

RECORD

7530-286-8363

(53-B-23540)

FEDERAL SUPPLY SERVICE

(GPO)

Flight Records

Sources of failure

1. Balloon
2. inflation (ascent rate)
3. Landing
4. Balloon mast
5. no altitude data
6. Contractor
7. Recovery too late
8. no recovery
9. Parachute or rigging
10. Trajectory
11. unacceptable floating altitude
12. ~~balloon failed in~~ Balloon committed to undesirable weather conditions
13. miscellaneous
14. Range (Safety or optics)
15. LAUNCH AIRCRAFT

$$(P_a - P_{He})V = L$$

$$\begin{array}{r} .0765 \text{ air} \\ - .0659 \\ \hline \end{array}$$

$$He \quad .0106 \text{ #/ft}^3 \text{ at } 288.1^\circ, 1013.2 \text{ mb}$$

$$\left[217525 \left(\frac{P}{T} \right) - 301407 \left(\frac{P}{T} \right) \right] V$$

$$\text{or } 1873844 \left(\frac{P}{T} \right)$$

HAFB #	DATE	PROJECT	BALLOON			EQUIP WT.	MAX ALT.	TOTAL HOURS	REC. TIME	IMPACT LOCATION
			MFG	DIA	MILS					
569	16 JAN	2084	WINZ	23		35	189		390.	
570	16 JAN	2084	WINZ	23		35	125	1.3		
571A	17 JAN	780A-7851	GM	128	2.0	555	1600	25.0	3.4	OK 10 mi N OROCAPOA
572A	17 JAN	2084	WINZ	23	2X1.5	35	193	22.0	1.5	
573A	17 JAN	2084	WINZ	39.34	2X1.5	35	247	30.0	0.7	10 mi SE CUTTER
574A	17 JAN	2084	WINZ	39.34	2X1.5	78	204	47.2	1.8	
575A	18 JAN	2084	"	"	"	78	202	46.0	30AKS	
576A	21 JAN	2084	"	39.34	2X1.5	78	208	37.0	1.2	
577	22 JAN	2084	"	39.34	2X1.5	78	189	50.2	1.3	OK
578	22 JAN	2084	WINZ	31	3.3	80	120	33.2	28	
579	22 JAN	7635	WINZ	128	2.0	555	1085	10.0	0.3	OK HATCH, NM
580	25 JAN	7635	WINZ	128	2.0	555	703	20.2	0.3	
581	25 JAN	2084	WINZ	39.34	2X1.5	78		47.0		
582	29 JAN	2084	WINZ	39.34	2X1.5	78	198	49.0	1.7	30AKS
583	31 JAN	7635 7663	WINZ	128	2.0	555	983	3.3	OK	5 mi W OROA, NM
585	1 FEB	2084	WINZ	39.34	2X1.5			1.5		
585	4 FEB	2084	WINZ	31	3.3	80	20	30.7		
584	31 JAN	2084	WINZ	31	3.3	80	20	0	0.0	OK
587	1 FEB	2084	WINZ	31	3.3	80	20	52.0	1.5	OSCAR RANGE
588	5 FEB	2084	WINZ	31	3.3	80	20	37.0		
589	"	2084	WINZ	31	3.3	80	20	42.2		
590	6 "	2084	WINZ	31	3.3	80	20	39.5	4.3	
591	6 "	2084	WINZ	39.34	2X1.5	78	319	49.0	4.0	20AKS PORTALES, NM
592	8 "	2084	WINZ	31	3.3	80	175	31.0	0.9	
593	11 "	2084	WINZ	31	3.3	80	175	26.2		
594	11 "	2084	WINZ	31	3.3	80	175	31.5	1.7	
595	12 "	770A-6665	GM	66	2.0	229	397		390.	JENORA, TEX
596	13 "	2084	WINZ	39.34	2X1.5	78	200	1.6		10 mi S HAFB
597	13 "	2084	WINZ	31	3.3	80	175	24.0	1.6	
598	20 "	2014	WINZ	23	2X1.5	35	192	10.0	0.3	
599	20 "	201A	WINZ	39.34	2X1.5	78		41.3	4.3	60AKS
600	27 "	6665	GM	11	2	7.0	17	3.1	OK	5 mi N HAFB
601	27 "	2084	WINZ	23	2X1.5	35	178			10 mi S SALINA PH.
602	27 "	6665	GM	11		7.0	17	6.6	3.0	OK
603	27 "	6665	GM	11		7.0	17			OK
604	27 "	7851	WINZ	23	2X1.5	36	254	0.1	0.5	OK WHITE SAND DUNE
605	28 "	6665	GM	11		7.0	17	8.1	3.0	OK 7 mi E CONDON FIELD
606	28 "	201A	WINZ	39.34	2X1.5			50.0	4.2	60AKS MESQUERO, N.
607	28 "	6665	GM	11		7.0	17	0.6		SALT SITE
608	1 FEB	201A	WINZ	39.34	2X1.5	78	214	36.0	1.6	30AKS 5 mi NW BENT, NM

HDO	ASCENT RATE	RESULTS				PAYLOAD DESC.	RESULTS REMARKS
		BA	HAFB	CONT.	X		
		S	F	F	4	FLARES	
		S	S	S		FLARES	TOTAL SUCCESS
27	400	S	PS	PS	2	1400# PAYLOAD CYLINDER	140 FPM IN INVERSIONS
		S	F	F	10	FLARES	FLOATING WIND SLOW
		F	N	F	1	FLARES	BALLOON FAILED
		S	PS	F	4	FLARES	1 FLARE SEQ. FAILED
700			F	F	3	FLARES	400 IN. LATE ON LAUNCH
560		S	F	F	10	"	ASCENDING OVER TARGET AREA
950		S	S	F	6	"	135 KNOT SET
600		S	S	S		SHOT BAGS	AIR-HELIUM
85	600	N	S	PS		RANGE SAFETY COMMAND	LAUNCHED FROM HATCH, NM.
		F	N	F		"	BALLOON FAILED IN TURBULANCE OVER MTS.
785		S	S	PS		FLARES	HOLD ON ONE HOT RUN - 130 KNOT SET
975		S	F	F	4,6	FLARES	LAUNCHED FROM NUTT, NM.
140	440	S				RANGE SAFETY COMMAND	LAU
		S	S	S		FLARES	TOTAL SUCCESS
		F	N	F		SHOT BAGS	DESCENDED IN TURBULANCE OVER MTS.
0		N	PS	PS		SHOT BAGS	INFLATION PROBLEMS, AIR-HELIUM
		S	S	S		"	DUCT APPENDIX
		S	S	S		"	AIR AND HELIUM NOT MIXED
		S	S	S		"	
		S	S	S		"	2070 FREE LIFT
		S	S	F		FLARES	
		S	S	S		SHOT BAGS	AIR-HELIUM WITH HOT RUNS
	850	S	F	F	11	"	
	950	S	S	S		"	TOTAL SUCCESS
0		S	PS	F		CONTROL PACKAGE	
66	900	S	S	S		FLARES	CALIBRATION MISSION
		S	F	F	11	SHOT BAGS	
		N	F	F	4	FLARES	LAUNCHED TOO LATE
	900	S	S	S		FLARES	TOTAL SUCCESS
5		S	S	S			HURRICANE BALLOON
42		F	N	F	1	FLARES	
		S	S	S			
		F	N	F			
2		S	S	S		MANNED	BALLOON JUMPS AT WHITE SANDS
38		S	S	S			
33	1030	S	PS	PS	11	FLARES	HOT RUN, BALLOON HIGH
1		S	S	S			
80		S	PS	F	4	FLARES	

BALLOON											
HAFB #	DATE	PROJECT	MFG	DIAM.	MILS	WT.	EQUIP	MAX	TOTAL	REC.	IMPACT LOCATION
							WT.	ALT.	HOURS	TIME	
726	7 AUG	208A	WINZ	45	2X15	112	217		2.5	OK	3 MI S SALINAS PEAK
727	8 AUG	221A	GM	45	2.0	107	184	62.0	2.8	OK	8 MI NNW SALT
728	9 AUG	208A	WINZ	45	2X15	112	196	61.5	2.0	OK	BLACKTOP MT. SAN ANDRES RANGE
729	12 AUG	221A	GM	45	2.0	106	110	64.8	2.1	OK	28 MI NNW HAFB
730	12 AUG	208A	WINZ	31	3.3	78	23	60.3	1.6		
731	13 AUG	221A	GM	45	2.0	105	105	64.7			
732	14 " "	221A	GM	45	2.0	107	106	1.9	OK		8 MI SSW SALINAS PEAK
733	15 " "	221A	GM	45	2.0	105	104	2.0	OK		2 MI SE 100E 1788
734	21 " "	7635	GM	128	2.0	550	554	90.0	2.6	OK	5 MI NW LAKE CUCERO
735	22 " "	7635	GM	128	2.0	548	417	73.0	2.2		
736	3 SEP	221A	WINZ	45	2X15	112	248	60.0		13 MFS	CLUBURN, TEXAS
737	4 SEP	7218	GM	66	2.0	226	1732	24.0	0.6	OK	5 MI E HAFB
738	4 " "	221A	WINZ	45	2X15	117	129	64.8			
739	5 SEP	208A	WINZ	23	2X15	38	193	18.7	1.0	OK	SW 50
740	" "	221A	WINZ	45	2X15	113	130	65.0	2.7	10 DAY	4 MI N TULY RANGE CAMP
741	6 " "	208A	WINZ	23	2X15	44	185	19.7	1.3	OK	4 MI W SALT
742	6 " "	7218	GM	86	2.0	372	1636	58.0	1.7	OK	12 MI ESE ESCONDIDA, N.M.
743	9 " "	221A	GM	66	2.0	227	429	63.0	2.3	OK	2 MI SW TULAROSA
744	9 " "	208A	WINZ	39.34	2X15	78	223		0.7	OK	8 MI N SIERRA BLANCA
745	13 SEP	7218	GM	130	2.0		1800	81.0	3.4	50 MFS OK	10 MI ENE 3 RIVERS
746	17 " "	221A	GM	66	2.0	226	415		1.5	10 DAY	10 MI ENE 3 RIVERS
747	25 " "	7674	GM	128	2.0	541	500	90.0	3.3	OK	6 MI SSW ESCONDIDA
748	26 " "	7635	GM	128	2.0	550	650	89.0	3.0	OK	3 MI SE TULAROSA
749	27 " "	7218	GM	166	2.0	966	1425	95.0		OK	OROGRADE
750	1 OCT	7674	WINZ	92.5		292	238	95.0	2.9	OK	
751	30 OCT	7674	GM	92.5	2.0	295	298	12.0	0.3	OK	5 MI N ALAMOGORDO
752	30 OCT	208A	WINZ	23	2X15	44	187	17.5	1.0	OK	1.5 MI SW 3 RIVERS
753	7 OCT	7674	WINZ	92.5	2.0	293	262	90.7	8.2	OK	15 MI N RINCON
754	7 OCT	208A	WINZ	23	2X15	43	197	19.5	1.4	OK	2.5 MI S TULY PEAK
755A	8 OCT	7218	GM	86	2.0	376	1884	56.5	3.7	OK	10 MI E PICACHO
756	9 OCT	7621	GM	128	2.0	535	400	95.0	4.6	OK	12 MI ESE PINON
757	9 " "	208A	WINZ	23	2X15	43	195	17.3	0.6	OK	BEACON
758	9 " "	208A	WINZ	23	2X15	44	186	17.3	1.9	10 DAY	10 MI W TULAROSA
759	11 " "	208A	WINZ	23	2X15	44	189	18.3	1.0	OK	10 MI E SALINAS PEAK
760	16 " "	208A	WINZ	45	2X15	112	209	2.4	2.4	30 DAY	OSCURA RANGE CAMP
761	16 " "	7621	GM	128	2.0	555	430	93.0	2.1	30 DAY OK	
762	23 " "	221A	WINZ	45	2X15	112	132	65.3	2.6	OK	2 MI W 3 RIVERS, N.M.
763	24 OCT	221A	WINZ	45	2X15	112	134	63.0	2.0	10 DAY	3 MI S VALEROFT
764	25 " "	7649	GM	128	2.0	555	450	55.0	1.3	OK	25 MI S PINON

RESULTS									
H00	ASCENT RATE	BALLOON	HAFB	CONT.	*	PAYLOAD DESCRIPTION	REMARKS		
		S	S	S		FLARES	TOTAL SUCCESS		
24	530	S	F	F	14 2,4	FLARES	NO FLARES, SLOW ASCENT RATE		
25	950	S	S	S		FLARES	TOTAL SUCCESS		
26	950	S	S	S		FLARES	TOTAL SUCCESS		
	920	S	S	S		SHOT BAGS			
	910	S	F	F	4	FLARES			
27		S	S	F	14	"	RADAR COMMUNICATIONS OUT		
23		S	S	PS	12	"			
	1030	S	S	S					
	670	S	PS	F	6	NITROUS OXIDE	NO DETINATION		
		S	F	F	16	FLARES			
5	1000	S	S	S		DUMMY LOAD			
		S	F	F	4	FLARES			
		S	S	F	6	BEACON	DRY RUNS ON SPORATIC BEACON		
		S	F	F	4	FLARES			
	715	S	S	PS		BEACON	5 DRY RUNS		
32	930	S	S	S		DUMMY LOAD	LAUNCH FROM WHITE SANDS PICNIC GROUNDS		
30	660	S	F	F	2	FLARES			
	1000	S	F	F	10	FLARES			
		S	S	S		DUMMY LOAD			
35		S	S	S		FLARES	INSTRUMENTATION TEST		
24		S	S	S			IMPACT 1.5 MILES FROM HIGHWAY		
15	860	S	S	S		SODIUM CANNISTER	TOTAL SUCCESS - ARTIFICIAL MOONLIGHT		
30	700	S	S	S		WADC GONDOLA	GONDOLA AND DUMMY FREE FALL TEST		
		S	S	S		INFRARED GEAR	LAUNCHED FROM U.S. PICNIC GROUNDS		
9	290	S	F	F	4	INFRARED GEAR	CUT ON COMMAND BALLAST		
30	940	S	S	S		BEACON	TOTAL SUCCESS		
58	710	S	S	S		INFRARED GEAR			
25	1000	S	S	PS	14	BEACON	DRY RUNS - NO OPTICS		
70	915	S	S	S		G.M. GONDOLA	HELICOPTER RECOVERY		
55	750	S	S	S		SUN SEEKER			
	1070	N	N	F	4	BEACON	REFL. BALLOON FAILED ON DROPPING RADAR		
18	750	S	PS	F	4	BEACON			
13	920	S	S	PS	4	BEACON			
50		S	S	S		FLARES	FLARE TEST		
14	950	F	S	PS	1	SUN SEEKER	800 SERIES BALLOON		
72	1030	S	F	F	4 10	FLARES			
70	920	S	F	F	10	FLARES			
55	835	F	F	F	13	COSMIC RAY GEAR	800 SERIES BALLOON		

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BALLOON

HAIR	DATE	PAYLOAD	ASG	DIAM	WT	WT	MAX	TOTAL	REC	IMPACT	LOCATION
995	15 DEC	5534	RAV	18	0.75	4.0	5				
996	16 DEC	6065	GM	217	2.0		100.3		OK		
997	17 DEC	6665									
998	17 "	6665									
999	17 "	5534									
1000	18 "	2214									
1001	18 "	2214									
1002	18 "	6665									
1003	19 "	2214									
1004	19 "	5534	RAV	18	0.75	4.0	5				
1005	6 JAN	7659									
1006	7 "	7659									
1007	7 "	7659									
1008	7 "	7659									
1009	8 "	7659									
1010	8 "	7659									
1011	9 "	7222	GM	95			57.0		OK		
1012	9 "	7659									
1013	9 "	7659									
1014	14 "	5043	GM		2.0		70.0		OK	6 1/2 mi NNW SALT	
1015	14 "	7222	GM	130	2.0				OK	30 mi ESE RSW	
1016	30 "	208A	WINZ	31						6 1/2 mi NNW SALT,	
1017	30 "	7222	WINZ	176	2.0				OK		
1018	30 "	7222	WINZ	176	2.0				5 DAYS		
1019	4 FEB	7222	WINZ	176	2.0		98.0	4.0	OK	1 mi N BENT, N.M.	
1020	6 "	7222							OK		
1021	10 "	7222	WINZ	176	2.0				OK		
1022	11 "	7222	WINZ	176	2.0				OK		
1023	11 "	208A	WINZ	31							
1024	11 "	2214	GM	66	2.0				OK		
1025	12 "	6665									
1026	12 "	4603	GM	66	2.0				OK	15 mi SSE ALAMOGORDO	
1027	14 "	7222	GM	166	2.0				OK	30 mi W Hqn	
1028	16 "	7222	GM	166	2.0				2 DAYS		
1029	17 "	208A	WINZ	31	3.3						
1030	18 "	208A	WINZ	31	3.3				OK		
1031	19 "	2214	GM	66	2.0						
1032	20 "	208A	WINZ	31							
1033	25 "	7222	WINZ	49	2.5						
1034	27 "	7659	RAV	128	1.5	384	3220	0.5	OK		

HDO	ASCENT	DATE	GALE	HAIR	COUNT	RESULTS	REMARKS
						PAYLOAD DESCRIPTION	
						PS	
1085						S S S	CREE QUATER
						S S S	
						S S S	
						S S S	DART TOTAL SUCCESS
						S S PS	DART
						S S S	AIR DROP
						S S F 14	DART
						S S S	
						S S S	RADIO SPHERE
						S S S	"
						S S S	"
						S S S	"
						S S S	"
980						F N PS 1	ANTHROPOMORPHIC DUMMIES
6	680					F S S 1	ANTHROPOMORPHIC DROP DUMMIES 2 MILES FROM TARGET CENTER
						S S S	INFRARED
						S S F 6	RADAR BEACON
						S PS PS 2	ANTHRO. DUMMIES 3 MILES OFF ON 70 MILE TRAJECTORY
						S F F 4	"
730						S PS PS 14	"
						S S S	" TOTAL SUCCESS
						S F F 4	"
						S S S	"
						S F F 10	RADAR BEACON 12 MIN. LATE
						S S S	DART TOTAL SUCCESS
						S S S	
						S S S	
						S S S	ANTH. DUMMIES
						S S S	"
						S S S	RADAR BEACON
						S S F	" 1 MILE FROM TARGET CENTER
						S F F 104	DART
						S S S	RADAR BEACON
						S S PS	
						S S S	2 PARACHUTE BOMBS

BALLOON										IMPACT LOCATION
HAFB	DATE	PROJECT	MFG	DIAM	MILS	PAYLOAD WT.	MAX ALT.	TOTAL REC. HRS	TIME	
1035	6 MAR 59	7659	GM	128	2.0					
1036	"	7659	GM	128	2.0					
1037	10 "	6665	SCH.	40	0.25	10	100.0			
1038	10 "	6665								
1039	11 "	6665								
1040	11 "	6665								
1041	12 "	6665								
1042	12 "	6665								
1043	12 "	5043	GM	128	2.0		0.1			
1044	13 "	7659	GM	128	2.0					
1045	13 "	6665								
1046	17 "	7659	WINZ	128	2.0					OK
1047	24 "									
1048	24 "									
1049	1 APR 59	6665	GM	128	2.0					
1050	2 APR	6665	RAV	128						
1051	29 APR	7659	RAV	128	2.0	837	50.7	1.6		
1052	5 MAY	5043								OK
1053	6 MAY	7659		128	1.5					OK
1054	8 MAY	5043		128	2.0					OK
1055	16 MAY	7222	WINZ		2X1.5		9.0			OK 4 MI SW TULAROSA
1056	19 MAY	7222	WINZ	45	2X1.5		12.0			OK 4 MI NE PINON
1057	20 MAY	7222	WINZ	45	2X1.5					OK
1058	22 MAY	7222	WINZ	3	2X1.5					OK
1059	27 MAY							0.5		OK
1060	27 MAY	6665								
1061	28 MAY	7659		128	2.0					OK
1062	8 JUN	7659		128	2.0					
1063	10 JUN	5043								
1064	17 JUN	5043								
1065	14 JUN	7659								
1066	24 JUN	7659	WINZ	128	2.0		20.0	1.8		OK CONRAIN AREA, HMV
1067	26 JUN	7659	WINZ	128	2.0		89.0	3.4		OK 3 RIVERS, NM
1068	29 JUN	7659		128	2.0					OK 32 MI NE BIG SPRINGS, TEX.
1069		4603	GM	66	2.0					OK
1070	10 JUL	4603	GM	66	2.0					OK VIL. BEAR PEAK
1071	15 JUL	6665								OK
1072	16 JUL	6665								OK
1073	17 JUL	7222	GM	176	2.0					OK

RESULTS										PAYLOAD DESCRIPTION
HDB	ACCEM RATE	BALLOON	HAFB	CONT	1	2	3	4	5	
		F	PS	PS	1					INFRARED
		S	S	S						NIGHT LAUNCH
		S	S	S						LIGHTS TRACKED 92 MILES AT NIGHT
		S	S	S						
		S	S	S						
		F	N	F						
		S	S	S						
		S	S	S						
		F	F	F						
		S	S	S						NAIL IN BALLOON BOX
		S	S	S						
		S	S	S						
		S	S	S						SUNSENER RAVEN VALVE
		S	S	S						MOONSENER FIRST STRATOSPHERE MOON SHOTS
		S	S	S						INFRARED
		S	S	S						CHOKER CHOKER TEST IN FISTS TO 12
		S	S	S						PAR. BOMB
		F	S	PS						INFRARED
		S	S	S						" IMPACT 2000 FT. FROM HIGHWAY
		F	F	F						INFRARED VALVE BALLOON FAILED
		S	S	S						"
		S	S	S						OPEN GONDOLA MANNED NIGHT FLIGHT
		S	S	S						"
		S	S	S						"
		S	S	S						"
		S	S	S						"
		S	S	S						MISS 1001 FT 5 HOT GUNS
		S	S	PS						F100 DROP
		S	S							LOW ALT. 9 INCH CASSEGRAIN
		F	N	F	1					INFRARED
		S	S	S						"
		S	S	S						"
		S	S	S						SUNSENER
2.0		F	F	F						"
		S	S	S						" IMPACT 1/4 MILE FROM RECOVERY CREW
		F	N	F						COSMIC RAY LAUNCH FROM MINERAL WELLS, TEXAS
		S	S	S						RETRACT.
		S	S	S						RETRACTOR
		S	S	S						F-100 DROP AIR LAUNCH
		S	S	S						"
		S	S	S						PAR. BOMB 200# DROP

BALLOON

H-1418	DATE	PROJECT	DIM	GILS	REC	WT.	PAYLOAD	MAX	TOTAL	REC.	IMPACT
							WT	ALT	HOUS	TIME	
1074	4 AUG 59	6892	201	0.75	RAV			126.5		OK	
1075	13 AUG	6892	2	0.75	WIN2			35.0		10AY	
1076	19 AUG	6892	176	1.5	WIN2			106.5		10AY	
1077	24 AUG	666	66	2.0	GA					OK	
1078	24 AUG 59		66	2.0	GM					OK 10AY	
1079	26 AUG		66	2.0	GM					10AY	
1080	9 SEP	5043	92							OK	
1081	22 SEP	7659	176		RAV					10AY	12 MI NW CLIFF, N.M.
1082	22 SEP	7659	116	2.0	RAV	333	578	45.		OK	3 MI ESE MOUNTAIN PARK
1083	25 SEP	7659	128	2.0	WIN2	547	753	45.0		30AYS	6 MI N MATHILL
1084	6 OCT	7659	128	2.0	WIN2	536	717	42.0		OK	
1085	8 OCT	7659	200	1.5	WIN2	1065	1000	107.0		OK	3 MI E HAGERMAN, N.M.
1086		7222	66	2.0	GM						
1087		7222	61	2X1.5	WIN2						
1088	16 NOV	7222	177	2.0	GM						
1089	19 NOV	6685									
1090	30 DEC	6665	128	2.0	RAV	543	4035	15.6		OK	2 MI ESE SALINAS PEAK
1091	11 DEC	7222	177	2.0	GM	1265	1360			OK	
1092	9 JAN 60	7659	128	2.0	RAV					OK	10 MI E HAGERMAN, NM
1093	20 JAN	7222	61	2X1.5	WIN2	175	890	13.0	8.7	OK	20 MI E EL PASO
1094	22 JAN	6665								4 DAYS	
1095	29 JAN	7222	39.95	2X1.5	WIN2			7.4	5.8	OK	EAC
1096	30 JAN	6665	70								
1097	16 FEB	7659	177	0.25	SCH			115K			
1098	"	7659			SCH			143K			
1099	"	7659			"			100K			
1100	17 "	7659			"						
1101	17 "	7659			"						
1102	17 "	7659			"						
1103	18 "	7659			"						
1104	18 "	7659			"						
1105	18 "	7659			"						
1106	19 "	7659			"						
1107	19 "	7659			"						
1108	19 "	6665	72.8	2.0	WIN2					OK	MESA, N.M.
1109	19 "	7659			SCH						
1110	23 "	"			SCH						
1111	23 "	"			SCH						
1112	23 "	"			SCH						

RESULTS

H-1418	ACCENT	BALLOON	WIND	CONF.	X	PAYLOAD	DESCRIPTION
	RATE						
		S	S	S			
		F	N	F			
		S	S	S			
		S	S	S			
		S	PS	PS			
		S	S	S			
		S	S	S			
		S	PS			TELESCOPE	
		F	F	F	2	SUNSENER	
1220		F	N	F	1	"	
1180		F	N	F	1	"	
7		S	S	F		"	TAPE RECORDER JAMMED
		S	S	S			
		S	S	S			
		S	S	S			
		F	S	S		CAPT. KITTINGER	HIGHEST WORLD RECORD FOR BAIL OUT
		S	S	S		FLIP DROPS	
		S	S	S		2 PARACHUTE DROPS	CANYON LAUNCH FIRST LAUNCH CRANITE CAP
		S	S	S		CAPT. KITTINGER	
		S	S	S		SUNSENER	
77	500	S	S	S		OPEN CONDOLA STRA	LT. M. CLURE, MAJOR LEVIN PILOTS
		S		F		RADIOPHONE	PARACHUTE DRAK TEST
		S	S	S		MAJ. LEVIN	PILOT OFF SOLO
		S	S	S			
		S	S	S			
		S	S	S			
		S	S	S			
		S	S	S			
		S	S	S			
		S	S	S			
		S	S	S			
		S	S	S			
		S	F	F	4	RADIOPHONE	
		S	S	S			
		S	S	S			
		S	S	S			
		S	S	S			

RADAR REFLECTIVITY TEST
209,000 gals

BALLOON

HAFB	DATE	PROJ	MPG	DIAM	MILS	WT	WT. RAYLOAD	MAX ALT.	TOTAL HOURS	REC TIME	IMPACT LOCATION
1148	8 SEP	9774	WINZ	128	2.0			0.5	0.1	OK	KING-1
1149	9 SEP	9774	WINZ	128	2.0			88.5		OK	1.5 mi NE NOTT
1150	13 "	5043	RAV	128	1.5					OK	
1151	16 "	117L	RAV	117	1.5					OK	
1152	21 "	4603	WINZ	70.4	3.0			57.0			
1153	27 "	4603	WINZ	70.4				60.5		OK	45 mi E OROGRANOE
1154	27 "	6665	RAV	86	0.5			113.0			45 mi
1155	29 "	4603	WINZ	70.4						OK	
1156	5 OCT	7659	RAV	130	1.0			85.0		OK	
1157	12 OCT	7659	RAV	130	1.0			84.5		OK	7 mi E PILACHO
1158	19 OCT	117L	RAV	117	1.5			0.0	0.0	OK	LAUNCH SITE
1159	21 OCT	117L	RAV	117	1.5					OK	
1160	28 OCT	7659	WINZ	133				111.0K		OK	ODESSA, TEXAS
1161	3 NOV	7659	WINZ	134	0.75					OK	
1162	2 NOV	7659	WINZ	134	0.75			0.1	0.1	OK	LAUNCH SITE
1163	3 NOV	7659	WINZ	134	0.75					OK	
1163	29 NOV	7659	WINZ	150						OK	15 mi NE HOBBS
1164	15 DEC	117L									
1165	16 DEC	117L									
1166	10 JAN	117L	WINZ	150						OK	6 mi E HAFB
1167	7 FEB	117L	GM	130						OK	
1168	10 FEB	7659	WINZ	72.3				20.0		OK	
1169		5043	RAV								
1170	1 MAR	7659	WINZ								
1171	2 MAR	5043	WINZ								
1172	8 MAR										
1173	14 MAR	117M	WINZ	238.8							

RESULTS

HDO	ASSENT RATE	BALL	WIND	CNT	PAYLOAD	REMARKS
	200	F	N	F	1	MIT SATELLITE CAMERAS
		S	S	S		"
		S	S	S		INFRARED GEAR
		S	S	S		DISCOVERER
		S	PS	PS	12	REFRACTOMETER
		S	S	S		"
		F	S	S		SHOT BAG
		S	S	S		"
		S	S	S		BALL BRASS INFRARED
		S	S	PS		"
		F	N	F	1	DISCOVERER
		S	S	S		
		S	S	PS		COSMIC RAY GEAR
		S	S	PS		"
		N	F	F	2	"
		S	S	S		"
		S	S	S		9" TELESCOPE
		S	S	S		"
		F	F	F		
		S	S	S		DISCOVERER CAPSULE
		S	S	S		"
		S	S	S		RADIO PHANE
		F	N	PS		INFRARED
		S	S	S		SUN SEEKER
		S	S	S		INFRARED
		S	S	S		

HOVERING FLIGHT

FIRST 1/2AIL LAUNCH

THRU 50K 4 TIMES

~~260 MI DE~~ ~~260 MI DE~~

WRONG CROSS LOAD

~~260 MI DE~~

COMMAND VALVE TOUCHDOWN

Ectatocera triguttata - after first study

March 1961 ^{45K} 090-20 m. base 145-25 m. valley 150-15 then down to base

FESTS

30 JUN 66 466-63 R-⊕ all day -

0 0-go

Res. ⊕

1966 TIME RECORD

13 JAN +1/2 ON MISSION
17 JAN ARRIVED 0705MST DUE TO DEGRADING WX
18 0715
19 0705
20 0715
21 0710
24 0710
25 0705
27 0705
28 0710
1 FEB 0710
2 FEB 0705
4 " 0710
5 " 0710
7 " 0710
8 " 0715
9 " 0710
11 " 0705
15 " +1 mission
16 " 0705
17 " 0710
18 " 0705
28 MAR +20"
27 MAR +55"
23 MAR +35

BALLOON DATA

67 4.85, 3/4 MIL, pull out 179A duct, torque 570 ± 10
 $\sigma = 0.4$ max load 600#

Test Flights

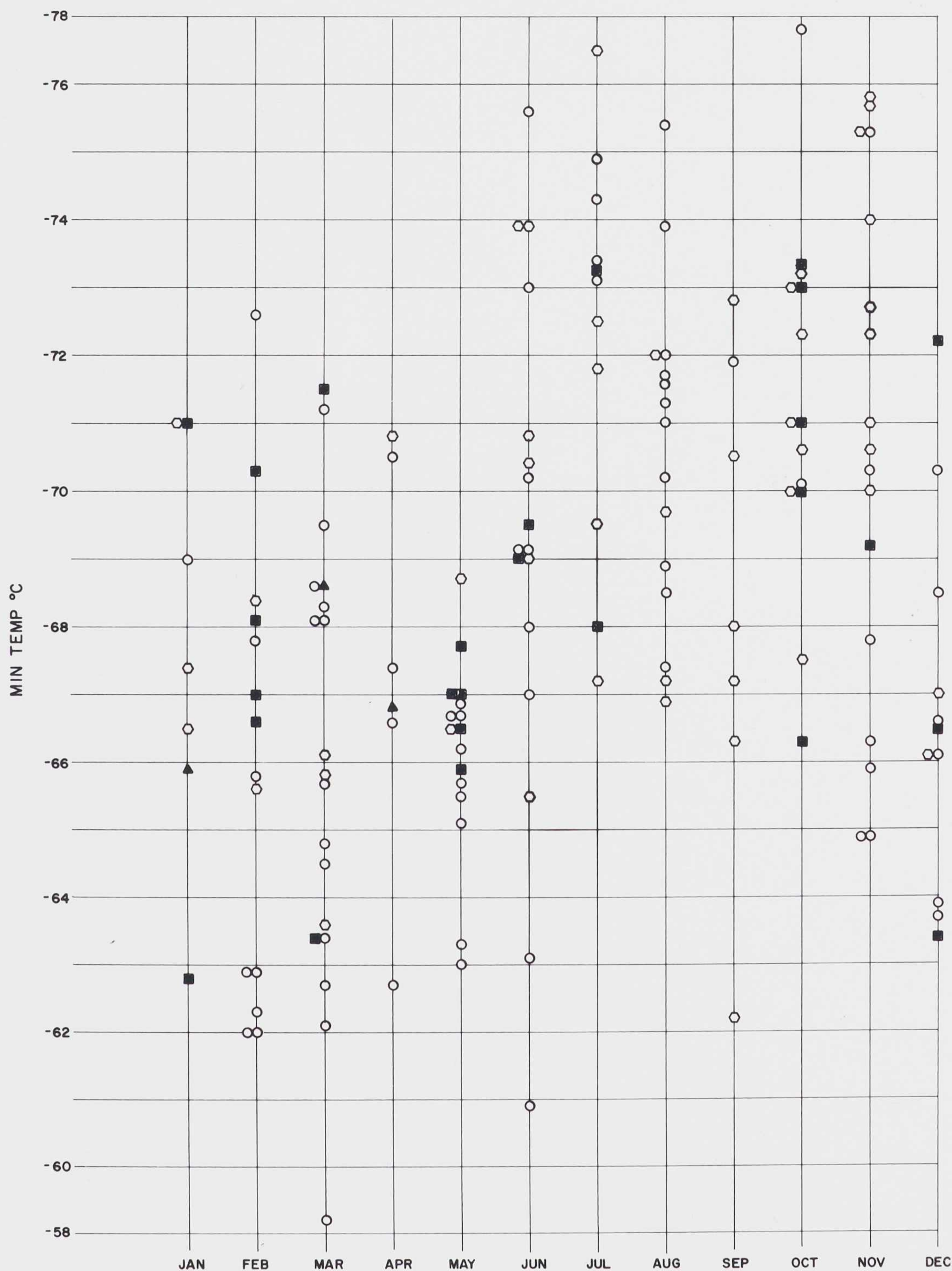
1. Tracking over OVEST
2. compensate for sale by command ballast
3. Tenshore in jets over Sacramento
4. ~~High altitude targets~~
5. dial altimeter for banner blow
6. rainsonde - radar target test
7. ~~lower~~ lowering - dashed circulation
8. use Sacramento as blob/C
9. 3 day flight
10. balloon vs. radar
11. Value test - lowering - E. Monty, test an.
12. 120K trail balloon after dropping load - 3/4/mid 69'
13. ~~Aslan~~ T-4 shape test
14. Two balloon same later
15. Value target
- 16.



BALLOON SUCCESS RECORD VS MINIMUM CLIMB OUT TEMPERATURE CREH 1963-67

LEGEND

POLYETHYLENE	STRATOFILM
○ — SUCCESS — ○	
■ — FAILURE — ▲	



ACCURACIES OF METEOROLOGICAL UPPER AIR DATA

By

Dr Johannesen (Hq, AWS-DDS)

These accuracies are based on the current field accuracy of the standard GMD-1A radiosonde without hypsometer and wind finding equipment. Most meteorological errors show a normal distribution faithfully up to about two standard deviations (2 σ) but get somewhat irregular beyond this. Hence this distribution can be applied with good success for any calculations involving confidence limits, tolerance acceptance rates, etc. The values quoted below are root mean square errors; that is about 68 percent of the errors are less than the quoted values.

Some of the quantities given below need no further qualifications; they can be applied under nearly all operating conditions, seasons, and climatic regimes. For example, there is little reason to assume that the random error of the temperature element is different in the tropics from the middle latitudes. For winds, however, this is not the case. The error in winds is dependent upon the geometric position of the drifting balloon in relation to the tracking equipment. This is, climatologically speaking, a function of geographical location and season because it is dependent upon such things as mean wind speed and vertical wind structure. There is little use in stating that the root mean square vector error of wind finding is 3 knots, 11 knots, or 39 knots. This will be amplified in Section II below. The vector error depends on the angle of elevation of the line of sight to the balloon from the tracking equipment (α) and the height of the balloon (h).

I. Radiosonde Data (r.m.s. error):

A. Pressure error at a mathematically defined height:

At SFC ± 0.1 mb

10,000 ft ± 0.7 mb

20,000 ft ± 1.0 mb

30,000 ft ± 1.2 mb

40,000 ft ± 1.0 mb

elevation angle is by and large determined by the mean wind speed below the level in question; as winds, when they are strong, undergo only small directional changes with height. For any given wind run, it is possible by this method to draw the envelope to the wind profile that contains any percentile vector error that may be desired.

REFERENCES:

1. AWS Technical Report 105-133 (For methodology, numerical values have been up-dated.)
2. Field Accuracy of the GMD-1 Radiosonde and Wind Finding Equipment. Typed manuscript, AWS (Source of numerical values for this paper, based on experimental data.)

50,000 ft $\pm$ 0.7 mb
60,000 ft $\pm$ 0.55 mb
70,000 ft $\pm$ 0.40 mb
80,000 ft $\pm$ 0.30 mb
90,000 ft $\pm$ 0.20 mb
100,000 ft $\pm$ 0.12 mb

B. Height error at a mathematically defined pressure:

Approximately 0.26% of height or:

Surface Pressure $\pm$ 3 ft

700 mb $\pm$ 27 ft

500 mb $\pm$ 45 ft

300 mb $\pm$ 80 ft

200 mb $\pm$ 105 ft

150 mb $\pm$ 125 ft

100 mb $\pm$ 147 ft

50 mb $\pm$ 180 ft

25 mb $\pm$ 208 ft

10 mb $\pm$ 250 ft

C. Temperature Error: $\pm$ 0.7°C

D. Density at mathematically defined height may be determined on the assumption that temperature and pressure errors are both normally distributed and independent which leads to the formula:

$$\frac{\sigma \rho}{\rho} = \sqrt{\left(\frac{\sigma P}{P}\right)^2 + \left(\frac{\sigma T}{T}\right)^2}$$

Here $\sigma \rho, \sigma P, \sigma T$ are rms errors of density, pressure and temperature respectively and ρ, P and T are density, pressure and temperature. We arrive at a table as follows:

10,000 ft	0.3%
20,000 ft	0.3%
30,000 ft	0.4%
40,000 ft	0.5%
50,000 ft	0.6%
60,000 ft	0.7%
70,000 ft	0.8%
80,000 ft	0.9%
90,000 ft	1.0%
100,000 ft	1.2%

II. WIND VECTOR ERROR:

Error in direction is a quantity that hardly would occur in any practical problem and is very much a function of wind speed, among other things. Hence, this discussion will be restricted to vector error.

Present procedure (1959) gives winds which are mean values for a 2,000 feet layer below 14 kms and for a 4,000 feet layer above this level. The figures quoted below refer necessarily to this convention, and winds computed through shallower layers will have proportionately larger errors. The dominant term of the wind vector error can be written:

$$\sigma V = \frac{0.9 h \times 10^{-2}}{\sin^2 \alpha}$$

Here σV is the rms vector error in knots, h is the height of the balloon in thousands of feet and α is the elevation angle. The