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DIRECTOR OF CENTRAL INTELLIGENCE

Security Committee

file 1.4.9

SECOM-D-279

28 November 1984

MEMORANDUM FOR: SECOM Members

FROM: [redacted] STAT
Chairman

SUBJECT: Third Party Involvement in Government-Industry Security

At our October seminar, we discussed a proposal from the Security Affairs Support Association (SASA) to act as a broker between the government and its contractors on personnel security clearance problems. Attached for your information is a copy of a revised SASA proposal sent me by Maj. Gen. John E. Morrison, Jr., USAF Ret., SASA Executive Vice President. The letter will be scheduled for discussion at the 9 January 1985 SECOM meeting.

[redacted] STAT

Attachment: a/s

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DRAFT

20 Nov 84

Dear (Industry Member)

For several years, SASA has been made aware informally of difficulties being experienced by U.S. industry in personnel security clearance matters. Some of the difficulties appear minor, while others are not. Many seem to be rooted in differing interpretations of personnel security regulations. Considering their nature in the context of the essentiality of maintaining the highest possible standards in national security matters, we recognize that solutions satisfactory to all concerned may not be achievable. Even so, your association believes that the quest for solutions, properly and sensitively mounted, might prove immensely beneficial to both government and industry.

We therefore, propose to embark on a tightly controlled study program to determine comprehensively, the nature and extent of existing difficulties and subsequently, seek solutions with appropriate government authorities.

We believe that there has been some hesitancy in expressing what might be interpreted as complaints in personnel security matters. However, we feel that this reluctance might be overcome by having SASA serve as an intermediary to receive and process industry views on personnel security clearance problems on a completely non-attributable basis. SASA would not release the identification of the source of any problems received.

Your association has already sought the informal views of key government authorities regarding our proposal and has received sufficient encouragement to warrant seeking your views before we proceed further. Specifically, we would like you to

advise us if you are interested in having SASA undertake a program focused on the resolution of personnel security clearance problems. If the consensus indicates that SASA should proceed we would intend to use your comments on a completely non-attribution basis---source identification removed---to finalize our arrangements with those in government whose cooperation is essential to program success. Let us repeat our assurance that all responses will be sensitively handled. Absolutely no source identification will be revealed whatsoever.

SASA is mindful that it is offering to embark on a program which involves sensitive concerns of considerable magnitude and complexity, but we are persuaded that the potential outcomes for both government and industry thoroughly justifies such a special effort.

We will be looking forward to your views as soon as possible. You will receive the results of our survey when completed. Please advise if you have need for further information or clarification.

SASA

THE SECURITY AFFAIRS SUPPORT ASSOCIATION

November 20, 1984

[redacted] STAT

Chairman, DCI's Security Committee
Via Ames ISC, Rm 1225,Ames Building
Washington, D.C. 20505

Dear [redacted] STAT

I have finally recast our proposed letter to industry and am enclosing it herewith. Note, as I promised I have asked for industry views as to whether or not they think a SASA program would be helpful. No further actions are contemplated until our survey is completed. At that time we'll talk further.

Sorry for the delay, but I have been thoroughly occupied with a SASA Symposium "Software Trends in the Intelligence Community". You may find the enclosed material of interest.

All the best.

Kindest personal regards,

John E. Morrison, Jr. STAT
Executive Vice President

JEM/hlb
Encls.

80 West Street • Suite 110 • Annapolis, Maryland 21401 • (301) 269-5424

COLLOQUY

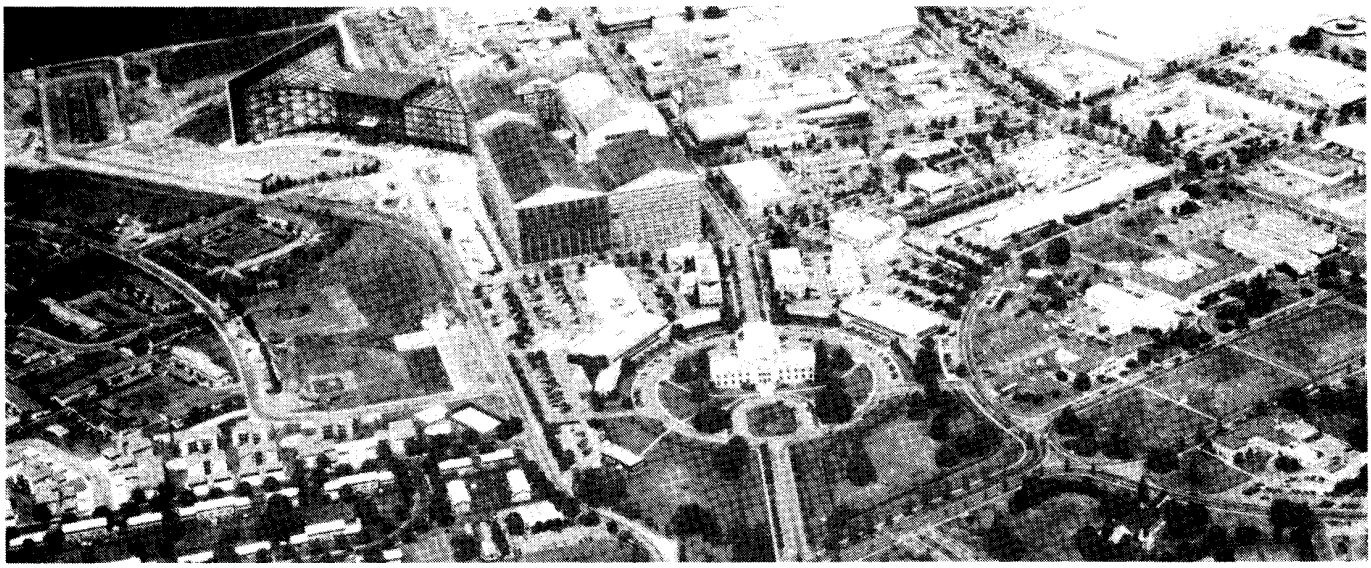
80 West Street
Annapolis, Maryland 21401

a publication of SECURITY AFFAIRS SUPPORT ASSOCIATION

Volume 5 Number 4 October 1984

"SOFTWARE TRENDS IN THE INTELLIGENCE COMMUNITY"

SYMPOSIUM REGISTRATION UNDERWAY



NASA AMES RESEARCH CENTER

High interest is already apparent in the SASA West Coast Symposium '84 which will take place on Tuesday and Wednesday 13-14 November 1984. The event, which will be held at the SECRET classification level, is being conducted at the NASA Ames Research Center in Mountain View, California. Outstanding lecturers from both industry and government will explore with attendees, current developments, mid-term plans and long-range trends in software applications for intelligence community programs. The symposium will be introduced by Dr. Bill Mehuron, Deputy Director, National Security Agency, Research and Engineering. Among the list of scheduled speakers are such highly respected professionals as Dr. Dick Scott of GTE, Mr. Mark Williams, ESL, Col. Bill Whitaker, WIS JPMO, Mr. Bob Vidensek, ESL, Drs. Harry Boehm and Kwang-I Yu of TRW, Dr. Stewart Steele, RCA, Dr. Elliott Bell, DOD Computer Security Center, and Dr. Stephen Kent of BBN. Of special interest, Mr. Kermit (Kay) Speierman, Chief Scientist of NSA will be present to offer a first-hand view of the newly created National Super Computing Research Laboratory. We are also pleased to announce that our guest speaker at the SASA hosted symposium dinner on 13 November will be the Deputy Director of Central Intelligence, Mr. John McMahon.

(continued on page 2)

Symposium Registration Underway - continued

GUEST SPEAKER
MR. JOHN N. McMAHON

Registrations for the symposium will be limited to a total of 300 attendees with registrations to be accepted on a "first come, first served basis". Registrations will close on **1 November 1984.** Registration fees are $190.00 for SASA members, $225.00 for non-members and $90.00 for government and academe attendees. Fee includes cost of luncheons and the reception and dinner on 13 November. We urge any members or others who may be interested in this specially focused software exchange to seek registration and motel accommodations as early as possible.

Should you have any questions regarding any aspect of the symposium, they may be directed to the Symposium Program Director, Mr. Don Webster, TCI, (415) 961-9180 (West Coast), or Mr. Bill Parsons, SASA Headquarters (301) 269-5424 (East Coast).

SASA AUDIT REVIEW

In compliance with SASA Bylaws governing control of association funds, an annual audit of the financial records was conducted by Certified Public Accountants licensed by the State of Maryland.

Reporting to the Chairman of the Finance Committee, the audit team advised that "it was not aware of any material modifications that should be made to the financial records which appeared to be maintained in conformity with generally accepted accounting principles."

The audit team recommended that the fiscal year of the association be changed to match the SASA tax year which begins on 1 July each year and runs through 30 June of the following year. The Board of Directors is expected to approve this recommendation at its December 1984 quarterly meeting.

MEHURON RECEIVES AWARD

LT. GEN LINCOLN D. FAURER & DR. WILLIAM O. MEHURON

Dr. William Mehuron, Member of the SASA Board of Directors recently received the Exceptional Civilian Service Award for his "exceptionally meritorious service" as the Deputy Director, NSA for Research and Engineering since 1981. The citation, presented by Lt. Gen. Lincoln Faurer, Director of the National Security Agency, stated that under the direction of Dr. Mehuron, the NSA Research and Engineering organization has placed renewed emphasis on all aspects of its mission, including the performance of basic and applied research, the development of technology and the delivery of operational systems. The successes which his organization has achieved were attributed to the personal leadership of Dr. Mehuron and to the sound principles of management which he established throughout the organization.

HAGAMAN LEAVES AFCEA

Brig. General Harry T. Hagaman, USMC (Ret.), Director of AFCEA Intelligence/Special Projects, has resigned the latter post effective 12 October 1984 to join the SASA member organization, H.R.B. Singer Co. as the Director of their Washington office. During his 2 year association with AFCEA, Gen. Hagaman spearheaded the growth of the intelligence interests and activities of the association. His replacement is expected to be announced shortly after 1 November.

BOLAND AND ROBINSON HONORED

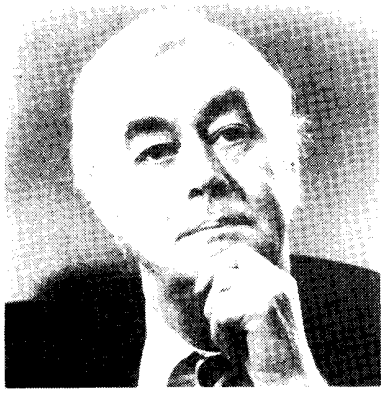
CONGRESSMAN
EDWARD P. BOLAND

CONGRESSMAN
J. KENNETH ROBINSON

A host of colleagues and admirers joined Congressman Edward P. Boland and Congressman J. Kenneth Robinson at a reception in their honor in the Rayburn House Office Building on Wednesday evening, September 26, 1984. Both congressmen were being honored for their distinguished service as members of the House Permanent Select Committee on Intelligence (HPSCI) which they will be leaving at the termination of the 98th Congress. Mr. Boland has the distinction of being the first and only chairman of the HPSCI since it was established by The House in 1977. Under the current rules he and others on the committee who have served for six years must be replaced by new members. Mr. Robinson has also completed the prescribed tenure, however, unlike Mr. Boland, he is not seeking reelection and will retire at the end of this term after 14 years service.

SPEAKER OF THE HOUSE
THOMAS P. O'NEILL

Among the dignitaries paying tribute to the departing congressman were Speaker Tip O'Neill, Senator Pat Moynihan, and the House Minority leader Bob Michel. Speaker O'Neill, after expressing his own views of the significant contribution which each of the honorees had made to our national security, read letters of appreciation which had been forwarded to each by President Carter. Similarly, in separate letters read by Mr. Michel, President Reagan expressed his commendation of the devoted service of both Boland and Robinson. Secretary Weinberger, who could not be present, was represented by Ass't Secretary of Defense C³I, Mr. Don Latham, who presented Chairman Boland and Representative Robinson with Letters of Appreciation signed by the Secretary.



SENATOR
DANIEL P. MOYNIHAN

Speaking for himself and the DCI, Mr. John McMahon, Deputy Director of Central Intelligence, lauded the exemplary service and contributions of both honorees.

Other government notables present on the occasion were Judge William Webster, Director of the Federal Bureau of Investigation, Mr. Edward C. Aldrich, Under Secretary of the Air Force, Vice Admiral E. A. Burkhalter, Director IC Staff, Lt. Gen. James Williams, Director DIA and Mr. Robert Rich, Deputy Director NSA.

In addition to those mentioned, there were numerous key industrial figures on hand to pay their respects to the honorees.

SASA was represented by its Executive Vice President John Morrison who expressed to both Congressman Boland and Congressman Robinson our association's appreciation of their outstanding service in support of national intelligence.

HOUSE MINORITY LEADER
ROBERT H. MICHEL

Other departing committee members being honored at the reception were Representative Mazzoli, Mineta, Fowler, Gore, Whitehurst and Young.

CONGRESS SEES NEED TO STRENGTHEN COMSEC AND COMPUSEC

PRESIDENT REAGAN SIGNS DIRECTIVE

Congressional Committees in both Houses are concerned over the vulnerability of U.S. communications and information systems, and will be paying close attention over the next year to the corrective measures now underway within the Executive Branch to remedy the situation. The Conferees from the Armed Services and Select Intelligence Committees in both the House and Senate have included in the report accompanying the FY 1985 Department of Defense Authorization Act (H. Rept. 98-1080) a strong statement in support of the need to strengthen U.S. communications and information systems security.

In the report the conferees stated that the communications security (COMSEC) posture and practices of the U.S. government are poor and that the security of the nation's automated information systems presents a similar problem. The report goes on to say that although considerable progress has been made, the process of securing essential U.S. communications is progressing too slowly. The conferees concluded that the advantages the U.S. holds in advanced technology, strategic policy and planning, nuclear weapons development and deployment, and numerous other vital areas are in danger.

This concern on the part of the conferees prompted them to direct the Secretary of Defense to provide to the Committees on Armed Services and Select Committees on Intelligence a report on the status of the measures being implemented to remedy the deficiencies in COMSEC and an assessment of the additional funds and personnel required. This report is to be completed by March 1, 1985. Additionally the Armed Services and Intelligence Committees intend to examine in greater detail the subject of U.S. communications security in connection with congressional review of the fiscal year 1986 budget request.

The addition of COMSEC language to the Conference report was described by Rep. Beverly B. Byron in a recent interview with the N.Y. Times as "unusual." The Maryland Democrat suggested the conferees express their concern after her visit last April to NSA's headquarters at Fort Meade. In Rep. Byron's view, "the problem of improving the security of the nation's communications was so important that it should not be delayed."

Congressional action on this subject, as expressed in the FY 85 DoD Authorization Act, coincides with other Congressional and Executive Branch initiatives to strengthen the U.S. COMSEC and COMPUSEC posture. A number of bills have been passed or introduced in Congress which are designed to discourage fraudulent use of computers, and the Executive Branch, under the aegis of the National Security Council, has issued a directive restructuring the policy apparatus overseeing U.S. COMSEC and computer security activities. The directive, NSDD 145 dated September 17, 1984 supercedes and cancels PD/NSC-24.

COMMENTS BY THE PRESIDENT

In the August edition of "COLLOQUY" I expressed my belief that the SASA Charter Amendment was one of the major achievements of the Association. My earlier conviction has been further strengthened by the enthusiastic response from the government sector to this accomplishment. SASA headquarters has received numerous requests for information about our association from federal employees who are expressing interest in the various initiatives within our approved operating program. I am especially pleased to note that our first membership application from a federal employee has been received. Anyone contemplating submission of an application for SASA membership might wish to know that the next group of applicants will be presented to the Board of Directors for approval at its next quarterly meeting tentatively scheduled for 4 December 1984. Any applications received by 30 November can be processed for consideration by the Board at that session.

SASA PRESIDENT
DR. ROBERT HERMANN

Planning for the forthcoming symposium at the Ames Research Center on 13 and 14 November is in full swing and commitments for registration at press time provide a sound basis for optimism over the expected resounding success of this event. I strongly recommend that anyone desirous of attending not delay in forwarding their registration forms to SASA headquarters.

LATHAM SWORN IN AS ASSISTANT SECDEF C³I

ASS'T SECDEF C³I
DONALD C. LATHAM

On August 6, 1984, Donald C. Latham was sworn in as the Assistant Secretary of Defense (Command, Control, Communications and Intelligence). Notwithstanding the reordering of the three C's (Communications used to be first), this reestablished the OSD C³I function at the Assistant Secretariate level, similar to the position as it existed from 1977 to 1981.

The requirement to have effective C³ and intelligence oversight functions in the Office of the Secretary of Defense was recognized during the late 1960's. Lessons learned during the war in Vietnam, coupled with rapidly expanding technologies, gave rise to the need for more immediate management support directly to the Secretary. In July 1970, the position of Assistant to the Secretary of Defense (Telecommunications) was established, and by January 1972 the Congress authorized Assistant Secretary positions for both Telecommunications and Intelligence with Dr. E.B. Rechtin and Dr. Al Hall sworn in, respectively. In 1974, the Telecommunications job was moved to the status of "Director" with command and control responsibilities added, still reporting directly to the Secretary. Between 1977 and 191, Tom Reed and Dick Schriver served as the "DTACCS". By 1976, the post-Watergate scrutiny of intelligence activities led to reorganizations throughout the Intelligence Community. The ASD (Intelligence) was also named to be the Director of Defense Intelligence, and Dr. Tom Latimer (now HPSCI Staff Director) acted in that capacity throughout 1976 and early 1977.

In March 1977 the Department of defense merged the C³ and inteligence functions, creating an Assistant Secretariate for C³I managerially subordinated to the new Under Secretary of Defense for Research and Engineering. Dr. Gerry Dinneen was the first ASD (C³I), and was dual hatted as the Principal Deputy Under Secretary for R&E until 1981. Dr. Bob Hermann (President of SASA) was the Principal Deputy ASD (C³I) from 1977 to 1979, and Dr. Harry Van Trees followed from 1979 to 1981.

In 1981, the Department moved to assure more complete integration of C³I programs with major weapon and electronics systems development. The function was reestablished as a Deputy Under Secretary for C³I within the Office of the USDR&E, and Don Latham was named to fill the position. During the succeeding years, as C³ and Intelligence programs drew increasing interest on the Hill, Congress began to press for higher level leadership and accountability for DoD C³I programs. As both Houses reviewed the Fiscal 1984 Defense Budget, they concurrently developed firm direction to the Department for the establishment of a single focal point within OSD for C³I. Finally, the lawmakers added another Assistant Secretary authorization to an existing DoD sponsored bill and the ASD (C³I) was again established in law.

Don Latham comes to the new ASD position armed with the immediate experience of three years as the DUSD (C³I). His academic background and public and industrial experience make him uniquely qualified to lead DoD's C³I efforts. This includes military and civilian service in the National Security Agency, over ten years with the Martin Marietta Corporation (Aerospace), and two years as Division Vice president, Engineering with RCA Government Systems Division before accepting the White House appointment in 1981. Secretary Latham is currently serving as a member of the SASA Board of Directors.

MEMBERSHIP APPLICATION PROCESSING

SASA By Laws provide that all applicants for membership must be sponsored either by two members in good standing, or one member of the Board of Directors. Additionally, all applicants must be approved by majority vote of the Board of Directors. Lastly, the By Laws specify that all applicants, in order to be eligible for SASA membership, must currently be, or intend to be, engaged in supporting in some manner, directly or indirectly, the efforts of the intelligence community of the United States government. This last proviso makes it incumbent upon the Board of Directors to establish applicant screening measures for determining membership eligibility prior to voting on an application.

To meet the By-Law requirements, when possible it is suggested that members provide prospective applicants with the names of two members (themselves and one other), who are willing to serve as sponsors for the individual or group applicant. By agreeing to sponsor an applicant, you will be attesting to the applicant's or organization's current involvement, or intention to become engaged, in providing support to the intelligence community. Applicants should be advised to provide the names of the SASA members who will sponsor them on their application form and forward a copy of their employer/corporate capabilities manual or equivalent publication that will provide the information required for Board of Directors screening. In the event two members are not available to serve as sponsors, you are requested to consult with SASA headquarters.

1984 MEMBERS WELCOMED

The SASA Board of Directors, at its quarterly meeting on 11 September in Washington, D.C. unanimously approved 15 Group and 13 Individual applications for membership in the Association. The addition of these newest members brings the SASA 1984 membership attrition to 18 Group and 19 Individual members.

SASA extends its warmest welcome to the following 1984 members:

GROUP

Cray Research
Poseidon Group, Ltd.
Concept & Design, Inc.
Emerson Electric Co.
SAIC
Gould Inc., Computer Systems Division
Space Applications Corp.
BETAC Corp.
P.T. Unger Associates
The Pymatuning Group, Inc.
Birch Associates, Inc.
Sanders Associates, Inc.
Itek Optical Systems
Analytical Assessments Corp.
The MITRE Corp.
H R B- Singer, Inc.
System Development Corp.
Northrob Corp. Defense Systems Division

INDIVIDUAL

Stephen D. Sawin
William A. Franklin
Harold W. Vorhies
K. Bruce Jenkins
Robert E. Armentrout
Andrew D. Farrell
Joseph John Cane
Martin Hurwitz
Marcus J. Langholz
Russell J. Gaspard
Oliver Rae Kirby
Karl V. Kline
Joel S. Gardner
Jerome Raffel
Raymond A. Ezekiel
Anthony G. Oettinger
Herbert J. Livingston
Donald E. Heitzman

DUES REDUCTION

SASA is pleased to announce that at its meeting of 11 September 1984 the Board of Directors unanimously approved a reduction of annual dues to $25.00 for individual memberships. The reduction became effective immediately. The Board also has under active consideration a comprehensive restructuring of the overall dues schedule which would take effect at the beginning of the association's new fiscal year, 1 July 1985, which was adjusted from 1 January 1985 by the board at its last meeting.

NEW MEMBERSHIP CERTIFICATES

More in consonance with its recently attained professional status, the association is now in the process of designing a new membership certificate which will be available shortly. At that time all members will receive a registered certificate signed by the SASA president.

PROPOSED LEGISLATION ON DCI POST

Senate bill (S3019) proposed jointly by Senators Barry Goldwater and Patrick Moynihan, Chairman and Vice-Chairman of the Senate Select Committee on Intelligence respectively, would require that the posts of the Director, Central Intelligence and the Deputy Director of Central Intelligence be filled by "career civilian or military intelligence officers." Under current law (PL80-253) appointees to the two top Central Intelligence billets may be civilians or military officers but the law does not require intelligence experience. However, the law does preclude concurrent assignment of military officers in both slots.

The proposed legislation will be considered by the 99th Congress at which time it is expected to receive a hard look by the Administration which traditionally desires to make its own appointments to such posts and by those in Congress who feel that "outsider" talent, in the top intelligence management position, can produce *"new views and new ideas"*.

THE ENGIMA SOLUTION:
POLISH - FRENCH CONTRIBUTIONS

The publication in 1974 of Group Captain F. W. Winterbotham's **The Ultra Secret** revealed the fascinating story of the immense contribution to the Allied cause in World War Two achieved from exploitation of the German cipher machine Enigma. The story of the events leading to that war-time cryptanalytic success is equally fascinating.

The Enigma, an electro-mechanical wired enciphering machine with a series of wheels, was put on the European commercial market in the 1920s. It was adopted by the German Navy in 1926, the German Army in 1929, and the German Air Force in 1934. Each service subjected it to a series of modifications such as the addition of variable inter-connecting plugs between the keyboard and the wheels, introducing the frequency of changes in the settings. By the outbreak of the war, the Germans believed they had a secure machine, even in the event of its capture. It truly was a formidable challenge for any cryptanalyst.

A team of Polish mathematicians began addressing the challenge in 1928. Augmented in September 1932, the team acquired a commercial model and sought to discover how the Germans had modified it for military use. It took them just four and a half months to achieve a mathematical break-through against the early version of Enigma.

There is evidence that they were aided in this success by documents provided by the French. From 1932 to 1939, General Gustave Bertrand of the cryptanalysis section of French Intelligence had contact with a German, Hans-Thilo Schmidt, who was employed in the cipher branch of the German Army until 1934 and subsequently in the German Air Force Communications Intelligence Section. Schmidt provided over 300 documents on the Enigma, including instructions for one of the machines; Army keys for 1932, 1933 and half of 1934; a cipher text with its clear text basis; and key data - everything except details on the internal wiring of the wheels.

SASA HISTORIAN
ROBERT E. DRAKE

In 1933 Bertrand approached the British, Poles and Czechs with the information seeking help in exploiting it. Neither the Czechs nor the British manifested much interest, but the Poles quickly entered into limited collaboration with the French. Helped by a Pole working in an Enigma factory in Germany, the Polish team in 1934 began to develop its own crude Enigma machine. Several experimental models were put together through French-Polish cooperation between 1934 and 1938. The Poles and French also collaborated on the interception and decryption of German signals between 1936 and 1938.

In 1937 the Polish team developed the Bombe, a machine devised for finding Enigma keys by the rapid automatic testing of tens of thousands of possible combinations. Improved versions evolved up to 1939. This device clearly facilitated the exploitation of Enigma traffic, but details on when the Poles began reading Enigma, how extensively and how currently, remain obscure. Nevertheless, it is clear that some messages were being read.

Meanwhile, the British in April 1937 had manually broken the Enigma used in Spain by the Germans, Italians and Franco's forces in the Spanish Civil War. It was a machine similar to the commercial model. But, by the end of 1937, the British had given up trying to break the model used by the German Navy. The Poles too had run into trouble with German Naval Enigma after April 1937.

Trouble mounted when, on 15 September 1938, the Germans introduced two new wheels, making five now available for selection. While the Poles worked out the wiring for the new wheels, they ceased to be able to read traffic as of mid-December 1938. The French also could make no progress on their own, so General Bertrand invited the Poles and British to a conference on Enigma.

This meeting in Paris on 7-9 January 1939 did not result in any exchange of Enigma results. The Polish cryptanalysts were under instructions not to disclose their successes unless the other participants revealed some progress. The Poles apparently concluded that the French and British had nothing to offer.

It is interesting to note that British policy as late as April 1939 still precluded cryptanalytic exchange with the French.)

Not long after this rather abortive meeting, the Poles invited the British and French to meet again in Warshaw on 24-25 July. The Poles were obviously prompted to take this initiative by the deteriorating international situation coupled with their continuing lack of success against Enigma. They consequently decided to ask for close collaboration with France and Britain.

So it was that the Poles at this historic meeting explained their methods for breaking Enigma and agreed to provide the British and French each with a copy of a Polish-built Enigma machine and technical drawings of the Bombe. It was further agreed that the British would concentrate on breaking daily keys while the Poles would be responsible for more theoretical research. By 16 August 1939 the promised Polish materials, including information on wheel wirings, were in British hands. The war began on 1 September.

By October the Polish cryptanalysts were in Paris with Bertrand's organization and in December, with help from the British, made the first war-time break into Enigma. Another break was soon achieved by the British, and the exploitation of Enigma was set in motion. Between January and June 1940, when Bertrand's group disbanded upon the fall of France, over 120 Enigma keys were solved, mostly by the British. By the end of May the first British-made Bombe was delivered. From the summer of 1940 more and better models followed and formed the essential basis for the Ultra contributions to Allied victory in World War II.

Security Affairs Support Association
80 West Street
Annapolis, Maryland 21401

COLLOQUY — OCTOBER 1984

Security Affairs Support Association (SASA)

Presents

Software Trends in the Intelligence Community

13-14 November 1984
NASA Ames Research Center
Mountain View, California

Declassified in Part - Sanitized Copy Approved for Release 2011/11/10 : CIA-RDP87T00623R000100080011-7

SASA Gratefully Acknowledges
the Symposium Support Provided by

*Dr. William O. Mehuron	National Security Agency
*Mr. Clark G. Fiester	GTE Government Systems Corporation
*Mr. Donald Littler	GTE Government Systems Corporation
*Mr. Luther L. Smith	ESL, Incorporated
*Mr. William Pretto	GTE Government Systems Corporation
*Mr. William E. Holland	GTE Government Systems Corporation
*Mr. Donald Jacobs	ESL, Incorporated
*Mr. Richard B. Gentile	National Security Agency
*Mr. James Leer	Technology for Communications International
*Ms. Kathleen Connell	Ames Research Center
*Mr. David Kerlin	Commissioned Officer's Mess Moffett Naval Air Station

THE SECURITY AFFAIRS SUPPORT ASSOCIATION

13 November 1984

WELCOME!

The Association is very pleased to welcome you to its symposium on "Software Trends in the Intelligence Community." This event is being sponsored by the Department of Defense and has been designed for you - the senior and middle management personnel from industry, government and academe who have interests in gaining an appreciation of current developments, mid term plans and long range trends in software applications for intelligence community programs. It is our hope that you will find the program not only highly informative but personally enjoyable as well.

SASA is extremely grateful to the outstanding professionals from government and industry who have been willing to devote their time to sharing their knowledge on software trends with our symposium attendees. Many, many thanks to each of them. We also deeply appreciate the superb cooperation and support extended to the association by the Director and staff of NASA Ames Research Center and the Commander and staff of the Moffett Naval Air Station.

Before your departure, we would be indebted if you would give us your thoughts on the symposium and any suggestions for themes that you would like the association to address in the future. Please make your comments on the last page of your symposium notebook.

Donald C. Webster
Symposium Program Director

THE SECURITY AFFAIRS SUPPORT ASSOCIATION

P R O G R A M

13 NOVEMBER 1984

0730 - 0900 Registration

0900 - 0915 Administrative

0915 - 0930 Welcome

0930 - 0945 INTRODUCTION TO STIC - **Dr. William O. Mehuron**

0945 - 1045 ARTIFICIAL INTELLIGENCE APPLICATIONS

Dr. Richard W. Scott, *GTE Government Systems Corporation* . . . In the last two years, Artificial Intelligence (AI) has emerged as a key technology that is on the threshold of making a major impact on both commercial and DoD activities. The DoD Intelligence community has several new initiatives to evaluate and exploit this technology. To date, however, there are a few AI systems which are used to support DoD operations. This presentation will discuss the develpment of both current and planned AI systems for use in operations. Key challenges to the development of successful AI applications will also be represented.

1045 - 1100 Break

1100 - 1200 ARTIFICIAL INTELLIGENCE TECHNOLOGY

Mr. Mark A. Williams, *ESL, Incorporated* . . . One of the main objectives of Artificial Intelligence is to make machines more useful by having them exhibit characteristics we associate with intelligence in human behavior. To achieve intelligence behavior, Artificial Intelligence systems must implement techniques that address a number of issues that deal with what the system needs to know, how to combine what it knows to draw conclusions, and how to deal with uncertainties. This presentation will first define the main technical issues involved in achieving intelligent behavior and describe their role in the implementation of AI systems. Proven techniques that address these technical issues will then be itemized and described. Advantages and limitations of the various techniques will be indiciated, followed by a survey of current tools and AI programming languages that implement these techniques The presentation wil conclude with a discussion of some of the pragmatic considerations for designing and building AI systems.

1200 - 1315 Lunch at Moffett NAS

1315 - 1415 SOURCE LANGUAGES - ADA: THE STATE OF THE ART

Col. William A. Whitaker, USAF, *WWMCCS Joint Program Management Office* . . . The World Wide Military Command and Control System (WWMCCS) Information System (WIS) is one of the first major mission critical Defense systems to be designed and implemented in Ada. The choice of Ada supports the "software first" philosophy of the program which dictates a machine independence only possible with Ada. This presentation addresses the state of Ada technology as seen by a large system, and the expectations for the near future.

1415 - 1515 SOFTWARE DEVELOPMENT METHODOLOGY

Mr. Robert Vidensek, *ESL, Incorporated* . . . The need for reliable, accurate and field maintainable software predicates the need for integration of good software management practices and software development techniques. Methodologies for management to stay abreast of development status and recognize problems early and for software development teams to better generate the product and suport management needs are paramount. This presentation describes a development approach with methodologies to help satisfy those needs.

1515 - 1530 Break

1530 - 1645 DATABASE MANAGEMENT SYSTEMS

Dr. Barry W. Boehm, Dr. Kwang-I Yu, *TRW, Incorporated* . . . Current commercial database technology is maturing, but is still unable to support a number of critical intelligence community requirements. These include extra-high levels of performance, reliability, and security, and the ability to support multiple data models. This representation will discuss the status and results of several advanced research projects which address some of these critical needs.

1800 - 2100 Reception and Dinner at Moffett NAS

P R O G R A M

14 NOVEMBER 1984

0730 - 0900 Registration

0900 -1000 DIGITAL SIGNAL PROCESSING TECHNOLOGY

Dr. Stewart A. Steele, *RCA, Government Systems Division* . . . This presentation assesses Digital Signal Processing Technology, and discusses future trends. Basic building block elements and chips are defined with their relationships to the required technology. Various architectures existing today and planned for the future, including a current assessment of data flow approaches, are presented. The important issue of software and the implication of its use for real-time digital signal processing is discussed. The type of development tools required to build modern cost effective digital processing units are also identified. Important hardware/software trade-offs and their influence on the performance of a system are quantified. Trends, as they apply to micro electronics, architectures, and expected performance, are highlighted.

1000 - 1100 DIGITAL SIGNAL PROCESSING APPLICATIONS

Dr. Dennis Wilson, *Ford Aerospace and Communications Corporation* . . . With the advent of VHSIC technology, digital signal processing is becoming a more powerful means of implementing signal processing functions. Algorithms that will be implemented using the digital signal processing software range from demodulators and demultiplexers of communication signals to signal recognition and selection processing. After signals are reformatted and selected, they may be compressed for storage or transmission, then re-expanded. Among these algorithms are some of the most demanding algorithm development tasks of today. The selection task includes such things as voice keyword recognition. The software that is used to implement the algorithms can also be a very demanding real-time software design task. The algorithms of digital signal processing and the software that will implement those algorithms on the machines of the future will be explored.

1100 - 1115 Break

1115 - 1215 SECURE SOFTWARE SYSTEMS

Dr. D. Elliott Bell, *DOD Computer Security Center* . . . "Secure Software Systems" can refer to a large number of different concepts of "secure"; including, Physical security, identification and authentication security, and "computer security". Furthermore, with the advent of software systems that are more and more distributed (in a variety of senses), secure software systems can include other concepts such as TEMPEST and COMSEC. This presentation will address primarily the current state of computer security in software systems, as exemplified in vendor products and in research projects. Also covered will be the modern dilemma of the intermingling of computer security and COMSEC in the new world of distributed systems that include terminals and peripherals with significant computational power and storage capacity. Areas of possible and probable advance in the state of the art for secure software systems will be outlined briefly.

1215 - 1330 Lunch at Moffett NAS

1330 - 1430 INTERNET SYSTEMS AND PROTOCOLS

Dr. Stephen Kent, *BBN Communications* . . . Packet Networks are rapidly becoming the preferred means of interconnecting mainframes, terminals and personal computers, for both long haul and local connections. This trend is based on many factors, including the economic advantages that accrue from multiplex communications, and the development of standards that allow communication among equipments from diverse vendors. Members of the DoD Intelligence Community have been in the forefront of the transition to this technology, often advancing the state-of-the-art in areas such as high band width packet switching and packet network security. This presentation will examine current packet network technology, protocol standards, inter-networking and future trends. Examples will be drawn from packet networks deployed and under development for the DoD intelligence Community.

1430 - 1530 NATIONAL SUPER COMPUTING RESEARCH LABORATORY

Mr. Kermith H. Speierman, *National Security Agency* . . . The National Super Computing Research Laboratory is being established to perform research in parallel processing using advanced parallel processing prototype architectures and software. Research will be conducted in algorithms, languages, representational methods, operating systems, and machine architecture. This research will be centered on a set of real applications that are important to our national security. The prototypes will be specially built under contract with industry in collaboration with universities who have been doing research in this area. As many as six (6) different prototypes will be built. The availability of different architectures in the laboratory will encourage comparative analysis and a deeper understanding of the relationship between algorithm structure and processor structure. Emphasis will be on learning how to do parallel processing on real problems.

B I O G R A P H I E S

DR. WILLIAM O. MEHURON

Dr. Mehuron was appointed Deputy Director for Research and Engineering, National Security Agency (NSA) in July 1981. In this position, he is responsible for directing the research, technology, system development, and system acquisition program to meet signals intelligence (SIGINT), secure communications (COMSEC), and computer security (COMPUSEC) requirements.

The Research and Engineering Organization, directed by Dr. Mehuron, has over 2,000 professional, technical, administrative, and support personnel. It has a multi-million dollar budget, and over 300 projects ranging from the basic research to large-scale system acquisition.

Prior to his NSA assignment, Dr. Mehuron served with the Department of the Navy for six years, most recently as Director of Research and Development Plans for the Navy's RDT & E organization.

Before entering government, Dr. Mehuron worked 15 years in private industry, with RCA, GE and the MITRE Corporation.

Dr. Mehuron received his BSEE degree with Distinction from Purdue University in 1959. He earned a MSEE in 1962 and a PhD (EE) in 1966 from the University of Pennsylvania. Dr. Mehuron is a member of the SASA Board of Directors.

D. ELLIOTT BELL

D. Elliott Bell is the Deputy Chief of the Research and Development Office of the Department of Defense Computer Security Center. He received his B.S. in mathematics at Davidson College in 1967 and his M.S. and Ph.D. from Vanderbilt University in 1969 and 1971, respectively. He spent twelve years at the MITRE Corporation working on a variety of assignments, including basic computer security modeling work. Since joining the Computer Security Center, he has been involved in the general R&D program and in the BLACKER Phase 1 program.

DR. BARRY W. BOEHM

Dr. Boehm is currently Chief Engineer of TRW's Software and Information Systems Division. Previously, he headed the Information Sciences Department at The Rand Corporation, and was Director of the 1971 Air Force CCIP-85 study. His responsibilities at TRW include direction of TRW's internal software R&D program, contract software technology projects, the TRW software development policy and standards program, the TRW Software Cost Methodology Program, and the TRW Software Productivity System, an advanced software engineering support environment.

Dr. Boehm received his B.A. in Mathematics from Harvard in 1957 and his M.A. and Ph.D from UCLA in 1961 and 1964, respectively. During 1978-79 he was a Visiting Professor of Computer Science at USC; he is currently also a Visiting Professor of Computer Science at UCLA. He serves on the Governing Board of the IEEE Computer Society, and on the editorial boards of several journals. His most recent book, *Software Engineering Economics,* was published by Prentice-Hall in September 1981.

B I O G R A P H I E S

DR. STEPHEN T. KENT

Dr. Kent is the Chief Scientist of BBN Communications Corporation, a subsidiary of Bolt Beranek and Newman, Inc. At BBN, he has served as project leader or principal investigator for a number of projects, including the development of end-to-end encryption systems for packet switched networks, design of a secure transport layer protocol, design of personal authentication systems, and performance analysis of end-to-end network security systems. Dr. Kent is the author of several publications on the topic of network security. He is the communication security editor for the Journal of Telecommunication Networks and a member of the board of directors of the International Association for Cryptologic Research. Dr. Kent has served as a national lecturer for the ACM and has lectured on the topic of network security in the United States and Western Europe for George Washington University, USC, MIT, the Department of Defense and several private firms. He received S.M., E.E. and PhD. degrees in computer science from the Massachusetts Institute of Technology.

DR. KWANG-I YU

Dr. Kwang-I Yu was born in Hong Kong and grew up in Malaysia. He became a United States citizen in 1980. He joined TRW in December 1980, after completing his dissertation on "Communicative Databases" (an architecture for managing large numbers of distributed databases) at Caltech.

At TRW, Dr. Kwang-I Yu is a senior staff engineer in the Software and Information Systems Division of the TRW Defense Systems Group. His principal duty has been to direct IR&D research in the database technology area. He also advises on major proposals and contracts. Currently, he is the principal investigator of the "Associative Mass Storage Device" IR&D project, where he leads a team of engineers in the development of advanced computer architectures for relational database management and text processing. Dr. Kwang-I Yu holds a B.S. in Physics and Mathematics from the Univerity of Richmond (Virginia) and a Ph.D. in Computer Science from Caltech.

DR. RICHARD W. SCOTT

Dr. Scott is currently responsible for Artificial Intelligence technology applications at GTE Government Systems, Western Division, Mountain View, California. Dr. Scott is the program manager for the development of several knowledge-based systems in support of DOD intelligence applications. He also manages Western Division's AI independent research and development program.

Dr. Scott has 18 years experience in the design and development of C^3 systems with emphasis on the automation of intelligence processing and analysis systems. Previously, he was the program manager for the development of a real time ELINT C^3I system. In his activities at GTE, he has extensive interface with the R&D, S&T and operational elements of the DOD community.

In addition to his current AI related activities, Dr. Scott has expertise in the areas of data base management, modeling and decision analysis. Dr. Scott received his PhD from Standford University in 1974.

B I O G R A P H I E S

KERMITH H. SPEIERMAN

Mr. Speierman graduated from the University of Southern California in June 1953 with an AB Degree in Mathematics, and pursued graduate studies at the University of California from August 1954 to March 1955.

From August 1953 to August 1954, Mr. Speierman was a Programmer with the Electro Data Corporation. Between September 1955 and January 1959, he was Chief, Mathematics Section, Atomic Energy Division, Babcock and Wilson Company. Mr. Speierman then joined the Burroughs Corporation as Assistant to the Manager of the Technical Services Department, Electro Data Division, and subsequently was Senior Staff Scientist, Burroughs Laboratories, from February 1959 until November 1965.

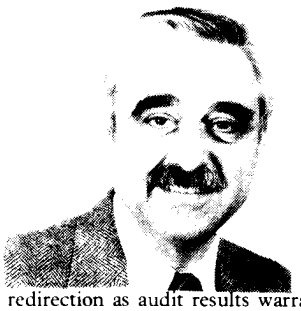
In November 1965, Mr. Speierman joined the National Security Agency and was assigned as Chief, Software, C9, until July 1973, when he was appointed Deputy Chief, Information and Computer Services, C Group and from January 1974 to May 1977, Mr. Speierman served as Chief. In August 1980, Mr. Speierman became the Deputy Director for Telecommunications and Computer Services and on 1 June 1983 was designated as Chief Scientist, NSA.

DR. STUART A. STEELE

Dr. Steele is Manager of Computer Control and Software Systems at RCA, Moorestown, NJ. He is responsible for 300 computer system personnel developing software intensive real-time systems. Applications include Air Traffic Control, Command and Control, Distributed Processing, Signal Processing, Simulators, Radar Processing, and Intelligence Data Gathering. High technology efforts are in Ada and Advanced Operating Systems.

Prior experience includes guidance and control system engineering and he has served as Assistant Professor of Electrical Engineering at the Pennsylvania State University with responsibility for the Digital Systems Laboratory.

Dr. Steele has published over 40 papers in the Computer Control and Software Engineering field. He has a B.S. in EE from Bucknell University and an M.S. and Ph.D. in EE from the Pennsylvania State University.



ROBERT J. VIDENSEK

Mr. Vidensek has over 25 years of experience in software development. That experience spans both line and project management at McDonnell Douglas, TRW, the Aerospace Corporation, and currently ESL.

His current assignment at ESL is corporate Software Practices Manager where he is responsible for generations and administration of software development policies and for assisting project managers in the use of and shaping of those policies to project particulars. He is also responsible for auditing software activities for on-going projects and for recommendations leading to project redirection as audit results warrant. In his role of Software Practices Manager, he originated and developed a software quality assurance group and a software configuration management group at ESL.

He is the father of ESL's Software Productivity Improvement Project (SPIP) and serves that project as a member of its steering committee.

Mr. Vidensek holds an MS degree from Kansas State University.

BIOGRAPHIES

COL. WILLIAM WHITAKER, USAF

PHOTO NOT AVAILABLE

Col. Whitaker has more than 28 years in the United States Air Force, much of that at the Air Force Weapons Laboratory specializing in field testing and computer simulation of nuclear weapons and their effects. He served as Chief Scientist of AFWL. In 1973 Col. Whitaker was transferred to the Pentagon, Office of the Director of Defense Research and Engineering, where he was responsible for Defence basic research, advanced weapons technology, and advanced computer technology. He identified the need for software research and established and chaired the High Order Language Working Group, which formulated and ran the effort that produced the Ada language. He continued this as Assistant to the Director of the Defense Advanced Research Projects Agency. He has become a user of Ada at his subsequent assignment as Technical Director for Digital Technology with the Air Force Armament Laboratory and in his present position as Director for Advanced Technology of the World Wide Military command and Control System (WWMCCS) Information System (WIS). WIS is one of the largest early systems to use Ada as the implementation language and Col. Whitaker has been involved in preparing the technology foundation that led to the decision to use Ada and in developing and evaluating tools, techniques, standards, and guidelines for implementation.

He holds B.S. and M.S. degrees from Tulane University and a Ph.D. in Physics from the University of Chicago.

MARK A. WILLIAMS

As Manager of the Artificial Intelligence center at ESL, Mr. Williams is responsible for AI research and development, AI marketing support, staff training, new concept formulations, technology infusion, and AI equipment and facilities. His current technical efforts involve the application of AI to tactical and strategic reconnaissance. Specific areas of research include multiple, distributed, autonomous and cooperating expert systems for signal understanding, and the integration of AI techniques with conventional signal processing techniques.

Prior to becoming the AI Center manager, Mr. Williams was responsible for automated SIGINT signal acquisition and classification technology at ESL. Pattern recognition theory and digital signal processing techniques were applied to achieve high probabilities of correct classification for both single channel VHF/UHF signals and for baseband signals carried in multiplexed, multichannel communications systems. Concepts of machine learning and articifial intelligence were applied to the automatic classifiers to yield adaptive classification algorithms capable of improving performance during system operation.

DR. DENNIS L. WILSON

Dr. Wilson has a Ph.D. in Electrical Engineering and more than 20 years of experience in digital signal processing algorithms. He is currently with Ford Aerospace and Communications Corporation where he leads a group involved in advancing the state of the art in the algorithms and implementation of digital signal processing. Specific projects that have come under Dr. Wilson's direction include advanced signal recognition and signal demodulation algorithm development.

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Computer Sciences Corporation
Computer Science Innovations, Inc.
Cray Research, Inc.
Defense Intelligence Agency
E-Systems, Inc., Garland Division
E-Systems, Inc., Greenville Division
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Gould, Inc.
GTE Government Systems Corporation
Harris Corporation
HRB-Singer, Inc.
Hughes Aircraft Company
Intelligence Community Staff
Intercon Systems Corporation
Litton ITEK Optical Systems
Lockheed Missile & Space Company, Inc.
Loral Electronic Systems
McDonnell Douglas Astronautics Company
National Security Agency
Office of the Chief of Naval Operations
Planning Research Corporation
Probe Systems, Inc.
RCA
Science Applications International Corporation
System Development Corporation
Sperry Corporation
Stanford Telecommunications, Inc.
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