

Copy No. 2

Preliminary Report  
(Revised 17 March 1952)

of

SPECIAL COMMUNICATIONS ADVISORY GROUP

(SCAG)

12 March 1952

Phil.

This is marked "Preliminary Report" but it is the report. No final version was produced.

~~S. Hurst~~

Friedman

✓ Mr Friedman

Many Thanks  
MP

Refer to classification history 28 March

The Special Communications Advisory Group has completed six meetings. As a result of its studies, SCAG has arrived at the following conclusions and recommendations:

EO 3.3(h)(2)  
PL 86-36/50 USC 3605

General Conclusions

(1) There is a clear-cut promise of [redacted]

See definition of "Solution" on p.2

(2) Much more effort by AFSA is justified on the Albatross problem.

Recommendations

(1) More programming and computing time should be allocated to the Roberts' and related approaches for determining [redacted]

(2) An expanded program should be initiated in high-speed machine developments with particular emphasis on new approaches to AFSA's special problems.

(3) A Senior Civilian Technical Director should be appointed, reporting directly to the Director of AFSA.

(4) A separate research organization should be established, headed by a Director of Research. The Director of Research should report in parallel with the heads of Development and Operations to the Technical Director. If proposal (3) is adopted, he would report directly to the Senior Civilian Technical Director.

(5) More use should be made of the potentialities of outside contractors for basic research as well as machine development.

In addition to the above recommendations, which appear to be capable of implementation within AFSA, the following points requiring cooperation of outside agencies are extremely significant:

[redacted]

(2) The importance of the Albatross problem to the national security fully justifies a major expansion of the effort and funds expended in AFSA's operation.

These conclusions and recommendations are based on the following discussion.

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The Special Communications Advisory Group was established jointly by the Armed Forces Security Agency and the Research and Development Board with the support of the Central Intelligence Agency. The first meeting of this Group took place on 4 and 5 June 1951. In discussing the mission of the Group, it was concluded that SCAG should:

- (a) Provide advice and assistance to AFSA in meeting special problems.
- (b) Maintain familiarity with these special problems and make recommendations to AFSA in connection with their solution.

Although many related problems exist, it was decided to concentrate the activity of SCAG on the Albatross problem. During these sessions it has examined in some detail the work of AFSA on the problem. It is the purpose of this report to summarize conclusions reached. Three major questions must be answered before proceeding with the recommendations. These are:

- (1) Is the problem solvable?

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P2/ [redacted] The extent of the effort which should be placed on the problem depends to some degree upon the extent of this currency. The members of SCAG are of the opinion that there is [redacted]

- (2) Is the Armed Forces Security Agency using its [redacted]

- (3) Are there resources outside of AFSA which should be brought to bear on the problem?

78: The answers to the last two questions must be conditioned by certain limitations on resources. Certain technical avenues leading toward a solution are not being completely explored and additional logistics support can be applied to improve present operating conditions. SCAG believes the answer to Questions 2 and 3 is "No." AFSA does not appear to be giving <sup>h</sup>priorities in machine time and programming personnel to the Albatross problem consistent with the urgency and importance of the problem. The machine development program developed in connection with Albatross appears to have reached a point where greatly expanded effort will be justified.

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[Redacted]

Recovery of the System

There are three general approaches in [Redacted]

[Redacted]

Since, however, limited information of a direct nature can be of tremendous assistance, every possible effort should be expended toward

[Redacted]

(2) Recovery through [Redacted]

[Redacted]

Methods of increasing this type of information call for closer scrutiny of [Redacted] and increasing the [Redacted]

[Redacted]

(3) Analytical methods: Researches by AFSA indicate that certain

[Redacted]

These methods are dependent upon the further development of both [Redacted] and high-speed computing devices.

It is the opinion of SCAG that much more effort is warranted in this area.

More detailed recommendations concerning this increase of effort are contained in the following paragraphs.

Analytical Methods

Several suggestions have been made by Roberts and others of [Redacted]

[Redacted]

An examination of these suggestions requires an expanded effort on the part of AFSA both in personnel and in computing machine time.

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The difficulties of conducting this sort of research under present conditions indicate the desirability of approaching this as a research problem assigned to a special group.

Another analytical approach to the [redacted]

EO 3.3(h)(2)  
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[redacted] Application of these methods requires the development of special purpose computers. It appears to SCAG that an expanded effort in the development of devices such as the NOMAD System or [redacted] is required.

[redacted] there will be a requirement for large quantities of special purpose [redacted] equipment. This requirement can be judged to some extent by experience with the [redacted]

[redacted] Although it is difficult to plan this equipment prior to detailed knowledge still to be acquired from the recovery stage, SCAG believes that AFSA should place increased emphasis on planning for this eventuality. The key to this operation lies in [redacted]

[redacted] AFSA has experimented with such [redacted] in several forms. The results of these experiments are such that an active development and construction program can be started.

#### Basic Research

The study of the Albatross problem by AFSA has developed the fact that there is little opportunity (because of the pressure for operational results) for the conduct of any basic research in cryptographic problems.

[ It is SCAG's firm opinion that a strong basic research program is of great importance in supporting the development and operation work of AFSA and that a separate basic research organization should be set up. Research should be kept separate from development and operations with personnel and facility assignments which cannot be infringed upon by development and operation requirements. The experience of members of SCAG in industrial research organization is that to be fully effective research should be set up under a civilian research director reporting to the technical director. ]

A number of important research areas have been discussed in the SCAG meetings including research on the [redacted]

[redacted] research on

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VHF components for use in analytical equipment, research on information theory, and research on ionospheric anomalies for remote interception of low power communication circuits.

#### Machine Development

P10  
 In view of the rapid advances being made in high-speed electronic devices, SCAG is of the opinion that a great deal more emphasis should be placed on the development of electronic devices especially designed to handle the sort of problems arising in AFSA operations. A number of these machine developments have been mentioned in the foregoing discussions of analytical approaches to specific problems and because of the unusual nature of the machine requirements for this sort of work, an integrated machine development program is indicated to develop means for handling large volumes of this analytical work expeditiously.

#### Administrative Matters

// In its relation to the Albatross problem SCAG has been faced with some of the administrative problems of AFSA, and has considered problems of military versus civilian control of this activity. In the light of the tactical and strategic responsibilities of AFSA in times of national emergency, the necessity for military responsibility is acknowledged. However, it is recommended that a senior technical director with both technical and management experience, reporting directly to the Director of AFSA, be appointed with fully delegated authority for all operations within his field of responsibility.

P6  
 In order to attract and to keep key personnel and other top-flight people needed for the performance of AFSA's mission, SCAG feels that a careful revision of personnel policy is needed, particularly with respect to the assignment of technically qualified people and their adequate recognition and compensation.

Working conditions of the personnel are not satisfactory for carrying out such intensive work under great pressure for achievement. A great deal should be done in providing adequate working conditions and equipment.

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AFSA should take greater advantage of outside organizations in connection with both research and development. It is SCAG's opinion that AFSA has not taken full advantage of outside results both in connection with machine development and basic research. In connection with the recommendations for a separate research activity, the expansion of this activity by means of outside research contracts offers a method of expanding certain phases of research more rapidly than it could be done if complete dependence were placed on AFSA's own research group. Many of these research projects are essentially of low classification and therefore lend themselves to outside handling. For full advantage to be derived, however, as much of the background of the problem as possible must be given to the groups doing the work. There has been considerable criticism of procurement procedures due in part to the present complicated method of transmitting information between AFSA and the contractor. *research?*

#### Budget Considerations

The SCAG has tried to find how important this problem is to the national security and, from what has been said to us, we feel that the effort devoted to the problem is entirely inadequate. [ In fact it has not been obvious that any expansion of research and development has been undertaken in areas which are related to the Albatross problem. ] There are indications that a major expansion of the entire effort is in order and that a broader program, particularly in research and development, should be considered and planned from a long-range point of view at this time. *must*

FOR THE SPECIAL COMMUNICATIONS ADVISORY GROUP:

/s/Howard T. Engstrom  
HOWARD T. ENGSTROM  
Chairman

17 March 1952

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