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*Downsizing Future
USAF Fighter Forces*

*Living Within the
Constraints of History*

Kevin N. Lewis

*Prepared for the
United States Air Force*

Project AIR FORCE

Approved for public release; distribution unlimited

PREFACE

How should U.S. Air Force fighter forces be structured and organized in the future? No one doubts that airpower will play a continuing vital role in future American defense planning. That role may, in fact, grow in importance as U.S. defense downsizing continues, as the global strategic environment evolves, and as technological and other developments present new operational opportunities. On the other hand, such capabilities are expensive to modernize and operate, so decisions about fighter force size, mix, and other attributes are fraught with controversy—and further declines in the defense budget could intensify debate over these forces.

This report provides a framework for approaching systematically certain issues pertinent to a future fighter force roadmap. It presents alternative postures, based on force and mission planning themes, and it discusses selected issues associated with the operational, modernization, and other implications of those alternatives. While the ultimate USAF fighter force may differ from the options presented here, the methodology offered nevertheless highlights key planning issues and has considerable value for that reason.

The foundation of the approach described here is the concept of a “core fighter force.” The core force notion, quite simply, refers not to some objective posture goal in its own right, but rather to a set of resources—a baseline fighter inventory—that is likely to remain in hand *no matter what other decisions are taken regarding force size and mission mix*. Barring extreme change in the basic structure of the U.S. national military concept or, perhaps, radical reductions in defense budgets beyond the scale of any now contemplated, this

core set of forces is assumed to constitute a fixed basis for the USAF posture no matter what other factors come into play.

Given this foundation for force planners, the balance of the USAF fighter posture planning problem can be conceived of as a set of decisions about which (and how many) forces to maintain above and beyond this core. In the near term, force levels may be driven mainly by resource constraints. Force mix questions will reflect operational requirements deriving from the contingencies used for planning, the availability of nonfighter force substitutes, estimates of the relative effectiveness of fighter and other forces in meeting a broad array of objectives, and other influences. All in all, the key decisions to be made in laying out an overall plan for USAF fighter forces for the rest of the 1990s should be viewed as how to constitute this residual posture, not how to lay out from scratch a fighter force.

This research was conducted under the Strategy and Doctrine Program of Project AIR FORCE and was sponsored by the Director of Plans, Headquarters, United States Air Force.

The research upon which this report is based was originally performed in response to USAF Staff interrogatories in 1991-1992. The lines of the report follow those originally laid down, although the material has been updated to reflect subsequent developments, notably the Clinton administration's "Bottom-Up Review."

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CONTENTS

Preface	iii
Figures	xi
Tables	xiii
Summary ..	xv
Acknowledgments	xxv
Acronyms and Abbreviations	xxvii
Chapter One	
INTRODUCTION	1
Some Caveats and Conventions	6
Chapter Two	
THE CURRENT CONTEXT FOR FORCE PLANNING	11
Origins of the Present USAF Tactical Fighter Posture	12
Origins of the Modern USAF Fighter Force	12
Materiel Origins of the "Modern" USAF Tactical Fighter Structure	14
Consequences of the Stability of the Modern USAF TAF in Recent Years	18
Factors Influencing USAF Fighter Force Reduction Plans Thus Far	18
USAF Combat Aircraft Procurement and Current Choices	20
The Base Force, and Posture Changes to Date	24

Plans and Their Consequences: Force Reductions to Date, and Those Planned	27
Subsequent Force Adjustments	30
Chapter Three	
DETERMINANTS OF USAF FIGHTER FORCE PLANNING	33
Issues to Be Resolved	34
Determining Force Reductions: In Principle and in Practice	35
Pertinent Lessons of Previous Drawdowns for Current Choices	36
Conceptual Predicates of Historical USAF Force Reductions	37
Drawdown of Marginal Force Elements	39
Changing Status of the ARC over Time—Especially During Drawdowns	40
Chapter Four	
RULES FOR FORCE PLANNING: SIZING, MIXING, AND OTHER CONCEPTS	43
Principles for Guiding Further Reductions	43
Other Rules for Force Planning	45
Defining a Core USAF Fighter-Attack Force	45
Chapter Five	
OPTIONS FOR ALTERNATIVE REDUCED POSTURES	51
The Five Options, and the Operational “Concept” They Imply	52
A. A Continued Proportional Drawdown (“Business as Usual” Posture Reductions)	52
B. An ARC Force Purity Option	52
C. An ARC Air-to-Air Force Emphasis	53
D. An Active/Reserve Twin MRC Alignment	53
E. A Compensatory USAF Division of Labor	54
The Basis for the Selections of Particular Types of Forces	54
Invariant Parts of the Posture	55
The Baseline Multirole (F-16) Fighter Posture	56
The Quantity and Mix of Interdiction-Type Forces	58
Other Aircraft Types	60

The Basis for the Overall Force Levels Used in the Assessment	61
Five Alternative Downsized TAF Force Structure Options ..	64
Chapter Six	
A BRIEF ASSESSMENT OF THE FIVE OPTIONS AND REMARKS ON ALLIED ISSUES	71
Consequences of the Existence of a "Core" 18-FWE TAF Posture	71
Relevance of These Points to Related TAF Planning Issues	74
USAF TAF Replacement Issues for Various Reduced Posture Levels	74
The Quantitative and Mission Mix Requirements of MRCs	83
Balancing USAF and USN/USMC Tactical Combat Aviation Capabilities	89
Chapter Seven	
PROSPECTS FOR THE FUTURE	95
Appendix: BIBLIOGRAPHIC NOTE ON FORCE STRUCTURE AND ACQUISITION DATA	101

FIGURES

1. Evolution of the Total USAF Fighter Attack Force Structure, FY54-94	4
2. FY70 Projected Versus Actual USAF Tactical Posture: Fighter Forces in Fighter Wing Equivalents	15
3. Procurement of USAF Fighter-Attack Aircraft Constituting the Baseline TAF from Which Reductions Would Come	23
4. Estimated "Maintenance" Posture for a 36-Fighter Wing Equivalent TAF Through FY00	25
5. TAF Evolution Under the Pre-Desert Storm Base Force Plan	26
6. The Final Base Force Plan and the BUR Adjustment	29
7. Divestiture of USAF Air Defense Fighter Forces, FY62-72	40
8. Posture Replacement Requirements for the Base Force and 18-FWE Core Posture Levels: Cumulative Force Deficit by Type of Aircraft	76
9. The Evolution of USN/USMC TAF Structure: Comparison of Plans	93

TABLES

S.1.	The "Core" USAF Fighter Force	xviii
1.	Mid-1970s USAF TAF Posture and Modernization Plan for the 1980s	17
2.	Composition and Origins of Recent USAF Fighter- Attack Forces	21
3.	A Baseline for USAF TAF Reduction: A Hypothetical Maximum USAF Posture for the Early 1990s (as of FY91)	22
4.	Summary of Developments: Planned Drawdown to the Base Force (Combat Types)	28
5.	Active Versus ARC Representation in the Tactical Recce Force (PAA) FY62-92	41
6.	Planning Criteria for Force Design: Permissible Forces	44
7.	The Core USAF Fighter Structure	48
8.	Option A: Continued Proportional Drawdown	65
9.	Option B: An ARC Purity Force Option	66
10.	Option C: ARC Air Superiority Emphasis Force Concept	67
11.	Option D: Active/Reserve Twin MRC Alignment	68
12.	Option E: USAF Compensatory Concept	69
13.	TAF Replacement Requirements: Necessary Procurement of Aircraft Types to Sustain Indicated Force, by Five-Year Block, FY01-20.	77
14.	Composition of the Five Options, by Force Level: High-End and Low-End Aircraft	82
15.	Comparison of A Priori Plans and Maximum Contingency Commitments	83

16.	Hypothetical Requirements for USAF TAF Resources Given Various Contingencies and Other Demands in Fighter Wing Equivalents	87
17.	USAF Tactical Force Deployments in Support of Desert Shield: Forces by Type in Fighter Squadron Equivalents	88

SUMMARY

A crucial question before USAF force and budget planners is how to fashion a future fighter force that can underwrite the military objectives specified in U.S. national strategic concepts, yet is financially and politically viable within the current and projected planning environment. A number of approaches and concepts have been put forward that seek to provide a basis for effecting the best possible resolution of these conflicting planning determinants. In this author's view, many of these approaches are not, however, necessarily the best ones for addressing the tradeoffs that must be made in the years ahead. Such approaches misstate the real issues for resolution, do not identify the correct tradeoffs with which planners should now be concerned, and provide insufficient or inadequately flexible and operationally based guidance for the design of future fighter forces.

My purpose in this report is to suggest an alternative framework for thinking about future USAF fighter forces, and to provide some illustrative solutions of this framework as it might be implemented in practice. The approach described depends on a constrained "universe of choice" in our future force planning. In fact, something one might call the "tyranny of the past" has a considerable grip on the realm of planning choices before us at the present time. Quite simply, the USAF's fighter force posture is built upon a large and costly capital stock—in this case airplanes (and associated systems) already developed, purchased, and installed in the force structure. Even under far more lavish budget conditions than now prevail, it is just not possible to undertake rapid change in the basic posture that exists now: even with vastly more resources than are currently programmed, it could take years to produce new aircraft, train new per-

sonnel, and equip and deploy these units. And if new aircraft models were desired, we would not see them for many years—the lead times for the development, testing, and introduction of new types of plane well exceed a decade. In short, the choices we have before us in the realm of USAF fighter planning must be based on the stock in hand.¹

That being the case, the basic proposition to be developed and used as a foundation for the design of specific force options is that of a “core USAF fighter force” for the interim planning period: generally speaking, the interval between now and the end of the 1990s. This core posture follows from an assessment of force acquisition history and the operational needs flowing from contemporary doctrine for planning contingencies. This core posture represents the materiel basis of a force that the USAF is almost certain to retain, no matter what decisions are made regarding its total size, mix, and configuration of fighter forces. This report contends that the questions for debate should revolve around those additional capabilities that might be retained above and beyond the core posture, and not around the design of the USAF fighter force generally. By focusing debate in this way, the true tradeoffs between additional force capabilities of all types can be assessed in the framework of the existing and anticipated resource environment.

DETERMINANTS OF THE CORE POSTURE AND THE CURRENT PLANNING CONTEXT

Review of the historical antecedents of the current posture, and of the form USAF fighter force reductions have taken to date, sheds considerable light on the context of current decisions. The pertinent history explains how planned USAF mission structure evolved in the wake of decisions taken mainly in the 1970s to rebuild and restructure USAF fighter capabilities in response to Southeast Asian war les-

¹This condition is characteristic of the current, if not every historical, context for planning. During the early 1950s, so many aircraft were produced, and turnover in unit equipment was so rapid, that fairly major adjustments in the force structure could be effected in reasonably short order. The conditions characterizing that time, however, no longer exist. Further, we assume no particularly severe national emergency at which time we might take ordinarily inconceivable steps such as the involuntary recall of trained personnel, the reactivation of aircraft consigned to retirement at the USAF's “boneyard,” etc.

sons and in light of the changing requirements of the U.S.-Soviet military balance. To date, planned and actual force reduction decisions can be attributed to rather straightforward posture characteristics, notably the relative modernity of various posture elements. This evaluation also shows how the now-defunct Base Force—in its various manifestations—does represent a transitional force structure, in the sense that reductions below this benchmark posture involve a qualitatively different kind of process than did the reductions leading to it. These transitional qualities are retained, albeit at lower numerical levels, in the posture laid out by the Clinton administration's "Bottom-Up Review."

Of greater importance to future planning decisions, however, is an important set of findings that are firmly rooted in a set of decisions already taken. From our review of the origins of the most modern collection of fighters in the current USAF inventory, the notion emerges of what is called in this report a "core USAF fighter posture." This core force, detailed in Table S.1, characterizes the *materiel basis* for USAF posture that we should expect to see maintained under most foreseeable circumstances. This core posture is described as a basis for a minimum force because it represents the long-term, sustainable force that can be maintained using USAF assets already in hand.²

What is of interest, then, is the incremental force that might be retained beyond this core: what it could accomplish, how much it would cost to operate, etc. This approach to the problem casts the tradeoffs involved in a useful context and permits us to avoid grandiose but unproductive disputes over wholesale posture planning "alternatives" which, I suggest, are not really alternatives at all, since

²The figures contained in this table are computed on the basis of the force of each type sustainable over the planned total service life of each type. Total procurement of each model of aircraft can support, over a given interval, a force of given size in a way that depends on planned lifetime, allotted overhead (assignment of aircraft not to tactical units, but to training, test, etc.), and attrition (based on average annual loss rates). For instance, a total of 470 F-15CDs were procured between FY78 and FY86; given a total overhead factor of about 80 percent (combined operational overhead and expected attrition), a total of 258 PAA aircraft could be maintained given a 35-year weapon system life. This does not mean that this force would exist in each and every year—the number is simply a baseline over the total life of the aircraft type in question.

Table S.1
The "Core" USAF Fighter Force

Type	Primary Aircraft Authorized	Fighter Wing Equivalents
F-15C	270	3.75
F-15E	120	1.66
F-117	36	0.50
F-16C	870	12.08
Total	1296	18.00

presumably all would include a fixed element (something akin to our core posture) as well as variable force components that are the matter for real consideration.

In sum, our decisions about what a future USAF fighter force might be should revolve around what increment above and beyond the core posture should be retained. In other words, the debate is not over, say, 18 versus 24 FWE: it is over the additional few FWE beyond those specified in the core force, and the composition and disposition of those additional resources.

FROM THE CORE FORCE TO SPECIFIC POSTURE ALTERNATIVES

Given the existence of a core posture, we then move on to force structure alternatives that involve various increments above and beyond that nucleus of forces. One way to conceive of alternative USAF fighter force options is to begin the design process by weighing three basic planning considerations.

1. The total size of the "tactical" fighter force. Three options are selected, somewhat arbitrarily: namely, forces of 23, 21, and 18 FWE. Given the combinatorics of overall force constitution, it turns out that these three force levels coincide with important force planning thresholds. At 23 FWE, it is possible to retain most of the current force elements, some at reduced levels, if that is desired. At 18 FWE, only something resembling the core force can be retained, and it probably turns out that the economics of supporting small, special-

purpose fleets not having some particularly important capability (such as F-117s) militate against retaining some aircraft types. A force level of around 20-21 FWE appears to represent an important threshold in planning: the pressures for numerical and type reduction here conflict substantially with the various rosters of aircraft types we may wish to retain.

2. Force design themes. Given alternative force structure "top lines," we examine five separate options that vary according to a range of underlying assumptions about mission priority, readiness, active/reserve mix, and the like. These options are:

- **A. A continued proportional drawdown.** This option draws down the currently programmed posture on a "business as usual" basis: current mission, active/reserve, and other relationships are preserved to the maximum extent possible.
- **B. An ARC force purity option.** To minimize the logistical, training, and other burdens on supporting USAF reserve components, this option "necks down" reserve force types and, presumably, capabilities, to the extent possible. More specialized missions are reserved for active forces.
- **C. An ARC air-to-air force emphasis.** Capitalizing on the continued maintenance of an all-reserve air defense posture, this option puts a relatively larger emphasis for air superiority augmentations on Reserve Component elements.
- **D. An active/reserve twin MRC alignment.** On the assumption that nearly simultaneous major contingencies are unlikely (and/or are profoundly affected for total force planning purposes by mobility limitations), this option strives, to the extent possible, to maintain a robust and diverse base of capabilities in the Reserve Component for meeting a second contingency.
- **E. A compensatory USAF division of labor concept.** This option draws on current plans and force management realities influencing the fighter forces of the Navy and Marine Corps. Since these are shifting technically and doctrinally in the direction of a more multimission force, one of the most vital consequences of this option for USAF planning is that relatively greater emphasis should be placed on USAF force capabilities for the most demanding air superiority and long-range attack missions.

3. Constitution of air defense forces. What factors and issues surround the size and mix of aircraft that remain designated for a homeland air sovereignty (traditionally, "strategic air defense") mission? It is assumed that these forces will continue to be air-to-air oriented, that they will be operated, as they now are, by the Air National Guard, and that they will have over time an expanded responsibility for the augmentation of contingency force packages and possibly also for participation in various lesser contingency missions. However, various force enhancements (substituting F-15s for F-16/ADVs, utilization of advanced munitions, etc.) could permit a limited downsizing in this force component.

DESIGNING AND ASSESSING TOTAL FIGHTER FORCE PACKAGES

Given any particular set of future fighter force alternatives, what factors should determine our selection among them? In the short run, the discarding of capabilities will follow from the ongoing balancing act between the need to bring USAF budgets into line with top-line budget guidance and the need for USAF force structure as a whole to be capable of meeting contingency requirements.³ As this highwire act plays out over the next few years, however, the problem of simply "getting there" must increasingly give way to decisions about the longer term. Fortunately, we can defer final decisions on many such choices at least for a short while. On the other hand, there will be vital fighter force structure decisions to be made in the years ahead, and the report considers three that would seem to merit particularly detailed analysis.

- A primary concern in refining the USAF's fighter forces for the years ahead is the mission mix of the available operation inventory; in operational terms, this matter should reflect the particular requirements (both numerical and compositional) for USAF theater combat capabilities for the major contingencies considered the most important in overall strategic and force planning.

³An exception to this rule would exist in the case where a decision is made to add to USAF fighter force capabilities for the long-range attack mission, whether this might take the form of procuring additional F-15Es or augmenting and modernizing certain F-111 types.

- Whatever technical campaign analyses might tell us about the advantages of certain fighter force elements, a future USAF fighter force structure must be supportable within the current and projected resource environment; further, given the increasing pressure on forces of all kinds imposed by resource constraints, the arguments for given force levels and mixes must be both sufficiently compelling and clear to justify necessary operational and investment spending.
- Finally, there is no doubt that future USAF fighter force planning should be closely integrated with fighter capability plans of the Navy and USMC.

CONCLUSIONS OF THE ANALYSIS

On the basis of the material presented in this report, five general points emerge as probably among the most important ones for USAF force planners concerned with the reshaping of fighter-attack force structure through the balance of the 1990s. These might be summarized best as follows.

- The future air-to-air posture of the USAF is not a primary issue in the short run. Few would disagree that technological advances, such as AMRAAM, and the existence of potential reserve capabilities in the form of ANG air defense squadrons, mean that the USAF can defeat in air-to-air operations likely adversary forces through the 1990s. On the other hand, how to structure the follow-on F-22 program remains uncertain. There are pressures, for instance, to make decisions, perhaps in the short run (i.e., the next year or two), that might affect substantially U.S. air superiority potential over a longer timeframe. But there is no real pressure to make all these decisions now. To be sure, there may be some modest costs associated with a decision to defer "final" F-22 choices for a couple of years, but these are probably well worth paying in order to preserve key options on how many planes of this type to buy, at what rate, and in what configuration.
- As the USAF's fighter posture declines in size, the most difficult decisions to make will concern those force elements with special mission capabilities. For a variety of reasons, particularly diffi-

cult choices loom in any additional round of USAF fighter force reductions when it comes to certain aircraft types with a relatively high degree of mission specialization: the F-111F, EF-111A, F-4G, and A-10A. The arguments for such forces are strong, but in each case there are countervailing incentives to retire these units should additional force reductions be ordered. For instance, the F-111F is expensive to operate, logistically problematic, and could require some not-inexpensive measures to assure survivability in demanding future threat environments. On the other hand, there is no denying the fact that the range/payload and two-man capabilities of that aircraft make it an attractive resource in many scenarios. Similarly, few would dispute the operational value of the EF-111A, but if the F-111F fleet is retired, the support burdens of the former type aircraft could grow excessively.

- Because of its dominance of the inventory in terms of force numbers, its modernity, and the requirements (imposed by contingency needs) for minimum numbers of aircraft, how many of what kinds of the F-16 multirole fighter should be retained is, to use a term borrowed from operations research, the slack variable of the near-term fighter force planning problem. That the sizing of such forces is the pivot of all future options follows straightforwardly from their representation in the current inventory, their responsibilities and allocations among missions, components, etc., their attractive support features, and the increasing pressures that could exist for multirole capabilities should substantial cuts render prohibitively costly the retention of certain specialized forces.
- The fact that some USAF fighter force components increasingly represent unique if scarce capabilities of great importance, along with the need to achieve balance among the fighter forces of all U.S. military services, is an issue meriting particular consideration. When the nation's future fighter forces as a whole are examined, it is clear—given that the future Navy/USMC fighter posture is to revolve more and more around a multirole fighter—that if there are various high-priority but demanding missions beyond the capabilities of such forces (long-range attack and air

superiority being of particular significance), the USAF will have to maintain these resources.⁴ But such capabilities are expensive, involve technological risks when it comes to force modernization, and, in general, tend to create particular problems for planners when budgets shrink. Such difficulties should not, however, overrule the basic demands of U.S. power projection forces. Accordingly, the fact that providing high-end aircraft for certain demanding missions will be increasingly a USAF responsibility should be taken into account when future budget and other resource decisions are made.

- Finally, the issue of integrating active and reserve component fighter elements remains central to the design of any future force structure. Over the years, the USAF has pursued various strategies for the integration of active and air reserve components. The pertinent history is quite involved, but beginning in the late 1970s, the main emphasis of ARC planning and equipping came to be the maintenance of a highly capable reinforcing and supporting force in the "global war" planning context that guided planners for so long. Today, with the devolution of that planning framework, we might consider the merits of quite different Active/ARC integration concepts. It is entirely possible to imagine two force structures that, from a simple "bean count" perspective, seem identical, but that rely on alternative strategic concepts that give rise to very different Active/ARC force planning concepts. For instance, one might configure a future reserve force to serve as a "second echelon" to active force units—this force would serve as a rotation and backfill base in the event

⁴It must be noted that, on account of remarkable technological developments, it makes no sense to view long-range attack-capable fighters as a force element independent of U.S. bomber capabilities. However, as of this writing, the prospects for procuring additional modern bombers seem doubtful, there are delays with the full equipping of these aircraft for precision conventional attacks, and bombers must always retain some responsibility for nuclear deterrence missions even if that requirement continues to decline in urgency. Note that U.S. deep attack forces, including the FB-111A which in the late 1980s may have been programmed for the support of theater operations, amounted to 442 aircraft in FY88; that total will decline to 174 airplanes a decade later plus 54 additional F-111Fs that might be retired by the turn of the century.

of a major contingency. On the other hand, one might design a reserve component posture so that it would, in effect, take the lead in meeting the requirements of a "second" contingency. What each approach implies in terms of assumptions about the relationship of possible conflicts, the role of deterrence, readiness and equipment requirements, and many other factors may vary terrifically even as top-line posture seems to stay more or less the same.

Despite the scale and speed of the reductions under way, and the additional decrements to planned fighter forces that may be ordered to bring defense budgets into line with federal fiscal targets, it is likely that at least a minimum capability to support the nation's military strategy can be maintained—up to a point. Whether or not the posture remaining is militarily sufficient, adequately harmonized with military needs and the capabilities of other DoD elements, and flexible enough to meet the needs that volatile global environments may impose on the U.S. defense establishment depends on sound, bold, and thoughtful force management supported by a thorough determination of needs. These can, I suggest here, be assured by focusing on those specific areas of greatest interest: it is not necessary, nor is it desirable, to block out from scratch a master plan on a blank planning canvas. The issues for the short-term and interim planning periods boil down to relative handfuls of aircraft that the USAF may retain or discard. A cold look at the capabilities represented in these force packets, and the assessment of their value relative to the other marginal additions or reductions in U.S. defense programs of other sorts, promises to be the most effective way of assuring that USAF forces for the rest of the 1990s remain effective for any military problems encountered, and to provide a sound foundation for the modernization of the force structure to meet the evolving needs after the turn of the century.

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ACRONYMS AND ABBREVIATIONS

AEW&C	Airborne early warning and control
ANG	Air National Guard
ARF	Air Reserve Forces (Air Force Reserve and Air National Guard)
BAI	Battlefield air interdiction
CAS	Close air support
CINC	<i>Commander-in-chief</i>
FWE	Fighter wing equivalent
FY	Fiscal year
GPF	General-purpose forces
MFP	Major force program
MRC	Major regional contingency
MRF	Multirole fighter
MYP	Multiyear procurement
PAA	Primary aircraft authorized
SEAD	Suppression of enemy air defenses
TAF	Tactical air force(s)

TAI	Total active inventory
TBM	Tactical ballistic missile

Shaping the future USAF fighter posture—how big it should be, what capabilities it should have, how those capabilities should be organized, and what modernization options should be pursued—is one of the most important issues confronting Air Force planners. It will be a complex balancing act between two distinct but related tasks. One is to resolve complex questions about how to manage the restructuring of existing capabilities on a year-to-year basis; the issue, contrary to some current rhetoric, is not what force should be conjured up for a totally new world, but rather how today's forces and concepts, most of them legacies of the Cold War planning environment, should be reshaped in a safe and expeditious way.

The other task concerns the techniques we devise to assure the smoothest possible reconciliation of the capabilities surviving the current drawdown with the capabilities that will represent the first truly new posture of what has come to be known as the "post-Cold War" planning world. In the next several years, many current uncertainties will be resolved. It will become steadily more clear what the real threats for the future may be, which technological options for force enhancement are the best ones to pursue, what contingencies should guide force and operational planning, and how future budgets may be both sized and allocated among competing enterprises. This second task of fighter force planning obviously is closely linked to the first, but it has some distinct features. Thus, it is in the interests of planners not to confuse the two sides of the puzzle as they have been described here: trying to solve decisively every problem all at once is a risky business, and probably also a futile one, given

the likelihood that many of the propositions underlying our apparent current choices will change over time.

The best way to avoid the pitfalls is to conceive of the fighter force planning problem as a dynamic one. This means we should avoid the temptation to set a final fighter roadmap in concrete just now; the plans we produce should be dynamic ones. The options we design and select among in the next few years could well change in both detail and underlying rationale, facts that seem to endorse a more measured planning approach. For that approach to be successful, however, it must be continually mindful not only of the real current choices but also about how these interim decisions might dovetail with longer-term ones. In this report I will recommend the use of a planning framework that explicitly divides our choices into two categories: (1) short-term issues concerning the essential foundation of the fighter posture that, at least at this time, should probably be taken as constants; and (2) longer-term concerns that represent the real choices of interest, the ones most sensitive to the way that budgets and overall strategic interests play out.

Such an approach will require something of a departure from the way fighter force planning has been tackled in the past. That much is apparent from even the most cursory review of the historical record. Throughout most of the modern era of defense planning, the USAF fighter-attack force structure has remained quite stable in terms of its overall size.¹ While the composition, active/reserve mix, mission orientation, degree of modernity, relative capabilities, and other attributes of the tactical fighter force structure have evolved considerably, the size of the total posture (measured in nominal fighter wing equivalents, i.e., "FWEs" of 72 PAA aircraft) has remained, in relative terms, surprisingly constant, at least over more recent years.

There are many reasons for this stability; the most important ones stem from resource realities and the nature of the overall strategic and operational planning environment that the USAF has been preparing for. In particular, the requirements imposed by a "global war" planning concept based on a Soviet-led threat go a long way toward explaining the overall constancy of the fighter posture. Given

¹For a more detailed discussion of this matter, see Kevin N. Lewis, *Planning Future U.S. Fighter Forces*, Santa Monica, CA: RAND, MR-285-AF, 1993.

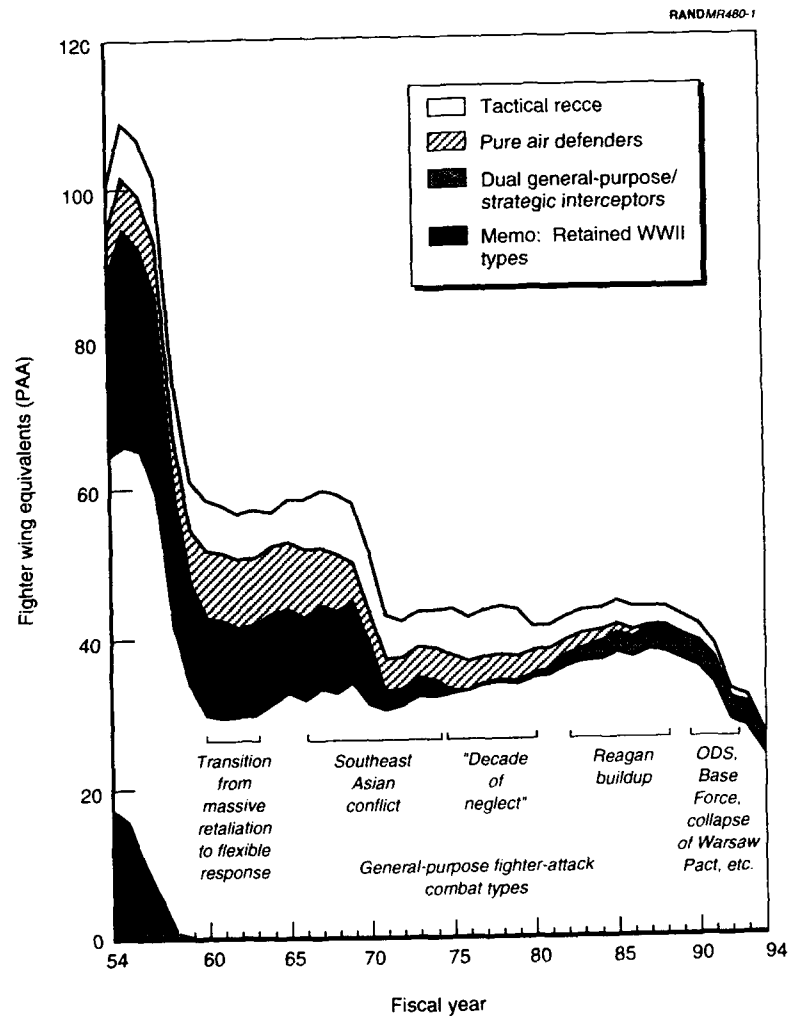
a set of requirements to meet massive, ready, and increasingly capable Communist-bloc forces in Europe and possibly other theaters simultaneously, it has been possible both to justify and to finance from year to year a "general-purpose force" fighter-attack force structure that over the past three decades has fallen into the 30–35 FWE range.² (Figure 1 summarizes this history.)

Beginning in the late 1980s, however, both of the prime movers of this longstanding planning system derailed. The end of the classic Soviet-centered threat and the prevailing sense that, for many reasons, the U.S. defense budget should decline and remain at a low level combined to undermine the rationales for sustaining USAF forces of traditional size and shape. The question of designing an alternative force—one of much smaller size and, perhaps, different internal constitution—began to emerge as a central planning problem for the future. Complicating the deliberations have been such additional factors as a requirement to recognize a conceptually and doctrinally new airpower planning environment;³ our interpretation of the lessons of the Gulf War; the need to reassess not just USAF but total national long-term power projection requirements (some of this occurring increasingly under the aegis of a "roles and functions" debate); and various other management and force planning issues (such as the possible need to plan deliberately so as to sustain the USAF fighter production industrial and design base, and the possible need to revamp the active/reserve balance of U.S. forces). In all, the past few years have been a turbulent and volatile time for USAF fighter force planners. The force structure that will ultimately emerge from this interaction of manifold factors and constraints would certainly be of a scale, and possibly mix and constitution, unknown in the past.

On the other hand, even though the pressures to revamp the total posture have been powerful, not all the facts that the design of a future USAF fighter force should depend on are yet completely clear. In recent years, and particularly since the arrival of the Clinton ad-

²This includes Reserve Component forces but excludes air defenses, tactical reconnaissance and electronic warfare, and certain special operational and air control variants.

³One in which traditional distinctions and the compartmentalization of force types into, for example, "strategic" and "tactical" categories had eroded.



NOTE: During the rapid buildup of forces and introduction of new aircraft types during the 1950s, some units were substantially under strength. Therefore, authorized strength, as shown here, may overstate real capabilities, especially during the mid-1950s.

Figure 1—Evolution of the Total USAF Fighter-Attack Force Structure, FY54-94

ministration, it has been somewhat unclear, for instance, what the ultimate level of DoD budgets for the long haul might be, and what relative weight different strategic themes for force planning should carry for planners.⁴ Another vexing problem follows from the requirement to balance planning for traditional contingencies with preparations for possible new problems (ranging from peacekeeping and limited intervention to dealing with proliferation of weapons of mass destruction).⁵ Finally, the ultimate future shape of USAF and, for that matter, total U.S. fighter (and, beyond that, larger aerial power projection) posture depends centrally on a variety of decisions yet to be taken on certain programs. In short, while there is a need to draw down and revamp USAF fighter forces, some of the most important decision areas lie in an atmosphere of considerable uncertainty.

Under these murky circumstances, what determinants might be considered as a basis for an alternate force posture? In this report I consider this question in general terms and lay out various alternative frameworks for force reordering. Despite the multitude of variables and uncertainties, it is quite possible, within general bounds, to sketch out some overall planning themes that might play important roles in shaping a further-reduced USAF fighter force that remains robust in the face of future circumstances. In the chapters that follow, I first consider the current context for addressing such issues and focus in particular upon choices already made. Next I inspect the formally stated goals and certain other possible goal statements that might shape future force structure. Given these, I suggest certain overall planning principles and set forth some general alterna-

⁴The Clinton administration has completed a so-called "Bottom-Up Review" (BUR) outlining its force plans, and has submitted corresponding defense budgets to Congress. However, the survivability of the BUR—both as a concept and as the basis for a specific force plan—is not assured. Further, as we shall see below, there are at least two major problems bedeviling the Clinton defense budget. First, basic budget levels are under considerable pressure. But second, and on the other hand, even assuming that BUR should be the basis of future U.S. posture, that plan is underfunded, perhaps dramatically so. It is impossible to say how the battle over future defense budgets will play out, but it would not be a particularly risky bet to wager that the ultimate result will not follow currently anticipated lines.

⁵For a discussion of this and related points, see Carl Builder et al., *Report of a Workshop on Expanding USAF Noncombat Mission Capabilities*, Santa Monica, CA: RAND, MR-246-AF, 1993.

tive forces. Finally, I discuss some related issues that might bear on the specifics of ultimate plans.

Despite the complexity of the many issues involved, one very fundamental reality underlies this analysis. That reality, already alluded to, is that a phenomenon one might call the "tyranny of the past" has a considerable grip on the current realm of planning choices. Barring some kind of very unusual (and probably emergency) development, when it comes to USAF fighter planning for the next decade or so, the motto might be "What you see is what you (might) get." The most recent generation of tactical combat aircraft has been bought out, and nearly all airplanes have been delivered. No new aircraft are planned (raising some important issues when it comes time to make the very momentous decision to stand down production lines); future models are years away from even initial production. We are now several years into a large-scale drawdown and realignment of USAF combatant posture on a scale not known for decades. Reversing decisions already taken would be difficult and costly, and would probably occur only on an emergency mobilization basis. In short, the USAF posture rests upon a large and costly capital stock—in this case airplanes (and associated systems) already developed, purchased, and installed in the force structure. Even with vastly more resources than are currently programmed, it could take years to produce new aircraft, train new personnel, and equip and deploy these units. And if new models were desired, we would not see them for many years—the lead times for the development, testing, and introduction of new aircraft types well exceeds a decade. In short, the choices we have before us in the realm of USAF fighter planning must be based on the resources that have so far survived the speedy dismantling of the Cold War defense posture.⁶

SOME CAVEATS AND CONVENTIONS

Before proceeding with the discussion, it is important to note a few caveats and terminological conventions. First, it is necessary to in-

⁶As noted already, these aspects of force reconstitution are a modern phenomenon. For instance, during the early 1950s, so many aircraft were produced, and turnover in unit equipment was so rapid, that fairly major adjustments in the force structure could be effected in reasonably short order. Such conditions no longer exist.

roduce a modest disclaimer on the use of certain terminology. In recent years, a new and welcome approach has displaced a traditional post-World War II taxonomy of missions, functions, and capabilities. So far as this report is concerned, that old scheme involved organizational, budgetary, and doctrinal distinctions between "strategic" and "tactical" airpower. That distinction, always blurry, has now finally given up the ghost as a result of changing requirements, downsizing, and demonstrated experience. With the devolution of the primary Soviet threat (including its formidable nuclear component), and the creative use of airpower in the Gulf War,⁷ even the most hidebound traditionalists have come to recognize the arbitrariness of traditional mission-oriented taxonomies.

Nonetheless, for the sake of convenience, and because this report is concerned with the historical evolution of fighter-attack forces as well as related units, I periodically refer to the USAF's "tactical air forces" (TAF). When this term is used it should be understood to refer to fighter-type forces in an aggregate sense (with the degree of aggregation depending on the context). For instance, when referring to the USAF's "total TAF" posture, I mean all fighter-type forces—that is, those traditionally defined as general-purpose forces, plus those fighter forces associated with "strategic" air defense, and also, on some occasions, those tactical reconnaissance aircraft generally derived from fighter-attack models. The further back one goes, the more necessary it becomes to rely on this terminological convention: until the 1960s, for instance, most interceptor-type aircraft were housed organizationally within Air Defense Command, save for those deployed in overseas theaters, even though some of those airplanes would certainly be employed in nonstrategic contingencies. In short, "TAF" is intended as a general descriptor only, and it implies nothing about the employment of those forces. For my use of this shorthand, I beg the reader's indulgence in advance.⁸

⁷In which "strategic" bombers operated, as they did in Vietnam, in direct support of ground forces, while "tactical" A-10s participated in the "strategic" mission of Scud hunting.

⁸For the purist, I would note also that under some even broader definitions of "TAF" we might include various observation and air control aircraft types, some fighter-type SOF units, aggressor and demonstration teams, and to the extent that it might have a wartime mobilization role, some components of the training and rotation base.

Further, the material presented in this report does not address various technical details that would figure in the ultimate configuration of force structure; those are left for subsequent analysis. I have also not considered important readiness and related operational points that might have some bearing on the total USAF fighter force's ability to meet the potential and real requirements of regional contingencies.⁹ However, it is not expected that such matters would influence the sorts of larger-scale force tradeoffs addressed here.

This report also does not delve into certain managerial aspects of force planning, except in passing. In practical terms, to take one case in point, the configuration of the USAF's fighter posture must reflect an array of complex considerations regarding the distribution of aircraft of certain types among active and reserve, or forward and stateside, units in the interest of managing efficiently the rotation of units and crews, assuring an adequate pool of trained personnel for Reserve Component units, and so on. As a general rule, I assume that the more the posture consists of relatively larger blocks of fewer types of aircraft, the less troublesome such issues become. For another example, the smaller the TAF posture maintained by the USAF becomes, presumably, the more important the readiness of the residual force structure would be. Thus, the declining size of the available Active Component force would seem to place a premium on Reserve Component readiness. Another issue not explicitly considered is on various "force multipliers," particularly systems that would enhance the performance of units deployed to combat theaters. These measures (including modern munitions, command-and-control capabilities, and the like) are always desirable, but their relative significance might grow as posture size declines. Finally, the evolutionary course of a downsized TAF could, if the past is any guide, be affected by various exogenous phenomena. For example, the complex interplay of factors that has in the past shaped various Reserve Components should be expected to go on influencing force

⁹For instance, one might hope that any reduction in force would be accompanied by a robusting-up of personnel in units: most important, the pilot-to-seat ratio of combat units might be increased, as a result of Gulf War experience and in order to get more combat mileage out of existing, more scarce units.

design. Concerns about industrial base, mobilization, forward deployment, arms transfer, and other issues are more examples of "external" influences that force planners would ignore at their peril.

I wish to stress that the primary purpose of this report is to discuss, in the most general terms, a few selected issues associated with possible force structure and other planning options that may emerge in the next few years. The format chosen is that of an essay: the aim is not to posit any particular arguments for one or another line of policy, but rather to discuss certain points and to lay out what I believe to be a few of the more interesting issues that underlie them. The points raised here are not and cannot be, given the current state of play in the overall planning community insofar as both strategic and force planning issues are concerned, anything like a roadmap for U.S. tactical fighter-attack forces over the next couple of decades. What remains to be decided before any such comprehensive plan could be devised is nothing less than a total strategic concept, within which the value of fighter forces will have to be weighed and assessed in the context of many U.S. military capabilities and various management and resource issues. The fundamental reality of the present situation is that tight or even inadequate budgets, particularly for the acquisition of new major defense end items, will play a dominating role in our considerations of future force options.

But just as we cannot justifiably devise a plan that omits the effects that resource and other determinants of force structure will have on future acquisition plans, so too must we stifle the understandable inclination to allow resources to dominate all aspects of planning. At various points in the past (most recently in the 1980s), it can be argued that we went too far in the other direction in ignoring the long-term resource ramifications of our posture choices under temporary circumstances of budgetary largesse. To take a reverse "mirror image" tack now seems, no matter how compelling the arguments, just as ill advised. It is also, in view of how the force modernization process has really worked over the years, a prescription for possibly serious future problems. Current arguments for highly austere approaches to force modernization may carry much weight; but basic issues of our national military aims aside, the implications of such

arguments are not, to this author, as clear in their import as they seem to others to be.¹⁰

¹⁰In particular, many of the alternative fighter force modernization proposals and critiques now circulating are based upon historical data on the past allocation of resources and various trends in the budgetary determinants of fighter force structure. As I will suggest below, while such points are well worth heeding, they should not alone constitute a basis for future plans. Such projections have proved highly erroneous in the past. More important, the fact remains that how we choose to allocate our resources is as much a strategic decision as is, say, the number of major regional contingencies we opt to plan for. It makes little sense to acknowledge radical new circumstances for the threats, contingencies, and other inputs of planning and at the same time hold to traditional patterns of resource allocation that are just as much an artifact of the "global war" planning era as the fixation on the NATO central front contingency or the role of nuclear deterrence in our national strategy.

THE CURRENT CONTEXT FOR FORCE PLANNING

The ongoing drawdown of the U.S. military posture has transported force planners into a veritable *terra incognita*. No matter what ultimately transpires, we do know that our fighter force of the late 1990s will differ in many key ways from the one we have become so familiar with over the years. Despite the dramatic nature of the transformation now under way, the problem of charting a course for future forces is not one that can or should be undertaken on a blank canvas. Although some have argued that a future USAF fighter force should be, in effect, built from the bottom up, such an approach is neither useful nor desirable. In fact, viewing the USAF fighter planning problem in this way incurs both risks and inefficiencies.

For one thing, although the details may remain uncertain and the ultimate product quite novel in some respects, the building blocks of USAF fighter forces through the end of the present decade, and to a diminishing extent, those of subsequent years, are already well known. The USAF posture of the 1990s will consist almost entirely of forces already procured. Suppose a dramatic new orientation in the way we think about airpower planning—from the highest doctrinal, conceptual, and strategic issues, to the most technical and refined weapons and operational choices—were to be published in final form right now. Barring an emergency mobilization, it would take many years to see an alternative force of any distinctly different constitution put in place, owing to procurement lead times (especially if new items must be developed). Thus, it is useful to review briefly the historical predicates of the building blocks we must deal with now, no matter how much we decide we would like to modify those at the margin or in totality.

To inform the debate over as well as the design of future options, this chapter considers three topics:

- The origins of the present TAF structure;
- The materiel bases of that posture;
- The history and goals of the Bush administration's "Base Force" plan and the successor "Bottom-Up Review" scheme, as well as the force reductions made to date.

ORIGINS OF THE PRESENT USAF TACTICAL FIGHTER POSTURE

The USAF general-purpose fighter posture has been rather stable in terms of overall size since the adoption of the strategic concept of flexible response in the early 1960s. In terms of the general mission emphases of those forces, a similar, if less stable, degree of consistency dates back to the late Vietnam era. But most of the current and planned force structure dates from plans and programs launched in the early and mid-1970s (though in some cases, the roots of the programs precede this interval).

Origins of the Modern USAF Fighter Force

As the conflict in Southeast Asia wound down, attention focused on the neglected requirements of meeting Soviet-led conventional threats, particularly the one oriented toward Central Europe. Compared with the situation surrounding the original promulgation of a flexible response strategy, the planning environment of the early 1970s proved different and, in many respects, more severe. To cite just a few of the changes with which contemporary force planners had to contend:

- The overall U.S. strategic position in Central Europe had been weakened as a result of the Southeast Asian war. The diversion of resources to that conflict, the withdrawal of France from NATO's integrated military command, the qualitative improvement of Soviet forces, the suppression of the Czech revolution (with the residual effect of a more significant Soviet forward force-in-being), and the general realization of a condition of

strategic parity had two effects: it increased the premium on successful conventional NATO defense of the Central Front, and it made that task all the more difficult.

- The direct consequences of the Vietnam experience were by no means altogether favorable for the USAF, to put it mildly. These problems might be viewed as falling into two main categories. First, many premises on which USAF fighter planning had been based in the early 1960s were undermined by Vietnam experience. To give one such example, it had been expected that the USAF tactical fighter force in the 1970 timeframe would consist largely of F-105 and F-111 tactical fighter-bombers. But due to war-related developments, the posture consisted of a quite different mix of aircraft; in FY71, over half of the USAF fighter force consisted of aircraft types either not previously programmed in large numbers or not planned at all (F-4/A-7/A-37). Second, various pre-Vietnam doctrinal beliefs—for instance, regarding the proper ways to attain air superiority—were found wanting.¹
- These misfortunes were complicated and amplified by other military developments of the late 1960s and early 1970s. For instance, the military outcome of the air portion of the 1973 Mideast War heralded to some observers a major military-technical revolution. Some critics were ready to write the obituary for the manned combat aircraft as a player in modern warfare. Of course those extreme views proved to be of little ultimate consequence, but it was clear that a far more complex approach to force planning was necessary.
- Reduced budgets, a tendency in some quarters toward isolationism, and turmoil throughout the defense establishment as a whole all combined to undercut what seemed to some to be the most direct solutions to the various difficulties facing USAF planners in the early 1970s. For instance, while the air-to-air lessons of the war were digested (in materiel form) in part by the

¹Both the USAF and Navy/USMC fighter communities had to come to grips with a substantially different air-to-air problem than the one anticipated in advance of Vietnam. See Lewis, *op. cit.* One of the responses to what was, compared with Korea, a lackluster air-to-air exchange rate in the Vietnam conflict was more realistic training and a rethinking of armaments requirements. Another set of initiatives involved defense-suppression and electronic warfare capabilities.

F-15, quantities of F-15s in procurement plans had to be reduced under budgetary pressures.² An alternative approach (featuring a so-called high/low fighter mix consisting of high-end systems like the F-15 and the Navy's F-14, and a then-conceptual "lightweight" fighter) was mandated for a fighter force planning.³

Against this backdrop, a total USAF fighter roadmap appeared for what might be called the modern TAF posture. Let us consider that plan now.

Materiel Origins of the "Modern" USAF Tactical Fighter Structure

USAF tactical aviation had followed quite a bumpy path between the formal adoption of flexible response by the Kennedy administration and the generation of post-Vietnam aviation posture requirements. In the early 1960s, USAF planners, still strongly influenced by the doctrine of massive retaliation, envisioned a future force structure built around aircraft optimized for the long-range attack (including nuclear strike) mission. Further, strategic air defense against enemy bombers was a high priority. The strike role was to be filled by relatively costly, specialized interdiction aircraft (initially the F-105, later the F-111).⁴ The remainder of the posture (intended to fulfill the strategic air defense mission) would be modernized with an F-106 follow-on. Figure 2 shows, in the bar on the left, the forces associated with plans laid out in about 1962 for a 1970s-vintage USAF posture.

But as Figure 2 also shows, quite a different host of aircraft populated the USAF TAF structure by 1970; new doctrinal and other propositions governing aviation posture planning also were rapidly gaining acceptance. The reasons were both numerous and well known,

²The original design for the F-15 dates to the 1960s, but certain "lessons-learned" changes (such as the installation of a gun) reflect the Southeast Asian experience.

³See, for instance, J. Schlesinger, *Annual Report to the Congress for FY75 and FY76/77*, for a summary of the rationale of the high/low fighter mix concept.

⁴The F-111 was programmed in the early 1960s for a total production run, including recce variants, of at least 1,564 units (excluding more than 800 Navy items).

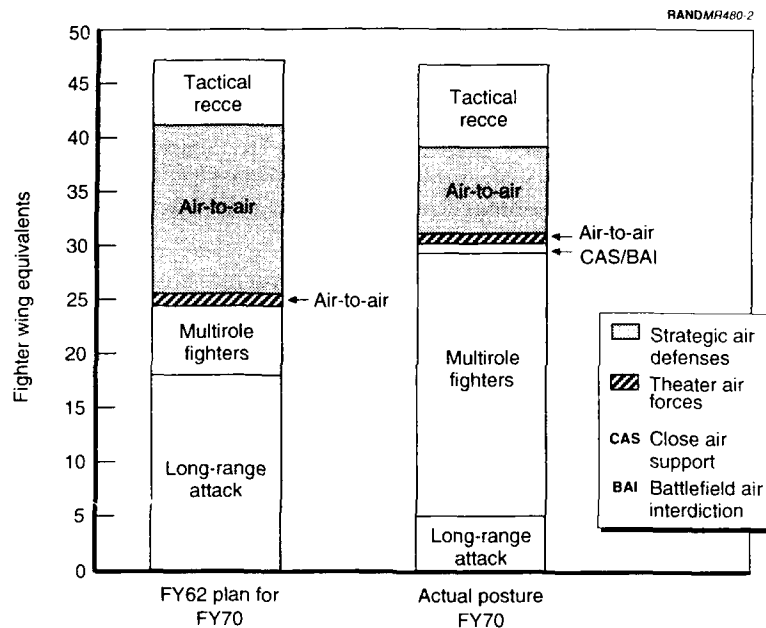


Figure 2—FY70 Projected Versus Actual USAF Tactical Posture: Fighter Forces in Fighter Wing Equivalents

and they included the loss of substantial inventory as a result of Vietnam War attrition,⁵ the demonstrated operational requirements of the Southeast Asian theater (at odds in some ways with those that had underlain some previous planning), shifts in the European military balance, and more. Accordingly, as planners looked to a follow-on force to the one acquired in the 1960s, they were obliged to take into account several demanding characteristics of the expected theater air operational environment of the future. These included

⁵Total F-105 combat losses through the summer of 1972 (by which time all F-105 models save the F-105G "Wild Weasel" had been withdrawn from service in Southeast Asia) amounted to about 330 aircraft (representing some 40 percent of the total program buy).

- The requirement for closer air-ground force integration, and in particular the need to place more emphasis on the direct support mission;
- The need, imposed by austere post-Vietnam budgets, to follow two new acquisition mandates: a high/low aircraft mix (given the unaffordability of a totally high-end force structure), and the expansion of schedules toward a longer production period for force modernization;
- The operational and technical requirements imposed by the modern high-threat air defense environment;
- The need to think beyond mere airframe design to take advantage of the possibilities of a variety of promising technical opportunities, precision-guided munitions (PGMs), sensor systems (such as AWACS), specialized defense-suppression and electronic warfare systems, and the like;
- Decisions taken largely in the 1972–1975 timeframe to rely more upon Reserve Component forces as part of a total force structure plan.

As a result, planners settled upon a force structure optimized to meet the demanding and diverse requirements of modern theaters of operation (with Central Europe the canonical case), a structure based on a full threat-and-requirements spectrum and one that has been preserved, albeit with various adjustments, to the present (in terms of both the forces actually put on line and those planned for the future). The FY75 force structure and plans for its modernization accordingly reflected these various determinants. The programmed posture, and plans for its modernization, are given in Table 1. Combining Active and Reserve Component forces, the proposed 1980s posture envisioned (to use contemporary terminology) a mission mix (excluding defense-suppression and electronic warfare resources) of about one-sixth air-to-air optimized aircraft, one-twelfth interdiction forces, one-fourth attack (CAS/BAI), and one-half multirole forces.⁶

⁶Note that in terms of training, specialized equipment installations, etc., some of the aircraft falling into the multirole fighter (MRF) category more rightly should be placed in other categories; however, Table 1 shows aircraft types in terms of the baseline airframe concerned (and its potential range of roles) and not actual, say, wartime mission emphasis or peacetime designated operational capability.

Table 1
Mid-1970s USAF TAF Posture and Modernization Plan for the 1980s

Force Element	Actual FY75 Posture		Planned 1980s Force	
	Types	Quantity (FWE)	Types	Quantity (FWE)
Air-to-air ^a	n/a	—	F-15	6.0
Multirole				
Active	F-4	14.0	F-16	5.3 ^b
Reserve	F-4/F-100	5.3	F-4	8.3
Interdiction				
Active	F-111	3.8	F-111	3.0
Reserve	F-104DC/F-105	2.1	n/a	—
Attack (CAS/BAI)				
Active	A-7	3.0	A-10	6.0 ^c
Reserve	A-7/A-37	3.2	A-7	3.0
Totals				
Active		20.8		20.3
Reserve		10.6		11.3
Specialized systems				
Defense suppression				
Active	F-4WW/F-105G	1.0	F-4G ^d	-1.3
Reserve	n/a	—		
Electronic warfare ^a	n/a ^e	—	EF-111A ^f	-0.5/0

SOURCES: K. N. Lewis, *Historical Survey of U.S. Defense Budgets and Forces: Basic Data*, Santa Monica, CA: RAND, forthcoming (1995). Also, various authors, *Annual Report of the Secretary of Defense to the Congress* ("Posture Statements") for FY73-77.

^aActive Component representation only.

^bBased upon FY76 original, explicitly "minimal" proposed F-16 procurement plan.

^cSome to be allocated to Air Reserve Component forces.

^d116 F-4Es to be modified to F-4G configuration per mid-1970s plans.

^eIn mid-1970s, no combat types were configured strictly for the electronic warfare mission.

^f42 total F-111As to be modified to EF-111A configuration per mid-1970s plans.

The mid-1970s planned TAF force, unlike its early-1960s predecessor, actually was largely realized. After the determination of this set of posture goals, the decision was made to expand this force from a level of 32+ FWE to a force goal of 36 FWE: this force was attained by

retaining some aircraft that would otherwise have been retired. The boom in defense budgets in the 1980s coincided with a short-lived (and highly optimistic) plan to increase posture to a level of as many as 44 FWE. But the real development of note in the 1980s was a more ambitious modernization program than had been conceived originally. As we shall see, proposed Base Force force and BUR structure plans essentially have sought generally to preserve this force structure in terms of mission mix proportions, if not actual force size.

Consequences of the Stability of the Modern USAF TAF in Recent Years

An interesting characteristic of defense posture of all sorts, tactical fighter forces included, has been a gradual tendency toward increasing stability (or convergence) of posture over time.⁷ As the post-Vietnam global war fighter force, and its land-force, maritime, and other equivalents, were planned and implemented, forces have tended to preserve certain characteristics in spite of various perturbations. One might, to stretch the parallel, imagine that the force structures laid out in the immediate aftermath of the Vietnam War evolved into a canonical global war posture to be maintained regardless of influences (such as budget expansions and contractions) that might affect total force size and constitution. Figure 1 showed the history of the USAF's total fighter posture: in terms of the internal configuration of the fighter-attack force, there has been a steady convergence toward a force structure with a given distribution of types of aircraft (and, by implication, missions) over time.

FACTORS INFLUENCING USAF FIGHTER FORCE REDUCTION PLANS THUS FAR

In recent years it has become popular to try to frame the defense planning process in general in terms of what might be called "zero-based" or "bottom-up" terms: to begin with a collection of national objectives or some other overarching set of total-capabilities design

⁷See K. N. Lewis, "The Discipline Gap and Other Reasons for Humility and Realism in Defense Planning," in Paul K. Davis (ed.), *New Challenges for Defense Planning: Rethinking How Much Is Enough*, Santa Monica, CA: RAND, 1994.

criteria, and then construct a posture in successive echelons of detail. In this way, one might argue, the forces acquired will be most likely to support national strategies. This approach to planning tends to gain particular currency with the arrival of new defense leaderships; under the Bottom-Up Review undertaken by the Clinton administration, a total strategy and capabilities review sought to harmonize U.S. strategic and military objectives with unfolding resource realities.

This approach is useful in principle because it lays out priorities and objective functions by which many aspects of planning should proceed. Whatever the theoretical merits of such undertakings, however, the fact remains that over the short run, our ability to change very many of the basic parameters of force design is limited to a set of choices firmly circumscribed by choices already made. In the case of USAF fighter forces, for instance, procurement of major combat end items for the next several years now seems likely to consist, *at most*, of limited quantities of aircraft for attrition replacement or evaluation purposes.

In short, because of the relative "youth" of U.S. aircraft, the posture we have now on order or in hand will be, with rather limited modifications, the posture that will exist at the end of this decade. Given the size of the USAF TAF capital stock, in short, and the long lead times needed to bring new force elements on line, short-term adjustments of any consequence in the fighter posture are not feasible (barring some set of emergency developments). That being the case, the key matters to be resolved about USAF fighter forces revolve instead around what elements of the existing inventory to retain, how they should be deployed, and so on. Thus, it is worthwhile to define the universe of possible options in materiel terms: specifically, what are the possibilities insofar as future force structure choices are concerned? Admittedly, many variables should enter such a consideration.⁸ But the core operational inventory remains beyond much

⁸For instance, while we may be limited in terms of the major end items that ultimately may comprise our operational fighter-attack force inventory, we might nonetheless elect to pursue radical modification programs that seek to expand mission capability, extend service lifetime of on-hand forces, and so forth. We may decide to augment unit performance by the judicious acquisition of ancillary resources (pods, munitions, various supporting capabilities, etc.).

adjustment, save for decisions on what resources to discard. This point—that the present planning problem is one of deciding what posture elements to remove from active service rather than which national capabilities we would like to have (by a top-down, bottom-up, or any other planning scheme)—cannot be emphasized too strongly.

USAF Combat Aircraft Procurement and Current Choices

To examine the options before us, we need to begin with the historical procurement of fighter forces. Table 2 shows the USAF posture at various points in its recent history. By FY90, the majority of units procured over recent history are represented in the posture.⁹ Forces shown represent all fighter force elements (that is, both Active and Reserve Component general-purpose forces and all forces assigned to strategic air defense roles).

By FY90 (and taking into account a modest number of undelivered F-16Cs and F-15Es), we have basically arrived at what might be called the "terminal state" of the current generation of USAF fighter-attack forces. Making the adjustment for those undelivered units, we have the total force from which reductions will take place, shown in Table 3. Note that those data *do not* allow for any force reduction, as a result either of the introduction of new F-15E/F-16C or of any movement to the Base Force or BUR posture as an alternative to that force. This represents, in effect, the maximum force structure that would be possible (for both general-purpose and air defense forces) were all drawdown and modernization plans envisioned as of FY90 to be halted, with the only subsequent force changes being those resulting from the deliveries of ordered items. We see that the force as defined in this way amounts to a formidable 45 FWE: deducting 2.5–3 FWE for homeland air defense duties leaves at least a 40-FWE tactical fighter force. Of course, this portrayal does not take into account obvious and necessary posture modifications that would be undertaken (e.g., the retirement of obsolescent F-4s); it is given here solely

⁹A relative handful of F-16 block 50s and some F-15Es represent modest exceptions—but the aircraft yet to be delivered will not result in any net increase in available force structure.

Table 2
Composition and Origins of Recent USAF Fighter-Attack Forces

	Cumulative Procurement Through			Total Procure- ment Through FY92	PAA (AC/RC)		
	FY80	FY85	FY90		FY80	FY85	FY90
A-7DK	473	479	479	479	354	270	246
A-10A ^a	527	607	607	607	252	468	420
A-37B ^d	240	240	240	240	84	0	0
F-4CD	1375	1375	1375	1375	522	480	18
F-4E ^a	812	812	812	812	258	234	198
F-15AB ^b	404	404	404	404	90	276	360
F-15CD	235	430	470	470	90	276	360
F-15E	0	0	164	209	0	0	48
F-16AB ^b	425	785	785	785	66	456	462
F-16CD	0	354	1224	2380	0	48	564
F-101B	480	480	480	480	54	0	0
F-105BDF	825	825	825	825	150	0	0
F-106AB	340	340	340	340	183	102	0
F-111ADE ^a	331	331	331	331	168	126	102
F-111F	106	106	106	106	84	72	72
F-117A	7	44	59	59	0	12	36

SOURCE: See the bibliographical note at the back of this report.

NOTE: Data excludes prototypes and MASF procurement; includes Desert Storm supplemental.

^aForce structure data do not include certain force elements resulting from modifications of some of these aircraft for missions other than strictly tactical fighter-attack ones, including OA-10/OA-37 forward air controller (FAC) aircraft, F-4G defense-suppression units, and EF-111A electronic warfare types.

^bForce (PAA) data do not include F-16As and F-15As assigned to the homeland air defense mission.

as a baseline to use in the determination of various drawdown alternatives (see Table 3).¹⁰

¹⁰The table also excludes certain types that might be represented in a real 40-FWE posture, such as FB-111s assigned to a TAF role.

Table 3
A Baseline for USAF TAF Reduction: A Hypothetical Maximum USAF
Posture for the Early 1990s (as of FY91)

Type of Aircraft	Total Active Inventory	PAA
F-4D/E/G	257	132
F-15E	142 ^a	144 ^a
F-15AC	790	558
F-16AC	1390 ^a	1314 ^a
F-111DEF	270	168
F-117A	54	36
A-10A	591	420
A-7DK	331	246
Total	3826	3248
Fighter wing equivalents	n/a	45.1
Other combat-derived types		
EF-111A	42	32
RF-4C	173	126
OA-37B	50	40
OA-10A	67	51

^aThese types continue in production, so final TAI does not correspond with PAA shown.

Now let us consider the procurement history of USAF fighter forces that are represented in the posture over the FY80-90 timeframe. Figure 3 summarizes, for successive five-year blocks, the total procurement of combat aircraft for those periods. The crosshatched portions of each bar represent aircraft types removed from the inventory before the commencement of the USAF fighter drawdown: accordingly, these do not figure in subsequent planning. The bar portions shaded light gray are aircraft that should be out of the operational inventory by FY93: some of these were previously scheduled for retirement, but most are drawdown related. Finally, the bar portions shaded dark gray are scheduled for substantial or total reduction under current plans. Figure 3 shows that for the most part, modernity has driven force reductions (actual and planned) to date.¹¹ Also

¹¹A-10 force structure is a partial exception, as we shall see below.

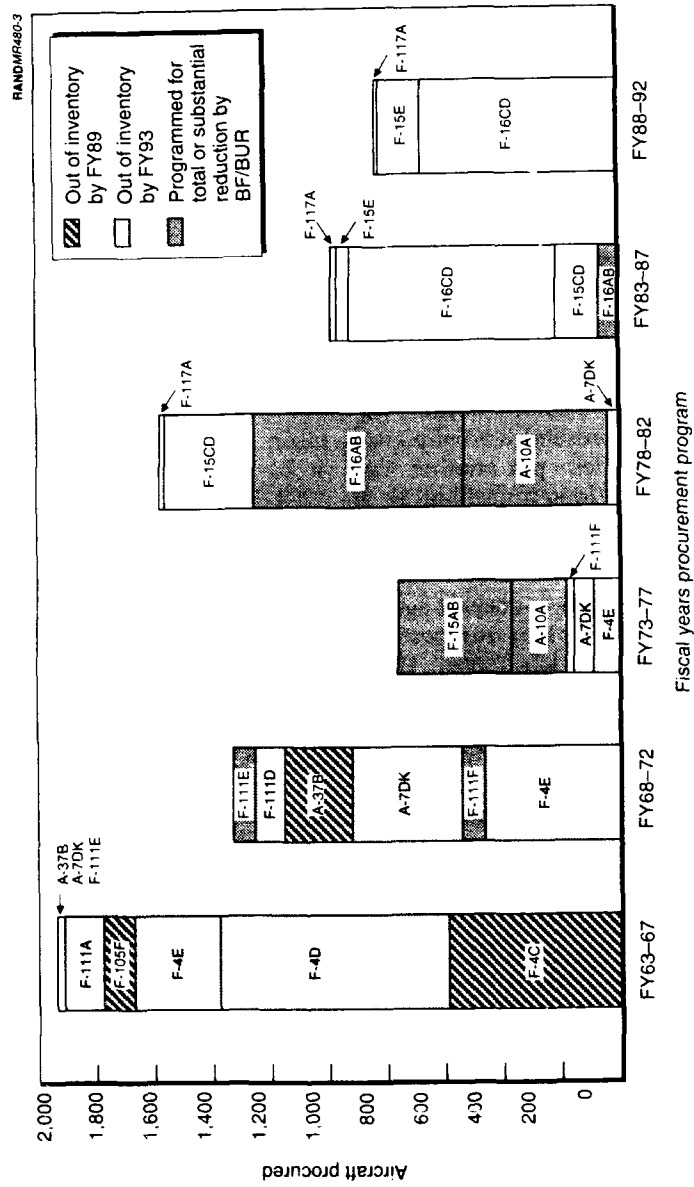


Figure 3—Procurement of USAF Fighter-Attack Aircraft Constituting the Baseline TAF from Which Reductions Would Come

clear from Figure 3 is the standing of the core posture (to be reviewed in further detail below) as a function of acquisition era.

Mindful of such possibilities, consider the steps that we have taken so far in reducing the force, and those that might yet follow.

THE BASE FORCE, AND POSTURE CHANGES TO DATE

Between 1990 and 1993, formal plans for U.S. military force structure were cast in terms of the so-called Base Force. As articulated by the Chairman of the Joint Chiefs and others, the Base Force was intended to represent the minimum force structure required if the United States was to remain "a military superpower." The Base Force structure has since given way to a force structure laid out in the Clinton administration's Bottom-Up Review.¹² But the Base Force nonetheless represents a good place to begin the analysis of subsequent possibilities: put another way, the Base Force was the first, and what in the long run will prove the most dramatic, change from what I have described as the steady-state USAF fighter force fielded throughout most of the global war planning era.

The Base Force was conceived against a backdrop of rapidly changing expectations for long-run posture options (as circumstances had materialized by the late 1980s). Until about 1988, some of the more optimistic projections of long-term force structure and ultimate budget levels continued to shape some armed services force planning. As noted, in the heady days preceding the extended downturn of the budget and the adoption of the Base Force, various force alternatives, including even a possible expansion of the fighter force, had been entertained. At the very least, the goal of maintaining a steady-state posture of about 36 FWE was retained until late in the decade.

To have maintained the fighter force at levels consistent with long-term characteristic levels (i.e., to have continued the force structure pattern shown for recent years in Figure 1) would have required additional procurement of fighters then in production (in particular,

¹²See Les Aspin, *The Bottom-Up Review*, Washington, D.C.: Department of Defense, 1993.

the F-16 and, to a modest degree, the relatively early acquisition of some follow-on types, particularly the then-unselected ATF) as well as the retention of various older fighter forces (particularly those with special functions, such as the F-4G). Had we taken all the steps envisioned in plans laid out in the late 1980s, the USAF fighter force structure might have unfolded over the 1990s as shown in Figure 4.

For reasons requiring no discussion here, such an outcome was not to be. Rapid shifts in the strategic and resource environments in the late 1980s combined to make it quite clear that simply staying at historical force levels would not be possible. Beginning in about 1988/89, the prospect of significant force reductions affecting nearly every part of the U.S. defense posture was considered. A year or two later, declining budget projections were officially incorporated into

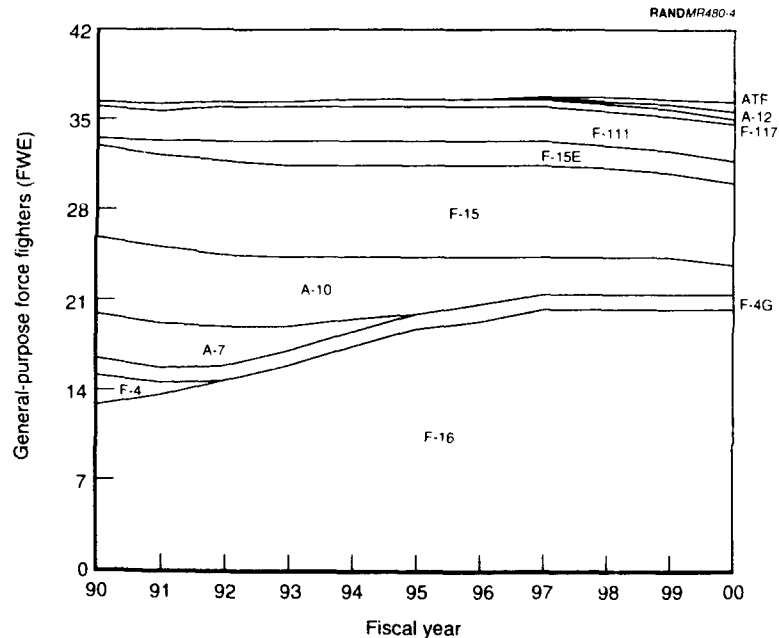


Figure 4—Estimated "Maintenance" Posture for a 36-Fighter Wing Equivalent TAF Through FY00

planning guidance, and U.S. force structure goals were adjusted sharply downward to levels on the order of 26.5 to 28 FWE. As conceived in the original Base Force (announced, ironically, just hours before Iraq invaded Kuwait), the USAF force structure was to unfold approximately as shown in Figure 5.

Finally, we note an adjustment in the baseline Base Force program as laid out in Figure 5: the evolution of force drawdown plans prior to the 1992 election saw a final revision in ultimate force objectives.¹³ Specifically, experience in the Gulf War apparently led to some modest revisions of the Base Force plan as originally laid out.

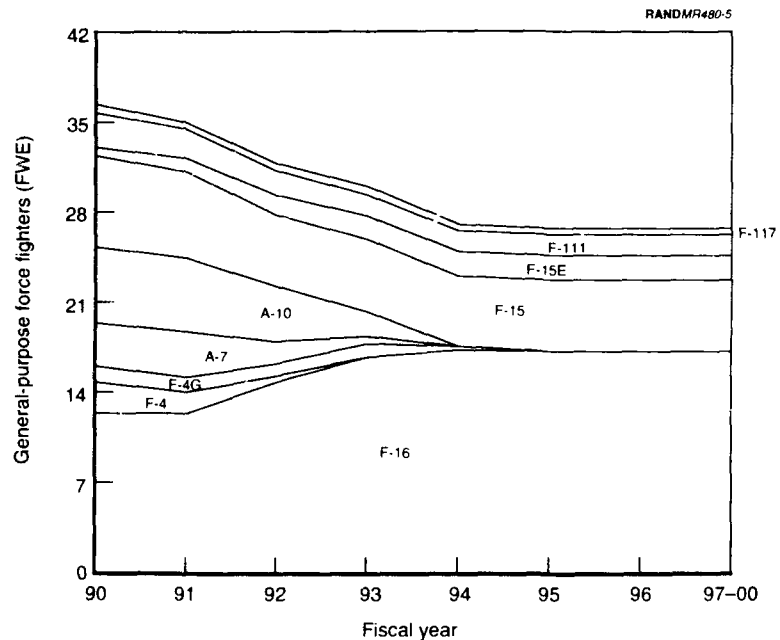


Figure 5—TAF Evolution Under the Pre-Desert Storm Base Force Plan

¹³Reflecting, among other things, the outcome of the fall 1990 budget summit.

PLANS AND THEIR CONSEQUENCES: FORCE REDUCTIONS TO DATE, AND THOSE PLANNED

Against the backdrop of these rapidly changing plans, we turn now to those force decrements that have taken place already: that is, the difference between the evolving posture and the force structure that might have been maintained had the USAF's TAF force goal remained at a total of about 36 FWE (not counting air defenders). The differences in the changed posture through FY93 are given in Table 4. We see that the TAF's deconstruction from a notional 36-wing steady-state plan has consisted of three types of initiative: (1) the earlier than planned retirements of some systems (A-7, A-10, F-4G, F-15A, and older F-111s), (2) some reduction in procurement quantities (mainly F-16C/Ds, which would not substantially influence the numbers in the table as of FY93), and (3) the accelerated modernization of the Reserve Component.

The Base Force plan as configured was noteworthy in many respects: most obviously, it represented a greater than 25 percent force reduction compared with prospective force levels envisioned not long before. Further, the plan did not anticipate the acquisition of follow-on systems on the same schedule as had been expected. Though a few details remained subject to uncertainty and debate (e.g., the nature of F-16 modification programs for CAS/BAI missions, the question of whether to maintain RF-4Cs in the force, the issue of active/reserve balance, etc.), the final Base Force plan roughly follows the lines of the one appearing in Figure 6. Alongside that portrayal is a depiction of the new (BUR) force plan.

Figure 6 begins with a nominal "baseline" USAF combat TAF force (the force in FY87) and shows, first, two successive waves of reductions, one through FY92 and one from FY92 to FY94. It is interesting to note that in just two years (FY92 through FY94), the USAF total TAF operational inventory dropped by more than 7 FWE of aircraft, nearly all of the most recent generation of aircraft. This force is larger than that maintained by the in-being tactical Royal Air Force. Then, the residual force for FY94 is compared against two future milestones: first, the posture that would have been in place in FY97 had the Base Force unfolded, and second, the FY97 posture proposed

by the BUR. What these columns show is that the BUR future goals are substantially less than those proposed previously, mainly in the F-15 and F-16 fleets. What the last column indicates is that with a few exceptions (notably, the G&R F-16 force), we are already down to a force level not appreciably greater than that proposed for the future by the BUR.

Table 4
Summary of Developments: Planned Drawdown to the Base Force
(Combat Types)

	Baseline (FY87)	Phase I (To FY92)	Phase II (To FY94)	Base Force FY97 vs. FY94	BUR FY97 vs. FY94
Active Component					
TAF (PAA)					
F-4E	222	-222	—	—	—
F-4G	72	-30	-18	-24	-24
F-111ADEF	192	-54	-84	+6	—
F-15E	0	+108	+30	+6	—
F-15AC	432	-114	-54	+42	-12
F-16AC	588	-72	-132	+96	—
A-10A	300	-192	+12	+24	+12
F-117A	18?	+18?	—	—	—
Reserve Component					
TAF (PAA)					
F-4CDE	306	-306	—	—	—
F-15A	60	+30	-18	+18	-27
F-16AC	96	+384	-15	+177	-90
A-10A	186	-6	-30	-42	-6
A-7DK	270	-144	-126	—	—
F-4G	0	+6	+18	—	-24
Air defense forces					
(PAA)^a					
F-15A (Active)	54	-54	—	—	—
F-16A	36	+144	-60	+24	—
F-15A	0	+36	-6	+6	—
F-4CD	126	-126	—	—	—
F-106A	30	-30	—	—	—

^aAir National Guard unless noted otherwise.

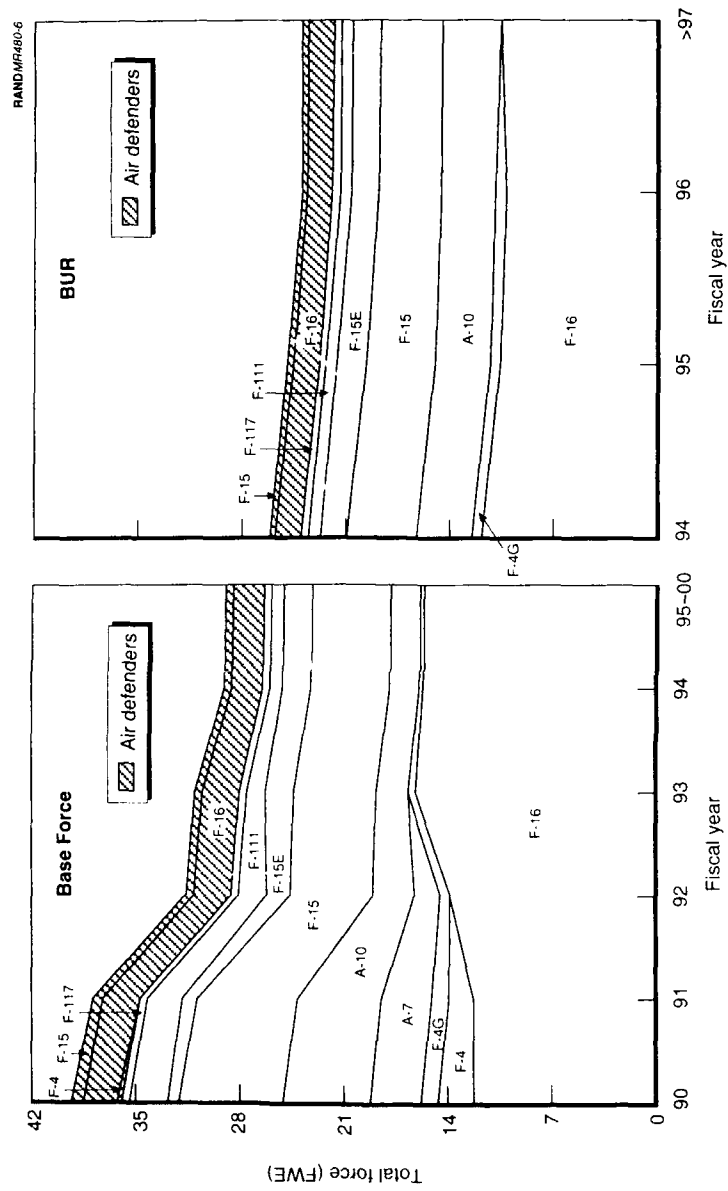


Figure 6—The Final Base Force Plan and the BUR Adjustment

SUBSEQUENT FORCE ADJUSTMENTS

Although the Bush administration remained fairly steadfast in its endorsement of the Base Force as a "floor" below which U.S. military capabilities should not go,¹⁴ alternative plans involving significant further reductions in overall force structure are now apparently *en train*. As the comparative data in Table 4 show, the Clinton administration has approved a reduction in planned forces below Base Force levels, a process that has involved the removal of more and more contemporary and special-purpose combat units. Like its predecessor, the Clinton administration has sworn that it will not waver from these new force targets. However, keeping in mind that they are underfunded and that pressures on defense spending continue, and taking into account the somewhat less than steadfast positions held by the Clinton administration on some policies, it is not entirely imprudent to rule out the possibility of further reductions in force. Given our recent experience as a case in point, what forms might subsequent reductions take, and what force options might be considered?

A survey of recent proposals and developments over the past several years (including some prior to the BUR) indicates that the drawdown of the USAF's fighter-attack forces might ultimately come to rest in the 18-23 FWE range. Where the final force may arrive within this range is now anyone's guess. On the one hand, only modest adjustments to BUR levels might be entertained. This would represent one option at the higher end of the spectrum just cited. On the other hand, Les Aspin when a congressman proposed a series of force options, one of which ("Option C") has been widely presumed to approximate the sort of posture that might now be under consideration in internal DoD review of force alternatives.¹⁵ According to this proposal, the USAF tactical posture would be reduced to a level of 18 FWE (of which 10 would be active and 8 reserve), not counting an unidentified 2 additional wings of electronic warfare and defense-suppression aircraft and 2.5 wings of homeland air defense fighters

¹⁴It should be noted that toward the end, particularly after the "Rose Garden" deal, the official position on the Base Force began to soften.

¹⁵See *Defense 1997 Alternatives*, Office of Representative Les Aspin, Chairman, House Armed Services Committee, February 25, 1992.

that would be available to supplement theater forces in an emergency. Details on the internal mix of various forces proposed are sketchy, largely because they are closely related to a number of complex decisions (for one, the ultimate procurement quantity of the USAF's F-22 fighter). But we can be reasonably confident that the most important long-term issue in future force mix decisions concerns the fraction of the force constituted by (and the operational assignments of) relatively less costly multirole fighters.¹⁶

In sum, the inescapable reality of the situation is as follows: within a relatively brief interval, the USAF will have discarded close to half of the force structure it maintained throughout the course of the so-called global war planning era. Moreover, a relatively greater proportion of the forces remaining may be deployed stateside rather than overseas, in reserve as opposed to active units, and equipped with what might turn out to be a relatively less costly and specialized mix of aircraft. This in and of itself amounts to no less than a revolution in the USAF's TAF planning problem. But many details remain unclear about the specific attributes of the forces remaining in hand. For one thing, one of the undeniable luxuries of a larger (e.g., mid-30s of FWEs) posture, composed of many aircraft types with many different attributes, was that one could draw from a fairly large pool of capabilities in designing a force for commitment to anything less than an all-out global conflict.¹⁷ With a smaller force, and one that most probably will be quite streamlined in terms of the variety of capabilities and types of aircraft composing it, the premium on "guessing right" in advance about contingency requirements would grow, since there would be a smaller and less varied reserve to draw on to field a contingency force.

¹⁶Presently, these would be the USAF's F-16; in the future, that aircraft would be replaced by some kind of as-yet notional multirole fighter (MRF) that might be procured by both the USAF and Navy. It should be noted that proponents of relatively larger cuts in force structure, undoubtedly motivated by a desire to draw down defense budgets and unconvinced of the rationales for forces of, say, 21-23 as opposed to 18-20 FWE, often have endorsed what has come to be known as a "silver bullet" force design strategy. Under this concept, there would be fewer high-end (e.g., F-22) aircraft procured (on the assumption that the qualitative edge enjoyed by such aircraft would trade off more heavily with numbers than other observers might think is appropriate).

¹⁷In this case, obviously, anything and everything would be committed to forward theaters.

Accordingly, even rather modest variations in the numbers and types of aircraft in the field could turn out to be quite consequential. Later in this report I will assess some options: these will take the form of particular alternative force mixes at various force levels. None of them is intended to represent the right solution given any or all possible future planning needs--rather, they are put forward simply as possible choices in the interest of promoting discussion about the real significance of even fairly modest variations in the posture we may end up fielding. But before proceeding to a review of those options, let us review some key background material on the overall problem of future fighter force planning.

DETERMINANTS OF USAF FIGHTER FORCE PLANNING

When he was once asked about the operative U.S. guidance for planning central nuclear war plan options, then Under Secretary of Defense William Perry noted candidly that "U.S. targeting policy is based on the forces we have."¹ This frank assertion underscores the existence of real-world disconnections among what in theory should be closely integrated elements of an ideal top-down defense planning process. According to such models we would, at least in principle, attempt to determine force requirements and characteristics on the basis of complex assessments that take into account national aims, operational concepts for their attainment, alternative scenarios, criteria, and conditions under which we might seek to accomplish particular goals, and the like.

But in the real world, it typically turns out that U.S. objectives and capabilities can and do diverge substantially.² One of the chief reasons for this is the basic fact that, like it or not, we will seldom have available the resources required to implement all the measures conservative planners deem desirable. When available resources fall short of requirements, we find ourselves facing difficult decisions indeed, since if the "optimum" solution to a planning problem is force element X for a budget of \$Y, we don't necessarily do best by buying, say, half of X if the funds ultimately available turn out to be half of \$Y.

¹Testimony of William Perry, House Armed Services Committee, *Hearings on Military Posture for FY1980*, Part I, Book 3, pp. 24-25.

²This is so even in a case like strategic offensive planning, where various operations and force structure issues, while quite complicated, are nonetheless far more clear cut than they are in many theater force planning drills.

(And, of course, we don't tend to know well in advance that we will wind up with half of \$Y, as opposed to two-thirds or one-quarter. That is, a portion of an optimized solution may not be—and usually isn't—optimal in itself.) Given that the force downsizing now under way is driven to a large degree by fairly straightforward resource considerations, it follows that the problems accruing from requirements versus resource gaps that we have come to know so well historically should now be lurking throughout our defense planning process.

ISSUES TO BE RESOLVED

In determining the proper size and mix of a reduced fighter force, some overall issues to be resolved include the following:

- Overall top-line fighter posture size (the size of the total force in FWE, that is), which should logically be a function, over the long run, of several factors, including: (a) resource availability and force costs; (b) the requirements of the evolving national defense strategy; and (c) the effects that alternative ways of accomplishing certain missions (including the use of manned bombers, missiles, and the analogous force elements of the other services) could have on the overall requirements for USAF TAF structure.
- The long-term sustainability of a posture of given size, which is in turn a function of budget availability, programming issues (like lead times), the estimated requirements of operational contingencies, forward deployments, and other factors.
- The priorities that should be accorded to particular missions and functions in which TAF elements now participate or may someday participate.³

³In addition, some more specific issues related to the determination of the overall constitution of the USAF's TAF should include various matters, including: (1) The anticipated nature of possible contingencies, and the need to effect a proper balance between the "shooter" portion of the USAF's TAF and various other force elements (including target acquisition, C3I, and other elements); (2) Possible tradeoffs between total force structure size and capabilities defined in a larger sense (a function of such matters as the expected performance attributes of modern munitions); (3) The expected productivity of TAF force elements, including their ability to accomplish operational objectives on particular timetables, the proper personnel, training, and

Only a few of these issues can be addressed in the following assessment of the most basic posture considerations pertinent to possible future TAF design. Putting aside such additional points, then, consider how we might in theory proceed from a given baseline (I use the Base Force) to some downsized posture.

DETERMINING FORCE REDUCTIONS: IN PRINCIPLE AND IN PRACTICE

Deciding on the future shape of a military posture of any sort is a balancing act with two major components. The first follows from certain structural determinants and characteristics of the present posture. Defense force structure of any kind cannot be decided and implemented in a single year. It is a product of a great many historical choices, policies, preferences, and the like, on account of lead times and other phenomena. Second, TAF planning in fact involves a cluster of issues that in one way or another involve our options for what kind of force we should have in the long run. The former component of the force planning problem is pertinent mainly to choices that will affect posture out to the end of the present decade. The latter will increasingly come into its own over the longer term. Some of the factors that fall into this second component of the planning problem are as follows:

- **Feasibility considerations.** Simply put, we must first and foremost be concerned with the question of what is possible, within a given time frame, given prospective resource availability, the lead times involved in acquiring capabilities, the ancillary and

logistical support required to sustain given utilization rates in combat, and the like; (4) Certain accounting and definitional issues, for instance, whether systems specifically or optionally configured for missions other than strict TAF fighter-attack ones are to be counted (EF-111, defense-suppression resources, if any, etc.); (5) The existence of alternatives to traditional TAF posture elements within a given set of scenarios, objectives, and so forth, including the possible employment of what are now defined as strategic air defenses to accomplish certain missions, the possible dual use of some supporting forces and special operational forces to accomplish some missions, the mobilization potential of the training and support base, etc.; (6) The accounting conventions we utilize (especially in a transition period), given the considerable turmoil that now characterizes the TAF (due, for just one example, to the rapid re-equipment of ARF forces); and (7) Selected political and administrative issues (e.g., transfer of units such as A-10s to Army/USMC, transfer of selected units to other budget and force categories, etc.).

related capabilities needed to support a given element of posture, etc.

- **Strategic and operational objectives.** Planning depends centrally on the articulation of various principles and propositions that specify national objectives, strategic and operational goals and means for achieving those objectives, the ways that force structure contributes to goals, and the like. Analyses of this sort frequently follow what is essentially a bottom-up (or zero-based) planning approach.
- **Priorities.** Given a number of tradeoffs that arise in the course of analyzing future force options from either of the preceding perspectives, we need to resolve questions about the priority of given capabilities, the possible employment of multimission or multifunction resources in the accomplishment of arrays of tasks, the ability of substitute approaches (including non-USAF, coalition, and other ones) to meet objectives, and so on.

The more short term in consequence are the problems we confront, the more our decisions will be shaped by feasibility considerations; in longer-term estimates of force structure needs, we will be relatively more concerned with some of the larger questions arising from the kinds of evaluations that would go on as part of the approach outlined in the second bullet above. Clearly, our decisions in designing a new fighter force will lead to a set of choices that could have major and enduring effects, not all of them perhaps fully intended.

PERTINENT LESSONS OF PREVIOUS DRAWDOWNS FOR CURRENT CHOICES

It is instructive to examine pertinent historical experience to see whether any lessons emerge from the ways force structure drawdowns have been effected in the past. The history might indicate certain internal USAF priorities and approaches to the ways these priorities might be expressed during an ongoing force reduction. A historical background also provides some insight on the reasons for the present state of USAF force planning—and by association, the planning environment and other conditions we must now deal with.

One immediately finds, however, that from a force planner's perspective there are relatively few direct analogs to shed much light on the present situation. Recall Figure 1, which showed the historical constitution of the large-scale USAF TAF. It is apparent that the only parallel to the present situation (in terms of scale, anyway) came after the Korean War, when the demobilization of theater air forces combined with the doctrinal shift toward the "optimum mix" force planning concept to yield a major reduction in overall TAF force size. However, a long list of extenuating factors (including the rapid changeover in inventories brought about by technological advances), a requirement to deploy substantial U.S. forces in certain forward theaters, major reorganizations in command structures, training, equipping, and logistical philosophies and approaches, and various other unique historical factors caution against an overly literal interpretation of this record as a decisive historical parallel. Nonetheless, certain concepts for managing force reductions do seem to recur and are worth noting here.

Conceptual Predicates of Historical USAF Force Reductions

Despite the absence of direct parallels, we do see some interesting patterns if we take a larger definition of the TAF and examine its evolution as a whole, as opposed to concentrating simply on a TAF as one might characterize it in contemporary terms. Figure 1, appearing in Chapter 1, provided a historical overview of the USAF total TAF over the long haul. Revisiting that history, we can identify three elements of what might be considered an ongoing TAF downsizing process.

- The first phase of the historical (post-World War II) posture reduction of TAF resources is, of course, the very substantial draw-down of USAF homeland strategic defense forces that took place over an extended period beginning around 1957, with the majority of reductions taking place over a decade and a half. Total programmed force structure (all components) declines from a total of about 43 FWE in FY57, to just 7 FWE in FY72, to less than 3 FWE at the present time. Under the BUR, further reductions to an endpoint of just over 2 FWE (all Air National Guard) are pro-

grammed. In addition to this decline in force structure, other reductions and streamlining initiatives took place: among them, the abandonment of USAF BOMARC SAMs, the retirement or replacement of a variety of warning, evaluation, and other systems, and so on. As is well known, this reduction is primarily the result of fundamental strategic changes, but other factors (including the improved technical capabilities of follow-on forces and organizational and other factors serving to blend the air defense and more strictly "tactical" missions) also account for some of the change.

- A second, albeit less dramatic, drawdown over time has been in the area of certain ancillary combat capabilities assigned, generally, to theater air forces. Figure 1 shows the reductions that have taken place in one chief element of this posture, namely the tactical recce force. Tactical aircraft configured for reconnaissance missions (that is, specially modified or equipped variants of tactical fighters and bombers) fall from a level of 9.3 FWE in FY57, to 5.7 FWE in FY62, to only about 1 FWE today. Under current plans, future tac recce forces may decline to essentially cadre levels or disappear altogether, to be replaced by pod-equipped fighter-attack types (and tactical reconnaissance capabilities have been greatly augmented and improved by measures to exploit other intelligence and recce sources, and by the acquisition of highly specialized systems whose functions extend beyond reconnaissance to other missions, including the real-time control of fighter-attack forces). Similar, if more erratic, shifts over time can be found in the cases of electronic warfare, air control forces, and the like. As with tactical recce resources, the displaced capabilities are replaced by non-force-structure alternatives, by limited numbers of highly capable modern systems, or by capabilities that can be placed aboard combat aircraft types, obviating some of the need for separate combat units.
- The third historical phase of the overall TAF drawdown, of course, involves fighter-attack combat units per se. This is the phase upon which we are now embarked.

In short, while there has never really been a drawdown in modern theater combat (i.e., attack) units to rival in size or consequence the one that is now under way,⁴ there are some historical data on substantial and permanent force reductions in other TAF units. Inspection of the pertinent history reveals overall patterns of adjustment that are reflected by shifts in the historical USAF posture as it responds to various budgetary and strategic dislocations over time.

Drawdown of Marginal Force Elements

The first and by far most predictable response to external and resource pressures is the jettisoning of, relatively speaking, "marginal" force structure (marginal here meaning those force elements most functionally nonessential, technologically obsolescent, available in odd quantities, or for which reasonable alternatives exist). Interestingly, with the exception of the current drawdown, most major reconfigurations in the historical TAF posture have come at times when major modernization programs were under way. We accordingly see the availability of new equipment for Active Component forces translating into opportunities for the modernization of the reserves, with the oldest and least-effective units not otherwise deemed necessary on mix grounds being retired outright.

For instance, the evolution of the strategic interceptor force between FY62 and FY72 (shown in Figure 7) reflects a large number of interrelated factors. But from the vantage point of the present discussion, we can relate the increasing "marginalization" of these forces to the shift in overall U.S. strategic doctrine, large-scale changes in the strategic balance, and the shift in offensive force configurations on both sides in the direction of ballistic missiles (developments that took place in the context of a growing resource squeeze occasioned by the shift to "flexible response" and by the emergence of requirements of the Southeast Asian conflict).

⁴A precipitous drawdown after mid-1950s peaks to levels almost 20 FWE lower can be accounted for in significant part by the retirement of units equipped with World War II-vintage aircraft.

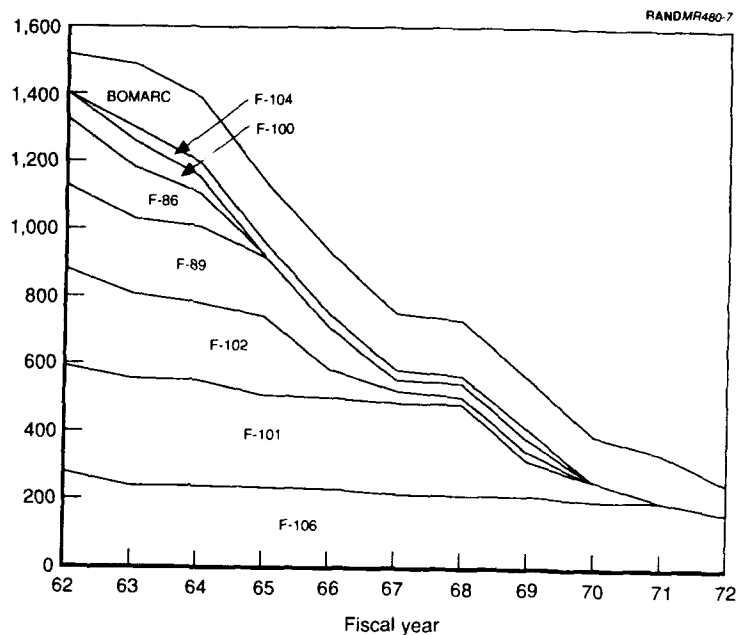


Figure 7—Divestiture of USAF Air Defense Fighter Forces, FY62-72

Changing Status of the ARC over Time—Especially During Drawdowns

A second development common to historical drawdowns relates to the role played in the total USAF TAF of the ARC—the Air Reserve Components (Air National Guard and Air Force Reserve). There are two phenomena that quite consistently describe the course of USAF posture planning over the years and that are pertinent to the present planning context:

- The ARC has grown in relative and absolute importance no matter what else is going on.
- The increasing emphasis on ARC forces over time tends to be amplified by posture contractions; the requirement to contend

with force structure "shrinkage" also leads to an expansion in the roster of roles the ARC is expected to play.

When it comes to the large-scale overhaul of the core fighter-attack TAF, we find, as noted previously, little direct prior experience.⁵ But one suggestive parallel of this process at work historically can be found, as shown in Table 5, in the case of USAF tactical recce forces (defined as those *combat-type* aircraft tasked to perform the manned reconnaissance mission, for instance, RF-101s, RF-4s, or RB-57s).

So far as future force mix is concerned, we might note numerous fine points of the changing tactical reconnaissance posture, for instance, exploration of certain programs to enable modern manned and unmanned systems to replace traditional specialized recce aircraft. Nonetheless, the results of the overall trends taken in larger perspective are clear: over time, the ARC has been assigned an ever greater responsibility in this mission area, first in terms of relative numbers, and second in terms of equipment modernity. When we compare these developments with others (e.g., the fact that recce adjustments

Table 5
Active Versus ARC Representation in the Tactical Recce Force (PAA)
FY62-92

Fiscal Year	Active Recce	ARC Recce	Total Force	% Active Component	Total FWE	Relative Force Size (FY62=1.00)
1952 ^a	261	0	261	100	3.6	0.55
1957	486	180	666	73	9.3	1.14
1962 ^a	368	108	476	77	6.6	1.00
1967 ^a	372	210	582	64	8.1	1.22
1972	246	162	408	60	5.7	0.86
1977	180	162	342	53	4.8	0.84
1982	108	132	240	45	3.3	0.50
1987	90	108	198	45	2.8	0.42

^aDenotes fiscal year in which some aspect of total force structure is influenced by under way contingency: FY52: Korean War (full mobilization of ARC); FY62: Cuban crisis (ARC mobilization); FY67: Vietnam (force expansion).

⁵Save, of course, what is now under way with the continuing drawdown toward the Base Force.

reflect the choice of "shooter" platforms as a relatively higher priority), we begin to understand some of the reorientation. Yet another factor underlying the overall trends in this force component simply reflects the recognition that tactical recce capabilities could be preserved, in a way that would not compromise overall force potential, by locating them in reserve components.

So although we have never, as part of a deliberate, strategy-based force revamping, drawn down our fighter-attack posture to the extent envisioned under the Base Force plan (never mind some further reduced scheme), it is apparent that the *total* USAF fighter posture has gone through some major analogous reductions of other sorts, as we have just seen with the homeland air defense and tactical reconnaissance forces. These examples are suggestive of the general sorts of strategy the USAF might choose to follow in effecting a major reduction below the steady-state TAF posture it has maintained for at least two decades.

In addition to the approaches surveyed, other historical tendencies in overall force structure management could also be illustrated. One finds, as suggested previously, episodic pressures to disband small, specialized fleets, retire inventory components for which there are readily available substitutes, and deactivate components with particularly onerous cost burdens (especially logistical ones).⁶ Though the current drawdown has features that differ from previous ones in ways other than reductions in total inventory size, it is not unreasonable to expect that the broad outlines of previous drawdowns would be replicated in a drawdown of the dimensions now under way. In fact, this expectation is borne out by the nature of the choices made so far and that we continue to make.

⁶One of the best cases in point can be found in FAC, SAR, SOF, and related forces during the post-Vietnam retrenchment.

**RULES FOR FORCE PLANNING: SIZING, MIXING,
AND OTHER CONCEPTS**

Given the background of USAF fighter force reductions presented so far, by what rules might alternative USAF fighter-attack force structures be configured? I shall begin this chapter with a summary of certain rules and principles, then examine selected practicalities. As suggested previously, the options we might consider should, unless we wish to explore truly drastic reductions below the strengths now under consideration, be fairly intuitive. In particular, the logic that generally seemed to have given rise to the Base Force can be applied to an entire spectrum of below-Base Force structure objectives to yield reasonable postures that bound the likely posture "decision space." However, when we take into account selected additional considerations (how USAF forces might be explicitly designed, from a perspective of collective U.S. roles and functions, with those of the USN/USMC in mind; how USAF air defense forces might be equipped; and the way we view alternative posture modernization choices emerging toward the end of the present planning interval), we discover relatively modest force variants that might be of greater interest to planners than what a "business as usual" approach to a below-Base Force posture would yield. Hypothetical cases of various alternatives will be given subsequently to illustrate such points.

PRINCIPLES FOR GUIDING FURTHER REDUCTIONS

Force planning criteria to govern the constitution of the U.S. fighter-attack force have been specified by USAF officials. For instance, in hearings before Congress, senior USAF acquisition executives indi-

cated that future USAF tactical fighter forces should meet the criteria laid out in Table 6. Shown also in that table are the force component limits suggested by those criteria for a range of overall force sizes (measured in FWE).

Unless we are considering truly radical reductions, such criteria unfortunately tell us little about the specific attributes of the total USAF fighter-attack force, at least over the short run. For instance, "pure" (that is, purpose-designed) air-to-surface and air-to-air forces even under the Base Force amount to only about 5-1/3 FWE and 5-1/2 FWE, respectively. The bulwark of the Base Force (and, certainly, any reduced variant of it) will be the multirole F-16. Not counting air defense-assigned variants, 15-2/3 FWE of F-16s would populate the Base Force—this is almost 60 percent of the inventory. Except in a scenario in which forces are reduced below 22 FWE, and in which each and every air-to-surface aircraft is maintained (probably an unlikely proposition, given the constitution of that force), it is quickly apparent that we should have no problems living within these planning criteria; so we are left with little practical guidance for fine-tuning the features of a reduced force.¹

Table 6
Planning Criteria for Force Design: Permissible Forces

Mission and Criterion	Guidance for Force Composition	Allowable Force for Alternative Postures (in FWE)		
		26.50	23.00	21.00
Air-to-air	≤ 35%	≤ 9.25	≤ 8.00	≤ 7.35
Multirole	≥ 40%	≤ 10.60	≥ 9.25	≥ 8.40
Air-to-surface	≤ 25%	≤ 6.65	≤ 5.75	≤ 5.25

SOURCE: *Hearings on DoD Appropriations for FY92*, Defense Subcommittee on Appropriations, U.S. House of Representatives, Part 5, p. 365.

NOTE: Force possibilities have been rounded off.

¹Indeed, depending on how one defines the designated mission of particular F-16s, the issue of living within (or up to) the ceilings specified in Table 6 generally boils down to how we opt to count various elements of the F-16 force.

OTHER RULES FOR FORCE PLANNING

More specific rules would be more helpful in making decisions about the mix of aircraft within a given posture ceiling than such statements of principle as the mission mix rules shown in Table 6. Based on the factors that seem to have guided force planning during the global war period and especially over the course of the programmed drawdown toward (until recently) the then-official Base Force, several general rules of thumb regarding force mix (for any given posture size) seem to be worthy of mention. Drawing upon the most recent historical record, in fact, most of the Base Force drawdown can be explained by the following guidelines:

- Remove oldest systems. Consolidate, in all components, the most modern types of forces as the basis for force structure.
- Reduce, defer, or cancel procurement no longer required for the maintenance of a larger (e.g., 36 FWE) force structure.²
- Increase the proportion of the force constituted by, and the modernization of equipment within, the Air Reserve Forces.
- Retain, within rough proportional envelopes, the basic force mission and type mixes of the prereductions force structure.

In particular, the modernity of remaining force structure seems to be the most important single determinant of the force posture mix: as Figure 3 suggested, how young a given type of force is seems to have been the strongest indicator as to whether a type of aircraft would be retained in the posture or not.

Defining a Core USAF Fighter-Attack Force

A useful next step in this line of reasoning involves the definition of what I call a "core" USAF fighter-attack posture. Such a core posture

²The primary choice related to this option was the termination of the planned outyear F-16 multiyear procurement (a choice that not only reduces posture but also requires retention of a slightly older and less upgraded multirole fleet). Though it preceded the determination of Base Force levels, the reduction of planned F-15E purchases is a partial case of this. The cancellation of the A-12 and the slippage of the F-22 beyond the frontier of the current planning envelope are related (though special) cases.

concept helps define the most important inventory retention and discard issues by limiting the scope of the options USAF planners would be most likely to consider. The concept permits analysts to clarify the most important tradeoffs by removing elements of the posture that are likely to remain operational for the period under consideration (through the early part of the next decade) under most, if not all, circumstances. The core posture notion presumes that the levels of certain sorts of force components are highly unlikely to go below a certain point. Thus, the postures that would be assessed can be viewed as combinations of the core posture and some portion of the residual force—that which planners deem to meet best some combination of tests and criteria that take into account operational utility, logistical and personnel burdens, mission mix demands, and other factors.

In short, the core posture concept permits the concentration of our analytic effort on residual force elements the retention or abandonment of which represent the choices of real interest, as opposed to a grand revamping of the force structure as a whole. The argument underlying the concept is that this is the true envelope (or “decision space”) within which the real choices will have to be made, for any given set of force objectives that might be imposed for budgetary and other reasons. In following this approach we can avoid the range of complexities and numerous extraneous (and probably effectively irrelevant) points that might be introduced into our decision calculus were we to pursue a “zero-based” USAF force design approach.

What criteria determine the “membership” of a given part of our force inventory in the core posture? The considerations are real-world ones, and they combine the usual criteria by which we justify force retention decisions as well as simple common sense. The core posture, then, represents a combination of those forces that are

- **In being.** The core does not depend on any future choices, but exists as a result of decisions and investments already made.
- **Sufficiently modern.** The core carries the logic of USAF fighter force reductions made so far forward to a logically terminal, if not theoretically ultimate, point. Forces retained in the core posture are quite simply the newest ones. They therefore have the advantages, using time of acquisition as a surrogate, of the rela-

tively greatest capability within a class of forces, the fewest logistical burdens (such as those that accrue to more elderly forces), and the like.

- **Of reasonably indisputable operational importance.** The core posture includes those aircraft whose contribution to theater air campaigns is not subject to question (such as the entire F-15E and F-117 fleets), as well as those that would probably meet with at most token dispute in a debate over what other capabilities to retain (such as F-15s and F-16s).
- **Sustainable and available.** The core posture represents the inventory of forces that can be counted on over the whole course of the planning period in question. In other words, when we seek to lay out a fighter roadmap for, say, the next ten years, we can rely on having the resources included in the core posture *no matter what else happens*. If we never buy another tactical aircraft, we can count on being able to deploy the core posture at any point during the next decade or so.

There is an important distinction between the core posture, as defined here, and the postures that we might lay out as part of specific force plans the rest of the decade, for instance. Unlike the force structure that may be specified in any plan for any given year, the core posture is a sort of abstract "constant" posture. As such, it is not comparable to the forces included in actual plans (except by coincidence). If the posture that exists under a given plan in a given year is an "output" (that is, the force that is feasible and considered most desirable for any particular array of reasons), then the core posture is in contrast an "input"—a set of resources from which we can constitute a force. For that reason, the core posture may differ in some modest and occasionally perplexing respects from the forces that may be laid out in an actual force roadmap. I shall return to this point shortly.

Examination of historical buy rates, adjusted for such factors as attrition, training base requirements, etc., suggests a national core USAF fighter structure of 18 FWE. This is not to suggest that this represents in and of itself an ideal combination of capabilities, nor does it in any way presume to be the "optimal" force structure that we might aim for, given a set of resource constraints. It is determined, rather, by the conditions just specified. This force is presented in Table 7.

Table 7
The Core USAF Fighter Structure

Type	PAA	FWE
F-15C	270	3.75
F-15E	120	1.66
F-117	36	0.50
F-16C	870	12.08
Total	1296	18.00
Memo: F-16C Posture by block (notional)		
Block 50/52	168	2.33
Block 40/42	300	4.16
Block 30/32	312	4.33
Block 25	90	1.25

To return to the discussion of the distinction between the core posture and "real" (plan) postures, note, for instance, that the total F-15E force specified in this plan is less than the total actual programmed force retained under all the options that I present in a subsequent section. This does not mean that those other 12 PAA F-15Es are somehow outside the core, nor that they are not a force element that we would wish to retain under all circumstances. Rather, the figure 120 is selected because that is the number that can be sustained over the entire life of the system when we allow for attrition.³ The 120 aircraft figure is therefore a maximum *sustainable* value, and not the one that we would necessarily plan for in the next several years.

Similarly, as we shall see when we examine certain options in the chapters that follow, the core F-16C force is actually larger than some of the options laid out. Again, this doesn't mean that the options discussed actually go below some kind of minimum F-16C standard (i.e., fail to meet an "objective" represented somehow by the core posture). Rather, that apparent anomaly reflects the fact that under all the options we consider below, we would be maintaining a differ-

³That is, using typical loss rates for double-engined aircraft and allowing for F-15E service life, we could, given a program total buy of 200 aircraft (excluding Desert Storm attrition replacements), maintain more like 120 than 132 aircraft.

ent mix of F-16s for a number of reasons (e.g., on account of their role in nominally "strategic" air defense assignments). Under such circumstances, the combinatorics of the option presented (including such matters as training and rotation base requirements or the need for block purity for some force elements) might, for some years in a plan, produce an F-16C force lower than the one given in this core posture, and different in terms of the blocks in actual PAA units. In sum, it is important not to conceive of the core force as an actual future force option (though there is nothing to prevent us from doing so). Rather, it is a baseline from which we can draw the units that exist in the options to be considered, and as such it enables analysis to focus on those areas in which the real tradeoffs exist.

If the Base Force represents the maximum allowable force structure in a new reduced budget environment, and the core structure just shown represents a foundation of sorts, what (other than the BUR) intermediate postures might we consider? Put another way, taking into account the difference between the Base Force and the core posture, what forces would we consider retaining if the structure did not fall as far as the 18 FWE given in the core force? There are many ways to approach the problem conceptually. We might do so on the basis of particular types of aircraft, building on this core posture (or any other "rock bottom" minimum essential structure) and viewing the pertinent planning problem as one of determining what additional forces are both affordable and feasible, such that our ability to meet any given set of operational requirements is maximized. To this end, I now introduce a variety of useful planning themes. These are intended to highlight various aspects of the tradeoffs between the forces above and beyond those of a minimum core posture and those that might be affordable and feasible.

OPTIONS FOR ALTERNATIVE REDUCED POSTURES

In this chapter I apply some of the principles laid out previously to produce a series of alternative TAF postures. Each posture appearing in this chapter revolves around a notional force design "theme." In terms of overall force constitution, some of the options are rather similar, but there may be significant internal mix differences (insofar as, say, active/reserve force balance, or procurement requirements for follow-on systems, are concerned). Further, the options do not reflect some of the technical but nonetheless important managerial points that will play roles in the ultimate configuration of the USAF TAF posture.¹

In the discussion that follows, each option is compared with the now-defunct 26.5-FWE Base Force plan and with the 18-FWE "core" option outlined previously. A selected design theme for each option is used to develop three different forces of 23, 21, and 18 FWE. It may well prove that some of the themes may be blended, and other factors may be brought to bear on the force structure as ultimately conceived and formalized; nonetheless, the tableaux that follow highlight what seem to be the important trades among alternative forces.

¹For instance, crew ratios, readiness of (and within) various units, alternative unit organizational concepts, etc.

THE FIVE OPTIONS, AND THE OPERATIONAL "CONCEPT" THEY IMPLY

Before reviewing the particular composition of these force structure alternatives, let us first consider the concepts behind the five options.

A. A Continued Proportional Drawdown ("Business as Usual" Posture Reductions)

Option A represents a more-or-less proportional approach to the total TAF force mixing problem that mirrors both the baseline posture on which cuts will occur and the steps that have already been taken to attain that baseline. In other words, the same principles that apparently characterized the design of the Base Force are assumed to continue in force in the configuration of this option. Under this plan we would see, for instance, the earliest withdrawal, as required, from service of any of the options for various specialized mission platforms.² There is some shifting of air superiority types out of the tactical posture into the air defense posture; this is motivated by the superior ability of F-15s to cover more airspace (at reduced squadron numbers), the assumed longer life of these robust aircraft (particularly when flown primarily in an air defense role), and the desire to retain such aircraft in order to maintain more diversity in a posture that will include ever-increasing numbers of F-16s (as overall force levels go down). Option A does not necessarily reflect a particular emphasis on the possible contingencies the United States might face in the future: it is, if you will, a "business as usual" posture.

B. An ARC Force Purity Option

Option B, like Option A, is shaped strongly by managerial and efficiency considerations: it seeks to concentrate types of forces, especially in the reserve components, so that the fewest types of aircraft are maintained with corresponding training and logistical benefits

²For instance, F-111s (because of their age and cost) and A-10s (because of their relatively small presence in the posture and a desire to reduce to the total support infrastructure for the posture, particularly at levels below 23 FWE).

reaped. Mindful of the retention of so many F-15s in the reserve tactical force, there is some accommodation within the active forces and the air defense forces to emphasize the maintenance of specialized types no longer represented in the reserve components.

C. An ARC Air-to-Air Force Emphasis

Option C assigns responsibility for the maintenance of a second MRC package's air-to-air resources to the combined tactical and strategic air defense forces of the reserve components. This option assumes that reserve readiness in the air defense roles would be sufficient for reserve units that might be called upon to meet the air superiority requirements of a second MRC. A related proposition behind this option is that by maintaining an adequate degree of qualitative superiority in the Active Component air superiority forces (though the fielding of AMRAAM, and in the longer run, the F-22s), the numerical requirements for air superiority forces on a routine basis would be reduced.

D. An Active/Reserve Twin MRC Alignment

Option D effectively anticipates a global situation in which the probability of near-simultaneous ("concurrent") full-up MRCs is deemed sufficiently low that USAF reserve components would be able, given a sufficient run-up interval, to provide a substantial and balanced force package for a second contingency. A related possible set of circumstances under which this option might appear attractive has to do with the unfolding of events in and after a large Desert Storm-like regional contingency. In this option, for instance, any rotational requirements for active deployments, either to an active MRC or to one or more other, probably lesser, contingencies (for instance, various "no fly" enforcement duties), and even to ongoing forward deployments, could be met by reserve component units. Finally, this option might be consistent with an operational assignment scheme in which reserve forces might be the first choice when it came to meeting various reduced-intensity requirements (with active forces held largely in reserve for a full-up shooting regional contingency of greater relative importance to U.S. interests). This option, more than some of the others, implies a central role for the ARC in day-to-day

operational duties. Consequently, the ARC is assigned a rather complete spectrum of operational aircraft types.

E. A Compensatory USAF Division of Labor

Option E is based upon the assumption that current USN/USMC strategic concepts and associated aviation plans are more or less fully implemented.³ A detailed review of the total Navy plan is beyond the scope of the present discussion, but the general drift of the plan is toward multimission forces, oriented toward operations in and around a so-called "littoral" region of operation. The multimission focus is apparent, for instance, in the proposed retirement of the A-6E fleet, as well as in plans to equip both F-14s and AV-8Bs for missions other than the ones they were designed for. Most important, it now appears that the bulk of USN/USMC air resources will consist of the multimission F/A-18 (with currently operational types as well as the follow-on F/A-18E/F). Given the implications of this emphasis (both in terms of its mission focus and the characteristics, such as operational radii, of much of the Navy inventory), USAF force plans for the balance of the decade and beyond would be designed with a view toward the provision of various "specialty" capabilities, chief among them long-range attack forces.

THE BASIS FOR THE SELECTIONS OF PARTICULAR TYPES OF FORCES

Having briefly reviewed a few of the leading propositions behind the five options, we can now turn to a few brief rationales for the selection of particular quantities and types of aircraft for retention under the various alternative reduced TAF postures. Before considering in detail possible options for the future USAF fighter force, it is, of course, necessary to know just what we are working with. While some variations to that rule might be considered,⁴ the USAF's TAF

³See Sean O'Keefe et al., *From the Sea, Preparing the Naval Service for the Twenty-First Century, A New Direction for the Naval Service*, Department of the Navy, September 1992, and *Navy Force 2001*, Department of the Navy, 1993.

⁴For instance, recent RAND research has recommended the acquisition of additional F-15E aircraft to enhance capabilities for long-range attack and to even out long-term acquisition profiles. But at present, neither this nor any other proposal has been en-

roadmap for the decade must adhere to the premise of "what you see is what you get."

To lay out the possibilities for how to decide on what force building blocks to retain systematically, the constituent components of future posture alternatives must be broken down into types of forces. We now consider several such components:

- **Invariant parts of the posture.** We revisit briefly the notion of the core posture introduced previously.
- **Multirole forces.** The bulk of USAF fighter forces for the 1990s will consist under any imaginable scenario of F-16s. Because of two factors—the large existing inventory, and the relatively low operational costs of F-16s compared with some others—decisions about how many of these aircraft to retain and under what organizational arrangements are the most "dynamic"; choices about future USAF F-16 posture will be involved in virtually every other force tradeoff and in some sense thus represent a "slack variable" in our net force planning problem.
- **Long-range attack forces.** The value of these forces is without dispute, but the costs of operating and replacing them are high. How to balance such considerations is *probably the hardest part* of the planning puzzle.
- **Other aircraft types.** We consider what generally are "specialty" aircraft here—the A-10 and F-4G, among others.
- **Total force sizing issues.** Having reviewed the force structure building blocks of the future USAF fighter force, we quickly inspect some of the determinants of overall force strength.

Invariant Parts of the Posture

As noted in the discussion on the core USAF fighter posture appearing earlier, certain force elements do not vary significantly for any of the options. They are retained more or less at their full planned complement down to and including the 18-FWE "core" posture.

dorsed. See Christopher Bowie et al., *The New Calculus: Analyzing Airpower's Changing Role in Joint Theater Campaigns*, Santa Monica, CA: RAND, 1993.

Among these are the F-117A, the F-15E, and the F-15C. The rationale for full retention of the first two programs follows in a self-evident way from their extremely important role in any conceivable major regional contingency. Put somewhat more vividly, if one were to add up the "required" forces laid out in the primary CINC war plans, it would almost certainly be the case that the *net* demand for the F-117A/F-15E force would amount to 200 percent or more of the total available inventory. The F-15E force, however, is not maintained at the current level of 144 PAA aircraft. All of the reduced options are given at 132 PAA, and the F-15E "core" force is put at 120 PAA.⁵ The programmed F-15C force aircraft is easily sustainable in light of historical procurement of that aircraft type. The choice of 270 for a total maximum force level (and core level) reflects, in addition to inventory realities, estimated requirements for supporting overseas deployments, operations on two MRCs, supportive air defense forces, and various other considerations.⁶

The Baseline Multirole (F-16) Fighter Posture

The single largest constituent of the USAF's TAF is multirole fighters (F-16A/Cs). The reasons for this date to a series of decisions⁷ taken in the early and mid-1970s to adopt a so-called "high/low" force planning mix for USAF fighter forces. Chief determinants of subsequent USAF plans to obtain and operate these types of aircraft included the following:

- The unaffordability of an all "high-end" TAF.
- The requirements for "raw" numbers of aircraft resulting from the particulars of the global East-West balance, and the opera-

⁵This has been done in light of the insufficiency of the total program buy (about 200 aircraft, excluding Gulf War attrition replacements) as a basis for a full 2 FWE over the long run. For a service lifetime on the order of 25-30 years, and annual attrition in the 0.75-1.00 percent range, a force of 120-132 is a reasonable range for the long run. For simplicity's sake, I have assumed 132 PAA for the three reduced options (reflecting sustainable levels through the 1990s) and 120 PAA for the longer haul (i.e., looking beyond FY00).

⁶See Bowie et al., op. cit.

⁷For a brief review of some of the issues involved, see the discussion in Lewis, *Planning Future U.S. Fighter Forces*, op. cit.

tional and other objectives and attributes of the two sides' strategies and postures.

- The advantages of maintaining a force that could "swing" from one set of missions to another as changing theater priorities demanded.
- Certain specific traits of the Central European, Northeast Asian, and other operational environments (among them the density of useful targets and missions to be found within the range and capabilities of an airplane like the F-16).
- The suitability of such aircraft for Reserve Component use, and the attractive nature of such airplanes to key U.S. allies around the globe.

In short, while the USAF has always maintained aircraft types with many of these characteristics, the decision to design the modern TAF around such instruments (at least numerically) derived from many specific features of the U.S.-Soviet balance. In principle, then, it follows that the numbers, roles, and so on of such forces should be significantly affected by the changed overall military environment now confronting us. On the other hand, such forces continue to be enormously important because they constitute the raw material of the majority of our posture for the decade, because such aircraft are viewed very favorably when it comes to accommodating resource constraints (both operational and logistical), and because various qualitative improvements to such forces have expanded and could continue to expand their potential very considerably beyond the mission résumé envisioned at the time of the original "high/low" decisions.

Given the continuing requirements imposed by U.S. strategy as well as budget limitations, a substantial number of such aircraft are retained for all the alternatives considered. In fact, we maintain all of the most modern F-16 species (that is, almost all available inventory from all F-16C blocks) in all cases, and so these aircraft are essentially another invariant part of the overall USAF TAF. How many of the older F-16As to maintain, how F-16s are expected to figure in the air defense posture, and the possible modification and/or specialization of some of these models for special-purpose missions would depend on a range of detailed calculations and considerations beyond the

scope of this report.⁸ But for the sake of our calculations here, these forces have been treated in a simple way, namely that of a total USAF TAF "slack variable." Specifically, after all other requirements and various force characteristics (of the other types discussed in this list) have been made, we basically "fill up" (and make various adjustments in light of the subsequent posture combinatorics) the force structure to the allowed ceiling with F-16As. However arbitrary this approach, the results do turn out, as we shall see, to be consistent with various other possible criteria by which we might have made overall force structuring decisions.

The Quantity and Mix of Interdiction-Type Forces

Long-range attack aircraft constitute a vital part of the nation's total roster of airpower resources. As was apparent during the Gulf War, such forces provide the essential means for exploiting U.S. technical superiority as a counterbalance to enemy ground formations, for bringing firepower to bear on an adversary at all points during a scenario, for attacking strategic targets, and for raising the enemy's costs of aggression to unacceptable levels.⁹

In the modern operational environment, such forces must be technologically advanced to survive and operate effectively; and this in effect means that aircraft capable of performing such missions are among the most costly ones in the inventory. This presents a basic dilemma: on the one hand, these forces are of inestimable operational value, but on the other, their acquisition conflicts with the imperative to live within budget ceilings. Unfortunately, a series of developments in the middle and late 1980s (including the termination of the Navy's A-12 program, the halving of the USAF F-15E buy, and

⁸For just one example, it was discovered not long ago that particularly older F-16s were experiencing a higher than expected degree of structural damage on account of demanding flying profiles; the "cure" to such damage was estimated to be quite costly. Rather than carry out a full program of repairs on the fleet, one assumes that, in the interests of economy, only those aircraft in relatively better shape would be retained. Clearly this sort of factor would play a role in determinations of future force constitution. Equally obviously, a detailed assessment of this and the many other possible technical and other issues involved in USAF TAF fleet maintenance is beyond the scope of all but the most detailed analysis.

⁹See Bowie et al., *op cit*.

the limitation of B-2 production) reduced the available inventory of aircraft of all types able to perform such missions. Subsequently, the Navy's proposal to retire the reliable but aging workhorse of its interdiction fleet, the A-6E, further reduces the available supply of long-range attack forces expected to be available through the 1990s.¹⁰

The questions of how many such aircraft should be maintained (and, in the future, acquired), what their attributes should be, and what mix of types should be maintained are among the most important now on the U.S. defense planning agenda. A variety of proposals have been put forward for enhancing U.S. capabilities to perform such missions. These include the acquisition of a limited number of "silver bullet" follow-on interdiction aircraft (almost certainly an attack version of the USAF's F-22), bomber force enhancements, possible additional buys of F-15E aircraft, and the like. But with the exception of some bomber and munitions enhancements and the possible acquisition of more F-15Es, such initiatives would not put substantial new capability on line during this decade. Consequently, the options are limited for the augmentation, if that is deemed desirable, of long-range USAF attack resources.¹¹

Some possible alternative force configurations offering more or fewer long-range attack resources are presented among the five options. I take the retention of the F-15E and F-117A fleets as invariants: the question thus remaining is whether (and how many) addi-

¹⁰Bowie et al., *ibid.*, recommends the procurement of additional F-15Es as an interim step to relieve this deficiency.

¹¹Historically, the question of how many long-range attack aircraft are "enough" has been one of the thorniest faced by analysts. The application of airpower in this way has been hard to analyze in many cases, and many operational issues are greatly influenced by the scenarios one assumes. Desert Storm showcased the virtues of such capabilities dramatically: this was in part a consequence of the great distances involved in the theater of operations, the existence of an all-air interval prior to the onset of ground operations, the existence of a rich target array, and so on. In other cases, demands on forces might be somewhat different. For instance, in more geographically modest theaters, LANTIRN and GPS-equipped F-16Cs could perform quite ably in some strike roles (although such units would still probably remain a great consumer of tanker resources). Even in such cases, however, there would still be an enormous premium on the availability of the relative handful of stealthy forces maintained by the USAF, as well as on the range/payload and advantages of a two-man crew conferred by the F-15E and F-111.

tional aircraft of such types should be maintained. Such choices are presented in two ways. First, there is the matter of maintaining F-111Fs in the fleet. These airplanes are programmed (at a level of about 3/4 of a FWE in the BUR posture with a retirement rate not yet disclosed but likely to be around the turn of the century¹²), but are expensive to operate and would probably require considerable upgrading if they are to remain operationally viable through the 1990s. In addition, some options also call for a force of F-111E/Gs. About 60 PAA F-111Es have by now been phased out of the active inventory, and an uprated version of the "G" model (a "tactical" version of the FB-111A, also now retired) might supplement or substitute for these. Alternatively, however, additional F-15Es might be procured—but since there is no plan for these, this initiative is not explicitly listed.¹³

Other Aircraft Types

We are left with the problem of determining how many of what other types of specialty aircraft might be included in a reduced TAF posture. The real answer to this question, as is immediately apparent, relates mainly to timing: in the short run, we probably would retain some of these types simply because reasonable alternatives are not readily available. But in the long run, what is the place in the force structure of such types as the F-4G, A-10A, RF-4C, and EF-111A?

Under some earlier plans to date, most of these types had been scheduled for rapid retirement. However, the Gulf War contributions of these aircraft essentially won them temporary spots in the future USAF structure. Ultimately, though, resource desiderata will compel another look at these force elements under reduced posture plans. The fact remains that, the A-10A excepted, the specialized systems under consideration are old and increasingly difficult to maintain. It is also the case that alternatives to each type exist (in the form of F-15/F-16s modified for the defense-suppression mission, F-16Cs equipped for CAS, and various tactical reconnaissance alternatives,

¹²How long to retain the F-111Fs depends critically on the status of bomber upgrade programs; these are now fraught with some uncertainties.

¹³If the reader is inclined toward this option, however, it is possible to read the F-111E/G entry as a "placeholder" that might consist partially or totally of some additional number of F-15Es.

whether they take the form of some pod or some unmanned systems), although several of these alternatives have recently experienced various difficulties.

In the present analysis, all Phantom specialty variants are retired. The rationale simply follows from the operational costs of these elderly systems, costs aggravated by the overhead burdens of supporting small fleets. It is presumed that some combination of modifications to current aircraft of other sorts, and perhaps various non-aircraft alternatives, should replace these systems.¹⁴ Depending on the option in question, A-10As are retained, reduced, or eliminated entirely, again because of the burdens involved in supporting small fleets of aircraft whose mission might be performed by other, albeit properly modified, forms.¹⁵ Whether the EF-111A would be retained under the various plans is another matter. The value of the system notwithstanding, the ultimate fate of these aircraft probably would turn out to be related to a decision to maintain other F-111 types for long-range attack. Again, the logistical and other support requirements associated with a force of at most a couple of dozen aircraft, no matter how useful, would loom relatively larger the smaller the posture were to become.

THE BASIS FOR THE OVERALL FORCE LEVELS USED IN THE ASSESSMENT

This assessment has defined the five alternative TAF options in terms of three possible force levels (in addition, in the tabular portrayals following, I include for each option an approximate Base Force posture and the notional core 18-FWE force structure previously introduced). Those force structures reside at strengths of 23, 21, and 18

¹⁴The *recce* problem remains sticky and prospects for its resolution seem unclear as of this writing; on the other hand, the modification of either F-16s or F-15s (or both) for lethal defense suppression (perhaps in combination with unmanned systems) seems an inevitable proposition. There is no compelling reason why the USAF could not seek to duplicate the Navy's program of equipping virtually every combat aircraft in the force with some HARM capability, although the tactical issues inherent in the current USAF approach to defense suppression would presumably require a more aggressive attack on the defense localization problem and a comparatively extensive (and costly) set of modifications to some USAF aircraft.

¹⁵In addition, the retention of a nontrivial number of OA-10s remains an option; this question is not, however, explicitly addressed.

FWE for the general-purpose forces portion of the posture. In addition to these are ANG "strategic" air defense forces consisting of 162, 144, and 144 PAA, respectively.¹⁶

There are two bases for the selection of these totals. First, they are consistent with some levels proposed by a variety of advocates. Thus, the 23-FWE force is presumed to represent an incremental decrement to the BUR as a consequence mainly of the requirement to meet near-term budget targets;¹⁷ the 18-FWE level represents a sort of minimum posture, and the 21-FWE level is given as an intermediate posture.

The second basis for the selection of these totals follows from the sorts of posture choices that would have to be made in each case. For instance, the 23-FWE force could be associated generally with current strategic goals (albeit with fewer reserves, a higher reliance on ARC forces for early contingency commitment, substitution of increased readiness and capability measures, such as a "robusting up" of personnel associated with units, and possibly fewer forward presence units).

The 18-FWE force is intended as a minimum posture, but one that probably poses some serious problems when it comes to certain day-to-day operating imperatives, such as providing an adequate rotation base to support forward deployments (and one for which extensive and possibly total mobilization would be necessary to sustain contingency operations) and assuring an adequate degree of support in the Active Component for air reserve forces. In addition, by virtue of its equivalence to the core force in overall strength, the 18-FWE force would constitute the minimum force structure at which undisputed "front line" weaponry could be maintained without reductions. Again, the 21-FWE force is intended as a notional intermediate case. As we shall see below, a force of around 21 or so FWE represents a highly interesting transitional case: the cuts required to move from

¹⁶In contrast, the programmed Base Force air defense posture resides at a level of 180 PAA, the BUR force is set at 150 PAA, and a notional core 18-FWE posture is somewhat arbitrarily given as 132 PAA.

¹⁷The BUR force, including OA-10s and SDFs, is a bit larger than 24 FWE.

the Base Force to approximately a 21-FWE force would be sufficiently large that some major decisions about force design would be required, but not so large that the available choices would begin to disappear (as a result of the approach of the posture to the mix and strengths laid out in the core 18-FWE posture).

Force sizing and mix for the air defense portion of the posture has a rather different set of bases. The smaller the general-purpose force component of the TAF goes, the more one should expect the air defense forces to assume a backup, reinforcing role. The deeper the general-purpose fighter force cuts planned, the more air defense forces would have to be integrated into overall force planning.¹⁸ On the other hand, unless the basic air sovereignty mission were to be abandoned altogether, there are other imperatives that would continue to shape the total size of the air defense assigned posture. Put simply, while the forces and budgets for air forces may decline, the size of the airspace to be controlled remains the same. There are clearly limits, due to an array of operational factors, that we cannot go below if we are to maintain a minimum degree of aerospace control. A force of 132 PAA aircraft is probably too low, unless major departures from current policy (and, possibly, modes of operation) are contemplated. Perhaps some technical solution (e.g., a very highly reliable space surveillance system) could provide sufficient warning to trade off, say, with alert aircraft numbers. But all in all, such solutions are probably beyond the time frame of the current assessment, and in any event their costs would exceed those of continuing to maintain the present system (barring certain sorts of technological revolution). For this reason, the air defense posture is assumed to hold more or less constant at around 2 FWE. Because of the reduction in forces (not to mention the availability of aircraft, along with other considerations), it is assumed that this reduction in air defense posture would place a premium on the substitution of longer-ranged and more capable air superiority aircraft (i.e., we should prefer, as the posture declines, more F-15s above air-defense-configured block 15 F-16A aircraft).

¹⁸This assertion is made in a relative sense only. This process of integration has been under way, in fact, if not always formally, for quite some time.

FIVE ALTERNATIVE DOWNSIZED TAF FORCE STRUCTURE OPTIONS

Some of the foundations behind the five main force options were reviewed earlier. We now proceed to a brief description, in terms of the aircraft mixes assigned to each, of the five options just reviewed. All options must meet three basic conditions:

- The practice of removing from the inventory those oldest and least capable units is continued. In other words, we continue the pattern of "oldest/least capable out."
- Small fleets that have disproportionate logistical and personnel costs not associated with any particular countervailing operational benefits are retired.
- The basic structure of the USAF fighter aviation posture should be generally preserved, in terms of its overall characteristics.

Given these matters of guidance, Tables 8 through 12 describe in detail the force structure objectives for each of the five options.

Table 8
Option A: Continued Proportional Drawdown

	Base Force	23 FWE	21 FWE	18 FWE	Core/18 FWE
Active general-purpose forces					
A-10A	72	0	0	0	0
F-15A	18	0	0	0	0
F-15C	270	270	240	186	186
F-15E	144	132	132	132	120
F-16C	480	444	402	330	342
F-111F	60	54	36	0	0
F-117	36	36	36	36	36
F-4G	18	0	0	0	0
Total active	1098	936	846	684	684
Reserve general-purpose forces					
A-10A	66	90	42	0	0
F-15A	90	108	78	36	0
F-15C	0	0	30	84	90
F-15E	0	0	0	0	0
F-16A	282	114	66	0	0
F-16C	372	408	450	492	522
F-111F	0	0	0	0	0
F-111EG	0	0	0	0	0
Total reserve	810	720	666	612	612
Air defenders (ANG)					
F-15A	36	36	48	60	60
F-16A	144	108	78	42	72
F-16C	0	18	18	42	0
Total air defense	180	162	144	144	132
Total TAF (AC/RC)					
A-10	138	90	42	0	0
F-15	414	414	396	366	330
F-16	1278	1092	1014	906	942
F-15E	144	132	132	132	120
F-111	60	54	36	0	0
F-117	36	36	36	36	36
F-4G	18	0	0	0	0
Grand total	2088	1818	1656	1440	1428

Table 9
Option B: An ARC Purity Force Option

	Base Force	23 FWE	21 FWE	18 FWE	Core/18 FWE
Active general-purpose forces					
A-10A	72	36	0	0	0
F-15A	18	0	0	0	0
F-15C	270	270	240	186	180
F-15E	144	132	132	132	120
F-16C	480	408	384	330	348
F-111F	60	54	54	0	0
F-117	36	36	36	36	36
F-4G	18	0	0	0	0
Total active	1098	936	846	684	684
Reserve general-purpose forces					
A-10A	66	0	0	0	0
F-15A	90	84	72	42	0
F-15C	0	0	36	84	90
F-15E	0	0	0	0	0
F-16A	282	192	90	0	0
F-16C	372	444	468	486	522
F-111F	0	0	0	0	0
F-111EG	0	0	0	0	0
Total reserve	810	720	666	612	612
Air defenders (ANG)					
F-15A	36	60	66	90	60
F-16A	144	84	60	0	72
F-16C	0	18	18	54	0
Total air defense	180	162	144	144	132
Total TAF (AC/RC)					
A-10	138	36	0	0	0
F-15	414	414	414	402	330
F-16	1278	1146	1020	870	942
F-15E	144	132	132	132	120
F-111	60	54	54	0	0
F-117	36	36	36	36	36
F-4G	18	0	0	0	0
Grand total	2088	1818	1656	1440	1428

Table 10
Option C: ARC Air Superiority Emphasis Force Concept

	Base Force	23 FWE	21 FWE	18 FWE	Core/18 FWE
Active general-purpose forces					
A-10A	72	48	0	0	0
F-15A	18	0	0	0	0
F-15C	270	240	222	186	180
F-15E	144	132	132	132	120
F-16C	480	444	420	330	348
F-111F	60	36	36	0	0
F-117	36	36	36	36	36
F-4G	18	0	0	0	0
Total active	1098	936	846	684	684
Reserve general-purpose forces					
A-10A	66	36	0	0	0
F-15A	90	144	78	0	0
F-15C	0	36	48	84	90
F-15E	0	0	0	0	0
F-16A	282	78	90	0	0
F-16C	372	426	450	528	522
F-111F	0	0	0	0	0
F-111EG	0	0	0	0	0
Total reserve	810	720	666	612	612
Air defenders (ANG)					
F-15A	36	0	66	144	60
F-16A	144	162	78	0	72
F-16C	0	0	0	0	0
Total air defense	180	162	144	144	132
Total TAF (AC/RC)					
A-10	138	84	0	0	0
F-15	414	420	414	414	330
F-16	1278	1110	1038	858	942
F-15E	144	132	132	132	120
F-111	60	36	36	0	0
F-117	36	36	36	36	36
F-4G	18	0	0	0	0
Grand total	2088	1818	1656	1440	1428

Table 11
Option D: Active/Reserve Twin MRC Alignment

	Base Force	23 FWE	21 FWE	18 FWE	Core/18 FWE
Active general-purpose forces					
A-10A	72	54	54	30	0
F-15A	18	0	0	0	0
F-15C	270	270	240	186	180
F-15E	144	108	108	132	120
F-16C	480	438	378	300	348
F-111F	60	30	30	0	0
F-117	36	36	36	36	36
F-4G	18	0	0	0	0
Total active	1098	936	846	684	684
Reserve general-purpose forces					
A-10A	66	66	54	42	0
F-15A	90	108	72	0	0
F-15C	0	0	30	84	90
F-15E	0	24	24	0	0
F-16A	282	54	0	0	0
F-16C	372	408	426	456	522
F-111F	0	24	24	30	0
F-111EG	0	36	36	0	0
Total reserve	810	720	666	612	612
Air defenders (ANG)					
F-15A	36	36	54	72	60
F-16A	144	102	24	0	72
F-16C	0	24	66	72	0
Total air defense	180	162	144	144	132
Total TAF (AC/RC)					
A-10	138	120	108	72	0
F-15	414	414	396	342	330
F-16	1278	1026	894	828	942
F-15E	144	132	132	132	120
F-111	60	90	90	30	0
F-117	36	36	36	36	36
F-4G	18	0	0	0	0
Grand total	2088	1818	1656	1440	1428

Table 12
Option E: USAF Compensatory Concept

	Base Force	23 FWE	21 FWE	18 FWE	Core/18 FWE
Active general-purpose forces					
A-10A	72	0	0	0	0
F-15A	18	0	0	0	0
F-15C	270	270	222	186	180
F-15E	144	132	132	132	120
F-16C	480	438	396	330	348
F-111F	60	60	60	0	0
F-117	36	36	36	36	36
F-4G	18	0	0	0	0
Total active	1098	936	846	684	684
Reserve general-purpose forces					
A-10A	66	72	72	36	0
F-15A	90	90	48	0	0
F-15C	0	0	48	84	90
F-15E	0	0	0	0	0
F-16A	282	96	0	0	0
F-16C	372	414	456	456	522
F-111F	0	0	0	36	0
F-111EG	0	48	42	0	0
Total reserve	810	720	666	612	612
Air defenders (ANG)					
F-15A	36	48	72	90	60
F-16A	144	96	54	0	72
F-16C	0	18	18	54	0
Total air defense	180	162	144	144	132
Total TAF (AC/RC)					
A-10	138	72	72	36	0
F-15	414	408	390	360	330
F-16	1278	1062	924	840	942
F-15F	144	132	132	132	120
F-111	60	108	102	36	0
F-117	36	36	36	36	36
F-4G	18	0	0	0	0
Grand total	2088	1818	1656	1440	1428

**A BRIEF ASSESSMENT OF THE FIVE OPTIONS
AND REMARKS ON ALLIED ISSUES**

In the preceding chapter, I introduced several alternative USAF fighter force structures designed according to certain general force structure design "themes." This chapter considers a few specific issues and consequences associated with these options. It does so in overview terms and does not focus on the many technical issues that might figure in detailed analyses of U.S. force performance under selected scenario conditions that might be used for planning. Nor does it relate centrally to the relative operational, manpower, and other costs and burdens of the various alternatives. Recall that all of what follows derives from the fact, noted previously, *that the baseline USAF fighter-attack posture available through the rest of the 1990s will be based upon the inventory of fighter-attack aircraft now operational or on order.*

Put simply, then, no matter how our assessments of such matters as forward deployments, mission mix requirements for various MRC scenarios, or active/reserve mix may involve complex and diverse factors and considerations, our choices overall are restricted to what turns out to be limited to a fairly constrained and, it might be suggested, logical decision universe. Many immediate choices do in fact boil down to a fairly simple menu of preferences we might express straightforwardly in our near-term posture design options.

**CONSEQUENCES OF THE EXISTENCE OF A "CORE"
18-FWE TAF POSTURE**

In Chapter Four I suggested the existence of a "core" TAF posture, an analytic device based on the modernity of forces, general mission

mix requirements, and various other factors. To apply the core posture concept to the analytic task at hand requires us to assume that something akin to this posture would probably be maintained under virtually any near-term TAF downsizing and restructuring scheme, no matter what other strategic, operational, or resource-related determinants underlie our specific choices. In short, decisions about the USAF fighter posture over the next 5–10 years properly should be viewed not as one among various packets of forces consisting of, say, 18 or 21 or 23 FWE, but rather should be cast in terms of the choices we might make on how to configure the residual posture—those few wings of fighters permitted by overall fighter force strength, which in turn would be determined mainly by what the budget traffic would allow. This matter may at first seem academic, but focusing on choices involving just the residual force instead of the USAF's fighter forces as a whole helps clarify quite sharply the issues before us and allows us to address explicitly the particulars of the short-term TAF capabilities question we now confront. In other words, a key question as we design fighter postures at or above the core posture level concerns what residual forces we might wish to maintain. The essence of this decision turns on two fundamental matters: (1) the size of the posture (i.e., whether we opt for 18 or 21 FWE, the size of our air defense establishment, etc.); and (2) the mission mix we think should be emphasized when it comes to making decisions about whether to retain various elements of that residual posture.

The difference in ranges of values for the five options represents one way of describing the scope of permissible choices—it is this range of force possibilities that should constitute the grounds for debate, not the entirety of the TAF. We see, then, that (in this case) at the 23-FWE level, the range of choices (that is, the maximum range between the highest and lowest complement of an aircraft of given type for any two options) amounts to about 1.5 FWE of A-10s, about a squadron of F-111Fs, and up to two squadrons of older F-111E/Gs (or, possibly, additional new-buy F-15Es).

Mindful of these points, consider some basic points emerging from this assessment as a whole. When we consider *only* the "tactical" (i.e., to use PPBS categories, forces in MFPs II/V.2) components of the TAF, we find that we have considerable leeway in the forces we

might ultimately strive to maintain for different force structures. But when we add in a separate air defense element (whether the primary mission of that force is in fact air defense in the traditional sense, or whether it is conceived as a larger "air sovereignty," strategic reserve, or Western Hemispheric force), the apparent force structure ramifications of the different posture-configuration policies wash out to a substantial extent. This is mainly because any reduction of the air superiority complement we might opt for in the basic "tactical" posture would be in effect "restored" *were we to maintain an "air defense" posture separate from the TAF posture for force planning purposes.*

In planning future forces for the air defense mission, it would seem to make sense—given that the aircraft are available (i.e., already "paid for")—to substitute where possible F-15s for F-16s to some significant extent. Though they may be more expensive on a unit basis, they provide, in conjunction with other capabilities (improved weapons, AWACS, etc.), superior capabilities for the air defense role than do the multirole F-16s. Given their longer range and greater endurance, superior onboard capabilities, and the advantages of two engines, a smaller air defense force consisting of a richer mix of F-15s could meet the same overall mission requirements as could a larger force with fewer of those aircraft. Flown in ANG air defense units, the F-15s' service lives almost certainly would be longer than those of the F-16s that might otherwise be likely to populate the air defense posture.

By following this course, moreover, the USAF could retain a significant reserve force of air superiority resources that could be called upon as necessary to augment, back up, or take the lead in various contingency circumstances as the requirements of an emergency might demand. As a result, if air superiority force numbers in the general-purpose force inventory are subjected to serious pressures, the overall problem in finding such capabilities if contingency developments demand them could be largely mitigated if a substantial air-to-air posture were to be maintained in ANG air defense units. For this reason, the availability of air-to-air units does not appear to be the long pole in the tent as far as total future fighter posture planning is concerned.

RELEVANCE OF THESE POINTS TO RELATED TAF PLANNING ISSUES

In the balance of this chapter I consider three points that figure centrally in a variety of related planning issues now commanding considerable attention.

- Replacement of fighter force major end items.
- Requirements for regional contingencies.
- The mission mix of the total national theater air combat posture; in particular, the interrelationships of Navy/USMC force structure alternatives and various USAF TAF posture alternatives.

USAF TAF Replacement Issues for Various Reduced Posture Levels

One of the most important issues on the present defense resources agenda concerns long-range procurement prospects for U.S. fighter-attack aircraft generally. All things considered, in fact, inventory replacement issues seem to many observers to be as much a determinant of near-term posture planning choices as various other issues. *To be sure, there are many other issues at stake beyond the mere replacement of TAF end items.*¹ Most important of all issues, perhaps, concerns the timing of the various "stairsteps" of a future USAF TAF drawdown profile: even if they are not ultimately replaced, it is not clear that what seem today to be unaffordable posture levels of the long run should be rushed into now (particularly given the current volatile state of both future funding prospects and the turbulent strategic environment). Nonetheless, it seems inevitable, if only for political reasons, that various planned long-term or even interim posture levels that exceed what decisionmakers consider feasible funding levels are not likely to be viewed at present with much favor. That being the case, we consider here very briefly the general replacement needs of USAF TAF combat elements in general.

¹Many possibilities exist (with their own funding ramifications), for instance, for various modifications and other enhancements of current systems, and there is probably considerably more flexibility in the outyear funding prospects and scheduling for U.S. TAFs than some historically based assessments might suggest.

Although we have many options for managing future TAF inventories (and although in the past we have frequently underestimated the "staying power" of forces in the inventory), we can apply general rules to demonstrate the magnitude, if not the exact year-to-year scheduling, of future fighter replacement requirements. To begin with, let us aggregate replacement requirements in such a way that inventory demands after about FY00 are to be met with two notional future aircraft. We postulate first a "high-end" aircraft intended to follow on both to the F-15 and to current long-range attack airplanes (this aircraft is expected to be the F-22 for the air superiority role, and a modified version of that airframe for long-range attack missions). Second, we postulate a "low-end joint follow-on aircraft": such an airplane will, if it ever comes into being, be intended to replace current multirole aircraft and attack forces, particularly the F-16 and Navy/USMC F-18. Making various assumptions about the service lifetimes of different aircraft, overhead buy needs, and the like, we can develop a rough estimate of total procurement quantities over the next few decades.

Figure 8 shows the posture shortfalls for the two extreme future force variants considered in this report. That is to say, to determine the replacement needs for future USAF fighter-attack forces, we must begin with a baseline force that requires replacement: the largest such force is assumed to be the final 26.5-FWE Base Force posture (before its demise), and the smallest is given as the USAF core fighter posture defined in Chapter Four. For comparative purposes, Figure 8 also shows BUR replacement requirements. (It should be noted that in the discussion that follows, allowance for air defense forces has been made.) These three profiles are given because they constitute plausible maximum and minimum fighter force replacement scenarios over the next quarter century or so (as well as the current plan): the values for any of the intermediate options discussed in this report (including the need to refresh the inventory of aircraft for air defense roles) would fall between these bounding values.

As aircraft obsolescence and other forces work over time to drive the viable inventory of combat airplanes below requirements, we accrue a posture deficit as indicated on the vertical axis of Figure 8. Clearly, the deficit for the smaller of the bounding postures (i.e., the "core/18-FWE" posture) will begin to accrue later on because it does not

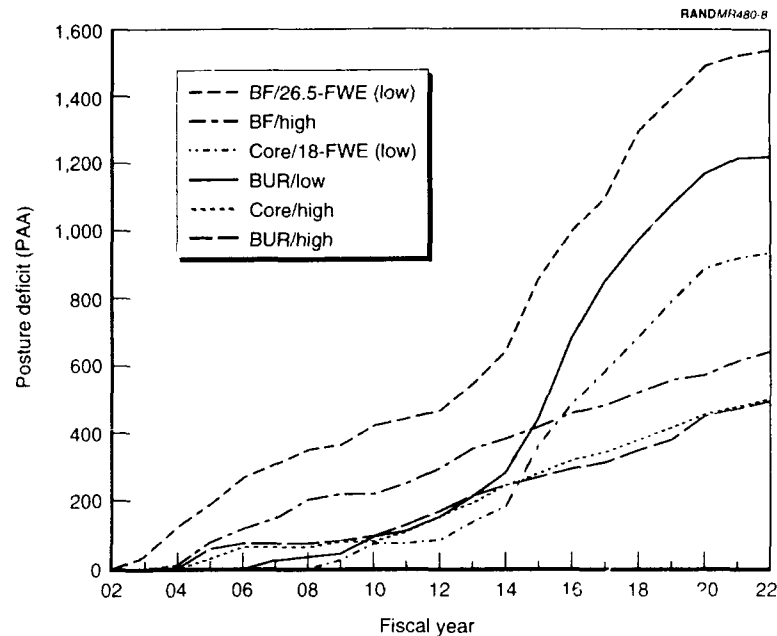


Figure 8—Posture Replacement Requirements for the Base Force and 18-FWE Core Posture Levels: Cumulative Force Deficit by Type of Aircraft

include the older aircraft retained in the Base Force ("BF/26.5-FWE") posture; and it will rise more slowly and to a smaller total value, because of the smaller size of the inventory to be replaced, and because we can control the retirement of existing aircraft models (smoothing out the effects of "waterfall"-type inventory falloffs) by judicious spreading of flying hours and by virtue of the larger attrition reserve that becomes available with a smaller long-term posture.

For each baseline posture scenario in Figure 8, we also distinguish between the replacement requirements for high-end aircraft (F-15s, F-111s, F-117s, and F-15Es) and low-end aircraft (F-16s, A-10s, and F-4Gs). By applying standard overhead factors, and assuming a two-year lag between funding for and operational availability of all aircraft (and assuming that RDT&E of all aircraft has proceeded on the

necessary schedules), the total procurement requirement for each kind of aircraft for each scenario by five-year block is as given in Table 13.²

Obviously, the other force alternatives in this report would fall between the values given for the two scenarios. Despite the limitations inherent in this simple evaluation, it does suffice to show the most important aspects of the force rejuvenation problem. Two interesting issues stand out in particular. First, when we consider the rough average annual replacement needs of the forces, the budgetary requirements are not all that different for a force that most people think now is unaffordable and one that many would think is not adequate. Suppose, for example, that a high-end fighter has a total program cost on the order of \$80–100 million per copy, while the unit price tag on a low-end airplane is about \$40–50 million. Then the total procurement tab required to replace the Base Force over the period FY00–20 would fall somewhere between the totals shown in Table 13. We see that the average annual figure for the fighter procurement programs required by the Base Force/26.5-FWE and core/18-FWE scenarios amounts, depending on what one assumes for

Table 13

TAF Replacement Requirements: Necessary Procurement of Aircraft Types to Sustain Indicated Force, by Five-Year Block, FY01–20

Fiscal Year	Base Force		BUR Force		Core Posture	
	Low	High	Low	High	Low	High
2001–2005	312	150	24	75	0	66
2006–2010	156	150	132	97	90	96
2011–2015	630	186	705	145	498	186
2016–2020	442	156	360	184	348	156
Average procurement per year						
2001–2020	77	32	61	25	47	25

NOTE: The “high” option is assumed to be an F-22, the “low” one a joint F-16/F-18 replacement.

²These data also reflect the assumption that we would buy out each program by about FY20—that is, that all procurement, including procurement for attrition management, would end at that point. This may well be unrealistic.

the unit price of fighters, to some \$9.0–11.3 billion per year for the Base Force replacement program, and roughly \$7.5–9.4 billion per year for the core posture replacement plan.³

If the procurement programs under consideration are stretched out to 25–30 years,⁴ the annual procurement budget needs for the fighter portion of the core and Base Force replacement scenarios would fall to figures on the order of \$7.2–9.0 billion per year for the Base Force and \$6.0–7.5 billion for the core force for a 25-year replacement scheme and, respectively, to \$6.0–7.5 billion and \$5.0–6.3 billion annually for a 30-year replacement plan.

These are formidable numbers, of course, and many have argued—on the basis of historical data (including the shares of defense or service budgets invested in aircraft procurement of differing types), possible future top-line budget scenarios, and other assertions—that a Base Force-sized force is an excessively expensive proposition from an investment perspective, and that even smaller forces could well trespass into the realm of the budgetarily infeasible (and that some alternative plans aiming at smaller forces must themselves be either cut further or realigned to emphasize a greater representation in the posture of lower-end aircraft).⁵ But even putting aside the fact that

³These figures obviously do not allow for the effects that might be introduced by changed production rates, the interaction of USAF and Navy fighter buys, or alternative completion dates, notably the extension of these nominal programs beyond FY20. Further, the data do not, from an analytic perspective, include such salient factors as the amount of funding already invested in some of these programs (and that should be disregarded as “sunk” for the sake of option comparison). Also not factored in are possible amelioration of unit costs by other techniques, and the smoothing out of replacement profiles by the judicious use of residual service lifetimes of existing assets and/or the toleration of temporary posture deficits in the interests of total program stability. In short, the estimates here are ballpark in nature—but they are nonetheless consistent with unit acquisition costs that are now considered reasonable for both types of notional future procurement program.

⁴That is, if the USAF follows what might be considered the traditional Navy procurement pattern of buying force structure airplanes up front and then switching to sustained attrition replacement buys, instead of condensing procurement into the most “industrially efficient” concentrated program.

⁵For a demonstration of methodologies that apply historical procurement budgets and patterns to possible future resource scenarios, the reader should consult *FY92 Hearings on Appropriations*, op. cit., or Congressional Budget Office, *Balance and Affordability of the Fighter and Attack Aircraft Fleets of the Department of Defense*, Washington, D.C., April 1992.

the Base Force has now been abandoned as a force goal in favor of some smaller posture (notably the BUR force), there are numerous deficiencies with such reasoning. Many of them follow from the analytic assumptions made by some critics of the force modernization plans implied by various future posture options. For one thing, the assumption of historical budget shares is manifestly contradicted by the cyclical nature of procurement budgets as a whole and of various major components within DoD investment accounts. Another flaw comes from the presumption that the scheduling of replacement programs is, for whatever reasons, beyond our control.⁶ Further, these assessments do not take into account changing defensewide investment realities, many of which should reduce the former degree of competition between fighter force modernization and other major defense end items. It is true that there are countervailing trends that are not favorable—but these are seldom articulated, never mind treated in any sort of quantitative way; nor have various shifts in either policy or management been considered that might have some important bearing on the way DoD allocates its admittedly shrinking pool of overall investment dollars.

The sense of hopelessness with which many commentators approach future fighter acquisition requirements is fueled, further, by a tendency to view procurement demands in terms of total force replacement demands. Such estimates are, of course, necessary for the sake of the preparation of budgets, but they ill inform our larger operational and strategic deliberations over the feasibility and possible desirability of alternative USAF fighter forces. They do this because they overlook the fact that the USAF will, in fact, retain some posture; I have, as discussed previously, defined that force as the core fighter posture. The key question in considering whether any particular below-Base Force USAF fighter posture is in the best interests of the nation, given the overall set of national requirements for which we prepare, is not "Will we retain a force of a given size?" but "How much of a force above and beyond the core posture do we wish to retain, and what types of aircraft will that residual consist of?"

⁶See Lewis, *Planning Future Fighter Forces*, op. cit., for a review of the flaws of such assessments and a discussion of the factors that should be included in a more realistic reckoning of future fighter aircraft procurement programs.

Let us examine, then, the differences between the Base Force replacement program and that for the core fighter posture. Returning to the notional modernization programs introduced previously, the differences in program cost between the Base Force and the core posture are, for the 20-year replacement plan, \$1.5–1.9 billion per year; for the 25-year plan, \$1.2–1.5 billion; and for the 30-year plan, \$1.0–1.3 billion. If, instead of a 26.5-FWE force, we are considering a force on the order of 20–23 FWE (plus air defenses), then the differences between those options (already described) would fall within a range of \$700 million to \$1.2 billion a year, depending on which option we are considering, the assumptions we make about unit costs, and the time frame over which the force is to be procured. *The bottom line, in short, is not whether we can afford a \$10-billion-a-year (or any other) fighter program—it is whether the additional billion or so is a justifiable investment given the role airpower could play in future U.S. national defense preparations.*

Though these dollar figures are high, if theater aerospace power is a sufficiently high priority for the United States, they are feasible amounts to entertain investing in USAF fighter forces, especially given the reduced demands for procurement of other system types whose priority (and/or requirements) are reduced as a result of the changing overall planning environments. The basic fact is that, as defense planners, we must base our decisions about how to allocate resources, scarce or not so scarce, on an overall assessment of what additional military capabilities will be of greatest value in the changing environment we now confront. If, as seems to be the case, fighter forces of all sorts are likely to play a large and possibly increasing role in that environment, then the key question to be resolved should be whether an additional few wings of whatever mix we might consider are, in view of all the possibilities, worth the money. If, for another billion dollars a year, we can bring about the most significant enhancement of our total roster of capabilities, then that should be our course. The real answer to the question of future force options should revolve around such matters, and not whether any particular program will fit under an arbitrary top line.

As a final comment on this topic, there is no doubt that historically based assessments of the total demands of fighter force replacement do tell us some interesting things, and they serve as a useful warning for the sorts of more specific problems we may face in the years

ahead. But the automatic and complete extension of such results to the larger question of national defense priorities in the emerging post-Cold War defense environment is, at least to this author, not justified. In response to some of the analyses that have proliferated on the subject of (typically) the unaffordability of future USAF fighter forces, it makes little sense to suppose that while every other aspect of the U.S. defense planning problem—threats, scenarios, strategic and operational goals, the overall availability and necessity of resources for defense, etc.—should be viewed as having changed dramatically over the past years, we should not also at least consider the possibility of alternative resource allocation patterns among various defense budget accounts. Historical resource allocation patterns have in fact converged to some fairly stable shares over time, but there is nothing magic about those proportions, and even if they have proved valid until now, no one has yet shown that such allocation concepts should remain in place while every other component of the defense planning problem gives way to a new concept or approach.

The second issue, perhaps a more interesting one from a current force planner's perspective, has to do with the timing of replacement needs. Again, it is impossible to do justice to all the issues involved,⁷ but it is apparent from the portrayal in Table 14 that the issue of *when* outlays must be made to cover force modernization needs varies substantially over the five-year blocks shown, reflecting the inevitable effects of historical procurement schedules. For instance, note the large low-end replacement bulge in the FY11–FY15 period: clearly, the scheduling of our follow-on procurement programs should seek, as already indicated, to dampen out such bulges.

To illustrate the issues associated with all the points just raised, I now apply these sorts of results to the five alternative options for the three force levels considered (see Table 15, which includes air defense aircraft). Note that the design of the options is not pure, in the sense that various ratios (e.g., of high- to low-end aircraft) are preserved as we draw down the force structure. This is a consequence of the combinatorics of the force design issues, and the fact that we are

⁷Which include the realities of current program management, issues associated with the viability of the defense industrial base, etc.

Table 14
Composition of the Five Options, by Force Level:
High-End and Low-End Aircraft

	Force Structure Option				
	A	B	C	D	E
23 FWE					
High-end	634	636	624	672	684
Low-end	1182	1182	1194	1146	1134
21 FWE					
High-end	600	636	618	654	660
Low-end	1056	1020	1038	1002	996
18 FWE					
High-end	534	570	582	540	564
Low-end	906	870	858	900	876

NOTE: High-end = F-22/"FA-22" type aircraft; low-end = follow-on F-16/F-18 type aircraft.

dealing with various "chunks" of existing force structure that have inescapable consequences for planning for the near and intermediate-range future (unlike the previous comparison along a spectrum between the Base Force and especially the core postures, which represent, essentially, more "zero-based" force designs).

As with the prior discussion, however, we do see that the five options considered reflect generally the same properties as do the Base Force and core force structures. Particularly, the differences among all the options at a given level between high and low mix are not all that great: over an extended replacement period, the relative annual replacement costs should not be so large that any one of them is to be preferred on account of its long-term replacement demands—that is, on an averaged year-to-year basis. On the other hand, our choice of relative mission and capability emphasis does have, in several cases, some significant implications for the timing of future procurement spending. The most important of these is probably that in the options that emphasize maintaining relatively more long-range attack forces, the need to replace older systems (the nominal F-111E/G force, followed by F-111Fs) and thus the issue of program sequencing become quite important. For instance, in options where we seek to enhance such wherewithal, we might face a short-run decision,

Table 15
Comparison of A Priori Plans and Maximum Contingency Commitments

	Korea		Vietnam		Southwest Asia	
	Plan	Actual	Plan	Actual	Plan	Actual
XX-equivalents (Army/USMC)	4.7	10.3	6.0	11.7	5.7	11.0
TFW-equivalents (USAF)	4.5	9.6	5.7	10.0	7.0	10.1
CVBGs	[2]	4-6	3.0	3-6	3.0	3-6
Bombers	24.0	-110	0.0	-96	33.0	-70
Commitment of total USAF						
TAF to regional contingencies						
as percentage of AC/RC						
fighter-attack force	31%		30%		30%	

namely, whether to procure more F-15Es; not doing so means that, by the assumptions used in this discussion, we must reorient F-22 procurement more heavily and more early toward attack variants.

This seems, on account of the nature of the historical hand we have been dealt, to be especially salient in the larger force options. But the numbers alone do not capture the full essence of the real planning problem. As a matter of common sense, it would seem that the smaller our posture as a whole, the more we would expect it to do, unless the global operational environment and the daily realities of force operations and management oblige by declining commensurably. We might accordingly plan replacement schedules for smaller force structures in such a way that we would "front load" our inventory modernization plans with more intensive acquisition of more expensive forces. Yet again, the timing, rather than the absolute numbers, seems to be of greatest interest given the current constraints under which planning must now proceed.

The Quantitative and Mission Mix Requirements of MRCs

One of the primary means for generating and also justifying particular USAF TAF force size and mix options is to consider the requirements for such forces in the contingencies for which the United States formally plans. Throughout the Cold War period, this ap-

proach was followed with admittedly mixed results. On the one hand, the demands for force structure of all sorts stemming from a true global conflict between the two superpower blocs were so great that just about any posture could be justified in the name of a prudent in-hand USAF posture.⁸ On the other hand, such calculations have been analytically complex as well as contentious, and the actual contingencies for which we have prepared have varied in their requirements for USAF forces. Nonetheless, until major exogenous and domestic results intervened recently, one does note a tendency to persist in one's estimate of the nominal requirements and allocations of forces in support of various requirements.

With the retirement of the "global war" planning approach, these issues have become more salient and more central to the determination of future force levels and mixes. These days, for instance, one commonly hears about USAF TAF packaging in terms of various force blocks (such as MRC equivalents or even Desert Storm equivalents). Thus, analysis of contingency-based requirements for future TAF structures could be derived from a combination of such contingencies (the totals for these tasks being based on assumptions about the number, type, circumstances, and, perhaps most of all, the timing of possible MRCs), with suitable adjustments made for the retention of proper rotation bases, forward-deployed "presence" elements, force withholds for reserve or "lesser" contingency cases, and so on.

An inspection of the historical record reveals an interesting fact about the perceived and actual requirements for major regional contingencies. In peacetime planning, the forces estimated as necessary for such operations have commonly fallen into the range of 4.5-7 FWE; but once contingencies are under way, they have tended to consume as much as twice that force structure. Interestingly, this gap between requirements is estimated in peacetime, and the per-

⁸Indeed, while the details of such planning have never been fully released, it has been clear from occasional indicators that the forces considered "prudent" by the Joint Chiefs of Staff for a true worldwide superpower conflict have exceeded, sometimes by a large margin, the forces that would be available to the United States under anything but a full and extended mobilization. In the early 1980s, for instance, a notional "prudent risk" requirement for a USAF TAF of some 57 FWE was reported. See K. N. Lewis, *What If the Reagan Defense Buildup Is Over?* Santa Monica, CA: RAND, P-7347, 1987.

ceived necessities of real contingencies apply across the board to all sorts of U.S. forces. As Table 15 shows,⁹ there is a relatively constant difference factor of 1.5 to 2 between "planned" and "actual" (in the case of Vietnam, maximum) deployments to regional contingencies.¹⁰

The reasons for this divergence between planned and real commitments, and for the relative constancy of U.S. commitments to MRCs, have many bases, of course. And there are also inevitable limits to the applicability of this record to any particular future contingencies.¹¹ Given the still unclear, but definitely quite different, context for future operations of such a scale, we should be quite careful about any attempt to apply automatically such historical precedent to enforce estimates for future contingency requirements. Nonetheless this record is, at the least, suggestive, and we should keep it in mind as we contemplate future requirements.

Ideally, of course, we would base not only the internal mix of our future forces but also our arguments for the retention of various quantities of forces on detailed contingency plans for regional contingencies. There are three problems with this approach from the perspective of the current report, however. The first is that such plans and their requirements remain classified, and we can only speculate about the possibility here. Second, with the dominating Central Europe major conflict removed as the pivot of all planning, the possible phasing and other interactions among multiple MRCs yield a decidedly more complex planning problem. Third, even with full access to all current plans, serious questions remain about how much we might be willing to bet that our current estimates of needs are reliable, and about how current assessments might evolve in a rapidly and unpredictably changing world. To circumvent these

⁹See Lewis, *Planning Future Fighter Forces*, op. cit.

¹⁰I hasten to note that this does not necessarily reflect poorly on the "accuracy" of plans—after all, the calculus of risk and requirement naturally change once a shooting conflict becomes imminent, and the commitment of resources to real contingencies reflects contemporary assessments of the prudence of diverting from European-oriented reserves certain force element increments.

¹¹It is hard to conceive of three more different conflicts than the ones cited in Table 15, and the difference in the then-current strategic contexts is at least as great. There is no reason why we should not consider future regional contingencies to be just as unique.

problems, and to remain consistent with the current report's attempt to frame the issues in the broadest possible terms, consider the various force requirements presented in Table 16 for a hypothetical roster of posture needs for USAF tactical fighter forces.

Each of the total force requirements (associated here with a particular scenario) has been designed to correspond roughly to the three force levels considered here, namely the 23-, 21-, and 18-FWE cases. While not every possible factor is captured in this portrayal,¹² the rough numbers appearing in Table 12 show how different even the Base Force posture is compared with the traditional force structure maintained during much of the Cold War. In particular:

- The reduction of total force structure from the mid-30s of FWE to the mid-20s (or lower) in peacetime can be associated substantially with the decline of former forward presence needs; but in contingencies, it means that (unless forward forces could be shaken loose from their presence requirements) it becomes necessary from the start to factor reserve forces into operational planning in a one-contingency scenario.
- Force reductions also mean that it is impossible to view nonmajor contingency requirements as simple force "set asides": all force elements, including air defense forces, must be more seamlessly integrated into total contingency planning.
- The reduced depth of the force structure (and, perhaps, internal force mix issues, about which more is noted below) places a premium—reinforced by other considerations, to be sure—on the rapid resolution of contingencies of all sorts.
- A smaller reserve means that decisions to commit forces become more complex and the consequences of failure more significant.

¹²Note that this portrayal shows a breakout by specific requirement under wartime or crisis contingencies: the data do not address issues arising under more routine circumstances, such as rotation base requirements and efficient active/reserve force ratios. I also omit consideration of the very difficult and novel question about how to support a cluster of more modest requirements (e.g., simultaneous deployments to enforce various "no fly zones," support peacekeeping efforts, etc.), none of which in their own right poses a serious resource problem, but which, in combination with readiness concerns, rotation base demands, etc., may raise some tricky force management questions.

Table 16
Hypothetical Requirements for USAF TAF Resources Given Various Contingencies and Other Demands in Fighter Wing Equivalents

Overall Scenario/Level of Risk	Continuing Deterrence (Presence)		MRC 1	MRC 2	MRC 1 "Mop Up"/ Reserve	Lesser Contingencies Withhold	Less: Double Counts	Total (FWE)
	EUR	PAC						
High requirement	2.7	2.7	8-10	8-10	2-2.5	1.3	2	23-27
Medium requirement	2.0	2.0	8-10	6-8	1.5-2	1.3	1.5	22-24
Low requirement (type 1)	1.8	1.5	7-8	5-7	1.5-2	1.3	1	18-20
(or)								
Low requirement (type 2)	1.8	1.5	9-10	4-6	1.5	1.3	1	18-20

NOTE: A "high requirement" here is tantamount to a lower-risk and relatively more pessimistic view of defense needs, and soon. The two low requirements (type 1 and 2) are simply representative of two alternative combinations of contingencies for the low requirement (higher-risk) scenario.

- The fact that planning requires the total integration at all times of all TAF elements probably increases the requirement that all in-hand forces be highly ready and equipped for relatively demanding scenarios. In other words, "weak links" cannot be tolerated, nor can overly tailored forces (or plans).

Looking beyond the matter of simple force numbers, we can also look to recent historical experience for some lessons about the mission mix issues of a future USAF TAF at reduced levels. Consider, for instance, the commitment of USAF fighter-attack forces by type to Operation Desert Shield (Table 17). Force levels deployed and, in particular, the commitment of long-range attack resources are revealing: total forces deployed included 48 F-15Es, 64 F-111s, and 42 F-117As, out of a total authorized strength of 48, 72, and 36 of each type, respectively. This means that of the most modern long-range attack types (and the ones programmed for retention under the Base Force plan), just about all available resources were deployed to ODS (including, apparently, some of the F-117A training base).

Experienced planners know well that the determination of "how much is enough" USAF tactical airpower depends centrally not only

Table 17
USAF Tactical Force Deployments in Support of Desert Shield:
Forces by Type in Fighter Squadron Equivalents

	Mid-1990 Force (FSE ^a)	Total Force Committed (FSE)	Percentage of Type Committed
Active forces			
Attack ^b	11.5	4.7	41%
Multirole ^c	28.5	10.0	35%
Defense suppression	3.5	2.0	57%
Air superiority	18.1	5.0	28%
Long-range attack	10.8	6.8	63%
Reserve forces			
Attack ^b	16.3	0.8	5%
Multirole	16.5	1.7	10%
Air superiority	3.0	.0	0%

^aFSE being 24 PAA; these are, then, each 1/3 FWE.

^bExcluding F/A-16 and OA-10.

^cIncludes 18 PAA F-16 Aggressors.

on the numerical and force mix requirements of prospective contingencies to which such forces might be committed. Further, our decisions about ultimate force levels involve determinations about force operations that have not figured centrally in our planning to date. At reduced force levels, it is apparent that the Reserve Component would have to be much more actively involved, either in combat operations or in a backfill capacity to support forward theater presence and continuing deterrence missions. Moreover, the reserves would, under all options, become absolutely essential to any contingency (or cluster of contingencies and situations) involving more than one clear-cut regional engagement. As we have seen elsewhere throughout this report, finally, the issue of mission mix is an absolutely essential one at all reduced force levels: this is especially the case because of what are bound to be terrific demands by any CINC on special attack resources (notably stealth fighters), and because one major element of the planned fighter forces (one that is at a disadvantage as a result of its age, maintenance costs, and the like, namely, the F-111F fleet) poses problems as budgets decline.

Balancing USAF and USN/USMC Tactical Combat Aviation Capabilities

A final consideration to be discussed here concerns the most efficacious balancing of the total *national* inventory of what we have defined traditionally as "tactical" air combat resources. In historical experience in the presence mission and in regional contingencies, as well as in planning for major, including global, conflict with the Soviet Union and its allies, the TAFs of the USAF and those of the Sea Services (USN, USMC, and their associated reserve arms) have been integrated to various extents.

By necessity, operational planning has been coordinated—though the record here is not without evidence of frictions and disagreements relating to effort levels, priorities, roles and functions, and the like.¹³ On the other hand, the historical force planning record has presented a somewhat more complex picture. There is no gainsaying

¹³For an excellent discussion of some of the pertinent issues, see James A. Winnefeld and Dana J. Johnson, *Joint Air Operations: Pursuit of Unity in Command and Control, 1942-1991*, Annapolis: Naval Institute Press, 1993.

the facts that the doctrines and concepts behind, not to mention the configuration of, the aviation postures of the USAF, USN, and USMC have varied considerably over time, and that a host of traditional, practical, and other more mundane considerations have made the blending of force planning for the three tactical air forces maintained by the United States a most difficult matter. During those historical intervals in which certain favorable resource and external factors (such as immediate war requirements) have existed, relatively less attention has been paid to the total TAF integration problem; indeed, the variety of resources, capabilities, etc. maintained by U.S. forces has on occasion been viewed almost positively, heralded as a matrix of such virtues as flexibility, diversity, and complementarity. On the other hand, during periods of financial austerity or doctrinal tumult, the services' distinct approaches to force planning have been seen as less advantageous insofar as the efficiency of the national defense effort is concerned.

Historically, the record of joint TAF force structuring in itself could almost be used as a text for studying the problems of collective force planning. Many of the "success stories" of joint acquisition and utilization of force elements have been inadvertent.¹⁴ On the other hand, deliberate attempts to procure relatively common airframes have, it would seem, gone terribly astray.¹⁵ Today, with major uncertainties looming about the future of U.S. fighter forces, with debates about roles and functions beginning to heat up, and, above all else, with concern over resource constraints raising questions about the basic feasibility of continuing to do force planning as usual, enormous controversy is brewing over the future of U.S. fighter force options in general. While commonality in force structures may have been perceived in the past as desirable, some now believe that more

¹⁴Examples include the USAF's departure from its early-1960s force plans to meet the requirements of the Vietnam War by procuring large numbers of "Navy" aircraft. Those plans had envisioned a 1970-era posture consisting almost entirely of long-range attack forces (the F-105 and F-111), but in reality the majority of the USAF's posture at that time consisted of the Navy-designed F-4 and A-7 aircraft. Lesser cases include the F-86/FJ series and A-3D/B-66 programs.

¹⁵The common TFX (F-111/F-111B) and Lightweight/Air Combat Fighter programs are two outstanding examples—both were to have put on line a more or less standard all-service airframe, and both ultimately fell apart, giving rise to independent efforts.

rationalized national TAF planning is, for resource reasons, an out-and-out necessity.

It is impossible to say now what forms the future investment plans for the various air services of the United States will take. These matters are now the subject of intensive DoD review, and it is unlikely that the issue will be settled even with the conclusion of the Bottom-Up Review. In any case, the basic problems before us as we consider force alternatives for the near and medium term—say the period out to and just beyond the turn of the century—really are substantially independent of any new roadmap for future fighter force acquisitions. As noted previously, the USAF force structure in the late 1990s should consist almost entirely of aircraft owned or funded to date; the same is true for the Navy/USMC air team, although to maintain even reduced force levels, the Department of the Navy must continue to procure F/A-18C/D aircraft. This does not, though, rule out possible adjustments in the force structures of the air inventories concerned in order to maximize the total national roster of capabilities that may be called upon in future contingencies and for other purposes. That being the case, our design of USAF TAF alternatives, and our selection among them (so far as both size and mix are concerned) should take into account the historically determined basis for possible USN/USMC options. What, then, can be said about future Navy/Marine air prospects, and what is suggested thereby about possible future USAF TAF priorities?

Plans for the future USN/USMC air structure have gone through a variety of changes over the past few years. Recently, according to the Navy's new roadmap for its future posture,¹⁶ a quite radical reformulation of long-term aviation resources has been proposed. While the fate of various specific aspects of this plan remains uncertain, the basic drift of this new initiative can be summarized as follows:

- As Figure 9 (based on an estimate of existing inventories and statements in the public press to date) suggests, the combined Navy/USMC (active and reserve) posture might decline by about one-fourth, from a level of some 15-1/2 FWE at present to 11-2/3

¹⁶As summarized in the *Task Force 2000* plan, reported on in *Navy News*, U.S. Naval Institute *Proceedings*, and other publications, various issues.

FWE by the end of the decade. In addition, there could be a substantial "necking down" in the number of combat aircraft types maintained in the Navy/USMC inventory. This overall reduction would be associated with a number of very innovative posture steps, including the integration of all USMC F/A-18A/C fighters into a sort of common carrier deployment "pool," a reduction in size and a revolutionary remixing of aircraft wings, and possible novel alternatives for aircraft suits aboard deployed carriers.

- The proportion of aircraft in the Navy Department inventory that can be considered basically multirole in nature (i.e., F/A-18s) will increase as a proportion of the total inventory. Given various historically determined force realities, this trend should become more decisive still after FY00. A decision to emphasize either a follow-on F/A-18E/F or a joint "JAF" or "JAST" fighter plane in preference to a more costly F/A-X type aircraft will amplify this tendency, as does the remarkable Navy proposal to retire its entire A-6E fleet by the end of the decade.
- Not apparent in the Navy initiative are other proposals and concepts that have no less an implication for the configuration of a "national TAF" structure. For instance, there are now plans to equip the F-14 family of aircraft to deliver ordnance (including laser-guided bombs), and some AV-8Bs may be modified to give them an improved air-to-air capability. Although both of those aircraft were designed for very specialized missions, these initiatives in effect seek to further enhance the Navy/Marine air forces' multirole potential.

In short, the Navy Department seems to have put forward an innovative and, in view of resource constraints, probably workable plan that is consistent with its avowed doctrine of focusing on the conduct of air operations in support of combat in littoral regions. To do this, it has apparently deemphasized both the longstanding emphasis in carrier wing planning on fighting independent "blue ocean" campaigns involving extensive air operations (though considerable potential for such operations would remain), and the Navy seems also to have elected to opt out of the maintenance of an array of force elements that would, in terms of nominal performance characteristics and orientation, duplicate many components of the USAF's TAF (as is most apparent from the decision to retire the A-6E).

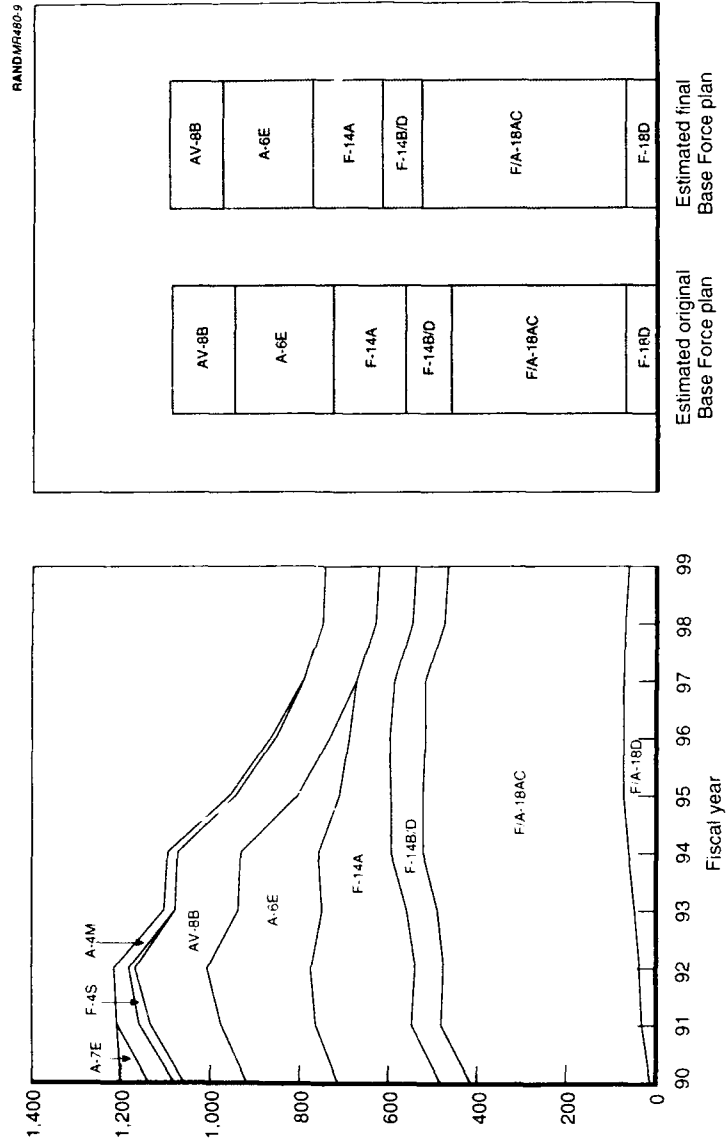


Figure 9—The Evolution of USN/USMC TAF Structure: Comparison of Plans

On the assumption that something like this Navy plan could come to pass, the implications for the USAF are intriguing. It would seem that to maximize the total national résumé of airpower capabilities, and to ensure a full spectrum of options, the USAF should do everything possible to maintain capabilities for certain operations, among them the ability to carry out the most demanding offensive air-to-air and long-range attack options. While analysis of possible contingencies and force capabilities strongly indicate that a full USAF mission spectrum must be maintained, and while various technological advances like LANTIRN and AMRAAM mean that multirole forces can carry out ever more successfully a variety of demanding operations, the USAF must continue to emphasize the high-end air superiority and the long-range attack missions. Although detailed analysis must precede any final decisions on the matter, the USAF should at the least entertain the option of emphasizing such capabilities even at the expense of multirole fighter force levels, a course that would seem to argue against a force downsizing policy that simply reduced all mission capabilities, by relatively constant factors, or that succumbed to the temptation of overfavoring multirole forces on account of their attractive routine cost characteristics. This possibility is one of the reasons that some of the TAF alternatives given earlier do involve the retention of disproportionately more interdiction and air superiority resources.

PROSPECTS FOR THE FUTURE

As we have seen throughout this report, the continuing U.S. defense buildddown toward, and perhaps beyond, the so-called BUR posture represents a combination of two processes:

- The consolidation and realignment of U.S. force structure that began when it became apparent in the middle and late 1980s that originally planned posture buildup objectives could not be achieved, given resource constraints.
- The downsizing from late-1980s force objectives that followed a series of developments culminating in the collapse of an organized Soviet bloc threat and the subsequent requirement to find alternatives to the precepts and principles of the "global war" planning environment that had shaped U.S. strategy and planning for about three decades.

The buildddown can, then, be thought of conceptually as having two major components. The first one is mainly managerial and operational in nature, and is concerned primarily with relatively short-run issues. This general problem involves various force planning concerns and considerations that would have to be addressed as a consequence of any change from a steady-state force structure. Some of the key issues of the drawdown from this vantage point relate to the most efficient matching of capabilities and resources in hand, in the "pipeline," or otherwise programmed over the short run, and the large-scale objectives have to do with maintaining near-term capability without producing longer-haul problems or foreclosing important options.

The other part of the drawdown problem is conducted under a longer-term planning horizon, and is more concerned with longer-term strategy and resource priority issues. Despite the dramatic shifts in the defense planning context, basic U.S. strategy and wherewithal remain similar in their most important qualitative dimensions to those of prior years; but over the longer run it is possible to conceive of major realignments of resource priorities that stress entirely new approaches to certain fundamental strategic and operational questions. Whereas the first set of objectives concerns capabilities that are more or less "in hand," this latter set of issues relates to possible ways that basic priorities might be reformulated, and how such new priorities might be expressed in the form of resource allocation decisions not yet made. Clearly, this longer-run planning problem is related to the short-term problem: our résumé of choices in the longer term of course depends on the options we elect to retain or discard in the short run, and much of the force structure that would be in hand under even a substantially reformulated set of strategic and operational planning dicta would remain, for the foreseeable future, as it is fielded today or on drawing boards (and in budgets and plans).

Yet at the same time, the second set of planning questions differs fundamentally from the first set in several important ways. For one thing, the optimistic statements of a few commentators aside, it can take years to implement a true overhauling of priorities, and even with a much clearer view of the future than is now available, the lead times for putting modern military capabilities on line are so long that we would not see the full realization of a major alternative plan for some time. In addition, the requirements of both strategies and more routine planning should and do recognize the unbreakable links among the many components of an integrated military posture. Military capabilities are, after all, far more than accretions of hardware choices: they also reflect basic decisions on training, doctrine, acquisition of crucial ancillary capabilities, the role of any major element of the U.S. military posture (in this case, USAF theater forces) in meeting the desiderata of national policymakers, and much more.

Many of the points surrounding such issues remain unclear and, as of this writing, subject to possibly significant influence by decisions and events that cannot now be predicted with much confidence. On the other hand, our ability to respond to changing developments is

greater than we might now suppose and could include initiatives not now in any official plan. So while the longer-term aspects of the posture planning problem are closely related to short-run choices, there are questions inherent in those choices that are subject to rather different considerations, which lie mostly beyond the most immediate agendas of those concerned with the ongoing defense posture build-down. These two components are obviously interrelated in profound ways; but for a variety of reasons, the far more dramatic and apparently consequential determination of long-haul U.S. strategic, resource, and operational requirements for a new defense environment has attracted the attention of planners, Congress, and others.

One consequence of this understandable focus on the long run has been a tendency to focus force structure plans on as-yet unagreed-upon schemes that might best be called "zero based." These approaches draw upon a host of rationales, arguments, and principles, but the overall aim is to design new force targets that do not, in my view, adequately address how such choices will affect important decisions relating to the near-term maintenance of capabilities as well as options for the future. When one takes into account several basic realities—the cyclical nature of defense investment budgets over the long run, the consequences of choices already made, the inevitably underestimated lead times involved in modifying defense force structure, and the relationships among various posture elements and between "front end" (i.e., "combatant" force structure) and the balance of the defense establishment (which includes, among other things, a considerable infrastructure that supports, directly or indirectly, U.S. combat elements)—many components of the planning process are in fact beyond our control.

This report has been based on the proposition that short-run force management choices (that is, certain decisions that have been made recently and will be made in the period out through about FY95) should be framed more clearly to better inform long-term deliberations about the ultimate set of capabilities—as manifested in the fighter-attack force structure—that the USAF may wish to maintain. These decisions will not and should not be the last word on ultimate force objectives. They rather seek to demonstrate the consequences for future planning choices of taking certain choices in the short run. Determination of long-run posture requirements obviously will have to take into account factors that go well beyond the mere task of in-

ventory maintenance—such as operational and doctrinal considerations, choices about weaponry and other systems, the way that fighter forces and other capabilities (for instance, long-range bombers) should interleave and interact, etc. That being the case, we have restricted our attention here to some simple inventory management issues, mindful of the fact that these represent only part of the evolving picture.

Determination of the “optimum” course to follow in preparing plans for a downsized TAF will, of course, need to draw from many more considerations, large and technical alike, than are reviewed here. And if the past is any guide, plans will reflect various exogenous phenomena that one might characterize as being separate from the purely analytic, if such a thing exists at all. As one case in point, recall that the F-4G had been headed for retirement from the nominal Base Force until the Gulf War. Likewise, the complex interplay of factors that in the past has shaped various Reserve Component structures should be expected to continue to play some role in the future. Concerns about industrial base, mobilization, forward deployment, arms transfer, and other issues are yet more examples of influences that force planners would ignore at their peril.

We also need to remember that force planning for any given posture element does not, and must not, proceed in a vacuum. The ultimate melding of fighter forces with other means for the attack of enemy objectives (by long-range bombers, various missile systems, etc.) is one area of undisputed importance, yet one where not all the answers, and perhaps not even all the right questions, are now in hand. The success of U.S. forces in Desert Storm highlighted the fact that planning for the application of aerospace power is a holistic undertaking: how future fighter forces should interact with new means for locating targets, how to plan and control forces, how best to accomplish the suppression of enemy air defenses and communications, and other such issue clusters will shape the particulars of our future fighter plans, just as they have in the past.

Finally, and perhaps most important, though we have acknowledged the fact that the global war planning milieu is now behind us, and while we are well along the path to a reduced and reconfigured operational force structure, major adjustments in other elements of the overall planning process have not so far kept pace. It is not entirely

reasonable to assume that while the operational world may be changing dramatically, we can or should maintain the same internal patterns of resource allocation. Perhaps the future will see an enhanced or diminished role for airpower as an element of U.S. military capabilities, and funding and other priorities should reflect this fact. Accordingly, some current estimates of the feasibility of certain future modernization initiatives that are based upon historical allocation patterns may not be very useful guideposts to what is or is not feasible as far as TAF modernization initiatives are concerned.

Nonetheless, until we have a better grip on these and other issues, we need to recognize that short-run imperatives could demand posture adjustments, alternative grand vision or no. That being the case, an approach along the lines presented in this report holds some limited utility for at least bounding the scope of the possibilities for future USAF TAF configurations.

**BIBLIOGRAPHIC NOTE ON FORCE STRUCTURE
AND ACQUISITION DATA**

Major sources (in addition to those cited specifically below) include such well-known publications as the *Jane's* series, the Putnam aircraft series organized in separate volumes along both service and manufacturer lines, and numerous annual publications (for instance, the various "yearbook"-type publications produced by industry and other associations, including the annual reviews in such periodicals as *Air Force*, U.S. Naval Institute *Proceedings*, *Sea Power*, etc.). Less common periodicals include such English and foreign-language items as *Air International* and *Air Fan*. I have also drawn from the highly diverse and esoteric literature on aviation history and related topics that is well known to the historical, enthusiast, and hobby communities. Specific data were also culled from numerous other sources; much is owed to various professional and industry contacts and sources: for instance, data on F-117A production were taken from an unclassified vugraph provided by Lockheed. Hearings and other official documents also proved vital to this research (as far as both historical and possible future force structure and procurement issues go), as did various service, DoD, and other government publications. Official historical sources—for instance, the Naval History office at the Washington Navy Yard—made available published and archival material.

The force structure projections appearing in this document reflect the author's best estimates at the time of writing, and they reflect both official plans and various factors such as planned and historical aircraft acquisition rates.

In addition to congressional hearings and other such items, sources of particular interest to those wishing further elaboration on some of the background materials presented in this document include:

- The annual Secretary of Defense reports to the U.S. Congress, also known as the Secretary's "Posture Statement." An analogous document is also published by the Joint Chiefs of Staff.
- Christopher Bowie, et al., *The New Calculus: Analyzing Airpower's Changing Role in Joint Theater Campaigns*, Santa Monica, CA: RAND, 1993.
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