

INTERDICT # 8
9 April 69

INTERDICTION STUDY APPROACH

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Overall Program Objective:

To provide a broad base of competence in the general area of interdiction weapons systems which can be used to assist in shaping future Department Of Defense requirements and result in the acquisition of related government sponsored study contracts which, in turn, lead to capture of significant interdiction weapon RDT&E programs.

Interdiction weapons should prove a fruitful product area since the nation has been faced with the perennial question of what weapons should be available for interdiction type missions. Historically we have had to fight each new war with the weapons developed in the last war, with quick fixes and compromises to meet the exigencies of the moment. It is believed that a thorough study of the interdiction problem will provide the basic understanding and competence required to make substantive contributions to this field of endeavor.

Specific 1969 Goals:

The specific goal for 1969 is to conduct an interdiction study to answer the question:

"What are the best weapon systems to kill any static, surface targets of military value beyond the combat zone as a function of ground based defenses?"

In brief, the initial phase of the study program is to ascertain just what are the critical questions that must be answered and to define the system requirements for interdiction weapons. New concepts will be developed to meet these requirements and their capabilities compared with that of existing or

planned (CDP¹ or later) systems. To do this an evaluation process must be evolved and rating rules established, by which the new concepts and existing systems can be rated relative to one another. Then weapon mix studies will be undertaken.

Study Approach:

In order to gain maximum coverage of the subject in a minimum amount of time a matrix of three scenarios by 3 to 5 new interdiction weapon system concepts will be studied. The scenarios to be used are:

1. Central Europe - A battle between two highly sophisticated competitors, wherein interdiction weapons will likely play their strongest role.
2. Mid-East - A battle between less sophisticated competitors, wherein interdiction weapons should be reasonably useful.
3. Vietnam - A guerrilla-type war, wherein interdiction weapons may have marginal effectiveness.

The 3 to 5 concepts are planned to span the spectrum of a very cheap cost per round weapon, which may have limited capability, to a highly refined (and probably expensive) weapon system designed to have a high single missile kill probability against difficult targets. These will bracket a modular tactical missile concept, versatile enough to handle most targets reasonably well with primary emphasis on holding down cost per round, cost of ownership, and cost of operations. Perhaps two others can be identified that are unique enough to include in the general study.

Working on the premise that the questions, properly and accurately state, will chart the course of the study and provide the basis for work statements that can be related to each of the work packages which will go to make up the study, a conscientious effort was undertaken to construct a logical question tree which starts with the objective or the top level question that the study undertakes to answer. In order to answer this first level question, the answers to certain second level questions must be answered, which in turn postulate questions at the third, fourth, fifth level, etc. Careful attention was given to the top level question, to assure that the solution is reasonable and attainable with the resources available.

¹ Concept Development Phase.

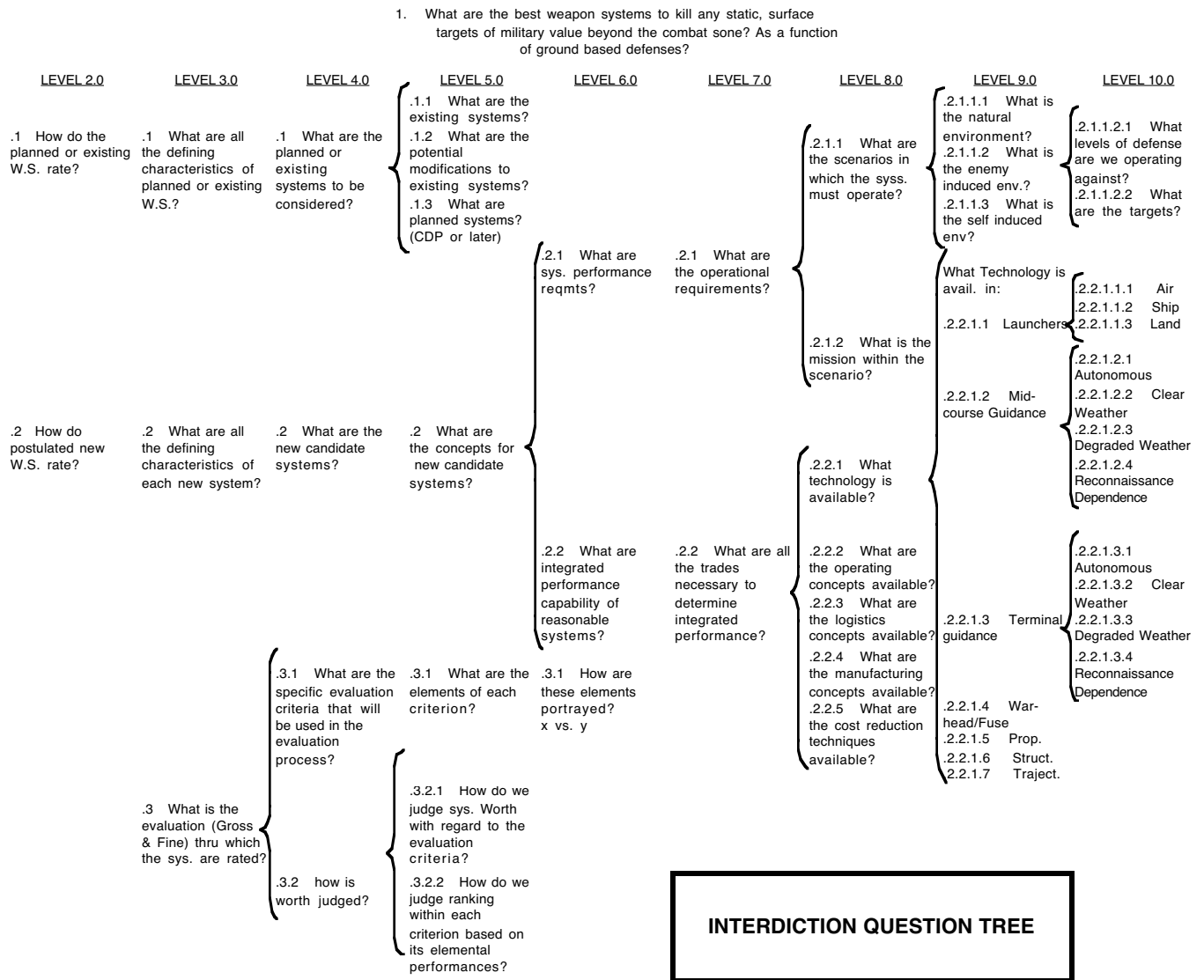


Figure 1 - Interdiction Question Tree

The question tree that has evolved is presented in Figure 1. It is significant that the questions below the first level are quite general and applicable to any study of this type. The scope of the study is established by the Level 3.0 questions and the depth of the study is established by the number of question levels to be considered. The administratively imposed constraints of time and money establish the level at which the study starts, with all questions posed at lower levels answered by assumptions and intuitive reasoning. Of course, the higher the level at which the study is started, the more vulnerable it becomes, because the assumptions that must be made for the lower level questions are the Achilles heel of any study.

To attain the objectives of providing a broad base of competence, it is believed that the interdiction study should start about Level 10.0. Attention is drawn especially to the questions at Level 8.0 which start with "What technology is available?" and the subsequent questions relating to operating, logistic and manufacturing concepts that are available. More will be said below on the early consideration of these aspects at the weapon concept formulation phase.

The scope of the study defines three major lines of questions on which work can commence reasonably concurrently. These lines related to 1) The capabilities of planned or existing systems, 2) That of the new concepts, and 3) The evaluation process.

A preliminary draft of the study schedule is presented in Figure 2.

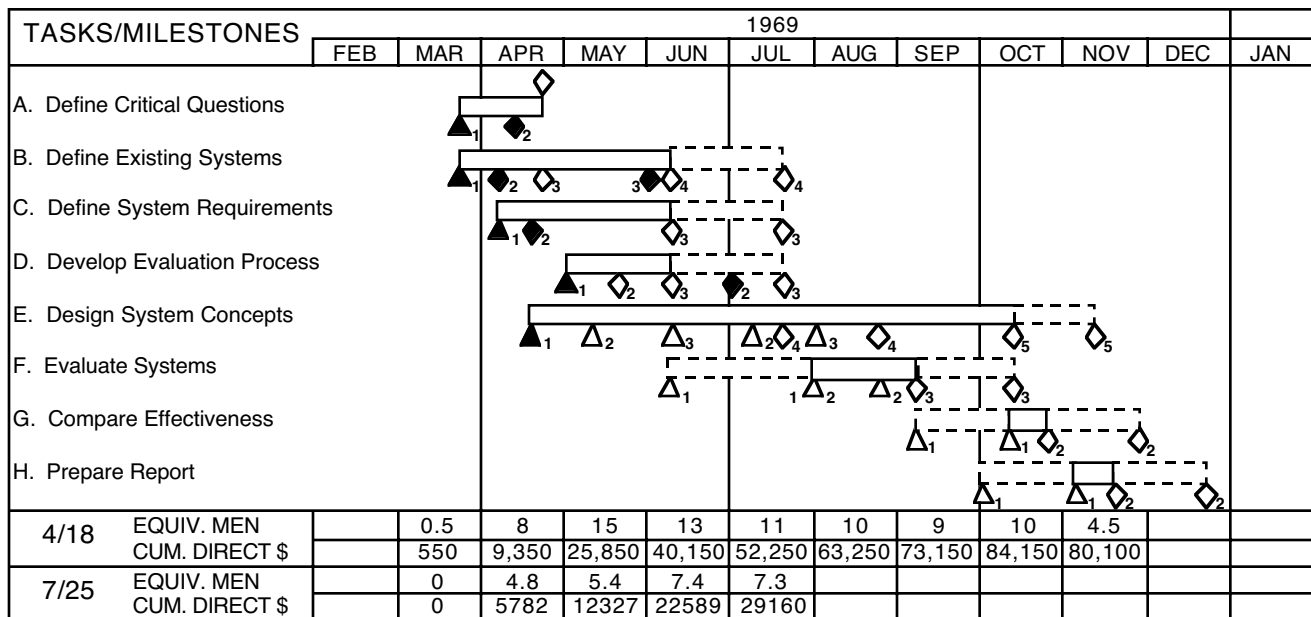


Figure 2 - Program Operating Plan, Interdiction Study, 1969

Inspection shows the interdiction study broken down into eight basic elements, as follows:

- (1) Define critical questions (Issue study plan)
- (2) Define existing and planned systems
- (3) Define system requirements
- (4) Develop evaluation process
- (5) Design system concepts
- (6) Evaluate systems
- (7) Compare effectiveness
- (8) Prepare report.

Referring back to Figure 1, and the discussion above, it is apparent that most of the critical questions have been defined. Operations Analysis people are already involved in defining preliminary operational requirements so that work can begin on Design System Concepts. The development of the evaluation process and the work that must be done to establish reasonably well-founded final operational requirements will be completed in mid-June. Tests of the evaluation model will be undertaken by running a series of interdiction problems in appropriate scenarios with varying defense levels using simple airborne ordnance to establish a baseline that can be improved by the introduction of interdiction weapons. The credibility of the quantitative results obtained with the evaluation model will be established by comparing the results obtained with current interdiction type weapons and current defense levels encountered in the Vietnam war, for which some quantitative results are available. If the results of these investigations do not correlate well with experience, modifications will be made to the process as required to make the answers credible.

CURRENT (In Service or Production)

<u>NAVY</u>	<u>LAUNCH WT.</u>	<u>AIR FORCE</u>	<u>LAUNCH WT.</u>
TALOS	7,000 lbs	MACE C	18,560 lbs.
SUBROC	4,000	MACE B	18,000
TORPEDOS, MK 14/16	3,600	MACE A	14,000
ASTOR	2,000 +	HOUND DOG	9,600
BULLPUP B	1,785	QUAIL	1,100
ASROC	1,500	LASER GUIDED BOMB	893
STANDARD ARM	1,300		
WALLEYE	1,100	<u>ARMY</u>	
BULLPUP A	571	PERSHING	10,225
TORPEDO, MK 46	550	SERGEANT	9,875
ALFA	500	HONEST JOHN	4,700
SHRIKE	390	LACROSS	2,300
		LITTLE JOHN	800

PLANNED (CDP or Later) Est. IOC Dates in Parenthesis

<u>NAVY</u>	<u>LAUNCH WT.</u>	<u>AIR FORCE</u>	<u>LAUNCH WT.</u>
TORPEDO, MK 48 (1970)	4,000	LAPM (1972-4)	15,000
CONDOR (1971)	2,500	SCAD (1972)	1,000-3,500
HARPOON (1972)	1,400	SRAM (1969-70)	2,200
		MAVERICK (1972)	375
		<u>ARMY</u>	
		LANCE XR (1970)	3,000
		MARS (1973)	2,000

Figure 3 - Inventory of Existing and Planned Interdiction Missiles – Preliminary

A "blue sky" list of existing and planned systems, some 50 in number, has been assembled and listed in Figure 3. Consideration will be given to what potential modifications to existing systems appear to make sense, and a rough gross screening process will be used to reduce this number to perhaps 5 to 10 systems that will be considered in detail. These selected systems will be defined in sufficient detail to introduce into the evaluation system when it is completed about mid-June.

With the issuance of a preliminary set of operational requirements, which will be perhaps 80% correct, a review of classical missile technology, logistics concepts, and manufacturing concepts will be undertaken in which the functional organizations will be asked to offer recommendations which will directly affect the cost and/or effectiveness of the weapon from the point of view of their technical discipline. Each will be asked to define the characteristics of the most dependable and low cost system approaches that should be considered in the formulation of weapon system concepts. Key men in each of these areas will be identified as the principal point of contact for the duration of

the study and these individuals will be asked to be present when the new system concepts are formulated about mid-May.

Perhaps four or five new weapons will be conceived at this time for further detailed evaluation. Concurrent with the issuance of the final system requirements, preliminary design of the conceptual systems will be initiated to a level of detail that is adequate to ascertain feasibility of the concept and to provide sufficient input information to the evaluation system so that they can be rated relative to one another.

Completion of evaluation of individual existing and new system concepts should be completed about mid-September at which time mix studies will be undertaken and completed near the end of October. The final overall evaluation of results and recommendations for further work will be assembled into a final report which is tentatively scheduled for mid-November 1969.

It should be noted that the study has carefully avoided addressing the question of "*Where is the target?*" The critical importance of this perennial question cannot be avoided. There is little doubt that consideration of this question could constitute a study larger in scope than the currently planned Interdiction Study which must assume that target location, identification, and time of attack has been provided from other sources than the interdiction weapon system proper.

Study Implementation:

As mentioned above issuance of the detailed study plan is scheduled for mid-April. This plan will be formulated by assembling a time-phased work breakdown structure consisting of statements of work anticipated to answer the questions posed in Figure 1. Estimates of man-hour requirement to answer each question will be assigned and summed to see how well the planned program fits the administratively assumed budget level. Adjustments in the program and modification to the work statement will be made until the summed budget equals that assumed, and an assessment made to establish what sacrifices or compromises must be made to fit into the budget constraint. Assuming that the study still shows promise at this budget level, discussions will be initiated with designated representatives of supporting functions to arrive at mutually agreeable work statements and manhours of effort to be expended. In the event the summation of these agreed to levels of effort is not in consonance with the budget level assumed, the program will be reassessed to modify either the work content or the budget level. On approval of the negotiated plan, issuance of the work

breakdown structure with related agreed to work statement and levels of effort with performance dates assigned will constitute authorization to proceed.

Management Control:

Expenditures of effort and accomplishment of milestones will be measured against the negotiated study plan as issued.