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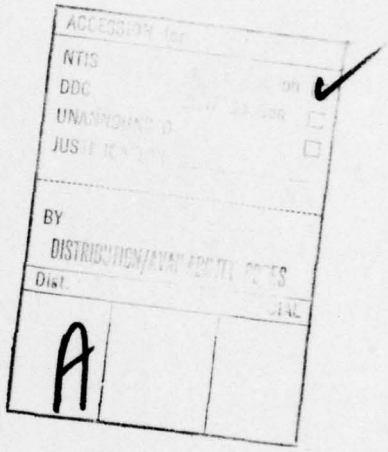
This Final Technical Report documents research on developing a prototype executive aid for crisis management. The report contains four chapters, four appendices, and a bibliography. Chapter 1 describes the effort in the context of ARPA's Crisis Management Program. Chapter 2 reviews the structure of the prototype executive aid, while Chapter 3 considers the role of data in the aid and the types of data required. Chapter 4 summarizes aid evaluation and

transfer. The four appendices highlight various facets of the research, including the sample for which data have been collected, the types of data gathered, and the weighted objectives solution algorithm.



EXECUTIVE SUMMARY

This project had four specific objectives.

1. Design and develop a prototype executive aid for crisis managers that would enhance option evaluation and selection in crises. The aid was to help provide for faster operation generation, more reliable option evaluation, and improved option selection during crises.

2. Employ evidence from past U.S. crises as a means to inform future Department of Defense crisis management efforts.

3. Assess the performance of the prototype executive aid in improving crisis option evaluation and selection.

4. Transfer the aid to a demonstration computer system specified by the Defense Advanced Research Projects Agency (ARPA) for implementation and further evaluation.

CACI, Inc.-Federal successfully accomplished these four objectives by

- Developing and analyzing an historical data base of 101 U.S. crises between 1956 and 1976.

- Designing a prototype executive aid for crisis managers that can run on a variety of micro- and minicomputer systems as well as large computer systems.

- Generating an interactive computer program for the executive aid that gives users considerable flexibility while also permitting unsophisticated users to exercise the system without major difficulties.

- Evaluating the usefulness of the prototype executive aid based on comments from action officers, resource managers, and qualified personnel at ARPA, the Office of Naval Research, U.S. Navy OP 942, Defense Intelligence Agency, U.S. Air Force, Joint Chiefs of Staff/J-3, J-5, National Military Intelligence Center, Central Intelligence Agency, and other organizations in the national security community. Numerous enhancements to various versions of the executive aid resulted from demonstrations to these agencies.

- Transferring the prototype executive aid for crisis managers from a commercial computer system to an ARPA-purchased Tektronix 4051 minicomputer with 32K storage. The software, data files, and parameters used in the prototype executive aid will be transferred to the ARPA Demonstration and Development Facility (DDF) when the PDP-11/70, dedicated to the ARPA Crisis Management Program, becomes available.

- Preparing this project final report, a user's guide for the prototype executive aid (CACI, 1977c), documentation for the computer software (CACI, 1977d), and a listing of the historical data from 101 U.S. crises between 1956 and 1976 used in the executive aid (CACI, 1977e).

The prototype executive aid that resulted from this research effort represents a pathbreaking attempt to systematize existing knowledge and create new knowledge on historical patterns in U.S. crisis management experience over the last 20 years. It will provide crisis managers at major command centers with additional analytic capabilities during times of stress by

- Expanding the range of alternative analogies of crisis situations available to the crisis manager in the Department of Defense.

- Presenting systematic evidence on the relationships between a declared U.S. policy objective and actions that have been historically taken to achieve the policy objective.

- Providing a means to facilitate policy response selection based on the historical evidence when multiple (and perhaps inconsistent) policy objectives are followed in the crisis.

After an introductory overview of the research, Chapter 2 details CACI's research to design and generate the prototype executive aid. Chapter 3 describes how the historical evidence used in the aid was generated, how the empirical parameters were derived, and some of the key patterns isolated in the data. Chapter 4 summarizes efforts to evaluate the aid and transfer the software to an ARPA-designated computer system.

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CHAPTER 1. INTRODUCTION

This report summarizes CACI, Inc.-Federal's progress in developing prototype executive aids for crisis managers. The research is funded by the Defense Advanced Research Projects Agency's Cybernetics Technology Office (ARPA/CTO) as part of its Crisis Management Program. Accordingly, the first part of this chapter briefly discusses the goals of the ARPA Crisis Management Program. The second part reviews CACI's role and the place of the executive aids in the Crisis Management Program. The third section summarizes the tasking required for this project and relates activities in each task to the rest of the report.

THE ARPA CRISIS MANAGEMENT PROGRAM

The ARPA Crisis Management Program is a major undertaking to develop, test, and transfer technologies in three areas:

1. Computer-based early warning and monitoring systems;
2. Computer-based executive aids for crisis managers; and
3. New quantitative methods for advanced warning, monitoring, and management.

Wide-ranging research has been directed toward each of these areas by ARPA since 1974. Initial work through 1976 was directed toward certain basic research themes that are prerequisites for effective technology development in social sciences. Characteristic of this type of research was CACI's attempt to inventory past U.S. crises (CACI, 1975) and to identify the major patterns of problems encountered in past U.S. crises (CACI, 1976).

By 1976, however, a corner had been turned in the research needs for crisis management. Significant new information had been developed that

was directly applicable to producing user-oriented, computer-based aids to

- Assist defense operations centers in identifying what indicator and warning patterns signal the onset of a crisis; and
- Develop option generation and evaluation aids to assist crisis managers after the crisis has begun.

Continued research and testing along these two lines will provide the basis for future efforts in the program. Attention to systematic evaluation of the analysis products (including software) will also increase as ARPA field tests the various aids in command centers throughout the Department of Defense.

CACI'S ROLE IN THE CRISIS MANAGEMENT PROGRAM

CACI's efforts within the Crisis Management Program contribute to three classes of research products:

1. Computer-based decision aids applicable to national and major command centers during crisis management activities.
2. Data bases on the changing nature of crises, problems likely to be encountered, the types of objectives sought, actions taken, and the results achieved.
3. Reports summarizing the problems of crisis management, the opportunities for improving crisis management techniques and decision-making, and research gaps in the field of planning for better national security crisis management.

Figure 1 illustrates the relationships among these various classes of products in ARPA's Crisis Management Program. CACI's initial attempts to reconceptualize crises as "extraordinary military management activity" instead of the more common "grand crisis" definition and to develop an

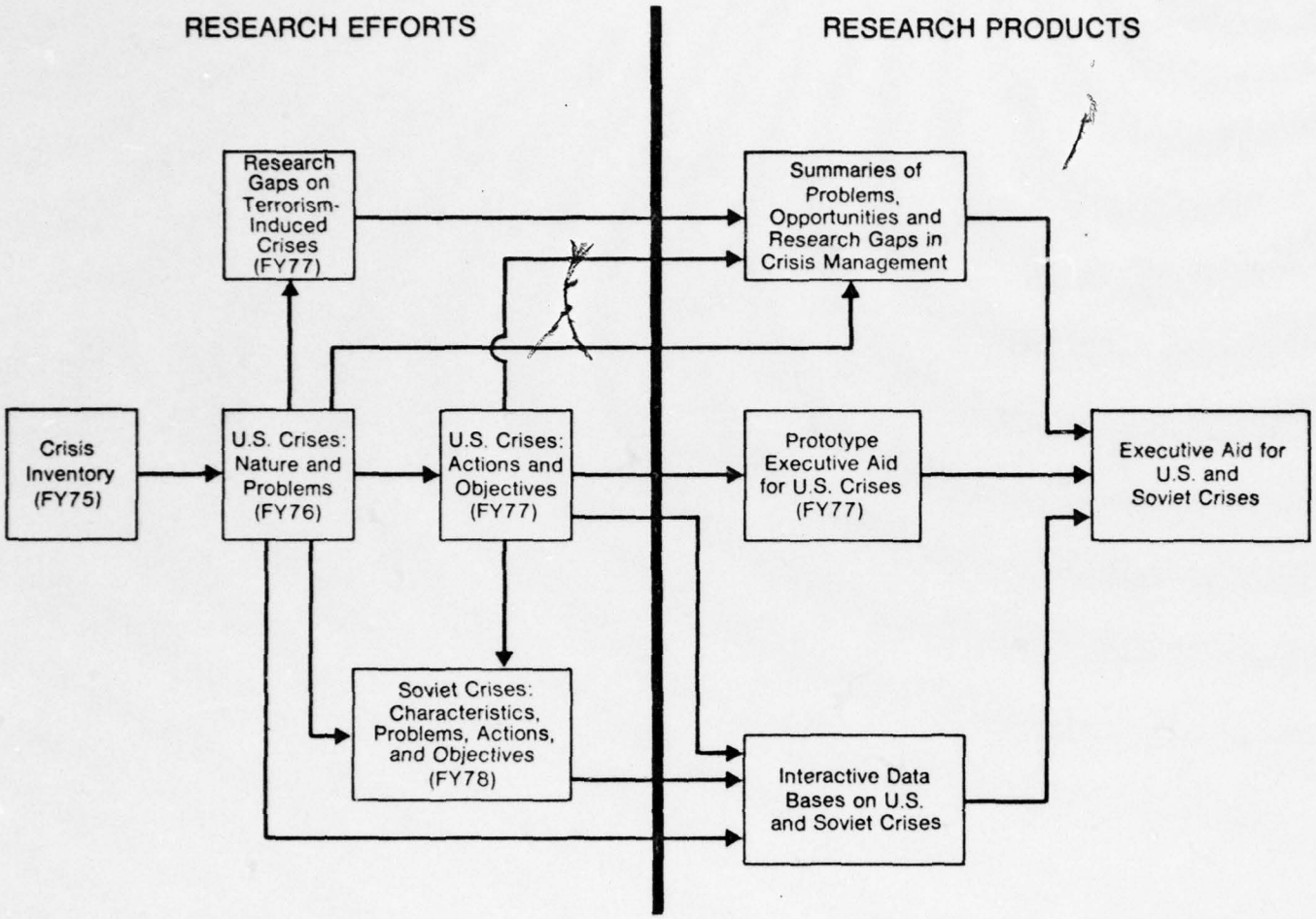

Figure 1. Research Efforts and Research Products

inventory of U.S. crises using this definition began in FY75 (CACI, 1975). These efforts were continued and expanded during FY76 in CACI's seminal assessment of the background characteristics and problems encountered in a sample of U.S. crises between 1946 and 1975 (CACI, 1976).

Analysis during FY76 indicated at least three major directions for additional research. First, one tangent of the research (Shaw, et al., 1976) identified terrorist-induced crises as a growing area of concern. Subsequent analyses have identified research and development gaps in this area (CACI, 1977a). Second, the need to reduce crisis management problems by determining the most effective set of actions for different crisis contexts and policy objectives was identified. Accordingly, CACI's efforts during FY77 have focused on examining the relationship between U.S. crisis actions and policy objectives and developing a prototype executive aid for crisis managers that incorporates these empirical relationships (CACI, 1977b). Third, the FY76 research showed the need for comparable information about major adversaries. Accordingly, CACI's research during FY78 will develop the information base needed to examine Soviet crisis management behavior systematically and develop interactive software to aid U.S. crisis managers.

RESEARCH TASKING ON THE PROTOTYPE EXECUTIVE AID FOR CRISIS MANAGEMENT

CACI's efforts under Contract No. N00014-77-C-0135 are directed toward developing a prototype executive aid for crisis management. The aid is focused on behavior and policy responses after the crisis has occurred. It is not an early warning device.[1] Rather, it seeks to inform response option recommendation by action officers and response option selection by decision-makers in the Department of Defense once extraordinary military management activity has begun and the manipulation of key military assets to achieve U.S. policy objectives is being discussed.

[1] ARPA's early warning efforts are reported in Andriole (1976), Andriole and Young (1977), Wittmeyer (1976), and Daly (1977).

A voluminous literature exists on behavior of individuals and nations during international crises.[2] Almost all of this literature suggests that individuals placed under stress (as they are by definition in international crises) display reduced information search, consider fewer alternatives, overreact to isolated pieces of information, and generally engage in what would otherwise be suboptimal choice generation and selection. Given the criticality of wide-ranging information search and alternative generation within the time constraints imposed by a crisis to optimal policy option selection, CACI has developed an executive aid that will assist crisis management in three ways.

1. Expand the range of alternative analogies of crisis situations available to the crisis manager in the Department of Defense.

2. Present systematic evidence on the relationship between a declared U.S. policy objective and actions that have historically been taken to achieve that objective.

3. Provide an algorithm to facilitate policy response selection based on the historical evidence when multiple (and perhaps inconsistent) policy objectives are followed in the crisis.

Expanding Available Alternative Analogies

Jervis (1976) has recently reviewed the evidence on the importance of personal experience and historical analogies in alternative generation and selection, particularly under stress. The preponderance of this research suggests that individuals tend to focus on major salient events from past experience and on rules and "lessons learned" from

[2] This literature has most recently been reviewed for ARPA in Shapiro and Gilbert (1975). Other major discussions of this research are found in Zinnes (1976), Hoole and Zinnes (1976), Holsti (1972), Janis (1972), Hermann (1972, 1969), Tanter (1974), Candela and Tanter (1974), Holsti, et al. (1968), Allison (1971), and many, many others. Attempts to develop organizational guidelines from this literature are found in Shapiro and Cummings (1976), Havron and Blanton (1977), Hermann (1975, 1974), Milburn (1969), and Phillips (1977).

the past experience of the organization.[3] Accordingly, one thrust of the prototype executive aid is packaging information on past U.S. crises that can be recalled to show analogous situations in which the United States pursued similar policy objectives and/or considered similar actions. While a number of incidents may be known to defense crisis managers, it is unlikely that all or most action officers and decision-makers would have such detailed information at their disposal. Thus, crisis management may be improved simply by providing more systematic information on past crises that had many of the same characteristics.

Systematic Evidence on Past U.S. Actions and Objectives

Recent research by Blechman and Kaplan (1977) suggests that a clear "style" to U.S. crisis responses exists in which primary reliance is placed on naval forces. However, they also conclude that the most effective single means for obtaining the primary U.S. policy objective in a crisis is to use long-range, land-based aircraft.

The prototype executive aid for crisis management builds on this path-breaking research as well as other analyses on the limits to using force and coercive diplomacy (George, et al., 1971; Stern, forthcoming). Information on U.S. objectives is linked to actions taken in past crises to help guide response selection. Thus, with the prototype executive aid, the crisis manager will be able to examine what actions have been most strongly associated with any single objective over a sample of U.S. crises since 1956. In turn, this information should help crisis decision-makers to evaluate the likely efficiency of using different combinations of actions to achieve a specific policy objective.

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[3] In interviews with a series of U.S. foreign policy advisors, Shapiro and Bonham (1973) encountered recurrent references to "the lessons from..." syndrome. Similar evidence is present in analyses of previous crises and previous intelligence shortfalls (Ben-Zvi, 1976; Shlaim, 1976; Lee, 1977).

Response Evaluation Given Multiple Objectives

Seldom, if ever, does the United States pursue a single policy objective in a crisis. Rather, a number of objectives, some of which may be inconsistent with each other, are simultaneously pursued. To respond to a very real crisis management problem -- how response options should be evaluated given multiple policy objectives -- the prototype executive aid includes an algorithm for evaluating the effectiveness of past actions given a user-specified set of policy objectives. This algorithm should help crisis managers to evaluate response alternatives in a more realistic, multiple-objective setting.

The research to develop a prototype executive aid for crisis management was carried out in six interrelated tasks. Each task contributed toward developing and evaluating executive aids to assist crisis management. The six tasks are:

1. Analyze the Historical Data Base for the Crisis Management Executive Aid.
2. Design a Prototype Executive Aid to Assist Crisis Management.
3. Generate Interactive Computer Software for the Prototype Crisis Management Executive Aid.
4. Evaluate the Usefulness of the Executive Aid for Crisis Management.
5. Transfer the Executive Aid to an ARPA-Designated Computer System.
6. Prepare Software Documentation and Final Reports.

The remainder of this report discusses research on these tasks. Chapter 2 details research on Tasks 2 and 3 (designing and generating the aid). Chapter 3 presents additional information on the historical evidence in the aid (Tasks 1, 2, and 3). Chapter 4 summarizes evaluation of the aid (Task 4) and plans for transferring the aid to an ARPA-designated system (Task 5).

CHAPTER 2. STRUCTURE OF THE PROTOTYPE CRISIS MANAGEMENT AID

The six sections of this chapter describe the structure of CACI's prototype executive aid for crisis management. The first section discusses the design characteristics of the aid. The second section presents an overview of the structure of the aid. The next three sections each outline the operation of a separate part of the crisis management aid. Finally, the major points on the structure of the prototype executive aid are summarized in the last section.

DESIGN CHARACTERISTICS FOR THE PROTOTYPE CRISIS MANAGEMENT AID

As indicated in Chapter 1, CACI's prototype executive aid will increase the capability of crisis managers in the Department of Defense to evaluate and select response options during crises. The aid is structured to

- Provide additional historical analogies by identifying past U.S. crises in which the United States pursued similar policy objectives or undertook similar actions.
- Present empirical evidence on the relationships between a user-designated policy objective and the actions that have historically been most closely associated with achieving that objective.
- Enable crisis managers to evaluate the appropriate sets of actions given sets of policy objectives.

In addition to these assistance goals, CACI's prototype executive aid is designed to be empirically based, user-oriented, and portable across comparable computer systems.

Empirical Base

CACI's prototype executive aid for crisis management is heavily based on past U.S. crisis data. Unlike several other aids that are being

developed under Defense Advanced Research Projects Agency (ARPA) funding, this prototype crisis management aid uses data on past U.S. crisis actions and policy objectives in a sample of 101 crises since 1956.[1] Parameters used throughout the model are empirically derived to show the relationships between past U.S. actions and policy objectives given the actions and policy objectives of crisis initiator(s).[2]

User-Oriented Software

The interactive computer system is self-prompting and heavily user-oriented. Users will not have to resort to auxiliary materials or manuals, although a user's manual (CACI, 1977c) is available. Moreover, the system contains different programs so that users who only desire to search the crisis histories will not have to obtain other unwanted information. On the other hand, the system is designed to lead even naive users through the sequences.

Program Portability

As part of its research effort, CACI has developed the program on a commercial computer system and on an ARPA-owned Tektronix 4051 minicomputer. These programs will be transferred to ARPA's Demonstration and Development Facility (DDF) when the PDP-11/70 at that site is available. Accordingly, the program has been designed to minimize the problems likely to be encountered in transferring it from one computer system to another.[3] The program has been written in standard BASIC language. It requires limited computer core and can be run on interactive operating systems with quite different program size ceilings.

---

[1] Appendix A lists the 101 crises in the sample.

[2] Chapter 3 details the data collection, sampling, and parameter estimation efforts.

[3] CACI (1977d) documents the Tektronix version of the programs.

OVERVIEW OF THE CRISIS MANAGEMENT AID

The executive aid consists of a system of programs that permit a user to search the data base for a number of different types of information and to examine historical relationships found in the 101 crises. Figure 1 presents a flow diagram of how the programs in the system are related to each other.

The program begins with some preliminary information on the nature and capabilities of the aid.

********** PROTOTYPE EXECUTIVE AID PROGRAM **********

THIS PROTOTYPE EXECUTIVE AID WAS DEVELOPED FOR
THE DEFENSE ADVANCED RESEARCH PROJECTS AGENCY'S
CYBERNETICS TECHNOLOGY OFFICE
BY
C A C I, INC-FEDERAL
UNDER OFFICE OF NAVAL RESEARCH CONTRACT NO. N00014-77-C-0135

THE AID IS DESIGNED TO ASSIST DEPARTMENT OF DEFENSE PERSONNEL IN EVALUATING PROPOSED COURSES OF ACTION AND SETS OF U.S. OBJECTIVES BASED ON DATA FROM 101 CRISES INVOLVING THE UNITED STATES BETWEEN 1956-1976.

THE AID IS INTERACTIVE SO THAT THE USER CAN OBTAIN DESIRED INFORMATION BY RESPONDING TO QUESTIONS POSED BY THE COMPUTER.

THE AID OFFERS THE USER THREE LEVELS OF ANALYTIC ASSISTANCE:

1. THE CAPACITY TO SEARCH FOR HISTORICAL CASES WITH SETS OF USER-SPECIFIED U.S. ACTIONS OR OBJECTIVES;

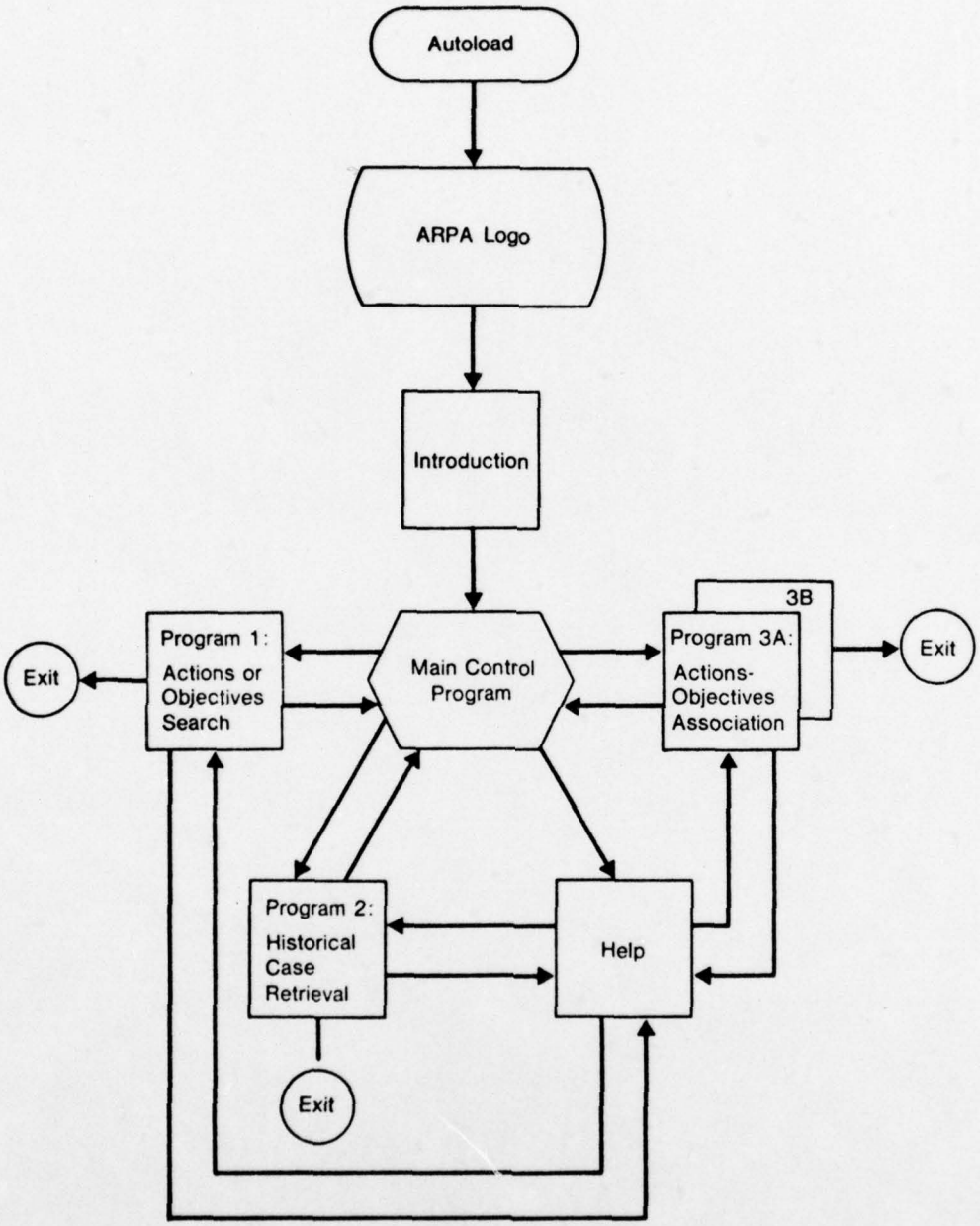


Figure 1. Connections Among Programs of the Executive Aid System

2. THE CAPACITY TO IDENTIFY, ACROSS ALL CASES, THOSE ACTIONS THAT HAVE HISTORICALLY BEEN MOST STRONGLY ASSOCIATED WITH EACH OBJECTIVE SELECTED BY THE PROGRAM-USER;

3. THE CAPACITY TO IDENTIFY, ACROSS ALL CASES, THOSE ACTIONS THAT HAVE HISTORICALLY BEEN MOST COMMONLY ASSOCIATED WITH SETS OF U.S. OBJECTIVES SELECTED BY THE PROGRAM USER.

The introduction continues by describing the three programs that have these various types of analytic assistance.

** DESCRIPTIONS OF THE THREE EXECUTIVE AID PROGRAMS **

PROGRAM NO. 1 ACTIONS OR OBJECTIVES SEARCH

YOU MAY SELECT ONE OR MORE U.S. ACTIONS OR U.S. OBJECTIVES. ONE-LINE DESCRIPTIONS OF ALL HISTORICAL CASES HAVING THESE ACTIONS OR OBJECTIVES WILL BE PRINTED.

PROGRAM NO. 2. HISTORICAL CASE RETRIEVAL

YOU MAY CHOOSE A SPECIFIC HISTORICAL CASE AND LIST THE U.S. ACTIONS OR U.S. OBJECTIVES PRESENT IN THAT CASE.

PROGRAM NO. 3 ACTIONS-OBJECTIVES ASSOCIATION

YOU MAY SELECT ONE OR MORE U.S. OBJECTIVES AND LIST THE U.S. ACTIONS MOST COMMONLY ASSOCIATED HISTORICALLY WITH THOSE OBJECTIVES.

YOU MAY SELECT A PROGRAM BY ENTERING '1', '2', OR '3', OR
YOU MAY OBTAIN ADDITIONAL INFORMATION BY ENTERING 'H'.

If the user requests additional information ('H'), the "Help" program is printed.

********** 'H E L P' PROGRAM *********

THIS EXECUTIVE AID IS DESIGNED TO ASSIST THE CRISIS MANAGER IN EXPLORING U.S. ACTIONS AND OBJECTIVES IN PAST CRISES INVOLVING THE UNITED STATES.

A DATA BASE CONTAINING CODES FOR U.S. ACTIONS AND OBJECTIVES IN A SELECTED SET OF 101 CRISES OCCURRING BETWEEN 1956 AND 1976 HAS BEEN STORED.

THE CRISIS MANAGER MAY USE THIS DATE BASE IN THREE WAYS:

1. TO LIST U.S. ACTIONS OR OBJECTIVES IN A SPECIFIC CRISIS,

2. TO SELECT A SET OF U.S. OBJECTIVES OR ACTIONS AND IDENTIFY PAST CRISES IN WHICH THEY WERE PRESENT, AND

3. TO SELECT A SET OF U.S. OBJECTIVES AND LIST THE U.S. ACTIONS MOST OFTEN ASSOCIATED WITH THOSE OBJECTIVES IN THE 101 HISTORICAL CASES.

EXPLANATIONS OF THE PROGRAMS AND THE USER-SELECTED OPTIONS ARE INCLUDED WITH EACH PROGRAM.

CAREFUL ATTENTION TO THE PRINTED INSTRUCTIONS SHOULD ALLOW THE PROGRAM USER TO EXPLORE THE DATA BASE AS INDICATED.

ARE YOU READY TO CHOOSE ONE OF THE PROGRAMS ('Y' OR 'N')?

If 'Y' is entered, the user then selects one of the three programs.

If 'N' is entered, the program prints further guidance.

A D D I T I O N A L I N F O R M A T I O N

SUGGESTED PROGRAM SEQUENCE

- THIS EXECUTIVE AID FOR CRISIS MANAGERS CONSISTS OF THREE COMPUTER PROGRAMS CALLED IN BY THE PROGRAM USER THROUGH THIS MAIN CONTROL PROGRAM.

- WHILE THE PROGRAMS MAY BE RUN IN ANY ORDER, A NEW USER MAY FIND IT MORE INFORMATIVE TO RUN THEM IN THIS ORDER:

  PROGRAM NO. 1: TO EXAMINE SPECIFIC HISTORICAL CRISES.

  PROGRAM NO. 2: TO SEARCH FOR CASES WITH SELECTED ACTIONS/OBJECTIVES.

  PROGRAM NO. 3: TO EXAMINE THE HISTORICAL ASSOCIATION BETWEEN ACTIONS AND OBJECTIVES.

- THE USER MAY RETURN TO THE MAIN CONTROL PROGRAM AT ANY TIME BY PRESSING KEY NO. 2 (UPPER LEFT KEYBOARD).

PROGRAM CODES

- EACH PROGRAM OFFERS SEVERAL OPTIONS. THE USER'S CHOICE IS INDICATED BY A CODE LETTER ENTERED AT THE KEYBOARD.

- CODES USED BY THE PROGRAMS ARE:

'A' - TO INDICATE U.S. ACTIONS

'O' - TO INDICATE U.S. OBJECTIVES

'H' - FOR ADDITIONAL INFORMATION

'LA'- TO LIST U.S. ACTIONS

'LO'- TO LIST U.S. OBJECTIVES

'P' - TO HALT THE CURRENT OPERATION AND PROCEED WITH THE PROGRAM

'Y' - TO SELECT THE DISPLAYED ITEM (ACTION OR OBJECTIVE)

- DEFINITIONS OF THE CODES ARE REPEATED IN EACH PROGRAM.

PROGRAM-DEFINED KEYS

- THE KEYS (LOCATED IN THE UPPER LEFT HAND CORNER OF THE KEYBOARD) MAY ALSO BE USED TO CONTROL THE SYSTEM.

KEY NO. 1: TO REPEAT THE CURRENT PROGRAM.

KEY NO. 2: TO RETURN TO THE MAIN PROGRAM FOR A NEW PROGRAM CHOICE.

KEY NO. 3: TO END THE CURRENT PROGRAM.

KEY NO. 4: TO CALL THE 'HELP' PROGRAM FOR ADDITIONAL INFORMATION.

KEY NO. 5: TO LOCATE AND IDENTIFY THE CURRENT PROGRAM.

STANDARD KEYBOARD KEYS THAT MAY BE USED ARE:

'RETURN' - PRESSED AFTER EACH KEYBOARD ENTRY

'CLEAR' - TO CORRECT AN ENTRY.
IN CASE OF AN ERROR, 'CLEAR' MUST
BE PRESSED BEFORE 'RETURN'.
THEN, THE ENTRY MAY BE RETYPED.

'BREAK' - TO END A PROGRAM AT ANY TIME.

'HOME/PAGE' - TO CLEAR A FULL SCREEN AND ALLOW
PROGRAM EXECUTION TO CONTINUE.

The introductory program ends by again asking whether the user is ready to select one of the data retrieval or analysis programs.

PROGRAM 1. SEARCH FOR ACTIONS OR OBJECTIVES

Program 1 is designed to expand the number of historical analogies available to the user for analysis during a crisis. Accordingly, the user is permitted to have the 101 cases searched for a specified set of actions or objectives. The interactive sequence begins with information on the available options.

EXECUTIVE AIDS FOR CRISIS MANAGEMENT

PROGRAM NO. 1

SEARCH FOR CASES WITH SELECTED U.S. ACTIONS OR OBJECTIVES

ENTER 'A' TO SELECT CASES BY U.S. ACTIONS.
ENTER 'O' TO SELECT CASES BY U.S. OBJECTIVES.
ENTER 'LA' TO LIST THE 57 U.S. ACTIONS.
ENTER 'LO' TO LIST THE 48 U.S. OBJECTIVES

Users entering 'LA' or 'LO' will receive a list of the 57 U.S. actions categories or the 48 U.S. objectives categories, respectively.[4] If either 'A' or 'O' is entered, the program lists the appropriate entries and requests a user selection after each.

```
U.S. ACTIONS
-----------------------------------------------------
ENTER       'Y' TO SELECT THE DISPLAYED ITEM
PRESS 'RETURN' TO REJECT THE DISPLAYED ITEM
ENTER       'P' TO PROCEED WITH THE DATA BASE SEARCH
-----------------------------------------------------

    1 COMMIT LAND FORCES TO COMBAT

    2 COMMIT SEA FORCES TO COMBAT

    3 COMMIT AIR FORCES TO COMBAT
Y
SELECTED
    4 COMMIT SUPPORT SERVICES (LAND)

    5 COMMIT SUPPORT SERVICES (SEA)

    6 COMMIT SUPPORT SERVICES (AIR)
Y
SELECTED
    7 REPOSITION LAND FORCES

    8 REPOSITION SEA FORCES

    9 REPOSITION AIR FORCES

   10 THREATEN NUCLEAR FORCES AS DETERRENT

   11 REDEPLOY NUCLEAR FORCES AS DETERRENT
P
```

The list of actions or objectives is stopped by entering 'P'. A summary of the selections is printed next, followed by the results of the search of the 101 historical crises.

---

[4] Appendix B lists the actions categories. Appendix C provides a list of U.S. objectives.

```
THE FOLLOWING ACTIONS/OBJECTIVES WERE SELECTED:

    3 COMMIT AIR FORCES TO COMBAT
    6 COMMIT SUPPORT SERVICES (AIR)


-------------------------------------------------------------------------
THE FILE WILL BE SEARCHED FOR CRISES WITH THESE U.S. ACTIONS/OBJECTIVES.
MATCHES ARE PRINTED AS THEY ARE FOUND.
-------------------------------------------------------------------------

    65 1969 ANTI-U.S. RIOTS IN ISTANBUL

    76 1972 SOVIET SHIPS BOMBED IN HAIPHONG HARBOR

  ---------------------------------------------------

    THE SEARCH OF THE HISTORICAL FILE IS COMPLETED.
    2                 MATCHES WERE FOUND.

-------------------------------------------------------------------------
```

Once the search is completed, the program can be run for another set of actions or objectives. Alternatively, the user can turn to another section of the system through the Main Control Program.

```
-------------------------------------------------------------------------

      ---------------------------------------------------

          'ENTER 'R'  TO RETURN TO THE PROGRAM OPTIONS.
      PRESS KEY NO. 2   TO RETURN TO THE MAIN CONTROL PROGRAM.
      PRESS KEY NO. 3   TO END THE PROGRAM.
      ---------------------------------------------------

-------------------------------------------------------------------------
```

PROGRAM 2. SEARCH FOR A SPECIFIC HISTORICAL CASE

The second retrieval program in the aid enables the user to search for either U.S. actions or policy objectives in any of the 101 historical crises.

EXECUTIVE AIDS FOR CRISIS MANAGEMENT

PROGRAM NO. 2

LIST U.S. ACTIONS/OBJECTIVES IN SPECIFIC HISTORICAL CASES

ENTER 'A' TO LIST U.S. ACTIONS FOR A SELECTED CASE.

ENTER 'O' TO LIST U.S. OBJECTIVES FOR SELECTED CASE.

ENTER 'LC' TO LIST THE 101 CASES.

ENTER 'H' FOR ADDITIONAL INFORMATION.

ENTER 'E' TO END PROGRAM.

By entering 'H' the user obtains some additional information on the historical cases.

THE HISTORICAL CASES ARE IDENTIFIED BY THE INTEGERS 1-101

PERIOD	CASE ID'S
1956-1959	1 - 19
1960-1969	20 - 69
1970-1976	70 - 101

YOU MAY ELECT TO PRINT U.S. ACTIONS OR U.S. OBJECTIVES.

IF YOU DO NOT KNOW THE ID. NO. OF THE CASE YOU WISH TO EXAMINE, YOU MAY LIST THE 101 CASES.

ENTER 'A' TO LIST U.S. ACTIONS FOR A SELECTED CASE.

ENTER 'O' TO LIST U.S. OBJECTIVES FOR SELECTED CASE.

ENTER 'LC' TO LIST THE 101 CASES.

ENTER 'H' FOR ADDITIONAL INFORMATION.

ENTER 'E' TO END PROGRAM.

Entering 'LC' will produce a list of 101 cases and the identification numbers for each (see Appendix A). Users who are not familiar with the data base or who do not have access to a user's manual (CACI, 1977c) may wish to enter 'LC'. A more experienced user will generally enter 'A' or 'O'.

If either 'A' or 'O' is entered, the program prints:

```
    ENTER  NO. OF SELECTED HISTORICAL CRISIS (1-101).
    ENTER '999' TO RETURN TO THE LIST OF PROGRAM OPTIONS.
```

By entering a search for objectives ('O') and a request for information on the tenth case, the user receives the following listing.

```
U.S. OBJECTIVES
 10  1958 V.P. NIXON SOUTH AMERICAN VISIT

    12 CONFIRM OR RE-ESTABLISH PRESTIGE
    28 ASSURE CONTINUED ECONOMIC ACCESS
    31 DENY SUCCESS TO TERRORISTS/HIJACKERS
    32 PROTECT HUMAN LIFE
```

The program permits the user to see other information on another case. By entering '999' one halts the sequence. If 'A' is then selected the user can obtain comparable information on U.S. actions in a crisis. For example, a user selecting another case (12) would be informed that this was a 1958 Berlin Crisis in which the United States took six actions.

ENTER NO. OF SELECTED HISTORICAL CRISIS (1-101).
ENTER '999' TO RETURN TO THE LIST OF PROGRAM OPTIONS.

U.S. ACTIONS

12 1958 USSR ORDERS U.S., FRANCE, UK OUT OF BERLIN

36 PROVIDE OTHER MILITARY LOGISTICS ASSISTANCE
37 PROVIDE OTHER MILITARY ASSISTANCE
46 EMPLOY DIPLOMACY
51 REAFFIRM EXISTING POLITICAL-MILITARY COMMITMENT
52 LODGE PROTEST(S)
56 U.S. ACTS WITH TWO OR MORE OTHER NATIONS

By entering '999' the user will end this sequence. The program then prints the option list and permits the user to move through the Main Control Program to another part of the system.

PROGRAM 3. HISTORICAL ASSOCIATION BETWEEN U.S. ACTIONS AND OBJECTIVES

This is a two-part program that gives information on the relationship between past U.S. crisis actions and a single U.S. policy objective and between U.S. actions and sets of U.S. objectives. The algorithm used in the program to relate sets of actions and objectives is listed in Appendix D.

EXECUTIVE AIDS FOR CRISIS MANAGEMENT

PROGRAM NO. 3

HISTORICAL ASSOCIATION BETWEEN U.S. ACTIONS AND OBJECTIVES

A. MOST FREQUENT ACTIONS FOR EACH USER-SELECTED OBJECTIVE

B. EVALUATION OF ACTIONS FOR USER-WEIGHTED OBJECTIVES

ENTER 'LA' TO LIST THE 57 U.S. ACTIONS.

ENTER 'LO' TO LIST THE 48 U.S. OBJECTIVES.

ENTER 'S' TO SELECT U.S. OBJECTIVES.

ENTER 'E' TO END PROGRAM

Users who are not familiar with the actions categories (see Appendix B) or objectives categories (see Appendix C) can obtain this information by entering 'LA' or 'LO'. More experienced users will generally proceed to the selection ('S') option. Once 'S' is entered, the program prints the list of U.S. objectives. The user selects the objectives that are to be pursued in a specific crisis.

```
THE U.S. OBJECTIVES WILL BE DISPLAYED ONE BY ONE.
-------------------------------------------------------

    ENTER       'Y' TO SELECT THE DISPLAYED OBJECTIVE
    PRESS 'RETURN' TO REJECT THE DISPLAYED OBJECTIVE
    ENTER       'P' TO END THE SELECTION OF OBJECTIVES
-------------------------------------------------------
```

The objectives are printed next with the user free to select up to 15 items. Entering 'P' ends the listing of objectives.

```
PLEASE SELECT OBJECTIVES ('Y', 'RETURN', OR 'P')
-------------------------------------------------------
    1 DETER IMMINENT ATTACK
Y
SELECTED
    2 IMPROVE OR RECTIFY DETERRENCE POSTURE
Y
SELECTED
    3 PUT DOWN REBELLION
    4 RESTORE A REGIME
    5 REGAIN ACCESS TO ECONOMIC RESOURCES
    6 RESTORE PEACE
Y
SELECTED
    7 RESTORE TERRITORIAL INTEGRITY
    8 RESTORE MILITARY BALANCE OF POWER
    9 RESTORE READINESS
   10 PRESERVE READINESS
   11 PRESERVE PEACE
   12 CONFIRM OR RE-ESTABLISH PRESTIGE
P
-------------------------------------------------------
```

After the user has selected the objectives that are to be pursued in the crisis, the program informs the user of the next set of information that is to be displayed.

NOTE:

---

* THE ACTIONS MOST FREQUENTLY ASSOCIATED HISTORICALLY WITH EACH OBJECTIVE YOU HAVE SELECTED WILL NOW BE DISPLAYED.

* IN ADDITION TO THE LIST OF ACTIONS, THEIR RELATIVE FREQUENCY OF OCCURRENCE WHEN THIS OBJECTIVE WAS PRESENT WILL BE DISPLAYED ON A BAR CHART.

The program then prints a list of all actions associated with each objective that have conditional probabilities of 0.50 or larger.[5] A graphic display of the magnitude of each probability is also given.

---

1 DETER IMMINENT ATTACK

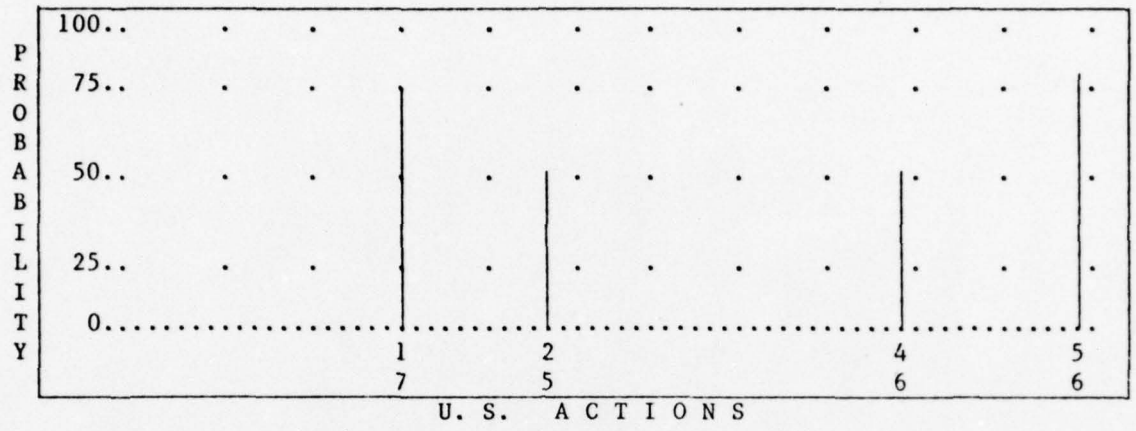
---

17 SHOW OF MILITARY FORCE
25 IMPROVE, MAINTAIN FORCE READINESS
46 EMPLOY DIPLOMACY
56 U.S. ACTS WITH TWO OR MORE OTHER NATIONS

---

[5] Chapter 3 details information on procedures for developing these probabilities.

CONDITIONAL PROBABILITIES OF ASSOCIATED U.S. ACTIONS



The user is then given a chance to select a new set of objectives ('R') or weight the ones just selected.

ENTER 'R' TO RETURN TO PROGRAM OPTIONS.

ENTER 'W' TO ASSIGN WEIGHTS TO OBJECTIVES ALREADY SELECTED.

If 'W' is entered, the program prints additional instructions, followed by the objectives selected by the user.

```
    * YOUR OBJECTIVES WILL BE LISTED ONE BY ONE.
    * PLEASE ENTER A NUMERICAL WEIGHT FOR EACH.
    * USE A POSITIVE SCALE FROM 0 to 100.
    * HIGHER WEIGHTS SHOULD BE ASSIGNED TO MORE
      IMPORTANT OBJECTIVES.
DETER IMMINENT ATTACK
100
IMPROVE OR RECTIFY DETERRENCE POSTURE
34.7
RESTORE PEACE
98
```

Once scaled from 0 to 100, the objectives are ordered by magnitude and printed for inspection.

```
YOUR OBJECTIVES ARE:
--------------------------------------------------

VALUE OBJECTIVE
100.00 DETER IMMINENT ATTACK
 98.00 RESTORE PEACE
 34.70 IMPROVE OR RECTIFY DETERRENCE POSTURE
```

Then, using the algorithm listed in Appendix D, the program calculates the "relative contribution" of all actions associated with these three objectives as weighted by the user.

```
-----------------------------------------------------------------
RELATIVE CONTRIBUTION OF U.S. ACTIONS FOR THE WEIGHTED OBJECTIVES
-----------------------------------------------------------------

CONTRIBUTION ACTION

0.30 U.S. ACTS WITH TWO OR MORE OTHER NATIONS
0.28 EMPLOY DIPLOMACY
0.15 IMPROVE, MAINTAIN FORCE READINESS
0.15 SHOW OF MILITARY FORCE
0.06 PROVIDE OTHER MILITARY ASSISTANCE
0.06 ACCEPT A NEW MILITARY COST

-----------------------------------------------------------------
```

Once this is completed, the user can either repeat the process (to apply new weights to the set of objectives that have been chosen) or switch to another part of the executive aid (such as Program 1 or 2).

```
-----------------------------------------------------------------

PRESS 'HOME/PAGE' TO CONTINUE.  THEN, YOU MAY:
                    ASSIGN NEW WEIGHTS TO THESE OBJECTIVES
                    PRESS KEY NO. 3 TO END PROGRAM, OR
                    PRESS KEY NO. 2 TO RETURN TO THE MAIN
                                    CONTROL PROGRAM.

-----------------------------------------------------------------
```

SUMMARY

This chapter presented the design characteristics, levels of assistance, and interactive sequences for CACI's prototype executive aid for crisis management. The aid contains three levels of assistance to the defense crisis manager based on historical evidence from U.S. crises. How that historical evidence is being gathered and processed to support the executive aid is discussed in Chapter 3.

CHAPTER 3. DATA USED IN THE EXECUTIVE AID

This chapter describes the data used in CACI's prototype executive aid for crisis management. The chapter is organized into four sections. The role of data in the executive aid is briefly discussed in the first section. The crisis sample, types of data gathered for the aid, some of the conventions used to guide data acquisition, and the ways that the data have been used in the aid are described in the second section. The third section describes some of the major patterns in the crisis data. Finally, a summary section reviews the major topics covered in the chapter.

THE ROLE OF DATA IN CACI'S PROTOTYPE EXECUTIVE AID FOR CRISIS MANAGEMENT

CACI's crisis management aid is heavily dependent on data from past U.S. international crises. These data guide the user in selecting and evaluating potential responses to international crises. Rather than deriving information from the user's subjective assessments, CACI's prototype executive aid gives the user an historical perspective on the course(s) of action that are being considered for the current crisis. In short, it attempts to use actual historical information on past crises to expand both the range of information and analogies available to the user. It packages certain information from past U.S. experience in international crises to aid the user in evaluating responses and identifying relevant alternative analogies (Jervis, 1976: 270).

Data on past U.S. crises or data-based analyses of past U.S. crisis behavior are used to aid U.S. decision-makers in three ways.

1. Raw data on the crises are available to expand the range of alternative analogies available to the user. This broadens the consideration given to alternative responses to the crisis when time, organizational, and individual pressures to exclude options from consideration are the greatest.

2. Empirical parameters, derived from past U.S. behavior in crises, are used to help the analyst evaluate how well certain actions will contribute to achieving a particular objective.

3. Analyses based on combinations of historical occurrences are available to help the user determine the most advantageous means to achieve sets of objectives.

These three areas constitute the ways in which the prototype crisis management aid can assist the decision-maker. Each is empirically supported to facilitate more systematic use of past U.S. crisis management experiences in formulating and evaluating responses to current crises.

DATA GENERATION FOR THE PROTOTYPE EXECUTIVE AID

Sample Selection

A sample of 101 U.S. crises between 1956 and 1976 was developed from a universe drawn from several different sources. First and foremost among the sources for the crisis sample was CACI's previous research on crisis management in which crises between 1946 and 1975 were inventoried (CACI, 1976, 1975). Additionally, crises identified in two other major studies of U.S. crisis and crisis-like behavior (Blechman and Kaplan, 1977; Mahoney, 1976a) were examined to expand the CACI crisis list. Finally, U.S. crises during 1976 (listed in Table 1) were inventoried to complete the lists to the end of the last calendar year. Together, these sources provided the basis for the sample of 101 crisis incidents drawn for this analysis.[1]

Unlike the crisis cases examined in CACI's research on crisis management problems (CACI, 1976), only international crises are included in the 101-case sample. Since domestic crisis responses by the U.S. military are both very constrained (occurring only after Presidential-level decisions have been made) and now very routinized, only the less certain,

[1] Appendix A presents the final sample of 101 cases.

TABLE 1

Crisis Incidents During 1976[a]

Date (year, month, day)	Incident
760107	Moroccan-Algerian dispute and U.S. arms aid
760225	Cambodia alleges U.S. bomb attack at Siem Rap
760314	Sadat ends Soviet-Egypt treaty
760320	Thailand orders U.S. bases closed directly
760412	Greek protest over U.S.-Turkish defense pact
760521	North Atlantic Treaty Organization (NATO) foreign ministers express concern over Warsaw Pact buildup
760616	First evacuation from Lebanon
760619	United States pledges arms to Kenya, Zaire
760701	Greek-Turkish dispute over Aegean waters
760727	Second evacuation from Lebanon
760818	North Koreans kill Americans in tree-cutting incident
760906	Defector delivers MIG-25 to Japan
761007	Panama talks resumed after student riots
761009	North Korea proposes new peace treaty to United States, South Korea
761018	France withdraws 10,000 troops from West Germany
761100	U.S. Navy loses Tomcat plane at sea
761204	U.S.-Philippine base negotiations collapse

[a] Generally using CACI's definition of crisis as "a period of increased military management activity at the national level that is carried on in a sustained manner under conditions of rapid action and response resulting from unexpected events or incidents that have occurred internationally, internally in a foreign country, or in the domestic United States and that have inflicted or threatened to inflict violence or significant damage to U.S. interests, personnel, or facilities" (CACI, 1976: 2-5). The only variation from this definition was an exclusion of domestic U.S. crises.

potentially more threatening international crises since 1956 have been chosen to support the prototype executive aid.

Case selection for the sample of 101 crises also took into account CACI's major empirical findings on crisis behavior (CACI, 1976). Thus, crises selected for the sample were primarily politico-military since this type of incident was most commonly encountered in recent U.S. history. Major power crises were emphasized as were crises completed in less than 7 or more than 30 days. Similarly, geographical locations and time of occurrence were also stressed with an oversampling of more recent (1970-1976) crises and an undersampling of 1950's-era crises.

Data on Past U.S. International Crises

Past U.S. crises are being examined for two types of data:

1. Information on U.S. actions during the crisis.
2. Information on U.S. policy objectives during the crisis.[2]

Data in each of these areas were coded from public sources. An initial analysis of the quality of information on problems encountered in U.S. crises between 1946 and 1975 (CACI, 1976) suggested that public reporting on U.S. crisis behavior was adequate to permit the research team to determine whether an action or policy objective was present during the crisis. Additional study of a number of official (but unclassified) U.S. Government publications, such as command histories, reports to the U.S. Congress, and annual reports by the Secretary of Defense and the secretaries of the three services, suggested that sufficient information for binary coding (that is, an action was present or absent) was available in the open sources. Accordingly, the data used for the prototype crisis management aid are solely from unclassified sources. Should greater specificity be needed for certain kinds of information at a later date, the classified sources can be employed at that time.

[2] Data were also gathered on the crisis initiator's actions and objectives. These data are not presently used in the prototype executive aid.

U.S. Crisis Actions. Appendix B lists 57 distinct types of U.S. crisis actions that have been identified based on past crises, previous diplomatic responses, or requirements for systematically using military assets in the crises. These 57 discrete action types are grouped under 8 major headings:

1. Commitment to combat operations
2. Commitment of supporting service forces
3. Repositioning for combat contingency
4. Forces employed as a deterrent
5. Military operations
6. Military assistance
7. Other military actions
8. International participation in the crisis

Discrete codings were made for each of these general headings and for the many more specific variables contained under each for the crises covered in the project. Information coding was restricted to the presence or absence of the U.S. action.

U.S. Policy Objectives in the Crisis. Over 45 different U.S. crisis policy objectives are listed in Appendix C. These policy objectives, based on current or past U.S. policy concerns during crises, are grouped into six general headings:

1. Deterrence
2. Restore status quo ante
3. Maintain status quo
4. Change in status quo
5. Access or denial objectives
6. Other policy objectives

As with the U.S. crisis actions, each of the crises covered in this research effort was coded for the U.S. policy objectives. Each crisis was coded for the presence or absence of the policy objective in the U.S. Government's response crisis. Only unclassified sources were used.

Empirical Parameters Used in the Prototype Executive Aid

Data collected on U.S. actions and objectives were used to generate empirical parameters for the prototype executive aid. These parameters serve two purposes. First, they aid the analysts in evaluating the relationship between one or more actions that the United States might take in a crisis and any single objective that the United States might wish to pursue in that crisis. Second, they are used to develop information on a set of actions across a set of user-specified objectives.

Initial attempts to develop parameters linking actions to objectives using regression analysis or regression-like solutions (such as probit analysis) proved unsuccessful given the often skewed data distributions. Moreover, data on success or failure to achieve the various objectives in each of the crises (which made the regression solution appear particularly appealing) could not be systematically obtained from unclassified sources. Accordingly, all of the parameters included in the model are conditional probabilities of the occurrence of any of the 57 U.S. actions given any of the 48 U.S. objectives. The probabilities were developed from simple frequencies of occurrence drawn from contingency tables for all 57 actions and all 48 objectives.[3]

Coding Procedures

Information on U.S. actions and policy objectives was coded for each of the 101 crises. Three coders from CACI's professional staff (two with

[3] The existing version of the prototype executive aid uses all probabilities of 0.50 or larger. Probabilities for each action and objective pair were computed by CACI, however. Thus, the 0.50 cutoff in the current version of the aid can readily be modified.

Ph.D.'s and a military background, one with a Ph.D. and some military service) were used to examine historical material on each crisis. As already noted, only unclassified data sources were consulted.

After reading the available source materials on each of the crises, a coder determined the U.S. actions and policy objectives and the actions and objectives of the crisis initiator. When a set of crises had been coded in this manner the three staff members jointly considered the codings before finally entering the information into the data file. During this process each coder related the events of the crisis and defended the coding made in each category. The results of this process are dichotomously coded data files for U.S. actions and policy objectives for a sample of 101 U.S. crises between 1956 and 1976. Because of resource constraints, no reliability checks were run on the data. Informed peer review was used in place of systematic reliability testing.

EXAMINING THE U.S. OBJECTIVES AND ACTIONS DATA

CACI examined the frequencies and cross-sectional relationships between U.S. actions and objectives in 101 crises. The analyses covered the 101 crises as a set and subsets of crises drawn to cover the date of occurrence and type of U.S. adversaries involved. Date of occurrence was examined to test for shifts in U.S. crisis behavior over time in response to changes in the international system (such as increased system complexity, greater economic interdependence, and diffusion of power throughout the system). Accordingly, the 101 crises were divided into 54 crises that occurred between 1956 and 1965 and 47 crises between 1966 and 1976.[4] As a second subset criterion, CACI identified 45 of the 101 crises that involved one or more Communist countries or groups. These 45 cases were examined for variations in crisis behavior as a result of activities by a major U.S. adversary.

[4] Previous analyses (CACI, 1976; Blechman and Kaplan, 1977; Mahoney, 1976b) indicate that 1966 was a watershed year in U.S. involvement in international crises.

U.S. policy objectives and actions were separately examined. Frequency distributions for all 101 cases were examined. Subsets of cases were then analyzed. The data were then factor analyzed to search for latent patterns in 101 cases and in the various subsets.[5] Analyses for U.S. policy objectives are presented first, followed by U.S. actions.

U.S. Policy Objectives in Crises

Data were coded for 48 U.S. policy objectives (Appendix C). For ease of analysis, 30 of these 48 objectives are examined in this section. The 30 objectives reported here are those that showed the clearest definition and the most consistent patterns.

Frequency Distributions. Table 2 lists the frequency distributions for 30 key U.S. policy objectives in the full sample of 101 crises and in the subsets of crises selected by date group and crisis adversary. The first column, showing U.S. objectives in all 101 crises, indicates that protection of legal and political rights (50 cases), protection of military assets (40), preserving a regime from external threat (34), preventing the spread of Communist influence (32), and preserving territory or facilities (31) were the most common U.S. policy objectives. Least frequent U.S. objectives were regime restoration (1), insuring self-sufficiency (1), preventing nuclear proliferation (3), restoring military readiness (5), and regaining access to economic resources (5).

For the most part, U.S. policy objectives during crises appear to have changed little over the 20-year period. In only a small number of instances are the changes notable:

- Preserve balance of power increased from 11 cases in 1956-1965 to 18 cases between 1966-1976.

[5] Principal components with varimax orthogonal rotation were derived. Rotated solutions are presented in this section, although unrotated solutions had an almost identical structure.

TABLE 2

Frequency Distribution of U.S. Objectives

	1956-1976 Crises	1956-1965 Crises	1966-1976 Crises	Crises With Communist Adversaries	Crises Without Communist Adversaries
Deter imminent attack	13	08	05	07	06
Improve or rectify deterrence posture	25	15	10	15	10
Put down a rebellion	09	06	03	03	06
Restore a regime	01	01	00	01	00
Regain access to economic resources	05	01	04	01	04
Restore peace	28	18	10	13	15
Restore territorial integrity	14	08	06	09	05
Restore military balance of power	21	09	12	14	07
Restore readiness	05	02	03	03	02
Preserve readiness	24	08	16	06	18
Preserve peace	28	13	15	14	14
Confirm or reestablish prestige	32	14	18	19	13
Preserve territory or facilities	31	19	12	20	11
Preserve regime from external threat	34	22	12	20	14
Preserve regime from internal threat	24	16	08	10	14
Preserve, restore, or improve alliance	27	15	12	11	16
Protect legal and political rights	50	28	22	24	26
Induce maintenance of current policy	21	16	05	11	10
Dissuade from a new policy	23	11	12	11	12
Protect a military asset	40	24	16	19	21
Assure continued economic access	19	11	08	03	16
Preserve or regain control of sea	09	05	04	07	02
Preserve or regain control of air	08	03	05	07	01
Contain opponents	16	08	08	11	06
Prevent spread of war	20	11	09	10	10
Preserve lines of communication	13	06	07	02	11
Preserve balance of power	29	11	18	13	16
Prevent spread of Communist influence	32	17	15	15	17
Prevent nuclear proliferation	03	02	01	02	01
Insure self-sufficiency	02	02	00	02	00
Number of Crises	101	54	47	45	56

- Preserve readiness increased from 8 cases in 1956-1965 to 16 cases over the next 10 years.
- Confirm or reestablish prestige grew from 14 to 18 cases over the two time periods.
- Restore military balance of power occurred in 9 cases in the first time period and in 12 cases after 1966.

In short, the objectives that changed most over the two periods are those more consistent with a defensive policy in which global deterrence predominates. More offensive policy objectives, such as regional uses of military force, are less commonly observed.

Table 2 also presents variations in policy objective by type of adversary. To simplify these variations Table 3 displays variations in the 10 most common U.S. objectives (across all 101 crises) by type of adversary. Among the 30 policy objectives, four appear to vary significantly depending on whether the United States is confronting a Communist adversary.

1. Preserve territory or facilities (found in 20 crises in which the United States faced Communist adversaries and 11 when it did not).
2. Preserve a regime from external threat (present in 20 crises involving Communist adversaries and 14 crises when Communist adversaries were not present).
3. Confirm or reestablish prestige (19 cases with Communist adversaries and 13 cases without a Communist adversary).
4. Preserve, restore, or improve alliance (11 with Communist adversaries and 16 without).

In all other cases, the frequency of objectives did not vary significantly across the different types of adversaries.

Patterns of Objectives. The 30 core U.S. policy objectives were factor analyzed across the 101 crises and the various temporal and adversary subsets. Table 4 presents the results of these analyses for 101 crises.

TABLE 3

Most Frequent U.S. Objectives by Type of Adversary, 1956-1976

	Crises in Which U.S. Faced Communist Adversaries	Other Crises	Total
Protect legal and political rights	24	26	50
Protect military asset	19	21	40
Preserve regime from external threat	20	14	34
Confirm or reestablish prestige	19	13	32
Prevent spread of Communist influence	15	17	32
Preserve territory or facility	20	11	31
Preserve balance of power	13	16	29
Preserve peace	14	14	28
Restore peace	13	15	28
Preserve, restore, or improve alliance	11	16	27
Number of Cases	45	56	101

TABLE 4

Factor Structure of U.S. Objectives in 101 Crises, 1956-1976[a]

Variables	Factor 1	2	3	4
Prevent spread of Communist influence	.69	.21	.07	.09
Preserve balance of power	.64	.22	-.08	.02
Contain opponents	.57	-.04	.18	.05
Restore military balance of power	.51	.11	.11	.28
Prevent spread of war	.46	-.16	.26	.54
Preserve regime from external threat	.46	-.14	.21	.16
Preserve, restore, or improve alliance	.43	-.04	.04	.21
Deter imminent attack	.40	.09	-.14	.35
Protect a military asset	-.19	.68	-.16	.24
Preserve lines of communication	.10	.60	-.12	-.11
Protect legal and political rights	.01	.52	-.06	.14
Improve or rectify deterrence posture	.26	.45	-.03	.23
Preserve readiness	.25	.45	-.25	-.35
Confirm or reestablish prestige	-.06	.41	-.14	-.09
Put down a rebellion	-.07	.03	.80	.05
Restore territorial integrity	.16	.14	.58	.01
Preserve regime from internal threat	.10	-.15	.48	.00
Restore peace	.30	-.12	.47	.37
Preserve or regain control of sea	-.06	.11	-.12	.50
Restore readiness	.06	.08	.05	.46
Preserve or regain control of air	.05	.11	.03	.41
Restore a regime	-.02	-.09	.21	-.04
Regain access to economic resources	-.03	-.13	-.07	-.08
Preserve peace	.25	.22	-.19	-.18
Preserve territory or facilities	.29	.24	.01	.29
Induce maintenance of current policy	.21	.05	-.14	.11
Dissuade from a new policy	.22	.06	-.21	-.26
Assure continued economic access	-.00	.09	.09	-.30
Prevent nuclear proliferation	-.07	-.22	-.06	.01
Insure self-sufficiency	.03	.00	.04	.08
Percent variance explained	39	30	18	13

[a] Variance structure, orthogonal rotation. Variables with small cell sizes were dropped to minimize distortion.

Using a factor loading of 0.40 or higher to guide interpretation suggests that the first factor is a containment of communism dimension, the second a preservation of U.S. military capability and protection of U.S. interests factor, and the third a preservation of stability and peace dimension. The fourth factor is a mixed pattern involving restoration of control or readiness.

Factor analysis of subsets of crises (Table 5) varied substantially. Containment, the major policy objective during 1956-1965 and when the United States faced Communist adversaries, declined in importance after 1966 and when non-Communist adversaries were faced. Between 1966-1976 containment was the second most important policy objective cluster. In crises with non-Communist adversaries, containment was the third most important factor. Similarly, preserve stability moves from fourth to first in importance over the two time subsets and over the different types of adversaries.

Tables 6 and 7 compare the highest loading items for the first factor in each of the subsets reported in Table 5. Thus, Table 6 shows the highest loading items from the first factor extracted for the 1956-1965 data (containment) and the 1966-1976 data (preserve stability). Table 7 compares the same information for the first factor derived using data in which the United States faced Communist adversaries (containment) with the first factor for the non-Communist adversaries (preserve stability). The clusterings of major factor loadings clearly show wide differences in the structure of the first factor among the four crisis subsets.

Table 6 indicates that the primary high loading items for the 1956-1965 crises (the containment factor) were a variety of actions that involved deterrence, status quo, and defensive policies. In the first factor in the 1966-1976 data, however, the highest loading items involved U.S. efforts to restore peace and government stability and prevent conflict. Relative to the earlier period, containment of Communist adversaries was given less emphasis. This finding is consistent with a number of commentaries on changes in the international system during this time period. U.S. actions focused more on peace and stability over the last 10 years and less on containing communism.

TABLE 5

Major Factors of U.S. Objectives for Selected Subsets of Crises

Factors of U.S. Objectives	Percent Variance Explained
1956-1965 Crises	
1. Containment	41
2. Preserve capability/ protect interests	28
3. Preserve capability/ preserve stability	16
4. Preserve stability	14
1966-1976 Crises	
1. Preserve stability	39
2. Containment	27
3. Protect interests/ preserve capability	19
4. Miscellaneous	15

Factors of U.S. Objectives	Percent Variance Explained
Crises With Communist Adversaries	
1. Containment	41
2. Protect interests/ preserve capability	25
3. Preserve capability/ preserve stability	21
4. Preserve stability	14
Crises Without Communist Adversaries	
1. Preserve stability	34
2. Preserve capability/ protect interests	28
3. Containment	23
4. Preserve capability/ deterrence	16

TABLE 6

Comparing Dominant Objectives Factors
for 1956-1965 and 1966-1976 Crises

U.S. Objectives	Factor Loadings for First Factor After Orthogonal Rotation: 1956-1965 Crises	1966-1976 Crises
Deter imminent attack	.71	.57
Preserve regime from external threat	.56	.47
Preserve territory or facility	.55	.42
Preserve or regain control of air	.54	.01
Prevent spread of war	.53	.74
Prevent spread of Communist influence	.52	.25
Preserve balance of power	.49	.26
Preserve or regain control of sea	.49	.02
Improve or rectify deterrence posture	.45	.07
Induce maintenance of current policy	.40	.17
Preserve peace	.16	.46
Preserve regime from internal threat	-.00	.50
Restore territorial integrity	-.06	.53
Restore peace	.35	.78
Percent variance explained	41	39

TABLE 7

Comparing Dominant Objectives Factors by Type of Adversary

U.S. Objectives	Factor Loadings for First Factor After Orthogonal Rotation: Crises With Communist Adversaries	Crises Without Communist Adversaries
Prevent spread of Communist influence	.85	-.07
Contain opponents	.67	-.05
Restore military balance of power	.63	.09
Prevent spread of war	.63	.61
Preserve balance of power	.60	.01
Restore peace	.59	.63
Preserve regime from external threat	.54	.13
Preserve territory or facilities	.51	.11
Preserve, restore, or improve alliance	.47	-.07
Deter imminent attack	.45	.06
Improve or rectify deterrence posture	.44	.23
Restore territorial integrity	.41	.72
Preserve regime from internal threat	.23	.40
Restore readiness	-.02	.59
Regain control of air	.18	.62
Put down a rebellion	.27	.71
Percent variance explained	41	34

The primary clustering of U.S. policy objectives in crises with Communist adversaries (Table 7) consisted of containing Communist influence, maintaining balance of power, and preventing the spread of conflict. On the other hand, crises without Communist adversaries emphasized preserving peace and stability and maintaining U.S. military capability as the major policy objectives. Thus, some overlaps exist in the U.S. policy objectives pursued in crises, regardless of the nature of the adversary.

U.S. Actions in Crises

Data were coded for 57 U.S. crisis actions (Appendix B). This analysis uses 33 of these categories. Most of those excluded represent successive refinements of the categories covered in this analysis.

Frequency Distributions. Table 8 lists the frequency of occurrence of 33 U.S. actions in all 101 crises, sets of crises divided by time of occurrence, and sets of crises divided by nature of the adversary. In the 101 crises (the left-most column on Table 8), 8 actions occurred 20 times or more: employ diplomacy (74 instances), redeploy nonnuclear forces (31), reaffirm existing politico-military commitments (31), provide other military assistance (30), provide supplies from U.S. depots (29), lodge protests (23), reposition sea forces (20), and reposition air forces (20). Least frequent U.S. actions in the 101 crises included threatening nuclear forces (2 instances), drawing down equipment from U.S. units for assistance in the crisis (2), changing nuclear alert status (2), committing sea forces to combat (3), committing air forces to combat (3), and threaten to or actually withdrawing support (3).

The least frequently taken actions are extreme moves that are used only as a last resort. Their low frequency of use reflects the reluctance of decision-makers to take extreme measures in crises. In contrast, the most frequent categories mainly include low risk responses that do not foreclose peaceful conflict resolution and that are not likely to escalate the conflict. They are not irrevocable but they do signal U.S. resolve and capabilities in a crisis.

TABLE 8

Frequency Distributions of U.S. Actions

U.S. Actions	1956-1976 Crises	1956-1965 Crises	1956-1976 Crises	Crises With Communist Adversaries	Crises Without Communist Adversaries
Commit land forces to combat	05	05	00	02	03
Commit sea forces to combat	03	02	01	02	01
Commit air forces to combat	04	02	02	03	01
Commit land support	17	10	07	07	10
Commit sea support	17	07	10	04	13
Commit air support	19	12	07	11	08
Reposition land forces	13	04	09	09	04
Reposition sea forces	20	13	07	12	08
Reposition air forces	20	09	11	16	04
Threaten nuclear forces	02	02	00	02	00
Redeploy nuclear forces	08	01	07	08	00
Change nuclear alert status	02	00	02	02	00
Threaten nonnuclear forces	15	10	05	05	10
Redeploy nonnuclear forces	31	17	14	19	12
Change nonnuclear alert status	10	07	03	06	04
Provide military advisory assistance	14	10	04	08	06
Provide training for combat troops	08	07	01	06	02
Provide other military training	06	03	03	03	03
Draw down equipment from U.S. units	02	00	02	01	01
Provide supplies from U.S. depots	29	17	12	14	15
Provide supplies from nonmilitary sources	09	04	05	04	05
Provide military maintenance assistance	04	03	01	01	03
Provide other military logistic support	15	10	05	10	05
Provide other military assistance	30	15	15	12	18
Employ diplomacy	74	38	36	30	44
Mediate a dispute	07	02	05	02	05
Threaten or do withdraw support	03	01	02	00	03
Advocate/support peacekeeping efforts	11	05	06	06	05
Improve scientific/technical capabilities	04	01	03	02	02
Reaffirm existing political/military commitment	31	18	13	16	15
Lodge protests	23	13	10	14	09
Other U.S. actions	07	04	03	04	03
Number of Crises	101	54	47	45	56

Analysis of the crises between 1956-1965 and those between 1966-1976 suggests that the United States became more careful in its use of military force over time. All instances of U.S. commitment of land forces occurred before 1966. At the same time, nuclear deterrent forces were increasingly used in strategic and tactical roles after 1966. A comparison of most common actions in crises with Communist adversaries and crises without Communist adversaries (Table 9) shows few variations across the two crisis subsets. Air forces were repositioned approximately four times more frequently in crises involving Communist adversaries than in crises without Communist adversaries.[6] Sea support forces were committed more than three times as often against non-Communist adversaries in crises than against Communist adversaries in crises. Many of these uses of sea support forces were to evacuate U.S. nationals in times of crisis. Other uses of sea power in crises involving less-developed countries brought forth cries of modern day "gunboat diplomacy." Repositioning air power in crises involving Communist adversaries is a highly visible and relatively low cost manipulation of force to achieve a desired outcome.

Patterns of Actions. Table 10 presents the factors derived from U.S. actions taken in 101 crises between 1956-1976. Four interpretable factors result. First, a show of force factor built around various types of force redeployment and repositioning emerges. Second, a military aid and assistance factor is present. Third, a commitment to combat factor is identified, composed of commitment of air, sea, and land forces to action. Finally, a fourth direct involvement factor involving either "supplies from nonmilitary sources" (that is, a covert operation or assistance) or U.S. land forces is extracted.

Factor analyses were also completed for the subsets of crises by time period and by type of adversary (Table 11). The factor structures of U.S. actions change significantly over time as the importance of military aid and commitment of forces to combat declines from the first to the second

[6] Blechman and Kaplan (1977) concluded that land-based, long-range air power was the most effective U.S. military force in crises.

TABLE 9

Most Frequent U.S. Actions by Type of Adversary, 1956-1976

U.S. Actions	Crises With Communist Adversaries	Crisis Without Communist Adversaries	Total Number of Crises
Employ diplomacy	30	44	74
Redeploy nonnuclear forces	19	12	31
Reaffirm existing political/ military commitment	16	15	31
Provide other military assistance	12	18	30
Provide supplies from U.S. depots	14	15	29
Lodge protests	14	09	23
Reposition sea forces	12	08	20
Reposition air forces	16	04	20
Commit air support	11	08	19
Commit sea support	04	13	17

TABLE 10

Factor Structure of U.S. Actions in 101 Crises, 1956-1976[a]

Variables	Factor 1	2	3	4
Reposition air forces	.80	.27	-.11	-.09
Reposition sea forces	.64	-.05	-.06	-.04
Redeploy nonnuclear forces	.55	-.10	.01	.11
Redeploy nuclear forces	.54	.04	-.04	.23
Change nuclear alert status	.51	-.11	.08	.20
Reposition land forces	.51	.03	-.15	-.06
Provide training for combat troops	.02	.70	-.06	.11
Provide military advisory assistance	.11	.65	-.07	-.13
Provide supplies from U.S. depots	.21	.62	.00	.09
Provide other military logistic support	.16	.58	-.05	-.07
Provide military maintenance assistance	-.08	.40	.06	-.05
Commit sea forces to combat	-.00	-.04	.74	.17
Commit air forces to combat	-.05	-.05	.69	.13
Commit land forces to combat	-.03	.15	.51	-.22
Provide supplies from nonmilitary sources	.05	.17	-.02	.41
Commit land support	-.12	.21	.39	-.41
Advocate or support peacekeeping forces	.36	-.03	.21	.38
Commit sea support	-.16	-.05	.01	-.35
Employ diplomacy	.07	.16	-.28	.35
Improve scientific-technical capability	-.09	-.05	-.03	-.31
Commit air support	-.18	.31	.13	-.30
Threaten nuclear forces	.25	.06	-.00	-.02
Threaten nonnuclear forces	-.02	.22	.13	.02
Change nonnuclear alert status	.37	-.12	.39	.04
Provide other military training	.05	.38	-.11	.21
Draw down equipment from U.S. depots	.09	.13	-.07	-.26
Provide other military assistance	.08	.30	.01	.05
Threaten to or do withdraw support	-.15	-.04	-.04	-.27
Reaffirm existing political-military commitment	.32	.23	.07	.03
Lodge protest	-.06	.04	.09	.23
Other U.S. actions	-.22	-.04	-.06	.12
Mediate a dispute	.18	-.06	-.07	.13
Percent variance explained	37	28	21	14

[a] Varimax solution, orthogonal rotation.

TABLE 11

Major Factors of U.S. Actions for Selected Subsets of Crises

Factors of U.S. Actions	Percent Variance Explained
1956-1965 Crises	
1. Military aid	36
2. Commit forces to combat	25
3. Reposition forces	21
4. Miscellaneous	17
1966-1976 Crises	
1. Deterrence	43
2. Commit military support	22
3. Reposition forces	19
4. Military aid	17

Factors of U.S. Actions in Crises	Percent Variance Explained
With Communist Adversaries	
1. Reposition forces	34
2. Military aid	28
3. Commit forces to combat	24
4. Miscellaneous	13
Without Communist Adversaries	
1. Commit forces to combat	29
2. Commit military support	27
3. Military aid	24
4. Reposition forces	20

time period, while deterrence became most important in the post-1966 time period.[7] Similarly, the predominant clusters of U.S. actions differed greatly depending on whether Communist adversaries were involved in the crisis. Against Communist countries or groups, the United States tended to reposition military forces (often as a deterrent). Against non-Communist adversaries, on the other hand, the United States more frequently committed military forces to combat situations.

Tables 12 and 13 compare the highest loading items for the first factor in each of the crisis subsets reported in Table 11. Table 12 shows the highest loading items from the first factor extracted for the 1956-1965 data (military aid) and the 1966-1976 data (deterrence). Table 13 compares the same information for the first factor derived using data in which the United States faced a Communist adversary (reposition forces) with the first factor for the non-Communist adversaries (commit forces to combat). As with the factors of U.S. policy objectives, the U.S. actions factors differ widely across the various subsets of crises.

Giving military aid was the dominant U.S. action prior to 1966. After 1966 the United States tended to redeploy, reposition, and increase the alert status of its forces.[8] In addition to clear changes in U.S. aid policy, the switch to repositioning may come from both changes in policy and changes in clarity with which "signals" to adversaries could be transmitted. Once aid is removed, manipulation of existing forces is a logical alternative means to show concern and resolve.

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[7] U.S. military aid has declined in scope over the 1956-1976 time period. The value of U.S. military aid has increased for only a limited number of countries (such as Israel and South Korea) over the same period. Unambiguous historical support for the increased importance of deterrence is difficult to identify, however. Since the Dominican intervention of 1964, U.S. policy has involved far less actual or threatened use of force in crises. The rise of the deterrence factor after 1966 may summarize this pattern.

[8] The highest loading item for 1966-1976, "advocate/support peacekeeping efforts," is coded to include actual commitment of support and the desire to support these efforts. Hence, it loads higher than any other action by including both words and deeds.

TABLE 12

Comparing Dominant Actions Factors for 1956-1965 and 1966-1976[a]

	1956-1965 Crises	1966-1976 Crises
Provide military advisory assistance	.82	-.15
Provide training for combat troops	.81	-.05
Provide supplies from U.S. depots	.68	.05
Provide other military logistic support	.50	-.02
Reposition air forces	.49	.44
Provide military maintenance assistance	.48	-.04
Provide other military training	.42	-.01
Provide supplies from nonmilitary sources	.21	.50
Redeploy nonnuclear forces	-.06	.54
Reposition sea forces	-.02	.55
Change nonnuclear alert status	-.12	.61
Redeploy nuclear forces	.27	.64
Change nuclear alert status	--	.76
Advocate/support peacekeeping effort	-.05	.83
Percent variance explained	36	43

[a] Action categories with loadings less than 0.40 in both cases are not shown.

TABLE 13

Comparing Dominant Actions Factors by Type of Adversary[a]

U.S. Actions	Crises With Communist Adversaries	Crises Without Communist Adversaries
Advocate/support peacekeeping force	.76	-.05
Change nonnuclear alert status	.71	.06
Change nuclear alert status	.67	--
Reposition sea forces	.65	-.05
Reposition air forces	.62	-.05
Redeploy nonnuclear forces	.51	-.08
Redeploy nuclear forces	.51	--
Mediate a dispute	.45	-.09
Reaffirm existing political-military commitment	.40	-.10
Commit land support	-.15	.40
Commit land forces to combat	-.06	.65
Commit sea forces to combat	.11	.96
Commit air forces to combat	.03	.96
Percent variance explained	34	29

[a] Action categories with loadings less than 0.40 in both cases are not shown.

Moreover, as worldwide monitoring capabilities of powers increased after 1966 (with the use of various types of electronic and photographic reconnaissance capabilities), repositioning of forces was more likely to be monitored and interpreted as a crisis-related activity.

Variations in U.S. actions in crises with Communist adversaries and without Communist adversaries are shown in Table 13. The clear differences in most common U.S. action clusters for differing types of adversaries are seen in this table. Against Communist adversaries, the United States sends signals and gestures with its forces, apparently depending on the extensive monitoring capabilities of these states to check such force positioning. Against non-Communist adversaries, the United States has more commonly committed forces in an effort to achieve U.S. objectives in the crisis. Sea and air forces are both very high loading items in these crises.

SUMMARY

This chapter described the types of data used in the prototype executive aid for crisis management, the uses of the data in the executive aid, the sample of cases for which the data have been coded, and the coding procedures used for data gathering. Several different types of judgmentally coded data on past U.S. crises are used in the aid. Listings of the categories of data sought are presented in Appendices B and C of this report.[9] Evaluation and transfer of the aid are discussed in the next chapter.

[9] Data for the 101 cases are presented in CACI (1977d).

CHAPTER 4. EXECUTIVE AID EVALUATION AND TRANSFER

As Chapters 2 and 3 indicated, a prototype executive aid for crisis management has been developed and tested. An elaborate historical data base has been coded and analyzed. This chapter charts additional efforts under Contract No. N00014-77-C-0135 to evaluate and transfer the executive aid. Efforts in each of these areas are separately discussed.

EVALUATING THE PROTOTYPE EXECUTIVE AID

After the prototype executive aid for crisis management was developed and tested internally at CACI, its performance as a crisis management tool was evaluated by demonstrating the aid to action officers throughout the Department of Defense. Given the operational constraints of a crisis center (significant threat, short decision time, involvement of senior personnel from the Department of Defense), the aid could be tested and evaluated in "real time" crisis conditions. But individuals who have been involved in prior crisis center operations were shown the aid to help evaluate its usefulness for the crisis management aid. This evaluation assessed the crisis management aid along three dimensions.

1. Validity. Did the executive aid evaluate decision options in the same way as did action officers who saw the aid operate? Did the aid produce counter-intuitive results?

2. Reliability. Was the executive aid viewed as a means to enhance option evaluations? Did its results seem reproducible, precise, and accurate given the information available to the action officers?

3. Acceptance. Do those who have used the aid tend to evaluate it positively, particularly concluding that it improved the speed and quality of decision-making?

Retired military personnel at CACI worked closely with the programming staff to ensure that the format and output from the prototype executive aid would best meet the needs of actions officers in Department of Defense command centers throughout the world. Additionally, researchers, program managers, action officers, and other interested personnel in a number of agencies in the national security community were briefed on the characteristics of the aid. Demonstrations of the interactive software and the output format were also held. Individuals from the Defense Advanced Research Projects Agency (ARPA), the Office of Naval Research, U.S. Navy OP 942, Center for Naval Analyses, Joint Chiefs of Staff (JCS)/J-5, JCS/J-3, National Military Intelligence Center, Defense Intelligence Agency, U.S. Air Force/Studies and Analysis, and the Central Intelligence Agency were all briefed on one or more versions of the prototype executive aid.

Comments from individuals in each of these agencies have been incorporated into the current version of the prototype executive aid. Additional revisions are likely as the aid is put into a test context at one or more major command centers in Department of Defense facilities around the world. These uses of the prototype executive aid in more realistic crisis or crisis-like conditions will constitute the ultimate assessment of the usefulness of the aid.

TRANSFERRING THE PROTOTYPE EXECUTIVE AID

The initial version of the prototype executive aid for crisis management was developed on a commercial time-sharing computer system. A second, more advanced and appreciably more elaborate prototype was developed on an ARPA-owned Tektronix 4051 minicomputer. The Tektronix version of the prototype executive aid has been described in this report and in the accompanying documentation (CACI, 1977d) and user's guide (CACI, 1977c).

While the Tektronix 4051 can be demonstrated to interested Department of Defense personnel and used in command centers, the aid will also be

transferred to the planned ARPA Demonstration and Development Facility (DDF) that is to be operated under the ARPA Crisis Management System. When the DDF computer system (a PDP-11/70) comes on line, CACI personnel will transfer the Tektronix 4051 version of the prototype executive aid to that facility.

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APPENDIX A

SAMPLE OF CRISIS INCIDENTS

SAMPLE OF 101 CRISES INCLUDED IN THE EXECUTIVE AID

1	1956	MIDEAST WAR; SUEZ CANAL CRISIS
2	1956	U.S. NAVY P4M SHOT DOWN IN EAST CHINA SEA
3	1956	HUNGARIAN REVOLUTION
4	1957	JORDAN SURVIVES DISMEMBERMENT; OUSTS EGYPTIANS
5	1957	UN COMMAND RENOUNCES KOREAN ARMISTICE
6	1957	CASTRO REVOLUTION; FRICTION WITH U.S.
7	1957	SYRIA/TURKEY - U.S. DISPUTE
8	1957	USSR LAUNCHES SPUTNIK
9	1958	U.S. MARINES SENT TO LEBANON
10	1958	V.P. NIXON'S SOUTH AMERICAN VISIT
11	1958	QUEMOY-MATSU SHELLED BY CHINESE COMMUNISTS
12	1958	USSR ORDERS U.S., FRANCE, UK OUT OF BERLIN
13	1958	UNARMED U.S. TRANSPORT SHOT DOWN AT ARMENIAN BORDER
14	1959	USSR TRAWLER "NOVOROSSISK" CUTS MARINE CABLES
15	1959	FORCES FROM CUBA INVADE PANAMA
16	1959	MATSU ISLAND BOMBARDED BY CHINESE COMMUNISTS
17	1959	INSURGENCY IN LAOS
18	1959	ANTI-U.S. RIOTS IN PANAMA
19	1960	CUBA/U.S. DISSENSION
20	1960	ANTI-U.S. PROTESTS IN JAPAN OVER PEACE TREATY
21	1960	FRANCE BECOMES A NUCLEAR POWER
22	1960	NEW CRISIS IN BERLIN
23	1960	U-2 INCIDENT
24	1960	INITIAL CONGO CRISIS
25	1960	NICARAGUA VS COSTA RICA
26	1961	BAY OF PIGS: OPERATIONAL PHASE
27	1961	DOMINICAN REPUBLIC CRISIS
28	1962	U.S. INCREASES MILITARY SUPPORT TO RVN
29	1961	PRO-U.S. COUP IN KOREA
30	1961	BERLIN BORDER CLOSED BY EAST GERMANS
31	1961	"SANTA MARIA" INCIDENT
32	1962	TAIWAN STRAITS CRISIS; QUEMOY, MATSU SHELLED
33	1962	U.S. TROOPS TO THAILAND
34	1962	CUBAN MISSILE CRISIS
35	1962	INDIA-CHINA CONFLICT
36	1962	FRANCE SEEKS "NUCLEAR CLUB" MEMBERSHIP
37	1963	U.S. NAVY TO GULF OF SIAM
38	1963	HAITI-DOMINICAN REPUBLIC DISPUTE
39	1963	DMZ VIOLATIONS IN KOREA
40	1963	CYPRUS TROUBLE; GREEK-TURKEY WAR THREAT
41	1964	CANAL ZONE FLAG RIOTS
42	1964	REBELLION IN ZANZIBAR

43 1969 LIBYA CLOSES U.S. BASE; FRANCE BECOMES SUPPLIER
44 1964 U.S. RECON PLANE SHOT DOWN OVER EAST GERMANY
45 1964 TONKIN GULF INCIDENTS
46 1964 PRC EXPLODES FIRST A-WEAPON
47 1964 COUP IN BRAZIL
48 1964 U.S. SUPPORT TO CONGO
49 1964 CAMBODIA DOWNS U.S. C-123
50 1964 U.S.-CUBA DISCORD: GUANTANAMO
51 1965 FURTHER TENSIONS WITH USSR OVER CUBA
52 1965 INSURGENCY IN THAILAND
53 1965 SOVIET HARASSMENT OF U.S. NAVY SHIPS
54 1966 INDIA-PAKISTAN CONFLICT
55 1965 DOMINICAN REVOLT; U.S. INTERVENTION
56 1966 U.S. DROPS FOUR H-BOMBS OFF SPANISH COAST
57 1966 FRANCE LEAVES NATO
58 1967 ISRAELI "SIX DAY" WAR
59 1967 ATTACK ON USS LIBERTY
60 1968 SEIZURE OF USS PUEBLO BY NORTH KOREANS
61 1968 U.S. JETLINER FORCED DOWN IN KURILES
62 1968 SOVIET INVASION OF CZECHOSLOVAKIA
63 1968 U.S. NAVY IN BLACK SEA
64 1968 JAPAN DEMANDS RETURN OF OKINAWA
65 1969 ANTI-U.S. RIOTS IN ISTANBUL
66 1969 U.S./PERU FISHING AND TRADE DISPUTE
67 1969 USSR/CHINA BORDER CLASH
68 1969 NAVY EC-121 SHOT DOWN BY NORTH KOREA
69 1969 OPERATION "RED HAT" - MOVEMENT OF TOXIC MUNITIONS
70 1970 "COLUMBIA EAGLE" MUTINY
71 1970 U.S. GENERAL OFFICERS LAND IN ARMENIA
72 1970 JORDAN/PALESTINE GUERRILLAS/SYRIA CONFLICT
73 1971 U.S.-ECUADOR FISHING DISPUTE
74 1971 HELICOPTER SEIZURE IN PHNOM PENH
75 1971 INDIA-PAKISTAN WAR
76 1972 SOVIET SHIPS BOMBED IN HAIPHONG HARBOR
77 1973 LIBYA ATTACKS U.S. C-130
78 1973 MIDEAST WAR
79 1973 ARAB OIL EMBARGO
80 1973 U.S. WORLDWIDE ALERT
81 1973 IDI AMIN OUSTS MARINES
82 1973 PANAMA CANAL NEGOTIATIONS
83 1974 COUP IN PORTUGAL
84 1974 INDIAN ATOMIC BOMB
85 1974 CYPRUS CIVIL WAR; TURK INVASION
86 1975 U.S. ENDS AID; TURKS CLOSE U.S. BASES
87 1975 OPERATION "EAGLE PULL" - EVACUATION OF CAMBODIA
88 1975 U.S. EVACUATION OF SAIGON
89 1975 SEIZURE OF "MAYAGUEZ"
90 1975 ANGOLA CIVIL WAR
91 1976 FIRST LEBANON EVACUATION (APRIL-JUNE)

92	1976	SECOND LEBANON EVACUATION (JULY)
93	1976	CAMBODIA PROTESTS BOMBING OF SIEM RAP
94	1976	SADAT ABROGATES SOVIET TREATY
95	1976	U.S. BASES IN THAILAND CLOSED
96	1976	GREECE THREATENS BASE RIGHTS TREATY
97	1976	NATO RESPONSE TO WARSAW PACT BUILDUP
98	1976	THE AEGEAN CRISIS
99	1976	"PANMUNJOM TREE" CRISIS
100	1976	USSR DEFECTOR WITH MIG-25
101	1976	NAVY LOSES TOMCAT FIGHTER FROM CARRIER

APPENDIX B

U.S. CRISIS ACTIONS CATEGORIES

U.S. ACTIONS

1 COMMIT LAND FORCES TO COMBAT
2 COMMIT SEA FORCES TO COMBAT
3 COMMIT AIR FORCES TO COMBAT
4 COMMIT SUPPORT SERVICES (LAND)
5 COMMIT SUPPORT SERVICES (SEA)
6 COMMIT SUPPORT SERVICES (AIR)
7 REPOSITION LAND FORCES
8 REPOSITION SEA FORCES
9 REPOSITION AIR FORCES
10 THREATEN NUCLEAR FORCES AS DETERRENT
11 REDEPLOY NUCLEAR FORCES AS DETERRENT
12 CHANGE ALERT STATUS OF NUCLEAR FORCES AS DETERRENT
13 THREATEN NONNUCLEAR FORCES AS DETERRENT
14 REDEPLOY NONNUCLEAR FORCES AS DETERRENT
15 CHANGE ALERT STATUS OF NONNUCLEAR FORCES
16 REDEPLOYMENT OF PEACEKEEPING FORCES
17 SHOW OF MILITARY FORCE
18 MILITARY BLOCKADE OR QUARANTINE
19 ISOLATED MILITARY CONTACT
20 MILITARY FORCES USED IN SEARCH AND RESCUE OPERATION
21 MILITARY INTELLIGENCE COLLECTION
22 MILITARY INTELLIGENCE DISSEMINATION TO AN ALLY
23 MILITARY INTELLIGENCE DESSEMINATION TO AN ANTAGONIST
24 MILITARY MANEUVERS OR TRAINING EXERCISES
25 IMPROVE, MAINTAIN FORCE READINESS
26 COVERT MILITARY OPERATION
27 MILITARILY INTERVENE BETWEEN COMBATANTS
28 AIRLIFT PERSONNEL AND/OR SUPPLIES AND EQUIPMENT
29 PROVIDE MILITARY ADVISORY ASSISTANCE
30 PROVIDE MILITARY TRAINING FOR COMBAT TROOPS
31 PROVIDE OTHER MILITARY TRAINING
32 DRAW DOWN MILITARY EQUIPMENT FROM U.S. UNITS
33 PROVIDE MILITARY SUPPLIES FROM U.S. DEPOTS
34 PROVIDE SUPPLIES FROM NONMILITARY SOURCES
35 PROVIDE MILITARY MAINTENANCE ASSISTANCE
36 PROVIDE OTHER MILITARY LOGISTICS ASSISTANCE
37 PROVIDE OTHER MILITARY ASSISTANCE
38 MAKE POLITICAL/ECONOMIC COMMITMENT IMPLYING NEW MILITARY MISSION
39 UNDERTAKE A NEW MILITARY MISSION
40 ACCEPT A NEW MILITARY COST
41 MODIFY AN EXISTING DEFENSE TREATY
42 MODIFY AN EXISTING BASE RIGHTS TREATY
43 MODIFY AN EXISTING STATUS OF FORCES AGREEMENT
44 SEEK ASSISTANCE IN DECISION-MAKING

45 TAKE NO MILITARY ACTION
46 EMPLOY DIPLOMACY
47 MEDIATE A DISPUTE
48 THREATEN TO, OR ACTUALLY, WITHDRAW SUPPORT
49 ADVOCATE/SUPPORT PEACEKEEPING EFFORTS
50 IMPROVE SCIENTIFIC/TECHNICAL CAPABILITIES
51 REAFFIRM EXISTING POLITICAL-MILITARY COMMITMENT
52 LODGE PROTEST(S)
53 OTHER
54 U.S. ACTS ALONE
55 U.S. ACTS WITH ONE OTHER NATION
56 U.S. ACTS WITH TWO OR MORE OTHER NATIONS
57 UNITED NATIONS INVOLVED

APPENDIX C

U.S. CRISIS OBJECTIVES CATEGORIES

U.S. POLICY OBJECTIVES

1 DETER IMMINENT ATTACK
2 IMPROVE OR RECTIFY DETERRENCE POSTURE
3 PUT DOWN REBELLION
4 RESTORE A REGIME
5 REGAIN ACCESS TO ECONOMIC RESOURCES
6 RESTORE PEACE
7 RESTORE TERRITORIAL INTEGRITY
8 RESTORE MILITARY BALANCE OF POWER
9 RESTORE READINESS
10 PRESERVE READINESS
11 PRESERVE PEACE
12 CONFIRM OR RE-ESTABLISH PRESTIGE
13 PRESERVE TERRITORY AND/OR FACILITIES
14 PRESERVE REGIME FROM EXTERNAL THREAT
15 PRESERVE REGIME FROM INTERNAL THREAT
16 PRESERVE, RESTORE, OR IMPROVE ALLIANCE
17 PROTECT LEGAL AND POLITICAL RIGHTS
18 INDUCE MAINTENANCE OF CURRENT POLICY
19 DISSUADE FROM A NEW POLICY
20 PROTECT A MILITARY ASSET
21 SUPPORT A NEW GOVERNMENT
22 INDUCE NATIONAL REORIENTATION
23 INDUCE ADOPTION OF A NEW POLICY
24 BRING ABOUT THE FALL OF A REGIME
25 SUPPORT INSURGENCY
26 DENY POLITICAL ACCESS
27 DENY MILITARY ACCESS
28 ASSURE CONTINUED ECONOMIC ACCESS
29 PRESERVE OR REGAIN CONTROL OF THE SEA
30 PRESERVE OR REGAIN CONTROL OF THE AIR
31 DENY SUCCESS TO TERRORISTS/HIJACKERS
32 PROTECT HUMAN LIFE
33 PROVIDE SANCTUARY OR ASYLUM
34 SUPPORT CRITICAL NEGOTIATIONS
35 DISCOVER INTENTIONS OR ACTIONS
36 PREPARE FOR ALTERNATIVE MISSIONS
37 SUPPORT UNITED NATIONS EFFORTS
38 CONTAIN OPPONENT(S)
39 PREVENT SPREAD OF WAR
40 PRESERVE LINE OF COMMUNICATIONS
41 REGAIN TECHNICAL ADVANTAGE
42 RESTORE PRESTIGE
43 PRESERVE BALANCE OF POWER

44 PREVENT SPREAD OF COMMUNIST INFLUENCE
45 PREVENT NUCLEAR PROLIFERATION
46 INSURE SELF-SUFFICIENCY
47 AVOID DIRECT INVOLVEMENT
48 PRESERVE SECRECY

APPENDIX D

ALGORITHM FOR DETERMINING ACTIONS GIVEN MULTIPLE OBJECTIVES

INTRODUCTION

Statistical analysis of the historical crisis data base produces a set of parameters designed as $\{\beta_{ij}\}$. In turn, this set is constructed from an equation for each policy objective.

$$\Phi_1 = \beta_{11}A_1 = \beta_{12}A_2 + \ldots + \beta_{1n}A_n$$

$$\Phi_2 = \beta_{21}A_1 + \beta_{22}A_2 + \ldots + \beta_{2n}A_n$$

$$\Phi_3 = \beta_{31}A_1 + \beta_{32}A_2 + \ldots + \beta_{3n}A_n$$

$$\vdots$$

$$\Phi_m = \beta_{m1}A_1 + \beta_{m2}A_2 + \ldots + \beta_{mn}A_n$$

where:

Φ_i represents the i-th objective, coded as the presence (1) or absence (0) of that objective for the United States in the crisis.

A_j represents the j-th action taken by the United States in some historical crisis situation(s), codes as the presence (1) or absence (0) of that action in a specific crisis.

β_{ij} is an empirically derived conditional probability of the impact of A_j on Φ_i.

If all of the policy objectives are equally weighted, then:

$\sum_{i=1}^{m} \Phi_i$ represents the maximum objective "value" attainable for a set of actions;

$\sum_{j=1}^{n} \beta_{ij}$ represents the value associated with the i-th objective if all actions are taken; and

$\sum_{i=1}^{n} \beta_{ij}$ represents the contribution of the j-th factor to the sum of all objectives.

The algorithm uses W_1 as the user-assigned weight for the i-th objective. This user-entered "raw" weight is based on a 0-100 numeric scale. The program scales these raw entries to a standardized weight, ω_i, such that $\sum_{i=1}^{m} \omega_i = 1$. Then, $\sum_{i=1}^{m} \omega_i \beta_{ij}$ represents the relative contribution of an action (A_j) to the user-specified set of objectives. When ω_1 is large, an action (A_j) can make a relatively large contribution to the policy objectives specified by the user even though the action itself is not very effective. On the other hand, a very effective action may be relatively useless if it contributes to a low priority objective.

The program computes the relative contribution of each action, C_j, where $C_j = \sum_{i=1}^{m} \omega_i \beta_{ij}$. These C_j's are then sorted and printed in descending magnitude.