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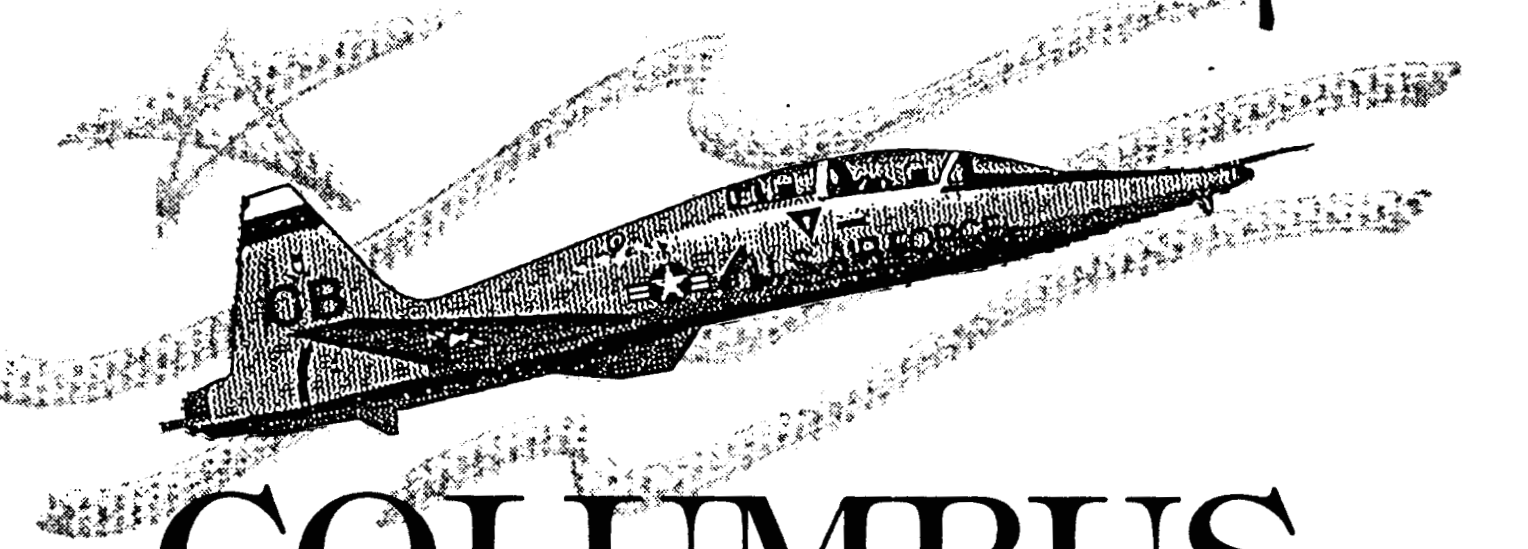


COLUMBUS

Where the Future is Flying

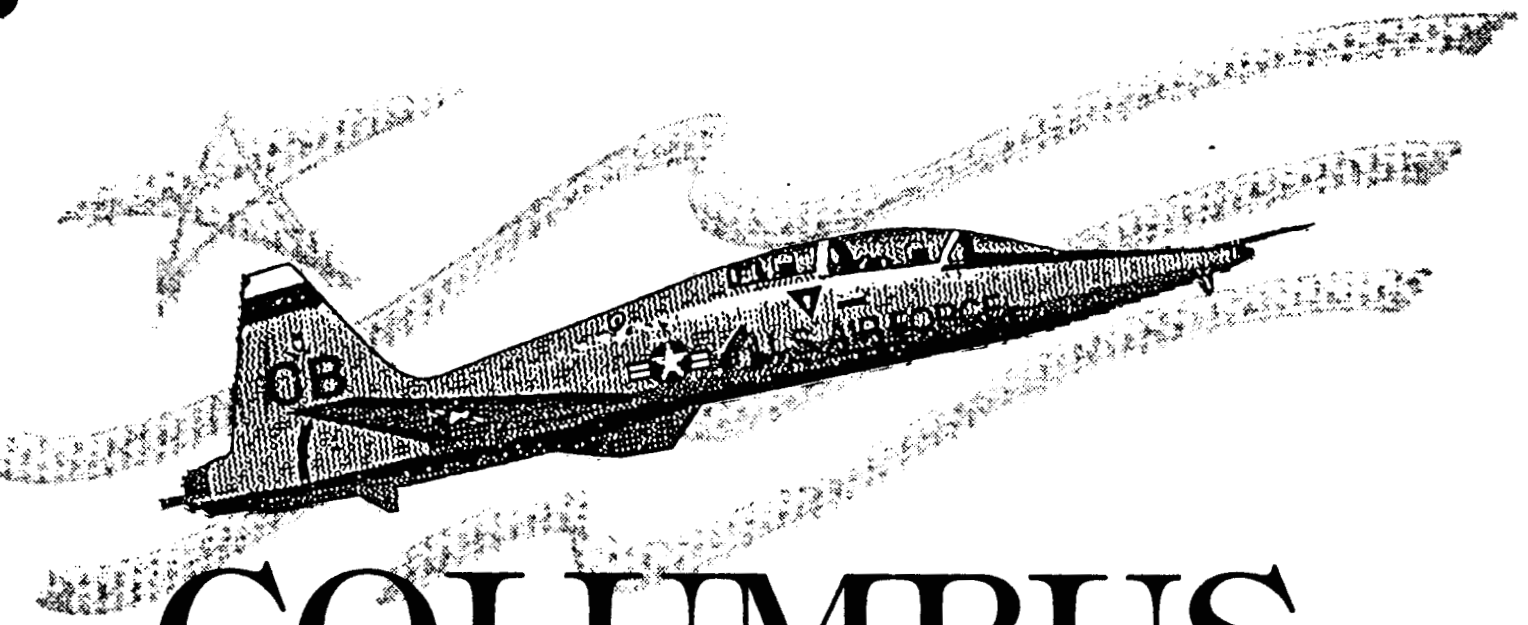
★

CAFB 2000 ASSESSMENTS

Prepared & Submitted to the

Defense Base Closure & Realignment Commission

June 9, 1995



COLUMBUS

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Preface

Columbus and Lowndes County citizens believe Columbus Air Force Base is the best Undergraduate Pilot Training base.

Citizens in neighboring communities and counties believe CAFB is the top UPT base.

But, more importantly, the United States Air Force, in its analysis of UPT bases, rated Columbus the top base.

A careful analysis of all the data clearly indicates that, overall, with all factors considered, Columbus Air Force Base is the best facility for Undergraduate Pilot Training for now and for years to come.

This document has been prepared by CAFB 2000 team members, a group of community volunteers working as part of the Base/Community Council. These volunteers have diligently reviewed and studied Data Calls and Analysis from all the Undergraduate Pilot Training bases. They have laboriously reviewed and studied all reports and studies related to the UPT bases -- those prepared by the USAF, the Joint Cross Study Group, the Defense Base Realignment and Closure Commission (DBRCC) staff, and other base community groups -- placed on file with the DBRCC.

Col. Nick Ardillo and Col. Paul Rowcliffe have served as technical advisers to the CAFB 2000 team. Their first-hand knowledge of CAFB has proven to be invaluable in analyzing the Data Calls and base-community studies about UPT bases. Col. Ardillo (USAF Retired) of Jackson, is Deputy Chief of Staff for Governor Kirk Fordice. Col. Ardillo served as Commander of the 14th Flying Training Wing at Columbus from September 1991 to April 1993. Col. Rowcliffe (USAF Retired) of Columbus is site manager for Reflectone Training Systems at CAFB. He previously served as Commander of the 14th Flying Training Wing Operations Group.

In this briefing document only matters related to the military value of CAFB are addressed, as these issues have been identified as the critical factors on which realignment and closure decisions will be based. The key attributes of CAFB which are unique and those which set it apart from other UPT installations are presented. In addition, issues/concerns about CAFB cited in other analyses have been investigated, and findings that negate these issues, or put them in proper perspective, have been submitted in this briefing.

Having completed an extensive review and detailed study of the all the data has convinced CAFB 2000 team leaders that, without a doubt, ***Columbus Air Force Base*** is ***"where the future is flying."***

COLUMBUS...Where the Future is Flying

Columbus Air Force Base has the flexibility and versatility to perform its present mission and the potential to assimilate additional missions. This versatility is why the Air Force, in its analysis, gave Columbus the highest ranking on Criteria I, the Flying Training Mission, and Criteria II, Facilities and Infrastructure. During the Department of the Air Force's discussions about Base Closure, Mr. James F. Boatright, who served as group chair, stated that Criteria I and Criteria II were the two most important criteria to the Air Force.

(Please refer to Tab 1 for "Air Force Ranking of Criteria I, Flying Training Mission," and "Air Force Ranking of Criteria II, Facilities & Infrastructure.")

As the graph on *"Criteria II -- Facilities and Infrastructure"* indicates, Columbus was the only UPT base to receive a green rating by the Air Force. The facilities and infrastructure of Columbus AFB are a valuable asset to the Air Force and will become more valuable as the military services downsize, becoming leaner.

RECOGNITION

Columbus Air Force Base has consistently been recognized for exceptional performance, demonstrating the success of the base in fulfilling its mission. The following list of recognitions earned by CAFB units is not all-inclusive, but it reflects the top-notch performance of the base's mission.

- **14th Flying Training Wing**
  - **Air Force Outstanding Unit Award for the period July 1, 1992, to June 30, 1994**

- **14th Civil Engineering Squadron**
  - **Air Force Outstanding Civil Engineer Unit (Small Base)**
  - **AETC Outstanding Civil Engineer Unit (Small Base)**
  - **AETC Outstanding Resources Flight**
  - **AETC Outstanding Environmental Flight**
  - **AETC Gen. Thomas D. White Natural/Cultural Resources Management Award**

- **Public Affairs Office**
  - **Air Force Public Affairs Director's Excellence Award (Small Wing)**
  - **AETC Public Affairs Director's Excellence Award (Small Wing)**

- **14th Services Squadron**
  - **AETC Mickey L. Johnston Outstanding Services Squadron Award (Small Base)**

- **14th Communications Squadron**
  - **Air Force Communications-Maintenance Effectiveness Award (Small Unit)**
  - **AETC Communications-Maintenance Effectiveness Award (Small Unit)**

- **50th Flying Training Squadron**
  - **Col. Joseph Duckworth Annual USAF Instrument Award (AETC Nominee)**

- **14th Mission Support Squadron**
  - **AETC Outstanding Satellite Civilian Personnel Flight**

- **Financial Management**
  - **AETC Outstanding Financial Analysis Office**

The list of individual military and civilian personnel earning recognitions is also extensive. The fact that CAFB units and personnel are so successful is indicative of two important elements: **the facilities are outstanding and the environment affords a pleasing quality of life creating highly motivated people.**

KEY ATTRIBUTES

There are several key attributes which make Columbus Air Force Base a critical installation and, logically, the best one to keep operable as the United States downsizes its military and re-engineers its forces. These key attributes are also why the Air Force ranked Columbus "first" in its analysis.

■ FLEXIBLE FACILITIES

The most important attribute is *flexibility, flexibility, flexibility.* Columbus can, without tremendous expense, support any of the Air Force's five flying missions:

(1) Trainer
(2) Fighter
(3) Bomber
(4) Tanker
(5) Transport.

Having been a Strategic Air Command (SAC) Base, home to the B-52, Columbus Air Force Base has the infrastructure to provide surge capabilities, in both pilot production and additional missions. One recent example illustrates this point. CAFB served as the temporary home to the KC-135s of the Air National Guard's 186th Air Refueling Group from Meridian without interrupting its regular training schedule.

■ RUNWAYS

CAFB's three parallel runway configuration, *(Please refer to the aerial photograph, Tab 2)* with the two-mile long center runway, accounts for much of its flexibility and its high rating on facilities and infrastructure. But that's not all CAFB has to offer.

Only Columbus has all runways and all aprons capable of supporting all flying missions. The Columbus Data Call shows an upgrade is needed on taxiway one for heavy aircraft; however, that assumes the use of three runways. With a two runway operation, the third runway has the load carrying capacity to support heavy aircraft and can be used as a parallel taxiway. Under this scenario, no upgrades are needed to handle heavy aircraft.

Because of its valuable asset of infrastructure, CAFB is frequently used by the Space Shuttle as it is transported across the country. A photograph of the Space Shuttle Endeavour landing at CAFB *(found in Tab 3)* is one illustration of the multi-mission capabilities of the base's runway infrastructure. Columbus is also a reception base for NEACP (National Emergency Airborne Command Post).

■ HYDRANT FUELING

Columbus features the only hydrant fueling system in the Air Education Training Command (AETC). This system has 16 tanks of 50,000 gallons each for a total hydrant fuel capacity of 800,000. There are 16 pumps, each with a discharge rate of 300 gallons per minute, and eight fuel laterals with 41 hydrant outlets. Seven outlets are modified for rapid defuel operations of 200 gallons per minute. Three wide-bodied heavy aircraft can be serviced simultaneously.

Utilizing hydrants versus trucks, wide-bodied heavy aircraft can be refueled/defueled quicker and with fewer resources. The fillstands, located at the

hydrants allow rapid turnaround of fuel trucks. Utilizing the hydrant fillstands reduces fuel truck turnaround time by 15 minutes as compared to utilizing a fillstand at the bulk storage depot. This allows aircraft to be turned faster from one sortie to the next resulting in more efficient use of resources.

■ FUEL STORAGE

Fuel storage capacity is 56,648 barrels, which is 16,783 more than required. *(See "Aviation Fuel Capacity/Requirement," Tab 4.)* There is not even a close second in this criteria as the next closest base has only an excess capacity of 6,458 barrels over requirements; the other two bases have a capacity shortage, as reflected in the graph, "Aviation Fuel Capacity/Requirements."

■ ORDNANCE STORAGE

In addition, Columbus also features extensive magazine space compared to the other pilot training bases. Columbus has 28,177 square feet of magazine space. The nearest second to Columbus has 2,264 square feet of magazine space.

■ GUNNERY RANGE

Columbus AFB is the only UPT base being reviewed by the Commission which has access to a target for air-to-ground/bombing practice. This range is required for Introduction to Fighter Fundamentals' training. *(Please refer to photograph of "SeaRay," Tab 5.)*

The gunnery range is located only 35 miles southwest of Columbus, or four (4) minutes, by an AT-38, from Columbus. Strafing and practice ordnance delivery are both done at SeaRay.

This gunnery range facility could not be readily replaced at some other location to provide IFF. It would cost millions of dollars to replace. However, replacement cost is not the only critical factor. It would be very difficult to secure the land for such a facility, especially without local objection, and environmental permits might be even more difficult to secure. In addition, the environmental cleanup involved in closing an existing range could be cost prohibitive, exceeding $4 million an acre according to environmental experts.[1]

[1]Based on information provided by the Environmental Specialists in the Mississippi Department of Environmental Quality.

■ SAFETY FACTORS

Another aspect of critical importance to CAFB's military value is related to the issue of safety or, as we refer to it, T-38 Takeoff Risk.

The performance of the T-38, and to a greater extent the AT-38, is adversely affected by elevation and high temperatures on takeoff and landing. The higher the temperature at higher levels above sea level, the longer the runway must be to ensure safety. High temperature and high pressure altitude, which approximates ground elevation, increases aircraft takeoff distance, and abort stopping distance.

Therefore, high pressure altitudes and high temperatures increase the risk of an aircraft making a barrier engagement at the end of the runway during an abort situation, or even worse, departing the end of the runway. If a combination of temperature and pressure altitude reach a high enough level, T-38 flying is normally terminated, since above a given takeoff roll speed, it is impossible to stop in the remaining runway.

Please refer to Field Elevation graph, Tab 6, which shows the field elevation for each of the pilot training bases. As can be seen, Columbus has the lowest elevation, which is the best condition.

Runway lengths are graphically illustrated, *also in Tab 6.* Columbus has the longest runway available to stop an aborting aircraft, or to takeoff after an engine has failed.

According to AETC training publications and directives, as reflected in quotes to follow, in the T-38, "optimum (maximum) wheel braking is difficult to achieve. There are hazards associated with attempting heavy braking at high speeds." Aircraft procedures are emphatic: "don't attempt optimum braking above 100 knots." Instead, AETC procedures "outline a combination of aerobraking and wheel braking designed to provide the shortest PRACTICAL stopping distance CONSISTENT WITH SAFETY." THIS METHOD IS THE SAFEST WAY TO STOP THE T-38 BUT NOT THE QUICKEST." "Because of the difficulties and hazards associated with heavy braking at high speeds, the pilot's ability to stop the T-38 falls short of the theoretical capabilities of the aircraft." However, "since the computed performance data is based on the AIRCRAFT'S capability, ACTUAL STOPPING DISTANCE WILL ALMOST ALWAYS EXCEED THE COMPUTED VALUE."

Because an abort will probably require more distance than predicted by aircraft data, AETC has defined takeoff data which allows the pilot a 2,000 foot runway length buffer to stop the aircraft using the SAFEST braking procedures. This 2,000-foot buffer is needed to provide a "REALISTIC MEASURE OF WHEN A PILOT CAN EXPECT TO BE ABLE TO STOP IN THE REMAINING RUNWAY."

The *"T-38 Takeoff Risk"* Graph, *in Tab 6,* illustrates the temperature at each UPT base, above which this 2,000-foot buffer no longer exists -- shown as the yellow area on this graph. Remember, AETC has stated this buffer is realistically needed to stop the aircraft. As can be seen, Columbus has the highest temperature point (114 degrees Fahrenheit), which equates to less risk for T-38 operations.

The temperature points above which the aircraft could not stop, even using MAXIMUM braking, is shown in red in the *"T-38 Takeoff Risk"* graph. At this point T-38 flying is normally stopped. Again, Columbus has the highest temperature before flying would need to terminate.

Finally, comparing these critical temperature points against normal high monthly temperatures *(See "Normal Daily High Temperature Data/Takeoff Risk" graph, Tab 6)* shows that Columbus NEVER OPERATES IN THE YELLOW INCREASED RISK AREA WHERE THE 2,000-FOOT BUFFER DOES NOT EXIST, OR EVER REACH A POINT WHERE T-38 FLYING IS NORMALLY STOPPED. BOTTOM LINE -- COLUMBUS CONDITIONS EQUATE TO SIGNIFICANTLY LESS RISK FOR T-38 FLYING OPERATIONS BECAUSE OF THE LOWER FIELD ELEVATION AND LONGER RUNWAY LENGTH AVAILABLE. THIS IS A PIVOTAL POINT WHEN CONSIDERING THE OVERALL ABILITY OF THE BASE TO ACCOMPLISH THE MISSION IN THE SAFEST ENVIRONMENT.

■ SURGE CAPABILITIES

At the BRAC "Adds" Hearing in Washington, May 10, the question of future needs for pilot production capacity was posed. It was indicated, at that time, that Columbus' capacity was 408 students. However, Columbus has tremendous surge capabilities. The *"CAFB Infrastructure Supports Pilot Production" graph, Tab 7,* shows that, in the very recent past, Columbus has not only met, but exceeded, that capacity, utilizing its current facilities and current airspace. With its present facilities and infrastructure, CAFB has the capability to surge quickly in terms of pilot production.

■ GEOGRAPHIC LOCATION

Columbus' geographic location in the continental United States is a plus. Each weekend AETC sends upwards of 100 aircraft on cross-country training sorties, ranging from coast to coast. It is an important logistical/maintenance requirement to provide support to these aircraft across the country for such occurrences as unforeseen maintenance problems. As the only pilot training base east of the Mississippi, Columbus is responsible for this support over a large geographic area, basically all support east of the Mississippi.

WEATHER

Two new analyses of data developed by the BRAC staff were presented at the Adds Hearing. In both Staff Analysis I and II, Columbus Air Force Base dropped slightly in the rankings. There are two considerations which adversely affected those rankings and need to be corrected.

The first consideration is WEATHER, as related to icing. The Staff Analyses plugged in uncertified data on icing forecast days. Unfortunately, that uncertified data was the only data available at that time. This document includes a schedule of the number of sorties flown and the number of sorties lost to icing at CAFB during the past 30 months. *Please refer to "Icing Impact on Mission," Tab 8.*

As you can see, 167,000 sorties have been flown, with 335 sorties cancelled due to icing. That's less than *two-tenths of one percent*, and making it a non-issue. Whatever the icing data analyses show, it is one factor that is inclusive of the overall sorties cancelled or rescheduled. Therefore, to include both items in the overall data analysis is, in fact, double counting the affects of icing on training accomplishment. There is actually little difference among the UPT bases on sorties lost to weather. Those lost sorties are the real issue. The most accurate data of sorties cancelled/rescheduled is based on a 10-year historical record which comes from the Air Force 1993 Data Call. This report showed Columbus with a T-37 weather-attrition factor of 22.5 percent and a T-38 factor of 22.9 percent and ranked Columbus second for the fewest T-37 sorties cancelled and third in the T-38.

Weather is generally not a problem unless the combination of student load and extended period of bad flying weather combine to preclude work arounds and rescheduling to maintain required student flow. Like the other bases, Columbus has always graduated classes on time and met the training requirements on time. Sorties cancelled/rescheduled is probably the best measure of weather effects that stop flying, whether it be thunderstorms, icing, or crosswinds above aircraft limitations.

However, there are weather conditions that limit the accomplishment of certain aspects of training requirements and impact safety margins. In previous presentations we have heard about the effects of crosswinds above 25 knots which is the limiting crosswinds for the T-38. However, other crosswind limitations also affect training; T-38 student solo flights and formation takeoffs and landings are limited to 15 knots of crosswind. In the T-37 the aircraft limitation is 17.5 knots, and solo students are limited to 13 knots. In addition, training of T-37 touch and go landings, which is a significant part of the syllabus, is limited to 16 knots. Considering these limitations, the Data Call input on the percentage of time crosswinds are above 15 knots takes on increased significance. At two of the other bases, crosswinds are above 15 knots 6.8 percent of the time. This equates to a significant hinderance to accomplishing training syllabus requirements because of flying status restrictions. *(See "Percent of Crosswinds At or Below 15 Knots," Tab 9.)*

AIRSPACE

AIRSPACE is the second consideration which contributed to CAFB's lower ranking in the analyses by the BRAC staff. The original Joint Data Call included all available training airspace. This resulted in the following airspace areas:

- **COLUMBUS 45,092 cubic nautical miles**
- **LAUGHLIN 58,868 cubic nautical miles**
- **REESE 31,116 cubic nautical miles**
- **VANCE 36,084 cubic nautical miles**

and placed Columbus second in available airspace.

In Staff Analysis II, only airspace owned/scheduled was included. This gave Columbus 20,545 cubic miles of airspace. However, this did not include Meridian I. E. MOA which is scheduled and exclusively used by Columbus. This airspace has been a primary T-37 training area for numerous years under a letter of

agreement *(a copy of which can be found in Tab 12)*. This area should have been included in the Air Force Data Call and increases Columbus airspace to 22,319 cubic nautical miles. (See "Original Data Call Cubic Miles of Airspace" and Airspace Maps illustrating Airspace Used by CAFB, Tab. 10.)

Finally, when considering all the airspace **we do use**, you get a total of 40,496 cubic nautical miles.

USABLE AIRSPACE is an additional consideration. The Joint Data Call on airspace included the note: "Since Air Traffic Control Assigned Airspace (ATCAA) is not charted, bases can only report ATCAA they *actually use* or impact their operations."

When reporting ATCAA, some bases reported airspace to an *unusable* high ceiling for T-37 and T-38 aircraft since the ceiling is established by letter of agreement with the FAA. All indications are, it is impractical to use airspace above 30,000 feet for T-37 and T-38 aircraft because of limited aircraft maneuverability in accomplishing training syllabus requirements. Adjusting *owned/scheduled* airspace for all four locations to a maximum usable altitude of 30,000 feet results in the following cubic miles of MOA/ATCAA airspace.

- **COLUMBUS 22,319 cubic miles airspace**
- **LAUGHLIN 21,522 cubic miles airspace**
- **REESE 19,191 cubic miles airspace**
- **VANCE 24,106 cubic miles airspace**

The average distance to Columbus' training area, after MOA One and Three are considered as one continuous block, is 21.5 miles.

The *"Usable Owned/Scheduled Airspace" is vividly illustrated in a graph, Tab 11.*

We believe this represents the most realistic evaluation of airspace for T-37 and T-38 aircraft. Although there are different methods for evaluating the airspace structure of each base *(See Airspace Analysis in Tab 12)* and each results in different conclusions, airspace is not a limiting factor in regards to pilot graduate capacity at Columbus. Columbus' airspace is viewed favorably by the Air Force due to the close proximity of MOAs to the base, which allows student pilots to maximize their training time. This closeness to training areas is one of the reasons

Columbus was one of the two UPT bases least costly to train pilots, according to the COBRA Data Analysis.

CONCLUSION

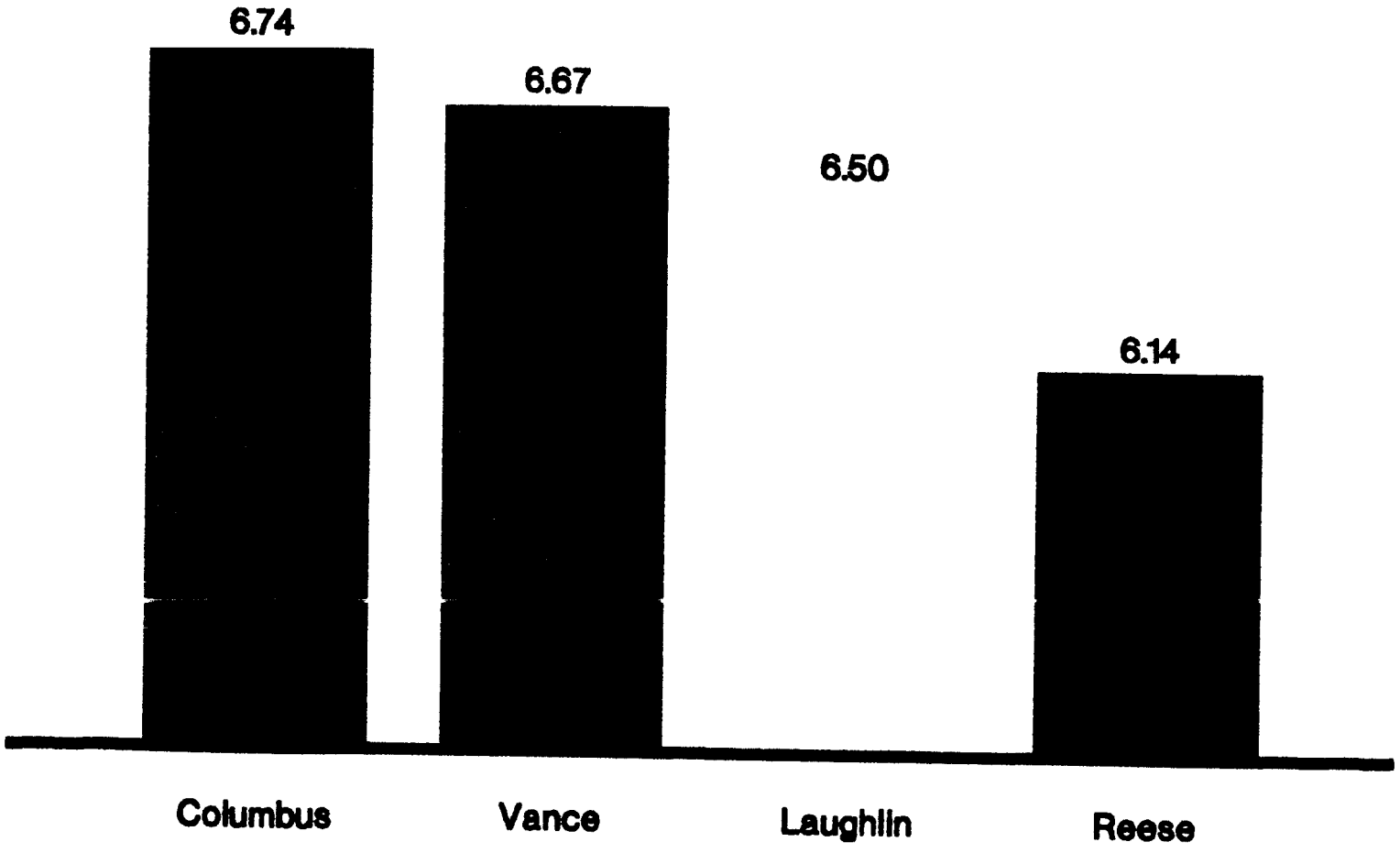
There have been numerous analyses involving the data for the Air Force's pilot training bases: the Joint Cross Service Group Data Call and analysis, USAF Data Call and analysis, BRAC Staff Analysis I and II, and numerous base/community studies. Admittedly, analytical results can be skewed by inaccurate data, different weighting factors, and the application of different methods for analyzing and interpreting the data.

Regardless of varied inputs or methodologies applied, Columbus Air Force Base has consistently ranked no worse than second in any of the analyses. Columbus Air Force Base brings to the Air Force's pilot training a unique configuration and capability which translates directly into flexibility, versatility, and safety for performing its present mission, and the potential for the assimilation of additional missions. Columbus is the only one of the four bases being reviewed for possible closure which is capable of accommodating every aircraft in the Air Force inventory, both now and in the foreseeable future. As the U.S. military pares itself, **long range thought and planning must be focused on ensuring that the remaining bases are multi-mission capable.** Columbus meets that critical multi-mission requirement.

Both the Air Force and the Joint Cross Service Study Group ranked Columbus Air Force Base as the Number One Undergraduate Pilot Training Base. Later analyses, which included some misconceptions and utilized uncertified data, ranked Columbus no lower than Number Two. Consequently, it is difficult to see how Columbus Air Force Base could be the base selected for closure.

By any analysis, COLUMBUS AIR FORCE BASE should remain open.

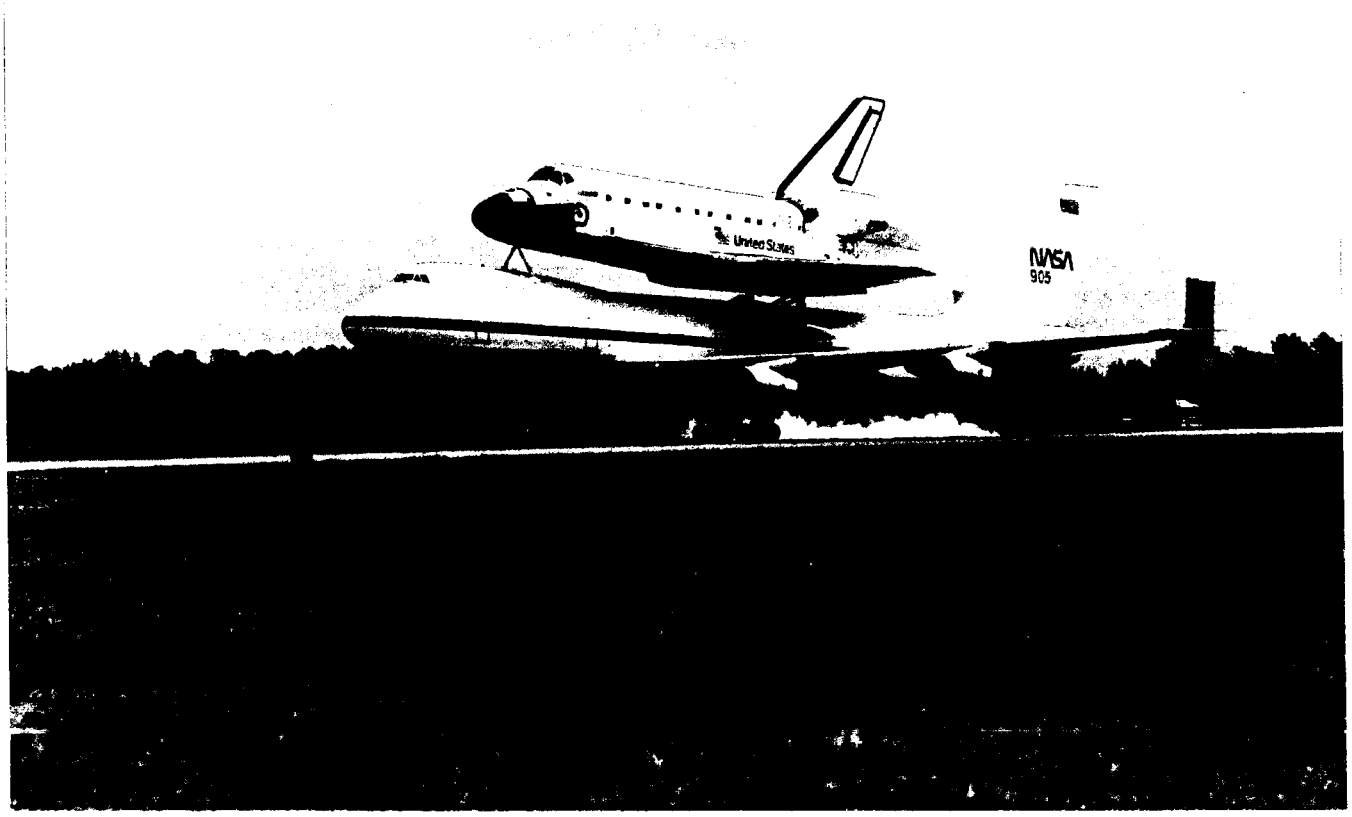
Air Force Ranking of Criteria I, Flying Training Mission: Columbus received highest ranking!



Air Force Ranking of Criteria II, Facilities & Infrastructure: Columbus was the *only* base rated GREEN

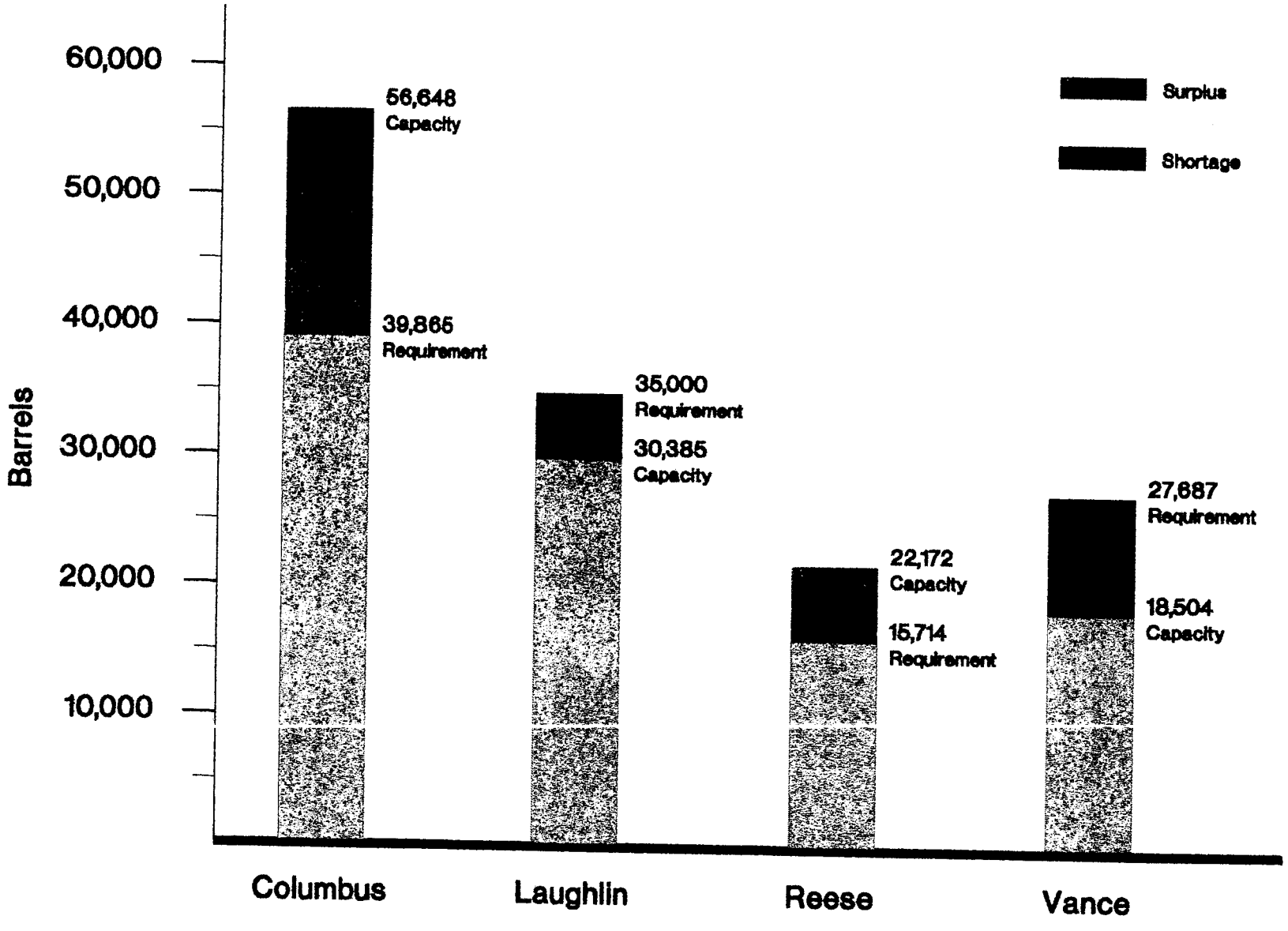
(All others received a GREEN MINUS)

Columbus AFB's three parallel runway configuration, with the two-mile center runway, accounts for its high rating on facilities and infrastructure.

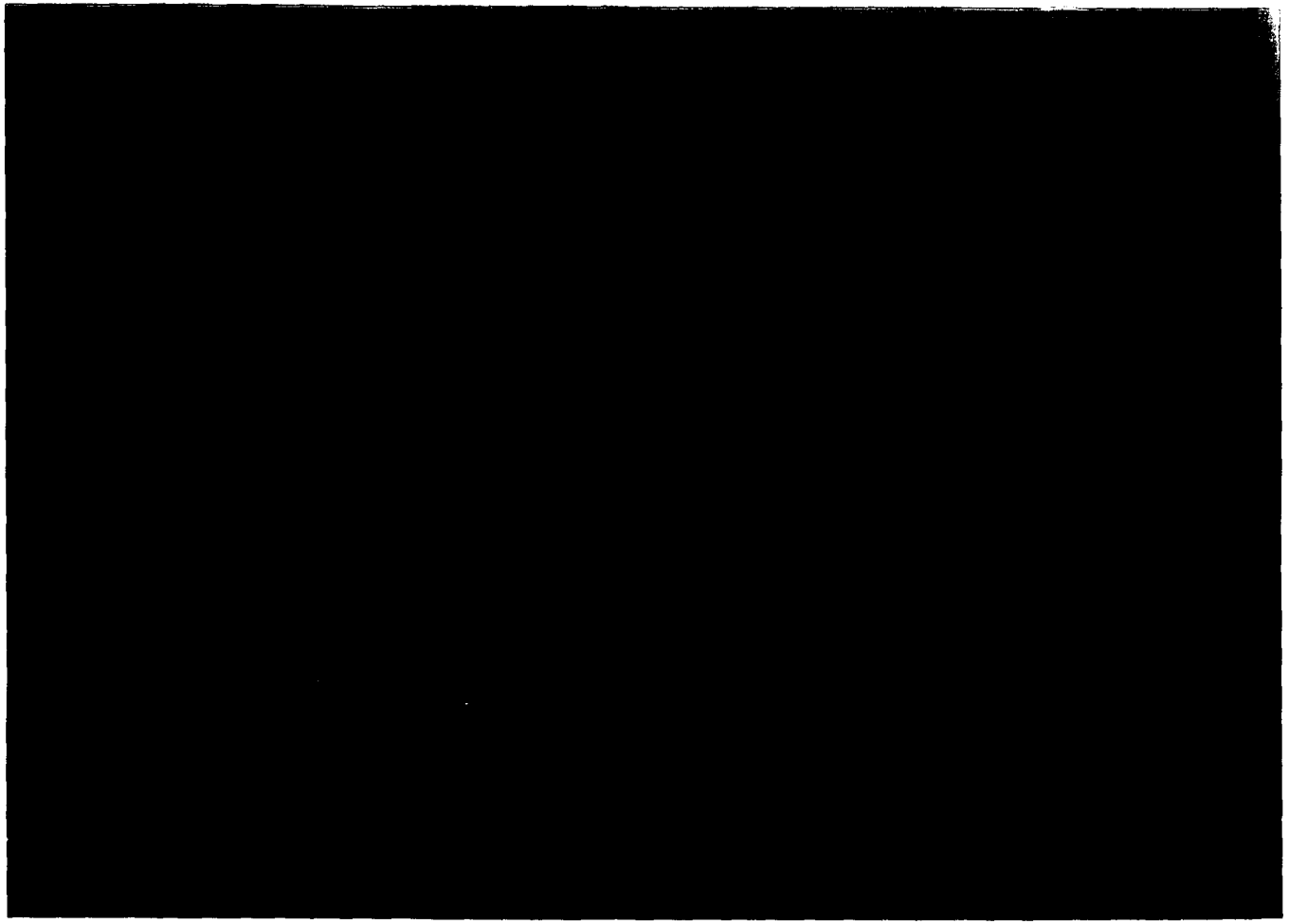


Space Shuttle Endeavour, riding atop a modified 747, landed at Columbus Air Force Base enroute to Florida to prepare for another mission. The versatile infrastructure of CAFB makes this possible

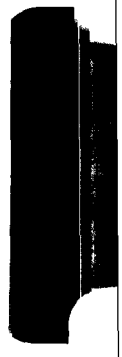
Aviation Fuel Capacity/Requirement*



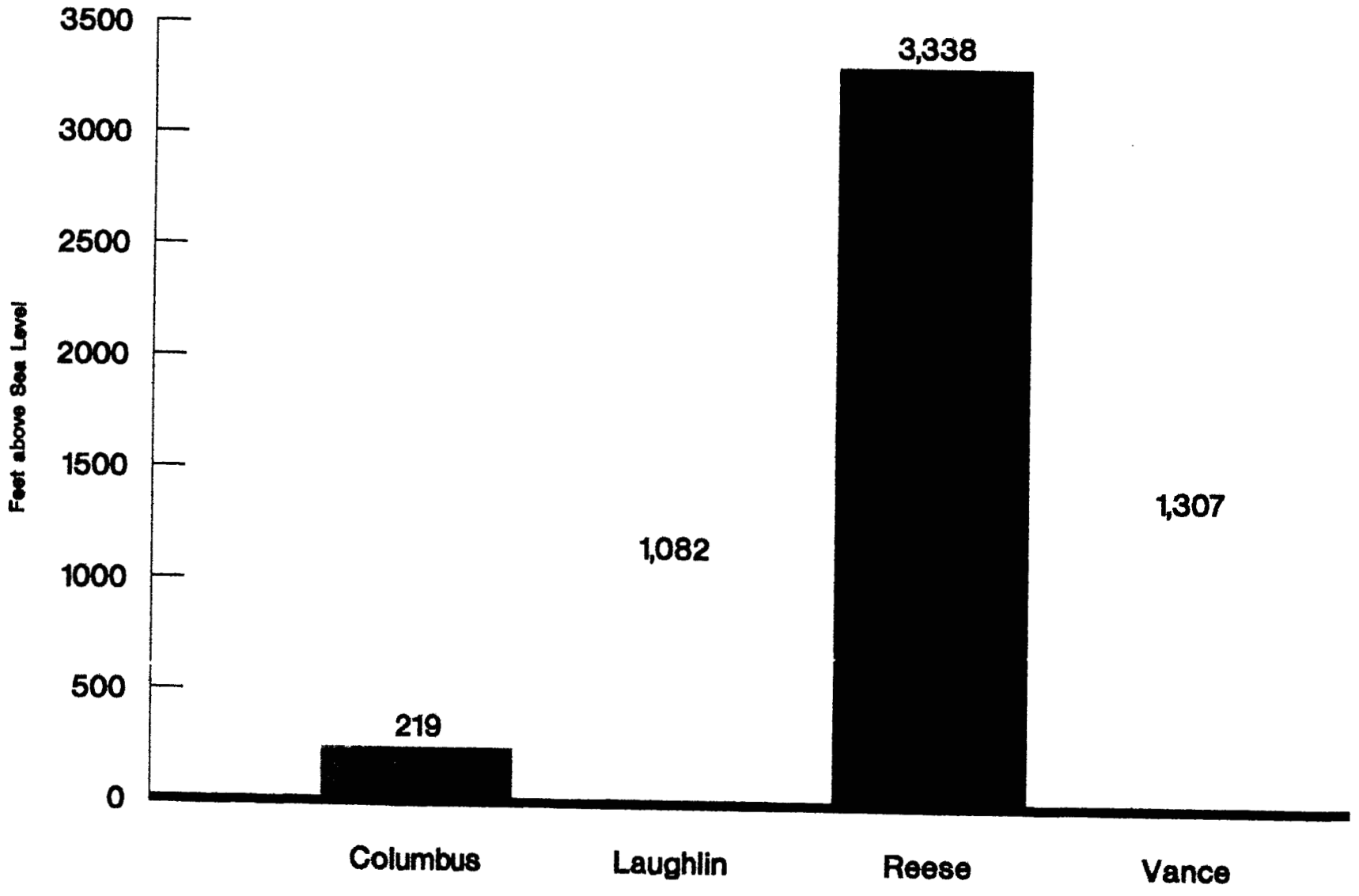
*Data taken from 1995 Air Force Data Calls



SeaRay, the gunnery range used by Columbus Air Force Base in Introduction to Fighter Fundamentals, is 35 miles southwest of Columbus.



Field Elevation



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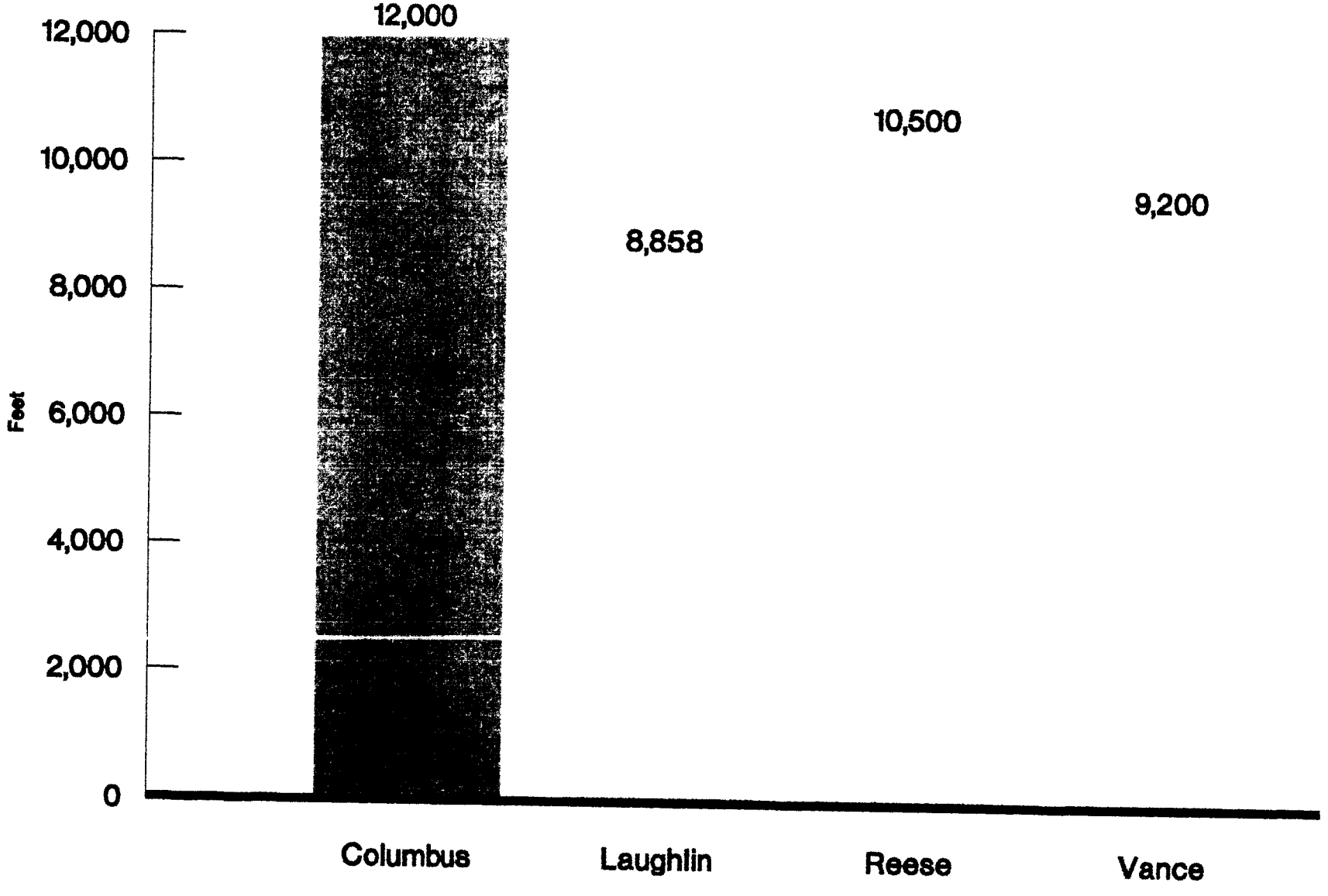
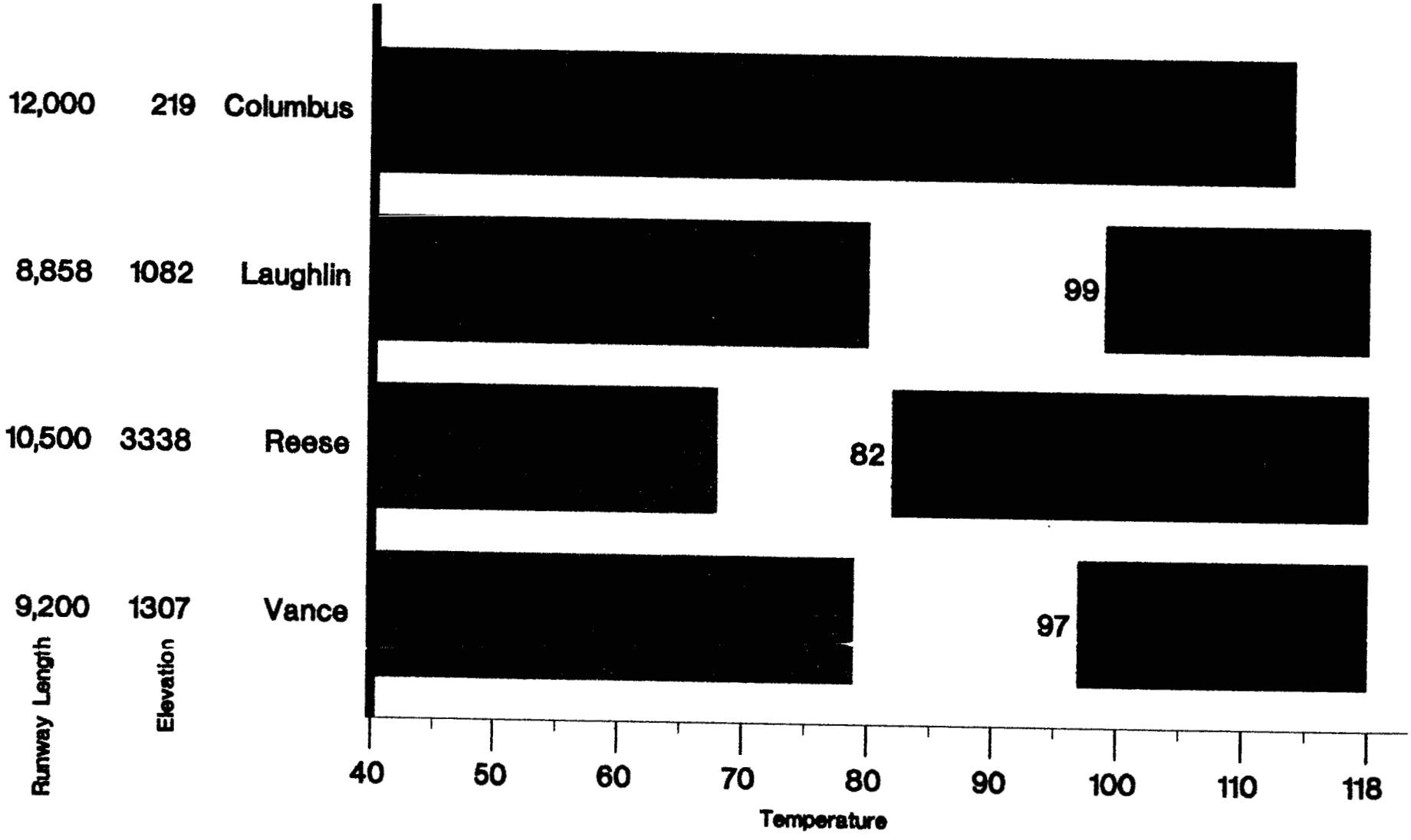
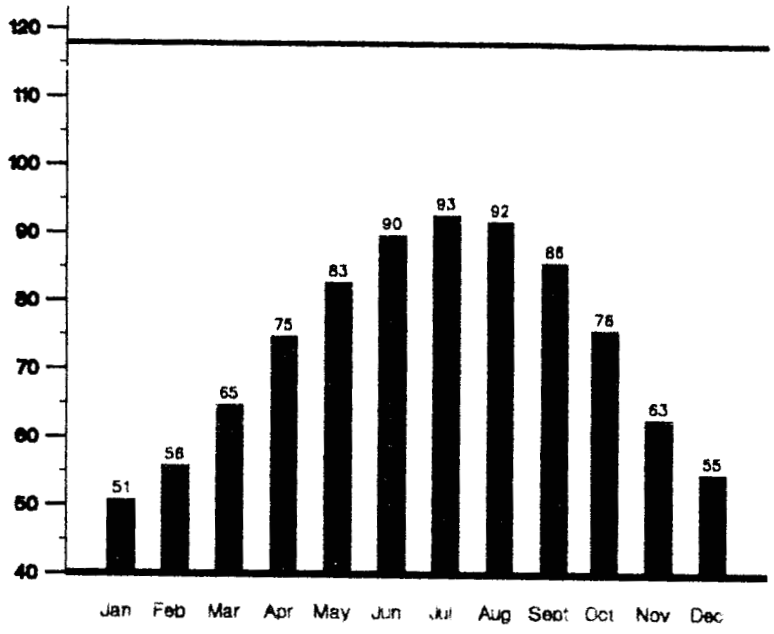


T-38 Takeoff Risk

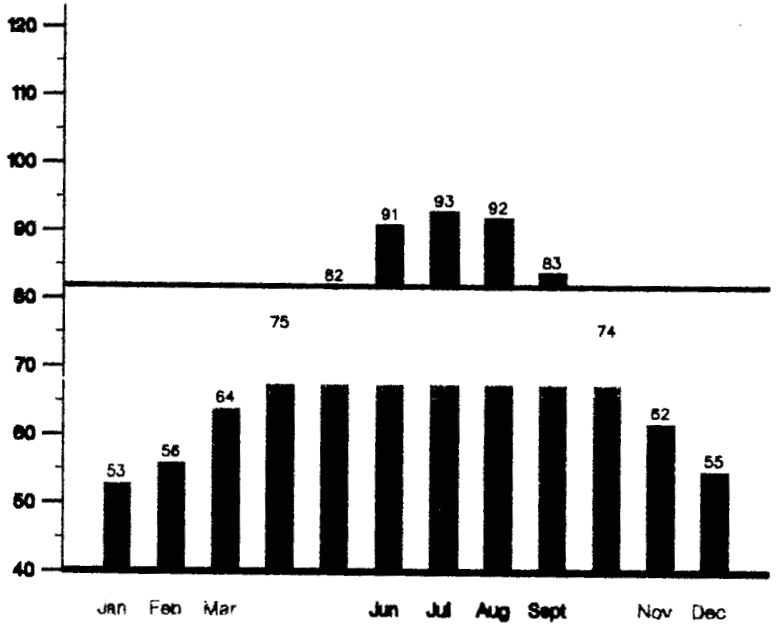


Normal Daily High Temperature Data/Takeoff Risk*

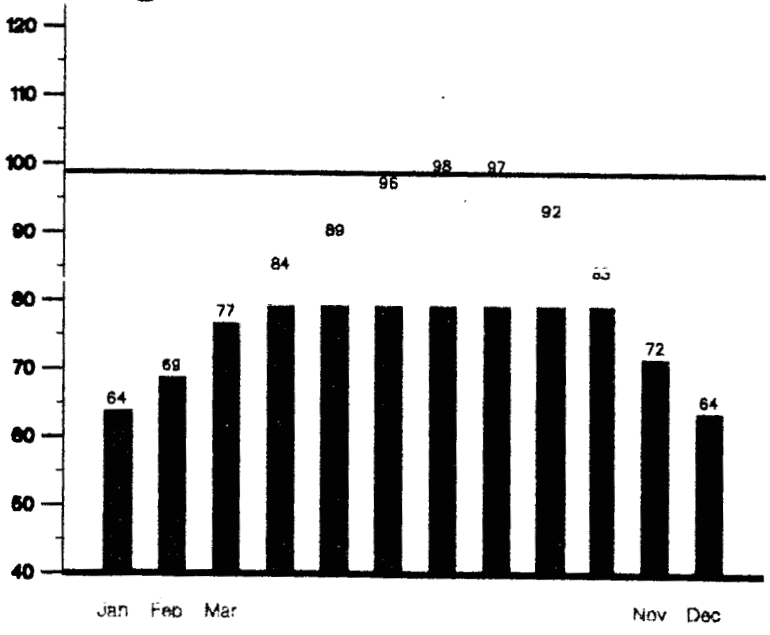
Columbus



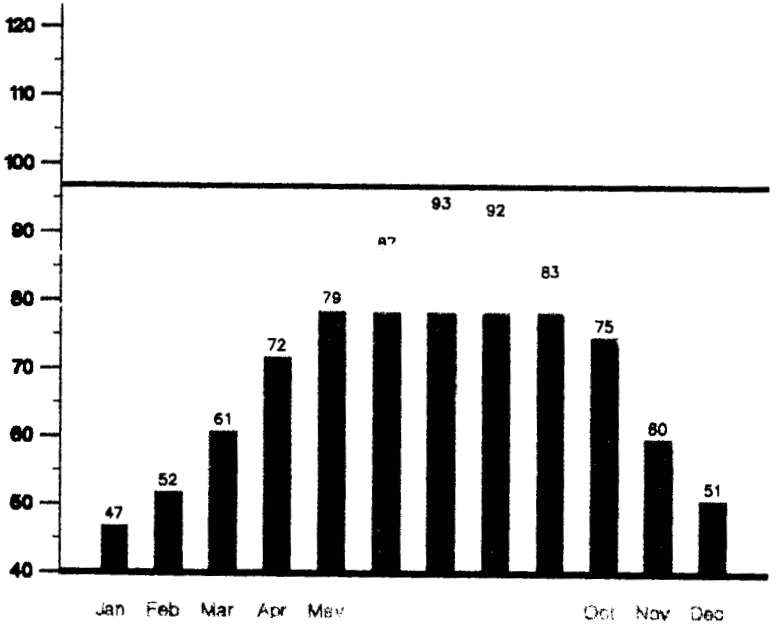
Reese



Laughlin

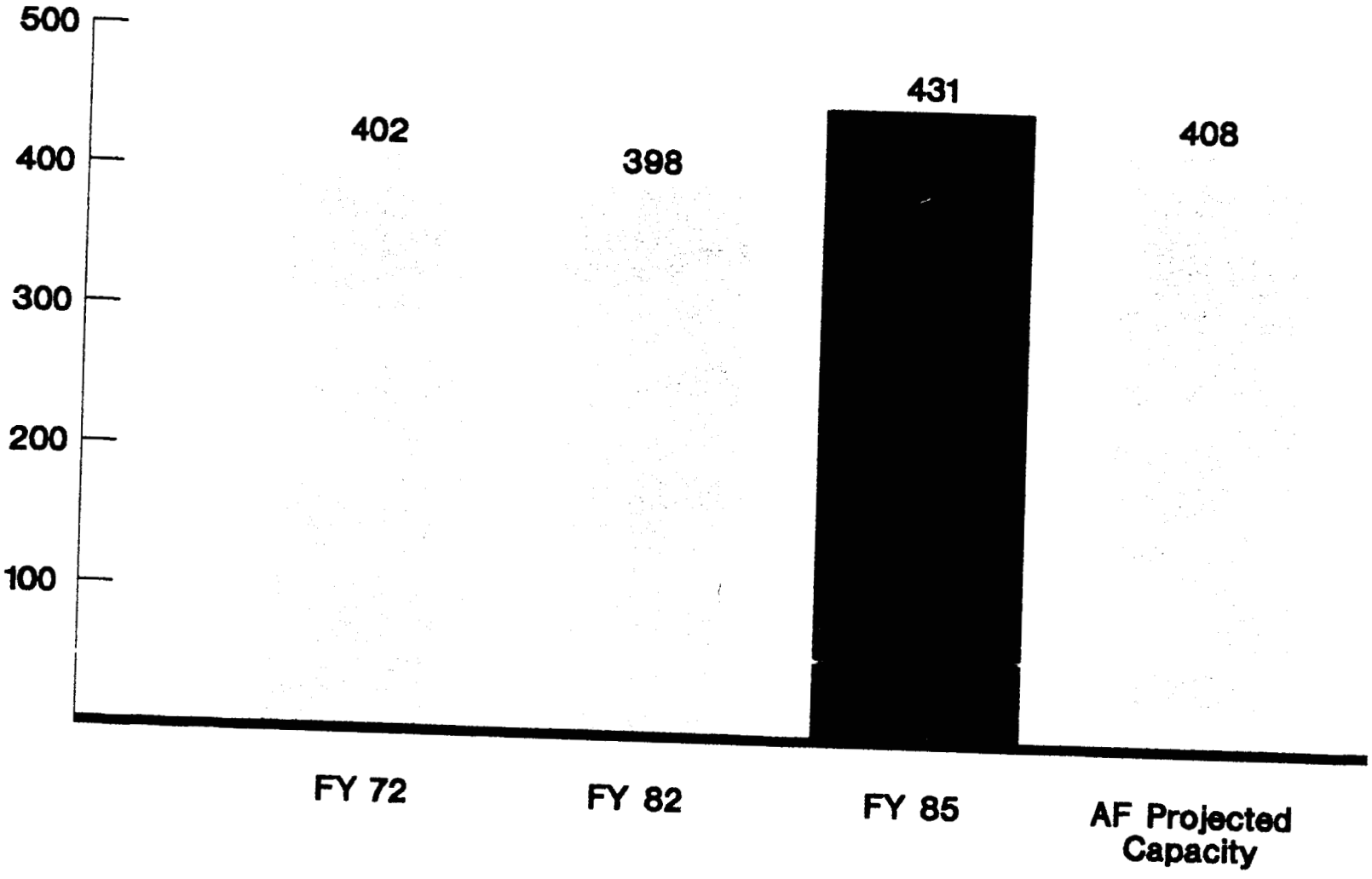


Vance

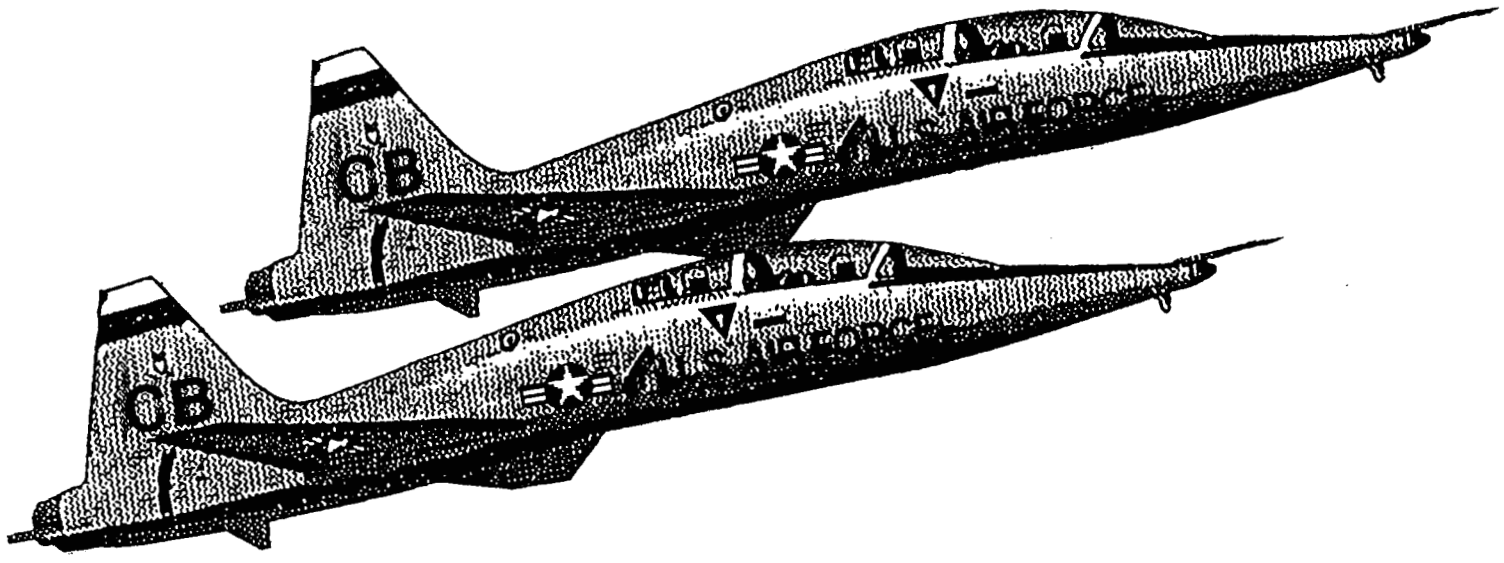


* Based on data provided by the National Weather Service

CAFB Infrastructure Supports Pilot Production



ICING IMPACT ON MISSION

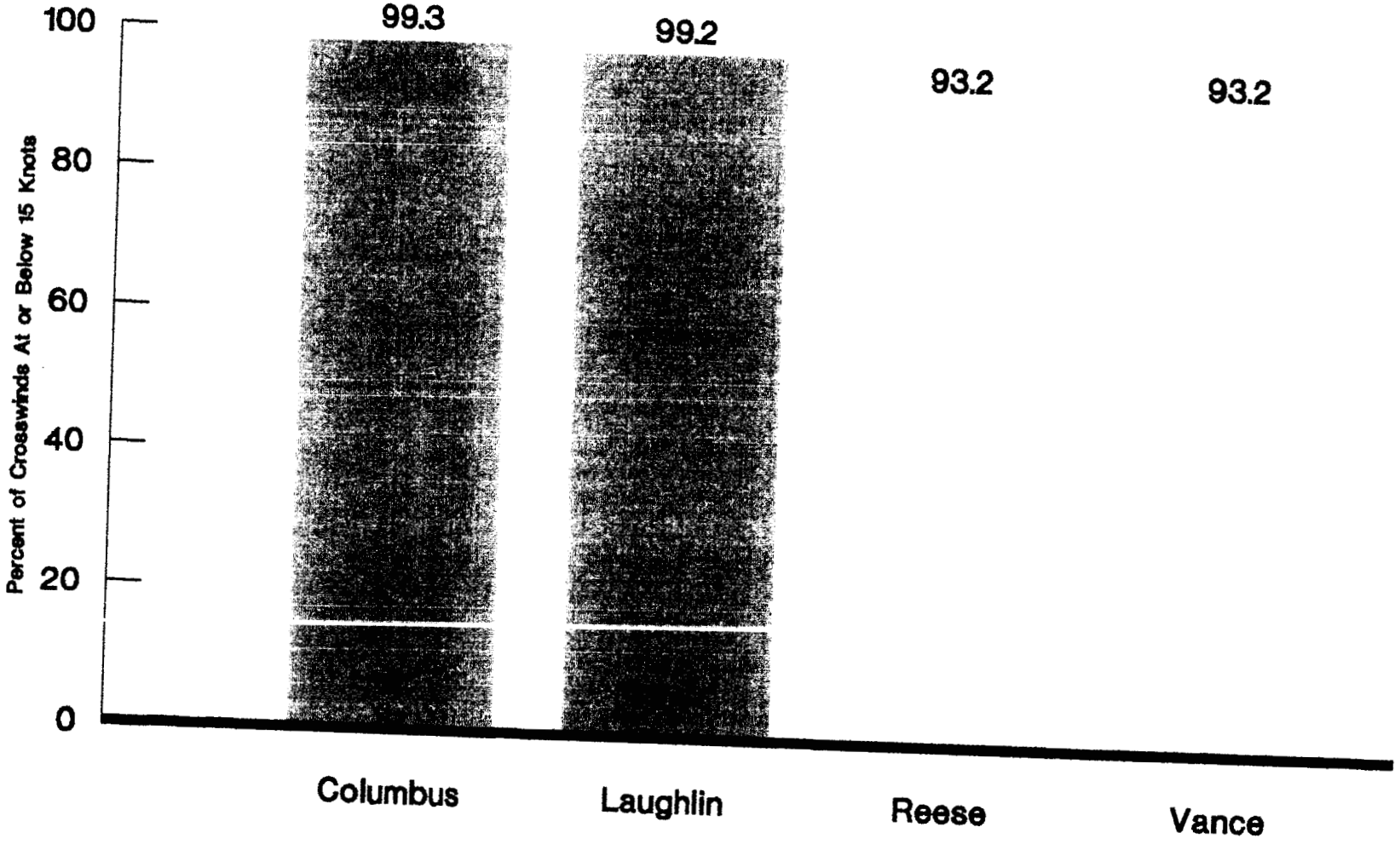


1 OCT 92 – 31 MAR 95 167,000 SORTIES FLOWN

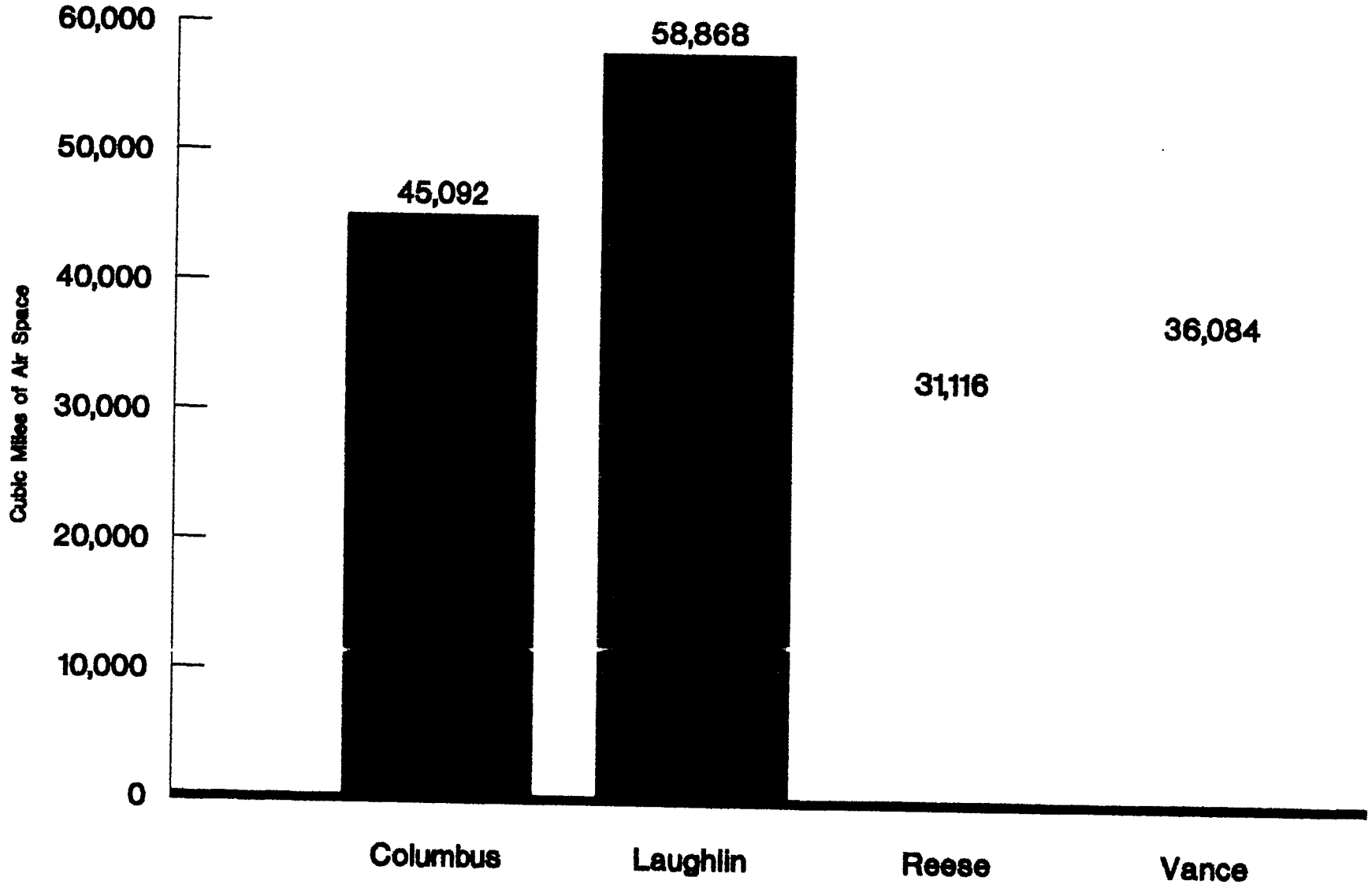
335 SORTIES LOST BECAUSE OF ICING

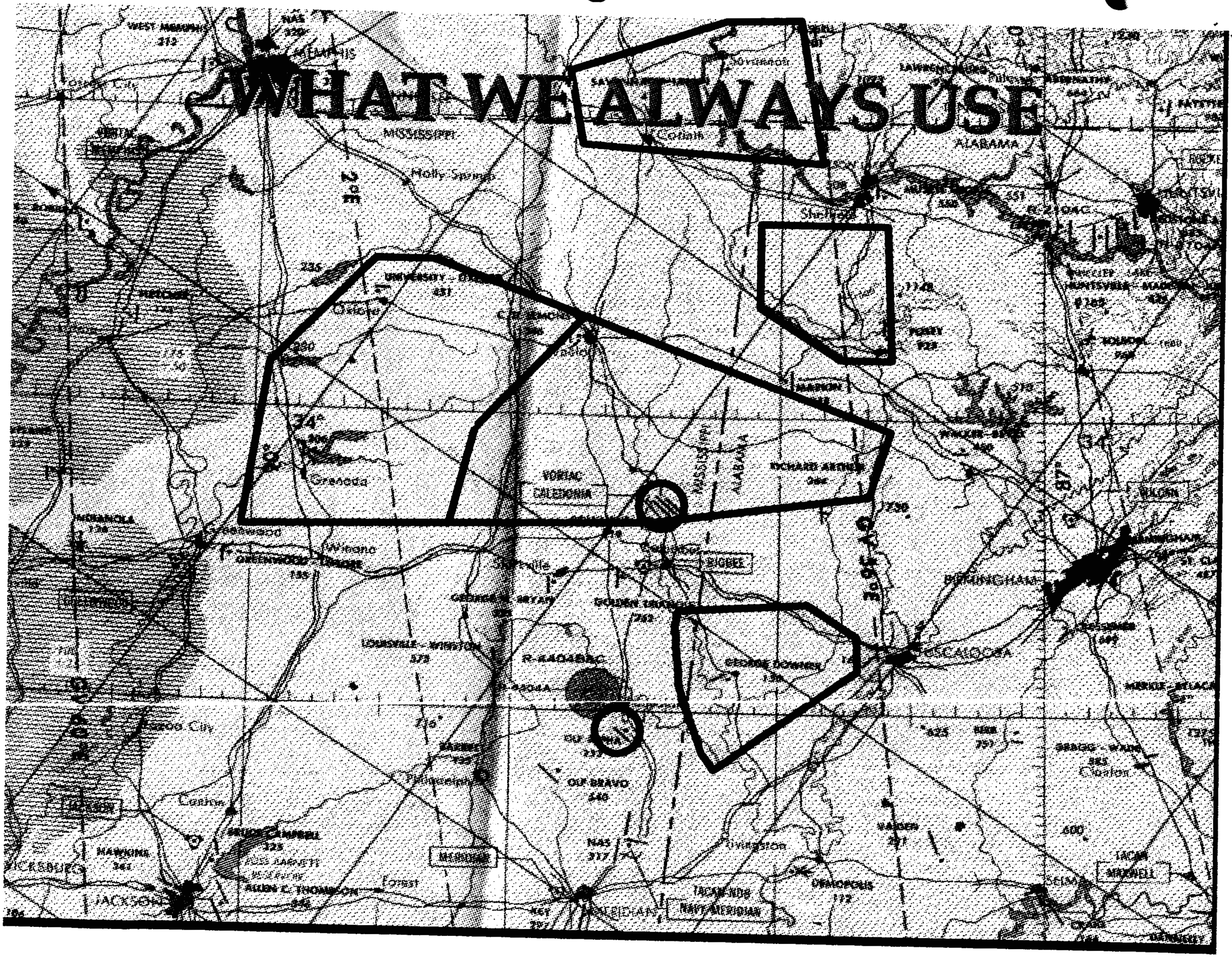
ONLY 0.2% OF TOTAL SORTIES WERE LOST

Percent of Crosswinds At or Below 15 Knots

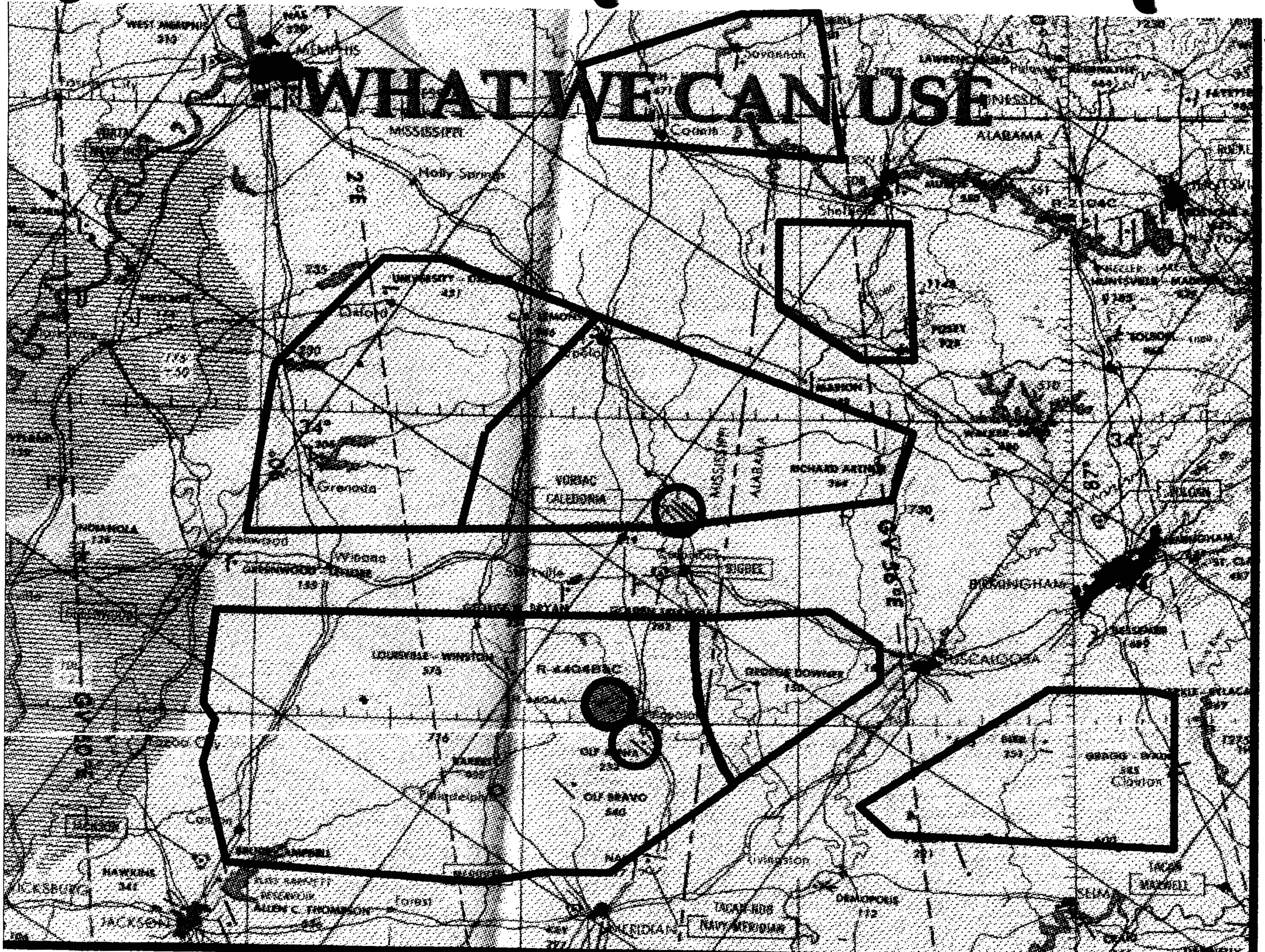


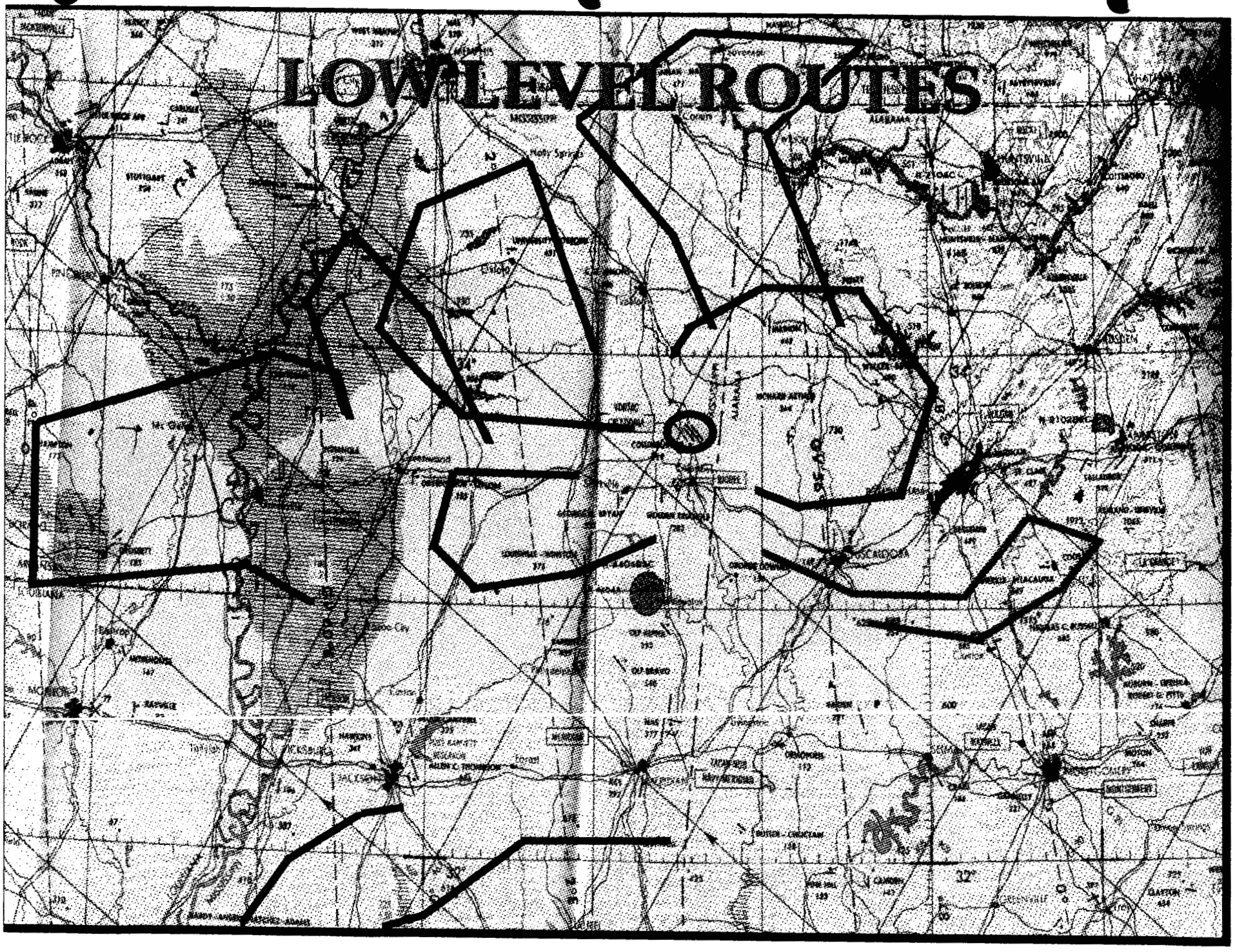
Original Data Call Cubic Miles of Airspace



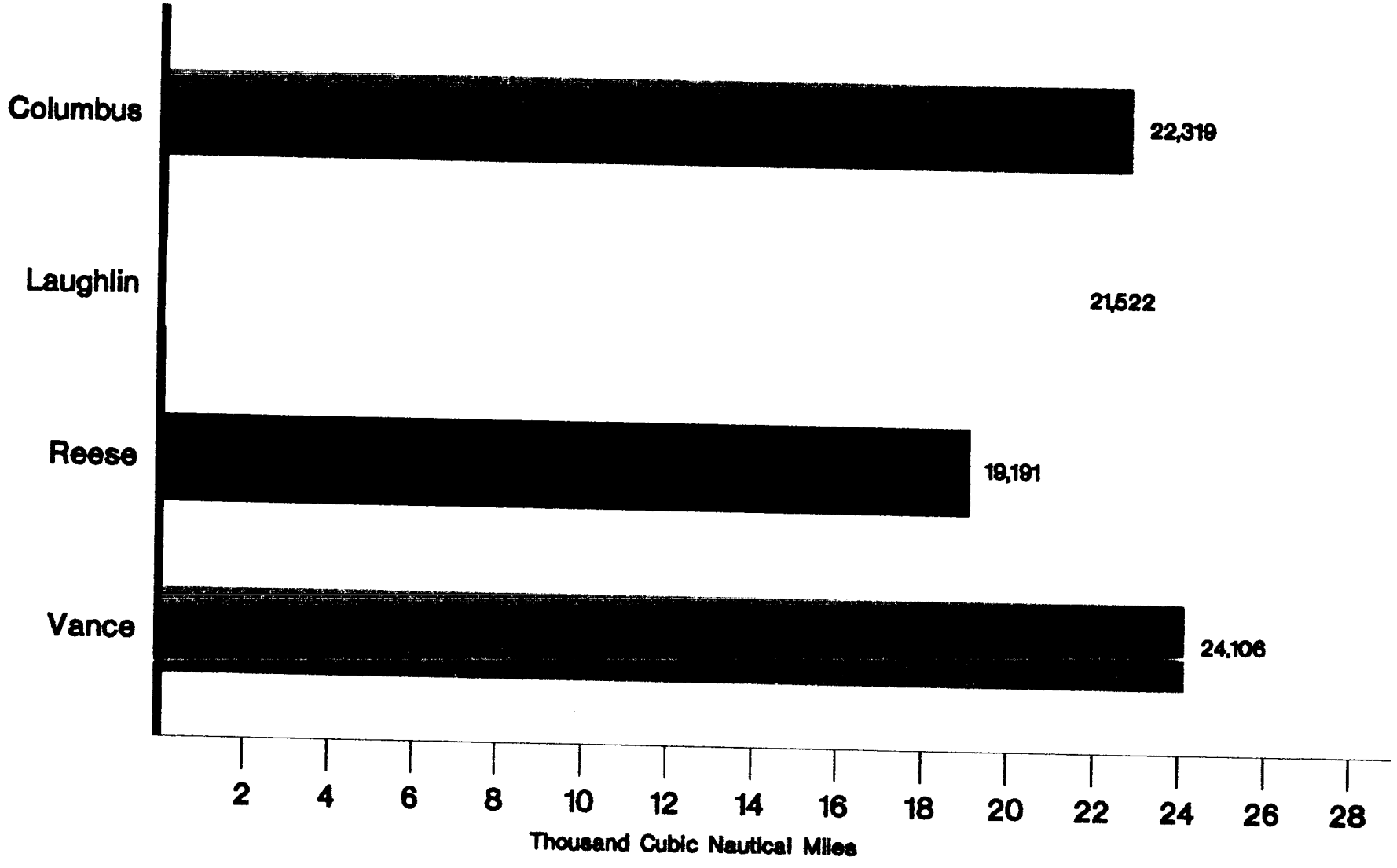

WHAT WE ALWAYS USE
MISSISSIPPI
ALABAMA
Holly Springs
Oxford
Grenada
Greenwood
Winona
CALEDONIA
BIGBEE
BIRMINGHAM
TUSCALOOSA
Meridian
Jackson
Memphis
Philadelphia
Forest
Livingston
Corinth
Sheffield
Clanton
DEMOPOLIS
NAVY MERIDIAN
MAXWELL
2°E
34°
87°
GV 0°

WHAT WE CAN USE




LOW LEVEL ROUTES

Usable Owned/Scheduled Airspace



AIRSPACE ANALYSIS

Staff Analysis two included airspace owned and/or scheduled by the applicable base. Although Columbus is not the owner, by letter of agreement Columbus exclusively schedules and manages Meridian 1 East MOA. Columbus also exclusively schedules and uses the Birmingham 1 MOA every Monday. Including this airspace into the calculations results in a comparable airspace figure for Columbus of 23,531 cubic nautical miles of owned/scheduled airspace. (23,341 for MOA only airspace). Including this airspace in the overall calculations of average distance to training areas results in an average distance of 33.10 miles.

Name	Area NM2	Alt	Volume	Distance	CNA x Distance
A440	177	6,500	189	1	189
CMB1	2,643	15,000	6,521	1	6,521
CBM2	647	15,000	1,596	45	71,820
CBM3	2,668	15,000	6,582	42	276,444
CMB4	1,379	13,000	2,949	74	218,226
Caledonia 1	877	4,000	577	12	6,924
Caledonia 2	804	4,000	529	12	6,340
Greenwood	831	4,000	547	45	24,615
Memphis	857	4,000	564	75	42,300
Oxford	809	14,000	532	45	23,940
R4404	78.5	11,500	149	37	5,513
Meridian 1E	719	15,000	1,774	15	26,610
Birmingham 1	2,390 *478	13,000	5,110 *(1022)	62	63,364
TOTAL	14,405.5		23,531		772,806

*only .2 of this value is used since it is only scheduled by CBM are day/week, although it can be used at other times when scheduled through Birmingham.

****Average Distance to Airspace= 772,617 = 33.10**
23,342

Based on these corrections , comparative analysis for staff analysis 2 should be:

	Reese	Columbus	Laughlin	Vance
AMT MOA/ATCAA	**27,214**	**23,342**	**40,435**	**27,945**
****Avg dist to airspace**	**32.6**	**33.1**	**16.8**	**12.3**

A440 airspace not included in Average Distance calculations.

In staff analysis two the distance to training airspace was figured using total cubic nautical miles of each MOA times the distance to each MOA divided by total cubic nautical miles of air space. However Columbus MOA 1 and MOA3 are continuous air space blocks tangent to each other and therefore should be considered one block of airspace. These two MOAs could just as well have been designated a single MOA since they are continuous air space blocks. Using this assumption would equate to MOA three distance being one mile rather than 42, (the same as MOA 1), and the average distance to the MOAs would be reduced to 21.5 miles. Calculations resulting in the above mentioned average distance to training airspace are shown below.

Name	Area NM2	Alt	Volume	Distance	CNA x Distance
A440	177	6,500	189	1	189
CMB1	2,643	15,000	6,521	1	6,521
CBM2	647	15,000	1,596	45	71,820
CBM3	2,668	15,000	6,582	1	6,582
CMB4	1,379	13,000	2,949	74	218,226
Caledonia 1	877	4,000	577	12	6,924
Caledonia 2	804	4,000	529	12	6,348
Greenwood	831	4,000	547	45	24,615
Memphis	857	4,000	564	75	42,300
Oxford	804	4,000	532	45	23,946
R4407	78.5	11,500	149	37	5,513
Meridian 1E	719	15,000	1,774	15	26,610
Birmingham 1	2,390 *478	13,000	5,110 *1,022	62	63,364
TOTAL			23,531		502,952

**Average Distance = $\frac{502,763}{23,342}$ = 21.5 miles

Using this assumption the comparative analysis of Average Distance to training areas is:

	Reese	Columbus	Laughlin	Vance
**Average Distance to airspace	32.6	21.5	16.8	12.3

**A440 airspace not included in Average Distance to airspace calculations.

In Staff Analysis 2 only airspace that was owned/scheduled was considered. If this is the criteria that is to be used when analyzing usable airspace for pilot training using T-37 and T-38 aircraft (only aircraft used by all pilot training bases) then an additional adjustment should be made. In the Joint Data Call on Airspace the following "note" was included: "Since ATCAA is not charted, bases can only report ATCAA they actually use or impact their operations." When reporting ATCAA some bases reported airspace to an unusable high ceiling for T-38 aircraft since the ceiling is established by letter of agreement with the FAA. However, airspace above FL300 is not normally used for T-38 aircraft. It is impractical to accomplish syllabus requirements above this altitude because of aircraft maneuverability limitations at high altitude. Reporting altitudes above FL300 for the T-38 ignores the "note", "only report ATCAA they actually use or impact their operation." The following charts adjust the cubic nautical mile of airspace by including owned/scheduled airspace only up to FL300. If airspace above FL300 must be used for T-38 training then it should be considered a training limitation due to lack of aircraft maneuverability/response above this altitude for syllabus required maneuvers.

COLUMBUS

Name	Area NM2	Alt	Volume	Distance	CNA x Dist
A440	177	6,500	189	1	189
CBM1	2,643	15,000	6,521	1	6,521
CBM2	647	15,000	1,596	45	71,820
CBM3	2,668	15,000	6,582	1	6,582
CBM4	1,379	13,000	2,949	74	218,226
Caledonia 1	877	4,000	577	12	6,924
Caledonia 2	804	4,000	529	12	6,340
Greenwood	831	4,000	547	45	24,615
Memphis	857	4,000	564	75	42,300
Oxford	809	14,000	532	45	23,940
R4404	78.5	11,500	149	37	5,513
Meridian 1E	719	15,000	1,774	15	26,610
Birmingham 1	2,390	13,000	5,110 *(1022)	62	63,364
TOTAL			23,531		502,952

*only .2 of this value is used since only scheduled by CBM one day/week, although it can be used at other times when scheduled through Birmingham.

**Average Distance = $\frac{502,763}{23,342} = 21.5$

No altitude changes required.

LAUGHLIN

Name	Area NM2	Alt	Volume NM3	Distance	CNM x Distance
A 663 A	708	6,000	698.7	1	698.68
A 663 B	154	3,000	76.0	22	1,671.71
AV 1	4,500	13,000	9,621.7	20	192,434.21
AV 2	469	13,000	1,002.8	40	40,111.84
AV 3	1,975	15,000	4,872.5	15	73,087.99
Los Pecos ATCAA*	7,980	4,000	5,250.0	15	78,750
TOTAL	15,786		21,521.7		386,754.43

*Joint Data Call reported an altitude block of FL 260 - FL 450 for an altitude of 19,000 feet. "Airspace actually used or impact their operation" should be capped at FL 300 for T-38 except for the one time special syllabus supersonic run requirement which can be done on a track and does not require an area. Therefore the altitude for the Pecos ATCAA should be 4,000 instead of 19,000. If airspace above FL 300 must be used, then it should be considered a training limitation.

**Average Distance = $\frac{384,384}{20,747} = 18.53$

**Alert Airspace is not included in Average Distance to airspace calculations.

REESE

Name	Area NM2	Alt	Volume NM3	Distance	CNA x Distance
A637	1,250	2,700	555.1	1	555.09
Reese 1	1,022	6,000	1,008.6	31	31,265.13
ATCAA 1	1,022	8,000	1,344.7	31	41,686.84
Reese 2	828	8,000	1,089.5	12	13,073.68
ATCAA 2	828	5,000	680.9	12	8,171.05
Reese 3	2,677	6,000	2,641.8	47	124,113.49
ATCAA 3	2,677	8,000	3,522.4	47	165,551.32
Reese 4	894	8,000	1,176.3	16	18,821.05
ATCAA 4	894	5,000	735.2	16	11,763.16
Reese 5	1,437	6,000	1,418.1	46	65,232.24
ATCAA 5	1,437	8,000	1,890.8	46	86,976.32
High A*	1,340	2,000	440.8	15	6,612.00
High B*	893	2,000	293.7	49	14,391.30
High C*	1,226	2,000	403.3	49	19,761.70
High D*	908	2,000	298.7	15	4,480.50
High E*	1,023	2,000	336.5	15	5,047.50
Tourch*	405	2,000	133.2	25	3,330.00
Norman	464	8,000	610.5	20	12,210.00
Ramsey	464	8,000	610.5	20	12,210.00
TOTAL	21,689		19,190.6		645,302.37

Joint Data Call reported an altitude block of FL 280 - FL 390 for an altitude of 11,000 feet for A, B, C, D, E, High and Tourch. "Airspace actually used or impact their operation" should be capped at FL 300 for T-38 except for the one time special syllabus supersonic run requirement which can be done on a track and does not require an area. Therefore, the altitude for these areas should be 2,000 instead of 11,000. If airspace above FL 300 must be used, then it should be considered a training limitation.

** Average Distance = $\frac{644,747}{18,635} = 34.6$

**Alert Airspace is not included in Average Distance to airspace calculations.

VANCE

Name	Area NM2	Alt	Volume NM3	Distance	CNM X Distance
A 562A	209	5,700	299.1	1	299.06
A 562B	140	8,800	202.6	17	3,444.74
Vance 1A	6,298	8,000	5,286.8	1	8,286.84
ATCAA 1A	6,298	6,000	6,215.1	1	6,215.13
Vance 1B	2,132	11,000	3,857.2	1	3,857.24
ATCAA 1B	2,132	6,000	2,103.9	1	2,103.95
Eagle 2N	998	4,000	650.0	40	26,000.00
Eagle 2S	916	4,000	602.6	40	24,104.00
Eagle 3N	532	4,000	547.4	66	36,128.40
Eagle 3S	930	4,000	611.8	66	40,378.80
Eagle 6	612	4,000	402.6	18	7,246.80
Tourch	500	4,000	328.7	18	5,921.05
TOTAL	21,997		24,107.8		163,986.01

Joint Data Call reported an altitude block of FL 280 - FL 350 for an altitude of 9,000 feet for Eagle 2N, 2S, 3N, and 3S. Eagle 6 reported altitude block was FL 260 - FL 430 for an altitude of 17,000. "Airspace actually used or impact their operation" should be capped at FL 300 for T-38 except for the one time special syllabus supersonic run requirement which can be done on a track and does not require an area. Altitude blocks for these areas reflect this change in the chart above. If airspace above FL 300 must be used, then it should be considered a training limitation.

**Average Distance = $\frac{160,242}{23,606} = 6.9$

**Alert Airspace is not included in Average Distance to airspace calculations.

Based on the preceding analysis, comparative total cubic nautical miles of airspace which are actually used or impact T-37/T-38 operations and the average distance to MOA/ATCAA are:

	Reese	Columbus	Laughlin	Vance
Amt MOA/ATCAA	**19,191**	**23,531**	**21,522**	**24,108**
Avg dist to airspace	**34.6**	**21.5**	**18.5**	**6.9**

The change to using blocks of continuous airspace, regardless of arbitrary designations, demonstrates the inconsistencies of using this method of computing an average distance to training areas, since it does not take into consideration the furthest distance to the end of the MOA airspace. The Air Force divides MOAs and ATCAA into smaller individual aircraft working areas. Each training flight or formation must remain in this smaller block of airspace during their time in the training area. Therefore a more realistic measure of defining the overall average distance to training airspace is the distance to each individual working area. Using this realistic measure the calculations for the average Columbus distance to T-37 and T-38 working areas are shown. Individual training areas data was not available for the other bases.

Area	Distance
1L	10
1H	10
2L	22
2H	22
3L	22
3H	22
4L	32
4H	32
5L	32
5H	32
Red L	15
Red H	15
White L	30
White H	30
Blue L	30
Blue H	30

16 386

Average Distance 24.1

T-38

Area		Distance
1		12
2		12
3		12
4		12
5		29
6		45
7		45
8		45
9		66
10		60
11		66
Pickwick	1	74
Pickwick	2	74
Echo		45
Caledonia	1	12
Caledonia	2	12
Greenwood		45
Memphis		75
Oxford		45
A440		1
R4404		37
TOTAL	21	824

Average Distance 39.2

Taking this analysis a step further, an even more realistic approach to obtaining a meaningful number which represents the average distance to the training areas is to weight each distance by the percentage of overall training accomplished in each area. The following data shows the percent of training accomplished in each area and is used in calculations to determine a weighted average distance to the areas based on the percentage of training accomplished in each area.

Coluumbus AFB MOA Usage

Area	FAA Designation	Number of Sorties	% of Total	Number of Hours	% of Total
T-37					
1	Columbus 1	1366	9.58%	696	11.31%
1 High	Columbus 1	1128	7.91%	563	9.15%
2	Columbus 1	1961	13.75%	713	11.59%
2 High	Columbus 1	757	5.31%	369	6.00%
3	Columbus 1	1021	7.16%	397	6.45%
3 High	Columbus 1	338	2.37%	174	2.83%
4	Columbus 1	1340	9.39%	464	7.54%
4 High	Columbus 1	271	1.90%	127	2.06%
5	Columbus 1	699	4.90%	257	4.18%
5 High	Columbus 1	116	0.81%	52	0.84%
Red	Meridian 1 East	1843	12.92%	799	12.98%
Red High	Meridian 1 East	999	7.00%	466	7.57%
White	Meridian 1 East	1015	7.12%	464	7.54%
White High	Meridian 1 East	446	3.13%	213	3.46%
Blue	Meridian 1 East	670	4.70%	270	4.39%
Blue High	Meridian 1 East	279	1.96%	122	1.98%
Surge	Columbus 1	11	0.08%	6	0.10%
Surge High	Columbus 1	4	0.03%	2	0.03%
Totals		***14264***	***100.00%***	***6154***	***100.00%***
T-38					
1	Columbus 1	2625	17.70%	949	17.03%
2	Columbus 1	1597	10.77%	589	10.57%
3	Columbus 1	1398	9.42%	587	10.53%
4	Columbus 1	2099	14.15%	753	13.51%
5	Columbus 1	829	5.59%	270	4.84%
6	Columbus 3	1055	7.11%	396	7.11%
7	Columbus 3	700	4.72%	250	4.49%
8	Columbus 3	239	1.61%	96	1.72%
9	Columbus 3	335	2.26%	133	2.39%
10	Columbus 3	116	0.78%	50	0.90%
11	Columbus 3	142	0.96%	58	1.04%
Echo	Columbus 2	1922	12.96%	678	12.17%
Pickwick 1	Columbus 4	635	4.28%	267	4.79%
Pickwick 2	Columbus 4	404	2.72%	160	2.87%
FCF	Columbus 1	55	0.37%	15	0.27%

Source: 14 OSS/DOOR

Coluumbus AFB MOA Usage

Area	FAA Designation	Number of Sorties	% of Total	Number of Hours	% of Total
T-38 (Cont)					
Caledonia 1	ATCAA/High Shuttle	209	1.41%	103	1.85%
Caledonia 2	ATCAA/High Shuttle	22	0.15%	10	0.18%
Greenwood	ATCAA/High Shuttle	128	0.86%	75	1.35%
Oxford	ATCAA/High Shuttle	35	0.24%	20	0.36%
Memphis	ATCAA/High Shuttle	0	0.00%	0	0.00%
Surge A	Columbus 1	100	0.67%	42	0.75%
Surge B	Columbus 1	50	0.34%	18	0.32%
Surge C	Meridian 1 East	87	0.59%	31	0.56%
Meridian	Meridian 1 West	4	0.03%	1	0.02%
Birmingham	Birmingham 1/2	47	0.32%	22	0.39%
Totals		*14833*	*100.00%*	*5573*	*100.00%*
AT-38					
Smurf 1	Columbus 3	1372	38.11%	554	37.46%
Smurf 2	Columbus 3	1026	28.50%	448	30.29%
Smurf 3	Columbus 3	790	21.94%	297	20.08%
1	Columbus 1	47	1.31%	27	1.83%
2	Columbus 1	15	0.42%	15.9	1.07%
3	Columbus 1	7	0.19%	3.8	0.26%
4	Columbus 1	22	0.61%	8.3	0.56%
5	Columbus 1	14	0.39%	9.1	0.62%
Meridian	Meridian 1 West	13	0.36%	9	0.61%
Birmingham	Birmingham 1/2	294	8.17%	107	7.23%
Totals		*3600*	*100.00%*	*1479.1*	*100.00%*

Source: 14 OSS/DOOR

T-37 Weighted Average Distance to Individual Training Areas

T-37

Area	Distance	Percent of Tng	Weighted Distance
1L	10	9.58	.958
1H	10	7.91	.791
2L	22	13.75	3.025
2H	22	5.31	1.168
3L	22	7.16	1.575
3H	22	2.37	.521
4L	32	9.39	3.005
4H	32	1.90	.608
5L	32	4.90	1.568
5H	32	.81	.259
Red L	15	12.92	1.938
H	15	7.00	1.050
White L	30	7.12	2.136
White H	30	3.13	.939
L	30	4.70	1.410
H	30	1.96	.588
Surge *	12	.08	.010
Surge High A	12	.03	.004
TOTAL 18	410	100%	21.553

Surge area is normally used by T-38. Is added here to provide 100% total. Note extremely small percentage of use.

Average Distance 21.553

T-38 Weighted Average Distance to Individual Training Areas

Area	Distance	Percent Tng	Weighted Distance
1	12	17.70	2.12
2	12	10.77	1.29
3	12	9.42	1.13
4	12	14.15	1.70
5	29	5.59	1.62
6	45	7.11	3.20
7	45	4.72	2.12
8	45	1.61	.72
9	66	2.26	1.49
10	60	.78	.47
11	66	.96	.63
Echo	45	12.96	5.83
Pickwick 1	74	4.28	3.17
Pickwick 2	74	2.72	2.01
FCF	12	0.37	.04
Caledonia 1	12	1.41	.17
Caledonia 2	12	0.15	.02
Greenwood	45	0.86	.39
Oxford	45	0.24	.11
Memphis	75	0.00	.00
Surge A	12	.67	.08
Surge B	12	.34	.04
Meridian E	15	.59	.09
Meridian 1 W	15	.03	.00
Birmingham	63	.32	.20

Average Distance 28.64

Although there are different methodologies for evaluating the airspace structure of each base resulting in different conclusions, airspace has never been a limiting factor in regards to pilot graduate capacity. Although Columbus may have a smaller amount of airspace using the methodology of Staff Analysis Two, Columbus does not have the lowest pilot graduate capacity. Consequently, even when airspace is considered within the limitations placed by Staff Analysis Two, airspace has never been a limiting factor in pilot output. Infrastructure and facilities not airspace are true limiting factors. Columbus excels in each of those areas, which accounts for its pilot training capacity.

MEMPHIS ARTC CENTER,MERIDIAN RADAR AIR TRAFFIC CONTROL FACILITY
COLUMBUS APPROACH CONTROL,
TRAINING AIR WING ONE AND THE 14TH FLYING TRAINING WING
LETTER OF AGREEMENT

Effective: January 9, 1989

SUBJECT: MERIDIAN ONE EAST AND WEST MILITARY OPERATIONS AREAS (MOA's) AND ATC ASSIGNED AIRSPACE (ATCAA)

1. PURPOSE. This agreement establishes procedures between the following facilities for control and use of the subject areas:

Memphis ARTC Center (CENTER) - the controlling agency,

Meridian Radar Air Traffic Facility (RATCF),

Columbus Approach Control (RAPCON),

Training Air Wing One (TRAWING ONE) - the scheduling/using agency for the Meridian One West MOA, and

14th Flying Training Wing (14th FTW) the scheduling/using agency for the Meridian One East MOA.

2. CANCELLATION. Memphis ARTC Center, Meridian RATCF, Columbus Approach Control, Training Air Wing One, and 14th Flying Training Wing Letter of Agreement, dated March 7,1983, Subject: Meridian East and West Military Operations Areas and ATCAA is canceled.

3. AREA. The Meridian One East and West MOA's include airspace as defined in Attachments 1 and 2 from 8,000 feet up to, but not including, FL180. The Meridian ATCAA includes that airspace from FL180 through FL230 overlying the Meridian One East and Meridian One West MOA's.

4. RESPONSIBILITIES.

a. The Commander of TRAWING ONE is responsible for:

(1) TRAWING ONE aircraft remain within assigned airspace.

(2) Proper notification is made concerning activation/deactivation of subject airspace.

(3) Aircraft shall not depart enroute to/enter the subject airspace without prior coordination with the controlling agency.

(4) Military assumes responsibility for separation of aircraft (MARSA) for all aircraft under the jurisdiction of TRAWING ONE.

(5) All other military aircraft as prescribed in FAA Handbook 7610.4 Special Military Operations, Part 5, Section 2, Paragraph 5-14.

b. The Commander of 14th FTW is responsible for:

(1) 14th FTW aircraft remain within assigned airspace.

(2) Proper notification is made concerning activation/deactivation of subject airspace.

(3) Aircraft shall not depart enroute to/enter the subject airspace without prior coordination with the controlling agency.

(4) All other military aircraft as prescribed in FAA Handbook 7610.4 Special Military Operations, Part 5, Section 2, Paragraph 5-14.

c. CENTER shall execute appropriate NOTAM actions required by activation/deactivation of the subject areas.

d. The Controlling Agency for each of the areas shall restrict MOA/ATCAA activities as necessary in order to accommodate SAFI (FAA Semi-Automatic Flight Inspection flights when such flights cannot accept alternatives due to mission derrogation. Normally SAFI flights will be assigned FL240 to avoid MOA/ATCAA activity interruption.

5. DELEGATION OF AUTHORITY. CENTER hereby delegates to RAPCON its authority as the Controlling Agency of the Meridian One East MOA/ATCAA, as defined in Attachment 1 and 2 of this letter.

6. MOA/ATCAA ACTIVATION/DEACTIVATION.

a. Meridian One West areas will normally be activated within the published hours as indicated below, but may also be scheduled active for Saturdays/Sundays.

(1) Meridian One West MOA/ATCAA (80-FL230) intermittent Sunday through Friday, Sunrise to Sunset.

(2) Meridian One West MOA (80 to, but not including, FL180) intermittent Sunday through Friday, Sunset to 0500Z.

b. Meridian One East MOA/ATCAA will normally be activated within the published operational times, daylight hours, Monday through Friday. Other times by NOTAM.

7. NOTIFICATION.

a. FOR MEI 1 WEST MOA/ATCAA TRAWING ONE shall:

(1) Furnish CENTER Mission Coordinator/Watch Supervisor and RATCF Supervisor by noon each Friday, a realistic activity schedule in ZULU time, covering Sunday through Saturday of the following week. Make the same notification when any part of a scheduled period is canceled and 2 1/2 hours' notice for changes contrary to schedule.

(2) Notify RATCF Supervisor and CENTER Sector Controller when activity will be interrupted for a period of one hour or more, and of reactivation request.

b. RAPCON/RATCF Supervisors and appropriate Sector Controllers shall coordinate directly with each other concerning requirements in paragraphs 5 and 6 above.

8. ALTIMETER SETTINGS.

a. All aircraft operating in the areas shall use local altimeter settings; Columbus AFB for the Meridian One East MOA and NAS Meridian for all others.

b. Navy UPT aircraft and RAPCON shall adjust altitude assigments when a change in atmospheric pressure affects the lowest usable flight level, in accordance with the following:

Local Altimeter Setting	Highest Available Altitude
29.92" or higher	FL230
29.91" to 28.92"	FL220
28.91" to 27.92"	FL210

9. ATTACHMENTS.

a. Attachment 1 - Depicts Meridian One East and West MOA/ATCAA.

b. Attachment 2 - Narrative description of Meridian One East and West MOA/ATCAA.

Air Traffic Manager
Memphis ARTCC

Air Traffic Manager
Meridian RATCF

Air Traffic Representative
Columbus AFB, MS

Commander, 1948 Communications Squadron
Columbus AFB, MS

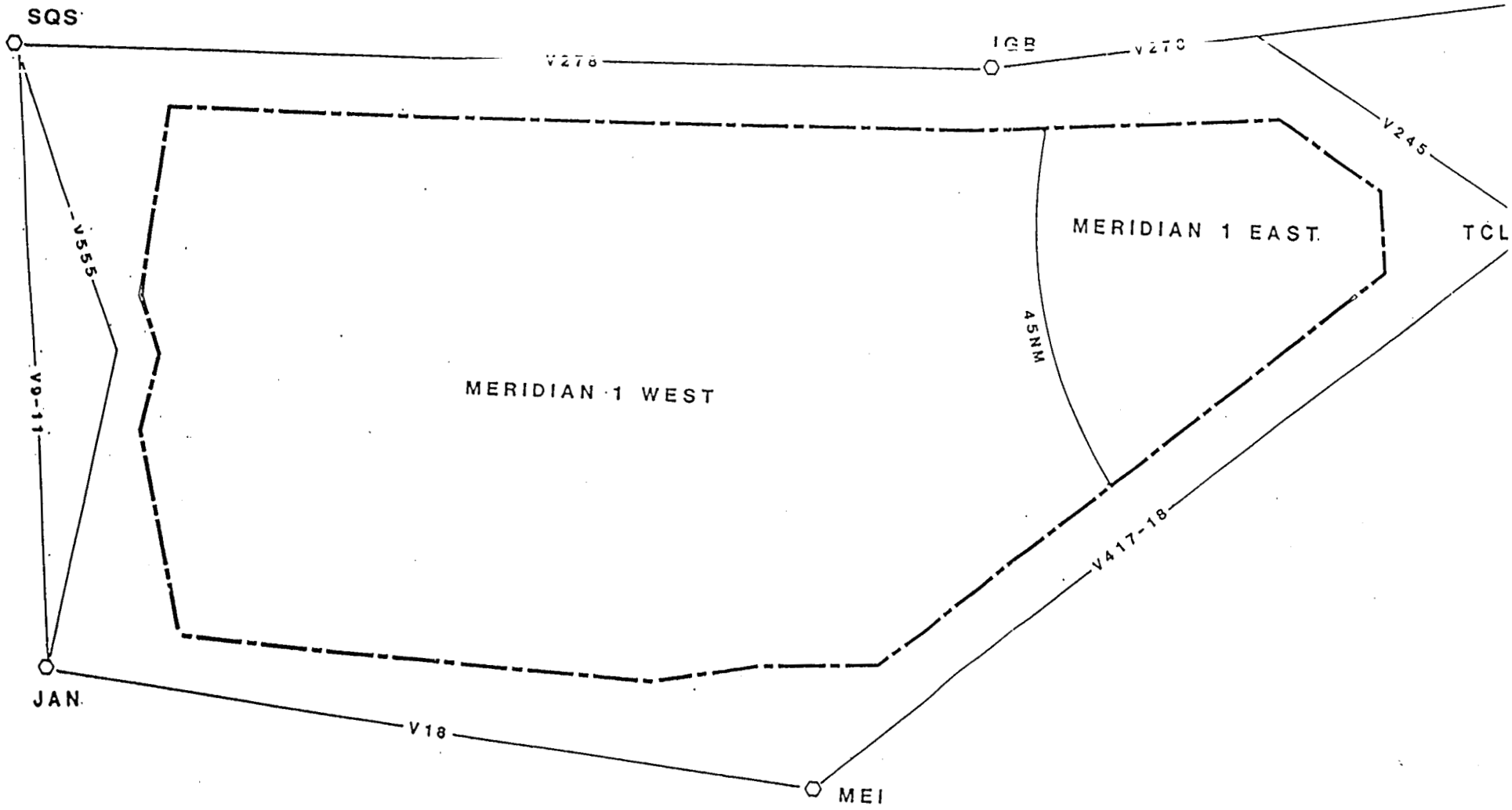
Commander
Training Air Wing One

Commander
14th Flying Training Wing

ATTACHMENT 1

MEMPHIS ARTC CENTER, MERIDIAN RATCF,
COLUMBUS RAPCON, TRAINING AIR WING ONE,
AND THE 14TH FLYING TRAINING WING
LETTER OF AGREEMENT

SUBJECT: MERIDIAN ONE EAST AND WEST MOA/ATCAA



REV 1: 11/11/93

Memphis ARTCC, Meridian RATCF, Columbus RAPCON,
TRAWING ONE and 14th FTW Letter of Agreement
Subj: Meridian One East and West MOA and ATCCA

ATTACHMENT 2

1. Narrative description of Meridian One East MOA/ATCAA:

From	33-18-30/87-49-00	to
	33-11-00/87-48-30	to
	33-07-30/87-53-30	to
	33-03-35/87-59-10	to
	32-51-12/88-17-11	thence via TCL 45 DME arc north to
	33-23-48/88-25-04	to
	33-25-00/88-00-00	to Point of Beginning

2. Narrative description of Meridian One West MOA/ATCAA:

From	33-23-48/88-25-04	thence via TCL 45 DME arc south to
	32-51-12/88-17-11	to
	32-34-00/88-42-00	to
	32-34-00/88-54-05	to
	32-32-00/89-06-10	to
	32-34-30/89-56-00	to
	32-53-00/90-01-00	to
	33-00-10/89-59-15	to
	33-05-35/90-01-40	to
	33-23-00/89-59-30	to
	33-23-30/88-31-00	to Point of Beginning

ATLANTA ARTC CENTER, 187TH FIGHTER GROUP, AND

14TH FLYING TRAINING WING LETTER OF AGREEMENT

EFFECTIVE: May 1, 1995

SUBJECT: BIRMINGHAM AND BIRMINGHAM 2 MOA/ATCAA

1. PURPOSE. To establish procedures for coordination and operations in the Birmingham and Birmingham 2 MOA/ATCAA's depicted in Annexes 1 and 2. This agreement is supplementary to procedures contained in the Air Traffic Control Order 7110.65 and Special Military Operations Handbook 7610.4.

2. CANCELLATION. Atlanta ARTC Center, 187th Fighter Group (FG), and 14th Flying Training Wing Letter of Agreement effective 6/23/94; Subject: Birmingham and Birmingham 2 MOA/ATCAA.

3. SCOPE. The procedures contained herein are applicable to all users of the Birmingham and Birmingham 2 MOA/ATCAA.

4. RESPONSIBILITIES. Military assumes responsibility for separation of aircraft (MARSA) while operating in the MOA's. EXCEPTION: T-38 aircraft operating in the Birmingham MOA are not MARSA. Schedulers shall ensure that Birmingham MOA T-38 operations are not scheduled simultaneously with any other activity in the Birmingham MOA. Scheduling units shall ensure their missions comply with scheduled times coordinated with Atlanta ARTC Center (ARTCC).

The 187th Fighter Group, Dannelly Field, Montgomery, Alabama, is designated the scheduling agency for the Birmingham and Birmingham 2 MOA/ATCAA's and shall ensure all users are familiar with and comply with the operational procedures in this letter of agreement. The 14th Flying Training Wing, Columbus AFB, Mississippi, shall schedule all activity in the MOA's during those hours the 187th FG is closed.

5. PROCEDURES.

a. Scheduling Requests for utilization of one or both of the MOA's during the published hours shall be submitted to the Atlanta ARTCC Weather Coordinator at least one hour in advance.

b. Operational

(1) Aircraft shall not begin operations in a MOA prior to receipt of an ATC clearance specifying the block altitude assignment and expect further clearance (EFC) time. When the use of a MOA will compromise safety of flight, the controlling agency may restrict, delay, or deny use of a MOA until such time as flight safety will no longer be jeopardized by MOA use

(2) Radar Services: Constant radar services are not provided by ATC for operations in the BHM and BHM2 MOA's/ATCAA due to equipment limitations. Upon acknowledgment of the block altitude clearance and entry into the MOA/ATCAA, radar services are terminated. The pilot is responsible for remaining within a MOA. In areas of radar and radio coverage, ATC may assist in the event of an inadvertent exit of a MOA. Aircraft may be requested to change direction and/or maintain a specific altitude. The pilot shall immediately abort his maneuver and comply with ATC instructions

Example:	Work (direction) for (number) miles.
Phraseology:	Work south for 10 miles.
Meaning:	The pilot shall conduct maneuvers toward the south for 10 miles, then resume own navigation.

(3) Aircraft shall not exit the BHM and BHM2 MOA's/ATCAA prior to receipt of an ATC clearance. ATC shall reestablish radar contact as soon as practical.

(4) Radio Failure

(a) If radio failure occurs prior to receiving a MOA clearance, the pilot shall proceed to the OKW196039 and proceed on course without delay.

(b) If radio failure occurs after receiving a MOA clearance, the pilot shall depart from the OKW196039 fix at the EFC time and proceed to destination at the highest altitude of the last assigned block.

(5) The flight leader shall squawk the last assigned transponder code, all others, the first two digits plus 00.

(6) Aircraft operating within the Birmingham and Birmingham 2 MOA/ATCAA's shall operate on the current Birmingham altimeter setting. Atlanta ARTCC shall not assign FL230 when the altimeter setting is below 29.92. In addition, FL220 shall not be used when the altimeter setting is below 28.92.

(7) IFR flight plans shall include the OKW196039 fix followed by the desired delay and remarks indicating altitudes requested.

EXAMPLE: OKW196039/D0+45. REMARKS: BHM MOA 180B230
OKW196039/D0+45. REMARKS: BHM 2 5B70

NOTE: To expedite receiving IFR clearance into the Birmingham MOA's from VFR flight, the military should file a proposed flight plan from the OKW196039 with the desired delay, including altitude/routing to destination and remarks.

6. ATTACHMENTS.

Annex 1
Annex 2

for R. B. Moran
Nancy B. Shelton
Air Traffic Manager
Atlanta ARTC Center

M. Scott Mayes
M. Scott Mayes, Col., USAF
Commander, 187th Fighter Group

Garry R. Trexler, Col., USAF
Commander, 14th Flying Training Wing
Columbus AFB, Mississippi

SUPPORT AGREEMENT

1. AGREEMENT NUMBER (Provided by Supplier)	2. SUPERSEDES AGREEMENT NR. (If this replaces another agreement)	3. EFFECTIVE DATE (YYMMDD)	4. EXPIRATION DATE (May be "Indefinite")
N63043-93060-001	REVISION NO. 1	93-06-16	INDEFINITE

5. SUPPLYING ACTIVITY	6. RECEIVING ACTIVITY
a. NAME AND ADDRESS COMMANDING OFFICER ATTN: MANAGEMENT SERVICES, CODE 00F00 NAVAL AIR STATION 1155 ROSENBAUM AVENUE SUITE 13 MERIDIAN MS 39309-5003	a. NAME AND ADDRESS COMMANDER 14th FLYING TRAINING WING COLUMBUS AIR FORCE BASE, MS ATTN: LGX 2803
b. MAJOR COMMAND N00062	b. MAJOR COMMAND ATC

7. SUPPORT PROVIDED BY SUPPLIER

a. SUPPORT (Specify what, when, where, and how much)	b. BASIS FOR REIMBURSEMENT	c. ESTIMATED REIMBURSEMENT
REVISION 1: ADD THE FOLLOWING CATEGORY OF SUPPORT: B12 - Equipment Operation, Maintenance, and Repair	Non-Reimbursable	$0

ADDITIONAL SUPPORT REQUIREMENTS ATTACHED: [ ] YES [X] NO

8. SUPPLYING COMPONENT		9. RECEIVING COMPONENT	
a. COMPTROLLER SIGNATURE B. W. WHITE BWWhite	b. DATE SIGNED 6-18-93	a. COMPTROLLER SIGNATURE Michael J. McGrevey MICHAEL J. McGREVEY, Major, USAF	b. DATE SIGNED 26 Jun 93
c. APPROVING AUTHORITY		c. APPROVING AUTHORITY	
(1) Typed Name T. L. HIGHTOWER, CAPT, USN		(1) Typed Name THOMAS S. LAMPLEY, Colonel, USAF	
(2) Organization NAS Meridian, MS	(3) Telephone Number DSN 637-2430	(2) Organization Commander, 14th Support Group	(3) Telephone Number Autovon: 742-7093
(4) Signature [signature]	(5) Date Signed 12 AUG 1993	(4) Signature [signature]	(5) Date Signed 28 Jun 93

10. TERMINATION (Complete only when agreement is terminated prior to scheduled expiration date.)

a. APPROVING AUTHORITY SIGNATURE	b. DATE SIGNED	c. APPROVING AUTHORITY SIGNATURE	d. DATE SIGNED

previous editions are obsolete.

REVISION NO. 1 TO SUPPORT AGREEMENT N63043-93060-001

ADD TO SPECIFIC PROVISIONS:

CATEGORY OF SUPPORT	SUPPLIER WILL:	RECEIVER WILL:
B12 - Equipment Operation, Maintenance, and Repair (Non-Reimbursable)	Provide maintenance support for AN/GRT-22, AN/GRR-24, and associated antenna(s) to be installed at SeaRay Range. Provide quarterly preventive maintenance for radios. Radios will be made available to technicians for the entire day without interruption. Provide annual maintenance for antenna(s). Corrective maintenance will require a minimum of one (1) hour response time from time of trouble call to arrival of technician on site. Preventive/corrective maintenance will be accomplished by lowering radios by rope from the tower and transporting them to the Target Range facilities building. Provide Ground Electronics personnel to transport necessary test equipment to facilitate all maintenance.	Provide all parts support for radios and antenna(s).

The following is a list of all required preventive maintenance for the AN/GRT-22, AN/GRR-24, and associated antenna(s):

Equipment	MIP/MRC	Maintenance Time	Total Time
AN/GRT-22	C-922/Q-1R	.6 x 2 x 2 Quarterly	2.4 hours
	C-922/S-2	3.0 x 2 x 2 Semi-Annual	12.0 hours
	C-922/S-3	.5 x 2 x 2 Semi-Annual	2.0 hours
AN/GRR-24	C-932/Q-1	.8 x 2 x 2 Quarterly	3.2 hours
	C-932/S-1	.5 x 2 x 2 Semi-Annual	2.0 hours
	C-932/S-2	1.5 x 2 x 2 Semi-Annual	6.0 hours
	C-932/R-1	.2 x 2 x 2 Semi-Annual	.8 hours
Antenna(1)	Unknown	.5 x 2 x 1 Annual	1.0 hours
Transportation	time	.75 x 4	3.0 hours
	Total Annual Preventive Maintenance		32.4 hours

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N63043-93060-001	None	93-04-01	INDEFINITE

5. SUPPLYING ACTIVITY	6. RECEIVING ACTIVITY
a. NAME AND ADDRESS COMMANDING OFFICER ATTN: MANAGEMENT SERVICES, CODE 10300 NAVAL AIR STATION 1155 ROSENBAUM AVENUE SUITE 13 MERIDIAN MS 39309-5003	a. NAME AND ADDRESS COMMANDER 14th FLYING TRAINING WING COLUMBUS AIR FORCE BASE, MS ATTN: LGX 2803
b. MAJOR COMMAND N00062	b. MAJOR COMMAND ATC

7. SUPPORT PROVIDED BY SUPPLIER

a. SUPPORT (Specify what, when, where, and how much)	b. BASIS FOR REIMBURSEMENT	c. ESTIMATED REIMBURSEMENT
A3 - Common Use Facility Operations, Maintenance, Repair and Construction	Percentage of Total Estimated Cost (% To Be Determined)	$9,646.
A6 - Fire Protection	Percentage of Total Estimated Cost (% To Be Determined)	$0
B13 - Explosive Ordnance	Percentage of Total Estimated Cost (% To Be Determined)	$0 - Services are currently performed by Camp Shelby EOD personnel at no cost. Costs will be pro-rated, should any occur.
B31 - Training Services	Non-Reimbursable	$0

ADDITIONAL SUPPORT REQUIREMENTS ATTACHED: [ ] YES [X] NO

8. SUPPLYING COMPONENT		9. RECEIVING COMPONENT	
a. COMPTROLLER SIGNATURE B W White B. W. WHITE	b. DATE SIGNED 3-30-93	a. COMPTROLLER SIGNATURE M. Paul J. McGrevey MICHAEL J. MCGREVEY, Major	b. DATE SIGNED 31 MAR 93
c. APPROVING AUTHORITY		c. APPROVING AUTHORITY	
(1) Typed Name T. L. HIGHTOWER, CAPT, USN		(1) Typed Name NICK P. ARDILLO, JR., Colonel, USAF	
(2) Organization NAVAL AIR STATION MERIDIAN, MS 39309	(3) Telephone Number (601) 679-2430 DSN 637-2430	(2) Organization 14th Flying Training Wing Columbus AFB MS 39710	(3) Telephone Number (601) 434-7006 DSN: 742-7006
(4) Signature	(5) Date Signed 1 APR 93	(4) Signature Nick P. Ardillo	(5) Date Signed 1 Apr 93

10. TERMINATION (Complete only when agreement is terminated prior to scheduled expiration date.)

a. APPROVING AUTHORITY SIGNATURE	b. DATE SIGNED	c. APPROVING AUTHORITY SIGNATURE	d. DATE SIGNED

DD Form 1144, MAR 92 — Previous editions are obsolete.

SUPPORT AGREEMENT

1. AGREEMENT NUMBER (Provided by Supplier)	2. SUPERSEDED AGREEMENT NO. (If this replaces another agreement)	3. EFFECTIVE DATE (YYMMDD)	4. EXPIRATION DATE (May be "Indefinite")
N[illegible]043-93060-001	None	93-04-01	INDEFINITE

5. SUPPLYING ACTIVITY	6. RECEIVING ACTIVITY
a. NAME AND ADDRESS COMMANDING OFFICER ATTN: MANAGEMENT SERVICES, CODE 10300 NAVAL AIR STATION 1155 ROSENBAUM AVENUE SUITE 13 MERIDIAN MS 39309-5003	a. NAME AND ADDRESS COMMANDER 14th FLYING TRAINING WING COLUMBUS AIR FORCE BASE, MS ATTN: LGX 2803
b. MAJOR COMMAND N00062	b. MAJOR COMMAND ATC

SUPPORT PROVIDED BY SUPPLIER

a. SUPPORT (Specify what, when, where, and how much)	b. BASIS FOR REIMBURSEMENT	c. ESTIMATED REIMBURSEMENT
- Common Use Facility Operations, Maintenance, Repair and Construction	Percentage of Total Estimated Cost (% To Be Determined)	$9,646.
- Fire Protection	Percentage of Total Estimated Cost (% To Be Determined)	$0
- Explosive Ordnance	Percentage of Total Estimated Cost (% To Be Determined)	$0 - Services are currently performed by Camp Shelby EOD personnel at no cost. Costs will be pro-rated, should any occur.
- Training Services	Non-Reimbursable	$0

ADDITIONAL SUPPORT REQUIREMENTS ATTACHED: [ ] YES [X] NO

8. SUPPLYING COMPONENT		9. RECEIVING COMPONENT	
a. COMPTROLLER SIGNATURE B.W. WHITE	b. DATE SIGNED 3-30-93	a. COMPTROLLER SIGNATURE Michael J. McGrevey MICHAEL J. MCGREVEY, Major	b. DATE SIGNED 31 MAR 93
c. APPROVING AUTHORITY (1) Name J. HIGHTOWER, CAPT, USN		c. APPROVING AUTHORITY (1) Typed Name NICK P. ARDILLO, JR., Colonel, USAF	
(2) Organization NAVAL AIR STATION MERIDIAN, MS 39309	(3) Telephone Number (601) 679-2430 DSN 637-2430	(2) Organization 14th Flying Training Wing Columbus AFB MS 39710	(3) Telephone Number (601) 434-7006 DSN: 742-7006
(4) Signature	(5) Date Signed 1 APR 93	(4) Signature Nick P. Ardillo	(5) Date Signed 1 Apr 93.

TERMINATION (Complete only when agreement is terminated prior to scheduled expiration date.)

a. APPROVING AUTHORITY SIGNATURE	b. DATE SIGNED	c. APPROVING AUTHORITY SIGNATURE	d. DATE SIGNED

1144, MAR 92 Previous editions are obsolete

11. GENERAL PROVISIONS *(Complete blank spaces and add additional general provisions as appropriate: e.g., exceptions to printed provisions, additional parties to this agreement, billing and reimbursement instructions.)*

a. The receiving components will provide the supplying component projections of requested support. *(Significant changes in the receiving component's support requirements should be submitted to the supplying component in a manner that will permit timely modification of resource requirements.)*

b. It is the responsibility of the supplying component to bring any required or requested change in support to the attention of 14th Flying Training Wing, Columbus Air Force Base, MS prior to changing or cancelling support.

c. The component providing reimbursable support in this agreement will submit statements of costs to 14th Flying Training Wing, Columbus Air Force Base, MS

d. All rates expressing the unit cost of services provided in this agreement are based on current rates which may be subject to change for uncontrollable reasons, such as legislation, DoD directives, and commercial utility rate increases. The receiver will be notified immediately of such rate changes that must be passed through to the support receivers.

e. This agreement may be cancelled at any time by mutual consent of the parties concerned. This agreement may also be cancelled by either party upon giving at least 180 days written notice to the other party.

f. In case of mobilization or other emergency, this agreement will remain in force only within supplier's capabilities.

ADDITIONAL GENERAL PROVISIONS ATTACHED: [X] YES [ ] NO

12. SPECIFIC PROVISIONS *(As appropriate: e.g., location and size of occupied facilities, unique supplier and receiver responsibilities, conditions, requirements, quality standards, and criteria for measurement/reimbursement of unique requirements.)*

ADDITIONAL SPECIFIC PROVISIONS ATTACHED: [X] YES [ ] NO

DD Form 1144, MAR 92 (Back)

ADDITIONAL GENERAL PROVISIONS

SUPPORT AGREEMENT BETWEEN

COMMANDING OFFICER, NAVAL AIR STATION, MERIDIAN, MISSISSIPPI
AND
COMMANDER, 14TH FLYING TRAINING WING, COLUMBUS AIR FORCE BASE, MISSISSIPPI

1. PURPOSE: The purpose of this agreement is to identify the support requirements of 14th Flying Training Wing, Columbus Air Force Base, Mississippi, herein referred to as the Receiver, and the support given by Naval Air Station, Meridian, Mississippi, herein referred to as the Supplier. This agreement also defines the mutual responsibilities of the Supplier and the Receiver for administrative and logistical support of the Receiver.

2. AUTHORITY: DoDI 4000.19

3. POLICY: This agreement includes the use of the Noxubee County Range (R4404)/SeaRay Target Range and associated services at Noxubee County, Mississippi, by personnel of the Receiver as mutually agreed upon by both parties. Command jurisdiction of Noxubee County Range (R4404)/SeaRay Target Range will be exercised by Naval Air Station, Meridian, Mississippi. Support will be provided consistent with the capabilities and resources of the Supplier. The anniversary and effective dates of this agreement will be the signature date of the Supplier approving official. The Supplier approving authority for this agreement is Naval Air Station, Meridian, Mississippi, and 14 FTW/CC for the Receiver.

4. DESCRIPTION OF RECEIVER: 14th Flying Training Wing, Columbus Air Force Base, Mississippi. Provide instruction in Course AT38BAJDAA/WA, INTRODUCTION TO FIGHTER FUNDAMENTALS (IFF). Upon completion of this course, pilots are qualified to attend U. S. Air Force Fighter Operational courses.

5. MISSION STATEMENT: To provide a stage for training syllabus (ordnance) for prospective Naval aviators and Air Force pilots.

6. MISSION EQUIPMENT: Inert target range.

7. BUILDINGS AND FACILITIES: Spotting tower and control tower; two 15KW generators; four 100-gallon propane tanks; storage hut with head facilities.

8. FUNDING AND RESPONSIBILITIES: The Receiver will reimburse the U. S. Navy for the net identifiable cost for the support provided in accordance with NAVCOMPT Manual, Volume 7, Chapter 5 and DoDI 4000.19.

9. COST AVOIDANCE: N/A

10. SUPPORT FUNCTIONS AND RESPONSIBILITIES: Support functions and responsibilities of the Supplier and Receiver are in accordance with governing NAVCOMPT Manual directives and DoDI 4000.19 except as set forth in attachment hereto. Attachment Two will consist of three columns listing support functions and Supplier-Receiver responsibilities. Functions will be listed in the left hand column; Supplier responsibilities will be listed in the center column, with corresponding Receiver responsibilities in the right hand column. Additional support functions may be considered for inclusion, as agreed upon by negotiating parties.

11. PLANNING FACTORS: Support planning factors are contained in this and other attachments to the agreement. If there is any significant change in these planning factors, the support contained in the agreement will be renegotiated.

a. Mission
b. Unit Strength
c. Buildings and Facilities

12. AUGMENTATION PERSONNEL: No additional manpower is required. A manpower statement is attached.

13. CHANGES, REVIEWS, AND REVISIONS: This agreement will be reviewed as necessary, but not less than triennially. The agreement may be revised at any time when considered by either Supplier or the Receiver. It should be reviewed and revised whenever there are significant changes in the Receiver/Supplier mission, planning factors, requirements and/or responsibilities.

SPECIFIC PROVISIONS

SUPPORT AGREEMENT BETWEEN

COMMANDING OFFICER, NAVAL AIR STATION, MERIDIAN, MISSISSIPPI
AND
COMMANDER, 14TH FLYING TRAINING WING, COLUMBUS AIR FORCE
BASE, MISSISSIPPI

CATEGORY OF SUPPORT	SUPPLIER WILL:	RECEIVER WILL:
A3 - Common Use Facilities Operations, Maintenance, Repair and Construction (Reimbursable)	Provide Receiver a minimum of two one-hour training blocks on Receiver's duty days.	Coordinate with Supplier for use of range.
	Notify Receiver as soon as possible of scheduling changes that impact their usage of the range.	Schedule range periods as far in advance as practical (4 working days minimum), to avoid conflict with TRAWING ONE student sorties.
	Maintain all real property, facilities, and equipment, to include any agreed upon improvements, on a pro rata basis ("Pro Rata" usage will be determined by monthly ordnance expenditure reports).	Reimburse Supplier (on pro rata basis) for facility and equipment maintenance costs allocated to Receiver as consequence of Receiver use of the range.
A6 - Fire Protection (Reimbursable)	Maintain necessary fire fighting agreements and procedures for fires on and around the range.	Comply with COMTRAWINGONEINST 3710 series range regulations as they apply to 14 FTW mission.
B13 - Explosive Ordnance (Reimbursable)	Provide range maintenance/ support and explosive ordnance disposal (EOD) on a pro rata basis, as defined in Category A3, with Receiver.	Coordinate with Supplier and obtain cost estimate. Provide funding as required and ensure costs are identified to correct support code.

ATTACHMENT TWO

CATEGORY OF SUPPORT	SUPPLIER WILL:	RECEIVER WILL:
B13 (continued)	Ensure ordnance is marked for accountability purposes.	Ensure Receiver Munitions personnel mark Receiver training ordnance for accountability purposes.
B31 - Training Service (Non-Reimbursable)	Provide two trained personnel to perform marksmanship/scoring tasks.	Advise Supplier of present and forecasted training requirements. Schedule trainees, monitor training progress, and maintain individual training records.
	Provide range access to Range Control Officer for all scheduled range periods.	Receiver will provide Range Control Officer, trained to Air Force standards, for Receiver. Range Control Officer will conduct initial scorers training and on-going training management.