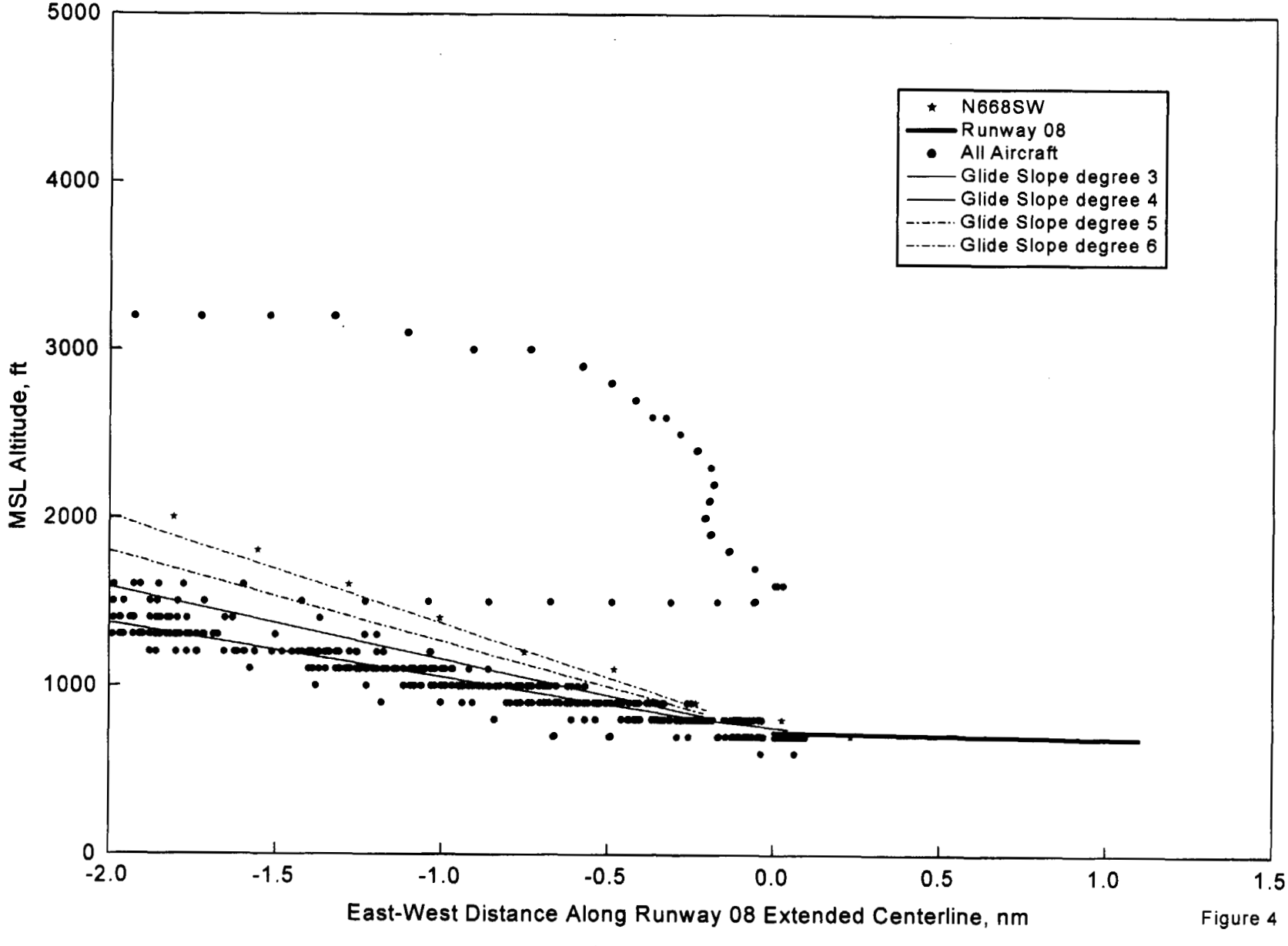

Figure 4

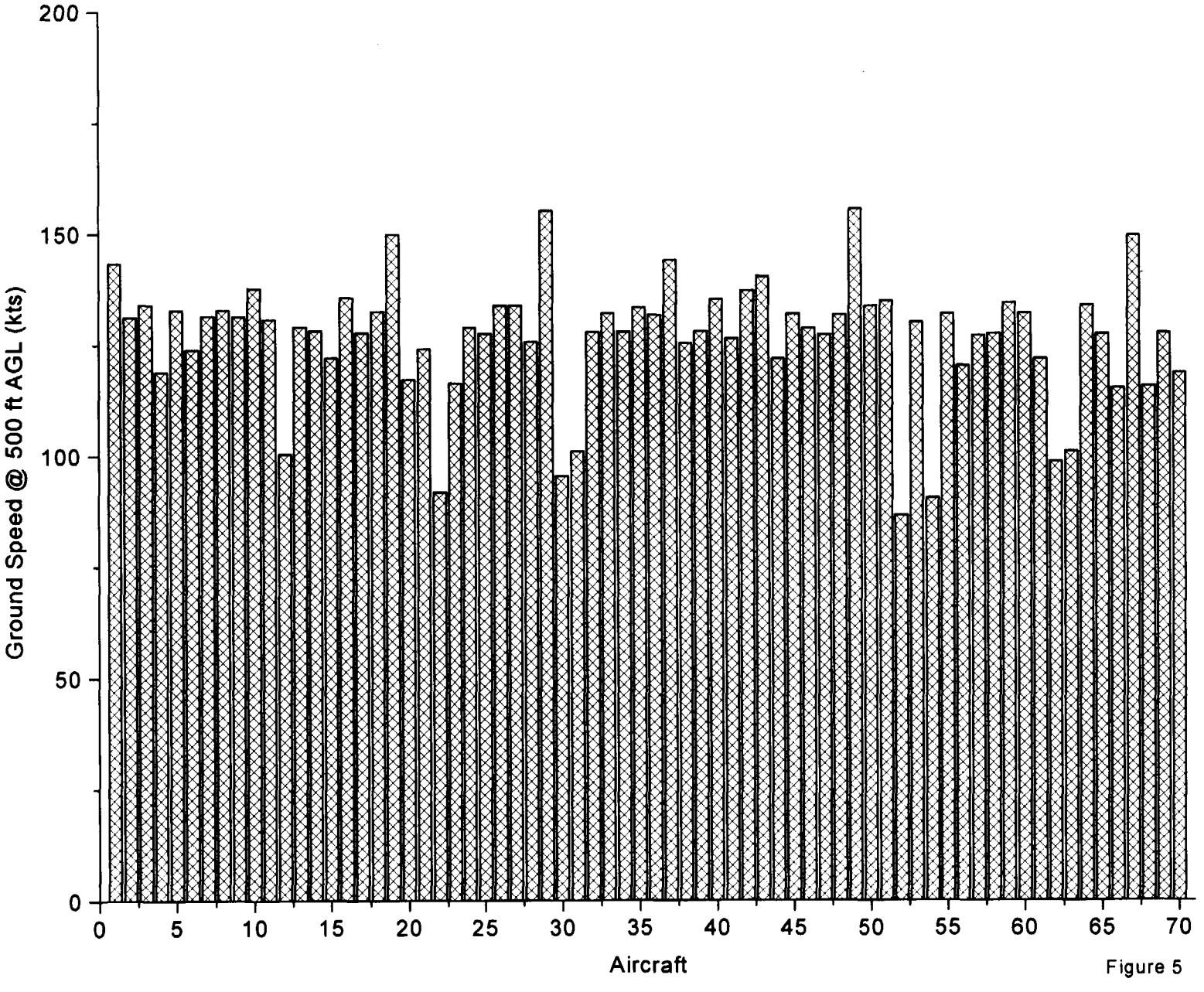
Ground Speed @ 500ft AGL
Ground Speed @ 500 ft AGL (kts)
200
150
100
50
0
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
Aircraft

Figure 5

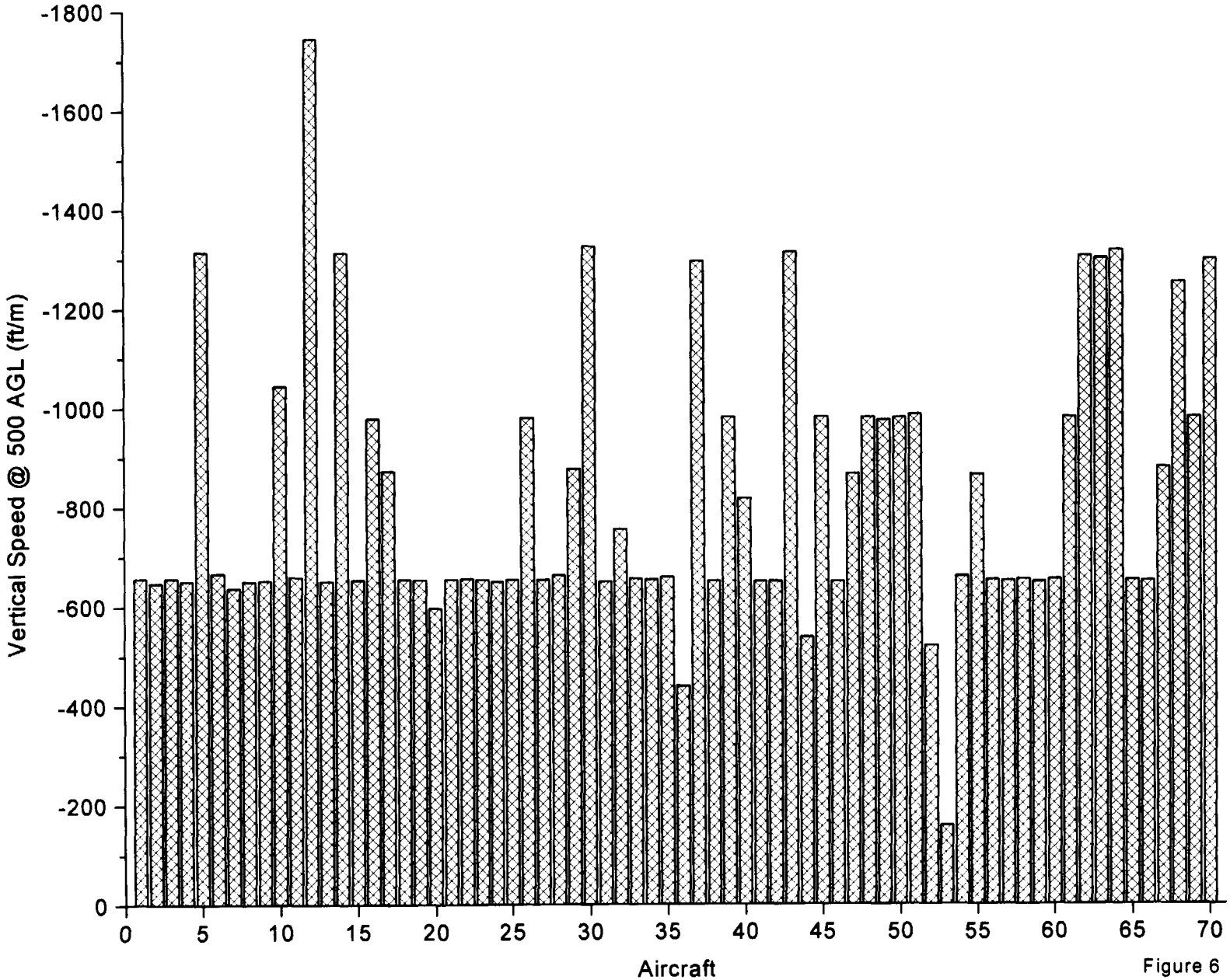
Vertical Speed @ 500ft AGL
Vertical Speed @ 500 AGL (ft/m)
-1800
-1600
-1400
-1200
-1000
-800
-600
-400
-200
0
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
Aircraft

Figure 6

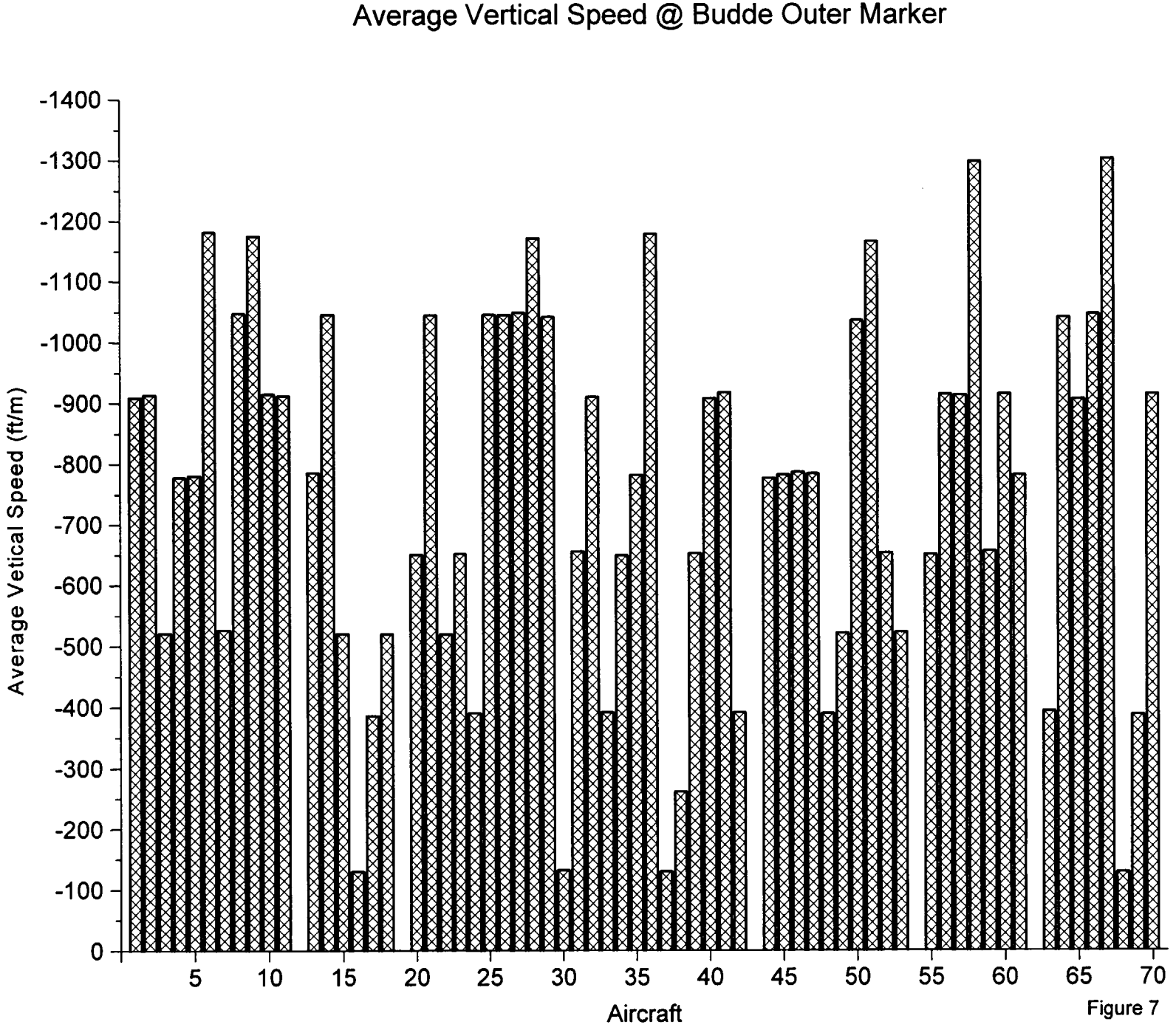
Average Vertical Speed @ Budde Outer Marker
Average Vetical Speed (ft/m)
-1400
-1300
-1200
-1100
-1000
-900
-800
-700
-600
-500
-400
-300
-200
-100
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
Aircraft

Figure 7

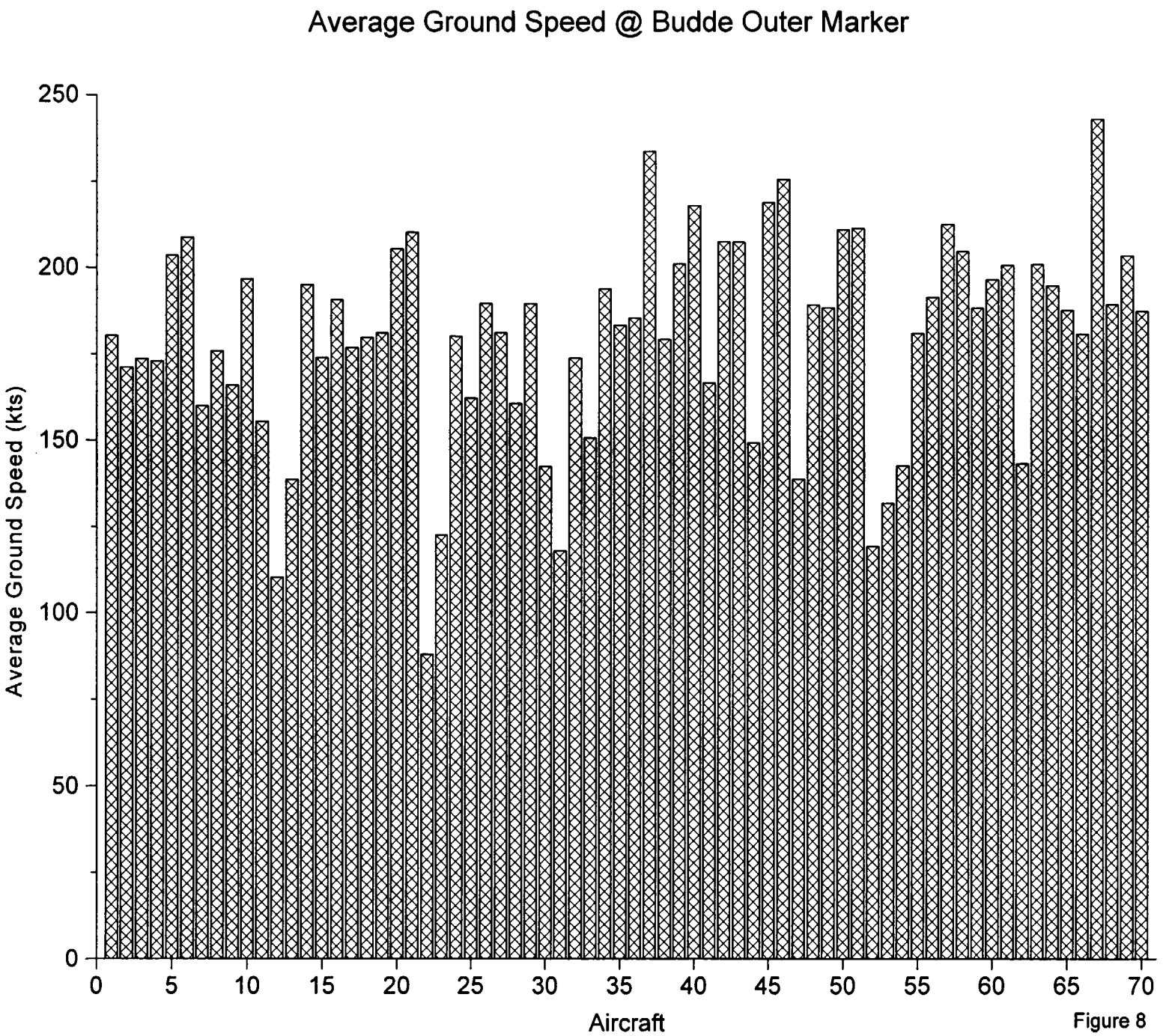
Average Ground Speed @ Budde Outer Marker
Average Ground Speed (kts)
250
200
150
100
50
0
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
Aircraft

Figure 8

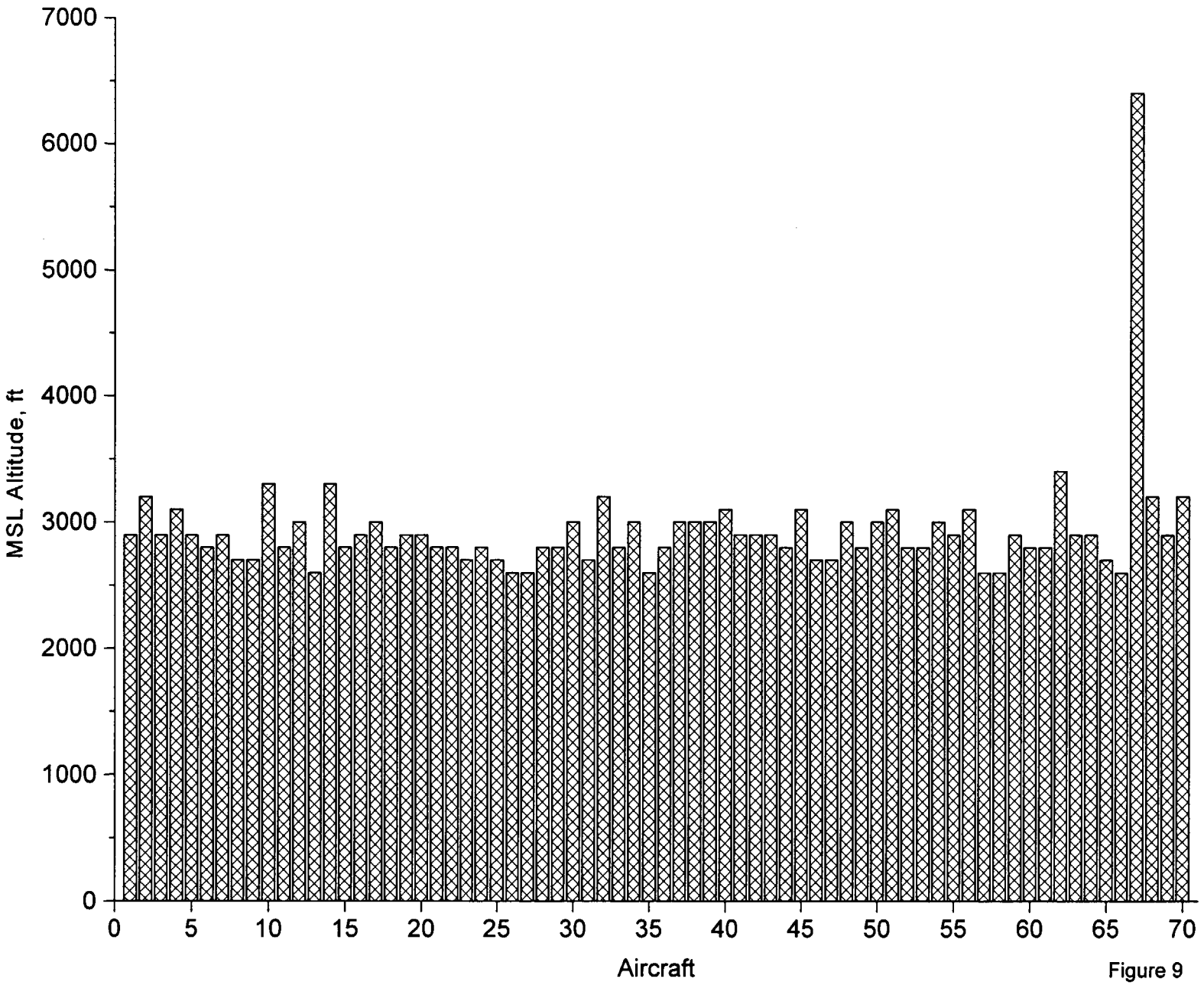
Altitude @ Budde Outer Marker
MSL Altitude, ft
7000
6000
5000
4000
3000
2000
1000
0
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
Aircraft

Figure 9

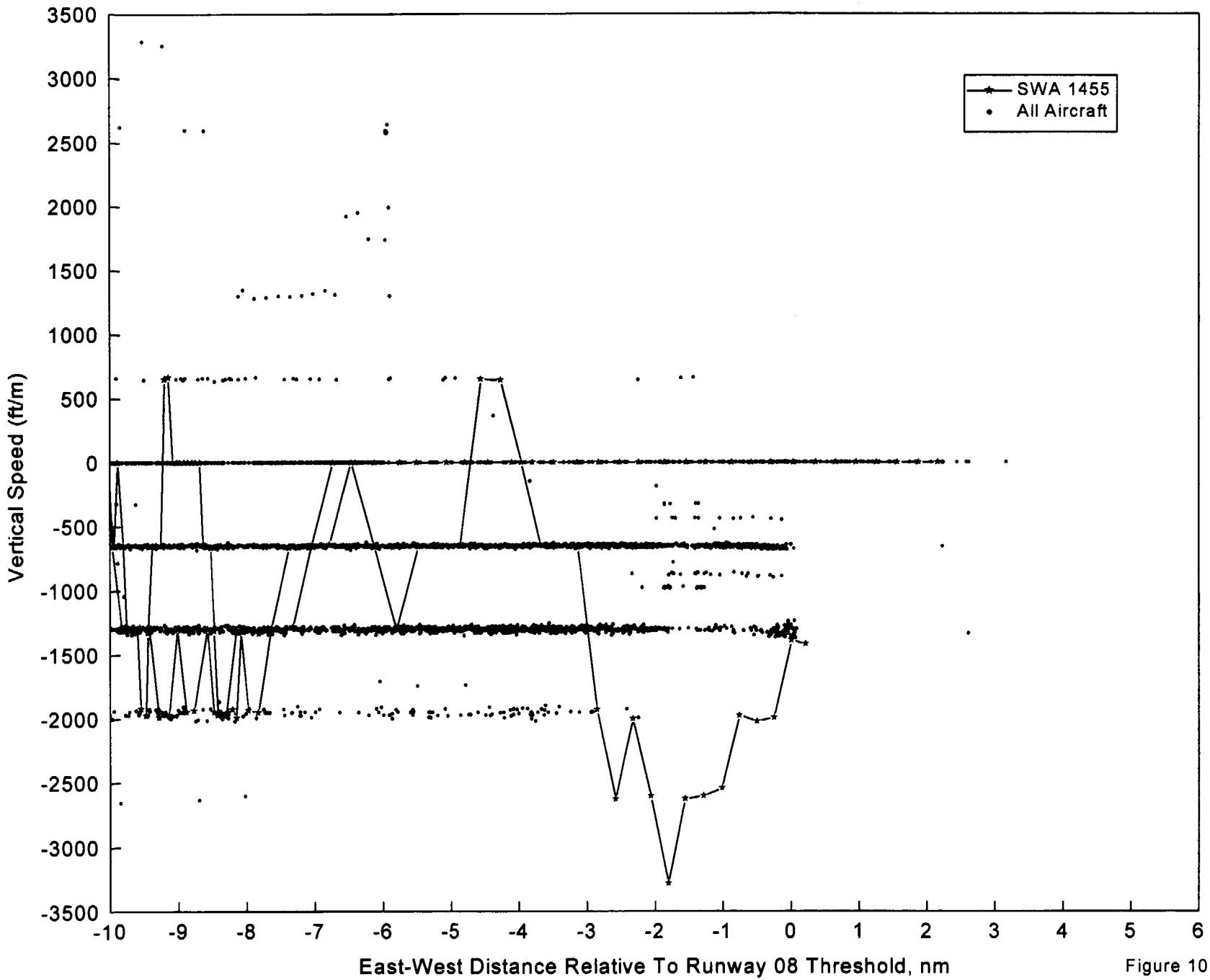
East-West Distance vs. Vertical Speed
SWA 1455
All Aircraft
Vertical Speed (ft/m)
3500
3000
2500
2000
1500
1000
500
0
-500
-1000
-1500
-2000
-2500
-3000
-3500
-10
-9
-8
-7
-6
-5
-4
-3
-2
-1
0
1
2
3
4
5
6
East-West Distance Relative To Runway 08 Threshold, nm

Figure 10