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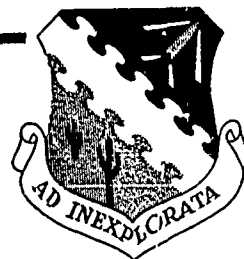
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FTC-TR-73-3

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**AIR FORCE
FLIGHT EVALUATION
(SYSTEMS) OF THE
A-10A PROTOTYPE AIRCRAFT
APPENDIX V - WEAPON DELIVERY**

JOSEPH C. ORWAT
Captain, USAF
Weapon Delivery Project Engineer

TECHNICAL REPORT No.73-3

JUNE 1973
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EDWARDS AIR FORCE BASE, CALIFORNIA
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UNITED STATES AIR FORCE**

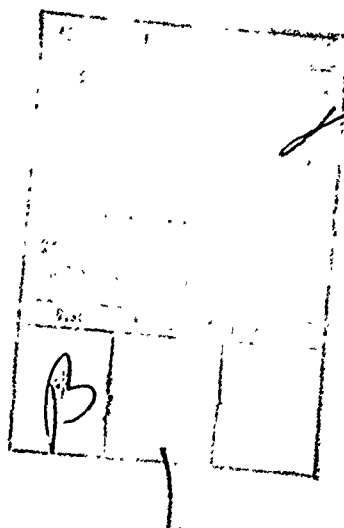
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⑥ **AIR FORCE
FLIGHT EVALUATION
(SYSTEMS) OF THE
A-10A PROTOTYPE AIRCRAFT,
APPENDIX V, WEAPON DELIVERY.**

⑨ Final rept.,

⑩ JOSEPH C. ORWAT
Captain, USAF
Weapon Delivery Project Engineer

⑪ Jun 73

⑮ AFFTC-F-72-4-9

⑫ 123 p.

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FOREWORD

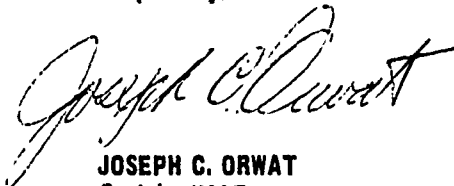
The Air Force Flight Evaluation (AFFE) of the A-10A aircraft began on 10 October 1972 with the acceptance of the first aircraft from the contractor. The second aircraft was accepted on 24 October 1972. A total of 138.5 hours was accumulated during 87 flights. The program was completed on 9 December 1972.

This appendix presents the results from the Weapon Delivery phase of the AFFE. The basic report, FTC-TR-73-3 Air Force Flight Evaluation (Systems) of the A-10A Prototype Aircraft, published under separate cover, presents the results of the general system evaluation, quantitative reliability and maintainability, and personnel subsystem test and evaluation.

Test authority for the program was provided under Program Introduction Document No. F-71-7-10, submitted by the A-X System Program Office, and AFFTC Project Directive No. F-72-4-9.

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Prepared by:



JOSEPH C. ORWAT
Captain, USAF
A-X Weapon Delivery Project
Engineer

Reviewed and approved by:

16 May 1973



GEORGE P. LYNCH, JR.
Lieutenant Colonel, USAF
A-X Joint Test Force Director



WILLIAM L. SKLIAR
Colonel, USAF
Ass't Deputy Commander for Operations



HOWARD M. LANE
Brigadier General, USAF
Commander

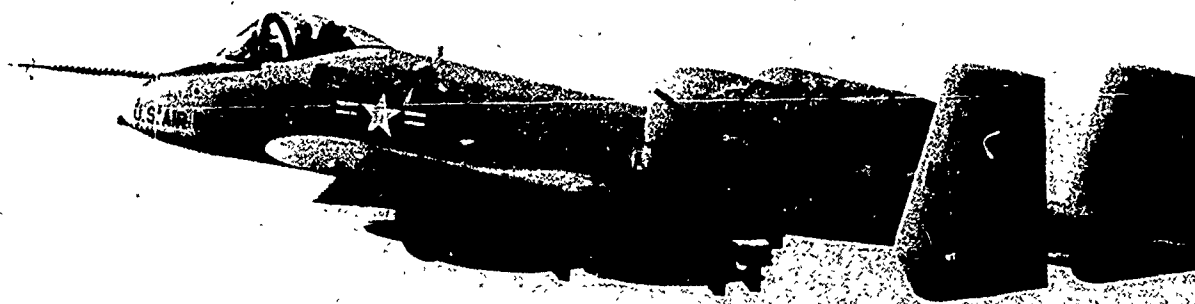
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INTRODUCTION

This appendix presents the results of the Weapon Delivery phase of the A-10A AFPE. This evaluation was part of the A-X Competitive Prototype Program. Two A-10A aircraft, S/N 71-1369 and 71-1370, were assigned to the AFPE. A total of 138.5 hours was accumulated during 87 flights of which 60.7 hours were devoted to weapon delivery missions and 13.7 hours to systems evaluation. The remaining flight hours were devoted to performance, flying qualities, and operational suitability evaluation.

After the AFPE was completed, an additional test was conducted at the request of the A-X SPO to obtain the best scores using contractor selected release conditions.

PROGRAM OBJECTIVES

The objectives of the Weapon Delivery phase of A-X AFPE were to:

1. Evaluate the A-9A and A-10A prototypes in the weapon delivery area to detect differences in capability.
2. Apply a statistical method to produce a score for each prototype.
3. Provide inputs to the Source Selection Evaluation Board.

To accomplish these objectives, the weapon delivery evaluation was based on the following:

1. The tests were designed to increase observed differences between the competing aircraft by selection of the most difficult delivery conditions from a combined pilot/aircraft point-of-view. The test was not designed to show the best possible A-X accuracies.
2. Four closely matched pilots were selected to fly both prototype under identical conditions. No attempt was made to differentiate between inherent aircraft accuracy and pilot ability.

Within these constraints, the tests were further designed to provide realism and measure effectiveness by considering the following:

1. Bombing hit percentages within radii close to the nominal lethal radii of the MK-82.
2. Bombing miss percentage outside specified rectangles to represent hazards to friendly troops.
3. Strafing hit percentages within a circle representative of the vulnerable areas of a tank.
4. Simulated combat delivery conditions with short tracking time, no dry passes, and limited passes per profile with run-in heading changes consistent with range safety limitations.

TEST PROCEDURES

The procedures used as a guide in assessing the weapon delivery performance of the competing aircraft were prepared jointly by USAF, AFSC, ADTC, ASD, TAC, AFFTC and private consultants.

WEAPON DELIVERY

Two AFFTC test pilots and two TAC pilots were selected to participate in the A-X weapon delivery portion of the AFFE. These pilots participated in an A-37 Weapon Delivery Training and Evaluation Program with three other pilots prior to the AFFE. Profiles and procedures designed for the AFFE were utilized. Weapon delivery scores obtained during this evaluation were considered to insure the selection of four closely matched pilots to participate in the AFFE. Results of this evaluation are contained in reference 1.

An A-9A and an A-10A aircraft were flown as a flight of two for weapon delivery over the Precision Impact Range to reduce environmental variables. They flew the same sequence of headings, profiles, and events. A special scheduling system was implemented to insure that each of the four pilots flew an equal number of missions in each aircraft and that each aircraft flew as flight lead and number two an equal number of times. In addition, the A-X weapon delivery pilots rotated between the A-9A and A-10A to permit flying of different aircraft on consecutive sorties whenever possible.

The tests were flown in five different profiles designated as Alpha, Bravo, Charlie, Delta, and Echo. A description of these profiles is presented in table I. No dry passes were allowed. Existing pilot balloon (PIBAL) winds were provided to the pilots prior to each mission. Each aircraft was ballasted to simulate the operating weight and inertias of the proposed production aircraft. Weapon loading was full 20mm ammunition in all cases plus either 10 MK-82 (one per pylon) or 6 B-37K racks with BDU-33's (4 per rack) and 4 inert MK-82's on single pylons on the outer most stations.

BOMBING

The release altitudes were selected to assure recovery within the aircraft and range operating restrictions. A specified roll-in altitude was used for each profile and the release altitude calculated to permit pullout using a 2-second buildup to 4 g's (or 80 percent of maximum usable lift). The minimum altitudes for the profiles were above the MK-82 fragmentation pattern. The difference between the roll-in altitude and release altitude was set to the minimum feasible level based on previous A-1 and A-37 flight experience. In any case it did not exceed six seconds tracking time for bombing. One bomb was delivered per pass with the bombing attack azimuth changing at least 90 degrees for each pass. These attack headings corresponded to the cardinal headings. Three bombing passes were performed per profile, i.e., three profile Alpha deliveries followed by three profile Bravo deliveries, until all programmed bombs were released. The initial profile for a mission was rotated so that an equal number of bombs were released for each profile. Bomb release sequence by station was stipulated prior to mission launch. During the mission, weapon impacts were recorded by range personnel using the triangulation method. Immediately following the mission these impacts were surveyed.

STRAFING

Strafing passes were conducted on the Dual-Air-Ground-Range (DAGRAG). Four strafing passes were performed per profile on the same heading. Strafing duration was limited to 60 rounds per pass by a timer. A new strafing banner was used for each pass. These banners were mounted at 45 and 15 degrees to the vertical for profiles DELTA and ECHO, respectively. Tracking time for the DELTA profile was limited by restricting the roll-in altitude as described for the bombing profiles. ECHO tracking time was restricted by initiating the final approach at a specified altitude and ground distance from the target. The hits in the 20- X 20-foot banner were scored to determine the hits within a 3-foot and 6-foot radius for profiles Echo and Delta, respectively.

Table I

A-10A WEAPON DELIVERY RELEASE CONDITIONS

	Flight Profile				
	ALPHA	BRAVO	CHARLIE	DELTA	ECHO
Base altitude (ft AGL)	8,200	4,500	2,600	5,100	1,100
Base airspeed (KIAS)	220	220	220	220	165
Dive angle (deg)	60	45	25	45	10-20
Speed brake (pct)	30	40 ^a 45 ^b	35 ^a 40 ^b	30	0
Power setting	IDLE	IDLE	IDLE	IDLE	IDLE
Release altitude (ft AGL)	4,550	2,250	1,250	2,700	--- ^c
Release airspeed (KIAS/KCAS)	340/350	265/275	240/250	290/300	165/175
Sight setting (MILS)	100 ^a 096 ^b	160 ^a 158 ^b	200 ^a 198 ^b	000	006

^aBDU-33

^bMK-82

^cCease fire before 1,600-foot foul line.

OPTIMUM WEAPON DELIVERY PROFILE

The weapon delivery portion of the A-X AFFE was designed to detect and emphasize differences in capability between the A-9 and A-10 aircraft. As a result the best possible accuracies were not shown because the optimum release condition for each aircraft was not used. Therefore, an additional test was designed to obtain the scores for each aircraft using the contractor's estimated optimum delivery condition. This test was accomplished after the completion of the weapon delivery phase of the AFFE.

The basic test procedures used during this test were the same as those used in the weapon delivery portion of the AFFE with the following exceptions:

1. Only one contractor-defined profile was used during this evaluation.
2. All releases were made from the same attack heading.
3. Twenty-four BDU-33 bombs were dropped from each aircraft during each mission.
4. The four pilots used during the AFFE weapon delivery evaluation were used in this test. In general, the two pilots with the best scores in the A-9 aircraft evaluated the A-9 and the two pilots with the best scores in the A-10 aircraft evaluated the A-10.

WEAPON DELIVERY EFFECTIVENESS ANALYSIS

Weapon delivery assessment was based on weapon effectiveness where weighting factors were assigned to scoreable bomb impacts, gross bomb misses and scoreable strafing impacts. The scoring target arrangement is illustrated in figure 1.

For bombing, each bomb was scored as a hit (impact within Area I), or a gross miss (impact within Area II). Radius of the circle for Area I (R) was 40 feet for Profile Alpha, 35 feet for Profile Bravo, and 30 feet for Profile Charlie. Dimension X was 260 feet, 150 feet, and 120 feet for Profiles Alpha, Bravo, and Charlie, respectively.

Likewise, a radius of 6 feet for Area III (r) was used for strafing impacts for Profile Delta and a radius of 3 feet for Profile Echo.

As will be shown later, bomb impact in Area I, or a strafing impact within Area III, was additive (after weighting) to the score. However, gross bomb misses in Area II, subtracted (after weighting) from the score, since such impacts could represent strikes on friendly troops.

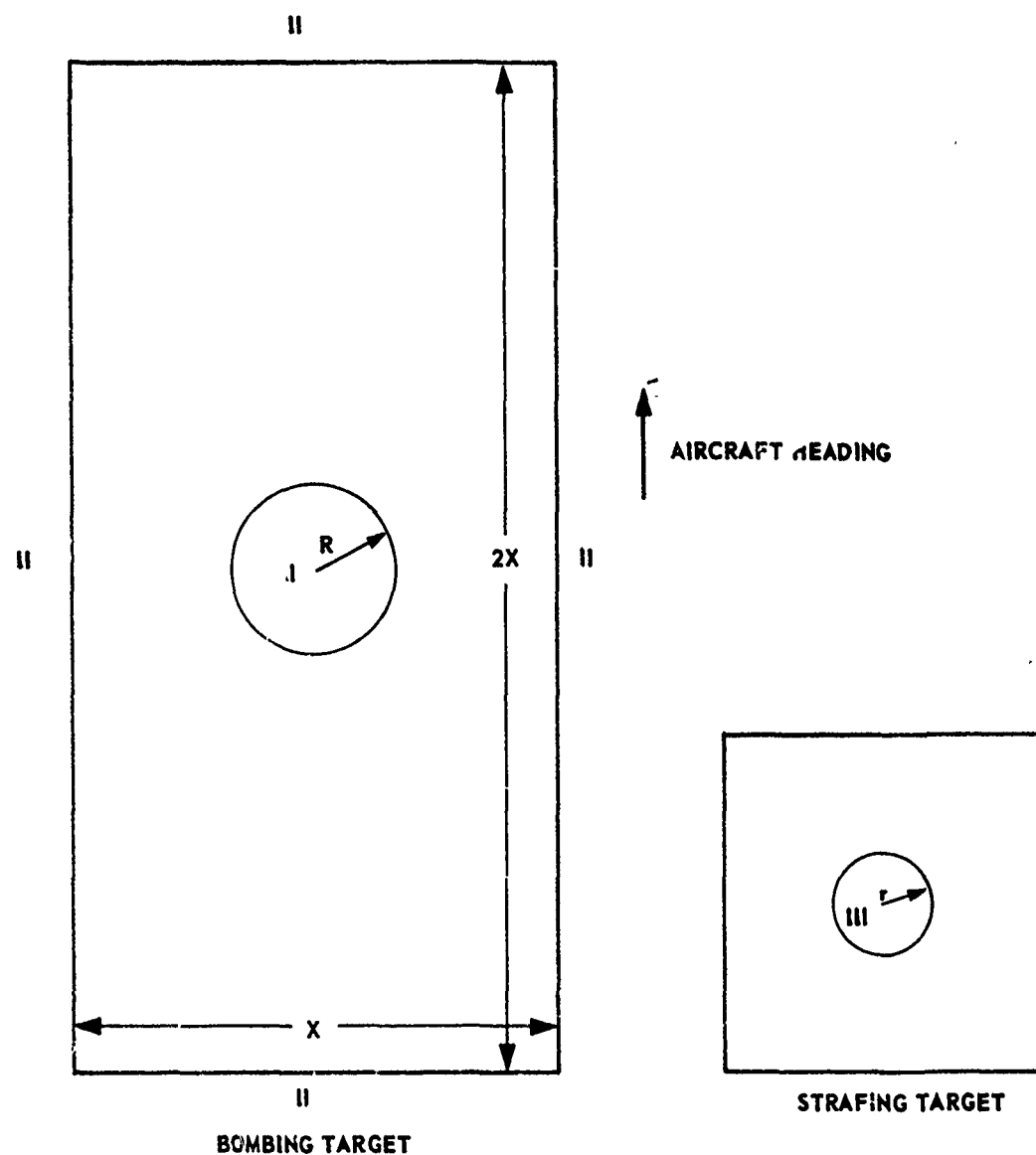


Figure 1 Scoring System

WEIGHTING

The profile weighting factor was applied to the various profiles to designate importance or degree of difficulty. The weights were:

Alpha	30%
Bravo	30%
Charlie	40%
Delta	50%
Echo	50%

The area weight was applied to impact areas based on hits within Area I and Area III being highly desirable and hits within Area II undesirable since it was representative of friendly troop positions.

The weights were:

Weight for bomb impact Area I	200
Weight for bomb impact Area II	-100
Weight for strafing impacts Area III	100

(Note: Bomb impacts within the rectangle X by 2X, but outside Area I, were scored as 0 since such impacts do not constitute an effective target kill.)

These weights were then apportioned to sum to a total average score of 100. The weights were used in the computation of K factors as shown below.

K-FACTORS

K_{AH}	=	6 (0.3) (200)	=	Profile Alpha hit weight
K_{BH}	=	6 (0.3) (200)	=	Profile Bravo hit weight
K_{CH}	=	6 (0.4) (200)	=	Profile Charlie hit weight
K_{AM}	=	6 (0.3) (-100)	=	Profile Alpha gross miss weight
K_{BM}	=	6 (0.3) (-100)	=	Profile Bravo gross miss weight
K_D	=	4 (0.5) (100)	=	Profile Delta hit weight
K_E	=	4 (0.5) (100)	=	Profile Echo hit weight

SCORING

Explanation of Terms

A, B, C, D, E, = Profile Designation

P_H - (subscript H) = Percent of hits (Area I & III) for Profile P (replace P by A, B, C, D, or E).

P_M - (subscript M) = Percent of gross misses (Area II) for Profile P.

P^N - (superscript N) denotes Northrop prototype.

$P_{H(i,j)}$ - (subscripts i and j) denote pilot i and all (sum) j passes (where i can equal 1, 2, 3, or 4 and j equal 1, 2, 3 for bombing or 4 for strafing).

i.e.,

$A_{M(2,3)}^F$ = Percent gross misses for pilot 2, on all 3rd passes, profile Alpha, Fairchild-Republic prototype.

$D_{H(1,2)}^N$ = Average percent hits for pilot 1, on all 2nd passes, profile Delta, Northrop prototype.

A total numerical score was computed for each contractor which defines overall weapon effectiveness. These scores were computed as an average score obtained by each pilot, each profile, and each 1st through N passes. These individual scores were computed as follows:

Bombing effectiveness score for pilot i, all j passes, profile P, Fairchild-Republic prototype:

$$BS_{P(i,j)}^F = K_{PH} \frac{P_{H(i,j)}^F}{P_{H(i,j)}^F + P_{H(i,j)}^N} + K_{PM} \frac{P_{M(i,j)}^F}{P_{M(i,j)}^F + P_{M(i,j)}^N}$$

Bombing effectiveness score for pilot i, all j passes, profile P, Northrop prototype:

$$BS_{P(i,j)}^N = K_{PH} \frac{P_{H(i,j)}^N}{P_{H(i,j)}^F + P_{H(i,j)}^N} + K_{PM} \frac{P_{M(i,j)}^N}{P_{M(i,j)}^F + P_{M(i,j)}^N}$$

There were 36 individual bombing effectiveness scores for each contractor's prototype (4 pilots x 3 profiles x 3 passes/profile).

Strafing effectiveness score for pilot i, all j passes, profile P, Fairchild-Republic prototype:

$$SS_{P(i,j)}^F = K_P \frac{P_{H(i,j)}^F}{P_{H(i,j)}^F + P_{H(i,j)}^N}$$

Strafing effectiveness score, for pilot i, all j passes, profile P, Northrop prototype:

$$SS_{P(i,j)}^N = K_P \frac{P_{H(i,j)}^N}{P_{H(i,j)}^F + P_{H(i,j)}^N}$$

There were 32 possible strafing effectiveness scores for each contractor's prototype (4 pilots x 2 profiles x 4 passes/profile).

TEST RESULTS

BOMBING

The bombing results are presented in the following format: scatter plots per profile, frequency and cumulative distribution plots per profile in both feet and mils, overall frequency and cumulative distribution plots in both feet and mils, and first, second, and third pass cumulative distribution per profile.

Specifics for each mission are presented in tabular form in the Mission Summary Section. This tabulated data shows the atmospheric conditions, release conditions, surveyed impact, pilot, profile, and other pertinent data.

Figures 2, 3, 4, 6, 8, 10, 12, 14, 16, 18, 20, 32, 33, 36, 37, and tables II and IV along with the bombing and strafing scores were submitted to the Source Selection Advisory Council. Table II presents the circular error average (CEA) and the circular error probable (CEP) for the three bombing profiles along with CEA and CEP for all profiles. This data represents 635 bombs and 250 strafing passes. First, second, and third pass cumulative distribution data are presented for each profile in figures 21 through 29. A comparison was made between the data from all passes for a given profile with first, second, or third pass data for that profile. The results are summarized in table III. The results show no overall significant difference in accuracy between first pass, second pass, third pass, and all pass data. The data indicates that the range patterns flown eliminated the effect of pass number on the overall accuracy, and each pass was essentially a "first pass."

STRAFING

The strafing results are presented in the following format: frequency and cumulative plots for hits on the banner and bulls per profile. A bull was a hit within a six-foot radius for profile DELTA and a three-foot radius for profile EC40. Specifics for each mission are presented in the Mission Summary section. This tabulated data shows the pilot, profile, pass, roll-in-direction, rounds fired, hits, bulls, target number, and other pertinent data. Table IV presents the average percent hits and average percent bulls for the two strafing profiles.

OPTIMUM PROFILE

Figure 38 presents the bomb impact points for the optimum weapon delivery profile along with the delivery conditions. The CEA for this profile was 44 feet. This shows an improvement of approximately three to one when compared to the overall CEA of 109 feet obtained using the procedures set up for the A-X AFPE.

BOMBING AND STRAFING EFFECTIVENESS SCORES

The numerical scores for bombing and strafing determined by the weapon delivery scoring system are 129.16 and 100.32, respectively.

Table II

A-10A BOMBING ACCURACY

Flight Profile	CEA No. (ft)/Bombs	CEP (ft)
ALPHA	138/207	114
BRAVO	102/213	93
CHARLIE	88/215	78
OVERALL	109/635	93

Table III

A-10A WEAPON DELIVERY ACCURACY BY PASS

Pass	Flight Profiles		
	ALPHA	BRAVO CEP (ft)	CHARLIE
First	108	102	69
Second	123	89	82
Third	108	89	78
Overall	114	93	78

Table IV

A-10A STRAFING ACCURACY

	Average Percent No. Hits ^a / Passes	Average Percent Bulls ^b
DELTA	18.2/124	6.38
ECHO	61.4/126	6.78

^aHit - Impact on 20 x 20 ft banner

^bBull - Impact within 3 ft radius - ECHO
6 ft radius - DELTA

MISSION SUMMARY

EXPLANATION OF TERMS

<u>Item</u>	<u>Description</u>
A-WIND	Magnitude and direction of wind at release altitude
B-WIND	of profile Alpha, Bravo, and Charlie, respectively.
C-WIND	
Weapon Type	3 - BDU-33 8 - MK-82
Data Code	A - Actual dive angle and release altitude.* B - Nominal dive angle and actual release altitude. C - Actual dive angle and nominal release altitude. D - Nominal dive angle and release altitude.

*Dive angle and release altitude were obtained from radar tracking.

PASS	OPS-NO	PROFILE	CARO- HOG	DATE DAY-MON-YR	A. NO.	MISSION CONT. PILOT			FLT NO.	A-WIND		B-WIND		C-WIND		WEAPON TYPE	ROLL-IN- DIRECTION	
						NO.	SCORE	DOWN-RANGE (FT)		MAG	DIR	MAG	DIR	MAG	DIR		RADIAL MISS (MILS)	PASS SEQ.
	28718			13 10 72	70	2	F	4	2	12	190	02	005	02	.040	3	L	
1	A	E	A	54	3650	3905	202 172	28.1	200.0	6.7	51.2	51.6	1	090				
2	A	N	A	65	3825	4066	162 074	44.6	155.7	10.3	38.2	39.6	2	090				
3	A	H	A	62	3850	4177	20 189	3.1	-19.7	0.6	-4.7	4.7	3	190				
4	B	S	D	45	2250	2797	157 041	-118.4	-103.0	-34.0	-36.8	50.1	1	149				
5	B	E	D	45	2250	2797	186 268	-185.8	6.4	-53.4	2.3	53.4	2	149				
6	B	H	D	45	2250	2797	147 251	-47.8	-138.9	-13.7	-49.6	51.5	3	149				
7	C	H	D	25	1250	2144	70 280	68.9	12.1	18.7	5.6	19.5	1	186				
8	C	S	A	33	1400	2027	86 139	-66.8	-54.1	-22.7	-26.6	35.0	2	186				
9	C	E	D	25	1250	2144	30 342	-9.2	-28.5	-2.5	-13.3	13.5	3	186				
10	A	N	A	63	4275	4605	34 285	8.7	-32.8	1.7	-7.1	7.3	1	090				
11	A	H	A	58	4175	4679	114 105	-110.1	-29.5	-20.9	-6.3	21.9	2	090				
12	A	S	A	60	3950	4352	134 063	-60.8	-119.3	-12.6	-27.4	30.2	3	090				
13	B	E	A	43	2250	2873	103 298	-90.9	-48.3	-24.7	-16.8	29.9	1	149				
14	B	N	A	41	2500	3285	239 263	-29.1	-237.2	-6.7	-72.1	72.5	2	149				
15	B	H	A	43	2250	2873	75 185	6.5	-74.7	1.7	-26.0	26.0	3	149				
16	C	S	A	35	1300	1817	95 187	94.2	11.5	37.0	6.3	37.6	1	186				
17	C	E	A	27	1500	2455	115 262	-113.8	16.1	-28.3	6.5	29.1	2	186				
18	C	N	A	32	1600	2361	102 225	-72.1	-72.1	-20.6	-30.5	36.8	3	186				
19	A	H	A	58	4150	4651	54 076	-52.3	13.0	-10.0	2.8	10.4	1	190				
20	A	S	A	57	4175	4721	157 010	-154.6	-27.2	-28.9	-5.7	29.5	2	090				
21	A	E	A	64	4950	5296	298 347	-67.0	-290.3	-11.8	-54.8	56.0	3	090				
22	B	N	A	44	2700	3401	227 252	-70.1	-215.8	-16.3	-63.4	65.5	1	149				
23	B	H	A	41	2575	3384	138 112	-127.9	-51.6	-28.7	-15.2	32.5	2	149				
24	B	S	A	43	2425	3097	91 274	-6.3	90.7	-1.6	29.3	29.3	3	149				

PASS	OPS-NO	DATE			A/C	MISSION CONT.			PILOT	FBI				BCH				MAG DIR	CROSS-RANGE (MILS)	WEAPON	ORIENTATION	
		DAY	MON	YR		ALT (FT)	SLANT-RANGE (FT)	SCORE		DOWN-RANGE (FT)	CROSS-RANGE (FT)	MAG DIR	DOWN-RANGE (MILS)	CROSS-RANGE (MILS)	RADIAL MISS (MILS)	PASS SEQ.	DIR					
	29202	18	10	72	70	5	F	1	2	01	105	02	010	05	300	3		L				
	PROFILE	CARD-HDG	DATA	DIVE																		
2	A	N	A	60	4407	97	166	-94.1	23.4	-19.3	5.3	20.0	2	090								
3	A	M	A	58	4819	145	066	-132.4	58.9	-24.5	12.2	27.4	3	090								
5	B	E	A	48	2577	105	004	7.3	-104.7	2.3	-40.6	40.7	2	149								
6	B	N	A	50	2600	94	284	22.7	-91.2	6.3	-29.9	30.5	3	149								
7	C	M	A	37	1150	236	088	-235.8	8.2	-12.0	5.2	12.1	1	186								
8	C	S	A	39	1250	122	351	-120.4	19.0	-55.9	11.6	57.1	2	186								
9	C	E	A	38	1251	119	281	-117.1	-20.6	-52.8	-12.4	54.2	3	186								
12	A	S	A	50	3825	267	357	-266.6	13.9	-55.4	3.2	55.5	3	090								
13	B	E	A	49	2150	75	156	7.8	-74.5	2.5	-29.2	29.3	1	149								
14	B	N	A	49	2700	55	351	54.3	-8.6	14.3	-2.6	14.5	2	149								
15	B	M	A	51	2300	127	116	-114.1	-55.6	-36.8	-20.8	42.3	3	149								
16	C	S	A	42	1225	128	080	-22.2	-126.0	-11.4	-81.8	82.6	1	186								
17	C	E	A	30	1225	145	083	143.9	-17.6	49.8	-9.3	51.7	2	186								
18	C	N	A	35	1425	95	156	-86.7	38.6	-31.1	19.3	36.6	3	186								
19	A	M	A	63	3986	156	107	-149.1	-45.6	-34.7	-11.4	36.5	1	090								
20	A	S	A	58	3813	223	111	-218.9	-42.5	-51.2	-11.1	52.4	2	090								
21	A	E	A	62	4000	160	310	-122.5	-102.8	-26.0	-23.6	35.1	3	090								
22	B	N	A	49	2550	131	125	118.7	55.3	33.1	18.3	37.8	1	149								
23	B	M	A	50	2050	167	106	-160.5	-46.0	-56.9	-19.1	60.1	2	149								
24	B	S	A	47	2125	150	161	141.8	-48.8	45.3	-18.9	49.1	3	149								

PASS	PROF	CPS-NO	DATE DAY-MON-YR	CARD- HOG	DATA CODE	ALT (FT)	A/C NO.	MISSION CONT. PILOT NO.	SCORE MAG	DOWN-RANGE (FT)	FLY NO.	A-WIND MAG DIR	B-WIND MAG DIR	C-WIND MAG DIR	WEAPON TYPE	ROLL-IN- DIRECTION	MIL SEQ.	
29347			19 10 72				7	6	F	4	2	03	305	03	295	06	265	L
1	B	E	A	40	2725	3601		101	064	90.7		-44.2	19.0	-12.2		22.6	1	160
2	B	N	A	40	2150	2841		111	236	-62.0		-92.0	-16.5	-32.3		36.3	2	160
3	B	M	A	35	2130	3413		161	114	-147.0		-65.4	-34.0	-21.7		40.3	3	160
4	C	S	A	27	0875	1406		125	129	78.6		-97.1	34.7	-69.1		77.3	1	200
5	C	E	A	30	0850	1283		99	049	74.7		-64.9	38.5	-50.5		63.5	2	200
6	C	N	A	30	1200	1812		104	307	62.5		-83.0	22.8	-45.8		51.2	3	200
7	A	H	A	66	4250	4475		47	128	-37.0		-28.9	-7.8	-6.4		10.1	1	100
8	A	S	A	58	4000	4460		145	063	-65.8		-129.1	-13.2	-28.9		31.8	2	100
9	A	E	A	60	3850	4223		54	117	48.1		24.5	10.3	5.8		11.8	3	100
10	B	N	A	42	2300	2952		118	253	-34.5		-112.8	-9.1	-38.2		39.2	1	160
11	B	M	A	42	2200	2824		113	115	-102.4		-47.7	-28.2	-16.9		32.9	2	160
12	B	S	A	45	2275	2806		70	130	44.9		-53.6	12.9	-19.1		23.1	3	160
13	C	E	A	30	1075	1623		44	087	43.9		-2.3	17.9	-1.4		17.9	1	200
14	C	N	C	30	1250	1887		101	203	-92.9		-39.4	-32.6	-20.9		38.7	2	200
15	C	M	O	25	1250	2103		189	202	70.8		-175.2	20.0	-83.3		85.6	3	200
16	A	S	A	57	3900	4387		28	118	13.1		-24.7	2.6	-5.6		6.2	1	100
17	A	E	A	58	4200	4683		50	180	0.0		49.9	0.0	10.6		10.6	2	100
18	A	N	A	60	3850	4223		87	273	4.5		-86.8	0.9	-20.5		20.5	2	100
19	B	M	A	43	2350	2975		129	172	-17.9		-127.7	-4.7	-42.9		43.1	1	160
20	B	S	A	42	2200	2824		101	115	42.6		-91.5	11.7	-32.4		34.4	2	160
21	B	E	A	43	2450	3102		47	211	-24.2		40.2	-6.1	12.9		14.3	3	160
22	C	N	A	33	1600	2284		215	319	162.2		-141.0	49.7	-61.7		79.2	1	200
23	C	M	A	33	1375	1963		27	226	19.4		-18.7	6.9	-9.5		11.8	2	200
24	C	S	A	35	1350	1862		27	119	8.7		-25.5	3.4	-13.7		14.1	3	200

PASS	PROFILE	CPS-NO	CARD-NO	DATE	DAY-MON-YR	A/C NO.	MISSION CONT. PILOT		FLY NO.	A-WIND		B-WIND		C-WIND		WEAPON TYPE	ROLL-IN-DIRECTION	
							NO.	SCORE		MAG	DIR	MAG	DIR	MAG	DIR		PASS SEQ.	MIL SET.
		29552		21	1	72	7	8	F	1	19	030	05	330	04	260	3	L
1	A		E	A	50	4200	4607	380	203	-148.4	349.7	-29.3	75.9	81.4	1	100		
2	A		N	A	50	4300	4716	325	183	-324.5	-17.0	-62.7	-3.6	62.8	2	100		
3	A		W	A	61	4650	5361	226	164	-62.2	-217.2	-11.3	-42.9	44.3	3	100		
4	B		S	A	54	2350	2633	143	220	109.5	91.9	37.1	55.3	50.9	1	160		
5	B		E	A	46	2500	3345	173	167	38.9	168.5	10.4	55.3	56.3	2	160		
6	B		N	A	42	2450	3145	20	012	19.5	4.1	4.8	1.3	5.0	3	160		
7	C		W	A	31	1425	2111	109	098	-167.9	-15.1	-34.5	-7.1	35.2	1	200		
8	C		S	A	38	1600	2105	51	136	36.6	-35.4	13.2	-16.8	21.4	2	200		
9	C		E	A	37	1350	1803	73	065	66.1	-33.8	27.4	-17.1	32.3	3	200		
10	A		N	A	58	3450	3847	39	128	-24.0	30.7	-5.5	7.9	9.7	1	100		
11	A		W	A	59	4225	4672	141	165	-36.4	-136.1	-7.0	-29.1	29.9	2	100		
12	A		S	A	59	4850	5363	100	301	-51.5	85.7	-8.6	15.9	18.1	3	100		
13	B		E	A	46	2150	2619	94	003	4.9	-93.8	1.5	-35.8	35.8	1	160		
14	B		N	A	42	2050	2631	53	066	21.5	48.4	6.3	18.3	19.4	2	160		
15	B		W	A	48	2125	2528	127	063	-113.1	57.6	-37.5	22.7	43.9	3	160		
16	C		S	A	34	1425	1999	57	328	-48.3	30.2	-17.2	15.1	22.9	1	200		
17	C		E	A	34	1400	1964	93	114	84.9	37.8	30.8	19.2	36.3	2	200		
18	C		N	A	31	1500	2222	88	051	55.3	68.3	16.8	30.7	35.3	3	200		
19	A		W	A	61	4000	4354	137	107	-131.0	-40.0	-27.6	-9.1	29.1	1	100		
20	A		S	A	59	4475	4948	117	306	-68.7	94.6	-12.5	19.1	22.8	2	100		
21	A		E	A	64	4200	4477	43	155	18.1	38.9	3.8	8.7	9.5	3	100		
22	B		N	A	38	2250	3068	81	229	-53.1	-61.1	-12.7	-19.9	23.6	1	160		
23	B		W	A	49	2625	3089	135	179	-2.3	-134.9	-0.6	-43.6	43.6	2	160		
24	B		S	A	53	2550	2883	205	158	190.0	-76.7	58.2	-26.6	64.3	3	160		

PASS	PROFILE	OPS-NO	CARD-NO	DATE	DAY-MON-YR	A/C NO.	MISSION CONT. PILOT			FLT NO.	A-WIND MAG DIR	B-WIND MAG DIR	C-WIND MAG DIR	WEAPON TYPE	ROLL-IN-DIRECTION				
							SCORE	DOWN-RANGE (FT)	CROSS-RANGE (FT)										
29702				23	10	72	70	9	F	3	1	14	095	13	085	11	075	3	R
1	C	E	A	31	1100	1629	75	018	23.1	-71.3	9.6	-43.7	44.8	1	200				
2	C	S	A	36	1300	1764	67	142	52.7	-41.2	22.0	-23.3	32.1	2	200				
3	C	M	A	28	1400	2202	85	107	-81.2	-24.8	-23.4	-11.2	26.0	3	200				
4	A	N	A	67	4650	4869	223	153	-198.6	101.2	-30.9	20.7	44.1	1	100				
5	A	E	A	07	4625	4843	228	193	-51.2	222.1	-10.1	45.8	46.9	2	100				
6	A	S	A	62	3950	4268	89	121	-83.6	-30.4	-18.1	-7.1	19.4	3	100				
7	B	M	A	41	2100	2734	152	346	36.7	147.4	10.3	53.9	54.9	1	160				
8	B	N	A	50	2250	2620	118	325	96.6	-67.6	31.6	-25.8	40.8	2	160				
9	B	E	A	48	2300	2737	17	203	-6.6	15.6	-2.0	5.7	6.0	3	160				
10	C	S	A	31	1250	1851	160	208	141.2	75.1	51.5	40.5	65.5	1	200				
11	C	M	A	35	1200	1655	132	350	22.9	129.9	10.0	78.5	79.1	2	200				
12	C	N	A	35	1375	1896	172	319	129.8	-112.8	49.6	-59.4	77.4	3	200				
13	A	E	A	61	4150	4517	27	065	24.4	-11.4	4.9	-2.5	5.5	1	100				
14	A	S	A	64	4100	4370	99	072	-30.5	-94.1	-6.5	-21.5	22.5	2	100				
15	A	M	A	63	4200	4507	330	338	123.6	305.9	25.5	67.8	72.5	3	100				
17	B	E	A	43	2000	2532	50	340	-17.1	-46.9	-5.3	-18.5	19.3	2	160				
18	B	S	A	47	2200	2648	152	165	146.8	-39.3	46.0	-14.8	48.3	3	160				
19	C	M	A	37	1300	1736	201	344	55.4	193.2	23.8	11.2	13.7	1	200				
20	C	N	A	30	1350	2339	69	255	-17.8	-66.6	-5.7	-32.6	33.1	2	200				
21	C	E	A	35	1100	1517	68	273	-67.9	-3.5	-32.4	-2.3	32.5	3	200				
22	A	S	A	63	4100	4399	86	326	-71.2	48.6	-15.1	10.9	18.6	1	160				
23	A	M	A	60	4225	4634	255	329	131.3	218.5	25.8	47.1	53.7	2	100				
24	A	N	A	62	3850	4160	115	331	100.5	-55.7	22.3	-13.4	26.3	3	100				

PASS	PROFILE	CPS-NO	DATE		A/C	MISSION CONT. PILOT		FLT	A-WIND		B-WIND		C-WIND		WEAPON	ROLL-IN-	
			DAY-MON-YR	TIME	NO.	NO.	NO.		NO.	DIR	MAG	DIR	MAG	DIR		TYPE	DIRECTION
		29803	24 10 72		70	10	F 2	1	12	355	09	355	07	355	3	L	
			CARD-HDG	DATA DIVE CODE ANG.	ALT (FT)	SLANT-RANGE (FT)	SCORE MAG ANG	DOWN-RANGE (FT)	CROSS-RANGE (FT)	DOWN-RANGE (MILS)	CROSS-RANGE (MILS)	CROSS-RANGE (MILS)	CROSS-RANGE (MILS)	CROSS-RANGE (MILS)		RADIAL MISS (MILS)	PASS SEQ. SET.
1	A		E	A 59	4125	4561	150 269	-149.9	2.6	-29.7	0.5	-29.7	0.5		29.7	1	100
2	A		N	A 57	4000	4500	109 214	-90.3	-60.9	-17.6	-13.5	-17.6	-13.5		22.4	2	100
3	A		H	A 61	3925	4272	83 073	-79.3	24.2	-17.0	5.6	-17.0	5.6		17.9	3	100
4	B		S	A 43	2130	2775	47 115	19.8	-42.5	5.4	-15.3	5.4	-15.3		16.2	1	160
5	B		E	C 35	2250	3229	53 279	-52.3	-8.2	-11.2	-2.5	-11.2	-2.5		11.5	2	160
6	B		N	D 45	2250	2775	85 219	-66.0	-53.4	-19.2	-19.2	-19.2	-19.2		27.2	3	160
7	C		H	D 25	1250	2103	50 112	-46.3	-18.7	-13.0	-8.9	-13.0	-8.9		15.8	1	200
8	C		S	D 25	1250	2103	151 114	61.3	-137.6	17.2	-65.1	17.2	-65.1		67.3	2	200
9	C		E	D 25	1250	2103	81 102	79.2	16.8	22.3	8.0	22.3	8.0		23.7	3	200
10	A		N	D 60	4550	4991	79 211	-67.7	-40.6	-12.3	-8.1	-12.3	-8.1		14.6	1	100
11	A		H	D 61	4550	4991	107 128	-84.3	-65.8	-15.4	-13.1	-15.4	-13.1		20.2	2	100
12	A		S	D 60	4550	4991	46 045	-32.5	-32.5	-5.9	-6.5	-5.9	-6.5		8.8	3	100
13	B		E	D 45	2250	2775	102 219	-62.7	80.3	-18.3	28.9	-18.3	28.9		34.2	1	160
14	B		N	D 45	2250	2775	13 187	-12.9	-1.5	-3.7	-0.5	-3.7	-0.5		3.8	2	160
15	B		H	D 45	2250	2775	44 066	-40.1	17.8	-11.7	6.4	-11.7	6.4		13.3	3	160
16	C		S	D 25	1250	2103	37 120	19.5	-32.0	5.2	-15.2	5.2	-15.2		16.1	1	200
17	C		E	D 25	1250	2103	69 016	19.0	-66.3	5.3	-31.5	5.3	-31.5		31.9	2	200
18	C		N	D 25	1250	2103	32 319	24.1	-20.9	6.8	-9.9	6.8	-9.9		12.0	3	200
19	A		H	D 60	4550	4991	99 121	-84.8	-50.9	-15.4	-10.2	-15.4	-10.2		18.5	1	100
20	A		S	D 60	4550	4991	142 042	-105.5	-95.0	-19.2	-19.0	-19.2	-19.0		27.0	2	100
21	A		E	D 60	4550	4991	64 101	62.8	12.2	11.4	2.4	11.4	2.4		11.7	3	100
22	B		N	D 45	2250	2775	118 184	-117.7	-8.2	-34.3	-2.9	-34.3	-2.9		34.5	1	160
23	B		H	D 45	2250	2775	24 241	20.9	-11.6	6.1	-4.1	6.1	-4.1		7.4	2	160
24	B		S	D 45	2250	2775	67 356	-66.8	4.6	-19.5	1.6	-19.5	1.6		19.5	3	160

PASS	PRF FILE	OPS-NO	CARD- HDG	DATE DAY-MON-YR	ALT (FT)	A/C NO.	MISSION CONT. PILOT			DOWN-RANGE (FT)	CROSS-RANGE (FT)	A-WIND		B-WIND		C-WIND		WEAPON TYPE	ROLL-IN- DIRECTION	
							NO.	SCORE MAG ANG	NO.			MAG DIR	NO.	MAG DIR	NO.	MAG DIR	NO.			MAG DIR
		30103		27 10 '72		70	13	F	2			2	10	180	14	230	19	245	3	L
1	B	E	0	45	2250	2775	41	126	32.3	23.5	9.4	8.4	12.5	1	160					
2	B	N	A	36	2000	2620	34	248	-12.7	-31.5	-3.2	-11.1	11.6	2	160					
3	B	W	A	42	2000	2567	16	101	-157.1	-39.5	-47.6	-11.8	49.1	3	160					
4	C	S	A	27	1300	2090	117	078	-24.3	-114.4	-7.2	-54.7	55.2	1	200					
5	C	E	A	20	1400	2301	16	157	13.4	-8.7	3.5	-3.7	5.1	2	200					
6	C	N	A	26	1250	2055	126	009	124.7	17.5	36.9	8.5	37.8	3	200					
7	A	W	A	58	3850	4293	71	149	-36.5	-60.8	-7.6	-14.1	16.1	1	100					
8	A	S	A	62	4500	4862	182	003	-179.7	-28.4	-34.2	-5.8	34.7	2	100					
9	A	E	A	60	2050	2248	85	015	22.0	-82.1	8.9	-36.5	37.5	3	100					
10	B	N	A	39	3000	4026	33	293	12.8	-30.3	2.3	-7.5	7.9	1	160					
11	B	W	A	45	2100	2590	51	171	-7.9	-50.3	-2.4	-19.4	19.6	2	160					
12	B	S	A	45	2000	2466	42	073	-12.2	-40.1	-4.0	-16.2	16.7	3	160					
13	C	E	A	28	1400	2202	81	071	76.5	-26.3	22.0	-11.9	25.1	1	200					
14	C	N	A	29	1500	2311	217	355	216.1	-18.9	60.6	-8.1	61.2	2	200					
15	C	W	A	34	1275	1788	62	222	41.4	-46.0	16.5	-25.7	30.6	3	200					
16	A	S	A	57	4150	4668	20	141	-153.2	-128.5	-29.1	-27.5	40.1	1	100					
17	A	E	A	56	3850	4371	29	301	-24.8	-14.9	-5.0	-3.4	6.0	2	100					
18	A	N	A	57	4000	4500	67	139	-50.5	43.9	-9.9	9.7	13.9	3	100					
19	B	W	A	45	2100	2590	128	203	50.0	-117.8	15.6	-45.4	48.1	1	160					
20	B	S	A	44	2100	2623	56	063	-25.4	-49.8	-7.7	-19.0	20.5	2	160					
21	S	E	A	37	2150	2980	8	192	-1.6	7.8	-0.4	2.6	2.6	3	160					
22	C	N	A	23	1200	2120	104	002	103.9	3.6	27.7	1.7	27.7	1	200					
23	C	W	A	27	1250	2009	6	271	59.9	-0	18.5	0.0	18.5	2	200					
24	C	S	A	30	1200	-812	64	168	62.6	-13.3	22.8	-7.3	24.0	3	200					

PASS	PROFILE	GPS-NO	DAY/MON-YR				ADG	MISSION CONT. PILOT				RBT	MAGNITUDE				MAGNITUDE	WEAPON	CORRECTION
			28	10	72	DATA CODE		ALT (FT)	SLANT-RANGE (FT)	SCORE	F		1	CROSS-RANGE (FT)	DOWN-RANGE (MILS)	CROSS-RANGE (MILS)			
30202																			
1	B	E	A	40	1	5	2610		54	174	5.6	53.7	1.6	20.5	20.6	1	160		
2	B	N	A	39	2100		2818		93	229	-61.0	-70.1	-16.1	-24.9	29.6	2	160		
3	B	M	A	47	2450		2943		19	107	-18.1	-5.5	-5.1	-1.8	5.4	3	160		
4	C	S	A	32	1425		2071		99	178	98.9	-3.4	32.8	-1.6	32.8	1	200		
5	C	E	A	36	1575		2137		137	087	136.8	-7.1	47.1	-3.3	47.2	2	200		
6	C	N	A	28	1450		2281		30	113	-11.7	27.6	-3.2	12.1	12.5	3	200		
7	A	M	A	57	3850		4331		219	124	-181.5	-122.4	-37.2	-28.2	46.7	1	100		
8	A	S	A	65	4150		4395		36	320	-27.5	23.1	-5.9	5.2	7.9	2	100		
9	A	E	A	65	4225		4475		12	221	-7.8	9.3	-1.6	2.0	2.6	3	100		
10	B	N	B	45	2450		3021		67	268	-2.3	-66.9	-0.6	-22.1	22.1	1	160		
11	B	M	A	50	2650		3086		26	162	-8.0	-24.7	-2.2	-8.1	8.3	2	160		
12	B	S	A	44	2200		2748		47	176	46.8	-3.2	13.6	-1.1	13.7	3	160		
13	C	E	A	29	1350		2080		46	128	36.2	28.3	11.3	13.6	17.6	1	200		
14	C	N	A	32	1475		2144		72	353	71.4	-8.7	22.9	-4.0	23.2	2	200		
15	C	M	A	35	1300		1764		81	149	-41.7	-69.4	-17.4	-39.3	43.9	3	200		
16	A	S	A	65	46.1		48.5		23	321	-17.8	14.4	-3.4	2.3	4.5	1	100		
17	A	E	A	65	4400		4661		85	129	66.0	53.4	13.3	11.4	17.6	2	100		
18	A	N	A	50	4200		46.7		56	198	-53.2	-17.3	-10.5	-3.7	11.1	3	100		
19	B	M	A	45	2300		2836		102	121	-87.4	-52.5	-24.9	-18.5	31.0	1	160		
20	B	S	A	46	2210		2741		55	166	53.3	-13.3	15.9	-4.8	16.7	2	160		
21	B	E	A	42	2100		2695		90	149	46.3	77.1	13.3	28.6	31.5	3	160		
22	C	N	A	31	1400		2073		45	323	35.9	-27.0	11.6	-13.0	17.5	1	200		
23	C	M	A	38	1475		1940		127	152	-59.6	-112.1	-23.3	-57.7	62.3	2	200		
24	C	S	A	31	1300		1925		108	176	107.7	-7.5	37.7	-3.9	37.9	3	200		

OPS-NO	PASS PROFILE	CARD-HOG	DATE DAY-MON-YR	ALT (FT)	A/C NO.	MISSION CONT. PILOT		DOWN-RANGE (FT)	CROSS-RANGE (FT)	A-WIND		B-WIND		C-WIND		WEAPON TYPE	ROLL-IN-DIRECTION	
						NO.	SCORE MAG ANG			NO.	MAG DIR	MAG DIR	MAG DIR	MAG DIR	MAG DIR		RADIAL MISS (MILS)	PASS SER.
32005			15 11 72		69	16	F	4	1	20	268	19	253	17	238	3	R	
1	C	E	D	25	1250	2103	72 268	-71.9	2.5			-20.3		1.1		20.3	1	200
2	C	S	D	25	1250	2103	81 179	80.9	-1.4			22.8		-2.6		22.8	2	200
3	C	H	B	25	1250	2103	130 293	119.6	50.7			33.8		24.1		41.5	3	200
4	A	N	A	62	4250	4592	241 272	6.4	-240.8			1.6		-52.4		52.4	1	100
5	A	E	A	62	4575	4943	440 139	288.6	332.0			54.0		67.1		86.2	2	100
6	A	S	A	72	5625	5756	390 205	353.4	164.8			59.9		28.6		66.4	3	100
7	B	H	A	42	2525	3241	91 335	38.4	82.4			9.2		25.4		27.0	1	160
8	B	N	A	43	2250	2848	196 354	194.9	-20.4			54.0		-7.1		54.5	2	160
9	B	E	A	37	2275	3153	50 305	-46.9	-28.6			-9.3		-9.0		13.0	3	160
10	C	S	A	32	1550	2253	4 180	3.9	0.0			1.2		0.0		1.2	1	200
11	C	H	C	31	1250	1851	168 305	137.6	96.3			50.1		52.0		72.2	2	200
12	C	N	A	34	1325	1859	185 351	182.7	-28.9			70.0		-15.5		71.7	3	200
13	A	E	A	58	4350	4851	180 149	92.7	154.2			17.1		31.8		36.1	1	100
14	A	S	A	68	4500	4687	320 256	77.4	310.4			15.8		66.2		68.1	2	100
15	A	H	C	56	4550	5166	36 314	25.8	29.0			4.4		4.8		6.5	3	100
16	B	N	A	36	2575	3631	148 218	-116.6	-91.1			-22.7		-25.0		33.8	1	160
17	B	E	A	34	2525	3690	105 276	-104.4	-10.9			-19.3		-2.9		19.5	2	160
18	B	S	A	42	2325	2984	9 199	85.0	29.3			22.2		9.8		24.2	3	160
19	C	H	A	28	1350	2124	108 234	87.3	-63.4			26.1		-29.8		39.7	1	200
20	C	N	A	32	1450	2108	166 034	137.6	92.8			44.9		44.0		62.8	2	200
21	C	E	A	24	1525	2628	36 022	13.4	-33.3			2.9		-12.6		13.0	3	200
22	A	S	A	63	4725	5070	250 267	13.0	249.6			2.4		49.2		49.2	1	100
23	A	H	A	59	4200	4644	74 078	-72.3	15.3			-14.0		3.3		14.4	2	100
24	A	N	A	53	3975	4395	15 053	9.0	11.9			1.8		2.7		3.2	3	100

OPS-NO	CARD- HOG	DATE DAY-MON-YR	A/C NO.	MISSION CONT. PILOT	FLY NO.	A-WIND MAG DIR	B-WIND MAG DIR	C-WIND MAG DIR	WEAPON TYPE	SOIL-IN- DIRECTION
PASS	PROFILE	DATA CODE	ALT (FT)	SCORE MAG ANG	DOWN-RANGE (FT)	CROSS-RANGE (FT)	DOWN-RANGE (MILS)	CROSS-RANGE (MILS)	RADIAL MISS (MILS)	PASS SEQ.
32205		17 11 72	69	17	F 1	1 09 195	08 035	10 034	8	L
1	C	A 26	1150	115 208	-53.9	101.5	-17.2	53.5	56.2	1 198
2	C	A 34	1450	33 066	13.4	30.1	4.6	14.7	15.5	2 198
3	C	A 27	1525	39 299	34.1	18.9	8.6	7.6	11.5	3 198
4	B	A 34	2110	12 316	-86.3	63.3	-19.1	27.0	33.1	1 158
5	B	A 36	2000	130 273	-129.8	-6.8	-32.5	-2.4	32.6	2 158
6	B	A 43	2025	126 112	-26.1	123.2	-8.0	47.9	48.6	3 158
7	C	A 28	1025	22 264	21.8	-2.2	8.5	-1.4	8.6	1 198
8	C	A 31	1000	277 347	-269.8	62.3	-22.4	41.9	29.4	2 198
9	C	B 25	1000	13 297	-11.5	-5.9	-4.0	-3.4	5.3	3 198

PASS	PROFILE	CPS-NO	DAY-DATE-YR			AGC	MISSION CONT. PILOT			FBI	MAG-MIN-R			MAG-MIN-R	MAG-MIN-R			WEAPON	DIRECTION	
			18	11	72	18	18	F	2		2	15	270	17	262	15	270			
			CARO- DATA DIVE			ALT	SLANT-RANGE	SCORE	DOWN-RANGE	CROSS-RANGE	DOWN-RANGE	CROSS-RANGE	DOWN-RANGE	CROSS-RANGE	DOWN-RANGE	CROSS-RANGE	DOWN-RANGE	RADIAL MISS	PASS	MIL SET.
			HDC	CODE	ANG.	(FT)	(FT)	MAG	ANG	(FT)	(FT)	(FT)	(MILS)	(MILS)	(MILS)	(MILS)	(MILS)			
1	C		E	A	32	1125	1635	87	287	-83.1	-25.4	-34.9	-15.5	38.2	1	200				
2	C		S	A	32	1150	1671	80	175	79.6	-6.9	32.7	-4.1	33.0	2	200				
3	C		W	A	34	1300	1823	191	264	189.9	-19.9	74.2	-10.9	75.0	3	200				
4	A		N	A	62	3825	4133	112	203	-103.0	-43.7	-23.0	-10.5	25.3	1	100				
5	A		E	A	55	4250	4872	200	011	38.1	-196.3	6.8	-40.2	40.8	2	100				
6	A		S	A	57	4275	4803	123	95	11.7	-122.5	1.9	-25.4	25.5	3	100				
7	B		W	A	54	1900	2129	27	200	9.2	-25.3	3.8	-11.9	12.5	1	160				
8	B		N	A	47	2100	2528	160	284	38.7	-155.2	12.7	-61.4	62.7	2	160				
9	B		E	A	40	2000	2643	210	267	-209.7	10.9	-60.0	4.1	60.1	3	160				
10	C		S	A	34	1125	1578	152	208	134.2	71.3	60.6	45.2	75.6	1	200				
11	C		W	A	38	1375	18.9	168	288	159.7	51.9	67.1	28.6	72.9	2	200				
12	C		N	A	34	1250	1753	139	272	4.8	-138.9	1.9	-79.2	79.2	3	200				
13	A		E	A	58	4000	4460	47	272	-46.9	-1.6	-9.4	-0.3	9.4	1	100				
14	A		S	A	63	4175	4480	153	089	-2.6	-152.9	-0.5	-34.1	34.1	2	100				
15	A		W	D	60	4550	4991	77	146	-43.0	-63.8	-7.8	-12.7	15.1	3	100				
16	B		N	A	47	1825	2197	126	268	-4.4	-125.9	-1.6	-57.3	57.3	1	160				
17	B		E	A	45	2000	2465	87	286	-83.6	-23.9	-27.4	-9.7	29.1	2	160				
18	B		S	A	46	2000	2436	70	063	-31.7	-62.3	-10.7	-25.5	27.7	3	160				
19	C		W	A	32	0950	1381	75	216	44.0	-60.6	21.9	-43.9	49.1	1	200				
20	C		N	D	25	1250	21.3	162	264	-16.9	-161.1	-4.7	-76.5	76.7	2	200				
21	C		E	D	25	1250	2103	31	320	-19.9	-23.7	-5.6	-11.2	12.6	3	200				
22	A		S	A	60	4150	4552	108	180	107.9	0.0	21.6	9.0	21.6	1	100				
23	A		W	A	62	3850	4160	131	101	-128.5	-24.9	-28.6	-6.0	29.2	2	100				
24	A		N	A	62	3425	3701	75	155	-67.9	31.6	-16.9	8.5	19.0	3	100				

OPS-NO	DATE DAY-MON-YR	A/C NO.	MISSION CONT. PILOT NO.	FLY NO.	A-WIND MAG DIR	9-WIND MAG DIR	C-WIND MAG DIR	WEAPON TYPE	ROLL-IN- DIRECTION					
32303	18 11 72	69	19 F	3	1 29 265	18 247	09 290	8	L					
PASS PROFILE	CARD- HOG	ALT (FT)	SLANT-RANGE (FT)	SCORE MAG ANG	DOWN-RANGE (FT)	CROSS-RANGE (FT)	CROSS-RANGE (MILS)	RADIAL MISS (MILS)	PASS SET.					
1	C	E	A	26	0950	1566	145 283	-141.2	-32.6	-54.7	-20.8	58.5	1	198
2	C	N	A	22	1225	2228	1.8 182	15.0	116.9	3.7	47.9	48.1	2	198
3	C	W	A	22	1300	2365	290 074	-278.7	79.9	-64.7	33.7	73.0	3	198
4	A	S	A	55	5050	5802	253 118	-241.6	-78.1	-36.0	-13.4	38.5	1	096
5	A	E	A	60	4450	4890	35 278	-34.6	-4.8	-6.4	-0.9	6.5	2	096
6	A	N	A	65	4450	4720	81 212	-68.6	-42.9	-13.7	-9.0	16.4	3	096
7	B	W	A	38	2100	2868	235 041	-154.1	177.3	-39.3	61.8	73.2	1	158
8	B	S	A	35	2300	3307	88 018	-83.6	-27.1	-17.5	-8.2	19.4	2	158
9	B	E	A	37	2350	3263	100 195	-25.8	96.5	-5.7	29.5	30.1	3	158

OPS-NO	DATE	A/C	MISSION CONT. PILOT	FLT	A-WIND	B-WIND	C-WIND	WEAPON	ROLL-IN-
	DAY-MON-YR	NO.	NO.	NO.	MAG DIR	MAG DIR	MAG DIR	TYPE	DIRECTION
325.5	20 11 72	69	20 F	2	13 037	15 037	09 360	3	R
PASS PROFILE	CARD- DATA DIVE	ALT	SLANT-RANGE	SCORE	DOWN-RANGE	CROSS-RANGE	CROSS-RANGE	RADIAL MISS	PASS
HOG	CODE ANG.	(FT)	(FT)	MAG ANG	(FT)	(MILS)	(MILS)	(MILS)	SEQ. SET.
1	B E A 37	2250	3119	166 301	-142.2	-85.4	-32.9	-27.4	42.8 1 160
2	B S A 47	2550	3069	61 098	8.4	-6.4	2.2	-19.6	19.8 2 160
3	B W A 38	2350	3204	47 227	34.3	-32.0	7.8	10.0	12.7 3 160
4	C N C 27	1250	2009	34 228	-22.7	-25.2	-7.0	-12.5	14.4 1 200
5	C E A 27	1525	2451	98 242	-77.6	41.3	-19.7	16.8	25.9 2 200
6	C S A 31	1600	2370	130 201	121.3	46.5	34.5	19.6	39.7 3 200
7	A W A 57	3650	4106	116 258	113.4	-24.1	24.5	-5.8	25.2 1 100
8	A N A 56	3325	3775	132 214	-109.4	-73.8	-25.5	-19.5	32.1 2 100
9	A E A 61	3625	3976	93 136	64.6	66.8	14.8	16.8	22.4 3 100
10	B S A 39	2250	3019	165 137	120.6	-112.5	29.7	-37.2	47.6 1 160
11	B W A 42	2275	2920	56 266	55.8	-3.9	14.9	-1.3	14.9 2 160
12	B N A 44	2050	2561	118 326	97.8	-65.9	30.5	-25.7	39.9 3 160
13	C E A 31	1375	2036	89 048	66.1	-59.5	21.9	-29.2	36.5 1 200
14	C S A 32	1450	2108	132 199	124.8	42.9	40.7	20.3	45.5 2 200
15	C W A 30	1325	2001	165 252	156.9	-50.9	51.9	-25.4	57.8 3 200
16	A N A 58	3500	3903	100 279	15.6	-98.7	3.5	-25.3	25.5 1 100
17	A E A 60	4000	4387	90 270	-89.9	0.0	-18.6	0.0	18.6 2 100
18	A S A 63	4550	4882	120 172	118.8	-16.7	22.6	-3.4	22.9 3 100
19	B W A 38	2600	3545	29 124	-24.0	-16.2	-4.9	-4.5	6.7 1 160
20	B N A 42	2325	2984	77 255	-19.9	-74.3	-5.2	-24.9	25.4 2 160
21	B E A 40	2200	2907	112 027	50.8	-99.7	13.2	-34.3	36.7 3 160
22	C S A 31	1700	2518	68 241	34.9	58.8	9.1	23.3	25.9 1 200
23	C W A 28	1400	2202	147 221	96.4	-110.9	27.8	-50.3	57.5 2 200
24	C N A 31	1325	1962	152 327	127.4	-82.7	43.8	-42.1	60.8 3 200

PASS	CPS-NO	PROFILE	CARD- HDC	DATE		ALT (FT)	A/C NO.	MISSION CONT. NO.	PILOT	FLY NO.	A-WIND		B-WIND		C-WIND		WEAPON TYPE	ROLL-IN- DIRECTION	
				DAY	MON-YR						MAG	DIR	MAG	DIR	MAG	DIR			MAG
1	32548	B	E	20	11 72	1600	70	21	F	1	2	26	022	13	034	07	040	3	R
2		B	S			2025													
3		B	M			1850													
4		C	R			1250													
5		C	E			1325													
6		C	S			1025													
7		A	M			4000													
8		A	N			4000													
9		A	E			3650													
10		B	S			1700													
11		B	M			1800													
12		B	N			1600													
13		C	E			1150													
14		C	S			1250													
15		C	M			1300													
16		A	N			3250													
17		A	E			3675													
18		A	S			3850													
19		B	M			1875													
20		B	N			2250													
21		B	E			1875													
22		C	S			1175													
23		C	M			1100													
24		C	N			1225													

PASS	PROFILE	CPS-NO	DAYBASE-YR			ACF	MISSION CONT. PILOT			RBI	MACHINE			MACHINE	MACHINE			WEAPON	DIRECTION		
			21	11	72		ALT	SLANT-RANGE	SCORE		DOWN-RANGE	CROSS-RANGE	DOWN-RANGE		CROSS-RANGE	DOWN-RANGE	CROSS-RANGE		CROSS-RANGE	RADIAL	MISS

OPS-NO	DATE	A/C	MISSION CONT. PILOT	FLT	A-WIND	B-WIND	C-WIND	WEAPON	ROLL-IN-
PASS PROFILE	CARD- DATA DIVE	NO.	NO.	NO.	MAG DIR	MAG DIR	MAG DIR	TYPE	DIRECTION
HOG	CODE ANG.	SLANT-RANGE (FT)	SCORE MAG ANG	DOWN-RANGE (FT)	CROSS-RANGE (FT)	DOWN-RANGE (MILS)	CROSS-RANGE (MILS)	RADIAL MISS (MILS)	PASS SEQ. SET.
32706	22 11 72	69	23 F 2	2	29 063	27 054	25 063	3	R
1	B E A 41 1600	2083	124 346	-30.0	-120.3	-11.0	-57.7	58.7	1 160
2	B S A 4 1956	2577	6 161	-2.9	-5.2	-0.8	-2.0	2.2	2 160
3	B W A 43 2050	2595	39 235	31.9	-22.3	9.7	-8.6	12.9	3 160
4	C N A 29 0925	1425	68 310	43.7	-52.0	19.8	-36.5	41.6	1 200
5	C E A 28 0900	1416	58 350	-10.0	-57.1	-4.5	-40.3	40.5	2 200
6	C S A 30 1150	1736	48 162	45.6	-14.8	17.4	-8.5	19.3	3 200
7	A W A 51 3425	4096	66 319	43.3	49.8	8.8	12.1	15.0	1 100
9	A E A 56 3500	3974	360 355	-31.3	-358.6	-6.9	-90.2	90.5	3 100
10	B S A 41 1925	2506	87 021	-81.2	-31.1	-24.8	-12.4	27.8	1 160
11	B W A 42 1925	2471	80 231	62.1	-50.3	19.5	-20.3	28.2	2 160
12	B N A 43 1875	2374	12 292	47.5	-117.7	15.8	-49.6	52.0	3 160
13	C E A 37 1150	1536	29 337	-11.3	-26.6	-5.5	-17.3	18.2	1 200
14	C S A 32 1100	1599	89 147	74.6	-48.4	32.1	-39.3	44.1	2 200
15	C W A 31 1200	1777	118 254	113.4	-32.5	43.0	-18.2	46.8	3 200
16	A N A 57 4050	4556	200 224	-143.8	-138.9	-28.0	-30.4	41.4	1 100
17	A E A 56 3600	4087	184 264	-182.9	19.2	-39.4	4.7	39.7	2 100
18	A S A 53 3750	4387	92 302	-48.7	78.0	-9.4	17.7	20.1	3 100
19	W A 44 2000	2498	194 294	171.2	91.0	54.8	36.4	65.8	1 160
20	B N A 47 2250	2708	175 261	-21.3	-173.6	-6.5	-64.1	64.4	2 160
21	B E A 49 1750	2312	91 314	-65.4	-63.2	-21.4	-27.3	34.7	3 160
22	C S A 30 1100	1661	99 141	75.8	-63.6	30.2	-38.3	48.7	1 200
23	C W A 31 1250	1851	155 221	115.1	-103.7	41.9	-56.0	70.0	2 200
24	C N A 35 1250	1724	152 294	66.6	-136.6	28.0	-79.2	84.0	3 200

[illegible]

PASS	PROFILE	OPS-NO	CARD- HDS	DATE DAY-MON-YR	A/C NO.	MISSION CONT. PILOT		FLT NO.	A-WIND		B-WIND		C-WIND		WEAPON TYPE	ROLL-IN- DIRECTION	
						NO.	SCORE		DOWN-RANGE (FT)	CROSS-RANGE (FT)	MAG	DIR	MAG	DIR			MAG
		32906		24 11 72	69	25	F	3	2	04	310	04	290	03	210	8	L
1	C	E	A	25	1856	60	114	54.8	24.4		17.5		13.1		21.8	1	198
2	C	N	O	25	2109	120	149	-102.8	61.8		-28.9		29.3		41.1	2	198
3	C	W	A	24	2117	25	202	9.3	-23.1		2.5		-10.9		11.2	3	198
4	A	S	A	64	4125	144	262	20.0	142.5		4.2		32.3		32.6	1	096
5	A	E	A	63	4225	12	107	11.4	3.5		2.3		0.7		2.4	2	096
6	A	N	A	55	3775	22	213	-19.0	-10.9		-3.8		-2.5		4.5	3	096
7	B	W	A	41	2300	16	244	14.3	-7.0		3.6		-2.3		4.3	1	158
8	B	S	A	37	2200	92	288	-28.4	87.4		-6.6		28.6		29.4	2	158
9	B	E	A	38	1975	46	134	33.0	31.9		8.9		11.8		14.8	3	158

PASS	OPS-NO	PROFILE	CARD- HOG	DATE		A/C NO.	MISSION CONT. PILOT NO.		DOWN-RANGE (FT)		CROSS-RANGE (FT)		A-WIND		B-WIND		C-WIND		WEAPON TYPE	ROLL-IN- DIRECTION	
				DAY-MON-YR			ALT (FT)	SLANT-RANGE (FT)	SCORE MAG ANG	F	4	DOWN-RANGE (MILS)	CROSS-RANGE (MILS)	06	070	12	070	06		070	3
	33001			25 11 72	69	26	F	4	1	28	640	12	070	06	070	3					
1	A	E	A	53	4000	4292	92	204	-37.4	84.0	-8.1	19.5	21.1	1	100						
2	A	N	A	61	4000	4354	124	229	-81.3	-93.5	-17.1	-21.4	27.5	2	100						
3	A	M	A	63	4100	4399	216	173	-26.3	-214.3	-5.5	-48.7	49.0	3	106						
4	B	S	A	46	2275	2771	106	081	-16.5	-104.6	-4.9	-37.7	38.0	1	160						
5	B	E	A	40	2250	2973	106	284	-102.8	-25.6	-26.1	-8.6	27.5	2	166						
6	B	N	C	39	2250	3019	38	112	-14.2	35.2	-3.5	11.6	12.1	3	160						
7	C	M	A	34	1500	2104	47	060	-40.7	23.4	-13.7	11.1	17.7	1	200						
8	C	S	A	31	1400	2073	92	153	81.9	-41.7	26.6	-20.1	33.4	2	200						
13	B	E	A	40	2175	2874	39	091	38.9	0.6	10.2	0.2	10.2	1	160						
14	B	N	A	41	2175	2874	63	105	14.2	102.3	3.7	56.4	56.6	2	160						
15	B	M	A	47	2100	2528	84	348	17.4	82.1	5.7	32.5	33.0	3	160						
16	C	S	A	35	1400	1931	29	209	25.3	14.0	9.5	7.2	11.9	1	200						
17	C	E	A	34	1525	2139	63	026	27.6	-56.6	9.2	-26.4	28.0	2	200						
18	C	N	C	32	1250	1817	50	028	44.1	23.4	16.7	12.9	21.1	3	200						
19	A	M	A	60	4150	4552	37	111	-34.5	-13.2	-6.9	-2.9	7.5	1	100						
20	A	S	A	55	4800	5500	105	016	-100.9	-28.9	-16.0	-5.2	16.8	2	100						
21	A	E	A	61	3950	4299	214	137	145.9	156.5	31.1	36.3	47.9	3	100						
22	B	N	A	41	2450	3190	105	102	-21.8	102.7	-5.2	32.1	32.6	1	160						
23	B	M	A	44	2450	3061	73	346	17.6	74.8	4.6	23.1	23.5	2	160						
24	B	S	A	44	2400	2998	80	198	76.0	24.7	20.3	8.2	21.9	3	160						

PASS	CPS-NO	PRJFILE	CARD-HDG	DATE		A/C NO.	MISSION CONT.		PILOT	FLY		A-WIND		B-WIND		C-WIND		WEAPON	ROLL-IN-	
				DAY-MON-YR	TIME		NO.	NO.		NO.	DIR	DIR	DIR	MAG	MAG	MAG	DIR		DIR	TYPE
	33003			25	11	72	69	27	F	2	1	32	633	16	047	09	075	8		L
1	C	E	A	30	1000	1513	109	038	67.1	-85.8	29.2	-56.7	63.8	1	198					
2	C	N	A	28	1100	1735	85	070	29.0	79.8	10.6	46.1	47.2	2	198					
3	C	W	A	27	1100	1773	17	053	-13.5	10.2	-4.7	5.7	7.4	3	198					
4	A	S	A	57	4400	4960	77	240	38.5	66.6	6.8	13.4	15.1	1	096					
5	A	E	A	57	3800	4284	180	254	-173.0	49.6	-35.8	11.5	37.6	2	096					
6	A	N	A	65	3600	3819	147	213	-123.2	-80.0	-30.4	-20.9	36.9	3	096					
7	B	W	A	42	18.6	2314	105	050	-80.4	67.4	-27.0	29.1	39.7	1	158					
8	B	S	A	43	1975	2504	94	068	-35.2	-87.1	-11.0	-34.7	36.5	2	158					
9	B	E	A	40	1625	2151	80	146	57.5	-55.5	20.2	-25.8	32.7	3	158					

PASS	OPS-NO	DATE DAY-MON-YR	CARO- HDG	DATA CODE	GIVE ANG.	ALT (FT)	A/C NO.	MISSION CONT. PILOT		FLT NO.	A-WIND		B-WIND		C-WIND		WEAPON TYPE	ROLL-IN- DIRECTION	
								SCORE MAG	ANG		CROSS-RANGE (FT)	DOWN-RANGE (HLS)	CROSS-RANGE (HLS)	CROSS-RANGE (HLS)	CROSS-RANGE (HLS)	CROSS-RANGE (HLS)			RADIAL MISS (MILS)
	33206	27 11 72					24	28	F	1								8	L
1	A		E	C	68	4550	4745	148	195		-38.3	142.9	-7.7	30.1	31.1	1	096		
2	A		N	A	67	3900	4089	121	156		-110.5	49.2	-25.7	12.0	28.4	2	096		
3	A		W	A	64	3900	4163	148	113		-136.2	-57.8	-30.6	-13.8	33.6	3	096		
4	B		S	A	51	2600	3000	111	339		-103.6	39.7	-29.9	13.2	32.7	1	158		
5	B		E	A	52	1825	2085	22	191		-4.1	21.5	-1.7	10.3	10.5	2	158		
6	B		N	B	45	2050	2532	99	082		13.7	98.0	4.4	38.7	38.9	3	158		
7	A		W	A	58	3200	3575	185	074		-177.8	50.9	-44.5	14.2	46.7	1	096		
8	A		S	A	62	3275	3544	62	334		-73.7	35.9	-19.2	10.1	21.7	2	096		
9	A		E	A	74	4300	4373	107	227		-78.2	72.9	-17.5	16.6	24.2	3	096		

PASS	PROFILE	CPS-NO	DATE DAY-MON-YR	A/C NO.	MISSION CONT. NO.	PILOT	FLY		A-WIND		8-WIND		C-WIND		WEAPON TYPE	ROLL-IN- DIRECTION
							NO.	DIR	MAG	DIR	MAG	DIR	CROSS-RANGE (FT)	DOWN-RANGE (MILS)		
		3329	27 11 72	7.	29	F	4	1	24	050	18	050	15	068	8	L
1	C	E	D	25	1250	2109	126	009	19.7	-124.4	5.5	-59.0	59.2	1	198	
2	C	N	A	27	1050	1692	58	139	-43.7	38.0	-16.0	22.4	27.6	2	198	
3	C	W	A	25	1100	1856	177	185	-176.3	15.4	-56.2	8.3	56.9	3	198	
4	A	S	A	58	4200	4693	62	353	-61.5	7.5	-11.7	1.6	11.8	1	096	
5	A	E	A	66	4475	4718	163	001	2.8	-162.9	0.5	-34.5	34.5	2	096	
6	A	N	A	63	3875	4164	172	355	171.3	-14.9	38.2	-3.6	38.4	3	096	
7	B	W	A	37	2225	3090	102	344	28.1	98.0	6.5	31.7	32.3	1	158	
8	B	S	C	38	1250	1707	42	268	1.4	41.9	0.6	24.5	24.5	2	158	
9	B	E	A	37	2025	2812	168	305	-137.6	-96.3	-35.2	-34.2	49.1	3	158	

PASS	PROFILE	OPS-NO	DAY-DATE-YR			A6C	MISSION CONT. PILOT				NO.1	NO.2				NO.3	WEAPON	ORIENTATION					
			CARD-HDC	DATA CODE	OIVE ANG.		ALT (FT)	SLANT-RANGE (FT)	SCORE			DOWN-RANGE (FT)	CROSS-RANGE (FT)	DOWN-RANGE (MILS)	MAG-THIR			CROSS-RANGE (MILS)	DOWN-RANGE (MILS)	RADIAL (MILS)	MISS	PASS SEQ.	L
									MAG	ANG													
33306			28	11	72	70	30	F	3	2	22	295	07	195	06	185	3						
1	B	E	A	47	2270	2732	85	088	84.9	-2.9	25.8	-1.0					25.8	1	160				
2	B	N	A	45	1995	2460	100	142	74.3	66.9	24.4	27.1					36.5	2	160				
3	B	W	A	45	2095	2552	124	106	-119.1	-34.1	-38.3	-13.3					40.6	3	160				
4	C	S	A	24	1145	1973	22	072	-6.7	-20.9	-1.9	-10.6					10.7	1	200				
5	C	E	A	27	1245	2001	87	187	-10.6	86.3	-3.2	43.1					43.2	2	200				
6	C	N	A	27	1470	2363	55	096	-5.7	54.6	-1.5	23.1					23.1	3	200				
7	A	W	A	62	3600	3890	14	137	-9.5	-10.2	-2.2	-2.6					3.4	1	100				
8	A	S	A	62	4450	4808	89	106	24.5	-85.5	4.7	-17.7					18.4	2	100				
9	A	E	A	63	4300	4614	179	129	139.1	112.6	28.0	24.4					37.2	3	100				
10	B	N	A	39	2070	2778	63	179	-62.9	1.1	-16.8	0.3					16.8	1	160				
11	B	W	A	41	3000	3906	157	076	-152.3	37.9	-29.9	9.7					31.4	2	160				
12	B	S	A	39	1870	2509	74	295	-31.2	67.0	-9.2	26.7					28.2	3	160				
13	C	E	A	25	1170	1968	108	171	16.8	106.6	5.0	54.1					54.4	1	200				
14	C	N	A	27	1200	1929	122	098	-16.9	120.8	-5.4	62.6					62.8	2	200				
15	C	W	A	27	1200	1929	90	310	68.9	57.8	22.2	29.9					37.3	3	200				
16	A	S	A	64	4270	4551	43	161	40.6	-13.9	8.3	-3.0					8.9	1	100				
17	A	E	A	63	4270	4582	177	128	139.4	108.9	28.3	23.7					37.0	2	100				
18	A	N	A	65	3770	3993	8	148	-6.7	4.2	-1.6	1.0					1.9	3	100				
19	B	W	A	41	2195	2858	165	055	-135.1	94.6	-36.3	33.1					49.1	1	160				
20	B	S	A	44	2350	2936	77	058	-40.8	-65.3	-11.1	-22.2					24.8	2	160				
21	B	E	A	45	2270	2799	172	155	72.6	155.8	21.0	55.6					59.5	3	160				
22	C	N	A	28	1270	1998	45	054	26.4	36.4	8.4	18.2					20.0	1	200				
23	C	W	A	25	1370	2305	66	343	19.2	63.1	4.9	27.3					27.8	2	200				
24	C	S	A	26	1220	2005	80	224	57.5	55.5	17.4	27.7					32.7	3	200				

OPS-NO	PASS PROFILE	CARD- HOG	DATE DAY-MON-YR	A/C NO.	MISSION CONT. PILOT		FLT NO.	A-WIND		B-WIND		C-WIND		WEAPON TYPE	ROLL-IN- DIRECTION	
					NO.	SCORE MAG ANG		DOWN-RANGE (FT)	CROSS-RANGE (FT)	MAG DIR	DOWN-RANGE (MILS)	MAG DIR	CROSS-RANGE (MILS)			MAG DIR
33406			29 11. 72	69	31	F	2	2	25	04.2	21	055	20	060	8	L
1	C	E	A 24	1100	1901	6	123	5.0	3.2	1.5	1.7	2.3	1	198		
2	C	N	A 29	1050	1621	82	052	50.4	64.6	20.1	39.8	44.6	2	198		
3	C	W	A 30	1225	1854	76	314	54.6	52.7	19.4	28.4	34.4	3	198		
4	A	S	A 57	3625	4086	330	294	-134.2	301.4	-29.1	73.7	79.3	1	096		
5	A	E	A 60	3225	3544	100	204	-40.6	91.3	-10.4	25.7	27.8	2	096		
6	A	N	A 61	3800	4143	37	232	-22.7	-29.1	-5.0	-7.0	8.6	3	096		
7	B	H	A 44	2150	269.	131	287	125.2	38.3	37.2	14.2	39.8	1	158		
8	B	S	A 40	1725	2283	61	356	-60.8	4.2	-20.1	1.8	20.2	2	158		
9	B	E	A 39	1625	2184	88	255	-85.2	22.7	-28.9	10.4	30.7	3	158		

OPS-NO	DAY-MON-YR			AOC	MISSION CONT. PILOT				RBT	HAC-MINR		HAC-MINR	HAC-MINR	WEAPON	DIRECTION	
	29	11	72		32	F	4	2		18	065				18	056
PASS PROFILE	CARD-HDG	DATA OIVE CODE ANG.	ALT (FT)	SLANT-RANGE (FT)	SCORE MAG ANG	DOWN-RANGE (FT)	CROSS-RANGE (FT)	DOWN-RANGE (MILS)	CROSS-RANGE (MILS)	RADIAL MISS (MILS)	PASS SEQ.	MIL SET.				
1	C	E C	27	1250	2014	147 291	-137.2	-52.6	-42.2	-26.1	49.6	1 198				
2	C	N B	30	1125	1703	146 050	93.8	111.8	36.4	65.6	75.0	2 198				
3	C	H D	25	1250	2109	17 330	8.5	14.7	2.3	6.9	7.3	3 198				
4	A	S A	62	4025	4356	122 140	93.4	-78.4	19.8	-18.0	26.7	1 096				
5	A	E A	56	3450	3925	138 067	127.0	-53.9	28.4	-13.7	31.5	2 096				
6	A	N C	61	4550	4961	61 358	60.9	-2.1	11.2	-0.4	11.2	3 096				
7	B	H A	44	2425	3034	118 285	113.9	30.5	30.0	10.0	31.6	1 158				
8	B	S A	41	2625	3424	98 289	-31.9	92.6	-7.1	27.0	27.9	2 158				
9	B	E A	40	2175	2879	120 096	119.3	12.5	31.3	4.3	31.6	3 158				

PASS	PROFILE	OPS-NO	CARD- HOG	DATE DAY-MON-YR	A/C NO.	MISSION CONT. PILOT		FLY NO.	A-WIND		B-WIND		C-WIND		WEAPON TYPE	ROLL-IN- DIRECTION	
						NO.	NO.		MAG	DIR	MAG	DIR	MAG	DIR			
1	A	33505	E	30 11 72	69	33	F	3	1	21	062	16	068	07	064	3	L
2	A		N														
3	A		H														
4	B		S														
5	B		E														
6	B		N														
7	C		H														
8	C		S														
9	C		E														
10	A		N														
11	A		H														
12	A		S														
13	B		E														
14	B		N														
15	B		H														
16	C		S														
17	C		E														
18	C		N														
19	A		H														
20	A		S														
21	A		E														
22	B		N														
23	B		H														
24	B		S														

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OPS-NO	DAY-DATE-YR			A6C	MISSION CONT. PILOT				RGT				MAG-MINR				WEAPON				DIRECTION	
	1	12	72		DATA	DIVE	ALT	SLANT-RANGE	SCORE	DOWN-RANGE	CROSS-RANGE	DOWN-RANGE	CROSS-RANGE	DOWN-RANGE	CROSS-RANGE	DOWN-RANGE	CROSS-RANGE	RADIAL MISS	PASS	SEQ.	SET.	
PASS	PROFILE	HOG	CARD-	CODE	ANG.	(FT)	(FT)	(MILS)	(MILS)	(MILS)	(MILS)	(MILS)	(MILS)	(MILS)	(MILS)	(MILS)	(MILS)	(MILS)	(MILS)	(MILS)	(MILS)	
33605						69	34	F	2	1	18	358	68	659	03	360	3		L			
1	C	E	0	25	1250	2103	61	041	40.0	-46.0	11.3	-21.8	24.6	1	200							
2	C	N	0	25	1250	2103	25	281	4.7	-24.5	1.3	-11.6	11.7	2	200							
3	C	W	A	28	1225	1927	84	025	-35.5	76.1	-11.7	39.4	41.1	3	200							
4	A	S	A	59	4100	4533	154	012	-150.6	-32.0	-30.0	-7.0	30.8	1	100							
5	A	E	A	59	3975	4395	250	278	-247.5	-34.7	-50.9	-7.9	51.5	2	100							
6	A	N	C	58	4550	5074	121	270	0.0	-120.9	0.0	-23.8	23.8	3	100							
7	B	W	A	45	2300	2836	35	215	20.0	-28.6	5.7	-10.1	11.6	1	160							
8	B	S	A	44	2275	2842	72	016	-69.2	-19.8	-19.4	-6.9	20.7	2	160							
9	B	E	A	43	2175	2753	128	333	-58.1	-114.0	-16.6	-41.4	44.6	3	160							
10	C	N	A	28	1375	2163	16	310	10.2	-12.2	3.0	-5.6	6.4	1	200							
11	C	W	A	31	1325	1982	54	306	43.6	31.7	15.0	16.1	22.0	2	200							
12	C	S	A	28	1250	1966	57	230	36.6	43.6	11.8	22.1	25.1	3	200							
13	A	E	A	62	4250	4592	111	030	55.5	-96.1	11.1	-20.9	23.7	1	100							
14	A	N	A	55	3975	4556	109	141	-84.7	68.5	-16.2	15.0	22.1	2	160							
15	A	W	A	57	4325	4865	112	096	-111.3	-11.7	-20.3	-2.4	20.4	3	100							
16	B	S	A	41	2100	2734	12	149	10.2	-6.1	2.8	-2.2	3.6	1	160							
17	B	E	A	46	2000	2436	59	257	-57.4	13.2	-19.3	5.4	20.1	2	160							
18	B	N	A	43	2225	2817	57	295	24.0	-51.6	6.7	-18.3	19.5	3	160							
19	C	W	A	29	1300	2033	44	324	25.8	35.5	8.3	17.7	19.6	1	200							
20	C	S	A	27	1200	1929	29	244	12.7	26.0	4.0	13.5	14.1	2	200							
21	C	E	A	25	1350	2271	57	273	-56.9	-2.9	-14.8	-1.3	14.9	3	200							
22	A	N	A	58	3550	3958	80	324	64.7	-47.0	14.6	-11.8	18.8	1	100							
23	A	W	A	57	3950	4443	79	041	-51.8	59.6	-10.3	13.4	16.9	2	100							
24	A	S	A	57	4000	4500	208	010	-204.8	-36.1	-40.4	-8.0	41.2	3	100							

PASS	CPS-NO	PROFILE	CARD- HOG	DATE DAY-MON-YR	A/C NO.	MISSION CONT. PILOT	SCOPE	SLANT-RANGE (FT)	ALT (FT)	FLI NO.	A-WIND			B-WIND			C-WIND			WEAPON TYPE	ROLL-IN- DIRECTION	
											MAG	DIR	DIR	MAG	DIR	MAG	DIR	MAG	DIR		RADIAL	MISS SEQ.
1	336.9	C	E	1 12 72	69	35	F	4	27.9	21.0	12.0	14.5	18.8	1	200							
2		C	N	27 0900	1447	35	127	25.4	15.8	8.4	7.9	11.5	2	200								
3		C	H	30 1325	2001	30	032	21.2	-30.3	8.8	-18.0	20.1	3	200								
4		A	S	33 1175	1677	37	215	-42.5	-100.3	-9.7	-25.2	27.0	1	100								
5		A	E	40 3625	3976	109	067	36.7	-4.5	7.6	-1.2	7.7	2	100								
6		A	N	63 4175	4480	37	083	5.5	105.8	1.1	23.6	23.7	3	100								
7		B	H	60 4075	4470	106	087	4.0	-38.7	0.9	-12.4	12.4	1	160								
8		B	S	39 2325	3120	39	186	109.2	41.9	31.5	15.5	35.1	2	160								
9		B	E	42 2100	2695	117	201	-64.9	86.2	-14.7	26.6	30.4	3	160								
10		C	N	39 2375	3238	108	217	-63.0	15.7	-18.5	7.2	19.9	1	200								
11		C	H	28 1375	2163	65	166	65.2	-52.8	22.0	-25.5	33.7	2	200								
12		C	S	33 1450	2070	84	231	-7.1	24.8	-2.5	10.5	10.8	3	200								
13		A	E	32 1350	1362	22	289	-37.5	-31.4	-7.8	-7.2	10.7	1	100								
14		A	N	60 3950	4332	49	310	-55.6	-22.4	-10.7	-4.8	11.7	2	100								
15		A	H	58 175	4555	66	202	-19.4	59.9	-4.1	14.0	14.6	3	100								
16		B	S	60 3900	4278	63	018	-29.5	63.4	-7.2	20.4	21.6	1	160								
17		B	E	40 2150	2841	73	208	-34.2	64.4	-9.1	22.6	24.4	2	160								
18		B	N	44 2200	2748	42	346	40.7	-10.1	11.8	-3.6	12.4	3	160								
19		C	H	32 1400	2035	46	177	-2.4	-45.9	-0.8	-22.5	22.5	1	200								
20		C	S	30 1250	1887	50	193	48.7	11.2	17.0	5.9	18.0	2	200								
21		C	E	30 1350	2039	13	217	-7.8	10.3	-1.5	5.0	5.6	3	200								
22		A	N	61 4375	4762	30	119	-14.5	26.2	-2.8	5.5	6.1	1	100								
23		A	H	57 3850	4331	61	355	5.3	60.7	1.0	14.0	14.0	2	100								
24		A	S	58 3950	4444	36	178	-7.4	-35.2	-1.5	-7.9	8.1	3	100								

OPS-NO	DATE		A/C NO.	MISSION CONT. PILOT		FLT A-WIND		B-WIND		C-WIND		WEAPON TYPE	ROLL-IN-DIRECTION		
	DAY-MON-YR			NO.	SCORE	DOWN-RANGE (FT)	CROSS-RANGE (FT)	MAG DIR	DOWN-RANGE (MILS)	MAG DIR	CROSS-RANGE (MILS)		MAG DIR	RADIAL MISS (MILS)	PASS SEQ.
33701	2	12 72	70	36	F	1		32	288	24	278	14	265	3	L
PASS	PROFILE	CARD-HDG	ALT (FT)	SLANT-RANGE (FT)	SCORE MAG ANG	DOWN-RANGE (FT)	CROSS-RANGE (FT)	A-WIND MAG DIR	DOWN-RANGE (MILS)	B-WIND MAG DIR	CROSS-RANGE (MILS)	C-WIND MAG DIR	RADIAL MISS (MILS)	PASS SEQ.	MIL SET.
1	C	E A	30	0900	1353 23 197	-6.7	21.9	-3.2	16.1			16.5	1	200	
2	C	N A	25	0800	1346 21 298	9.8	-18.5	4.3	-13.7			14.4	2	200	
3	C	W A	30	0825	1246 51 221	33.4	-38.4	17.7	-30.8			35.6	3	200	
4	A	S A	62	3450	3723 183 077	-41.1	-178.3	-10.2	-47.8			48.9	1	100	
5	A	E A	56	3350	38.3 85 263	-84.3	10.3	-19.5	2.7			19.7	2	100	
6	A	N A	62	3450	3728 118 141	-91.7	74.2	-22.7	19.9			30.2	3	100	
7	B	W A	4	1550	2.48 124 15	-94.9	79.7	-35.3	38.9			52.3	1	160	
8	B	S A	44	2050	2561 95 053	-57.1	-75.8	-17.8	-29.6			34.5	2	160	
9	B	E A	37	1900	2633 136 303	-114.0	-74.0	-31.2	-28.1			42.3	3	160	
10	C	N A	28	1125	1770 85 053	51.1	67.8	18.3	38.3			42.5	1	200	
11	C	W A	30	0900	1353 67 252	63.7	-20.7	31.0	-15.2			34.5	2	200	
12	C	S A	31	1125	1666 48 174	47.7	-5.0	19.3	-3.0			19.5	3	200	
13	A	E A	56	3550	4030 62 326	-34.6	-51.3	-7.5	-12.7			14.8	1	100	
14	A	N A	58	3350	3735 132 157	-121.5	51.5	-29.1	13.8			32.2	2	100	
15	A	W A	62	3300	3566 229 056	-189.8	128.0	-49.2	35.9			60.9	3	100	
16	B	S A	41	2175	2832 79 009	-78.0	-12.3	-21.1	-4.3			21.6	1	160	
17	B	E A	35	2100	3013 136 300	-117.7	-67.9	-27.2	-22.5			35.3	2	160	
18	B	N A	39	1900	2550 60 138	-44.5	40.1	-13.0	15.7			20.4	3	16	
19	C	W A	33	1000	1427 86 085	-85.6	7.4	-42.0	5.2			42.3	1	200	
20	C	S A	29	1000	1541 42 180	41.9	0.0	17.6	0.0			17.6	2	200	
21	C	E A	27	11.1	1768 8. 134	57.5	55.5	20.2	31.4			37.3	3	200	
22	A	N A	69	3650	3785 169 036	136.7	99.3	34.8	26.2			43.6	1	100	
23	A	W A	65	3650	3866 204 045	-144.2	144.2	-35.2	37.3			51.3	2	100	
24	A	S A	61	3550	3864 67 006	-66.6	-7.0	-15.8	-1.8			15.9	3	100	

OPS-NO	A/C NO.	MISSION NO.	CJNT.	PILOT	ELI. NO					
28516	70	1	F	2	1					
PASS	PROFILE	ROLL-IN-DIRECTION	MTL SET.	TARGET NO.	ROUNDS FIRED	HITS ON TARGET	HITS IN BULL	PERCENT HITS	PERCENT BULLS	PERCENT BULLS REL TO HITS
2	D	L	000	12	52	0	0	0.00	0.00	0.00
3	D	L	000	13	61	0	0	0.00	0.00	0.00
4	D	L	000	14	61	12	4	19.67	6.55	33.33
5	E	R	006	1	62	10	2	16.12	3.22	20.00
6	E	R	006	2	61	47	4	77.04	6.55	8.51
7	E	R	006	3	61	43	3	76.49	4.91	6.97

2

OPS-NO	A/C NO.	MISSION NO.	CGNT.	PILOT	FLT. NO.					
28718	70	2	F	4	2					
PASS	PROFILE	ROLL-IN-DIRECTION	MIL SET.	TARGET NO.	ROUNDS FIRED	HITS ON TARGET	HITS IN BULL	PERCENT HITS	PERCENT BULLS	PERCENT BULLS REL TO HITS
2	D	L	000	19	62	12	5	19.35	8.06	41.66
3	D	L	000	18	61	8	3	13.11	4.91	37.50
4	D	L	000	17	61	0	0	0.00	0.00	0.00
5	E	R	006	10	61	10	0	16.39	0.00	0.00
6	E	R	006	9	60	0	0	0.00	0.00	0.00
7	E	R	006	8	61	61	4	100.00	6.55	6.55
8	E	R	006	7	61	57	3	93.44	4.91	5.26

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PASS	PROFILE	ROLL-IN-DIRECTION	HIL SET.	TARGET NO.	ROUNDS FIRED	HITS ON TARGET	HITS IN BULL	PERCENT HITS	PERCENT BULLS	PERCENT REL TO HITS
1	D	R	000	1	61	1	0	1.63	0.00	0.00
2	D	R	000	2	62	1	0	1.61	0.00	0.00
3	D	R	000	3	61	29	14	47.54	22.95	48.27
4	D	R	000	4	61	0	0	0.00	0.00	0.00
5	E	L	006	11	61	43	0	70.49	0.00	0.00
6	E	L	006	12	61	60	7	98.36	11.47	11.66
7	E	L	006	13	61	11	0	18.03	0.00	0.00
8	E	L	006	14	60	27	1	45.00	1.66	3.70

OPS-NO. A/C NO. MISSION NO. CONT. PILOT FLI. NO.

29202 70 5 1 2

PASS	PROFILE	ROLL-IN-DIRECTION	MIL SET.	TARGET NO.	ROUNDS FIRED	HITS ON TARGET	HITS IN BULL	PERCENT HITS	PERCENT BULLS	PERCENT BULLS REL TO HITS
1	D	R	000	10	61	0	0	0.00	0.00	0.00
2	D	R	000	9	66	20	0	30.30	1.00	0.00
3	D	R	000	8	62	0	0	0.00	0.00	0.00
4	D	R	000	7	59	10	4	16.94	6.77	40.00
5	E	L	006	20	61	2	0	3.27	0.00	0.00
6	E	L	006	19	62	34	1	54.83	1.61	2.94
7	E	L	006	18	61	24	4	39.34	6.55	16.66
8	E	L	006	17	61	16	0	26.22	0.00	0.00

OPS-NO	A/C NO.	MISSION NO.	CONT.	PILOT	FLY. NO.					
29347	70	6	F	4	2					
PASS	PROFILE	ROLL-IN-DIRECTION	MIL SET.	TARGET NO.	ROUNDS FIRED	HITS ON TARGET	HITS IN BULL	PERCENT HITS	PERCENT BULLS	PERCENT BULLS REL TO HITS
1	D	L	000	20	62	0	0	0.00	0.00	0.00
2	D	L	000	19	62	0	0	0.00	0.00	0.00
3	D	L	000	18	61	38	20	62.29	32.78	52.63
4	D	L	000	17	62	1	0	1.61	0.00	0.00
5	E	R	006	10	61	10	0	16.39	0.00	0.00
6	E	R	006	9	61	38	7	62.29	11.47	18.42
7	E	R	006	8	62	14	0	22.58	0.00	0.00
8	E	P	006	7	60	3	0	5.00	0.00	0.00

OPS-NO	A/C NO.	MISSION NO.	CONT.	PILOT	FLT. NO	PASS	PROFILE	ROLL-IN-DIRECTION	MIL SET.	TARGET NO.	ROUNDS FIRED	HITS ON TARGET	HITS IN BULL	PERCENT HITS	PERCENT BULLS	PERCENT BULLS REL TO HITS
29702	70	9	F	3	1											
1	0	L	000	11	60	9	1	15.00	1.66	11.11						
2	0	L	000	12	60	0	0	0.00	0.00	0.00						
3	0	L	000	13	60	5	1	8.33	1.66	20.00						
4	0	L	000	14	62	12	5	19.35	8.06	41.66						
5	E	R	006	1	61	60	22	93.36	36.06	36.66						
6	E	R	006	2	61	17	3	27.86	4.91	17.64						
7	E	R	006	3	62	59	9	95.16	14.51	15.25						
8	E	R	006	4	60	32	0	53.33	0.00	0.00						

OPS-NO	A/C NO.	MISSION NO.	CJNT.	PILOT	FLT. NO					
29803	70	10	F	2	1					
PASS	PROFILE	ROLL-IN-DIRECTION	MIL SET.	TARGET NO.	ROUNDS FIRED	HITS ON TARGET	HITS IN BULL	PERCENT HITS	PERCENT BULLS	PERCENT BULLS REL TO HITS
1	D	L	000	11	61	0	0	0.00	0.00	0.00
2	D	L	000	12	60	0	0	0.00	0.00	0.00
3	D	L	000	13	61	1	0	1.63	0.00	0.00
4	D	L	000	14	61	1	0	1.63	0.00	0.00
5	E	R	006	1	61	56	2	91.80	3.27	3.57
7	E	R	006	3	61	31	3	50.01	4.91	9.67
8	E	R	006	4	61	60	0	98.36	0.00	0.00

OPS-NO	A/C NO.	MISSION NO.	CONT.	PILOT	FLY. NO.	PASS	PROFILE	ROLL-IN-DIRECTION	MIL SET.	TARGET NO.	ROUNDS FIRED	HITS ON TARGET	HITS IN BULL	PERCENT HITS	PERCENT BULLS	PERCENT BULLS REL TO HITS
30103	70	13	F	2	2											
1	D	L							000	20	61	20	11	32.78	18.03	55.00
2	D	L						000		19	61	14	6	22.95	9.83	42.85
3	D	L						000		18	62	0	0	0.00	0.00	0.00
4	D	L						000		17	61	0	0	0.00	0.00	0.00
5	E	R						006		10	61	51	4	83.60	6.55	7.84
6	E	R						006		9	61	7	1	11.47	1.63	14.28
7	E	R						006		8	61	43	5	70.49	8.19	11.62
8	E	R						006		7	61	61	8	100.00	13.11	13.11

OPS-NO	A/C NO.	MISSION NO.	CONT.	PILOT	FLT. NO	PASS	PROFILE	ROLL-IN-DIRECTION	MIL SET.	TARGET NO.	POUNDS FIRED	HITS ON TARGET	HITS IN BULL	PERCENT HITS	PERCENT BULLS	PERCENT BULLS REL TO HITS
30292	7C	14	F	1	2											
1	D	L	000	62	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	D	L	000	62	1	0	0	0	1.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	D	L	000	62	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	D	L	000	62	39	16	0	0	62.90	25.80	41.02	0.00	0.00	0.00	0.00	0.00
5	E	R	006	61	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	E	R	006	61	11	0	0	0	18.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	E	R	006	62	3	0	0	0	4.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	E	R	006	61	43	2	0	0	70.49	3.27	4.65	0.00	0.00	0.00	0.00	0.00

PASS	OPS-NO	A/C NO.	MISSION NO.	CONT.	PILOT	FLY. NO	HITS ON TARGET	HITS IN BULL	PERCENT HITS	PERCENT BULLS	PERCENT BULLS REL TO HITS
	36532	69	15	F	3	2					
	PROFILE	ROLL-IN-DIRECTION	MIL SET.	TARGET NO.	ROUNDS FIRED						
3	D	R	000	8	62	0	0	0.00	0.00	0.00	0.00
4	D	R	000	7	62	0	0	0.00	0.00	0.00	0.00
5	E	L	006	20	62	54	9	87.09	14.51	16.66	16.66
6	E	L	006	19	62	43	3	69.35	4.83	6.97	6.97
7	E	L	006	18	64	53	9	82.81	14.06	16.98	16.98
8	E	L	006	17	61	45	1	73.77	1.63	2.22	2.22

OPS-NO	A/C NO.	MISSION NO.	CONT.	PILOT	FLT. NO	PASS	PROFILE	ROLL-IN-DIRECTION	MIL SET.	TARGET NO.	ROUNDS FIRED	HITS ON TARGET	HITS IN BULL	PERCENT HITS	PERCENT BULLS	PERCENT BULLS REL TO HITS
32305	69	16	F	4	1											
1	D					R		000	1	62	42	16	67.74	25.80	38.09	
2	D					R		000	2	59	21	10	35.59	16.94	47.61	
3	D					R		000	3	60	7	4	11.66	6.66	57.14	
4	D					R		000	4	60	16	4	26.66	6.66	25.00	
5	E					L		006	11	60	55	5	91.66	8.33	9.09	
6	E					L		006	12	60	56	6	93.33	10.00	10.71	
7	E					L		006	13	59	39	1	66.10	1.69	2.56	
8	E					L		006	14	60	45	6	75.00	10.00	13.33	

PASS	OPS-NO	A/C NO.	MISSION NO.	CONT.	PILOT	FLY. NO	HITS ON TARGET	HITS IN BULL	PERCENT HITS	PERCENT BULLS	PERCENT BULLS REL TO HITS
	32205	59	17	F	1	1					
	PROFILE	ROLL-IN-DIRECTION	MIL SET.	TARGET NO.	ROUNDS FIRED						
1	D	R	300	1	60		8	4	13.33	6.66	50.00
2	D	R	600	2	60		0	0	0.00	0.00	0.00
3	D	R	000	3	60		5	1	8.33	1.66	20.00
4	D	R	000	4	60		0	0	0.00	0.00	0.00
5	E	L	006	11	60		47	6	78.33	10.00	12.76
6	E	L	006	12	60		5	0	8.33	0.00	0.00
7	E	L	006	13	60		57	3	95.00	5.00	5.26
8	E	L	006	14	59		29	3	49.15	5.08	10.34

OPS-NO	A/C NO.	MISSION NO.	CONT.	PILOT	FLI. NO.					
32302	69	18	F	2	2					
PASS	PROFILE	ROLL-IN-DIRECTION	MIL SET.	TARGET NO.	ROUNDS FIRED	HITS ON TARGET	HITS IN BULL	PERCENT HITS	PERCENT BULLS	PERCENT BULLS REL TO HITS
1	D	R	000	10	60	0	0	0.00	9.00	0.00
2	D	R	000	9	60	2	1	3.33	1.66	50.00
3	D	R	000	8	60	4	1	6.66	1.66	25.00
4	D	R	000	7	60	5	2	8.33	3.33	40.00
5	E	L	006	20	60	45	2	75.00	3.33	4.44
6	E	L	906	19	60	60	10	100.00	16.66	16.66
7	E	L	306	18	59	34	4	57.62	6.77	11.76
8	E	L	506	17	59	54	18	91.52	30.50	33.33

PASS	OPS-NO	A/C NO.	MISSION NO.	CONT.	PILOT	FLT. NO	HITS ON TARGET	HITS IN BULL	PERCENT HITS	PERCENT BULLS	PERCENT BULLS REL TO HITS
	32303	59	19	F	3	1					
	PROFILE	ROLL-IN-DIRECTION	MIL SET.	TARGET NO.	ROUNDS FIRED						
1	D	R	000	1	60	0	0	0	0.00	0.00	0.00
2	D	R	000	2	60	3	0	0	5.00	0.00	0.00
3	D	R	000	3	61	42	21		68.85	34.42	50.00
4	D	R	000	4	59	21	6		35.59	10.16	28.57
5	E	L	006	11	59	24	0		40.67	0.00	0.00
6	E	L	006	12	60	13	0		21.66	0.00	0.00
7	E	L	005	13	59	58	0		98.30	0.00	0.00
8	E	L	006	14	60	18	0		30.00	0.00	0.00

OPS-NO	A/C NO.	MISSION NO.	CONT.	PILOT	FLY. NO	PASS	PROFILE	ROLL-IN-DIRECTION	MIL SET.	TARGET NO.	ROUNDS FIRED	HITS ON TARGET	HITS IN BULL	PERCENT HITS	PERCENT BULLS	PERCENT BULLS REL TO HITS
32505	59	20	F	4	2											
1	D						L		000	20	61	0	0	0.00	0.00	0.00
2	O						L		000	19	60	40	18	66.66	30.00	45.00
3	D						L		000	18	60	38	17	63.33	28.33	44.73
4	O						L		000	17	62	38	7	61.29	11.29	18.42
5	E						R		006	10	60	0	0	0.00	0.00	0.00
6	E						R		006	9	60	53	7	88.33	11.66	13.20
7	F						R		006	8	59	53	5	89.83	8.47	9.43
8	E						R		006	7	54	57	16	96.27	27.58	28.07

OPS-NO	A/C NO.	MISSION NO.	CONT.	PILOT	FLY. NO	PASS	PROFILE	ROLL-IN-DIRECTION	MIL SET.	TARGET NO.	ROUNDS FIRED	HITS ON TARGET	HITS IN BULL	PERCENT HITS	PERCENT BULLS	PERCENT BULLS REL TO HITS
32548	70	21	F	1	2											
1	D							L	300	20	62	6	0	0.00	0.00	0.00
2	D							L	000	19	62	9	5	14.51	8.06	55.55
3	D							L	000	18	62	14	1	22.58	1.61	7.14
4	D							L	000	17	62	0	0	0.00	0.00	0.00
5	E							R	006	13	62	28	4	45.16	6.45	14.28
6	E							R	006	9	62	8	0	12.90	0.00	0.00
7	E							R	006	8	62	2	0	3.22	0.00	0.00
8	E							R	006	7	60	60	8	100.00	13.33	13.33

OPS-NO	A/C NO.	MISSION NO.	CCNT.	PILOT	FLI. NO	HITS ON TARGET	HITS IN BULL	PERCENT HITS	PERCENT BULLS	PERCENT BULLS REL TO HITS
32606	70	22	F	3	2					
PASS	PROFILE	ROLL-IN-DIRECTION	MIL SET.	ROUNDS FIRED						
1	D	L	000	61	0	0	0	0.00	0.00	0.00
2	D	L	300	62	11	1	17.74	1.61	9.09	9.09
3	D	L	600	62	28	9	45.16	14.51	32.14	32.14
4	D	L	000	61	2	0	3.27	0.00	0.00	0.00
5	F	R	006	60	26	0	43.33	0.00	0.00	0.00
6	E	R	006	61	61	16	100.00	26.22	26.22	26.22
7	E	R	006	60	30	0	50.00	0.00	0.00	0.00
8	E	R	006	61	43	3	70.49	4.91	6.97	6.97

88

OPS-NO	A/C NO.	MISSION NO.	CGMT.	PILOT	FLT. NO	HITS ON TARGET	HITS IN BULL	PERCENT HITS	PERCENT BULLS	PERCENT BULLS REL TO HITS
32706	59	23	F	2	2					
PASS	PROFILE	ROLL-IN-DIRECTION								
1	D	L	20	59	0	0	0	0.00	0.00	0.00
2	D	L	19	59	0	0	0	0.00	0.00	0.00
3	D	L	18	59	0	0	0	0.00	0.00	0.00
4	D	L	17	60	9	5	15.00	8.33	55.55	55.55
5	E	R	16	60	17	0	28.33	0.00	0.00	0.00
6	E	R	9	60	13	0	21.66	0.00	0.00	0.00
7	E	R	8	60	0	0	0.00	0.00	0.00	0.00
8	E	R	7	60	44	12	73.33	20.00	27.27	27.27

OP S-NO	A/C NO.	MISSION NO.	CONT.	PILOT	FLY. NO.	PASS	PROFILE	ROLL-IN-DIRECTION	MIL SET.	TARGET NO.	ROUNDS FIRED	HITS ON TARGET	HITS IN BULL	PERCENT HITS	PERCENT BULLS	PERCENT BULLS REL TO HITS
32901	59	24	F	1	1											
1	D	L	000	11	60	10	3	16.66	5.00	30.00						
2	D	L	000	12	60	32	17	53.33	21.66	40.62						
3	D	L	000	13	57	26	10	45.61	17.54	38.46						
4	D	L	000	14	50	27	1	45.00	1.66	3.70						
5	E	R	006	1	59	48	8	81.35	13.55	16.66						
6	E	R	006	2	60	21	0	35.00	0.00	0.00						
7	E	R	006	3	60	52	4	86.66	6.66	7.69						
8	E	R	006	4	60	43	0	71.66	0.00	0.00						

52

PASS	OPS-NO	A/C NO.	MISSION NO.	CONT.	PILOT	FLT. NO	HITS ON TARGET	HITS IN BULL	PERCENT HITS	PERCENT BULLS	PERCENT BULLS REL TO HITS
	32956	59	25	F	3	2					
	PROFILE	ROLL-IN- DIRECTION	MIL SET.	TARGET NO.	POUNDS FIRED						
1	D	L	000	29	59		0	5	0.00	0.00	0.00
2	D	L	000	19	60		2	0	3.33	0.00	0.00
3	D	L	000	18	60		6	1	10.00	1.66	16.66
4	D	L	000	17	59		45	25	76.27	42.37	55.55
5	E	R	006	10	59		30	0	50.84	0.00	0.00
6	E	R	006	9	59		42	3	71.18	5.06	7.14
7	E	R	006	8	59		46	2	77.96	3.38	4.34
8	E	P	006	7	59		48	4	81.35	6.77	8.33

OPS-NO	A/C NO.	MISSION NO.	CONT.	PILOT	FLT. NO	HITS ON TARGET	HITS IN BULL	PERCENT HITS	PERCENT BULLS	PERCENT BULLS REL TO HITS
33001	59	26	F	4	1					
PASS	PROFILE	ROLL-IN-DIRECTION	MIL SET.	ROUNDS FIRED						
1	D	L	000	59	17	3	28.91	5.68	17.64	
2	D	L	000	59	43	13	72.88	22.93	30.23	
3	D	L	000	59	5	0	8.47	0.00	0.00	
4	D	L	000	59	8	1	13.55	1.69	12.50	
5	E	R	006	59	40	1	67.79	1.69	2.50	
6	E	R	006	59	56	6	94.91	10.16	10.71	
7	E	R	006	58	50	8	86.20	13.79	16.00	
8	E	R	006	59	48	1	81.35	1.69	2.08	

2

OPS-NO	A/C NO.	MISSION NO.	CONT.	PILOT	FLY. NO	PASS	PROFILE	ROLL-IN-DIRECTION	MIL SET.	TARGET NO.	ROUNDS FIRED	HITS ON TARGET	HITS IN BULL	PERCENT HITS	PERCENT BULLS	PERCENT BULLS REL TO HITS
33003	59	27	F	2	1											
1	0	L	000	11	59	20	8	33.89	13.55	40.00						
2	0	L	000	12	59	15	5	25.42	8.47	33.33						
3	0	L	000	13	59	28	4	47.45	6.77	14.28						
4	0	L	000	14	59	27	9	45.76	15.25	33.33						
5	E	R	006	1	58	41	8	70.68	13.79	19.51						
6	E	R	006	2	59	53	6	89.83	10.16	11.32						
7	E	R	006	3	59	48	8	81.35	13.55	16.66						
8	E	R	006	4	59	55	16	93.22	27.11	29.09						

PASS	OPS-NO	A/C NO.	MISSION NO.	CONT.	PILOT	FLT. NO	HITS ON TARGET	HITS IN BULL	PERCENT HITS	PERCENT BULLS	PERCENT BULLS REL TO HITS
	33206	69	28	F	1	2					
	PROFILE	ROLL-IN-DIRECTION	WIL SET.	TARGET NO.	ROUNDS FIRED		HITS ON TARGET	HITS IN BULL	PERCENT HITS	PERCENT BULLS	PERCENT BULLS REL TO HITS
1	D	L	300	20	60		0	0	0.00	0.00	3.00
2	D	L	000	19	59		14	3	23.72	5.38	21.42
3	D	L	000	18	60		20	6	33.33	10.00	30.00
4	D	L	000	17	60		14	5	23.33	8.33	35.71
5	E	R	006	10	59		52	5	88.13	8.47	9.61
6	E	R	006	9	59		51	13	86.44	22.03	25.49
7	C	R	006	8	59		36	2	61.01	3.38	5.55
8	E	R	006	7	60		55	12	91.66	20.00	21.81

PASS	OPS-NO	A/C NO.	MISSION NO.	CONT.	PILOT	FLT. NO	HITS ON TARGET	HITS IN BULL	PERCENT HITS	PERCENT BULLS	PERCENT BULLS REL TO HITS
	33269	70	29	F	4	1					
	PROFILE	ROLL-IN-DIRECTION	MIL SET.	TARGET NO.	ROUNDS FIRED						
1	0	R	000	1	61	0	0	0	0.00	0.00	0.00
2	0	R	000	2	61	44	20	72.13	32.78	45.45	
3	0	R	000	3	61	0	0	0.00	0.00	0.00	
4	0	R	000	4	61	0	0	0.00	0.00	0.00	
5	E	L	006	11	61	40	4	65.57	6.55	19.00	
6	E	L	006	12	60	0	0	0.00	0.00	0.00	
7	E	L	006	13	60	19	0	31.66	0.00	0.00	
8	E	L	006	14	60	4	0	6.66	0.00	0.00	

OP 5-NO	A/C NO.	MISSION NO.	CONT.	PILOT	FLY. NO	HITS ON TARGET	HITS IN BULL	PERCENT HITS	PERCENT BULLS	PERCENT BULLS REL TO HITS
33326	75	35	F	3	2					
PASS	PROFILE	ROLL-IN-DIRECTION	MIL SET.	TARGET NO.	ROUNDS FIRED	HITS ON TARGET	HITS IN BULL	PERCENT HITS	PERCENT BULLS	PERCENT BULLS REL TO HITS
1	D	R	00	13	60	14	0	23.33	0.00	0.00
2	D	R	00	9	60	2	0	3.33	0.00	0.00
3	Q	R	00	8	60	7	1	11.66	1.66	14.28
4	D	R	00	7	60	31	9	51.66	15.00	29.03
5	E	L	05	30	60	50	0	83.33	0.00	0.00
6	F	L	06	13	61	60	10	98.36	16.39	16.66
7	E	L	06	10	59	56	4	94.91	6.77	7.14
8	E	L	06	17	60	59	12	98.33	20.00	20.33

PASS	PROFILE	A/C NO.	MISSION NO.	CORR.	PILOT	FLT. NO	HITS ON TARGET	HITS IN BULL	PERCENT HITS	PERCENT BULLS	PERCENT BULLS REL TO HITS
	334J6	59	31	5	2	2					
1	D	2	300	18	59	9	9	6	100	0.60	0.00
2	D	R	100	9	60	33	33	14	55.00	23.33	42.42
3	D	R	200	8	59	9	9	9	100	0.00	0.00
4	D	R	100	7	66	3	3	0	5.00	0.00	0.00
5	E	L	300	20	59	4	4	0	10.77	0.00	0.00
6	E	L	300	19	59	36	36	3	61.01	5.08	8.33
7	E	L	300	18	59	57	57	9	96.61	15.25	15.78
8	E	L	300	17	59	40	40	1	68.96	1.72	2.50

OPS-NO	A/C NO.	MISSION NO.	CONT.	PILOT	FLT. NO	HITS ON TARGET	HITS IN BULL	PERCENT HITS	PERCENT BULLS	PERCENT BULLS REL TO HITS
33410	59	32	F	4	2					
PASS	PROFILE	ROLL-IN-DIRECTION	MIL SET.	ROUNDS FIRED	HITS ON TARGET	HITS IN BULL	PERCENT HITS	PERCENT BULLS	PERCENT BULLS REL TO HITS	
1	D	R	000	59	0	0	0.00	9.00	0.00	
2	D	R	000	59	4	0	6.77	0.00	0.00	
3	D	R	000	60	8	0	13.33	0.00	0.00	
4	D	R	000	59	20	3	33.89	13.55	40.00	
5	E	L	006	59	22	0	37.28	0.00	0.00	
6	E	L	006	59	14	0	23.72	0.00	0.00	
7	E	L	006	59	43	6	72.88	10.16	13.95	
8	E	L	006	59	54	13	91.52	22.03	24.07	

PASS	OPS-NO	A/C NO.	MISSION NO.	CONT.	PILOT	FLI. NO	HITS ON TARGET	HITS IN BULL	PERCENT HITS	PERCENT BULLS	PERCENT BULLS REL TO HITS
	33505	59	33	F	3	1					
	PROFILE	ROLL-IN-DIRECTION	MIL SET.	TARGET NO.	ROUNDS FIRED						
1	D	R	000	1	59	0	0	0.00	0.00	0.00	0.00
2	U	R	000	2	59	6	2	10.16	3.38	33.33	33.33
3	D	R	000	3	59	0	0	0.00	0.00	0.00	0.00
4	D	R	000	4	60	1	0	1.66	0.00	0.00	0.00
5	E	L	006	11	59	29	0	49.15	0.00	0.00	0.00
6	E	L	006	12	59	8	0	13.55	0.00	0.00	0.00
7	E	L	006	13	58	32	3	55.17	5.17	9.37	9.37
8	E	L	006	14	59	25	0	42.37	0.00	0.00	0.00

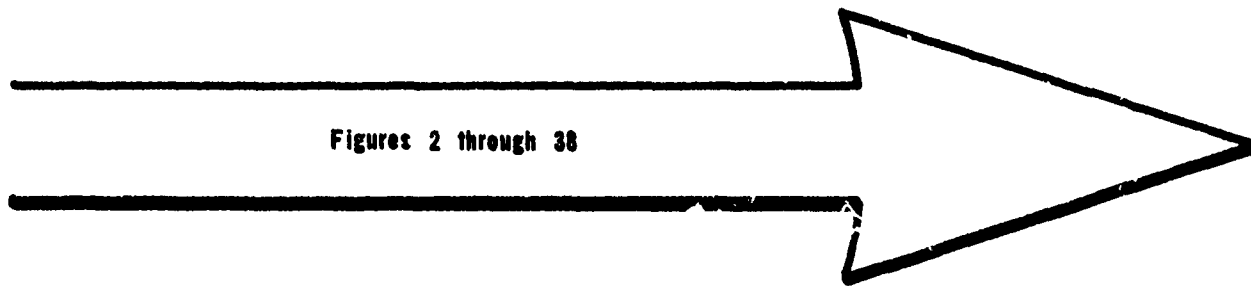
OPS-NO	A/C NO.	MISSION NO.	CONT.	PILOT	FLT. NO.					
33605	69	34	F	2	1					
PASS	PROFILE	ROLL-IN-DIRECTION	MIL SET.	TARGET NO.	ROUNDS FIRED	HITS ON TARGET	HITS IN BULL	PERCENT HITS	PERCENT BULLS	PERCENT BULLS REL TO HITS
1	0	R	000	1	59	0	9	0.00	0.00	0.00
2	0	R	000	2	60	44	18	73.33	30.00	40.90
3	0	R	000	3	59	31	16	52.54	27.11	51.61
4	0	R	000	4	59	34	16	57.62	27.11	47.05
5	E	L	006	11	58	44	9	75.86	0.00	0.00
6	E	L	006	12	59	43	2	72.88	3.38	4.65
7	E	L	006	13	59	53	1	98.30	1.69	1.72
8	E	L	006	14	60	47	4	78.33	6.66	8.51

OPS-NO	A/C NO.	MISSION NO.	CONT.	PILOT	FLY. NO	PASS	PROFILE	ROLL-IN-DIRECTION	MIL SET.	TARGET NO.	ROUNDS FIRED	HITS ON TARGET	HITS IN BULL	PERCENT HITS	PERCENT BULLS	PERCENT BULLS REL TO HITS
33659	69	35	F	4	1											
						1	0	R	000	1	59	0	0	0.00	0.00	0.00
						2	0	R	100	2	59	0	0	0.00	0.00	0.00
						3	0	R	000	3	60	0	0	0.00	0.00	0.00
						4	0	R	000	4	59	40	16	67.79	27.11	40.00
						5	E	L	006	11	58	34	1	58.62	1.72	2.94
						6	E	L	006	12	59	55	11	93.22	18.64	20.00
						7	E	L	006	13	53	46	2	79.31	3.44	4.34
						8	E	L	006	14	59	57	23	96.61	38.98	40.35

OPS-NO	A/C NO.	MISSION NO.	CONT.	PILOT	FLI. NO	HITS ON TARGET	HITS IN BULL	PERCENT HITS	PERCENT BULLS	PERCENT BULLS REL TO HITS
33703	79	37	F	1	1					
PASS	PROFILE	ROLL-IN-DIRECTION	MIL SET.	ROUNDS FIRED						
1	0	R	090	58	1	0	1.72	0.00	0.00	
2	0	R	060	61	17	5	27.86	8.19	29.41	
3	0	R	090	61	15	5	24.59	8.19	33.33	
4	0	R	090	58	9	2	15.51	3.44	22.22	
5	E	L	096	61	26	2	42.62	3.27	7.69	
6	E	L	006	61	0	0	0.00	0.00	0.00	
7	E	L	006	61	30	1	49.18	1.63	3.33	
8	E	L	006	60	45	1	75.00	1.66	2.22	

TEST DATA

Figures 2 through 38



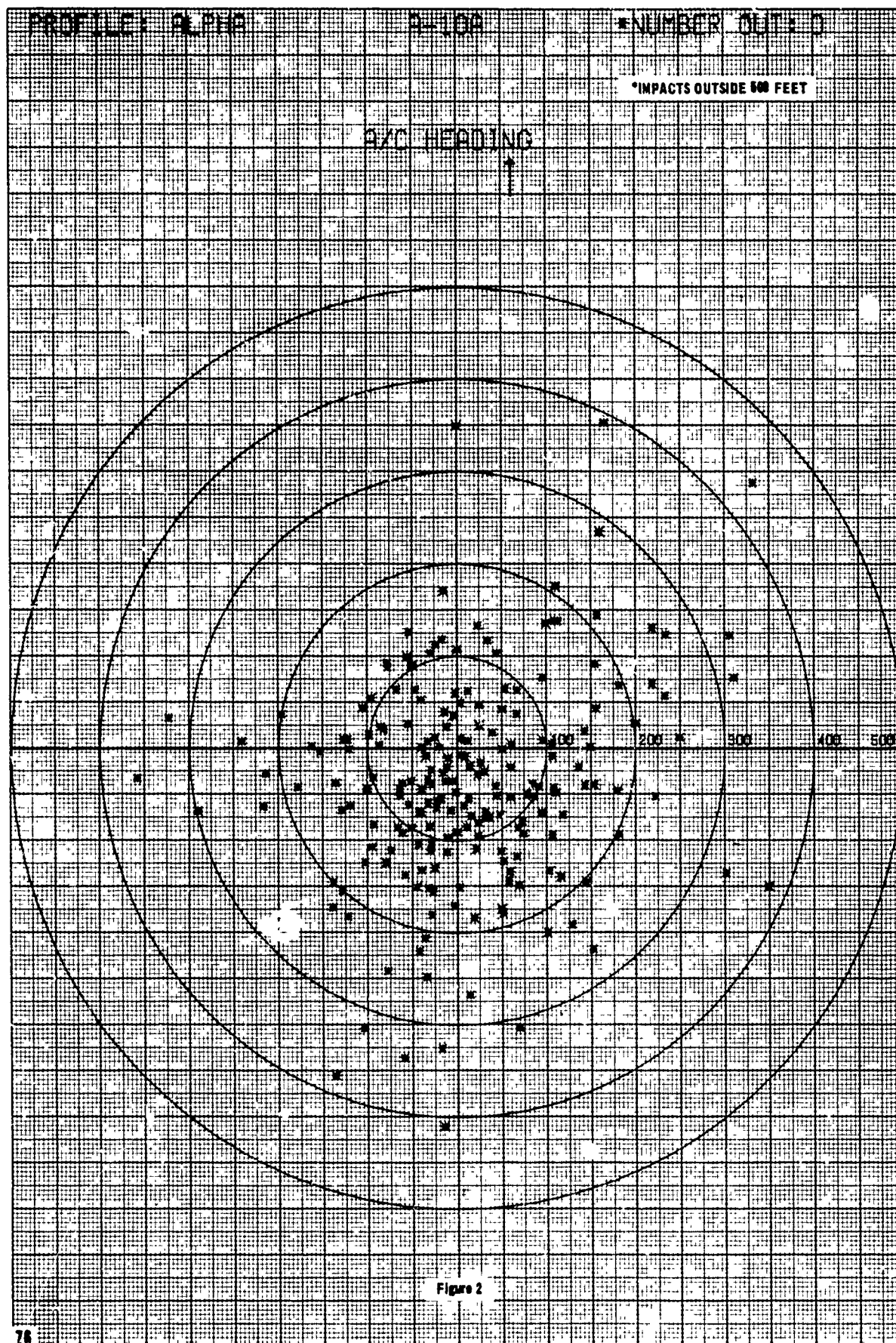


Figure 2

PROFILE: BRAVO

A-10A

NUMBER OUT: 0

A/C HEADING

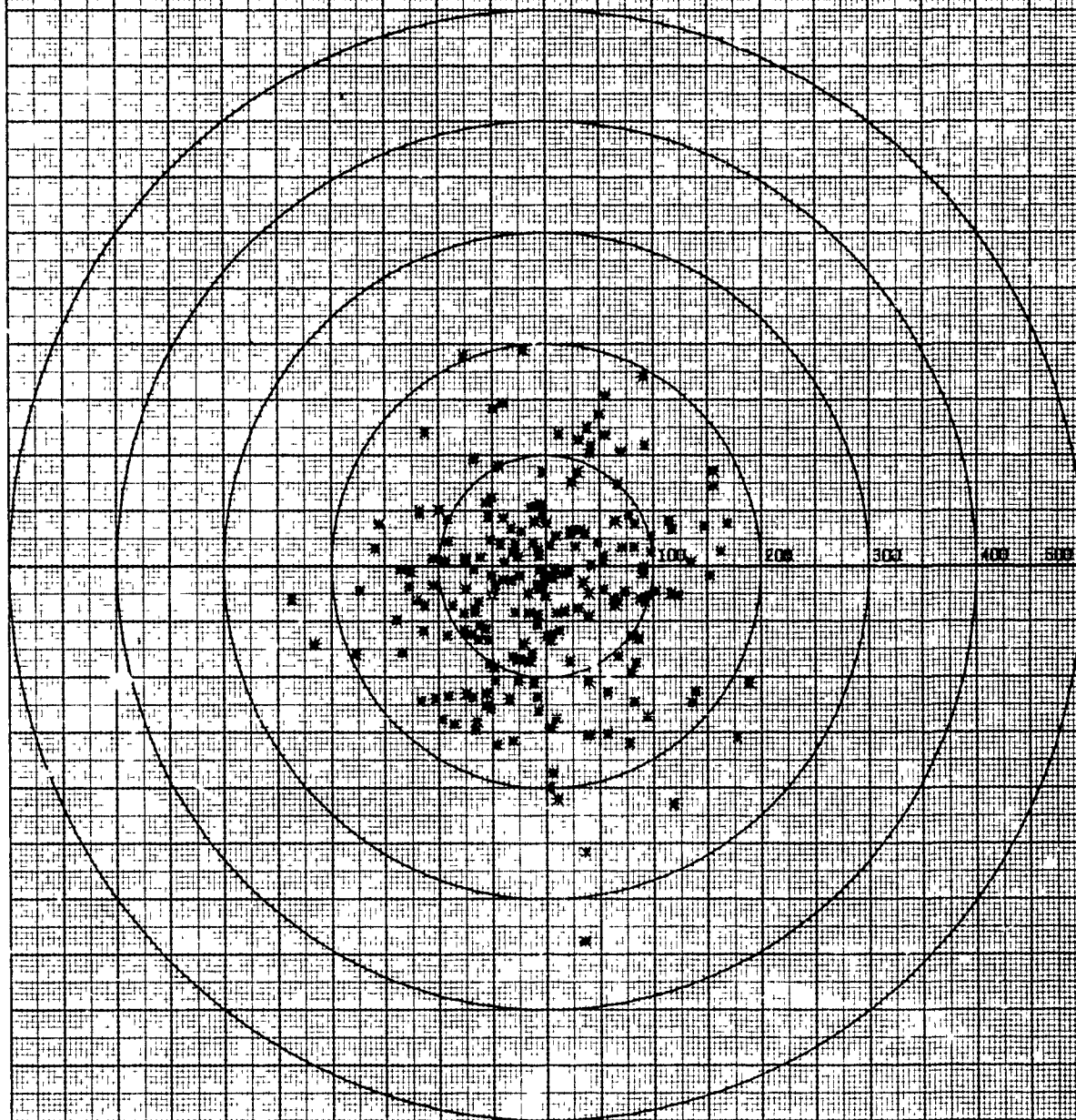


Figure 2

PROFILE: CHARLIE

B-10A

NUMBER OUT: 0

A/C HEADING

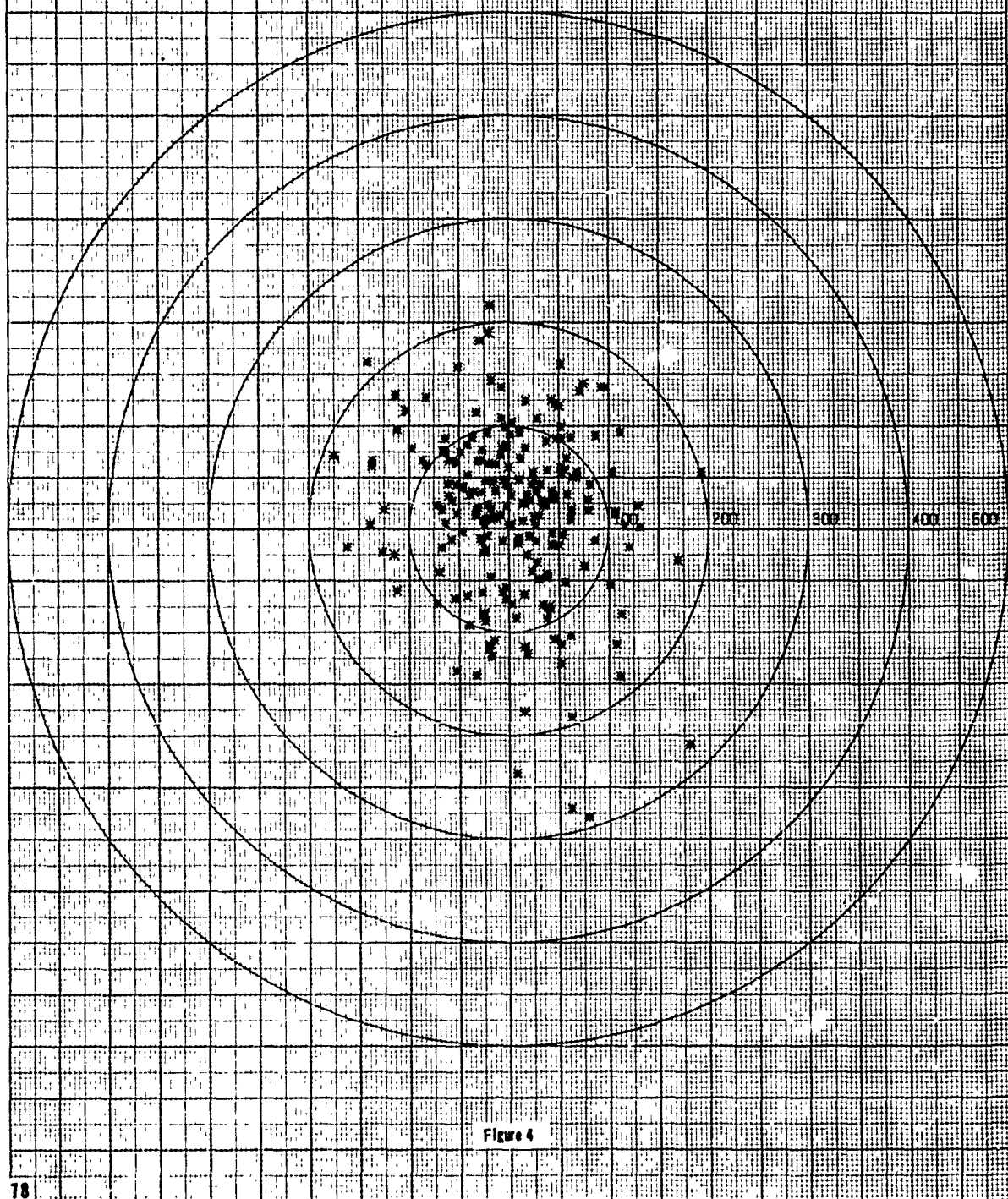
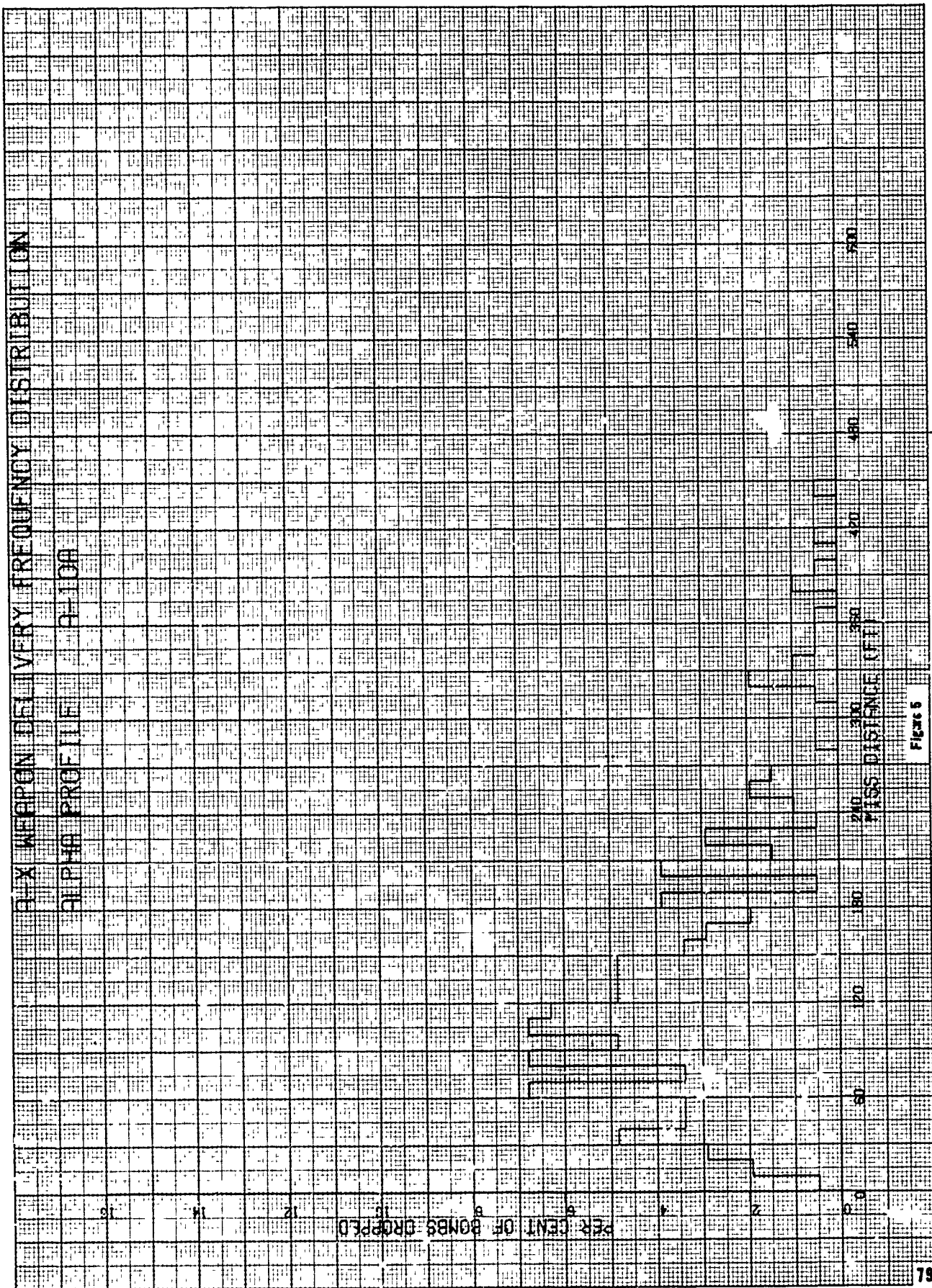


Figure 4



A-X WEAPON DELIVERY CUMULATIVE DISTRIBUTION

ALPHA PROFILE

A-10A

PER CENT OF BOMBS WITH MISS DISTANCE LESS THAN R FEET

100.0

97.5

75.0

62.5

50.0

37.5

25.0

12.5

0.0

0

50

100

150

200

250

300

350

400

450

500

550

600

650

700

750

800

850

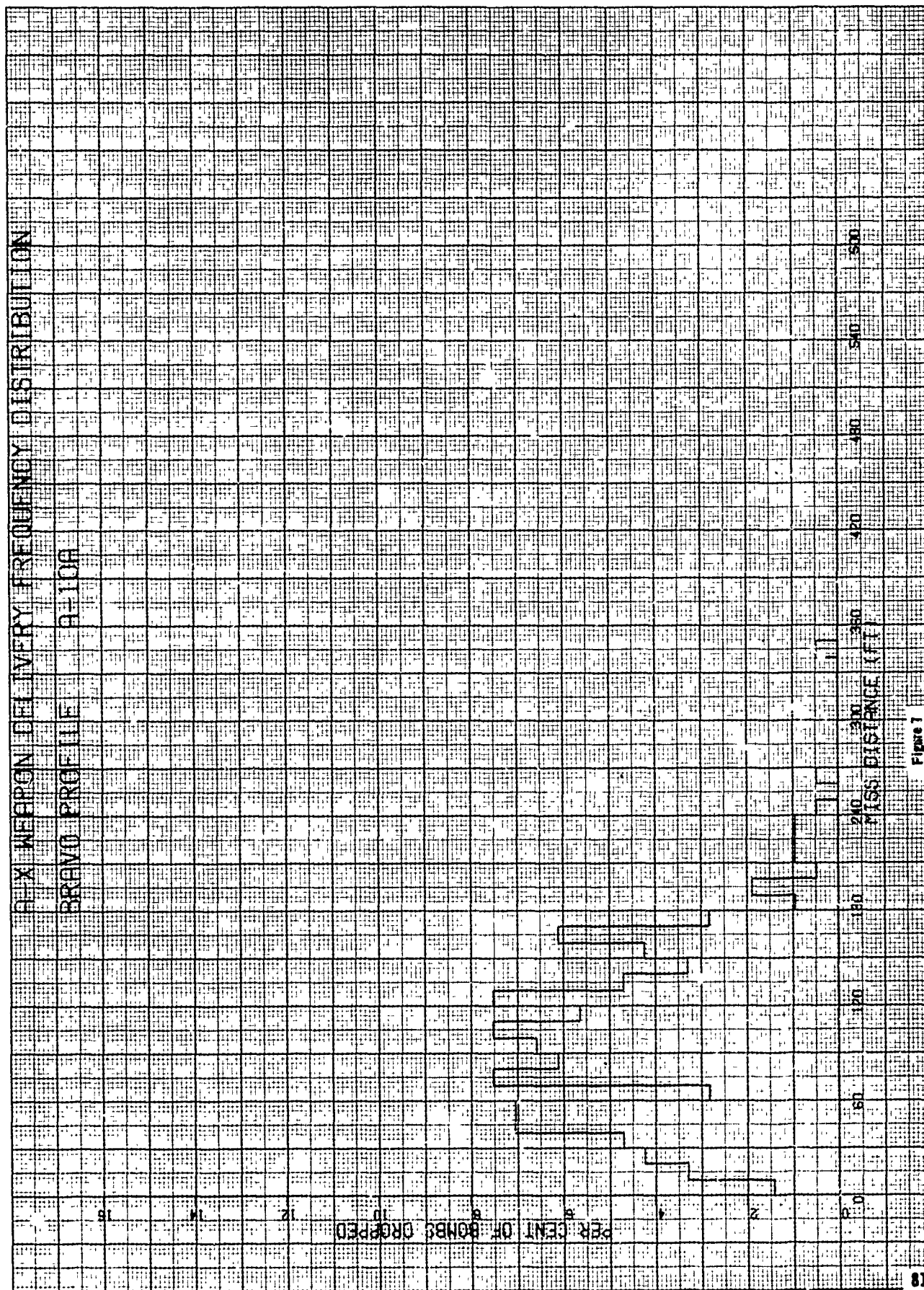
900

950

1000

MISS DISTANCE (FT)

Figure 6



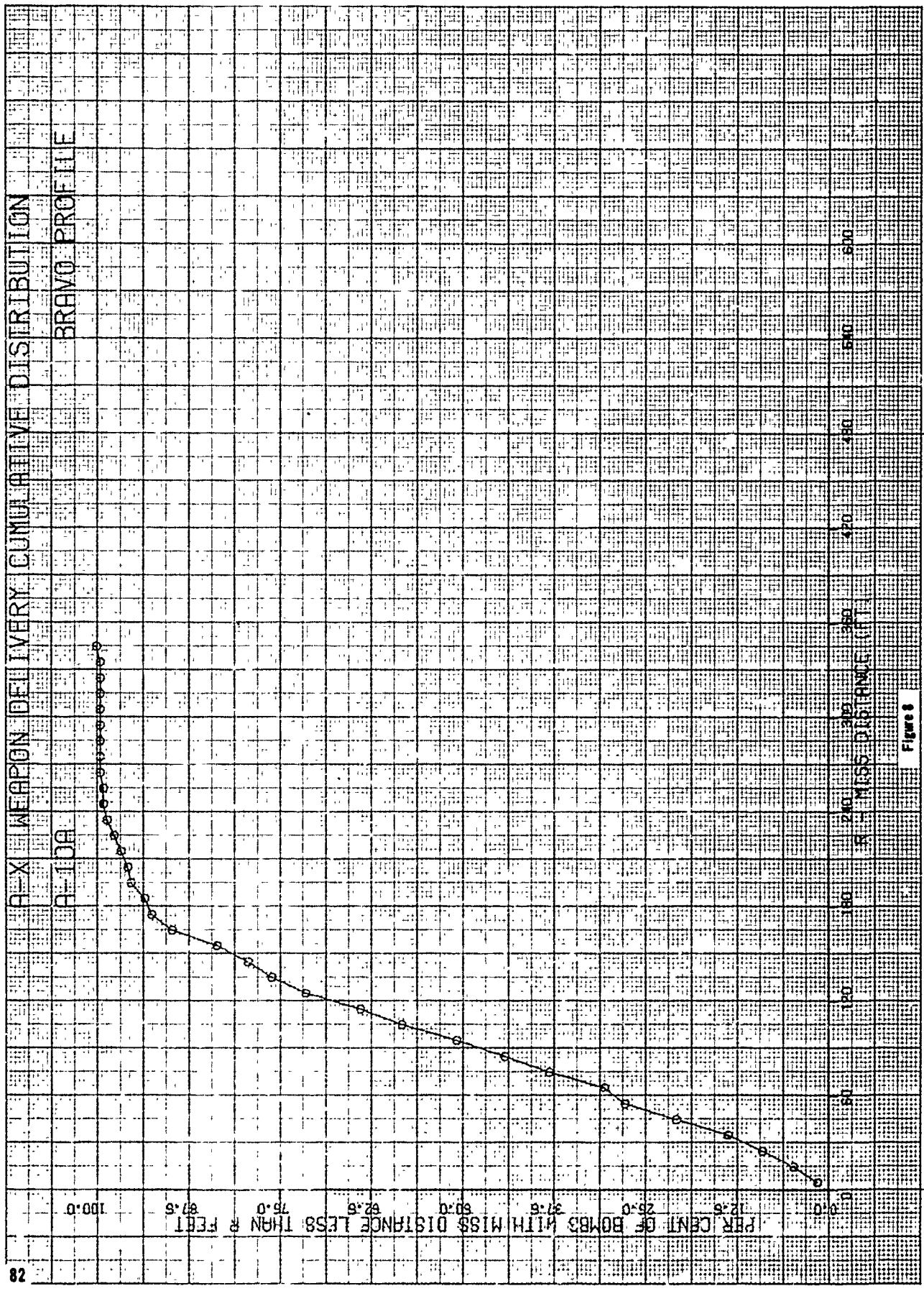


Figure 8

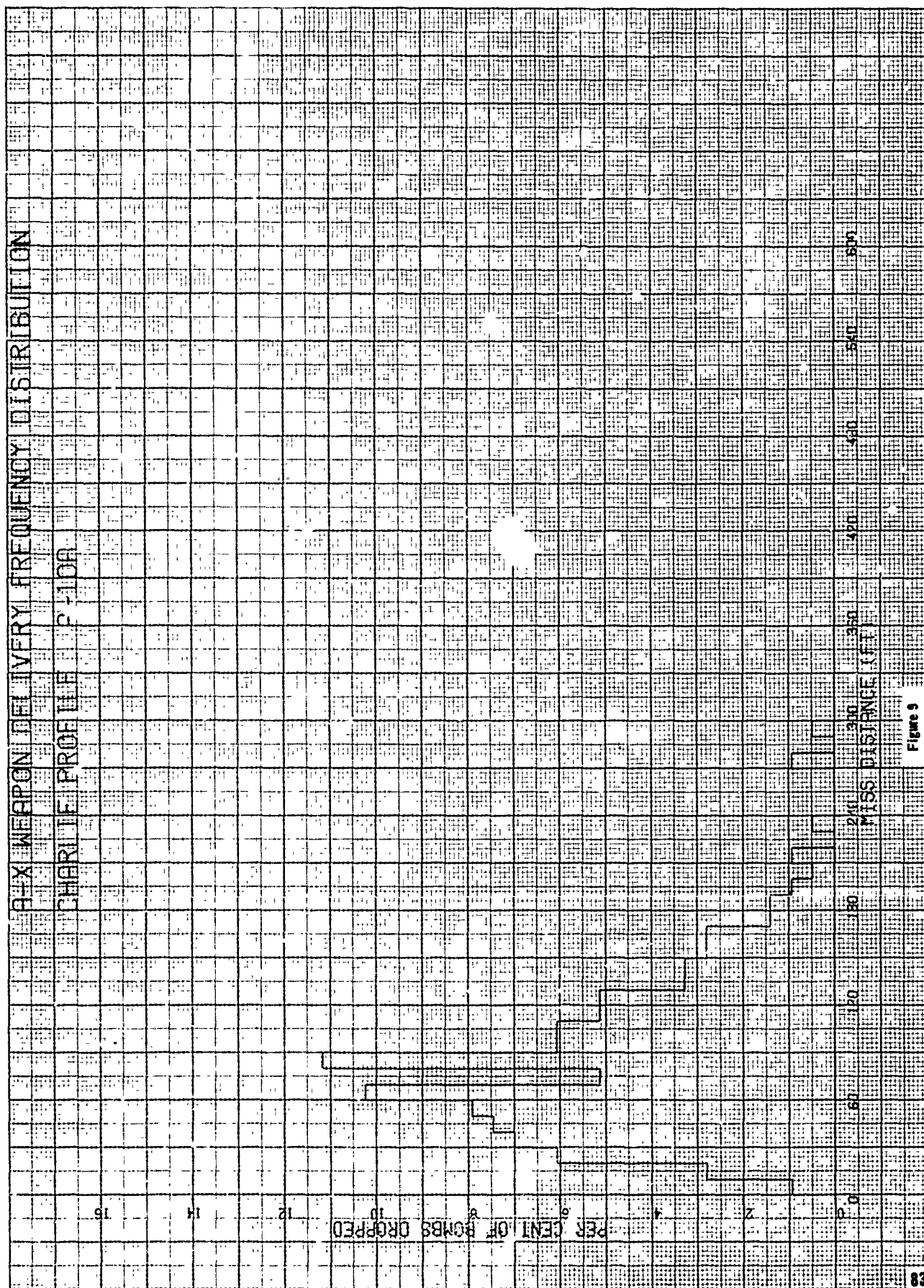


Figure 9

ALX WEAPON DELIVERY CUMULATIVE DISTRIBUTION CHARLIE PROFILE

AL-108

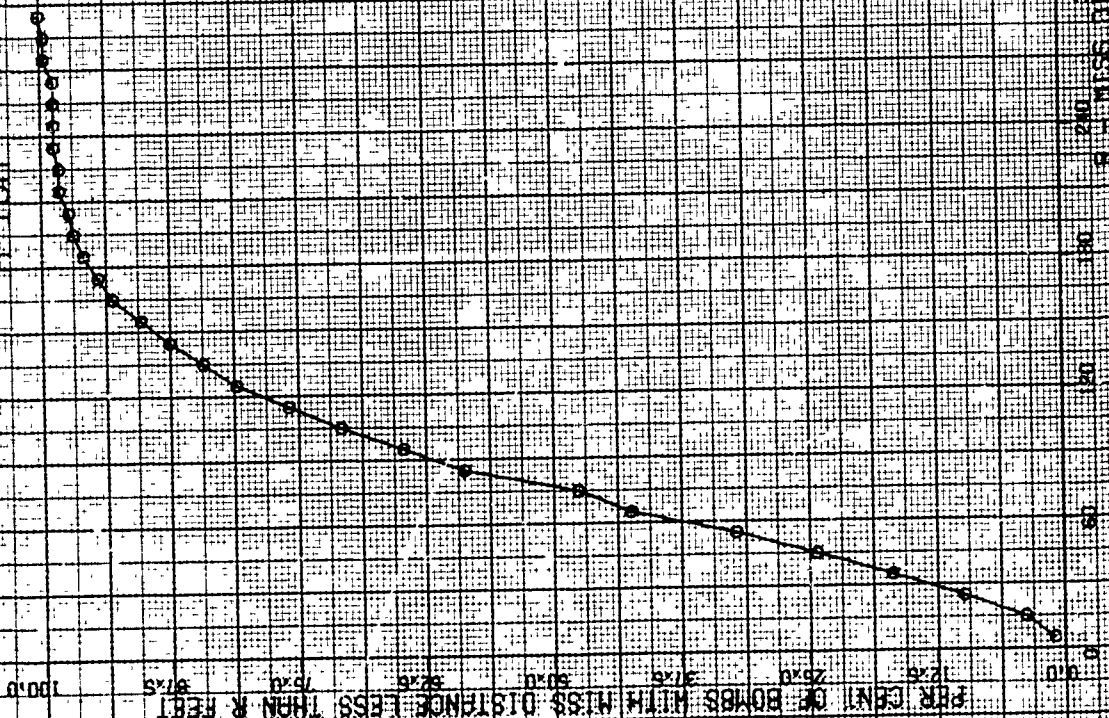


Figure 10

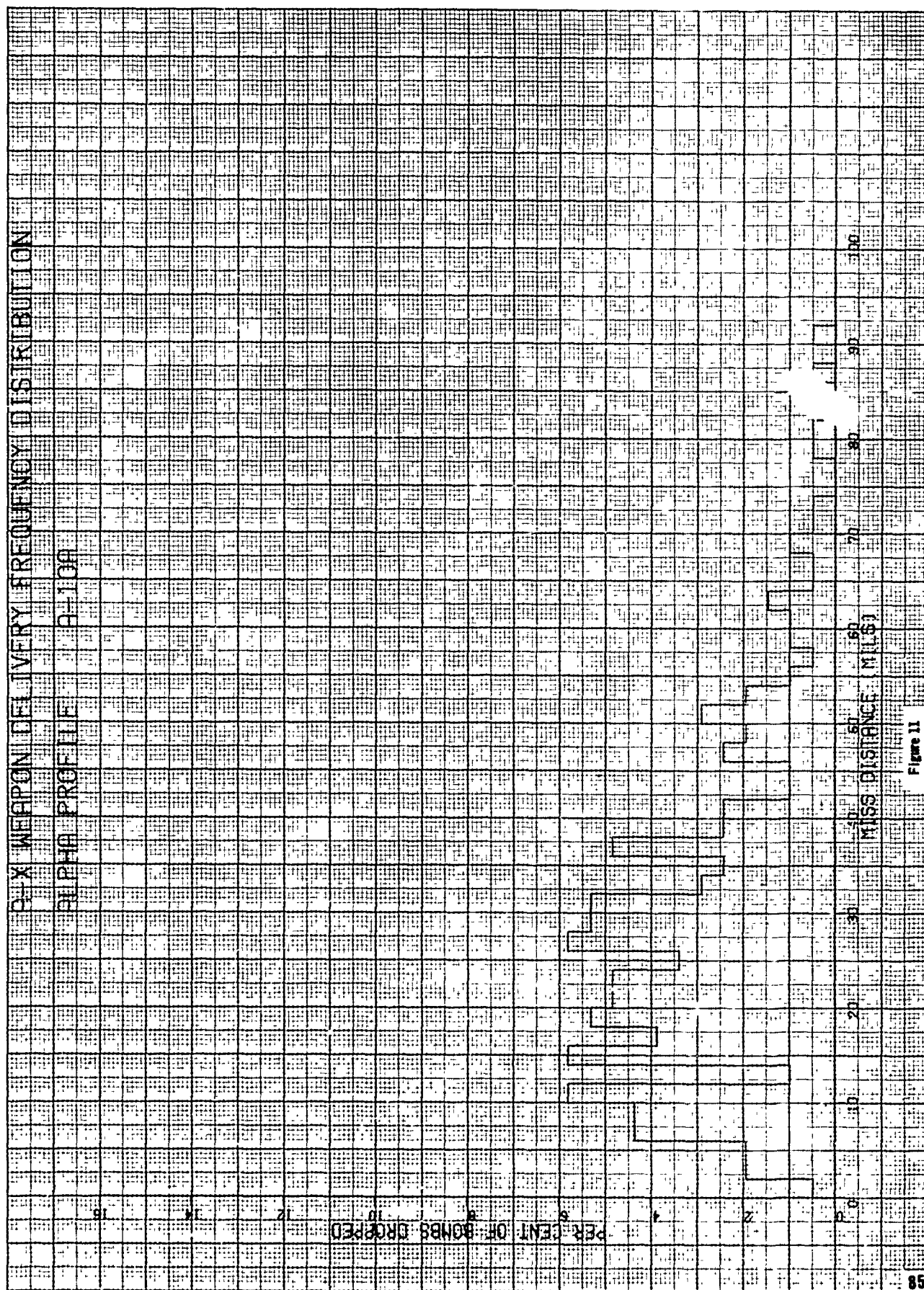


Figure 11

A-X WEAPON DELIVERY CUMULATIVE DISTRIBUTION

ALPHA PROFILE

A-10A

100.0

97.5

95.0

92.5

90.0

87.5

85.0

82.5

80.0

77.5

75.0

PER CENT OF BOMBS WITH MISS DISTANCE LESS THAN R MILS

R - MISS DISTANCE (MILS)

Figure 12

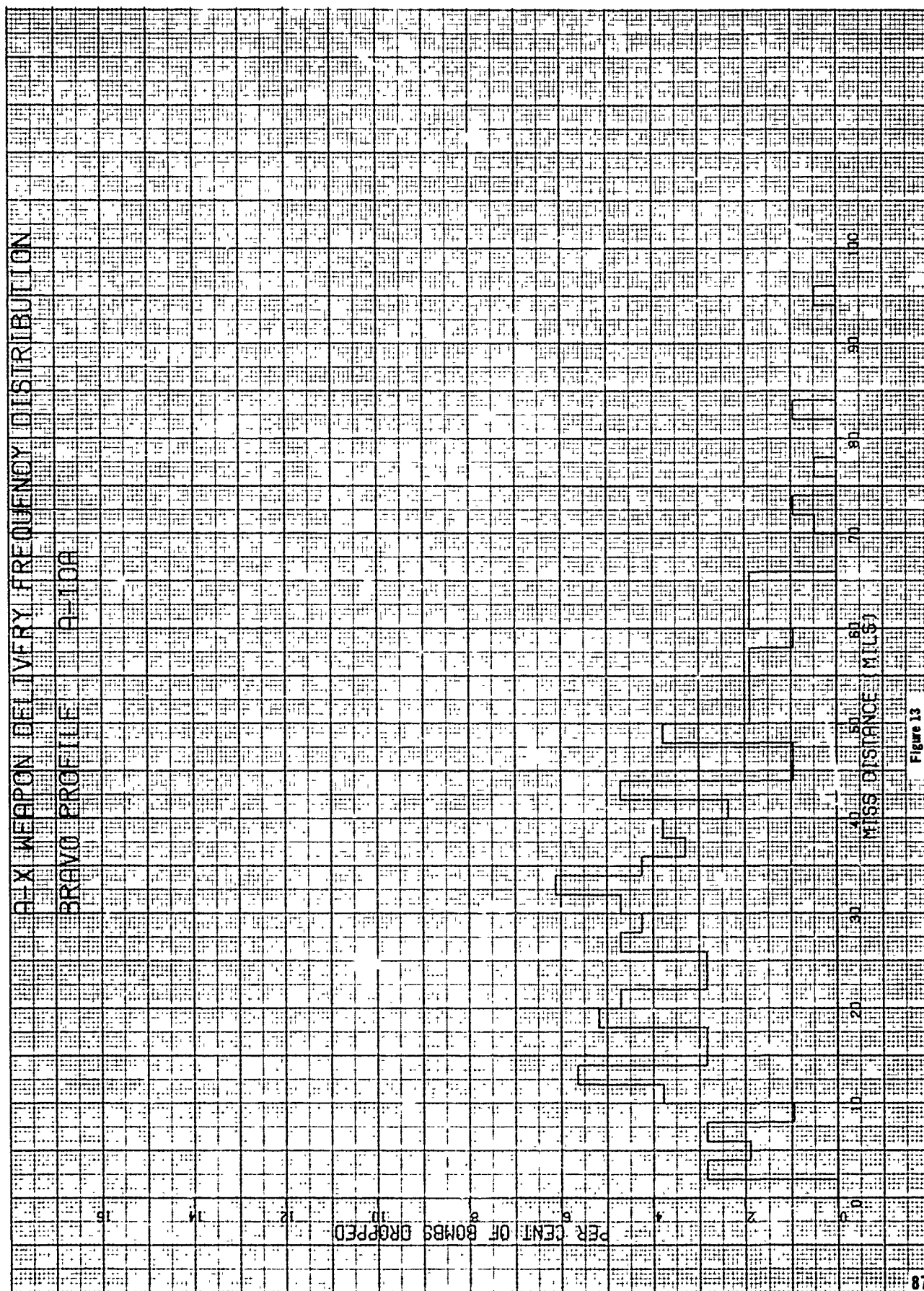


Figure 13

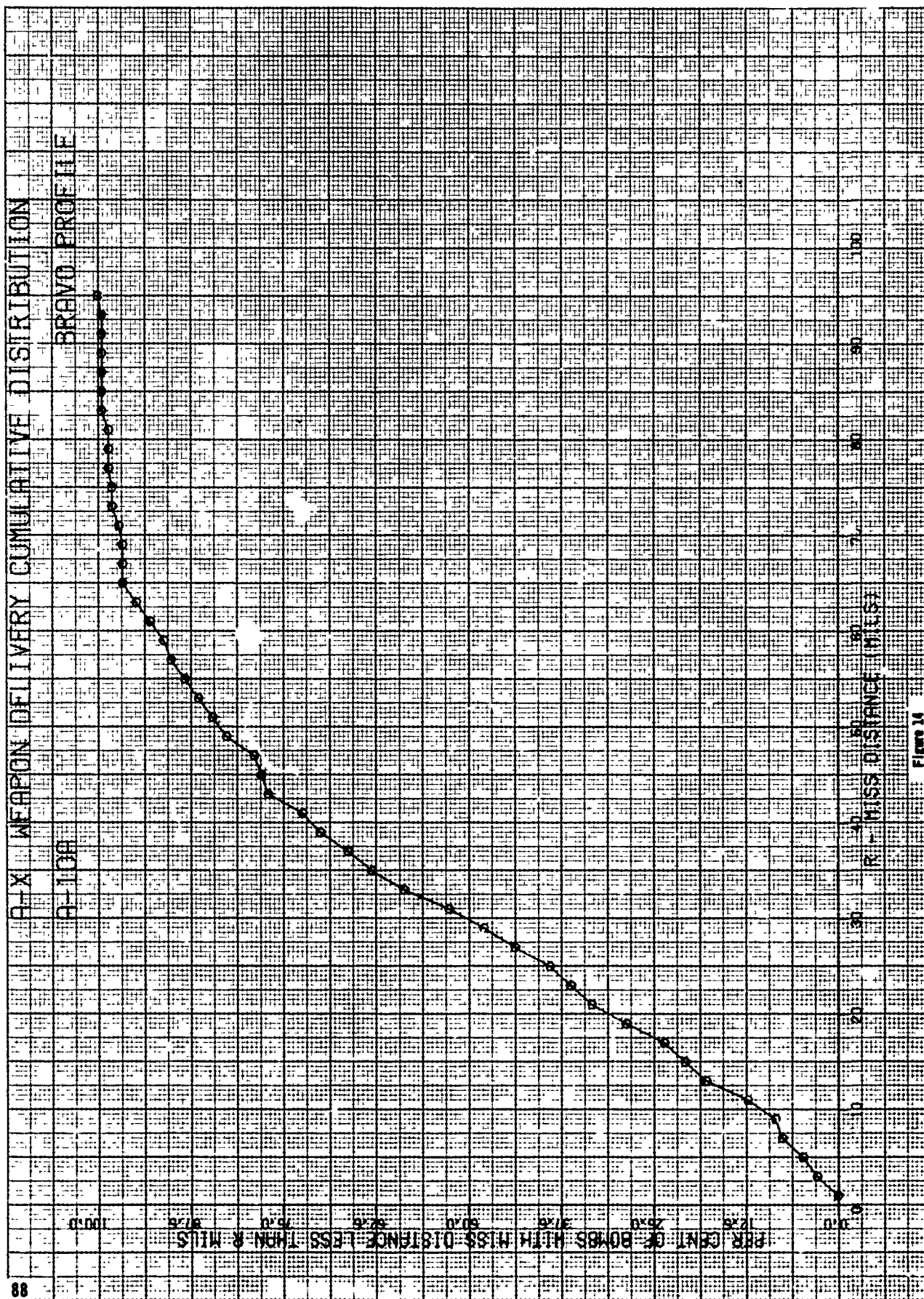


Figure 14

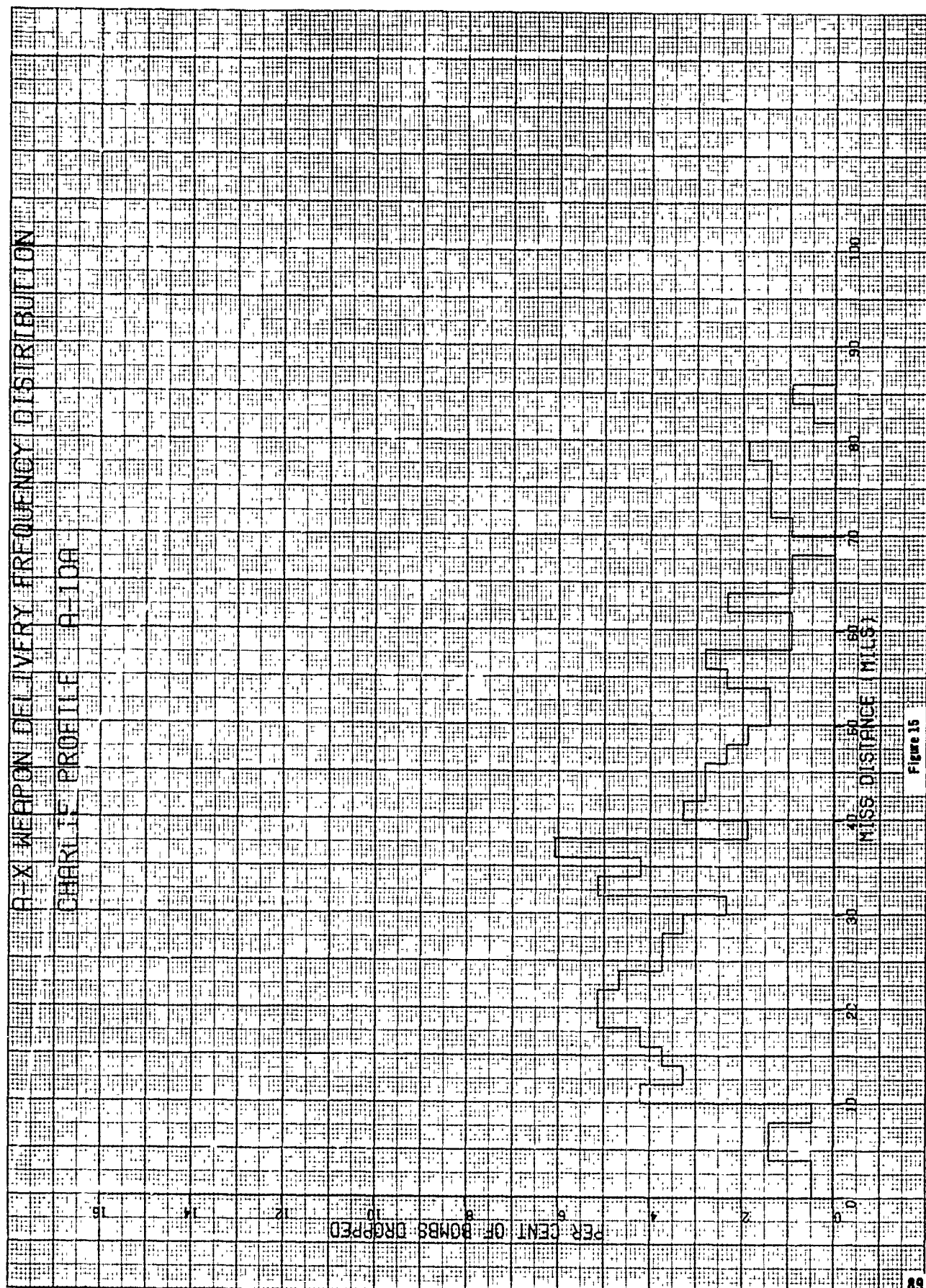


Figure 15

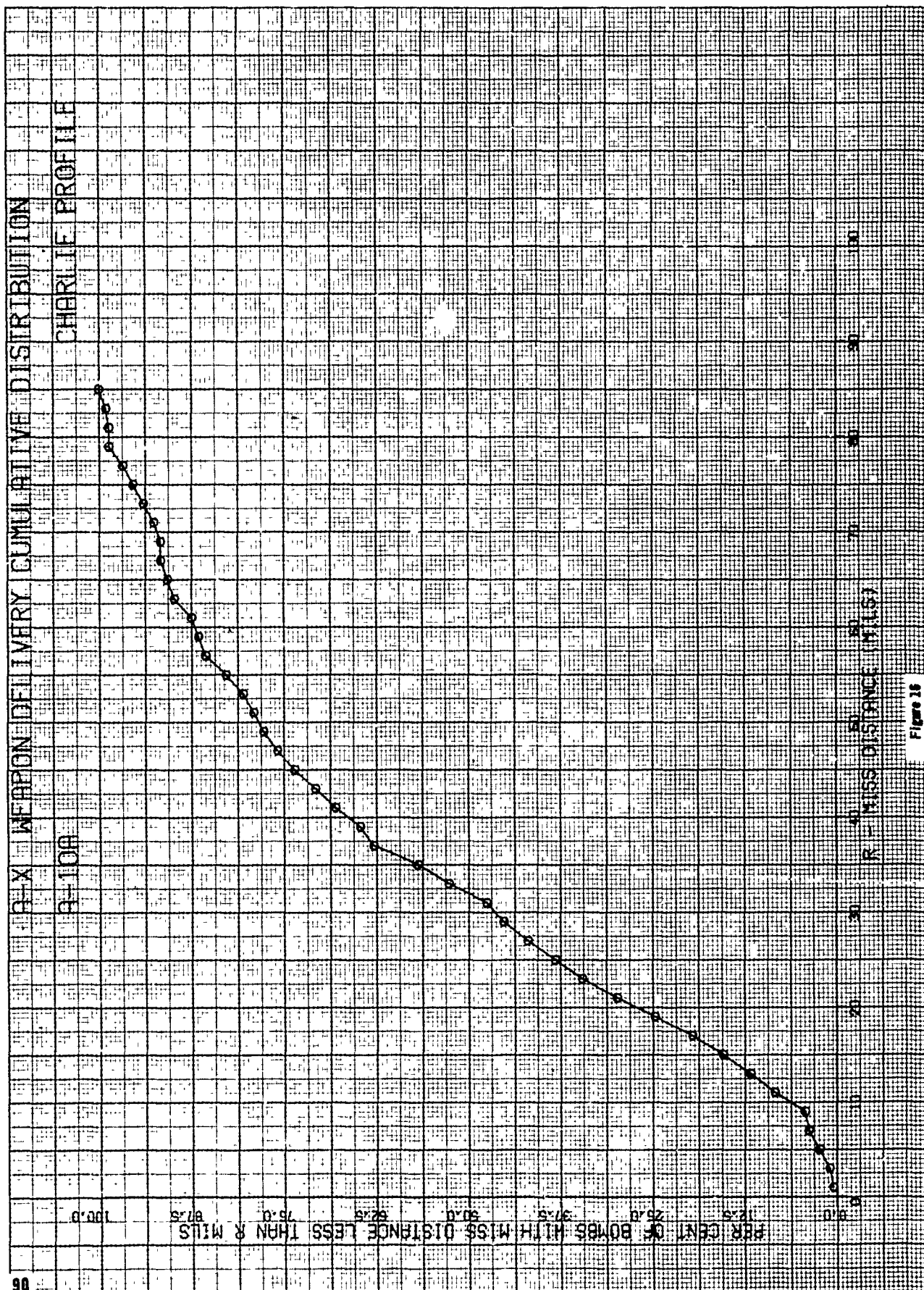


Figure 16

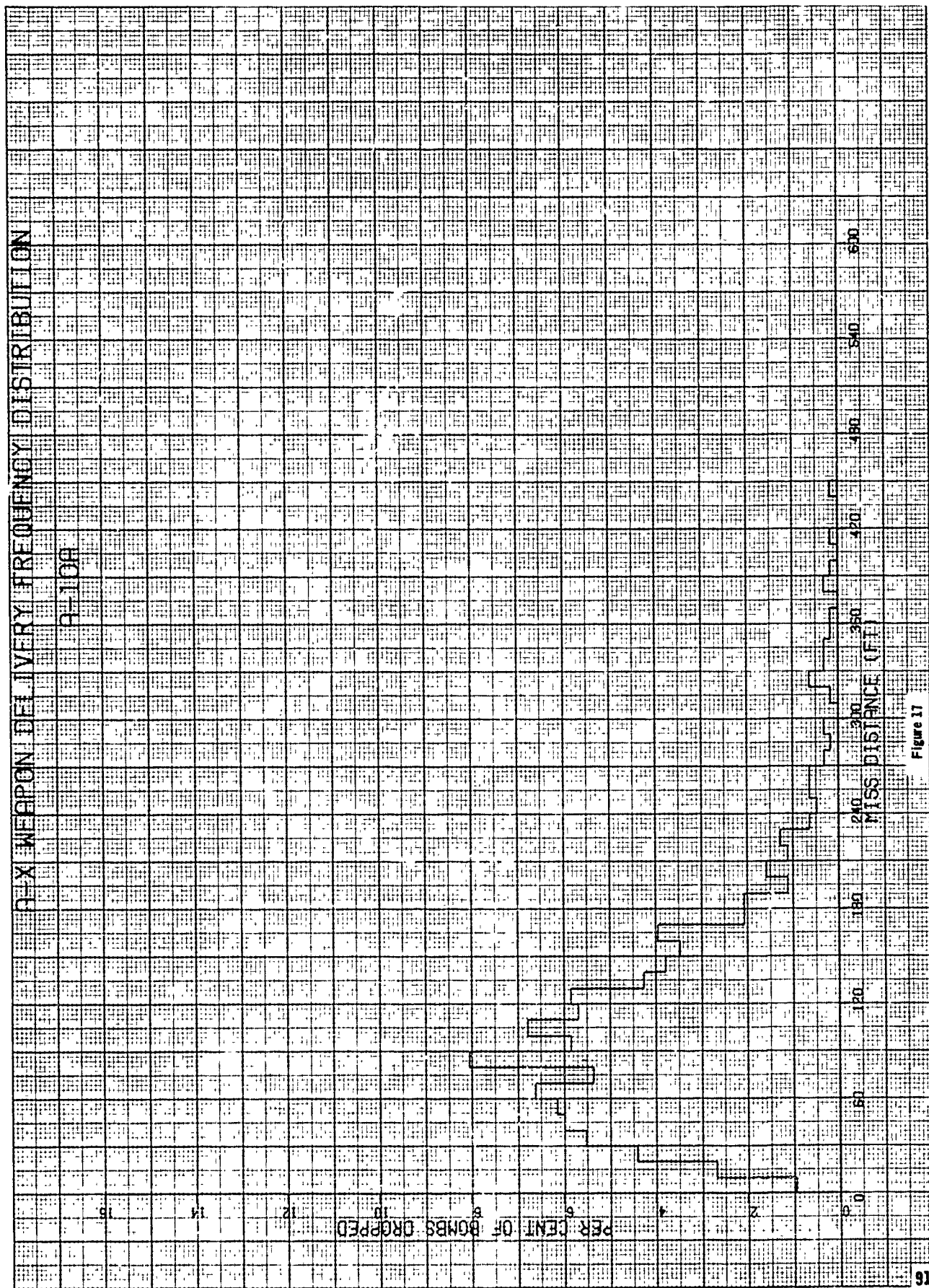


Figure 17

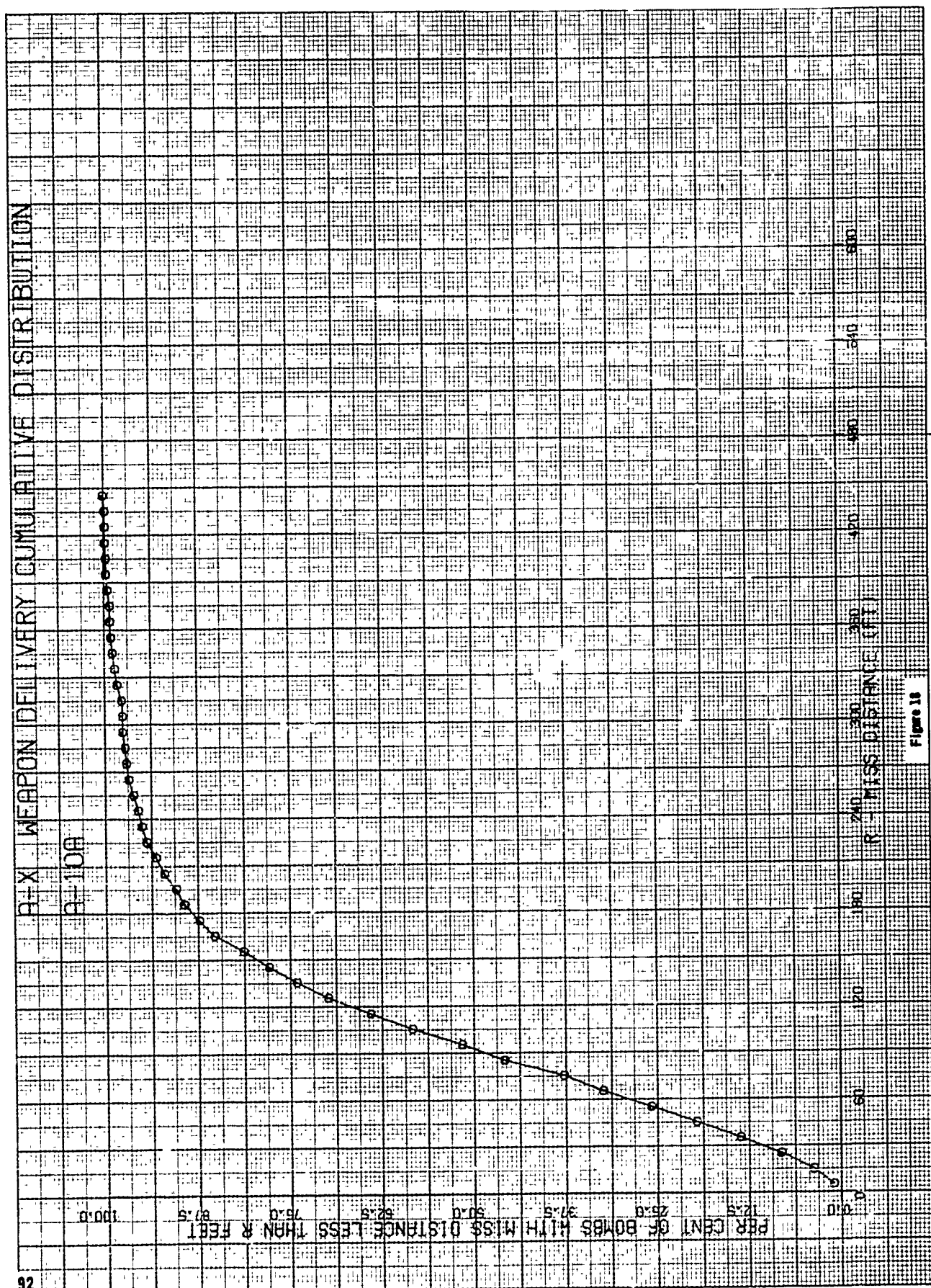


Figure 16

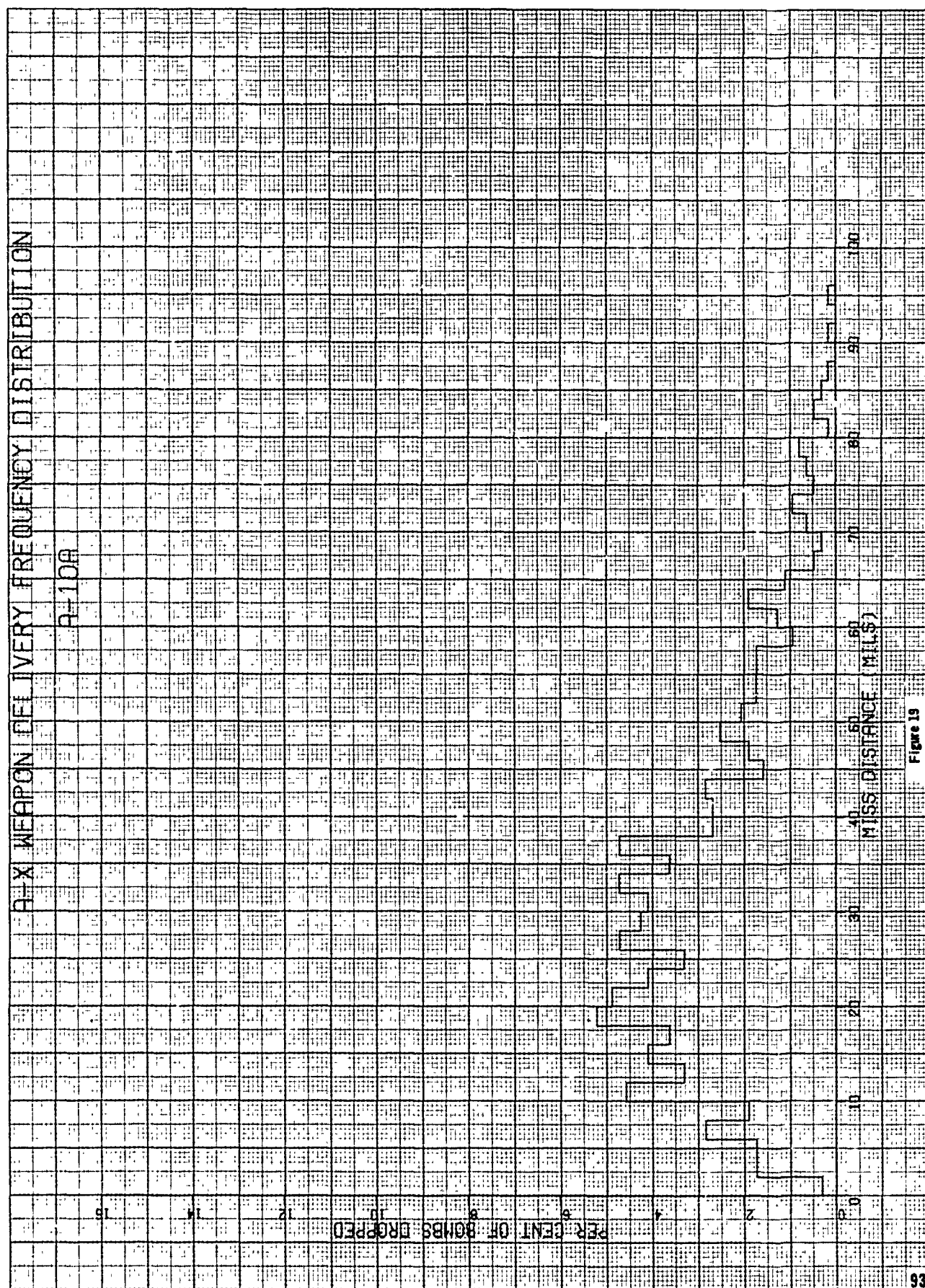


Figure 19

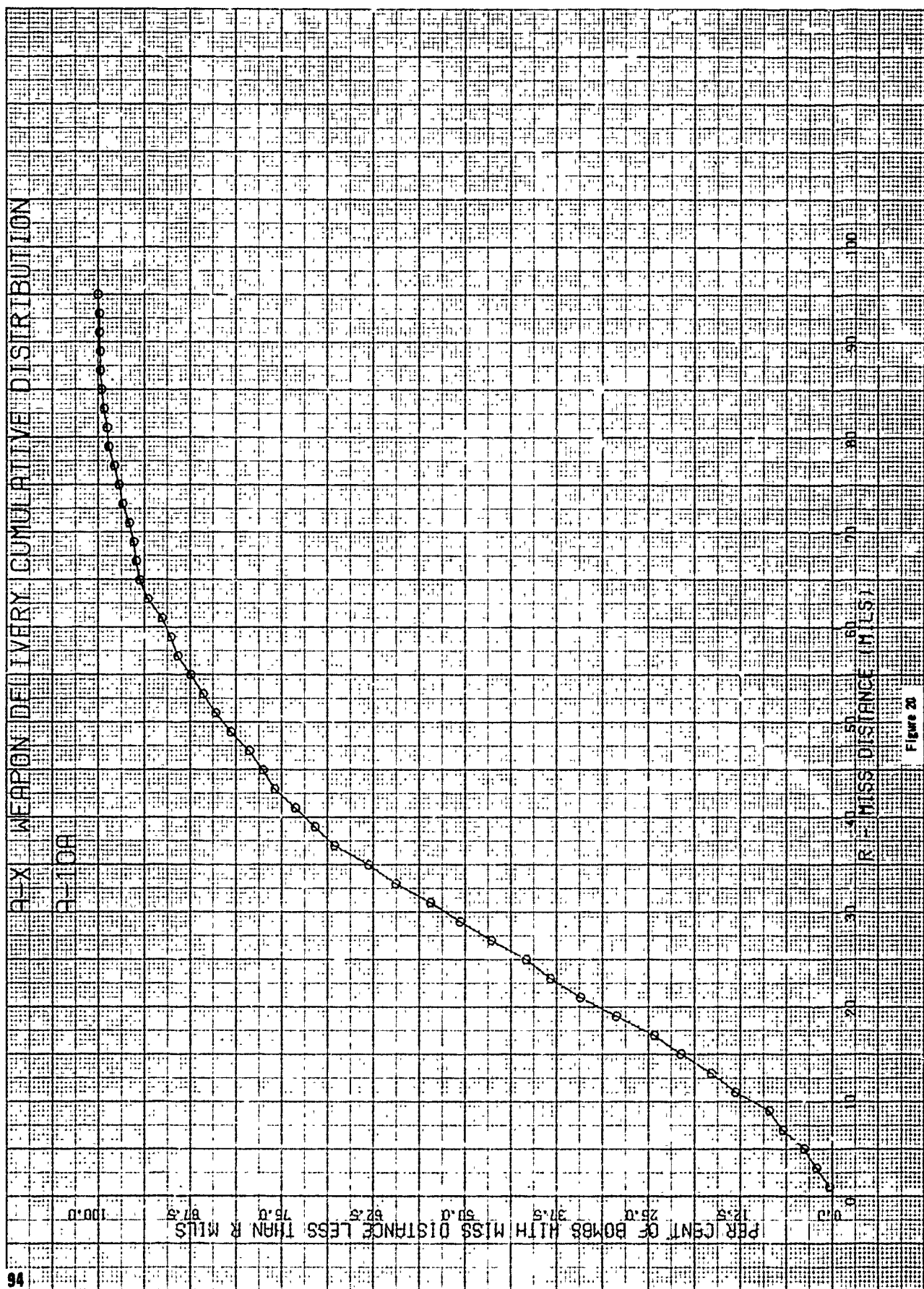


Figure 20

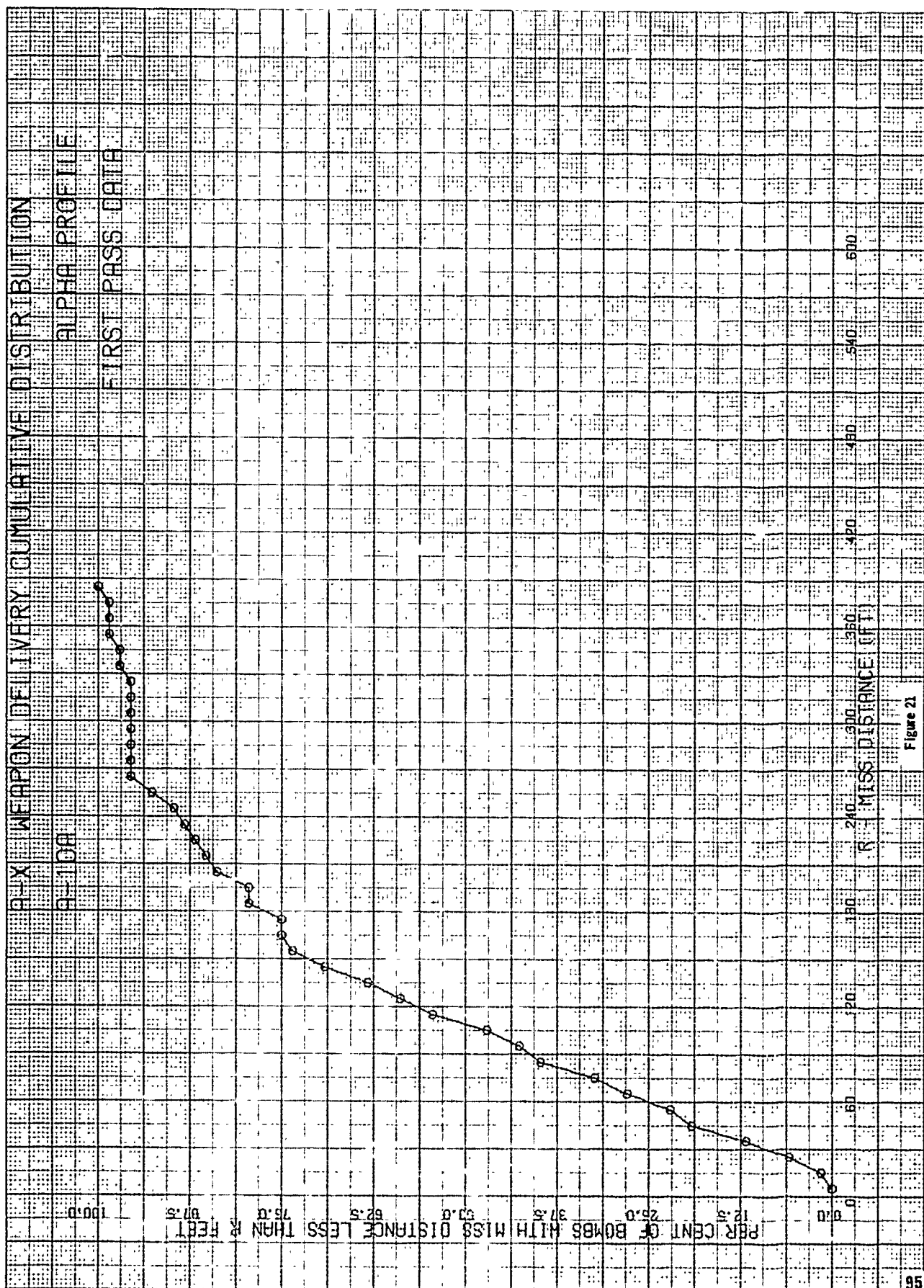


Figure 21

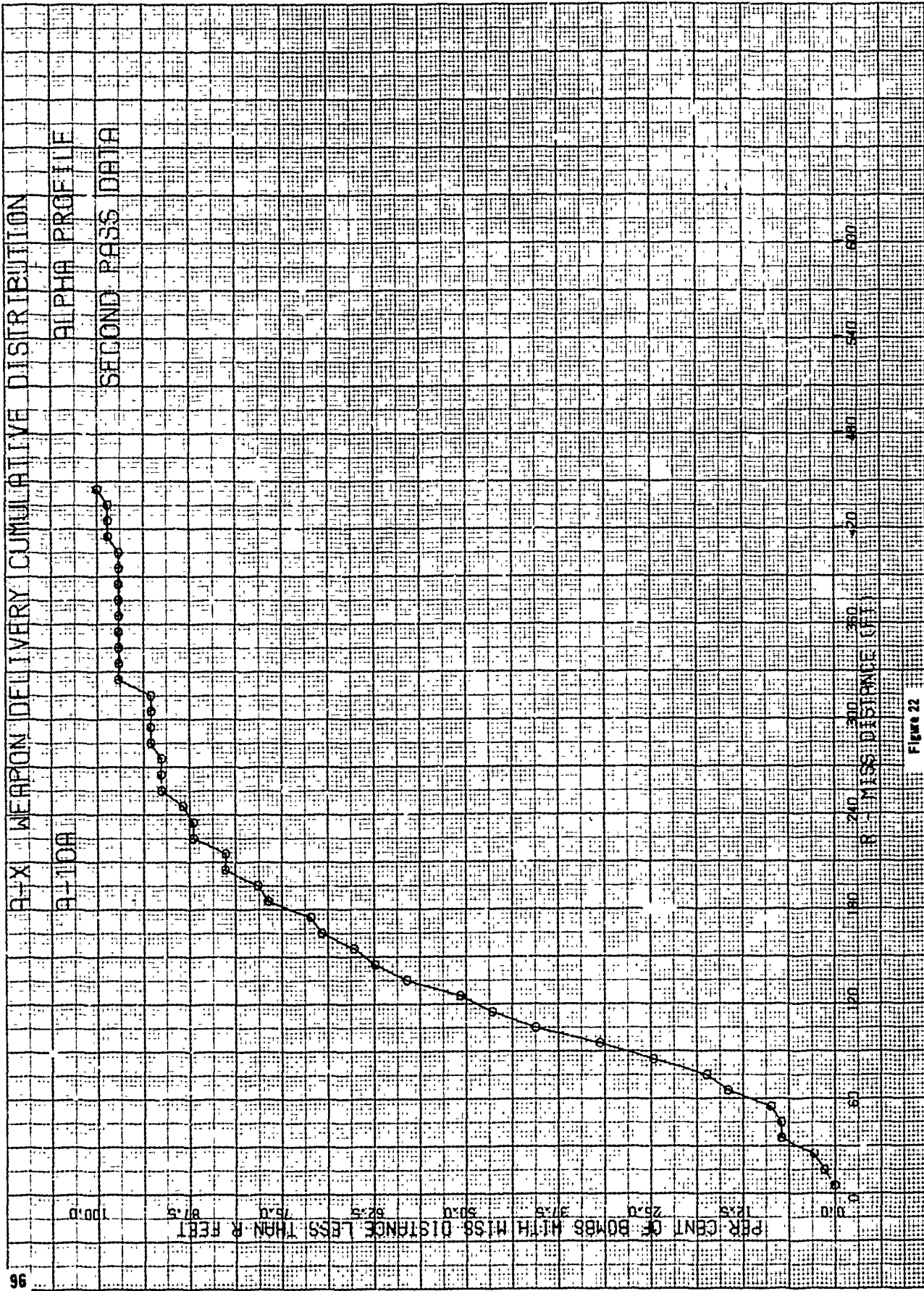


Figure 22

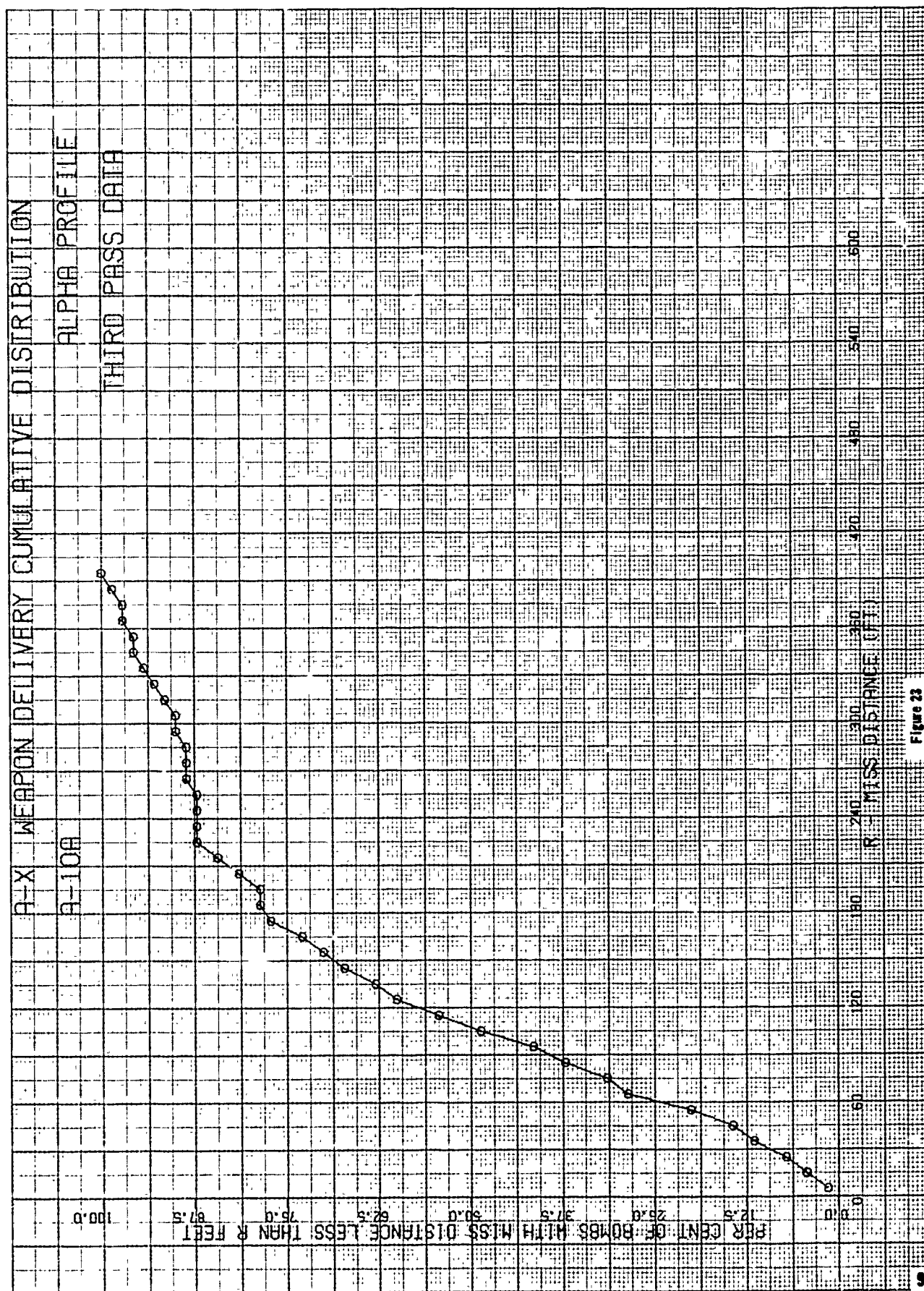


Figure 23

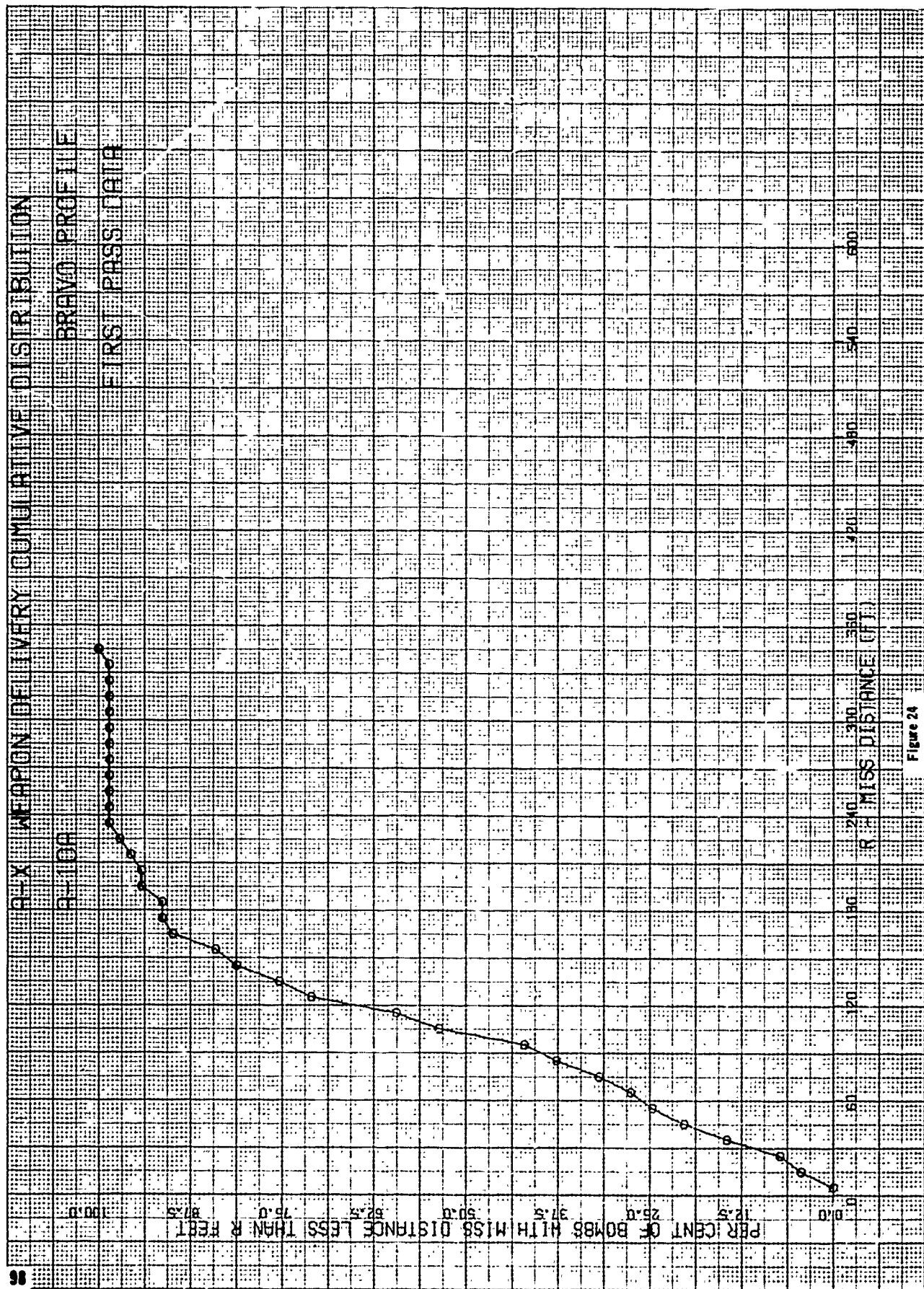


Figure 24

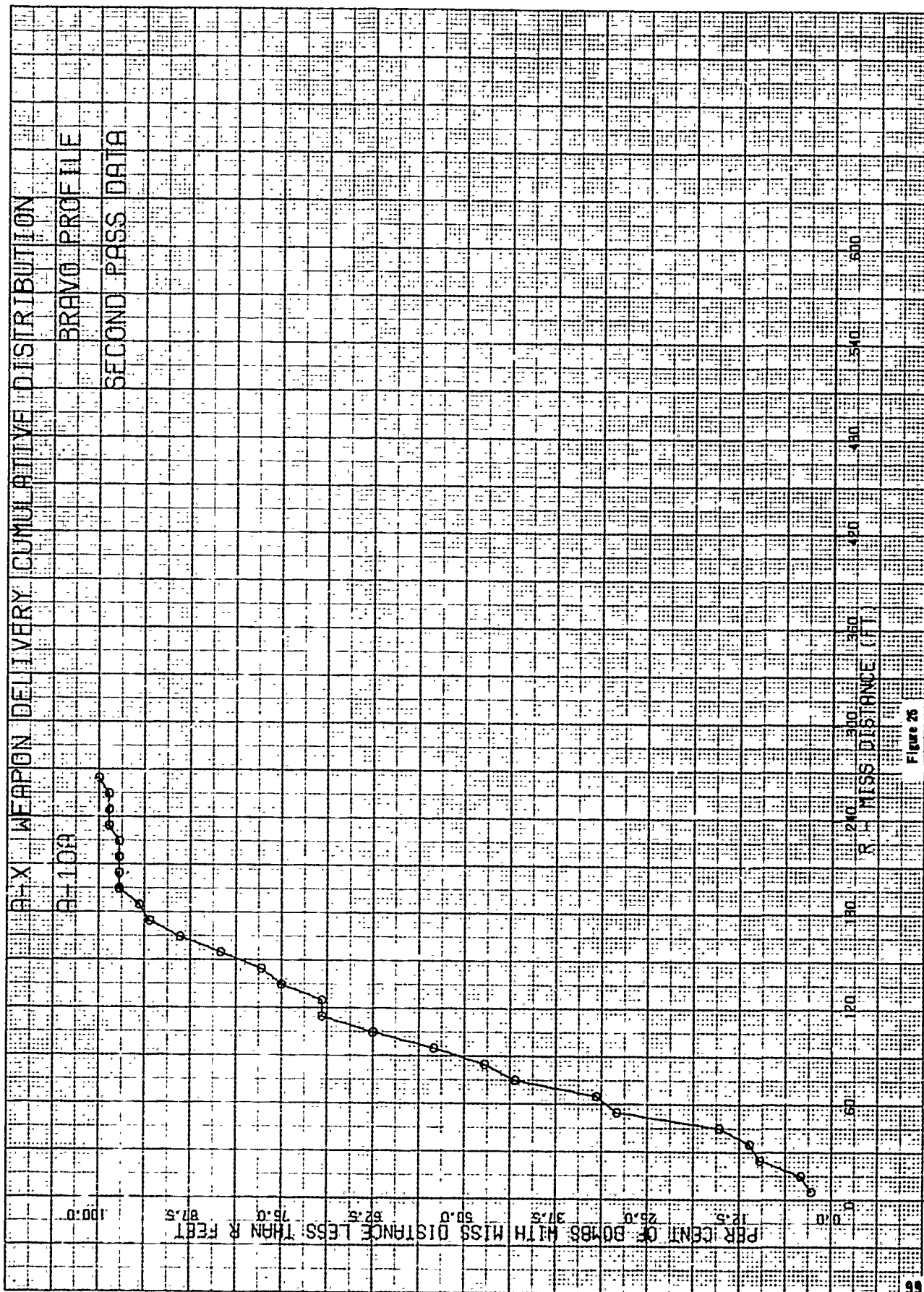


Figure 25

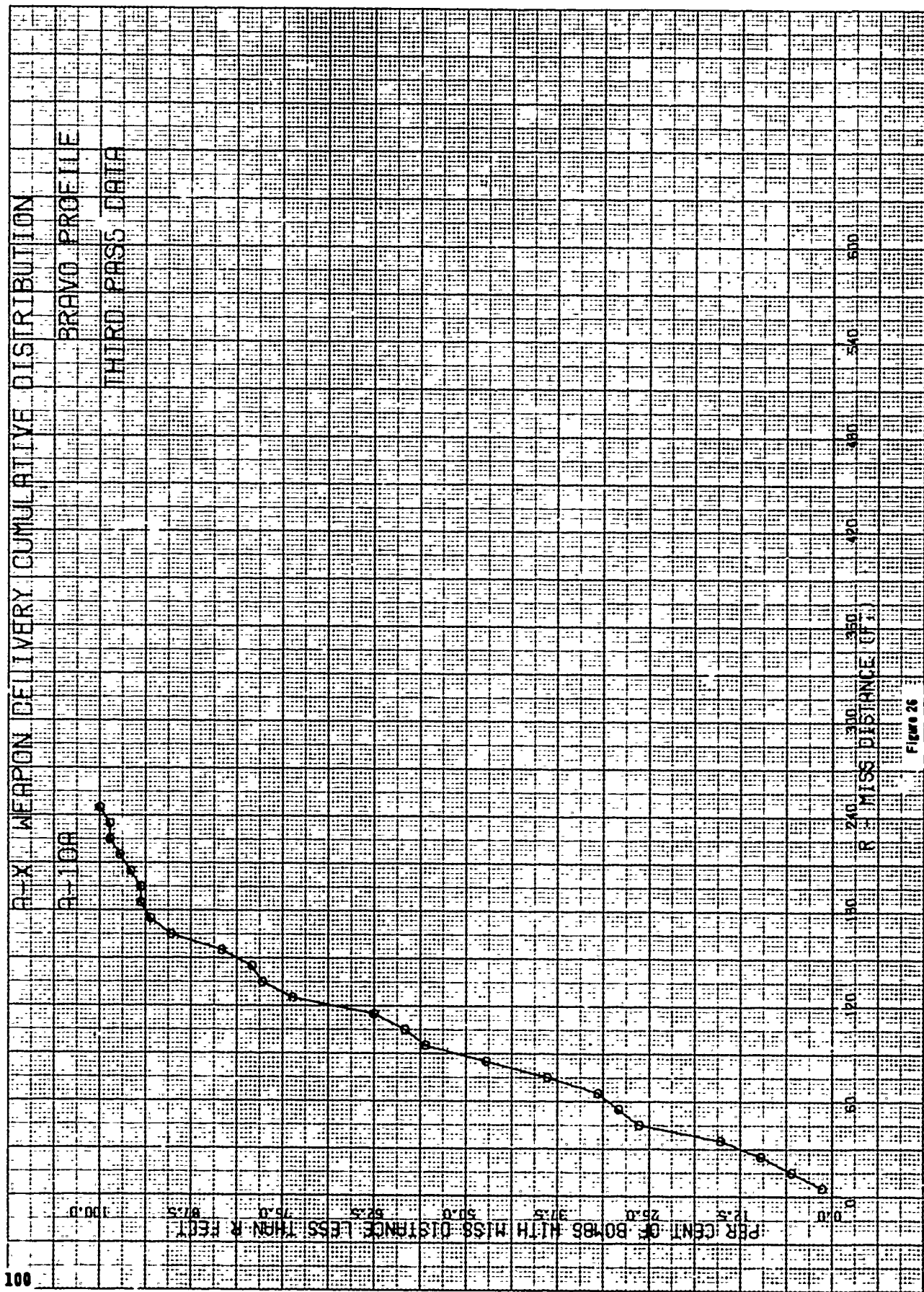


Figure 26

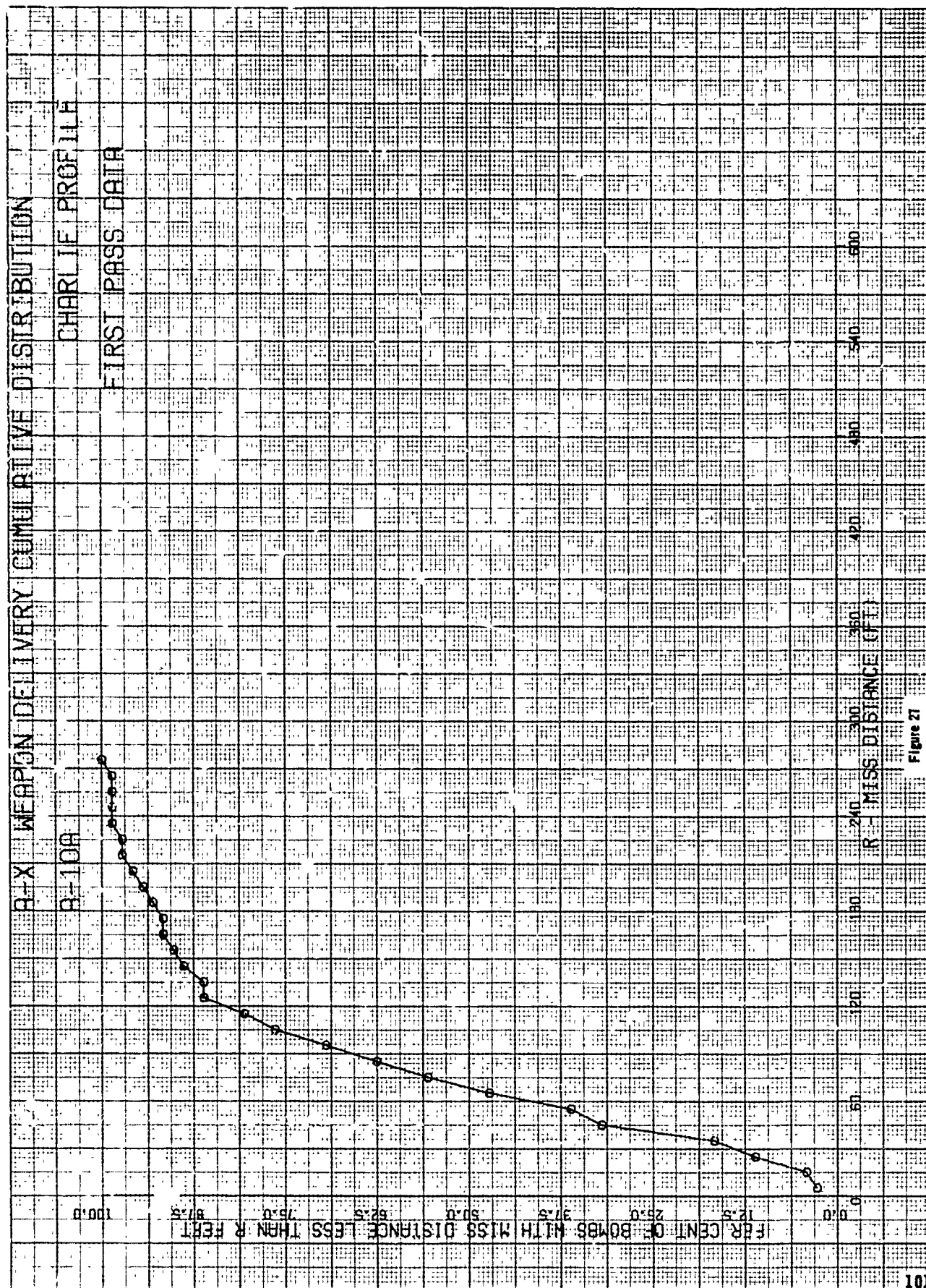


Figure 27

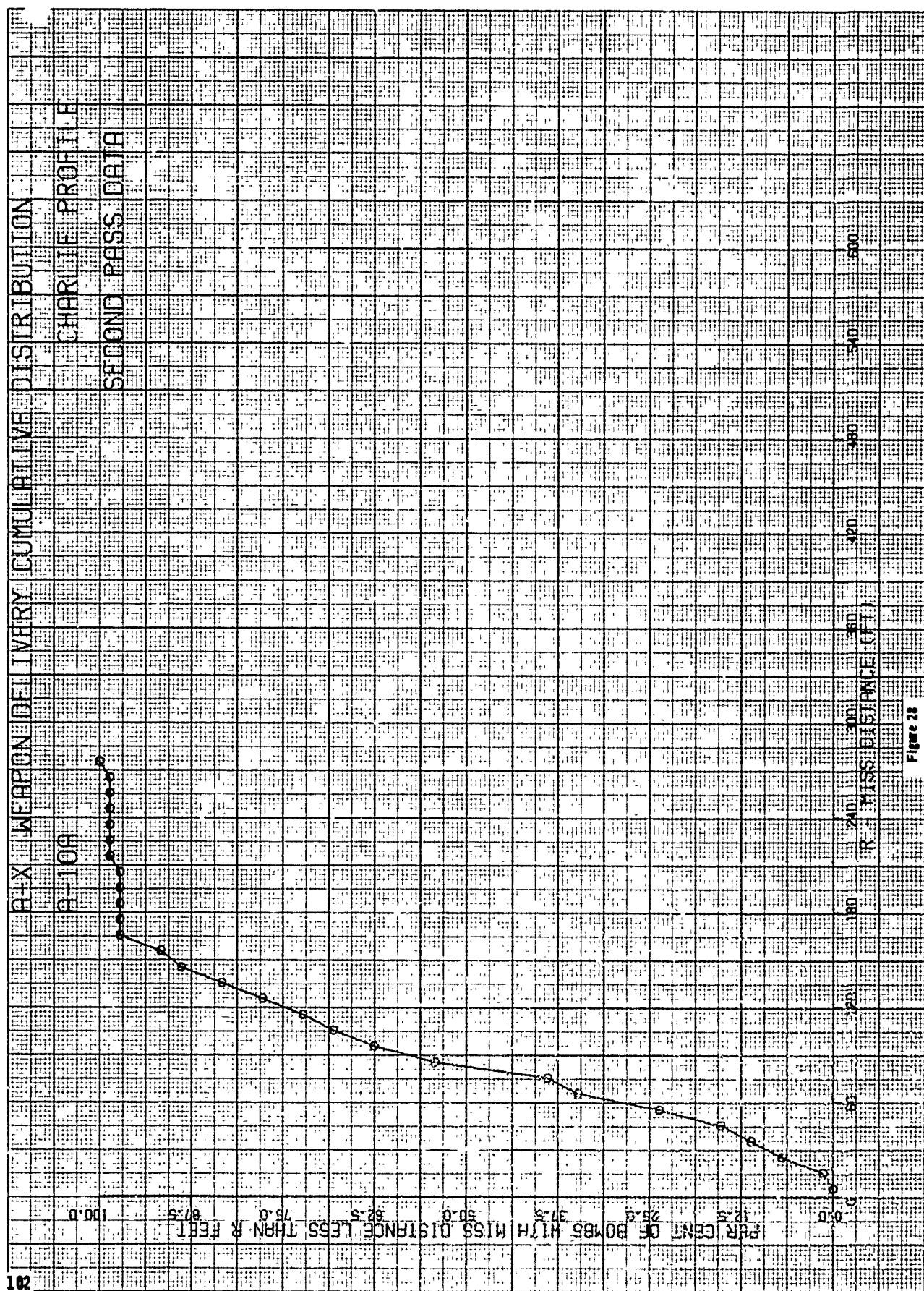


Figure 28

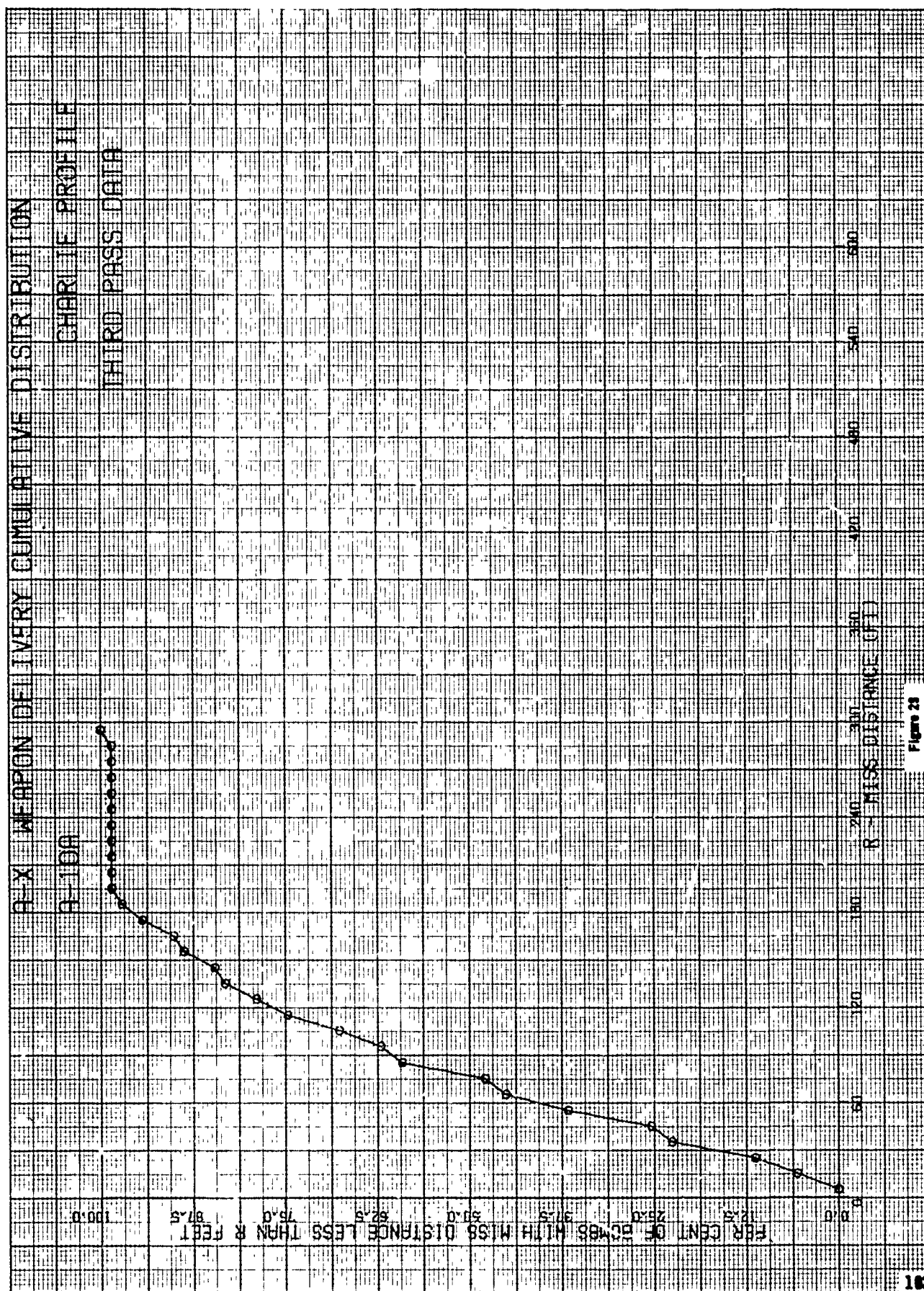


Figure 28

A-X STRAFING FREQUENCY DISTRIBUTION

PROFILE ECHO A-10A

64

56

48

40

32

24

16

8

0

PERCENT OF STRAFE PASSES

*PERCENT OF PASSES WITH ZERO PERCENT HITS OR BULLS.

6

12

18

24

30

36

42

48

54

60

66

72

78

84

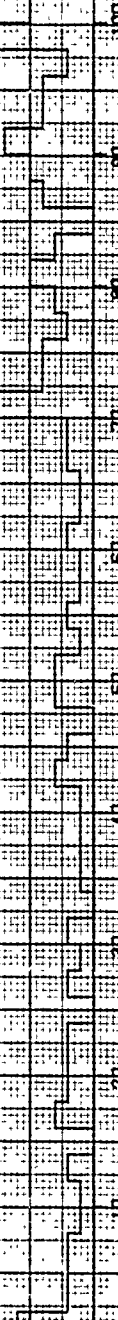
90

96

100

PERCENT HITS PER PASS

Figure 36



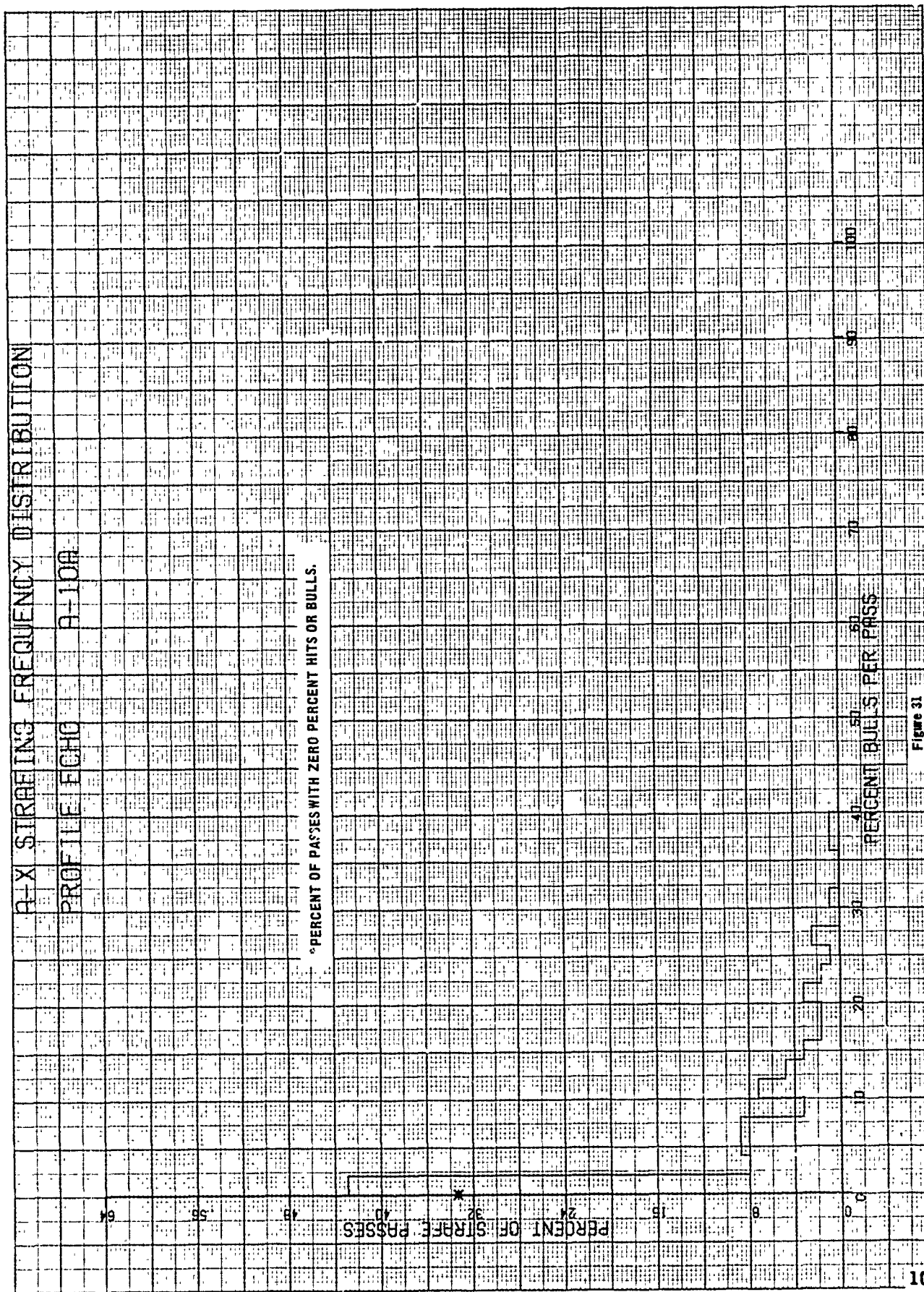


Figure 31

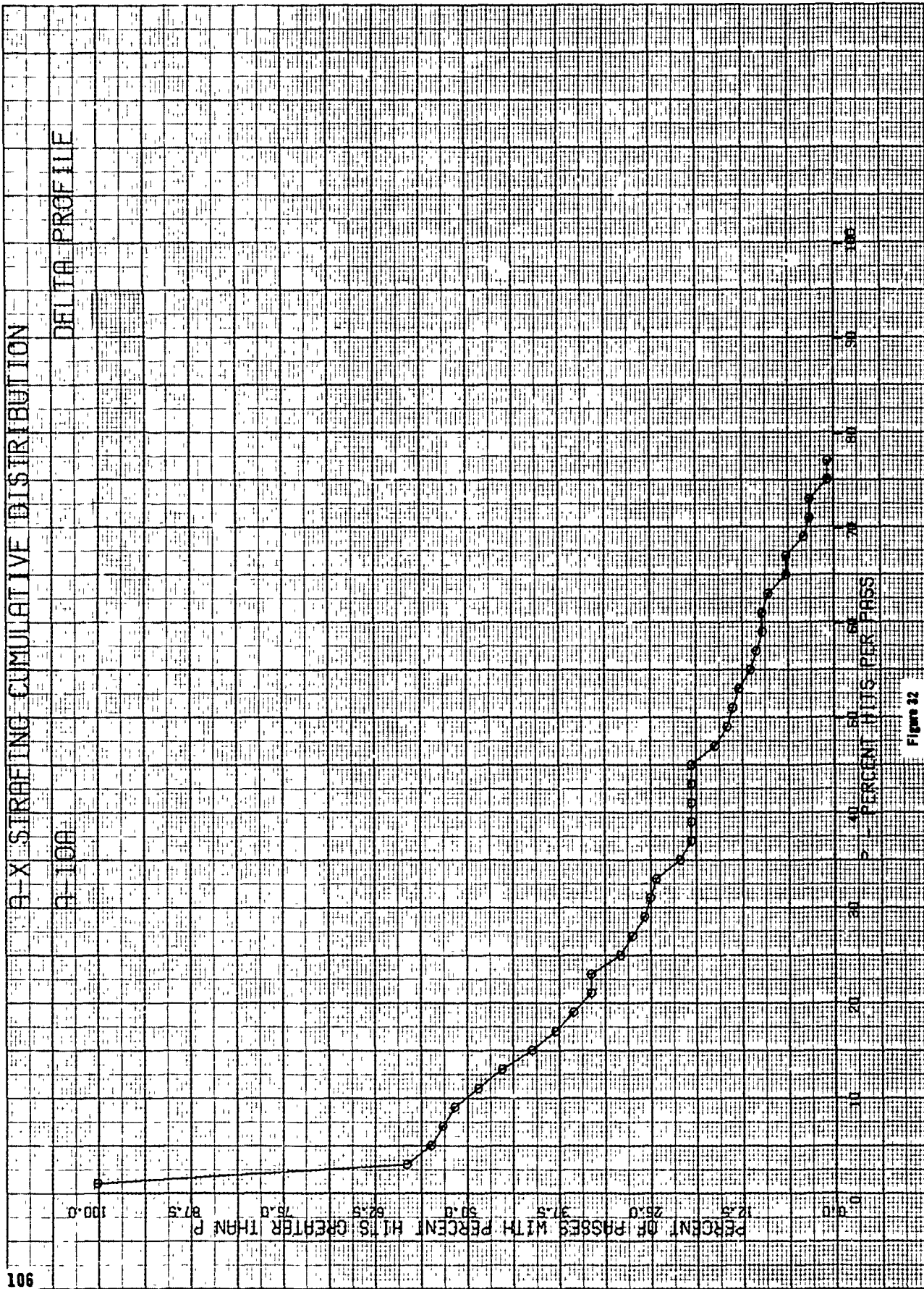


Figure 32

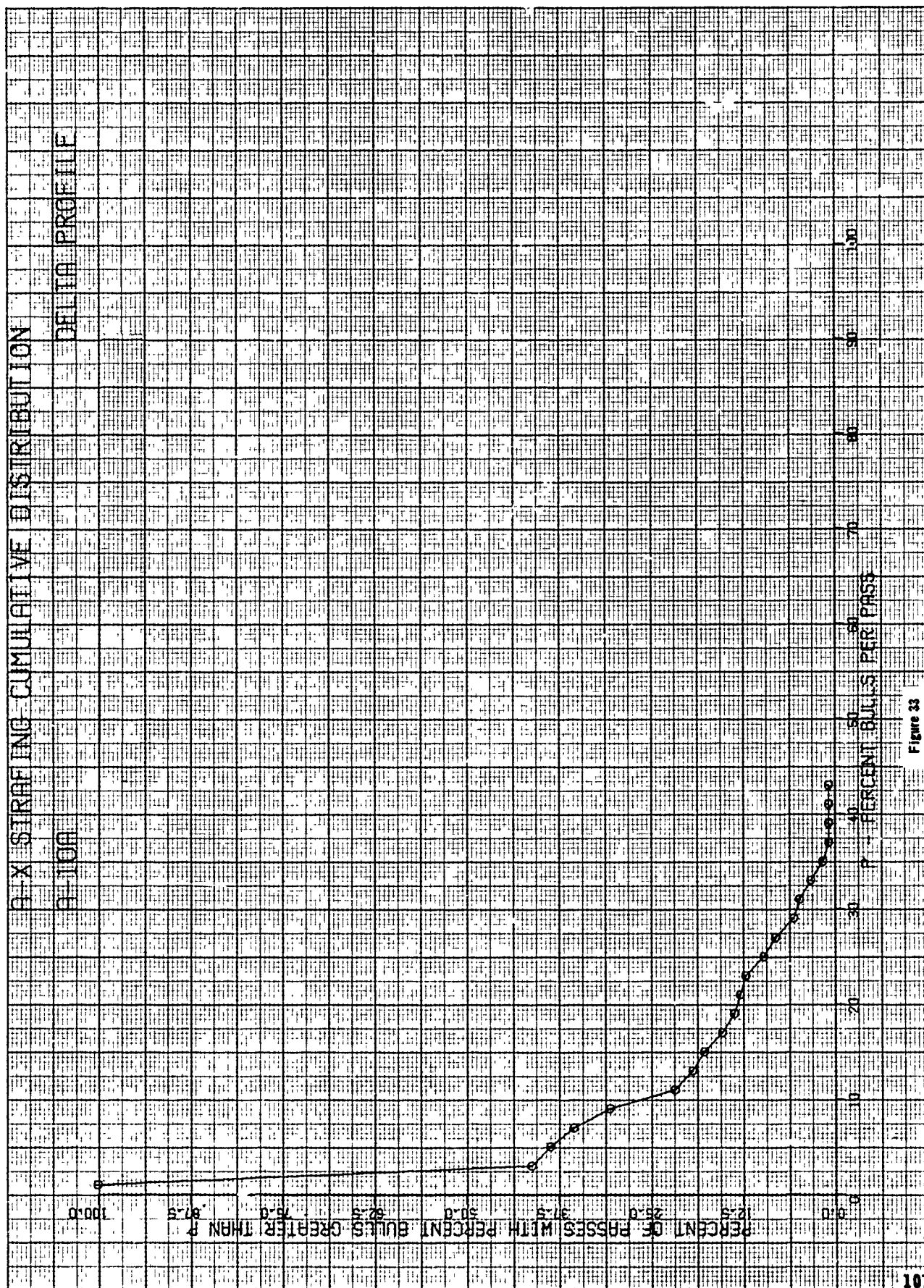


Figure 33

A-X STRAFING FREQUENCY DISTRIBUTION

PROFILE DELTA A-10A

54

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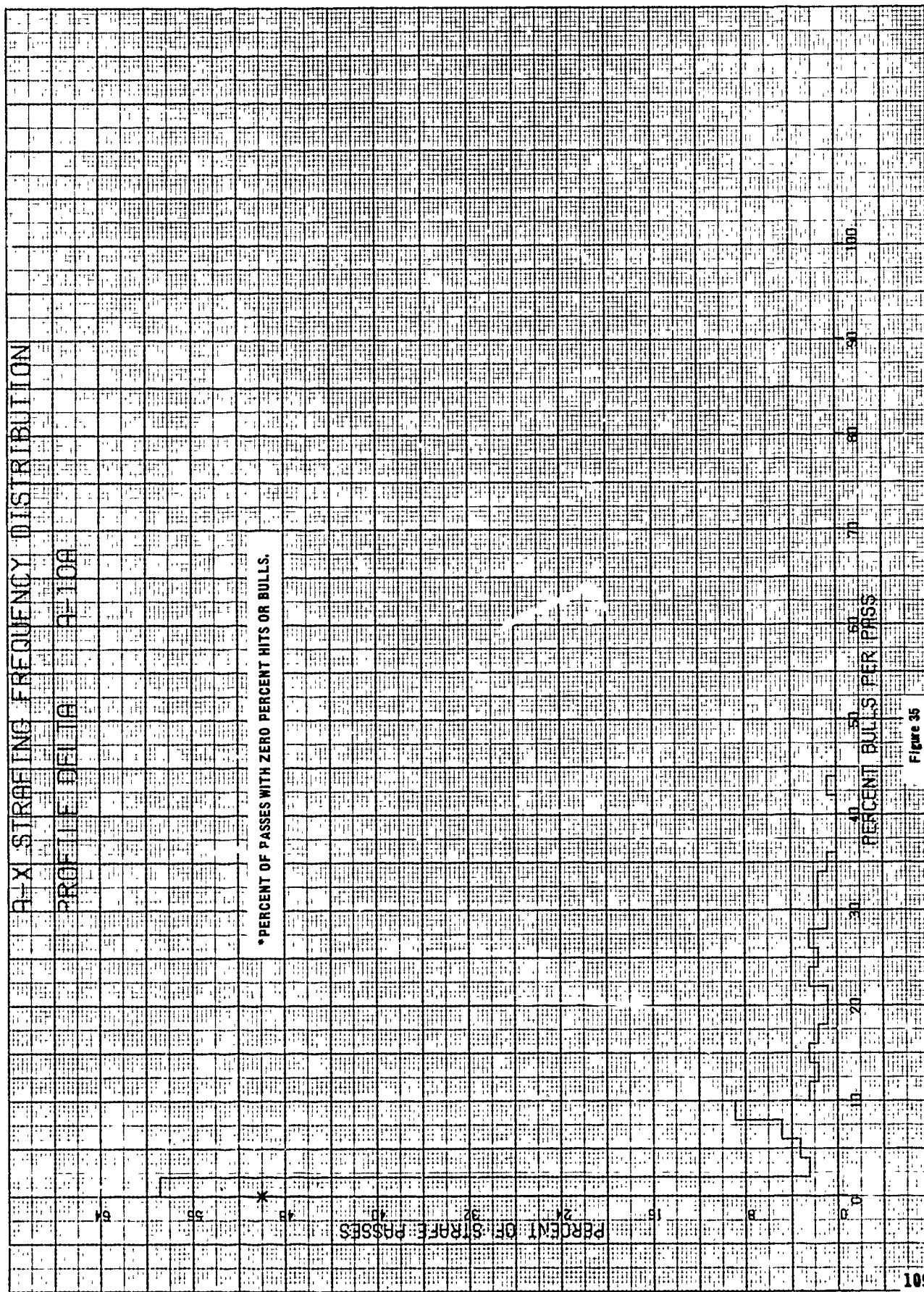
72

PERCENT OF STRAFE PASSES

*PERCENT OF PASSES WITH ZERO PERCENT HITS OR BULLS.

PERCENT HITS PER PASS

Figure 14



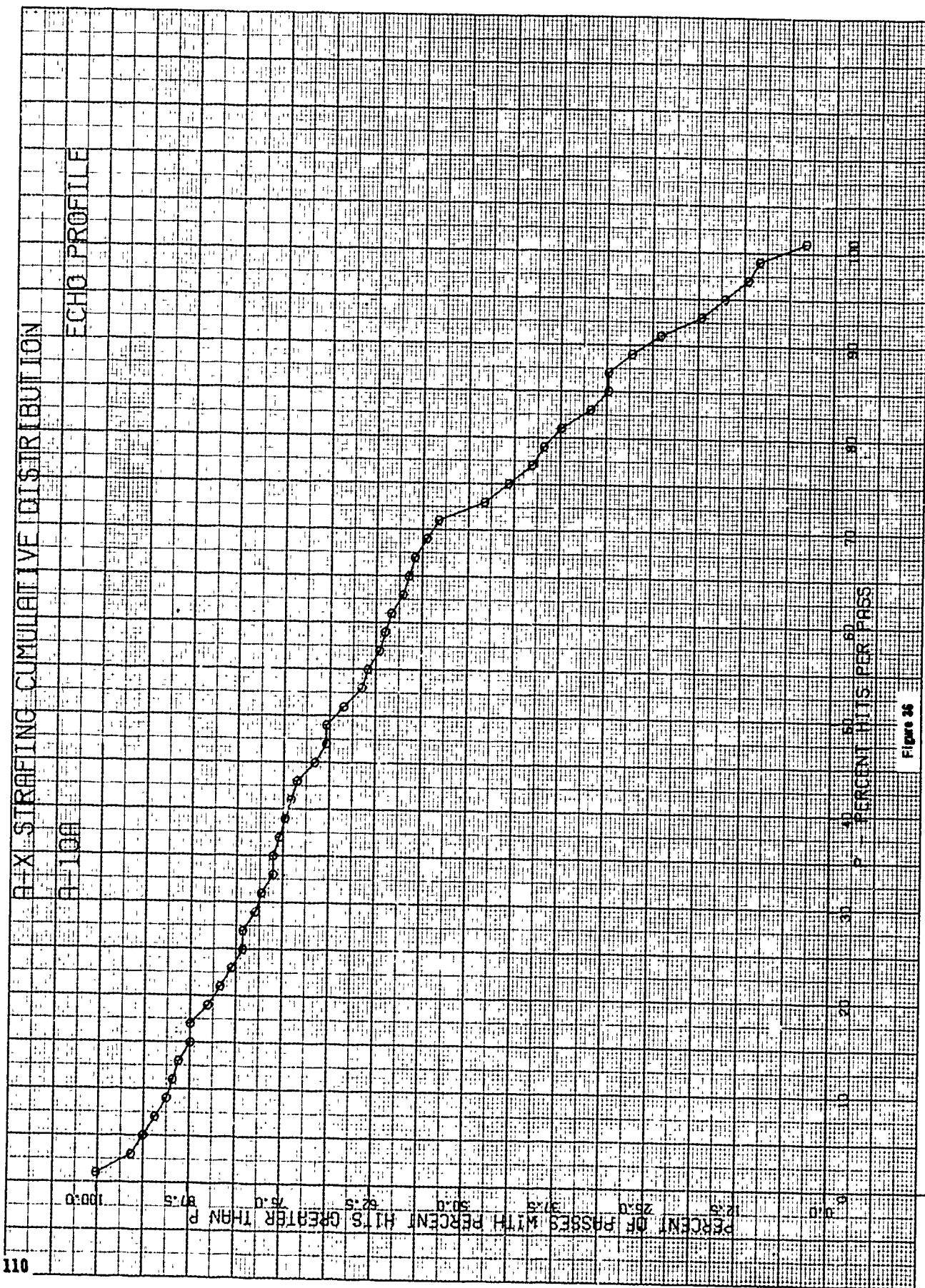


Figure 36

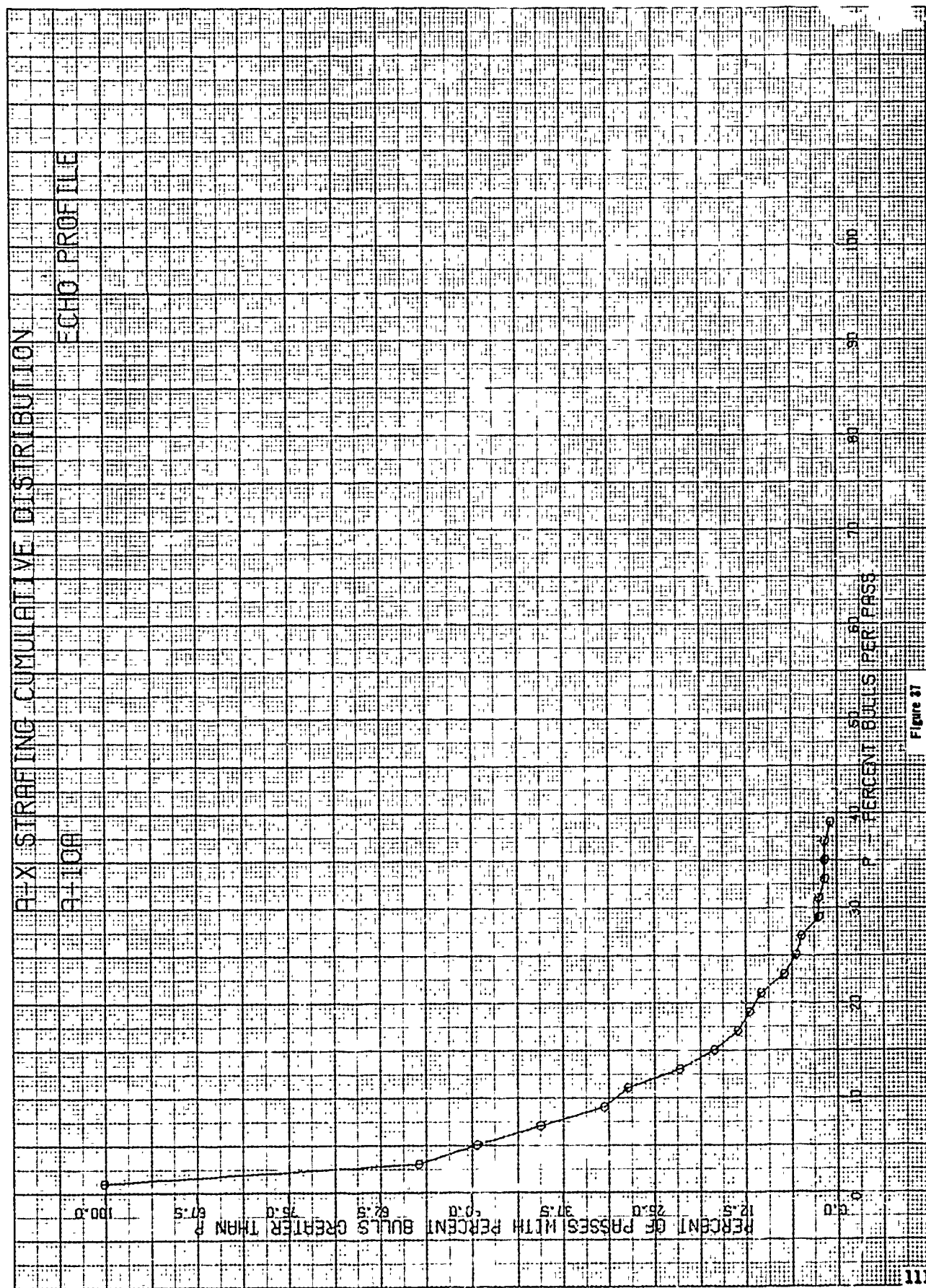
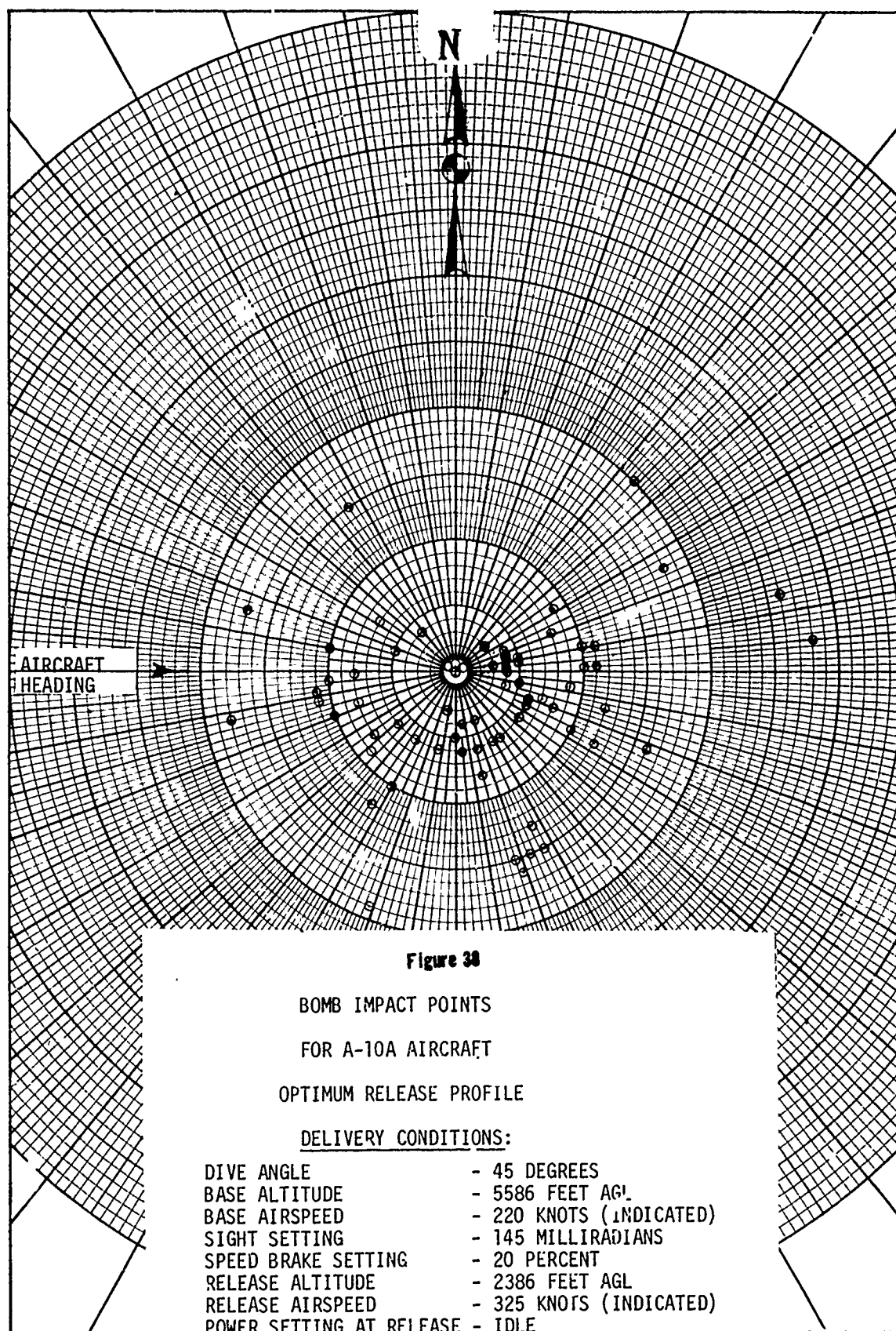


Figure 37



Scale: 1 division = 5 feet

REFERENCE

1. Fortner, Larry D., Major USAF, and Orwat, Joseph C., Captain USAF, A-37 Weapons Delivery Training and Evaluation Program, Technical Letter Report from AFFTC/TGH to ASD/SDX, Air Force Flight Test Center, Edwards AFB, California, October 1972.

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13. ABSTRACT The Air Force Flight Evaluation of the A-10A aircraft began on 10 October 1972 with the acceptance of the first aircraft from the contractor. The second aircraft was accepted on 31 October 1972. A total of 138.5 hours was accumulated during 87 flights. The program was completed on 9 December 1972. This appendix presents the results from the <u>Weapon Delivery</u> phase of the AFEE. The basic report, FTC-TR- 73-3, <u>Air Force Flight Evaluation (Systems) of the A-10A Prototype Aircraft</u> , published under separate cover, presents the results of the general system evaluation, quantitative reliability and maintainability, and personnel subsystem test and evaluation. Test authority for the program was provided under Program Introduction Document No. P-71-7-10, submitted by the A-X System Program Office, and AFFTC Project Directive No. F-72-4-9.			

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