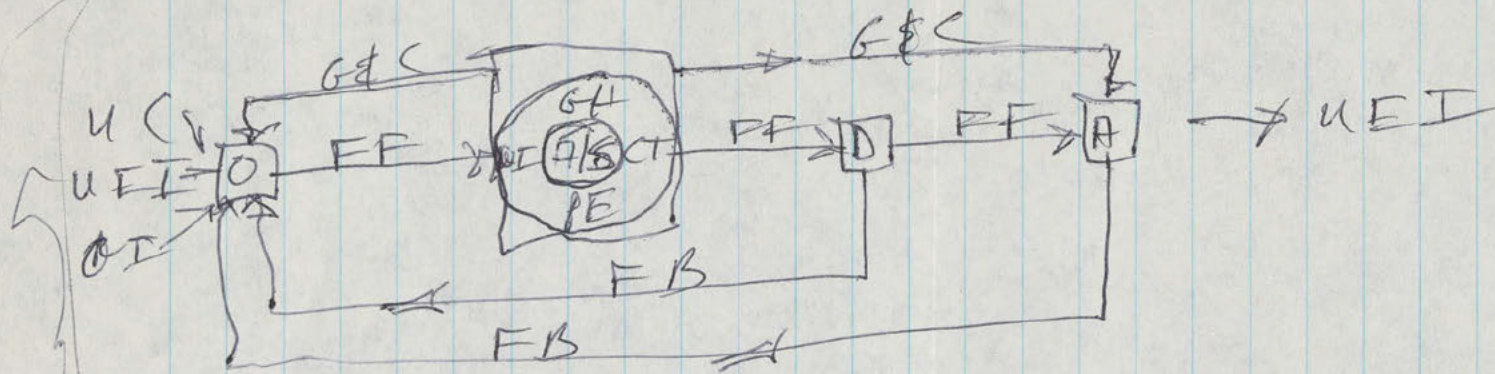


Powered by Telecom, & Spring on 26 Oct 98



~~Let~~ $D = H, m, C, \text{ or } R, \text{ or } \dots$
 $A = T, m, R, \text{ or } E, \text{ or } \dots$

~~Then have feedback~~
~~loop~~ then ~~done~~
~~compression~~ ^{in general} can be
 used to represent

how we deal with
 this world around us,
 regardless of our perspective

• Hansen Cycle
Rolls Royce

• Dr Frank Whittle
apt 5th

• Equidant to VC
~~with~~ with by pass
heating and free
running apt for

• Bring, & E P & W
Work similar to
man named Swan
at Boeing

• Felt this year could
make Colorado
economical.

• See Piccola
about

M. simulation

• by W. S. S. S.

• ~~by~~ ~~named~~
simulation so good
in ~~selecting~~ F. X

— How come NS.

(5175)

Nothing - wing / fuel
and LE Ext.

GD - LG Huntman's
assault on wing
Body

LTV - LG / wing

$$\begin{array}{r} 3301 \\ 34015 \\ \hline 7315 \end{array}$$

1.2	6.46
0.9	8.46
ACC	50
G	3.76

$$NCW = \underline{34015}$$

$$ST\text{ Combat} = \underline{37315}$$

Check EW

- How far has ^{word} Ray go on our ^{major} task oriented mission

More S vs number

Range argument

Rule 10b

- Old vs New rules
- old rules not combat relevant (example)

Reader argument

Diff - CID, PID, DEFINITION
AST

~~Numbers~~ More Range need to have - but not necessary

~~numbers~~ - ~~congruence~~

~~congruence~~

- number

- EW, FE or

survivor to rely because could be repeated

water ~~dry~~ better argument

420 625
 30 600 700 725
 F-18
 - F-18 422 985
 - (1.2) 2.76
 - (1.9) 3.06
 - Acc 99 recs

(2) Vapz went around
 Clements

FIS museum

F-16 267

F-17 240

F-19

Design

Discipline

* Conclusion *
 Our rule ~~seems~~
 better not this
 design ~~and~~
 not this superior
 design

23 January 1975

Memo To: Major General Slay

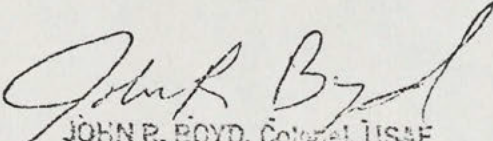
Subject: ACF Wing Area

1. In 1972 during the LWF competition General Dynamics (GD) proposed a design that grossed out at 16,960 lbs. at the beginning of combat on the 500 nm Air Superiority Mission. Using a fixed engine (the F100) it was my understanding that GD after conducting many trade-offs provided the Air Force a well balanced design (optimized!) for this mission.

2. Now we find using essentially the same basic aerodynamic configuration and engine the proposed LWF will become the ACF with the addition of missionized avionics and other equipment packages and will gross out at approximately 21,000 lbs. on the same 500 nm Air Superiority Mission.

3. With 280 ft^2 of wing for both configurations this means that wingloading must go from about 61 lbs./ft² for the proposed LWF to about 75 lbs./ft² for the ACF as a result of some 4,000 lb. increase in gross weight. (The wingloading of the F-4E, with full internal fuel and 4 AIM-7's is 80 lbs./ft².)

4. Such a gross weight change raises the question of whether the wing area should be increased. In my opinion I feel we must seriously examine the possibility of adding additional wing to minimize a performance degradation related to the weight increase. If not we are placed in the position of supporting the idea that the selection of wing area is independent of gross weight.


JOHN R. BOYD, Colonel, USAF

Chief, Development Plans & Analysis Group
D/Optl Rqmts & Dev Plans, DCS/R&D

Our Cys

AF/RDQL/Capt Spinney/lpb/77007/28 Feb 75

MEMORANDUM FOR VICE CHIEF OF STAFF, UNITED STATES AIR FORCE

SUBJECT: Integration of Force Planning and Development
Planning

The AFSC briefings to the Air Force Council on 28 Jan 75 highlighted the effects of the current economic environment on the weapon systems acquisition program and the supporting RDT&E program. AFSC/XR proposed that these effects can be addressed by examining alternative acquisition rates. AF/RD concurs with this proposal.

AFSC's recommended approach is consistent with AF/RD's proposal to implement an Air Staff Development Planning process. In essence, we propose to integrate Development Planning with Force Planning in order to better shape future forces in an uncertain economic environment. We feel that a working group should be tasked to develop the mechanism for this integration.

The supporting rationale and the steps necessary to implement our proposal are attached to this memorandum.

1 Attachment
Proposal

RDQL File Cy
~~RDQL~~ Read File
RDQ Read File
RD File Cy
CVAE Exec Sys

DEVELOPMENT PLANNING

1. BACKGROUND

Over the past year, AF/RD has conducted a study of how the Air Staff should do Development Planning. We have concluded that Development Planning is interdependent with Force Planning and that the Air Staff needs to pursue an integrated (as distinguished from coordinated) approach to both. This conclusion is based upon the following fundamental considerations:

a. There are two crucial steps in Development Planning: (1) Identify alternatives; and (2) Choose sets of alternatives that are consistent with available resources. The first step consists of identifying all the hardware options that could be procured during the planning time horizon. These options would then be costed out for several acquisition strategies, (i.e., different acquisition rates and/or IOCs.) The second step consists of choosing sets of these options (i.e., future force structures which the Air Force can afford to procure and operate in the future).

b. Systems Command has demonstrated a methodology for accomplishing the first step (Re: AFSC/XR briefing to AF Council, 23 Jan 75). We concur with the AFSC methodology and believe that it is proper for AFSC to perform this task.

c. Choosing from among the hardware options is clearly an Air Staff responsibility. Air Staff Development Planning has the objective of providing better information to the corporate decision-makers in order to assist them in making this choice. Such information should include economic and acquisition management considerations together with Force Structure considerations.

(1) Economic Considerations: There is substantial basis for the belief that forthcoming Congressional Appropriations will be significantly less than those required to procure the programmed force structure. Although we can be reasonably certain of these future restrictions, we are uncertain of their absolute magnitudes.

(2) Acquisition Management Considerations: The increasing complexity of weapon systems leads to production economies-of scale and contractual rigidities that makes it very expensive to change acquisition rates once production

plans are set and contracts are signed. Clearly a restrictive budget would force changes in our current acquisition program leading to increased costs. The strong likelihood of such a budget suggests that we should examine alternative acquisition strategies to cope with lower appropriations. By hedging against lower appropriations we can develop our acquisition program so as to reduce the adverse effects of probable production changes which would arise from emerging budget restrictions.

(3) Force Structure Considerations: Force Structure decisions must provide the basis for forging weapon systems procurement rates and the RDT&E efforts required to support such procurement. However, the opposite is also true. The impact of technology and the uncertainty of future appropriations force us to consider alternative RDT&E/Procurement strategies in shaping force structure decisions.

d. Thus Force Planning and Development Planning are interdependent activities, each with the objective of providing balance to the Air Force Program. Recognizing that the Program is the output of the PPBS, it follows that we must integrate the resource inputs to the PPBS. Input categories can be defined in terms of resources being allocated to Operations and Support (O&S), Investment, and Research and Development. In addition to being integrated in the desired Program, these resource categories must also be internally consistent. That is to say, each category should be in harmony with the other two. For example, we do not want to expend R&D resources for the engineering development of systems that we will be unable to procure. Likewise we do not want to procure systems that are too costly to operate.

In conclusion, the above considerations suggest that routine coordination can not effectively surmount the internal strains being created by our emerging economic stress. Therefore, we feel that we must integrate Development Planning and Force Planning.

2. RECOMMENDATIONS

a. Under the aegis of the Air Force Council a director level steering group should be established to supervise a working group chartered to develop a scheme for integrating Force and Development Planning. This steering group would be composed of XOX, XOD, PRP, PRM, LGX, LGY, ACB, and RDQ.

b. As its objective, the working group will develop the staff capability to provide you with information on probable future consequences of current decisions. This will help you as a decision maker by explicitly providing integrated information on the strains to the AF Program which are the result of our changing economic environment. To do this, the working group should be accountable to you through the steering committee and the Air Force Council.

c. Proceeding from the premise that Development Planning is dependent upon Force Planning, and vice versa; this working group would develop the interface necessary to provide the requisite procurement and development programs needed to determine the size and composition of future forces. The complex interdependencies stated in the preceding paragraph suggest that there is no a priori way of determining the details of this integration. We have identified a conceptual approach, however, we feel that the working group should make the final determination. In order to do this, the working group should be tasked with the following generalized activities:

- (1) Select a conceptual approach.
- (2) Determine those tasks necessary to implement the concept.
- (3) Identify what information is needed and what the flow of information should be.
- (4) Tune the tasks and information flow to the budget cycle.
- (5) Shape the organizational structure to accomplish the activities discussed above.

d. In order to effectively implement and test this approach, we feel that the working group must be established during March 1975 if we are to impact the FY 78-82 POM. Members of this group (it need not be large but it must represent the spectrum of relevant Air Staff decisions) must not be constrained by other work commitments if this complex effort is to be productive.

$$\Delta W = (mv) \left[\frac{\dot{w}_o + \dot{w}_c}{T_o + T_c - D_c} \right]$$

$$\Delta E_s = \bar{P}_s \Delta t = \bar{P}_s \frac{\Delta W}{\dot{w}}$$

$$\Delta W = \frac{\dot{w} \Delta E_s}{\bar{P}_s} = \frac{\left(\frac{\dot{w}_o + \dot{w}_c}{2} \right) \left(\frac{v_c^2}{2g} \right)}{\frac{P_{s_o} + P_{s_c}}{2}}$$

$$\Delta W = \left(\frac{v^2}{2g} \right) \frac{\dot{w}_o + \dot{w}_c}{\left(\frac{T - D}{w} \right) X}$$

$$\Delta W = \left(\frac{\dot{w} v^2}{2g} \right) \frac{\dot{w}_o + \dot{w}_c}{(T - D)}$$

$$\Delta W = \frac{1}{2} m v \left[\frac{\dot{w}_o + \dot{w}_c}{(T - D)} \right]$$

$$\Delta W = (mv) \left[\frac{\dot{w}_o + \dot{w}_c}{2(T - D)} \right]$$

$$\Delta W = \Delta P = \bar{F} \Delta t$$

$$mv = \left[\frac{(T_o - D_o) + (T_c - D_c)}{2} \right] \left[\frac{\Delta W}{\dot{w}} \right]$$

$$\Delta W = (mv) \left[\left(\frac{\dot{w}_o + \dot{w}_c}{2} \right) \left(\frac{2}{(T_o - D_o) + (T_c - D_c)} \right) \right]$$

from the desk of

FRANK SIEDOR

April 23, 1975

Col. Boyd:

At 0930 on 7 May we are having a short demonstration of this model at our UAC Main Conference Room at 1125 15th St. N.W., Washington, D.C. (20005).

I think this model should be of interest to you.

Will call you in near future.

Frank

F. N. Siedor



TACTICAL AIR DEFENSE
OPERATIONS RESEARCH MODEL
WITH GRAPHIC DISPLAY

1. The model is event-oriented and covers, in detail, the complex interactions of multiple aircraft attacks with a variety of weapons against ground targets defended by a variety of or mix of ground systems. Radar, visual and infrared sensors are handled, as well as four different modes of missile guidance. Several options are available for rules of engagement and threat ordering, and the model is structured to accept alternatives as modules when needed. The model has been validated against a model used by SHAPE Technical Center, The Hague.
2. The simulation is part of an overall software environment. A data bank of resident scenarios is used as needed to define inputs. On-line interactive graphics are available to assist in evaluation of tactics. The program flexibility allows the model to be expanded as needs develop. A report writer is used to format output into a readily understandable report. Full accountability of every action allows complete checking.
3. Several unusual features of the model are worth noting. The communication paths and their associated delays and errors are simulated. Secondly, to a large degree, data is transferred in the model in the fashion used in the real world. Three levels of information and three levels of data exist which change with time. This permits a realistic treatment of the fact that neither opposing side in the engagement may be able to obtain full, accurate information of the actual circumstances.

Thus, for example, the air damage assessment may not match the actual ground damage, and multiple strikes against already destroyed targets might be scheduled.

4. Maneuvering of aircraft is allowed on a very flexible basis including adaptive changes to the flight plans in response to events. This gives rise to the need for special techniques to represent terrain masking.
5. The effects of ECM are simulated in the model, including spot and barrage jamming (both on-board and standoff).
6. Costs of the battle are calculated for both sides, including losses.
7. The model operates with various graphic displays which allow observation of the simulation as it evolves. The portable display is a 19 inch CRT terminal, linked by telephone to an N.C.S.S. computer.

• Multiple Thrusts } represent dispersion & concentration



• Focus of Efforts } represents dispersed concentration hence unequal & uneven distribution of effort(s)

(Lund leaves out)

• CODA loops in-and-up before down-and-out
ie cascades upward first then cascades downward

• Technique ⇒ a way of doing something
~~that flow into one another~~
~~that are combined~~

• Tactics ⇒ a variety of techniques to produce
some ~~result~~ action(s) to realize
some end.

have
~~independent~~
~~& separate~~ a variety of techniques that interconnect
(or flow into) one another ~~that represent or~~ to produce
action(s) to realize same end

• Sources ⇒ not just military

- ① Terrain doesn't wage wars o o o
 - ② The 25 year War
The Army and Vietnam } Impressions
 - ③ Impact of 20th century science on war (we don't understand except in terms of hardware)
 - ④ Packard Commission, Senate Armed Services Committee -- so 'called reform, contrast with some Rogers commission results.
-

Point

We know for too little; yet we're willing to squander enormous sums on the paraphernalia for waging it.

o Buzginski's -- Game Plan

Newton, Roger G. "What makes Nations Tick"
Harvard U Press

FABOK



Synthesis of Warden & Boyer

May. ~~1994~~ Rita Webb

