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DEPARTMENT OF THE AIR FORCE
HEADQUARTERS UNITED STATES AIR FORCE
WASHINGTON, D.C.

17 DEC 1968

MEMORANDUM FOR THE DISTRIBUTION LIST

SUBJECT: Minutes of the Defense Science Board Combined Task Force
on Penetration, and EW/Sub-Group on Effectiveness Evaluation
Meeting on 17 Dec 1968 (U)

General Session - Briefings

The chairman, Dr. Larry Hunter, opened the meeting by summarizing the
previous meeting. Dr. Hunter crystallized discussions to date in four
main points.

    1. Any model is sensitive to intelligence and input data. Use
of models to predict future time period effectiveness complicates the
problem.

    2. Our attention is focusing on overall effectiveness evaluation
and identification of the contribution to mission success provided by
EW.

    3. The general area of command and control capability and its
degradation due to EW and tactics is lacking in knowledge.

    4. Many existing testing efforts are now viewed as providing in-
puts to an aggregate model. A review is needed to establish the
relationships.

Major J. Vance, USAFSS, presented a briefing on Project COMFY COAT.
He discussed the role of COMFY COAT in the Southeast Asia theater
providing several examples of the projects product. The type of
data used and the methodology of correlation and evaluation was
presented.

Dr. Hunter asked if we knew enough about the command and control in
North Vietnam to predict EW effectiveness against it. Maj Vance
replied that data could be provided, and Col Wack noted that we had
not yet stressed the command and control operation and therefore had
no demonstrated data on its degradation.

In response to a question from Mr. Porter, concerning the Electronic
Operational Support (EOS) role, Maj Vance indicated that COMFY COAT
data may provide a basis for judgement as to the requirement for TAC
ELINT and identify the reason for the requirement.

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Lt Comdr Evans asked whether the effectiveness of selected elements of a penetration have been identified (i.e., the particular jammer or maneuver contribution). Maj Vance answered that some data is available but indicated that most data is gross because several elements of countermeasures are always applied in combination.

Col Tucker, SAC/NORAD JOTF, then introduced the SNOW TIME/TOP RUNG program. He outlined the agreements, management, functions and responsibilities of the participating commands and of JOTF (the Joint Operations Task Force). He provided a good understanding of the complexity and involvement in planning and conducting a large scale exercise.

Mr. Trask, SAC/NORAD JOTF, presented an outline of how data is handled by the JOTF and the participating commands. SAGE tracks are compared with actual bomber positions to determine if (1) an undetected track (2) a partial track, (3) a complete track, or (4) a false track has occurred. JOTF maintains the master data base for the participating commands.

It was pointed out by Col Wack that an instrumentation requirement exists for the purpose of obtaining better quality data of the penetration as observed at selected radar sites. Mr. Trask agreed that better quality data is desired and would allow a better analysis to be performed.

In response to a question by Dr. Hunter, Mr. Trask pointed out that no conclusions are established on the basis of one mission. The data from several missions are compiled and general trends are documented.

The NORAD participation in terms of mission, data collection, data analysis and modelling was introduced by Lt Col Brossius, Hq NORAD (NOEV-S). The NORAD objective is to provide measured effectiveness factors obtained from SNOW TIME data as an input to a model. The output of this model, through extrapolation to enemy penetration conditions, would be a statement of expected effectiveness against the threat.

The NORAD operations analyst performing an analysis of SNOW TIME data, Mr. Wheeler, Hq NORAD, pointed out the objectives of NORAD analysis:

    1.   Estimate current effectiveness against the threat.

    2.   Assess the impact of phasedowns and reorientation.

    3.   Provide support for recommended improvements to force size and structure.

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Mr. Wheeler went on to point out that his analysis treats the aggregate effects of jamming, tactics, operators, etc., primarily because current instrumentation does not permit a detailed analysis. Two data summaries were presented as the front end of the aggregate model of the defense system. The data are the actual bomber tracks and the tracks as presented by SAGE. (These are the same type of data used in the COMFY COAT program to evaluate effectiveness of EW.)

Mr. Wheeler stated that passive tracking of our defense system is done manually, with no automatic assistance, in response to a question from Dr. Lauderdale.

It was again pointed out that extrapolation to expected enemy conditions using modelling techniques is being attempted when Mr. Porter asked whether we tried to simulate Soviet penetration tactics in a SNOW TIME exercise. A further discussion on this point with Dr. Hunter pointed out that the modelling effort, correlation with exercise results and extrapolation, will be without using detailed data.

Lt Comdr Evans asked whether any simulation of large scale exercises is done, or planned. Mr. Wheeler responded that this was planned as part of the required instrumentation capability. A replay of past missions and synthetic raid generation will be attempted.

Maj Hendrikson, Hq SAC, presented the objectives of SAC participation in SNOW TIME. These are:

1. Tactics development and verification.

2. Developing SIOP ECM degrade information.

3. EW Officer procedures evaluation.

He also pointed out that the computer facility at Hq SAC was used extensively to process and prepare tapes and data decks from exercises. These data are then provided to JOTF for retention in the master data base.

The lessons learned from SNOW TIME, TOP RUNG exercises by SAC, were discussed by Maj Kefalas, Hq SAC. He talked about the effect of jamming levels and aircraft density on defense system tracking ability. He summarized how the results of the exercises were factors in developing tactics, SIOP planning factors, and improving EW officer procedures.

In response to a question from Mr. Carpenter, it was pointed out that although lessons learned in the exercises identify requirements for new capability, that the final Required Operational Capability is generated by Hq SAC staff action with the concepts, plans, etc., personnel all contributing.

Maj Burton pointed out that the majority of exercise data is gathered
at flight levels considerably higher than currently planned for SIOP
execution. This is due to flying safety restrictions associated with
a peacetime exercise.

It was further pointed out that the model developed by Autonetics is
being applied to more closely evaluate our capability to penetrate
Soviet defenses, in response to a question from Lt Comdr Evans.

Col Burkhalter, Hq USAF, Studies and Analysis, discussed attempts to
solve the problem of valid prediction modeling underway within the
Air Force. He indicated the Air Force Chief of Staff has requested
that such a model be constructed. He went on to say that it would
attempt to incorporate the capabilities of various existing models
and that an effort will be made to insure that the model may accept
as input data, that data gathered during operational and various
R&D testing programs.

When asked by Mr. Porter what the schedule for model development might
be, Col Burkhalter indicated that within sixty to ninety days the kind
of model to be built will be identified. He further stated that the
model is expected to be operational within one to two years.

When Dr. Hunter brought out the point that attention to sensitivity is
most important in model development, Col Burkhalter indicated that
various levels of aggregation will be identified as required to tie-in
needed subroutines.

The capability and type of model currently being used by the Air Force
Studies and Analysis group was discussed by Lt Col Drake from that
office. The PEGASOS model uses selected input files, such as the
number of interceptor bases and locations, number of interceptors and
types, number of bombers and type and route, etc.   It then provides
the number of surviving bombers by type and segment, fighter passes
by type and segment, etc. The DIA Pk handbook is used to calculate
attrition, and Lt Col Drake noted that improvements are being incorpo-
rated in this area. In this model, decoys look extremely effective
when enough are added to accommodate all defensive weapons. However,
turn around times, delays or saturation of command and control are not
currently accountable in the model.

Dr. Hunter noted that this type of model is useful as a tool to determine
sensitivities, but that belief of direct model outputs as deterministic
would be a fallacy.

Dr. Myers had questioned earlier the usefulness of using such a model
to determine the merit of penetration speed against 1975 threats, when
defensive effectiveness is dependent upon tracking slew rates, data
handling capacity and reaction times, and the basic threat is only
postulated, much less any detail data assumed.

Mr. Camp observed that the model indicates numerous targets (including decoys) to be most effective against defenses, whereas generic SNOW TIME data indicated the insensitivity of the defense to mass. He went on to point out that this was a good example of the problem before this group. On one hand a model, on the other hand data, and no relationship between the two.

The feasibility of simulating a Soviet Command and Control Center to learn more about its capability was briefed by Dr. Safford from the MITRE Corp. In his briefing he noted the importance of such data to be a result of the role such a center plays in allocating defenses against penetrators. He stated the objective of the simulation to investigate the man-machine interface and study the cause/effect relationship of missed tracks, inaccurate tracks, and false tracks. He concluded stating that such a simulation is feasible and that some value may be derived within six to eight months after start of construction.

Executive Session

The discussion which took place with the briefings resulted in very little time being available for an executive session. Dr. Hunter established that the next meeting will be an executive session.

A brief discussion in response to Dr. Hunter's question of, is there anything else we should discuss prior to the preparation of an interim report, took place.

Col Wack indicated that the basic situation as observed from operations has been briefed. He did indicate that briefings on operational intelligence would need to be discussed at the proper clearance level.

Lt Col Lester offered more detail on various test facility capabilities if desired, but he felt that an understanding of the basic R&D problem has been provided through the briefings thus far.

Capt Lindberg mentioned that some aspects of the NAVY air defense simulation may be applicable and if so, appropriate to discuss.

Subsequent to this brief discussion, the meeting was adjourned.
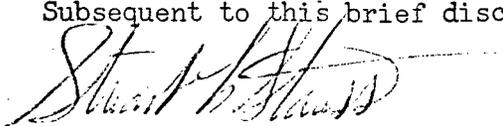
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Mr. Kenneth McVicar

Dr. John M. Myers

Mr. John M. Porter

Dr. Lloyd Lauderdale

Capt Chantee Lewis, USN

Capt Donald Lindberg, USN

Col Joseph H. Wack, USAF

Mr. Richard Camp

Lt Col George Lester, USAF

Maj Robert Burton, USAF

Maj James Vance, USAF

Mr. Stuart L. Stauss, Admin Secy

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