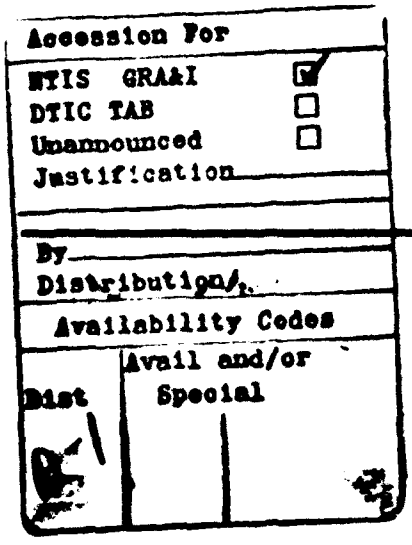
RAND

Planning Future U.S. Fighter Forces

Kevin N. Lewis

Prepared for the United States Air Force

Project AIR FORCE



PREFACE

Originally a version of this report was prepared for presentation at the Washington Strategy Seminar's ongoing series of conferences on airpower and related military issues. The Air Staff requested that a paper reviewing similar issues be prepared and published under Project AIR FORCE to make it more widely available.

The author wishes to stress that the primary purpose of this document is to discuss, in general terms, selected points associated with possible force structure and other planning options that may emerge in the next few years. The format chosen is that of an extended essay. The aim is not to put forward any arguments for any line of policy or other but rather to consider some key matters and to present what the author believes to be a few of the more interesting underlying issues. The resolution of a host of questions about the future size, constitution, mix, and capabilities of U.S. fighter-attack forces clearly will depend on a vast array of considerations. Some will be technical, some political, others will be of primary managerial nature; the variety of such questions aside, however, all could be influenced by substantial resource constraints. It is hard to say how these factors will combine nor, in the absence of decisions yet to be made and analysis yet to be conducted, how the current and future debate over U.S. fighter forces might unfold. What seems clear, however, is that the best possible resolution of certain key planning questions will depend on taking a broadest possible view of the manifold and interrelated planning issues involved. This essay, then, is intended to promote in a modest way the consideration of such points in an integrated fashion.

This report should be of interest to planners and policymakers concerned with the future of United States Air Force and Navy/Marine Corps aviation.

CONTENTS

FIGURES

TABLES

SUMMARY

A multitude of uncertainties and controversies surround planning for future U.S. military forces, particularly for air power capabilities for theater contingencies and, in particular, for what traditionally have been termed U.S. tactical aviation forces.[1] Throughout the modern defense planning era, fighter forces have been a central element in U.S. defense planning, and all indications are that the relative importance of such forces will remain high and may well grow. But such forces are expensive to design, buy, and operate, and major disputes exist over the proper size and configuration of the future U.S. fighter posture. One main task before policymakers and planners, then, will

[1]This report is concerned with issues relating to the design of future U.S. fighter forces, that is, those fighter and attack forces that have until recently been described generically as "tactical aviation." Over the last few years, doctrinal and operational thinking about theater conflict has undergone enormous change, reflecting not only an abrupt shift in the overall defense planning environment brought about by the devolution of the Soviet/Warsaw Pact threat but a host of other matters as well. These days, the dividing lines between what were once conceived as fairly compartmented kinds of military aviation capabilities have eroded substantially, if they have not collapsed altogether. It is well understood that forces other than those of classical tactical fighter-attackers would play vital roles in any theater contingency involving air power (including bombers, missiles, and rotary wing aviation, etc.). The old distinctions among missions and functions, never very decisive, also have withered manifestly. For example, in Operation *Desert Storm* we saw "strategic" B-52s engaged in direct air support strikes against battlefield targets, while "tactical" A-10s engaged in the "strategic" mission of hunting down mobile Scud launchers. Also general agreement is that the total resumé of theater combat aviation must include all those other resources (such as capabilities for surveillance, targeting, electronic warfare, etc.) without which a theater air campaign could not succeed. Notwithstanding such points, this report limits its focus to traditional fighter forces: thus when terminology such as "tactical" or "theater" is used, it is simply in acknowledgment of long-standing taxonomic conventions and is not meant in any more profound doctrinal sense.

be to strike the most effective and efficient balance between necessary force capabilities and the substantial and growing resource constraints that will act on all the components of America's military posture.

As important as aviation capabilities may be, and irrespective of the intense scrutiny such forces receive on both resource and strategic grounds, the present debate on the future of U.S. fighter forces unfortunately overlooks a number of important considerations that should shape our choices about which air power resources to buy and maintain. This oversight partly is a carryover from our absorption with certain traditional controversies and rivalries—for instance, the dispute over land- versus sea-based fighter units that has been such a staple of the defense policy debate over the years. It also reflects the general confusion and uncertainty about the ultimate scale of the national resources required to maintain a prudent and balanced defense posture. Current disputes also reflect a failure to conceive of the total U.S. military posture (and within it, the large role to be played by fighter aviation) in the new and as yet not well formed overall U.S. defense concept. Before the breach of the Berlin Wall, for better or worse, various precepts came to guide U.S. planning for a "Global War" strategy oriented toward a large, diverse, and worldwide Soviet-centered military threat. With the devolution of that threat, many old and established principles for force and budget planning no longer remain on a solid footing. What is needed now is a fresh look at some basic issues that should inform U.S. planning no matter what options lie before us, and no matter how cloudy the events that underlie the new security environment may seem today.

Even to attentive audiences of the defense debate, episodic controversies over programs and other issues related to tactical air force modernization suggest that the U.S. fighter posture has been in a state of constant flux. But when a longer view of our tactical air forces is taken, we find a surprising degree of stability. When some special purpose capabilities (e.g., pure homeland defense fighter interceptor forces) are factored out, the total inventory of U.S. fighters has remained relatively constant for some time. True, the constituents of that posture have undergone continual adjustment in terms of their identities, capabilities, costs, mission emphases, allocations among active and reserve components, and a host of other considerations. Even so, the overall U.S. TAF posture has remained

reasonably stable in quantitative terms for many years.[2] The reasons for this phenomenon are complex. Given all the data, however, a key determinant of this force property is that the basic requirements for tactical aviation forces, measured in various ways, have seemed to find, and then maintain despite many perturbations, a sort of "natural" force level. Only recently with the movement toward the Base Force programmed by the Bush administration (if not some even more substantially reduced force structure) have aggregate force numbers dropped below historically characteristic levels.

This pattern is quite interesting because of the highly cyclical nature of the fighter modernization process over time. Review of the data indicates that investment accounts, especially investment in major weapons systems, are by far the most volatile components of the overall U.S. defense budget. When U.S. defense budget top-lines have grown, procurement tends to account for a disproportionate share of the increase. When budgets fall, procurement falls earliest and typically drops the most in proportional terms. Again, the reasons are quite complicated and include both fact-of-life issues (e.g., the fact that boom-and-bust planning tends to contribute to block *obsolescence* problems that must be resolved in subsequent disproportionately large investment initiatives) as well as policy and strategic choices (e.g., those related to decisions about the relative priorities of certain missions or capabilities).

The consequences of this historical legacy for current planning are particularly noteworthy in light of some of the arguments now being made by various participants in the defense debate. In particular, it may not be the best policy to view the overall fighter modernization problem as a steady-state posture maintenance problem as some analysts have postulated in their assessments. Postulating a fighter force whose modernization and replacement requirements adhere to a particular schedule based on historical decisions and various design and other characteristics may be useful for deriving general impressions about the long-term resource requirements needed to keep a particular force structure healthy. But history tells us that fighter force structure as a whole (as well as its constituents) seldom

[2]Interestingly, the actual deployments of fighter forces in support of real contingencies (Korea, Vietnam, and Operation *Desert Storm*) also tend to be quite consistent over time, despite major changes in the nature of the conflict.

obey the terms of orderly plans, and the options open to planners in keeping a posture of given size in business during times of nominally "inadequate" funding are as diverse as they are hard to predict. Further complicating this scenario is the question, as yet unaddressed in much detail, about how the overall inventory management process works during times of major posture reduction.

It is equally important, when making decisions about planning, not to base estimates about the budgetary requirements of force structure on year-to-year, or (worse) snapshot, estimates. A long-haul, net appreciation of resource and posture requirements (one that quite literally looks ahead a generation in planning) is essential. To predicate important decisions with longer-haul consequences on short-run considerations, no matter how compelling at the time, may risk creating problems that over the long run will be far greater than the benefits near-term expedience may confer. Fortunately the situation for the U.S. fighter force (and especially USAF) posture in the next five or so years seems very positive and reflects the very substantial modernization funds devoted to U.S. air forces in the 1980s.

This favorable situation will not last forever; also it does not characterize all aspects of the current context. It does mean, however, that the U.S. does not have to make every decision immediately about what programs to underwrite or terminate (or how to buy them, or how many, etc.). Hopefully as requirements and other issues become more clear in the next couple of years, a more reasoned modernization plan can be fashioned. This is not to argue arbitrarily for delaying or deferring various programs, a choice that will only add to the severity of the management problems involved in managing an out-year procurement "balloon payment." But it does suggest that we should not be in any short-term rush to foreclose options unless absolutely demanded by other considerations (chiefly nonmilitary).

Review of the pertinent historical data also indicates some important information about the programs that the United States should consider underwriting. Regardless of the previous rationales for given capabilities, the conceptual soundness of different force structuring approaches, and the merits of given weapon systems, the main question now faced in virtually all military choices is whether a proposed capability can be afforded, where affordability is defined not

just in cost-effectiveness terms but in a larger context that includes national priorities other than national security. This concern is certainly a priority, and there is no denying that it has been (and will continue to be) necessary to pass up even very promising capabilities because of budgetary (and just as salient political) traffic.

Yet affordability is a broad concept and must be viewed as more than the price tag of a program or the unit cost of a given aircraft. A two-decade long debate over various issues, notably the trade-offs between force quality and quantity, seems to have tilted, as the outcomes of *Desert Storm* suggest to many, in the favor of doing a given job right, as opposed to doing more of it. An emphasis on quality could become even more important in planning given the facts that traditional rationales for numerical requirements are no longer as compelling as they were in a more purely Soviet-oriented planning environment. Indeed, strategic and operational imperatives seem to be placing an ever greater premium on accomplishing objectives as promptly as possible. Further, the size, nature, and roles of our infrastructure[3]—the general support "tail"—must be carefully managed in both its cost and other dimensions, since growing evidence indicates that "tooth" suffers disproportionately and perhaps imprudently compared with the fate experienced by tail under conditions of austerity. To cut corners in the short run at the expense of capabilities that must then be improvised, acquired, or worked around (often inefficiently) at some point in the future seems an even less sound approach despite top-line budget pressures.

Naturally the degree to which this philosophy can or should be implemented has limits. In the future, we may well rue not having procured more B-2s, for instance. For better or worse, however, this does not change the basic resource or political calculus, rather than any really decisive analytic basis, that has shaped that program. Beside the argument for taking a longer look at the issues than some critics are willing to allow, this point would seem to further endorse the short-run advantages of not committing ourselves to especially negative choices—that is, which programs not to underwrite—before being absolutely necessary. Given the costs involved in undoing such choices later (or the other penalties that might accrue from

[3]Both operational and physical infrastructure must be considered.

having opted to go without them), it seems that we should be careful now about discarding options, acquired at a very premium price, if final choices about some programs could be postponed in the interim.

These issues for mission mix impact another area of planning with major implications for the way in which the current tactical fighter modernization debate seems to be evolving. Historically, the requirements for given numbers of aircraft overall were influenced strongly by the particular characteristics of the Central European theater and the scenario assumptions governing planning for a potential NATO–Warsaw Pact conflict. Given that so many other classic foundations of planning for the canonical Soviet threat have been rightly jettisoned, it seems just as appropriate to qualify the grounds for any given numerical force requirement in light of new strategic realities. Strategic and force management concerns alike, however, are not well understood and seldom are raised in discussions about future air power options; these do have important ramifications for total force size. Put another way, it probably is not sound policy to simply determine the requirements of given contingencies, add up their total for the ones we deem to be a reasonable basis for planning, and then buy that many aircraft.[4]

Such issues create a very compelling rationale for U.S. tactical aviation capabilities as a whole with as much depth and breadth as permitted under resource constraints, no matter how severe. On the other hand, it does not matter how many units are maintained if they are not the right ones. *Historically, we have continually experienced the greatest strains when fielding adequate numbers of certain kinds of systems, such as the most advanced kinds of long-range attack aircraft and defense suppression forces.* Thus as noted above, it is especially important that we look beyond the short-run considerations involved in this year's budget to take a longer view. It may be vital to discard the obsolescent notion of simply procuring whatever aircraft may be available (especially when, as usually the case, it is not the high-end model) just, say, to fill up carrier decks or the ramps at

[4]Just as important as these considerations will be other crucial but equally poorly characterized factors, for instance, maintaining an adequate rotation base for forward deployed forces or a sufficient strategic reserve to handle unanticipated developments.

bases. *By viewing the roster of U.S. tactical fighter forces' capabilities as a national resource and by taking the long view, we stand the best odds of putting a posture on line that will be most able to meet the demands placed upon our military position—demands that have proven hard to predict even in the so-called Cold War planning regime, never mind in the uncertain new planning context.*

ACKNOWLEDGMENTS

I would like to thank Colonel Jamie Gough III, Colonel Charles Miller, and Lieutenant Colonel Joe Alt for their help in supporting my work on U.S. force structure and budget issues. Without their background, this paper would not have been possible. I would also like to thank my program directors, David Ochmanek and Christopher Bowie, for their advice in focusing this manuscript, and Louis Finch for his careful critique. Finally, I would like to thank Pam Thompson for putting together the artwork.

ACRONYMS

ASW	Anti-Submarine Warfare
BAI	Battlefield Air Interdiction
CAS	Close Air Support
CINC	Commander in Chief
CVW	Aircraft Carrier (Operational) Wing
FW	Fighter Wing
FWE	Fighter Wing Equivalent
FYDP	Five (or Future) Years' Defense Plan
GPF	general purpose forces
GPS	global positioning system
IOC	Initial Operational Capability
JCS	Joint Chiefs of Staff
LRIP	Low Rate Initial Production
MRC	Major Regional Contingency
MRF	Multi-Role Forces
ODS	Operations *Desert Shield/Storm*
PAA	Primary Aircraft Authoritized
SLEP	Service Life Extension Program
TAF	Tactical Air Force(s)
TFSE	Tactical Fighter Squadron Equivalent
TFWE	Tactical Fighter Wing Equivalent
VMFA	Fighter Attack Squadron (USMC air wing)

Chapter One

INTRODUCTION

As the United States restructures its policies, strategy, forces, and budgets for dealing with the post–Cold-War environment, determining the ultimate size, mix, and cost of U.S. fighter forces—a critical element of U.S. airpower capabilities—is proving to be a highly controversial task for two primary reasons.[1] The first is the crucial and apparently growing role airpower plays in supporting our national strategy. A failure to provide our armed forces with an adequate degree of aerospace superiority could undermine deterrence and lead to a catastrophe in a future conflict. The second is cost. Depending on how budget shares are defined and assigned, in modern times, the United States has invested annually between 20 and 50 percent of

[1] In this report, the term "fighters" is used to refer to fixed-wing combatant fighter-attack aircraft now including much of the inventories of the USAF and Navy/USMC combat aviation communities. The scope of the discussion might well be expanded to include other vital capabilities and forces with similar roles and functions (such as long-range bombers, attack-capable rotary-wing forces, or various unmanned systems). A more thorough discussion, of course, should also include extensive treatment of those additional force and non-force systems and capabilities without which the combat forces cannot attain their fullest potential, such as aerial refuelers, electronic combat forces, logistical support capabilities, C3I, and targeting and control resources. As we saw during the Gulf War, the difference between a true air power force and one representing an accretion of combat airframes can be enormous—as Iraq certainly learned the hard way. Many of the most important of these capabilities (such as planning, strategic concepts, personnel and equipment quality, etc.) cannot be assessed meaningfully by simple bean counts of tails on the ramp. Note that in many places, we use the expression Navy to refer to both Navy and USMC forces. The Navy is, of course, responsible for procuring the USMC's aviation forces, and the links between the two air forces run deep. The precise sense in which such terminology should be interpreted should be clear from the context.

its defense budget on aerospace power.[2] On average, at least half of that sum probably could be charged straightforwardly without dispute to tactical fighter forces. Predictably, then, given pressures on defense budgets, current fighter force modernization plans are undergoing increasing scrutiny and have become the subject of much debate.

This report examines three general aspects of the current context in which choices for the future U.S. theater combat aviation posture should be viewed. First, it lays out current plans for the near- and mid-term evolution of U.S. fighter aviation. Next the report discusses certain longer-term budget and cost issues related to the maintenance of these and other plans. Finally, it analyzes selected force mix points to suggest some directions for making decisions about force structure priorities and trade-offs. This issue is intimately related to the present and historical budgetary context for tactical aviation planning.

The points raised in this report are not intended, given the current state of play within the overall planning community insofar as both strategic and force planning issues are concerned, nor could they even in principle aspire to represent anything along the lines of 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 budgets, particularly for the acquisition of new major defense end-items, will play a dominating role as determinants of future force options.

But just as we cannot with any justification devise a plan that omits the effects that resource and other influences on force structure will have on future acquisition plans, so too must we stifle the under-

[2]Estimates of the total "cost" of our aerospace combat capabilities depend on the definitions used. They range from the narrow (e.g., methods that count only the direct investment and operational costs of the units themselves) to the broad (schemes that include the many other force elements and capabilities that are integrally related to aerospace power, as well as a pro rata overhead slice).

standable inclination to allow resource realities to shape all aspects of planning in and of themselves. At various points in the past (most recently in the 1980s, for instance), it can be argued that we went too far in the other direction, by ignoring the long-term resource ramifications of contemporary posture and modernization choices under transitory circumstances of budgetary largesse. To reverse the situation now, no matter how compelling the arguments along such lines may seem these days, is equally ill-advised. It is also, in view of the way that the force modernization process has really worked over the years (for fighter forces in particular), a prescription for future problems of possibly great consequence. Current arguments for highly austere approaches to force modernization do carry much weight. The basic issue of our national military aims aside, however, the implications of such arguments are not, to this author, as clear in their import as they seem to others.

In particular, many of the alternative fighter force modernization proposals and critiques now circulating are based on historical data concerning past allocation of resources and various trends in the budgetary determinants of fighter force structure. As we suggest below, while such points are well worth heeding, alone they should not constitute a basis for future plans. Not only do we have a wealth of cautionary evidence, one finds that such projections historically have proven to be highly unreliable. 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 for which we may choose to plan. It makes little sense to acknowledge radical new circumstances for the threats, contingencies, and other inputs of planning, while retaining traditional patterns of resource allocation that are just as much an artifact of the "Global War" planning era as is the fixation on the NATO Central Front contingency or the role of nuclear deterrence in our national strategy.

Chapter Two

HISTORICAL U.S. FIGHTER AVIATION POSTURE AND PLANNING

Briefly reviewing the historical tactical fighter aviation posture helps set the stage for an assessment of future force planning needs and issues. Figure 1 shows USAF, USN, and Marine fighter forces from FY62–FY92 in "Fighter Wing Equivalents" (FWE)—i.e., multiples of 72 PAA aircraft.[1] The figure depicts the *total* strength of U.S. tactical combat aviation resources, including all reserve components and manned fighter-interceptor forces assigned to the homeland defense mission.[2]

The figure dramatically illustrates the relative stability of the total U.S. fighter posture over this entire historical period. If a large early

[1]PAA (formerly UE) refers to authorized aircraft counted in combat units; this tally does not include, for instance, the inventory of aircraft assigned for training, modification, test, or reserved for attrition losses, etc.

[2]These are included since they are more and more indistinguishable in type and even potential employment from standard theater forces. Indeed, organizationally speaking, the USAF abolished a separate Air Defense Command some years ago, creating an air defense element under its former Tactical Air Command. Also air defense forces have been included because of the different force assignment rules observed by the USAF in the 1960s. Then the "tactical" air force consisted of the forward theater air forces (e.g., U.S. Air Forces Europe), the Tactical Air Command, and the relevant reserve components. But for the most part, TAC consisted only of forces with primary attack missions (only air defenders with forward air forces were counted as "theater forces"). That, however, would not exclude air defense forces with administrative assignments to Air Defense Command from deployment with TAC units in a contingency. Also note that Figure 1 does not include reconnaissance, electronic warfare, and related aircraft, although it does include tactical bombers.

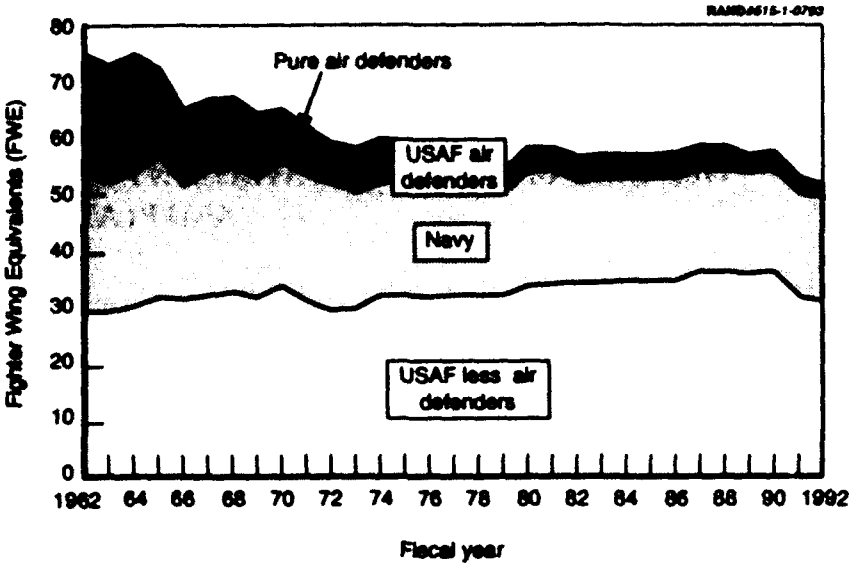


Figure 1—U.S. Historical Fighter Force Structure, FY62–FY92

slice of the air defense forces is factored out (in particular, those air defense fighters designed and deployed solely over their lifetimes for homeland air defense), one finds that the "core" U.S. fighter force over this whole three-decade interval has tended to fluctuate within and around a range of 55 to 60 FWE.[3] Only in the past couple of years has the total posture begun to fall below this historically consistent

[3]The apparent growth of the USAF General Purpose Force fighters over time can be interpreted as the increasing assignment of air superiority aircraft (previously known as interceptors) from the homeland air defense forces to the tactical force. In particular, the rationale behind the distinction between "theater" and "air defenders" contained in Figure 1 follows from a force accounting convention followed by the USAF in the earlier part of the period. "Tactical forces" referred to all forces deployed in forward theaters (including those with air-to-air missions, such as F-102s), but homeland TAC units generally consisted of aircraft with pure or mainly ground attack roles. In contrast with more recent organizational concepts, all units with air-to-air capabilities were assigned to Air Defense Command even though some of these units would reinforce forward theaters under mobilization. Thus, Figure 1 distinguishes between those air-defense-assigned units that might be forward deployed and those that probably would not, since aircraft of a given type (e.g., F-106s or F-89s) had never been used in any forward theater and were neither equipped nor otherwise prepared for theater operations.

"envelope" as a result of movement toward the reduced force levels envisioned for the post–Cold War period, such as those planned under the Bush administration's Base Force and, undoubtedly, the Clinton administration's ultimate force objectives.

The rough historical stability of the overall posture demonstrated in Figure 1 now should be compared with the procurement quantities of those aircraft that have constituted the overall force structure just portrayed. Figures 2 and 3, respectively, show quantities of USAF and USN/USMC tactical combat aircraft types procured over the past couple of decades. The articles acquired constitute the current fighter force, and those bought in the 1980s will continue to constitute the vast majority of that overall force through most of the 1990s.

Figures 2 and 3 show the numbers of aircraft procured. If we were to survey our historical TAF fighter procurements in dollar terms (e.g., procurement of general purpose forces aircraft authority), a more vivid and dynamic pattern would emerge (particularly if we were to

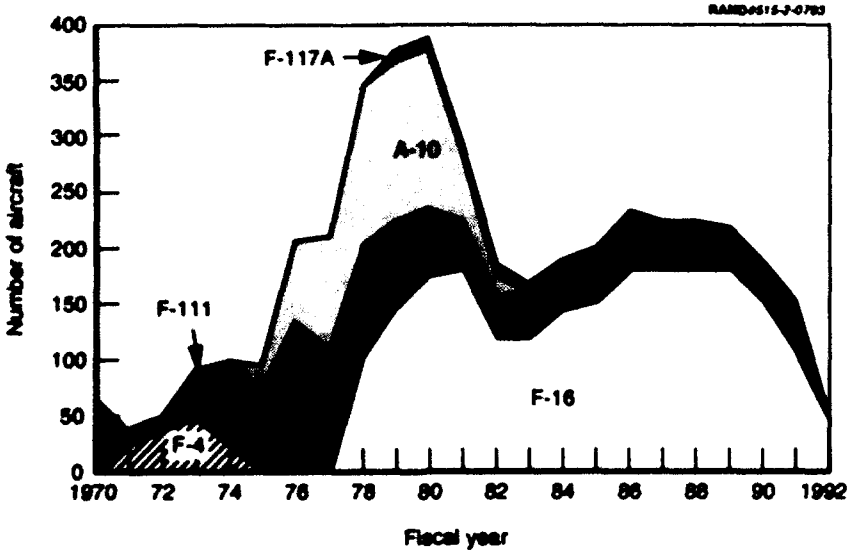


Figure 2—USAF Procurement of Fighter/Attack Types, FY70–FY92

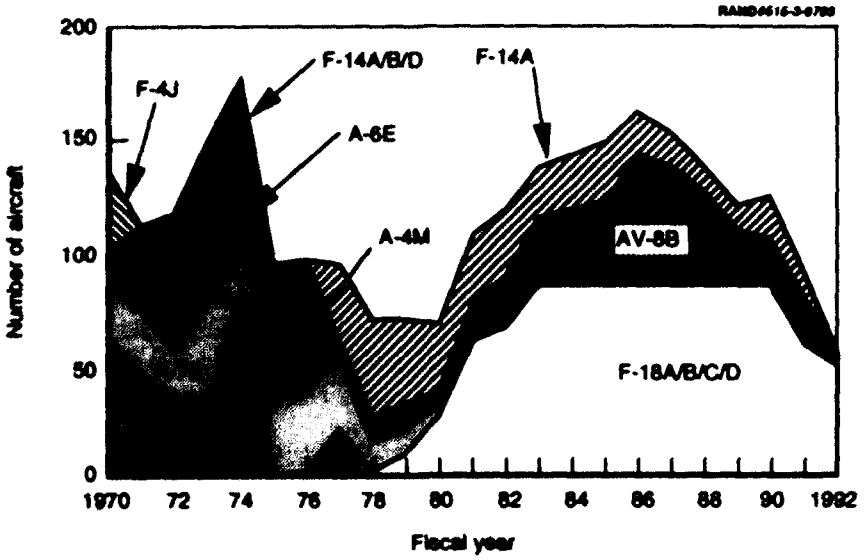


Figure 3—Navy and Marine Procurement of Fighter/Attack Types, FY70–FY92

examine the whole of the post–World War II record)—that of a certain cyclicity in procurement quantities.[4] This cyclicity is driven by one of the most fundamental characteristics of the U.S. defense budget over the past few decades: the relative volatility of procurement funding compared with overall movement (either up or down) in defense budgets as a whole. Though plans for future budgets typically assume stable funding trends, defense budgets historically tend to jump up within a handful of years in response to some particular stimulus and then erode at relatively modest rates over an extended period.[5] When budgets go up in this way, procurement is a dispro-

[4]The pattern, as noted, extends historically backward before FY70. "Boom and bust" oscillations would be apparent if we were to extend this figure further into the past, although the amplitude of the surveys and their values would be larger. This sinusoidal pattern is also evident in many other major force areas, including ground forces modernization programs, shipbuilding and conversion, etc. See Kevin N. Lewis, *National Security Spending and Budget Trends Since World War II*, N-2872-AF, RAND, 1990.

[5]We are now eight years into such a period of erosion. Whether the gradual decline will become a rout, as some have feared, must await next year's budget.

portionate "winner"; when they come down, procurement leads the way there as well, and it falls the fastest as a component of the defense budget total. Procurement, in short, can be viewed as the most historically dynamic part of the defense budget, and its various ups and downs do much to explain the total movement of defense budgets.

As might be expected as a major component of the total defense budget, procurement of aircraft by the different Services clearly reflects this overall boom-and-bust pattern. If we look at this appropriation, including procurement of aircraft for all services, however, we find a somewhat incongruous history. Figure 4 shows that while the cyclical pattern of aircraft procurement follows the defense-wide pattern for all investment, the trait of volatility is somewhat less pronounced. In general, aircraft procurement represents a reasonably consistent part of the total DoD topline. The most important reasons are

1. Procurement of aircraft as a whole in modern times has been a consistently high DoD budget priority.[6] Typically, when procurement quantities fall, so do the amounts and percentages for procurement of new aircraft. Programs for modification of aircraft tend to increase as a relative priority within aircraft procurement plans when extended periods of financial austerity exist.[7]

---

[6]Thus, the average share of the total DoD budget constituted by USAF and USN aircraft procurement, plus RDT&E for aircraft, averaged 6.2 percent during FY72–FY82. For the interval FY83–FY92 (one with very different programmatic and policy emphases), the figure was 7.3 percent. Interestingly, because of the higher emphasis on the "high end" combat systems during the 1980s, the numbers of aircraft of certain kinds do not vary appreciably by epoch. For instance, total USAF procurement of general purpose forces aircraft during FY75–FY81 amounted to a sum of about half that of the following seven fiscal years. But the total number of combat aircraft procured was roughly the same for both intervals, reflecting mainly the higher unit cost of the items being acquired.

[7]For instance, during nine consecutive years associated with the so-called "decade of neglect," aircraft modifications were 15 and 17 percent, respectively, of the total USAF and Navy budgets for aircraft procurement—representing historically large fractions. A review of the various major programs financed by these initiatives (including numerous Navy CILOP programs, B-52 cruise missile modifications, the C-141B program, and USAF tactical programs like F-4G and EF-111A) suggests the importance of such initiatives to the maintenance of viable and responsive force structures.

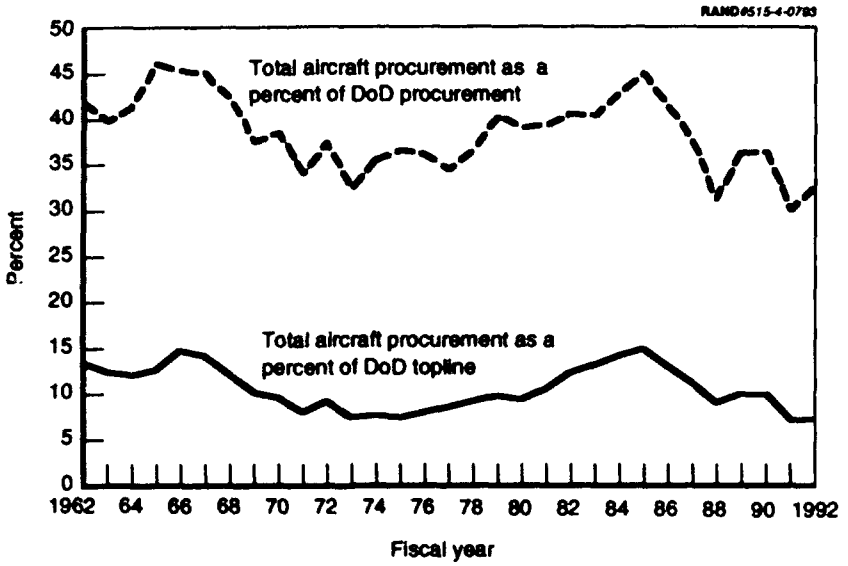


Figure 4—Historical DoD Procurement of Aircraft, FY62–FY92

2. Primary differences regarding the size, mix, and emphases during all phases of the budget cycle in tactical aircraft procurement are more than just a question of numbers. A key issue is the quality (and, in turn, costs) of the aircraft procured. This finding is especially true for the USAF, which, unlike the Navy during various historical intervals, has tended to procure its aircraft with larger annual buys over a shorter period.
3. For historical, coincidental, and strategic reasons, one finds a general tendency to interleave various types of aircraft programs over time (tactical fighters as opposed to bombers, patrol aircraft, lifters, and other specialized systems, although notorious exceptions exist). Many believed that this approach made the most management sense by avoiding the production rate penalties involved in running too many low-rate programs simultaneously.

How should we interpret these various data syndications and trends? The maintenance, enhancement, and modernization of our fighter posture represent a complex combination of priorities, management approaches, and other choices. It is far from being a simple matter of

writing checks for the development and procurement of new airframes. When considering the modernization issues inherent in our transition to a future Base Force (or a follow-on, revised posture target when finally specified), we need to consider a range of interlocking budget and force structure issues that go far beyond the rote replacement of aircraft as they hit predetermined milestones in arbitrary lifecycles.[8]

Even though we have tried hard to keep fighter force modernization on track, we have demonstrated repeatedly how modernization programs, dramatic and modest alike, can keep the force operationally in good order without always demanding new airframes on a very strict schedule. As noted, we can look to the cases, for instance, of the F-4G Wild Weasel or EF-111A (which represented significant new capabilities), of a variety of aircraft "pods and mods" that have enhanced performance, and of routine and dramatic upgrades and other programs that have extended service lifetimes at the same time that new capabilities are often added. (For instance, until recently some A-6Es have been scheduled to undergo their *second* major service-life-extension program). In the future then, what we may see will be more than a matter of adjusting the price tag of an arbitrary collection of aircraft so it will fit under some historically determined average investment line. For one thing, that line has been anything but straight over the years. For another, while such analysis represents a very useful baseline for analysis, extrapolating from such data does not present a very realistic picture of choices.

---

[8]It is true that of all major procurement accounts, the modernization of our tactical combat air forces probably has been a top priority over time, at least when it has come to the outright purchase of new weapon-system end items. But we are well advised to look to the cases of other kinds of systems for examples of the kinds of initiatives that may become more prevalent in the future tactical air posture. One could consider the substantial capability improvement permitted at relatively modest cost by the KC-135 re-engining program, the C-141B stretch program, and many others. We have undertaken numerous modifications for combatant forces before, but their importance may grow with declining resources. As noted, the fraction of the procurement of aircraft appropriation represented by modifications grows during lean budget years, reflecting the need to upgrade instead of buy new systems. However, often, when we take into account the enhanced performance made possible, the solution appears as good if not better than new production.

Chapter Three

U.S. TACTICAL AIR FORCE PLANS

Until recently, future U.S. force structure objectives were framed in terms of the so-called Base Force concept. The Base Force laid out the set of military capabilities that the Bush administration believed to be essential if the United States was to maintain its status as a military superpower. It is now apparent that the Base Force will be superseded by some new plan whose details remain unclear at this writing. Any follow-on concept probably will be subject to considerable turmoil and possible revision; therefore, any new scheme probably should be treated, at least initially, with flexibility. Even so, and despite the inevitable turbulence that will characterize future deliberations on force structure and capabilities, it is necessary to think about possible future force alternatives in detail to determine near- and mid-term modernization and other requirements.

In the absence of a definitive and reliable total force roadmap for planning, we might as well think of the Base Force (along with any modifications already announced) as a baseline of sorts against which future options should be assessed. That being the case, what are the requirements for U.S. tactical aviation elements within this overall concept, and what budgetary and other questions do these requirements raise? And, what do possible posture variants, given the limited information available at present, mean for our future choices of several types?

DETERMINANTS OF TACTICAL AVIATION FORCE STRUCTURE

U.S. force objectives, as laid out in the Base Force concept, revolved around several strategic goals. The most demanding and important, in terms of force structure and, consequently, budget requirements, is the Joint Chiefs of Staff recommendation to plan to fight two concurrent major regional contingencies (MRC). Through Korea, Vietnam, and the Gulf War, we have some practical experience with such conflicts. They have varied enormously in terms of their most prominent military, strategic, political, coalitional, environmental, and technical features. *Remarkably, however—because they were so different in so many ways—they all involved about the same total force commitment:* about 10 or so FWE of USAF/USMC combat forces and, roughly, three committed carrier wings (with surge commitments of up to six carriers). In contrast with actual peak-fielded forces, advance planning for such contingencies consistently has tended to specify a requirement for about half these force levels.[1] This experience, summarized in Figure 5, suggests that such contingencies tend to consume more posture than previously thought necessary by planners—and highlights the uncertainties and risks involved in basing our overall fighter force posture on a priori contingency plans alone. Real-world experience, the often quite different decision processes that inform force planning in peacetime, and actual operational decisions when national goals and American lives are on the line do indeed counsel a conservative approach in such matters.

But the maintenance of a posture for a two-MRC (or some alternative) requirement is only part of the problem in designing future U.S. fighter forces. Over time we have tended to adhere to some general principles, some articulated and some implicit, in total fighter force structuring. We cite just a few here to give a sense of how their injection into planning might influence our future force decisions. For example, for the USAF, some of these additional issues include:

---

[1]For a detailed review of both plans and force commitments for such contingencies, see Kevin N. Lewis, *The Mid-Level Contingency in U.S. Force Planning*, RAND (forthcoming).

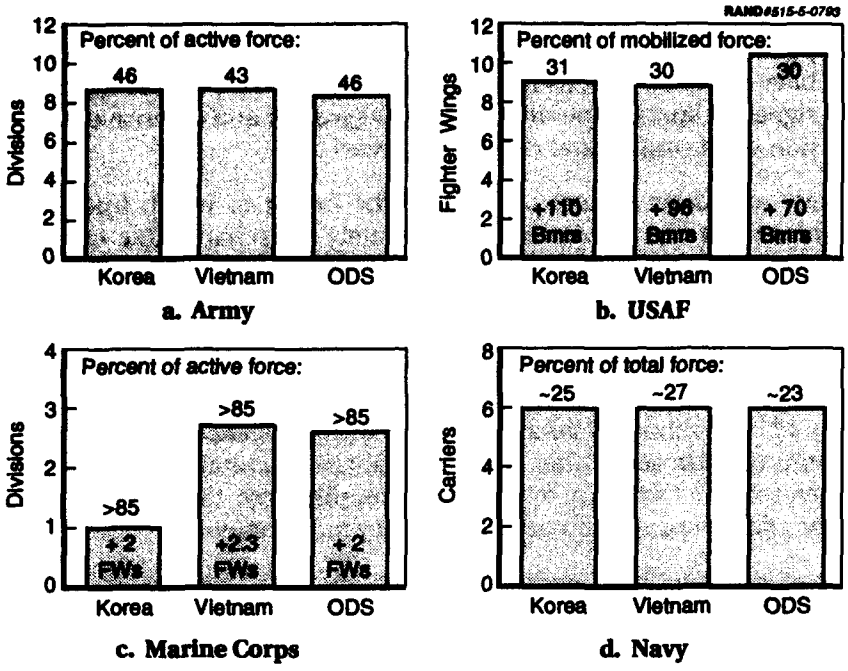


Figure 5—Constancy of Historical MRC Force Commitments

1. The requirement to maintain an adequate rotation base stateside to support forward deployments not only in operational but in other forward theaters as well
2. The fact that some units may be at a reduced level of readiness as they transition from one type of equipment to another, go through reconfigurations of other sorts, etc.
3. The need to balance such active/reserve force planning concerns as the preference of the reserve components to operate the same types of forces as those maintained in the active force and the requirement for production of trained personnel
4. The maintenance of continental air defense requirements and other auxiliary types of forces (such as the fighter detachments associated with former Navy carrier ASW wings)

5. Concern with issues associated with other specialty training, capability, and other operational requirements (which historically have included various nuclear-related withholds, fighter types assigned to special operations forces, aggressor and defense evaluation units, and theater defense reserves).

These and other factors undermine the extent to which front-line fighter units can be viewed as completely interchangeable components in a total war machine. In the future enough of these factors will be operational to considerably influence the total force in terms both of size and mix and, in turn, of budgetary requirements.[2] In short, our net force requirements should not be viewed simply as a concatenation of the various force packages that we might feel should be maintained for a selected set of contingencies designed for planning purposes. Other factors will shape the total posture at any given time and will vary over time in complex ways that are often independent of contemporary contingency requirements.

USAF FIGHTER FORCE STRUCTURE PLANS

The Base Force fighter roadmap called for the USAF to maintain 26.5 FWE of tactical aircraft, down from Cold War force levels that tended to reside in the mid-30s of FWEs.[3] Generally speaking, the USAF Base Force was designed to preserve most of the pre-drawdown relationships existing within the force structure (such as active/ARC mix, mission distribution, etc.). Since the 26.5 FWE objective emerged a couple of years ago, some relatively minor adjustments have been made in terms of force mix, but the overall transitional roadmap has

---

[2]Many of the same issues seem to be at work for the USN/USMC TAF forces as for USAF forces. In addition, some special aspects of maritime air posture planning should be noted, including various requirements to maintain carrier group rotations subject to OPTEMPO constraints, the need to rotate USMC units through carrier qualifying cycles, and the like. The same sort of remarks applicable to USAF planning also applies to USN/USMC aviation.

[3]In addition, about 2.5 TFWE would be retained as homeland air defenses. Also depending on one's counting scheme, various additional combat support forces might be counted separately from the 26.5, but these do not represent any substantial number of aircraft.

remained quite constant.[4] Figure 6 shows the transition from General War force structure to an estimated late-1990s Base–Force-type posture.[5] The USAF has benefited from moving out quickly on the drawdown; in addition, it has a very young and very capable posture. With very few exceptions, it already has paid for the entirety of the Base Force posture that will be on hand at the end of the decade.

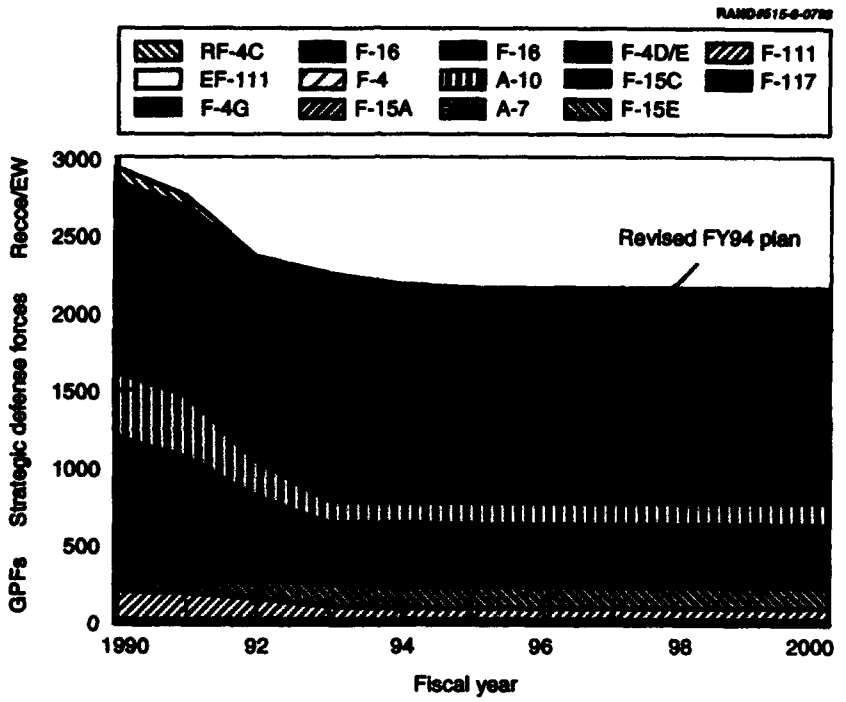


Figure 6—USAF GPFs: Estimated Revised Plan for FY94

[4]Some estimates of future USAF force requirements produced in the 1990 timeframe called for the complete elimination of such aircraft types as the A-10, F-4G, and RF-4C. In the wake of Gulf War experience, however, plans were adjusted marginally to include the retention of limited numbers of such aircraft.

[5]In the FY94 budget process now under way, USAF TAF force goals have been decremented by another 2.5–3 FWE.

USN/USMC FIGHTER FORCE STRUCTURE PLANS

Whereas the USAF's fighter plan has been relatively stable over the past few years, in comparison the Navy has been subject to considerable turmoil. Navy/USMC long-term fighter force structure woes follow from characteristics of their acquisition policies, a number of missteps and cancellations of important programs, a degree of investment overcommitment as a result of the plan to acquire a force structure built around the theme of a "600-ship Navy" in the early and mid-1980s, and, finally, the historically great variety of aircraft maintained in operational units by USN/USMC forces. Consequently, during the past couple of years, USN/USMC long-range plans have several major modifications; all have aimed at the ultimate target of about 13 carrier wings (CVW) plus four USMC wings. The combat components of this plan until recently have remained roughly constant over the short run, although longer-term force goals have been in considerable flux.

The main numerical difference in these plans has concerned the ultimate role to be played by the multirole F/A-18 in both Navy and USMC aviation. The first iteration of these plans called for relatively few F/A-18s to be bought: about 100 C/D models from FY92–FY97, along with the initial procurement (beginning in FY96) of 42 F-18E/Fs. This iteration would have implied the retention of relatively more F-14s and A-6Es in the inventory compared with subsequent plans.[6] In the spring of 1991, however, F/A-18 procurement objectives were expanded considerably (120 additional C/Ds and 108 E/Fs) during the same period, with the same start-up of F/A-18E/Fs (acquisition in FY96). This increase would have involved a corresponding reduction in the F-14/A-6E types in CVW (by about 64 PAA) by FY00 and a more rapid decline after that.

Subsequently, a revised plan was put forward. Although its details remain less than entirely clear, the highlights included: (1) an extended F/A-18C/D procurement program; (2) deferral in the first procurement and IOC of advanced F/A-18E/F models; (3) the revamping of both CVW organizations—USMC force size and configu-

[6]In addition, the USMC would lose its A-6 squadron forces to the Navy, replacing these with F-18Ds for the all-weather attack and other roles and helping the USN to avoid deficits in its medium-attack inventory.

ration; and (4) some adjustments in the relationship between USN and USMC aviation. The former change was driven substantially by the need to avoid shortages in total carrier forces; this adjustment has caused the jettisoning of previous "standard" CVW complements in favor of more flexible CVW organizations.[7]

Finally, in the last few months, the Navy apparently has proposed an even more radically different concept for the configuration of USN and USMC tactical fighter units through the 1990s. As part of the overall "Task Force 2000" briefing, the total number of aircraft assigned to each wing has been reduced further (ultimately to 50). Much more important, however, has been a dramatic departure from historical practice in the operational concept and related force mix of Navy and USMC fighter forces. The Navy has proposed a total jettisoning of special purpose aircraft. The F/A-18 (both the proposed E/F model and the C/Ds) will be emphasized in the overall force. Service lifetimes of the C/Ds will be increased to avoid inventory shortfalls. The aging A-6E will be retired from the force completely by FY00, and F-14s and AV-8Bs will be modified to allow operation in a more multimission fashion. Aircraft not modified will be phased out of the operational inventory, along with A-6Es, and the majority of one of the Navy's reserve wings. To deal with deficits in airframes and to compensate for aircraft types retired early, wholesale integration of USMC with USN force units is proposed. Under the plan, all VMFA units will be "integrated" into carrier deployment cycles (leaving only the V/STOL AV-8B and the F/A-18D, which has range limitations and performs USMC missions other than all-weather attack as "pure" USMC aviation elements). The Navy also is contemplating some very innovative deployment concepts. Under the new scheme, for instance, amphibious carriers and missile ships

[7]Traditionally the Navy's CVW organization has been oriented around type of wings, although the fleet has featured more than one type of wing at any given point. Because of various deck constraints (for instance, *Midway* class CVs could not handle the F-14 and, therefore, an extra F-18 squadron was substituted for it). In 1992 the Navy decided to deploy CVW with about 60 combat aircraft (so-called "power projection" wings), presumably following rough force-mix requirements in lieu of CVW with at least notionally formal squadron sets of fixed organization. By the second decade of the 2000s, the Navy hopes to field carrier wings consisting of about 42 F-18s and 18 AXs. In addition, given related shortfalls in various tactical CVW aircraft of other sorts (E-2Cs, EA-6Bs, etc.) and the reduced requirement to operate against the most high-end kinds of threats, the Navy may deploy fewer of these types on its CVW.

might replace traditional big-deck carrier battle groups in some presence roles. To take another example, currently the *Roosevelt* is deployed in the Mediterranean with a partial CVW. The balance of the ship's complement has been filled in by helicopters to support Marine ground combat units aboard that ship. Whatever its fate, the Navy plan is novel in its recognition of both resource realities and the changing strategic environment. Further, it most properly and creatively exploits the inherent flexibility of big-deck multirole CVNs.

Apart from the developments just noted, changes in the USMC's force structure have been relatively more decisively influenced by projected cutbacks in available personnel. Under the Basic Force USMC, active-military personnel levels have been scheduled to decline to about 159,000 by FY97. Given the traditionally lean nature of USMC force structure, such a manpower reduction inevitably leads to severe force reductions. Already, and in addition to various other tactical aircraft, the USMC has planned to deactivate four F/A-18 squadrons and two AV-8B Harrier squadrons in the near term. Guidance also was issued, as noted above, that a certain number of USMC squadrons be integrated more closely into fleet aviation. Overall, and even before announcement of the Task Force 2000 concept, these developments effectively would reduce the total "pure" USMC tactical combat squadrons by about one-third, with perhaps other USMC squadrons being "dual" squadrons, i.e., assignable either to carrier deployments or USMC wings on a rotating basis. Finally, both Navy and USMC Reserve combat squadrons could be changed considerably in their concept from potentially autonomous units to more general reserves intended to round out or backfill active units.[8]

Taken together, these developments amount to both a reduction in and remixing of overall USN/USMC tactical-aviation force structure over time. (See Figures 7 and 8.)

---

[8]Ultimately, the USMC Reserve may disappear entirely as a combatant (fixed-wing) force. This development, in fact, would not be new but rather in some ways might be analogous conceptually to the situation before FY75 when the Navy and Marine reserve forces shared a common pool of aircraft.

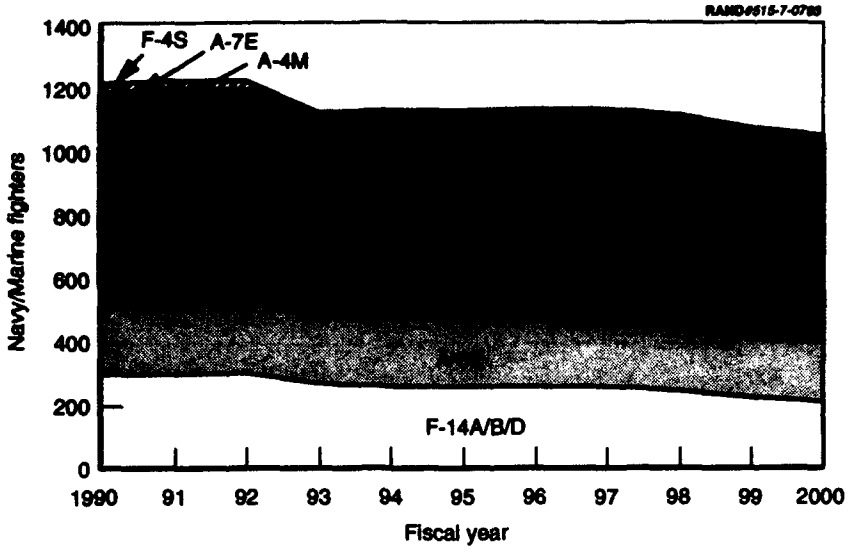


Figure 7—USN/USMC GPFs: FY92 Base Force Plan

From the preceding discussion, it should be clear that we are now well embarked on a radical transformation of the total U.S. national pool of tactical fighter capabilities. In the evolving debate over the future configuration and rationale for U.S. military capabilities, many discussions have centered on the best way to reconcile two very powerful competing "engines" for future tactical air force planning. To some, probably future budgets are the horse that is drawing the total force planning cart. To others, convinced that fighter forces will play at least an equal and most likely enhanced role in future national military strategy, the maintenance of a fully modernized and extremely capable overall fighter force should be such a high priority that TAF modernization initiatives should take precedence over all other candidates in a predicted intense competition for limited procurement dollars. At stake are a number of specific modernization choices (leading controversial candidates include the USAF's F-22, the F/A-18E/F, and the total number of Navy aircraft carriers to be retained).

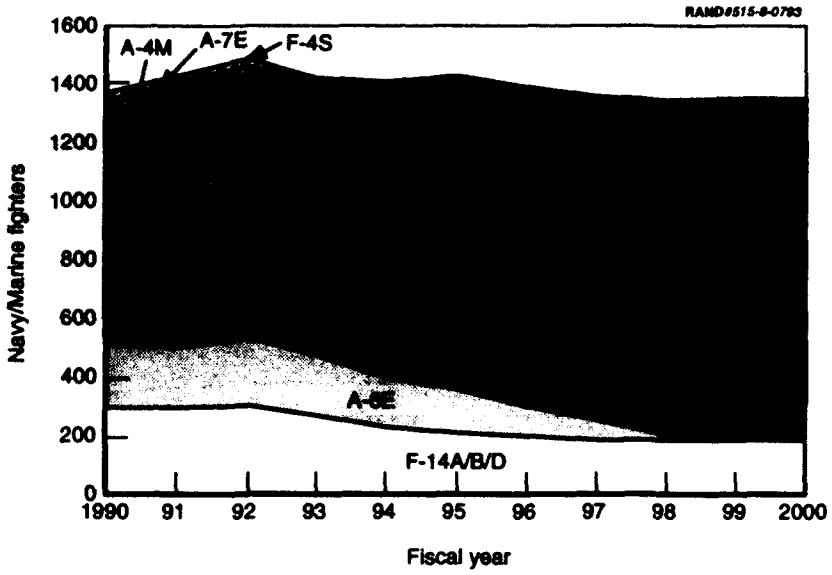


Figure 8—Revised USN/USMC GPF Plan: Based on Task Force 2000

The reconciliation among the various views promoted ultimately must depend on the establishment of some top-level strategic guidelines that can give rise to objective functions for evaluating the candidates. But already, and despite the absence (yet) of such guidance, an air of urgency surrounds the current debate over choices. As we suggest below, this anxiety may be premature. It is not clear that all such decisions need to made at once or in the very short run. The costs, if you will, of a more measured approach to modernization are not so great, even with the downward slide in defense budget authority. On the other hand, the penalties associated with guessing wrong now are potentially very high.

Though much remains obscure, it does seem clear, with the sorts of force levels that have been under discussion lately and considered rather mainstream (USAF fighter force levels in the 21–24 TFWE range, and Navy carrier/wing postures in the 10–12 range), that the United States probably can satisfy the requirements for two reasonably robust major theater force packages if the necessary investments in allied fields and capabilities (munitions, command and

control, intelligence, surveillance, and command capabilities like JSTARS, etc.) are fully underwritten. The days when the USAF had planned to commit from the start no fewer than 80 TFSE to European defense, and in which the Navy would fight a multitheater, multispectrum threat against a highly offensive enemy force are gone. Thus to a degree we have not yet determined the requirement for a certain baseline number of tactical combat units.

Seemingly at least in the short run, the questions to be resolved, in the emerging planning environment, bear more on force mix choices than on force size. A fundamental question is integral to these issues. In the modern strategic and operational environment, what performance attributes are valuable? More specifically, should the United States be willing to "pony up" the resources to procure a sufficient number of high-end ("high quality," to use the buzzword of prior debates) systems to maintain an absolutely superior total national aerospace force.

If this debate sounds familiar, it is because we have been through it before, albeit under somewhat different circumstances and with different ultimate goals. We can review that experience in light of the possible future resource and force planning context to gain a clearer grasp on the specific issues and choices now before us. The next chapter will suggest, all factors considered, that the situation is not as bleak as some might suggest.

Chapter Four

DoD BUDGET PROSPECTS AND U.S. TACTICAL AIR MODERNIZATION

What goes up, it is sometimes said, also must come down. This old saw characterizes well historical defense budgets. Following real and typically short-term growth in DoD top lines, historically the budget has embarked on an extended period of real erosion.[1] This pattern characterizes relatively well the unprecedented buildup of the early 1980s. Following a nearly 50 percent real growth spurt in total DoD authority over five years, DoD budgets topped out in FY85 and began a steady decline at a relatively modest rate (averaging about 2 percent per year through FY90). Thus the present DoD drawdown was already several years under way by the time that the breakup of the Soviet empire combined with domestic concerns over national priorities to produce calls for a so-called peace dividend. Barring dramatic developments abroad, the Bush administration saw that pressures for continued real defense budget cuts should be expected to continue indefinitely. Accordingly, the Base Force plan and its corresponding budget mapped out a plan that would cut force structure to levels below any known during the Cold War. Further, to preserve the readiness and capability of the remaining U.S. posture, budget plans were stripped of all but the most urgent investment priorities.[2]

---

[1] For a detailed assessment of this history, see K. N. Lewis, *National Security Spending and Budget Trends*.

[2] Even so, it was clear to a few analysts that the Base Force program probably was still underfunded. Further, the Base Force plan essentially was an unforgiving one—any deviation from the roadmap (particularly one coming under the rubric of what one might call a "discipline gap," such as Congressional insertion of unrequested weapons funds, politically imposed delays in such economies as end-strength reductions and

Subsequently, the Clinton administration has called for additional reductions going well beyond those laid out in the Base Force scheme. The ultimate form of these reductions remains unclear as of this writing, but it probably would not be considered too risky a wager to bet that funds for force modernization for the next few years will continue to be quite tight.

The implications of a likely "procurement holiday" for U.S. tactical fighter force structure now seem to be quite mixed. On the one hand, U.S. Air Force fighter programs had been mainly bought out by the early 1990s. Plans through the rest of the decade called for, at the most, a relative handful of attrition replacement aircraft and some prototype and perhaps limited initial production of F-22s. The fighter forces of the Navy and Marine Corps, unfortunately, are not now so well off. A variety of programmatic reverses and other decisions[3] have sown the seeds for a rather serious force replacement problem in the early 2000s. As noted above, a series of planned retrenchments and realignments in Navy/USMC tactical fighter posture has been undertaken to mitigate the effects of these problems.

Given the historical record, such problems might not seem to pose insurmountable hurdles. But these times are not normal, and the combination of several years of underinvestment in force modernization and the requirements for routine modernization that will begin in the next decade for all fighter components seem to raise a spectre of some potentially grave difficulties in the early 2000s. To capture the salient features of the current situation, we can exploit the historical record to garner a sense of the scale of the difficulties that may confront us over the next decade or two. As noted previously, when defense budgets have moved up or down, procurement is by far their most volatile component. Thus U.S. tactical aviation procurement plans, even if they are funded fully, will yield historically low procurement levels. But on what basis should the afford-

base closures, etc.) would have a detrimental effect on the capabilities programmed under the Base Force plan. In addition, other phenomena—unreimbursed overseas operations, funds diverted to defense conversion, civilianization of military technology, assistance to other governments, worker retraining and facilities conversion and cleanup, etc.,—would have the same effects.

[3]Including the cancellation of the A-12, a decision to terminate F-14D remanufactures, and continued dispute over the future of the F/A-18 force (including a proposed F/A-18E/F follow-on version), etc.

ability of future tactical aviation postures be evaluated? Four main points help set the context:

1. The current budget is deliberately not funded to sustain adequate long-term procurement on a level sufficient to maintain the Base Force indefinitely. This imposition of what has been described as a procurement holiday is by no means a reckless or unwise strategy, given the other priorities before us. The U.S. has responded to previous situations with analogous characteristics in various adaptive ways. Longer-term penalties are associated with such a tactic, including the loading of future budgets with blocks of investment initiatives that may not contain much scheduling flexibility and that raise the prospects of large deferred procurement raised should be combined with planned program schedules to create daunting investment "bulges." Since the current approach appears to be a necessary evil, we must be reconciled to do the best we can under the circumstances.

2. The present plan contains little room for error. For instance, the Base Force plan appeared modestly underfunded (by about 2–3 percent) for FY93–98. The program also contains manpower deficiencies in light of declared posture goals. In addition to the deferral of what otherwise would be more routine procurement, we are clearly living "near the edge." Obviously, any adjustments made to the present plan (say, insertion by Congress of favored but unresourced programs or failure by that body to comply with schedules for the standdown of units or closure of bases) could create problems.[4] One might refer to a combination of sins, these examples among them, as comprising a "discipline gap." Thus while on paper, various plans for future force structures under reduced budget circumstances may be both managerially feasible and nominally affordable given projected budgets. Such plans both by design and necessity are "tight"; they generally assume that steps taken unfold on a fairly precise schedule and with few, if any, deviations. To stray from plans (whether on the force structure side, by addition or deletion of certain components, or

[4]JCS Chairman General Colin Powell, for instance, has testified that were Congress merely to inject a one-year delay in the deactivation of reserve component forces, it would add a $10 billion "penalty" onto the Army's budget through FY97. The implications for orderly program management require no elaboration.

on the budget side, as a result of force adjustments, the addition of various unanticipated and unreimbursed activities, or by deviation from schedules stipulated in plans) can have dire effects for the coherence and soundness of plans overall.[5]

3. Aviation modernization and related posture plans cannot be isolated from other decisions that involve posture. Given the central place in USN force planning overall of carrier force operations, for example, opting for a given level of sea-based air power has powerful implications for a vast variety of shipbuilding and other programs.[6] In addition, numerous trade-offs can be imagined between aviation forces and other elements of the joint force posture. Under some circumstances, the U.S. might enter a coalition as the primary provider of air power, while other allies contribute ground forces (a development that would have implications for the size of our ground establishment and its configuration).[7] Similarly, ultimately we might elect to posture ourselves, particularly for a second "concurrent" contingency, so that aviation resources would be the primary force employed to blunt an enemy attack and drive up the costs of an adversary's aggression. If an effective air power "stopper" for a second contingency could be maintained, readiness requirements for ground force units would be affected, with noteworthy budgetary and force implications for active/reserve mix and strategic mobility requirements.

4. The task of modernizing U.S. tactical air power should not be viewed as having to be resolved in the short run. The simple management tasks of achieving a coherent drawdown of the

---

[5]Not all possible adverse effects along these lines, of course, are "sins." The costs of unanticipated requirements (e.g., peacekeeping requirements—the price tag on one of which, Somalia, now is said to amount to three-quarters of a billion dollars) would exacerbate all other difficulties.

[6]For reasons such as these, it does not make a great deal of sense to think of the cost and budgetary consequences of tactical air power without factoring in at the very least the appropriate force overhead involved—carrier groups, stateside training, rotation bases, etc. Despite this apparent fact, some critiques of current DoD TAF modernization plans seem to assume that such other force elements (for instance the number of carriers or the design of carrier groups) should be held more or less constant while the size and mix of the aviation establishment should be up for grabs.

[7]Indeed, former Secretary Dick Cheney has made statements to this effect regarding the ongoing Bosnian crisis.

forces already in hand speak against getting too far ahead of the game, as does the continuing volatility of possible options.

These questions are just a few that we would have to consider closely, *even assuming that the original Base Force plan were to be retained and remain more or less on track.* Of course, this proposition is already invalid. One can only speculate on how the priorities of the new administration, now continuing controversies over strategies and programs, might play out and what effects additional budget pressures might yield. As a matter of prudence, therefore, we need to carefully analyze options if defense budgets should come down faster and/or more substantially than plans (either those of the Bush or Clinton administrations) have stated.

A related issue involves the long-term procurement requirements of the Base Force (or, for that matter, any other intended steady-state defense posture). When the continuing investment requirements of a given defense posture are assessed, frequently they are based to some significant extent on the estimated useful service lifetimes of the major end-items concerned. Traditionally, certain categorical factors are used in such assessments. For instance, modern fighter-attack aircraft are expected to remain in operational inventories for some 20 or more years; nuclear submarines are presumed to have expected service lives of 25 years; a transport helicopter presumably can remain operational for 30 years; and an aircraft carrier (if it receives an extensive overhaul, refueling, and modernization treatment) can be deployable for 45 years or more. Such data can be folded into steady-state posture maintenance procurement requirement estimates by dividing total force levels by projected lifetimes, adjusting inventory needs to take into account equipment attrition, float, training, research needs, etc.

In fact, the situation is more complex. Service longevity of major materiel items reflects many different types of, one might say, obsolescence phenomena. In some cases, the primary constraints are technical; a system is designed to withstand safely so many flying hours, or so many submergence cycles (for an SSN), so many "traps" (for some carrier-based planes), etc. In other cases, obsolescence also reflects expected threat developments. Over a given time interval, for instance, adversary advances in weapons performance might require U.S. equipment upgrades that are more extensive than the

straightforward modifications of equipment, munitions, or doctrine. With whatever other considerations may be at work, support costs figure into the overall posture replacement requirements. Then it may be possible to keep a given ship, aircraft, or combat vehicle technically and tactically viable for some length of time but only at an ever-increasing maintenance and repair burden. As equipment ages, servicing may be required more frequently, spare parts may become increasingly scarce, and more attention to safety-related maintenance may be necessary. Finally, the duration that we can reasonably expect a given system to remain technically, operationally, and economically "viable" will depend on its usage. Heavier than intended use may shorten the life of some systems.[8] We might also, by technical means (modifications, SLEPs) or changes in operational patterns (fewer hours of utilization, less demanding missions, etc.), increase the viability of some units. In short, many factors can be expected to combine to complicate what some ordinarily would presume to be straightforward projections of inventory replacement needs.

Nonetheless, while some equipment replacement schedules may not be as hard and fast as some analyses suggest, there are limits to our ability in what steps to take to retain these in service (or to the affordability of the steps that would be required to maintain some hardware items in service). The specifics of individual cases aside, we should strive, where possible, to maintain reasonably orderly posture sustainment plans to avoid turbulence in related military endeavors (e.g., training and basing plans) and, more importantly, to avoid adverse combinations of system replacement requirements that cumulatively would represent intolerably large investment bulges in the budget. Unfortunately, a number of factors have conspired and continue to work against such stability. Historical reality is one factor that cannot be avoided. Review of the data shows that, for a variety of reasons, we may have bought some types of weapons in large quantities over short periods of time. As a result, we may not have much choice but to approach the replacement of

[8]For example, the heavy use of B-52s in a conventional role in Vietnam was associated with such extensive structural fatigue in some aircraft that certain models had to be retired well ahead of original schedules. Similarly, the intense flying schedules of airlifters in support of Gulf War operations may have come at the expense of the remaining lifetime of some aircraft, for instance, C-141s.

some weapons classes on similar condensed schedules. Production base economies are another important consideration; sometimes it just happens to be more efficient to replace a large number of systems within a relatively short interval. Influencing all other factors is the ability of the DoD budget as a whole to support a given degree of modernization. The historical data show rather decisively that procurement is the major beneficiary of defense "booms" and is equally the first casualty of budget declines.

This process exactly is apparent in current plans for DoD major systems procurement. To maintain a ready posture and to facilitate a smooth defense builddown, current and planned budgets have programmed a relatively small amount for the acquisition of major weapon systems. What some have called a "procurement holiday" may not represent an overwhelming short-run problem, since large quantities of high-quality equipment were procured in the 1980s and since the posture to be equipped over the long run (under the Base Force, not to mention any reduced alternative) will be that much smaller. But the cumulative effects of deferring procurement for many years, plus the need to move ahead on certain follow-on programs will create the potential for a major procurement "balloon payment" from FY00–FY10. Although we can mitigate some of the effects of this requirement and try to reschedule some replacements to smooth out budget needs, the overall funding demands for major system acquisition from FY00–FY10 undeniably will be quite substantial. All this, finally, presumes that no further major divestiture of posture takes place and that no major options than do not involve new procurement are adopted (for instance, life extensions, acceptance of longer lives, or dramatic life-extending changes in active/reserve or active/mobilization status). *Then almost certainly we will be confronted with a procurement "tab" at that point that could be beyond our means.*

Whatever the virtues of and however one might have assessed the probability for success for the Base Force plan, it is now apparent that the evolution of U.S. force structure over the FY94–FY99 period will be of some form other than those that until very recently represented the formal future force goals of the Base Force plans. Most indications suggest that the remaining forces will be smaller than those programmed in the final Bush administration budget. The likelihood also is that fewer forces will be deployed forward and

that relatively more combatant force structure will reside in the Reserve components. One issue, however, is raised by the debate surrounding the most prudent and reasonable ways to revamp the Base Force scheme. That issue concerns the quite different underpinnings of two separate kinds of planning deliberations. Over the past couple of years, the distinctions between these planning undertakings has become blurred. With the conceptual merger of the two concepts, risks are raised that the future posture for all U.S. forces and tactical fighter forces in particular, may not be suitable for the strategic and military environments in which they may be needed to operate.

The existence of two distinct planning issues is a proposition that has received little attention, and many people might be inclined to dismiss the argument that each comes with its own particular set of problems and tasks. Therefore, this distinction needs to be characterized in some detail. In this author's opinion, the two separate planning tasks are

1. A near-term, force management approach to the drawdown
2. A longer-term "roadmap" describing the military capabilities that the U.S. ultimately might wish to possess for the sake of deterrence and defense in the wake of the drawdown.

While the two issues have many unique aspects, they do overlap in some respects. For instance, obviously forces (i.e., capabilities) discarded during the drawdown phase of an operation would not be available in the long run. Similarly, the short-term plan needs to be fairly specific about which longer-haul options merit funding now, or those capabilities will not be in hand in the future. Equally clear is that the relative weighting that one might place on the two approaches should change during the next several years. Thus in the short run (when the premium presumably is on the generation of maximum outlay reductions), the arguments in favor of posture reductions at the greatest speed compatible with military coherence, quality, and effectiveness, are strong. Unless there are countermanding personnel, logistical, modernization, or other concerns, it makes no sense to pay much to retain those forces that might be earmarked for early deactivation for, say, an extra year. On the other hand, after the majority of posture cuts are taken, the relative priority of longer-term planning issues gains in importance. One might

visualize the interrelationship of the two kinds of planning as a pair of opposing wedges: as one declines in size over time (that is, loses relative importance), the other gains proportionately.

The significance of this distinction between kinds of planning comes to light in the briefest review of the debate over characteristics of the Base Force (and, now, any new alternative to it; for instance, the "Option C" force structure proposed by former Congressman Les Aspin). While the Base Force sketched out a future resumé of U.S. military capabilities based nominally on a new strategy for national security, the real value of the Base Force seems to have been in its concepts for the management of force reductions over the short run. For instance, the Base Force did not really call for any radical restructuring of the overall, large-scale U.S. military establishment. Service shares, mission emphases, and other aspects of the plan are, a few exceptions aside, quite consistent with those characterizing the preceding decade or two. In terms of the reduction size called for by the Base Force plan, a similar logic is at work that preserves the essence of the pre-drawdown national military posture.

Thus, a common thread runs through the reductions of posture of all sorts. A relatively full set of capabilities in hand at the twilight of the "Global War" competition between the United States and Soviet Union is preserved, albeit at lower levels. This fact exposed the Base Force to much criticism on the grounds that it failed to come to grips with the possibly quite different strategic and operational requirements that might characterize the evolving global military context. But from two points of view, the Base Force had enormous value. First, it can be shown that the Base Force sought to maintain a maximum degree of coherence of the U.S. posture as it drew down. Asymmetrical posture reductions of many sorts, in principle, might be called for under a radical revamping scheme for the future global environment (assuming that one knew the end result), but such an approach might lead to many fact-of-life disruptions that ultimately would involve substantial penalties. A key case in point concerns personnel policy. The Base Force, by virtue of its maintenance of a relative degree of proportional status quo, would seem the best way to avoid future problems in experience, skill, and other personnel profile issues. Anyone familiar with the like problems resulting from the helter-skelter post-Vietnam drawdown can attest decisively to longer-term problems that otherwise might be involved.

Second, the Base Force can be seen as deferring for future consideration a review of the ultimate reconfiguration of U.S. capabilities that might lead to a force mix radically unlike that of today, five years ago, or, for that matter, at the culmination of the Base Force plan (assuming that it remained the objective plan and could be implemented reliably). Other plans have not been so reluctant about making such trades in the short run. For instance, the "Option C" proposal put forward by former Congressman Les Aspin is one such plan and is based on a much more forward-looking overall force structure concept tied to new strategic options. To illustrate, under the Base Force at the end of the drawdown the Navy would maintain a force of roughly 70 to 80 nuclear attack submarines (SSN). This number, of course, simply represents the remaining force after obsolescent units are retired. But "Option C" calls for a posture of only about 40-some SSNs. Given the pertinence of SSNs to a now fading major "blue water" anti-submarine warfare (ASW) campaign against Soviet submarines to achieve maritime superiority early in a global war, disproportionate reductions in such forces seem to make good sense if one assumes that the Russians will not continue to maintain an offensively oriented Navy, if the need to secure sea lanes against enemy submarines arises during a massive reinforcement of Europe, etc.

These examples illustrate what was meant earlier by the different aims and means of the short- and longer-term planning perspectives. Both are important to our current choices, of course. But it is quite another thing to fail to notice the distinction between the two, for then we can get into considerable trouble. For one thing, probably no sensible student of military affairs would be willing to wager too much on the unfolding of one particular future strategic environment. Also depending on the way particular currently uncertain developments evolve, the implications for future planning could be quite different. For another, when the distinction is not kept in mind, the risk exists that we might implicitly yet unjustifiably allow inconsistent assumptions about the relevance of our current choices for the future to become intermingled. That is, by failing to distinguish between the different assumptions that might guide our short- versus longer-term choices, we risk basing our longer-term vision of force requirements and objectives (in this case) on a set of propositions that might be relevant only if one assumes many of the features

of short-term planning decisions and analysis. Tangible differences are seen between the results one would get if planning were done on the basis of a future strategic concept as opposed to considerations of budgetary, operational, personnel, and other feasibility issues. Both are necessary, and such approaches must be carefully blended—but woe may come to those who would forget which is which.

ALTERNATIVES TO PRESENT PLANNING GOALS

Given that FY94–99 budget and force structure plans will be adjusted significantly, we must think for the longer term about force structures other than the current Base Force. Indeed, the Base Force's concept and rationale should not be confused with various longer-term possibilities. The Base Force explicitly focuses on the difficult problem of near-term transition. DoD planners wisely have designed this drawdown to avoid a replay of previous drawdowns, with all their pernicious effects on readiness and capabilities. As was just suggested, mindful of long-term uncertainties, the Base Force sought to preserve a broad range of U.S. capabilities, at least through the mid-1990s, when a possibly quite different planning context for U.S. forces may have emerged.[9] For this reason, assessments of future U.S. force modernization budgetary requirements must be questioned, given their tendency to presume that changes will be minimal when it comes to how force requirements and modernization needs should be computed.

---

[9]The Base Force has been criticized on numerous grounds, not the least being the perception that it seems to feature certain characteristics that, some have argued, are more representative of a down-sized global war force structure than of an alternative force that is derived from the possibly quite different aspects of a new global security system. Whatever the merits of this argument, the fact remains that the Base Force, in fact, does retain, albeit at reduced force and funding levels, most if not all of the mission and functional areas that existed in the U.S. defense posture before the drawdown. Analysis of the specifics of the Base Force suggests that the specific rationales behind the drawdown differ among the Services and, indeed, within their various components. Whatever the rationales at work, however, the same broad spectrum of force elements is retained. Indeed, this point seems to be behind the emerging issue of duplicative Service roles and functions. By avoiding decisive decisions on the abandonment or radical revamping of different force elements, however, the Base Force is preserving some degree of flexibility insofar as the force options it retains for future decisionmakers are concerned.

Take, for instance, a recent Congressional Budget Office analysis on the *Balance and Affordability of the Fighter and Attack Aircraft Fleets of the Department of Defense.*[10] As an analytic effort, this report does an excellent job of capturing some of the key problems and issues confronting U.S. tactical aviation modernization. But many of the foundations of that analysis reflect certain status quo assumptions about force planning. For example:

1. The report assumes that future aviation modernization objectives could conflict with other procurement initiatives. This assumption is true if all present plans are retained and if such plans are treated independently. But by no means are aircraft plans and many other procurement initiatives independent. If we assume the automatic retention of the present number of carriers, a direct relationship exists not only between USN aircraft requirements and future carrier inventory maintenance but also between these and the procurement of some other ships intended to operate as part of carrier groups.
2. The report uses average age as a basis for replacement needs. In many cases, however, considerable leeway will exist for pushing beyond such dates because of the availability of "surplus" airframes from combat units that have been deactivated. Also, we have often been in error regarding service lifetimes (for instance, the F/A-18C/D may have a longer lifespan than previously projected). Such an approach overlooks various life extension options that have been used successfully in the past.
3. The report (and various proposals that draw on its findings, notably the House Armed Services Committee's fighter restructuring plan) are based on the precise fulfillment of Service objectives, although historically these have never worked out as envisioned, even in the best of times.
4. The report supports some of its conclusions by the use of historical averages, although in fact the procurement picture as a whole is considerably unlinear in its evolution over time. Because

[10]Congressional Budget Office, April 1992. The CBO Report, as a sophisticated analytic treatment, in fact, has been adopted as the basis of certain political proposals, notably the Aspin/Dickinson House Armed Services Committee (HASC) proposal on restructuring U.S. tactical air modernization programs.

fighter modernization historically has been a very high priority, fighter plans are relatively less volatile than others; but straight-lining past experience does not fully capture the scope of the issues we may confront.

Consider just a couple of cases that illustrate the perils of such analysis in capturing the actual evolution of plans (with corresponding implications for budgets and capabilities). For an admittedly extreme case in point of how plans can go awry, consider the USAF's objectives, as laid out in the early 1960s for its 1970 fighter posture. Table 1 compares the projected force with the actual force on hand in FY70 (as seen from a starting point of FY62). The two postures bear little resemblance to each other in terms of force mix, although in total size they are quite similar.[11]

While the divergence in this case between plans and reality may be particularly traumatic because of the conjunction of some extremely potent and rather unique force drivers—such as the Vietnam War, many of the factors combining to overthrow earlier plans can be spotted in other leading cases. Even in the case of planning intervals where funding exists to pursue major modernization initiatives and where the overall planning environment is quite stable (a situation

[11]We must recall, of course, that this side-by-side comparison of planned and actual force structure paints a particularly extreme picture of the degree to which reality can defy our intentions. At least two major forces were at work throughout this period to undermine planning, and these severe perturbations were exacerbated by a number of more mundane but nonetheless important developments. Major developments included the reconfiguration of the U.S. general-purpose force structure away from a nuclear-oriented posture toward a posture built around the flexible response concept and the effects of unforeseen Vietnam War requirements. The former led to a substantially diminished emphasis on long-range nuclear strike forces (and a corresponding reduction in posture plans for such systems as the F-105 and F-111). The latter force also reduced some force elements through major attrition (notably F-105s) and led to immediate requirements for different systems from those programmed. (These include two types of aircraft of Navy design, the F-4 and the A-7, which had not begun to enter the inventory by FY70, as well as the adoption of an attack version of the T-37.) Less dramatic but nonetheless important developments included the diversion to war requirements of funds that otherwise would have been invested in more orderly modernization (requiring, among other things, the retention of older types in the force), certain reorganizational effects, a modestly increased role for the USAF's Reserve components, some acquisition missteps (including unfortunate early experiences with the TFX/F-111 program), anticipating the return to a NATO/Soviet focus in the wake of the Guam doctrine and the end of the Southeast Asian contingency, and an overall increase in emphasis on tactical aviation in general (sometimes at the expense of other USAF forces, such as strategic air defenses, tactical nuclear delivery systems, and other capabilities).

Table 1

FY70 Projected Versus Actual USAF Tactical Posture: Combat Forces in Tactical Fighter Wing Equivalents

Mission Type	Plan (1962)	Actual (1970)
Long-range attack (F-111/F-105)	17.8	4.9
Air superiority	1.0	0.9
Multirole	6.6	24.4
Attack	0.0	0.8
Tactical reconnaissance	6.1	7.6
Air defense fighters	15.6	7.8

describing, for instance, the early 1980s), plans have the tendency not to materialize as written. If we consider projected acquisition plans for major USAF tactical forces in the early 1980s, for instance, when defense resources were not in scarce supply, we find that the anticipated USAF tactical aviation posture for the late 1980s differs from the force structure actually realized.

For another case in point about the ways that some simple indicators may not fully capture the scope of the fighter replacement problem, we can consider the issues of average age and technological obsolescence in the following way. Norman Augustine,[12] for example, has noted that given the steady cost escalation in fighters, eventually over time the posture should evaporate, so that at some point in the 21st century the entire U.S. budget will be sufficient to maintain an air force of only one airplane.[13] This trend is indeed valid, but like perennial warnings about the imminent fiscal collapse of (say) New York City or the global banking system, somehow the reality defies predictions and the city (or the fighter posture) somehow keeps limping along. One major reason that the posture has not disap-

[12]Augustine, Norman R., *Augustine's Laws and Major System Development Programs*, American Institute of Aeronautics and Astronautics, New York, 1983.

[13]One can plot the unit flyaway or other cost of, say, the hundredth production item in a new airplane program, plot these costs versus some index (say first fight or IOC) and find a quite clear upward trend.

peared at the rate that some indicators may have suggested follows from the fact that a given procurement of aircraft translates over time into a much more enduring posture.

We can try to offer one reason by devising an index to highlight some of the true long-term sustainability and, in turn, requirements for USAF fighter forces in the following way. First, we calculate total procurement quantities measured in Fighter Wing Equivalents (FWE). Second, we calculate a cumulative tabulation of total life-cycle FWEs: the sum, over the lifetime of a given type of aircraft, of the number of FW equivalents available in all years in which that type of aircraft was represented in the force structure as a whole.[14] The size of the ratio of the second sum to the first will reflect attrition, the rates at which force structure components become obsolescent or otherwise wash out of the inventory, training base requirements, and a host of other factors. Figure 9 shows the results of these calculations.

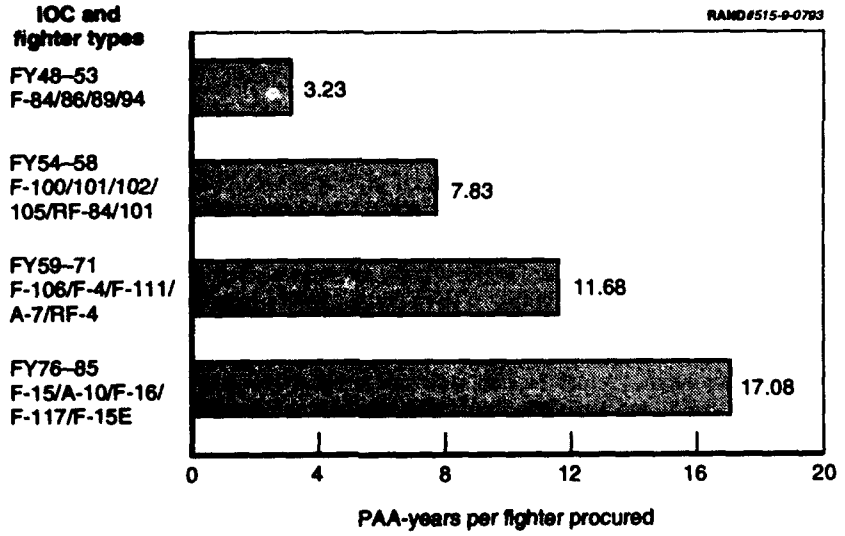


Figure 9—Quantifying Procurement-to-Posture "Yield" of Tactical Air Forces

[14]Active and reserve, and strategic defense as well as general-purpose forces.

As seen clearly in Figure 9 a given buy of aircraft over time has translated into relatively "more" force structure over time because of:

1. Longer-lived systems[15]
2. Reduced procurement for a given unit of posture (resulting from reduced attrition)[16]
3. Smaller training base requirements
4. More true multi-mission capabilities[17]
5. Reduced technological obsolescence
6. Unit cost growth and program management philosophies
7. More rational logistical policies and practices.

In fact beginning with the earliest generations of USAF fighter aircraft, we have, speaking very roughly, seen over time an increase of about three or four years of force structure per airplane bought. Thus if aircraft of the mid-40s to mid-50s era produced about four years each of force structure per airframe, those of the mid-70s to mid-80s are yielding figures more in the 14- to 20-year range. Although this index is very crude, it follows that something like the Augustinian phenomenon will apply only to the extent that the unit costs of follow-on systems are growing faster than the increased service life that each new generation of airplanes enables.[18]

---

[15]Obviously, numerous unique factors shape all these statistics, for instance, externally driven force "attrition" (either in the form of wartime losses or by mandated posture reductions) as well as other factors. But the basic point of the figure remains valid.

[16]In the early 1950s, for instance, up to several hundred Naval aviators were dying *per year* in accidents. It is true, then, that it may well have been safer flying combat sorties during Operation *Desert Storm* than it was to have been in peacetime training at that time.

[17]We can compare, for instance, the experience of the F-86, in which ground attack and air-air capabilities ultimately were fielded in the form of two tailored aircraft (the F-86H and F-86D/L, respectively), with that of the F-16, in which the same airframe could perform both missions—although some specialized modifications have been made for particular roles (as with the ADF version and CAS/BAI equipped models). One should note in passing the gradual disappearance of the specialized tactical-reconnaissance oriented fighter to, ultimately, a pod-equipped standard issue version.

[18]The additional costs of modifications are not taken into account, of course, nor are various penalties associated with operating older and, in some cases, significantly

In short, various one-dimensional statistics often do not capture the full scope of the possibilities before planners concerned with force management. Traditionally we have seen the most flexibility and innovation in such regard when we are forced to be creative by procurement deficits; there is no doubt that the future will witness many innovations that may not now figure centrally in our plans.

Basing future funding possibilities on historical data is a useful but by no means conclusive way to conduct analyses about possible future resource levels. No matter how much of a historical pattern may exist within (or among) various force, appropriations, Service, or other accounts, such patterns within the context of the available history (tending to describe a steady-state budget insofar as various levels of effort are concerned) are subject to large enough fluctuations year to year that particular funding "bulges" may similarly be accommodated in future budgets.

More generally, it does not make much sense to presume that all the other historical predicates for defense planning should go out the window (because of epochal worldwide shifts in threats, domestic priorities, or what have you) while internal budget relationships follow traditional "global war" patterns. New policies and approaches to planning—including alternative active/reserve, forward deployment, and other readiness choices, industrial base concerns, and much more—would seem to imply at least the possibility of significant, if not overwhelming, changes in the way U.S. defense resources are allocated among competing force candidates. More substantially, we may opt for major policy shifts that might have much larger import for the way that defense resource priorities are set. In short, while it is assumed that the perpetuation of traditional ratios within the overall defense budget can provide some useful insights, it does not follow that a historical pattern should somehow remain sacred when every other planning assumption is up for grabs.

A related fact is that while we often overestimate what our budgets can deliver in terms of fieldable force structure, sometimes we do err

---

smaller fleets of given types. On the other hand, these probably usually are substantially smaller than the operational costs associated with maintaining larger fleets (with corresponding training bases) and of continually reequipping units with new models (with associated turnovers in the necessary logistical base).

in both directions. This fact follows directly from the volatile and cyclical character of defense budgets over time, and it is highlighted by a comparison of planned versus actual Five-Year Defense Plans (FYDPs) since the mid-1970s. Figure 10 shows the difference between the total value of various five-year defense plans dating from FY76 and the actual amounts, measured in constant dollars. As one might expect, in most cases, the total actually available falls short of the amount projected in advance—but during the then anticipated effects of the early Reagan buildup does exceed, in total, the amounts projected in the late 1970s and early 1980s. Although the effects probably will never be as traumatic as the ones shown here, we must (barring catastrophic developments) at least allow for the possibility that we have not accurately forecast real budget outcomes in, it turns out, either direction.

Looking beyond the top lines we also find that while we can and do fall short in many of our plans (more specifically, we wind up with fewer aircraft than we otherwise would have deemed desirable or necessary to maintain a given force structure). We have also occasionally been too pessimistic about the prospects for force modernization and sustainment. During the mid-1970s, for instance, pub-

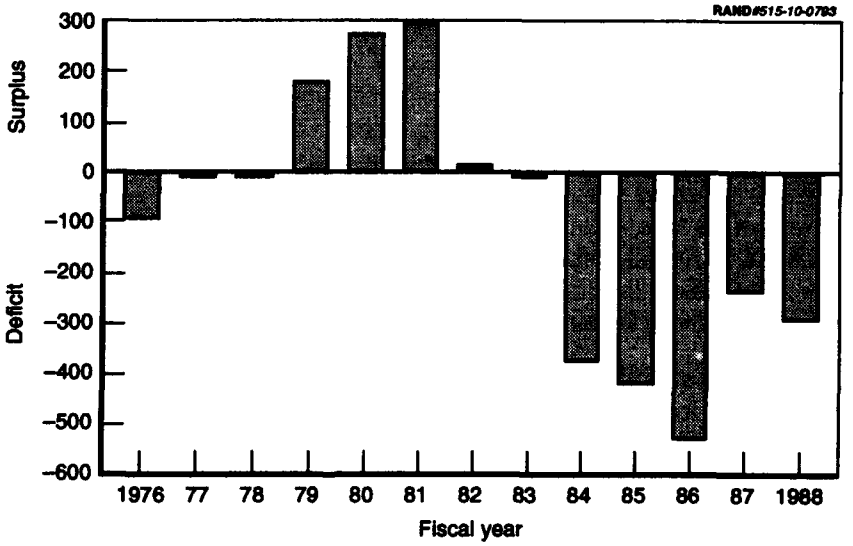


Figure 10—Five-Year Budgets with Respect to Plan ($M, FY93)

lished plans for follow-on aircraft programs of several types were concocted in a generally pessimistic budget atmosphere. But because of unanticipated developments, these budgets were adjusted upward, in some cases significantly. Table 2 shows the total buys for some selected aircraft programs as laid out through FY 1976 and compares those quantities with the actual buy totals through FY92.

One of the most interesting things about the data given in Table 2 is that the force levels envisioned both for the mid-1970s procurement objectives and for the total buy quantities (as these unfolded during

Table 2

Procurement Quantities: Plans Versus Reality, Selected Programs

	Procurement Quantities[e]	
Program (All Types)	Total Planned in FY76	Actual Through FY92
F-14	390	632
F-15	729	1083
F-16	650[d]	1985[c]
F/A-18	800[b]	918[a]
A-10	733[f]	707
AV-8B	336[b]	276
A-6E	93	205
EA-6B	77	165
E-2C	65[b]	139
AH-64	472	811

NOTES:

[a]Procurement of F-18C/D continues after FY92; LRIP F/A-18E/F programmed for late 1990s.

[b]FY77 Plan. FY75 Plan was for 36.

[c]Limited procurement after FY92.

[d]Considered subject to revision upward; this figure represents U.S. portion of initial buy (including Euro consortium) of 1000. Plan in FY82 Defense Report given as 1388.

[e]Plans data generally exclude R&D and prototype aircraft, always excluded from actuals. Numbers exclude conversions (e.g., A-6A to A-6E).

[f]Goal revised upward to 825 in FY81; reduced to 687 in FY82.

the 1990s) are generally identical.[19] In other words, the issue of note behind the data given in this table concerns the rate of modernization of force structure and not its expansion. These data imply, to the extent that the acquisition goals laid out in the mid-1970s were envisioned as ultimate ones,[20] that planners envisioned either a smaller force structure for the future, a possibility that is not supported by any other evidence or that a much less substantially modernized force, in fact, comprised the contemporary force structure targets. On the proposition that remaining at or near historically characteristic force levels was the goal, of course, at some time it would become necessary to remedy the inevitable obsolescence problem associated with the original procurement rates programmed. In other words, it was a foregone conclusion, even at the time, that at some point it would be essential to pursue modernization initiatives subsequent to those indicated in this plan.

In actuality, of course, the planners proved to be quite in error about future resource availability: their expectations, made under conditions of then-current budget stringency proved to be too pessimistic in light of actual developments. Such outcomes are to be expected in a business as uncertain as force structure planning. Even with the materialization of substantially greater resources than were once anticipated, however, it was not worthwhile to contemporary policymakers to make the decisions that would be required to increase the size of force structure substantially above either planned levels or historically typical ones. On balance, then, this case study illustrates

---

[19]Although increasing overall TAF posture size was discussed during the 1980s, the actual buys were consistent only with the maintenance of the posture that had been more or less in hand not only in the early 1980s but in the mid-1970s, as well. The attainment of larger force goals, e.g., procurement of the Navy aircraft required to support, say, a 16-carrier inventory, would involve acquisition increments well beyond the ones shown here. (Since production, at the end of the 1980s, is tapering off for most if not all of the types displayed, and since deficiencies exist with respect to the maintenance of even baseline 1980-era force structure, one cannot attribute the larger buy quantities to any larger force structure.)

[20]Of course, the option of extending production of types beyond planned objectives always remains. For one case in point, the ultimate F-16 program size was expected to rise beyond the 800 or so aircraft shown in the table. Even so, the pre-1980s buildup goal of 1388 F-16s was pretty much oriented toward the replacement only of active component F-4s. Thus, the expansion of the total F-16 program procurement beyond that level has enabled a faster degree of modernization of Reserve Component forces than might otherwise might have been anticipated.

that the key variable associated with abrupt shifts, in this case a relatively atypical one in the direction of increased investment resources, concerns the speed with which force structure is modernized, not (much rhetoric to the contrary) the size of the force in any major way.

THE CASE FOR RETAINING OPTIONS

Handling the mundane aspects of the drawdown anticipated under the Base Force concept will be trying, to say the least. Under routine Cold War conditions, such tasks as achieving the orderly transition of new equipment into the reserve components, maintaining a balanced personnel pool, scheduling deployments and unit rotations, upgrading and modifying in-hand forces, and such other ordinary tasks represented major scheduling, logistical, and other planning problems. Now, of course, we are confronted with the exceptional task of achieving major Guard and Reserve modernization on an unprecedented scale. Issues include dealing with the consequences of base closures, the withdrawal of forward units to stateside locations, the establishment of new combat organizations (such as USAF composite wings), contending with the extended aftermath of the Gulf contingency, attempting to plan our ongoing personnel drawdown to retain the correct mix of skills, experience, and a host of other matters.

Needless to say, this task is very difficult. To undertake such challenges in an atmosphere of uncertainty regarding the ultimate force structure targets amplifies these problems to the extent that we may be justifiably concerned about the dissipation of some of the impressive capabilities that we worked for more than a decade to put on line and that decisively demonstrated their value in Operations *Desert Shield/Storm*. A sense of the magnitude of the issues involved can be captured by posing just a couple of questions that we need to resolve at some point regarding not only fighter force posture but other force questions as well:

1. Is it realistic to assume that the longer-term U.S. posture (that is, the one that will emerge around the turn of the century) should preserve all the hallmarks of the Base Force? As the longer view becomes a little more clear, perhaps rather different priorities will emerge, and it may be necessary to depart from the relative levels

of effort (in terms of Service budgets, force structure, personnel allocations, etc.) that presently underpin the Base Force.

2. Should the foundation for U.S. force structure planning continue to be heavily based on such traditional considerations as threat capabilities and scenario requirements? Such factors must be injected into *any* planning approach. At the very least, such considerations are necessary to test the adequacy and efficiency of our combat capabilities, to provide a basis for the preparation of detailed plans, etc. But everything about our Cold War experience with the types of intermediate-scale contingencies now at the center of our planning framework suggests that our a priori estimates of force requirements, the contingency plans developed in advance for these contingencies, and the ways in which conflicts unfold have been dramatically at odds with what actually transpired. One "virtue," if you will, of having the Soviets as an adversary is that their raw capabilities were so formidable and diverse that almost anything could be justified in terms of forces and operational preparations. The force structure that we had devised for a global war scenario was diverse and sizable enough to permit substantial improvisation for the other sorts of conflicts we actually fought. With the dissipation of this two-edged "luxury" and the overall downsizing of our posture, we have the justification neither for an all-purpose set of capabilities nor the maintenance of large de facto reserves from which we could draw to meet the often bizarre contingencies thrust upon us.[21] Can we expect both the future to be clearer and our ability to predict the specific needs of what have tended to be unusual regional contingencies to be sufficiently more accurate that we can continue to rely on a threat- and scenario-dominated approach to planning? Also, we do not have to explore alternatives to these traditional planning formulas?[22]

---

[21]The recent Gulf contingency provides numerous illustrations to this effect. For instance, the force structure fielded by mid-January 1991 bore little resemblance in size, mix, or committed units to OPLANs developed for that region. The same was true of Vietnam and, to the extent that coherent plans can be said to have existed, of Korea.

[22]One major but largely unaddressed issue concerns the question of desirable "strategic reserve" capabilities (i.e., the size and capabilities of the residual force available after potential contingency deployments and, perhaps, essential minimum forward deployments and certain overhead burdens are factored out).

3. **Should the existing allocation of roles, missions, and responsibilities, as codified originally in various post–World War II legislation and agreements, be retained; or are some alternatives, possibly involving redistributed roles, missions, responsibilities, areas of geographic specialization, etc., more appropriate given possible future realities?**

Examining the evolving debate over force structure plans and prospective defense budgets through the 1990s provides some reasonable points of departure for assessing current plans and alternatives. First, if we assume that we adhere as closely as possible to current budget and force structure plans, modernizing the U.S. fighter force posture probably will be difficult at best. The odds that every aspect of the future modernization context will play out according to present plans are probably close to nil.

Considerable relief will be gained by departing from present procurement and force replacement schedules using historical experience as a guide. For instance, the flavor of much nascent criticism of proposed fighter modernization plans suggests that the key issue to be resolved is the restructuring of current plans to fit under proposed or alternative budget ceilings. But if budgets come down, alternatives exist to fooling with procurement schedules and plans: schedule changes, reduced organizational concepts, readiness and deployment restructuring, various force structure life-support measures, etc. *The historical record indicates that a very diverse playbook exists for modernizing despite apparently insurmountable funding problems.* This should not be taken as advocacy for a kind of "somehow it'll all work out" approach to fighter modernization; however, substituting rigid alternatives for rigid plans probably is not the best alternative.

WHEN SHOULD DECISIONS BE MADE?

Urgency is perhaps the most important issue. Do we really need to lay out a detailed plan for fighter force structure for the next two decades? Many of the really important decisions about follow-on programs are several years away. Although definitive near-term choices about future programs may save hundreds of millions, or even billions, of dollars in future years; we would pay for such savings with an enormous loss of options for a future planning era in

which priorities, budgets, and requirements are bound to change. Following a conservative approach and continuing to develop the next generation of fighter forces at a measured pace is prudent and responsible when considering the costs of such an approach compared with the total defense budget, the uncertain conditions that face us over the short and long term, and our poor track record in predicting what systems can and should be acquired. *In short, we would be ill-advised to compress the near term and the longer term into a single planning problem by preselecting the options we think we might want several years down the road.* The future, after all, is not a product of our short-term choices: that applies to even our most grand strategic deliberations, never mind the particulars of our weapons programmatics. Our ability to predict future weapons programs is limited (even with far more stability than we have today). It seems reasonable that our program choices should be sufficiently flexible to accommodate to changing circumstances.

Even with a substantial future augmentation of the resources to be invested in air power in general, we will be limited in the degree to which we can replace many of these future inventory losses with systems of a given type. If the posture we will have through the end of this decade is more or less what we have already bought, then the forces that will serve for the first few decades of the next century will be those that are on the drawing board today. Our options here are not infinite, and it is clear from a survey of feasible choices that some important posture features can be forecast with some reliability.

A near-term approach that both preserves options and does not sacrifice during the complex drawdown process the very formidable capabilities we have spent so much and worked so hard to obtain is a prudent policy. If we view the chronological dimensions of the present fighter force modernization problem as sequential and not simultaneous, we will be better off in the long run, although we may have to pay a little more up front for the flexibility to make certain choices later rather than earlier.

Chapter Five

THE MISSION MIX OF FUTURE U.S. TACTICAL AIR FORCES

The debate over the possible reconfiguration of our fighter forces is blurring some key issues. The primary job before us, perhaps, should not focus on such tasks as determining how best to fill up available carrier decks, whether to prototype, or how to fit procurement plans beneath historical and statistically predicated ceilings of budget feasibility. Rather, the questions to be addressed might be restructured more usefully to address:

1. The total set of national air combat capabilities we should seek to maintain given the potential requirements of the future
2. The most efficacious, balanced, and affordable ways of putting these capabilities on line.

This complex and far-reaching assessment, moreover, must be completed against the backdrop of the near-term realities of managing an unprecedented drawdown and reorganization of existing combat resources so that the legacy of the buildup of the past decade is not squandered.

Larger questions of ultimate goals and capabilities have received lip service, but there has been little discussion about reconciling the many operational and resource issues involved. Such analysis would go far beyond the simple task of refreshing current aircraft inventories with new airframes. More importantly, we need to conceive of:

1. A larger image of how air power would contribute to the pursuit of national objectives in what might be a very broad range of possible contingencies
2. How the potentially opposing qualities of peacetime efficiency, deterrence potential, and wartime effectiveness (again, under a broad range of scenarios that might include some based on altogether new contingencies) are to be balanced
3. How available and planned aircraft resources could be modified, equipped, armed, and employed so as to get more meaningful capability from whatever posture we already have in hand
4. How traditional tactical air capabilities should be integrated with other means of delivering firepower (including long-range bombers, missiles, combat helicopters, etc.) and with the various intelligence, control, communications, and other support resources that, when melded skillfully, make the difference between an air force that looks impressive on paper and one that can really get the job done—as was most amply evident from the recent Gulf episode.

These questions clearly involve issues that range well beyond the scope of this report. It is also evident that whatever our answers, we can still posit some relevant principles about fighter force modernization. For instance, the proper balancing of total force quantity versus the requisite performance requirements of that force is an essential consideration. In the mid- and late 1970s, as noted previously, much of this kind of discussion took place under the rubric of a so-called "quantity/quality quandary." The issues today are similar, but differ in some important respects. The quality-versus-quantity issue of previous eras focused mainly on aircraft characteristics as well as force structure configuration (for instance, how necessary such attributes as supersonic speed or beyond visual range detection and engagement capabilities truly may have been). Today, many developments (technological, military, conceptual, and doctrinal) have reshaped the basic issue with a focus on an emerging revolution in the potential decisiveness of air operations.[1] Basing our future force

[1]For instance the follow-on missile to the *Sparrow*, AMRAAM, permits relatively less sophisticated aircraft to participate in the long-range air battle, as do a variety of improvements in various electronic and other capabilities. After some "teething pains"

structure on historical rules and principles, for example, the ability to prevail in a set-piece early-phase air superiority battle or the ability to rack up various arbitrary percentages of selected enemy target rosters may not best exploit the promise of such new capabilities.[2] Finally, a singular focus on the affordability of particular programs in the near term risks ignoring the truly noteworthy questions now before us.

Examining the question of tactical-air-posture mission mix and size illustrates many pertinent points of particular importance in the future. A key consideration in fighter force planning for both USAF and Navy/Marine air elements has been the need to balance between numbers, mission mix, and force quality within the overall context of resource and other constraints. The inevitable consequence—the emphasis within both the USAF and USN/USMC air elements on multirole fighters (MRFs) and specialized units—has succeeded in maintaining sufficient numbers of forces while assuring a reasonable mix of assets. Even so, the high costs and various other difficulties associated with some forces—and in particular, forces for long-range precision attack—have led to various force imbalances. Both Services basically had no shortages of air superiority or multirole aircraft. The former is a result of the high priority placed on these programs in the initial phases of the buildup of the present modern air posture in the 1970s.[3] The concentration on MRFs reflects unique

---

and false starts, advanced air-to-ground munitions seem now to be coming fully into their own and should permit new approaches to air campaign planning. New technologies, such as those to be installed on the E-8 JSTARS aircraft, should revolutionize the conduct of attack operations in a future conflict. Stealth, while very expensive, requires some totally new approaches to planning and holds the potential for achieving decisive and prompt results in what previously had been the most difficult part of a total air campaign, namely the early attainment of decisive air superiority. The requirement to defeat a breathtaking Soviet style "air operation" involving literally thousands of aircraft on both sides also seems to be outdated for in planning purposes.

[2]It should be noted, however, that such capabilities as cited above nonetheless could remain important in some scenarios. Moreover, analysis of force options employing these operational criteria remains useful for many reasons.

[3]As Service planning began to turn away from the requirements of the Southeast Asian conflict toward traditional planning for conflict with the Soviet bloc, the top aviation priority was putting air superiority forces on line capable of defeating a numerically superior and qualitatively improving Warsaw Pact air threat. Between FY73 and FY79, procurement of high-end F-14 and F-15 aircraft, for each Service, amounted to fully 3/7 of total fighter attack aircraft procured (with most of the balance going to low-end attack aircraft intended primarily for battlefield air support).

Service-oriented features and often is associated with the relatively low unit cost and flexibility of these aircraft.

On the other hand, traditionally the operational requirements of aircraft intended for the technically most demanding missions (air superiority or long-range attack) have given rise to aircraft that cost considerably more on a unit basis than less sophisticated ones *for a given set of intended applications.*[4] As more is expected of each platform, this disparity becomes larger. To maintain a total posture of a given size makes it difficult to stock an inventory entirely with such high-end systems. To recall a point made earlier, just this situation in the mid-1970s led to the decision that both the USAF and Navy should adopt a so-called "high-low" approach to force planning. High-end systems, such as the F-15 and F-14, would be complemented by what began life as "lightweight" (or "air combat") fighters: a systems concept that evolved into the present mainstays of the USAF and Navy postures, the F-16 and F/A-18.

Over time, both systems grew considerably in intended mission and cost to emerge as full-fledged multirole fighters. In so doing, they filled a classic niche in the U.S. fighter posture design philosophy. The U.S. emphasis on multirole fighters represented a complex dovetailing of resource constraints, requirements for relatively large numbers of "inventory filler" aircraft, and overall posture flexibility. In a major contingency, multirole assets could be assigned to various missions as needed. For instance, in the early days of a European conflict when enemy air attacks would be most intense, F-16s could play fully in the air defense battle, "swinging" to ground attack

[4]Obviously the relationship between the cost of a given aircraft design and the mission depends on factors other than the mission; for example, the operational scenario within which the mission is to be performed, the specifics of the threat, the availability of supporting, complementing, or substitutive forces, etc. In some cases, the counter-air mission might require maximum reasonable capabilities, while in others, a less ambitious design will do. Because the United States has maintained a flexible posture intended to operate in a broad range of scenarios against many possible opponents, however, and because the costs of overtailoring one's force against all possible threats with a broad range of high and low capability within a general mission tend to be unacceptable, overall, the U.S. has tended to design to relatively stringent operational standards within the constraints imposed by costs and force structure (including net quantitative) requirements. Some, including Secretary Aspin, have argued for revamping this approach to a posture with more internal "tiers" of capabilities, the high end being referred to (presumably generically) as a "silver bullet" force.

missions as an aerial threat abated.[5] The emphasis on numbers of systems (to be met by a combination of more expensive specialized aircraft and larger numbers of less expensive, less capable multirole systems) was a reasonable policy in light of the very large air postures maintained by potential U.S. adversaries.[6] Also smaller and (in the case of the USAF) single engine fighters were designed whose characteristics were consistent with the geographical and other aspects of likely European and Korean theaters (short ranges, requirements for large and efficient support bases, commonality with allied air forces equipped with like forces, etc.). Such systems also lent themselves to other missions, such as reconnaissance, defense suppression, close air support, and nuclear alert. The USAF also found its F-16s an excellent choice for the air defense mission and a good means for modernizing and standardizing the assets of its Guard and Reserve components.

The Navy, given carrier deck-spot and other limitations, also has been quite clever in designing a posture "neck-down" plan to exploit the flexibility of F/A-18s. The commonality of these forces for both Navy and USMC missions also afforded certain logistical and training savings. In short, the multirole type aircraft (such as the F-16 and F-18) seemed a good solution to a range of demanding problems associated with the operational and technical particulars of the major Cold War theaters of operation. Considering that both the USAF and USN/USMC now possess and will continue to maintain substantial multirole fighter complements and because the budgets to replace these forces at the end of their effective lifecycles will be large even if follow-on multirole programs take on relatively austere or numerically constrained forms, the balance between specialized and multirole capabilities remains a critical issue. The question of MRF replacements could become even more important given the fact that such aircraft are even now seen by some advocates potentially as outright substitutes for more expensive single-mission systems.

---

[5]It should be noted that this "swing" is easier said than done. The demands for high proficiency, combined with reduced training time, often mean that some Guard and Reserve forces are specialized for a single role (e.g., ground attack), even though they are nominally designated as multirole units. Active forces are more likely to have multiple operational capabilities.

[6]Adversaries whose concept of operations, it should be added, stressed a brief, intense, and possibly short-notice combat phase.

A key question relating to long-term U.S. fighter force configuration thus becomes the relative emphasis to be accorded to alternative mission mixes of future aircraft within each Service's posture. This matter leads immediately to the question of what capabilities future fighter inventories should retain in terms of operational objectives. With the requirement for large numbers of systems no longer as compelling as it may once have been in the historical U.S./USSR aviation balance, we clearly need to review overall requirements for force size trade-off with the need for special-purpose platforms.[7]

The answers depend on the outcomes of detailed analysis and reflection, but the recent experience of the U.S. Navy in the Gulf contingency is very suggestive in this regard. On a mission-by-mission basis, Table 3 shows available USAF TAF forces at the beginning of the Gulf War (in squadron equivalents), the size of the force ultimately deployed, and the fraction of the force available of each general mission type that was deployed (as "percent com-

Table 3

USAF Force Commitment to the Gulf Contingency by Mission Type: Actual Force Assessment

Force Element	Fighter Squadron Equivalents Available Worldwide	Total Committed Force	Percent Committed
Long-range attack	10.6	7.1	67
Air superiority	21.1	5.2	25
Attack/CAS/BAI	20.7	6.0	29
Multirole	44.2	10.0	23
Defense suppression/EC	5.3	3.5	66
Tactical reconnaissance	7.5	1.0	13

[7]A word about the use of the term "capabilities" as it appears here is in order. Modern MRF forces have evolved to the point where they bear little resemblance to the concepts envisioned by proponents of the original lightweight fighter. A Block 50 F-16C with LANTIRN or AMRAAM, or an F-18E/F, hardly would be considered a classic MRF in the sense in which that term was used in, say, the mid-1970s. Nonetheless, various system and other performance limitations remain on such forces under the most demanding operational conditions, and cost issues associated with more-specialized aircraft such as the F-22 or A-X, in any event, will keep heavy MRF-emphasis attractive for many.

mitted"). As can be seen, the vast majority of our long-range attack aircraft and defense suppression assets were committed; the same does not hold true for the MRF elements of the force posture.

We could do the same calculation for the USN/USMC, with slightly different results (and with different significance) because of the nature of the contingency, Navy/USMC worldwide force availability, etc. No matter how one approaches the problem, the United States would seem, under the Base Force and even the sorts of smaller force structures that have been mentioned in the press recently, to have the general sort of aircraft numbers on hand to meet two concurrent major regional contingencies. But such raw data conceal some very important issues with major implications for long-term planning.

First, as we saw in Table 3, the majority of USAF long-range attack resources were more or less completely consumed by this one contingency and would also be consumed under the Base Force, never mind any reduced force, objectives. True, not every contingency would involve the same combination of targets, ranges, etc., as did *Desert Storm.* Also various technological advances (such as LANTIRN and advanced munitions) could help relieve the total burden on our long-range fighter-bombers (as would employment of what used to be designated as "strategic" bombers). Nonetheless, the operational and strategic requirements for massed employment of long-range airpower in the early stages of conflict remain and so too will the pressures on this part of our inventory.

Furthermore, while perhaps we could make do with fewer strike squadrons, the issue of particular attack capabilities (such as stealth and various other precision attack forces) looms as very substantial. As Secretary D. B. Rice and others have pointed out, during the early critical days of that conflict, the numerically modest F-117A contingent on hand covered a disproportionate number of critical targets while only flying a small fraction of the total allied sorties.[8] If we look beyond these combat resources toward other vital capabilities—including electronic combat resources, communications, aerial refueling, and the total logistics picture—we find other cases in

[8]See, for instance, Donald B. Rice, *Reshaping for the Future,* Department of the Air Force, 1992, which summarizes Secretary Rice's 20 February 1992 testimony before the House Armed Services Committee.

which well over half of available units or capabilities were committed to the Gulf contingency.[9]

Even in the pre-drawdown posture, these capabilities are all scarce assets, and they will be not only scarcer but also potentially more in demand, since future conflicts could well witness a premium on quality of forces, limitation of collateral damage and friendly casualties, and the rapid attainment of operational results. Judging from public statements and recent experience, the Unified Commanders place a fairly high premium on the priority availability of air power capable of enabling the United States to destroy critical targets at all ranges within enemy territory. Put slightly differently, if we were to add up the force requirements in the various CINC warplans, we would probably find that one of the most notable gaps between this cumulative statement of demand and actual force availability would be in the areas of long-range attack aircraft and those defense suppression and other forces that would permit air operations throughout the theater at acceptable costs.

In short, both in the pre-drawdown context and in the Base Force (or alternative) era, probably we are not likely to experience overall numerical shortages in available aircraft. With a 26.5 TFWE force, for instance, the USAF could (provided it had the logistics, mobility resources, communications, munitions, etc.) deploy seven to nine wings to each of two contingencies, while maintaining three to five TFWEs in other forward theaters, and allowing another three to five TFWEs for units undergoing type transition and other purposes (including the maintenance of a modest rotation base). If one or both regional contingencies arose and evolved into protracted or more severe than expected conflicts, rotation and attrition shortfalls would occur. However, factoring in Navy/USMC forces plus any allied capabilities (as well as some non-aircraft substitutes), probably the U.S. could endure even this situation. For smaller overall forces, the situation becomes more problematic. If U.S. TAF resources overall did not fall below, say, a combined total of about 32 to 34 TFWEs (counting all Services), we probably could still cope with these situations, although different problems, potentially serious,

[9]Beyond this, questions concern the availability of critical resources called on during especially the most critical deployment phases of Operation *Desert Shield*, a topic beyond the scope of this report.

would begin to emerge. Even with forces somewhat less than specified in the Base Force plan and providing that the United States maintains *adequate readiness, training, communications, weapons resources, and mobility resources,* we can meet the numerical requirements. Force mix issues, however, pose a different set of problems.

Now more than ever, the question of "how much is enough" remains most uncertain. The tactical fighter-attack capability required to meet the total roster of potential requirements in the evolving new security system depends (even in the most general terms) on factors, guidance, and other choices yet to be made. Subordinate issues of how that capability is to be provided pose additional vexing questions, for instance, in what circumstances and numbers and by which Service. Regardless of the ways our analysis, judgment, and other deliberations may inform our approach to these issues, the additional facts remain that even consensus solutions must be compatible with equally uncertain resources and related matters. During the global war planning era, the United States (within the coalitions in which we participated) generally relied extensively on airpower to offset numerical advantages enjoyed by potential adversary forces. The degree to which such capabilities would substitute for additional forces of other types and the ways in which these forces would interact with ground and other capabilities were always analytic hot potatoes.

In the emerging security environment, probably the reliance on tactical fighter forces to offset numerically disadvantageous ground force balances will be less important overall. Nonetheless, important overall force trades must be considered. In many scenarios, very formidable aviation forces can be deployed much more promptly than large ground formations can be moved. Major trade-offs are available that relate to the speed needed for certain operational effects to be produced by the various available means. Also some politically and strategically based issues (relating to casualties, prisoners, collateral damage, tolerance of host governments to different kinds of presence deployments, etc.) influence the ultimate design of our total theater force posture.

POSTSCRIPT: THE QUALITY/QUANTITY DEBATE REVISITED

For at least a generation, the issue of force affordability has been discussed continuously. The debate relating to tactical fighter forces often has been framed in terms of a so-called "quantity versus quality" trade-off. Proponents of the former school have contended, among other things, that the expected additional operational payoff of adding increased capability to major weapon end items does not yield results worth the investment required. A variety of historical data frequently is cited to show that technology does not perform as well in real combat circumstances as expected in advance. Various tactical conditions and realities are cited as favoring a quantity-oriented emphasis. Opponents of high-end weaponry also have cautioned against the perils of losing sight of larger strategic goals by focusing too much on the qualitative balance between opposing forces that, although important in their own right, represent only one dimension of potential overall campaigns. The advocates of a relative emphasis on a quantitative approach to force design also include various logistical, human factors, and related points.

On the other hand, one finds (in this admittedly oversimplified summary of a long-standing and complex debate) advocates who believe that the relative emphasis in our force planning should be on the quality end of the equation. Here, too, one finds many persuasive arguments. Examples are the arguments that the West as a whole has required technological superiority to offset numerically superior communist bloc forces, that U.S. forces require a high degree of qualitative capability to permit the rapid attainment of war objectives (by most efficiently using available combat forces), and that the relative costs of labor and technology in Western market economies favor a concentration on military capital.

Over the past couple of decades, this debate has seesawed. This development is not surprising given the nature of technological evolution and the fact that planning for war, like actual conflict itself, represents a contest between adversaries who will continually strive to adjust the potential circumstances of combat in advantageous directions. Regarding the design of many sorts of forces (but especially fighter forces), the United States has elected to pursue what once was known as a "high/low" mix. The U.S. military position was designed

both to put on line a posture that combined some very high performance forces with other, individually less capable combat elements that could be afforded in larger numbers. The results of this balancing act have been variously praised and damned as representing a prudent set of hedges and failing to rein in certain groups with what have been perceived to be arbitrary political and bureaucratic interests. That aside, however, perhaps the most compelling case to be made in terms of a mix of capabilities has followed from the fundamental characteristics of the global war military balance. Given the size, diversity, capability, and multitheater nature of potential Soviet-bloc military challenges and the realities of peacetime defense budget constraints, a balanced approach has tended to seem the best response to a threat that would place severe stresses on both the number and capabilities of the available U.S. forces.

Historically as we confronted a Soviet-led military threat that tended to stress large numbers of relatively lower quality (although in some cases significantly improving over time), the arguments for a maximum reasonable level of performance in the design of our individual weapons generally was compelling in a straightforward way.[10] However persuasive this proposition might have been, the additional consideration remained that characteristic budget levels (in which the current modern fighter posture for the global war force structure was conceived) were insufficient to support an "all high" fighter force in either the Navy or the USAF. Resource constraints led to the adoption of a high/low mix for both the USAF and Navy. Although the ultimate outcome has followed lines quite different from those originally envisioned, the mix of force capabilities put on line came to reflect a complex balancing act among a number of considerations. Two outcomes of this process were the acquisition of aircraft specialized for some missions and a large force of multirole fighters that could "swing" from one role to another in a potential

[10]It should be noted, often some debate occurred concerning what level of performance in U.S. systems represented "excessive" capability in one of two senses: (1) that the acquisition of "too much" capability might increase unit costs so much that requisite numbers, still demanded by the sheer scale of the adversary threat (and the possibility that U.S. forces might be engaged in several simultaneous locations), would become unavailable; or (2) that going too far along advanced capability curves was logistically, doctrinally, and even tactically unsound because of how real world engagements might unfold. These would be influenced strongly by adversary counters to specific areas of U.S. superiority.

large-scale conflict, particularly if one with the Warsaw Pact in Europe evolved.

Thus a balance of sorts emerged in planning among the different elements of the overall fighter force that since has constituted the overall U.S. TAF. The maintenance of forces with very advanced capabilities reflected the basic realities of the general East-West balance. Also the forces of the U.S. and its allies not only depended vitally for success in combat on air superiority, but it was necessary to defeat numerically larger forces with a smaller force, a situation that did promote the design of a force with high-end attributes. At the same time, costs and the very large, diverse, and complex scale of a potential war (particularly in Central Europe) demanded maintenance of substantial numbers of fighters. In short, in all its manifestations, the U.S. tactical fighter force was designed with the characteristics of the very demanding global war contingency in mind; that contingency very significantly affected how forces were designed and melded into a total posture.[11]

With the devolution of that contingency, however, the overall rules of the force design game may have begun a fundamental process of change. The Gulf War experience seemed to endorse quite strongly the contentions of those advocates who had argued that quality had been shown in the end to be the best route to successfully attaining U.S. strategic objectives in a major regional conflict. On the other hand, it is quite true that the Gulf War manifested features that although quite favorable to air power in general might not be replicated in certain other substantial regional contingencies (e.g., major contingencies where weather, the ground environment, enemy forces and operations, etc., might have presented a less tractable overall "target" for U.S. air power when taken all together). Even so, it is not clear whether such circumstances could be addressed by alternative means of application of air power. Also it is not clear if the possible nature of such conflicts and, by extension,

[11]U.S. posture for the contingency also affected total force configuration in other ways. For instance, the ranges from bases to targets characteristic of a Central Front scenario naturally would lead to a different kind of fighter design (particularly for a multirole, "lower end" fighter aircraft) than if the planning scenario of interest had been characterized by a much larger relative theater of operations, one with a different basing environment or air defense threat, etc.

their inherent U.S. war goals would endorse a particular alternative posture. For instance, under less auspicious overall circumstances, the argument for a high-end air force might be less compelling versus the case for another kind of tactical fighter force. Possibly the role of air power of any and all kinds might be fundamentally different without any regard to the kinds of aircraft that might constitute the U.S. posture. Such complicated issues, of course, will have to be confronted in our future budget and force planning deliberations.

Chapter Six

CONCLUDING REMARKS: IMPLICATIONS FOR NEAR-TERM BUDGET AND PROGRAM CHOICES

In this report, we have reviewed several issues that inform the future prospects for U.S. fighter force modernization. The current set of modernization plans are a bit "dicey" in light of budget plans; further, various developments could push plans across the line into the realm of unfeasibility. The present set of budget and force modernization plans are not absolutely rigid. If a substantial historical record is any indicator, a range of possible techniques for mitigating the various adversities is available to keep the force structure in reasonably good shape, at least over the short run. Arguments that programs can be cut or restructured on the basis of the contemporary force and budget calculus are less persuasive than they might be under more routine circumstances. It is virtually certain that some key elements of current plans will change, possibly in major ways; thus it seems even more important not to foreclose various force modernization options in the short term.

One luxury often criticized as redundancy, or "oversupply" of forces, etc., has been that the resulting diversity of programmatic and operational options has enabled us to cope with the unforeseen in relatively efficacious ways. This flexibility has been apparent in our operational experience over time; for instance, the aviation forces (like our ground units) participating in the recent Gulf contingency, for the most part, were *not* those specified in prewar plans. True, we had a generous amount of time to retool our preparations and consider alternatives. Also our ability to put together what proved to be an extremely effective set of capabilities benefited from other fortu-

itous breaks that we should not reasonably count on occurring in every future scenario.

Thus a general rule of considerable import remains: the smaller our force structure becomes, the greater the risk to our ability to meet uncertain demands. The premium for better planning before a test of our prior choices is thrust upon us. This phenomenon, which is true for U.S. defense capabilities of all kinds, should promote a healthy respect for the requirement to maintain as many choices as possible. Depending on the costs of retaining more rather than fewer short-term choices, a strong case can be made for sticking with current plans to the extent possible and deferring major restructuring choices for at least a couple of years. We believe that the costs at stake, in fact, are sufficiently low to say that this course of action is justifiable.

To conclude, we might note that recent circuitous paths in the plans of the U.S. for tactical aviation modernization provide us with an opportunity to draw a couple of lessons about the planning process overall, particularly insofar as investment options are concerned. The current plans are far more than vague or generalized "guidance" for future options: that they often do not work out as planned is not an appropriate basis for arguing for a more casual approach to how we think about force modernization. If nothing else, too many practical, financial, as well as operational implications are associated with changes in plans to adopt, say, a more "impressionistic" approach to planning than we have followed historically. Major penalties will have to be paid any time the U.S. departs from plans. Given the current highly dynamic situation, certainly the case is that even if no further adjustments are made, the U.S. will be hard pressed simply to digest our force structure choices.

On the other hand, the continuing need for efficiency and effectiveness, as well as the difficult aspects of the ongoing drawdown, should be a sufficient reminder that the importance we attribute to various determinants of our force structure choices needs to be qualified in light of what might be called the true desiderata of force options. One lesson that we can draw from tactical aviation precedents (or, for that matter, most other major categories of posture modernization) is that we probably subscribe to a model of long-term force planning that places too much emphasis on the "higher order" eche-

lons of the planning process and not enough on the more mundane practical and resource issues that, in retrospect, time and again prove to be central in the evolution of our posture.

To apply this lesson to the contemporary debate over forces, we could note that many criticisms of current budget and force plans are prefaced with the observation that "now that the Soviet threat has dissipated, we can and should follow some alternative planning regime." True enough, but a look at the historical record suggests that even when the Soviet threat was alive and kicking in all its formidable glory, we made many choices that were not really fully justified by the requirements of that threat and the operational necessities that flowed from it. For some examples, we have adhered to some priorities and practices that have only been secondarily relevant to the Soviet challenge (cases concerning maritime forces, overall logistics concepts, and the structure of U.S. land force reserve components come to mind), and we have overlooked other requirements for capabilities that would seem to be very straightforward had the Soviet threat indeed been the primary or sole basis for historical U.S. planning.

This fact is not a basis for condemning our historical practices. It simply endorses a recognition that, by whatever means and for whatever reasons, we have prepared for a range of contingencies of which the Soviet threat has been only one, if certainly the major, component. After all, since World War II we have engaged in three major combat contingencies—none directly involving Soviet forces. We met these and other challenges with varying degrees of success and relied continuously on the fact that, quite to the contrary of the Soviet-dominated model said to have driven our budgets and force choices, we have been able to respond (again, with varying degrees of success). Arguing that we now should revamp our planning approach because of the events of the last couple of years insofar as the canonical Soviet threat has been concerned does have real meaning. The requirement to deal with the Soviet threat did have central implications for our budgets, force structure, and plans.

This situation was not, however, the only one for which we prepared (explicitly or otherwise). The U.S. has managed to have at least a core of capabilities in hand. This core was to be sound in light of contingencies whose details no one could have argued for credibly in

advance. To contend now that we need to replace a planning model that never really did fully describe our choices with some other model that could very well be just as inaccurate (if not a downright dangerous) a basis for practical planning makes little sense.

Again, this argument is not for maintaining overly conservative force levels, the same sorts of duplicative or parallel capabilities that we have had in the past, or higher budgets than featured in current plans. We can and must make some difficult choices on priorities, and many will be associated with the acceptance of some serious but hopefully not excessive risks. But a case can be made for being patient and flexible in our current choices. It is, therefore, important not to close options in the short run. Also it is vital that we do not lose sight of the final product—a coherent U.S. military posture in which tactical combat aviation will undeniably play a major role. If we bear such factors in mind and retain the operational and force flexibility that would follow from such an approach, we most likely would have the sorts of military capabilities that might be considered the most essential—in sufficient strength—to provide the greatest assurances that we can support our national interests no matter how a highly uncertain future unfolds.