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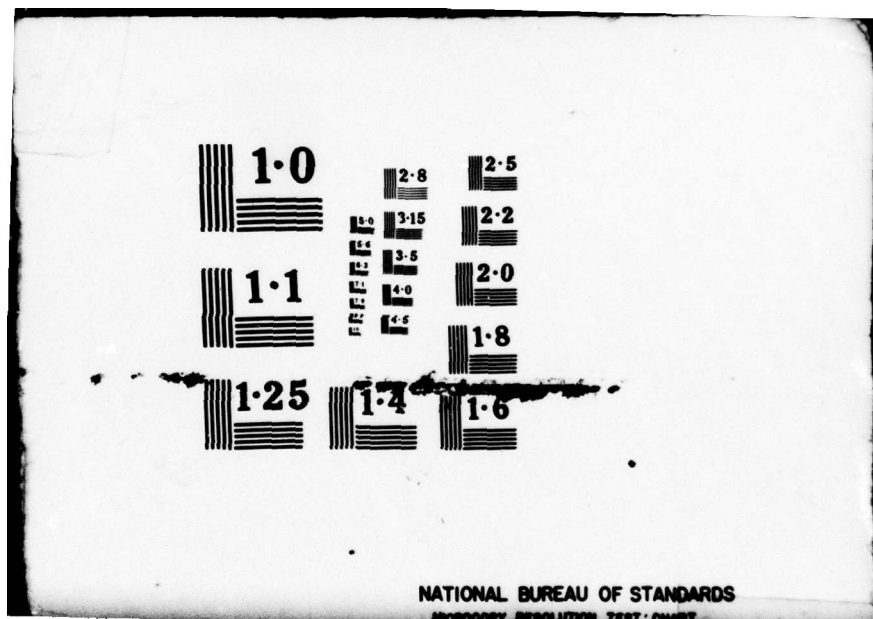
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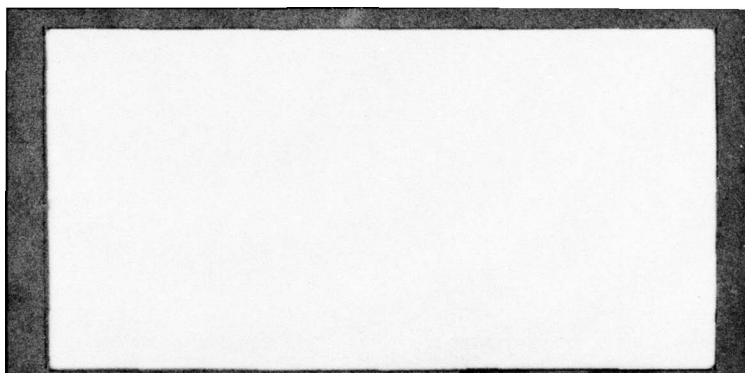
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**A PROPOSED CONCEPTUAL MODEL FOR THE
INTEGRATION OF ZERO-BASE BUDGETING
INTO THE RESOURCE MANAGEMENT SYSTEM
AT THE BASE LEVEL**

Robert J. Conner, GS-12, USAF
David B. Walker, Captain, USAF

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Robert J. Connor, Major, USAF
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A major impact of zero-base budgeting (ZBB) in the Air Force will be on the role of the base-level managers. The problem for the Air Force is to integrate the philosophy of centralized planning, programming and budgeting with the concept of operating management participation in a bottom-up ZBB process. The objective of this research is to develop a conceptual model of ZBB as it could be applied at base level in the Air Force and to provide support for the appropriateness of the proposed model by using an opinion survey of base-level responsibility center managers and resource advisors. A conceptual model is presented and results of the opinion survey are used to validate aspects of the model. The opinion survey also included questions pertaining solely to the attitudes of the base-level managers toward the zero-base budgeting process. The conclusion of the research is that, while there are several problems in the implementation of ZBB at base level, the responsibility center managers and resource advisors can perform the functions required by ZBB. The proposed model was supported in part by the results of the survey. Recommendations and areas for further study are presented.

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ZERO-BASE BUDGETING INTO THE RESOURCE
MANAGEMENT SYSTEM AT THE BASE LEVEL**

A Thesis

**Presented to the Faculty of the School of Systems and Logistics
of the Air Force Institute of Technology
Air University**

**In Partial Fulfillment of the Requirements for the
Degree of Master of Science in Logistics Management**

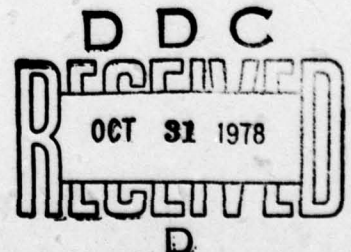
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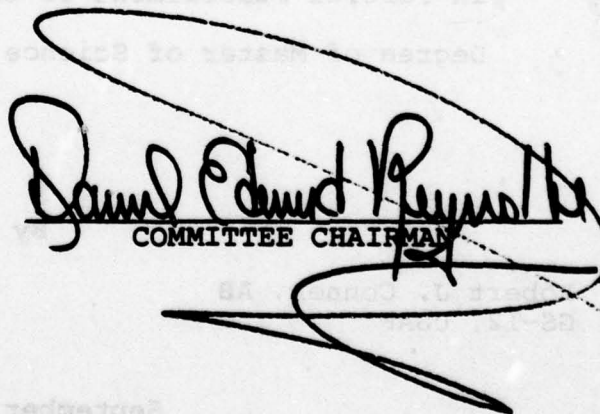
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Looking back over a year's effort to grasp and apply the ideas proposed by Stafford Beer, the authors are still hesitant to claim more than a rudimentary knowledge of this exciting, new approach to management. But the effort has been both challenging and worthwhile. It has been an educational process which has expanded our knowledge in many areas other than budgeting and management cybernetics.

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CHAPTER I

INTRODUCTION

In a White House Memorandum dated February 14, 1977, President Carter directed that all executive agencies in the federal government develop a zero-base budgeting (ZBB) system to be used in the preparation of their fiscal year 1979 budgets (5). The Air Force has developed partial guidance for ZBB budget preparation; however, due to time limitations, a comprehensive Air Force ZBB program has not been developed (33:4).

Statement of the Problem

In order to implement zero-base budgeting as directed by the President, the Air Force must determine what changes in budgeting policies and procedures will be required. In theory, ZBB is a relatively simple concept, but its application can be quite difficult because ZBB must be tailored to meet the peculiar requirements of each organization. Air Force implementation will probably be difficult since ZBB is new to the federal government and has never been implemented on such a major scale. Because a ZBB program tailored to meet the unique requirements of the USAF does not exist, there is a need to initiate research into the specific application of ZBB in the Air Force.

Justification

Zero-base budgeting is a theoretically sound budgeting process which has been successfully implemented in numerous companies and state and city governments (27:15).

An overview of ZBB is given in Chapter II. This section discusses some of the issues in implementation of ZBB by the Air Force.

In implementing zero-base budgeting, the Air Force has as one of its objectives

. . . to integrate the concepts and objectives of ZBB with the Department of Defense (DoD) Planning, Programming, and Budgeting System (PPBS) at the Headquarters level, and with the DoD Resource Management System (RMS) at the base level [33:9].

The implementation at HQ USAF has proceeded quickly with the establishment of a structure for the aggregation and processing of ZBB decision packages to meet DoD and Office of Management and Budget requirements (9; 19; 33:10-13). Although implementation of a basic structure patterned after the existing PPBS has been developed, the role of the Major Commands and field activities in the ZBB process has not been clearly defined (19).

A major impact of ZBB on budgeting in the Air Force will be on the role of the base level managers. One of the benefits of zero-base budgeting is that it involves managers at all levels within the organization in planning and budgeting (25:32). When ZBB is fully implemented, the Air Force budget will be developed using a bottom-up

budgeting approach and managers at all levels will be involved in budget formulation as well as budget execution (15:4). *This is a major reorientation of the concept of budgeting within the Air Force.* Under the PPBS, the base level managers, while playing a key role in the execution of the budget, have not had a direct role in budget formulation (33:8). Under ZBB, the base level responsibility center managers will be responsible for development of the basic information which will eventually be used in the preparation of the President's budget (19).

The key to a successful zero-base budgeting program is to tailor the budgeting system to meet the specific needs of the organization (22:35). *The problem for the Air Force is to integrate the existing philosophy of centralized planning, programming and budgeting with the concept of operating management participating in a bottom-up ZBB process.* The problem is further compounded because even though ZBB has been successfully used by various city and state governments, it has not been applied in the federal government or on the scale required by the Air Force (1:66). A pilot study on the use of ZBB was conducted by NASA for the House Appropriations Committee with mixed results (4:2; 16:58). Dr. Robert N. Anthony (1:67), one of the key figures in the development of the DoD PPBS, argues that because ZBB will be too time-consuming and costly, it will not be successful in the federal government. While other authorities

disagree (6:267; 25:24; 29:12) the feasibility of the use of ZBB in the federal government has not been clearly demonstrated.

Objectives and Research Questions

The objectives of this research were to develop a conceptual model of zero-base budgeting as it could be applied in the Air Force at base level, and to determine the attitudes of the responsibility center managers and resource advisors toward ZBB. The following research questions were designed to accomplish these objectives.

1. Can a conceptual model be developed which will describe the organizational structure and communication channels for the Air Force base level budgeting system using zero-base budgeting?

2. Can the applicability of the model be validated from a field survey of responsibility center managers and resource advisors?

3. What are the attitudes of the responsibility center managers and resource advisors toward zero-base budgeting in the Air Force?

Scope of the Study

This thesis was concerned with developing a zero-base budgeting model which could be applied to budgeting in the Air Force. No attempt was made to develop specific procedures. The research was directed toward developing

the model and, through this model, to relate the theoretical concepts of ZBB, as it is applied in business and in city and state government, to the specific requirements of the Air Force.

CHAPTER II

A THEORETICAL OVERVIEW OF ZERO-BASE BUDGETING

Zero-base budgeting is a management tool which combines budgeting, planning, and operations decision making into one process to improve efficiency and to reduce cost (30:13). The organization can use ZBB to set objectives, make operating decisions, and evaluate changing workloads as an integral part of the budgeting process (25:x).

In comparison to the traditional budgeting system, which merely requires managers to justify increases in present levels of spending, zero-base budgeting reviews all current and new programs and lays the burden of justification of a program's survival on the manager who is utilizing the resources to implement that program (20:22-23). Whether a program is several years old or brand new, it will have to be justified in the same manner. If a program is no longer congruent with the objectives of the organization, then it can be identified and eliminated.

The process of zero-base budgeting--like the traditional budgeting system--starts at the top, with management identifying the goals and objectives of the organization (26:7). At this point, the two systems diverge. Management under zero-base budgeting must go much further and

develop complementary supporting strategies and appropriate, realistic, tactical programs to support each strategy (6:101). Once top level management has defined these goals, each manager must translate these goals into his own objectives which will allow his unit to accomplish the goals of the whole organization (20:23). Therefore, policy-making decisions are spread throughout the management spectrum with each manager developing those objectives which will aid him in accomplishing his specific tasks.

The Zero-Base Budgeting Process

There are no "hard and fast" procedures for developing a ZBB system. As described above, each application should be uniquely tailored to the organization; however, when developing a ZBB system, each organization should develop a framework which consists of the following steps:

1. The purposes and objectives of the activity (unit) are described.
2. Performance and workload measures are developed.
3. Alternative ways of operating--including the current mode of operation--are described.
4. Each alternative is examined by cost/benefit analysis and the most appropriate (usually one or two) are chosen for further analysis.
5. A detailed incremental analysis is then performed. A minimum level of service is first developed. Then successive levels of service and cost are analyzed in terms of cost and output measures.
6. Detailed line-item costs are developed for each increment of service and cost [6:4].

Once objectives have been defined at all levels of the organization, a budget structure must be established. The individual units responsible for developing budgets

are labeled decision units and their budget justifications are decision packages (35:110-111).¹ A decision package is much more than a budget justification, however. It must also include the objectives of that activity, a cost/benefit analysis, and performance measures (10:47). In addition to a budget based on last year's performance level called a current level, the manager must prepare a minimum level budget below the current level and an enhanced level budget above it. These incremental packages can provide much greater flexibility to management than the traditional budget system (38:162).

The final basic element of ZBB is the ranking process. ZBB affords the manager at each level the opportunity to consolidate the decision packages for the organizations under his control and to rank them according to priority (32:41). Using incremental decision packages, he can decide on appropriate levels of output for each activity within his funding constraints.

Formulation

The basic element of the zero-base budgeting program is the decision unit. The decision units may correspond to the traditional budget units or they may represent more specific programs (23:2-3). Decision unit managers will

¹Appendix A is a glossary of zero-base budgeting and financial management terms to aid the reader in understanding the terminology used in this thesis.

build decision packages which describe and define the operations of their decision units. Top management will use these decision packages to rank the importance of each activity in relation to the organization's overall objectives and other activities within the organization (25:15).

Decision Units. Decision units are distinctive, meaningful units of an organization for which budget requests must be prepared and for which the manager of that unit makes significant decisions on the amount of spending and the quality and scope of its output (26:5). The level within the organization at which a decision unit is defined will depend upon the specifications of that particular organization. ZBB allows management considerable flexibility because decision units can be defined programmatically or organizationally. They may be used to define capital projects, special work assignments, or major programs (23:3).

Once decision units are defined they do not need to be redefined in subsequent budget cycles except to identify new programs (32:44). This is not to say that each decision unit will not be evaluated each budget cycle. The purpose of ZBB is to start from "no base at all" and justify all programs during each budget cycle, hence the name *zero-base budgeting* (27:13). By reassessing each program, management can continually evaluate the effectiveness of its programs on the basis of performance as well as cost,

and eliminate those decision units which are no longer necessary to accomplish the organization's objectives (25:33).

Decision Package. The decision package is the building block of the ZBB process, and the means by which decision unit managers justify their organization's existence (26:10-11; 25:111). The development of an accurate decision package is probably the most difficult step in the ZBB process because it must not only detail the costs of the decision unit for the budget period, but it must also describe specifically how the unit operates and meets its objectives (10:47). In short, the manager has to detail his entire operation from inputs to outputs.

The content and format of decision packages will vary between organizations, but they must provide all levels of management the information necessary to evaluate each decision unit. This information should include:

1. Purpose/objective.
2. Description of actions (What are we going to do, and how are we going to do it?)
3. Costs and benefits.
4. Workload and performance measures.
5. Alternative means of accomplishing objectives.
6. Various levels of effort (What benefits do we get for various levels of funding?)[23:3].

As described earlier, lower level managers develop objectives for their decision units after top management defines organizational objectives. The decision package is the vehicle that allows the lower level manager to tell

upper management how his unit will accomplish the organizational objectives. Each package clarifies the decision unit's objectives and determines the best method of achieving those objectives (30:13). It identifies alternative methods of operation and several incremental levels of spending based on incremental levels of performance (18:7). The workload measures provide top management with an indicator for comparing the performance of one work center with another. In this way, management can identify not only inefficiencies in operations but also innovative techniques which might apply to other decision units (20:91). In addition, workload measures provide the line manager written standards for evaluation of his unit throughout the budget cycle (31:2).

The two key words in developing decision packages are *alternative* and *incremental* (24:113). The decision unit manager must take the problem solution approach to analyzing his decision unit (25:13). (See Figure 1.) He must develop alternative means for accomplishing his objectives, and decision packages for each alternative may have to be developed (23:5). Often line managers feel that they have a better way to get the job done, but they are unable to convey this to top management. ZBB provides the method for getting these ideas to the chief executive (25:32). If the manager's alternative method is chosen as the best method, then the current method of operation is shown as

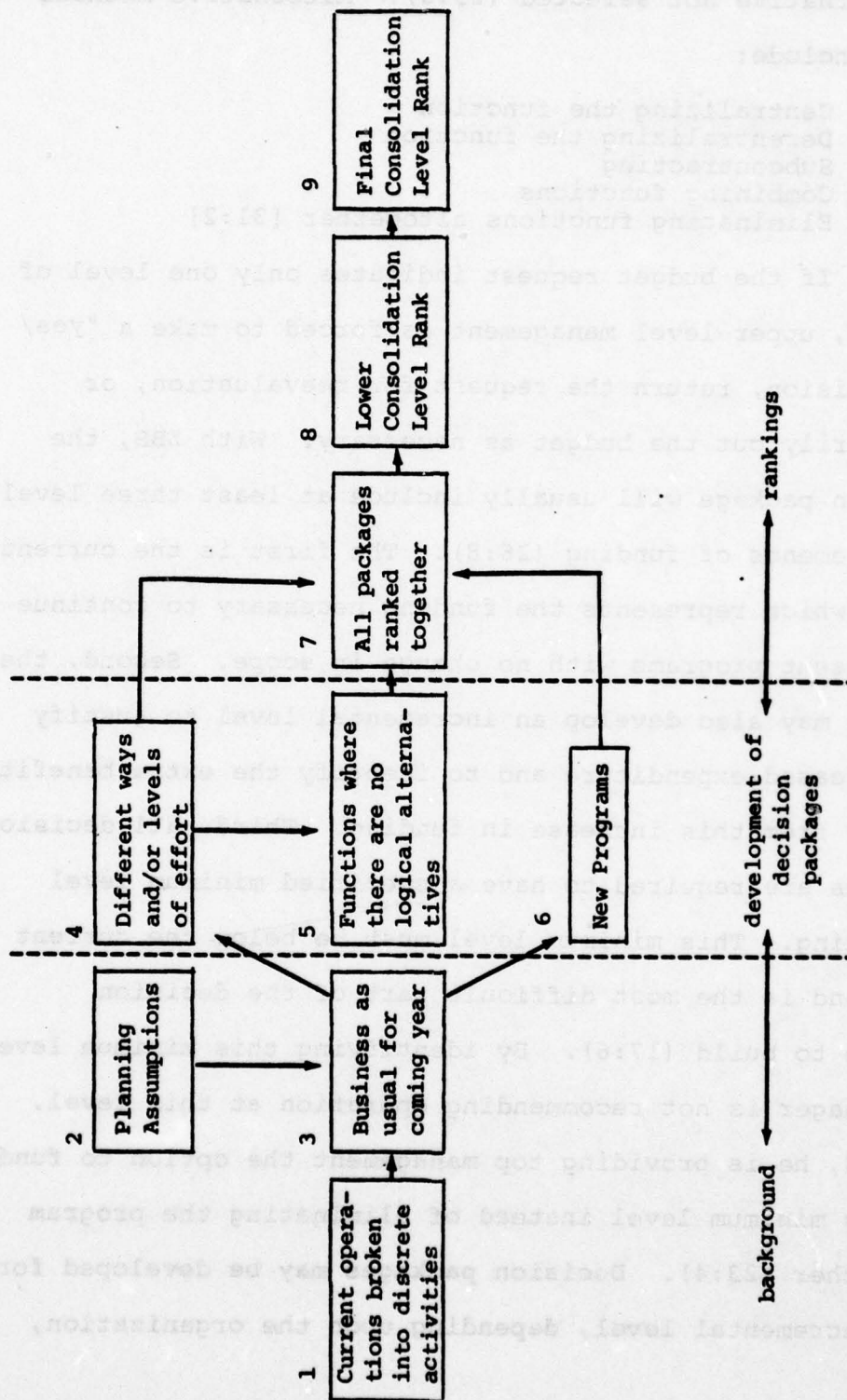


Fig. 1. The Decision Package Formulation Process (11:46)

an alternative not selected (25:6). Alternative methods might include:

1. Centralizing the function
2. Decentralizing the function
3. Subcontracting
4. Combining functions
5. Eliminating functions altogether [31:2]

If the budget request indicates only one level of funding, upper-level management is forced to make a "yes/no" decision, return the request for reevaluation, or arbitrarily cut the budget as necessary. With ZBB, the decision package will usually include at least three levels or increments of funding (26:8). The first is the current level, which represents the funding necessary to continue the present programs with no change in scope. Second, the manager may also develop an incremental level to justify an increased expenditure and to identify the extra benefits derived from this increase in funding. Third, all decision packages are required to have a specified minimum level of funding. This minimum level must be below the current level and is the most difficult part of the decision package to build (17:6). By identifying this minimum level the manager is not recommending operation at this level. Instead, he is providing top management the option to fund at this minimum level instead of eliminating the program altogether (23:4). Decision packages may be developed for each incremental level, depending upon the organization,

but usually one package is built as a series of increments from this minimum level (26:9).

Ranking

The final step in the ZBB process is ranking the decision packages, which allows managers at various levels to decide the importance as well as the necessity of the programs under their control (35:111). Not only do they rank the decision packages by priority, but through the use of increments they develop the most efficient use of programs to meet the overall organization's objectives (21:40).

Evaluation and Ranking Process. The ranking process begins with management one level above the decision unit. The manager at this level must prioritize the increments of the decision packages developed by the decision units under his control. The minimum level of the decision package from the most important program or activity will be assigned the highest priority for funding. All other increments are then ranked in sequence by decreasing priority. In Figure 2, the manager is responsible for ranking two programs labeled A and B. The minimum levels of Programs A and B are represented by A1 and B1, respectively, the current level by A2 and B2, and the enhanced level by A3 and B3. He may feel, however, that Program A is more important than Program B and rank the increments to reflect the added

ASSUME THAT A MANAGER IS RESPONSIBLE FOR TWO PROGRAMS A & B

DECISION PACKAGES FOR PROGRAMS A & B

A1	---	Minimum level	---	B1
A2	---	Current level	---	B2
A3	---	Enhanced level	---	B3

RANKING OF PROGRAMS A & B

Example 1

Program A is only slightly more important than program B

Example 2

Program A is very important while program B is relatively minor

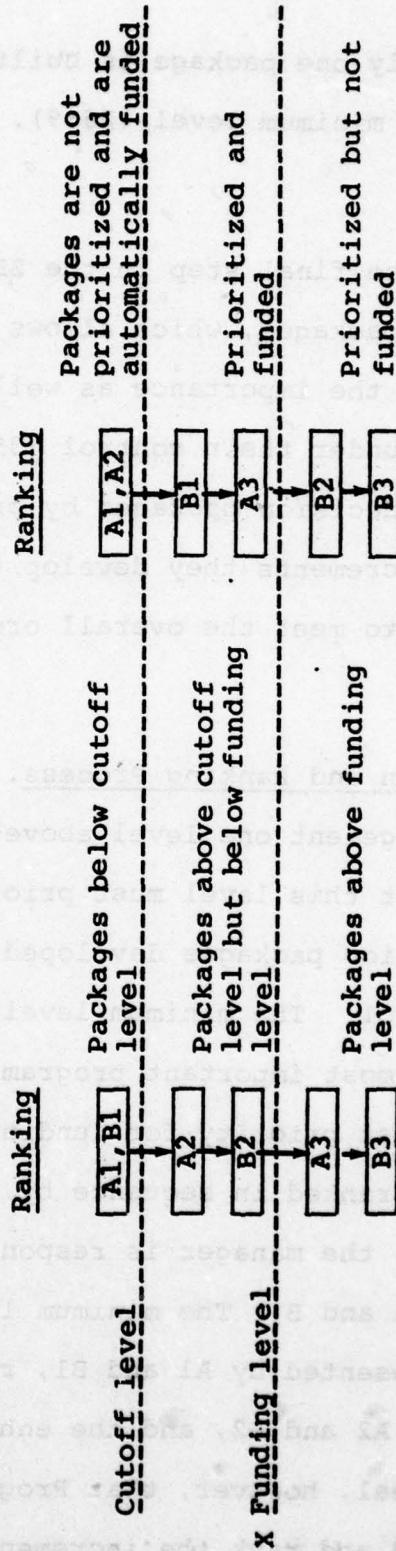


Fig. 2. The Ranking Process

importance of Program A. In this case he may rank the increments A1, A2, B1, A3, B2, B3. By prioritizing packages from Program A in this manner, the manager is telling top management that, if necessary, he can accept lower levels of funding for Program B, but increased levels of funding of Program A are very important for the accomplishment of his organizational objectives. The final product of the ranking process is a rank ordering of the increments of the decision packages from the minimum level of the highest priority program to the enhanced level of the lowest priority program (17:2).

The next step in the ranking process occurs at the next level of management. This intermediate-level manager consolidates all packages for decision units under his control and ranks the packages and increments according to his priorities (17:8). This ranking process continues in a similar fashion up the management organization to top-level management.

Cutoff and Funding Levels. The ranking process is made easier by looking at only those decision packages which are above the monetary cutoff level. The cutoff level is arbitrarily established by management to minimize the number of packages that must be analyzed in the ranking process. All packages above the monetary cutoff level must be prioritized, those below that level are lumped together

and funded automatically. Those packages below the cutoff level will be the high priority items which would be funded even if they were prioritized with all other decision packages (25:15-18).

Once the packages are prioritized they must be analyzed in relation to a given funding level. Decision packages below the cutoff level will be funded so consideration will be given to only those packages above the cutoff level. Those packages above the cutoff level but below the funding level will be funded. If they are above the funding level, they will be eliminated (25:15-18).

Referring to Figure 2, assume that the manager's funding level is depicted by line X. In example 1, current levels of both Programs A and B will be funded. In example 2, however, the manager has stressed the importance of Program A. In this instance, only a minimum level of funding will be provided for Program B while Program A will be funded at an incremented level. All packages falling below line X will be eliminated.

The manager does not have to spend his time analyzing the top packages. They will be approved automatically. Likewise, the bottom packages will be eliminated in the same fashion. The manager is therefore free to concentrate on those packages close to the funding level. These are the packages which may or may not be funded (30:16).

Once the manager has ranked his decision packages he sends them to the next higher level of management. This manager collects all the decision packages under his responsibility and uses the same ranking process described above. As the budget moves up the management structure, each manager will rank his decision packages based on his budget priorities and funding levels. Once top management has finished its ranking process, the finalized budget will filter down through the management structure. Each manager may not receive the levels of spending he requested, but he knows that he developed the spending and performance package that he will have to implement (26:10).

Summary

Zero-base budgeting is a management tool that requires managers to review and justify new and ongoing programs so that resources can be allocated in the light of organizational objectives. The theoretical constructs that underlie ZBB are conceptually simple. A manager that is responsible for a function or program prepares a budget justification that is evaluated by higher levels of management in terms of cost versus benefit. This review and ranking process is continued until a consolidated budget reflecting the highest priority programs is developed for the organization. Zero-base budgeting is a decision-making

tool that can involve all levels of management in the planning and budgeting process to improve efficiency and reduce cost (30:13).

CHAPTER III

DEVELOPMENT OF THE MODEL

ZBB and the Resource Management System

The Resource Management System (RMS) is a systematic approach for the control of resources in the DOD (37:2). The objective of RMS is ". . . to provide managers at all levels within the DoD with information that will help them assure that resources are obtained and used efficiently and effectively [37:2-3]." The RMS is divided into subsystems which provide the necessary structure for accomplishment of Air Force objectives.

The identification and integration of objectives with the resources necessary to accomplish those objectives is one of the functions of the Planning, Programming, and Budgeting System (PPBS). As a technique to accomplish the objectives of the PPBS, zero-base budgeting is a management tool which will specifically relate objectives of an organization with the resource requirements necessary to accomplish those objectives. One of the benefits to be derived by implementing ZBB in the government is the improved coordination of program and activity planning, evaluation, and budgeting (17:3). As mentioned earlier, ZBB is a management tool, but it is only one of many management tools which

Air Force managers must use to successfully achieve the objectives of the Resource Management System.

One of the problems with implementing ZBB in any organization is the necessity to uniquely tailor ZBB to the organization (22:35). The Resource Management System has evolved over a period of years. The system the Air Force has developed is a sound system for managing and controlling resources (36:96-97). ZBB is a tool for line managers to identify those resources necessary to accomplish their organizational objectives. The theory of zero-base budgeting does not address the issues of evaluation and control throughout the budget cycle, nor does it identify the specific roles that people within an Air Force organization play in the budgetary process. These problem areas in zero-base budgeting are functions of other subsystems of the RMS which need to be integrated with the concepts of ZBB.

In theory, zero-base budgeting can provide the base-level manager ". . . a basis for measuring budget versus actual, and accomplished versus projected work [12:25]." In the previous budgeting approach, the manager was told how much he would receive based on the bogey provided by major command headquarters (14:130). He was not given the opportunity to make decisions about the level of funding needed to accomplish his objectives as is required in a bottom-up approach. Often, when funding was less than

anticipated, he was required to adjust his objectives or method of operations in order to accommodate the new level of resources he was given.

Under ZBB, the approach will be bottom-up, but the structure of the Air Force budgetary system remains the same as it was for the traditional top-down system. It appears, therefore, that information needed to build a budget is still flowing upward in the Air Force, rather than downward. In the traditional system, base level information relating resources to objectives was sent to MAJCOM and higher levels. Preparation of the Air Force budget was accomplished by HQ USAF from the MAJCOM inputs. Aggregate information came back down to the base level, incorporated in the bogey, which was the guidance for preparing the base's spending plan (14:130). In the opinion of the authors, this also created another problem; the responsibility center manager (RCM) received more information than he needed and, therefore, had to determine what information was relevant.

The present budgeting structure does not appear to provide the right information, to the right people, at the right time. What may be necessary then, is not a drastic change in the Air Force budgeting system, but rather, a modification to show how the system can operate to provide information for the base level manager to develop his budget

and also, information for managers at all levels to analyze decision packages and rank them according to priority.

The model proposed in this chapter is a systems approach to budgeting in the Air Force. It identifies the tasks of the individuals involved in the budgeting process. Information channels are developed to accommodate routine information for the day-to-day operations, and command information channels for the information which the manager will need to develop ZBB inputs. By dividing information into separate channels, the manager will not be inundated with unnecessary information when he develops his budget inputs, but he will have a data base to evaluate his previous year's budget in light of actual accomplishment of objectives.

The next section of this chapter outlines the general model for systems control proposed by Stafford Beer (2:199). The chapter concludes with the development of a proposed model of the ZBB process in the Air Force. This model is a modification of the present base level budgetary structure.² The proposed model is a conceptual model for the application of ZBB in the Air Force at the base level.

²As a convention to aid the reader, the theoretical ZBB model will be referred to as the ZBB process, Beer's general systems model will be referred to as Beer's model, and the model developed in this research as the proposed model.

The model was developed from the theory of ZBB and library research by the authors into the USAF Resource Management System.

The Cybernetic Model

In order to make the transition from the theoretical process of ZBB to its practical application in the Air Force, it is necessary to identify a structure for budgetary information flow. There are three basic steps in the implementation of zero-base budgeting. First, top management must identify the organizational goals. Second, the organizational unit corresponding to the decision unit must be identified. Third, budgetary information in the form of decision packages must be prepared and consolidated in the ranking process. These three steps can be defined in terms of basic elements of control--purpose, as identified by top management; structure, as defined through the decision units; and information flow, as reflected in the decision package and the ranking process. The Air Force ZBB system can be approached as a specific application of a general system of control. For this research, this control system was modeled using the cybernetic model for control developed by Stafford Beer. (See Figure 3.)

The validity of the use of Beer's model as the conceptual basis for designing a ZBB process is supported by cybernetic theory. The theory proposed that all viable

Corporate Structure and its Quantification

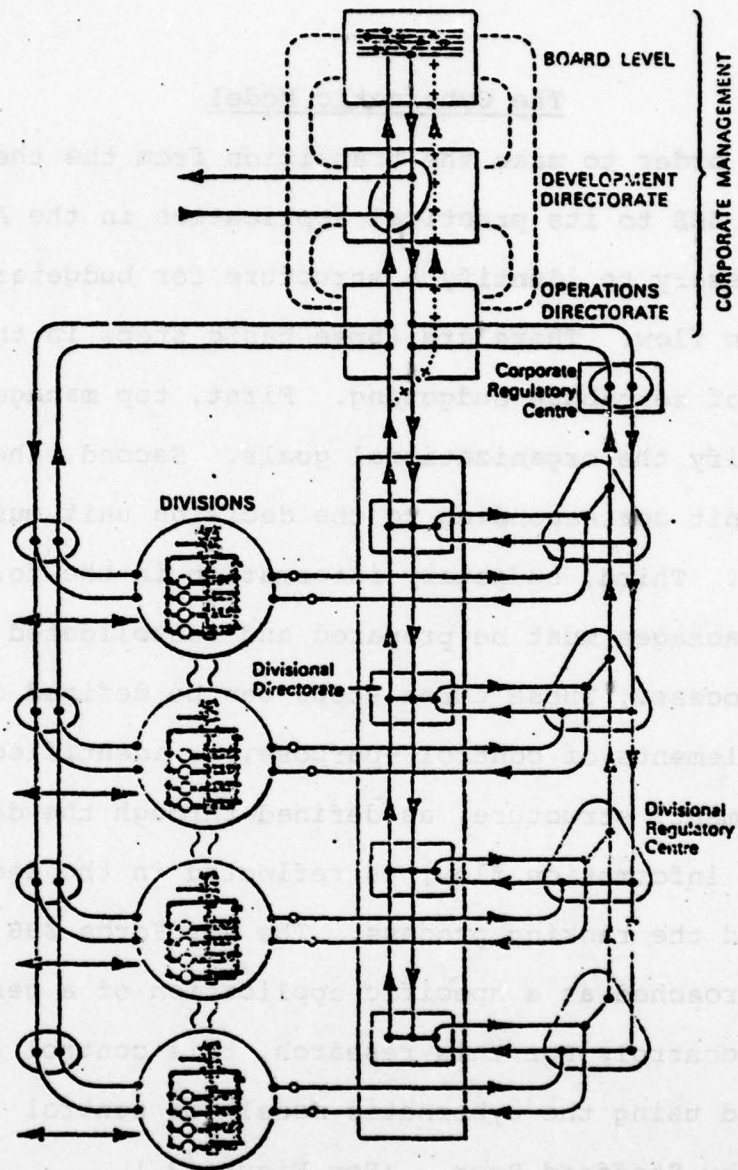


Fig. 3. Stafford Beer's Cybernetic Model for Control
(2:199)

systems function in the manner prescribed by the model, and, therefore, the value of the model is to ". . . make clear how the organization actually works, as distinct from the way it allegedly works, so that it may be streamlined and made more effective [2:198]." Beer's model outlines the procedures required to gather information and make decisions which maximize the output of the organization as a whole rather than the output of each of its parts.

Structure of the Model

System One. Beer's model is developed in five tiers or levels, labeled System One through System Five.. (See Figure 4.) Starting at the bottom, System One is identified as the divisional level. The division is responsible for producing an output and accomplishing a specific function. The division is controlled by a divisional directorate which ". . . assumes responsibility for programming, planning by objectives, and normative planning throughout the division [2:213]." The divisional directorate lies on the vertical command axis and reports to and receives instructions from higher management (2:213).

System Two. The divisional directorate is supported by the divisional regulatory center which monitors and filters input data and performs planning and programming functions. While supporting System One, this center is part of System Two. As shown in Figure 3, System Two is created by the

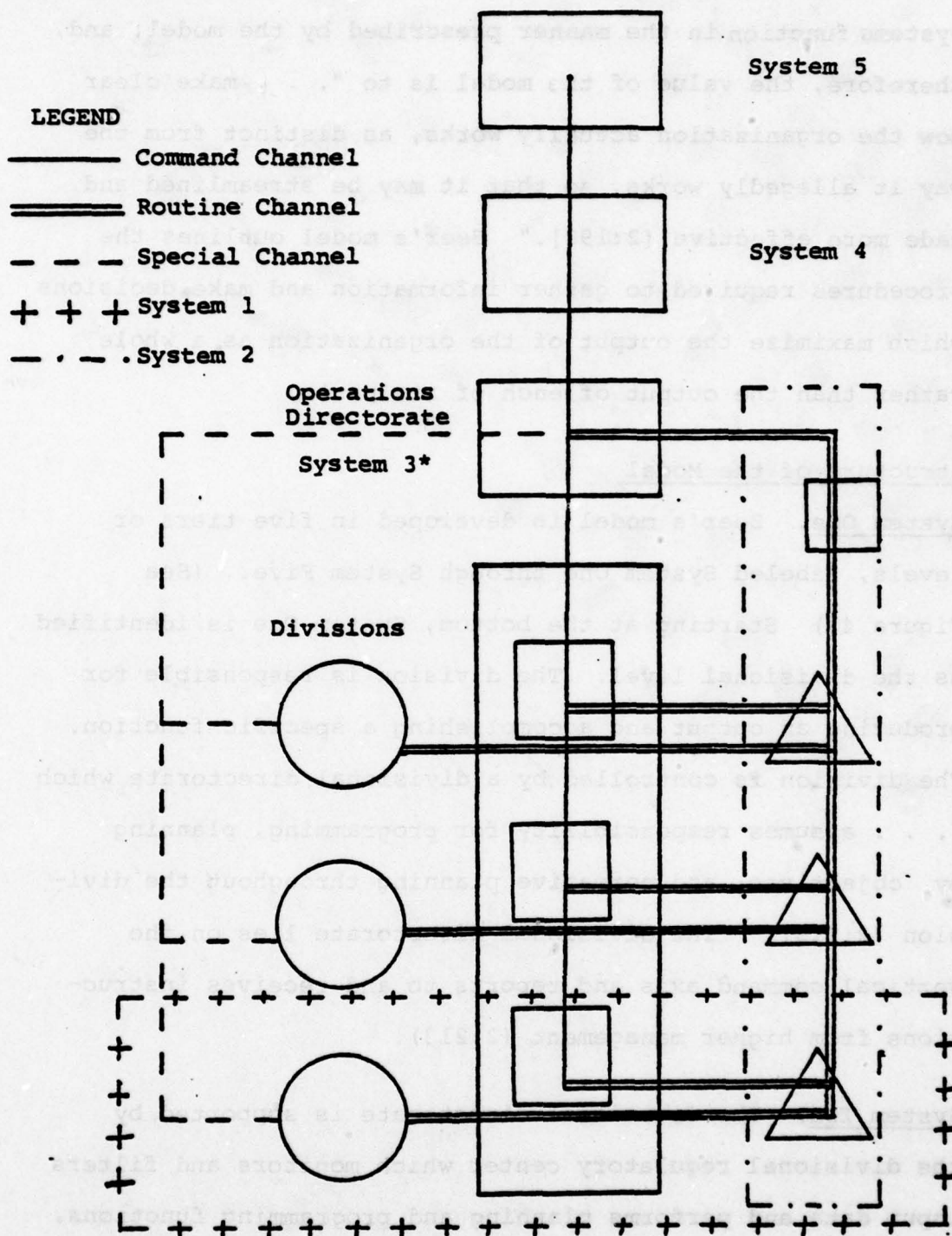


Fig. 4. Simplified Beer Model

*System 3 is made up of System 1 and System 2 with the Operations Directorate as its center.

linkage of the divisional regulatory centers with the corporate regulatory center. System Two coordinates the actions of System One and provides an information channel between System One and System Three (2:220). The primary function of System Two is to monitor and filter information between System One and System Three and make recommendations about necessary changes in routine operations which will maximize the output of the organization as a whole (2:227).

System Three. System Three, the operations directorate, monitors System Two and makes necessary changes in the structure of the routine operations of System One, based on recommendations of System Two. System Three is part of the chain-of-command and is, therefore, a transmitter of policy and special instructions to the divisions from higher levels of management (2:224).

System Four. System Four is the development directorate of the firm. It is responsible for research and development, project planning and management, monitoring of the external environment, developing purpose, and providing functional expertise to the rest of the organization (7:8). Although it performs many functions which are identified as staff functions in many organizations, it is an integral part of the command structure because it provides the information needed by System Five to make command decisions.

System Four's most important function is to look ahead, using the information it gathers from the environment and lower levels of the organization, and make recommendations to System Five, the board level, as to possible changes in organizational structure and purpose (2:252).

System Five. System Five is the highest level in the organization. Aided by System Four, it has the responsibility of defining purpose for the entire organization and implementing the structure within the organization to accomplish that purpose. The control process is designed so that System Five does not have to involve itself in the control of routine operations of the organization. This function is provided by the continuous interaction of Systems One, Two, and Three. Systems Four and Five develop a corporate strategy through long-range planning to insure continued viability of the organization as a whole (2:232).

Information Channels

Each division, although able to operate alone, contributes to the total output of the organization. Three channels of communication are used to control information flow within the organization. This information flow defines the contribution of each of the operating units in the control model. The three channels of communication are routine, command, and special (7:19). (See Figure 4.)

Routine Channel. The routine communication channel encompasses the divisions, the divisional regulatory centers, the corporate regulatory center, and the operations directorate. It is a high capacity, high variety³ information flow system. It includes information from System One, which is required by the higher levels of management for coordination of System One functions with the larger organization as a whole. This information is also necessary for communication with the environment. In many business and government organizations, this channel is flooded with unused and unuseable information obscuring the important information needed for control (7:19).

Command Channel. The command channel is the vertical axis starting with the divisional directorate and continuing up through System Three to Systems Four and Five. It is a low capacity, low variety information channel. Traveling up the channel are status reports defined in terms of performance measures. Traveling down the channel are any structural changes required to achieve organizational objectives. Two distinguishing characteristics of the command channel are brevity and informality (7:20).

Special Channel. When special problems or unique situations arise, they are handled through the special communication

³Capacity refers to the volume of information and variety refers to the different kinds of information in the system.

channel. This information channel is depicted by the direct lines running from System Three to the divisions in Figure 4. It is a low capacity, high variety channel, and its primary function is to disseminate information which is non-routine but does not change the structure of the organization (7:20-21).

Proposed Model

One objective of this research was to develop a conceptual model of zero-base budgeting as it could be applied in the Air Force. This section presents the proposed model for zero-base budgeting at the base level. (See Figure 5.) The proposed model was based on Beer's general model for control described above, library research by the authors into the base-level budgeting system as it existed prior to the introduction of ZBB in the Air Force, and research into the theory of ZBB as it is applied in city and state government and private industry. Chapter IV presents the methodology used to validate the proposed model.

The model presented here does not prescribe a ZBB system for the Air Force as a whole. Instead, it is limited to the structure and information channels for preparation of ZBB inputs to be used at the operating wing or center level.⁴ The model is limited to the operating wing for

⁴The model has been developed based on the structure of an operating wing, however, it is adaptable to the center concept which is used in the Air Training Command.

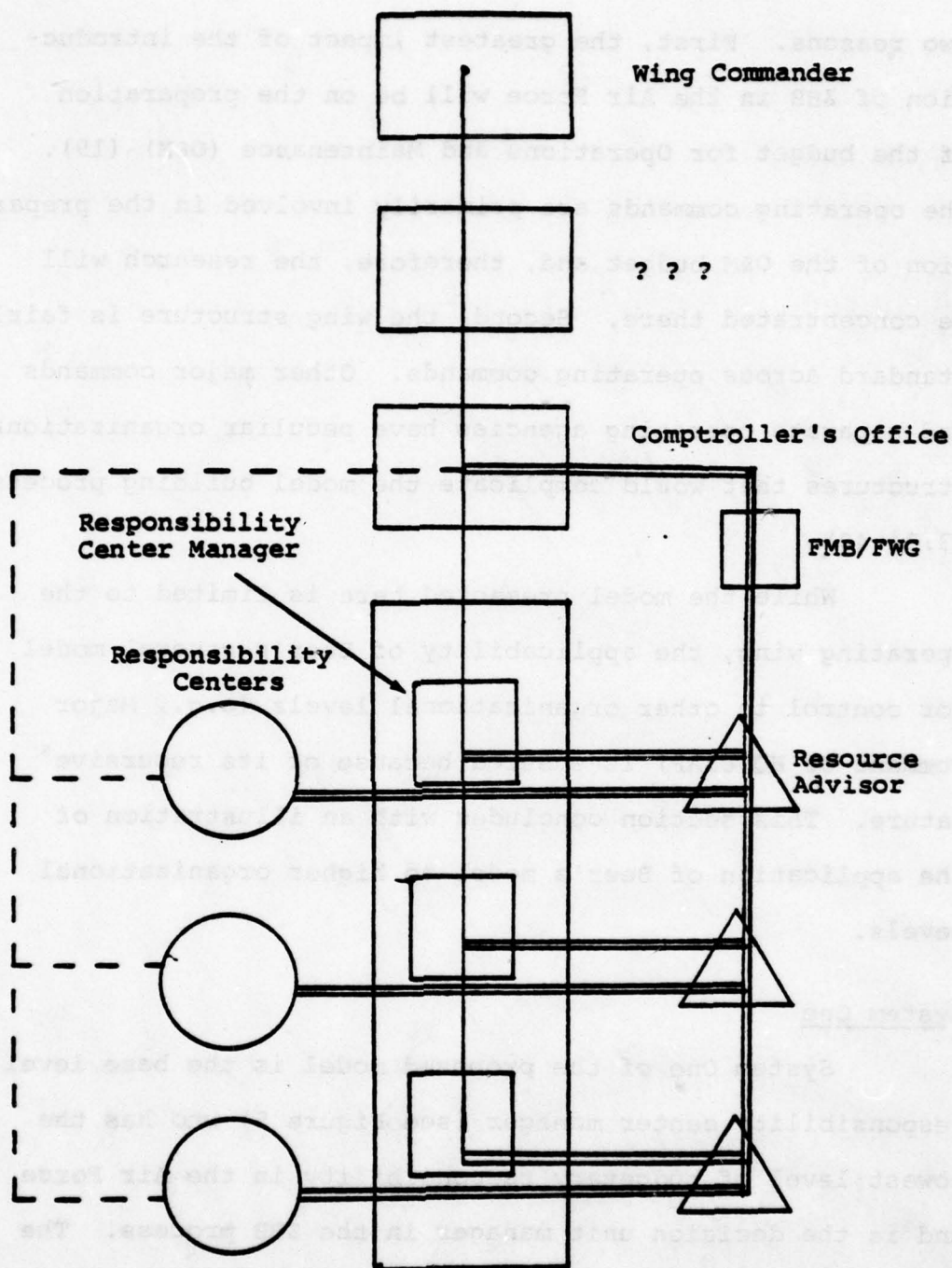


Fig. 5. Proposed Base Level Model

two reasons. First, the greatest impact of the introduction of ZBB in the Air Force will be on the preparation of the budget for Operations and Maintenance (O&M) (19). The operating commands are primarily involved in the preparation of the O&M budget and, therefore, the research will be concentrated there. Second, the wing structure is fairly standard across operating commands. Other major commands and separate operating agencies have peculiar organizational structures that would complicate the model building process (3:34-40).

While the model presented here is limited to the operating wing, the applicability of Beer's general model for control to other organizational levels (e.g., Major Command or HQ USAF) is ensured because of its recursive⁵ nature. This section concludes with an illustration of the application of Beer's model to higher organizational levels.

System One

System One of the proposed model is the base level responsibility center manager (see Figure 5) who has the lowest level of budgetary responsibility in the Air Force and is the decision unit manager in the ZBB process. The divisional directorates in the proposed model correspond

⁵The recursive property of Beer's paradigm means that it is applicable to all levels of the organization.

to the offices of the Deputy Commander for Operations, the Deputy Commander for Maintenance, the Deputy Commander for Resources, etc. Each of these commanders is the responsibility center manager for his responsibility center (8:3).

System Two

System Two is comprised of the divisional regulatory centers and the corporate regulatory center. The resource advisors (RA) represent the divisional regulatory center for their respective responsibility centers. As members of the Financial Working Group (FWG), the resource advisors also function as part of the corporate regulatory center. The other half of the corporate regulatory center is the Financial Management Board (FMB). The membership of the FMB is established by the Wing Commander and usually includes the Deputy Commanders listed above (8:4). It is the responsibility of these two groups to rank the wing's decision packages (8:7). In addition, these groups must coordinate the flow of routine budgetary information for all responsibility centers and consolidate this information into the wing's proposed budget (14:132,168-169). Once this budget is developed it is sent through the routine communication channel to System Three.

System Three

The base Comptroller's Office performs the function of System Three. In the proposed model, it assumes a line

function in the budgetary process and is the focal point for budgetary information. The Comptroller's Office is responsible for notifying the responsibility centers of any changes in the budgetary structure, such as implementation of ZBB, which it receives from higher headquarters. This office also monitors the proceedings of the FWG and FMB and makes recommendations on procedural matters (14:128, 134). Finally, it is the link in the budgeting process between the responsibility centers and the Wing Commander, who represents System Five.

System Four

System Four of the proposed model is unidentified in Figure 5. From analysis of the base level budgetary structure, there was no readily identifiable individual or organization which performed this function. Through the methodology, an investigation was conducted to determine if there was a System Four in the wing and if not, who at that level should perform this function.

System Five

As System Five, the Wing Commander has the overall responsibility for the Wing. Within the constraints established at higher headquarters, he must establish the goals of the budgetary process within the wing and also implement a structure which will accomplish that purpose. He should not have to involve himself in the routine budgetary

operations but should be able to make decisions which will answer future budgetary questions.

Information Channels

The preparation of the following year's budget is defined by the model to be a routine information process and, therefore, is the responsibility of Systems One, Two, and Three. As System Three, the base Comptroller's Office establishes the procedures to be used to develop the budget. These may be in the form of regulations from higher headquarters, or they may be local policy (14:132). This information is sent down the command channel to the responsibility center managers. The responsibility center manager and the resource advisor acting as Systems One and Two prepare the budget submission for their responsibility center (14:1434).

The resource advisor, as a member of System Two, takes this routine budgetary information to the Financial Working Group. This group develops the budget for the wing by ranking the importance of the elements of the budgets of each of the responsibility centers. This is the synergistic center for the development of the wing's budget. The objective of the Financial Working Group is to develop the wing's budget by maximizing the efforts of the wing as a whole rather than maximizing the efforts of each of the responsibility centers (14:168).

Consolidation of the budget by the FWG is equivalent to the first step in the ranking process in ZBB. This appears to be a slight divergence from ZBB theory which specifies that the line managers will be responsible for ranking decision packages. However, after the Financial Working Group has completed the budget, the Financial Management Board, composed of responsibility center managers, meets to approve or disapprove of the Financial Working Group's budget recommendations (14:168). The consolidation of the budget by the FWG frees the RCs from the time-consuming work inherent in the budgetary process.

Once the Financial Management Board has completed the budget, it is sent to the Comptroller's Office where it is checked for structure and format prior to approval by the Wing Commander. When the budget has the Wing Commander's approval, it is sent back down the command channel to the Comptroller's Office. It is the responsibility of this office to send the finalized budget to higher headquarters.

Communication to Higher Levels

A major premise of the cybernetic model is the Recursive System Theorem. "If a viable system contains a viable system, then the organization structure must be recursive [2:287]." The theorem states that each level of the organization is a system within a system. (See Figure 6.) The

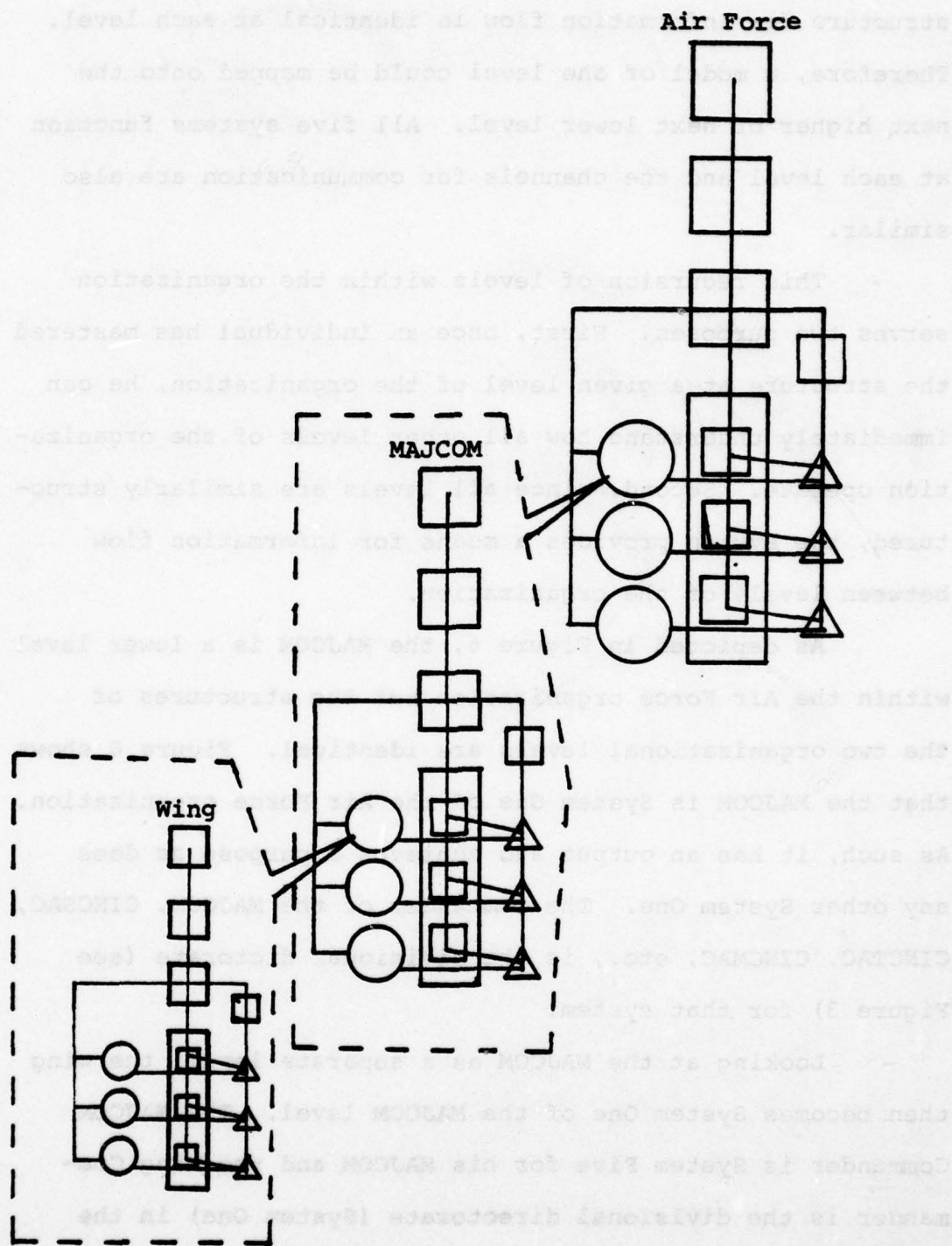


Fig. 6. Recursive Model

structure for information flow is identical at each level. Therefore, a model of one level could be mapped onto the next higher or next lower level. All five systems function at each level and the channels for communication are also similar.

This recursion of levels within the organization serves two purposes. First, once an individual has mastered the structure at a given level of the organization, he can immediately understand how all other levels of the organization operate. Second, since all levels are similarly structured, the system provides a means for information flow between levels of the organization.

As depicted in Figure 6, the MAJCOM is a lower level within the Air Force organization but the structures of the two organizational levels are identical. Figure 6 shows that the MAJCOM is System One of the Air Force organization. As such, it has an output and achieves a purpose as does any other System One. The Commander of the MAJCOM, CINCSAC, CINCTAC, CINCMAC, etc., is the divisional dictorate (see Figure 3) for that system.

Looking at the MAJCOM as a separate level, the wing then becomes System One of the MAJCOM level. The MAJCOM Commander is System Five for his MAJCOM and the Wing Commander is the divisional directorate (System One) in the MAJCOM model. As we have already seen, the Wing Commander is also System Five for his wing. Therefore, there is a

direct link between each level of the organization through the command channel. The commanders of each organization wear two hats, as System Five within their unit, and as the divisional directorate of System One within the next higher level of the organization.

The command channels of the levels of the organization are linked together through Systems One and Five. In a similar manner, the routine information channels are linked through Systems Two and Three. At the base level, the resource advisor is System Two and has the responsibility for aggregating and filtering the routine budgetary information up the routine channel to System Three where the routine budgetary information of the *wing* is aggregated and filtered before transmittal to higher levels of command. The base Comptroller's Office, as System Three, monitors this routine budgetary information and sends the important information to the MAJCOM Comptroller's Office which serves as System Three at the MAJCOM level. Therefore, as a part of the MAJCOM level structure, the base Comptroller's Office serves as System Two because it aggregates and filters the routine budgetary information of the MAJCOM level System One, the Wing (2:213).

The model is recursive because each level in the organization is organized in a manner similar to every other level. The command information channels are tied together through Systems One and Five and the routine information

channels through Systems Two and Three. A qualitative assessment of the recursion of the base level model to higher levels in the Air Force budgetary structure is addressed in Chapter VII.

CHAPTER IV

METHODOLOGY

The objectives of this research were to construct a conceptual model of zero-base budgeting as it could be applied in the Air Force at base level and to determine the attitudes of the responsibility center managers and resource advisors toward ZBB. In Chapter III, a model for zero-base budgeting at the base level was presented based on the theoretical requirements of ZBB and the general model for organizational control as proposed by Beer. Investigative questions were developed based on the proposed model. Three investigative questions were formulated to answer Research Question Three on the attitudes of the RCMs and RAs toward ZBB. An attitude measurement survey was developed to answer the investigative questions. This chapter presents the methodology used to develop, administer, and analyze the attitude measurement survey.

Population

The population for this research was the opinions of the base-level responsibility center managers who were members of the base Financial Management Boards and the opinions of their resource advisors in the Aerospace Defense

Command (ADCOM), Air Training Command (ATC),⁶ Strategic Air Command (SAC), and Tactical Air Command (TAC). The responsibility centers correspond to the deputate level within the wing organizational structure (e.g., DCS Operations). This population is a subset of the universe of Air Force responsibility center managers and resource advisors. It was determined that sampling of the universe was not feasible because of the lack of an adequate population frame (3:40). The conclusions of this research are not to be generalized to the universe but are limited to the population as defined.

Other major commands and separate operating agencies were excluded from the population for two reasons. First, the greatest impact of ZBB on the Air Force budgetary control system will be on the development of the budget for Operations and Maintenance (O&M) (19). Although all commands and agencies prepare O&M budgetary inputs, the operating commands identified above are primarily involved in this area. Therefore, this research was concentrated on the responsibility center managers and resource advisors in the operating commands who were responsible for the development of the O&M budget. The Military Airlift Command was specifically excluded since a significant portion of

⁶The survey was developed prior to the integration of Air University (AU) into ATC and, therefore, AU was not included in the population.

its operations and maintenance activities are industrially funded (36:63). Second, the wing structure of responsibility centers is well established and fairly constant across operating commands. Other commands, AFLC for example, have unique command structures for responsibility centers (3:34-40). Therefore, to preclude the probable confounding effects of conflicting budgetary structures, the research was limited to the major operating commands.

Instrument

Appendix C is the attitude survey that was used in this research. The survey was developed from specific investigative questions. (See Appendix B.) An explanation of the development of the statements used to validate the model is presented below in the discussion of the design to test the model.

Structure of the Attitude Measurement Survey

The survey was divided into two parts. Part I of the survey was answered by the responsibility center managers. Part II was answered by the resource advisors. Each part of the survey was divided into two sections. Section I of each part contained questions requesting demographic data. Section II was composed of statements about the zero-base budgeting process at the base level.

Validity of the Attitude Measurement Survey

Validity can be divided into two categories-- external validity and internal validity. External validity refers to the representativeness of the measurement. It was assumed that the measurement of the population in this research would ensure external validity. Internal validity is the ability of the instrument to measure as intended (12:120). The most effective method for determining internal validity is pilot testing; however, due to time constraints, pilot testing was not feasible. Therefore, internal validity was established in two ways. First, internal validity was established by consideration of the theory of ZBB, the base financial management structure, and the prescriptions of Beer's model in the construction of the attitude measurement statements. Second, prior to administration, the survey was reviewed and revised by faculty members of the Air Force Institute of Technology and by experts in USAF financial management at the HQ USAF in the Directorate of the Budget, Budget Management Division.

Design to Test the Model

Figure 7 is a flow diagram of the methodological process utilized in the development of the attitude measurement statements. Based on the theory of ZBB, the authors' review of the literature of the current base-level

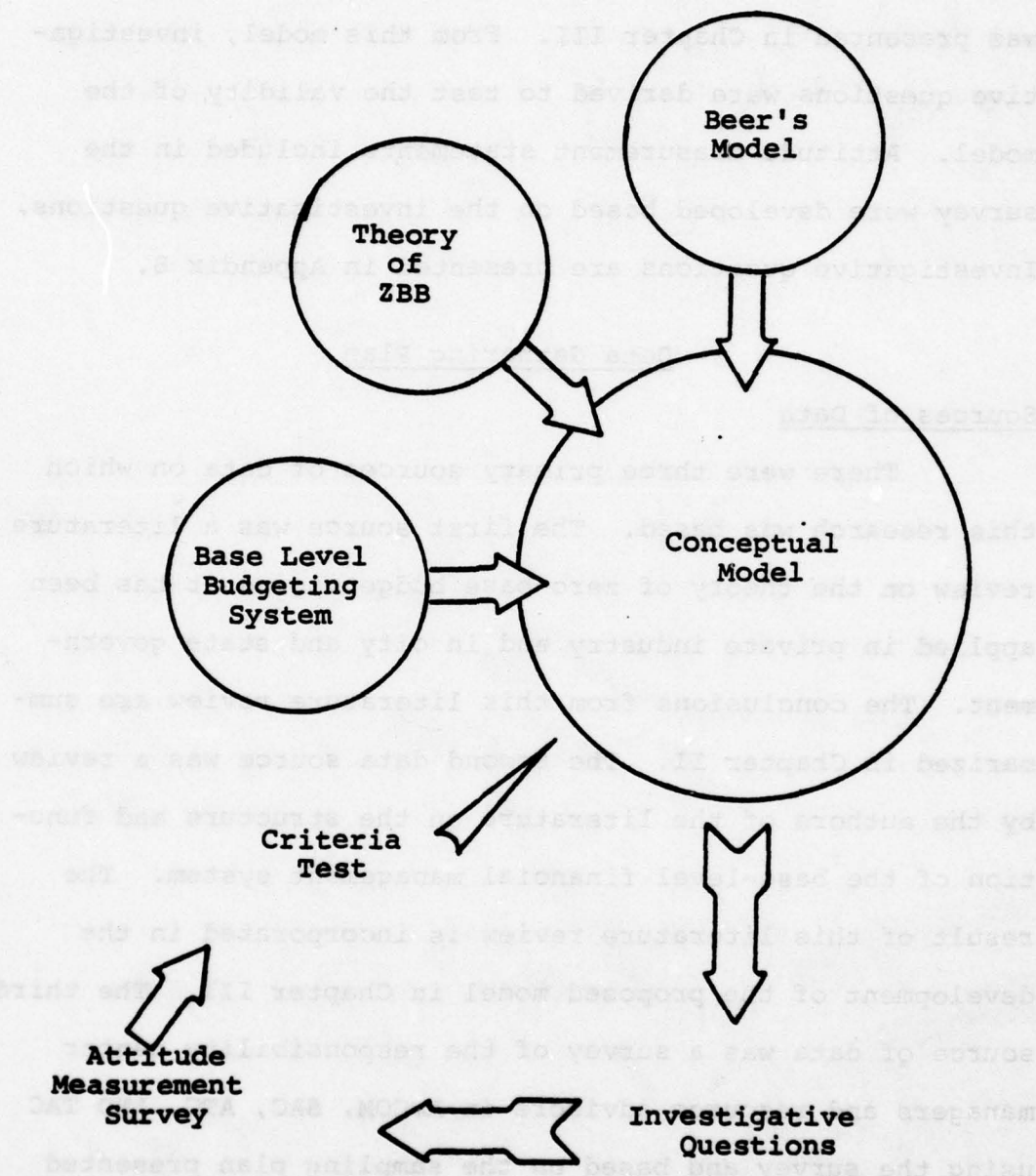


Fig. 7. Flow Diagram of the Methodology to Validate the Proposed Model

budgeting system, and the structure of Beer's general control model, a conceptual model was developed. This model was presented in Chapter III. From this model, investigative questions were derived to test the validity of the model. Attitude measurement statements included in the survey were developed based on the investigative questions. Investigative questions are presented in Appendix B.

Data Gathering Plan

Sources of Data

There were three primary sources of data on which this research was based. The first source was a literature review on the theory of zero-base budgeting as it has been applied in private industry and in city and state government. The conclusions from this literature review are summarized in Chapter II. The second data source was a review by the authors of the literature on the structure and function of the base-level financial management system. The result of this literature review is incorporated in the development of the proposed model in Chapter III. The third source of data was a survey of the responsibility center managers and resource advisors in ADCOM, SAC, ATC, AND TAC using the survey and based on the sampling plan presented above.

Administration of the Survey

The survey was administered to a census of the population. The responsibility center managers and resource advisors included in the census were identified by office symbol and base within each major command. A list of the responsibility centers by office symbol was obtained from each major command HQ/ACB. (See Appendix E.) The survey was mailed to each office with a cover letter and instructions. The cutoff date for responses to the survey was five weeks from the date mailed.

Scoring the Survey

The responses to the survey questions and statements were computer scored using a mark sense sheet. The numerical values to be assigned to each response are depicted in Table 1. Data analysis was performed directly on the coded raw scores.

Variables

There were three categories of variables to be measured by the survey. First, Section I of each part of the survey requested demographic data about the respondent. The demographic variables were considered nominal level variables. Second, Table 1 indicates the attitude measurement statements in the survey which were measured by a response scale of *strongly disagree* to *strongly agree*. The scale used was modeled after a Likert scale (11:248).

TABLE 1

SCORING THE ATTITUDE MEASUREMENT SURVEY

Survey Response	Numerical Value
Strongly Disagree	1
Disagree	2
Neither Disagree nor Agree	3
Agree	4
Strongly Agree	5

Responses 1-5, 11, 21, 33-37, 47, and 56 were not scored using a Likert scale.

The responses to these statements were treated as ordinal level data. Third, the responses to the remaining statements (11, 21, 22, 33, 47, 56) were measured using various scales or categories (see Appendix C). The responses to these statements were considered nominal level data.

Data Analysis Plan

This section describes the statistical techniques that were used to analyze the data from the survey and the criteria test that was used to test the validity of the proposed model.

Descriptive Statistics

Initial analysis of the data was limited to the computation of descriptive statistics and qualitative

analysis of these statistics to determine if gross tendencies were apparent in the data. Data was grouped by the categories: responsibility center manager, resource advisor, civilian or military, prior experience with ZBB, and major command. A frequency distribution was constructed for the responses to each question and attitude measurement statement (see Appendix D).

Analysis to Answer Research Question Two

Thirteen investigative questions were developed to answer Research Question Two. The investigative questions relate to a specific element of the proposed model. The investigative questions and the associated attitude measurement statements are listed in Appendix B.

Chi Square--Rationale

The Chi Square Goodness of Fit Test was used to determine if the responses for each attitude measurement statement were random (13:69). Frequency distributions were constructed for the responses to each statement. For this analysis, the response categories *strongly disagree* and *disagree* were collapsed into a single cell (cell 1). Similarly, the response categories *strongly agree* and *agree* were collapsed (cell 3). The *neither agree nor disagree* response category was identified as cell 2 for this test. A hypothetical frequency distribution with relative frequencies for the cells as follows, cell 1--.40,

cell 2--.20, cell 3--.40, was fitted to the data. The data were collapsed in order to avoid the biasing effect of the tendency of respondents to avoid response to extreme scale values (11:240).

Chi Square--Procedure

The statistical hypotheses were:

$$H_0: F_x(X) = F_o(X) \text{ for all } X$$

$$H_1: F_x(X) \neq F_o(X) \text{ for some } X$$

where

$F_x(X)$ is the actual cumulative distribution and

$F_o(X)$ is the hypothesized cumulative distribution.

The chi-square test statistic was:

$$\chi^2_t = \sum_{i=1}^k \frac{(O_i - E_i)^2}{E_i}$$

where

O_i is the observed cases for each cell,

E_i is the expected cases for each cell, and

K is the number of cells.

At the level of significance $\alpha = .05$, using a two-tailed test, reject H_0 if:

$$\chi^2_t < \chi^2_{df; .975}$$

or
$$\chi^2_t > \chi^2_{df; .025}$$

If H_0 was rejected, the responses to the attitude measurement statement were considered to be non-random.

Criteria Test--Rationale and Procedure

A criteria test was then performed on the responses to the attitude measurement statements. A predicted response tendency was specified for each statement based on the model characteristics. The relative frequencies of the actual responses to each statement were computed for each cell. If the actual response was in agreement with the prediction of the model and the relative frequency was greater than .50, this was considered support for the model. If the relative frequency was greater than .75, this was considered strong support. The criteria of a relative frequency of .50 or .75 were arbitrarily established based on the fact that .50 represents a majority and .75 a strong majority.

Analysis to Answer Research Question Three

Three investigative questions and their associated attitude measurement statements were developed to answer research question three. The questions and statements are listed in Appendix B. Three nonparametric statistical techniques were used to analyze the results of the survey. This section presents the methodology for this analysis.

The first step in the analysis of the attitude measurement statements to answer investigative question

fourteen was the construction of histograms and relative frequencies for each statement. The histograms are included in Appendix D. A subjective analysis of the relative frequencies was accomplished in order to characterize the aggregate response to each statement.

Sign Test--Rationale

Several attitude measurement statements were presented to both the responsibility center managers and the resource advisors. A Sign Test was used to determine if there was a significant difference between the responses of the RCMS and those of the RAs (12:105).

Sign Test--Procedure

Differences (D_i) were computed for the paired sample data. The statistical hypotheses were:

$$H_0: D = 0$$

$$H_1: D \neq 0$$

where D is the median difference. Utilizing the assumption that each sample was drawn from a continuous distribution, a normal approximation to the binomial probabilities was used (12:102). The test statistic was:

$$z_t = \frac{(k-0.5) - 0.5N}{0.5 \sqrt{N}}$$

where

K is the number of positive differences and

N is the number of paired observations.

H_0 was rejected at significance level $\alpha = .05$, and a statistically significant difference was concluded if

$$|z_t| > z_{.025} = 1.96$$

for the two-tailed test.

Mann-Whitney--Rationale

A Mann-Whitney U-Test was performed for the same set of statements that was analyzed with the Sign Test. While the Sign Test identifies statistically significant median differences between the paired data points, the Mann-Whitney U-Test identifies differences between the medians of two populations (28:119-121).

Mann-Whitney--Procedure

The statistical hypotheses are:

$$H_0: M_1 = M_2$$

$$H_1: M_1 \neq M_2$$

where M_i is the median for the i^{th} population. The test statistic was:

$$U = n_1 n_2 + \frac{n_1(n_1+1)}{2} - R_1$$

where

n_i is the number in the i^{th} group and

R_1 is the rank sum for the 1st group.

A standardized normal approximation was used for the sampling distribution of U.

At the $\alpha = .05$ confidence level, reject H_0 if:

$$|z_t| > z_{.025} = 1.96$$

for a two-tailed test, and conclude that the population medians are significantly different.

Kruskal-Wallis--Rationale

A Kruskal-Wallis One-way Analysis of Variance was performed to determine if there was at least one statistically significant difference among the comparisons of the median responses to the attitude measurement statements (12:198). Three analyses were performed using as the independent variable either major command, responsibility center type, or previous experience with zero-base budgeting.

Kruskal-Wallis--Procedure

The statistical hypotheses were:

$$H_0: M_1 = M_2 = \dots M_k$$

$$H_1: \text{at least one } \neq$$

where M_i is the median for the i^{th} group.

The test statistic was:

$$H = \frac{12}{N(N+1)} \sum_{i=1}^k \frac{R_i^2}{n_i} - 3(N+1)$$

where

n_i is the sample size for the i^{th} group,

R_i is the sum of ranks for the i^{th} group,

$$N = \sum_{i=1}^k n_i \quad \text{and}$$

k is the number of groups.

Since H is distributed approximately as a chi-square with degrees of freedom $k-1$, reject H_0 if

$$H \geq \chi^2_{.05, k-1}$$

at the $\alpha = .05$ level of significance. If H_0 was rejected, conclude that at least one median difference is statistically significant.

Since there is not a nonparametric technique for pairwise comparison of the group medians, a subjective analysis was used to characterize the contrasts between the medians for those statements found to be statistically significant overall. No quantitative statement could be made based on the test about the pairwise comparisons. At least one pairwise comparison will be significant at the $\alpha = .05$ level, but based on the result of the Kruskal-Wallis Test, a stronger conclusion could not be drawn.

Assumptions

1. Non-response to the attitude measurement survey did not bias significantly the conclusions of the research.
2. The survey was constructed and administered in a manner that did not bias the responses to the attitude measurement statements.
3. The measurement scale used in the survey produced ordinal level data.
4. The design to test the model used to generate the attitude measurement statements produced a valid measuring instrument.
5. The responses to the attitude measurement statements were drawn from a continuously distributed population.

Limitations

1. The test of the validity of the model was limited to the application of the model to the base-level budgeting process.
2. The generality of the conclusions of the research is limited to the population as defined and cannot be extended to the O&M budgeting process in other commands or operating agencies.

3. The limited experience of base-level financial managers with zero-base budgeting⁷ could have influenced the validity of the conclusions of the research.

⁷The Fiscal Year 1979 budget was the first application of zero-base budgeting in the Air Force. The procedures implemented for FY79 provided a gradual transition from the traditional budgeting system to ZBB. Therefore, Air Force managers had not completed a budget cycle based solely on the theoretical requirements of ZBB (29:12-14).

CHAPTER V

DATA ANALYSIS

Demographic Data Analysis

Attitude measurement surveys were distributed to 356 responsibility center managers and their resource advisors. The number of surveys returned prior to the cutoff date was 203 for an overall response rate of 57 percent.⁸ The breakdown of surveys distributed and returned by command is depicted in Table 2. Based on a Chi Square test ($\chi^2=1.277$, $df=3$), there was no statistically significant difference between the percent of the total distributed and the percent of the total returned by command.

The remaining demographic questions, as detailed in Tables 3, 4, and 5, were asked to differentiate between the responses of civilians and military personnel, between those individuals who had and had not participated in Fiscal Year 1980 zero-base budget preparation, and by the

⁸The responsibility center managers and resource advisors from the same unit used one scoring sheet to indicate their responses. In thirteen cases, the resource advisor from a specific unit responded but the responsibility center manager did not. In six cases the responsibility center manager responded but the resource advisor did not. In three cases where only the resource advisor replied, the demographic data for the responsibility center manager was supplied. Seven resource advisors responded to the survey but did not provide demographic data.

TABLE 2
TABULATION OF DEMOGRAPHIC DATA--BREAKDOWN BY MAJOR COMMAND

Major Command	Number Distributed	Percent of Total Distributed	Number Returned	Percent of Total Returned	Percent Response By Command
ADCOM	14	3.9%	8	3.9%	57.1%
ATC	69	19.4%	34	16.7%	49.3%
SAC	158	44.4%	92	45.3%	58.2%
TAC	115	32.3%	57	28.1%	49.6%
None Specified	-	-	12	5.9%	-
TOTAL	356		203		56.7%

TABLE 3
TABULATION OF DEMOGRAPHIC DATA--BREAKDOWN BY MILITARY VERSUS CIVILIAN

	MILITARY		CIVILIAN		TOTALS
	0-6	0-1 to 0-5	E-9 and Below	GS-15 GS-11 to GS-14 GS-10 and Below	
RCM ^a	104	67	7	0 7 5	190
RA ^b	3	95	32	0 13 44	187

^a Resource advisors included demographic data for one 0-6, one 0-1 thru 0-5 and one E-9 and below, but these three responsibility center managers did not complete their portion of the survey; therefore, their demographic data is excluded from the table above. In addition, there were ten cases where only the resource advisor completed his/her portion of the survey.

^b Three resource advisors completed both questions 34 and 35 pertaining to military and civilian status and these cases have been deleted from this table.

TABLE 4

TABULATION OF DEMOGRAPHIC DATA--BREAKDOWN BY
PRIOR EXPERIENCE WITH ZBB

	YES	NO	TOTAL
RCM	138	54	192
RA	151	39	190

TABLE 5

TABULATION OF DEMOGRAPHIC DATA--BREAKDOWN BY TYPE
OF RESPONSIBILITY CENTER

RC Type	Number Responding	Percent
Operations	34	17.6%
Maintenance	38	19.7%
Support	107	55.4%
Other	14	7.3%
Total	193	-

differences in the type of responsibility centers, i.e., operations, maintenance, support, etc. The breakdown of respondents by military or civilian indicated that 94 percent of the responsibility center managers (RCM) that responded to the survey were military and 6 percent were civilian. The resource advisors (RA) were 70 percent military and 30 percent civilian. Table 3 provides a detailed breakout. Seventy-two percent of the RCMs had previous experience in preparing the FY 79-80 zero-base budget submission, as had 80 percent of the RAs. The breakout of RCMs by type of responsibility center was 18 percent--operations, 20 percent--maintenance, 55 percent--support, and 7 percent--other.

Analysis of ZBB Attitude Measurement Statements

Research Question Three addresses the attitudes of the responsibility center managers and resource advisors toward zero-base budgeting in the Air Force. This section analyzes the perceptions of the RCMs and RAs toward zero-base budgeting and their ability to use ZBB to develop resource center budgets. The section is divided into three parts. Each part will present the analysis to answer the investigative questions relating to Research Question Three (see Appendix B).

As shown in Tables 6, 7, 8, and 9, four identical statements were posed to both the RCMs and RAs. A Sign

TABLE 6

RESULTS OF THE SIGN TEST AND MANN-WHITNEY U TEST--
STATEMENT 6/38: I UNDERSTAND THE DIFFERENCES
BETWEEN ZBB AND THE TRADITIONAL
BUDGETING SYSTEM

	Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree
RCM	1.6%	8.4%	10.0%	72.1%	7.9%
RA	1.0%	5.6%	12.7%	69.0%	11.7%

Sign Test: $Z = 1.1547$, $p = 0.2482$
Mann-Whitney U Test: $Z = 1.660$, $p = 0.0970$

TABLE 7

RESULTS OF THE SIGN TEST AND MANN-WHITNEY U TEST--
STATEMENT 7/39: ZBB HAS CHANGED OUR BUDGETING
PROCEDURES: IT IS MORE THAN A CHANGE IN NAME
FOR THE AIR FORCE BUDGETING PROCESS

	Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree
RCM	3.2%	18.4%	18.9%	50.0%	9.0%
RA	5.6%	19.3%	13.7%	52.3%	9.1%

Sign Test: $Z = 0.0000$, $p = 1.0000$
Mann Whitney U Test: $Z = 0.5440$, $p = 0.5892$

TABLE 8

RESULTS OF THE SIGN TEST AND MANN-WHITNEY U TEST--
STATEMENT 32/54: ZERO-BASE BUDGETING HAS
PROVIDED A SIGNIFICANT IMPROVEMENT
IN THE BUDGETING PROCESS

	Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree
RCM	12.2%	35.4%	42.9%	8.5%	1.1%
RA	11.2%	29.1%	44.9%	12.2%	2.6%

Sign Test: $Z = 2.1433$, $p = 0.0321$

Mann-Whitney U Test: $Z = 2.2900$, $p = 0.0220$

TABLE 9

RESPONSES TO STATEMENT 11/47--THE ZERO-BASE
BUDGETING TERMINOLOGY IS:

Response	RCM	RA
Confusing	10.5%	15.2%
Difficult but comprehensible	24.2%	37.1%
About as understandable as the previous budgeting terminology	48.9%	27.9%
Very simple; I had no problem adjusting to it	9.5%	11.7%
No opinion	3.2%	2.0%

Test and Mann-Whitney U Test were used to determine if the responses between RCMs and RAs within each matched pair differed significantly. A Kruskal-Wallis (K-W) One-Way Analysis of Variance was performed for each statement to determine if the responses were significantly different by major command, by responsibility center type, and by experience with ZBB. The results of the Sign and K-W tests are presented below.

Investigative Question Fourteen--
Attitudes Toward ZBB

The analysis of the results of the survey indicated that the RCMs and RAs collectively agreed that they understood the differences between ZBB and the traditional budgeting system (Table 6) and that it was more than just a change of name for the Air Force budgeting process (Table 7). However, a large percentage of RCMs and RAs were undecided on the issue of whether or not ZBB had made an improvement in the Air Force budgetary process (Table 8). A subjective analysis of statements 11/47 indicated that there was a difference of opinion between RCMs and RAs in their ability to understand ZBB terminology (Table 9). Nearly half of the RCMs who responded felt that zero-base budgeting terminology was about as understandable as the previous budgeting terminology, while the majority of RAs found zero-base budgeting terminology either confusing or difficult, but comprehensible.

Resource advisors, who were most intimately involved in the mechanics of mechanics of budget preparation, felt that zero-base budgeting was more time-consuming than traditional budgeting (Table 10).

TABLE 10

RESPONSES TO STATEMENT 53: PREPARATION OF A ZERO-BASE BUDGET IS MORE TIME-CONSUMING THAN THE PREPARATION OF A TRADITIONAL BUDGET

Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree
2.5%	9.6%	22.8%	41.6%	23.4%

Results of the Sign Test and Mann-Whitney U Test

A Sign Test was performed for the matched pairs of statements presented to both the RCMs and RAs. Tables 6, 7, 8 and 9 present the results of these tests. The response to the attitude measurement statement was treated as an experimental variable for each matched pair of RCMs and RAs in this analysis. A significant difference was found only for Statements 32/54 as shown in Table 8. The RAs were more likely to agree than were their RCMs within each matched pair (the RCM and RA in the same responsibility center), that ZBB had made a significant improvement in the budgeting process.

A Mann-Whitney U Test was performed to determine if there was a significant difference in the median response of the RCMs and RAs. The result of the test is presented in Tables 6, 7, 8 and 9. A significant difference ($\alpha=.05$) was found for Statements 32/54. As a group, the RAs were more likely to agree that ZBB had provided a significant improvement in the budgeting process.

Investigative Question Fifteen--Ability to Develop the Budget

The theory of ZBB prescribes identification of objectives by the decision unit manager as the first step in the budget preparation process (20:23). A series of statements was posed to the responsibility center managers to determine if they believed that they could, in fact, identify the objectives and relate the objectives to the funds required for their organization. This section presents the results of the analysis of these statements. Table 11 is a listing of the statements analyzed in this section. Table 12 is a summary of the responses to these statements.

Mission and Objectives

Before a manager can identify the objectives for his organization, he needs a clear statement of his unit's mission by a higher level of command (6:4). The RCMs were nearly unanimous in their agreement that their

TABLE 11
STATEMENTS USED IN ZBB ANALYSIS

Statement 8: The mission of my organization has been clearly defined by higher levels of command.

Statement 10: My organizational objectives are defined by my supervisors and I have no control over them.

Statement 12: The budget I prepare accurately identifies the funds I need to accomplish my organization's objectives.

Statement 13: I can identify the outputs of my organization and relate them to the resources necessary to accomplish my organizational objectives.

Statement 14: I make significant decisions on the amount of spending of my responsibility center.

Statement 16: I have the freedom to change my operating methods as long as I can accomplish the objectives of my organization.

Statement 17: My organization is operating at the minimum possible level of funding.

Statement 18: When significant changes in budget preparation are required, my resource advisor finds out about them before I do.

Statement 19: I establish minimum output levels based on my organization's mission and capabilities which are included in the budget I submit.

Statement 24: My organization is a consolidation of cost centers whose budgets I cannot control.

Statement 25: The information that I include in my budget justification is complete enough to enable someone at MAJCOM level or higher to determine the importance of my organization in relation to that of others.

Statement 28: The Financial Working Group has enough knowledge about the mission of the Wing to make the necessary tradeoffs between organizations to develop the Wing's or Center's budget.

TABLE 11--Continued

Statement 31: MAJCOM can estimate my budget needs well enough that my specific budget request is not necessary to develop the total Air Force budget.

Statement 40: I need a clear understanding of my organization's objectives to be able to develop our budget.

Statement 41: I prepare a specific budget based on the guidelines established by my responsibility center manager.

Statement 45: The budget I prepare is just a consolidation of the budgets of our cost centers plus the budget of the responsibility center staff.

Statement 46: The budget I prepare accurately identifies the funds needed to accomplish our organization's objectives.

Statement 49: As a member of the Financial Working Group, I have a good enough understanding of the budgeting process and the mission of the Wing or Center to be able to consolidate and rank budget submissions of the responsibility centers.

TABLE 12
RESPONSES TO STATEMENTS USED IN ZBB ANALYSIS (%)

Respondent	Statement	Strongly Disagree	Disagree	Neither Agree nor Disagree	Disagree	Strongly Disagree
RCM	8	3.2	4.7	3.2	53.2	35.8
RCM	10	17.4	53.2	12.1	13.2	4.2
RCM	12	2.1	5.8	6.3	58.4	27.4
RCM	13	0.5	5.3	7.4	67.4	19.5
RCM	14	2.1	9.5	7.4	57.9	23.2
RCM	16	0.0	13.2	11.6	61.1	14.2
RCM	17	2.6	14.7	11.1	39.5	32.1
RCM	18	2.6	16.3	17.9	51.6	11.6
RCM	19	1.1	13.2	21.2	59.3	5.3
RCM	24	25.3	54.7	10.0	8.9	1.1
RCM	25	0.0	6.8	14.7	66.3	12.1
RCM	28	1.1	10.5	13.2	66.8	8.4
RCM	31	33.7	45.8	7.4	10.5	2.6
RA	40	1.5	3.0	3.0	46.7	45.7
RA	41	3.6	19.8	19.8	45.7	11.2
RA	45	8.6	31.0	12.2	42.6	5.6
RA	46	1.5	4.6	8.1	56.3	29.4
RA	49	1.5	8.7	15.3	60.2	14.3

organization's mission had been clearly defined. Table 12 shows that 64.2 percent of the RCMs *agreed* with Statement 8 while 35.8 percent *strongly agreed*. However, the RCMs believed that their organizational missions were not so rigidly defined that they did not have the flexibility to determine their own organizational objectives. Looking at Statement 10 in Table 12, 17.4 percent of the RCMs *strongly disagreed* while 53.2 percent *disagreed* that their organizational objectives were defined by their superiors and that they had no control over them. When asked if they had the freedom to change their operating methods as long as they accomplished their objectives, 14.2 percent *strongly agreed* while 61.1 percent *agreed* (Statement 16, Table 12).

Decision Package Preparation

The next step in ZBB is to prepare the decision package which relates the funds needed to a specific set of objectives to be accomplished (10:47). The RCMs agreed that they could relate the outputs of their organization to the resources necessary to accomplish those outputs. The analysis of Statement 13 in Table 12 indicates that 19.5 percent *strongly agreed* and 67.4 percent *agreed* with the statement. When asked the same question with slightly different phrasing, the results are similar (Statement 12, Table 12). A total of 85.8 percent of the RCMs either *agreed* (58.4 percent) or *strongly agreed* (27.4 percent)

that the budget they prepared accurately identifies the funds needed to accomplish their organization's objectives. When presented with the same statement (Statement 46, Table 11), 56.3 percent of the RAs *agreed* and 29.4 percent *strongly agreed*.

Since the resource advisor performs a major role in the preparation of the responsibility center's budget, a series of statements was posed to the RAs to determine if they understood the organization's objectives and used the objectives in preparing the budget. As shown in Table 12, 92.4 percent either *agreed* or *strongly agreed* that they needed a clear understanding of their organization's objectives to be able to develop the budget (Statement 40), but only 56.9 percent *agreed* or *strongly agreed* that they prepared a budget based on the guidelines established by the RCM (Statement 41).

Minimum Level

One of the more controversial aspects of ZBB is the identification of a minimum level of effort below which a decision unit cannot operate effectively (17:6). Two statements (Statements 19 and 17 in Table 12) were presented to the RCMs to determine if they established a minimum level. When asked if they established a minimum level in their budget, 5.3 percent of the RCMs *strongly agreed* while 59.3 percent *agreed*; however, a large percentage

(21.2 percent) were undecided. Statement 17 was included in the survey to determine if the RCMs believed that they were already operating at the minimum possible level of funding. Analysis of the responses to this statement indicated that 32.1 percent *strongly agreed*, 39.5 percent *agreed*, 11.1 percent were *undecided*, 14.7 percent *disagreed* and 2.6 percent *strongly disagreed*. This issue of establishing the minimum level is discussed further in Chapter VII under Conclusions and Recommendations.

Control of Resources

Two statements were presented to the RCMs concerning their perception of their control over the level of spending in their organization. When asked if their organization was a consolidation of cost centers whose budgets they could not control (Statement 24, Table 12), 25.3 percent of the RCMs *strongly disagreed* while 54.7 percent *disagreed*. When presented with a similar statement (Statement 45, Table 12), the responses of the RAs were mixed with about 50 percent on each side. The interpretation of those responses is described in Chapter VII. A large majority of the RCMs *agreed* (57.9 percent) or *strongly agreed* (23.2 percent) that they do make significant decisions about the amount of spending of their responsibility centers (Statement 14, Table 12).

Consolidation and Ranking

The consolidation and ranking process is the final step in preparing a budget under zero-base budgeting (35:111). Two statements were included in the survey to gauge the opinions of the RCMS on this point. The first statement was posed to determine if, in the opinion of the RCMS, the budget they prepared was a necessary input to develop the Air Force budget. They were also asked if the information in their budget package provided a basis for making ranking decisions. The analysis of Statement 25 in Table 12 indicates that 12.1 percent *strongly agreed* and 66.3 percent *agreed* that their budget justification was complete enough to enable someone at MAJCOM level or higher to determine the importance of their organization in relation to others. When asked if MAJCOM could estimate their budget well enough that their budget request was not necessary to develop the total Air Force budget, 33.7 percent of the RCMS *strongly disagreed* while 45.8 percent *disagreed* (Statement 31, Table 12).

The Financial Working Group and the Financial Management Board are the groups responsible for consolidating and ranking the Wing's budget (8:7). Several statements were posed to the RCMS and RAs to determine if the FMB and FWG could perform this role. When asked if the FMB had enough knowledge about the Wing's mission to develop the budget, 66.8 percent of the RCMS *agreed* and 8.4 percent

strongly agreed (Statement 28, Table 11). The RAs had a similar assessment of the FWG's capability. The responses to Statement 49 in Table 12 indicated that 60.2 percent of the RAs *agreed* while 14.3 percent *strongly agreed* that the FWG could consolidate and rank the Wing's budget.

Accuracy of Budgeting

A series of three statements were analyzed to see how effectively the RCMs could identify and obtain the funding necessary to operate their responsibility centers. Figure 8 is a schematic representation of a cross-tabulation of the responses to the three statements. The statements were designed to determine if the RCM could accurately identify his funding needs, if the amount actually received in the last budget was within 10 percent of his request, and if the amount was sufficient to accomplish the objectives of his organization. For this analysis, the responses *strongly disagree* and *disagree* were collapsed into a single category labeled *disagree*. The responses *strongly agree* and *agree* were also collapsed into the single category *agree*. The data presented in Figure 8 were only for the RCMs that agreed with the first statement of the three (they can identify the funds that they need) and did not respond *undecided* to either of the last two statements. The percentages on the right side of Figure 8 are relative frequencies of the total usable cases

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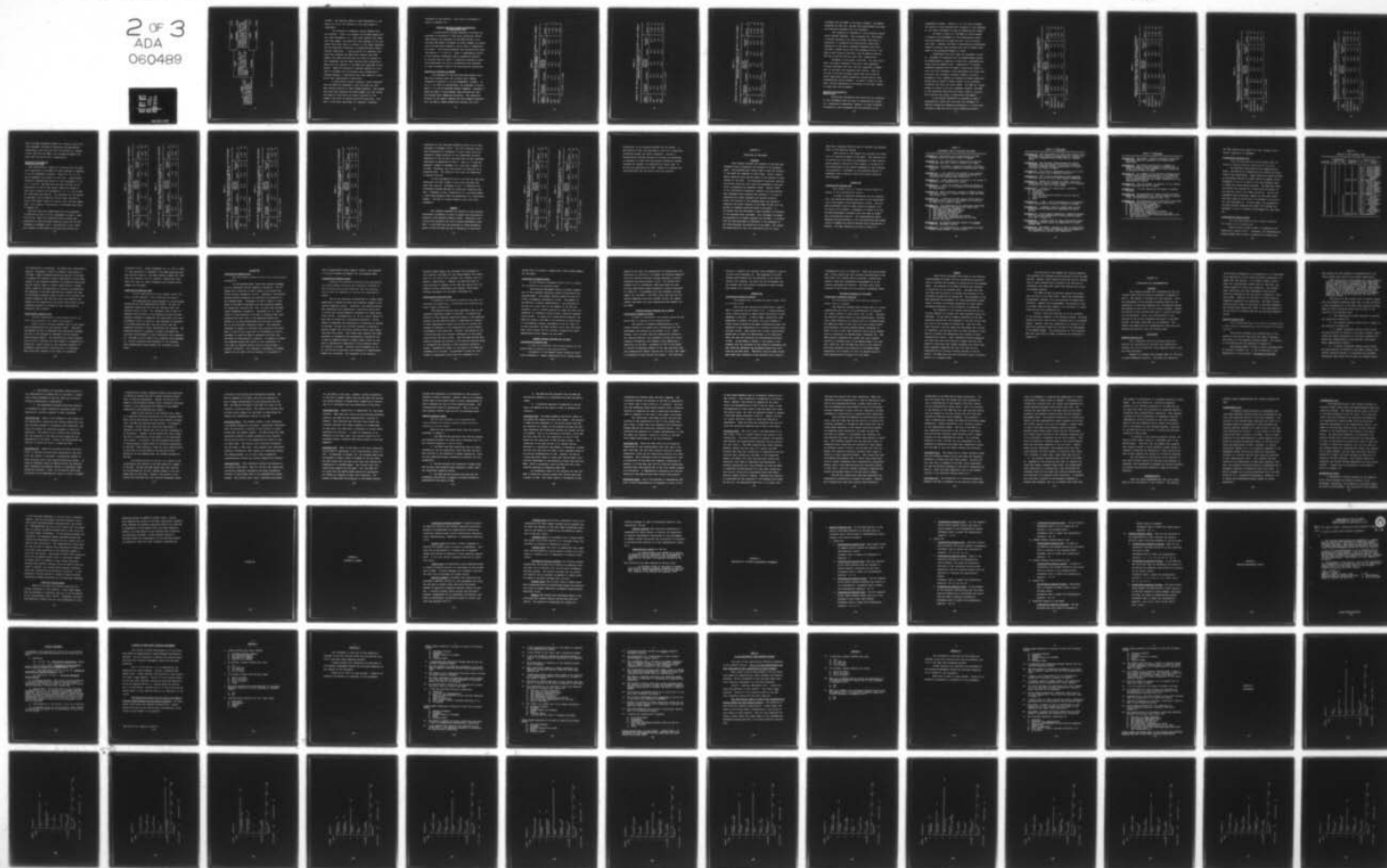
AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCH0--ETC F/G 5/1
A PROPOSED CONCEPTUAL MODEL FOR THE INTEGRATION OF ZERO-BASE BU--ETC(U)
SEP 78 R J CONNER, D WALKER

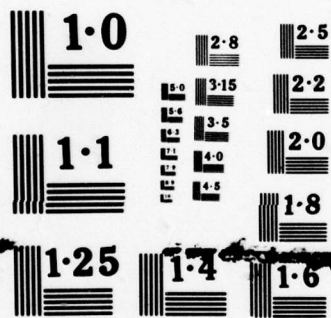
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NATIONAL BUREAU OF STANDARDS
MICROCOPY RESOLUTION TEST CHART

<p>AGREE</p> <p>Statement 12: The budget I prepare accurately identifies the funds I need to accomplish my organization's objectives.</p>	<p>AGREE</p> <p>Statement 20: The level of funding approved for this fiscal year was within 10 percent of the amount requested in the budget.</p>	<p>AGREE</p> <p>25.0%</p>
		<p>DISAGREE</p> <p>12.8%</p>
	<p>DISAGREE</p> <p>Statement 27: The amount I actually received in my operating budget this year is sufficient to accomplish my organizational objectives.</p>	<p>AGREE</p> <p>4.3%</p>
		<p>DISAGREE</p> <p>32.4%</p>

Fig. 8. Identification and Adequacy of Funds

(n=188). The absolute number of RCMs represented in the figure is 140 or 74.5 percent of the total number of respondents.

Two patterns of responses clearly emerged from the analysis. First, 25.0 percent of the RCMs agreed with all three statements, i.e., they could identify the funds that they needed, the funds that they received in the last budget cycle were within 10 percent of the funds requested, and the funds were sufficient to accomplish their organizational objectives. A second pattern of responses indicated that although the RCMs could identify the funds needed, the funds received were not within 10 percent of that requested, and the funds received were insufficient. There were 32.4 percent of the RCMs that responded in this manner. These two patterns of response capture 56.4 percent of the RCMs, and the patterns were interpreted to indicate honesty in identifying the funds needed to accomplish their organization's objectives.

A third pattern--agree, disagree, agree--suggested that the RCMs who responded in this way might not have been totally accurate in their budget requests. They agreed that they could identify the funds needed, but even though the funds received were not within 10 percent of the request, the level of funding was still sufficient. However, a very small percentage (4.3 percent) responded

according to this pattern. This issue is discussed in detail in Chapter VII.

Research Question Sixteen--Differences by Demographic Data

A Kruskal-Wallis One-Way Analysis of Variance was performed to determine if there were significant differences between the responses of the RCMs and RAs to the attitude measurement statements by major command, by experience with zero-base budgeting, and by type of responsibility center. This section presents the results of this test. (See Tables 13, 14 and 15.) Since a nonparametric analog to the contrast techniques used in parametric analysis of variance does not exist, a subjective analysis of pairwise differences was used to characterize the responses to those statements found to be statistically significant.

Analysis of Variance by MAJCOM

The responses to each attitude measurement statement were analyzed using the variable major command (response to Question 1) as the independent variable. At the $\alpha = .05$ level of significance, the responses to Statements 7, 27, and 44 differed between commands. Statement 7 asked the RCMs to state whether they believed that ZBB had changed their budgeting procedures. The subjective analysis of the median response for each command suggested that the RCMs in ADCOM agreed more strongly with this

TABLE 13

RESULTS OF THE KRUSKAL-WALLIS ONE-WAY ANALYSIS OF VARIANCE BY MAJOR COMMAND---
RESPONSES TO STATEMENT 7 (8)

Major Command	Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree	Median	N
ADCOM	0.0	0.0	12.5	37.5	50.0	4.375	8
ATC	2.9	17.6	20.6	52.9	5.9	3.410	34
SAC	5.6	21.3	15.7	48.3	9.0	3.335	89
TAC	0.0	17.5	24.6	50.9	7.0	3.474	57

$\chi^2 = 8.0947, p = 0.0441$

TABLE 14

RESULTS OF THE KRUSKAL-WALLIS ONE-WAY ANALYSIS OF VARIANCE BY MAJOR COMMAND--
RESPONSES TO STATEMENT 27 (%)

Major Command	Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree	Median	N
ADCOM	12.5	25.0	12.5	25.0	25.0	3.250	8
ATC	5.9	41.2	8.8	44.1	0.0	2.911	34
SAC	28.1	34.8	5.6	25.8	5.6	2.484	89
TAC	8.8	35.1	15.8	35.1	5.3	2.933	57

$\chi^2 = 8.6818, p = 0.0338$

TABLE 15

RESULTS OF THE KRUSKAL-WALLIS ONE-WAY ANALYSIS OF VARIANCE BY MAJOR COMMAND---
RESPONSES TO STATEMENT 44 (%)

Major Command	Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree	Median	N
ADCOM	12.5	0.0	62.5	0.0	25.0	3.250	8
ATC	0.0	0.0	8.8	70.6	20.6	4.118	34
SAC	0.0	13.6	22.7	45.5	18.2	3.683	88
TAC	5.4	23.2	8.9	50.0	12.5	3.410	56

$$\chi^2 = 10.3500, p = 0.0158$$

statement that the RCMs in the other commands. The median responses for ATC, TAC, and SAC were approximately the same and indicated agreement with the statement.

The responses to Statement 27 also differed significantly between commands. This statement was, "The amount I actually received in my operating budget this year is sufficient to accomplish my organizational objectives." Inspection of the median responses suggested that while the RCMs in ADCOM *agreed* with the statement ($M=3.25$), the RCMs in SAC *disagreed* ($M=2.484$), and the RCMs at ATC and TAC were *undecided* ($M=2.911$ and 2.933 , respectively).

Statement 44 was posed to the RAs. For this statement, the median response of the RAs in ATC suggested stronger agreement ($M=4.118$) than the responses in ADCOM, SAC, or TAC where the responses were similar. That is, the RAs in ATC more strongly agreed that they found out about significant budget preparation changes before their responsibility center manager. As shown in Table 15, however, the RAs responding to the survey on the whole tended to agree with this statement.

Analysis of Variance by Type of Unit

Significant differences were found for the responses to four statements when the type of responsibility center, i.e., Operations, Maintenance, Support, or Other (response to Question 5) was introduced into the analysis as the

independent variable. Tables 16, 17, 18, and 19 present the results of this analysis and a breakout of the responses to the survey statements by type of responsibility center.

As shown in Table 16, the RCMS as a whole tended to *disagree* with Statement 10, "My organizational objectives are defined by my superiors and I have no control over them." However, the RCMS in Operations and Maintenance tended to *disagree* less strongly with this statement than those in the categories Support or Other.

Differences were also found for Statements 26 and 31. Statement 26 suggested that the MAJCOM budget should be accomplished by a meeting of base-level representatives rather than the MAJCOM staff. Inspection of the median responses suggested that the RCMS in Operations tended to *agree* with this statement, while Maintenance and Other were *undecided*, and the RCMS in Support tended to *disagree*. Statement 31 was, "MAJCOM can estimate my budget needs well enough that my specific budget request is not necessary to develop the total Air Force budget. The RCMS as a group tended to *disagree* with this statement; however, the RCMS in the categories Operations and Other tended to *disagree* more strongly than those in Maintenance and Support.

A significant difference in response by type of responsibility center was also found for Statement 39, "ZBB has changed our budgeting procedures; it is more than a change in name for the Air Force budgeting process."

TABLE 16

RESULTS OF THE KRUSKAL-WALLIS ONE-WAY ANALYSIS OF VARIANCE BY
RESPONSIBILITY CENTER TYPE--RESPONSES TO STATEMENT 10 (%)

RC Type	Neither				Median	N
	Strongly Disagree	Disagree	Agree Nor Disagree	Strongly Agree		
Operations	12.5	43.8	18.8	15.6	2.659	32
Maintenance	10.5	42.1	13.2	28.9	2.764	38
Support	20.8	60.4	9.4	6.6	2.102	106
Other	21.4	50.0	14.3	14.3	2.215	14

$\chi^2 = 13.8213, p = 0.0032$

TABLE 17

RESULTS OF THE KRUSKAL-WALLIS ONE-WAY ANALYSIS OF VARIANCE BY
RESPONSIBILITY CENTER TYPE--RESPONSES TO STATEMENT 26 (%)

RC Type	Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree	Median	N
Operations	3.1	18.8	21.9	34.4	21.9	3.535	32
Maintenance	5.3	34.2	21.1	31.6	7.9	3.029	38
Support	10.5	41.9	21.9	18.8	7.6	2.704	105
Other	14.3	28.6	21.4	21.4	14.3	2.928	14

$\chi^2 = 12.6969, p = 0.0053$

TABLE 18

RESULTS OF THE KRUSKAL-WALLIS ONE-WAY ANALYSIS OF VARIANCE BY
RESPONSIBILITY CENTER TYPE--RESPONSES TO STATEMENT 31 (%)

RC Type	Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree	Median	N
Operations	59.4	31.3	6.3	0.0	3.1	1.564	32
Maintenance	18.4	52.6	15.8	10.5	2.6	2.260	38
Support	31.1	46.2	4.7	15.1	2.8	2.120	100
Other	35.7	57.1	7.1	0.0	0.0	1.712	14

$\chi^2 = 13.5555, p = 0.0036$

TABLE 19

RESULTS OF THE KRUSKAL-WALLIS ONE-WAY ANALYSIS OF VARIANCE BY
RESPONSIBILITY CENTER TYPE--RESPONSES TO STATEMENT 39 (%)

RC Type	Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree	Median	N
Operations	2.9	29.4	23.5	35.3	8.8	3.174	34
Maintenance	8.1	21.6	18.9	43.2	8.1	3.213	37
Support	3.9	17.6	10.8	58.8	8.8	3.507	102
Other	0.0	7.1	7.1	64.3	21.4	3.997	14

$$\chi^2 = 9.1698, p = 0.0271$$

While the RCMs responding tended as a group to *agree* with this statement, the RCMs in Operations and Maintenance tended more to be *undecided* ($M=3.174$ and $M=3.213$, respectively) than did the RCMs in the categories Support and Other ($M=3.507$ and $M=3.997$, respectively).

Analysis of Variance by Experience With ZBB

The Kruskal-Wallis Analysis of Variance was run using prior experience of the RCMs with ZBB (response to Question 4) as the independent variable. Tables 20; 21, 22, 23, and 24 summarize the results of this test. Significantly different responses were found for five statements, 6, 10, 15, 16, and 25. The RCMs that had been involved in the preparation of the FY 1980 budget submission tended to *agree* more strongly with statements 6, 15, 16, and 25 than did those RCMs that had not. For Statement 10, the pattern is reversed, and the RCMs that had not been involved in the FY 1980 budget tended to *disagree* less with this statement. This aspect of the analysis is discussed more fully in Chapter VII.

The final test was accomplished using the responses to questions 36 and 37 as the independent variable. Question 36 was, "Were you a resources advisor during the preparation of the zero-base budgeting inputs for FY 1980 (November to December 1977)," and Question 37 was, "Were you a member of the Financial Working Group during the

TABLE 20

RESULTS OF THE KRUSKAL-WALLIS ONE-WAY ANALYSIS OF VARIANCE BY PRIOR EXPERIENCE
WITH ZBB (RCM) --RESPONSES TO STATEMENT 6 (%)

Prior Experience?	Strongly Disagree	Disagree	Neither Agree Nor Disagree	Strongly Agree	Median	N
Yes	2.2	5.1	6.6	77.9	3.843	136
No	0.0	17.0	18.9	56.6	3.546	53

$$\chi^2 = 7.2340, p = 0.0072$$

TABLE 21

RESULTS OF THE KRUSKAL-WALLIS ONE-WAY ANALYSIS OF VARIANCE BY PRIOR EXPERIENCE
WITH ZBB (RCM) --RESPONSES TO STATEMENT 10 (%)

Prior Experience?	Strongly Disagree	Disagree	Neither Agree Nor Disagree	Strongly Agree	Median	N
Yes	19.9	54.4	11.8	8.8	2.248	136
No	11.3	49.1	13.2	24.5	2.566	53

$$\chi^2 = 4.2008, p = 0.0404$$

TABLE 22

RESULTS OF THE KRUSKAL-WALLIS ONE-WAY ANALYSIS OF VARIANCE BY PRIOR EXPERIENCE
WITH ZBB (RCM) --RESPONSES TO STATEMENT 15 (%)

Prior Experience?	Strongly Disagree	Disagree	Neither Agree Nor Disagree	Strongly Agree	Median	N
Yes	1.5	5.2	12.6	19.3	3.922	135
No	0.0	13.2	35.8	11.3	3.487	53

$$\chi^2 = 12.1147, p = 0.0005$$

TABLE 23

RESULTS OF THE KRUSKAL-WALLIS ONE-WAY ANALYSIS OF VARIANCE BY PRIOR EXPERIENCE
WITH ZBB (RCM) --RESPONSES TO STATEMENT 16 (%)

Prior Experience?	Strongly Disagree	Disagree	Neither Agree Nor Disagree	Strongly Agree	Median	N
Yes	0.0	8.8	11.4	15.4	3.876	136
No	0.0	24.5	13.2	11.3	3.487	53

$$\chi^2 = 5.9067, p = 0.0151$$

TABLE 24

RESULTS OF THE KRUSKAL-WALLIS ONE-WAY ANALYSIS OF VARIANCE BY PRIOR EXPERIENCE
WITH ZBB (RCM) --RESPONSES TO STATEMENT 25 (%)

Prior Experience?	Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree	Median	N
Yes	0.0	5.1	10.3	71.3	13.2	3.923	136
No	0.0	11.3	26.4	52.8	9.4	3.600	53

$$\chi^2 = 8.0702, p = 0.0045$$

preparation of the zero-base budgeting inputs for FY 1980 (November to December 1970)?" The test indicated significant differences for Statements 38 and 53 when using the response to either question as the independent variable. Inspection of the raw data indicated that the RAs responded identically to Questions 36 and 37. That is, if they had prepared a budget in November 1977, they were a member of the FWG. Therefore, only the analysis for Question 36 is presented here. The results of this test are summarized in Tables 25 and 26.

On both statements 38 and 53, the RAs that had prior experience with ZBB, tended to *agree* more strongly than those that had not. Statement 38 was, "I understand the differences between ZBB and the traditional budgeting system." Statement 53 was, "Preparation of a zero-base budget is more time-consuming than the preparation of a traditional budget." The RAs as a group tended to *agree* with both statements.

Summary

This chapter presented the analysis of the attitude measurement statements in order to answer the investigative questions under Research Question Three. Descriptive statistics were presented for each attitude measurement statement. A Sign Rank Test was performed on those statements posed to both the RCMs and RAs to determine if there were

TABLE 25

RESULTS OF THE KRUSKAL-WALLIS ONE-WAY ANALYSIS OF VARIANCE BY PRIOR EXPERIENCE
WITH ZBB (RA) --RESPONSES TO STATEMENT 38 (%)

Prior Experience?	Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree	Median	N
Yes	1.3	4.0	8.6	72.2	13.9	3.934	151
No	0.0	12.8	25.6	56.4	5.1	3.535	39

$$\chi^2 = 11.0602, p = 0.0009$$

TABLE 26

RESULTS OF THE KRUSKAL-WALLIS ONE-WAY ANALYSIS OF VARIANCE BY PRIOR EXPERIENCE
WITH ZBB (RA) --RESPONSES TO STATEMENT 53 (%)

Prior Experience?	Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree	Median	N
Yes	3.3	10.6	17.2	41.1	27.8	3.795	151
No	0.0	5.1	46.2	41.0	7.7	3.513	39

$$\chi^2 = 5.2725, p = 0.0217$$

differences in the responses between the two groups. A Mann-Whitney U-Test was performed to test for a significant difference between the median responses. Finally, a Kruskal-Wallis One-Way Analysis of Variance was performed to determine if there were significant differences between responses by command, by responsibility center type, or by previous experience with ZBB. Chapter VII presents the interpretations and conclusions from this analysis.

CHAPTER VI

VALIDATION OF THE MODEL

Overview

This chapter presents the analysis of attitude measurements used to determine the validity of the proposed model. The methodological design used to test the validity of the model was composed of three steps. First, investigative questions were derived based on the function of each element of the model. The investigative questions identify the primary functions that should be performed at the base level in preparing the budgetary inputs. Second, based on the investigative questions, specific attitude measurement statements were prepared and included in a survey of responsibility center managers and resource advisors. Third, the validity of the proposed model was tested by comparing the actual response of the RCMs and RAs with the pattern of response predicted based on the model. A Chi-square test was performed on each statement to determine if the responses were nonrandom. Only Statement 26 showed the possibility of random responses by the RCMs. A criteria test was then performed to determine if the responses to the survey matched the prediction of the model. The survey was administered so that the respondents were not aware

that their responses would be used to validate the proposed model of the budgetary system.

Each section in the chapter will discuss the validation of a specific element of the model. The sections will be divided into four parts; an explanation of each investigative question relating to that element, a discussion of the relationship of the survey statements to the investigative questions, a statement of the predicted pattern of responses, and an analysis using the criteria tests for each statement.

System One

Investigative Question One

Have higher levels of command clearly defined the purpose of the responsibility center?

In order to establish objectives for his organization, the System One manager must have a clear understanding of the purpose of his organization (2:202). The purpose as defined in Beer's model should be equated to an Air Force unit's mission. Statement 8 in Table 27 is the attitude measurement statement which was used to answer this investigative question. The responsibility center managers were asked whether or not they perceived that higher levels of command had clearly defined their organization's mission. The RCMs responses are shown in Table 28.

TABLE 27

STATEMENTS USED TO VALIDATE THE MODEL

Statement 8: The mission of my organization has been clearly defined by higher levels of command.

Statement 10: My organizational objectives are defined by my superiors and I have no control over them.

Statement 12: The budget I prepare accurately identifies the funds I need to accomplish my organization's objectives.

Statement 13: I can identify the outputs of my organization and relate them to the resources necessary to accomplish my organizational objectives.

Statement 14: I make significant decisions on the amount of spending of my responsibility center.

Statement 16: I have the freedom to change my operating methods as long as I can accomplish the objectives of my organization.

Statement 18: When significant changes in budget preparation are required, my resource advisor finds out about them before I do.

Statement 19: I establish minimum output levels based on my organization's mission and capabilities which are included in the budget I submit.

Statement 21: The responsibility for developing long-range budgetary planning at the base level rests with:

- A. The Wing or Center Commander
- B. The Financial Management Board
- C. The Financial Working Group
- D. The Comptroller's Office
- E. The individual Responsibility Centers
- F. No one has that responsibility at our base
- G. None of the above

Statement 23: My Resource Advisor handles our routine financial management matters.

Statement 24: My organization is a consolidation of cost centers whose budgets I cannot control.

TABLE 27--Continued

Statement 26: The consolidation of base level budget inputs at MAJCOM level should be accomplished by a meeting of base level representatives rather than by a MAJCOM staff.

Statement 28: The Financial Working Group has enough knowledge about the mission of the Wing to make the necessary tradeoffs between organizations to develop the Wing's or Center's budget.

Statement 29: The Financial Management Board is an active part of the base level budgetary structure.

Statement 30: The Financial Management Board should be an active part of the base level budgetary structure.

Statement 31: MAJCOM can estimate my budget needs well enough that my specific budget request is not necessary to develop the total Air Force budget.

Statement 33: I monitor my organization's spending:

- A. On a daily basis
- B. Frequently
- C. Occasionally
- D. Only when my Resource Advisor tells me that we have a problem
- E. Never

Statement 40: I need a clear understanding of my organization's objectives to be able to develop our budget.

Statement 41: I prepare a specific budget based on the guidelines established by my responsibility center manager.

Statement 43: During budget preparation, budgeting specialists in the base Comptroller's Office provide assistance when I request it.

Statement 44: I usually find out about significant budget preparation changes before my responsibility center manager does.

Statement 45: The budget I prepare is just a consolidation of the budgets of our cost centers plus the budget of the responsibility center staff operations.

TABLE 27--Continued

Statement 46: The budget I prepare accurately identifies the funds needed to accomplish our organization's objectives.

Statement 48: The budget justification I prepare is thorough enough to enable someone at MAJCOM level or higher to determine the importance of my organization in relation to that of others.

Statement 49: As a member of the Financial Working Group, I have a good enough understanding of the budgeting process and the mission of the Wing or Center to be able to consolidate and rank budget submissions of the responsibility centers.

Statement 50: Once the budget is prepared, my job becomes that of monitoring what we spend.

Statement 51: I do not reevaluate the budget throughout the year.

Statement 52: My responsibility center manager has delegated the responsibility for routine financial matters to me. He occasionally monitors what I do.

Statement 56: The responsibility for developing long-range budgetary planning at the base level rests with:

- A. The Wing or Center Commander
 - B. The Financial Management Board
 - C. The Financial Working Group
 - D. The Comptroller's Office
 - E. The individual responsibility center
 - F. No one has that responsibility at our base
 - G. Individuals other than those mentioned above have that responsibility
-

The RCMs showed strong support for this concept with 89 percent responding in agreement.

Investigative Question Two

Does the responsibility center manager have the freedom to develop specific objectives for his unit?

As divisional directorate of his responsibility center, the RCM has the responsibility to define the objectives of his organization. These objectives should be based on the mission defined by higher levels of command (2:213). Statements 10 and 16 in Table 27 are the statements used to answer the investigative question. The RCMs were asked who defined the organization's objectives and whether or not they had control over these objectives. The way the statements were structured, support for the model would have been shown by *disagreement* to Statement 10 and *agreement* with Statement 16. In both cases, the responses of the RCMs strongly supported the model (87.9 percent for Statement 10 and 75.3 percent for Statement 16) (see Table 28).

Investigative Question Three

Can the responsibility center manager determine the outputs of his organization?

Each division in Beer's model is responsible for producing an output (2:213). Therefore, the responsibility center manager must be able to identify the outputs that

TABLE 28

RESULTS OF THE CRITERIA TEST

Statement	Respondent		Predicted Response	Criteria Test	
	RCM	RA		%	Result
8	X		A	89.0	Strong Support
10	X		D	87.9	Strong Support
12	X		A	85.8	Strong Support
13	X		A	86.9	Strong Support
14	X		A	81.1	Strong Support
16	X		A	75.3	Strong Support
18	X		D	18.9	Nonsupport
19	X		A	64.6	Support
21	X		Nominal Data	(SEE APPENDIX D)	
23	X		A	82.7	Strong Support
24	X		D	80.0	Strong Support
26	X		A	34.4	Nonsupport
28	X		A	75.2	Strong Support
29	X		A	88.5	Strong Support
30	X		A	94.2	Strong Support
31	X		D	79.5	Strong Support
33	X		Nominal Data	(SEE APPENDIX D)	
40		X	A	92.4	Strong Support
41		X	A	56.9	Support
43		X	A	88.3	Strong Support
44		X	D	14.7	Nonsupport
45		X	D	39.6	Nonsupport
46		X	A	85.7	Strong Support
48		X	A	74.1	Support
49		X	A	74.5	Support
50		X	D	40.1	Nonsupport
51		X	D	95.5	Strong Support
52		X	A	66.9	Support
56		X	Nominal Data	(SEE APPENDIX D)	

his organization is producing. To answer this investigative question, Statements 13 and 19 in Table 27 were posed to the RCMs. These statements reflect the ability of the RCMs to identify the outputs of their organization, relate these outputs to the resources necessary to accomplish objectives, and set various levels of output (specifically a minimum level), based on the organization's mission and capability. The responses of the RCMs supported the concept that they could establish minimum levels of output (64.6 percent) and strongly supported the idea that they could identify the outputs of the organization and relate these outputs to the resources necessary to accomplish their organizational objectives (86.9 percent).

Investigative Question Four

Can the responsibility center manager relate the cost of his programs to the output they produce?

Cost is one of the many measures used in the evaluation of productivity for the resource center. Therefore, the RCM must be able to understand the relationship between the cost of the programs he implements and the outputs these programs produce. The responsibility center manager must be able to identify the funds needed to accomplish his objectives, relate outputs to the resources necessary to accomplish organizational objectives and, if necessary, make significant changes to his budget to accomplish

objectives (23:3). Survey Statements 12, 13, and 14, Table 27, were developed to determine if the RCMs perceived that they had this ability. The RCMs strongly agreed (86.9 percent, 85.8 percent, and 81.1 percent, respectively (see Table 28)) with all three statements which showed strong support for the model.

Investigative Question Five

Can the responsibility center manager control the level of funds expended in his responsibility center?

The responsibility center manager is the divisional directorate for his responsibility center. As such, he represents System Five for the cost centers within his resource center (2:232). He, therefore, must be able to determine the structure of the budgetary process and make necessary changes to accomplish the objectives of his unit. Statements 19 and 24, Table 27, were designed to determine if the RCMs perceived that they had control over the budgetary structure of their subordinate cost centers. The predicted pattern of response to support the model was *agreement* with Statement 14 and *disagreement* with Statement 24. The RCMs *strongly agreed* (81.1 percent) with Statement 14, *strongly disagreed* with Statement 24 80.0 percent which demonstrated strong support for the model in both cases.

System Two

Investigative Question Six

Does the resource advisor monitor day-to-day resource consumption?

In the proposed model, day-to-day resource consumption is considered routine budgetary information. One of System Two's functions in Beer's model is to monitor and filter routine information (2:213). Therefore, the resource advisors should accomplish the functions of System Two in the proposed model. Statements 23 and 33 (Table 27) were posed to the RCMs to determine who they perceived handled the System Two functions and, also, how they were provided routine budgetary information. Statements 50, 51, and 52 (Table 27) were directed to the RAs to determine what they perceived was their role in the budgetary process and whether or not they accomplished the functions of System Two as the divisional regulatory center. The predicted responses in support of the model were *agreement* for Statements 23 and 52 and *disagreement* for Statements 50 and 51. Statement 33 asked the RCMs to determine how often they monitored the organization's spending. To support the model, the responses should have fallen in the "occasional" or "only when my resource advisor tells me that we have a problem" categories. The responses to Statement 52 showed support for the model and the responses to Statements 23

and 51 demonstrated strong support; however, the responses to 33 and 50 showed non-support for the proposed model.

Investigative Question Seven

Based on the objectives defined by the responsibility center manager and using the information available to him concerning day-to-day operations, does the resource advisor have the capability to develop the organization's budget?

One of the functions of System Two is to make recommendations to System One about the necessary changes in the routine budgetary process. Therefore, the resource advisor must understand the organization's objectives and be able to relate the routine budgetary information to these objectives (2:223). Statements 40, 41, 45, 46, and 48 (Table 27) were used to answer this investigative question. The RA needs to understand the organization's objectives as defined by the RCM. He must use the RCM's guidance to develop a specific budget for the entire resource center using inputs from each cost center. This budget must identify the funds necessary to accomplish the organization's objectives and it must be complete enough to enable higher levels of command to determine the importance of that resource center in relation to others. Agreement with Statements 40, 41, 46, and 48 and disagreement with Statement 45 demonstrated support for the model. The responses of the resource

advisors showed support for the model with Statement 41 (56.9 percent, see Table 28) and strong support with Statements 40, 46, and 48 (92.4 percent, 85.7 percent, and 74.1 percent, respectively). However, the RAs were split on their opinions of whether or not they had control over the budgets of their subordinate cost centers, which demonstrated non-support for the model (Statement 45).

Investigative Question Eight

Do members of the Financial Working Group have the knowledge and capability to consolidate and coordinate the Wing's budget information?

The Financial Working Group represents part of the corporate regulatory center of the Wing. To perform the function of the corporate regulatory center in the budgetary process, the FWG should be able to understand the outputs of each responsibility center and be able to evaluate how changes in budgeting in one responsibility center affects the budgets of the other RCs. Further, they should act as a filter and send only relevant information to the higher levels within the Wing (2:223). Both the RCMs and RAs were asked to evaluate the ability of the Financial Working Group to accomplish the functions of the corporate regulatory center. Statement 28 (Table 27) was posed to the RCMs and Statement 49 to the RAs. As presented in Table 28, both groups of respondents *agreed* with the statements (75.2

percent and 74.5 percent, respectively) which showed support for the model.

Investigative Question Nine

Is the Financial Management Board a part of System Two as defined in the proposed model?

The Financial Management Board is another integral part of the corporate regulatory center as defined by the proposed model. Its primary function should be that of a filter of budgetary information (2:223). The members of the FMB have a greater understanding of the operation of the wing as a whole than do the members of the FWG and, therefore, are in a better position to judge the total consequences of a budgeting change within a specific responsibility center. To answer this investigative question, the RCMs were asked if the FMB is and should be an active part of the budgetary process (Statements 29 and 30, Table 27). In both instances, the RCMs strongly agreed with the statements (88.5 percent and 94.2 percent, respectively) which demonstrated strong support for the model.

Command Channel--Systems One to Three

Investigative Question Ten

Is there an information flow between System One and System Three as defined in the proposed model?

Information in the command channel should be structural information. Upward communication will contain status

reports of how well the organization is accomplishing its objectives in relation to its budget and downward communication will provide structural changes necessary to better accomplish the Wing's mission (7:20). To evaluate this downward flow of information, RCMs were asked how they received significant budget preparation changes (Statement 18, Table 27). Disagreement with the statement provided support for the model. The RCMs *agreed* that they did not receive budgetary structural changes through the command channel (see Table 28) which demonstrated non-support for the model.

Routine Channel--Systems Two to Three

Investigative Question Eleven

Is there an information flow between System Two and System Three as defined in the proposed model?

The purpose of downward communications in the routine channel is to update basic instructions for the development and analysis of the budget (7:19). These changes, which are sent from the Comptroller's Office to the resource advisors, are necessary to align the routine budgetary information with changes in the objectives or operations of the Wing. Statements 43 and 44 were posed to the RAs to determine whether or not they perceived that this communication channel existed and if it did, what types of information flowed through the channel. The predicted

pattern of response was *agreement* with Statement 43 and *disagreement* with Statement 44. The responses of the RAs showed strong support for the existence of the routine channel (88.3 percent, see Table 28) but non-support for the concept that only routine information flowed through the channel (14.7 percent).

System Four

Investigative Question Twelve

Does System Four, as defined by Beer's model, exist at the Wing level?

One of the key functions of System Four in Beer's model is planning for the future (7:8). In many organizations, future planning is based almost exclusively on what happened in the past. In Beer's model, System Four uses experience to predict the future, but also attempts to invent future situations and makes prescriptions about the operation of the organization in a variety of future possibilities (2:252). Beer stated that in many organizations, System Four is often not identifiable in its prescribed form, but that the functions are nevertheless performed (2:198). As was shown in Figure 5, the authors, after research into the structure of the financial management system, could not determine who performed System Four functions at the base level. Therefore, both the RCMs and RAs were asked their opinions of who performed this function

(Statements 21 and 56 in Table 27). There was strong agreement in both groups that this function was performed at the base level (92.3 percent and 94.6 percent, respectively). However, there was considerable disagreement as to who actually performed the function. The most often cited response in both groups was the Financial Management Board.

Recursive Property of the Model

Investigative Question Thirteen

Can the proposed base level model be extended to higher levels of command?

The recursive systems theory states that in a viable organization each level in the organization is organized in a manner similar to every other level (2:287). Applying the recursive system theory to the proposed model, the base level inputs should be an integral part of the MAJCOM budget. The RCMS were asked if they felt that their budget inputs were necessary to develop MAJCOM budgets (Statement 31, Table 27) and if base level personnel should assist MAJCOM staff in developing the MAJCOM budget (Statement 26). The RCMS strongly supported the concept that their budgets should be a necessary part of the MAJCOM budget (78.5 percent, Table 28), but the RCMS were split on the issue of base level personnel participating in the MAJCOM budget preparation (34.4 percent *for* and 43.9 percent *against*), which demonstrated non-support for the model.

Summary

Eight survey statements were posed to the resource center managers to answer the five investigative questions used to validate the existence of System One of the proposed model. The opinions of the RCMs validated the existence of System One in the proposed model. The RCMs also felt that they had the ability to perform the functions of the divisional directorate of System One. The responses of the RCMs supported the statement that they established minimum levels of output and strongly supported all other survey statements pertaining to the validation of System One.

The responses of the resource advisors did not as strongly support the concept that they performed System Two functions. Of the eight statements presented to the RAs concerning System Two, the responses of the RAs did not support two of the concepts of System Two. They felt that their function, once the budget was developed, was to monitor spending, and they were split on their opinions of their ability to budget the subordinate cost centers in their responsibility center. Their responses strongly supported the ideas that they could develop a budget and that they needed to reevaluate that budget throughout the fiscal year. Their responses supported the idea that they had the responsibility for routine financial matters in the RC; however, the RCMs said that they monitored routine financial matters on a frequent basis.

The existence of the command and routine communication channels was validated by the opinions of both the RCMs and RAs. However, their opinions as to the type of information in those channels was in conflict with the type of information that Beer said should flow through the routine and command channels.

The RCMs and RAs collectively agreed that System Four did exist at the base level. There was considerable disagreement, however, as to who performs the System Four functions. Despite this disagreement, the opinions of the two groups (RCMs and RAs) seemed to be consistent in identifying who had this responsibility.

Finally, there was confusion as to the existence of the recursive property in the budgeting system. The RCMs agreed that their inputs were a necessary part of the MAJCOM budget. However, they were undecided as to whether or not base level personnel should be involved in the development of the MAJCOM budget. The interpretation of this disagreement and other areas of model validation are discussed in Chapter VII.

CHAPTER VII

CONCLUSIONS AND RECOMMENDATIONS

Overview

This chapter presents the interpretations and conclusions drawn from the analysis presented in Chapters V and VI. The chapter is divided into five sections. First, the development of the proposed conceptual model for the integration of zero-base budgeting into the Resource Management System at base level will be briefly reviewed. Second, the results of the criteria test used to validate the model will be discussed. Third, the interpretation of the analysis of the survey statements pertaining to the RCMS' and RAs' attitudes toward ZBB will be presented. The chapter concludes with the recommendations drawn from this research and possible areas for further study.

Conclusions

Research Question One

Can a conceptual model be developed which will describe the organizational structure and communication channels for the Air Force base level budgeting system using zero-base budgeting?

Chapter III presents the proposed model for the wing or center budgeting structure. The model was limited to

the structure necessary for the preparation of an O&M budget by an operational wing or other equivalent organization in ADCOM, ATC, SAC and TAC. It is based on Beer's general model for organizational control and is a tailored, systematic approach to base level budgeting. The proposed model identifies five basic management functions that should be performed at the wing level in preparing a zero-base budget. Channels for the flow of various forms of budgetary information are identified. The model incorporates the basic ideas of the theory of zero-base budgeting and relates these theoretical ideas to the requirements of the Air Force to integrate ZBB into the existing budgetary system.

Research Question Two

Can the applicability of the model be validated from a field survey of responsibility center managers and resource advisors?

This section presents the interpretation of the results of the criteria test which was used to determine the validity of the proposed conceptual model. The results of the criteria test are presented in Chapter VI.

The proposed model is based on Beer's paradigm which is outlined in Chapter III. In the introduction to the presentation of his paradigm in The Brain of the Firm,

Beer argued that the paradigm is representative of the actual system that exists in any viable organization.

What follows is not put forward as a final prescription for organization, in the sense that responsible people ought to have it dispensed in their own institutions--and then just take the medicine. Quite the contrary; it is contended that all viable organizations are really like this already. Therefore, the value of the model is to make clear how the organization actually works, as distinct from the way it allegedly works, so that it may be streamlined and made more effective [2:198].

The results of the criteria test in general suggest that the proposed conceptual model was, at least partially, a valid representation of the base level budgeting process. There are five conclusions drawn from the test of the validity of the proposed model.

1. The responsibility center managers can perform the functions of System One.
2. The resource advisors perform only a subset of the functions of System Two.
3. A command information channel exists within the wing structure as defined in the model; however, appropriate and timely information is not being transmitted to System One (responsibility center manager) from System Three (Comptroller's Office).
4. A routine information channel exists within the wing structure as defined in the model; however, System Two (resource advisor) is overloaded with unneeded information that should flow through the command channel.

5. The function of long-range planning which is the responsibility of System Four in the model is, apparently, being performed at the wing level but by several diverse organizations or individuals.

6. The information available from this research is inadequate to draw a definitive conclusion about the theoretical, recursive property of Beer's paradigm.

Conclusion One. Based on the statement of the purpose for his organization, System One must develop objectives, prepare operating methods to accomplish those objectives, and obtain and manage the resources necessary to carry out operations. The results of the criteria test indicated that the responses of the RCMs strongly supported this prescription of the model. Clearly, the RCM performs the function of System One within an operating wing.

Conclusion Two. System Two performs two basic functions. First, it monitors the day-to-day operations of the division, and, second, it provides a coordinating linkage to other divisions and to the Corporate Regulatory Center. In terms of budgeting within an operating wing, the proposed model identifies the Resource Advisor as performing these System Two functions. First, the RA monitors day-to-day activities of the responsibility center in order to prepare

a representative budget submission based on the objectives as defined by System One and to ensure effective management of resource consumption. Second, the RA acts as a member of the Financial Working Group (corporate regulatory center) in the coordination and ranking of the budgets submitted by each responsibility center.

Based on the results of the criteria test, there is a departure from the prescription of the proposed model. While the RA does monitor the day-to-day resource consumption, the RCM also performs this function. In preparing the budget, the RA does not relate the objectives as defined by the RCM (System One) with the RA's knowledge of RC operations. Instead, the RAs agreed that their budget was only a consolidation of the budget of the subordinate cost centers. In addition, the RAs disagreed when asked if they prepared a budget based on objectives established by the RCM. This indicates a need for clear identification of the roles to be performed by the RCM and RA and a definition of the communication link between Systems One and Two.

The second function of the RA is to assist in the consolidation and ranking of the base budget as a member of the FWG. The RAs and RCMs agreed that this function can be performed by the FWG, lending support to the proposed model in this area. However, the results of the survey also indicated that the Financial Management Board

is active in the ranking and consolidation process. The FMB is composed of the RCMs, and could be expected to have a deeper understanding of wing operations than the FWG. The FMB was included in the model as a part of the corporate regulatory center. The results of criteria test provided strong support for the model in prescribing the ranking and consolidation function to the FMB.

Conclusion Three. The command channel is the information link between Systems One and Three. Significant information about the structure or purpose of the division is transmitted down the command channel. The RCMs agreed that when significant changes in budget preparation were required the RA was the first in the responsibility center to find out about them. The criteria test indicated non-support for the model in this area. This suggests that significant budgetary information, which should be transmitted through the command channel, is, in fact, being transmitted inappropriately through the routine communication channel.

Conclusion Four. This conclusion reflects the obverse of conclusion three above. That is, the RAs also agreed that significant budgetary information was being transmitted directly to them rather than to the responsibility center manager. The criteria test, again, indicated non-support

for the model in this area. However, routine information in the form of budget inputs from the RCs does flow through the routine channel to System Three (Comptroller's Office). This is in accordance with the prescription of the model.

Conclusion Five. System Four is responsible for long-range planning. When asked who within the wing performs budgetary planning, the RCMS and RAs responded with a variety of answers. This indicates that the base level budget participants believed that budget planning was accomplished at base level, but there was no consensus as to what office performed this function. In order for budgeting to be effective at the base level, this function should be consolidated within a planning staff which reports to the Wing Commander.

Conclusion Six. Beer, in the Brain of the Firm, stated that his paradigm is applicable to all organizational levels (2: 287). As described in Chapter III, the proposed model could be extended to higher levels of command in the Air Force. The RCMS agreed that the base level input was required for preparation of a MAJCOM budget. The criteria test indicated strong support for the model. But, the RCMS did not agree that the MAJCOM budget should be consolidated and ranked by a meeting of base level personnel. The concept of base-level participation in the MAJCOM ranking

process was considered to be equivalent to the recursive property of Beer's paradigm. However, this is an interpretation made by the authors based on their understanding of Beer's paradigm and the Air Force budgeting process. The interpretation might be inappropriate. This is an area that requires further study and will be addressed below.

Research Question Three

What are the attitudes of the responsibility center managers and resource advisors toward zero-base budgeting in the Air Force?

There are six conclusions drawn from the analysis presented in Chapter V.

1. The RCMs and RAs perceived that ZBB has changed the budgeting process, but there was no consensus that it has improved budgeting in the Air Force.

2. The RCMs found ZBB terminology about as understandable as the old terminology, while the RAs, who were more involved in the mechanics of budget preparation, found the new terminology either confusing or difficult but comprehensible.

3. The RAs believed that preparing a budget using ZBB was more time-consuming than preparing a budget under the traditional budgeting system.

4. The RCMs and RAs believed that they had the information and ability to prepare a decision package as prescribed by the theory of ZBB.

5. The RCMS and RAs perceived that the FMB and FWG had the capability to consolidate and rank the base's budget.

6. A bottom-up approach to budgeting in the Air Force, as defined in the theory of ZBB, is feasible and realistic.

Conclusion One. Zero-base budgeting has had an impact on the people who prepare the base level budget. The majority of RCMS and RAs responding to the survey agreed that ZBB had resulted in a change in the budgeting process and that they understood the differences between the present and the old systems. This is an encouraging conclusion, since ZBB has been used only for the preparation of the FY 79-80 budget and the transition to ZBB has been gradual. The indecision of the RCMS and RAs as to whether ZBB has resulted in a significant improvement in budgeting, reflects the fact that they have not made a final judgement based on the partial implementation of ZBB. However, the RAs as a group were more likely to agree that ZBB had made a significant improvement in the budgeting process than were the RCMS. This is noteworthy, since the RAs have had a more intensive exposure to budgeting under ZBB.

An interesting result of the analysis was that the RCMS in ADCOM more strongly agreed that ZBB was more than a change in name. This might reflect a difference in the

implementation programs among the major commands. The difference between the opinions of the RAs by responsibility center type is more difficult to interpret. The fact that the difference exists might indicate that a different approach to budgeting was used in Operations and Maintenance as compared to that used in the support activities.

The individuals, both RCMs and RAs, who had been involved in the preparation of the FY 79-80 budget were more likely to agree that they understood the differences between ZBB and the traditional budgeting system. This reinforces the approach of a gradual implementation of ZBB, but might also indicate a need for training of the base level budget participants in the new procedures.

Conclusion Two. While the RCMs found the new budgeting terminology no less understandable than that used in the past, most RAs, who were more directly involved in budget preparation, found the new terminology difficult but understandable. This difference could be interpreted as a lack of familiarity by the RCMs with budgeting terminology in general, or it may mean that the RAs found the terminology confusing when they applied ZBB to the total budget preparation procedures. A comprehensive orientation and training program for the RCMs and RAs could correct this problem.

Conclusion Three. One of the problems in implementing ZBB that is often highlighted by its opponents is that it will

be more time-consuming than an incremental budgeting system (12:223). This contention is supported by conclusion Three. However, this should be tempered by two facts. First, the implementation of ZBB in the Air Force is new. The experience of other users of ZBB has shown that after the initial cycle, the time and paperwork needed to prepare a zero-base budget decreases (12:22-3). Second, the RAs, as a group, were more likely to agree that ZBB was an improvement. These two facts are indicative that the Air Force can anticipate effective use of ZBB in the future.

Conclusion Four. The first step in the ZBB process is to have higher levels of command identify the purpose of the organization. From this statement of purpose, the manager then defines the organizational objective for his particular unit (20:23). The RCMs supported both these concepts. However, despite the fact that, as a whole, the RCMs believed that they have flexibility in identifying and controlling their objectives, the RCMs, in the categories Support and Other, felt that they had more control over objectives than those in Operations and Maintenance. A possible explanation for this difference is that the RCMs in Operations and Maintenance felt that their objectives were tied to flying hour requirements which were determined by higher levels of command. Comparing the opinions of those RCMs who had prepared FY 79-80 budgets with those who had not, the experienced RCMs felt, as a group, that

they had more control over their objectives. While the difference could be explained by a lack of familiarity with ZBB in the nonexperienced group, another cause could be that the managers who participated in the FY 79-80 budget had more experience in their jobs and, therefore, had more confidence in their ability to establish their objectives.

Once the RCMs had defined the organizational objectives, they felt that they had the ability to identify the resources necessary to accomplish these objectives, and to relate these resources to the outputs they would produce. To accomplish their objectives, the RCMs realized that they must be flexible in the methods they selected, and they believed that they could change these methods as necessary. The different methods that the RCMs must choose to accomplish their objectives are reflected in their budget as different levels of effort, and the RCMs felt that the budget they prepared accurately reflected their needs in relation to their operating methods. They agreed that they could define the minimum level of effort below which they could no longer accomplish their organizational objectives. However, most of the RCMs believed that they were already at this level. This will present problems in defining the current and minimum levels in the next year's budget.

The RAs also agreed that they must understand the organization's objectives to prepare the budget. However, only slightly more than half actually used guidelines

established by the RCMs during budget preparation. The RAs also agreed that the budget that they prepared was only a consolidation of the budgets of the cost centers and the responsibility center staff. This is in contrast to the opinions of the RCMs who felt that they had control over the budgets of the cost centers and that they made significant decisions about spending. This suggests a lack of communication between the RCMs and RAs during budget preparation. Budget preparation is an iterative process in the responsibility center. The role of the RCM is to make substantive decisions on the content of the budget; then the RA must translate these decisions into a budget proposal for the responsibility center. For zero-base budgeting to work, the RAs, who are responsible for the mechanics of preparing the budget must communicate closely with the RCMs so that the budget reflects his decisions.

Conclusion Five. The responsibility center managers agreed that the Financial Working Group could make the necessary tradeoffs to develop the base level budget. The RAs also felt that they, as members of the FWG, could consolidate and rank the decision packages of the base's responsibility centers. Under zero-base budgeting, this is the primary function of the Financial Working Group (8:7).

Conclusion Six. The feasibility of a bottom-up budgeting approach like ZBB is dependent on the ability of the lowest

level of management to identify and communicate its budget requirement to higher levels of command. Conclusions One through Five indicate that, as a group, the responsibility center managers surveyed could fulfill this role. The ranking and consolidation of the base level can be accomplished by the Financial Working Group and the Financial Management Board. The question remains--is it realistic to expect that the responsibility center managers can provide the initial inputs to the Air Force budget? A basic issue is that if the base level managers cannot accurately identify their budget needs, either the Air Force budget will become overly inflated or the necessary resources will not be provided to accomplish the Air Force mission. This issue is difficult to address based on the limited experience with zero-base budgeting in the Air Force. However, based on prior experience, most managers felt that they could identify the funds needed to accomplish their objectives although, in some cases, these funds were not provided. Our analysis indicated that over half of the RCMS who responded to the survey had been able to identify the funds they needed, obtained those funds, and accomplished their objectives or, alternatively, they identified the necessary funds but the funds they actually received were not sufficient to accomplish their objectives. It appeared that less than 5 percent of the managers attempted to inflate their budgets; that is, to request more funds than

they needed in anticipation of a possible reduction of their budget. The real problem for a bottom-up budgeting approach is the sizeable percentage of the RCMs who did not agree that they could identify the resources needed to accomplish their organizational objectives. This suggests a problem in lack of experience or inadequate training. A comprehensive training program for base level managers might be the most effective way to correct this problem. Even in the absence of this training program, a majority of the RCMs would still be able to perform the functions required of them by ZBB.

In contrast to the previous budgeting system, the RCMs saw their budget inputs as a necessary part of the MAJCOM budget. They felt that the budgets they prepared were complete enough to enable MAJCOM or higher levels of command to determine the importance of their organization. This further supports the concept of a bottom-up approach.

The conclusion of this portion of the research is that while further training of the base level managers is suggested, the responsibility managers and resource advisors can perform the functions required of them by zero-base budgeting.

Recommendations

There are three recommendations that can be made based on the conclusions of this research. This section

presents these recommendations and a brief rationale for each.

Recommendation One

A Planning Directorate which is responsible for long-range budgetary planning should be established at the wing level reporting directly to the Wing Commander. The analysis of the proposed model indicates that there is no consensus among the responsibility center managers and resource advisors surveyed as to which office at the base level performs this function. In the context of the PPBS, planning has been a function of HQ USAF. With the implementation of zero-base budgeting, greater emphasis will be placed on planning and decision making at the base level. Using the prescription of Beer's paradigm, a Planning Directorate (System Four) is an essential component of the management system that must be explicitly recognized. Planning is a critical function that should be performed at each organizational level. This research has been limited to an investigation of base level budgeting; however, the Planning Directorate should be responsible for a systematic approach to forecasting base level needs. It should encompass all activities performed within the base structure (i.e., Operations, Maintenance, Budgeting, etc.) to ensure the coordinated planning needed for budget preparation.

Recommendation Two

The responsibilities of the resource advisors in preparing budget inputs under zero-base budgeting should be explicitly defined. The resource advisor plays a key role in zero-base budgeting in the Air Force. He is the individual that must synthesize the objectives as defined by the responsibility center manager with the day-to-day operating requirements of the responsibility center. As a member of the Financial Working Group, he must also participate in the consolidation and ranking of the wing's budget. For base-level budgeting to be effective, the Resource Advisor must clearly understand the requirement not only to coordinate his actions with those of other participants in base-level budgeting, but also the need for the linkage between his responsibility center, the responsibility center manager, and the other RCs within the wing. System Two in Beer's paradigm provides the definition in concept of the RA's function. This function should be recognized and defined through appropriate Air Force policy guidance. Guidance can be promulgated in the Resource Advisor's Handbook (8).

Recommendation Three

A comprehensive training program for the responsibility center managers and resource advisors in the philosophy, terminology, and mechanics of zero-base budgeting should be established. One conclusion of this research

is that zero-base budgeting in the Air Force is feasible; however, like any new system, zero-base budgeting cannot work unless the participants understand what they should do. ZBB emphasizes the role of the lowest level of management to produce a decision package which is the source of the basic budget information. If the decision packages are inaccurate, the aggregated budget generated through the ranking and consolidation process will not reflect the true needs of the organization. The responsibility center manager must be able to identify his organization's objectives and relate those objectives to the resources needed to carry out his mission. The Resource Advisor must prepare an accurately documented budget input in the format needed by higher levels of command to make ranking decisions. Although this research indicates that the RCMs and RAs surveyed, in general, can perform these required functions, there was a significant percentage who could not. A comprehensive training program is needed to ensure uniform, high-quality budget preparation by the base-level managers.

Areas for Further Study

There are two areas for further study that are logical extensions of this research. First, Beer stated that his paradigm is recursive; that is, it can be applied to any organizational level (2:287). Therefore, the paradigm should be a useful tool for the investigation of the

budgeting process at MAJCOM or higher levels. Second, this research was limited to the major operational commands. Other commands and separate operating agencies are involved in preparation of O&M budgets using zero-base budgeting. However, the conclusions of this research were limited by the population surveyed. Future research should be directed toward the investigation of the zero-base budgeting process in other Air Force component organizations.

APPENDICES

APPENDIX A
GLOSSARY OF TERMS

Alternative decision packages--a decision package by which the decision unit manager identifies innovative methods of accomplishing his organization's objectives. Alternative methods might include centralizing, decentralizing, subcontracting, combining, or eliminating functions (31:2).

Current level--the level of effort necessary to maintain the present level of output or performance. This level may be maintained at a reduced cost if managers change their method of operation or make operating improvements. It may also reflect increased costs due to inflation (26:9).

Cutoff level--an expenditure level expressed either in terms of absolute dollars or a percentage of the current year's budget. Decision packages not included in the cutoff level will be reviewed and ranked (25:82).

Decision package--a document that identifies and describes a specific activity so that management can evaluate and rank it against other activities and decide whether to approve or disapprove specific levels of funding. A decision package should include the activity's purpose, consequences of not performing the activity, measures of performance, alternative courses of action, and costs and benefits (24:117).

Decision unit--distinctive, meaningful units of an organization for which budget requests may be prepared and for which the manager of that unit makes significant decisions on the amount of spending and the methods of operation of the unit (26:5).

Enhanced level--an increased level of effort above the current level which results in an increased output and justifies an increase in expenditure (23:3-4).

Funding level--the level of expenditure that represents the anticipated or actual amount of funds to be allocated to a decision unit or aggregation of decision units (25:82).

Incremental decision package--the decision package representing the minimum level reflects an essential funding level for the decision unit and the basic incremental decision package. The decision packages for the current and enhanced levels represent increments in funding which are added to the basic minimum level (24:113).

Minimum level--the critical level of effort below which operations would be discontinued because the decision unit could no longer effectively accomplish organizational objectives (23:4).

Ranking--the process that determines which of the activities will receive funding and how much they will receive. The ranking is accomplished by listing all

decision packages in order of decreasing benefit to the organization (24:116).

Resource advisor--the individual appointed by a responsibility center manager to monitor the preparation of resource requirements, participate in the development of expense targets and monitor the utilization of resources in the day-to-day operations of that responsibility center (8:1).

Responsibility center--in the DoD

. . . an organizational unit headed by an officer or supervisor who is responsible for the management of resources in the unit and who in most instances can significantly influence the expenses incurred by the unit.

This definition has been expanded by the Air Force

. . . to include a level in the chain of command such as that occupied by deputy commanders at wing and base level at which responsibility and accountability for a segment of the mission are assigned [34:2].

APPENDIX B
DERIVATION OF ATTITUDE MEASUREMENT STATEMENTS

I. Research Question Two: Can the applicability of the model of zero-base budgeting at the base level be validated from a field survey of responsibility center managers and resource advisors?

A. System One

1. Investigative Question One: Have higher levels of command clearly defined the purpose of the responsibility center?

Statement used to answer the investigative question: 8

2. Investigative Question Two: Does the responsibility center manager have the freedom to develop specific objectives for his unit?

Statements used to answer the investigative question: 10, 16

3. Investigative Question Three: Can the responsibility center manager determine the outputs of his organization? Statements used to answer the investigative question: 13, 19

4. Investigative Question Four: Can the responsibility center manager relate the cost of his programs to the output they produce?

Statements used to answer the investigative question: 12, 13, 14

5. Investigative Question Five: Can the responsibility center manager control the level of funds expended in his responsibility center? Statements used to answer the investigative question: 14, 24

B. System Two

1. Investigative Question Six: Does the resource advisor monitor day-to-day resource consumption? Statements used to answer the investigative question: 23, 33, 50, 51, 52.
2. Investigative Question Seven: Based on the objectives defined by the responsibility center manager, and using the information available to him concerning the day-to-day operations, does the resource advisor have the capability to develop the organization's budget? Statements used to answer the investigative question: 40, 41, 45, 46, 48
3. Investigative Question Eight: Do the members of the Financial Working Group have the knowledge and capability to consolidate and coordinate the Wing's budgeting information? Statements used to answer the investigative question: 28, 49

4. Investigative Question Nine: Is the Financial Management Board a part of System Two as defined in the proposed model?

Statements used to answer the investigative question: 29, 30

C. Command Channel--System Three to One

Investigative Question Ten: Is there an information flow between System One and System Three as defined in the proposed model?

Statement used to answer the investigative question: 18

D. Routine Channel--System Three to Two

Investigative Question Eleven: Is there an information flow between System Two and System Three as defined in the proposed model?

Statements used to answer the investigative question: 43, 44

E. System Four

Investigative Question Twelve: Does System Four, as defined by Beer's model, exist at the Wing level?

Statements used to answer the investigative question: 21, 56

F. Recursive Property of the Model

Investigative Question Thirteen: Can the proposed base level model be extended to

higher levels of command?

Statements used to answer the investigative question: 26, 31

II. Research Question Three: What are the attitudes of the responsibility center managers and resource advisors toward zero-base budgeting in the Air Force?

A. Investigative Question Fourteen: What are the opinions of the RCMs and RAs as to the usefulness and value of ZBB?

Statements used to answer the investigative question: 6, 7, 11, 32, 38, 39, 47, 53, 54

B. Investigative Question Fifteen: Do the RCMs and RAs agree that they can accomplish the actions in developing the budgeting inputs which are required by the theory of ZBB?

Statements used to answer the investigative question: 8, 10, 12-14, 17, 19, 24-25, 28-31, 40, 41, 45, 46, 49

C. Investigative Question Sixteen: Are there differences between the RCMs and RAs in their opinions of ZBB when compared by major command, experience with ZBB, and types of responsibility center?

Statements used to answer the investigative question: 6-8, 10-14, 16-19, 24-25, 28-33, 38-41, 45-54

APPENDIX C
ATTITUDE MEASUREMENT SURVEY

DEPARTMENT OF THE AIR FORCE
AIR FORCE INSTITUTE OF TECHNOLOGY (AU)
WRIGHT-PATTERSON AIR FORCE BASE, OHIO 45433



REPLY TO
ATTN OF: LSG (LSSR 4-78B/Mr. Conner/Capt Walker/AUTOVON 78-54845)

SUBJECT: A Survey of Base Level Financial Management

JUN 16 1978

TQ:

1. The attached questionnaire was prepared by a research team at the Air Force Institute of Technology, Wright-Patterson AFB, Ohio. The purpose of the questionnaire is to gather information about your perceptions of the base-level Financial Management System and zero-base budgeting.

2. Part I of the questionnaire is to be completed by the Responsibility Center Manager. Part II of the questionnaire should be completed by the Resource Advisor. Headquarters USAF Survey Control Number 78-131 has been assigned to this questionnaire. Participation in this research is voluntary.

3. The responses to the question; will be held confidential. Your cooperation in providing this data will be appreciated. Please return only the scoring sheet in the attached envelope within one week after receipt.

Henry W. Parlett

HENRY W. PARLETT, Colonel, USAF
Associate Dean for Graduate Education
School of Systems and Logistics

2 Atch

1. Questionnaire
2. Return Envelope

Strength Through Knowledge

PRIVACY STATEMENT

In accordance with paragraph 30, AFR 12-35, the following information is provided as required by the Privacy Act of 1974:

a. Authority:

- (1) 5 U.S.C. 301, Departmental Regulations, and/or
- (2) 10 U.S.C. 8012, Secretary of the Air Force, Powers, Duties, Delegation by Compensation; and/or
- (3) DOD Instruction 1100.13, 17 Apr 68, Surveys of Department of Defense Personnel; and/or
- (4) AFR 30-23, 22 Sep 76, Air Force Personnel Survey Program.

b. Principal purposes. The survey is being conducted to collect information to be used in research aimed at illuminating and providing inputs to the solution of problems of interest to the Air Force and/or DOD.

c. Routine uses. The survey data will be converted to information for use in research of management related problems. Results of the research based on the data provided, will be included in written master's theses and may also be included in published articles, reports, or texts. Distribution of the results of the research, based on the survey data, whether in written form or presented orally, will be unlimited.

d. Participation in this survey is entirely voluntary.

e. No adverse action of any kind may be taken against any individual who elects not to participate in any or all of this survey.

A SURVEY OF BASE LEVEL FINANCIAL MANAGEMENT

This survey is being administered to an Air Force-wide sample of Responsibility Center Managers and Resource Advisors. We are interested in getting your opinions about the base level Financial Management System and zero-base budgeting.

Part I of the survey is to be completed by the Responsibility Center Manager. Section I requests demographic data. Please complete the questions in this section. Your name is not required. Section II is an opinion survey on the base level budgeting system and zero-base budgeting. After you complete Section II, please remove and discard Part I of the survey. Forward Part II of the survey and the scoring sheet to your Resource Advisor for completion of the survey.

The same scoring sheet will be used by the Responsibility Center Manager and the Resource Advisor. The questions in both parts are numbered consecutively. Please darken the block on the scoring sheet corresponding to the letter of your answer to the question.

SECTION I

1. Please indicate your major command.
 - A. Aerospace Defense Command
 - B. Air Training Command
 - C. Strategic Air Command
 - D. Tactical Air Command
2. If military, please indicate your rank.
 - A. O-6
 - B. O-1 thru O-5
 - C. E-7 thru E-9
 - D. E-6 or below
3. If civilian, please indicate your grade.
 - A. GS-15 or above
 - B. GS-11 thru GS-14
 - C. GS-10 or below
 - D. Other
4. Were you involved with the preparation of zero-base budgeting inputs for FY-1980 (November to December 1977)?
 - A. Yes
 - B. No
5. Indicate which category your unit comes under.
 - A. Operations
 - B. Maintenance
 - C. Support
 - D. Other

SECTION II

The statements in this part of the survey are designed to get your opinions about how you perceive your role in the base level budgeting process.

Please consider your experience and knowledge of the Financial Management System and zero-base budgeting as you respond to the statements.

There are no right or wrong answers. Please be as objective as possible in responding to the statements.

Please answer Questions 6 through 10 using the following format:

- A. Strongly Disagree
 - B. Disagree
 - C. Neither Agree nor Disagree
 - D. Agree
 - E. Strongly Agree
6. I understand the differences between ZBB and the traditional budgeting system.
7. ZBB has changed our budgeting procedures; it is more than a change in name for the Air Force budgeting process.
8. The mission of my organization has been clearly defined by higher levels of command.
9. The usual procedure for developing this year's budget is to use last year's budget adjusted for inflation and/or the cost of new programs.
10. My organizational objectives are defined by my superiors and I have no control over them.
11. I find the zero-base budgeting terminology:
- A. Confusing
 - B. Difficult but comprehensible
 - C. About as understandable as the previous budgeting terminology
 - D. Easy to understand
 - E. Very simple; I had no problems adjusting to it.
 - F. No opinion

Please answer Questions 12 through 20 using the following format:

- A. Strongly Disagree
 - B. Disagree
 - C. Neither Agree nor Disagree
 - D. Agree
 - E. Strongly Agree
12. The budget I prepare accurately identifies the funds I need to accomplish my organization's objectives.
13. I can identify the outputs of my organization and relate them to the resources necessary to accomplish my organizational objectives.

14. I make significant decisions on the amount of spending of my responsibility center.
15. I have access to the "CALL" when I develop my budget.
16. I have the freedom to change my operating methods as long as I can accomplish the objectives of my organization.
17. My organization is operating at the minimum possible level of funding.
18. When significant changes in budget preparation are required, my Resource Advisor finds out about them before I do.
19. I establish minimum output levels based on my organization's mission and capabilities which are included in the budget I submit.
20. The level of funding approved for this Fiscal Year was within 10 percent of the amount requested in the budget.
21. The responsibility for developing long-range budgetary planning at the base level rests with:
 - A. The Wing or Center Commander
 - B. The Financial Management Board
 - C. The Financial Working Group
 - D. The Comptroller's Office
 - E. The individual Responsibility Centers
 - F. No one has that responsibility at our base
 - G. None of the above
22. The "CALL" is a useful part of my budget preparation.
 - A. Strongly Disagree
 - B. Disagree
 - C. Neither Agree nor Disagree
 - D. Agree
 - E. Strongly Agree
 - F. I do not use the "CALL" to prepare my budget

Please answer Questions 23 through 32 using the following format:

- A. Strongly Disagree
- B. Disagree
- C. Neither Disagree nor Agree
- D. Agree
- E. Strongly Agree

23. My Resource Advisor handles our routine financial management matters.
24. My organization is a consolidation of cost centers whose budgets I cannot control.
25. The information that I include in my budget justification is complete enough to enable someone at MAJCOM level or higher to determine the importance of my organization in relation to that of others.
26. The consolidation of base level budget inputs at MAJCOM level should be accomplished by a meeting of base level representatives rather than by a MAJCOM staff.
27. The amount I actually received in my operating budget this year is sufficient to accomplish my organizational objectives.
28. The Financial Working Group has enough knowledge about the mission of the Wing to make the necessary tradeoffs between organizations to develop the Wing's or Center's budget.
29. The Financial Management Board is an active part of the base level budgetary structure.
30. The Financial Management Board should be an active part of the base level budgetary structure.
31. MAJCOM can estimate my budget needs well enough that my specific budget request is not necessary to develop the total Air Force budget.
32. Zero-base budgeting has provided a significant improvement in the budgeting process.
33. I monitor my organization's spending:
 - A. On a daily basis
 - B. Frequently
 - C. Occasionally
 - D. Only when my Resource Advisor tells me that we have a problem
 - E. Never

PLEASE DISCARD PART I OF THE SURVEY. FORWARD PART II OF THE SURVEY TO YOUR RESOURCE ADVISOR ALONG WITH THE COVER LETTER AND SCORING SHEET.

PART II

TO BE COMPLETED BY THE RESOURCE ADVISOR

This part of the questionnaire should be completed by the resource advisor. Part I of this questionnaire has been completed by your responsibility center manager.

This survey is being administered to an Air Force-wide sample of responsibility center managers and resource advisors. We are interested in your opinions about base level Financial Management and zero-base budgeting.

Section I requests demographic data. Please complete the questions in this section. Your name is not required. Section II is an opinion survey on the base level budgeting system and zero-base budgeting.

The same scoring sheet is used by the responsibility center manager and the resource advisor. The questions in both parts are numbered consecutively. Please darken the block on the scoring sheet corresponding to the letter of your answer to each question. When you have completed the survey, please insert the answer sheet in the attached pre-addressed envelope and mail in out-going official distribution.

SECTION I

34. If military, please indicate your rank.
- A. 0-6
 - B. 0-1 thru 0-5
 - C. E-7 thru E-9
 - D. E-6 or below
35. If civilian, please indicate your grade.
- A. GS-15 or above
 - B. GS-11 thru GS-14
 - C. GS-10 or below
36. Were you a resource advisor during the preparation of the zero-base budgeting inputs for FY-1980 (November to December 1977)?
- A. Yes
 - B. No
37. Were you a member of the Financial Working Group during the preparation of the zero-base budgeting inputs for FY-1980 (November to December 1977)?
- A. Yes
 - B. No

SECTION II

The statements in this part of the survey are designed to get your opinions about how you perceive your role in the base level budgeting process.

Please consider your experience and knowledge of the Financial Management System and zero-base budgeting as you respond to the statements.

There are no right or wrong answers. Please be as objective as possible in responding to the statements.

Please answer Questions 38 through 46 using the following format:

- A. Strongly Disagree
 - B. Disagree
 - C. Neither Agree nor Disagree
 - D. Agree
 - E. Strongly Agree
38. I understand the differences between ZBB and the traditional budgeting system.
39. ZBB has changed our budgeting procedures; it is more than a change in name for the Air Force budgeting process.
40. I need a clear understanding of my organization's objectives to be able to develop our budget.
41. I prepare a specific budget based on the guidelines established by my responsibility center manager.
42. The usual procedure for developing this year's budget is to use last year's budget adjusted for inflation and/or the cost of new programs.
43. During budget preparation, budgeting specialists in the base Comptroller's Office provide assistance when I request it.
44. I usually find out about significant budget preparation changes before my responsibility center manager does.
45. The budget I prepare is just a consolidation of the budgets of our cost centers plus the budget of the responsibility center staff operations.
46. The budget I prepare accurately identifies the funds needed to accomplish our organization's objectives.
47. The zero-base budgeting terminology is:
- A. Confusing
 - B. Difficult but comprehensible
 - C. About as understandable as the previous budgeting terminology
 - D. Easy to understand
 - E. Very simple; I had no problems adjusting to it
 - F. No opinion

Please answer questions 48 through 54 using the following format:

- A. Strongly Disagree
- B. Disagree
- C. Neither Agree nor Disagree
- D. Agree
- E. Strongly Agree

- 48. The budget justification I prepare is thorough enough to enable someone at MAJCOM level or higher to determine the importance of my organization in relation to that of others.
- 49. As a member of the Financial Working Group, I have a good enough understanding of the budgeting process and the mission of the Wing or Center to be able to consolidate and rank budget submissions of the responsibility centers.
- 50. Once the budget is prepared, my job becomes that of monitoring what we spend.
- 51. I do not reevaluate the budget throughout the year.
- 52. My responsibility center manager has delegated the responsibility for routine financial matters to me. He occasionally monitors what I do.
- 53. Preparation of a zero-base budget is more time-consuming than the preparation of a traditional budget.
- 54. Zero-base budgeting has provided a significant improvement in the budgeting process.
- 55. During budget preparation, the Comptroller's Office provides historical financial data when I request it.
- 56. The responsibility for developing long-range budgetary planning at the base level rests with:
 - A. The Wing or Center Commander
 - B. The Financial Management Board
 - C. The Financial Working Group
 - D. The Comptroller's Office
 - E. The individual responsibility center
 - F. No one has that responsibility at our base
 - G. Individuals other than those mentioned above have that responsibility.

PLEASE INSERT THE ANSWER SHEET IN THE ATTACHED PRE-ADDRESSED ENVELOPE AND MAIL IN OUT-GOING OFFICIAL DISTRIBUTION.

APPENDIX D
HISTOGRAMS

VAR001

QUESTION 1

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MISSING CASES

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VAR003 QUESTION 3

CODE			
1	1	GS-15 OR ABOVE	182
2	9	GS-11 THRU GS-14	
3	4	GS-10 OR BELOW	
4	7	OTHER	
0		NO RESPONSE	182
(MISSING)			
		FREQUENCY	
		0	200
		40	
		80	
		120	
		160	

VALID CASES 21 MISSING CASES 182

VAR004 QUESTION 4

CODE		
1	138
	FY-80 BUDGET - YES	
2	54
	FY-80 BUDGET - NO	
3	1
0	10
(MISSING)	NO RESPONSE	
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	FREQUENCY	
VALID CASES	193	MISSING CASES 10

VAR005 QUESTION 5

CODE			
1	34	
	OPERATIONS		
2	38	
	MAINTENANCE		
3	107	
	SUPPORT		
4	14	
	OTHER		
0	10	
(MISSING)	NO RESPONSE		
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	FREQUENCY		
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VALID CASES	193	MISSING CASES	10

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1 AGREE-DISAGREE
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1 STRONGLY AGREE

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FREQUENCY

VALID CASES	MISSING CASES	13
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VALID CASES	MISSING CASES	13
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VAR007 STATEMENT 7

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1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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	VALID CASES	190	MISSING CASES	13
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VAR010	STATEMENT 10	CODE	VALID CASES	MISSING CASES
1	STRONGLY DISAGREE	33	190	13
2	DISAGREE	101		
3	AGREE-DISAGREE	23		
4	AGREE	25		
5	STRONGLY AGREE	8		
0	NO RESPONSE	13		
(MISSING)				
	FREQUENCY			

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VAR015 STATEMENT 15

CODE			
1	**	2	STRONGLY DISAGREE
2	****	14	DISAGREE
3	*****	36	AGREE-DISAGREE
4	*****	105	AGREE
5	*****	12	STRONGLY AGREE
0	****	14	NO RESPONSE
(MISSING)	1		
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	1	80	
	1	120	
	1	160	
	1	200	
			FREQUENCY

VALID CASES 189 MISSING CASES 14

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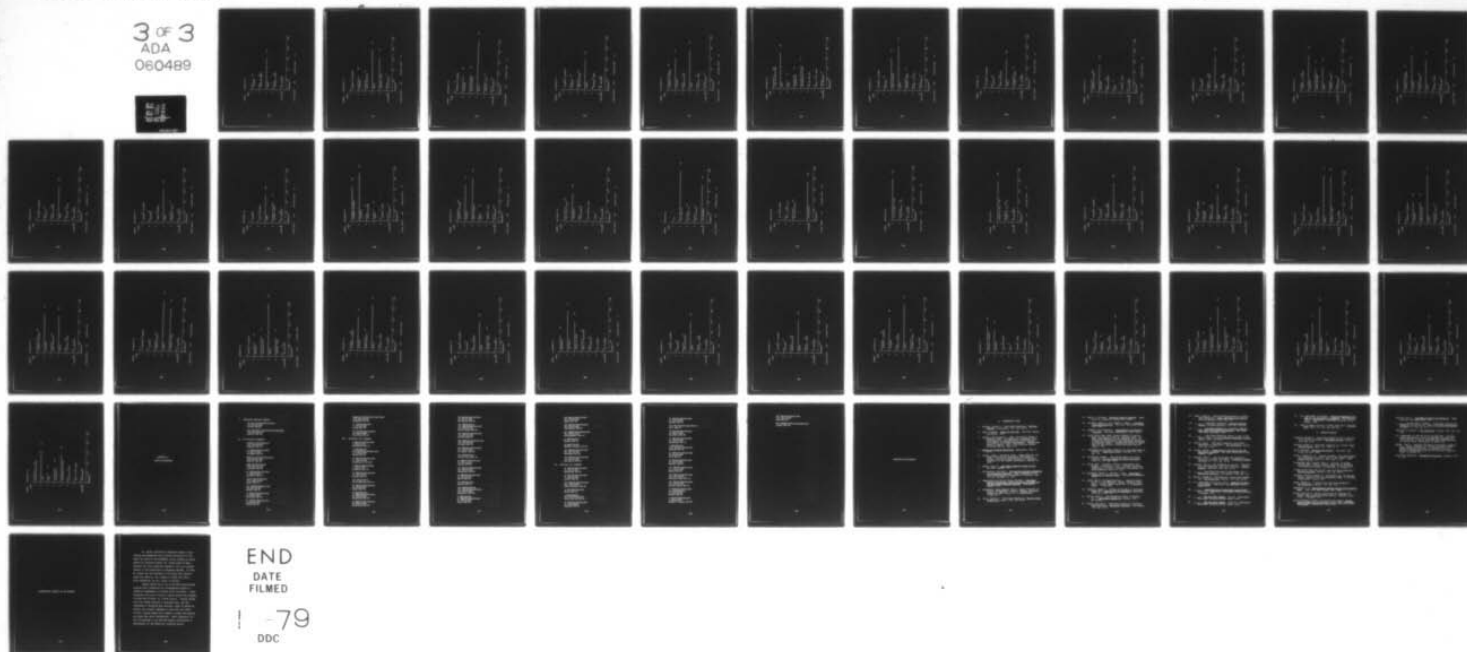
AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCH0--ETC F/G 5/1
A PROPOSED CONCEPTUAL MODEL FOR THE INTEGRATION OF ZERO-BASE BU--ETC(U)
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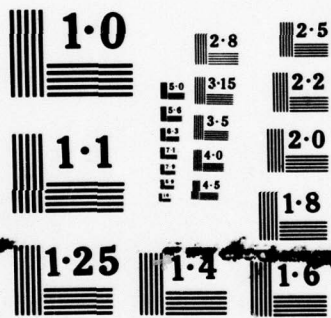
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VAR016 STATEMENT 16

CODE			
1	*****	25	
2	1 DISAGREE		
3	*****	22	
4	1 AGREE-DISAGREE		
5	*****	116	
6	1 AGREE		
7	*****	27	
8	1 STRONGLY AGREE		
9	*****	13	
10	1 NO RESPONSE		
11	*****	1	
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299	1		
300	1		

VALID CASES 100 MISSING CASES 13

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VAR021 STATEMENT 21

CODE

1	24	
	WING OR CENTER CMDR		
2	70	
	FMR		
3	14	
	FMR		
4	26	
	COMPTROLLER		
5	.....	44	
	RESPONSIBILITY CNTR		
6	5	
	NO ONE ON BASE		
7	5	
	NONE OF THE ABOVE		
8	15	
(MISSING)	NO RESPONSE		
	100	
	FREQUENCY		

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[illegible]

VALID CASES	190	MISSING CASES	13
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VAR024 STATEMENT 24

CODE		
1	***** STRONGLY DISAGREE	48
2	***** DISAGREE	104
3	***** AGREE-DISAGREE	19
4	***** AGREE	17
5	** STRONGLY AGREE	2
0 (MISSING)	*** NO RESPONSE	13
 FREQUENCY	40 80 120 160 200

VALID CASES 190 MISSING CASES 13

CODE

	VALID CASES	MISSING CASES
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183

MISSING CASES 13

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VAR030 STATEMENT 30

CODE		
1	***	
2	**	4
	DISAGREE	
3	***	7
	AGREE-DISAGREE	
4	*****	103
	AGREE	
5	*****	76
	STRONGLY AGREE	
0	***	13
(MISSING)	NO RESPONSE	
	.....	40
	.....	80
	.....	120
	.....	160
	.....	200
	FREQUENCY	

VALID CASES 190 MISSING CASES 13

VAR031 STATEMENT 31

CODE			
1	1	.....	64
	1	STRONGLY DISAGREE	
2	1	.....	87
	1	DISAGREE	
3	1	.....	14
	1	AGREE-DISAGREE	
4	1	.....	20
	1	AGREE	
5	1	.....	5
	1	STRONGLY AGREE	
0	1	.....	13
(MISSING)	1	NO RESPONSE	
	1	.....	1
	0	.....	1
	20	.....	1
	40	.....	1
	60	.....	1
	80	.....	1
	100	.....	1
	FREQUENCY		

VALID CASES 190 MISSING CASES 13

VAR035 QUESTION 35

CODE			
1	1	GS-15 OR ABOVE	1
2	15	GS-11 THRU GS-14	15
3	43	GS-10 OR BELOW	43
4	1		1
(MISSING)	143	NO RESPONSE	143
		FREQUENCY	
		0	40
		1	120
		2	160
		3	200

VALID CASES 60 MISSING CASES 143

VAR036 QUESTION 36

CODE

1	*****	*****	151
	1	FY-80 BUDGET - YES	
2	*****	39	
	1	FY-80 BUDGET - NO	
	0	***	13
	(MISSING)	1	NO RESPONSE
	1	.....	.....
	0	.....	.....
		40	.....
		80	.....
		120	.....
		160	.....
		200	.....
		FREQUENCY	

VALID CASES 190 MISSING CASES 13

VAR037 QUESTION 37

CODE		
1	.....	150
	MEMBER OF FWG - YES	
2	.....	40
	MEMBER OF FWG - NO	
0	.....	13
(MISSING)	NO RESPONSE	
	.....	40
	.....	80
	.....	120
	.....	160
	.....	200
	FREQUENCY	

VALID CASES 190 MISSING CASES 13

CODE

1 1 11 11 STRONGLY DISAGREE

2 *****
1 DISAGREE

3 ***** 27
1 AGREE-DISAGREE

4 *****
! AGREE 103

5 ***** 18
I STRONGLY AGREE

0 *** 6
(MISSING) 1 NO RESPONSE

[illegible]

VALID CASES	197	MISSING CASES	6
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3
STRONGLY DISAGREE

3

STRONGLY DISAGREE

6

DISAGREE

6

AGREE-DISAGREE

• •

AGREE

• •

STRONGLY AGREE

6

NO RESPONSE

(MISSING)

100
80
60
40
20
0
FREQUENCY

VALID CASES

197

MISSING CASES

6

CODE

CODE

7

• • • • •

• • • • •

I

197

VAR042 STATEMENT 42

CODE

1	*****	28
1	STRONGLY DISAGREE	
2	*****	72
2	DISAGREE	
3	*****	19
3	AGREE-DISAGREE	
4	*****	68
4	AGREE	
5	*****	10
5	STRONGLY AGREE	
6	*****	6
(MISSING)	NO RESPONSE	
	0	20
	1	40
	2	60
	3	80
	4	100
	FREQUENCY	

VALID CASES 197 MISSING CASES 6

VAR043 STATEMENT 43

CODE

1 *** 3
1 1 STRONGLY DISAGREE
1 1

2 *** 3
1 1 DISAGREE
1 1

3 ***** 17
1 1 AGREE-DISAGREE
1 1

4 ***** 94
1 1 AGREE
1 1

5 ***** 80
1 1 STRONGLY AGREE
1 1

0 ***** 6
(MISSING) 1 NO RESPONSE
1 1

1 1
0 1
20 1
40 1
60 1
80 1
100 1
FREQUENCY

VALID CASES 197 MISSING CASES 6

VAR045 STATEMENT 45

CODE		
1	17 STRONGLY DISAGREE	
2	61 DISAGREE	
3	24 AGREE-DISAGREE	
4	84 AGREE	
5	11 STRONGLY AGREE	
0	6 (MISSING) NO RESPONSE	
		FREQUENCY
		0 20 40 60 80 100

VALID CASES 197 MISSING CASES 6

VAR046 STATEMENT 46

CODE		
1	**	3
1	1	STRONGLY DISAGREE
2	**	9
2	1	DISAGREE
3	****	16
3	1	AGREE-DISAGREE
4	*****	111
4	1	AGREE
5	*****	58
5	1	STRONGLY AGREE
0	***	6
(MISSING)	1	NO RESPONSE
	1	
	0	40
	1	80
	1	120
	1	160
	1	200
		FREQUENCY

VALID CASES 197 MISSING CASES 6

CODE	DESCRIPTION	FREQUENCY
1	CONFUSING	30
2	DIFFICULT	73
3	ABOUT THE SAME	55
4	EASY TO UNDERSTAND	23
5	NO PROBLEMS	12
6	NO OPINIONS	4
0 (MISSING)	NO RESPONSE	6
	TOTAL	200

VALID CASES	197	MISSING CASES	6
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VAR048 STATEMENT 48

CODE		
1	1	STRONGLY DISAGREE
2	13	DISAGREE
3	37	AGREE-DISAGREE
4	117	AGREE
5	29	STRONGLY AGREE
0	6	NO RESPONSE
(MISSING)		
	40	
	80	
	120	
	160	
	200	
	FREQUENCY	

VALID CASES 197 MISSING CASES 6

VAR049 STATEMENT 49

CODE			
1	1	3	STRONGLY DISAGREE
2	1	17	DISAGREE
3	1	30	AGREE-DISAGREE
4	1	118	AGREE
5	1	28	STRONGLY AGREE
0	1	7	NO RESPONSE
(MISSING)	1		
	0	40	
	0	80	
	0	120	
	0	160	
	0	200	
		FREQUENCY	

VALID CASES 196 MISSING CASES 7

60

10

A5

23

6

1.

6

CONF

1	I	*****	101
1	I	STRONGLY DISAGREE	

2 07
1 DISAGREE

3 2 1 AGREE-DISAGREE

4 4 3
I AGREE

5 4 1 STRONGLY AGREE

0 *** 6
(MISSING) 1 NO RESPONSE

FREQUENCY

0 40 80 120 160 200

	VALID CASES	197	MISSING CASES	6
1. Age				
2. Sex				
3. Education				
4. Income				
5. Occupation				
6. Marital Status				
7. Health Status				
8. Living Arrangements				
9. Employment Status				
10. Social Network				
11. Mental Health				
12. Physical Health				
13. Substance Use				
14. Criminal History				
15. Family History				
16. Genetic Factors				
17. Environmental Factors				
18. Lifestyle Factors				
19. Access to Healthcare				
20. Health Insurance				
21. Medical History				
22. Current Medications				
23. Mental Health History				
24. Physical Health History				
25. Substance Use History				
26. Criminal History History				
27. Family History History				
28. Genetic Factors History				
29. Environmental Factors History				
30. Lifestyle Factors History				
31. Access to Healthcare History				
32. Health Insurance History				
33. Medical History History				
34. Current Medications History				
35. Mental Health History History				
36. Physical Health History History				
37. Substance Use History History				
38. Criminal History History History				
39. Family History History History				
40. Genetic Factors History History				
41. Environmental Factors History History				
42. Lifestyle Factors History History				
43. Access to Healthcare History History				
44. Health Insurance History History				
45. Medical History History History				
46. Current Medications History History				
47. Mental Health History History History				
48. Physical Health History History History				
49. Substance Use History History History				
50. Criminal History History History History				
51. Family History History History History				
52. Genetic Factors History History History				
53. Environmental Factors History History History				
54. Lifestyle Factors History History History				
55. Access to Healthcare History History History				
56. Health Insurance History History History				
57. Medical History History History History				
58. Current Medications History History History				
59. Mental Health History History History History				
60. Physical Health History History History History				
61. Substance Use History History History History				
62. Criminal History History History History History				
63. Family History History History History History				
64. Genetic Factors History History History History				
65. Environmental Factors History History History History				
66. Lifestyle Factors History History History History				
67. Access to Healthcare History History History History				
68. Health Insurance History History History History				
69. Medical History History History History History				
70. Current Medications History History History History				
71. Mental Health History History History History History				
72. Physical Health History History History History History				
73. Substance Use History History History History History				
74. Criminal History History History History History History				
75. Family History History History History History History				
76. Genetic Factors History History History History History				
77. Environmental Factors History History History History History				
78. Lifestyle Factors History History History History History				
79. Access to Healthcare History History History History History				
80. Health Insurance History History History History History				
81. Medical History History History History History History				
82. Current Medications History History History History History				
83. Mental Health History History History History History History				
84. Physical Health History History History History History History				
85. Substance Use History History History History History History				
86. Criminal History History History History History History History				
87. Family History History History History History History History				
88. Genetic Factors History History History History History History				
89. Environmental Factors History History History History History History				
90. Lifestyle Factors History History History History History History				
91. Access to Healthcare History History History History History History				
92. Health Insurance History History History History History History				
93. Medical History History History History History History History				
94. Current Medications History History History History History History				
95. Mental Health History History History History History History History				
96. Physical Health History History History History History History History				
97. Substance Use History History History History History History History				
98. Criminal History History History History History History History History				
99. Family History History History History History History History History				

VAR052 STATEMENT 52

CODE			
1	***** 15 I STRONGLY DISAGREE		
2	***** 30 I DISAGREE		
3	***** 20 I AGREE-DISAGREE		
4	***** 106 I AGREE		
5	***** 25 I STRONGLY AGREE		
0	***** 7 (MISSING) I NO RESPONSE		
		0 40 80 120 160 200	FREQUENCY

VALID CASES 196 MISSING CASES 7

VAR053 STATEMENT 53

CODE

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	1																																																																																								

VALID CASES	197	MISSING CASES	6
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CODE

1 1 6 1 STRONGLY DISAGREE

2 ***** 23
1 DISAGREE

3 ***** 30
I AGREE-DISAGREE

4 *****
1 AGREE

5 ***** 24
I STRONGLY AGREE

0 *** 7
(MISSING) 1 NO RESPONSE

FREQUENCY

0 40 80 120 160 200

VALID CASES	196	MISSING CASES	7
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9
10	10	10	10
11	11	11	11
12	12	12	12
13	13	13	13
14	14	14	14
15	15	15	15
16	16	16	16
17	17	17	17
18	18	18	18
19	19	19	19
20	20	20	20
21	21	21	21
22	22	22	22
23	23	23	23
24	24	24	24
25	25	25	25
26	26	26	26
27	27	27	27
28	28	28	28
29	29	29	29
30	30	30	30
31	31	31	31
32	32	32	32
33	33	33	33
34	34	34	34
35	35	35	35
36	36	36	36
37	37	37	37
38	38	38	38
39	39	39	39
40	40	40	40
41	41	41	41
42	42	42	42
43	43	43	43
44	44	44	44
45	45	45	45
46	46	46	46
47	47	47	47
48	48	48	48
49	49	49	49
50	50	50	50
51	51	51	51
52	52	52	52
53	53	53	53
54	54	54	54
55	55	55	55
56	56	56	56
57	57	57	57
58	58	58	58
59	59	59	59
60	60	60	60
61	61	61	61
62	62	62	62
63	63	63	63
64	64	64	64
65	65	65	65
66	66	66	66
67	67	67	67
68	68	68	68
69	69	69	69
70	70	70	70
71	71	71	71
72	72	72	72
73	73	73	73
74	74	74	74
75	75	75	75
76	76	76	76
77	77	77	77
78	78	78	78
79	79	79	79
80	80	80	80
81	81	81	81
82	82	82	82
83	83	83	83
84	84	84	84
85	85	85	85
86	86	86	86
87	87	87	87
88	88	88	88
89	89	89	89
90	90	90	90
91	91	91	91
92	92	92	92
93	93	93	93
94	94	94	94
95	95	95	95
96	96	96	96
97	97	97	97
98	98	98	98
99	99	99	99
100	100	100	100

APPENDIX E
SURVEY ADDRESSEES

I. Aerospace Defense Command

23 Air Div/SG/DCM/DP/DE/OT
148 CSG/CC/BCE
Duluth AFB MN

Air Def Wpns Cen/DTE/AC/SG/DCM/DCR
4756 ABG/CC/BCE
Tyndall AFB FL

II. Air Training Command

Chanute TTC/SG/DCR/TT
3345 ABG/CC/BCE
Chanute AFB IL

14 FTW/SG/DCM/DCO/DCR
14 ABG/CC/BCE
Columbus AFB MS

Keesler TTC/SG/DCM/DCR/TT
3380 ABG/CC/BCE
Keesler AFB MS

USAF MTC/MT/TT/DCR
3700 ABG/CC/BCE
Lackland AFB TX

47 FTW/SG/DCM/DCO/DCR
47 ABG/CC/BCE
Laughlin AFB TX

Lowry TTC/SG/TT/DCR
3415 ABG/CC/BCE
Lowry AFB CO

323 FTW/SG/DCM/DCO/DCR
323 ABG/CC/BCE
Mather AFB CA

12 FTW/SG/DCM/DCO/DCR
12 ABG/CC/BCE
Randolph AFB TX

64 FTW/SG/DCM/DCO/DCR
64 ABG/CC/BCE
Reese AFB TX

Sheppard TTC/SG/DCO/DCR/TT/MS
3750 ABG/CC/BCE
Sheppard AFB TX

71 FTW/SG/DCM/DCO
71 ABG/CC/BCE
Vance AFB OK

82 FTW/SG/DCM/DCO/DCR
82 ABG/CC/BCE
Williams AFB AZ

III. Strategic Air Command

2 BMW/SG/DCM/DCO/DCR
2 CSG/CC/BCE
Barksdale AFB LA

9 SRW/DCM/DCO
100 AREFW/SG/DCM/DCO/DCR
17 CSG/CC/BCE
Beale AFB CA

97 BMW/SG/DCM/DCO/DCR
97 CSG/CC/BCE
Blytheville AFB AR

7 BMW/SG/DCM/DCO/DCR
7 CSG/CC/BCE
Carswell AFB TX

93 BMW/SG/DCM/DCO/DCR
93 CSG/CC/BCE
Castle AFB CA

390 SMW/DCM/DCO
Davis Monthan AFB AZ

96 BMW/SG/DCM/DCO/DCR
96 CSG/CC/BCE
Dyess AFB TX

28 BMW/DCM/DCO
44 SMW/SG/DCM/DCO/DCR
44 CSG/CC/BCE
Ellsworth AFB SD

92 BMW/SG/DCM/DCO/DCR
92 CSG/CC/BCE
Fairchild AFB WA

90 SMW/SG/DCM/DCO/DCR
90 CSG/CC/BCE
FE Warren AFB WY

319 BMW/DCM/DCO
321 SMW/SG/DCM/DCO/DCR
321 CSG/CC/BCE
Grand Forks AFB ND

416 BMW/SG/DCM/DCO/DCR
416 CSG/CC/BCE
Griffis AFB NY

305 AREFW/SG/DCM/DCO/DCR
305 CSG/CC/BCE
Grissom AFB IN

410 BMW/SG/DCM/DCO/DCR
410 CSG/CC/BCE
KI Sawyer AFB MI

308 SMW/DCM/DCO
Little Rock AFB AR

42 BMW/SG/DCM/DCO/DCR
42 CSG/CC/BCE
Loring AFB ME

321 SMW/SG/DCM/DCO/DCR
341 CSG/CC/BCE
Malmstrom AFB MT

22 BMW/SG/DCM/DCO/DCR
22 CSG/CC/BCE
March AFB CA

320 BMW/DCM/DCO
Mather AFB CA

384 AREFW/DCM/DCO
381 SMW/SG/DCM/DCO/DCR
381 CSG/CC/BCE
McConnell AFB KS

5 BMW/DCM/DCO
91 SMW/SG/DCM/DCO/DCR
91 CSG/CC/BCE
Minot AFB ND

509 BW/SG/DCM/DCO/DCR
509 CSG/CC/BCE
Pease AFB NH

380 BMW/SG/DCM/DCO/DCR
380 CSG/CC/BCE
Plattsburg AFB NY

301 AREFW/SG/DCM/DCO/DCR
301 CSG/CC/BCE
Rickenbacker AFB OH

19 BMW/DCM/DCO
Robins AFB GA

68 BMW/DCO/DCM
Seymour Johnson AFB NC

351 SMW/SG/DCM/DCO/DCR
351 CSG/CC/BCE
Whiteman AFB MO

379 BMW/SG/DCR/DCO/DCM
379 CSG/CC/BCE
Wurtsmith AFB MI

IV. Tactical Air Command

67 TRW/SG/DCM/DCO/DCR
67 CSG/CC/BCE
Bergstrom AFB TX

27 TFW/SG/DCM/DCO/DCR
27 CSG/CC/BCE
Cannon AFB NM

355 TFW/SG/DCM/DCO/DCR
803 CSG/CC/BCE
Davis Monthan AFB AZ

33 TFW/DCM/DCO/DCR
Eglin AFB IL

1 SOW/DCM/DCO
834 CSG/CC/BCE/DCR
Eglin Aux Fld #9 FL

23 TFW/DCO/DCR/SG/DCM
23 CSG/CC/BCE
England AFB LA

35 TFW/SG/DCM/DCO/DCR
35 CSG/CC/BCE
George AFB CA

388 TFW/DCM/DCO/DCR/FTD-CC
Hill AFB UT

49 TFW/SG/DCM/DCO/DCR
49 CSG/CC/BCE
Holloman AFB NM

31 TFW/SG/DCM/DCO/DCR
31 CSG/CC/BCE
Homestead AFB FL

1 TFW/DCM/DCO
4500 ABW/CC/BCE/SG/DCR
Langley AFB VA

58 TFW/SG/DCM/DCO/DCR
58 CSG/CC/BCE
Luke AFB AZ

56 TFW/SG/DCM/DCO/DCR
56 CSG/CC/BCE
Macdill AFB FL

347 TFW/SG/DCM/DCO/DCR
347 CSG/CC/BCE
Moody AFB GA

366 TFW/SG/DCM/DCO/DCR
366 CSG/CC/BCE
Mountain Home AFB IN

354 TFW/SG/DCM/DCO/DCR
354 CSG/CC/BCE
Myrtle Beach AFB SC

57 TFW/SG/DCM/DCO/DCR
474 TFW/DCM/DCO
57 CSG/CC/BCE
Nellis AFB NV

4 TFW/SG/DCM/DCO/DCR
4 CSG/CC/BCE
Seymour Johnson AFB NC

363 TFW/SG/DCM/DCO/DCR
363 CSG/CC/BCE
Shaw AFB SC

552 AWCW/AD/FTD-CC/DCM/DCO/DCR
Tinker AFB OK

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