

AUG 01 2005

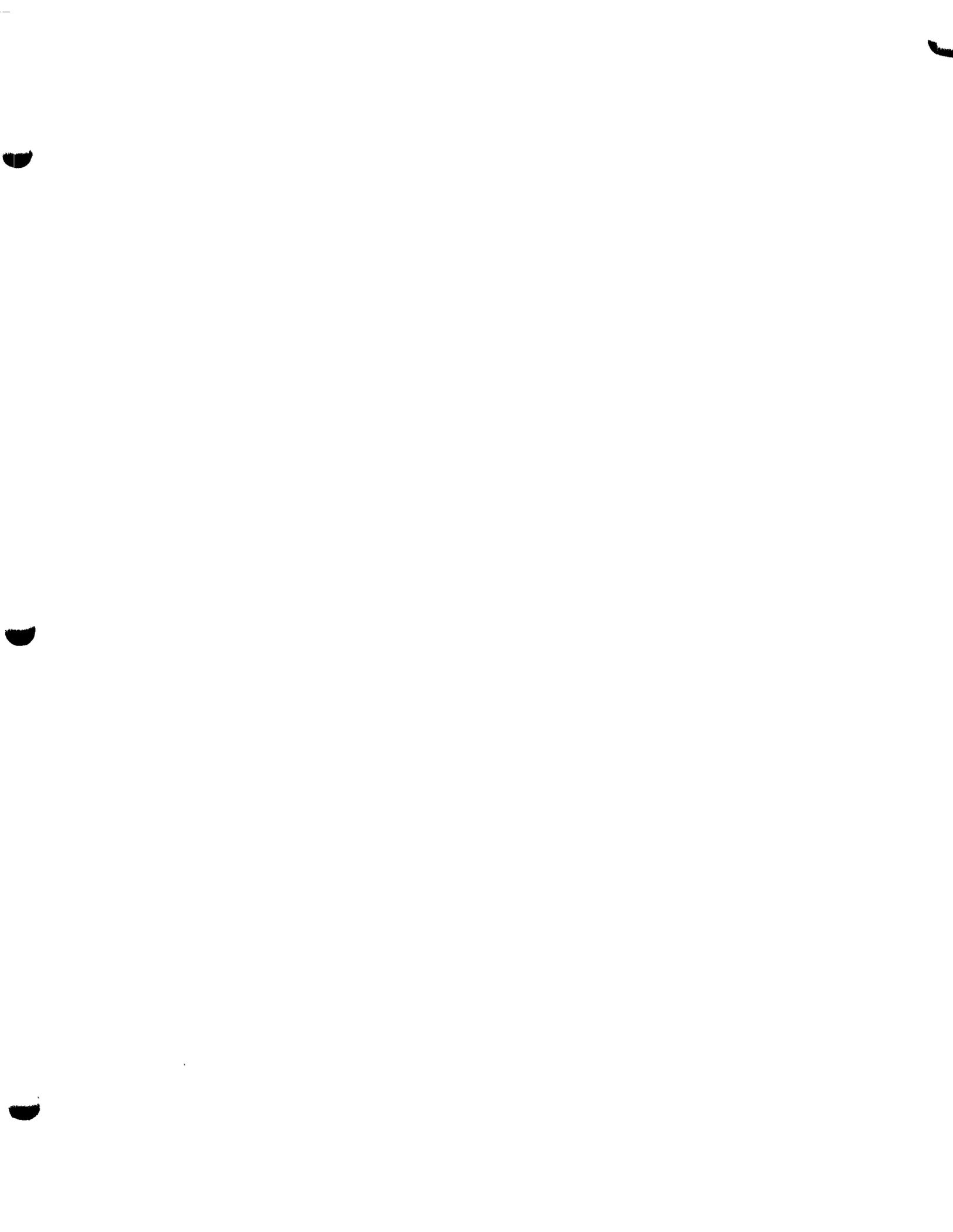
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**Col Worcester
Certification Letter**

2	Mission Compatibility Index (MCI) Analysis
3	Methodology
4	Homeland Defense
5	Cost of Base Realignment (COBRA)
6	F-15 Conversion (Pilot Training Costs)
7	Base Operating Support (BOS)
8	USCG Leave Behind Costs





DEPARTMENT OF THE AIR FORCE
102D FIGHTER WING (ACC)
MASSACHUSETTS AIR NATIONAL GUARD
OTIS AIR NATIONAL GUARD BASE MASSACHUSETTS

21 July 2005

MEMORANDUM FOR DEFENSE BASE CLOSURE AND REALIGNMENT COMMISSION

FROM: 102FW/CC

SUBJECT: Information to be Included as Part of the Public Record

The following information is being submitted to further validate the presentation we gave on 6 July in Boston:

- Otis ANGB MCI Recalculations
- MCI Methodology Flaws
- Homeland Defense Analysis
- COBRA/ADDER Runs
- F-15 Conversion Costs
- Base Operating Support Costs
- USCG Leave Behind Costs

I certify that the information provided is accurate and true. I respectfully request that this data be included as part of the public record.

//signed//
PAUL G. WORCESTER, Colonel, MA ANG
Commander



OTIS REVISED MCI SCORING DATA
19 July 2005

The purpose of this document is to outline all revised Mission Capability Index (MCI) Military Value attributes and provide quantitative justification. Otis has determined at least 9 of the 23 attributes of MCI score were incorrectly calculated due to erroneous/missing data and programming errors. This results in a new score of **61.82**. The attributes highlighted in red are the incorrect attributes. Yellow highlights indicate there are additional scoring increases that could not be accounted for due to limited/inaccurate information released by OSD. The Tab number references the question asked by OSD, Otis' analysis, and corrected response.

Mission Compatibility Index - Effective Weights (Fighter MCI)				
TAB	Name	Eff. %	DoD	Recalculated
	1	Current / Future Mission	46.00	
	1	Operating Environment	11.50	
	1242	ATC Restrictions to Operations	5.98	5.98
Tab 1	1271	Prevailing Installation Weather Conditions	5.52	0
	2	Geo-locational Factors	34.50	
Tab 2	1245	Proximity to Airspace Supporting Mission (ASM)	22.08	3.83
	1246	Proximity to Low Level Routes Supporting Mission	7.25	0.54
Tab 3	1270	Suitable Auxliary Airfields Within 50NM	5.18	2.59
	2	Condition of Infrastructure	41.50	
	3	Key Mission Infrastructure	22.83	
	8	Ramp Area and Serviceability	2.97	2.97
	9	Runway Dimension and Serviceability	2.28	2.28
	1207	Level of Mission Encroachment	2.28	1.75
Tab 4	1221	Hangar Capability - Small Aircraft	3.88	2.43
Tab 5	1232	Sufficient Explosives-sited Parking	3.65	1.21
Tab 6	1233	Sufficient Munitions Storage	4.79	0
	1235	Installation Pavements Quality	2.97	2.97
	4	Operating Areas	18.68	
Tab 7	1203	Access to Adequate Supersonic Airspace	6.72	2.69
Tab 8	1266	Range Complex (RC) Supports Mission	11.95	6.95
	3	Contingency, Mobilization, Future Forces	10.00	
	5	Mobility/Surge	4.40	
	1214	Fuel Dispensing Rate to Support Mobility and Surge	2.64	0.71
Tab 9	1241	Ability to Support Large-Scale Mobility Deployer	1.76	0.44
	6	Growth Potential	5.60	
	213	Attainment / Emission Budget Growth Allowance	1.68	1.01
	1205.1	Buildable Acres for Industrial Operations Growth	1.96	1.96
	1205.2	Buildable Acres for Air Operations Growth	1.96	1.47
	4	Cost of Ops / Manpower	2.50	
	7	Cost Factors	2.50	
	1250	Area Cost Factor	1.25	0.59
	1269	Utilities cost rating (U3C)	0.13	0.04
	1402	BAH Rate	0.88	0.18
	1403	GS Locality Pay Rate	0.25	0.25
		TOTAL	100.00	42.83
				61.82

Scores were recalculated using the algorithms described in *Department of the Air Force Analysis and Recommendations BRAC 2005 (Volume V, Part 2 of 2)*. Seven of nine attributes were accurately recalculated using missing data. In one case, attribute/equation 1266 (Tab 8), the algorithm described did not replicate the posted scores and therefore could not be accurately used to assess our true value using missing data. In another case, attribute 1203 (Tab 7), the listed score is incorrect when using the posted algorithm and actual OSD data. Otis' recalculated MCI score was **61.82** without any additional credit for attribute 1266. This MCI ranks Otis #24 out of 154 bases for Fighter Missions (see scores at right).

Microsoft Excel was used to recalculate six of the nine attribute scores. Formula 1245 was replicated using a combination of ArcGIS and Excel. All files are included on the CD.

Each tab will show the question and formula provided by OSD, followed by the recalculated score. The tab will also include auditable background information used for the recalculation.

Data used in scoring questions 1271, 1245, 1270, 1203, and 1266 was provided at the HAF level.

FIGHTER MCI (EXCEPT A-10S)		
RANK	BASE	OVERALL MCI SCORE
1	Seymour Johnson AFB	83.24
2	Langley AFB	82.84
3	Eglin AFB	81.40
4	Hurlburt Field	77.43
5	MacDill AFB	75.60
6	Tyndall AFB	73.63
7	Shaw AFB	72.20
8	Edwards AFB	71.92
9	Moody AFB	70.80
10	Holloman AFB	69.82
11	Eielson AFB	69.09
12	Luke AFB	69.06
13	Nellis AFB	68.73
14	Hill AFB	68.02
15	Dover AFB	66.69
16	Kirtland AFB	66.44
17	Pope AFB	65.86
18	Patrick AFB	64.96
19	Charleston AFB	64.94
20	March ARB	64.84
21	Andrews AFB	64.83
22	Davis-Monthan AFB	63.83
23	Mountain Home AFB	63.01
24	Otis AGB	61.82
25	Jacksonville IAP AGS	61.80
26	Barksdale AFB	61.49
27	Altus AFB	61.43
28	Little Rock AFB	60.78
29	McChord AFB	60.73
30	Fairchild AFB	60.32
31	Maxwell AFB	59.61
32	Homestead ARS	59.17
33	Robins AFB	59.13
34	Indian Springs AFS	59.11
35	Dyess AFB	58.96
36	Tinker AFB	58.47
37	Elmendorf AFB	58.35
38	Whiteman AFB	58.18
39	Beale AFB	58.10
40	Ellsworth AFB	58.06
41	Savannah IAP AGS	57.80
42	McGuire AFB	57.02
43	Minot AFB	56.64
44	McConnell AFB	56.47
45	Travis AFB	56.42
46	Sheppard AFB	56.26
47	Grand Forks AFB	55.88
48	Lackland AFB	55.79
49	McEntire AGS	55.74
50	Richmond IAP AGS	55.34

Tab 1

Mission	Fighter
Criterion	Current / Future Mission
Attribute	Operating Environment
Formula #	1271
Label	Prevailing Installation Weather Conditions
Effective %	5.52
Question	<p>Check the average number of days annually the prevailing weather is better than 3000¹/₃ Nautical Miles (NM).</p> <p>If installation has no runway or no active runway, or no serviceable, suitable runway then score 0 pts. See section 1.9 "Shared" for details.</p> <p>If the average number of days ≥ 300, get 100 points. Otherwise, if the average number of days ≤ 250, get 0 points. Otherwise, pro-rate the average number of days between 250 and 300 on a 0 to 100 scale.</p> <p>Example: The average number of days annually where the prevailing weather is better than 3000¹/₃ NM is 275. 275 is halfway between 250 and 300, for a score of 50.</p>
Source	AFCCC Climatological tables

Data for this question came from HAF (AFWA) according to *USAF Questionnaire Definitions*

<p><u>QUESTION TITLE</u></p> <p>1271 Air Operations - Prevailing Weather</p> <p><u>TEXT</u></p> <p>For installations with an active runway, how many days each year, averaged over 30 years, was the prevailing weather better than 3000¹/₃NM?</p> <p><u>AMPLIFICATION</u></p> <p>(HAF: AF/XO to list bases of interest; AFWA to answer) Record each installation entry in days/year. Answer should be weather data for the installation averaged over 30 years (CY1973 - 2003).</p>

Using data attained from AFCCC, Asheville NC, historical data over the past 30 years results in 72.5% of the days (or 264.6 days a year) meeting the criteria. This equates to an additional 1.6 more points in the MCI. The data sheets are on the next page.

GLOBAL CLIMATOLOGY BRANCH

PERCENTAGE FREQUENCY OF OCCURRENCE OF CEILING VERSUS VISIBILITY

AFCCC, ASHEVILLE NC

FROM HOURLY OBSERVATIONS

STATION NUMBER: 725060 STATION NAME: Old ANGB MA PERIOD OF RECORD: JAN 1973 - NOV 2004

UTC TO LST: -5

MONTH: ANN HOURS: ALL

CEILING IN FEET	VISIBILITY IN MILES															
	GE 7	GE 8	GE 5	GE 4	GE 3	GE 2 1/2	GE 2	GE 1 1/2	GE 1 1/4	GE 1	GE 3/4	GE 5/8	GE 1/2	GE 3/8	GE 1/4	GE 0

NO CEIL | 42.9 43.7 44.5 45.1 45.6 45.7 46.0 46.0 46.1 46.1 46.1 46.1 46.2 46.2 46.2 46.2

GE 20000| 49.8 50.8 51.7 52.4 53.1 53.2 53.4 53.5 53.6 53.6 53.7 53.7 53.7 53.7 53.7 53.8

GE 18000| 50.0 51.0 51.9 52.8 53.3 53.4 53.7 53.8 53.8 53.9 53.9 53.9 53.9 53.9 54.0 54.0

GE 16000| 50.0 51.1 52.0 52.7 53.4 53.5 53.7 53.8 53.9 53.9 53.9 53.9 54.0 54.0 54.0 54.1

GE 14000| 51.3 52.4 53.3 54.1 54.8 54.9 55.2 55.3 55.3 55.3 55.4 55.4 55.4 55.4 55.5 55.5

GE 12000| 52.9 54.0 55.0 55.7 56.5 56.6 56.9 57.0 57.0 57.1 57.1 57.1 57.2 57.2 57.2 57.2

GE 10000| 55.4 56.6 57.7 58.6 59.4 59.5 59.8 59.9 60.0 60.0 60.1 60.1 60.1 60.1 60.1 60.2

GE 9000| 56.0 57.2 58.3 59.1 59.9 60.1 60.4 60.5 60.6 60.6 60.6 60.7 60.7 60.7 60.7 60.8

GE 8000| 58.1 59.3 60.5 61.4 62.3 62.4 62.7 62.9 62.9 63.0 63.0 63.0 63.1 63.1 63.1 63.1

GE 7000| 59.1 60.4 61.6 62.5 63.4 63.5 63.9 64.0 64.0 64.1 64.1 64.1 64.2 64.2 64.2 64.3

GE 6000| 60.3 61.6 62.8 63.7 64.6 64.8 65.2 65.3 65.3 65.4 65.4 65.4 65.5 65.5 65.5 65.6

GE 5000| 62.0 63.4 64.7 65.7 66.6 66.8 67.1 67.3 67.4 67.5 67.5 67.5 67.5 67.5 67.5 67.6

GE 4500| 62.9 64.4 65.7 66.7 67.6 67.8 68.2 68.3 68.4 68.4 68.5 68.5 68.5 68.6 68.6 68.6

GE 4000| 64.3 65.8 67.2 68.2 69.2 69.4 69.8 70.0 70.0 70.1 70.1 70.1 70.1 70.2 70.2 70.2

GE 3500| 65.4 66.9 68.4 69.4 70.4 70.6 71.0 71.2 71.2 71.3 71.3 71.3 71.4 71.4 71.4 71.4

GE 3000| 67.3 68.8 70.4 71.5 72.4 72.8 73.2 73.4 73.4 73.5 73.5 73.5 73.6 73.6 73.7

*264.6 days
GE 3000/3*

GE 2500| 68.7 70.3 71.9 73.1 74.2 74.4 74.9 75.1 75.1 75.2 75.2 75.2 75.3 75.3 75.3 75.4

GE 2000| 70.3 72.0 73.7 75.0 76.2 76.4 76.9 77.1 77.2 77.3 77.3 77.3 77.4 77.4 77.4 77.5

GE 1800| 70.6 72.4 74.1 75.4 76.6 76.8 77.3 77.8 77.8 77.7 77.7 77.7 77.8 77.8 77.8 77.9

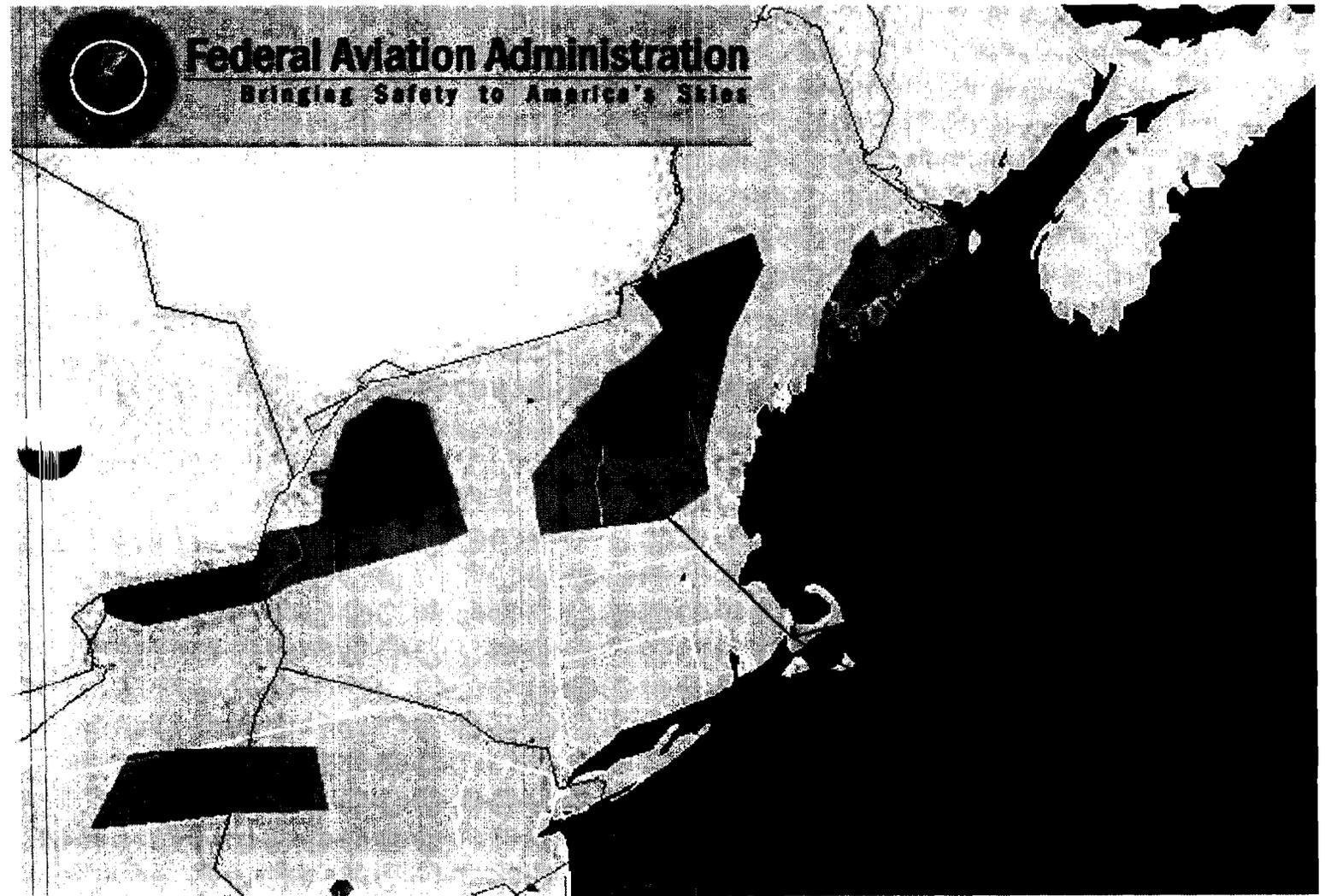
GE 1500| 71.7 73.5 75.4 76.7 78.0 78.3 78.8 79.0 79.1 79.2 79.3 79.3 79.3 79.3 79.3 79.4

GE 1200| 72.8 74.7 76.7 78.1 79.5 79.9 80.4 80.7 80.8 80.9 80.9 80.9 81.0 81.0 81.0 81.1

Tab 2

Mission	Fighter
Criterion	Current / Future Mission
Attribute	Geo-locational Factors
Formula #	1245
Label	Proximity to Airspace Supporting Mission (ASM)
Effective %	22.08
Question	<p>If installation has no runway or no active runway, or no serviceable, suitable runway then score 0 pts. See section 1.9 "Shared" for details.</p> <p>All airspace over 150 Nautical Miles (NM) away will be ignored. See OSD # 1245, column 2. (N/A means more than 250 NM.) Data is in OSD #s 1266, 1245 and 1274 must be matched via column 1 in each question.</p> <p>Calculate each of the subcategories scores listed below, and weight as listed.</p> <ul style="list-style-type: none"> 15% Airspace Volume (AV) 15% Operating Hours (OH) 10% Scoreable Range (SR) 11.25% Air to Ground Weapons Delivery (AGWD) .75% Low Angle Strafe (LA) 3% Live Ordnance (LO) 5% IMC Weapon Release (IW) 5% Electronic Combat (EC) 10% Laser Use Auth. (LU) 10% Lights Out Capable (LC) 5% Flare Auth. (FA) 5% Chaff Auth. (CA) <p>Each of the subcategories use the following general pattern for calculating them:</p> <p>Check the corresponding subcategory in formula #1266. If it would get 0 points for that subcategory, get 0 points here also. Otherwise, Compute a raw total for the subcategory for the base according to this formula: For each airspace: If the distance to the airspace is > 150 miles, get 0 points. Otherwise, if the distance to the airspace = 150 miles, get 10 points. Otherwise, if the distance to the airspace = 50 miles, get 100 points. Otherwise, pro-rate the distance to the airspace from 50 miles to 150 miles on a 100 to 10 point scale.</p> <p>Once you have a base raw subcategory total, find the highest, and the lowest, non-zero raw total for the subcategory across all bases. If the raw total = 0, that subcategory score = 0.</p>

When these errors/omissions are factored into the algorithm, Otis earns an additional 2.72 points for these airspaces. It is important to note that W105 was scored only as 2 separate airspaces. Following the pattern of other similar type airspaces, it should have actually been scored as SEVEN separate airspaces (W105A through G). Doing such would have GREATLY increased the score based on the methodology used in the algorithms. This is explained in detail in our MCI Methodology point paper. The following map depicts the missing airspaces. The FAA Memorandum of Agreement is included immediately after.



- LETTER OF AGREEMENT ON FILE
IN BASE OPS IN LOA BINDER
- ACCURATE, STILL IN EFFECT LAST REVIEW 14 APR 04

FEDERAL AVIATION ADMINISTRATION
BOSTON AIR ROUTE TRAFFIC CONTROL CENTER

TO: ALL HOLDERS OF THE BOSTON ARTCC/NE ADS/552ND ACW/101ST ACS/102ND ACS/
103RD ACS/ 174TH FW/103RD FW/305TH AMW LETTER OF AGREEMENT DATED
MAY 22, 1997.

1. **PURPOSE:** To transmit a new effective date for the new Boston ARTCC, NE ADS, 552nd ACW, 101st ACS, 102nd ACS, 103rd ACS, 174th FW, 103rd FW, and the 305th AMW Letter of Agreement dated May 22, 1997.
2. **EFFECTIVE DATE:** August 15, 1997.
3. **CANCELLATION:** Boston ARTCC, Northeast Air Defense Sector, 9th Air Force, 28th Air Division, and 380th Bomb Wing Letter of Agreement dated December 10, 1990.
4. **PRINCIPAL CHANGES:**
 - a. To change the effective date on the proposed agreement from May 22, 1997 to August 15, 1997.
 - b. Telephone number changes to Appendix A for AWACS scheduling.
 - c. Signature for the 305th Air Mobility Wing has been replaced by the 305th Operations Group Commander.


Heather Ackerman
Acting Air Traffic Manager
Boston ARTCC

Attachment

DISTRIBUTION: #1, NE ADS, 552 ACW, 101 ACS, 102 ACS, INITIATED BY: ZBW-530
103 ACS, 174 FW, 103 FW, 305 AMW, ANE-900/901/902, ANE-530, AEA-530, Montreal ACC,
Toronto ACC, Moncton ACC, New York ARTCC, Cleveland ARTCC, 104 FW, 158 FW, 102 FW,
157 ARW, 101 ARW, 107 ARW, 171 ARW, 152 ACG

✓

Boston Air Route Traffic Control Center (ARTCC), Northeast Air Defense Sector (NE ADS), 552nd Air Control Wing (ACW), 101st Air Control Squadron (ACS), 102nd ACS, 103rd ACS, 174th Fighter Wing (FW), 103rd FW, and 305th Air Mobility Wing (AMW)

LETTER OF AGREEMENT

EFFECTIVE: May 22, 1997

SUBJECT: Procedures for the Scheduling and Control of Military Aircraft within Boston Center Special Use Airspace (SUA) and Air Traffic Control Assigned Airspace (ATCAA)

1. **PURPOSE:** To define airspace areas, and the responsibilities associated with scheduling, coordination and control procedures for Military and Contract Aircraft, Military Schedulers, Military Radar Units (MRU), and Boston Center. These procedures are supplementary to those contained in the current issues of FAAH 7110.65 and FAAH 7610.4.
2. **CANCELLATION:** Boston ARTCC, Northeast Air Defense Sector, 9th Air Force, 28th Air Division, and 380th Bomb Wing Letter of Agreement dated December 10, 1990.
3. **SCOPE:** This agreement applies to the operation of Military and Contract Aircraft within the Boston Center SUA/ATCAA areas as defined in Attachment No. 1 through Attachment No. 12, and E3 orbit airspace as defined in Attachment No. 15 through Attachment 18.
4. **RESPONSIBILITIES:**
 - a. Commanders of Military Scheduling Units, MRUs, and the Manager of Boston Center shall ensure that all personnel involved with the scheduling, coordination and control procedures of Military and Contract Aircraft are familiar with the contents of this Letter of Agreement (LOA).
 - b. MARSAs applies:
 - (1) between participating aircraft entering, operating within, or exiting SUA/ATCAA, until standard ATC separation is established.
 - (2) for participating aircraft operating under MRU control or under autonomous operations.
 - (3) between aircraft operating within abutting SUA/ATCAA, when such airspace is simultaneously in use, under MRU control, or under autonomous operations.

5. SCHEDULING PROCEDURES:

- a. No SUA/ATCAA may be used without prior coordination with the scheduling unit.
- b. Military Schedulers shall:
 - (1) only schedule that airspace necessary to comply with the requirements of their scheduled mission.

(2) ensure that all flying units using the SUA/ATCAA are properly briefed on the procedures contained in this LOA.

(3) schedule SUA/ATCAA as defined in Attachment No. 1 through Attachment No. 12, determine priority of use, and de-conflict all airspace from other military operations.

(4) advise aircrews when there is adjacent SUA/ATCAA activity, whether it is autonomous or MRU control, and ensure they are familiar with the MARSAs procedures contained in paragraph 4.b.(3) of this agreement.

(5) advise the Boston Center Mission Coordinator (MC) of any revisions, additions, or cancellations of any scheduled airspace.

c. The 552nd ACW (AWACS) shall confirm SUA/ATCAA airspace with the appropriate scheduling agency and coordinate with Boston Center for E3 orbit airspace as depicted in Attachment No. 15 through Attachment No. 18.

d. The NE ADS, Sector Air Operations Center (SAOC) and Airspace Scheduling Office (DOOS) shall schedule all airspace as necessary for its Air Defense assets.

e. Boston Center shall:

(1) advise schedulers when adjacent SUA/ATCAA is scheduled and if the military airspace will be autonomous or under MRU control.

(2) NOT be responsible for determining which military aircraft are authorized to utilize SUA/ATCAA.

(3) advise the 552nd ACW as soon as possible when the E3 cannot be accommodated in an approved orbit to preclude the launching of the aircraft needlessly.

Note: Normal ETE from Tinker AFB to orbit airspace is 3 hours.

6. SUA/ATCAA PROCEDURES:

a. The MRU (Ground units only) or scheduling unit shall request:

(1) MOAs from the Boston Center MC prior to scheduled use according to the following parameters:

(a) CONDOR - 2 1/2 hours.

(b) FALCON, YANKEE - 1 hour if used within the charted days and times, otherwise 2 1/2 hours.

(2) ATCAAs from the Boston Center MC at least 1 hour prior to scheduled use. Extensions shall be made as soon as possible but not less than 10 minutes before the original expiration time.

Note: SCOTY B ATCAA needs to be coordinated with the 305th AMW before it can be scheduled with Boston Center (Attachment No. 14).

b. The 174th FW shall:

- (1) submit a monthly schedule for the SYRACUSE 1 MOA to Boston Center,
- (2) resolve all conflicts with IR801 prior to scheduling the SYRACUSE 1 MOA.

c. The 103rd FW may schedule the YANKEE 2 MOA for VFR operations at 5,000 feet MSL and below.

d. Military aircrews:

- (1) with the exception of Warning Areas and paragraph 6.d.(2) shall:
 - (a) file an IFR flight plan 30 minutes prior to proposed departure time.
 - (b) ensure the IFR flight plan contains an entry fix, name of SUA/ATCAA with the delay, and an exit fix (Attachment No. 13).
 - (c) request and receive an ATC clearance to enter/exit SUA/ATCAA.

* Note: An "as filed" departure clearance does not constitute a clearance to delay in SUA/ATCAA.

(2) DO NOT require an IFR flight plan or an entry/exit clearance for the DRUM and SYRACUSE MOAs or the YANKEE 2 MOA 5,000 feet MSL and below.

(3) shall be aware that NO IFR protection is provided in the:

- (a) SYRACUSE 1 MOA beyond the days and times in the published schedule.
- (b) YANKEE 2 MOA beyond the times scheduled by the 103rd FW.

(4) scheduled to operate in YANKEE 2 MOA for VFR operations at 5,000 feet MSL and below, shall contact Bangor AFSS on 255.4 MHZ prior to entry and provide an entry and exit time.

(5) when advised by ATC to remain clear of the Laconia Airspace, shall not fly in the Southeast corner of YANKEE 2 MOA, as depicted in Attachment No. 4, below 6,000 feet MSL.

(6) shall be aware that the FALCON MOA and the AKS I ATCAA encompass R-5201 (Attachment No. 2 and Attachment No. 3). The dimension, times and altitudes of R-5201 are published.

e. Boston Center shall:

(1) sterilize the SYRACUSE 1 MOA according to the monthly schedule submitted by the 174th FW.

(2) sterilize the YANKEE 2 MOA 5,000 feet MSL and below when scheduled by the 103rd FW.

(3) with the exception of paragraph 6.e.(1) and 6.e.(2), activate the SUA/ATCAA only upon the issuance of an ATC clearance to the first aircraft or formation flight to enter/delay in the SUA/ATCAA.

(4) activate Warning Areas on the scheduled time.

7. AUTONOMOUS PROCEDURES: In this agreement Autonomous Operations and Fighter Control are synonymous, and describe missions where aircrews are responsible for airspace integrity.

a. Autonomous operations are authorized in SUA/ATCAA.

b. Aircrews shall:

(1) monitor Boston Center assigned frequency while operating within SUA/ATCAA or 243.0 MHZ if cleared off Boston Center frequency.

(2) notify Boston Center 5 minutes prior to exiting SUA/ATCAA. Formation flights shall advise at this time if their intention is to breakup and return as separate elements.

(3) cancel the SUA/ATCAA with the Boston Center Sector Controller by the last aircraft exiting the airspace. Exception: Warning Areas and paragraph 6.d.(2).

c. Boston Center shall:

(1) clear aircraft into the SUA/ATCAA for the duration of the delay.

(2) after receiving a 5 minute notification from the aircrew, issue ATC clearance instructions to the aircrew.

(3) for traversals amend the altitude block when necessary via direct air to ground communications with the user until the traversal aircraft is clear of SUA/ATCAA.

Note: If required, ensure the appropriate altitude adjustment factor is applied, in accordance with paragraph 9.c. of this agreement.



8. MRU PROCEDURES:

a. The MRU:

(1) shall closely monitor its use and advise the Boston Center MC of delays and periods of non-use. Such periods of 30 minutes or more shall be released to Boston Center for ATC use.

(2) may coordinate for Mode 3 Codes prior to activation of the airspace.

(3) may conduct radar correlation checks with Boston Center to verify their equipment performance.

(4) shall notify Boston Center 5 minutes prior to the aircraft exiting SUA/ATCAA and provide the Boston Center Sector Controller with the following information:

- Aircraft identification/flight lead
- Flight breakup
- Special handling requirements
- Requested altitude

(5) shall after receiving clearance instructions from ATC, issue the clearance verbatim to the exiting aircraft.

(6) shall cancel the SUA/ATCAA with the Boston Center MC after the last aircraft has exited the airspace.

(7) shall immediately notify Boston Center when radio contact is lost/not established with aircraft under their control and provide Boston Center with the following information:

- Call sign, number/type aircraft, and beacon code.
- Position, altitude, and heading.
- Flight conditions if known.
- ETA at recovery base.

(8) shall immediately notify Boston Center when there is a loss of MRU radar control capability and:

(a) direct aircraft to remain within the approved SUA/ATCAA. Tanker aircraft operating in an SUA/ATCAA where a published anchor track exists shall maintain that air refueling pattern at last assigned altitude.

(b) inform Boston Center of the situation and estimate when control will be restored, and advise of aircrew intentions (return to base or remain autonomous).

b. Boston Center shall:

- (1) clear aircraft into the SUA/ATCAA for the duration of the delay.
- (2) at the time of hand-off issue an appropriate ATC clearance for aircraft exiting SUA/ATCAA.

Note: When a clearance is issued to the MRU, and that clearance takes the aircraft into another Sector's airspace, the Sector issuing the clearance is responsible for the coordination.

c. The MRU and the Boston Center Sector Controller shall:

- (1) effect a radar hand-off:
 - (a) only after the elimination of any potential conflict with other aircraft under their control.
 - (b) prior to the aircraft entering the receiving controllers airspace.
 - (c) by bearing/distance in relation to common reference points listed in Attachment No. 14.
- (2) NOT change the aircraft's flight path/altitude until the aircraft is established in airspace under their control.

d. Boston Center, for traversals, shall:

- (1) coordinate with the MRU for approval at least 5 minutes prior to the traversal aircraft entering SUA/ATCAA.
- (2) obtain a release of altitudes/flight levels as appropriate throughout the entire SUA/ATCAA for separation purposes.
- (3) provide a point-out of the traversal aircraft to the MRU.

Note: If required, ensure the appropriate altitude adjustment factor is applied, in accordance with paragraph 9.c. of this agreement.

e. Visiting MRUs may operate under the terms of this agreement provided:

- (1) they have coordinated with the appropriate scheduling unit.
- (2) the scheduling unit has briefed the visiting MRU on the procedures contained in this agreement and provided a copy to them.
- (3) the commander of each visiting MRU returns a completed copy of Appendix B to Boston Center.



9. AERIAL COMBAT TACTICS (ACT):

a. ACT operations conducted in the following combined MOA/ATCAA combinations shall operate on station altimeter setting derived as indicated below:

- FALCON/AKS 1 through 5 use GSS Altimeter.
- YANKEE 1/LASER use LEB Altimeter.
- CONDOR/SCOTY use AUG Altimeter.
- MOT Areas use FMH Altimeter (If above FL180 only use 29.92).

b. If aircraft are autonomous control, the MRU, or Boston Center shall ensure that aircraft:

(1) conducting ACT in a combined MOA/ATCAA are issued the appropriate altimeter setting.

(2) transitioning from a combined high/low operation to a high only operation at and above FL180 reset their altimeter to 29.92.

c. Boston Center shall apply the appropriate altitude adjustment factor to determine the lowest usable flight level to provide vertical separation from ATCAA airspace.

10. AERIAL REFUELING (AR):

a. Anchor aerial refueling, in an SUA/ATCAA, with an MRU.

(1) Military schedulers shall:

(a) advise aircrews when there is adjacent SUA/ATCAA activity, whether it is autonomous or MRU control.

(b) ensure aircrews are familiar with the MARSAs procedures contained in paragraph 4.b.(3) of this agreement.

(2) Aircrews shall ensure their IFR flight plan contains the computer code name of the SUA/ATCAA (see Attachment No. 13), with the anticipated delay.

b. Anchor aerial refueling, in an SUA/ATCAA, without an MRU (Autonomous).

(1) Military schedulers shall:

(a) advise aircrews when there is adjacent SUA/ATCAA activity, whether it is autonomous or MRU control.

(b) ensure aircrews are familiar with the MARSAs procedures contained in paragraph 4.b.(3) of this agreement.

(2) Aircrews shall ensure their IFR flight plan contains the computer code name of the SUA/ATCAA (see Attachment No. 13), with the anticipated delay.

(3) The Tanker Commander upon entering SUA/ATCAA accepts responsibility for the SUA/ATCAA activity regardless of the number of Tankers or Receivers.

c. Aerial refueling on a published AR Anchor NOT using the associated SUA/ATCAA.

(1) Military schedulers shall:

(a) ensure that aircrews are informed of abutting non-associated SUA/ATCAA activity, that is separated but adjacent to the AR Anchor lateral protected airspace.

(b) ensure that visiting aircrews are familiar with aerial refueling procedures contained in this agreement.

(2) Aircrews shall:

(a) ensure the IFR flight plan contains an entry fix (a delay if needed), name of AR Track, and an exit fix.

(b) as soon as possible advise Boston Center of end of AR request.

(3) Boston Center shall clear aerial refueling aircraft on to and off of the AR Track.

11. E3 MRU OPERATIONS: The E-3 orbit patterns are depicted in Attachment No. 15 through Attachment No. 18. A single flight level between FL270 - FL310 is required. Other orbits which are acceptable to the Center may be negotiated for individual missions and exercises. E-3 orbit patterns within the Center's airspace are not considered blocked or sterilized airspace. Standard ATC separation procedures apply.

a. AWACS shall:

(1) correlate their radar while en route in accordance with FAAH 7610.4, paragraph 13-9-e.

(2) retain aircraft under its jurisdiction at least 5 NM inside the perimeter of the SUA/ATCAA.

(3) remain within the defined lateral and vertical confines of the assigned orbit area.

(4) request through the Boston Center Sector Controller prior to changing the orbit flight track, circle/figure eight's, etc.



b. The Center shall assign different frequencies to the E-3 flight deck crew (front of the aircraft) and the MRU (rear of the aircraft). Frequencies for the MRU shall be specified during the advance coordination for the mission assigned.

- (1) Augusta Orbit - 377.15 UHF/No VHF assigned.
- (2) Plattsburgh, Watertown Orbit - 354.1 UHF/133.625 VHF.
- (3) W105, Nantucket Orbits - 380.15 UHF/No VHF assigned.

12. MISCELLANEOUS PROCEDURES:

a. Interceptors may be scrambled to assist aircraft experiencing in-flight emergencies. These interceptors shall be afforded the same priority normally associated with an active air defense mission.

b. Boston Center shall forward all Communications Instructions for Reporting Vital Intelligence Sightings (CIRVIS) reports received from any source as quickly as possible to the NE ADS SAOC Mission Crew Commander (MCC) using the following telephone numbers:

- (1) 587-6802/6803/6811/6812 DSN
- (2) (315) 334-6802/6803/6811/6812
- (3) Via Land-Line: IA 9269 or 9270, then dial 602 or 603

c. Electronic Counter Measures (ECM) Advisories.

(1) Annual authorizations for ECM/Chaff drops are coordinated between FAA HQ Spectrum Engineering Division (ASM-500) and the Air Combat Command (ACC). ECM/Chaff drops shall be in compliance with annual authorization requirements. Aircrews shall issue ECM/Chaff advisories to ATC prior to conducting approved ECM, or dispensing of approved Chaff.

(2) If Boston Center or terminal radar systems are adversely effected by ECM/Chaff, Boston Center shall request suspension of ECM/Chaff to the aircraft using the terms Stop Buzzer, Stop Stream, or Stop Burst. If unable to contact the aircraft ATC shall contact the NE ADS Data Quality Monitor (DQM), specifying the band and channel affected if known, and when feasible the expected duration of suspension.

d. Aircrews conducting counter-narcotic training in accordance with exemption No. 5305 shall:

- (1) operate only in ATCAA Areas depicted in Attachment No. 3, 5, 7, 8, and 10, at FL180 or above.
- (2) operate with required lights on while en route to/from the ATCAA.

- (3) operate mode C transponders on the assigned code at all times within the ATCAA.
- (4) advise Boston Center Sector Controller of intention to operate in the ATCAA without lights under exemption No. 5305.

13. AIR SOVEREIGNTY TESTS (AST) NE ADS:

a. NE ADS exercise branch shall:

- (1) coordinate all ASTs with Boston Center at least five days in advance.
- (2) request SUA/ATCAA for ASTs with the Boston Center MC at least two hours in advance.
- (3) coordinate the hand-off procedures of the target aircraft with the appropriate Boston Center Sector 15 to 30 minutes prior to target initial point (IP).

b. Boston Center shall:

- (1) assign the appropriate beacon code to the target aircraft.
- (2) NOT pass any information on target aircraft (NOPAR) to HUNTRESS Control.
- (3) release target aircraft to ZOOM Control frequency prior to target IP.

Note: If coordination is NOT accomplished in accordance with 13.a.(3), Boston Center shall terminate radar service on the target aircraft prior to the IP and instruct the aircraft to contact ZOOM Control.

14. ATTACHMENTS:

- | | |
|--------------------|--|
| No. 1 thru No. 12 | - SUA/ATCAA Maps with Coordinates |
| No. 13 | - Computer Fixes |
| No. 14 | - Common Reference Points |
| | - SUA/ATCAA Scheduling Agencies |
| No. 15 thru No. 18 | - E-3 Orbit Airspace |
| Appendix A | - E-3 Advanced Coordination Check-List |
| Appendix B | - Visiting MRU Signature Page |

SIGNATURE PAGE

Boston Center is the originator of this Letter of Agreement. Each command or facility shall have an original signature page to be retained on file. Boston Center shall retain each individual signature page, from each command or facility, and maintain them on file at Boston Center.

SIGNATURE ON FILE

Heather Ackerman
Acting Air Traffic Manager
Boston ARTCC

SIGNATURE ON FILE

John K. Scott, Col USAF
Commander
Northeast Air Defense Sector

SIGNATURE ON FILE

James W. Morehouse, Col USAF
Commander
552nd Air Control Wing

SIGNATURE ON FILE

Robert A. Johnson, Lt Col ANG
Commander
101st Air Control Squadron

SIGNATURE ON FILE

Wayne R. Mrozinski, Lt Col ANG
Commander
102nd Air Control Squadron

SIGNATURE ON FILE

David C. Clarke, Lt Col ANG
Commander
103rd Air Control Squadron

SIGNATURE ON FILE

Robert A. Knauff, Lt Col ANG
Commander
174th Fighter Wing

SIGNATURE ON FILE

James M. Skiff, Col ANG
Commander
103rd Fighter Wing

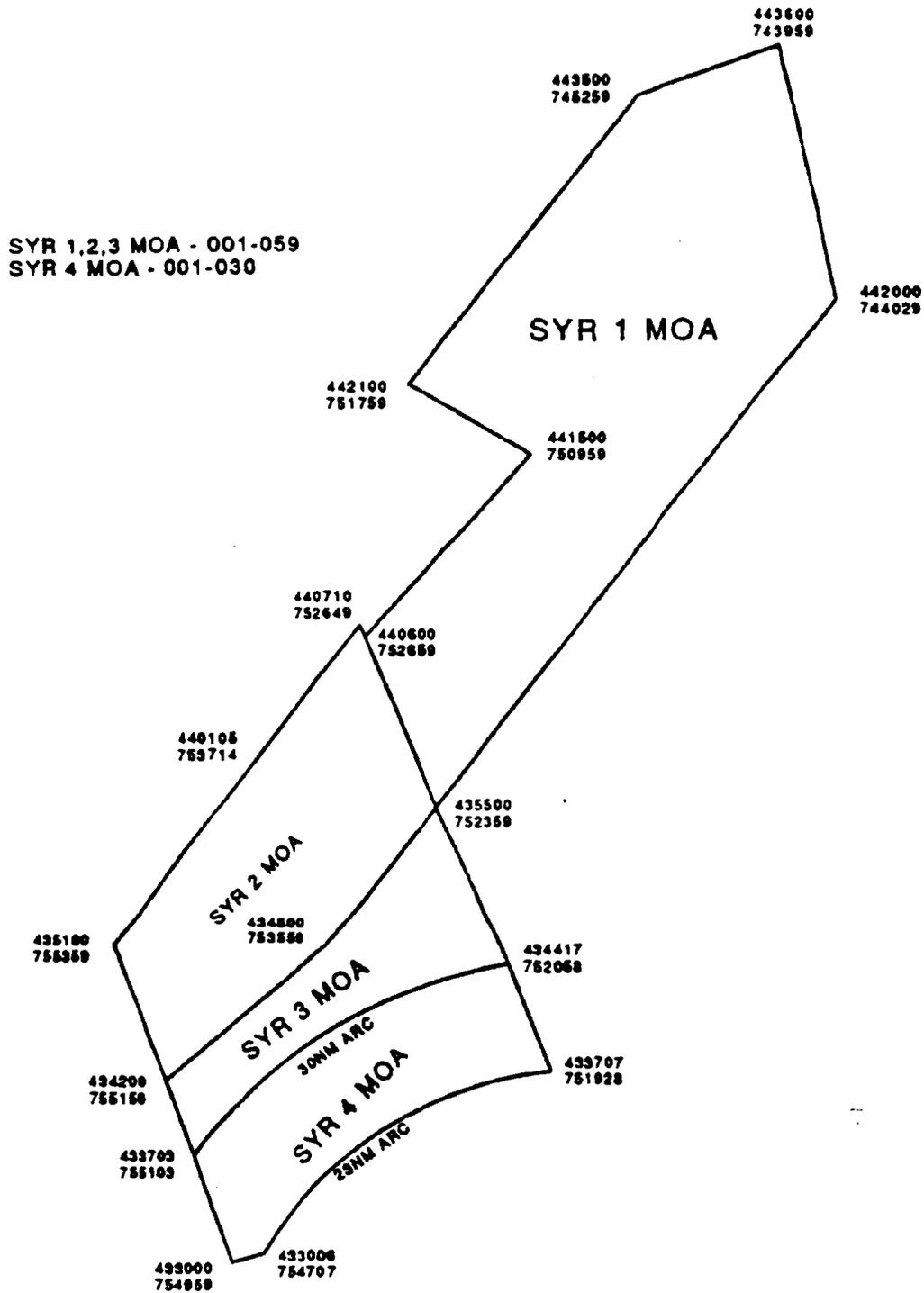
SIGNATURE ON FILE

Pual E. Schutt, Col USAF
Commander
305th Operations Group

BOSTON ARTCC/NEADS/552ND ACW/
101ST ACS/102ND ACS/ 103RD ACS/
174TH FW/103RD FW/305TH AMW

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ATTACHMENT NO. 1.

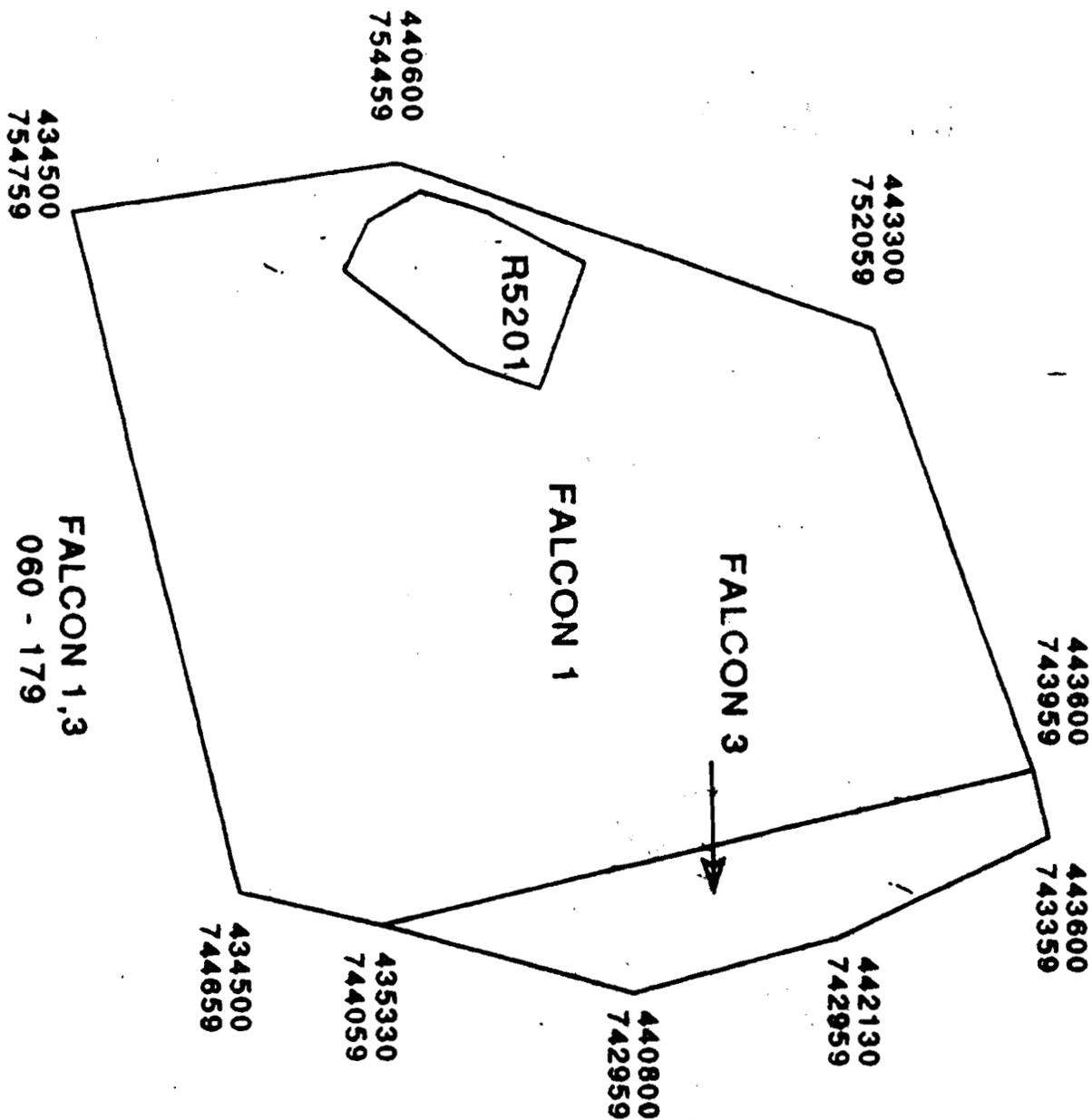


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174TH FW/103RD FW/305TH AMW

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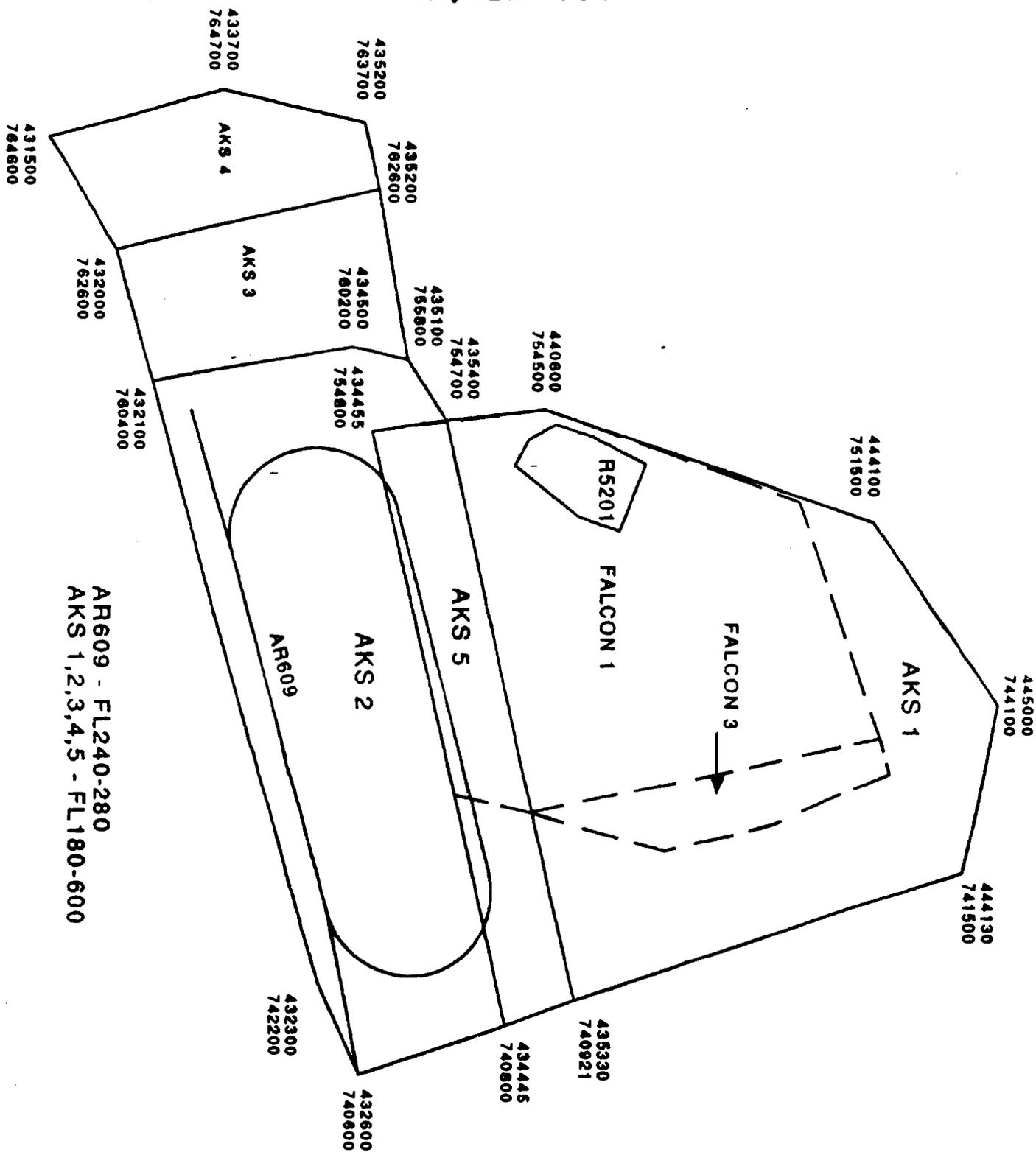
ATTACHMENT NO. 2



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ATTACHMENT NO. 3



AR609 - FL240-280
AKS 1,2,3,4,5 - FL180-600

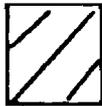
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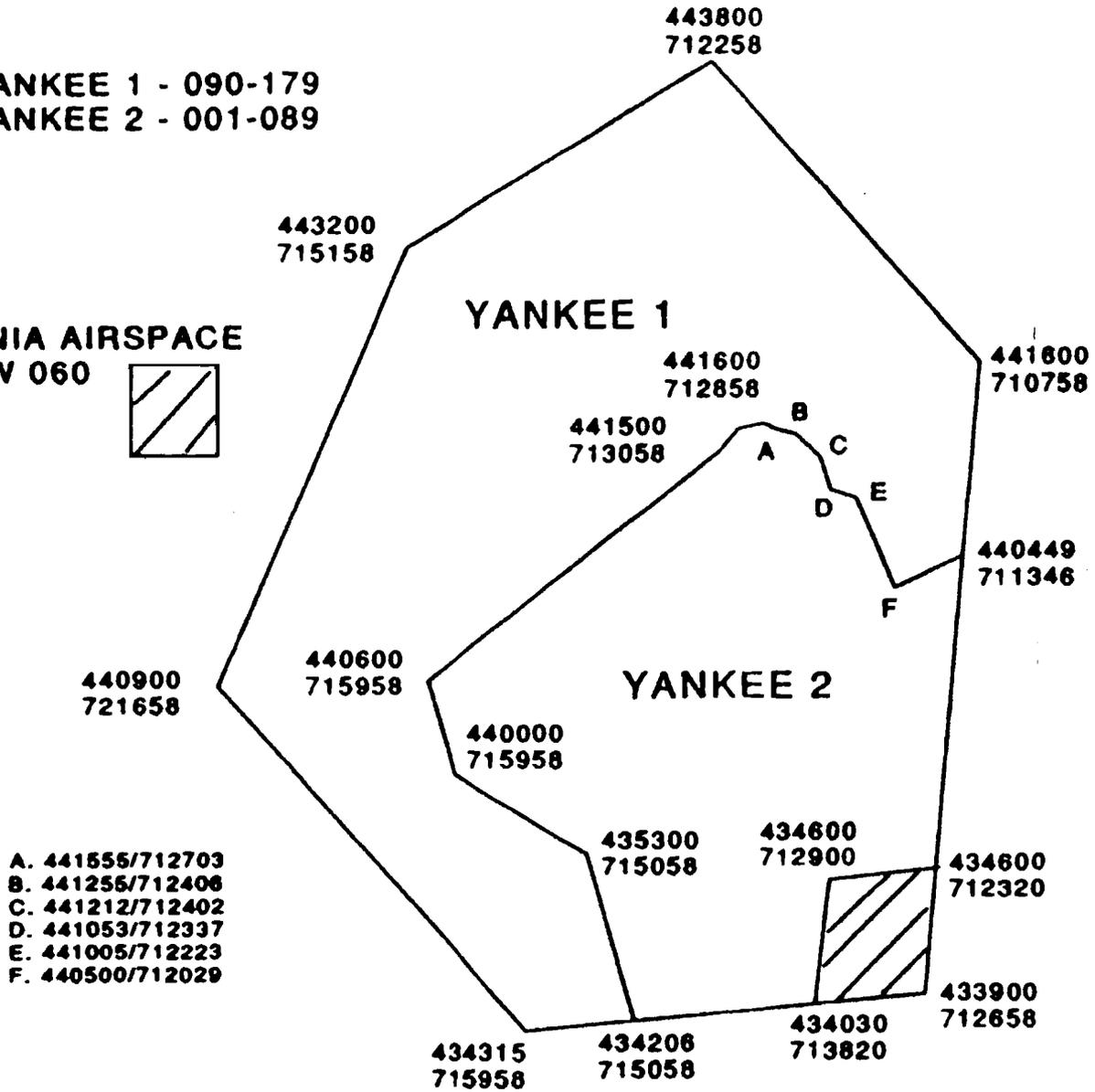


YANKEE 1 - 090-179
YANKEE 2 - 001-089

LACONIA AIRSPACE
BELOW 060



ATTACHMENT NO. 4

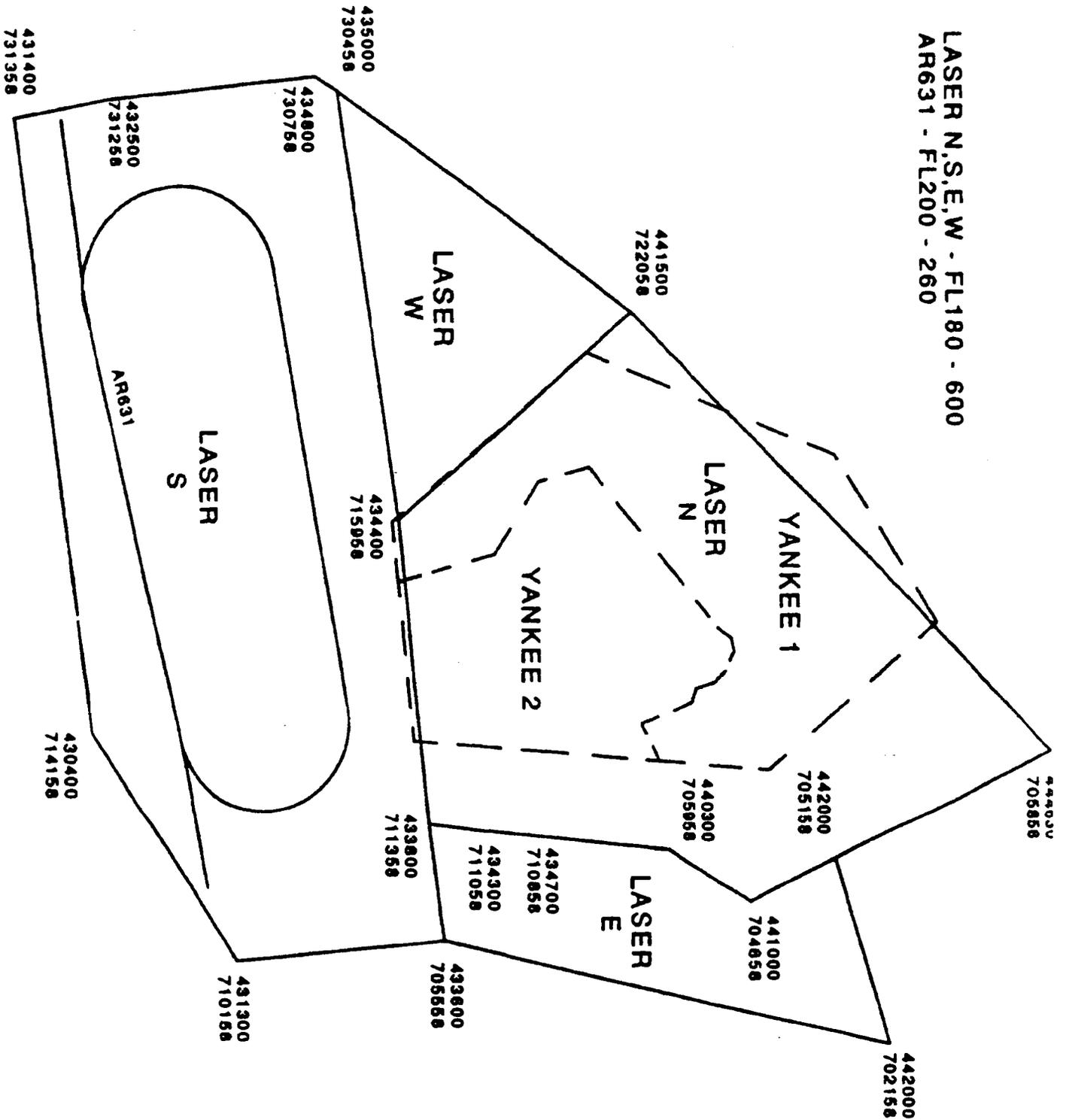


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101ST ACS/102ND ACS/103RD ACS/
174TH FW/103RD FW/305TH AMW

ATTACHMENT NO. 5

LASER N,S,E,W - FL180 - 600
AR631 - FL200 - 260



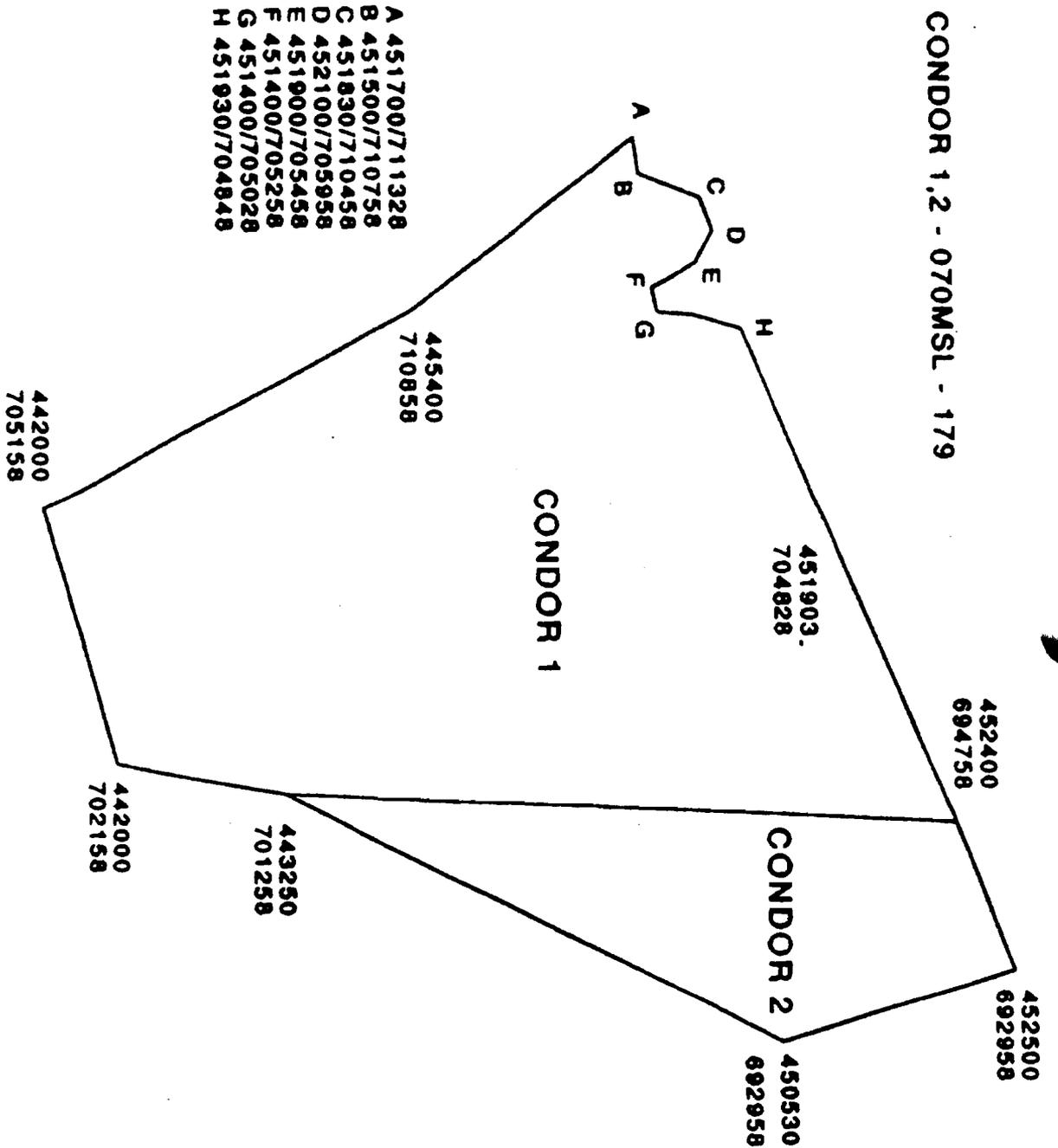
BOSTON ARTCC/NEADS/552ND ACW/
101ST ACS/102ND ACS/103RD ACS/
174TH FW/103RD FW/305TH AMW

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ATTACHMENT NO. 6

CONDOR 1,2 - 070MSL - 179

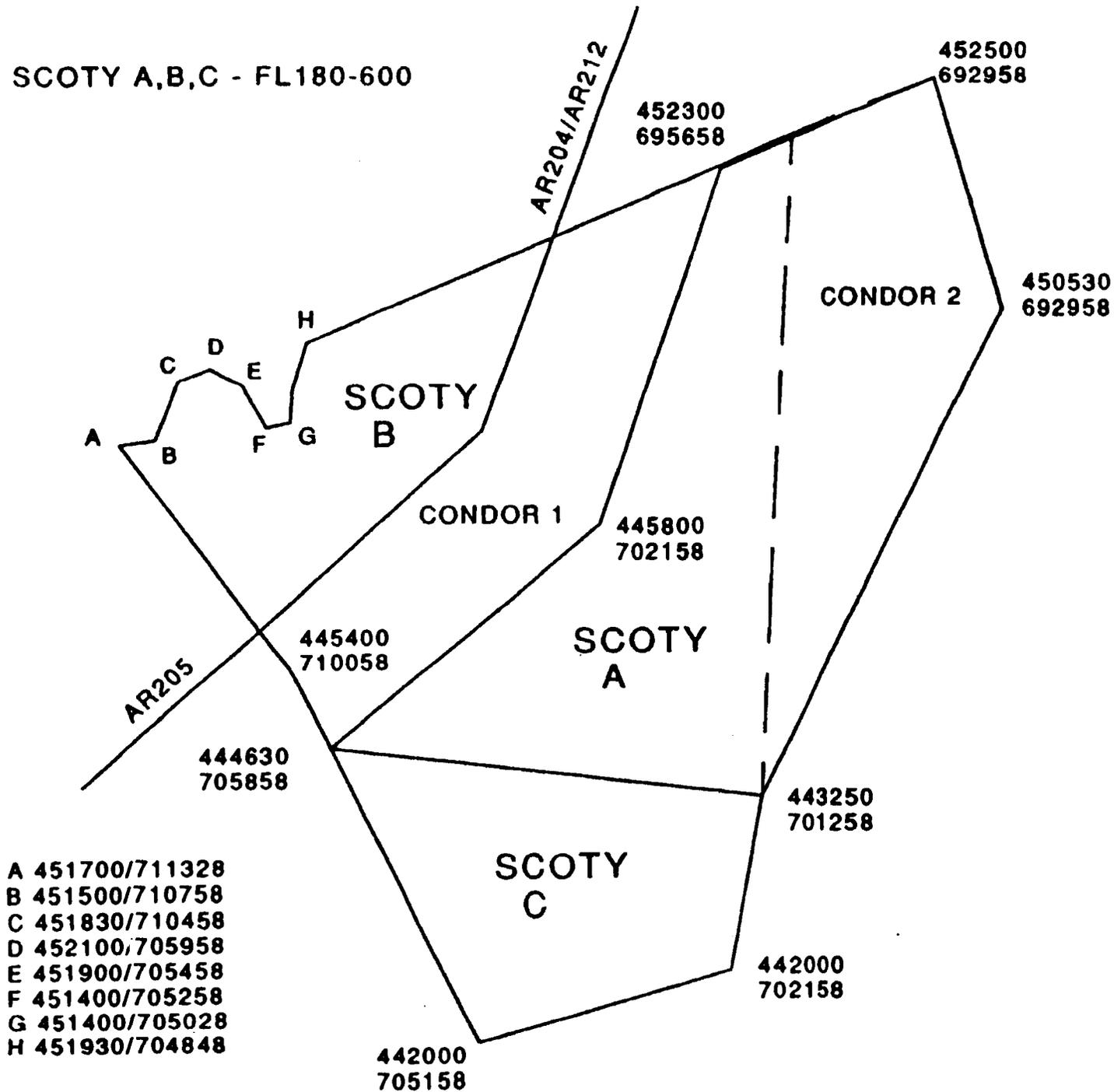


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174TH FW/103RD FW/305TH AMW

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SCOTY A,B,C - FL180-600

ATTACHMENT NO. 7

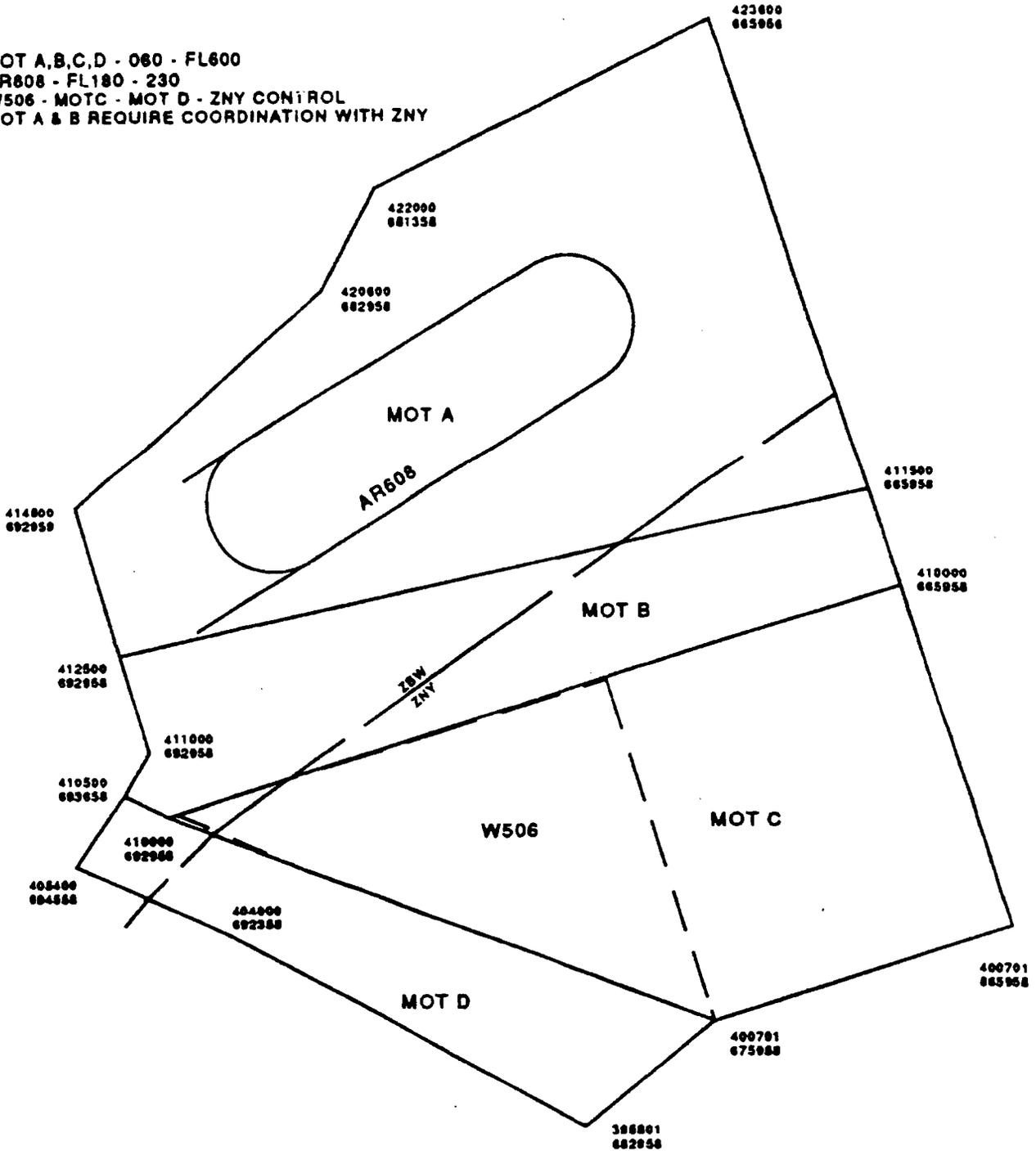


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BOSTON ARTCC/NEADS/552ND ACW/
101ST ACS/102ND ACS/103RD ACS/
174TH FW/103RD FW/305TH AMW

ATTACHMENT NO. 8

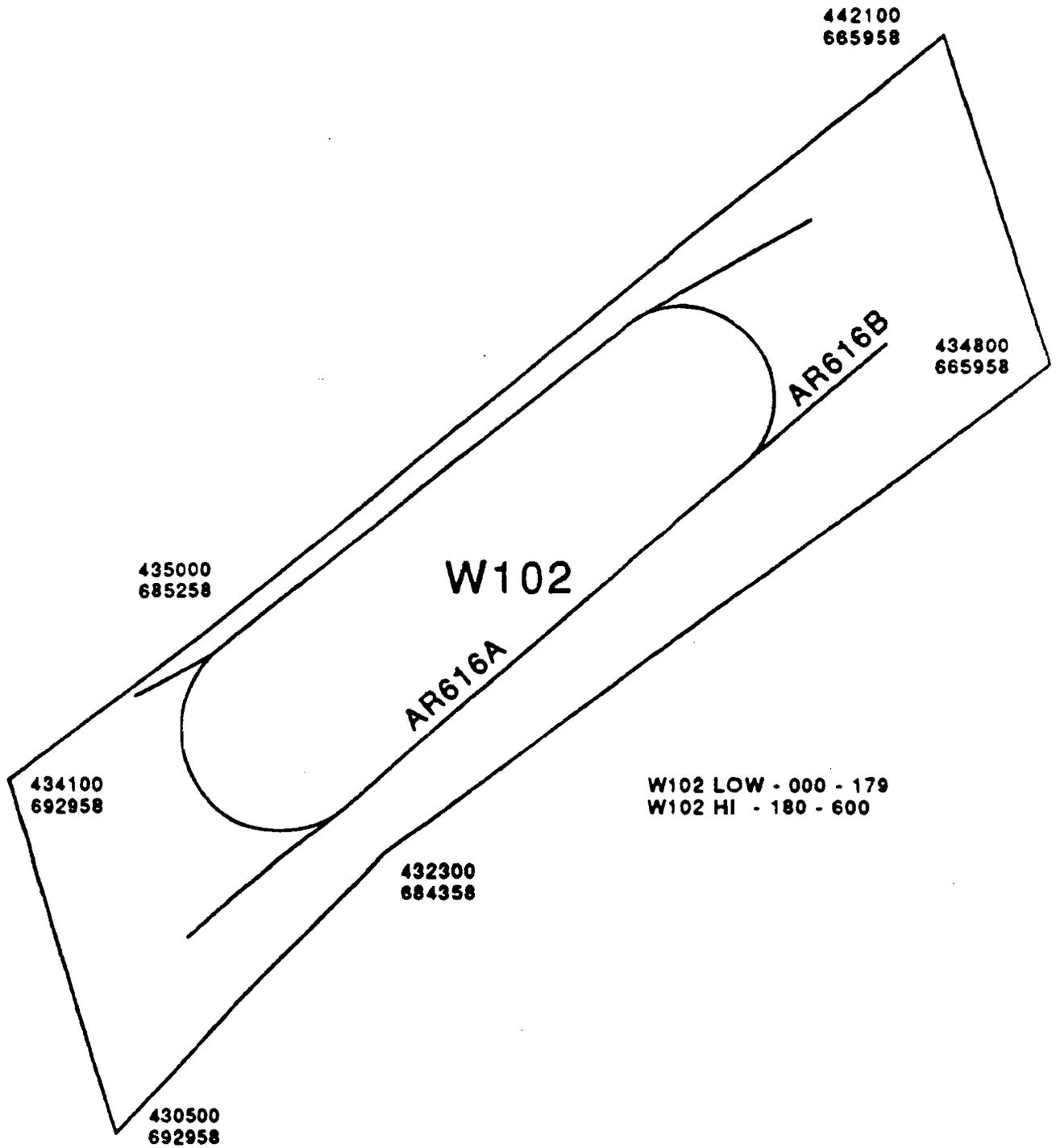
MOT A,B,C,D - 060 - FL600
AR608 - FL180 - 230
W506 - MOT C - MOT D - ZNY CONTROL
MOT A & B REQUIRE COORDINATION WITH ZNY



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174TH FW/103RD FW/305TH AMW

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ATTACHMENT NO. 9

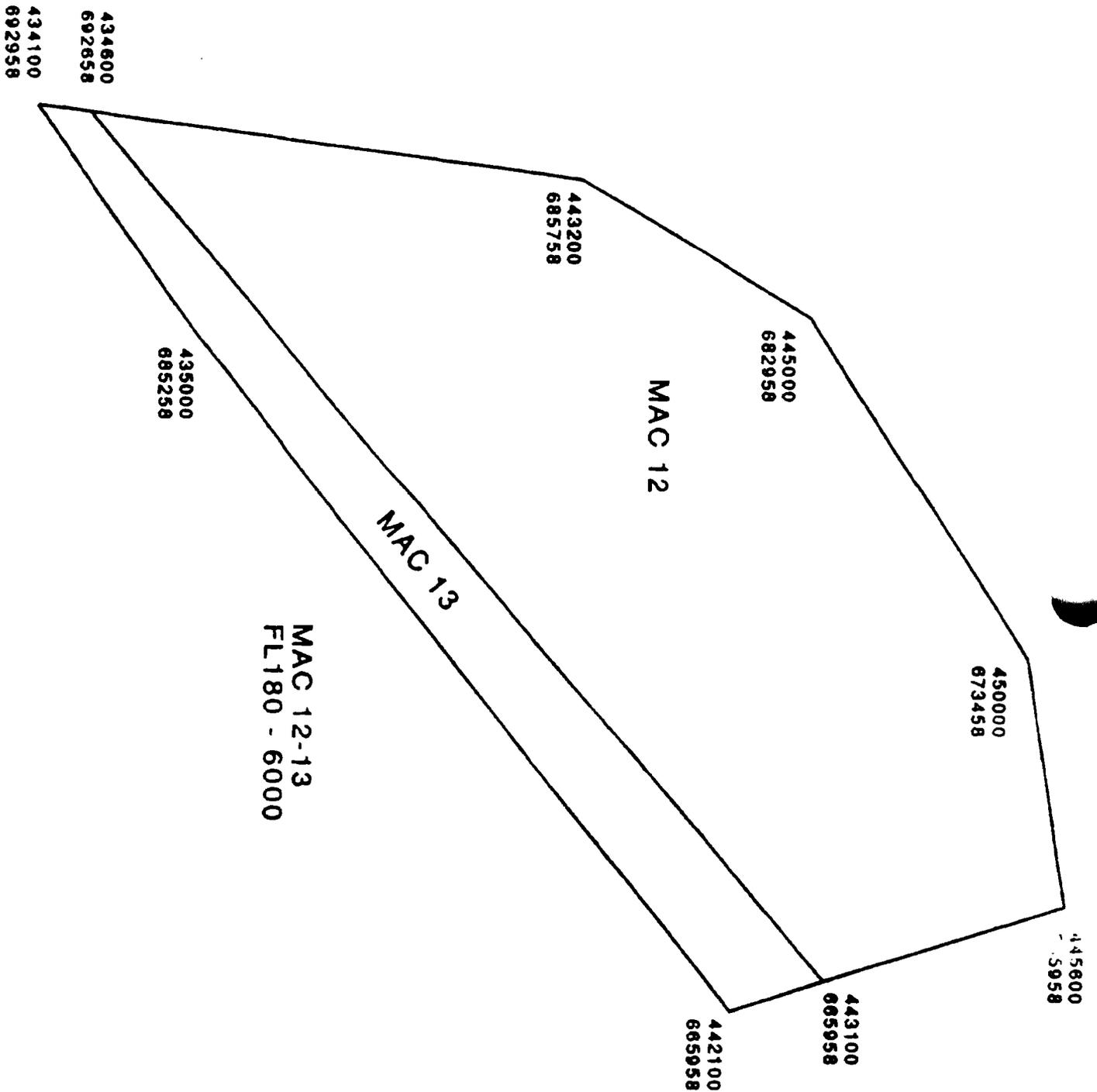


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174TH FW/103RD FW/305TH AMW

MAY 22, 1997

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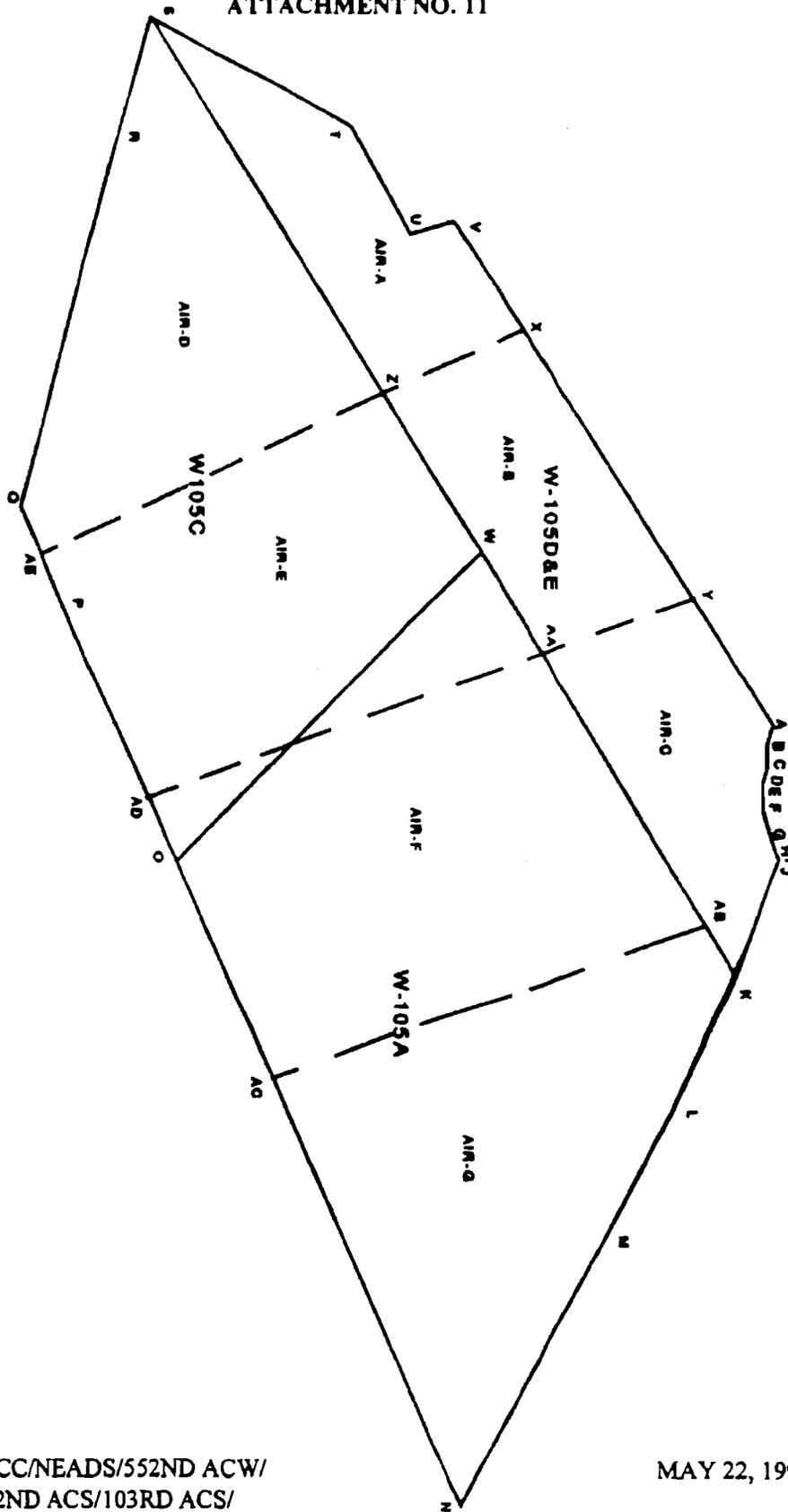
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BOSTON ARTCC/NEADS/552ND ACW/
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174TH FW/103RD FW/305TH AMW

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ATTACHMENT NO. 11



W-105

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101ST ACS/102ND ACS/103RD ACS/
174TH FW/103RD FW/305TH AMW

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**ATTACHMENT NO. 12
W105 LAT/LONGS AND ALTITUDES**

W105A	SFC to FL500
W105B	SFC to but not including FL180
W105C	SFC to FL500
W105D	SFC to but not including 15,000 feet MSL
W105E	15,000 feet MSL to FL500

Sub Operation Areas A/B/C/D/E/F/G SFC to FL500

<u>Point</u>	<u>Latitude/Longitude</u>	<u>Point</u>	<u>Latitude/Longitude</u>
A	41 06 52/70 22 51	R	40 04 20/72 29 58
B	41 05 26/70 19 47	S	40 11 55/72 46 53
C	41 04 35/70 16 00	T	40 34 00/72 19 58
D	41 03 43/70 14 10	U	40 38 00/71 59 58
E	41 03 21/70 13 01	V	40 44 00/71 59 58
F	41 02 32/70 09 24	W	40 36 00/71 05 00
G	41 02 29/70 05 12	X	40 52 15/71 26 00
H	41 02 34/70 01 26	Y	41 02 25/70 42 00
I	41 02 38/70 00 15	Z	40 30 00/71 26 00
J	41 02 30/70 00 00	AA	40 40 00/70 42 00
K	40 53 00/69 43 00	AB	40 49 45/69 58 00
L	40 39 50/69 23 28	AC	39 49 06/69 58 00
M	40 26 46/69 06 23	AD	39 44 15/70 42 00
N	39 58 00/68 29 50	AE	39 39 33/71 26 00
O	39 46 00/70 29 00		
P	39 40 45/71 14 58		
Q	39 38 42/71 33 46		

**ATTACHMENT NO. 13
SUA/ATCAA COMPUTER FIXES**

All aircrews shall file the delay in the SUA/ATCAA in which the operation is conducted. If the operation is conducted in more than one SUA/ATCAA, then the delay shall be filed in the SUA/ATCAA in which they exit. The SUA/ATCAAs listed in Boston Centers data base are stored as follows:

MOAs

FALCON	=	FALCN	SYRACUSE 1	=	SYR1
SYRACUSE 2	=	SYR2	SYRACUSE 3	=	SYR3
SYRACUSE 4	=	SYR4	DRUM 1	=	DRUM1
DRUM 2	=	DRUM2	CONDOR	=	CONDR
YANKEE	=	YANKE			

ATCAAs

MAC 12	=	MAC12	MAC 13	=	MAC13
LASER	=	LASER	LASER North	=	LASRN
LASER West	=	LASRW	LASER South	=	LASRS
LASER East	=	LASRE	AKS	=	AKS
AKS 1	=	AKS1	AKS 2	=	AKS2
AKS 3	=	AKS3	AKS 4	=	AKS4
AKS 5	=	AKS5	MOT Area	=	MOT
MOT A	=	MOTA	MOT B	=	MOTB
MOT C	=	MOTC	MOT D	=	MOTD
SCOTY	=	SCOTY	SCOTY A	=	SCTYA
SCOTY B	=	SCTYB	SCOTY C	=	SCTYC

RESTRICTED AREAS

R5201	=	R5201	R5206	=	R5206
R5203	=	R5203			

WARNING AREAS

W102 H&L	=	W102	W103	=	W103
W104 A/B/C	=	W104	W105 A	=	W105A
W105 C	=	W105C	W105 C	=	W105C
W105 D	=	W105D	W105 E	=	W105E
W106 A/B/C	=	W106	W107	=	W107
W108	=	W108	W386 A	=	W386A
W386 B	=	W386B	W506	=	W506

SUB OPERATION AREAS WITHIN WARNING AREA W105

AIR OP A = AIRA	AIR OP B = AIRB	AIR OP C = AIRC	AIR OP D = AIRD
AIR OP E = AIRE	AIR OP F = AIRF	AIR OP G = AIRG	

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**ATTACHMENT NO. 14
COMMON REFERENCE POINTS**

<u>FIX</u>	<u>LAT/LONG</u>	<u>FIX</u>	<u>LAT/LONG</u>
ACK	41°16'55"/070°01'36"	ALB	42°44'50"/073°48'11"
ART	43°57'07"/076°03'53"	BDL	41°56'27"/072°41'19"
BGR	44°50'31"/068°52'26"	BML	44°38'01"/071°11'10"
BOS	42°21'27"/070°59'22"	BTV	44°23'50"/073°10'58"
CON	43°13'11"/071°34'32"	ENE	43°25'32"/070°36'49"
FMH	41°39'35"/070°30'50"	GFL	43°20'30"/073°36'43"
GSS	43°13'55"/075°24'41"	HTO	40°55'08"/072°19'00"
LFV	42°01'02"/070°02'14"	MLT	45°35'12"/068°30'56"
MSS	44°54'52"/074°43'22"	MVY	41°23'46"/070°36'46"
NHZ	43°54'09"/069°56'43"	PLB	44°41'06"/073°31'22"
PSM	43°05'04"/070°49'55"	PVD	41°43'28"/071°25'47"
SLK	44°23'04"/074°12'16"	SYR	43°09'38"/076°12'16"

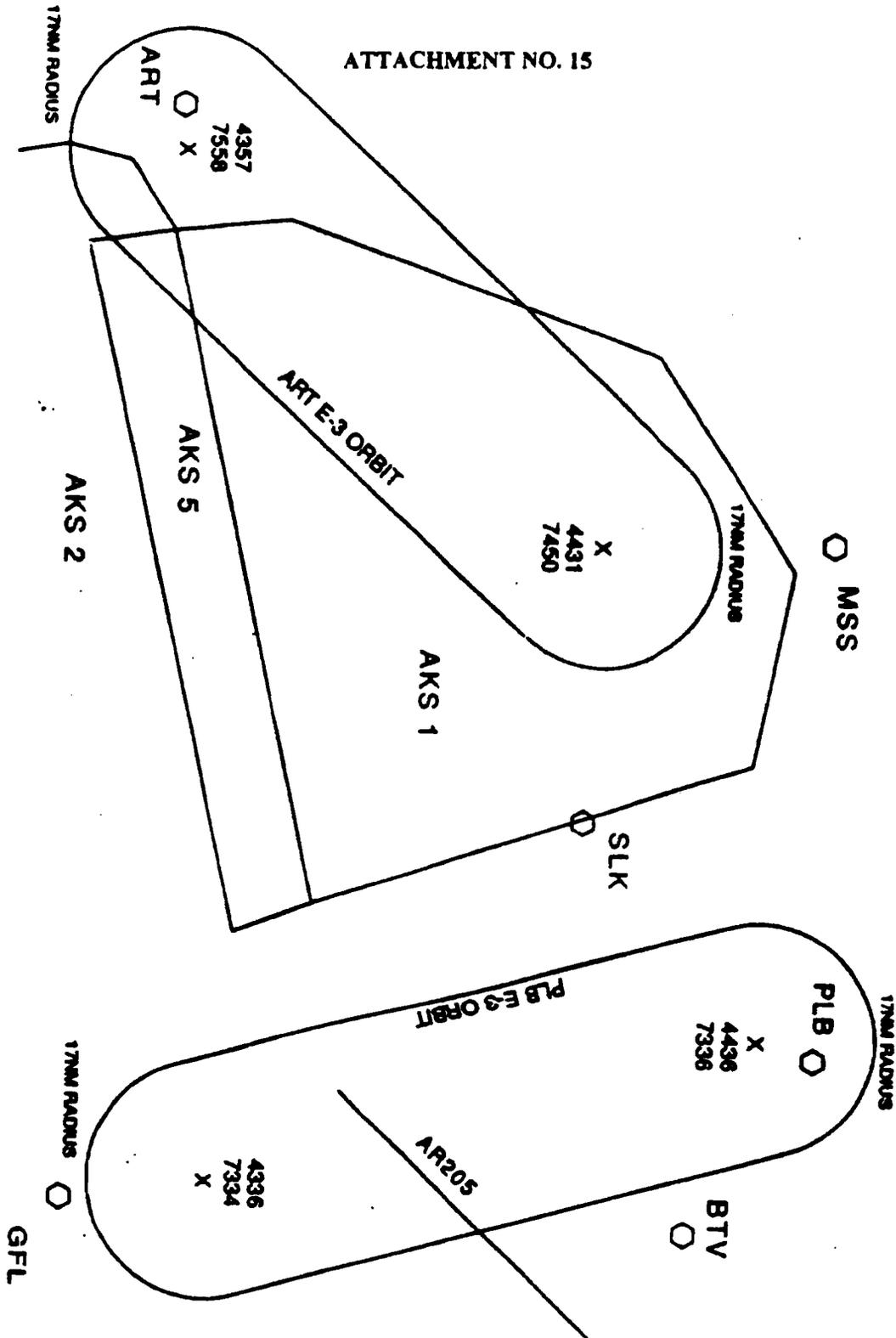
SUA/ATCAA SCHEDULING AGENCIES

<u>SCHEDULER & LOCATION</u>	<u>AIRSPACE</u>	<u>NUMBER</u>	<u>CONTROLLING AGENCY</u>
NE ADS @ Rome, NY	AKS 1/2/3/4/5(AR609) LASER E/W/N/S(AR631) MAC 12/13 MOT A/B(AR608) FALCON 1/3 W102 H(AR616A&B) CONDOR 1/2	DSN 587-6784	Boston ARTCC
305th AMW Mcguire AFB, NJ	SCOTY B(AR204/205/212)	DSN 440-6487 440-6488	Boston ARTCC
103rd FW @ Bradley Field, CT (Closed every other Monday)	YANKEE 1/2	DSN 636-8356 636-8357	Boston ARTCC
174 FW @ Syracuse, NY	SYR 1/2/3/4 DRUM 1/2	DSN 587-9214 587-9217	Wheeler Sack Approach Control
FACSFAC VACAPES @ Oceana, Virginia Beach, VA	W105 A/B/C/D/E SUB OP AREA A/B/ C/D/E/F/G	DSN 433-1218	Boston ARTCC

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ATTACHMENT NO. 15

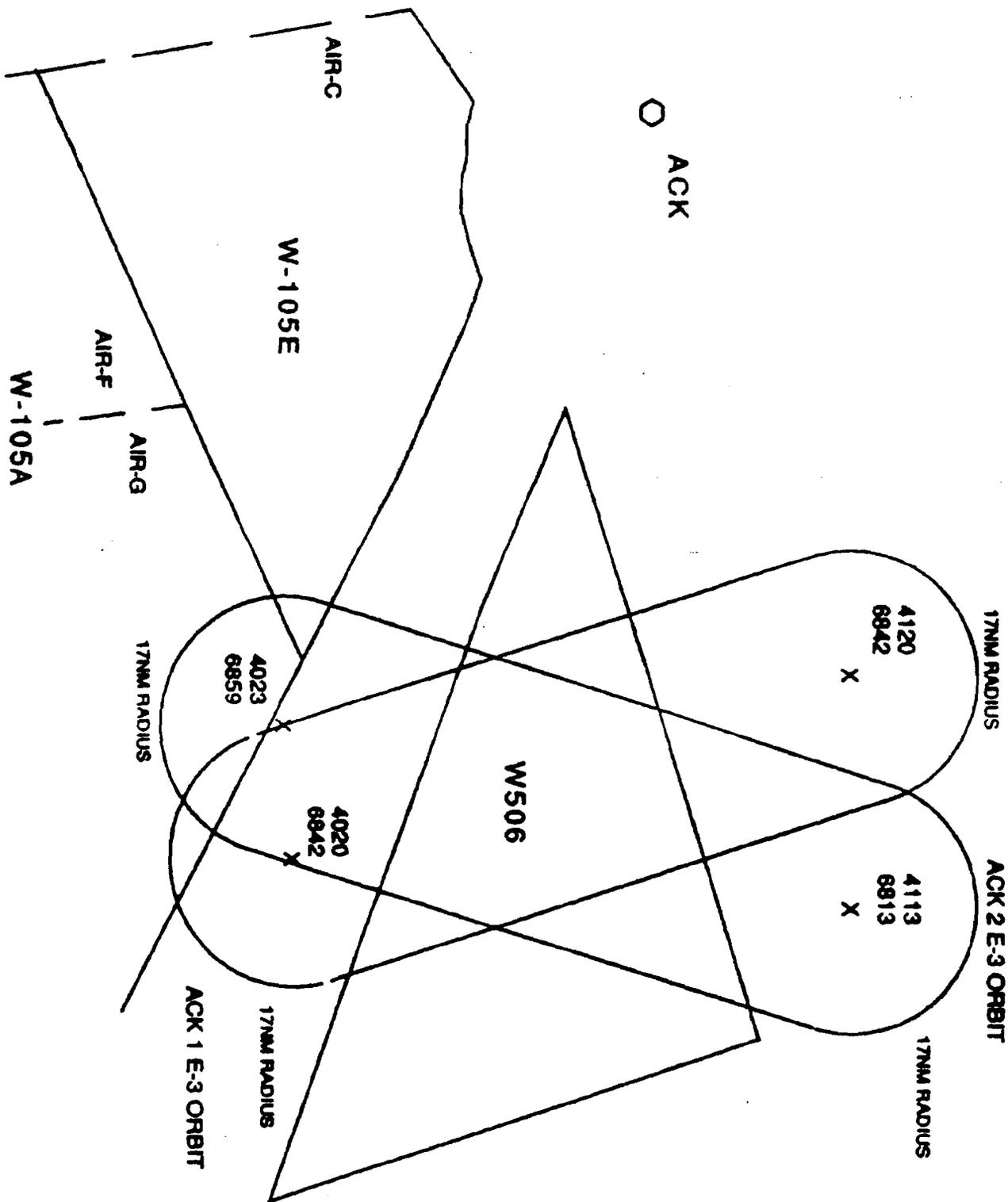


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101ST ACS/102ND ACS/103RD ACS/
174TH FW/103RD FW/305TH AMW

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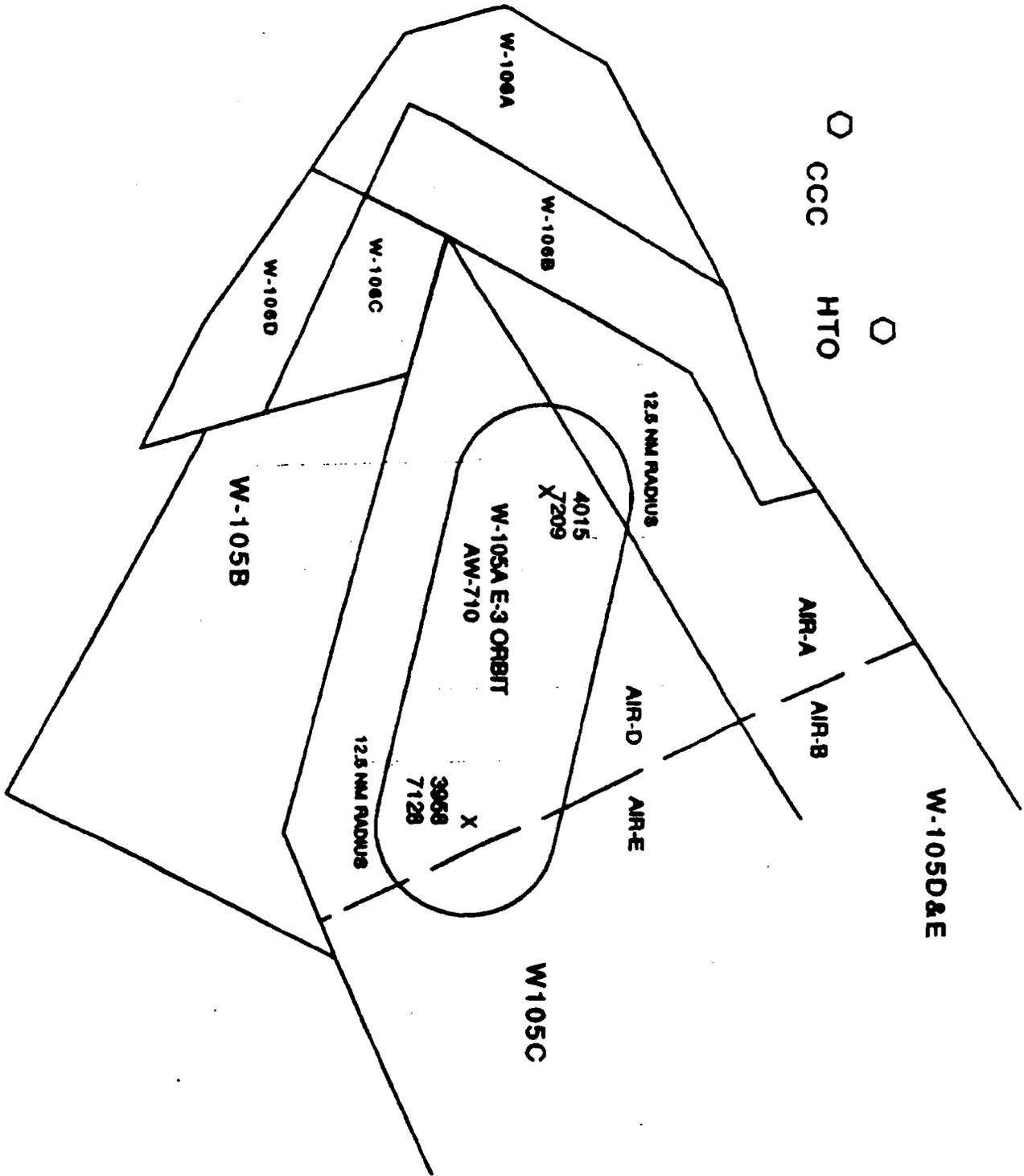
ATTACHMENT NO. 17



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101ST ACS/102ND ACS/103RD ACS/
174TH FW/103RD FW/305TH AMW

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ATTACHMENT NO. 18



BOSTON ARTCC/NEADS/552ND ACW/
101ST ACS/102ND ACS/103RD ACS/
174TH FW/103RD FW/305TH AMW

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Tab 3

Mission	Fighter
Criterion	Current / Future Mission
Attribute	Geo-locational Factors
Formula #	1270
Label	Suitable Auxiliary Airfields Within 50NM
Effective %	5.18
Question	<p>Identify runways within 50 NM of the installation that are 8,000ft x 150ft or greater and are suitable for use as an auxiliary runway.</p> <p>If installation has no runway or no active runway, or no serviceable, suitable runway then score 0 pts. See section 1.9 "Shared" for details.</p> <p>For each airfield listed in OSD Question 1270, if it is > 50 nautical miles (NM) away, it is not qualified to be counted. See OSD Question 1270, column 2 for this data. (N/A equals not qualified.)</p> <p>If the count >= 3, get 100 points. Otherwise, if the count = 2, get 75 points. Otherwise, if the count = 1, get 50 points. Otherwise, get 0 points.</p> <p>Example: There are three airfields listed, Alpha, Bravo and Charlie, at distances away of 20, 40, and 200 NM away respectively. Alpha and Bravo are both within the 50 NM limit, so they are qualified. Charlie is 200 NM away, which is > 50 NM, so it is not qualified. The number of qualified airfields for auxiliary use = 2, which results in a score of 75 points.</p>
Source	FLIP and Falcon View (or any other certified flight planning software)

In the Otis score for this formula, credit was only given for one auxiliary airfield, Logan International. Quonset State Airport (Org 157, KOQU) located in Rhode Island, was NOT included as a viable auxiliary airfield. OSD data shows the runway was a viable alternate runway within 50 miles. Quonset shows Otis as an auxiliary airfield in the OSD data (i.e. within 50 NM).

Section 1 Air/Space Operations, Question 9 Runways																
1 Airfield Identifier (ICAO 4 character identifier)	2 Runway Designator or (First End)	3 Runway Designator (Second End)	4 PCN (1)	5 PCI (2)	6 Date of Evaluation (3) (dd mmm yyyy)	7 Length (Ft)	8 Width (Ft)	9 Type of Arresting Gear, if available (First Set)	10 Type of Arresting Gear, if available (First End, Second Set)	11 Type of Arresting Gear, if available (Second End, First Set)	12 Type of Arresting Gear, if available (Second Set)	13 Pavement Type (4) (0)	14 Closed (Yes/No)	15 Serviceable (5) (Yes/No)	16 Own/controlled or Access only to runway (0)	
157 KOQU	16	34	59	N/A	N/A	1-Feb	8000	150	N/A	N/A	N/A	N/A	Asphalt	No	Yes	A
157 KOQU	5	23	N/A	N/A	N/A		4000	75	N/A	N/A	N/A	N/A	Asphalt	No	Yes	A

Section 39 Airfield Management, Question 1270 Air Operations - Auxiliary Airfield		
Org	1 Airfield Name (Text)	2 Distance Main Runway to Aux field (NM)
157	GENERAL EDWARD LAWRENCE LOGAN INTL	49.5
157	OTIS ANGB	40.2

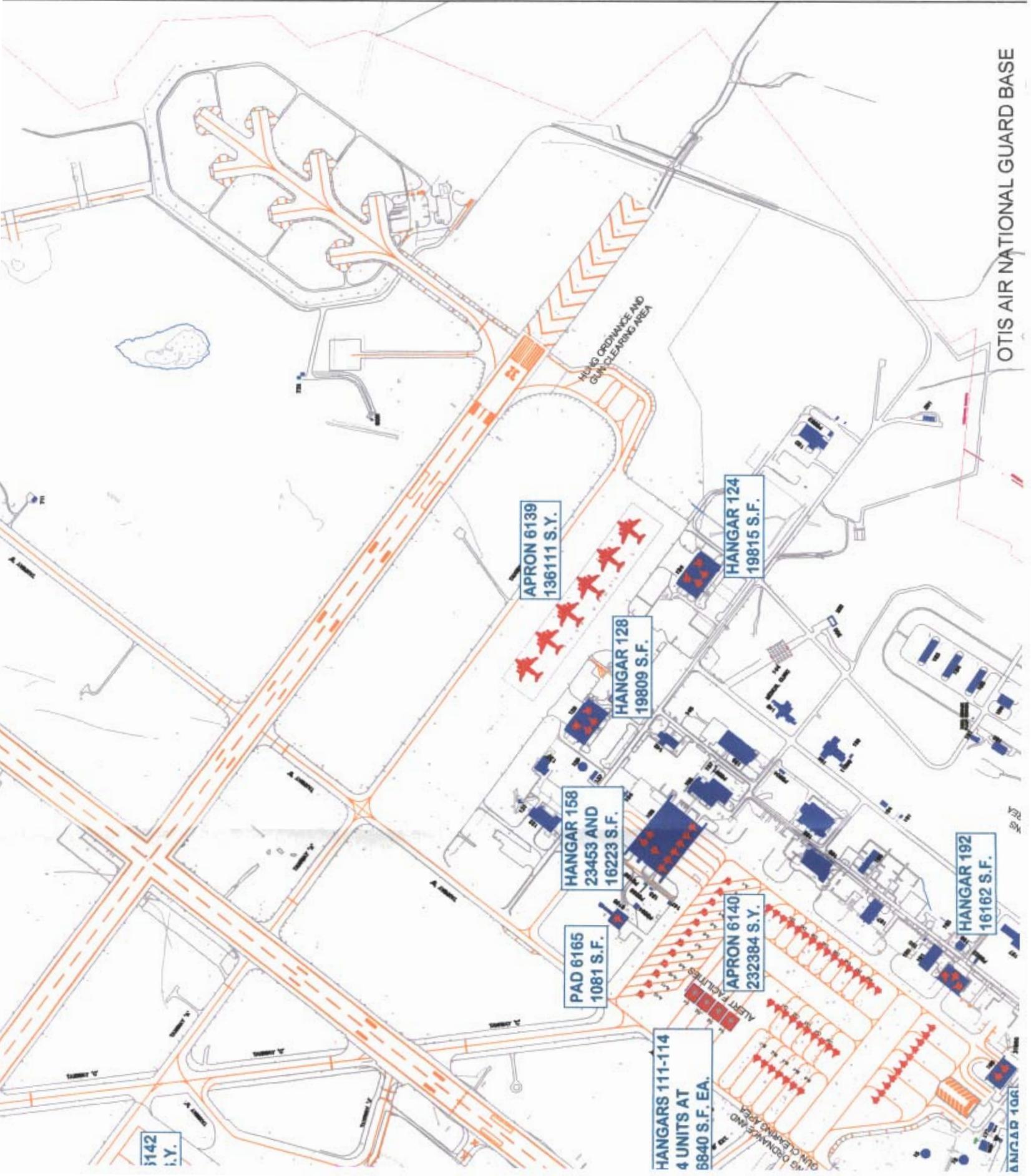


Tab 4

Mission	Fighter
Criterion	Condition of Infrastructure
Attribute	Key Mission Infrastructure
Formula #	1221
Label	Hangar Capability - Small Aircraft
Effective %	3.88
Question	<p>Check to see if the installation has Aircraft Hangar Facilities that will accommodate F-15 sized aircraft: state the number of F-15-sized acft (61ft long x 45ft wingspan x 19ft high) that can fit in the installation's maintenance hangars without modification.</p> <p>If the installation has no runway or no active runway, or no serviceable, suitable runway then score 0 pts. See section 1.9 "Shared" for details.</p> <p>Otherwise, sum the number of aircraft the hangars can hold. See OSD Question 1221, column 2 for this data. (N/A equals 0.)</p> <p>If the sum is ≥ 24 aircraft, get 100 points. If the sum = 6 aircraft, get 25 points. If the sum is < 6 aircraft, get 0 points. Otherwise, pro-rate the number of aircraft between 6 and 24 on a 25 to 100 point scale.</p> <p>Example:</p> <p>1) There are 7 hangars at the installation. with the following capacities: 0, 0, 1, 2, 2, 0, and 0, for a sum of 5 aircraft. That is less than 6 aircraft, so the score is 0.</p> <p>2) There are 7 hangars at the installation, with the following capacities: 1, 2, 3, 2, 2, 3, and 2, for a sum of 15 aircraft. 15 is halfway between 6 and 24, for a score of 50.</p>
Source	Real Property Records, Record Drawings, UFC 3-260-01

Otis was given credit for only 15 Hangar spaces. Upon further review, Otis did not take full credit for their potential hangar spaces. Total hangar capacity for small aircraft is proved to be 31. The following map with official real property record (SAF MIL7115 Report) listed quantities show these locations. The map is to scale.





OTIS AIR NATIONAL GUARD BASE

142
1.1 Y.

APRON 6139
136111 S.F.

HANGAR 128
19809 S.F.

HANGAR 124
19815 S.F.

HANGAR 158
23453 AND
16223 S.F.

PAD 6165
1081 S.F.

APRON 6140
232384 S.F.

HANGAR 192
16162 S.F.

HANGARS 111-114
4 UNITS AT
68840 S.F. EA.

HANGAR 10R

REAL PROPERTY CODES FOR BRAC MEETINGS

FAC NBR = the assigned number to identify that particular facility.

IN = the Air Force real estate land interest associated with the assigned facility. "1" = USGov fee-owned land. "7" = USAF leased land.

TC = type of construction of the assigned facility. For pavements "4" concrete and "5" bituminous asphalt.

CD = condition code which could be "1" through "6". "1" means usable class a. "2" means usable class b. "3" force use. "4" means sterile no utilities. "5" means committed to Congress no further improvements may be applied. "6" means disposal approved.

CD IN = command code for the ANG this is "54". "69" is Coast Guard. "52" is Regular Army. "67" is Army National Guard.

CC = facility type. "A" is a single purpose facility. "B" is a multi purpose facility. "D" is a function within a multi purpose facility – must have two or more "D" items for a "B" facility. "E" is for pavements, utilities, and other non-buildings. "X" is for plants and systems within "A" and "B" facilities.

TOTAL: indicates only those figures from "A", "D" and "E" facilities. If there is a "B" facility on your report that figure is not included in the bottom line.

REAL PROPERTY CODES FOR BRAC MEETINGS

Hangar #111 – Single purpose facility.
Constructed in 2002 on USGov fee-owned land.
6840 S.F.
Provides shelter for one aircraft.

Hangar #112 – Single purpose facility.
Constructed in 2002 on USGov fee-owned land.
6840 S.F.
Provides shelter for one aircraft.

Hangar #113 – Single purpose facility
Constructed in 2002 on USGov fee-owned land.
6840 S.F.
Provides shelter for one aircraft.

Hangar #114 – Single purpose facility.
Constructed in 2002 on USGov fee-owned land
6840 S.F.
Provides shelter for one aircraft.

Facility #124 – Multi-use facility.
Constructed in 1955 on USGov fee-owned land.
34,849 total S.F.
With some minor modifications to access hangar area there is approximately 19,815 S.F.
for up to four fighter aircraft.

Facility #128 – Single purpose facility.
Constructed in 1955 on USGov fee-owned land.
42,090 total S.F.
Hangar area available for up to four fighter aircraft with 19,809 S.F.

REAL PROPERTY CODES FOR BRAC MEETINGS

Real property records indicate current user is MA ArNG.

Facility #158 – Multi-use facility.

Constructed in 1956 on USGov fee-owned land.

149,498 total S.F.

There are two areas on the hangar floor that can be utilized for aircraft. The main hangar area for up to six aircraft with 23,453 S.F. The secondary area for up to three aircraft with 16,223 S.F.

Hangar 175 – Multi-use facility.

Constructed in 1953 on USAF leased land.

20,598 S.F.

With four aircraft cells for hardened shelter of one aircraft in each cell at 4052 S.F. each.

Hangar #192 – Multi-use facility.

Constructed in 1959 on USGov fee-owned land.

16,1652 S.F.

Hangar area provides space for three aircraft.

Hangar #196 – Multi-use facility.

Constructed in 1959 on USGov fee-owned land.

16,932 S.F.

Hangar area provides space for two aircraft.

Pad #6165 – Single purpose facility

Constructed in 1985 on USGov fee-owned land.

1081 S.F.

This is an engine test pad with a suppression system. The housing unit can hold one aircraft.

REAL PROPERTY CODES FOR BRAC MEETINGS

Apron #6139 – Aircraft Parking Apron
Constructed in 1943 on USGov fee-owned land
136,111 S.Y.
Provides parking space for several medium sized aircraft

Apron #6140 – Aircraft Parking Apron
Constructed in 1943 on both USAF leased land and USGov fee-owned land.
232,384 S.Y.
Provides space for several parking configurations of aircraft

Apron #6142 – Aircraft Parking Apron
Constructed in 1943 on USAF leased land.
128,300 S.Y.
Provides space for several aircraft.

14-JUL-2005 15:55

OTIS ANG BASE

Automated Civil Engineering Item

Inventory items with a cost of 100,000 will NOT show Cost Basis -- Expense Improvement is NOT included in Cost Basis.

Installation: OTIS ANG BASE

Instl: SPBN

CMD: ANG

Category: 113321

Description: APRON

Fac	YTC	CD	C	ABR	Vac	Out	Out	Total	Area	Rent	Rent	Cost	Est	Year
Nbr	NCD	IN	C	DRD	Area	NLS	LS	Area	Othr	Paid	Rec	Basis	Value	Comp
								UM	UM					
06130	142	54	E		0			5600 SY		0	0	0	0	1987
06139	152	54	E		0			136111 SY		0	0	839968	0	1943
06140	142	54	E		0			232384 SY		0	0	1781275	0	1943
06142	743	54	E					128300 SY		0	0	679360	0	1943
06144	743	54	E		47373			66733 SY		0	0	293547	0	1943
06146	144	54	E		31667			31667 SY		0	0	216326	0	1960
06148	144	54	E		17988			17988 SY		0	0	102943	0	1943
66140	142	69	E		0			26270 SY				2286539	0	1955
Total:					97028			645053				6199958	0	
Installation Total						0 SF		645053 SY		0 AC		6199958	0	

12-JUL-2005 09:57:02

OTIS ANG BASE

Automated Civil Engineer System

Installments of 100,000 will NOT show Cost Basis -- Expense Improvement is NOT included in Cost Basis.

Installation: OTIS ANG BASE

Instl: SPBN

CMD: ANG

Category: 116665 Description: PAD,PWR CHK W/SPR

Fac Nbr	ITC CD	C ABH	Vac	Out	Out	Total	Area	Rent	Rent	Cost	Est	Year
NCD IN	C DRD	Area	NLS	LS	Area UM	Othr UM	Paid	Rec	Basis	Value	Comp	
06165	142	54	E	0		2522	SY	0	0	359992	0	1985
Total:				0		2522				359992	0	
Installation Total				0	0 SF	2522	SY	0	0 AC	359992	0	

12-JUL-2005 10:00:00

OTIS ANG BASE

Automated Civil Engineer System

Any/All items with cost > 100,000 will NOT show Cost Basis -- Expense Improvement is NOT included in Cost Basis.

Installation: OTIS ANG BASE

Instl: SPBN

CMD: ANG

Category: 219943

Description: BE PAV GRND FCLTY

Fac Nbr	ITC	CD	C	AEH	Vac	Out	Out	Total	Area	Rent	Rent	Cost	Est	Year
	Nbr	NCD	IN	C	DRD	Area	NLS	Area	UM	Othr	UM	Basis	Value	Comp
							LS			UM	UM			
00124	1P2	54	B					35712	SF			807426	0	1955
00124	1P2	54	D					19815	SF			0	0	1955
Total:								19815		0		807426	0	
Installation Total						19815	SF	0		0	AC	807426	0	

Amount: 117005 SF and Cost: 1056545 SF. Cost Basis -- Expense Improvement is not included in Cost Basis.

Installation: OTIS ANG BASE Instl: SPBN CMD: ANG

Category: 141181 Description: ACFT SHLTR

WOC	CD	C	ABH	Vac	Out	Out	Total	Area	Rent	Rent	Cost	Est
Fac	MD	IN	C	Area	NLS	LS	Area UM	Other UM	Paid	Rec	Basis	Value
							SF					Year
00175	7P3	54	B	0			20598 SF	4 EA	0	0	1056545	0
00175	7P3	54	D	0			17005 SF	4 EA	0	0	0	1953
Total:				0			17005	4			1056545	0
Installation Total					17005 SF		0 SF	0 AC			1056545	0

12-JUL-2005 10:07:06

OTIS ANG BASE

Automated Civil Engineer System

Units: 'M' & 'A' and Cost > 100,000 will NOT show Cost Basis -- Expense Improvement is NOT included in Cost Basis.

Installation: OTIS ANG BASE

Instl: SPBN

CMD: ANG

Category: 141459

Description: READINESS, CRW

ITC	CD	C	AEH	Vac	Out	Out	Total	Area	Rent	Rent	Cost	Est	Year				
Fcd	Nbr	NCD	IN	C	DRD	Area	NLS	LS	Area	UM	Othr	UM	Paid	Rec	Basis	Value	Comp
00175	7P3	54	D		0		3593	SF	4	PN	0	0	0	0	0	0	1953
Total:					0		3593		4				0	0	0	0	
Installation Total						3593	SF		0	SY		0	AC		0	0	

Inventory: 101 101 and Code: 100,000 will not show cost basis -- Expense Improvement is not included in Cost Basis.

Installation: OTIS ANG BASE Instl: SPBN CMD: ANG

Category: 141183 Description: HG, ALERT

Page	MBR	NCD	IN	C	DRD	Area	Vac	Out	NLS	Out	IS	Total	Area	UM	Area	UM	Rent	Paid	Rent	Rec	Cost	Rasis	Est	Year
	00111	IPI	54	A		0						6840	SF								655197	0	2002	
	00112	IPI	54	A		0						6840	SF								655197	0	2002	
	00113	IPI	54	A		0						6840	SF								655197	0	2002	
	00114	IPI	54	A		0						6840	SF								656535	0	2002	
Total:							0					27360									2622126	0		
Installation Total												27360	SF								0	2622126	0	

12-JUL-2005 10:12:44

OTIS ANG BASE

Automated Civil Engineer System

Instl: 'A' & 'N' and Cost = 100,000 will show Cost Basis -- Expense Improvement is NOT included in Cost Basis.

Installation: OTIS ANG BASE

Instl: SPBN

CMD: ANG

Category: 211111

Description: HG MAINT

Fac Nbr	ITC Nbr	CD	C	ABH	Vac	Out	Out	Total	Area	Rent	Rent	Cost	Est	Year
					Area	NLS	LS	Area	Othr	Paid	Rec	Basis	Value	Comp
								UM	UM					
00158	1P3	54	B		0			149498	SF		0	8123107	0	1956
00158	1P3	54	D		0			23453	SF		0	0	0	1956
63170	1P2	69	A		0			47160	SF			8861082	0	1992
Total:					0			70613		0		16984189	0	
Installation Total							70613	SF		0	AC	16984189	0	

12-JUL-2005 10:17:59

OTIS ANG BASE

Automated Civil Engineer System

Im. It: 'P' & 'S' and Cost = 100,000 will NOT show Cost Basis -- Expense Improvement is NOT included in Cost Basis.

Installation: OTIS ANG BASE

Instl: SPBN

CMD: ANG

Category: 217713 Description: ECM POD SHP & STOR

Fac Nbr	ITC	CD	C	AEH	Vac	Out	Out	Total	Area	Rent	Rent	Cost	Est	Year
	NCD	IN	C	DRD	Area	NLS	LS	Area UM	Othr UM	Paid	Rec	Basis	Value	Comp
00158	1P3	54	D		0			16223 SF			0	0	0	1956
Total:					0			16223				0	0	
Installation Total						16223 SF		0 SY	0 AC			0	0	

12-JUL-2005 10:08:31

OTIS ANG BASE

Automated Civil Engineer System

Any del. items with cost > 100,000 will NOT show Cost Basis -- Expense Improvement is NOT included in Cost Basis.

Installation: OTIS ANG BASE

Instl: SPBN

CMD: ANG

Category: 218712

Description: SHP A/SE STOR FCLT

Fac Nbr	ITC NCD	CD IN	C DRD	ABH	Vac Area	Out NLS	Out LS	Total Area	UM	Area Othr	UM	Rent Paid	Rent Rec	Cost Basis	Est Value	Year Comp
00190	1P2	54	A					337	SF			0	0	0	0	1959
00191	1P3	54	A		0			8640	SF			0	0	291953	0	1963
00192	1P2	54	D		0			12598	SF			0		0	0	1959
00192	1P2	54	B		0			18271	SF			0	0	477810	0	1959
Total:					0			21575		0				769763	0	
Installation Total							21575 SF	0 SY		0 AC				769763	0	

12-JUL-2005 10:01:49

OTIS ANG BASE

Automated Civil Engineer System

Fac Nbr 101 and Cost > 100,000 will NOT show Cost Basis -- Expense Improvement is NOT included in Cost Basis.

Installation: OTIS ANG BASE

Instl: SPBN

CMD: ANG

Category: 610811

Description: ADMIN OFC, NON-AF

Fac Nbr	JTC Nbr	CD	C	ABH	Vac Area	Out NLS	Out LS	Total Area	UM	Rent Paid	Rent Rec	Cost Basis	Est Value	Year Comp
00102	7P3	67	A		0			16299	SF	0		140689	0	1963
00110	7P2	67	A		0			2304	SF			0	0	1941
00128	1P3	67	A		0			35785	SF	0	0	784999	0	1955
00158	1P3	74	D		0			813	SF			0	0	1956
00289	7P3	71	A		0			1657	SF	0	0	0	0	1941
00304	7S1	81	A		0			384	SF	0	0	0	0	1990
00306	7S2	81	A		0			3050	SF	0	0	0	0	1941
00650	1P2	7A	A					1524	SF	0	0	0	0	1964
00980	7P2	72	A					739	SF	0	0	0	0	1958
01146	7P2	71	A					1722	SF	0	0	0	0	1941
02410	7P2	7A	A					3130	SF	0	0	114516	0	1961
03137	7P2	4C	A					2000	SF	0	0	0	0	1957
63163	1P2	69	A		0			1920	SF			223642	0	1955
63164	1P2	69	A		0			1920	SF			233472	0	1955
70102	7S3	67	A		0			12304	SF			134023	0	1941
73133	7S2	67	A		0			2266	SF			0	0	1941
73134	7S2	67	A		0			2266	SF			0	0	1941
Total:					0			90083				1631341	0	
Installation Total						90083 SF		0 SY		0 AC		1631341	0	



Otis ANGB, MA Overview

As of	30 Sep 2005	30 Sep 2011
Assigned Weapon System Type(s) (MDS)	F-15	F-15
Total PAA	15	15
# Flying Squadrons	1	1
Total Available Aircraft Parking spaces	99	99
Unused Aircraft Parking Spaces	84	84

Template used	F-15
Standard PAA per squadron	24

Tab 5

Mission	Fighter
Criterion	Condition of Infrastructure
Attribute	Key Mission Infrastructure
Formula #	1232
Label	Sufficient Explosives-sited Parking
Effective %	3.65
Question	<p>List the number of explosives-sited parking spots by MDS (Mission Design Series).</p> <p>If installation has no runway or no active runway, or no serviceable, suitable runway then score 0 pts. See section 1.9 "Shared" for details.</p> <p>Total the number of explosives sited parking spots. See OSD Question 1232, column 2 for this data. (N/A equals 0.)</p> <p>If the total ≥ 47, get 100 points. Otherwise, if the total ≥ 24, get 66 points. Otherwise, if the total ≥ 12, get 33 points. Otherwise, get 0 points.</p> <p>Example: The installation has two listings for explosive sited parking spots, with 5 and 20 respectively, which totals to 25. 25 is between 24 and 47, so the score is 66 points.</p>
Source	AFMAN 91-201, Explosives Safety Standards; Installation Explosives Site Plan

Otis entered 18 explosive loaded sites based on current assigned aircraft and existing explosives site plan. The question did not ask what is the installations capability/capacity for explosive sited parking. Otis has 102 explosives loaded aircraft spots with no waivers or exceptions. This leads to an additional 2.44 points on the MCI score. Map from Tab 4 depicts in excess of 50 of the 102 loadable spots.

Tab 6

Mission	Fighter
Criterion	Condition of Infrastructure
Attribute	Key Mission Infrastructure
Formula #	1233
Label	Sufficient Munitions Storage
Effective %	4.79
Question	<p>List maximum explosive capacity for the installation's hazard classification Class 1.1 munitions storage areas, in pounds. Maximum assumes F-117 18 PAA (GBU-27) and F/A-22 24 PAA (GBU-32 & AIM 120).</p> <p>If installation has no runway or no active runway, or no serviceable, suitable runway then score 0 pts. See section 1.9 "Shared" for details.</p> <p>Otherwise, total the capacity. See OSD question 1233, column 1 for this data. (N/A means 0.)</p> <p>If the total ≥ 45312, get 100 points. Otherwise, if the total ≥ 38520, get 75 points. Otherwise, if the total ≥ 19260, get 25 points. Otherwise, get 0 points.</p> <p>Example: There are two storage areas, with a capacity of 10,000 each, for a total of 20,000. 20,000 is between 19,260 and 38,250, so the score is 25 points.</p>
Source	AFMAN 91-201, Explosives Safety Standards; Installation Explosives Site Plan

This answer to this question is munitions specific. A different answer will apply based on MDS and weapon system. The original answer was based on the approved site plan, which was based on a normal, realistic amount of explosive storage that was not MDS specific. It was not approved based on MDS capacity at the time. The following documentation shows how different munitions will change the final answer. The munitions storage area located at Otis is capable and approved to store HC 1.1 AIM Series Missiles totaling 31,104 lbs of NEW in each of the 40' X 80' Earth Covered Igloo's for a total capacity of 62,208 lbs. This leads to an additional 4.79 points in the MCI. The second two letters break down the maximum storage capacity based on Aim Series designation.



DEPARTMENT OF THE AIR FORCE
102D FIGHTER WING (ACC)
MASSACHUSETTS AIR NATIONAL GUARD
OTIS AIR NATIONAL GUARD BASE MASSACHUSETTS

17 June 2005

MEMORANDUM FOR RECORD

FROM 102ND Fighter Wing Safety Office
158 Reilly St., Box 15
Otis ANGB, MA. 02542-1330

SUBJECT: Sufficient Munitions Storage, Otis ANGB

1. The maximum explosive capacity hazard classification 1.1 by missile system, in pounds, without waivers.
2. AFMAN 91-201, par. 3.34, Explosive Safety Standards gives detailed guidance in the proper storage of AIM Series Missiles and adding the total hazard classification 1.1, in pounds. Testing has been completed and proven that detonation of warheads in All Up Round Containers (AURC's) will not propagate to any adjacent container either vertically or horizontally. Therefore, Maximum Credible Event (MCE) would be one AURC of four missiles when calculating Inhabited Building Distance / Quantity Distance (IBD / QD). The 40' X 80' Earth Covered Igloo's were built for the purpose to store AIM Series Missiles Hazard Class 1.1 to their physical capacity and at the same time comply with all site planning requirements.
3. The 102nd Fighter Wing is capable and is approved to store HC 1.1 AIM Series Missiles totaling 31,104 lbs in each of the 40' X 80' Earth Covered Igloo's.

//signed//

JOHN V. NOLAND, SMS, MA ANG
Ground/Explosive Safety Manager



DEPARTMENT OF THE AIR FORCE
102D FIGHTER WING (ACC)
MASSACHUSETTS AIR NATIONAL GUARD
OTIS AIR NATIONAL GUARD BASE MASSACHUSETTS

17 June 2005

MEMORANDUM FOR RECORD

FROM 102ND Fighter Wing Safety Office
158 Reilly St., Box 15
Otis ANGB, MA. 02542-1330

SUBJECT: AIM Series Missile break down

1. AIM-7 with WAU-17 warhead (36 lbs)

- 144 lbs per container
- 216 AURC's in each igloo stacking them 6 high
- 31,104 lbs in each igloo
- AURC dimensions
 - 15' long X 3'.75' wide X 1'.7 high

2. AIM-7 with WAU-10 warhead (26 lbs)

- 104 lbs per container
- Same AURC used as above
- 22,464 lbs in each igloo

3. AIM-9X Missile, warhead (7.9 lbs)

- 31.6 lbs per container
- 200 AURC's in each igloo stacking them 5 high
- 6,320 lbs in each igloo
- AURC dimensions
 - 11'.5 long X 3'.5 wide X 1'.9 high

//signed//

JOHN V. NOLAND, SMS, MA ANG
Ground/Explosive Safety Manager



DEPARTMENT OF THE AIR FORCE
102D FIGHTER WING (ACC)
MASSACHUSETTS AIR NATIONAL GUARD
OTIS AIR NATIONAL GUARD BASE MASSACHUSETTS

30 June 2005

MEMORANDUM FOR RECORD

FROM 102ND Fighter Wing Safety Office
158 Reilly St., Box 15
Otis ANGB, MA. 02542-1330

SUBJECT: Sufficient Munitions Storage for HC/D 1.2.1 AIM-120 Missile System

1. The maximum explosive capacity hazard classification 1.2.1 AIM-120 Missile System that can be stored at Otis Air National Guard Base, without waivers is 27,000 lbs.

2. The 102nd Fighter Wing is capable of storing the munitions specific assets in the following approved munitions storage facilities:

A. 2 each 40' X 80' Earth Covered Igloo's for a total Net Explosive Weight (NEW) of 12,000 lbs.

B. 5 each Above Ground Unbarricaded, ADC-Multicubical Magazines (30 cells) Type II ADC, Drawing #AD 33-13-20R2 for a total NEW of 15,000 lbs.

(1) The procedure will be to physically pull the AIM-120 out of its ALL UP Round Container (AURC), which will turn the munitions item to HC/D 1.1.

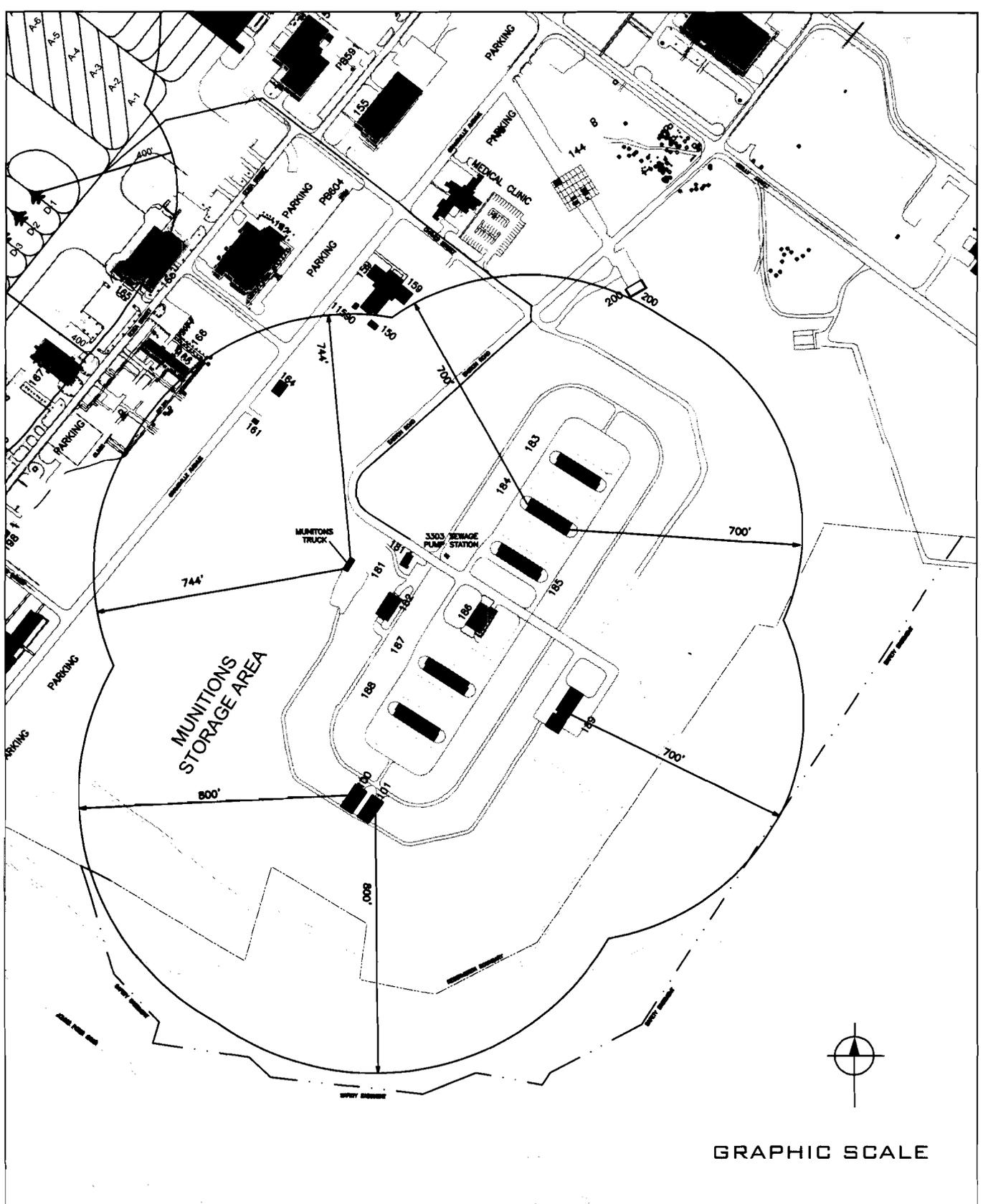
(2) AIM-120's will be placed on storage stands inside each cell not to exceed 100 lbs.

a) 1 Above Ground Multicubical Magazines with 30 cells is capable of storing 3,000 lbs.

b) 5 Magazines for a total of 15,000 lbs.

//signed//

JOHN V. NOLAND, SMS, MA ANG
Ground/Explosive Safety Manager



OTIS AIR NATIONAL GUARD BASE
EXPLOSIVE SAFETY MAP

Tab 7

Mission	Fighter						
Criterion	Condition of Infrastructure						
Attribute	Operating Areas						
Formula #	1203						
Label	Access to Adequate Supersonic Airspace						
Effective %	6.72						
Question	<p>Identify special use airspace that is suitable for supersonic training.</p> <p>If installation has no runway or active runway, or no serviceable, suitable runway then score 0 pts. See section 1.9 "Shared" for details.</p> <p>Otherwise, score each special use airspace suitable for supersonic training according to the following formula and return the single highest score.</p> <table border="0"> <tr> <td>% of Score</td> <td>Category</td> </tr> <tr> <td>50</td> <td>Operating Hours</td> </tr> <tr> <td>50</td> <td>Size</td> </tr> </table> <p>For Operating Hours:</p> <p>A supersonic special use airspace gets 100 points if it is available for use 24 hours a day and 0 points if it is unavailable for use. (N/A means unavailable for use.) For operating hours between those two boundaries, pro-rate the score linearly. See OSD question 1276, column 2 for this data.</p> <p>For Size:</p> <p>If the supersonic special use airspace is at least 150 nautical miles (NM) by 80 NM in size, and has an altitude block \geq 30,000, get 100 points. See OSD question 1276, column 7 for this data. (N/A means no.)</p> <p>Otherwise, if it is at least 100 NM by 60NM and has an altitude block \geq 30,000', get 80 points. See OSD question 1276, column 6 for this data. (N/A means no.)</p> <p>Otherwise, if it is at least 100 NM by 50 NM and has an altitude block \geq 30,000', get 60 points. See OSD question 1276, column 5 for this data. (N/A means no.)</p> <p>Otherwise, if it is at least 80 NM by 40 NM and has an altitude block \geq 30,000', get 40 points. See OSD question 1276, column 4 for this data. (N/A means no.)</p> <p>Otherwise, if it has an airspace volume \geq 2,100 NM squared and an</p>	% of Score	Category	50	Operating Hours	50	Size
% of Score	Category						
50	Operating Hours						
50	Size						

	<p>altitude block $\geq 20,000'$, get 20 points. See OSD question 1276, column 3 for this data. (N/A means no.)</p> <p>Otherwise, get 0 points.</p> <p>Example: A supersonic special use airspace is listed under OSD question 1276. It has an airspace of 105 NM by 61 NM in size, with an altitude block of 32,000'. That airspace is available for use 18 hours a day.</p> <p>(80 points for 100 NM by 60 NM, 30,000' altitude block airspace * 50%) + (75 points for 18 hours of use / (difference between 24 hours and 0 hours)) * 50%),</p> <p>This equates to 40 size points + 37.5 operating hours points = 77.5 points for this special use airspace. The overall score is the highest score received by any one special use airspace at the installation.</p>
Source	DoD #1203; Digital Aeronautical Flight Information Files (DAFIF), 30 Sep 04; FAA ATCAA Database

Using the referenced algorithm and stated data files, the score listed for Otis is incorrect. The formula uses data from OSD Question 1276:

Section 1 Air/Space Operations, Question 1276 Airspace Attributes - Supersonic

Org	1 Airspace Designat or (Text)	2 Operatin g Hours (Hr)	3 Airspace Volume					8 Not used. (Yes/No)
			>=2,100N M squared and 20,000' altitude block (Yes/No)	4 At least 80NM x 40NM and altitude block >=30,000' (Yes/No)	5 At least 100NM x 50NM and altitude block >=30,000' (Yes/No)	6 At least 100NM x 60NM and altitude block >=30,000' (Yes/No)	7 At least 150NM x 80NM and altitude block >=30,000' (Yes/No)	
27	W105	24	Yes	Yes	Yes	Yes	No	N/A
27	W106	24	No	No	No	No	No	N/A

The file lists W105 with a max block of 100NMx60NM which translates into 80 points. The operating hours translates into 100 points. The formula results in 90 points out of a hundred for this algorithm. When weighted, this results in 6.048 points, an increase of 3.358 over the posted score.

Tab 8

Mission	Fighter
Criterion	Condition of Infrastructure
Attribute	Operating Areas
Formula #	1266
Label	Range Complex (RC) Supports Mission
Effective %	11.95
Question	<p>If installation has no runway or no active runway, or no serviceable, suitable runway then score 0 pts. See section 1.9 "Shared" for details.</p> <p>All airspace over 150 Nautical Miles (NM) away will be ignored. See OSD # 1245, column 2. (N/A means more than 250 NM.) Data is in OSD #s 1266, 1245 and 1274 must be matched via column 1 in each question.</p> <p>Calculate each of the subcategories scores listed below, and weight as listed.</p> <ul style="list-style-type: none"> 15% Airspace Volume (AV) 15% Operating Hours (OH) 10% Scoreable Range (SR) 11.25% Air to Ground Weapons Delivery (AGWD) .75% Low Angle Strafe (LA) 3% Live Ordnance (LO) 5% IMC Weapon Release (IW) 10% Electronic Combat (EC) 10% Laser Use Auth. (LU) 10% Lights Out Capable (LC) 5% Flare Auth. (FA) 5% Chaff Auth. (CA) <p>Each of the subcategories use the following general pattern for calculating them:</p> <p>Compute a raw total for the base by following the instructions for the respective subcategory total.</p> <p>Find the highest, and the lowest, non-zero raw total for the subcategory across all bases.</p> <p>If the raw total = 0, that subcategory score = 0.</p> <p>Else, if the raw total = the highest raw total, the subcategory score = 100.</p> <p>Else, if the raw total = the lowest, non-zero raw total, the subcategory score = 10.</p> <p>Else, pro-rate the raw total between the lowest non-zero score and the highest score on a 10 to 100 scale.</p> <p>Once each score for each subcategory is known, multiply them by their respective weighting percentage and total the results for the overall score.</p>

AV Raw Total:

Get AV for the pts. See OSD # 1277, column 1. (N/A means 0.)

OH Raw Total:

Sum the pts for each airspace:

If the OH < 1 or = N/A, get 0 pts. See OSD # 1266, column 2.

Else, if the OH = 1 or IMTMT or INTMT, get 10 pts.

Else, if the OH = 24 or NOTAM, get 100 pts.

Else, pro-rate the OH between 0 and 24 on a 10 to 100 point scale.

SR Raw Total:

Sum the pts for each airspace:

If the SR = Yes, get 100 pts. See OSD # 1266, column.3.

Else, get 0 pts.

AGWD Raw Total:

Sum the pts for each airspace:

If the AGWD = Yes, get 100 pts. See OSD # 1266 column 4.

Else, get 0 pts.

LA Raw Total:

Sum the pts for each airspace:

If the LA = Yes, get 100 pts. See OSD # 1266 column 5.

Else, get 0 pts.

LO Raw Total:

Sum the pts for each airspace:

If LO = Yes, get 100 pts. See OSD # 1274, column 5.

Else, get 0 pts.

IW Raw Total:

Sum the pts for each airspace:

If IW = Yes, get 100 pts. See OSD # 1266, column 6.

Else, get 0 pts.

EC Raw Total:

Sum the pts for each airspace:

If EC = Yes, get 100 pts. See OSD # 1266, column.7.

Else, get 0 pts.

LU Raw Total:

Sum the pts for each airspace:

If LU = Yes, get 100 pts. See OSD # 1266, column 8.

Else, get 0 pts.

LC Raw Total

	<p>Sum the pts for each airspace: If LC = Yes, get 100 pts. See OSD # 1266, column 9. Else, get 0 pts.</p> <p>FA Raw Total Sum the pts for each airspace: If FA = Yes, get 100 pts. See OSD # 1274, column 3. Else, get 0 pts.</p> <p>CA Raw Total Sum the pts for each airspace: If CA = Yes, get 100 pts. See OSD # 1274, column 4. Else, get 0 pts.</p> <p>Example: AV = 20,000, get 20,000 pts; 10.</p> <p>There are two airspaces within 150 NM, and they both have these characteristics (which means their raw totals will be double the number of pts listed) followed by the lowest non-zero and highest raw totals across all bases and subcategory scores.</p> <p>OH = NOTAM, get 100 pts; 20,000 to 150,000 pts; 10. SR = Yes, get 100 pts; 200 to 500 pts; 10. AGWD = No, get 0 pts; 200 to 1000 pts; 10. LA = No, get 0 pts; 200 to 1000 pts; 0. LO = Yes, get 100 pts; 500 to 1000 pts; 10. IW = N/A, get 0 pts; 200 to 2000 pts; 0. EC = N/A, get 0 pts; 200 to 1000 pts; 0. LU = Yes, get 100 pts; 100 to 1000 pts; 20. LC = Yes, get 100 pts; 200 to 1000 pts; 10. FA = No, get 0 pts; 100 to 1000 pts; 0. CA = No, get 0 pts; 100 to 1000 pts; 0. Weighted, the overall score = 8.425 pts.</p>
Source	FLIP AP-1A; Falcon View or other certified flight planning software

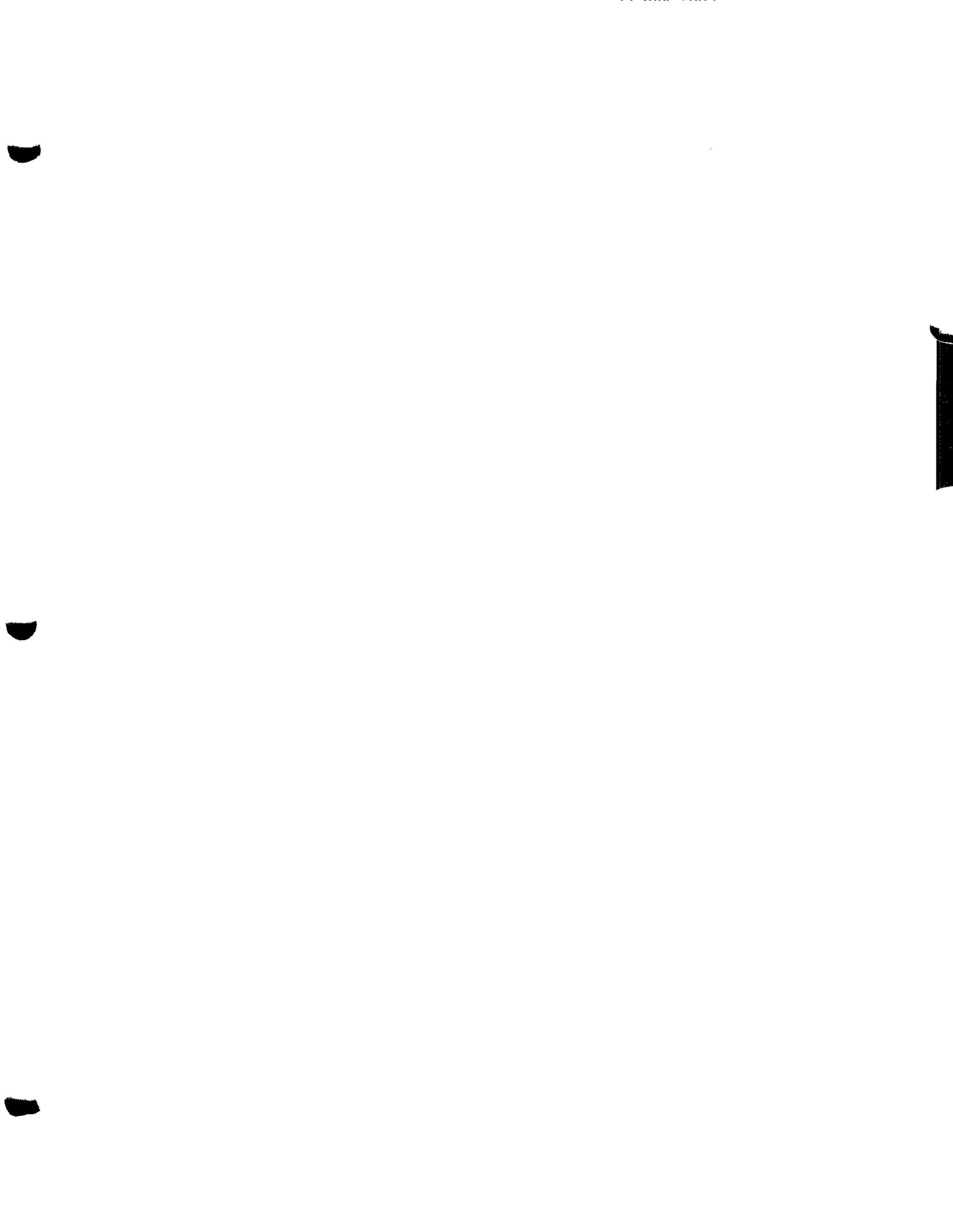
We re-created this formula using ArcGIS and Excel using the stated algorithms. Although we could replicate the example with our program, we could not duplicate the scores posted for this question. Therefore, we could not calculate the exact increase to the posted score. The three additional airspaces drive our overall rank for airspace volume (AV) to number one. Adding the three additional airspaces and correcting faulty airspace attribute data could lead to an increase as high as 2 points. We did not receive full credit for this question and it is NOT reflected in our recalculated MCI.

Tab 9

Mission	Fighter
Criterion	Contingency, Mobilization, Future Forces
Attribute	Mobility/Surge
Formula #	1241
Label	Ability to Support Large-Scale Mobility Deployment
Effective %	1.76
Question	<p>State installation's parking MOG for C-17 equivalents using surveyed/approved transient parking ramps.</p> <p>If installation has no runway or no active runway, or no serviceable, suitable runway then score 0 pts. See section 1.9 "Shared" for details.</p> <p>Otherwise, total the number of C-17 equivalents the installation transient ramp can hold. See OSD question 1241, column 1 for this data. (N/A equals 0.)</p> <p>If the total ≥ 6, get 100 points. Otherwise, if the total ≥ 4, get 75 points. Otherwise, if the total ≥ 2, get 25 points. Otherwise, get 0 points.</p> <p>Example:</p> <p>The installation transient ramp can hold 5 C-17 equivalents. 5 is between 4 and 6, so the score is 75 points.</p>
Source	ASR (Airfield Suitability Report)

Otis listed the ability to park three C-17s in the original data call. However, this was based on transient parking in a designated small area of the F-15 main ramp. It did not take into consideration the two other serviceable ramps at Otis.

Using all available serviceable ramps, Otis can park in excess of eight C-17s. The attached map (Diagram 1, Tab 4) shows the layout meeting all airfield-parking criteria. This leads to an additional 1.32 points in our MCI score.



MCI Flawed Methodology Analysis

20 July 2005

OSD Formula 1245: Proximity to Airspace Supporting Mission (22.08% of total MCI). In general, there are several aspects to this question/algorithm that are flawed:

1. The OSD range database was inaccurate/incomplete. Large amounts of military training airspaces were not evaluated in the MCI.
2. Quantity of airspaces within 150NM severely skews results.
3. Airspace saturation (density/scheduling) was not used as a metric
4. Airspaces that are too small for aircraft operation are included in analysis with same exact weighting for 11 of 12 attributes (85% of score).
5. Inconsistent sectoring of airspace (affects quantity of airspaces and significantly effects final score). Segmented airspaces artificially boost number of airspaces since airspaces are scored in an additive manner for each sub-category.
6. Operating hours were not tied to proximity (i.e. only had to be open 1 hr to get full credit for the proximity). Operating Hours are not meaningful for this equation as 1 hr is equivalent to 24 hrs
7. Airspace Volume (15%) Individual airspace volumes are not scored by proximity, only by total volume

Overview of 1245 algorithm. Before discussing the flaws in the algorithm, it is important to fully understand the algorithm. Following is a brief synopsis of the algorithm for OSD question 1245 developed after discussions with Mr. Dave Wendlekin of SAF/IEB and *Department of the Air Force Analysis and Recommendations BRAC 2005, Volume V, Part 2 of 2*:

The algorithm lays out weights (percentages) for each of the 12 airspace attributes (the term sub-category will be used interchangeably). These come from four separate data files; ASOPS 1245 (includes the distance to airspace information), Range Attribute 1274 and Range Attribute 1266 (includes the attribute data), and the total volume from 1277. The airspace designator must match across all three data files. All airspaces over 150 NM are thrown out.

The Airspace Volume (15%) is the combined volume for all airspaces used within 150 Nm (Range Attribute 1277). We cannot determine OSD's source documentation for individual airspaces. The total volume for each base is compared to all other bases. The highest base gets 100 points, the lowest non-zero base gets 10 points, all other bases pro-

rated on a 10 to 100 scale. This number is subsequently multiplied by the relative attribute weighting (15%).

The next attribute is Operating Hours (15%). All airspaces that are open for 1 hour are given a proximity score based on a formula; 100 points for 50NM or less, 10 points for 150 NM, and prorated for anything in between. For example, if a range was open at least 1 hour and was 100 NM miles away, a proximity score of 55 points is scored for that airspace, for that attribute. Next, all Operating Hour proximity scores for each airspace for a particular base are summed. The quantity of individual airspaces drives the amount of points awarded. Once this is done, the base with the highest point total in this particulate attribute (operating hours) received 100 points, the base with the lowest non-zero total received 10, all others prorated from 10 to 100. Lastly, the operating hour proximity score is weighted by the listed percentage, in this case 15%.

All the remaining 10 attributes are yes/no answers and are scored the same. If a yes is listed for a particular airspace attribute, the proximity score for that particular airspace attribute is entered. The scores for a particular attribute for each airspace are added and the base with the highest total in that sub-category receives 100 points, the base with the lowest non-zero receives 10, all others prorated in between. Finally, the base score for this attribute is multiplied by the weight. This is repeated for all 10 airspace attributes.

1245 Flaws: Now that the methodology for the algorithm is understood, the specific problems can be discussed in more detail.

1. The OSD range database was inaccurate/incomplete. Large amounts of military training airspaces were not evaluated in the MCI.

All airspaces used in the MCI calculations were determined at the OSD level. The listing was inaccurate and incomplete. OSD's database does not account for local base FAA letters of agreement. The GAO noted the lack of a sufficient database in their report to congress on ranges:

“OSD's training range inventory does not yet contain sufficient information to use as a baseline for developing the comprehensive training range plan required by section 366. As a result, OSD's training range report does not lay out a comprehensive plan to address training constraints caused by limitations on the use of military lands, marine areas, and air space that are available in the United States and overseas for training. OSD's training range inventory does not fully identify available training resources, specific capacities and capabilities, and existing training constraints caused by encroachment or other factors to serve as the baseline for the comprehensive training range plan.” *June 2004, DOD Report on Training Ranges, GAO-04-608*

The three databases reveal numerous inconsistencies in both listed ranges and the individual attribute data for the listed ranges. Specifically for Otis, there were 10

airspaces within 150 NM that were listed on datafile ASOPS 1245 but not on Range Attribute 1266 and 1274 datafiles, therefore not scored.
 Excerpt from data file (01_asops_01245_as_distas.xls)

27 AKS 1 ATCAA	209
27 AKS 2 ATCAA	191
27 AKS 3 ATCAA	265
27 AKS 4 ATCAA	280
27 AKS 5 ATCAA	203
27 CHESSIE A ATCAA	276
27 KINZUA CHARLIE ATCAA	271
27 LASER EAST ATCAA	119
27 LASER NORTH ATCAA	123
27 LASER SOUTH ATCAA	97
27 LASER WEST ATCAA	141
27 MAC 12 ATCAA	136
27 MAC 13 ATCAA	130
27 MISTY 2 ATCAA	295
27 MISTY 3 ATCAA	292
27 MOT A ATCAA	46
27 MOT B ATCAA	48
27 MOT C ATCAA	61
27 MOT D ATCAA	53
27 SCOTY A ATCAA	175
27 SCOTY B ATCAA	189
27 SCOTY C ATCAA	161

The missing airspaces for Otis are ATCAAs. Further analysis of the databases reveals 286 individual ATCAAs listed on the data file *ASOPS 1245* that could have been scored. Of those 286 ATCAAs, only 91 show up on the attribute data files (Range Attribute 1266 and 1274). Recall that to receive credit for a range, the range must show up on all three datafiles. Therefore only 91 of the 286 ATCAAs are scored. This translates into 109 bases receiving varying amount of credit for ATCAAs and 45 bases (including Otis) not receiving credit for ANY ATCAAs.

There were also key missing data points within the airspace attribute data files. In particular, the following highlighted areas were listed incorrectly in the data files and are updated to reflect correct values.

Org	1 Airspace Designator (Text)	From Datafile 1274				From Datafile 1266						From Datafile 1245		
		2 Airspace Volume: at least 2,100NM cubed; altitude block >=20,000' (Yes/No)	3 Flare (Yes/No)	4 Chaff (Yes/No)	5 Live Ordnance (Yes/No)	2 Operating Hours (#)	3 Scoreable range complex es/target array (Yes/No)	4 Air to Ground Weapons Delivery (Yes/No)	5 Low Angle Strafe Authorized (Yes/No)	6 IMC weapons release (Yes/No)	7 Electronic Combat (Yes/No)	8 Laser Use Authorized (Yes/No)	9 Lights-Out Capable (Yes/No)	2 Distance to Airspace/Route (NM)
27 R4101	No	N/A	N/A	No	12	No	No	No	No	No	N/A	No	N/A	2
27 R4105A	No	N/A	N/A	No	16	No	No	No	No	No	No	No	No	24
27 R4105B	No	N/A	N/A	No	16	No	No	No	No	No	No	No	No	24
27 W105A	Yes	Yes	Yes	No	24	No	No	No	No	No	No	Yes	24	33
27 W104A	No	Yes	Yes	No	24	No	No	No	No	No	No	Yes	50	50
27 W104B	No	Yes	Yes	No	24	No	No	No	No	No	No	Yes	62	62
27 W506	Yes	Yes	Yes	No	24	No	No	No	No	No	No	Yes	62	62
27 W103	No	Yes	Yes	No	24	No	No	No	No	No	No	Yes	64	64
27 R4102A	No	N/A	N/A	No	14	No	No	No	No	N/A	No	N/A	70	70
27 R4102B	No	N/A	N/A	No	14	No	No	No	No	N/A	No	N/A	70	70
27 W106B	No	Yes	Yes	No	24	No	No	No	No	No	No	Yes	87	87
27 W102H	Yes	Yes	Yes	No	24	No	No	No	No	No	No	N/A	97	97
27 W102L	No	Yes	Yes	No	24	No	No	No	No	No	No	Yes	97	97
27 W106A	No	Yes	Yes	No	24	No	No	No	No	No	No	Yes	113	113
27 W105B	No	Yes	Yes	No	24	No	No	No	No	No	No	Yes	123	123
27 YANKEE 1 MOA	No	Yes	No	No	12	No	No	No	No	No	No	Yes	126	126
27 YANKEE 2 MOA	No	Yes	No	No	12	No	No	No	No	No	No	Yes	126	126
27 W106C	No	Yes	Yes	No	24	No	No	No	No	No	No	Yes	130	130
27 W106D	No	Yes	Yes	No	24	No	No	No	No	No	No	Yes	143	143
27 LASER NORTH ATCAA	Yes	Yes	No	No	14	No	No	No	No	No	No	Yes	123	123
27 LASER SOUTH ATCAA	Yes	Yes	No	No	14	No	No	No	No	No	No	Yes	97	97
27 LASER EAST ATCAA	Yes	Yes	No	No	14	No	No	No	No	No	No	Yes	119	119
27 LASER WEST ATCAA	Yes	Yes	No	No	14	No	No	No	No	No	No	Yes	141	141
27 MOT A ATCAA	Yes	Yes	Yes	No	24	No	No	No	No	Yes	No	Yes	46	46
27 MOT B ATCAA	Yes	Yes	Yes	No	24	No	No	No	No	Yes	No	Yes	48	48
27 MOT C ATCAA	Yes	Yes	Yes	No	24	No	No	No	No	Yes	No	Yes	61	61
27 MOT D ATCAA	Yes	Yes	Yes	No	24	No	No	No	No	Yes	No	Yes	53	53
27 MAC 12 ATCAA	Yes	Yes	Yes	No	14	No	No	No	No	No	No	Yes	136	136
27 MAC 13 ATCAA	Yes	Yes	Yes	No	14	No	No	No	No	No	No	Yes	130	130

2. *Quantity of airspaces within 150NM severely skews results.*

Since the airspace attributes are additive for a particular base, the more airspaces a base is near, the greater number of points will be accumulated. For example, a base within 50NM of 20 airspaces would get four times more credit than a base within 50NM of 5 airspaces. This favors bases located in a heavily populated military training area, and is not indicative of the quality of training available. Langley AFB is within 150NM of 85 ranges and their score was 20.58 out of 22.08 or 93%. Otis had 19 ranges within 150NM and scored 3.83 out of 22.08 or 17.3%. The percent differences in score are very similar to the percent difference in the number of ranges. In reality, due to the number of military installations training in that geographic area, air traffic congestion and range saturation are very real issues that hinder training. Otis, on other hand, has unlimited access to their airspaces. The quality and expansiveness of a single large airspace was scored the same as small postage sized ranges.

3. *Airspace saturation (density/scheduling) was not used as a metric.*

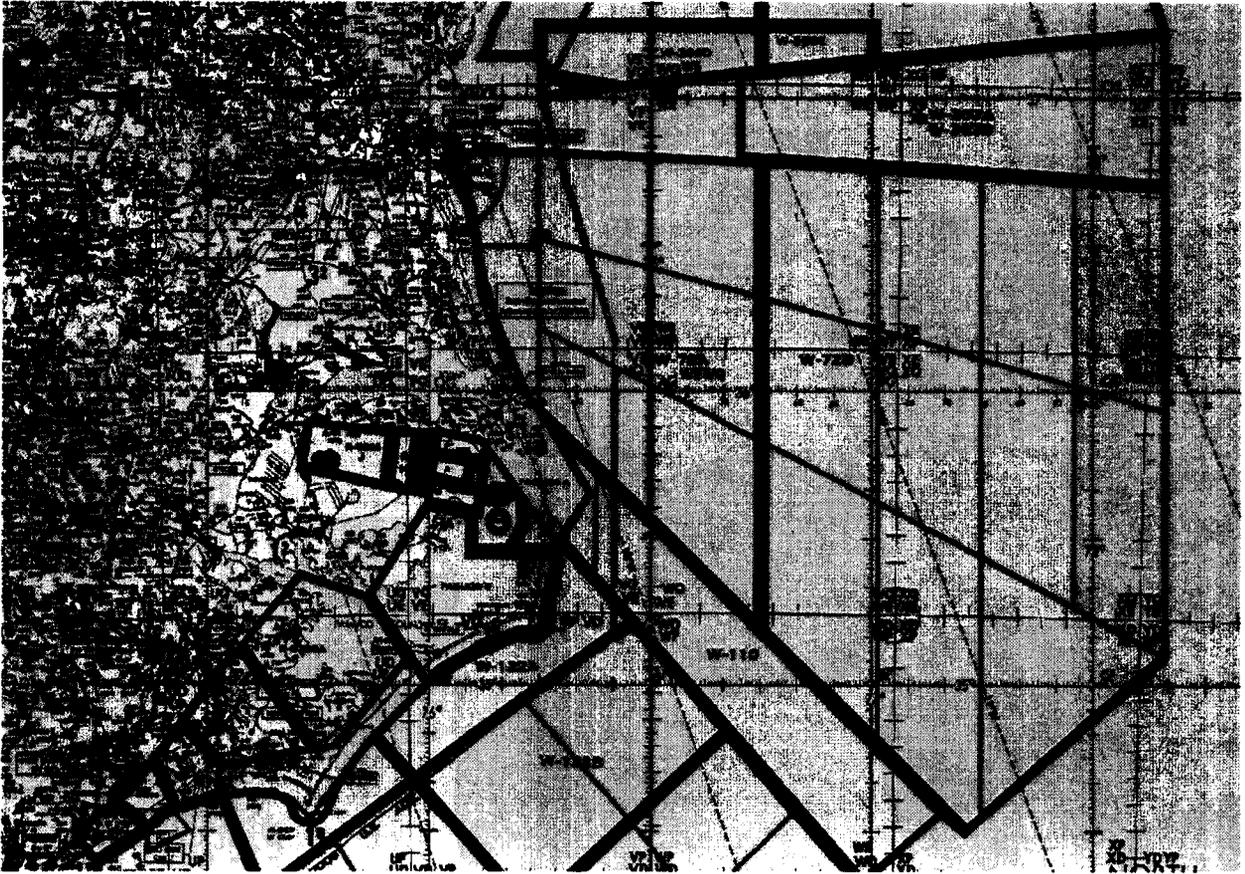
As previously stated, there is no allowance for airspace saturation in the calculations. These are important factors in determining the training capabilities of a base yet there is no mention of this attribute in the scoring. Other Guard units have raised this issue during the regional hearings.

4. *Airspaces that are too small for aircraft operation are included in analysis with same exact weighting for 11 of 12 attributes (85% of score).*

All airspaces, regardless of size, were treated equally for 11 of the 12 subcategories. Airspace volume was a cumulative value by base (i.e. one number) and couldn't be broken down. For example, Langley received separate credit for Camp Lejeune ranges R5306A, R5306C, and R5306D, which ranged from 4 NM² to 24 NM². These areas are too small to operate an F-15 or F-22, yet they received maximum credit across all subcategories. This severely overstates the value of their nearby ranges and their score reflects this.

5. *Inconsistent sectoring of airspace (affects quantity of airspaces and significantly affects final score). Segmented airspaces artificially boost number of airspaces since airspaces are scored in an additive manner for each sub-category.*

There are numerous examples of ranges being divided into sectors with each sector representing it's own airspace. For example, W72 (in the following picture) is broken down into 16 separate sectors, each sector showing up as an individual airspace. Since the weighting is equal for every airspace, this artificially distorts the score. Subcategory scores were increased 16 fold in this case. For example, if the airspace was Lights Out Capable, it should have accumulated 100 points. But being sectored, it now scores 1,600 points for the same airspace. In Langley's case, this happens often. In fact, 13 airspaces turn into 61 airspaces due to sectoring. Since all airspaces carry the same weight, the artificial quantity drives Langley to a 93% score in formula 1245. Simply, more airspaces equates to a higher score. It is interesting to note that OSD's own report (366 Report to Congress, Feb 04) lists W72 as 3 airspaces, yet it is credited with 16 in the MCI database.



W72 Sectored Airspaces

6. *Operating hours not tied to proximity (i.e. only had to be open 1 hr to get full credit for the proximity). Operating Hours are not meaningful for this equation as 1 hr is equivalent to 24 hrs*

This is worth 15% of total score in Formula 1245, yet an airspace only had to be open for 1 hr to receive full proximity credit. If two airspaces were the same distance from an installation, with one being opened 1 hour and the other for 24 hours, they would receive the same exact credit. This turns 15% of the score into a meaningless metric. Again, the quantity of airspaces is extremely important and a bases score would be artificially inflated regardless of actual operating hours.

7. *Airspace Volume (15%) Individual airspace volumes are not scored by proximity, only by total volume*

The Airspace Volume for this formula comes from data file 1277. It lists the total cumulative volume of airspace for each installation. Since this is not broken down into individual volumes, they can't be scored for proximity. For example, two airspaces with the same volume, one being 150 NM away and the other 50NM away would have the exact same effect on the final score.

OSD Formula 1266 (11.95% of MCI score): This formula follows the exact same methodology as Formula 1245, but instead of putting a proximity score in the matrix, it uses 100 points or 0 points for yes and no answers respectively for each subcategory. For operating hours, the total hours are cumulative. The airspace volume is treated the exact same way as in OSD Formula 1245.

Overall, this formula has exactly the same inherit flaws as OSD Formula 1245. With regards to number of airspaces greatly affecting the final score, it is actually more flawed than formula 1245. In formula 1245, a proximity score was entered into the matrix if a particular attribute had a yes, but in formula 1266, a yes value results in a 100 being entered into the matrix. This actually distorts the quantity of airspace flaw even further as bases with numerous airspaces are now getting full credit for each 'yes' in an attribute, whereas in 1245 they only get the proximity score (between 10 - 100 points).

Following the example in the guidance provided by OSD (*Department of the Air Force Analysis and Recommendations BRAC 2005, Volume V, Part 2 of 2*), our program would replicate the correct answer. However, the output from the program using the OSD data files did not replicate the actual reported scores. One of two things is true in this case; OSD didn't release all the components of the scoring or their scores are erroneous (i.e. flaw in their computer program/algorithm).

OSD Formula 1271 Prevailing Weather Conditions (5.52% of MCI): This question brought up concerns over the usefulness of the parameters (3000' ceiling and 3 NM visibility), source documentation and the actual number of days for Otis that showed up in the data file 1271. We were listed as having 249 days a year matching those criteria. However, when we ran the numbers from the listed data source (AFCCC) using the same time period, our numbers were different. This prompted us to contact the AFCCC to validate or clear up the error. The following email correspondence points out that the AFCCC was not asked to run the information for the 3000', 3NM parameter. We are not sure who provided the data in this case.

-----Original Message-----

From: Murphy John D Col AF/XOO-W [mailto:johnd.murphy@pentagon.af.mil]
Sent: Friday, July 01, 2005 2:37 PM
To: LeFavor, James, Lt Col, 101 FS/CC, 4386
Cc: Falvey Robert LtCol AFCCC/DO
Subject: RE: Weather data request

Flav

Here's what was entered for Otis into BRAC process:

During Data Call 09, was asked for <1000/3 (% of time) and X-wind >or=15kts (% of time)
Otis 24.3 15.2

Another earlier data call asked for % of time <1500/3 during Day/Night
Otis 23.7/24.4

Was never asked for 3000/3 info. Complained entire time that questions weren't entirely sound meteorological questions but could never get to source. If you need 3000/3 data or more climatological data, Lt Col Falvey should be able to provide. Thanks

v/r
jdm

-----Original Message-----

From: LeFavor, James, Lt Col, 101 FS/CC, 4386
[mailto:james.lefavor@MAOTIS.ANG.AF.MIL]
Sent: Friday, July 01, 2005 12:53 PM
To: RSS dd - WSO BRAC Clearinghouse
Cc: Murphy John D Col AF/XOO-W; Falvey Robert LtCol AFCCC/DO; Schiavi,
Anthony, E, Col, 102FW/CV, 4667
Subject: Weather data request

OSD Clearinghouse,

A request for data on OTIS ANGB climatology from AFCCC is pending your approval.

The specific request is for a Climatic Brief (time period: 1 Jan 1973 to 31 Dec 2003) identifying average annual number of days of ceilings less than 3000ft and/or visibility less than 3 miles.

Any questions, please contact me.

Jim "Flav" LeFavor, LTC, MAANG
Commander, 101 FS
DSN 557-4385

GAO

June 2004

MILITARY TRAINING

DOD Report on Training Ranges Does Not Fully Address Congressional Reporting Requirements





Highlights of GAO-04-608, a report to congressional committees

MILITARY TRAINING

DOD Report on Training Ranges Does Not Fully Address Congressional Reporting Requirements

Why GAO Did This Study

Section 366 of the National Defense Authorization Act for Fiscal Year 2003 required the Secretary of Defense to develop a report outlining a comprehensive plan to address training constraints caused by limitations on the use of military lands, marine areas, and air space that are available in the United States and overseas for training. The foundation for that plan is an inventory identifying training resources, capacities and capabilities, and limitations. In response to section 366, this report discusses the extent to which (1) the Office of the Secretary of Defense's (OSD) training range inventory is sufficient for developing the comprehensive training range plan and (2) OSD's 2004 training range report meets other requirements mandated by section 366.

What GAO Recommends

GAO recommends that OSD develop an integrated training range database that identifies available training resources, capacities and capabilities, and training constraints caused by encroachment and other factors; and makes several recommendations to enhance DOD's responsiveness to the legislative requirements. DOD disagreed with GAO's findings and three of its four recommendations. After reviewing DOD's comments, GAO continues to believe its recommendations are still valid.

What GAO Found

OSD's training range inventory does not yet contain sufficient information to use as a baseline for developing the comprehensive training range plan required by section 366. As a result, OSD's training range report does not lay out a comprehensive plan to address training constraints caused by limitations on the use of military lands, marine areas, and air space that are available in the United States and overseas for training. First, OSD's training range inventory does not fully identify available training resources, specific capacities and capabilities, and existing training constraints caused by encroachment or other factors to serve as the baseline for the comprehensive training range plan. Second, OSD and the services' inventories are not integrated, readily available, or accessible by potential users so that commanders can schedule the best available resources to provide the required training. Third, OSD's training range report does not include a comprehensive plan with quantifiable goals or milestones for tracking planned actions to measure progress, or projected funding requirements needed to implement the plan. Instead, the report provides the current status of the four services' various sustainable range efforts in the United States, which if successful, overtime should provide a more complete picture of the magnitude and impact of constraints on training.

OSD's training range report does not fully address other requirements mandated by section 366. For example, the report does not:

- Fully assess current and future training range requirements.
- Fully evaluate the adequacy of current resources to meet current and future training range requirements in the United States and overseas.
- Identify recommendations for legislative or regulatory changes to address training constraints, even though the Department of Defense (DOD) submitted legislative changes for congressional consideration on April 6, 2004.
- Contain plans to improve readiness reporting.

www.gao.gov/cgi-bin/getrpt?GAO-04-608.

To view the full product, including the scope and methodology, click on the link above. For more information, contact Barry W. Holman at (202) 512-8412 or holmanb@gao.gov.

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Abbreviations

DOD	Department of Defense
OSD	Office of the Secretary of Defense

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United States General Accounting Office
Washington, DC 20548

June 4, 2004

Congressional Committees

For some time, senior Department of Defense (DOD) and military service officials have reported that they face increasing difficulties in carrying out realistic training at military installations due to training constraints, such as those resulting from encroachment.¹ Title III, section 366 of the Bob Stump National Defense Authorization Act for Fiscal Year 2003, dated December 2, 2002,² required that the Secretary of Defense develop a comprehensive plan for using existing authorities available to the Secretaries of Defense and the military services to address training constraints caused by limitations on the use of military lands, marine areas, and airspace that are available in the United States and overseas for training. As part of the preparation of the plan, section 366 required the Secretary of Defense to conduct an assessment of current and future training range³ requirements and an evaluation of the adequacy of current DOD resources, including virtual and constructive assets, to meet current and future training range requirements. Section 366 further required the Secretary to submit the plan, the results of the assessment and evaluation, and any recommendations for legislative or regulatory changes to address training constraints in a report to the Congress at the same time the President submitted the budget for fiscal year 2004 and provide status reports annually between fiscal years 2005 and 2008 on implementation of the plan and any additional actions taken or to be taken. In addition, section 366 required the Secretary to develop and maintain an inventory that identifies all available operational training ranges, all training range capacities and capabilities, and any training constraints caused by limitations at each training range. We have previously reported on the need for an integrated and readily available or accessible comprehensive

¹ DOD defines "encroachment" as the cumulative result of any and all outside influences that inhibit normal training and testing. According to DOD, the eight encroachment factors are: endangered species habitat, unexploded ordnance and munitions constituents, competition for radio frequency spectrum, protected marine resources, competition for airspace, air pollution, noise pollution, and urban growth around military installations.

² P.L. 107-314, Title III, Section 366 (Dec. 2, 2002).

³ We use the term "training range" to collectively refer to air ranges, live-fire ranges, ground maneuver ranges, sea ranges, and operating areas.

inventory of the services' training ranges, capacities, and capabilities so that commanders can schedule the best available resources to provide the required training.⁴ Section 366 also required the Secretary of Defense to report to the Congress on the plans to improve the Global Status of Resources and Training System to reflect the readiness impact that training constraints caused by limitations on the use of military lands, marine areas, and airspace have on specific units of the military services. (See section 366 of the Bob Stump National Defense Authorization Act for Fiscal Year 2003 in app. I.)

Instead of issuing the first report along with the President's fiscal year 2004 budget submission in 2003, the Office of the Secretary of Defense (OSD) submitted to the Congress its *Implementation of the Department of Defense Training Range Comprehensive Plan* report on February 27, 2004. In an effort to obtain assistance from the military services in preparing this report, the Under Secretary of Defense for Personnel and Readiness, in a January 2003 memorandum, directed each of the military services to develop a single standalone report that could be consolidated to form OSD's overall report.⁵ As such, OSD's report reflects the varying levels of detail provided by each service.

Section 366 of the Bob Stump National Defense Authorization Act for Fiscal Year 2003 also required that the Secretary of Defense provide us a copy of the annual training range report and that we must provide the Congress with our evaluation of these annual reports. This report discusses the extent to which (1) OSD's training range inventory contains sufficient information to use as a baseline for developing the comprehensive training range plan required by section 366, and (2) OSD's training range report meets other requirements mandated by section 366, such as an assessment of current and future training range requirements; an evaluation of the adequacy of current DOD resources, including virtual and constructive assets, to meet current and future training range requirements; any recommendations for legislative or regulatory changes

⁴ U.S. General Accounting Office, *Military Training: DOD Lacks a Comprehensive Plan to Manage Encroachment on Training Ranges*, GAO-02-614 (Washington, D.C.: June 11, 2002).

⁵ Department of Defense, Under Secretary of Defense for Personnel and Readiness, *Guidance for Complying with the Provisions of Section 366* (Washington, D.C.: Jan. 28, 2003).

to address training constraints; and plans to improve the readiness reporting system.

To identify the extent that OSD's training range inventory contains sufficient information to use as a baseline for developing the comprehensive training range plan required by section 366, we reviewed the inventory contained in the OSD training range report and the services' inventory inputs to assess whether the inventory identified training capabilities (e.g., types of training that can be conducted and available targets), capacities (e.g., size of range or amount of training that can be accommodated), and constraints caused by encroachment for each training range.⁶ Also, we discussed the content of the inventories with knowledgeable OSD and service officials. To determine the extent to which OSD's training range report met other requirements mandated by section 366, we thoroughly reviewed the report for an assessment of current and future training range requirements; an evaluation of the adequacy of current DOD resources, including virtual and constructive assets, to meet current and future training range requirements; recommendations for legislative or regulatory changes to address training constraints; and plans to improve the readiness reporting system. In addition, we discussed the adequacy of OSD's report and the services' inputs with knowledgeable OSD and service officials and a representative of the contractor that prepared the report. Details about our scope and methodology appear at the end of this letter.

We conducted our work from December 2003 through April 2004 in accordance with generally accepted government auditing standards.

Results in Brief

OSD's training range inventory, which is a compilation of the individual services' inventories, does not contain sufficient information to use as a baseline for developing the comprehensive training range plan. As a result, OSD's report does not include a comprehensive plan to address training constraints caused by limitations on the use of military lands, marine areas, and airspace that are available in the United States and overseas for training—as required by section 366. While OSD's training range inventory lists the services' training ranges and capabilities as of November 2003 and the individual service input documents provide more descriptive examples

⁶ We did not verify the completeness or accuracy of OSD's inventory or the services' inventory inputs.

of constraints on training than we have seen previously, they do not fully identify existing limitations on training. Also, these inventories are not integrated, readily available, or accessible by potential users so that commanders can schedule the best available resources to provide the required training. An integrated training range database that could be continuously updated and shared among the services at all command levels, regardless of service ownership, would make these inventories more useful to identify available training resources, specific capacities and capabilities, and training constraints caused by encroachment. Without an inventory that fully identifies available training resources, specific capacities and capabilities, and existing training constraints caused by encroachment, it is difficult to frame a meaningful plan to address such constraints. As a result, OSD's report does not contain a comprehensive plan to address training constraints on military training ranges caused by limitations on the use of training ranges, as required by section 366. Instead, the report provides the current status of the services' various sustainable range efforts, which if successful, overtime should provide a more complete picture of the magnitude and impact of constraints on training. Even so, OSD's report does not include quantifiable goals or milestones for tracking planned actions and measuring progress, or projected funding requirements. The absence of these elements is significant given the legislative requirement for OSD to report annually on its progress in implementing the plan.

OSD's report, which is a consolidation of information provided by the services, does not fully address several other requirements mandated by section 366. For example, the report does not:

- Fully assess current and future training range requirements. Instead, it mainly describes the services' processes to develop, document, and execute current training and training range requirements.
- Fully evaluate the adequacy of current DOD resources, including virtual and constructive assets, to meet current and future training range requirements. Instead, the report broadly describes the types of ranges the services need to meet their training requirements in the United States. It does not indicate whether those types of ranges exist; are in the needed quantity and location; and the degree to which encroachment or other factors, such as inadequate maintenance or modernization, impact the services' ability to train on those ranges, including whether the ranges have the instrumentation, target sets, or other infrastructure needed to meet current and future training range requirements.

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- Identify recommendations for legislative or regulatory changes to address training constraints, even though DOD submitted legislative changes for congressional consideration on April 6, 2004.
 - Contain plans to improve the readiness reporting system, called the Global Status of Resources and Training System. This reporting system was to capture the impact on readiness caused by training constraints.

To serve as the baseline for the comprehensive training range plan required by section 366, we are recommending that OSD and the military services jointly develop an integrated training range database that identifies available training resources, specific capacities and capabilities, and training constraints caused by encroachment and other factors, which could be continuously updated and shared among the services at all command levels, regardless of service ownership. To improve future reports, we recommend that OSD provide a more complete training range report to the Congress to fully address the requirements specified in the section 366 mandate by (1) developing a comprehensive plan that includes quantifiable goals and milestones for tracking planned actions and measuring progress, and projected funding requirements to more fully address identified training constraints, (2) assessing current and future training range requirements and evaluating the adequacy of current resources to meet these requirements, and (3) developing a readiness reporting system to reflect the impact on readiness caused by training constraints due to limitations on the use of training ranges.

DOD disagreed with our findings that OSD's training range report failed to address the congressional reporting requirements mandated in section 366 and disagreed with three of our four recommendations. Our report outlined numerous instances where OSD's report did not address congressionally mandated reporting requirements. Our recommendations were intended to help DOD address all requirements specified in section 366. Without their implementation, DOD will continue to rely on incomplete information to support funding requests and legislative or regulatory changes to address encroachment issues. DOD's comments and our evaluation of them are discussed on pages 18-22.

Background

Over time, the military services report they have increasingly lost training range capabilities because of encroachment. According to DOD officials, the concerns about encroachment reflect the cumulative result of a slow but steady increase in problems affecting the use of their training ranges. Historically, specific encroachment problems have been addressed at individual ranges, most often on an ad hoc basis. DOD officials have

reported increased limits on and problems with access to and the use of ranges. They believe that the gradual accumulation of these limitations will increasingly threaten training readiness in the future. Yet, despite the reported loss of some capabilities, for the most part, the services do not report the extent to which encroachment has significantly affected training readiness.

Section 366 of the Bob Stump National Defense Authorization Act for Fiscal Year 2003

Section 366 of the Bob Stump National Defense Authorization Act for Fiscal Year 2003 required that the Secretary of Defense develop a comprehensive plan for using existing authorities available to the Secretaries of Defense and the military departments to address training constraints caused by limitations on the use of military lands, marine areas, and airspace that are available in the United States and overseas for training. Section 366 also required that the Secretary of Defense develop and maintain an inventory that identifies all available operational training ranges, all training range capacities and capabilities, and any training constraints at each training range. In addition, the Secretary must complete an assessment of current and future training range requirements and an evaluation of the adequacy of current DOD resources to meet current and future training requirements. Section 366 further required that the Secretary of Defense submit to the Congress a report containing the plan, the results of the assessment and evaluation of current and future training requirements, and any recommendations that the Secretary may have for legislative or regulatory changes to address training constraints at the same time the President submits the budget for fiscal year 2004 and provide status reports on implementation annually between fiscal years 2005 and 2008. While the initial report was due when the President submitted the fiscal year 2004 budget to the Congress, the department did not meet this initial reporting requirement.

In an effort to obtain assistance from the military services in preparing this report, a January 2003 memorandum to the Secretaries of the Army, the Navy, and the Air Force, the Under Secretary of Defense for Personnel and Readiness directed that each of the military services develop a single standalone report that could be consolidated to form OSD's overall report. Each service was expected to provide an assessment of current and future training requirements with future projections to 2024, a report on the implementation of a range inventory system, an evaluation of the adequacy of current service resources to meet both current and future training requirements, and a comprehensive plan to address constraints resulting in adverse training impacts. The memorandum stated that once the services' inputs were received, they would be incorporated into a single

report to address the section 366 reporting requirement. As discussed more fully later, the services' inputs were incorporated to varying degrees in OSD's final training range report.

DOD and the Services' Sustainable Range Initiatives

In completing our analysis for this and other engagements related to training ranges, we found that the department and the military services individually have a number of initiatives underway to better address encroachment or other factors and ensure sustainability of military training ranges for future use. In August 2001, the department issued its draft *Sustainable Range Action Plans*,⁷ which contained an action plan for each of the eight encroachment issues. Each action plan provided an overview and analysis of its respective encroachment issue along with strategies and actions for consideration by DOD decision makers. The department considered these action plans to be working documents supporting the overall sustainable range initiative. In June 2003, the Under Secretary of Defense for Personnel and Readiness issued a memorandum to the secretaries of the military departments providing guidance for sustainable range planning and programming efforts for fiscal years 2006-2011.⁸ The services, recognizing the importance of ranges, have begun to implement various internal programs aimed at ensuring long-term range sustainment and the ability to meet both current and future requirements. In addition, OSD and the services have various systems to assess the condition of their ranges and are attempting to develop methods to reflect the readiness impacts caused by encroachment and other factors. Our recent work and the work of the DOD Inspector General⁹ have identified a variety of factors that have adversely affected training ranges in recent years including a lack of adequate funding, maintenance, and modernization for training ranges.

The Army Deputy Chief of Staff for Training is responsible for establishing range priorities and requirements and managing the Range and Training

⁷ Department of Defense, *Sustainable Range Action Plans* (Draft) (Washington, D.C.: Aug. 2001).

⁸ The memorandum identified seven areas (Infrastructure, Operations, Maintenance, Encroachment, Environmental Responsibilities, Outreach, and New Technologies) that the Under Secretary believes will significantly advance the department's efforts toward building viable range sustainment programs.

⁹ Department of Defense Inspector General, *Acquisition: Major Range and Test Facility Base*, D-2004-035 (Washington, D.C.: Dec. 8, 2003).

Land Program, which includes range modernization and maintenance, and land management through the Integrated Training Area Management Program. This office is creating and implementing the Sustainable Range Program to manage its ranges in a more comprehensive manner; meet the challenges brought on by encroachment; and maximize the capability, availability, and accessibility of its ranges. According to an official of the Office of the Army Deputy Chief of Staff for Training, the Sustainable Range Program will evolve into a new Army training range regulation that will replace the current Army Regulation 210-21, Range and Training Land Program, and Army Regulation 350-4, Integrated Training Area Management.¹⁰

On December 1, 2003, the Navy centralized its range management functions, to include training and testing ranges, target development and procurement, and test and evaluation facilities, into the Navy Range Office, Navy Ranges and Fleet Training Branch. The Navy Range Office integration will streamline processes, provide a single voice for range policy and management oversight, and provide a single resource sponsor. Recognizing the importance of Navy training ranges and to meet congressional reporting requirements, the Navy is developing a Navy Range Strategic Plan. The Navy plans to have this completed by June 2004. In addition, the Navy is working with the Center for Naval Analysis to develop a transferable analytical tool for systematic and rigorous range assessment. This tool is expected to integrate existing initiatives, such as the range complex management plans, the Navy mission essential tasks lists, and an encroachment log, into a methodology to identify, assess, and prioritize physical range resource deficiencies—to include those caused by encroachment issues—across ranges. An official of the Navy Range Office stated that the Navy plans to pilot the tool at the Southern California Complex¹¹ by November 2004.

In October 2001, the Marine Corps established an executive agent for range and training area management to implement its vision for mission-capable ranges. The Range and Training Area Management Division is

¹⁰ Army regulations, *Range and Training Land Program*, 210-21 (Washington, D.C.: May 1, 1997), and *Integrated Training Area Management*, 350-4 (Washington, D.C.: May 8, 1998).

¹¹ The Southern California complex comprises nine instrumented areas and many associated training, warning, restricted, and operations areas in three major components: the San Clemente Island Range Complex, Naval Amphibious Base Coronado training areas, and offshore operating areas and airspace.

located within the Training and Education Command. These offices are charged with developing systems, operational doctrine, and training requirements for Marine Corps forces. In addition to its own ranges, the Marine Corps engages in extensive cross-service utilization by depending on extensive and extended access to non-Marine Corps training ranges.

The Air Force's Director of Operations and Training, Ranges and Airspace Division acts as the executive agent for range management for the Air Force. The associate director for ranges and airspace stated that Air Force range issues have become much more sensitive due to a number of recent events, including the Navy's departure from Vieques, Puerto Rico; controversy with the Mountain Home Range, Idaho; the loss of naval ranges in Hawaii; and the push to redesign the national air space. As a result, Air Force leadership has become more aware of range needs. The Air Force has an integrated approach to range management, to include range planning, operations, construction, and maintenance. Air Force Range Planning and Operations Instruction¹² is the primary document governing Air Force planning as it relates to its ranges. In addition, the Air Force, using RAND, has conducted two studies addressing its training requirements and training range capacities, capabilities, and constraints.¹³ In general, the studies found that the Air Force's training ranges did not always meet the services' training requirements. For example, one study found that the distance between Air Force training ranges and bases exceeded the established flying limitation for 19 percent of the total air-to-ground training requirements for fighter jets.

OSD's Prior Legislative Proposals

In 2002, the department prepared and submitted to the Congress a package of legislative proposals to modify or clarify existing environmental legislation to address encroachment issues. The proposals, known as the Readiness and Range Preservation Initiative, were tailored to protect military readiness activities, not the entire scope of DOD activities.¹⁴ The proposals sought, among other things, to clarify provisions of the

¹² Air Force Instruction, *Range Planning and Operations*, 13-212 (Washington, D.C.: Aug. 7, 2001).

¹³ RAND, *Relating Ranges and Airspace to Air Combat Command Missions and Training*, MR-1286-AF, and *A Decision Support System for Evaluating Ranges and Airspace*, MR-1286/1-AF (Langley Air Force Base, Va.: 2001).

¹⁴ Department of Defense, *Readiness and Range Preservation Initiative* (Washington, D.C.: Apr. 2002).

Endangered Species Act; Marine Mammal Protection Act; Clean Air Act; Solid Waste Disposal Act; Resource Conservation and Recovery Act; Comprehensive Environmental Restoration, Compensation, and Liability Act; and the Migratory Bird Treaty Act.

The Bob Stump National Defense Authorization Act for Fiscal Year 2003 enacted three provisions, including two that allow DOD to cooperate more effectively with third parties on land transfers for conservation purposes, and a third that provides a temporary exemption from the Migratory Bird Treaty Act for the unintentional taking of migratory birds during military readiness activities. In March 2003, the department submitted five provisions to the Congress; the National Defense Authorization Act for Fiscal Year 2004 enacted two provisions including a clarification of “harassment” under the Marine Mammal Protection Act and allowing approved Integrated Natural Resource Management Plans to substitute for critical habitat designation under the Endangered Species Act. DOD submitted proposed legislation to the Congress on April 6, 2004, in a continuing effort to clarify provisions of the Clean Air Act; Comprehensive Environmental Response, Compensation, and Liability Act; and the Resource Conservation and Recovery Act.

Prior GAO Reports and Testimonies

In 2002, we issued two reports on the effects of encroachment on military training and readiness. In April 2002, we reported that troops stationed outside of the continental United States face a variety of training constraints that have increased over the last decade and are likely to increase further.¹⁵ In June 2002, we reported on the impact of encroachment on military training ranges inside the United States and had similar findings to our earlier report.¹⁶ We reported that many encroachment issues resulted from or were exacerbated by population growth and urbanization. DOD was particularly affected because urban growth near 80 percent of its installations exceeded the national average. In both reports, we stated that impacts on readiness were not well documented. In our June 2002 report, we recommended that (1) the services develop and maintain inventories of their training ranges, capacities, and capabilities, and fully quantify their training requirements considering complementary approaches to training; (2) OSD create a DOD

¹⁵ U.S. General Accounting Office, *Military Training: Limitations Exist Overseas but Are Not Reflected in Readiness Reporting*, GAO-02-525 (Washington, D.C.: Apr. 30, 2002).

¹⁶ GAO-02-614.

database that identifies all ranges available to the department and what they offer, regardless of service ownership, so that commanders can schedule the best available resources to provide required training; (3) OSD finalize a comprehensive plan for administrative actions that includes goals, timelines, projected costs, and a clear assignment of responsibilities for managing and coordinating the department's efforts to address encroachment issues on military training ranges; and (4) OSD develop a reporting system for range sustainability issues that will allow for the elevation of critical training problems and progress in addressing them to the Senior Readiness Oversight Council for inclusion in Quarterly Readiness Reports to the Congress as appropriate. In addition, we testified twice on these issues—in May 2002 and April 2003.¹⁷ In September 2003, we also reported that through increased cooperation DOD and other federal land managers could share the responsibility for managing endangered species.¹⁸

In March 2004, we issued a guide to help managers assess how agencies plan, design, implement, and evaluate effective training and development programs that contribute to improved organizational performance and enhanced employee skills and competencies.¹⁹ The framework outlined in this guide summarizes attributes of effective training and development programs and presents related questions concerning the components of the training and development process. Over time, assessments of training and development programs using this framework can further identify and highlight emerging and best practices, provide opportunities to enhance coordination and increase efficiency, and help develop more credible information on the level of investment and the results achieved across the federal government.

¹⁷ U.S. General Accounting Office, *Military Training: DOD Lacks a Comprehensive Plan to Manage Encroachment on Training Ranges*, GAO-02-727T (Washington, D.C.: May 16, 2002); and *Military Training: DOD Approach to Managing Encroachment on Training Ranges Still Evolving*, GAO-03-621T (Washington, D.C.: Apr. 2, 2003).

¹⁸ U.S. General Accounting Office, *Military Training: Implementation Strategy Needed to Increase Interagency Management for Endangered Species Affecting Training Ranges*, GAO-03-976 (Washington, D.C.: Sept. 29, 2003).

¹⁹ U.S. General Accounting Office, *Human Capital: A Guide for Assessing Strategic Training and Development Efforts in the Federal Government*, GAO-04-546G (Washington, D.C.: March 2004).



OSD's Training Range Inventory Does Not Yet Contain Sufficient Information to Use as a Baseline for a Comprehensive Plan

OSD's training range inventory does not yet contain sufficient information to use as a baseline for developing a comprehensive training range plan. As a result, OSD's report does not include a comprehensive plan to address training constraints caused by limitations on the use of military lands, marine areas, and airspace in the United States and overseas, as required by section 366. Without a comprehensive plan that identifies quantifiable goals or milestones for tracking planned actions and measuring progress, or projected funding requirements, it will be difficult for OSD to comply with the legislative requirement to report annually on its progress in implementing the plan.

OSD's Training Range Inventory Does Not Contain Sufficient Information



OSD's training range inventory, which is a compilation of the individual services' inventories, does not contain sufficient information to provide a baseline for developing a comprehensive training range sustainment plan. Section 366 requires the Secretary of Defense to develop and maintain an inventory that identifies all available operational training ranges, all training range capacities and capabilities, and any training constraints at each training range. Although OSD's inventory lists the services' training ranges as of November 2003 and identifies capabilities, the inventory does not identify specific range capacities or existing training constraints caused by encroachment or other factors, such as a lack of adequate maintenance or modernization. Nevertheless, to date, this is the best attempt we have identified by the services to inventory their training ranges. In doing so, OSD and the services provided more descriptive examples of constraints than ever before but did not fully identify the actual impacts on training. Without such information, it is difficult to develop a meaningful plan to address training constraints caused by encroachment or other factors.

While OSD's inventory is a consolidated list of ranges and capabilities as of November 2003, OSD and the services' inventories are not integrated and accessibility is limited. Therefore, it is not a tool that commanders could use to identify range availability, regardless of service ownership, and schedule the best available resources to provide required training. In addition, OSD has no method to continuously maintain this inventory without additional requests for data, even though section 366 requires the Secretary of Defense to maintain and submit an updated inventory annually to the Congress. In 2001, RAND concluded that centralized repositories of information on Air Force ranges and airspace are limited,

with little provision for updating the data. RAND noted that a comprehensive database is a powerful tool for range and airspace managers that must be continuously maintained and updated.²⁰ In addition, a knowledgeable official of the Office of the Under Secretary of Defense for Personnel and Readiness stated that having a common management system to share current range information is needed to identify range availability, capabilities, capacities, and cumulative effects of encroachment on training readiness. This official also noted that it would take several years to develop such a system. However, OSD did not address this system in its report.

OSD's Training Range Report Does Not Include a Comprehensive Plan

Without an inventory that fully identifies available training resources, specific capacities and capabilities, and existing training constraints, it is difficult to frame a comprehensive training range plan to address constraints. As a result, OSD's report does not include a comprehensive plan to address training constraints caused by limitations on the use of military lands, marine areas, and airspace that are available in the United States and overseas for training—as required by section 366. Such a plan was to include proposals to enhance training range capabilities and address shortfalls, goals, and milestones for tracking planned actions and measuring progress, projected funding requirements for implementing planned actions, and designation of OSD and service offices responsible for overseeing implementation of the plan. However, OSD's report does not contain quantifiable goals or milestones for tracking planned actions and measuring progress, or projected funding requirements, which are critical elements of a comprehensive plan. Rather than a comprehensive plan, OSD and service officials characterized the report as a status report of the services' efforts to address encroachment that also includes service proposals to enhance training range capabilities, as previously discussed in the background, and designates OSD and service offices responsible for overseeing implementation of a comprehensive training range plan. According to a knowledgeable official of the Office of the Under Secretary of Defense for Personnel and Readiness, by providing the Congress a report on the current status of the individual services' efforts to put management systems in place to address encroachment issues and ensure range sustainability, OSD believed it was meeting the mandated requirements.

²⁰ RAND MR-1286-AF.

A professional journal article on sustaining DOD ranges, published by knowledgeable defense officials in 2000, notes that there should be some form of a national range comprehensive plan that provides the current situation, establishes a vision with goals and objectives for the future, and defines the strategies to achieve them.²¹ The article states that only with such a comprehensive plan can sustainable ranges and synergy be achieved. In addition, the article notes that while this plan should be done at the department-level, “DOD’s bias will be to have the services do individual plans.” In fact, OSD and service officials told us during our review that OSD should not be responsible for framing a comprehensive training range plan because the services are responsible for training issues. Despite that view, OSD has recently issued a comprehensive strategic plan and associated implementation plan—which includes all of the above elements—for more broadly transforming DOD’s training.²²

OSD’s Training Range Report Does Not Fully Meet Other Requirements Mandated by Section 366

OSD’s *Implementation of the Department of Defense Training Range Comprehensive Plan* report, which is a consolidation of information provided by the services, does not fully meet other requirements mandated by section 366. Specifically, it does not (1) fully assess current and future training range requirements; (2) fully evaluate the adequacy of current DOD resources, including virtual and constructive assets, to meet current and future training range requirements; (3) identify recommendations for legislative or regulatory changes to address training constraints; or (4) contain plans to improve the readiness reporting system.

OSD’s Report Does Not Fully Assess Current and Future Training Range Requirements

OSD’s report does not fully assess current and future training range requirements. Instead, the report describes the services’ processes to develop, document, and execute current training and training range requirements. The services’ inputs, as required by OSD’s guidance, vary in their emphasis on individual areas of requested information. Only the Air Force’s submission to OSD’s report identifies specific annual training

²¹ Jesse O. Borthwick, Senior Environmental Scientist, Eglin Range, Fla., and Eric A. Beshore, PE, RA, Colonel USAF (Retired), Senior Program Manager, Science Applications International Corporation, “Sustaining DOD Ranges: A National Environmental Challenge,” *Federal Facilities Environmental Journal*, Summer 2000.

²² Department of Defense, Office of the Under Secretary for Personnel and Readiness, *Strategic Plan for Transforming DOD Training* (Washington, D.C.: Mar. 1, 2002); and *Department of Defense Training Transformation Implementation Plan* (Washington, D.C.: June 10, 2003).

requirements by type of aircraft, mission category, type of training activity, and unit. By identifying its training requirements, the Air Force is in a better position to evaluate the adequacy of resources to meet current and future training requirements. Without a complete assessment, OSD and the services cannot determine whether available training resources are able to meet current and future requirements.

OSD's Report Does Not Fully Evaluate the Adequacy of Current DOD Resources to Meet Current and Future Training Range Requirements

OSD's report does not fully evaluate the adequacy of current DOD resources to meet current and future training range requirements in the United States and overseas. The report does not compare training range requirements to existing resources—a primary method to evaluate the adequacy of current resources—in the United States and does not evaluate overseas training resources. Instead, OSD's report states that generally the services' ranges allow military forces to accomplish most of the current training missions. However, this conflicts with later statements in the report noting that encroachment limits the services' ability to meet current core and joint training requirements.²³ For example, OSD's report discusses an evaluation of the Air Force's ranges in the United States, and identifies shortfalls in the Air Force's range resources and constraints that affect operations. The evaluation shows that the distance between Air Force training ranges and bases exceeded the established flying limitation for 19 percent of the total air-to-ground training requirements for fighter jets. The report also notes that the Army has shortages of modernized or automated ranges and has a significant overage of older ranges that do not fully meet current training requirements, but the report does not identify where these shortages occur or explain how this determination was made. In addition, the report states that 28 of 35 Army range categories²⁴ have some or major deficiencies that do not meet Army standards, or impair or significantly impair mission performance. The report further notes the condition of Marine Corps ranges and provides a general rating of the ranges by installation but does not identify specific shortfalls in resources or evaluate the adequacy of current resources to meet future training range requirements. OSD's report also notes that simulation plays a role in military training, but does not address the relative impact or adequacy of

²³ This statement also conflicts with numerous congressional testimonies given by OSD and service officials in the past 3 years that identify instances where encroachment impacts training.

²⁴ The Army defines range categories by the type of training that can be accomplished on them.

simulated training to meet current and future training range requirements, or to what extent simulation may help minimize constraints affecting training ranges.

OSD's Report Does Not Identify Recommendations for Legislative or Regulatory Changes

While OSD's report does not include any recommendations for legislative or regulatory changes to address training constraints, DOD submitted proposed legislation to the Congress on April 6, 2004, in an effort to clarify the intent of the Clean Air Act; Comprehensive Environmental Response, Compensation, and Liability Act; and the Resource Conservation and Recovery Act. Without these clarifications, according to DOD officials, the department would continue to potentially face lawsuits that could force the services to curtail training activities. According to DOD, the clarifications are to (1) grant test ranges a 3-year extension from complying with the Clean Air Act requirement when new units or weapons systems are moved to a range and (2) exempt military munitions at training ranges from provisions of the Comprehensive Environmental Response, Compensation, and Liability Act and Resource Conservation and Recovery Act to avoid the classification of munitions as solid waste, which could required expensive cleanup activities.

OSD's Report Does Not Include Plans to Improve the Readiness Reporting System

OSD's report does not address the department's plans to improve the readiness reporting system, called the Global Status of Resources and Training System, as required by the mandate. According to a knowledgeable OSD official, the Global Status of Readiness and Training System is not the system to capture encroachment impacts that are long-term in nature, rather it addresses short-term issues. Instead, according to an OSD official, the department is working on a Defense Readiness Reporting System, which is expected to capture range availability as well as other factors that may constrain training. However, OSD did not address either system in its report.

Conclusions

While OSD's *Implementation of the Department of Defense Training Range Comprehensive Plan* report addresses some of the mandated requirements, it does not fulfill the requirement for an inventory identifying range capacities or training constraints caused by encroachment or other factors, such as a lack of adequate maintenance or modernization; a comprehensive training range plan to address encroachment on military training ranges; an adequate assessment of current and future training range requirements; a sufficient evaluation of the adequacy of current DOD resources, including virtual and constructive

assets, to meet current and future training range requirements; recommendations for legislative or regulatory changes to address training constraints; or plans to improve the readiness reporting system. Instead, the report provides the current status of the services' various sustainable range efforts in the United States. Currently, OSD's inventory consists of individual services' inputs as of November 2003, but it is not a tool that commanders could use to identify range availability, regardless of service ownership, and schedule the best available resources to provide required training. In addition, OSD apparently has no planned method to continuously maintain this inventory. Without an integrated training range inventory that could be continuously updated and available at all command levels, the services may not have knowledge of or access to the best available training resources. This inventory may also have a significant impact on the ability of the services to support joint training. Also, without such an inventory, it will be difficult for OSD and the services to develop a comprehensive plan to address these issues to ensure range sustainability to support current and future training range requirements. As a result, even though various services' initiatives are underway to better address encroachment or other factors and ensure sustainability of military training ranges for future use, OSD's training range report did not include a comprehensive plan to address training constraints in the United States and overseas—as required by section 366. Without a plan that includes quantifiable goals and milestones for tracking planned actions and measuring progress, and projected funding requirements, OSD and the services may not be able to address the ever-growing issues associated with encroachment and measure the progress in addressing these issues. Similarly, OSD's training range report did not fully assess current and future training range requirements or fully evaluate the adequacy of current resources to meet these requirements. Without these types of analyses, OSD and the services will not be able to determine shortfalls in training resources to better allocate training resources and may continue to maintain ranges that are no longer needed to meet current training requirements. Finally, the report did not include any recommendations for legislative or regulatory changes to address training constraints or a plan to improve the readiness reporting system to reflect the impact on readiness caused by training constraints due to limitations on the use of training ranges. Without an inventory identifying range capacities or training constraints caused by encroachment or other factors or a comprehensive training range plan to address training constraints caused by limitations on the use training ranges, OSD and the services will continue to rely on incomplete information to support funding requests and legislative or regulatory changes to address these issues.

Recommendations for Executive Action

To serve as the baseline for the comprehensive training range plan required by section 366, we recommend that the Secretary of Defense direct the Under Secretary of Defense for Personnel and Readiness and the secretaries of the military services to jointly develop an integrated training range database that identifies available training resources, specific capacities and capabilities, and training constraints caused by limitations on the use of training ranges, which could be continuously updated and shared among the services at all command levels, regardless of service ownership.

To improve future reports, we also recommend that OSD provide a more complete report to the Congress to fully address the requirements specified in the section 366 mandate by (1) developing a comprehensive plan that includes quantifiable goals and milestones for tracking planned actions and measuring progress, and projected funding requirements to more fully address identified training constraints, (2) assessing current and future training range requirements and evaluating the adequacy of current resources to meet these requirements, and (3) developing a readiness reporting system to reflect the impact on readiness caused by training constraints due to limitations on the use of training ranges.

Agency Comments and Our Evaluation

In commenting on a draft of this report, the Deputy Under Secretary of Defense for Readiness disagreed with our finding that OSD's training range report failed to address the congressional reporting requirements mandated in section 366 of the Bob Stump National Defense Authorization Act for Fiscal Year 2003 and disagreed with three of our four recommendations. As it clearly points out, this report outlines numerous instances where OSD's report did not address congressionally mandated reporting requirements. Our recommendations were intended to help DOD address all requirements specified in section 366. Without their implementation, DOD will continue to rely on incomplete information to support funding requests and legislative or regulatory changes to address encroachment and other factors.

DOD disagreed with our first recommendation—to jointly develop an integrated training range database that identified available training resources, specific capacities and capabilities, and training constraints, which could be continuously updated and shared among all the services at all command levels regardless of service ownership. As discussed in our report, OSD's inventory consists of individual services' inputs as of November 2003 and is not a tool that commanders could use to identify range availability, regardless of service ownership, and schedule the best

available resources to provide required training. Further, as noted in our report, the individual service submissions continue to provide limited information on how training has been constrained by encroachment or other factors. In contrast, section 366 clearly requires the Secretary of Defense to develop and maintain an inventory that identifies all available operational training ranges, all training range capacities and capabilities, and any training constraints at each training range. DOD's suggestion that our draft report recommended that DOD should initiate a "massive new database" effort to allow OSD management of individual range activities is without merit. Our recommendation merely specified section 366 legislative requirements that were not found in OSD's training range report to the Congress.

Also, DOD's disagreement with our first recommendation seems inconsistent with other comments DOD officials have made as noted in this and other GAO reports regarding military training range inventories.²⁵ In commenting on this report, DOD specifically stated that it agreed that, as a long-term goal, the services' inventory systems should be linked to support joint use. In commenting on a prior report, DOD stated that the services were developing a statement of work in order to contract with a firm capable of delivering an enterprise level web-enabled system that will allow cross service, as well as intra-service training use of inventory data.²⁶ Further, in a 2003 study, the U.S. Special Operations Command stated that all components needed to create master range plans that addressed their current and future range issues and solutions.²⁷ The command also recommended that plans identify and validate training requirements and facilities available and define the acceptable limits of workarounds. Without an integrated training range inventory, we continue to believe that it will be difficult for OSD and the services to develop a comprehensive plan and track its progress in addressing training constraints and ensuring range sustainability.

DOD generally concurred with our second recommendation—to develop a comprehensive plan that includes quantifiable goals and milestones for tracking planned actions and measuring progress, and projected funding

²⁵ GAO-02-525 and GAO-02-614.

²⁶ GAO-02-614.

²⁷ U.S. Special Operations Command, *Tiger Team Report: Global Special Operations Forces Range Study* (MacDill Air Force Base, Fla.: Jan. 27, 2003).

requirements to more fully address identified training constraints. However, the department's comments suggest it plans simply to summarize ongoing efforts of individual services rather than formulate a comprehensive strategy for addressing training constraints. Without a plan that includes quantifiable goals and milestones for tracking planned actions and measuring progress, and projected funding requirements, OSD and the services may not be able to address the ever-growing issues associated with encroachment and other training constraints and measure the progress in addressing these issues. Also, a summary of ongoing efforts does not fully address the requirements of section 366, which calls for a comprehensive plan for using existing authorities available to the Secretaries of Defense and the military departments to address training constraints caused by limitations on the use of military lands, marine areas, and airspace that are available in the United States and overseas for training. Second, it directly contradicts DOD's concurrence with recommendations made in our June 2002 report where we specifically recommended that the department develop a plan with the same elements subsequently required by the mandate.²⁸ Third, it contradicts a January 2003 report of the Southwest Region Range Sustainability Conference sponsored by the Deputy Under Secretary of Defense for Readiness and the Deputy Under Secretary of Defense for Installations and Environment.²⁹ The conference report recommended a national range sustainability and infrastructure plan—which could also address section 366 requirements—to include range requirements, overall vision, current and future requirements, and encroachment issues. Without a comprehensive plan that includes quantifiable goals and milestones for tracking planned actions and measuring progress, and projected funding requirements, we continue to believe that OSD and the services may not be able to address the ever-growing issues associated with encroachment and other training constraints, and measure the progress in addressing these issues.

DOD disagreed with our third recommendation—to assess current and future training range requirements and evaluate the adequacy of current resources to meet these requirements. It stated that it is inappropriate and impractical to include this level of detail in an OSD-level report and that the Congress is better served if the department describes, summarizes, and

²⁸ GAO-02-614.

²⁹ Department of Defense Region IX Regional Environmental Coordinator, *Southwest Region Range Sustainability Conference Report* (San Diego, Calif.: Jan. 7, 2003).

analyzes range requirements. Clearly, these statements are contradictory in that section 366 requires that OSD report on its assessment of current and future training range requirements and an evaluation of the adequacy of current DOD resources to meet current and future training requirements, which could be accomplished by providing the aforementioned description, summary, and analysis of range requirements. While the department's training range report provided a description of the methodology used by each service to develop their requirements, it did not provide any detail regarding such analyses. Without these types of analyses, we continue to believe that OSD and the services will not be able to determine shortfalls in training resources to better allocate training resources and may continue to maintain ranges that are no longer needed to meet current training requirements. In addition, the department questions why we did not examine detailed requirements work being done at each installation. While we agree with DOD that this type of examination could be useful, it is unclear why OSD's report did not provide a discussion of the work underway at individual installations. While we may conduct such an examination in the future, section 366 did not specifically require us to conduct this examination, nor did it provide us sufficient time for such an examination.

DOD disagreed with our fourth recommendation—to develop a readiness reporting system to reflect the impact on readiness caused by training constraints. DOD further stated that it was inappropriate to modify the Global Status of Readiness and Training System report to address encroachment and that it plans to incorporate encroachment impacts on readiness into the Defense Readiness Reporting System. Our draft report recognized that the department does not believe that the Global Status of Readiness and Training System is the system to capture encroachment impacts. Given that OSD's training range reports are required to provide a status of efforts to address training constraints, it is unclear why OSD's report did not provide an assessment of progress in this area. We continue to believe that future reports should provide the Congress with information on DOD's progress toward improving readiness reporting—whether it is the Defense Readiness Reporting System as cited in DOD's comments or another system—to reflect the impact on readiness caused by training constraints due to limitations on the use of training ranges, as required by section 366.

We continue to believe our recommendations are valid and without their implementation, DOD will continue to rely on incomplete information to support funding requests and legislative or regulatory proposals to address

encroachment and other training constraints, and will not be able to fully address the congressionally mandated requirements in section 366.

The Deputy Under Secretary's comments are included in appendix II.

Scope and Methodology

To determine the extent to which OSD's training range inventory contains sufficient information to develop a comprehensive training range plan, we reviewed OSD's inventory of the services' training ranges to determine whether the inventory identified training capacities and capabilities, and constraints caused by encroachment or other factors for each training range. In addition, we reviewed the services' inputs to OSD's inventory and OSD's report for a comprehensive training range plan.³⁰ We also discussed OSD's inventory and the services' inputs and the need for a comprehensive training range plan with officials from the Office of the Director of Readiness and Training, Office of the Under Secretary of Defense, Personnel and Readiness; and a representative of the contractor, who compiled the report. Also, we reviewed two RAND studies on Air Force ranges and airspace.

To determine the extent to which OSD's *Implementation of the Department of Defense Training Range Comprehensive Plan* report meets other requirements mandated by section 366, we reviewed the report to determine if it contained an assessment of current and future training range requirements; an evaluation of the adequacy of current DOD resources, including virtual and constructive assets, to meet current and future training range requirements; recommendations for legislative or regulatory changes to address training constraints; and plans to improve the readiness reporting system. To obtain further clarification and information, we reviewed the individual submissions from the Army, Navy, Marine Corps, and Air Force. We also discussed OSD's report and the services' inputs with officials from the Office of the Director of Readiness and Training, Office of the Under Secretary of Defense, Personnel and Readiness; the Office of the Director, Training Directorate, Training Simulations Division, Office of the Deputy Chief of Staff, Department of the Army; the Navy Ranges and Fleet Training Branch, Fleet Readiness Division, Fleet Readiness and Logistics, Office of the Deputy Chief of Naval Operations; the Range and Training Area Management Division,

³⁰ We did not verify the completeness or accuracy of OSD's inventory or the services' inventory inputs.

Training and Education Command, Headquarters, Marine Corps; and the Office of the Director of Ranges and Airspace, Air and Space Operations, Headquarters, Air Force. We also met with a representative of the contractor who compiled the report. To determine what guidance the services were given when preparing their submission to the department's report, we also reviewed the January 28, 2003, memorandum from the Under Secretary of Defense for Personnel and Readiness to the military services.³¹ We also reviewed DOD's Sustainment of Ranges and Operating Areas directive³² that establishes policy and assigns responsibilities for the sustainment of test and training ranges and the department's Strategic Plan for Transforming DOD Training and Training Transformation Implementation Plan.³³

We assessed the reliability of the data in OSD's report by (1) reviewing existing information about military training ranges, (2) interviewing OSD and service officials knowledgeable about the report and training ranges, and (3) examining the data elements in the report by comparing known statistics and information. We determined that the data were sufficiently reliable for the purposes of this report.

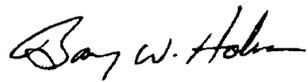
We are sending copies of this report to the appropriate congressional committees, as well as the Secretaries of Defense, the Army, the Navy, and the Air Force, and the Director, Office of Management and Budget. We will also make copies available to others upon request. In addition, the report will be available at no charge on GAO's Web site at <http://www.gao.gov>.

³¹ Department of Defense, Under Secretary of Defense for Personnel and Readiness, *Guidance for Complying with the Provisions of Section 366*.

³² Department of Defense Directive. *Sustainment of Ranges and Operating Areas*, 3200.15 (Washington, D.C.: Apr. 2003).

³³ DOD, *Strategic and Implementation Plans for Training Transformation*.

If you or your staff have any questions on the matters discussed in this letter, please contact me at (202) 512-8412, or my Assistant Director, Mark A. Little, at (202) 512-4673. Patricia J. Nichol, Tommy Baril, Steve Boyles, and Ann DuBois were major contributors to this report.



Barry W. Holman, Director
Defense Capabilities and Management

List of Congressional Committees

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Chairman

The Honorable Carl Levin
Ranking Minority Member
Committee on Armed Services
United States Senate

The Honorable Duncan Hunter
Chairman

The Honorable Ike Skelton
Ranking Minority Member
Committee on Armed Services
House of Representatives

The Honorable Ted Stevens
Chairman

The Honorable Daniel K. Inouye
Ranking Minority Member
Committee on Appropriations
Subcommittee on Defense
United States Senate

The Honorable Jerry Lewis
Chairman

The Honorable John P. Murtha
Ranking Minority Member
Committee on Appropriations
Subcommittee on Defense
House of Representatives

Appendix I: Section 366 of the Bob Stump National Defense Authorization Act for Fiscal Year 2003

SEC. 366. Training Range Sustainment Plan, Global Status of Resources and Training System, and Training Range Inventory.

(a) PLAN REQUIRED—(1) The Secretary of Defense shall develop a comprehensive plan for using existing authorities available to the Secretary of Defense and the Secretaries of the military departments to address training constraints caused by limitations on the use of military lands, marine areas, and airspace that are available in the United States and overseas for training of the Armed Forces.

(2) As part of the preparation of the plan, the Secretary of Defense shall conduct the following:

(A) An assessment of current and future training range requirements of the Armed Forces.

(B) An evaluation of the adequacy of current Department of Defense resources (including virtual and constructive training assets as well as military lands, marine areas, and airspace available in the United States and overseas) to meet those current and future training range requirements.

(3) The plan shall include the following:

(A) Proposals to enhance training range capabilities and address any shortfalls in current Department of Defense resources identified pursuant to the assessment and evaluation conducted under paragraph (2).

(B) Goals and milestones for tracking planned actions and measuring progress.

(C) Projected funding requirements for implementing planned actions.

(D) Designation of an office in the Office of the Secretary of Defense and in each of the military departments that will have lead responsibility for overseeing implementation of the plan.

(4) At the same time as the President submits to Congress the budget for fiscal year 2004, the Secretary of Defense shall submit to Congress a report describing the progress made in implementing this subsection, including—

(A) the plan developed under paragraph (1);

(B) the results of the assessment and evaluation conducted under paragraph (2); and

(C) any recommendations that the Secretary may have for legislative or regulatory changes to address training constraints identified pursuant to this section.

(5) At the same time as the President submits to Congress the budget for each of fiscal years 2005 through 2008, the Secretary shall submit to Congress a report describing the progress made in implementing the plan and any additional actions taken, or to be taken, to address training constraints caused by limitations on the use of military lands, marine areas, and airspace.

(b) **READINESS REPORTING IMPROVEMENT**—Not later than June 30, 2003, the Secretary of Defense, using existing measures within the authority of the Secretary, shall submit to Congress a report on the plans of the Department of Defense to improve the Global Status of Resources and Training System to reflect the readiness impact that training constraints caused by limitations on the use of military lands, marine areas, and airspace have on specific units of the Armed Forces.

(c) **TRAINING RANGE INVENTORY**—(1) The Secretary of Defense shall develop and maintain a training range inventory for each of the Armed Forces—

(A) to identify all available operational training ranges;

(B) to identify all training capacities and capabilities available at each training range; and

(C) to identify training constraints caused by limitations on the use of military lands, marine areas, and airspace at each training range.

**Appendix I: Section 366 of the Bob Stump
National Defense Authorization Act for Fiscal
Year 2003**

(2) The Secretary of Defense shall submit an initial inventory to Congress at the same time as the President submits the budget for fiscal year 2004 and shall submit an updated inventory to Congress at the same time as the President submits the budget for fiscal years 2005 through 2008.

(d) GAO EVALUATION—The Secretary of Defense shall transmit copies of each report required by subsections (a) and (b) to the Comptroller General. Within 60 days after receiving a report, the Comptroller General shall submit to Congress an evaluation of the report.

(e) ARMED FORCES DEFINED—In this section, the term ‘Armed Forces’ means the Army, Navy, Air Force, and Marine Corps.

Appendix II: Comments from the Department of Defense



PERSONNEL AND
READINESS

OFFICE OF THE UNDER SECRETARY OF DEFENSE
4000 DEFENSE PENTAGON
WASHINGTON, D.C. 20301-4000

MAY 20 2004

Mr. Barry W. Holman
Director, Defense Capabilities and Management
U.S. General Accounting Office
Washington, D.C. 20548

Dear Mr. Holman: *Barry*

This is the Department of Defense (DoD) response to the General Accounting Office Draft Report GAO-04-608, "MILITARY TRAINING: OSD Report on Training Ranges Does Not Fully Address Congressional Reporting Requirements," April 19, 2004 (GAO Code 350481).

The Department appreciates the opportunity to comment on this draft. We disagree with the GAO's findings that our February 2004 report to Congress fails to satisfy stated requirements. DoD therefore non-concurs with the GAO's recommendations in this area. The Department's comments to the GAO draft recommendations are enclosed.

Sincerely,

Paul W. Mayberry
Deputy Under Secretary
Readiness

Enclosure:
As stated



GAO-04-608/GAO CODE 350481

**“MILITARY TRAINING: DOD REPORT ON TRAINING
RANGES DOES NOT FULLY MEET CONGRESSIONAL
REPORTING REQUIREMENTS”**

**DEPARTMENT OF DEFENSE COMMENTS
TO THE RECOMMENDATIONS**

RECOMMENDATION 1: The GAO recommended that the Secretary of Defense direct the Under Secretary of Defense for Personnel and Readiness and the Secretaries of the Military Services to jointly develop an integrated training range database that identifies available training resources, specific capacities and capabilities, and training constraints caused by limitations on the use of training ranges, which could be continuously updated and shared among the Services at all command levels, regardless of Service ownership. (Page 18/Draft Report)

DoD RESPONSE: Non-concur. Each Military Service already possesses and is improving range information systems that address the features described in this recommendation. Further, the Department agrees that, as a long-term goal these systems should be linked to support joint use. It is DoD policy to document encroachment concerns and environmental considerations and improve information systems related to range management. The Services and OSD are moving forward in a deliberate approach that builds on existing systems and carefully manages the costs and risks inherent in information system integration and development. As part of our yearly Section 366 reports, the Department will document progress in this evolutionary effort to link and improve the Service range information systems.

However, the Department non-concurs with the recommendation that it should initiate a new massive database effort to allow OSD management of individual range activities. It must be recognized that each Service operates ranges to meet specific training requirements. While increased cross-Service or cross-functional use is a DoD goal, it does not resolve training constraints brought about by encroachment.

RECOMMENDATION 2: The GAO recommended that OSD provide a more complete report to the Congress to fully address the requirements specified in the Section 366 mandate by developing a comprehensive plan, which includes quantifiable goals and milestones for tracking planned actions and measuring progress, and projected funding requirements to more fully address identified training constraints. (Page 18/Draft Report)

DoD RESPONSE: Concur with comment. Meeting Section 366 requirements can be accomplished only through a long-term approach. Under OSD leadership, each of the Military Services has initiated an enhanced range management and comprehensive

planning process, as an integral element of expanding range sustainability programs. In line with this evolution, future reports will more fully address goals and milestones and projected funding requirements associated with these comprehensive plans. The Department is and will continue to execute a comprehensive program to improve sustainability of its ranges, and disagrees with the implication in this recommendation that it does not.

RECOMMENDATION 3: The GAO recommended that OSD provide a more complete report to the Congress to fully address the requirements specified in the Section 366 mandate by assessing current and future training range requirements and evaluating the adequacy of current resources to meet these requirements. (Page 18/Draft Report)

DoD RESPONSE: Non-concur. The Department has begun a program to better define range requirements. Because a valid requirements base must be a bottom-up process, this effort entails detailed work at each installation. It is unclear why GAO chose to not examine these efforts. Also, it is both impractical and inappropriate to include this level of detail in an OSD-level report. DoD believes that the Congress is better served if the Department describes, summarizes, and analyzes training requirements in its Section 366 reporting, rather than simply providing the requirements themselves. DoD therefore non-concurs with the GAO finding that it is not appropriately addressing this recommendation.

RECOMMENDATION 4: The GAO recommended that OSD provide a more complete report to the Congress to fully address the requirements specified in the Section 366 mandate by developing a readiness reporting system to reflect the impact on readiness caused by training constraints due to limitations on the use of training ranges. (Page 18/Draft Report)

DoD RESPONSE: Non-concur. The Department has, in its response to GAO's previous report and at other opportunities, stated that it is inappropriate to modify the SORTS report to address encroachment. DoD believes it is best to assess how encroachment impacts affect the ability of installations and ranges to conduct training and testing. DoD plans to incorporate encroachment impacts on readiness into the Defense Readiness Reporting System (DRRS), which is currently under development.

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SUMMARY OF AFIT PAPER ON ALERT LOCATION OPTIMIZATION

Background

-In March 2004, AFIT student Capt. Jon A. Eberlan published a thesis entitled "LOCATION OPTIMIZATION OF CONTINENTAL UNITED STATES STRIP ALERT SITES SUPPORTING HOMELAND DEFENSE"

-In his paper he uses mathematical optimization techniques to identify optimum placement of CONUS alert sites to defend potential targets in the U.S.

-The goal of each model he investigates is to provide coverage of these potential targets with the minimum number of alert locations

-Four (4) different models were analyzed, all with varying assumptions on potential alert airfields and potential targets

-MODEL IV is most applicable to alert site selection as it relates to the current BRAC considerations

SUMMARY OF AFIT PAPER ON ALERT LOCATION OPTIMIZATION

MODEL IV: Following is a brief synopsis of the assumptions in Model IV

- Only bases considered for alert locations are airfields currently being used by the ANG, AFR or the active duty Air Force
- Airfields must meet a minimum runway length
- The model is run eight times
 - Considers launch times of 5, 6, 7 and 8 minutes
 - Considers cruise speeds of 9 NM/minute and 8 NM/minute
- Assumes no airspace delays
- 66 "Type I" targets are considered: these are areas requiring constant strip alert coverage such as population centers, DOE, NRC and chemical sites
- "Type II" areas are not considered in this model: these are areas requiring coverage when requested by NORAD/NORTHCOM such as POTUS and VPOTUS coverage

SUMMARY OF AFIT PAPER ON ALERT LOCATION OPTIMIZATION

The following slide summarizes the results of the Model IV optimization. For each profile (varying launch time and speed), the optimizing program outputs the minimum number of sites required to provide coverage of the 66 Type I areas. The program also lists the optimum airfields by name – these are listed in Capt. Eberlan's report. Of the 8 profiles considered, Otis is listed as an optimum alert location on 6 of them (Pease is more optimum on 2 of the profiles). None of the models include Bradley, Atlantic City or Burlington as optimum alert locations for the given profiles.

The last slide maps the Model IV optimum alert locations for the baseline profile of 8 minute launch and 9 NM.minute cruise (which yields the 108 critical distance ring). This slide comes directly from Capt. Eberlan's thesis briefing.

Alert Location Optimization

Summary of Model IV*

PROFILE (20-minute response)

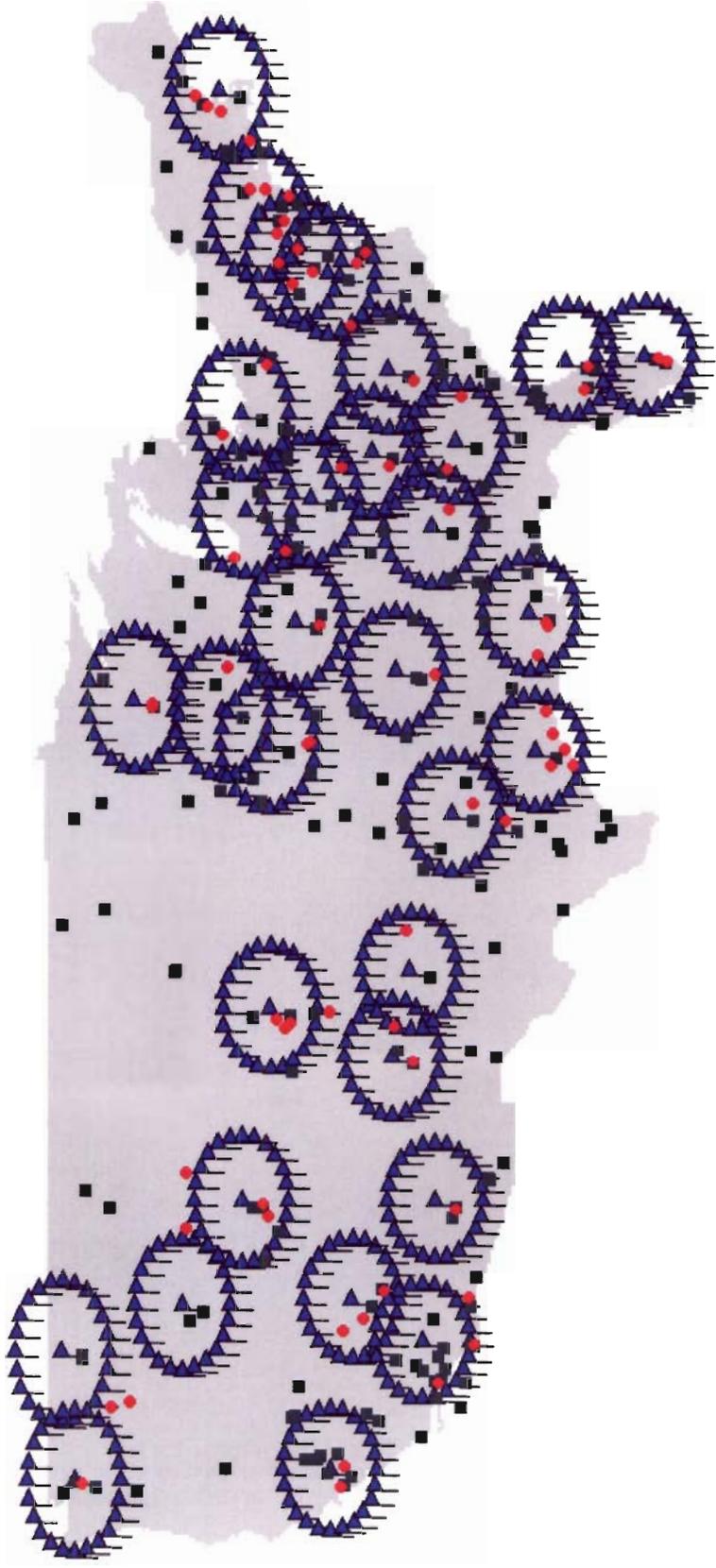
NORTHEAST BASES IN THE OPTIMUM SITE MODEL

<u>LAUNCH</u>	<u>ENROUTE</u>	<u>DISTANCE</u>	<u>OPTIMUM</u>	<u>OTIS</u>	<u>BRADLEY</u>	<u>ATLANTIC CITY</u>	<u>PEASE</u>	<u>BURLINGTON</u>
<u>TIME</u>	<u>SPEED</u>	<u>TRAVELED</u>	<u># SITES</u>					
8 min	9 nm/min	108 NM	32	X				
7 min	9 nm/min	117 NM	32	X				
6 min	9 nm/min	126 NM	29				X	
5 min	9 nm/min	135 NM	27				X	
8 min	8 nm/min	96 NM	33	X				
7 min	8 nm/min	104 NM	32	X				
6 min	8 nm/min	112 NM	32	X				
5 min	8 nm/min	120 NM	30	X				

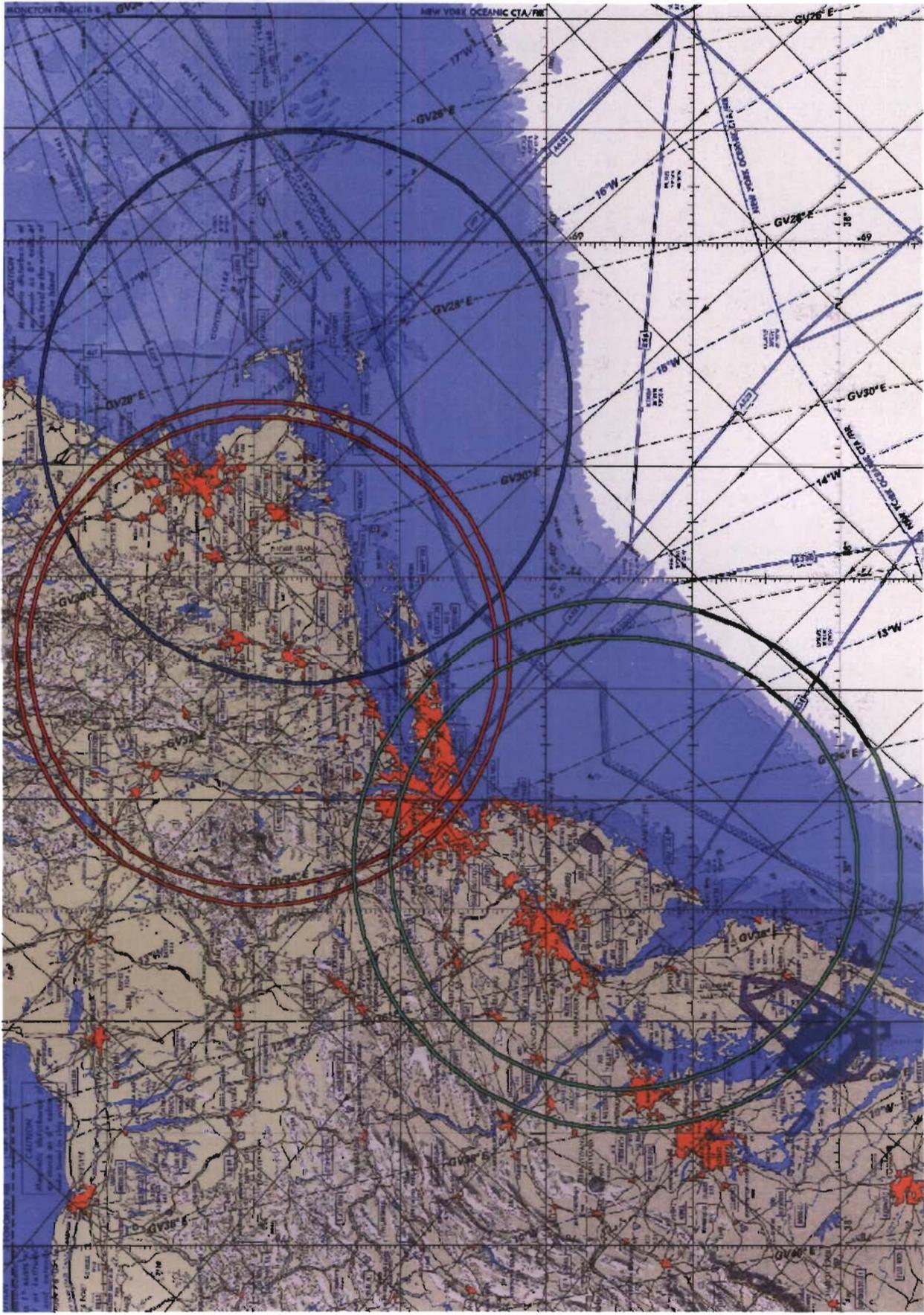
*Considers all currently used ANG, AFR and Air Force fields meeting minimum length requirement. Optimum model provides coverage to 66 priority sites in the CONUS.

NETWORK SOLUTION (AF ONLY – Model IV)

Critical Distance = 108NM



10 MINUTE RESPONSE STUDY



10 MINUTE RESPONSE

OVERVIEW

This comparison quantifies the effect of the location of alert facilities with regard to short notice response to threats. It is assumed that an airborne threat exists to either Boston or New York City, that the threat originates from over water and that the threat is proceeding directly toward the center of the city (in this case Logan and JFK). 10 minute fighter response time and associated distances are measured from takeoff and take into account over land restrictions – subsonic until 15 NM feet wet (when applicable).

10 MINUTE RESPONSE

Intercept Assumptions

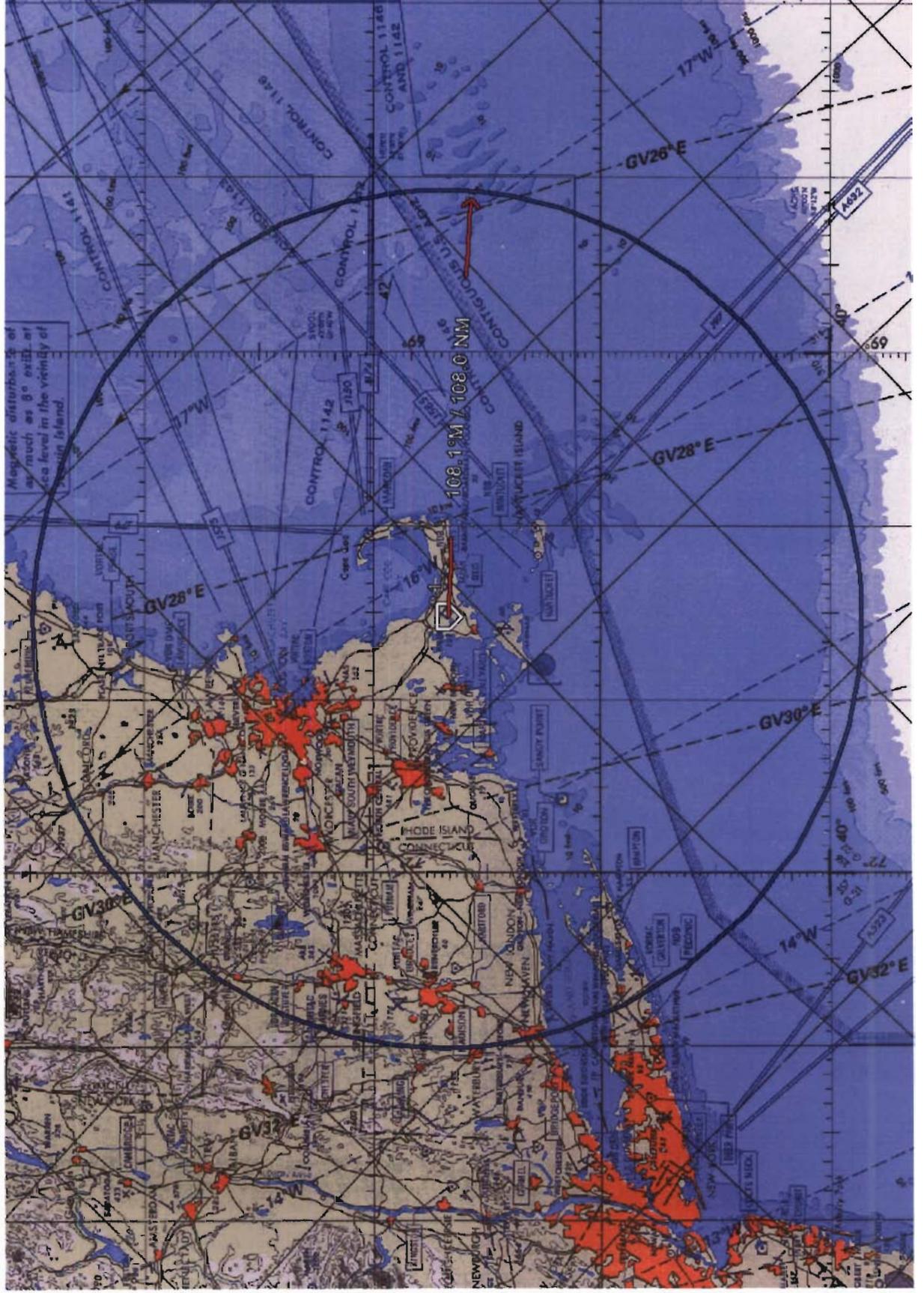
Profile 1: Max power takeoff and climb to FL200, .95M until 15 NM feet wet, then 1.2M to the 10 minute point. Heading is direct to optimum intercept point.

Profile 2: Max power takeoff and climb to FL200, then .95M to the 10 minute point (assumes 15 NM feet wet is not reached). Heading is direct to optimum intercept point.

OTIS 10 MINUTE RESPONSE

- For all threat axis considered, fighters from Otis can utilize Profile 1
- Otis fighters are 15 NM feet wet at approximately 42 NM from base
- Distance traveled by Otis fighters on Profile 1: 108 NM

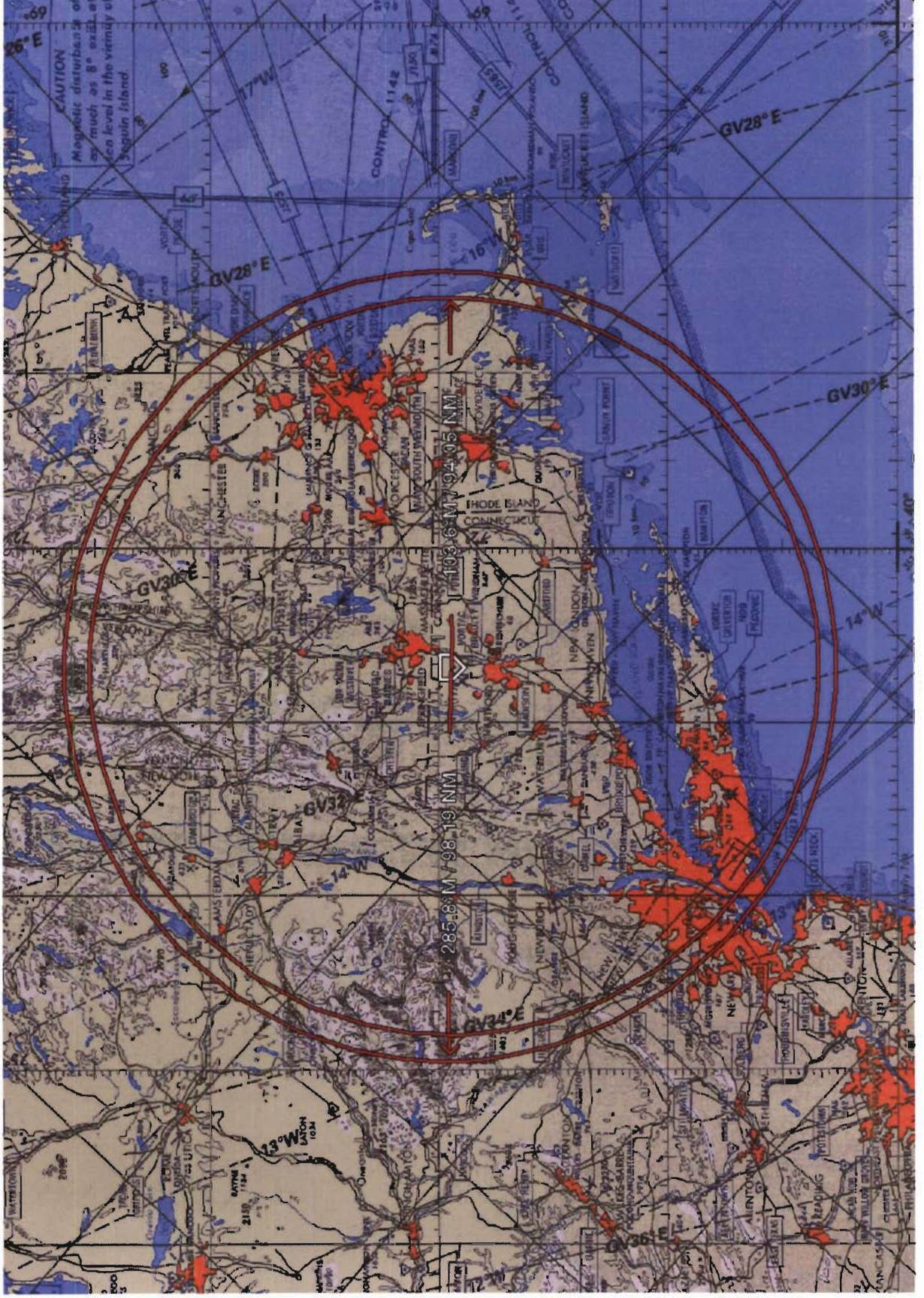
OTIS PROFILE 1 – 108 NM



BRADLEY 10 MINUTE RESPONSE

- For initial headings of approximately 140° to 200°, Bradley fighters can use Profile 1
- Bradley fighters are 15 NM feet wet at approximately 79 NM from base
- Distance traveled by Bradley fighters on Profile 1: 98 NM
- For all other initial headings, Bradley fighters must use Profile 2 since they never achieve 15 NM feet wet
- Distance traveled by Bradley fighters on Profile 2: 94 NM

BRADLEY PROFILES – 94/98 NM



ATLANTIC CITY 10 MINUTE RESPONSE

-For initial headings of approximately 070° to 200°, Atlantic City fighters can use Profile 1

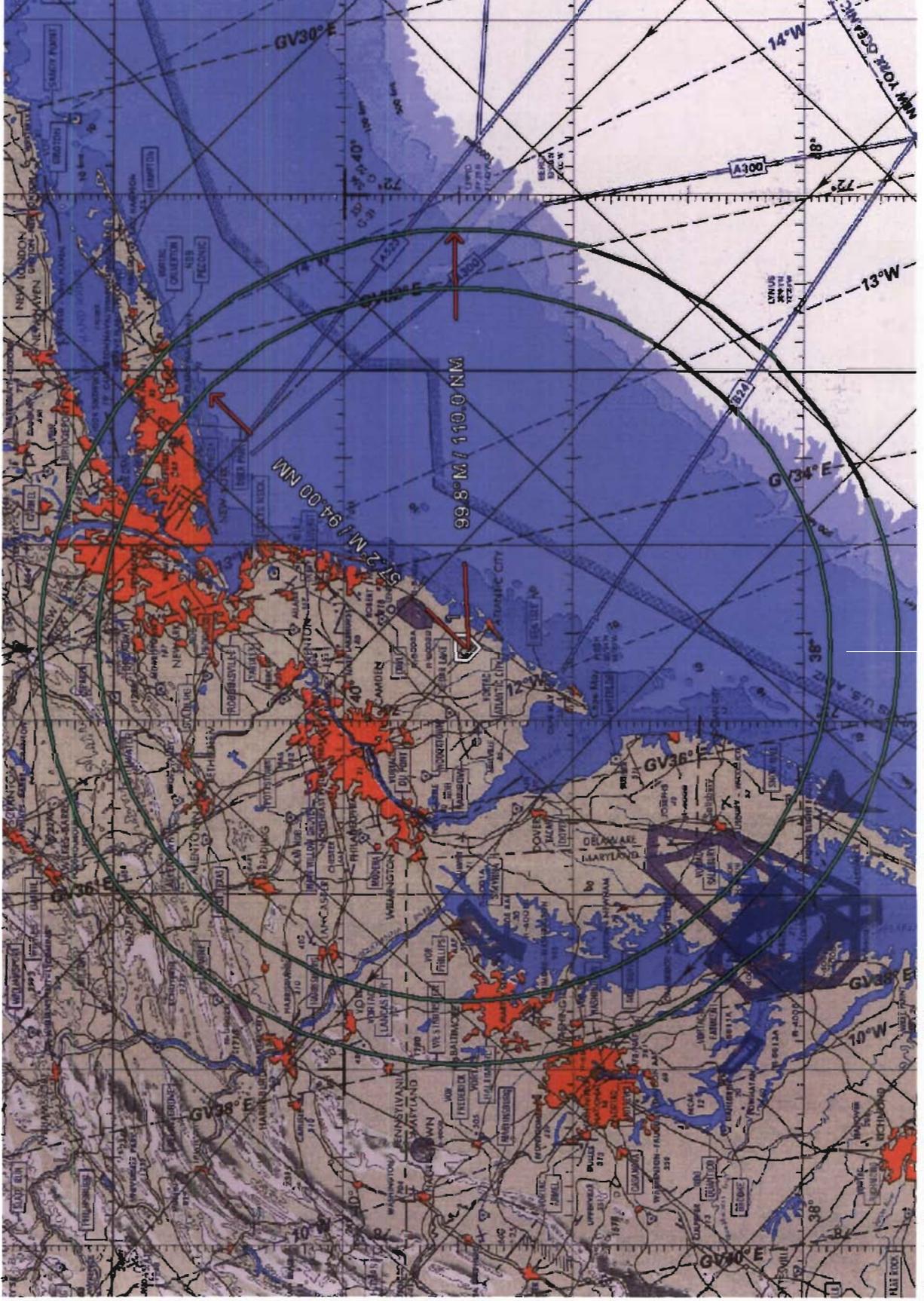
-Atlantic City fighters are 15 NM feet wet at approximately 35 NM from base

-Distance traveled by Atlantic City fighters on Profile 1: 110 NM

-For all other initial headings, Atlantic City fighters must use Profile 2 since they never achieve 15 NM feet wet

-Distance traveled by Atlantic City fighters on Profile 2: 94 NM

ATLANTIC CITY PROFILES - 94/110 NM



INTERCEPT DATA - BOSTON

Distance away (NM) from Boston that fighters can intercept threat along given axis within 10 minutes from takeoff

<u>THREAT AXIS</u>		<u>FMH</u>	<u>BDL</u>	<u>ACY</u>
BOS	045°	73	18	na
BOS	090°	108	14	na
BOS	135°	150	21	na
BOS	180°	157	56	na
BOS	225°	127	145	324

(na = interceptors do not reach this threat axis in 10 minutes from takeoff)

10 MINUTE RESPONSE - BOSTON



SUMMARY: Otis vs. Bradley

THREATS to BOSTON

045° threat: Otis can intercept 55 NM further away than Bradley

090° threat: Otis can intercept 94 NM further away than Bradley

135° threat: Otis can intercept 129 NM further away than Bradley

180° threat: Otis can intercept 101 NM further away than Bradley

225° threat: Bradley can intercept 18 NM further away than Otis

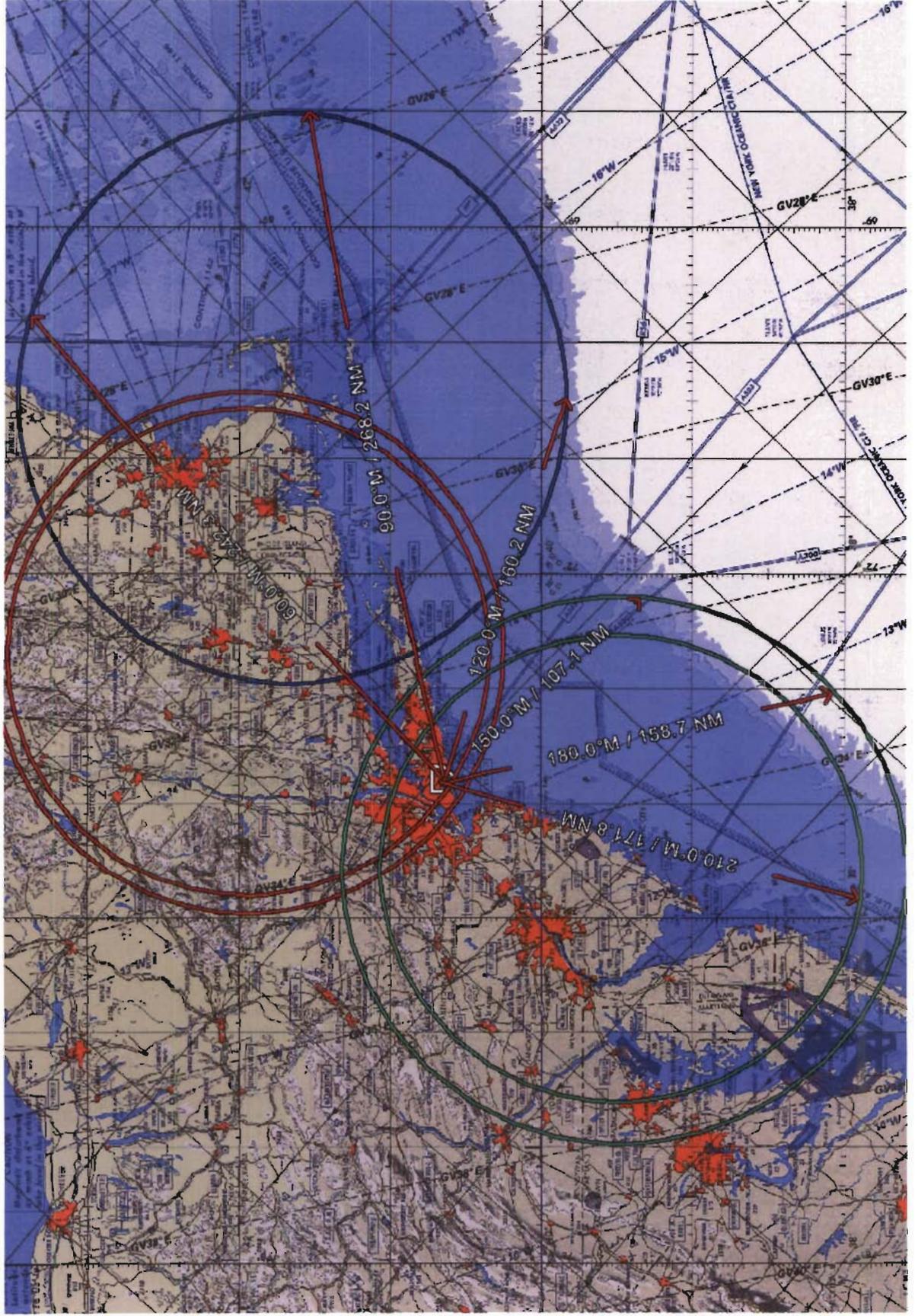
INTERCEPT DATA - NYC

Distance away (NM) from NYC that fighters can intercept threat along given axis within 10 minutes from takeoff

<u>THREAT AXIS</u>	<u>FMH</u>	<u>BDL</u>	<u>ACY</u>
JFK 060°	242	180	14
JFK 090°	268	135	20
JFK 120°	160	70	37
JFK 150°	na	10	107
JFK 180°	na	4	158
JFK 210°	na	3	171

(na = interceptors do not reach this threat axis in 10 minutes from takeoff)

10 MINUTE RESPONSE - NYC



SUMMARY: Otis vs. Bradley

THREATS to NEW YORK City

060° threat: Otis can intercept 62 NM further away than Bradley

090° threat: Otis can intercept 133 NM further away than Bradley

120° threat: Otis can intercept 90 NM further away than Bradley

150° threat: Bradley can intercept threat 10 NM from JFK*

180° threat: Bradley can intercept threat 4 NM from JFK*

210° threat: Bradley can intercept threat 3 NM from JFK*

*Otis does not reach this axis in 10 minutes from takeoff

BOTTOM LINE

Considering over water threats to the eastern seaboard's major metro areas of Boston and New York City, there is no case where a Bradley alert facility provides a better short notice response time than the current alert structure (Otis + Atlantic City). From any over water threat axis, interceptors from Otis and Atlantic City can always intercept airborne threats much further away from these cities than can interceptors operating from Bradley.

Comparing only Otis and Bradley, Otis still provides the best overall coverage of the two bases. Only from a southern threat axis does Bradley have a small coverage advantage, but in all other sectors, Otis provides a distinct and significant advantage in short response coverage.

Viper Intercept to ALLEX (W-102)

Intercept Assumptions

- Time is from immediate takeoff
- Configuration: standard ASA SCL w/2 bags
- Max power takeoff and Max Tech Order climbs
- Route is direct Allex
- Cruise at .95 Mach until gas allows acceleration to 1.2M
- Escort aircraft to Bangor, chase approach and landing, climb out to 10,000', hold for 10 minutes, max range home at FL350
- Assumes NO ATC delays
- Assumes VFR weather at home base (no alternate required) and no tanker available

Viper Intercept to ALLEX (W-102)

Fuel Assumptions

- 1000# STTO
- Max climb at 42000 #/hr to FL350
- .95 Mach at 6000 #/hr
- 1.2 Mach at 30000 #/hr
- max range cruise at 3000 #/hr
- max endure at 2500 #/hr
- approaches cost 10 minutes and 400 #
- Mil climbout at 6000 #/hr

Viper Intercept to ALLEX (W-102)

Results

In order to complete the profile without the need to divert for gas, the vipers must stay at .95M until 51 NM from ALLEX, then can accelerate to 1.2 Mach to complete the intercept.

Time to intercept: 30:59
Fuel at intx point: 4700#
Fuel on landing: 1400#



COBRA NET PRESENT VALUES REPORT (COBRA v6.10)

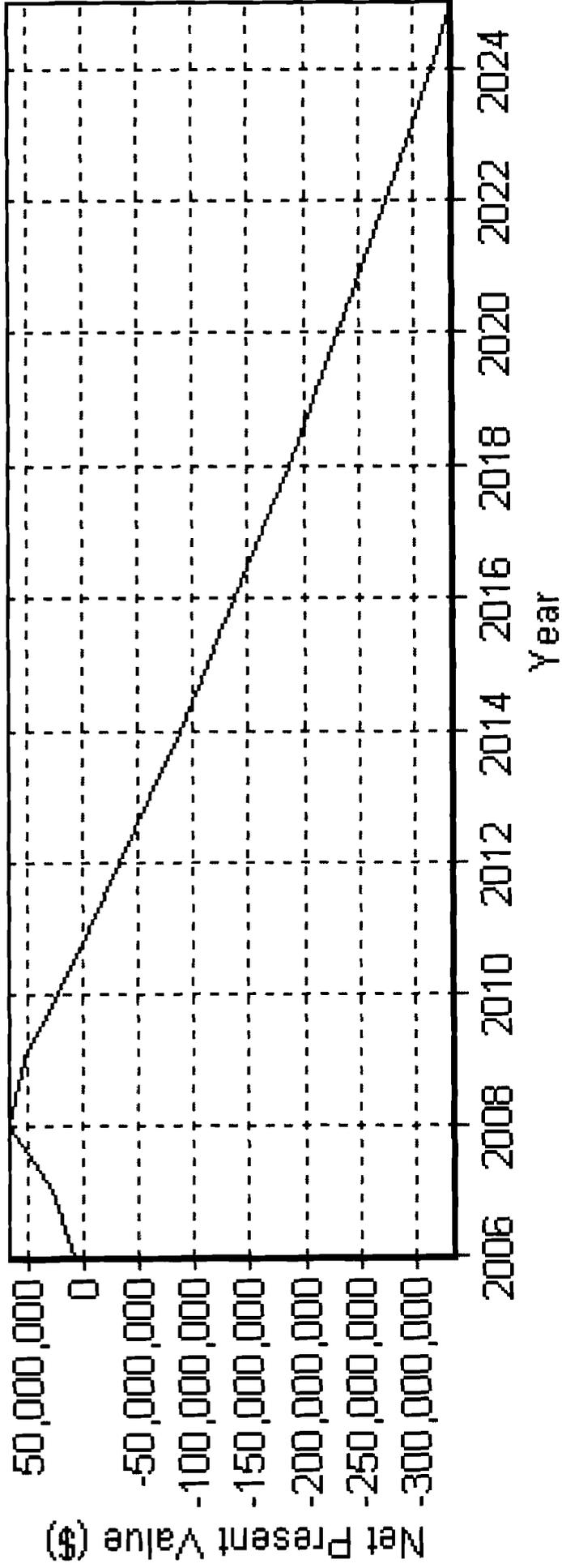
Data As Of 4/27/2005 2:39:59 PM, Report Created 7/25/2005 9:22:50 AM

Department : Air Force
 Scenario File : C:\Documents and Settings\sean.riley\My Documents\BRAC\Otis\COBRA USAF 0044V3 (142c3).CBR
 Option Pkg Name: COBRA USAF 0044V3 (142c3) Otis ANGB, Falmouth, MA
 Std Fctrs File : C:\Documents and Settings\sean.riley\My Documents\BRAC\COBRA\BRAC2005.SFF

Year	Cost(\$)	Adjusted Cost(\$)	NPV(\$)
----	-----	-----	-----
2006	9,294,686	9,167,230	9,167,230
2007	19,381,763	18,595,317	27,762,548
2008	40,567,754	37,861,531	65,624,079
2009	-15,505,760	-14,077,228	51,546,851
2010	-32,423,133	-28,634,259	22,912,591
2011	-33,561,133	-28,831,981	-5,919,389
2012	-33,561,133	-28,046,674	-33,966,063
2013	-33,561,133	-27,282,757	-61,248,819
2014	-33,561,133	-26,539,646	-87,788,466
2015	-33,561,133	-25,816,777	-113,605,243
2016	-33,561,133	-25,113,596	-138,718,839
2017	-33,561,133	-24,429,568	-163,148,407
2018	-33,561,133	-23,764,171	-186,912,578
2019	-33,561,133	-23,116,898	-210,029,477
2020	-33,561,133	-22,487,255	-232,516,732
2021	-33,561,133	-21,874,762	-254,391,494
2022	-33,561,133	-21,278,951	-275,670,445
2023	-33,561,133	-20,699,369	-296,369,814
2024	-33,561,133	-20,135,573	-316,505,386
2025	-33,561,133	-19,587,133	-336,092,519

COBRA NET PRESENT VALUE CHART (COBRA v6.10)

Data As Of 4/27/2005 2:39:59 PM, Chart Created 7/25/2005 9:24:23 AM



Department: Air Force

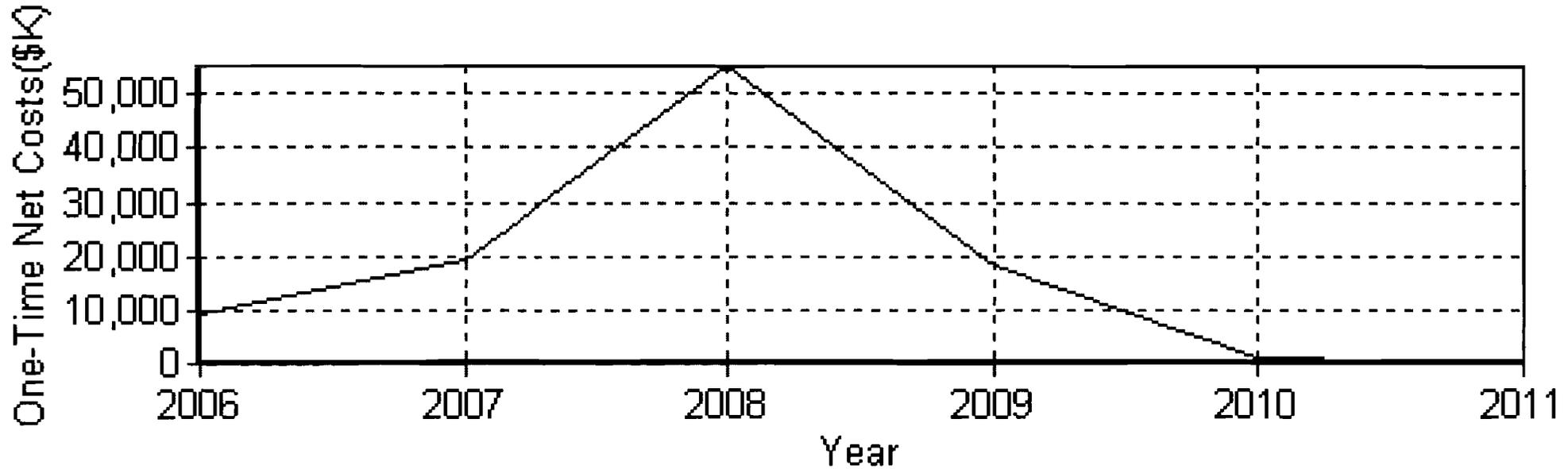
Scenario File: C:\Documents and Settings\sean.riley\My Documents\BRAC\Otis\COBRA USAF 0044V3 (142c3).CBF

Option Pkg Name: COBRA USAF 0044V3 (142c3) Otis ANGB, Falmouth, MA

Std Fctrs File: C:\Documents and Settings\sean.riley\My Documents\BRAC\COBRA\BRAC2005.SFF

TOTAL COBRA REALIGNMENT DETAIL CHART (COBRA v6.10)

Data As Of 4/27/2005 2:39:59 PM, Chart Created 7/25/2005 9:24:23 AM



- Series1
- Series2
- Series3
- Series4
- Series5
- Series6
- Series7
- Series8

Department: Air Force

Scenario File: C:\Documents and Settings\sean.riley\My Documents\BRAC\Otis\COBRA USAF 0044V3 (142c3).CBF

Option Pkg Name: COBRA USAF 0044V3 (142c3) Otis ANGB, Falmouth, MA

Std Fctrs File: C:\Documents and Settings\sean.riley\My Documents\BRAC\COBRA\BRAC2005.SFF

COBRA NET PRESENT VALUES REPORT (COBRA v6.10)

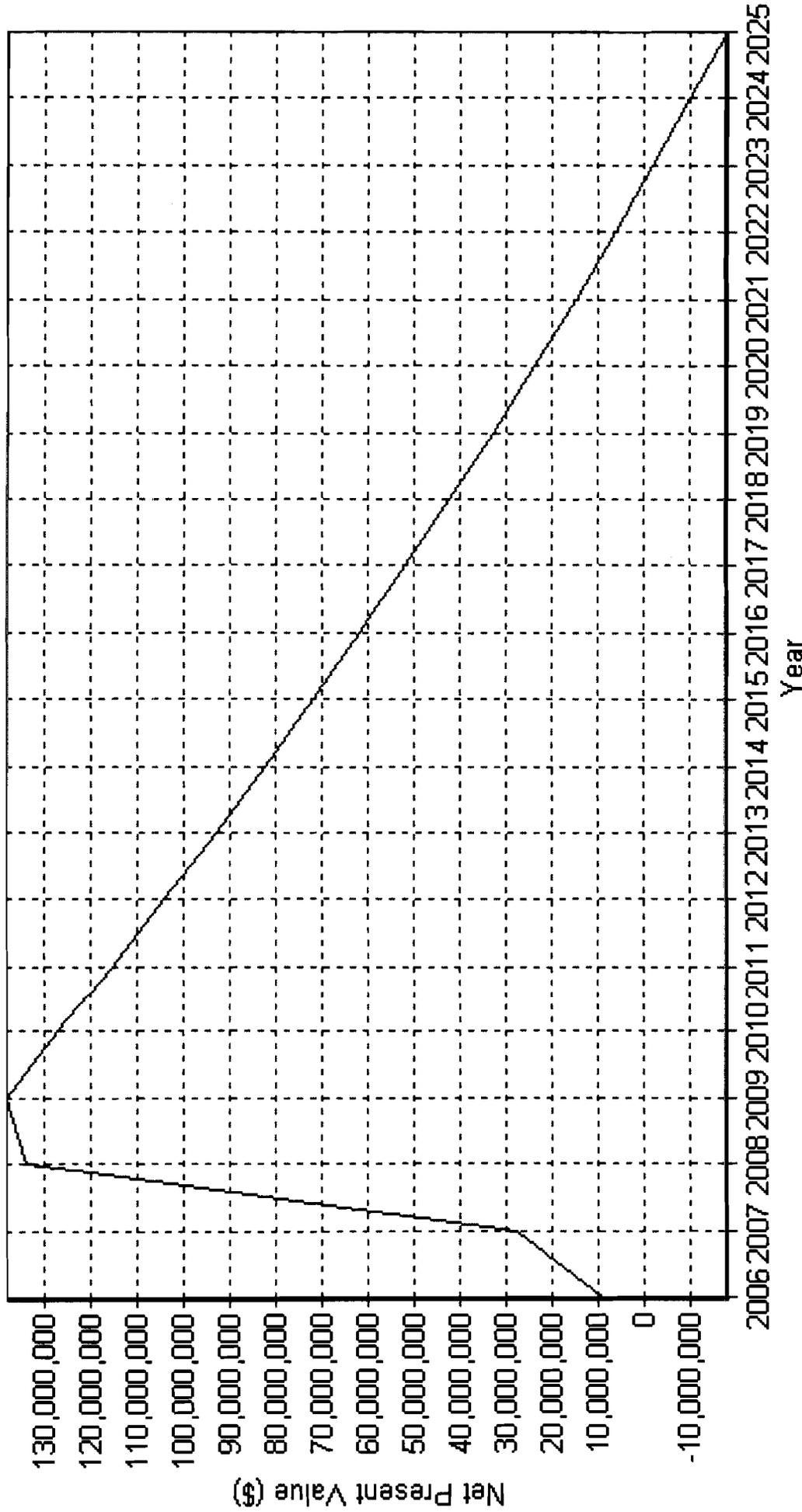
Data As Of 7/12/2005 7:35:31 AM, Report Created 7/25/2005 9:38:01 AM

Department : Air Force
 Scenario File : C:\Documents and Settings\sean.riley\My Documents\BRAC\Otis\COBRA BOS Conv Costs.CBR
 Option Pkg Name: COBRA USAF 0044V3 (142c3) Otis ANGB, Falmouth, MA
 Std Fctrs File : C:\Documents and Settings\sean.riley\My Documents\BRAC\COBRA\BRAC2005.SFF

Year	Cost (\$)	Adjusted Cost (\$)	NPV (\$)
----	-----	-----	-----
2006	9,294,686	9,167,230	9,167,230
2007	19,381,763	18,595,317	27,762,548
2008	113,703,754	106,118,723	133,881,271
2009	4,494,240	4,080,190	137,961,461
2010	-12,423,133	-10,971,401	126,990,060
2011	-13,561,133	-11,650,212	115,339,847
2012	-13,561,133	-11,332,891	104,006,956
2013	-13,561,133	-11,024,213	92,982,743
2014	-13,561,133	-10,723,943	82,258,800
2015	-13,561,133	-10,431,851	71,826,949
2016	-13,561,133	-10,147,715	61,679,234
2017	-13,561,133	-9,871,318	51,807,916
2018	-13,561,133	-9,602,449	42,205,467
2019	-13,561,133	-9,340,904	32,864,563
2020	-13,561,133	-9,086,483	23,778,080
2021	-13,561,133	-8,838,991	14,939,089
2022	-13,561,133	-8,598,240	6,340,849
2023	-13,561,133	-8,364,047	-2,023,198
2024	-13,561,133	-8,136,232	-10,159,430
2025	-13,561,133	-7,914,623	-18,074,053

COBRA NET PRESENT VALUE CHART (COBRA v6.10)

Data As Of 7/12/2005 7:35:31 AM, Chart Created 7/25/2005 9:38:01 AM



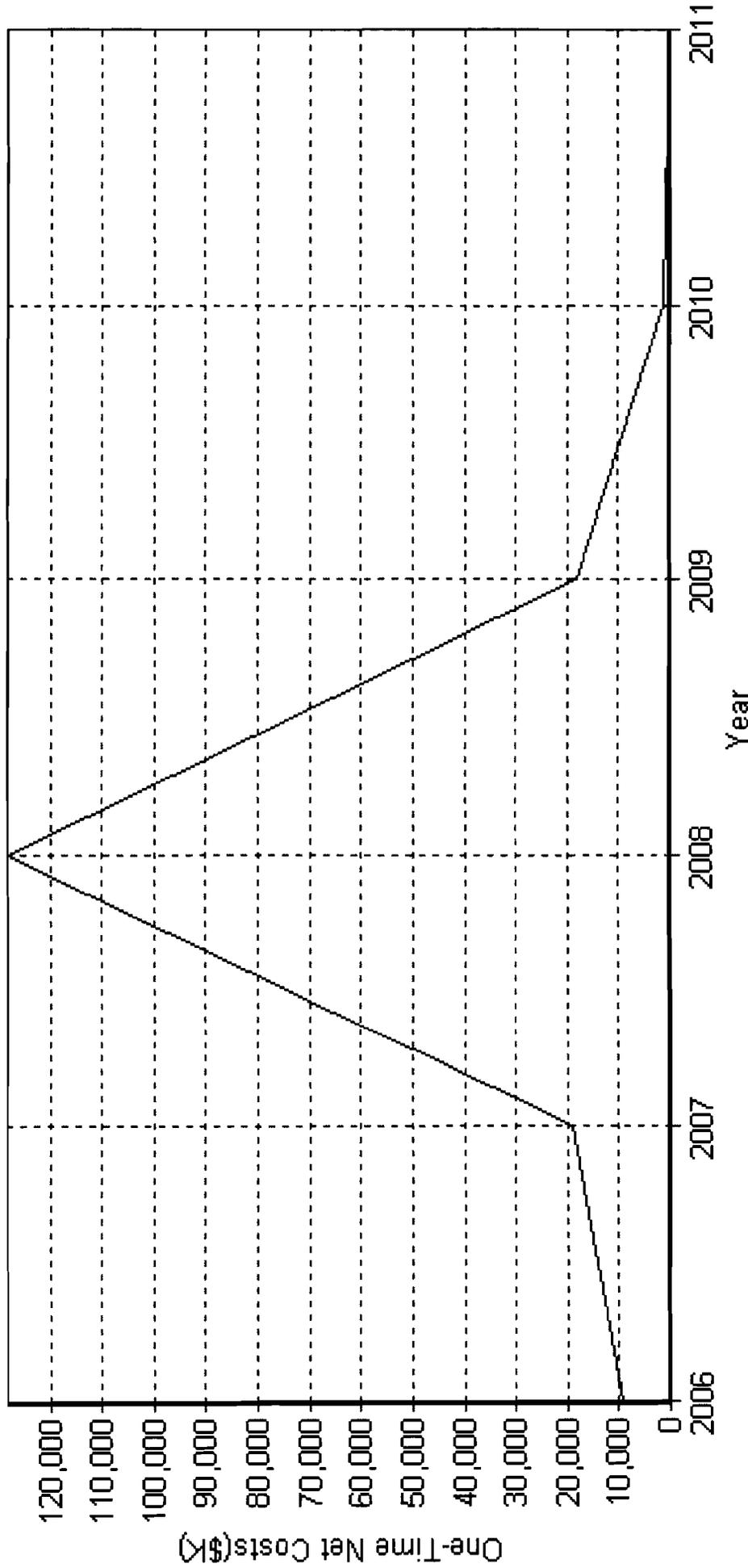
Department: Air Force

Scenario File: C:\Documents and Settings\sean.riley\My Documents\BRAC\Otis\COBRA BOS Conv Costs.CBR

Option Pkg Name: COBRA USAF 0044V3 (142c3) Otis ANGB, Falmouth, MA

Std Fctrs File: C:\Documents and Settings\sean.riley\My Documents\BRAC\COBRA\BRAC2005.SFF

TOTAL COBRA REALIGNMENT DETAIL CHART (COBRA v6.10)
 Data As Of 7/12/2005 7:35:31 AM, Chart Created 7/25/2005 9:38:01 AM



— Series1 — Series2 — Series3 — Series4 — Series5 — Series6 — Series7 — Series8

Department: Air Force
 Scenario File: C:\Documents and Settings\sean.riley\My Documents\BRAC\Otis\COBRA BOS Conv Costs.CBR
 Option Pkg Name: COBRA USAF 0044V3 (142c3) Otis ANGB, Falmouth, MA
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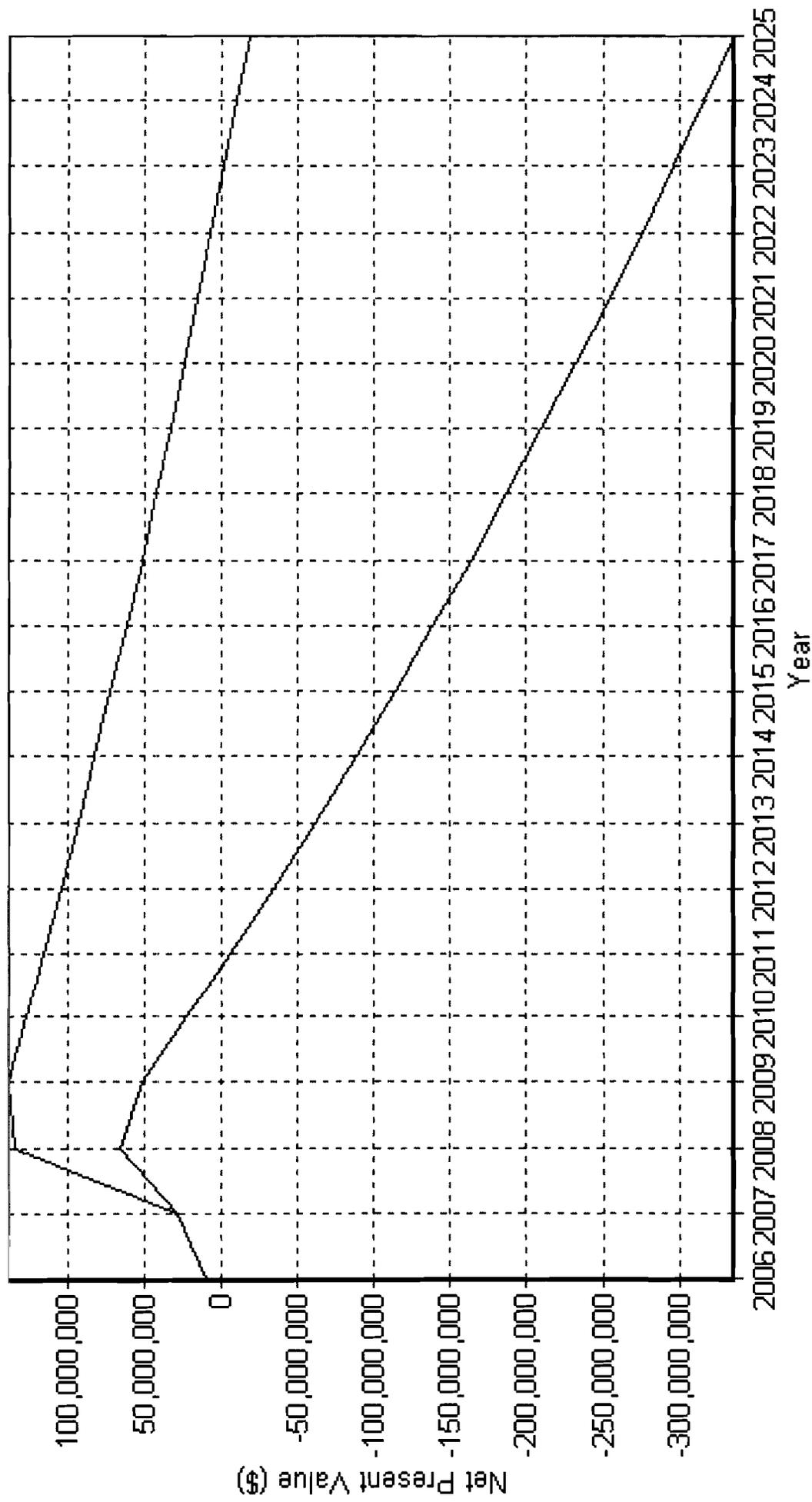
ADDER COMPARISON MULTIPLE NET PRESENT VALUES REPORT (ADDER v6.10)
Report Created 6/30/2005 8:05:26 AM

Year	One	Two
----	---	---
2006	9,167,230	9,167,230
2007	27,762,548	27,762,548
2008	133,881,271	65,624,079
2009	137,961,461	51,546,851
2010	126,990,060	22,912,591
2011	115,339,847	-5,919,389
2012	104,006,956	-33,966,063
2013	92,982,743	-61,248,819
2014	82,258,800	-87,788,466
2015	71,826,949	-113,605,243
2016	61,679,234	-138,718,839
2017	51,807,916	-163,148,407
2018	42,205,467	-186,912,578
2019	32,864,563	-210,029,477
2020	23,778,080	-232,516,732
2021	14,939,089	-254,391,494
2022	6,340,849	-275,670,445
2023	-2,023,198	-296,369,814
2024	-10,159,430	-316,505,386
2025	-18,074,053	-336,092,519

One :COBRA USAF 0044V3 (142c3) Otis ANGB, Falmouth, MA
Two :COBRA USAF 0044V3 (142c3) Otis ANGB, Falmouth, MA

ADDER COMPARISON MULTIPLE NET PRESENT VALUES CHART (ADDER v6.10)

Chart Created 6/30/2005 8:05:26 AM



COBRA USAF 0044V3 (142c3) Otis ANGB, Falmouth, MA
COBRA USAF 0044V3 (142c3) Otis ANGB, Falmouth, MA

ADDER COMPARISON ONE-TIME COST REPORT (ADDER v6.10)
 Report Created 6/30/2005 8:05:26 AM

One : COBRA USAF 0044V3 (142c3) Otis ANGB, Falmouth, MA
 C:\Documents and Settings\sean.riley\My Documents\BRAC\Otis\COBRA BOS Conv Costs.CBR
 Two : COBRA USAF 0044V3 (142c3) Otis ANGB, Falmouth, MA
 C:\Documents and Settings\sean.riley\My Documents\BRAC\Otis\COBRA USAF 0044V3 (142c3).CBR

(All values in 2005 Constant Dollars)

Category	Scenario One	Scenario Two	Delta
Construction			
Military Construction	47,466,000	47,466,000	0
Total - Construction	47,466,000	47,466,000	0
Personnel			
Civilian RIF	3,855,206	3,855,206	0
Civilian Early Retirement	674,022	674,022	0
Eliminated Military PCS	94,446	94,446	0
Unemployment	298,217	298,217	0
Total - Personnel	4,921,891	4,921,891	0
Overhead			
Program Planning Support	3,067,363	3,067,363	0
Support Contract Termination	0	0	0
Mothball / Shutdown	363,150	363,150	0
Total - Overhead	3,430,513	3,430,513	0
Moving			
Civilian Moving	18,667,422	18,667,422	0
Civilian PPP	1,703,808	1,703,808	0
Military Moving	246,119	246,119	0
Freight	838,049	838,049	0
Information Technologies	3,177,000	3,177,000	0
One-Time Moving Costs	5,367,000	5,367,000	0
Total - Moving	29,999,398	29,999,398	0
Other			
HAP / RSE	0	0	0
Environmental Mitigation Costs	3,054,000	3,054,000	0
Mission Contract Startup and Termination	0	0	0
One-Time Unique Costs	87,242,000	14,106,000	-73,136,000
Total - Other	90,296,000	17,160,000	-73,136,000
Total One-Time Costs	176,113,802	102,977,802	-73,136,000
One-Time Savings			
Military Construction Cost Avoidances	0	0	0
Military Moving	164,511	164,511	0
One-Time Moving Savings	0	0	0
Environmental Mitigation Savings	0	0	0
One-Time Unique Savings	0	0	0
Total One-Time Savings	164,511	164,511	0
Total Net One-Time Costs	175,949,291	102,813,291	-73,136,000

ADDER COMPARISON SUMMARY REPORT (ADDER v6.10)
Report Created 6/30/2005 8:05:26 AM

Scenario One : C:\Documents and Settings\sean.riley\My Documents\BRAC\Otis\COBRA BOS Conv Costs.CBR
: COBRA USAF 0044V3 (142c3) Otis ANGB, Falmouth, MA
Starting Year : 2006
Final Year : 2008
Payback Year : 2023 (15 Years)
NPV in 2025(\$K): -18,074
1-Time Cost(\$K): 176,114

Scenario One Net Costs in 2005 Constant Dollars (\$K)

	2006	2007	2008	2009	2010	2011	Total	Beyond
	----	----	----	----	----	----	-----	-----
MilCon	3,923	13,165	14,932	15,446	0	0	47,466	0
Person	0	0	-3,488	-16,963	-16,963	-16,963	-54,376	-16,963
Overhd	1,171	1,047	-5,424	4,073	3,401	3,401	7,669	3,401
Moving	2,629	3,688	22,336	458	724	0	29,835	0
Missio	0	0	0	0	0	0	0	0
Other	1,572	1,482	85,348	1,480	414	0	90,296	0
TOTAL	9,295	19,382	113,704	4,494	-12,423	-13,561	120,890	-13,561

POSITIONS ELIMINATED

Off	0	0	1	0	0	0	1
Enl	0	0	21	0	0	0	21
Civ	0	0	236	0	0	0	236
TOT	0	0	258	0	0	0	258

POSITIONS REALIGNED

Off	0	0	16	0	0	0	16
Enl	0	0	61	0	0	0	61
Stu	0	0	0	0	0	0	0
Civ	0	0	475	0	0	0	475
TOT	0	0	552	0	0	0	552

Scenario Two : C:\Documents and Settings\sean.riley\My Documents\BRAC\Otis\COBRA USAF 0044V3 (142c3).CBR
: COBRA USAF 0044V3 (142c3) Otis ANGB, Falmouth, MA

Starting Year : 2006
Final Year : 2008
Payback Year : 2011 (3 Years)
NPV in 2025(\$K): -336,092
1-Time Cost(\$K): 102,978

Scenario Two Net Costs in 2005 Constant Dollars (\$K)

	2006	2007	2008	2009	2010	2011	Total	Beyond
	----	----	----	----	----	----	-----	-----
MilCon	3,923	13,165	14,932	15,446	0	0	47,466	0
Person	0	0	-3,488	-16,963	-16,963	-16,963	-54,376	-16,963
Overhd	1,171	1,047	-5,424	-15,927	-16,598	-16,598	-52,331	-16,598
Moving	2,629	3,688	22,336	458	724	0	29,835	0
Missio	0	0	0	0	0	0	0	0
Other	1,572	1,482	12,212	1,480	414	0	17,160	0
TOTAL	9,295	19,382	40,568	-15,506	-32,423	-33,561	-12,246	-33,561

POSITIONS ELIMINATED

Off	0	0	1	0	0	0	1
Enl	0	0	21	0	0	0	21
Civ	0	0	236	0	0	0	236
TOT	0	0	258	0	0	0	258

POSITIONS REALIGNED

Off	0	0	16	0	0	0	16
Enl	0	0	61	0	0	0	61
Stu	0	0	0	0	0	0	0
Civ	0	0	475	0	0	0	475
TOT	0	0	552	0	0	0	552



F-15 Conversion Cost

Pilots required for 15 PAA F16 squadron at ACY to 24 PAA F15 squadron:

48 pilots needed to man a 24 PAA Fighter Squadron (does not include OSF)

(Source: NGB XOR, Lt Col Kriesel)

10 current/qualified F15 pilots "hired" by ACY for initial Cadre (no cost).

38 current F16 pilots to undergo conversion training.

INITIAL TRAINING: *Actual costs*

Assume four "B Courses" for new pilots and inexperienced F-16 pilots and the rest Track 1A Transition Courses designed for seasoned F-16 pilots transitioning to the Eagle.

Training cost of four F-15 B Course students:

\$10,000,000 Total

B Course specifics:

Personnel Funds	\$910,166
Operating Funds	\$1,609,668
Munitions Funds	\$12,871

Total **\$2,532,705**

(FY 02 Dollars. Source:

<http://usmilitary.about.com/library/milinfo/blafaircrewcost.htm?terms=air+force+aircrew+initial+training+costs>. This is the same source used by Portland and St Louis.

Secondary confirmation from Lt Col Kelly, 114th FS/CC Klamath Falls. Third source: 173rd FW OSF/CC, Lt Col Imrich.

Training cost of 34 F-15 TX Course:

\$68,000,000 Total

TX Track 1A Course specifics:

173rd OSF/CC stated that B-course costs \$2.5M, and TX course is \$2.0M

Total of \$78,000,00 for training all 38 pilots

Not included in 6 July brief. For info only:

MISSION QUALIFICATION TRAINING (MQT) To declare IOC:

Flying hour costs are included in unit annual operating costs.

The real cost = loss of advanced training at the expense of IOC upgrade training.

Mission Qualification Training cost of 38 F-15 fighter pilots is:

\$17,428,320 Total

- Length in training days: 90 calendar days at no TDY cost (home station)
- 11 syllabus sorties for the student at 13.6 flight hours (not including non-effective sorties or attrition losses)
- 24 direct support sorties of aircraft to fight with and against the student at 30.5 flight hours
- Average cost per flight hour currently at Otis ANGB - \$10,400
- Total minimum cost of flying hours dedicated to one student = \$458,640

Multiply by 38 projected MQT trainees = \$17,428,320 Total

**OTIS ANGB CURRENTLY HAS A PROVEN TEAM OF 26 PROFESSIONAL
F-15 FIGHTER PILOTS THAT HAS THE FOLLOWING TOTAL
UPGRADE QUALIFICATIONS:**

**16 INSTRUCTOR PILOTS
17 MISSION COMMANDERS
23 FOUR SHIP FLIGHT LEADERS
25 TWO SHIP FLIGHT LEADERS
4 WEAPONS SCHOOL GRADUATES
2 FUNCTIONAL CHECK FLIGHT PILOTS
24 NIGHT VISION GOGGLE PILOTS
20 PILOTS WITH COMBAT TIME**

COST: 0



**OVERVIEW ANALYSIS
BASE OPERATING COSTS
102 FW**

OPERATIONAL COSTS

	<u>LABOR</u>			<u>SUPPLIES/EQUIPMENT</u>			<u>TOTAL BOS</u>
	<u>UNITS</u>	<u>COST PER UNIT</u>	<u>TOTAL LABOR</u>	<u>UNITS</u>	<u>COST PER UNIT</u>	<u>TOTAL SUPPLIES</u>	
A CIVIL ENGINEERING							
1 ELECTRICAL TITLE V	11	73,648	810,128	1	54,230	54,230	864,358
ELECTRICITY BOS				1	412,053	412,053	412,053
2 ROADS AND GROUNDS TITLE V	10	57,911	579,110	1	136,955	136,955	716,065
3 STRUCTURES TITLE V	6	59,555	357,330	1	48,914	48,914	406,244
4 MECHANICAL TITLE V	4	65,689	262,756	1	32,613	32,613	295,369
TITLE 32	1	65,689	65,689				0
NATURAL GAS BOS				1	372,597	372,597	372,597
5 ENGINEERING TITLE V	6	95,130	570,781	1	68,355	68,355	639,136
6 MATERIAL CONTROL TITLE V	2	63,818	127,636	1	165,652	165,652	293,288
7 WORK CONTROL TITLE V	1	52,383	52,383			0	52,383
8 FIRE DEPARTMENT TITLE V	49	75,760	3,712,240	1	85,000	85,000	3,797,240
9 WWTF TITLE V	4	76,771	307,084	1	28,347	28,347	335,431
	94						0
B PMEL							
TITLE V	26	71,741	1,865,266				1,865,266
C TRANSPORTATION							
1 TITLE V	7	63,524	444,668	1	132,826	132,826	577,494
TITLE 32	7		0			0	0
D SECURITY							
1 SECURITY AGREEMENT (17 personnel)	1	831,000	831,000	1	20,000	20,000	851,000
TITLE V			0				0
TITLE 32	24						
TITLE 10	18						
E OPERATIONS							
1 WILDLIFE ABATEMENT	1	35,000	35,000				35,000
TITLE V (AIRFIELD SUPPORT)	3	63,550	190,650	1	65,300	65,300	255,950
TITLE 32 (AIRFIELD SUPPORT)	5	63,550	317,750				317,750
AIR TRAFFIC CONTROLLERS (SUPPORT)	1	180,000	180,000				180,000
NAVAIDS CONTRACT (AIRFIELD SUPPORT)	1	509,721	509,721				509,721
WEATHER OBSERVER CONTRACT	1	281,000	281,000				281,000
F EOD							
1 TITLE 32	1	80,000	80,000				80,000
AGR	1	91,000	91,000				91,000
G POL							
1 TITLE 32	8	79,467	635,736				
H MUNITIONS STORAGE							
1 TITLE 32	1	79,467	79,467				
I SUPPORT/MISC							
TITLE V	20	63,818	1,276,360				1,276,360
IT				1	42,500	42,500	42,500

TOTAL TITLE V PERSONNEL: 149

TOTALS LABOR AND SUPPLIES: 13,662,755 1,665,342 15,328,097

CAPITAL COSTS

1	AVERAGE ANNUAL FACILITY REPAIRS AND CONSTRUCTION OUTLAYS:	6,758,150
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TOTAL BOS COSTS:	\$22,086,247
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Discussion of Overview Analysis Base Operating Costs for the 102FW

Currently the 102FW has, in addition to its alert mission, a role as host to several other tenants on the Massachusetts Military Reservation (MMR).

In that role, the 102FW provides several core joint use services including electrical distribution, road maintenance, water and wastewater treatment provision, airfield operations and security, and PMEL services.

While some direct expenses are billed out to some of the larger tenants, the majority of expenses associated with this Base Operating Support role (BOS) are absorbed by the 102FW's Operations and Maintenance (O&M) budget in its role as host.

As such, if the 102FW were to depart the MMR, these BOS costs would need to be absorbed by another entity, most likely the new host, or spread out over the remaining tenants. In either event, it is necessary to quantify those costs in order to gain a fair assessment of the monetary impact of closing the 102FW.

This analysis has been developed to depict the current BOS costs as described above. A distinction is made between annual operational costs, which include labor, supplies, service contracts, and utilities, versus capital costs for facility modernization and construction. The following describes in further detail elements of the spreadsheet.

OPERATIONAL COSTS

A. Civil Engineering:

Currently there are 94 personnel in Civil Engineering performing BOS related activities and functions.

1. The Electrical shop repairs and maintains electrical operations for CG housing and operations, the waste water treatment plant, numerous lift stations, navigational aids, communications, 10 emergency generators, the airfield, as well as its own operations. There are 610 electrical transformers, 2068 utility poles and 372,636 lineal feet of electric utility lines, 13,800 feet of airfield approach lighting, 37,000 lineal feet of runway lighting, and 120,000 lineal feet of taxiway lighting on the MMR.

2. The Roads and Grounds shop is responsible for snowplowing, mowing, runway sweeping and de-icing. There are 144,013 lineal feet of roadways, 388,167 square yards of airfield runways, 502,605 square yards of airfield aprons, 295,614 square yard of airfield taxiways, and 8,234 square yards of driveways.

3. The Structures Shop takes care of repairs to the runway, taxiway, signage, and the exterior of buildings. In addition to the statistics described previously, there are 208 total mission and BOS buildings serviced by the structures shop.

4. The Mechanical Shop controls repairs to water and wastewater distribution systems, flushing fire hydrants, water flow tests, and heating, ventilation, and air conditioning. In addition to previously mentioned statistics, there are 350 fire hydrants on the MMR.

5. Engineering includes in house design and project management personnel responsible for Facilities Sustainment, Restoration, and Modernization (FSRM) and Military Construction (MilCon) projects. Currently there are 85 BOS related projects in the pipeline for the next six years, as well as some 20 others, which will be developed during that time period.

6. Material Control includes personnel who control supply and equipment ordering and distribution.

7. Work Control processes all written and verbal work order requests. For FY 04 5,790 BOS and mission work orders were processed and serviced.

8. The Fire Department responds to all emergency calls involving all tenants on the MMR. In FY 04 there were 866 responses and 59 mutual aid calls to surrounding towns. Currently the Fire Department services some 2.4 million square feet of facilities on the MMR.

9. The Waste Water Treatment Facility processes all water and wastewater treatment needs for all MMR tenants. There are 303,204 lineal feet of sewage main lines, and 520,027 lineal feet of water main lines. In FY 2004 48.4 million gallons of discharge were treated and 92.9 million gallons of water produced for MMR tenants.

B. Precision Measurement and Equipment Laboratory (PMEL):

1. There are 26 personnel responsible for PMEL work order requests supporting a variety of tenants. Currently our PMEL laboratory services 25 other Air Force Units in addition to the local Army and Coast Guard units.

C. Transportation:

1. 7 Title V (BOS) employees and supply and services costs associated with all repairs and maintenance of equipment assigned to the BOS function. Such equipment includes fire apparatus, snowplows and related equipment for roads and runways, and CE vehicles and grass cutting equipment for roads, runways, and acreage.

D. Security:

1. The 17 contracted individuals assigned to provide 24-hour security for airfield operations and various other BOS related functions.

E. Airfield Operations:

1. Listed are the Annual Wildlife Abatement Contract, and the Title V and Title 32 personnel who directly support the airfield. Also included, are the Annual Air Traffic Controller Contract, Navigational Aids Contract, and Weather Observer Contract.

F. Explosive Ordnance Disposal (EOD):

1. Two fulltime personnel assigned to provide EOD operations. Currently our EOD function services the 104th FW, the Army, 6th SWS, the 23d SOPS, and the Coast Guard, as well as a multitude of local entities in Southeastern New England.

G. Fuels:

1. The personnel associated with the fuels management program. Currently the 102d FW provides Petroleum Oil Lubricant (POL) services for the Army, Coast Guard, and the Air Force Center for Environmental Excellence (AFCEE).

H. Munitions Storage:

1. Personnel responsible for the storage of munitions. Currently the 102d FW service 6 tenants in this area.

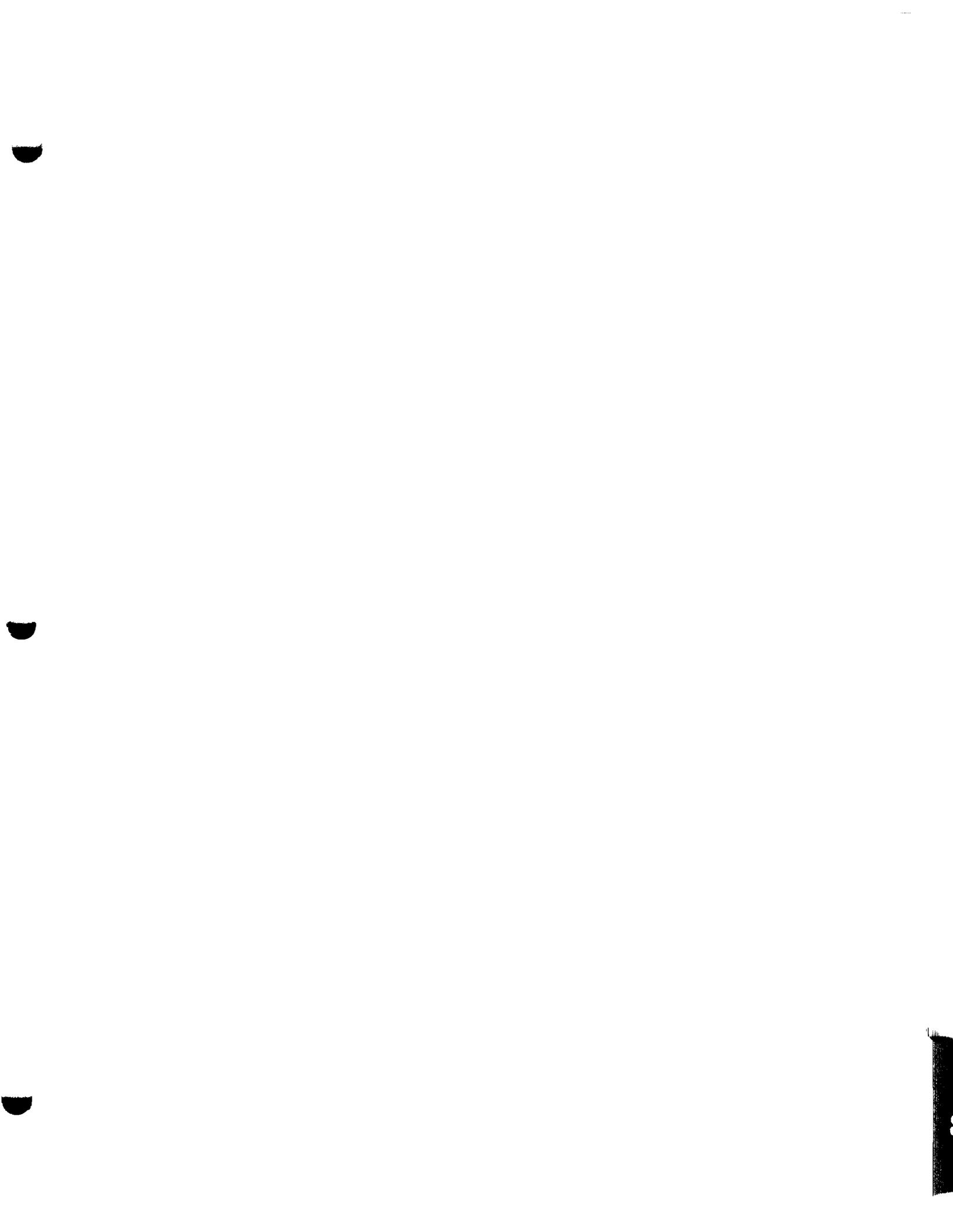
I. Support:

1. Reflects the balance of uncategorized Title V positions in the areas of accounting, management, procurement, personnel, secretarial, information technology, communications, and environmental. In the communications area, there are 468,950 lineal feet of communications and conduit in addition to the local switch that needs to be maintained.

CAPITAL COSTS

1. The total monetary value of all FSRM (facilities sustainment, restoration, and modernization) projects as well as Military Construction projects for BOS (base operating support) facilities beginning in FY 04 and going out through FY 09 was reviewed.

An average was then taken to arrive at the \$6,758,150 figure provided. This represents an estimate of what a typical yearly BOS outlay in FSRM and Milcon would be for either Otis or any host assuming its BOS responsibilities.



OTIS ANG
BASE OPERATING SERVICES

	Total 102nd Facility Engineering PAL (For reference only)	102nd Facility Engineering "BOS apportionment"	units	Cost per Unit (\$K)	Personnel Cost	Supplies / Eqpt / Utilities / Contract Costs (\$K) (FY04)	Total (\$K)
A. Facility Engineer Cost							
1 Electrical	13		11 FTE	80	\$880	\$54	\$934
2 Roads & Grounds	17		10 FTE	80	\$800	\$137	\$937
3 Structures	10		6 FTE	80	\$480	\$49	\$529
4 Mechanical	9		5 FTE	80	\$400	\$33	\$433
5 Material Control	4		2 FTE	80	\$160	\$166	\$326
6 Work Control	2		1 FTE	80	\$80	\$0	\$80
7 Fire Department	57		49 FTE	80	\$3,920	\$85	\$4,005
8 WTP & WWTP	4		5 FTE	80	\$400	\$28	\$428
9 POL	9		5 FTE	80	\$400	?	\$400
B. Utility Costs							
1 Electricity						\$412	\$412
2 Natural Gas						\$373	\$373
C. AFC43 Design Costs							
1 Engineering Staff	11		6 FTE	80	\$480	\$68	\$548
D. Transportation							
1 Motor Pool	?		7 FTE	80	\$560	\$133	\$693
E. Security							
1 Security Agreement Contract						\$250	\$250
F. Air Field Operations							
1 Wild Life Abatement					\$35	\$0	\$35
2 Airfield Manager / staff	8		4 FTE	80	\$320	\$0	\$320
3 Air Traffic Controller					\$350	\$0	\$350
4 Nav Aids					\$350	\$0	\$350
G. Support / Misc							
1 See "Word" Document	21		18 FTE	80	\$1,440	\$28	\$1,468
H. Annual AFC43 Maintenance							
1 Typical Year between 2M to 4M. FY04 at \$4078K						\$4,078	\$4,078
I. AC&I Costs							
1 See "Word" Document							
Total	165		129 FTE		\$11,055	\$5,894	\$16,949

Discussion of OTIS ANG Base
Base Operating Cost Summary
(i.e. Excel spreadsheet: BRAC.xls)

A. Facility Engineering Cost

1. Electrical: Includes labor and material costs for performing both high voltage and low voltage electrical repairs and maintenance. If 102nd operations leave, high voltage electricians would still be required to manage approximately 600 electrical poles for CG housing and operations, the Water Treatment Plant (WTP), Waste Water Treatment Plant (WWTP), numerous lift stations, Nav Aids, Comms, and approximately 10 emergency generators.
2. Roads and Grounds: 102nd currently does not contract out any mowing, snowplowing, or runway sweeping. All efforts are performed with in-house labor.
3. Structures Shop: Responsible for repairs to runway, taxiway, signage and exterior of buildings
4. Mechanical: Responsible for repairs to water and waste water distribution system, flushing fire hydrants, water flow tests, etc.
5. Material Control: Personnel who control Supply Distribution.
6. Work Control: Second gentleman at the Help Desk to handle increased call volume.
7. Fire Department: 102nd currently has 57 fire fighters. 43 are funded by the 102nd, 8 are funded by the Army National Guard, and 6 are funded by the Coast Guard. It is estimated that the number of Fire Fighters could be reduced to 49 if the department existed without the 102nd fighter wing.
8. WTP and WWTP: Those 2 plants are currently run with 4 technicians. However, a recent state inspection recommended that those plants are staff with 5 employees.
9. POL: The POL shop is currently staff for 9 members, and they are responsible for a 1M gallon fuel farm that is comprised of a 600K and 400K tank

B. Utility Costs

1. Electricity: Educated guess on quantity of electrical bill that is apportioned to Base Operating Services.
2. Natural Gas: Educated guess on quantity of natural gas bill that is apportioned to Base Operating Services.

Discussion of OTIS ANG Base
Base Operating Cost Summary
(i.e. Excel spreadsheet: BRAC.xls)

C. AFC43 Design Costs

1. Engineering Staff: 102nd currently has 11 engineering staff members who are responsible for performing facility designs, permit construction management, and operate the dig safe program. This function is more analogous to the services provided by a CEU.

D. Transportation

1. Motor Pool: 102nd currently has a limited number of GSA vehicles and billets shown are used to fix a myriad of utility trucks, construction equipment, and cars. If Coast Guard managed facility, there would need to be consideration for the purchase and maintenance of additional vehicles.

E. Security

1. Security Agreement Contract: 102nd currently has a security contract that employees 17 people and is valued at \$851K. They are on call 24 hours / day and provide security around the F15's and airfield. It is estimated that the CG would reduce scope of services if they managed the airfield.

F. Airfield Operations

1. Wild life abatement contractor keeps wild animals and birds off the airfield
2. The airfield manager and his staff ensure FOD is kept off the airfield, schedule flights, perform daily inspections on condition of runway and fencing, etc.
3. Air Traffic Controller: The contract for the air traffic controllers is part of a larger contract that covers 2 other bases.
4. Nav Aids: The 102nd facility engineer staff is responsible for the emergency generators and providing power to the airfield. The NAV AID contractor is responsible for the nav aid "box".

G. Support / Miscellaneous:

1. This includes such disciplines as accounting, management, procurement, civilian personnel, secretaries, OSHA safety, IT, COMMS, and environmental personnel

H. AFC43 Projects:

1. As noted on spreadsheet, 102nd will typically spend between \$2M to \$4M on non-recurring "AFC43-type" maintenance items.

Discussion of OTIS ANG Base
Base Operating Cost Summary
(i.e. Excel spreadsheet: BRAC.xls)

I. ACI projs:

1. 102nd indicates that they have the following MILCON projs are urgently pending:
\$1.3M approach lighting, \$2.0M taxiway slab repairs, \$7.0M control tower.