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GENERIC COMPUTER-BASED TRAINER HOST CONCEPT INVESTIGATION

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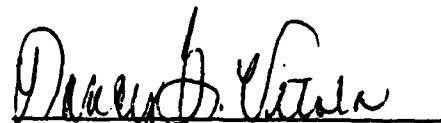
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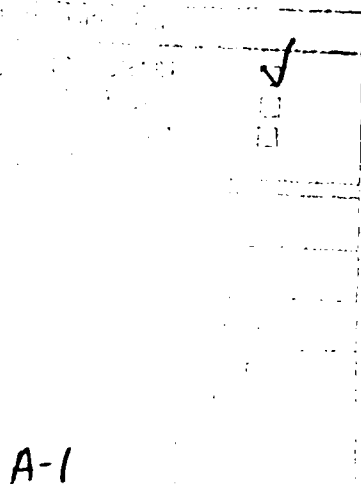
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GENERIC COMPUTER-BASED TRAINER HOST CONCEPT INVESTIGATION

I. INTRODUCTION

The United States Air Force (USAF) is relying on increasingly complex weapon systems. The strategy is to use superior technology to counter the superior numbers of opponent forces. Consequently more than 300,000 USAF personnel receive increasingly complex formal training each year. This training must be accomplished with unchanging or even decreasing resources. To compensate for this situation, the efficiency of training resources must be increased.

Within the United States Air Force there is an increasing use of computer-based training (CBT) to increase training productivity. Increased demand, decreasing hardware costs, and increased software production capability have all lead to an explosion of the use of CBT within the USAF. Computer-based training systems have been increasingly used within all USAF Major Commands (MAJCOMs). This increase in numbers of computer systems has been accompanied by a proliferation of different types of computer systems.

The proliferation of incompatible computers has the potential for generating many problems. If software must run on incompatible machines, then significant software conversion costs can result. Unit costs may be higher since a small number of computers of a given type may be purchased. Each type of system may have different operating characteristics and require a different set of user skills thereby increasing user training costs. Computer proliferation may also increase support costs since each type of computer may have unique maintenance, supply, and support requirements. That leads to increased training and inventory costs to provide these services. There also may be a loss in flexibility since hardware and software cannot be interchanged when failures occur. A certain degree of assignment flexibility may also be since an individual may only be familiar with a small percent of the computer system population.

This study seeks to address these problems by examining the feasibility of developing a family of generic computer-based training hosts (GCBTH) for USAF training use. The family would consist of a set of different size microcomputers. Each computer would cover a different functional range and would be upward compatible for hardware and software. This compatibility means that hardware and software developed for a certain system would also work on larger systems without modification. The need for a family of computers is hypothesized since it would be unlikely that a single computer configuration would be the most effective delivery system for a wide range of training needs.

A generic family of desktop CBT hosts has many potential advantages:

- o Since there is no single standard computer now required for training applications, a family of generic computers, if adopted, would appear to decrease the flexibility of developers. However, by design, a computer family is created to satisfy more than one

unique training/computer requirement. A computer family would satisfy a number of incremental changes in support requirements before it would be necessary to secure an exemption from the requirement to use the selected standard computer. In this way, a computer family may be preferable to any single standard computer (e.g., Zenith 248) which might be adopted by the USAF.

- o A generic family would probably mean a reduction in the number of different types of computers and would produce the cost advantages of larger buys.
- o A smaller total number of units would be necessary since some duplication of units could be eliminated due to greater transportability of courseware.
- o There would be a decrease in life-cycle costs due to decreased maintenance costs. This decrease would result from the use of maintenance skills that were common across the family and the reduction of parts inventories due to interchangeability of parts. There would also be an increased probability for swapping out parts from backup units.
- o Industry development activities might increase due to a concentration on a relatively small number of system architectures. It might also increase pressure on vendors to give greater priority to system compatibility during design.
- o A compatible family of computers would make it easier to establish a common set of computer procedures and so reduce computer operations training. This compatibility could have an especially large impact on small units by reducing temporary duty (TDY) needs.
- o Portability would increase. Hardware and software would be more portable since many operational skills would be common across locations.
- o It would be easier to establish a common data architecture for training software. This commonality would make it easier to collect training performance data across training systems.
- o Courseware could be produced more economically since a single application could serve on a larger population of delivery systems without translation. The updating of courseware would be easier for the same reason. The development time for new courseware would decrease since developers could concentrate their activities on a single system architecture and in general would be able to concentrate on courseware rather than delivery system development. If unique components are necessary for a new system, it might still be possible to get an early start on development by using the standard components of an existing system. Development times would also be reduced since procurement delays would be shortened if the family of systems was available through a continuing procurement contract.

- o Finally, a standard interface to peripheral devices would make it easier to insert embedded training microcomputers in the early stages of weapon system development.

Although there are many advantages to using a generic family of microcomputers as training hosts, there are some potential disadvantages:

- o Relative to a situation with no standards whatsoever, it would be necessary to go through an exemption process in order to obtain systems with functional requirements outside the capabilities of the generic system or systems.
- o There could be significant conversion costs. As incompatible microcomputers are phased out of use, it would be necessary to convert software and retrain administration and development personnel.
- o If a single manufacturer is used to supply all of the generic systems, this presents the potential for typical problems associated with a single source, such as production line constraints and less competitive pricing.

The purpose of this study was not to specify the exact composition of a generic computer-based trainer family. Rather, the purpose of the study was to determine the feasibility and benefit of developing a generic or generic family of desktop computer-based hosts for USAF training purposes.

For study purposes, data collection was limited to those microcomputer-based training applications being used by the USAF MAJCOMS based in the continental US. The basic approach taken in the study was to identify the central control unit (CCU) requirements for a sample of training applications, form candidate generic families which could satisfy those requirements, and then evaluate the families in order to determine if one of the families could satisfy the requirements for a generic trainer host family. For the purposes of this study, the CCU was defined as a desktop computer without any peripheral devices such as video displays or printers. The CCU included the central processing unit (CPU) which performs the primary system calculations, the random access memory (RAM) for data storage, the power supply, support chips (which perform various housekeeping functions), and the input and output channels (ports) for data communication.

The study had four basic phases. During the first phase, information was collected on the current, planned, and projected functional requirements of AF microcomputer-based training applications. Examples of functional requirements would be that an application needed a certain minimum response time or needed to be able to store a certain number of pages of text. Data was collected on minimum functions requirements rather than hardware requirements (such as CPU speed or RAM size) since the possibility existed that some applications might currently reside on microcomputers with excess functional capacity. Once the minimum functional requirements were collected, they were then translated into hardware requirements using a set of transformation rules. This methodology assured that a truly minimum set of requirements was generated for each application.

During the second phase of the study, the data base was collapsed to form a set of basic CCU system configurations. These basic systems represented all of the CCU configurations found in the sample. In the third phase, these basic systems were combined in various ways to form the candidate generic host families. Finally, in the fourth phase of the study, these candidate families were evaluated on their feasibility, operability, and relative costs.

II. METHODS

Sampling Method

All USAF microcomputer-based trainer applications were considered as candidates for inclusion in the examined population. The population included stand-alone microcomputer applications and microcomputers which served as intelligent delivery devices for networked or time-sharing training systems. Population definition data was collected through a literature review and interviews with USAF personnel.

Since it was beyond the scope of this study to examine the entire population of USAF microcomputer-based trainer applications, a sample of the population was selected for detailed analysis.

Since the actual population distribution of USAF training applications was unknown, a formal sampling methodology was not used. Instead, data collection was based on the organizational structure of the AF. The sample was formed by surveying the training applications within each of the continental U.S.-based MAJCOMs. Within each MAJCOM, an effort was made to identify applications for each level of four application attributes. The four application attributes that were monitored during data collection were: (1) student grade (enlisted/officers), (2) trainer types (page turners/Computer-assisted instruction/simulators), (3) organization administering the application (unit/base/MAJCOM), and (4) training content (operations/maintenance/ support). Student grade refers to whether the typical student in the application is an airman or an officer. Trainer type refers to the basic classes of computer-based training methodology used by the application. The administering organization is the AF organization which manages the use of the application. And finally, the training content is the general class of subject matter covered by the application.

The final size of the sample was determined by monitoring sample stability. As data collection continued, the sample distribution gradually stabilized until the addition of new data did not significantly alter the characteristics of the sample. Indeed, near the end of the data collection phase, the majority of identification of new applications provided by USAF personnel were for applications that were already contained in the population sample.

Data Collection Methodology

Three methods were used for data collection: a literature review, personnel interviews, and application demonstrations.

Literature review. The literature review used two basic approaches: computer data base searches and manual library searches. Three computer data bases were searched: Defense Technical Information Center (DTIC), Dialog-Computer Data base, and PsychLit. Manual searches were conducted at three university libraries. These searches were based upon combinations of the following project keywords: microcomputer, computer-assisted instruction, computer-based training, train(ers/ing), generic, requirements, selection, specification, projections, cost-benefits,

military, and Air Force. Several hundred peripheral references were generated by the search. However, no projects were located which had objectives and scope comparable to the GCBTH project, or as a consequence, had data bases which could be included in this study.

Only one paper was located which was of direct interest to this project. It was an interim technical paper by Killion, Boyle, and Eaton (1987). The paper is not a research report, but rather a discussion of the need for the design of a "common computer-based system for aircrew training." The authors suggest an approach similar to that used for the Z-150 computer acquisition and present a list of core system requirements for consideration as specifications for a standard training system.

Several other groups with an interest in the problems of computer proliferation were identified, but as far as could be determined, these groups have produced no documentation of their activities.

Interviews. Telephone interviews were the principal method of data collection for the study. Site visits were made to Keesler, Gunter, Maxwell, and Randolph Air Force Bases (AFBs) for personal interviews. Interviews were conducted with the AF training personnel associated with each of the applications selected for the population sample. Training development and administration personnel were the primary sources of information. If sufficient data were not available from training personnel on the specific training application, then, where possible, a hands-on examination of the application was accomplished.

Interview data were collected in two categories: general applications information and application-specific information. Three data collection question sets were used to collect this information: one set to identify general training applications and two sets for obtaining specific information on each identified application.

General training application information data collection. Table 1 contains the interview checklist which was followed to collect general applications information. The general application information included the locations of applications, contacts for further information, and the identification of planned and projected applications.

Training application information checklist. In addition to general training application information, detailed information about the identified applications was collected using a training application information checklist and a functional characteristics checklist. The application information checklist is presented as Table 2. This list guided the examiner in the collection of general information about a specific application. The general application information included non-functional information such as life-cycle expectations and demand data (number of units, number of students, and hours per student). The concept of demand value of a system played a significant role in formation of computer families. Each computer-based training application had a demand value associated with it. Three elements were considered in development of each application demand value:

- o The number of microcomputer units involved in the application;

TABLE 1. GENERAL INFORMATION PLAN

INTERVIEWEE

NAME:

RANK:

DUTY POSITION:

1. What current training applications do you have knowledge of?
- (Fill out an application description and checklist form for each application).
2. What problems are you currently having because of incompatible applications?
3. Do you use any support microcomputers (operational and training aids)? If possible, fill out an application description and checklist form for each aid.
4. What applications do you currently have in the planning stage?
(Fill out forms for each application.)
5. Do you have any projections about future USAF training applications?
(e.g., shifts in the current population parameters, users, locations, trainer types, functional content; functional characteristics shifts; i.e., new functions, shifts in old; technology shifts.)
6. What weights would you assign to our evaluation criteria?
7. Can you suggest other contacts with information that would be of value to this project?
8. Can you suggest any documents which might be of value to this study?

TABLE 2. TRAINING APPLICATION INFORMATION CHECKLIST

APPLICATION NAME: Official Air Force title for application

VENDOR/PROPONENT: Manufacturer/developer - Air Force agency sponsor/
administrator

TYPE OF APPLICATION: Type of trainer, (CAI, simulator, etc.)

AUDIENCE: Rank, specification title (duty position)

ORGANIZATIONAL LEVEL: Used at what Air Force organizational level

FUNCTIONAL CONTENT: Operations/support/maintenance

LOCATIONS: Where are they used

NUMBER OF UNITS: Number at each location

STUDENT HOURS/UNIT: Student hours for each application unit

PROJECTED APPLICATION LIFE: Projected date of end of use

INFORMATION SOURCES: Documents/personnel/demonstration location

STATUS: Stage of development: experimental, under development,
prototype, operational testing, testing and evaluation, in
production, preproduction copies, delivery date, implemented

PRINCIPAL TRAINING MISSION: Skills (level: initial/refresher) and
knowledge to be transmitted

ESTIMATED PROCUREMENT COST: Development and implementation cost

ESTIMATED ANNUAL SUPPORT COST: Annual maintenance, supplies, etc.

FUNCTIONAL INADEQUACIES: Any changes needed in the functional
characteristics of the application?

MICROCOMPUTER INADEQUACIES: Does the current delivery system satisfy all
the application's functional needs?

COMMENTS:

- o The number of students receiving training; and
- o The number of hours of training scheduled per student.

These factors were combined in a multiplicative function to result in the demand value associated with each application ($nunits \times nstudents \times nhours$ per student = demand value).

Training application functional characteristics checklist. Detailed information on the physical and functional characteristics of applications described in the general information checklist and the training application information checklist was collected using a functional checklist. The checklist is presented as Table 3. For each topic in the checklist, the interviewer gathered information on whether that functional characteristic was required for the operation of the application, and if appropriate, on the required levels of performance associated with that characteristic. Performance levels were classified into categories, each of which equaled a performance range. For example, "number of colors displayed" has three possible responses: (1) low (0-4 colors), (2) medium (5-16 colors), and (3) high (17-256 colors). The boundaries for response categories were based upon current commercial classifications.

Data Analysis

Transform methodology. The first step in the analysis of the data was to transform the physical and functional characteristics of the applications into a set of physical and functional microcomputer requirements. Since a single functional characteristic can be dependent upon multiple system capabilities, a systematic method was required to ensure that all of the hardware requirements were determined for each function. This specification process was guided by the transform flowchart listed in Tables 4 and 5.

The inputs for the flowchart are the functional characteristics of the surveyed applications (from the functional checklist). The output was a hardware specification list which defined the minimum microcomputer capabilities necessary to support the functions of that application.

The process started with the survey-generated list of functional characteristics for a specific application. Each characteristic was then examined for its needs within each of five computer capability classes: input, output, processing, environmental, and other. Within each capability class, an identical set of questions was asked for each application characteristic:

- o Did the characteristic generate any needs within this capability class? That is, were there any functions within this class of microcomputer capabilities that are necessary to produce the functional characteristic? For example, a hi-resolution graphics characteristic might produce computer capability requirements in output and processing, but not in the input and environmental classes.

TABLE 3. TRAINING APPLICATION FUNCTIONAL CHARACTERISTICS CHECKLIST

Functional Environment

OUTPUT

- I. Ports: What forms of output does the application use?

INPUT

- II. Ports: What forms of input does the application use?

PROCESSING

- III. Multitasking: Does the application do more than one task at a time (true concurrent processing)?

A. Small set of users, small multitasking load

B. Large set of users, large multitasking load

- IV. Response Times: In general, how quickly does the system need to respond to inputs?

- V. Keyboard Processing: Does the application use keyboard input?

- VI. Network Server: Does the application act as a network server?

- VII. Math Processing: Does the application have a heavy math processing load (e.g., graphics, computer-assisted design, spreadsheets, etc.)?

- VIII. Artificial Intelligence (AI) Processing: Does the application use AI techniques?

A. Response speed low, simple models (small vocabulary natural language processing, expert systems $\leq$ 500 rules)

B. Relatively high response speeds, larger models, (expert systems $>$ 500 rules, expert system development)

- IX. Video Processing: Does the application produce video output?

- A. Text: Is this output only text (and character graphics)?

1. $<$ 80 columns x 24 rows

2. $\geq$ 80 columns x 24 rows

TABLE 3. TRAINING APPLICATION FUNCTIONAL
CHARACTERISTICS CHECKLIST (cont.)

- B. Graphics: Are graphics output?
 - 1. Color: Are color graphics output?
 - a. Quality: What are the color graphics quality requirements?
 - 1. < 640 x 200 resolution, < 16 colors
 - 2. 640 x 200 - 1023 x 1023, 17-256 colors
 - 3. 1024 x 1024 - 4096 x 4096, < 32,000 colors
 - 4. > 4096 x 4096, > 32,000 colors
 - 2. Black and White: Are black and white graphics required (bit graphics)?
 - a. Quality: What quality of black and white graphics are required?
 - 1. < 740 x 348 resolution, < 16 shades
 - 2. > 740 x 348 resolution, > 16 shades
- X. Audio Processing: Does the application produce sounds?
 - A. Tone generation: Does the application produce nonvocal sounds?
 - 1. Quality: What quality of sounds are required?
 - a. Simple sound cues, one voice
 - b. Complex sounds, 2-8 voices
 - c. Hi-fidelity sound, > 8 voices
 - B. Voice Synthesis: Does the application use voice output?
 - 1. Quality: What quality of voice output is required?
 - a. Low-fidelity, mechanical sounding
 - b. Hi-fidelity, multiple voices
 - C. Voice Recognition: Does the application accept voice input?
 - 1. Quality: What quality of voice recognition is required?
 - a. Recognizes isolated words (pauses between words required) and context sensitive
 - b. Recognizes continuous speech

TABLE 3. TRAINING APPLICATION FUNCTIONAL
CHARACTERISTICS CHECKLIST (cont.)

- XI. Information Storage: What are your storage requirements?
- A. What size is the courseware?
 - B. What size is the instructional management software?
 - C. What size are the student records?
 - D. Are data and programs exchanged by hand-carry?

ENVIRONMENT

- XII. Environment Functions: Is it a fixed, movable, or mobile application?
- A. Do you move the application?
 - 1. How far?
 - 2. By what method?
 - B. Are there size limits for the application?
 - C. Is power supplied at the use site?
 - 1. If not, how long is the application used before it returns to a power-available location?
 - D. Is the climate stable?
 - E. Is the application classified?

TABLE 4. TRANSFORM FLOWCHART

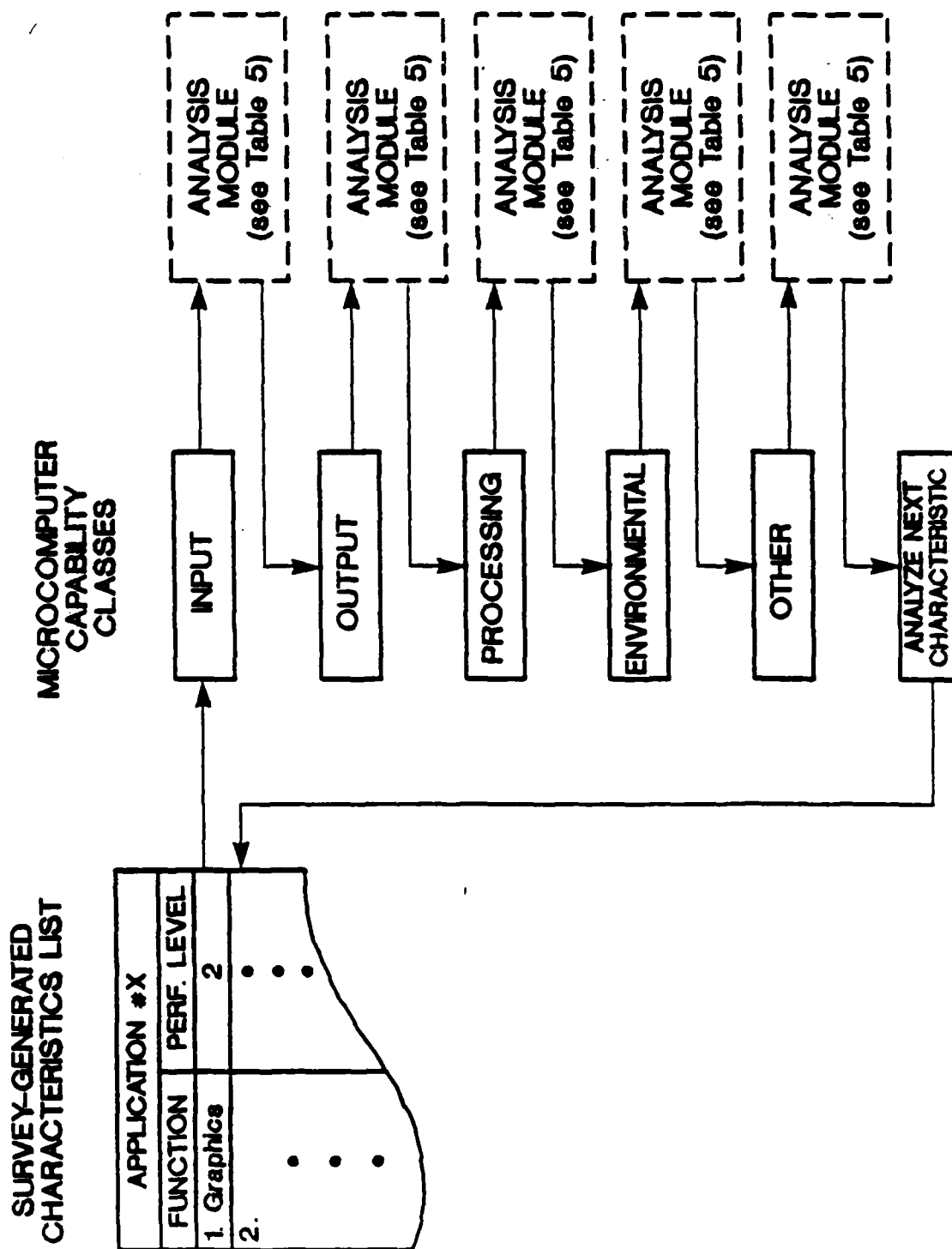
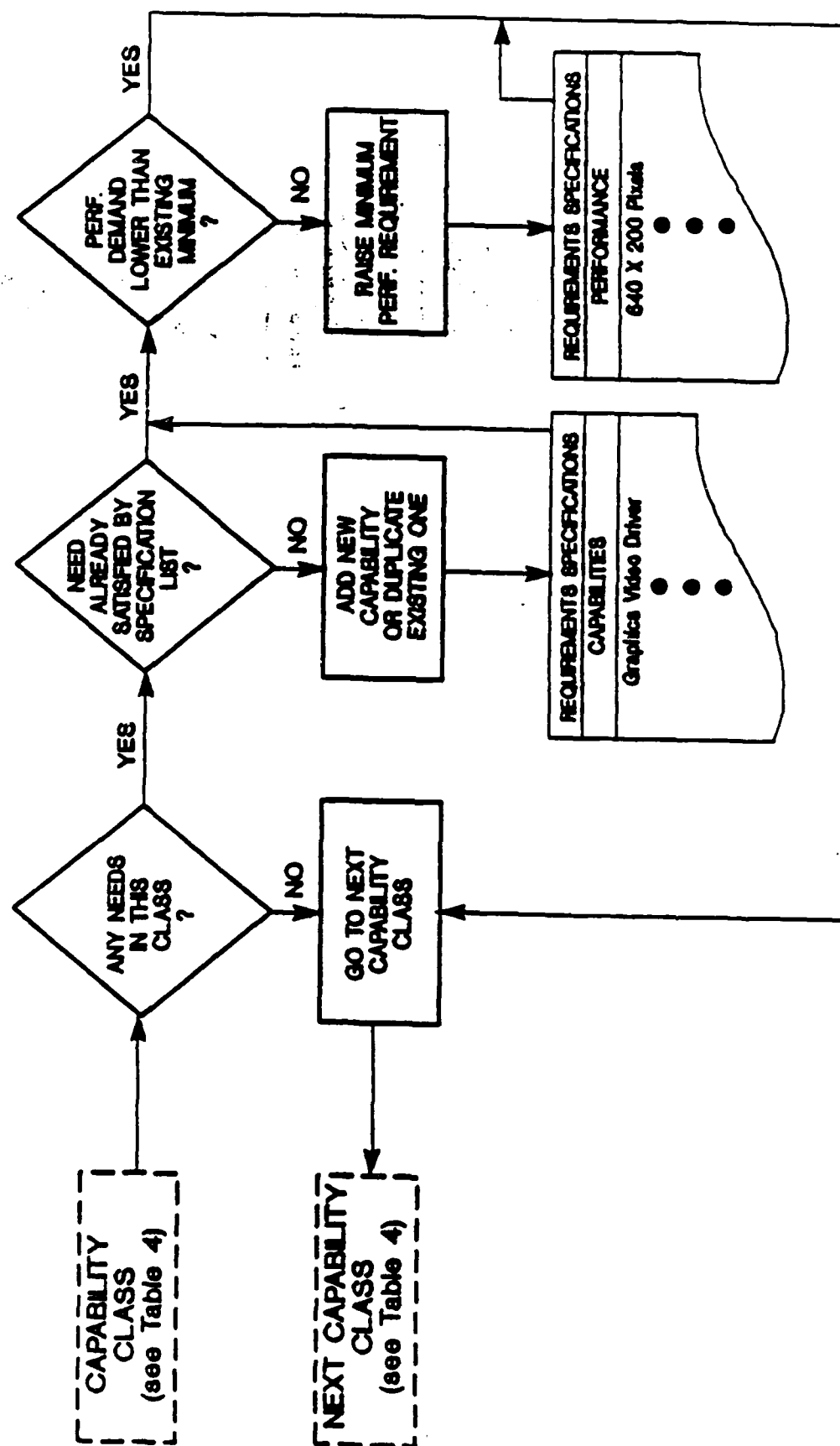


TABLE 5. TRANSFORM FLOWCHART-ANALYSIS MODULE



- o If it did generate a need, was that need already satisfied by a capability in the hardware specification list? In other words, were the capabilities that have already been generated for the list sufficient to produce this functional characteristic? If not, then the transform rules in Table 6 were used to determine the new capabilities that needed to be added to the specification list. The functional characteristic is located in the left hand column of Table 6 and the corresponding capability requirements are found in the right column.
- o Was the performance level required by this characteristic higher than the currently specified performance level? If it was, the performance level of the capability was raised to satisfy the application's minimum requirements. For example, a minimum performance specification may already exist for graphics resolution. If a new characteristic passed through with a higher performance requirement, then the minimum specification was raised to satisfy the new requirement.

After all of the functional characteristics for an application had passed through the flowchart, the result was a list of minimum capability requirements for the application. The capability requirements of the individual applications were then compiled to form a requirements data base representing the entire sample (see Appendix A).

Once the specific hardware requirements for an application were generated, it was then necessary to generate the specifications for the two system components with broad functional dependencies: random access (main) memory (RAM) and the central processing unit (CPU). The RAM size was determined by simply scanning the hardware specification list for the characteristic with the largest memory requirement. This value was then compared against the software RAM requirements and the larger of the two figures was used as the application's RAM requirement.

Shown in Tables 7 and 8 is the methodology for determining the system CPU requirements. The first column of Table 7 lists the system capabilities which have a major impact on CPU processing requirements. To the right are columns for each of the performance levels possible for the characteristics. Within the columns are demand points which were assigned based upon how much processing capability was required to generate that performance level for that particular characteristic. For each application then, a set of demand points was obtained for the listed characteristics. To determine the CPU required, the maximum demand point value for each application was located in the first column of Table 8. The second column of the table displays the corresponding CPU required by each application. Depicted in the third column is the average clock speed associated with each CPU demand value. It should be noted that there are two 16 bit CPUs listed in Table 8. Both CPUs use 16-bit arithmetic logic units for calculations, but the 16B CPU uses an 8-bit data bus (8 parallel lines for data transmission) while the 16A CPU has a 16-bit data bus. The 16B CPU can provide some cost savings when there is not a need for the higher data transmission rates.

TABLE 6. TRANSFORM TABLE: FUNCTION CHARACTERISTICS
X HARDWARE CAPABILITIES

<u>Application Characteristics</u>	<u>Hardware Capability</u>
I. Number output devices	Number output ports
II. Number input devices	Number input ports
III. Multitasking	
A. Level 1	Multiple CPUs, 32 bit CPU, > 640K
B. Level 2	> 32 bit cpu, > 640K
IV. Keyboard input	Keyboard processor
V. Network server	Network server subsystem
VI. High math load	Math coprocessor comparable to CPU word size
VII. Artificial Intelligence	
A. Level 1	16 bit CPU, 640K min.
B. Level 2	AI subsystems, 32 bit CPU, > 640K
VIII. Video Processing	
A. Text	
1. Level 1	80 col x 24 row video adapter
2. Level 2	> 80 col x 24 row adapter
B. Graphics	
1. Color	
a. Level 1	640 x 200, 16 colors max; graphics adapter
b. Level 2	640 x 200 - 1023 x 1023, 17-256 colors, graphics subsystem
c. Level 3	1024 x 1024 - 4096 x 4096, < 32,000 colors, graphics subsystem
d. Level 4	> 4096 x 4096, > 32,000 colors, graphics subsystem

TABLE 6. TRANSFORM TABLE: FUNCTION CHARACTERISTICS
X HARDWARE CAPABILITIES (cont.)

<u>Application Characteristics</u>	<u>Hardware Capability</u>
IX. Audio Processing	
A. Tone generation 1. Level 1 2. Level 2 3. Level 3	Sound processing chip Sound subsystem, 2-8 voices Sound subsystem, > 8 voices
B. Voice Synthesis 1. Level 1 2. Level 2	Low-fidelity single voice, voice synthesis subsystem High-fidelity, multiple voices, voice synthesis subsystem
C. Voice Recognition 1. Level 1 2. Level 2	Voice recognition adapter, without coprocessor Voice recognition subsystem, with coprocessor
X. RAM	
A. Pages of text	1 page text = 2.5K RAM
B. Pages of graphics	# graphics pages x graphics level requirements per page
C. Pages of data	1 page = 2.5K RAM
XI. Environmental	
A. Transportability	Transportable design
B. Power source	Self-contained power
C. Extreme environment	Ruggedized
D. Secured application	TEMPEST characteristics

TABLE 7. CPU SIZE DETERMINATION

Processing Functions	Level Required:	0	2	3	4	5
		<u>CPU Demand Values</u>				
o Multitasking		1-3	4	5		
o Response Times		1	2	3	4	5
o Math Processing		1-2	3	4	5	
o Artificial Intelligence		1-2	3	4	5	
o RAM Size	1. < 64K		1	2-3	4	5
	2. > 64K - < 4M					
	3. > 4M - < 16M					
	4. > 16M					

TABLE 8. CPU SPECIFICATION

<u>CPU Demand Value</u>	<u>CPU Bit Size</u>	<u>Average Clock Speed</u>
1	8	2 MHz
2	16B (8-bit data bus)	6 MHz
3	16A (16-bit data bus)	10 MHz
4	32	16 MHz
5	>32	>25 MHz

Generation of the sorted requirements list. The next step in the analysis was to reduce the size of the data base. This reduction was accomplished by removing from the data base redundant and nondiscriminating system characteristics.

It was not necessary to retain all of the application characteristics since the values of a core set of characteristics were determined by combining the values of other characteristics. For example, CPU performance values were determined by the requirements for multitasking, response times, artificial intelligence, graphics, and processing load.

In addition to removing the redundant characteristics, another set of characteristics was removed from the data base. These characteristics were eliminated because they failed to discriminate significantly between the applications in the sample, i.e., almost all applications had common values for these characteristics. For example, all but one application used a keyboard, therefore, the characteristic was dropped since it did not discriminate between applications. Four classification characteristics remained after reduction of the data base: CPU size, RAM size, use of a math coprocessor, and classified data processing (TEMPEST) requirements.

Once the data base was reduced, all of the demand values (see page 6 for definition) were divided by 100 to make subsequent calculations simpler. The applications were then sorted by the values for each of the remaining four characteristics (see Appendix B for the reduced and sorted data base).

Generation of basic systems configurations. Once the table of sorted applications was produced, the next step was to collapse the data by summing the demand data for systems with identical characteristics. This step produced a set of basic "generic" system configurations (see Table 11, page 26). These basic system configurations represent all of the different system configurations necessary to satisfy the entire range of hardware requirements for the training applications in the sample. After the data base was reduced, three steps remained in the analysis: the identification of all the unique system configurations contained in the sample; combining these basic systems to form candidate families; and finally, the evaluation of the families to determine their suitability to serve as a generic training host family.

Generation of system families. The basic systems were then combined in various ways to form the candidate system families. Since the purpose of the study was to determine the feasibility and benefit of developing a generic or generic family of desktop computer-based hosts for USAF training purposes, it was not necessary to evaluate all possible system family combinations. Therefore, three basic methods were chosen for forming the trial system families. The first set of families (the Basic systems families) was formed by using all of the basic systems. The second set of families (CPU families) was formed by using only the largest basic system for each CPU size range. And finally, the third set of families

(AFSSC families) was formed by using only those basic systems which matched the performance characteristics of the AF Standard Small Computer (AFSSC) - the Zenith Z-248.

Within each family type, a series of families was formed by starting with the complete set of systems (Basic systems, AFSSC systems, or CPU systems). The Systems were then sequentially removed one at a time in order of least importance to form a series of different size families. The family series ended when a family of only one system was reached.

Two family series were generated for the Basic systems and two family series were generated for the AFSSC systems. These pairs of sets were based on two different perceived measures of system importance; (1) the number of units in use, and (2) the demand values (number of units x number of students x number of hours per student). The first set of families was generated by using number of units in use: after each evaluation the next family was formed by removing the remaining system with the smallest number of units in use. The process was repeated for the second set of families except that systems with the smallest demand value were removed each time.

In this process, each time a system was eliminated from a family it was necessary to decide how to meet the needs of the training applications which were served by the system being dropped - the system's "coverage range." The following rules were used to determine the incorporation of the lost system's coverage range into the family.

- o If the system represented $> 1\%$ of the training sample (in demand value or number of units), then that system's range was added to the coverage of the next higher system whose characteristics would meet the needs of the range.
- o If the dropped system represented $< 1\%$ of the sample then:
 - If retention of the range added significant cost because new capabilities would have to be added to the adoptive system, then the range was dropped from the family's coverage.
 - If retention did not add significant cost, the system's range was added to the next higher system which satisfied that range's needs.

For the CPU families, the system removal sequence was based solely upon CPU size. The first set of families was generated by sequentially removing the system with the smallest CPU. The second set of families was generated by sequentially removing the system with the largest CPU.

Evaluation of families. The families of generic systems were then evaluated using a set of weighted evaluation criteria. The evaluation methodology is shown in the evaluation matrices displayed in Tables 9 and 10. The evaluations were composed of two basic components: a system evaluation matrix (shown in Table 9), and an overall family evaluation matrix (shown in Table 10). The system evaluation matrix is repeated once for each of the systems in the family being evaluated. The family evaluation matrix is used once for each family.

TABLE 9. SYSTEM EVALUATION MATRIX

SYSTEM CRITERIA	WEIGHTS	SYSTEM <u>M(j)</u>	FAMILY <u>F_k</u>	
			<u>RATING</u>	<u>WEIGHT X RATING</u>
- Technical Feasibility	<u>W₁</u>	<u>M_j</u>	<u>R_{1j}</u>	<u>V_{1j}</u>
- Available Resources	<u>W₂</u>		<u>R_{2j}</u>	<u>V_{2j}</u>
- Operational Suitability	<u>W₃</u>		<u>R_{3j}</u>	<u>V_{3j}</u>
- Procurement Costs	<u>W₄</u>		<u>R_{4j}</u>	<u>C_{1j}</u>
- Life Cycle Costs	<u>W₅</u>		<u>R_{5j}</u>	<u>C_{2j}</u>
			Sums = <u>ΣV_{1j}</u> <u>ΣC_{1j}</u>	
			Demand: <u>D_j</u> Proportional Weight (PW) = <u>PW_j</u> General Value (PW _j *ΣV _{1j}) = <u>GV_j</u> General Costs (PW _j *ΣC _{1j}) = <u>GC_j</u>	

TABLE 10. FAMILY EVALUATION MATRIX

<u>FAMILY EVALUATION FACTORS</u>	<u>WEIGHTS</u>	<u>FAMILY</u>	<u>RATING</u>	<u>WEIGHT X RATING</u>
- Family Costs	W_6	F_k	R_{6k}	V_{6k}
- Family Requirements Coverage	W_7		R_{7k}	V_{7k}
Sum of System General Values = $\sum_j (GV_j)$ Sum of Individual System Costs = $\sum_j (GC_j)$ The Family Cost = V_{6k} Family Requirements Coverage = V_{7k}				
Total Family Value = $(\sum_j (GV_j) + \sum_j (GC_j) + V_{6k} + V_{7k}) = FT_k$				

System evaluations. In the system matrix, the first column lists the criteria used for the evaluation of the individual systems. Five criteria were used for evaluation of each system: technical feasibility, available resources, operational suitability, procurement costs, and life-cycle costs.

Technical feasibility represents the probability that, within the near future, hardware will be available with the capabilities specified for that system. Operational suitability is a measure of how well the system will satisfy the functional needs of the training applications that will be delivered on the system.

Available resources are the USAF resources which already exist and can be directly transferred for use on the new system. This availability includes physical resources such as existing software, hardware, and facilities; and knowledge resources such as programming experience. Procurement costs are the costs for the development and implementation of the system. Finally, life-cycle costs are the costs incurred during the operational life of the system. These data include such costs as maintenance and supplies. These values were based on the wholesale prices of a single computer distributor. It is important to note that the cost figures derived by this process were used only as relative cost values. They were not intended to reflect actual USAF costs or lowest commercial costs.

The second column of Table 9 contains the weights (W_j) given to each of the system criteria. The weights used in this study are average values determined by an informal survey of 12 AF personnel contacted during data collection. These personnel represented a cross-section of the duty positions and grades found in the population sample. The resulting weights are not intended to represent the actual weights which should be used in a final evaluation, but rather represent an example of the weights which might be used.

Each system then has four columns of information displayed in the matrix. The first column of system information shows the identification numbers (M_j) of the basic microcomputer systems contained in each family.

The second column contains the ratings given to an individual system for each of the system criteria. All scores are subjective ratings assigned by the project team based upon survey data and the project team expertise. For all criteria, the ratings range in value from 1 to 5, with 1 indicating a very low rating and 5 indicating a very high rating. Therefore, all final scores can be interpreted in the same way, the higher the final score, the better the degree to which the systems satisfy the evaluation criteria. The original approach was to select a single constant, 1 for example, for all weights. However, it became apparent that a more meaningful value could be obtained if feedback was obtained from subjects and used to establish weights. This approach was suggested to the USAF and approved for use in the study.

To assure consistent assignment of the ratings, assignment tables were developed. For each evaluation criterion the range of computer functional values found in the sample was divided into 5 categories. Rating values of 1 to 5 were then assigned to each category.

The determination of ratings for a particular system was accomplished by looking up that system's value for a characteristic, seeing what category that value falls in, and then assigning the system the rating that corresponds to that category. For example, the range of procurement costs for the basic systems was divided into 5 equal intervals. A system with procurement cost in the highest cost interval received a procurement rating of 1 (lowest) and a system with a procurement cost falling in the lowest cost interval received a rating of 5 (highest) for procurement cost.

The final 2 columns for each system contain the products (V_{ij} and C_{ij}) of the ratings and criteria weights for the 5 evaluation criteria. For each system the first 3 products (V_{1j} , V_{2j} , and V_{3j}) are summed to produce a general system sum (SV_{ij}). The last 2 products (C_{1j} and C_{2j}) are summed to produce a general costs sum (SC_{ij}).

The row below these sums contains either the demand value (D_j) or the number of units for the system (U_j) depending upon the type of evaluation being conducted.

A proportion weight (PW_j) is then calculated for each system within a family. The PW determines the relative weight each individual system's values will be given in the calculation of total family values. For evaluations based on demand, this figure is the ratio of the system's demand divided by total family demand. For evaluations based on units, the PW is the ratio of the number of system units over the number of total family units.

Two final adjusted system scores are derived by multiplying the PW by each of the 2 system ratings sums to produce the general value (GV_j) and general costs (GC_j) for the system.

Family evaluations. Shown in Table 10 is the family evaluation matrix which was used for evaluating each family of systems as a whole.

The first 2 factors are the family evaluation criteria for family costs and family requirements coverage. Family costs represent those costs which vary as the number of different types of systems in a family change. This change would include costs such as inventory, training, support, and maintenance. Since it is beyond the scope of this study to determine the actual costs for these factors, a linear relationship was assumed for the relationship between family size and costs. Based on this assumption, the range of family sizes used in the study was divided into 5 equal intervals. Ratings of 1 to 5 were assigned, starting with the largest size families which received a rating of 1.

The family requirements coverage criterion rates the coverage range for the entire family. In other words, what percentage of the applications in our training sample could be delivered using the set of systems in a particular family? The family coverage was determined by dividing the sum of the demand values for the family by the total demand for the application sample. The possible range of coverage percentages (0-100%) was divided into 5 equal intervals and ratings of 1 to 5 were assigned, starting with the smallest percentages interval.

The next step in the evaluation was to sum the general system values ($S_j(GV_j)$) and the individual system cost values ($S_j(GC_j)$). Finally, the general system sum, the sum of system costs, and the two family evaluation values are summed to produce the total family value (FT_k). The total family value was used as the overall comprehensive figure of merit for each family.

III. RESULTS

Survey Data

Data base. Appendix A contains the complete data base for the survey. A total of 103 training applications were included in the sample. Each of the U.S.-based MAJCOMs (except Alaskan Air Command) was represented in the sample. The applications were worldwide and were administered from a total of 19 different AF bases. Thirty-four of the applications provided operations training, 44 provided support training, and 39 provided maintenance training (some applications serve multiple roles). Eighty-one applications provided training for airmen and 47 provided officer training.

Some of the data listed in the data base are researcher estimates. These estimates were made if the data sources did not supply complete application data. Estimates were based on researcher expertise and the equivalent values of similar applications. In the data base researcher estimates are noted by an asterisk (*).

Sorted and reduced data base. Displayed in Appendix B is the data base after redundant data was removed and the applications were sorted by their values for the remaining characteristics.

Basic systems. Depicted in Table 11 is the final set of 17 basic systems. The systems were produced by summing the demand and units values for the Appendix B systems with identical configurations. The configurations listed in Table 11 were the basic component systems that were used to build the candidate generic computer families. All system identification numbers refer to the system numbers in this table.

Demand values. Shown in Figure 1 is the percentage of total sample demand satisfied by each of the basic systems. Note that most of the demand in the sample was concentrated in 3 systems: 2, 14 and 16. Table 11 shows that system 2 was a 32-bit system with 2.3 MB RAM, system 14 was a 16A-bit system (see Table 8 for CPU descriptions) with 640K RAM, and that system 16 was a 16B-bit system with 640K RAM. All together these 3 systems would have satisfied 96% of the demand found in the population sample. This figure is produced by summing the 3 system's demand coverage values as shown in Table 11 and Figure 1. This data indicates that 96% of the training applications in the sample could have been delivered using just these 3 systems.

Units values. The percentage of training application units in the application sample that could have been delivered on each of the basic systems is shown in Figure 2. The term "units" refers to the number of copies of a training application that are being used. For example, 30 copies of the Orbital Mechanics: Ground Tracking training application are currently being used and each is delivered on its own microcomputer. A total of 16,634 training application units were included in the population sample. Note that relative to Figure 1, in Figure 2, system 2 represented a greatly reduced percentage of the sample. Conversely, based on number of units, system 16 represented a much higher percentage of the sample than it did based on demand values.

TABLE 11. BASIC SYSTEM CONFIGURATIONS

: SYSTEM :	CPU_BIT_SIZE	RAM_KBYTES	MATH	TEMPEST	COST	N_OF_UNITS	% UNITS	DEMAND/100	% DEMAND :
1	32	2304	X	0	2579	4	0.00	10	0.00
2	32	2304	0	0	2080	408	0.02	6986800	0.53
3	32	640 *	0	0	1706	12	0.00	30720	0.00
4	16A	7040	X	0	2470	15	0.00	3000	0.00
5	16A	3584	0	0	1360	500	0.03	30000	0.00
6	16A	2560	X	0	1384	2030	0.12	29320	0.00
7	16A	2560	0	X	2681	960	0.06	75810	0.01
8	16A	2560	0	0	1085	194	0.01	35200	0.00
9	16A	1280	X	0	1159	4	0.00	10	0.00
10	16A	1280	0	X	2456	24	0.00	2880	0.00
11	16A	1280	0	0	860	320	0.02	5700	0.00
12	16A	640 *	X	0	965	276	0.02	118005	0.01
13	16A	640 *	0	X	2262	106	0.01	57639	0.00
14	16A	640 *	0	0	666	5702	0.34	4580913	0.35
15	16B	640	X	0	461	63	0.00	882	0.00
16	16B	640 *	0	0	336	5976	0.36	1095805	0.08
17	8	64	0	0	213	40	0.00	186256	0.01
TOTALS :						16634	1	13238949	1

* Researcher estimates

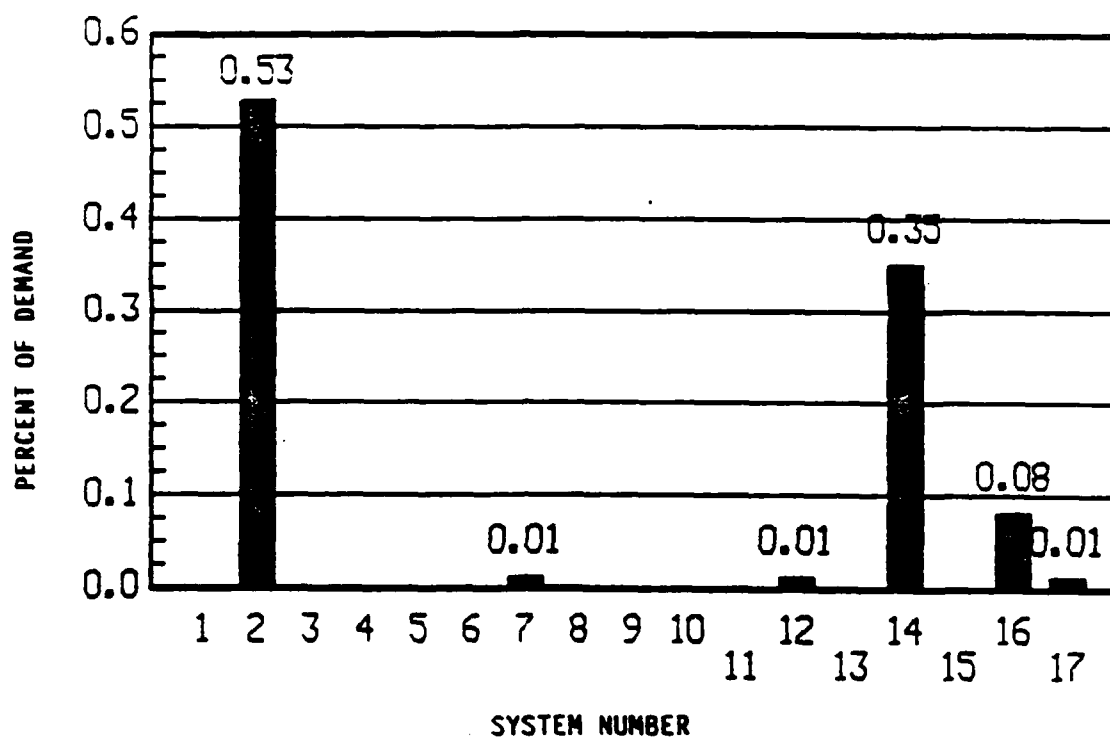


Figure 1. Percentage of total demand for each basic system.

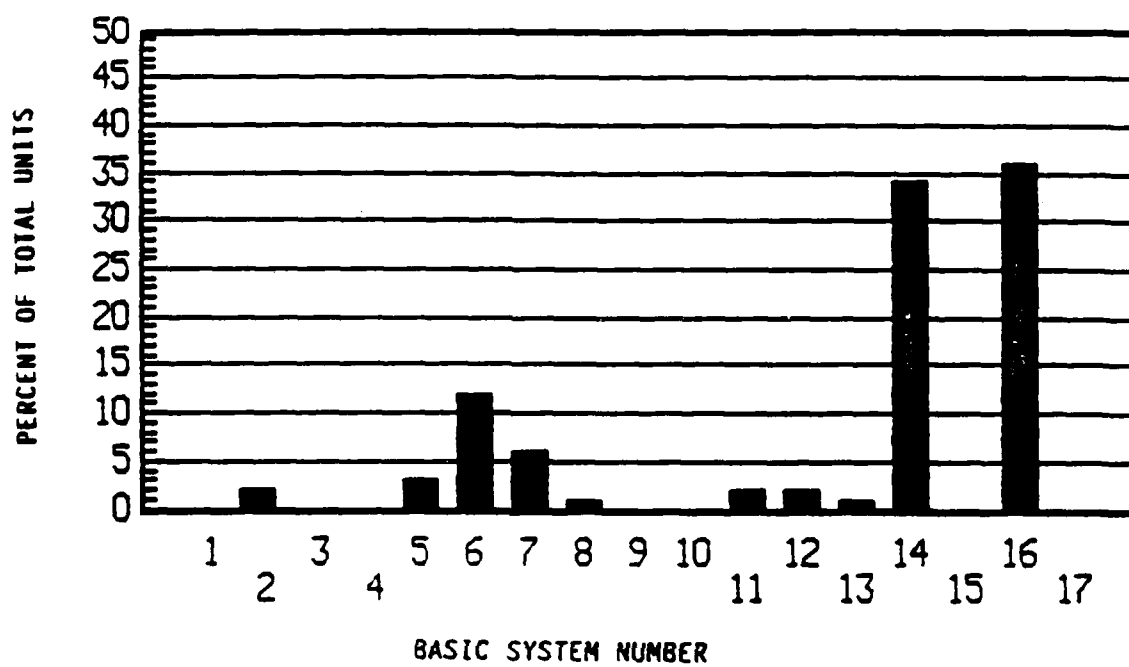


Figure 2. Percentage of total number of units for each basic system.

The differences between the distributions in Figures 1 and 2 reflect the different weights given to student load in the two figures. System 2 had a relatively low number of units, but each unit had a very heavy student load. System 16 had a relatively large number of units, but with lighter student loads.

Relative cost values. The relative cost values for the system components found in the application sample is displayed in Table 12. As indicated earlier, these values were based on the wholesale prices of a single computer distributor. It is important to note that the cost figures in Table 12 were used only as relative cost values. They were not intended to reflect actual AF costs or lowest commercial costs. Since system components must match the system's CPU capabilities, it was necessary to classify component costs according to CPU size. The CPU unit costs in Table 12 included the complete computer motherboard (except for RAM), the keyboard, and the computer case. To simplify the calculation of RAM cost values, the RAM size of each application was rounded up to the next higher standard commercial size. The RAM sizes were listed in kilobytes under the term RAM in column 1. The cost value for satisfying TEMPEST requirements was based on the AF cost for adding TEMPEST characteristics to the current AFSSC. The total cost value for each of the basic systems was calculated by adding up the cost values for all of the components used in that system.

Rating assignments. The ratings assigned to the system characteristics found in the sample are listed in Table 13: Column 1 contains the system evaluation criteria; column 2 contains the rating values used for each criterion, and column 3 shows the requisite system characteristic associated with each rating level. For technical feasibility all of the basic systems received a rating of 5 since all applications within the sample were based on proven and generally available technology.

Ratings for the available resources criterion were based on system CPU size. This approach was taken since the operational characteristics of a computer system were dominated by the type of CPU used in the system and resources were typically specific for a CPU type. Within the U.S. Air Force the majority of resources (skills, software, etc.) were based on a 16-bit CPU. Therefore, systems with 16-bit CPUs were given ratings of 5 for available resources. Since many 32-bit CPUs were designed to be downward compatible with 16-bit CPUs, most 16-bit resources were directly transferable to 32-bit systems. Therefore, 32-bit CPU systems were given a rating of 4 for available resources. Systems with 8-bit CPUs were assigned a resources rating of 2 since the majority of resources produced for 16-bit CPUs were not transferable to 8-bit systems.

For the operational suitability criterion, a simple formula (see Table 13) was used to calculate the system's rating. The CPU power supplied by a system was divided by the power required for the range of applications using that system. The result was the percentage of necessary power that a system can provide for use by an application. For example, if an application needs a 32-bit CPU (power rating of 5) and the candidate delivery system is a 16A-bit system (power rating of 3), then that candidate can only supply 60% of the necessary power (3/5).

TABLE 12. RELATIVE COST VALUES

		8 Bit	16B Bit	16A Bit	32 Bit
CPU Unit		195	210	540	1580
Math Coprocessor			125	288	499
TEMPEST			1596	1596	1596
RAM Kilobytes					
	64	18	18	18	
	256		45	45	
	640		126	126	126
	1280			320 *	
	2304			500 *	500 *
	2560			545 *	
	3584			820 *	
	7040			1631 *	
Expansion Board				95	95
* Includes expansion boards: 1 per 2Mb RAM above 640K for 16 bit, and 1 board per 2Mb above 1Mb for 32 bit.					

TABLE 13. RATING ASSIGNMENT TABLE - SYSTEMS

	Rating	Criterion
Technical Feasibility	5	all systems
Available Resources	4	32 bit CPU
	5	16A CPU
	5	16B CPU
	2	8 bit CPU
Operational Suitability	=	supplied power needed power X 5
		CPU Power
		32 bit 5
		16A 3
		16B 2
		8 bit .5
Procurement Costs		system cost
	1	2681
	1	2579
	1	2470
	1	2456
	1	2262
	2	2080
	2	1706
	3	1384
	3	1360
	3	1159
	3	1085
	4	965
	4	860
	4	666
	5	461
	5	336
	5	213
Life Cycle Costs		CPU
	3	32 bit
(-1 if Tempest)	4	16A
	5	16B
	5	8 bit

The resulting percentage was then multiplied by 5 in order to normalize the operational suitability ratings relative to the other criteria rating scales.

The system procurement cost values for the 17 basic systems ranged from 213 to 2681 (as calculated from the values in Table 12). This range of values was divided into 5 equal intervals (with the exception of the highest cost interval which was larger). The ratings of 1 to 5 were assigned in sequence so that the lowest cost interval received a rating of 5 and the highest cost interval was assigned a rating of 1.

Life-cycle costs were assigned based on the system's CPU size. The assumption was that as CPU size increased, the maintenance and support costs increased due to greater complexity and component costs. A deduction of one rating point was taken from any system requiring TEMPEST due to the increased costs associated with the maintenance of such a system.

The rating assignments for the family criteria are shown in Table 14. Family cost values were assigned based on the total number of basic system configurations used in a family. The range of 1 to 17 was divided into 5 equal intervals (with the exception of the largest family size category). The ratings of 1 to 5 were assigned in sequence so that the lowest family size interval (1 to 3 systems) got a rating of 5 and the highest family size range interval (13-17 systems) was assigned a rating of 1.

Family requirements coverage ratings were assigned based upon the percentage of sample demand a family satisfied. The coverage percentage was calculated by dividing the the family's total demand value by the total demand value for the sample. The range of 0 to 100% was divided into 5 equal intervals of 20% each. The rating values were then assigned to the coverage intervals. The ratings of 1 to 5 were assigned in sequence so that the lowest coverage interval (0 to 20% coverage) received a rating of 1 and the highest interval was assigned a rating of 5.

Family Evaluations.

Basic systems - demand removal. Displayed in Table 15 is the formation of the set of families based on the basic systems with system removal by demand. Seventeen families were generated for this evaluation set. Each row of the table represents a single family. The largest family in the set contained all of the basic systems and is shown in the bottom row. As one moves up the table, each row represents a new family formed by the removing from the previous family the system with the smallest demand value. The first column of the table shows the number of systems in the family. The second column shows the final family value (FTk) as calculated by evaluation matrix for each family. The next section of the table shows the member systems in each family. The identification numbers of the basic systems (see Table 11) are listed across the top of the columns. An "X" in a column indicates that the system was a member of that row's family. The last column in the table shows how each family differed from the family directly below it. An arrow (=>) indicates that the range of the eliminated system (number on

TABLE 14. RATING ASSIGNMENT TABLE - FAMILIES

=====		
	Rating	Criterion

Family Costs		Number of Systems in Family

	1	17
	1	16
	1	15
	1	14
	1	13
	2	12
	2	11
	2	10
	3	9
	3	8
	3	7
	4	6
	4	5
	4	4
	5	3
	5	2
	5	1

Family Requirements Cov		Percent of Demand Satisfied

	1	<=20
	2	>20..<=40
	3	>40..<=60
	4	>60..<=80
	5	>80
=====		

TABLE 15. EXAMPLE FAMILY FORMATIONS - BASIC SYSTEMS - BY DEMAND

FAMILY VALUES																	:Stepwise Removal of Systee With Lowest Demand Value																		
: Number of		: Basic Systems in Family																	:Sequential																
:Systems in Family		: Family Values		: 1	: 2	: 3	: 4	: 5	: 6	: 7	: 8	: 9	: 10	: 11	: 12	: 13	: 14	: 15	: 16	: 17	: Changes														
:	: 1	:	: 116.92	:	: X	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	: 14 =>2														
:	: 2	:	: 124.01	:	: X	:	:	:	:	:	:	:	:	:	:	:	: X	:	:	: 16 =>14															
:	: 3	:	: 124.59	:	: X	:	:	:	:	:	:	:	:	:	:	:	: X	:	:	: 17 =>16															
:	: 4	:	: 119.42	:	: X	:	:	:	:	:	:	:	:	:	:	:	: X	: X	: X	: 12 =>2															
:	: 5	:	: 119.56	:	: X	:	:	:	:	:	:	: X	:	:	:	: X	: X	: X	: X	: 7 dropped															
:	: 6	:	: 120.57	:	: X	:	:	:	: X	:	:	: X	:	:	:	: X	: X	: X	: X	: 13 =>7															
:	: 7	:	: 115.57	:	: X	:	:	:	: X	:	:	: X	: X	: X	: X	: X	: X	: X	: X	: 8 =>7															
:	: 8	:	: 115.58	:	: X	:	:	:	: X	: X	: X	: X	: X	: X	: X	: X	: X	: X	: X	: 3 =>2															
:	: 9	:	: 115.59	:	: X	: X	: X	: X	: X	: X	: X	: X	: X	: X	: X	: X	: X	: X	: X	: 5 dropped															
:	: 10	:	: 110.77	:	: X	: X	: X	: X	: X	: X	: X	: X	: X	: X	: X	: X	: X	: X	: X	: 6 =>2															
:	: 11	:	: 110.8	:	: X	: X	: X	: X	: X	: X	: X	: X	: X	: X	: X	: X	: X	: X	: X	: 11 =>8															
:	: 12	:	: 110.8	:	: X	: X	: X	: X	: X	: X	: X	: X	: X	: X	: X	: X	: X	: X	: X	: 4 dropped															
:	: 13	:	: 105.82	:	: X	: X	: X	: X	: X	: X	: X	: X	: X	: X	: X	: X	: X	: X	: X	: 10 =>7															
:	: 14	:	: 105.82	:	: X	: X	: X	: X	: X	: X	: X	: X	: X	: X	: X	: X	: X	: X	: X	: 15 =>14															
:	: 15	:	: 105.82	:	: X	: X	: X	: X	: X	: X	: X	: X	: X	: X	: X	: X	: X	: X	: X	: 9 =>6															
:	: 16	:	: 105.82	:	: X	: X	: X	: X	: X	: X	: X	: X	: X	: X	: X	: X	: X	: X	: X	: 1 dropped															
:	: 17	:	: 105.82	:	: X	: X	: X	: X	: X	: X	: X	: X	: X	: X	: X	: X	: X	: X	: X	:															

the left of the arrow) was added to the coverage range of the system to the right of the arrow. A system number and the word "dropped" indicated that when that system was removed from the previous family its coverage range was dropped from the family. This process was done whenever retention of the range would have added significant costs to the new family.

The family values shown in Table 15 are illustrated in Figure 3. The graph shows that the family with the 3 basic systems 2, 14, and 17 had the largest family value and that in general, as family size increased, the family value decreased.

Basic systems - units removal. The set of families using basic systems and removal of systems according to the number of units is depicted in Table 16. Again, this set of families started out with a family containing all of the basic systems. Each new family was formed by the removal of the remaining system with the smallest number of units. Shown in Figure 4 is a graph of the family values calculated for this set of families. For this set of families the 6 system family had the largest family value.

Comparison of basic system sets. Displayed in Figure 5 is a comparison of the family values generated by the two different methods of system removal. The hatched columns (graph A) represent the family values formed by removal based on the number of units. The solid columns (graph B) represent the family values formed by removal based on demand values. In general, families based on removal by units had higher family values than the demand-based families of equivalent size.

CPU systems - removal of smallest. The set of families formed using only the largest systems from each CPU category in the table of basic systems is shown in Table 17. Each new family was formed by removing the remaining system with the smallest CPU. Figure 6 displays the family values for each of the CPU families in this set.

CPU systems - removal of largest. Displayed in Table 18 are the set of families formed using only the largest system from each CPU category in the table of basic systems. Each new family was formed by removing the remaining system with the largest size CPU. Figure 7 displays the family values for each of the CPU families in this set.

Comparison of CPU family sets. A comparison of the family values generated by the two different methods of generating the CPU families is presented in Figure 8. The hatched columns (graph A) represent the family values formed by removal of the systems with the smallest CPU. The solid columns (graph B) represent the family values for the families formed by removal of the largest CPU systems. Families based on removal of the smallest CPUs had higher family values than the demand-based families.

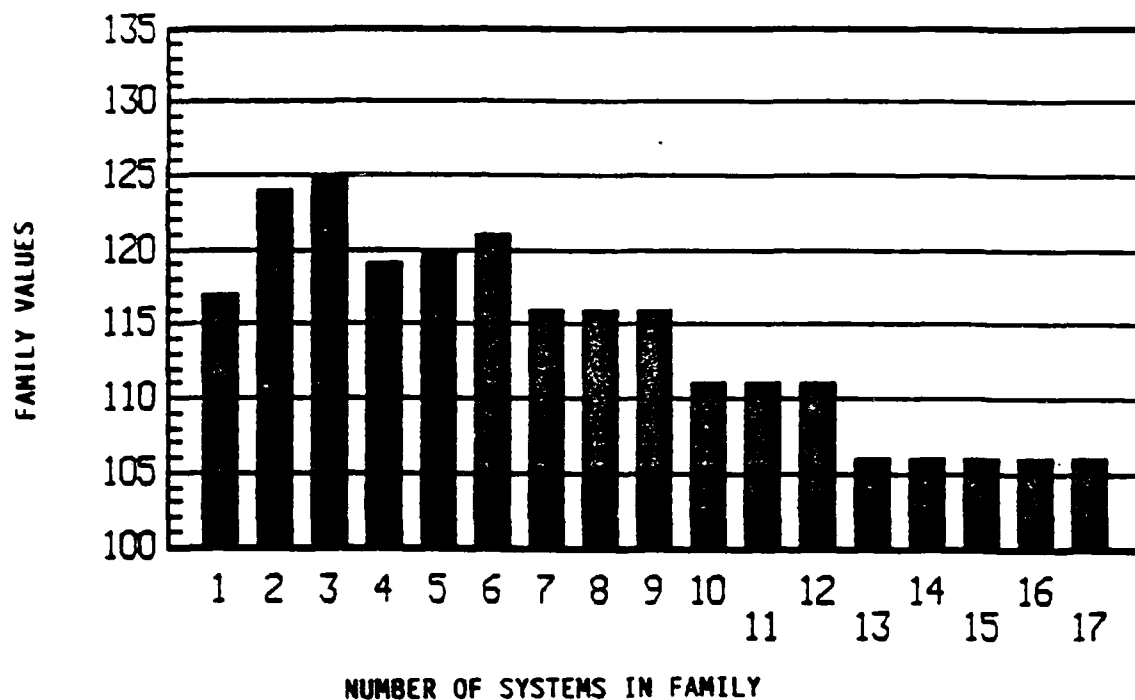


Figure 3. Values for the basic systems families based on demand. Family values for families formed from the 17 basic systems. Each succeeding family is formed by removing the remaining system with the smallest demand (units x students x hours/students).

TABLE 16. FAMILY FORMATIONS - BASIC SYSTEMS - BY UNITS

FAMILY VALUES		: Stepwise Removal of System With Lowest Number of Units																
: Number of	: Family Values	: 1	: 2	: 3	: 4	: 5	: 6	: 7	: 8	: 9	: 10	: 11	: 12	: 13	: 14	: 15	: 16	: 17
: Systems in Family		: Basic Systems in Family																
		: Sequential:																
		: Changes :																
: 1	: 67.55	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	: 14 dropped:
: 2	: 106.34	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	: 6 dropped :
: 3	: 125.4	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	: 7 dropped :
: 4	: 125.32	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	: 5 dropped :
: 5	: 127.75	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	: 2 dropped :
: 6	: 129.47	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	: 11 => 6 :
: 7	: 124.53	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	: 12 => 6 :
: 8	: 124.59	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	: 8 => 6 :
: 9	: 124.59	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	: 13 => 7 :
: 10	: 119.59	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	: 15 => 12 :
: 11	: 119.61	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	: 17 => 16 :
: 12	: 119.58	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	: 10 => 7 :
: 13	: 114.58	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	: 4 dropped :
: 14	: 114.65	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	: 3 => 2 :
: 15	: 114.65	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	: 9 => 6 :
: 16	: 114.65	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	: 1 dropped:
: 17	: 114.65	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:

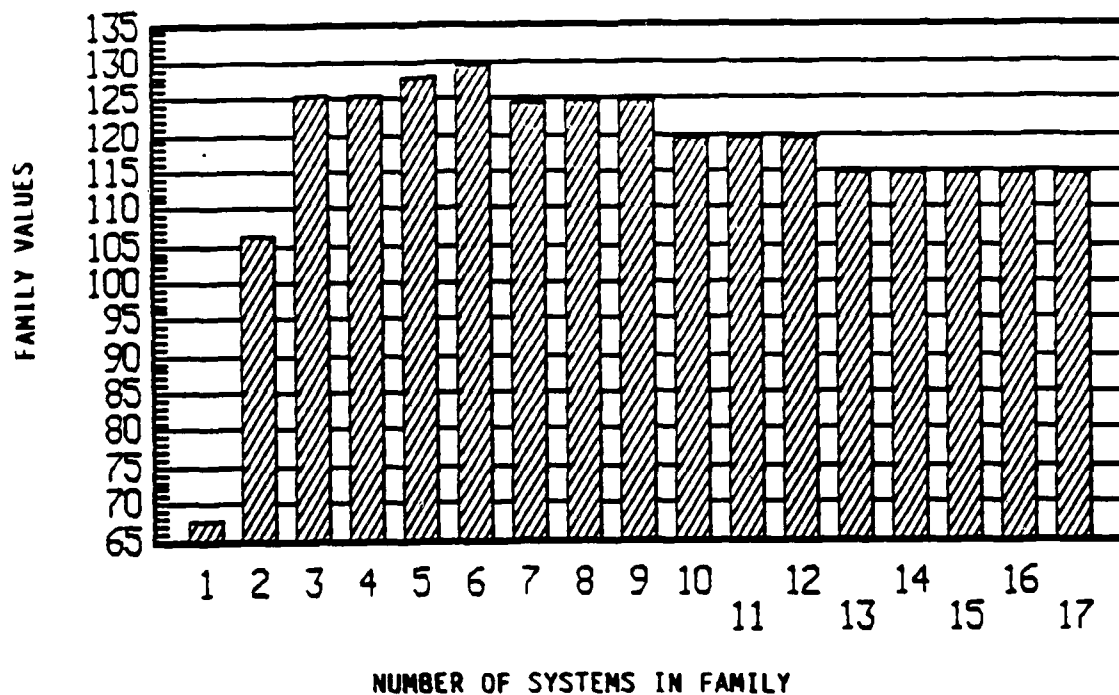


Figure 4. Values for basic systems families based on number of units used. Family values calculated for families formed from the 17 basic systems. Each succeeding family is formed by removing the remaining system which used the smallest number of units.

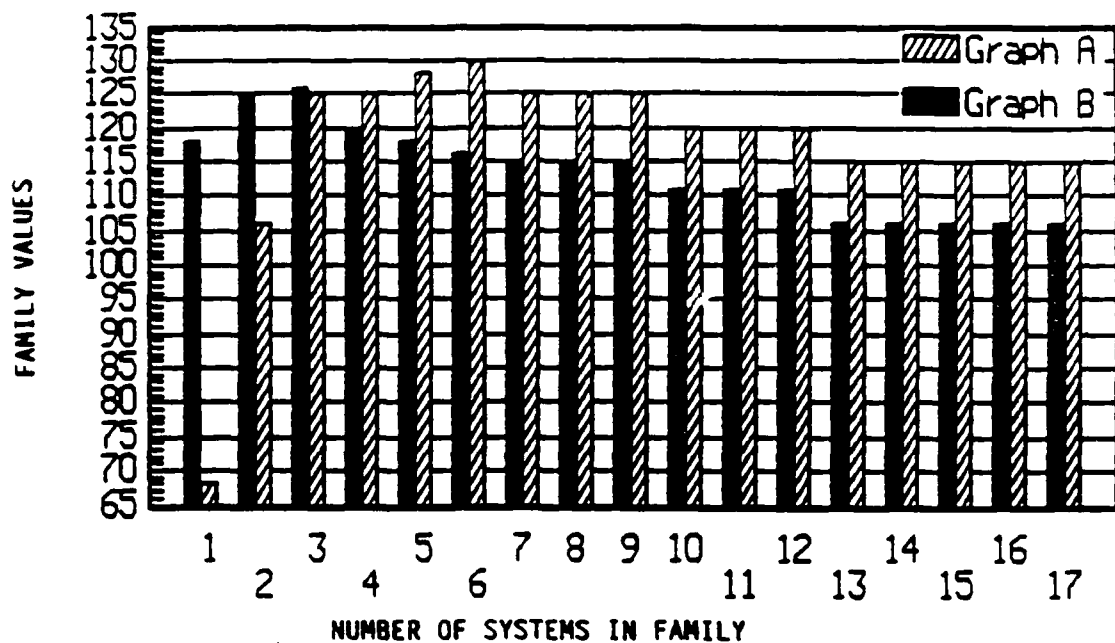


Figure 5. A comparison of values for units- and demand-based families of the 17 basic systems. Graph A shows the family values for the basic systems families formed by using the number of units. Each succeeding family is formed by removing the remaining system which used the smallest number of units. Graph B shows the family values for the 17 basic systems families formed by using demand values.

TABLE 17. FAMILY FORMATIONS - CPU SYSTEMS - BY SMALLEST CPU
: Stepwise Removal of Systems With Smallest CPU

Number of Systems in Family		Basic Systems in Family																
Demand Values		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	117.99	X																
2	118.47	X	X															
3	120.50	X	X	X												X		
4	115.34	X	X	X	X											X	X	X

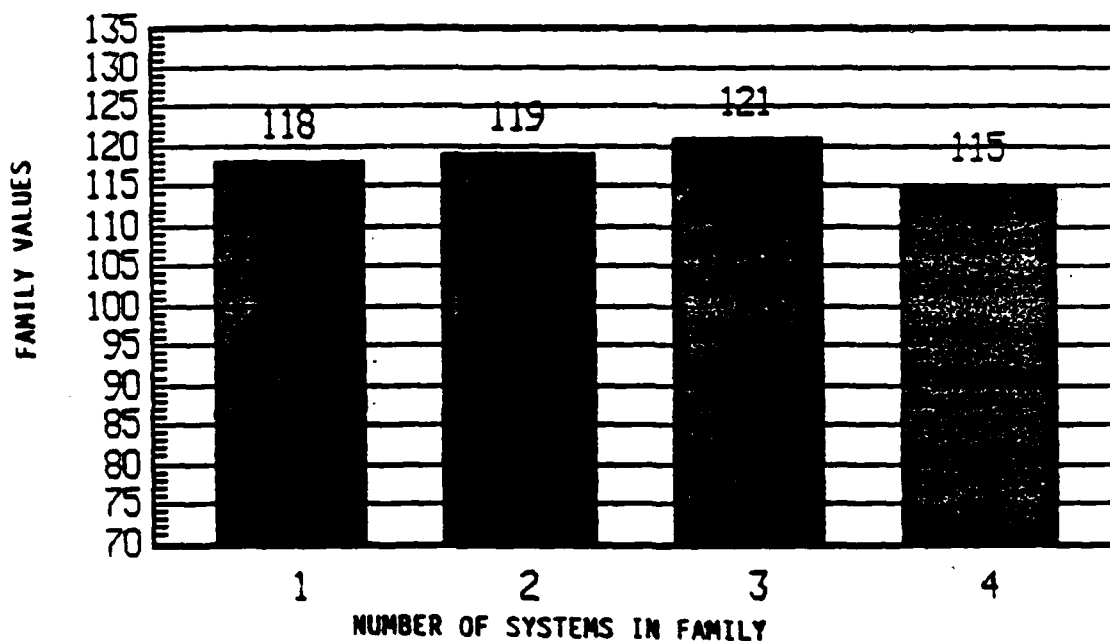


Figure 6. Values for families based on CPU size with sequential removal of the smallest CPU system. Family values calculated for families formed from systems based on the 4 different size CPU's defined in the study. Each succeeding family is formed by removing the remaining system with the smallest size CPU.

TABLE 18. FAMILY FORMATIONS - CPU SYSTEMS - BY LARGEST CPU

:Stepwise Removal of System With Largest CPU																					
:	Number of	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	
:	Systems in Family	:	Family Values	:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
:	1	:	31.10	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	X
:	2	:	38.55	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	X	:	X
:	3	:	74.29	:	:	:	:	X	:	:	:	:	:	:	:	:	:	:	X	:	X
:	4	:	115.34	:	:	:	X	X	:	:	:	:	:	:	:	:	:	:	X	:	X

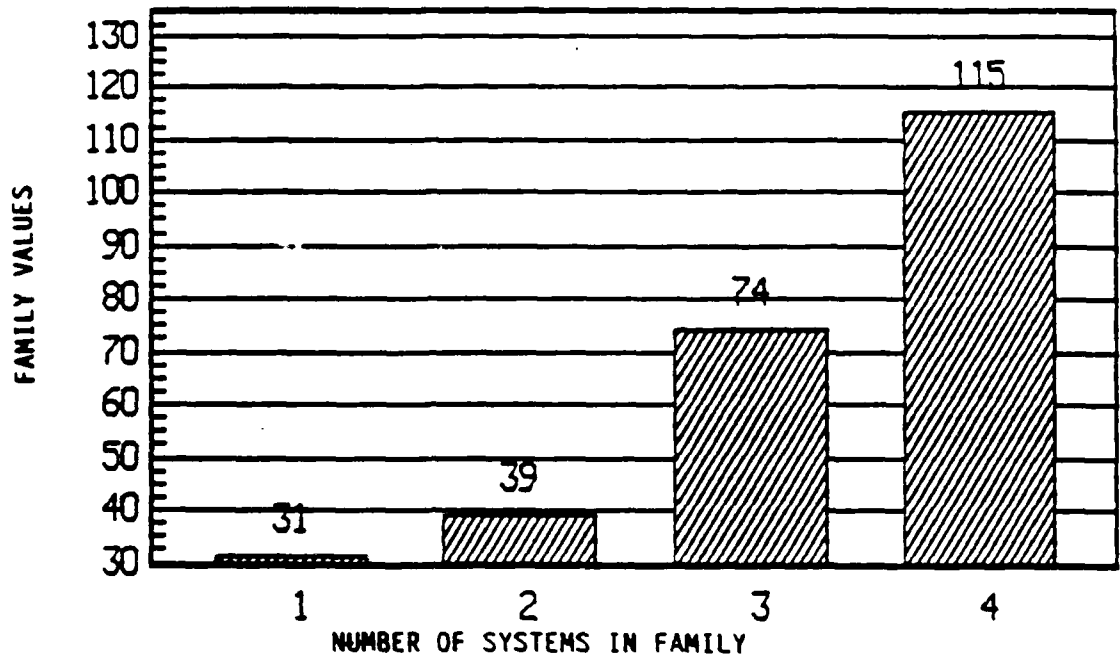


Figure 7. Values for families based on CPU size with sequential removal of the largest CPU system. Family values calculated for families formed from systems based on the 4 different size CPUs defined in the study. Each succeeding family is formed by removing the remaining system with the largest size CPU.

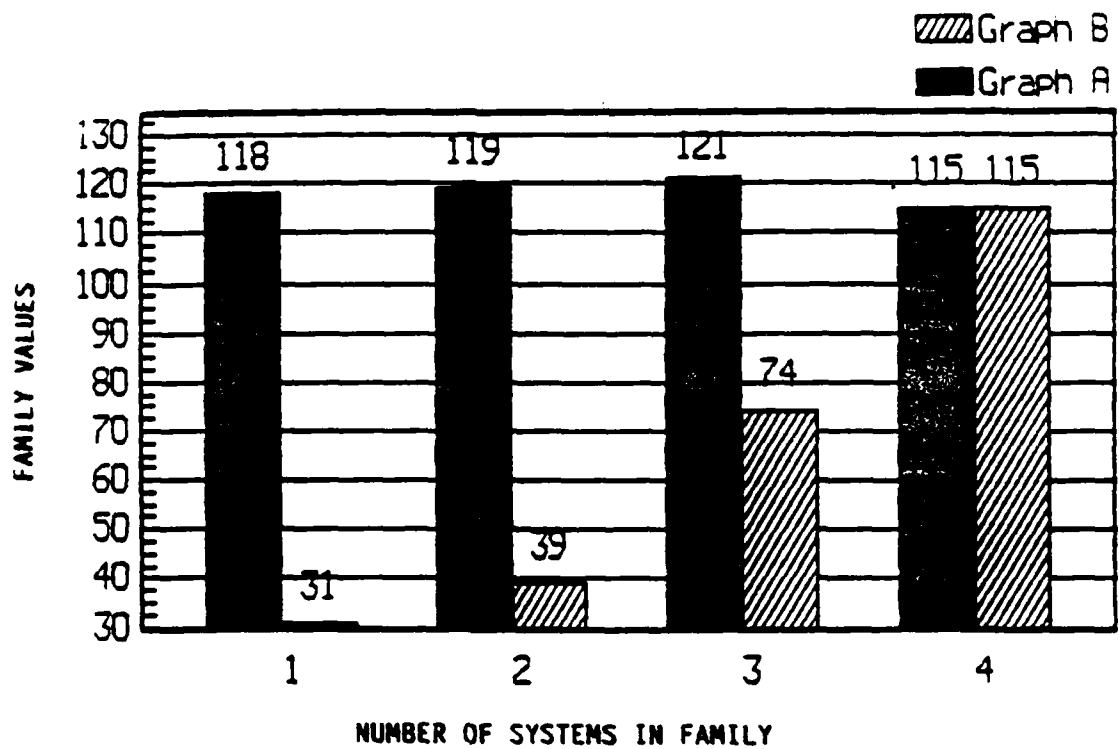


Figure 8. A comparison of values for CPU size-based families with ascending and descending removal of systems. Graph A shows the family values for the families formed by sequentially removing the remaining system with the smallest CPU. Graph B shows the family values for the families formed by sequentially removing the remaining system with the largest CPU. Each succeeding family is formed by removing the remaining system with the smallest demand (units x students x hours/students).

SSC systems - removal by demand. A set of families was formed (Table 19) by using only those basic systems with configurations matching the AFSSC. System removal was again based on the smallest demand value. The family values calculated for this set of families appear in Figure 9. All family values were low relative to the other sets of families.

SSC systems - removal by units. A second set of families was formed by using only those basic systems with configurations matching the AFSSC (Table 20). System removal was based on the smallest number of units. A graph of the family values calculated for this set of families is contained in Figure 10. All family values were higher than those produced by the demand-based evaluation of SSC families.

Comparison of AFSSC family sets. A graphic comparison of the family values generated by the two different methods of generating the AFSSC families is displayed in Figure 11. The hatched columns (graph A) represent the family values formed by removal of the systems with the smallest number of units. The solid columns (graph B) represent the family values for the families formed by using demand values.

General Findings

Besides the data collected for the generation of the basic system families some general trends were also noted during data collection:

- o The use of CBT within the AF is rapidly expanding. The number of planned applications far exceeds the total number of currently implemented applications. The primary factor impacting the growth of CBT seems to be the limited resources available for application development. Projected budget cuts can only exacerbate the development backlog.
- o Although the importance of CBT in the USAF is rapidly growing, no source could be found who had the complete "big picture" of the use of CBT across all the MAJCOMs.
- o We found a strong need and desire for enhanced courseware authoring skills. A variety of authoring systems are currently being used - each incompatible with the other. The result is nontransportable authoring skills and courseware. Resources are also being used for the evaluation and choice of authoring systems each time a new group begins courseware production. Several groups that were contacted during data collection were delaying courseware production while they conducted authoring system evaluations - a process that had already been performed repeatedly by other USAF groups. A standard courseware authoring system such as the USAF Instructional Support System (ISS) needs to be selected for use by the USAF. The Air Force Human Resources Laboratory reports that they are receiving about 5 enquiries a day about the microcomputer-based ISS that is currently under development.

TABLE 19. FAMILY FORMATIONS - SSC SYSTEMS - BY DEMAND

:Stepwise Removal of System With Smallest Demand:									
: Number of	:	:	:	:	:	:	:	:	: Sequential
: Systems in Family	: Family Values	:	1	2	3	4	5	:	: Changes
: 1	: 77.21	:	:	:	:	:	X	:	: 4 DROPPED
: 2	: 77.95	:	:	:	:	X	X	:	: 11 DROPPED
: 3	: 79.08	:	X	:	:	X	X	:	: 13 =>1
: 4	: 74.08	:	X	X	X	X	X	:	: 12 =>1
: 5	: 74.11	:	X	X	X	X	X	:	:

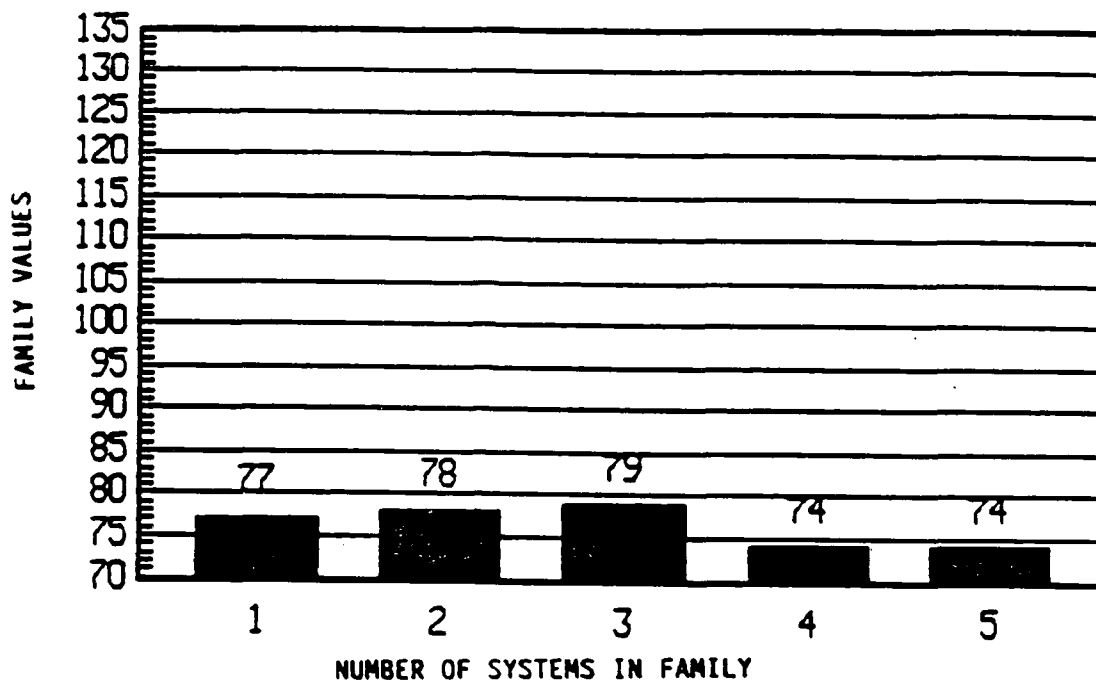


Figure 9. Values for AFSSC systems families based on demand. Family values calculated for families formed from 5 systems based upon different combinations of the AFSSC system's characteristics. Each succeeding family is formed by removing the remaining system with the smallest demand (units x students x hours/student).

TABLE 20. FAMILY FORMATIONS - SSC SYSTEMS - BY UNITS

:Stepwise Removal of Systems With Least Units									
: Number of		:	:					:Sequential:	:
:Systems in Family	:Family Values	:	1	2	3	4	5	: Changes	:
: 1	: 117.94	:	X					: 5 => 1	:
: 2	: 126.43	:	X				X	: 2 => 1	:
: 3	: 126.93	:	X	X			X	: 4 => 2	:
: 4	: 121.98	:	X	X		X	X	: 3 => 2	:
: 5	: 121.93	:	X	X	X	X	X	:	:

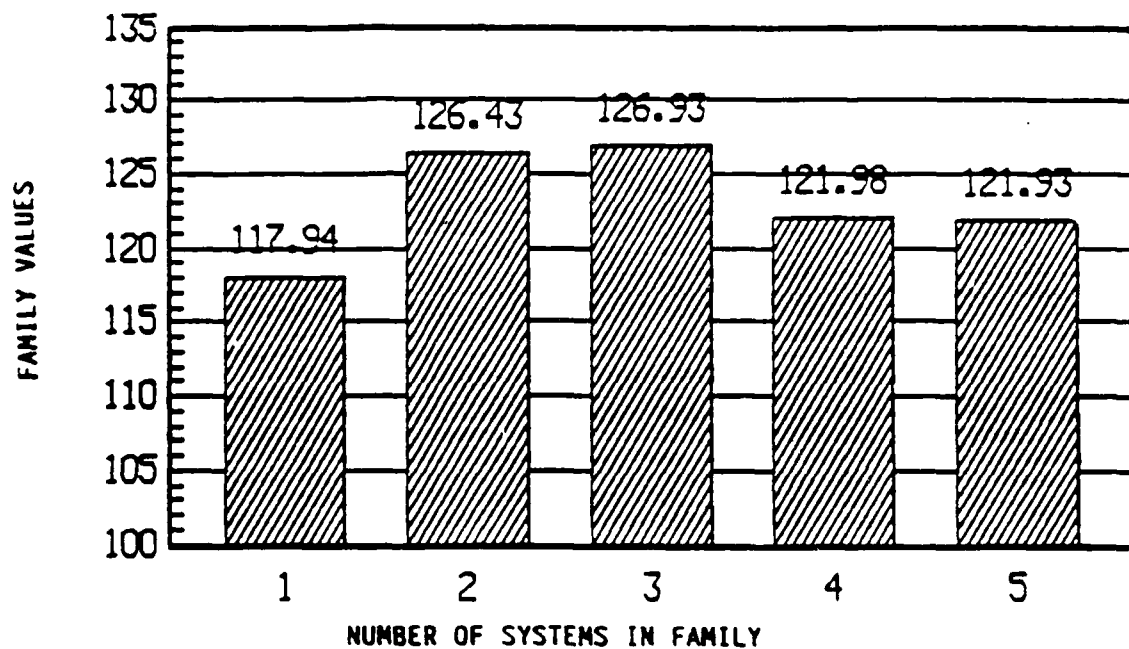


Figure 10. Values for AFSSC systems families based on number of units used. Family values calculated for families formed from 5 systems based upon different combinations of the AFSSC system's characteristics. Each succeeding family is formed by removing the remaining system which used the smallest number of units.

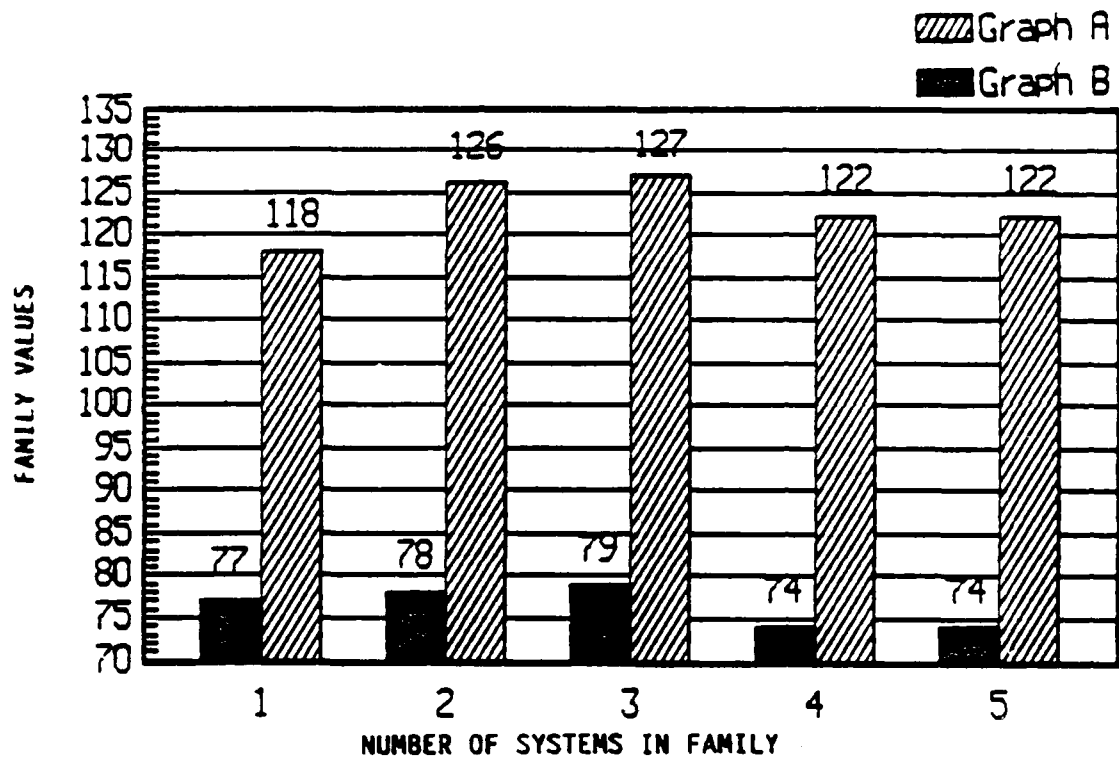


Figure 11. A comparison of values for units- and demand-based AFSSC clone families. Graph A shows family values for the AFSSC clone families formed by the number of units used. Each succeeding family is formed by removing the remaining system which used the smallest number of units. Graph B shows the family values for the AFSSC clone families formed by using demand values. Each succeeding family is formed by removing the remaining system with the smallest demand (units x students x hours/student).

- o Computer-based training seems to be well accepted by students and instructors. Although our population of contacts was severely biased since our goal was to locate people using or planning to use CBT, we encountered no one with a negative attitude toward CBT.
- o The great majority of the microcomputer-based applications located by this study use the AFSSC for courseware delivery. The dominance of the AFSSC may be due to several factors. First, some developers are not able to get an exemption for the use more powerful computer systems. Second, the computer capabilities currently used seem to be based on the limits of current development tools, skills and resources. The majority of courseware developers expressed satisfaction with the capabilities of the current AFSSC. However, as authoring skills and courseware technical complexity grow, the demand for system capabilities beyond the current AFSSC will increase. Indeed, the developers with the most experience in courseware development were the most likely to project a need for systems more powerful than the AFSSC.
- o It should also be noted that for some groups that were contacted, a GCBTH family could also satisfy the group's requirements for operational aids. Since training systems typically have a broader set of performance capabilities than operations systems, it makes more sense to define a future family of standard small computers using training requirements rather than operational needs.

IV. DISCUSSION

The results of this study support the feasibility of identifying a generic family of microcomputers to serve as hosts for training.

Based upon the sample of applications examined in this study, a single microcomputer system does not appear to be the best solution for the AFs training needs. For all of the family formation methodologies used in the study, a family of generic systems was a more effective solution than any single computer system. For the 17 basic systems families, a 3 system family produced the highest family value if system removal was by demand values. A combination of 6 systems was the most effective with removal by number of units. With the CPU size-based systems, the highest values were generated for the 3 system ascending removal family and the 4 system descending removal family. And finally, even for the AFSSC-based systems, both a 3 system family with demand removal and a 3 system family with units removal had higher family values than the single system family containing the current AFSSC.

For the values and configurations used in this study, the current AFSSC configurations were not the most effective set of systems for training delivery. The 17 basic systems families scored higher whether based on system removal by demand values or by number of units. Overall, the highest rated of all the units-defined families was the family which contained the Basic systems 2, 5, 6, 7, 14, and 16 (see Table 11 for Basic systems descriptions). Of the demand-based families, the family composed of the Basic systems 2, 14 and 17 had the highest rating. We cannot decide, based solely on their final scores, which of these two families represents the hypothetically best generic family, units-based or demand-based. Rather the choice would be based upon whether or not student load (number of students and student hours) was judged to be an important demand characteristic. If student load was important then the highest rated demand-based family would be chosen; if it was judged not important, then the highest rated units-based family would be chosen for use as the generic computer-based training hosts.

The computer system families evaluated in this study are not intended to represent all possible candidate generic families. Similarly, this study was not designed to provide the definitive selection of a generic computer-based trainer host family. The evaluations demonstrate the feasibility of using methods like those used in this study to compare candidate generic computer-based trainer host families.

V. CONCLUSION

The results of this study indicate that it is feasible to develop a generic family of microcomputer-based trainer hosts for USAF training purposes. Furthermore, the results of this study indicate that such a generic family of microcomputers may be a more effective training delivery solution than a single standard microcomputer. In each of the evaluations conducted in this study, relative to a single microcomputer, a family of microcomputers provided a superior balance of training coverage, functionality and costs. It should be possible to conduct a

full study on the identification of the single most effective generic computer-based trainer host system family. A larger application sample should be examined, actual cost figures should be determined, and a complete cost-benefits analysis should be conducted.

REFERENCE

Killion, T.H., Boyle, G.H., & Eaton, B.J. (1987). Common Computer-based training System: A Recommended Approach. (AFHRL-TP-86-61). Brooks AFB, TX: Training Systems Division, Air Force Human Resources Laboratory.

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APPENDIX A
GCBTH DATA BASE

DATA BASE ASSEMBLY ORDER

The GCBTH Survey Data Base data base pages are attached. Each section of the data base is numbered. Please follow the format specified below to assemble the data base.

TABLE NUMBERS

A-1	A-2	A-3	A-4	A-5	A-6	A-7
A-8	A-9	A-10	A-11	A-12	A-13	A-14
A-15	A-16	A-17	A-18	A-19	A-20	A-21

NOTE: Data Base items with asterisks (*) are researchers estimates.

APPLICATION	VENDOR	SPONSOR	ADMINISTRATION
302U1611 TERMINAL INSTRUMENTS PROCEDURES	Z-100	ATC	HING
AFSC 1921 OFFICERS BASE MANAGEMENT OPS	Z-248	ATC	BASE
BALLISTIC MISSILE INSTR. SYS 11 (BMIS II)	PC-AT	ATC/BMD	UNIT
HN/TPS43E AIRCRAFT CTRL & WARNING RADAR	SONY	ATC	HING
SPECTRUM ANALYZER	SONY	ATC	HING
E6AZU49131-011 Z-100 FAMILIARIZATION	Z-100	ATC	HING
E6AZU49131-013 INTRO TO THE Z-100 MICRO	Z-100	ATC	HING
E6AZU49131-MS-005 OPERATING SYSTEM	Z-100	ATC	HING
E6AZU49132-014 DATA BASE ON THE Z-100	Z-100	ATC	HING
E6AZU49132-015 TEACHER-CAT AUTHORIZING	Z-100	ATC	HING
E6AZU67231-000 SPREADSHEETS ON THE Z-100	Z-100	ATC	HING
E6AZU70230-000 MICROPROCESSING ON THE Z-100	Z-100	ATC	HING
E3A0R30020-009 ELECTRONIC PRINCIPLES TRNG	DIGIAC	ATC	HING
E3A0R73230-002 APPRENTICE PERSONNEL SPEC	Z-248	ATC	HING
E3A0R70230-003 APPRENTICE ADMINISTRATION SPEC	Z-248	ATC	HING
COMBAT COMM. NODAL CTRL. ELEMENT (CHCE)	CROMEMCO	ESD	HING
COMBAT COMM. NODAL CTRL. ELEMENT (CHCE)	CROMEMCO	ESD	HING
COMBAT COMM. NODAL CTRL. ELEMENT (CHCE)	IBM-AT	ESD	HING
E3A0R27230-000 AIR TRAFFIC CTRL OPER	Z-248	ATC	BASE
GRN-29 INSTRU LANDING SYS, FLITE CHECK	SONY	AFCC	UNIT
SPECTRUM ANALYZERS, OPER PROCEED & APPL	SONY	AFCC	UNIT
GPN-22 PRECISION APPROACH RADAR, SYS MAINT	SONY	AFCC	UNIT
GRN-29 INSTRUMENT LANDING SYS MAINT	SONY	AFCC	UNIT
GRN-30 LOCALIZER MAINT	SONY	AFCC	UNIT
GRN-31 NULL-REFERENCE GLIDESCOPE MAINT	SONY	AFCC	UNIT
GRN-31 CAPTURE EFFECT GLIDESCOPE MAINT	SONY	AFCC	UNIT
MD-921/MD-1002 & KY-801ENCODER/DECODER, O/M	SONY	AFCC	UNIT
SOLID STATE UNINTERRUPTED PWR SUPPLY MAINT	SONY	AFCC	UNIT
OSCILLOSCOPE MAINT	SONY	AFCC	UNIT
MULTIMETER OPERATION	SONY	AFCC	UNIT
FRN-43 VORTAC MAINT	SONY	AFCC	UNIT
FRN-44 VERY HI-FREQ OMIRANGE MAINT	SONY	AFCC	UNIT
FRN-45 TACTICAL AIR NAVIGATION MAINT	SONY	AFCC	UNIT
MS-133B MISSILE CONTROL COMM MAINT	SONY	AFCC	UNIT
SCOPE SIGNAL IIT MAINT	SONY	AFCC	UNIT
GPN-20 AIRPORT SURVEILLANCE RADAR MAINT	SONY	AFCC	UNIT
IPX-42 IFF/SIF MAINTENANCE	SONY	AFCC	UNIT
ENGLISH AS A SECOND LANGUAGE (ESL)	Z-248	AU	UNIT
COMPUTER ORIENTATION	Z-248	AU	UNIT
AUTHORIZING SYSTEMS	Z-248	AU	UNIT

TRAINING MISSION	OPERS	SUPP	MAINT	CAI	CMI	CBS	TRNG AID	GRNCH
INSTRUMENT APPROACH & DEPARTURE PROCEDURES	X	0	0	0	0	0	X	0
EMERGENCY SITUATION RESPONSES & COMBAT TANG	X	0	0	0	0	0	0	X
BALLISTIC MISSILE MAINTENANCE	X	0	0	0	0	0	0	X
RAIDAR MAINTENANCE TRAINING	0	0	0	0	0	0	0	X
TEST EQUIPMENT FAMILIARIZATION	0	0	0	0	0	0	0	X
FAMILIARIZATION TANG FOR Z-100 OPERATION	0	0	0	0	0	0	0	X
GENERAL INTRODUCTION FOR Z-100 OPERATION	0	0	0	0	0	0	0	X
OPERATING SYSTEM BASIC OPERATIONS	0	0	0	0	0	0	0	X
CUNIOR DATABASE TANG	0	0	0	0	0	0	0	X
CAI AUTHORIZING METHODS	0	0	0	0	0	0	0	X
PERCHOLIC SPREADSHEET TANG	0	0	0	0	0	0	0	X
PERCHTEXT SOUND TRAINING	0	0	0	0	0	0	0	X
INTRODUCTION TO COMPUTER REPAIR	0	0	0	0	0	0	0	X
FUNDAMENTALS OF PERSONNEL CAREER	0	0	0	0	0	0	0	0
APPRENTICE ADMIN SPEC	0	0	0	0	0	0	0	0
CNCE OPERATIONS	X	0	0	0	0	0	0	0
CNCE OPERATIONS	X	0	0	0	0	0	0	0
CNCE OPERATIONS	X	0	0	0	0	0	0	0
AIR TRAFFIC CONTROL	X	0	0	0	0	0	0	0
FLIGHT INSPECTION PROCEDURES	0	0	0	0	0	0	0	X
INTRO TO SPECTRUM ANALYZERS	0	0	0	0	0	0	0	X
AN/GPN-22 RADAR MAINTENANCE	0	0	0	0	0	0	0	X
MULTIPLE TASK SIMULATION	0	0	0	0	0	0	0	X
MULTIPLE TASK SIMULATION	0	0	0	0	0	0	0	X
MULTIPLE TASK SIMULATION	0	0	0	0	0	0	0	X
MULTIPLE TASK SIMULATION	0	0	0	0	0	0	0	X
MULTIPLE TASK SIMULATION	0	0	0	0	0	0	0	X
MULTIPLE TASK SIMULATION	0	0	0	0	0	0	0	X
MULTIPLE TASK SIMULATION	0	0	0	0	0	0	0	X
MULTIPLE TASK SIMULATION	0	0	0	0	0	0	0	X
MULTIPLE TASK SIMULATION	0	0	0	0	0	0	0	X
MULTIPLE TASK SIMULATION	0	0	0	0	0	0	0	X
MULTIPLE TASK SIMULATION	0	0	0	0	0	0	0	X
MULTIPLE TASK SIMULATION	0	0	0	0	0	0	0	X
MULTIPLE TASK SIMULATION	0	0	0	0	0	0	0	X
MULTIPLE TASK SIMULATION	0	0	0	0	0	0	0	X
FOREIGN OFFICER ENGLISH LANG. TANG	0	0	0	0	0	0	0	X
ADAPTIVE INSTRUMENT	0	0	0	0	0	0	0	X
INTERMEDIATE COURSE AUTHORIZING	0	0	0	0	0	0	0	X

TEXT	GRAPH	AI	SIMUL	AUDIENCE	LOCATIONS	# OF UNITS	STUDENTS/YR	HRS/STUDENT
0	0	0	0	ENLIST & OFFICER	KEESLER	10	180	32
X	X	0	X	LT, BASE OPS	KEESLER	37	248	64
X	X	0	X	1, 3 LEVEL MAINT	CARSH, VANDEN	24 *	40 *	300 *
X	X	0	X	3 LEVEL MAINT	KEESLER	12	300 *	50 *
X	X	0	X	3 LEVEL MAINT	KEESLER	12	1100 *	16 *
X	X	0	0	VARIOUS	WOLDRIDGE	572 *	572 *	7
X	X	0	0	VARIOUS	WOLDRIDGE	572 *	572 *	8
X	X	0	0	VARIOUS	WOLDRIDGE	572 *	572 *	8
X	X	0	0	VARIOUS	WOLDRIDGE	572 *	303	11
X	X	0	0	VARIOUS	WOLDRIDGE	572 *	136	8
X	X	0	0	VARIOUS	WOLDRIDGE	572 *	190	8
X	X	0	0	VARIOUS	WOLDRIDGE	572 *	166	24
X	X	0	0	VARIOUS	WOLDRIDGE	572 *	2500	248
X	X	0	0	VARIOUS, MAINT	KEESLER	30	1440	232
X	X	0	0	3 LEVEL, PERSONNEL	KEESLER	144	2516	184
X	X	0	0	3 LEVEL, ADMIN	KEESLER	202	500 *	40 *
X	X	0	X	5, 7, COMMUNICATIONS	KEESLER	4	500 *	40 *
X	X	0	X	5, 7, COMMUNICATIONS	KEESLER	10	500 *	40 *
X	X	0	X	5, 7, COMMUNICATIONS	KEESLER	14	500 *	40 *
X	X	0	X	LEV 3 AIR TRAF CTRL	KEESLER	32	1200	68
X	X	0	X	NAV AIDS MAINT	AFCC UNITS	68	440	10
0	0	0	X	ALL COMM SPECS	AFCC UNITS	300	4000	16
0	0	0	X	AIR TRAF CTRL RADAR	AFCC UNITS	30	57	57
0	0	0	X	NAV AIDS MAINT	AFCC UNITS	68	440	48
0	0	0	X	SEE ABOVE	SEE ABOVE	SEE ABOVE	SEE ABOVE	SEE ABOVE
0	0	0	X	SEE ABOVE	SEE ABOVE	SEE ABOVE	SEE ABOVE	SEE ABOVE
0	0	0	X	SEE ABOVE	SEE ABOVE	SEE ABOVE	SEE ABOVE	SEE ABOVE
0	0	0	X	SPACE CMD SYS OPR	AFCC UNITS	15	300	20
0	0	0	X	ELEC PAR POW SPEC	AFCC UNITS	30	150	16
0	0	0	X	ALL COMM ELEC MAINT	AFCC UNITS	400	10000	21
0	0	0	X	ALL COMM ELEC MAINT	AFCC UNITS	400	10000	21
0	0	0	X	NAV AIDS MAINT	AFCC UNITS	200	1000	49
0	0	0	X	SEE ABOVE	SEE ABOVE	SEE ABOVE	SEE ABOVE	180
0	0	0	X	SEE ABOVE	SEE ABOVE	SEE ABOVE	SEE ABOVE	180
0	0	0	X	MSL CON COMM	AFCC UNITS	3	60	87
0	0	0	X	GRND RADIO COMM	AFCC UNITS	12	180	350
0	0	0	X	AIR TRAF CTRL RADAR	AFCC UNITS	48	240	54
0	0	0	X	AIR TRAF CTRL RADAR	AFCC UNITS	78	390	18
0	0	0	0	2ND LT. - B GEN	AJ	22	210 *	35
X	X	0	0	E-3 TO 0-6	MAXWELL	11	1000 *	10
X	X	0	0	E-3 TO 0-6	MAXWELL	11	250 *	20

DEVID	LIFE	STATUS	P-COST	S-COST	CPU BIT	EST	I/O	PORTS	MULTI	KYBD	N-SERVER	MATH	AI	TEXT
25600	4	IMPLE	2.8K	UNK	8			2						1
0	INDEF	IMPLE	2.6	130/UNIT	16			8		X	0			1
288000	5-10	IN PROD	5.4	TBD	16			7		X	0			1
180000	INDEF	IN DEV	7.2	UNK	16			6		0	0			1
211200	INDEF	IN DEV	7.2	UNK	16			6		0	0			1
2290288	MIN 5	IMPLE	6.8K	GSA	16			2		X	0			1
2617472	5	IN DEV	6.8K	GSA	16			2		X	0			1
2617472	5	IN DEV	6.8K	GSA	16			2		X	0			1
1906476	5	IMPLE	6.8K	GSA	16			2		X	0			1
622336	5	IMPLE	6.8K	GSA	16			2		X	0			1
869440	5	IMPLE	6.8K	GSA	16			2		X	0			1
2278848	5	IMPLE	6.8K	GSA	16			2		X	0			1
1860000	5	IMPLE	.5	UNK	8			4		X	0			1
48107520	INDEF	QHL IORTN	6.8K	UNK	16			1		X	0			1
93514688	INDEF	IN DEV	6.8K	UNK	16			1		X	0			1
60000	INDEF	IN DEV	6.4	TBD	32			5		X	0			2
200000	INDEF	IN DEV	6.8	TBD	32			6		X	0			2
280000	INDEF	IN DEV	3.9	TBD	16			5		X	0			2
2611200	10	TEST, EVAL	4.1K	750/UNIT	16			2		X	0			1
387200	5-10YR	IMPLE	6.8K	100/UNIT	16			5		X	0			1
1920000	5-10YR	IMPLE	6.8K	100/UNIT	16			6		X	0			1
97470	5-10YR	IMPLE	6.8K	100/UNIT	16			6		X	0			1
1858560	5-10YR	IN DEV	6.8K	TBD	16			6		X	0			1
0	5-10YR	IN DEV	6.8K	TBD	16			6		X	0			1
0	5-10YR	IN DEV	6.8K	TBD	16			6		X	0			1
0	5-10YR	IN DEV	6.8K	TBD	16			6		X	0			1
90000	5-10YR	IN DEV	6.8K	TBD	16			6		X	0			1
72000	5-10YR	IN DEV	6.8K	TBD	16			6		X	0			1
84000000	5-10YR	IN DEV	6.8K	TBD	16			6		X	0			1
84000000	5-10YR	IN DEV	6.8K	TBD	16			6		X	0			1
98000000	5-10YR	IN DEV	6.8K	TBD	16			6		X	0			1
0	5-10YR	IN DEV	6.8K	TBD	16			6		X	0			1
0	5-10YR	IN DEV	6.8K	TBD	16			6		X	0			1
15660	5-10YR	PLANNED	6.8K	TBD	16			6		X	0			1
756000	5-10YR	PLANNED	6.8K	TBD	16			6		X	0			1
622080	5-10YR	PLANNED	6.8K	TBD	16			6		X	0			1
547560	5-10YR	PLANNED	6.8K	TBD	16			6		X	0			1
161700	5	IN DEV	GSA	GSA	16			5		X	X			2
110000	5	IN DEV	GSA	GSA	16			3		X	X			1
55000	5	IN DEV	GSA	GSA	16			3		X	X			1

[illegible]

CLASSIF	COMMENTS
0	TRAINING AIDS (CALCULATIONS)
0	37 UNIT LAN
X	NEW VERSION OF BMIS
0	RESIDENT FACILITIES
0	RESIDENT FACILITIES
0	OJT DISKS DISTRIB ON DEMAND
0	OJT DISKS DISTRIB ON DEMAND
0	OJT DISKS DISTRIB ON DEMAND
0	OJT DISKS DISTRIB ON DEMAND
0	OJT DISKS DISTRIB ON DEMAND
0	OJT DISKS DISTRIB ON DEMAND
0	OJT DISKS DISTRIB ON DEMAND
0	TRAINING AID FUNCTION
0	DELIVERED ON 16 UNIT LANS
0	DELIVERED ON 16 UNIT LANS
0	2 FULL-SIZE SIMULATORS
0	COMPONENTS FOR ABOVE SIMULATOR
0	COMPONENTS FOR ABOVE SIMULATOR
0	PCs USED AS PLATO TERMINALS
0	WORLDWIDE OJT, IVD
0	WORLDWIDE OJT, IVD
0	WORLDWIDE OJT, IVD
0	EVENTUAL WORLDWIDE OJT, IVD
0	SUB-APPLICATION FOR ABOVE
0	SUB-APPLICATION FOR ABOVE
0	SUB-APPLICATION FOR ABOVE
0	EVENTUAL WORLDWIDE OJT, IVD
0	EVENTUAL WORLDWIDE OJT, IVD
0	EVENTUAL WORLDWIDE OJT, IVD
0	EVENTUAL WORLDWIDE OJT, IVD
0	EVENTUAL WORLDWIDE OJT, IVD
0	SUB-APPLICATION FOR ABOVE
0	SUB-APPLICATION FOR ABOVE
0	EVENTUAL WORLDWIDE OJT, IVD
0	EVENTUAL WORLDWIDE OJT, IVD
0	EVENTUAL WORLDWIDE OJT, IVD
0	EVENTUAL WORLDWIDE OJT, IVD
0	EVENTUAL WORLDWIDE OJT, IVD
X	22 UNIT LAN, IVD
0	11 UNIT LAN, IVD
0	11 UNIT LAN, IVD

NAME	GRADE	BRANCH	ACTIVITY	LOCATION	PHONE
KEESLER	CIV	DIR. SYSTEMS SUPPORT ACTIVITY	X2797	3300	1CHTH/TTGP, 39534-5000
KEESLER	CIV	TECHNICAL APPLICATION OFFICER	X3671	3300	1CHTH/TTGP, 39534-5000
KEESLER	CIV	TRAINING MANAGER	X4310	58TH	115/00, 85309
LUKE	LT. COL	CHIEF OF OPERATIONS 58TH	X6972	58TH	115/00, 85309
LUKE	LT. COL	CHIEF OF OPERATIONS 58TH	X6972	58TH	115/00, 85309
LUKE	LT. COL	CHIEF OF OPERATIONS 58TH	X6972	58TH	115/00, 85309
LUKE	LT. COL	CHIEF OF OPERATIONS 58TH	X6972	58TH	115/00, 85309
LUKE	LT. COL	CHIEF OF OPERATIONS 58TH	X6972	58TH	115/00, 85309
LUKE	LT. COL	CHIEF OF OPERATIONS 58TH	X6972	58TH	115/00, 85309
CHARUTE	M/SGT	SYSTEM ADMINISTRATOR	X3320	3340	1CHTG/TINF 61868
CHARUTE	M/SGT	SYSTEM ADMINISTRATOR	X3320	3340	1CHTG/TINF 61868
CHARUTE	M/SGT	SYSTEM ADMINISTRATOR	X3320	3340	1CHTG/TINF 61868
CHARUTE	M/SGT	SYSTEM ADMINISTRATOR	X3320	3340	1CHTG/TINF 61868
CHARUTE	M/SGT	SYSTEM ADMINISTRATOR	X3320	3340	1CHTG/TINF 61868
CHARUTE	M/SGT	SYSTEM ADMINISTRATOR	X3320	3340	1CHTG/TINF 61868
USAFR	MAJ	ELECTRONICS ENGINEER	X2558	USAFR/DFXP, 80840	
WRIGHT-PAT	CIV	ELECTRONICS ENGINEER	X4075	ASD/ENETH BLDG. 126, 45433-6533	
MURPHY-PAT	CIV	ELECTRONICS ENGINEER	X4075	ASD/ENETH BLDG. 126, 45433-6533	
ALBUS	CAPT	ON THE JOB TRAINING OFFICE	X7204	443	1CHTS/TTI, 73523-5000
OFFUT	M/SGT	SAC SMALL COMPUTER OPR	X4076	55TH	COMBAT SUPPORT/DPMPD
OFFUT	CAPT	SAC SMALL COMPUTER OPR	X2545	HQ-SAC/SCRT, 68113-5001	
OFFUT	CAPT	SAC SMALL COMPUTER OPR	X2545	HQ-SAC/SCRT, 68113-5001	
OFFUT	CAPT	SAC SMALL COMPUTER OPR	X2545	HQ-SAC/SCRT, 68113-5001	
BROOKS	CIV	ISS PROGRAM MANAGER	X3992	AFMRL/IO, 78250	
CARSWELL	MAJOR	ROTS PGM MANAGER	X7473	436	STRATEGIC TRNG SQHQ. /DDTC
BROOKS	MAJOR	EXEC OFFICER/EDUCATION DIV	X3500	SCHOOL OF AEROSPACE MEDICINE	
KELLY	CIV	COMPUTER SCIENCE SPECIALIST	X4271	HQ ELECTRONIC SECURITY COMMAND	
GUNTER	SM/SGT	CHIEF OF PROGRAMS & TECHNOLOGY	X6212	SENIOR NCO ACADEMY	
HILLIAMS	CAPT	SMALL CAPTR PGM MANAGER-F5	X6212	425TH/TF1G	
HILLIAMS	CAPT	SMALL CAPTR PGM MANAGER-F5	X6212	425TH/TF1G	
HILLIAMS	CAPT	SMALL CAPTR PGM MANAGER-F5	X6212	425TH/TF1G	
HILLIAMS	CAPT	SMALL CAPTR PGM MANAGER-F5	X6212	425TH/TF1G	
HILLIAMS	CAPT	SMALL CAPTR PGM MANAGER-F5	X6212	425TH/TF1G	
MAXWELL	LT COL	ACSC/ASSOCIATE PGM COURSE DEV	X7901	ACSC/ASSOCIATE PGM COURSE DEV	
MAXWELL	LT COL	ACSC/ASSOCIATE PGM COURSE DEV	X7901	ACSC/ASSOCIATE PGM COURSE DEV	
MAXWELL	LT COL	ACSC/ASSOCIATE PGM COURSE DEV	X7901	ACSC/ASSOCIATE PGM COURSE DEV	
MAXWELL	LT COL	ACSC/ASSOCIATE PGM COURSE DEV	X7901	ACSC/ASSOCIATE PGM COURSE DEV	
MAXWELL	LT COL	ACSC/ASSOCIATE PGM COURSE DEV	X7901	ACSC/ASSOCIATE PGM COURSE DEV	
MAXWELL	LT COL	ACSC/ASSOCIATE PGM COURSE DEV	X7901	ACSC/ASSOCIATE PGM COURSE DEV	
GOODFELLOW	CIV	DEPUTY DIRECTOR SPECIAL PGM	X6636	AMERICAN SYSTEMS-CHANTILLY, VA.	
GOODFELLOW	CAPT	CHIEF OF CAT PLAYS	X5340	3480	1CHTH/TTGXZ, 76908
LANCLEY	MAJ	ASSTIST DIV CHIEF	X2102	HQ TAC/LGQT, 23665-5001	
HILL	CAPT	CMOR 4400 MAINT TRNG FLT	X0762	4400	MAINT TNG FLT, 84056-5000
HILL	CAPT	CMOR 4400 MAINT TRNG FLT	X0762	4400	MAINT TNG FLT, 84056-5000

IAD DESIGNER COURSE	SONYV-HI	ATC	MAJCOM
IAD MANAGER COURSE	SONYV-HI	ATC	MAJCOM
OPERATIONS RESOURCE MANAGEMENT	SPERRY	ATC	MAJCOM
CBI TRAINING SYSTEM (CBITS)	Z-24B	TAC	MAJCOM
CBI TRAINING SYSTEM (CBITS)	Z-24B	TAC	MAJCOM
CBI TRAINING SYSTEM (CBITS)	Z-24B	TAC	MAJCOM
BASIC COURSE	Z-24B	TAC-F16	MAJCOM
TRANSITION (TX) COURSE	Z-24B	TAC-F16	MAJCOM
CONVERSION (CX) COURSE	Z-24B	TAC-F16	MAJCOM
FIRE CHIEF COURSE	WANG PC	AFESC	GROUP
FIRE INSPECTOR COURSE	WANG PC	AFESC	GROUP
HAZARDOUS MATERIALS	WANG PC	AFESC	GROUP
FIRE PROTECTION SUPERVISOR COURSE	WANG PC	AFESC	GROUP
FIRE PROTECTION VEHICLE MAINTENANCE	WANG PC	AFESC	GROUP
BASIC FIRE PROTECTION COURSE	WANG PC	AFESC	GROUP
GENERAL TRAINING AIDS	Z-24B	USAFI	DIVISION
ABBREVIATED TEST LANGUAGE FOR ALL SYS TNR	Z-24B	TAC-F16	GROUP
ABBREVIATED TEST LANGUAGE FOR ALL SYS TNR	Z-24B	TAC-F16	GROUP
C-141 CREW & INSTRUCTOR TRAINING	Z-24B	NAC	GROUP
VARIOUS OFFICE APPLICATIONS	Z-100	SAC	MAJCOM
VARIOUS OFFICE APPLICATIONS	Z-24B	SAC	UNIT
MILNET TRAINING	Z-24B	SAC	UNIT
SOFTWARE ENGINEERING WITH AOA	Z-24B	SAC	GROUP
INSTRUCTIONAL SUPPORT SYSTEM	Z-24B	SAC	WING
BIB BOMBER ENHANCEMENT TRNG	Z-24B	AFSC	SQUADRON
TBD	Z-24B	AFSC	UNIT AND INTERMEDIATE
TBD	PC-COMP	ESC	DIVISION
TBD	ZENTH	AU	WING
POP UP PLANNING	Z-24B	TAC	SQUADRON
FLIGHT PLANNING	Z-24B	TAC	SQUADRON
HURDSTAR/OBIT/BASIC/DRACLE/HAR/LOTUS	Z-24B	TAC	SQUADRON
STANDARDIZATION & EVALUATION	Z-24B	TAC	SQUADRON
TESTING PROGRAM	Z-24B	TAC	SQUADRON
STRATEGY & RESOURCES (STAR)	Z-24B	AU	WING
CRISIS DECISION EXERCISE (CRIDEX)	Z-24B	AU	WING
JOPS/JCS CBI (LESSON 32)	Z-24B	AU	WING
CBI CBI (LESSON 36)	Z-24B	AU	WING
TACTICAL FORCE EMPLOYMENT (MINI-STICK)	Z-24B	AU	WING
SENTINEL BRIGHT PHASE II	ATT6366	ESC-AIC	WING
SENTINEL ASPEN PHASE I	MICROMAX	ESC-AIC	GROUP
INTRODUCTION TO IAD TRAINING	SONYVIEH HQ	TAC/LG	UNIT
F100 ENGINE IGNITION SYS TROUBLE SHOOTING	SONYVIEH HQ	TAC/LG	UNIT
F15 WIRING REPAIR TECH ORDER	SONYVIEH HQ	TAC/LG	UNIT

U	STANDALONES, IVO	:
0	STANDALONES, IVO	:
0	SMART TERMINAL TRNG TOOLS	:
X	12 SCHOOLHOUSE LANS	:
X	NETWORK SERVERS FOR ABOVE	:
X	SQUADRON STANDALONE PCs	:
X	DELIVERED ON ABOVE SYSTEMS	:
X	DELIVERED ON ABOVE SYSTEMS	:
X	DELIVERED ON ABOVE SYSTEMS	:
0	DELIVERY FY/88	:
0	DELIVERY FY/88	:
0	DELIVERY FY/88	:
0	DELIVERY FY/88	:
0	DELIVERY FY/88	:
0	DELIVERY FY/88	:
0	EACH CADET HAS A COMPUTER	:
0	2 - 9 UNIT LANS	:
0	LAN SERVERS FOR ABOVE	:
0	RECORDKEEPING: 27 COURSES	:
0	OUT DISKS DISTRIB ON DEMAND	:
0	OUT DISKS DISTRIB ON DEMAND	:
0	OUT DISKS DISTRIB ON DEMAND	:
0	PROGRAMMING TRAINING AIDS	:
0	PROJECTED ISS USE	:
0	OUT SAC SQUADRONS	:
0	PLANNED ISS APPLICATION	:
0	VERY EARLY PLANNING STAGE	:
0	EXPERIMENTAL USE	:
0	SQUADRON LAN	:
0	SQUADRON LAN	:
0	SQUADRON LAN	:
0	SQUADRON LAN	:
0	SQUADRON LAN	:
0	ON-SITE SEMINARS	:
0	ON-SITE SEMINARS	:
0	ON-SITE SEMINARS	:
0	ON-SITE SEMINARS	:
0	ON-SITE SEMINARS	:
0	VARIOUS COURSES (60)	:
X	INTERMED CPU BTAN VAX. & TERMS	:
0	OUT: EVENTUALLY ALL TAC UNITS	:
0	OUT: EVENTUALLY ALL TAC UNITS	:
0	OUT: EVENTUALLY ALL TAC UNITS	:

:	HILL	T. K. THOMAS	CAPT	CHIEF 4400 MAINT TENG FLT	X0762
:	WILLIAMS	ALLEN OATMAN	CIV	ENGINEER: SINGER-LINK	X6561
:	WILLIAMS	ALLEN OATMAN	CIV	ENGINEER: SINGER-LINK	X6561
:	WILLIAMS	ALLEN OATMAN	CIV	ENGINEER: SINGER-LINK	X6561
:	BROOKS	MES REGAN	CIV	FIN CHIEF OF INTELL SYS EVAL	X2981
:	BROOKS	MES REGAN	CIV	FIN CHIEF OF INTELL SYS EVAL	X2981
:	BROOKS	MES REGAN	CIV	FIN CHIEF OF INTELL SYS EVAL	X2981
:	BROOKS	MES REGAN	CIV	FIN CHIEF OF INTELL SYS EVAL	X2981
:	BROOKS	CHUCK CARPS	LT	RESEARCH PSYCHOLOGIST	X2981
:	SHEPPARD	CURRENCE	SGT	INSTRUCTOR	X6296
:	SHEPPARD	DUNLOP	LT	TECHNICAL APPLICATION OFFICER	X6129
:	SHEPPARD	DUNLOP	LT	TECHNICAL APPLICATION OFFICER	X6129
:	SHEPPARD	DUNLOP	LT	TECHNICAL APPLICATION OFFICER	X6129
:	SHEPPARD	DUNLOP	LT	TECHNICAL APPLICATION OFFICER	X6129
:	RANDOLPH	JOE INGRAM	CIV	TRAINING STAFF OFFICER	X4064
:	RANDOLPH	JOE INGRAM	CIV	TRAINING STAFF OFFICER	X4064
:	RANDOLPH	JOE INGRAM	CIV	TRAINING STAFF OFFICER	X4064
:	RANDOLPH	JOE INGRAM	CIV	TRAINING STAFF OFFICER	X4064
:	RANDOLPH	JOE INGRAM	CIV	TRAINING STAFF OFFICER	X4064
:	RANDOLPH	JOE INGRAM	CIV	TRAINING STAFF OFFICER	X4064
:	RANDOLPH	JOE INGRAM	CIV	TRAINING STAFF OFFICER	X4064
:	BROOKS	DICK VIGUE	CIV	SYSTEM ENGINEER ISS	X3992
:	BROOKS	KEVIN KLEINE	CAPT	COMPUTER SCIENTIST	X2981
:	WILLIAMS	ALLEN OATMAN	CIV	ENGINEER: SINGER-LINK	X6561

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0	OUT: EVENTUALLY ALL TAC UNITS	:
0	PART-TASK SIMUL:COMPONENT A	:
0	PART-TASK SIMUL:COMPONENT B	:
X	PART-TASK ALL TAC SQUADS	:
0	TRAINING TOOL-EFFECTIVE THINKING	:
0	UNDERGRAD SPACE TRAINING LAN	:
0	COURSE DEV UNDERGR SPACE TRNG	:
0	ANY AF OFFICE USING FORMS	:
0	WEATHER SCHOOL	:
0	13 UNIT LAN CBT DEV TRNG	:
0	IWD, PAGE TURNER	:
0	IWD, PAGE TURNER	:
0	IWD, PAGE TURNER	:
0	26 UNIT LAN, PROJ ALL ATC CTRS	:
X	6-12 UNIT LANs, ATC-TC's, EDH	:
X	DELIVERED ON ABOVE SYSTEMS	:
X	DELIVERED ON ABOVE SYSTEMS	:
X	DELIVERED ON ABOVE SYSTEMS	:
X	DELIVERED ON ABOVE SYSTEMS	:
0	PROJECTED FY'90 NEEDS	:
0	PROJECTED FY'90 NEEDS	:
0	PROJECTED FY'90 NEEDS	:
X	PROJECTED FY'90 NEEDS	:

32-MULTI	0	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
32-MULTI	0	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
32-MULTI	0	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
32-MULTI	0	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
32-MULTI	0	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
32-MULTI	0	1	2	3																																																																																																

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APPENDIX B
SORTED AND REDUCED GCBTH DATA BASE

REDUCED AND SORTED DATA BASE ASSEMBLY ORDER

The GCBTH Applications Sorted by Characteristics data base pages are attached. Each section of the data base is numbered. Please follow the format specified below to assemble the sorted data base.

TABLE NUMBERS

B-1	B-2
B-3	B-4
B-5	B-6

NOTE: Data Base items with asterisks (*) are researchers estimates.

*** APPLICATIONS SORTED BY CHARACTERISTICS ***

APPLICATION	VENDOR	CPU BITS	RAM Bytes	MATH	TEST	COST
AIR INTERCEPT TRAINING (RHOAR)	32 BIT	32	2304	X	0	2579
SENTINEL BRIGHT PHASE II	ATT6306	32	2304	0	0	2080
COMBAT COMM. NOCAL CTRL. ELEMENT (CNCE)	CRUMEMCO	32	2304	0	0	2080
COMBAT COMM. NOCAL CTRL. ELEMENT (CNCE)	CRUMEMCO	32	2304	0	0	2080
SENTINEL REOPEN PHASE I	MICROVAX	32	640 *	0	X	3302
RAPID PROTOTYPING OF INTELL TUTOR SYS	2248 *	16A	7040	X	0	2470
TECHNICAL EXECUTIVE ASSISTANT (TEXAS)	2248	16A	3584	0	0	1360
INSTRUCTIONAL SUPPORT SYSTEM	2248	16A	2560	X	0	1384
ORBITAL MECHANICS: GROUND TRACKING	2248	16A	2560	X	0	1384
CBI TRAINING SYSTEM (CBITS)	Z-248	16A	2560	0	X	2681
CBI TRAINING SYSTEM (CBITS)	Z-248	16A	2560	0	X	2681
RHOAR WARNING RECEIVER & ELEC COMBAT	Z-248 *	16A	2560	0	X	2681
A/E 241-169/171 NEAP CTRL FIRING CIRC TEST	SONYVIEW	16A	2560	0	0	1085
F15 WIRING REPAIR TECH ORDER	SONYVIEW	16A	2560	0	0	1085
F100 ENGINE IGNITION SYS TROUBLE SHOOTING	SONYVIEW	16A	2560	0	0	1085
INTRODUCTION TO IVD TRAINING	SONYVIEW	16A	2560	0	0	1085
COMBAT COMM. NOCAL CTRL. ELEMENT (CNCE)	IBM-AT	16A	2560	0	0	1085
AIR INTERCEPT TRAINING (RHOAR)	16 BIT	16A	1280	X	0	1159
BALLISTIC MISSILE INSTR. SYS II (BRUS II)	PC-AT *	16A	1280	0	X	2456
FORMS	2248 *	16A	1280	0	0	860
WEATHER TUTOR	2248	16A	1280 *	0	0	860
AUTHORIZING SYSTEMS	Z-248	16A	640 *	X	0	965
SOFTWARE ENGINEERING WITH ADA	Z-248	16A	640 *	X	0	965
B1B BOMBER ENHANCEMENT TRNG	Z-248	16A	640 *	X	0	965
COMPUTER ORIENTATION	Z-248	16A	640 *	X	0	965
TBO	Z-248	16A	640 *	X	0	965

N OF UNITS		DEMAND/100		: MM RANGE SUMS MM		: N OF UNIT DEMAND	
4	10	4	10	4	10		
368	6984000	408	6986800				
10	2000						
10	800						
12	30720	12	30720				
15	3000	15	3000				
500	30000	500	30000				
2000	25000	2030	29320				
30	4320						
360	39060	960	75810				
300	32550						
300	4200						
45	5760	194	35200				
45	7200						
45	3240						
45	16200						
14	2800						
4	10	4	10				
24	2880	24	2880				
300	3000	320	5700				
20	2700						
11	550	276	118005				
12	1152						
240	115200						
11	1100						
2	3						

ENGLISH AS A SECOND LANGUAGE (ESL)	16R					2262
CBI TRAINING SYSTEM (CBITS)	16R					2262
BALLISTIC MISSILE INSTRUCT. SYS (BMIS)	16R					2262
180						
GP-29 INSTRUMENT LANDING SYS MAINT	16R					666
GP-20 AIRPORT SURVEILLANCE RADAR MAINT	16R					666
GENERAL TRAINING AIDS	16R					666
TECHNICAL TRAINING COURSE-3AIR75100-0XX	16R					666
COMPUTER-BASED INSTRUCTION (DESIGNER)	16R					666
MD-921/MD-1002 & KY-801ENCODER/DECODER, O/M	16R					666
GP-22 PRECISION APPROACH RADAR, SYS MAINT	16R					666
GP-29 INSTRUMENT LANDING SYS, FLITE CHECK	16R					666
ABBREVIATED TEST LANGUAGE FOR ALL SYS TNR	16R					666
SOLID STATE UNINTERRUPTED PWR SUPPLY MAINT	16R					666
SPECTRUM ANALYZERS, OPER PROCEED & APPL	16R					666
180						
WS-133B MISSILE CONTROL COMM MAINT	16R					666
TPX-42 IFF/SIF MAINTENANCE	16R					666
E3ABR27230-000 AIR TRAFFIC CTRL OPER	16R					666
SCOPE SIGNAL ITI MAINT	16R					666
HN/TPS43E AIRCRAFT CTRL & WARNING RADAR	16R					666
OSCILLOSCOPE MAINT	16R					666
MULTIMETER OPERATION	16R					666
FRN-43 VORTAC MAINT	16R					666
SPECTRUM ANALYZER	16R					666
ABBREVIATED TEST LANGUAGE FOR ALL SYS TNR	16R					666
OPERATIONS RESOURCE MANAGEMENT	16R					666
IWD DESIGNER COURSE	16R					666
IWD MANAGER COURSE	16R					666
AFSC 1921 OFFICERS BASE MANAGEMENT OPS	16R					666
JOPS/JCS CAT (LESSON 32)	16R					666
STRATEGY & RESOURCES (STAR)	16R					666
C31 CAT (LESSON 36)	16R					666
CRISIS DECISION EXERCISE (CRIDEX)	16R					666
TACTICAL FORCE EMPLOYMENT (MINT-STICK)	16R					666
E3ABR73230-002 APPRENTICE PERSONNEL SPEC	16R					666
MILNET TRAINING	16R					666
C-141 CREW & INSTRUCTOR TRAINING	16R					666
WORDSTAR/DB111/BASIC/ORACLE/HR/LOTUS	16R					461
MANAGING THE ISO PROCESS-J30ZR/405T7500-007 XT, Z-24B	16R					336

22	1617	:	106	57639
12	1302	:		
72	54720	:		
1	1	:	5702	4580910
88	16586	:		
48	6221	:		
3000	1980000	:		
26	2184	:		
13	5980	:		
15	900	:		
30	975	:		
88	3872	:		
18	5616	:		
30	720	:		
300	192000	:		
20	780	:		
3	157	:		
78	5476	:		
32	26112	:		
12	7560	:		
12	1800	:		
400	840000	:		
400	840000	:		
200	98000	:		
12	2112	:		
2	624	:		
14	5684	:		
15	6000	:		
15	900	:		
37	5873	:		
1	1	:		
1	1	:		
1	1	:		
1	1	:		
1	1	:		
144	481075	:		
600	5400	:		
44	36300	:		
63	882	:	63	882
6	53	:	5976	1095804

: MANAGING THE ISO PROCESS FOR SENIOR OFFICERS XT, Z-24B	168	640 *	0	0	336
: MANAGING THE ISO PROCESS FOR MIDDLE MANAGERS XT, Z-24B	168	640 *	0	0	336
: E6RZU49132-014 DATA BASE ON THE Z-100	168	640 *	0	0	336
: E6RZU67231-000 SPREADSHEETS ON THE Z-100	168	640 *	0	0	336
: E6RZU49131-011 Z-100 FAMILIARIZATION	168	640 *	0	0	336
: E6RZU49131- MS-000S OPERATING SYSTEM	168	640 *	0	0	336
: E6RZU49131-013 INTRO TO THE Z-100 MIKRO	168	640 *	0	0	336
: E6RZU49132-015 TEACHER-CAT AUTHORIZING	168	640 *	0	0	336
: E6RZU70230-000 WORDPROCESSING ON THE Z-100	168	640 *	0	0	336
: TESTING PROGRAM	168	640	0	0	336
: POP UP PLANNING	168	640	0	0	336
: FLIGHT PLANNING	168	640	0	0	336
: STANDARDIZATION & EVALUATION	168	640	0	0	336
: VARIOUS OFFICE APPLICATIONS	168	640 *	0	0	336
: VARIOUS OFFICE APPLICATIONS	168	640 *	0	0	336
: FIRE PROTECTION VEHICLE MAINTENANCE	168	640	0	0	336
: FIRE PROTECTION SUPERVISOR COURSE	168	640	0	0	336
: FIRE INSPECTOR COURSE	168	640	0	0	336
: FIRE CHIEF COURSE	168	640	0	0	336
: BASIC FIRE PROTECTION COURSE	168	640	0	0	336
: HAZARDOUS MATERIALS	168	640	0	0	336
: E3HR70230-003 APPRENTICE ADMINISTRATION SPEC: Z-24B	168	640 *	0	0	336
: 30ZR1611 TERMINAL INSTRUMENTS PROCEDURES	8	64	0	0	213
: E3RUR30020-009 ELECTRONIC PRINCIPLES TANG	8	64	0	0	213

SUMS>

6	53	:	:
6	53	:	:
572	19065	:	:
572	8694	:	:
572	22903	:	:
572	26175	:	:
572	26175	:	:
572	6223	:	:
572	22788	:	:
63	882	:	:
63	630	:	:
63	882	:	:
63	882	:	:
600	5400	:	:
600	5400	:	:
50	2400	:	:
50	2400	:	:
50	2400	:	:
50	2400	:	:
50	2400	:	:
50	2400	:	:
202	935147	:	:
=====			
10	256	:	40 186256
30	186000	:	:
=====			
16634	13238945	:	16634 13238946

APPENDIX C
EVALUATION MATRICIES

TABLE OF CONTENTS FOR APPENDIX C EVALUATION MATRICIES

Appendix C contains evaluation matrices for the system families examined in this study.

EVALUATION MATRIX	PAGES
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TABLE C.1.2	C-7 through C-11
TABLE C.1.3	C-12 through C-16
TABLE C.1.4	C-17 through C-21
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TABLE C.1.6	C-27 through C-30
TABLE C.1.7	C-31 through C-34
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TABLE OF CONTENTS FOR APPENDIX C (Con't) EVALUATION MATRICIES

Appendix C contains evaluation matricies for the system families examined in this study.

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TABLE OF CONTENTS FOR APPENDIX C (Con't)
EVALUATION MATRICIES

Appendix C contains evaluation matricies for the system families examined in this study.

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TABLE C.1.1
Evaluation Matrix
Basic Systems Family - Elimination by Demand - 17 Systems

		SYSTEM		
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4	1	5	20
- Available Resources	4		4	16
- Operational Suitability	4		5	20
- Procurement Costs	3		1	3
- Life Cycle Costs	3		3	9
		SUMS>	56	12
		DEMAND:	10	
		PROPORTIONAL WEIGHT (PW)	=	.00
		GENERAL VALUE(PW*GEN SUM)	=	0.000042
		GENERAL COSTS(PW*COSTS SUM)	=	0.000009
		SYSTEM		
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4	2	5	20
- Available Resources	4		4	16
- Operational Suitability	4		5	20
- Procurement Costs	3		1	3
- Life Cycle Costs	3		3	9
		SUMS>	56	12
		DEMAND:	6986800	
		PROPORTIONAL WEIGHT (PW)	=	0.53
		GENERAL VALUE(PW*GEN SUM)	=	29.55376
		GENERAL COSTS(PW*COSTS SUM)	=	6.332949
		SYSTEM		
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4	3	5	20
- Available Resources	4		4	16
- Operational Suitability	4		5	20
- Procurement Costs	3		2	6
- Life Cycle Costs	3		3	9
		SUMS>	56	15
		DEMAND:	30720	
		PROPORTIONAL WEIGHT (PW)	=	.00
		GENERAL VALUE(PW*GEN SUM)	=	0.129943
		GENERAL COSTS(PW*COSTS SUM)	=	0.034806

SYSTEM			
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	1	3
- Life Cycle Costs	3	4	12
		SUMS>	60 15
		DEMAND:	3000
		PROPORTIONAL WEIGHT (PW) =	.00
		GENERAL VALUE(PW*GEN SUM) =	0.013596
		GENERAL COSTS(PW*COSTS SUM)=	0.003399

SYSTEM			
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	3	9
- Life Cycle Costs	3	4	12
		SUMS>	60 21
		DEMAND:	30000
		PROPORTIONAL WEIGHT (PW) =	.00
		GENERAL VALUE(PW*GEN SUM) =	0.135962
		GENERAL COSTS(PW*COSTS SUM)=	0.047586

SYSTEM			
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	3	9
- Life Cycle Costs	3	4	12
		SUMS>	60 21
		DEMAND:	29320
		PROPORTIONAL WEIGHT (PW) =	.00
		GENERAL VALUE(PW*GEN SUM) =	0.132880
		GENERAL COSTS(PW*COSTS SUM)=	0.046508

SYSTEM			
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	1	3
- Life Cycle Costs	3	4	12

```

:                                     : SUMS>          60      15 :
: DEMAND:          75810              :
: PROPORTIONAL WEIGHT (PW) = 0.01 :
: GENERAL VALUE(PW*GEN SUM) =0.343577 :
: GENERAL COSTS(PW*COSTS SUM)=0.085894 :
=====
: SYSTEM :
:
: SYSTEM CRITERIA      WEIGHTS : RATING  WEIGHT X RATING :
: - Technical Feasibility      4 :      5      20 :
: - Available Resources        4 :      5      20 :
: - Operational Suitability    4 :      5      20 :
: - Procurement Costs          3 :      3      9 :
: - Life Cycle Costs           3 :      4     12 :
:
:                                     : SUMS>          60      21 :
: DEMAND:          35200              :
: PROPORTIONAL WEIGHT (PW) = .00 :
: GENERAL VALUE(PW*GEN SUM) =0.159529 :
: GENERAL COSTS(PW*COSTS SUM)=0.055835 :
=====
: SYSTEM :
:
: SYSTEM CRITERIA      WEIGHTS : RATING  WEIGHT X RATING :
: - Technical Feasibility      4 :      5      20 :
: - Available Resources        4 :      5      20 :
: - Operational Suitability    4 :      5      20 :
: - Procurement Costs          3 :      3      9 :
: - Life Cycle Costs           3 :      4     12 :
:
:                                     : SUMS>          60      21 :
: DEMAND:          10                :
: PROPORTIONAL WEIGHT (PW) = .00 :
: GENERAL VALUE(PW*GEN SUM) =0.000045 :
: GENERAL COSTS(PW*COSTS SUM)=0.000015 :
=====
: SYSTEM :
:
: SYSTEM CRITERIA      WEIGHTS : RATING  WEIGHT X RATING :
: - Technical Feasibility      4 :      5      20 :
: - Available Resources        4 :      5      20 :
: - Operational Suitability    4 :      5      20 :
: - Procurement Costs          3 :      1      3 :
: - Life Cycle Costs           3 :      4     12 :
:
:                                     : SUMS>          60      15 :
: DEMAND:          2880              :
: PROPORTIONAL WEIGHT (PW) = .00 :
: GENERAL VALUE(PW*GEN SUM) =0.013052 :
: GENERAL COSTS(PW*COSTS SUM)=0.003263 :
=====

```

SYSTEM			
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	4	12
- Life Cycle Costs	3	4	12
		SUMS>	60 24
		DEMAND:	5700
		PROPORTIONAL WEIGHT (PW)	= .00
		GENERAL VALUE(PW*GEN SUM)	=0.025832
		GENERAL COSTS(PW*COSTS SUM)	=0.010333

SYSTEM			
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	4	12
- Life Cycle Costs	3	4	12
		SUMS>	60 24
		DEMAND:	118005
		PROPORTIONAL WEIGHT (PW)	= 0.01
		GENERAL VALUE(PW*GEN SUM)	=0.534808
		GENERAL COSTS(PW*COSTS SUM)	=0.213923

SYSTEM			
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	1	3
- Life Cycle Costs	3	4	12
		SUMS>	60 15
		DEMAND:	57639
		PROPORTIONAL WEIGHT (PW)	= .00
		GENERAL VALUE(PW*GEN SUM)	=0.261224
		GENERAL COSTS(PW*COSTS SUM)	=0.065306

SYSTEM			
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	4	12
- Life Cycle Costs	3	4	12
		SUMS>	60 15
		DEMAND:	57639
		PROPORTIONAL WEIGHT (PW)	= .00
		GENERAL VALUE(PW*GEN SUM)	=0.261224
		GENERAL COSTS(PW*COSTS SUM)	=0.065306


```

=====
: FAMILY EVALUATION FACTORS           ::          : RATING WEIGHT X RATING  ::
:   - Family Costs                     5 ::          :      1      5          ::
:   - Fee Requirements Coverage         5 ::          :      5     25          ::
=====
:SUM OF SYS PERFORMANCE VALUES       ::SUM GEN VALUES    57.71091  ::
:SUM OF INDIVIDUAL SYSTEM COSTS       ::SUM SYS COSTS     18.11146  ::
:THE FAMILY COST                       ::                  5          ::
:FAMILY REQUIREMENTS COVERAGE         ::                  25          ::
=====
:.....: TOTAL FAMILY VALUE = ::          105.8223      ::
=====

```

TABLE C.1.2
Evaluation Matrix
Basic Systems Family - Elimination by Demand - 16 Systems

		SYSTEM		
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4	2	5	20
- Available Resources	4		4	16
- Operational Suitability	4		5	20
- Procurement Costs	3		1	3
- Life Cycle Costs	3		3	9
		SUMS>	56	12
		DEMAND:	6986800	
		PROPORTIONAL WEIGHT (PW)	=	0.53
		GENERAL VALUE(PW*GEN SUM)	=	29.55376
		GENERAL COSTS(PW*COSTS SUM)	=	6.332949
		SYSTEM		
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4	3	5	20
- Available Resources	4		4	16
- Operational Suitability	4		5	20
- Procurement Costs	3		2	6
- Life Cycle Costs	3		3	9
		SUMS>	56	15
		DEMAND:	30720	
		PROPORTIONAL WEIGHT (PW)	=	.00
		GENERAL VALUE(PW*GEN SUM)	=	0.129943
		GENERAL COSTS(PW*COSTS SUM)	=	0.034806
		SYSTEM		
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4	4	5	20
- Available Resources	4		5	20
- Operational Suitability	4		5	20
- Procurement Costs	3		1	3
- Life Cycle Costs	3		4	12
		SUMS>	60	15
		DEMAND:	3000	
		PROPORTIONAL WEIGHT (PW)	=	.00
		GENERAL VALUE(PW*GEN SUM)	=	0.013596
		GENERAL COSTS(PW*COSTS SUM)	=	0.003399

		SYSTEM			
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING	
- Technical Feasibility	4	5	5	20	
- Available Resources	4		5	20	
- Operational Suitability	4		5	20	
- Procurement Costs	3		3		9
- Life Cycle Costs	3		4		12
		SUMS>		60	21
		DEMAND:		30000	
		PROPORTIONAL WEIGHT (PW) =		.00	
		GENERAL VALUE(PW*GEN SUM) =		0.135962	
		GENERAL COSTS(PW*COSTS SUM)=		0.047586	
		=====			
		SYSTEM			
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING	
- Technical Feasibility	4	6	5	20	
- Available Resources	4		5	20	
- Operational Suitability	4		5	20	
- Procurement Costs	3		3		9
- Life Cycle Costs	3		4		12
		SUMS>		60	21
		DEMAND:		29320	
		PROPORTIONAL WEIGHT (PW) =		.00	
		GENERAL VALUE(PW*GEN SUM) =		0.132880	
		GENERAL COSTS(PW*COSTS SUM)=		0.046508	
		=====			
		SYSTEM			
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING	
- Technical Feasibility	4	7	5	20	
- Available Resources	4		5	20	
- Operational Suitability	4		5	20	
- Procurement Costs	3		1		3
- Life Cycle Costs	3		4		12
		SUMS>		60	15
		DEMAND:		75810	
		PROPORTIONAL WEIGHT (PW) =		0.01	
		GENERAL VALUE(PW*GEN SUM) =		0.343577	
		GENERAL COSTS(PW*COSTS SUM)=		0.085894	
		=====			
		SYSTEM			
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING	
- Technical Feasibility	4	8	5	20	
- Available Resources	4		5	20	
- Operational Suitability	4		5	20	
- Procurement Costs	3		3		9
- Life Cycle Costs	3		4		12

		: : : : : SUMS>		60	21	: :
		: : DEMAND:		35200		: :
		: : PROPORTIONAL WEIGHT (PW) =			.00	: :
		: : GENERAL VALUE(PW*GEN SUM) =		0.159529		: :
		: : GENERAL COSTS(PW*COSTS SUM) =		0.055835		: :
=====						
		: : SYSTEM		: :		
=====						
: SYSTEM CRITERIA	WEIGHTS			RATING	WEIGHT X RATING	: :
=====						
- Technical Feasibility	4			5	20	: :
- Available Resources	4			5	20	: :
- Operational Suitability	4	9		5	20	: :
- Procurement Costs	3			3	9	: :
- Life Cycle Costs	3			4	12	: :
=====						
		: : : : : SUMS>		60	21	: :
		: : DEMAND:		10		: :
		: : PROPORTIONAL WEIGHT (PW) =			.00	: :
		: : GENERAL VALUE(PW*GEN SUM) =		0.000045		: :
		: : GENERAL COSTS(PW*COSTS SUM) =		0.000015		: :
=====						
		: : SYSTEM		: :		
=====						
: SYSTEM CRITERIA	WEIGHTS			RATING	WEIGHT X RATING	: :
=====						
- Technical Feasibility	4			5	20	: :
- Available Resources	4			5	20	: :
- Operational Suitability	4	10		5	20	: :
- Procurement Costs	3			1	3	: :
- Life Cycle Costs	3			4	12	: :
=====						
		: : : : : SUMS>		60	15	: :
		: : DEMAND:		2880		: :
		: : PROPORTIONAL WEIGHT (PW) =			.00	: :
		: : GENERAL VALUE(PW*GEN SUM) =		0.013052		: :
		: : GENERAL COSTS(PW*COSTS SUM) =		0.003263		: :
=====						
		: : SYSTEM		: :		
=====						
: SYSTEM CRITERIA	WEIGHTS			RATING	WEIGHT X RATING	: :
=====						
- Technical Feasibility	4			5	20	: :
- Available Resources	4			5	20	: :
- Operational Suitability	4	11		5	20	: :
- Procurement Costs	3			4	12	: :
- Life Cycle Costs	3			4	12	: :
=====						
		: : : : : SUMS>		60	24	: :
		: : DEMAND:		5700		: :
		: : PROPORTIONAL WEIGHT (PW) =			.00	: :
		: : GENERAL VALUE(PW*GEN SUM) =		0.025832		: :
		: : GENERAL COSTS(PW*COSTS SUM) =		0.010333		: :
=====						

SYSTEM			
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	4	12
- Life Cycle Costs	3	4	12

:::::::::::SUMS> 60 24
 DEMAND: 118005
 PROPORTIONAL WEIGHT (PW) = 0.01
 GENERAL VALUE(PW*GEN SUM) =0.534808
 GENERAL COSTS(PW*COSTS SUM)=0.213923

SYSTEM			
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	1	3
- Life Cycle Costs	3	4	12

:::::::::::SUMS> 60 15
 DEMAND: 57639
 PROPORTIONAL WEIGHT (PW) = .00
 GENERAL VALUE(PW*GEN SUM) =0.261224
 GENERAL COSTS(PW*COSTS SUM)=0.065306

SYSTEM			
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	4	12
- Life Cycle Costs	3	4	12

:::::::::::SUMS> 60 24
 DEMAND: 4580913
 PROPORTIONAL WEIGHT (PW) = 0.35
 GENERAL VALUE(PW*GEN SUM) =20.76107
 GENERAL COSTS(PW*COSTS SUM)=8.304428

SYSTEM			
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	5	15
- Life Cycle Costs	3	5	15

```

:                                     : SUMS>      60      30 :
: DEMAND:      882                    :
: PROPORTIONAL WEIGHT (PW) = .00 :
: GENERAL VALUE(PW*GEN SUM) =0.003997 :
: GENERAL COSTS(PW*COSTS SUM)=0.001998 :

```

```

: SYSTEM :
:-----:
: SYSTEM CRITERIA      WEIGHTS : RATING  WEIGHT X RATING :
:-----:
: - Technical Feasibility      4 :      5      20 :
: - Available Resources        4 :      5      20 :
: - Operational Suitability    4 :      5      20 :
: - Procurement Costs          3 :      5      15 :
: - Life Cycle Costs           3 :      5      15 :

```

```

:                                     : SUMS>      60      30 :
: DEMAND:    1095805                :
: PROPORTIONAL WEIGHT (PW) = 0.08 :
: GENERAL VALUE(PW*GEN SUM) =4.966277 :
: GENERAL COSTS(PW*COSTS SUM)=2.483138 :

```

```

: SYSTEM :
:-----:
: SYSTEM CRITERIA      WEIGHTS : RATING  WEIGHT X RATING :
:-----:
: - Technical Feasibility      4 :      5      20 :
: - Available Resources        4 :      2       8 :
: - Operational Suitability    4 :      5      20 :
: - Procurement Costs          3 :      5      15 :
: - Life Cycle Costs           3 :      5      15 :

```

```

:                                     : SUMS>      48      30 :
: DEMAND:    186256                  :
: PROPORTIONAL WEIGHT (PW) = 0.01 :
: GENERAL VALUE(PW*GEN SUM) =0.675301 :
: GENERAL COSTS(PW*COSTS SUM)=0.422063 :

```

```

: FAMILY EVALUATION FACTORS : RATING  WEIGHT X RATING :
: - Family Costs            5 :      1       5 :
: - Fam Requirements Coverage 5 :      5      25 :

```

```

: SUM OF SYS PERFORMANCE VALUES : SUM GEN VALUES  57.71086 :
: SUM OF INDIVIDUAL SYSTEM COSTS : SUM SYS COSTS   18.11145 :
: THE FAMILY COST : 5 :
: FAMILY REQUIREMENTS COVERAGE : 25 :

```

```

: TOTAL FAMILY VALUE = : 105.8223 :

```

TABLE C.1.3
Evaluation Matrix
Basic Systems Family - Elimination by Demand - 15 Systems

SYSTEM CRITERIA		WEIGHTS	SYSTEM	RATING	WEIGHT X RATING
- Technical Feasibility	4			5	20
- Available Resources	4			4	16
- Operational Suitability	4	2		5	20
- Procurement Costs	3			1	3
- Life Cycle Costs	3			3	9
			SUMS>	56	12
			DEMAND: 6986800		
			PROPORTIONAL WEIGHT (PW) =	0.53	
			GENERAL VALUE(PW*GEN SUM) =	29.55376	
			GENERAL COSTS(PW*COSTS SUM) =	6.332949	
SYSTEM CRITERIA		WEIGHTS	SYSTEM	RATING	WEIGHT X RATING
- Technical Feasibility	4			5	20
- Available Resources	4			4	16
- Operational Suitability	4	3		5	20
- Procurement Costs	3			2	6
- Life Cycle Costs	3			3	9
			SUMS>	56	15
			DEMAND: 30720		
			PROPORTIONAL WEIGHT (PW) =	.00	
			GENERAL VALUE(PW*GEN SUM) =	0.129943	
			GENERAL COSTS(PW*COSTS SUM) =	0.034806	
SYSTEM CRITERIA		WEIGHTS	SYSTEM	RATING	WEIGHT X RATING
- Technical Feasibility	4			5	20
- Available Resources	4			5	20
- Operational Suitability	4	4		5	20
- Procurement Costs	3			1	3
- Life Cycle Costs	3			4	12
			SUMS>	60	15
			DEMAND: 3000		
			PROPORTIONAL WEIGHT (PW) =	.00	
			GENERAL VALUE(PW*GEN SUM) =	0.013596	
			GENERAL COSTS(PW*COSTS SUM) =	0.003399	

		SYSTEM		
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4	5	5	20
- Available Resources	4		5	20
- Operational Suitability	4		5	20
- Procurement Costs	3		3	9
- Life Cycle Costs	3		4	12
			SUMS>	60 21
			DEMAND:	30000
			PROPORTIONAL WEIGHT (PW) =	.00
			GENERAL VALUE(PW*GEN SUM) =	0.135962
			GENERAL COSTS(PW*COSTS SUM) =	0.047586
		SYSTEM		
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4	6	5	20
- Available Resources	4		5	20
- Operational Suitability	4		5	20
- Procurement Costs	3		3	9
- Life Cycle Costs	3		4	12
			SUMS>	60 21
			DEMAND:	29330
			PROPORTIONAL WEIGHT (PW) =	.00
			GENERAL VALUE(PW*GEN SUM) =	0.132925
			GENERAL COSTS(PW*COSTS SUM) =	0.046524
		SYSTEM		
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4	7	5	20
- Available Resources	4		5	20
- Operational Suitability	4		5	20
- Procurement Costs	3		1	3
- Life Cycle Costs	3		4	12
			SUMS>	60 15
			DEMAND:	75810
			PROPORTIONAL WEIGHT (PW) =	0.01
			GENERAL VALUE(PW*GEN SUM) =	0.343577
			GENERAL COSTS(PW*COSTS SUM) =	0.085894
		SYSTEM		
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4	8	5	20
- Available Resources	4		5	20
- Operational Suitability	4		5	20
- Procurement Costs	3		3	9
- Life Cycle Costs	3		4	12

		SUMS>		60	21
		DEMAND:		35200	
		PROPORTIONAL WEIGHT (PW) =		.00	
		GENERAL VALUE(PW*GEN SUM) =		0.159529	
		GENERAL COSTS(PW*COSTS SUM)=		0.055835	
=====					
		SYSTEM			
SYSTEM CRITERIA		WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility		4	10	5	20
- Available Resources		4		5	20
- Operational Suitability		4		5	20
- Procurement Costs		3		1	3
- Life Cycle Costs		3		4	12
=====					
		SUMS>		60	15
		DEMAND:		2880	
		PROPORTIONAL WEIGHT (PW) =		.00	
		GENERAL VALUE(PW*GEN SUM) =		0.013052	
		GENERAL COSTS(PW*COSTS SUM)=		0.003263	
=====					
		SYSTEM			
SYSTEM CRITERIA		WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility		4	11	5	20
- Available Resources		4		5	20
- Operational Suitability		4		5	20
- Procurement Costs		3		4	12
- Life Cycle Costs		3		4	12
=====					
		SUMS>		60	24
		DEMAND:		5700	
		PROPORTIONAL WEIGHT (PW) =		.00	
		GENERAL VALUE(PW*GEN SUM) =		0.025832	
		GENERAL COSTS(PW*COSTS SUM)=		0.010333	
=====					
		SYSTEM			
SYSTEM CRITERIA		WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility		4	12	5	20
- Available Resources		4		5	20
- Operational Suitability		4		5	20
- Procurement Costs		3		4	12
- Life Cycle Costs		3		4	12
=====					
		SUMS>		60	24
		DEMAND:		118005	
		PROPORTIONAL WEIGHT (PW) =		0.01	
		GENERAL VALUE(PW*GEN SUM) =		0.534808	
		GENERAL COSTS(PW*COSTS SUM)=		0.213923	

SYSTEM			
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	1	3
- Life Cycle Costs	3	4	12
		SUMS>	60
		DEMAND:	57639
		PROPORTIONAL WEIGHT (PW) =	.00
		GENERAL VALUE(PW*GEN SUM) =	0.261224
		GENERAL COSTS(PW*COSTS SUM)=	0.065306

SYSTEM			
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	4	12
- Life Cycle Costs	3	4	12
		SUMS>	60
		DEMAND:	4580913
		PROPORTIONAL WEIGHT (PW) =	0.35
		GENERAL VALUE(PW*GEN SUM) =	20.76107
		GENERAL COSTS(PW*COSTS SUM)=	8.301428

SYSTEM			
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	5	15
- Life Cycle Costs	3	5	15
		SUMS>	60
		DEMAND:	882
		PROPORTIONAL WEIGHT (PW) =	.00
		GENERAL VALUE(PW*GEN SUM) =	0.003997
		GENERAL COSTS(PW*COSTS SUM)=	0.001998

SYSTEM			
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	5	15
- Life Cycle Costs	3	5	15
		SUMS>	60
		DEMAND:	882
		PROPORTIONAL WEIGHT (PW) =	.00
		GENERAL VALUE(PW*GEN SUM) =	0.003997
		GENERAL COSTS(PW*COSTS SUM)=	0.001998

```

:                                     ::::::::::::::SUMS>          60          30 ::
: DEMAND: 1095805 ----- ::
: PROPORTIONAL WEIGHT (PW) = 0.08 ::
: GENERAL VALUE(PW*GEN SUM) =4.966277 ::
: GENERAL COSTS(PW*COSTS SUM)=2.483138 ::

```

```

:                                     :: SYSTEM ::                                     ::
:-----:-----:-----:-----:-----:-----:-----:-----:-----:-----:
: SYSTEM CRITERIA          WEIGHTS ::          RATING      WEIGHT X RATING ::
:-----:-----:-----:-----:-----:-----:-----:-----:-----:-----:
: - Technical Feasibility      4 ::          5          20 ::
: - Available Resources        4 ::          2           8 ::
: - Operational Suitability    4 ::          5          20 ::
: - Procurement Costs         3 ::          5           15 ::
: - Life Cycle Costs          3 ::          5           15 ::
:-----:-----:-----:-----:-----:-----:-----:-----:-----:-----:
:                                     ::::::::::::::SUMS>          48          30 ::
: DEMAND: 186256 ----- ::
: PROPORTIONAL WEIGHT (PW) = 0.01 ::
: GENERAL VALUE(PW*GEN SUM) =0.675301 ::
: GENERAL COSTS(PW*COSTS SUM)=0.422063 ::

```

```

:-----:-----:-----:-----:-----:-----:-----:-----:-----:-----:
: FAMILY EVALUATION FACTORS ::          RATING      WEIGHT X RATING ::
: - Family Costs             5 ::          1           5 ::
: - Fee Requirements Coverage 5 ::          5          25 ::
:-----:-----:-----:-----:-----:-----:-----:-----:-----:-----:
: SUM OF SYS PERFORMANCE VALUES :: SUM GEN VALUES      57.71086 ::
: SUM OF INDIVIDUAL SYSTEM COSTS  :: SUM SYS COSTS       18.11145 ::
: THE FAMILY COST                ::          5 ::
: FAMILY REQUIREMENTS COVERAGE  ::          25 ::
:-----:-----:-----:-----:-----:-----:-----:-----:-----:-----:
: :::::::::::::: TOTAL FAMILY VALUE = ::          105.8223 ::

```

TABLE C.1.4
Evaluation Matrix
Basic Systems Family - Elimination by Demand - 14 Systems

		:: SYSTEM ::			
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING	
- Technical Feasibility	4	2	5	20	
- Available Resources	4		4	16	
- Operational Suitability	4		5	20	
- Procurement Costs	3		1		3
- Life Cycle Costs	3		3		9
		:::SUMS>		56	12
		DEMAND:		6986800	
		PROPORTIONAL WEIGHT (PW) =		0.53	
		GENERAL VALUE(PW*GEN SUM) =		29.55376	
		GENERAL COSTS(PW*COSTS SUM)=		6.332949	
		:: SYSTEM ::			
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING	
- Technical Feasibility	4	3	5	20	
- Available Resources	4		4	16	
- Operational Suitability	4		5	20	
- Procurement Costs	3		2		6
- Life Cycle Costs	3		3		9
		:::SUMS>		56	15
		DEMAND:		30720	
		PROPORTIONAL WEIGHT (PW) =		.00	
		GENERAL VALUE(PW*GEN SUM) =		0.129943	
		GENERAL COSTS(PW*COSTS SUM)=		0.034806	
		:: SYSTEM ::			
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING	
- Technical Feasibility	4	4	5	20	
- Available Resources	4		5	20	
- Operational Suitability	4		5	20	
- Procurement Costs	3		1		3
- Life Cycle Costs	3		4		12
		:::SUMS>		60	15
		DEMAND:		3000	
		PROPORTIONAL WEIGHT (PW) =		.00	
		GENERAL VALUE(PW*GEN SUM) =		0.013596	
		GENERAL COSTS(PW*COSTS SUM)=		0.003399	

		SYSTEM			
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING	
- Technical Feasibility	4	5	5	20	
- Available Resources	4		5	20	
- Operational Suitability	4		5	20	
- Procurement Costs	3		3		9
- Life Cycle Costs	3		4		12
		SUMS>		60	21
		DEMAND: 30000			
		PROPORTIONAL WEIGHT (PW) =		.00	
		GENERAL VALUE(PW*GEN SUM) =		0.135962	
		GENERAL COSTS(PW*COSTS SUM)=		0.047586	
		=====			
		SYSTEM			
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING	
- Technical Feasibility	4	6	5	20	
- Available Resources	4		5	20	
- Operational Suitability	4		5	20	
- Procurement Costs	3		3		9
- Life Cycle Costs	3		4		12
		SUMS>		60	21
		DEMAND: 29330			
		PROPORTIONAL WEIGHT (PW) =		.00	
		GENERAL VALUE(PW*GEN SUM) =		0.132925	
		GENERAL COSTS(PW*COSTS SUM)=		0.046524	
		=====			
		SYSTEM			
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING	
- Technical Feasibility	4	7	5	20	
- Available Resources	4		5	20	
- Operational Suitability	4		5	20	
- Procurement Costs	3		1		3
- Life Cycle Costs	3		4		12
		SUMS>		60	15
		DEMAND: 75810			
		PROPORTIONAL WEIGHT (PW) =		0.01	
		GENERAL VALUE(PW*GEN SUM) =		0.343577	
		GENERAL COSTS(PW*COSTS SUM)=		0.085894	
		=====			
		SYSTEM			
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING	
- Technical Feasibility	4	8	5	20	
- Available Resources	4		5	20	
- Operational Suitability	4		5	20	
- Procurement Costs	3		3		9
- Life Cycle Costs	3		4		12

		: : : : : SUMS>		60	21	: :
		: : DEMAND:		35200		: :
		: : PROPORTIONAL WEIGHT (PW) =		.00		: :
		: : GENERAL VALUE(PW*GEN SUM) =		0.159529		: :
		: : GENERAL COSTS(PW*COSTS SUM) =		0.055835		: :
		=====				
		: : SYSTEM :		: :		
		=====				
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING		
- Technical Feasibility	4		5	20		
- Available Resources	4		5	20		
- Operational Suitability	4	10	5	20		
- Procurement Costs	3		1	3		
- Life Cycle Costs	3		4	12		
		=====				
		: : : : : SUMS>		60	15	: :
		: : DEMAND:		2880		: :
		: : PROPORTIONAL WEIGHT (PW) =		.00		: :
		: : GENERAL VALUE(PW*GEN SUM) =		0.013052		: :
		: : GENERAL COSTS(PW*COSTS SUM) =		0.003263		: :
		=====				
		: : SYSTEM :		: :		
		=====				
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING		
- Technical Feasibility	4		5	20		
- Available Resources	4		5	20		
- Operational Suitability	4	11	5	20		
- Procurement Costs	3		4	12		
- Life Cycle Costs	3		4	12		
		=====				
		: : : : : SUMS>		60	24	: :
		: : DEMAND:		5700		: :
		: : PROPORTIONAL WEIGHT (PW) =		.00		: :
		: : GENERAL VALUE(PW*GEN SUM) =		0.025832		: :
		: : GENERAL COSTS(PW*COSTS SUM) =		0.010333		: :
		=====				
		: : SYSTEM :		: :		
		=====				
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING		
- Technical Feasibility	4		5	20		
- Available Resources	4		5	20		
- Operational Suitability	4	12	5	20		
- Procurement Costs	3		4	12		
- Life Cycle Costs	3		4	12		
		=====				
		: : : : : SUMS>		60	24	: :
		: : DEMAND:		118005		: :
		: : PROPORTIONAL WEIGHT (PW) =		0.01		: :
		: : GENERAL VALUE(PW*GEN SUM) =		0.534808		: :
		: : GENERAL COSTS(PW*COSTS SUM) =		0.213923		: :
		=====				

		SYSTEM			
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING	
- Technical Feasibility	4	13	5	20	
- Available Resources	4		5	20	
- Operational Suitability	4		5	20	
- Procurement Costs	3		1		3
- Life Cycle Costs	3		4		12
		SUMS>		60	15
		DEMAND: 57639			
		PROPORTIONAL WEIGHT (PW) =		.00	
		GENERAL VALUE(PW*GEN SUM) =		0.261224	
		GENERAL COSTS(PW*COSTS SUM)=		0.065306	
		SYSTEM			
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING	
- Technical Feasibility	4	14	5	20	
- Available Resources	4		5	20	
- Operational Suitability	4		5	20	
- Procurement Costs	3		4		12
- Life Cycle Costs	3		4		12
		SUMS>		60	24
		DEMAND: 4581795			
		PROPORTIONAL WEIGHT (PW) =		0.35	
		GENERAL VALUE(PW*GEN SUM) =		20.76506	
		GENERAL COSTS(PW*COSTS SUM)=		8.306027	
		SYSTEM			
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING	
- Technical Feasibility	4	16	5	20	
- Available Resources	4		5	20	
- Operational Suitability	4		5	20	
- Procurement Costs	3		5		15
- Life Cycle Costs	3		5		15
		SUMS>		60	30
		DEMAND: 1095805			
		PROPORTIONAL WEIGHT (PW) =		0.08	
		GENERAL VALUE(PW*GEN SUM) =		4.966277	
		GENERAL COSTS(PW*COSTS SUM)=		2.483138	
		SYSTEM			
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING	
- Technical Feasibility	4	17	5	20	
- Available Resources	4		2	8	
- Operational Suitability	4		5	20	
- Procurement Costs	3		5		15
- Life Cycle Costs	3		5		15

```

:                                     ::::::::::::::SUNS>      48      30 ::
:                                     :: DEMAND:      186256      ----- ::
:                                     :: PROPORTIONAL WEIGHT (PW) =      0.01 ::
:                                     :: GENERAL VALUE(PW*GEN SUM) =0.675301 ::
:                                     :: GENERAL COSTS(PW*COSTS SUM)=0.422063 ::
:                                     ::::::::::::::::::::::::::::::::::::::
: FAMILY EVALUATION FACTORS          ::          : RATING WEIGHT X RATING ::
:   - Family Costs                    S ::          :      1      5      ::
:   - Fan Requirements Coverage       S ::          :      5     25      ::
:                                     ::::::::::::::::::::::::::::::::::::::
: SUM OF SYS PERFORMANCE VALUES      ::SUM GEN VALUES      57.71086      ::
: SUM OF INDIVIDUAL SYSTEM COSTS       ::SUM SYS COSTS      18.11105      ::
: THE FAMILY COST                      ::          5      ::
: FAMILY REQUIREMENTS COVERAGE         ::          25      ::
:                                     ::::::::::::::::::::::::::::::::::::::
: :::::::::::::: TOTAL FAMILY VALUE = ::          105.8219      ::
:                                     ::::::::::::::::::::::::::::::::::::::

```

TABLE C.1.5
Evaluation Matrix
Basic Systems Family - Elimination by Demand - 13 Systems

		SYSTEM		
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4	2	5	20
- Available Resources	4		4	16
- Operational Suitability	4		5	20
- Procurement Costs	3		1	3
- Life Cycle Costs	3		3	9
		SUMS>		56 12
		DEMAND: 6986800		
		PROPORTIONAL WEIGHT (PW) = 0.53		
		GENERAL VALUE(PW*GEN SUM) =29.55376		
		GENERAL COSTS(PW*COSTS SUM)=6.332949		
		SYSTEM		
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4	3	5	20
- Available Resources	4		4	16
- Operational Suitability	4		5	20
- Procurement Costs	3		2	6
- Life Cycle Costs	3		3	9
		SUMS>		56 15
		DEMAND: 30720		
		PROPORTIONAL WEIGHT (PW) = .00		
		GENERAL VALUE(PW*GEN SUM) =0.129943		
		GENERAL COSTS(PW*COSTS SUM)=0.034806		
		SYSTEM		
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4	4	5	20
- Available Resources	4		5	20
- Operational Suitability	4		5	20
- Procurement Costs	3		1	3
- Life Cycle Costs	3		4	12
		SUMS>		60 15
		DEMAND: 3000		
		PROPORTIONAL WEIGHT (PW) = .00		
		GENERAL VALUE(PW*GEN SUM) =0.013596		
		GENERAL COSTS(PW*COSTS SUM)=0.003399		

		SYSTEM		
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4	5	5	20
- Available Resources	4		5	20
- Operational Suitability	4		5	20
- Procurement Costs	3		3	9
- Life Cycle Costs	3		4	12
			SUMS>	60 21
			DEMAND: 30000	
			PROPORTIONAL WEIGHT (PW) =	.00
			GENERAL VALUE(PW*GEN SUM) =	0.135962
			GENERAL COSTS(PW*COSTS SUM)=	0.047586
		SYSTEM		
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4	6	5	20
- Available Resources	4		5	20
- Operational Suitability	4		5	20
- Procurement Costs	3		3	9
- Life Cycle Costs	3		4	12
			SUMS>	60 21
			DEMAND: 29330	
			PROPORTIONAL WEIGHT (PW) =	.00
			GENERAL VALUE(PW*GEN SUM) =	0.132925
			GENERAL COSTS(PW*COSTS SUM)=	0.046524
		SYSTEM		
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4	7	5	20
- Available Resources	4		5	20
- Operational Suitability	4		5	20
- Procurement Costs	3		1	3
- Life Cycle Costs	3		4	12
			SUMS>	60 15
			DEMAND: 78690	
			PROPORTIONAL WEIGHT (PW) =	0.01
			GENERAL VALUE(PW*GEN SUM) =	0.356629
			GENERAL COSTS(PW*COSTS SUM)=	0.089157
		SYSTEM		
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4	8	5	20
- Available Resources	4		5	20
- Operational Suitability	4		5	20
- Procurement Costs	3		3	9
- Life Cycle Costs	3		4	12

		: : : : : SUMS>		60	21	: :
		: : DEMAND:		35200		: :
		: : PROPORTIONAL WEIGHT (PW) =		.00		: :
		: : GENERAL VALUE(PW*GEN SUM) =		0.159529		: :
		: : GENERAL COSTS(PW*COSTS SUM) =		0.055835		: :
		=====				
		: : SYSTEM				
: : SYSTEM CRITERIA		WEIGHTS		RATING	WEIGHT X RATING	: :
- Technical Feasibility	4			5	20	: :
- Available Resources	4			5	20	: :
- Operational Suitability	4	11		5	20	: :
- Procurement Costs	3			4	12	: :
- Life Cycle Costs	3			4	12	: :
		=====				
		: : : : : SUMS>		60	24	: :
		: : DEMAND:		5700		: :
		: : PROPORTIONAL WEIGHT (PW) =		.00		: :
		: : GENERAL VALUE(PW*GEN SUM) =		0.025832		: :
		: : GENERAL COSTS(PW*COSTS SUM) =		0.010333		: :
		=====				
		: : SYSTEM				
: : SYSTEM CRITERIA		WEIGHTS		RATING	WEIGHT X RATING	: :
- Technical Feasibility	4			5	20	: :
- Available Resources	4			5	20	: :
- Operational Suitability	4	12		5	20	: :
- Procurement Costs	3			4	12	: :
- Life Cycle Costs	3			4	12	: :
		=====				
		: : : : : SUMS>		60	24	: :
		: : DEMAND:		118005		: :
		: : PROPORTIONAL WEIGHT (PW) =		0.01		: :
		: : GENERAL VALUE(PW*GEN SUM) =		0.534808		: :
		: : GENERAL COSTS(PW*COSTS SUM) =		0.213923		: :
		=====				
		: : SYSTEM				
: : SYSTEM CRITERIA		WEIGHTS		RATING	WEIGHT X RATING	: :
- Technical Feasibility	4			5	20	: :
- Available Resources	4			5	20	: :
- Operational Suitability	4	13		5	20	: :
- Procurement Costs	3			1	3	: :
- Life Cycle Costs	3			4	12	: :
		=====				
		: : : : : SUMS>		60	15	: :
		: : DEMAND:		57639		: :
		: : PROPORTIONAL WEIGHT (PW) =		.00		: :
		: : GENERAL VALUE(PW*GEN SUM) =		0.261224		: :
		: : GENERAL COSTS(PW*COSTS SUM) =		0.065306		: :
		=====				

		SYSTEM		
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4	14	5	20
- Available Resources	4		5	20
- Operational Suitability	4		5	20
- Procurement Costs	3		4	12
- Life Cycle Costs	3		4	12
			SUMS>	60 24
			DEMAND: 4581795	
			PROPORTIONAL WEIGHT (PW) =	0.35
			GENERAL VALUE(PW*GEN SUM) =	20.76506
			GENERAL COSTS(PW*COSTS SUM)=	8.306027
		SYSTEM		
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4	16	5	20
- Available Resources	4		5	20
- Operational Suitability	4		5	20
- Procurement Costs	3		5	15
- Life Cycle Costs	3		5	15
			SUMS>	60 30
			DEMAND: 1095805	
			PROPORTIONAL WEIGHT (PW) =	0.08
			GENERAL VALUE(PW*GEN SUM) =	4.966277
			GENERAL COSTS(PW*COSTS SUM)=	2.483138
		SYSTEM		
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4	17	5	20
- Available Resources	4		2	8
- Operational Suitability	4		5	20
- Procurement Costs	3		5	15
- Life Cycle Costs	3		5	15
			SUMS>	48 30
			DEMAND: 186256	
			PROPORTIONAL WEIGHT (PW) =	0.01
			GENERAL VALUE(PW*GEN SUM) =	0.675301
			GENERAL COSTS(PW*COSTS SUM)=	0.422063

FAMILY EVALUATION FACTORS		RATING	WEIGHT	X	RATING
- Family Costs	5	1	5		
- Family Requirements Coverage	5	5	25		
SUM OF SYS PERFORMANCE VALUES		SUM GEN VALUES	57.71086		
SUM OF INDIVIDUAL SYSTEM COSTS		SUM SYS COSTS	18.11105		
THE FAMILY COST			5		
FAMILY REQUIREMENTS COVERAGE			25		
TOTAL FAMILY VALUE =			105.8219		

TABLE C.1.6
Evaluation Matrix
Basic Systems Family - Elimination by Demand - 12 Systems

		SYSTEM		
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4	2	5	20
- Available Resources	4		4	16
- Operational Suitability	4		5	20
- Procurement Costs	3		1	3
- Life Cycle Costs	3		3	9
		SUMS>	56	12
		DEMAND: 6986800		
		PROPORTIONAL WEIGHT (PW) =	0.53	
		GENERAL VALUE(PW*GEN SUM) =	29.55376	
		GENERAL COSTS(PW*COSTS SUM)=	6.332949	

		SYSTEM		
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4	3	5	20
- Available Resources	4		4	16
- Operational Suitability	4		5	20
- Procurement Costs	3		2	6
- Life Cycle Costs	3		3	9
		SUMS>	56	15
		DEMAND: 30720		
		PROPORTIONAL WEIGHT (PW) =	.00	
		GENERAL VALUE(PW*GEN SUM) =	0.129943	
		GENERAL COSTS(PW*COSTS SUM)=	0.034806	

		SYSTEM		
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4	5	5	20
- Available Resources	4		5	20
- Operational Suitability	4		5	20
- Procurement Costs	3		3	9
- Life Cycle Costs	3		4	12
		SUMS>	60	21
		DEMAND: 30000		
		PROPORTIONAL WEIGHT (PW) =	.00	
		GENERAL VALUE(PW*GEN SUM) =	0.135962	
		GENERAL COSTS(PW*COSTS SUM)=	0.047586	

		SYSTEM			
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING	
- Technical Feasibility	4	6	5	20	
- Available Resources	4		5	20	
- Operational Suitability	4		5	20	
- Procurement Costs	3		3	9	
- Life Cycle Costs	3		4	12	
		SUMS>		60	21
		DEMAND:		29330	
		PROPORTIONAL WEIGHT (PW) =		.00	
		GENERAL VALUE(PW*GEN SUM) =		0.132925	
		GENERAL COSTS(PW*COSTS SUM) =		0.046524	
		=====			
		SYSTEM			
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING	
- Technical Feasibility	4	7	5	20	
- Available Resources	4		5	20	
- Operational Suitability	4		5	20	
- Procurement Costs	3		1	3	
- Life Cycle Costs	3		4	12	
		SUMS>		60	15
		DEMAND:		78690	
		PROPORTIONAL WEIGHT (PW) =		0.01	
		GENERAL VALUE(PW*GEN SUM) =		0.356629	
		GENERAL COSTS(PW*COSTS SUM) =		0.089157	
		=====			
		SYSTEM			
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING	
- Technical Feasibility	4	8	5	20	
- Available Resources	4		5	20	
- Operational Suitability	4		5	20	
- Procurement Costs	3		3	9	
- Life Cycle Costs	3		4	12	
		SUMS>		60	21
		DEMAND:		35200	
		PROPORTIONAL WEIGHT (PW) =		.00	
		GENERAL VALUE(PW*GEN SUM) =		0.159529	
		GENERAL COSTS(PW*COSTS SUM) =		0.055835	
		=====			
		SYSTEM			
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING	
- Technical Feasibility	4	11	5	20	
- Available Resources	4		5	20	
- Operational Suitability	4		5	20	
- Procurement Costs	3		4	12	
- Life Cycle Costs	3		4	12	

```

:                                     : SUMS>      60      24 :
: DEMAND:      5700                  :
: PROPORTIONAL WEIGHT (PW) = .00 :
: GENERAL VALUE(PW*GEN SUM) =0.025832 :
: GENERAL COSTS(PW*COSTS SUM)=0.010333 :
=====
: SYSTEM :
:
: SYSTEM CRITERIA      WEIGHTS : RATING      WEIGHT X RATING :
: - Technical Feasibility      4 :      5      20 :
: - Available Resources        4 :      5      20 :
: - Operational Suitability    4 :      5      20 :
: - Procurement Costs          3 :      4      12 :
: - Life Cycle Costs           3 :      4      12 :
=====
:                                     : SUMS>      60      24 :
: DEMAND:      118005              :
: PROPORTIONAL WEIGHT (PW) = 0.01 :
: GENERAL VALUE(PW*GEN SUM) =0.534808 :
: GENERAL COSTS(PW*COSTS SUM)=0.213923 :
=====
: SYSTEM :
:
: SYSTEM CRITERIA      WEIGHTS : RATING      WEIGHT X RATING :
: - Technical Feasibility      4 :      5      20 :
: - Available Resources        4 :      5      20 :
: - Operational Suitability    4 :      5      20 :
: - Procurement Costs          3 :      1       3 :
: - Life Cycle Costs           3 :      4      12 :
=====
:                                     : SUMS>      60      15 :
: DEMAND:      57639              :
: PROPORTIONAL WEIGHT (PW) = .00 :
: GENERAL VALUE(PW*GEN SUM) =0.261224 :
: GENERAL COSTS(PW*COSTS SUM)=0.065306 :
=====
: SYSTEM :
:
: SYSTEM CRITERIA      WEIGHTS : RATING      WEIGHT X RATING :
: - Technical Feasibility      4 :      5      20 :
: - Available Resources        4 :      5      20 :
: - Operational Suitability    4 :      5      20 :
: - Procurement Costs          3 :      4      12 :
: - Life Cycle Costs           3 :      4      12 :
=====
:                                     : SUMS>      60      24 :
: DEMAND:      4581795            :
: PROPORTIONAL WEIGHT (PW) = 0.35 :
: GENERAL VALUE(PW*GEN SUM) =20.76506 :
: GENERAL COSTS(PW*COSTS SUM)=8.306027 :
=====

```

SYSTEM			
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	5	15
- Life Cycle Costs	3	5	15
		SUMS>	60 30
		DEMAND: 1095805	
		PROPORTIONAL WEIGHT (PW) =	0.08
		GENERAL VALUE(PW*GEN SUM) =	4.966277
		GENERAL COSTS(PW*COSTS SUM) =	2.483138

SYSTEM			
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	2	8
- Operational Suitability	4	5	20
- Procurement Costs	3	5	15
- Life Cycle Costs	3	5	15
		SUMS>	48 30
		DEMAND: 186256	
		PROPORTIONAL WEIGHT (PW) =	0.01
		GENERAL VALUE(PW*GEN SUM) =	0.675301
		GENERAL COSTS(PW*COSTS SUM) =	0.422063

FAMILY EVALUATION FACTORS		RATING WEIGHT X RATING	
- Family Costs	5	2	10
- Fam Requirements Coverage	5	5	25
SUM OF SYS PERFORMANCE VALUES		SUM GEN VALUES	57.69727
SUM OF INDIVIDUAL SYSTEM COSTS		SUM SYS COSTS	18.10765
THE FAMILY COST			10
FAMILY REQUIREMENTS COVERAGE			25
TOTAL FAMILY VALUE =			110.8049

TABLE C.1.7
Evaluation Matrix
Basic Systems Family - Elimination by Demand - 11 Systems

SYSTEM CRITERIA		WEIGHTS	SYSTEM	RATING	WEIGHT X RATING
- Technical Feasibility	4			5	20
- Available Resources	4			4	16
- Operational Suitability	4		2	5	20
- Procurement Costs	3			1	3
- Life Cycle Costs	3			3	9
			SUMS>	56	12
			DEMAND: 6986800		
			PROPORTIONAL WEIGHT (PW) =	0.53	
			GENERAL VALUE(PW*GEN SUM) =	29.55376	
			GENERAL COSTS(PW*COSTS SUM)=	6.332949	
SYSTEM CRITERIA		WEIGHTS	SYSTEM	RATING	WEIGHT X RATING
- Technical Feasibility	4			5	20
- Available Resources	4			4	16
- Operational Suitability	4		3	5	20
- Procurement Costs	3			2	6
- Life Cycle Costs	3			3	9
			SUMS>	56	15
			DEMAND: 30720		
			PROPORTIONAL WEIGHT (PW) =	.00	
			GENERAL VALUE(PW*GEN SUM) =	0.129943	
			GENERAL COSTS(PW*COSTS SUM)=	0.034806	
SYSTEM CRITERIA		WEIGHTS	SYSTEM	RATING	WEIGHT X RATING
- Technical Feasibility	4			5	20
- Available Resources	4			5	20
- Operational Suitability	4		5	5	20
- Procurement Costs	3			3	9
- Life Cycle Costs	3			4	12
			SUMS>	60	21
			DEMAND: 30000		
			PROPORTIONAL WEIGHT (PW) =	.00	
			GENERAL VALUE(PW*GEN SUM) =	0.135962	
			GENERAL COSTS(PW*COSTS SUM)=	0.047586	

SYSTEM			
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	3	9
- Life Cycle Costs	3	4	12
		SUMS>	60 21
		DEMAND:	29330
		PROPORTIONAL WEIGHT (PW) =	.00
		GENERAL VALUE(PW*GEN SUM) =	0.132925
		GENERAL COSTS(PW*COSTS SUM) =	0.046524

SYSTEM			
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	1	3
- Life Cycle Costs	3	4	12
		SUMS>	60 15
		DEMAND:	78690
		PROPORTIONAL WEIGHT (PW) =	0.01
		GENERAL VALUE(PW*GEN SUM) =	0.356629
		GENERAL COSTS(PW*COSTS SUM) =	0.089157

SYSTEM			
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	3	9
- Life Cycle Costs	3	4	12
		SUMS>	60 21
		DEMAND:	40900
		PROPORTIONAL WEIGHT (PW) =	.00
		GENERAL VALUE(PW*GEN SUM) =	0.185362
		GENERAL COSTS(PW*COSTS SUM) =	0.064876

SYSTEM			
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	4	12
- Life Cycle Costs	3	4	12
		12	

```

:                                     : SUMS>      60      24 :
: DEMAND:      118005 ----- :
: PROPORTIONAL WEIGHT (PW) = 0.01 :
: GENERAL VALUE(PW*GEN SUM) =0.534808 :
: GENERAL COSTS(PW*COSTS SUM)=0.213923 :
=====
: SYSTEM :
:
: SYSTEM CRITERIA      WEIGHTS : RATING      WEIGHT X RATING :
:
: - Technical Feasibility      4 :      5      20 :
: - Available Resources      4 :      5      20 :
: - Operational Suitability      4 :      5      20 :
: - Procurement Costs      3 :      1      3 :
: - Life Cycle Costs      3 :      4      12 :
:
:                                     : SUMS>      60      15 :
: DEMAND:      57639 ----- :
: PROPORTIONAL WEIGHT (PW) = .00 :
: GENERAL VALUE(PW*GEN SUM) =0.261224 :
: GENERAL COSTS(PW*COSTS SUM)=0.065306 :
=====
: SYSTEM :
:
: SYSTEM CRITERIA      WEIGHTS : RATING      WEIGHT X RATING :
:
: - Technical Feasibility      4 :      5      20 :
: - Available Resources      4 :      5      20 :
: - Operational Suitability      4 :      5      20 :
: - Procurement Costs      3 :      4      12 :
: - Life Cycle Costs      3 :      4      12 :
:
:                                     : SUMS>      60      24 :
: DEMAND:      4581795 ----- :
: PROPORTIONAL WEIGHT (PW) = 0.35 :
: GENERAL VALUE(PW*GEN SUM) =20.76506 :
: GENERAL COSTS(PW*COSTS SUM)=8.306027 :
=====
: SYSTEM :
:
: SYSTEM CRITERIA      WEIGHTS : RATING      WEIGHT X RATING :
:
: - Technical Feasibility      4 :      5      20 :
: - Available Resources      4 :      5      20 :
: - Operational Suitability      4 :      5      20 :
: - Procurement Costs      3 :      5      15 :
: - Life Cycle Costs      3 :      5      15 :
:
:                                     : SUMS>      60      30 :
: DEMAND:      1095805 ----- :
: PROPORTIONAL WEIGHT (PW) = 0.08 :
: GENERAL VALUE(PW*GEN SUM) =4.966277 :
: GENERAL COSTS(PW*COSTS SUM)=2.483138 :
=====

```

		: : SYSTEM			
: SYSTEM CRITERIA		WEIGHTS		: RATING WEIGHT X RATING	
: - Technical Feasibility		4		5 20	
: - Available Resources		4		2 8	
: - Operational Suitability		4		5 20	
: - Procurement Costs		3		5 15	
: - Life Cycle Costs		3		5 15	
				: : : : : SUMS> 48 30	
				: : DEMAND: 186256	
				: : PROPORTIONAL WEIGHT (PW) = 0.01	
				: : GENERAL VALUE (PW*GEN SUM) = 0.675301	
				: : GENERAL COSTS (PW*COSTS SUM) = 0.422063	

: FAMILY EVALUATION FACTORS		: : RATING WEIGHT X RATING	
: - Family Costs		5 2 10	
: - Fam Requirements Coverage		5 5 25	
: SUM OF SYS PERFORMANCE VALUES		: : SUM GEN VALUES 57.69727	
: SUM OF INDIVIDUAL SYSTEM COSTS		: : SUM SYS COSTS 18.10636	
: THE FAMILY COST		: : 10	
: FAMILY REQUIREMENTS COVERAGE		: : 25	
: : : : : TOTAL FAMILY VALUE =		: : 110.8036	

TABLE C.1.8
Evaluation Matrix
Basic Systems Family - Elimination by Demand - 10 Systems

SYSTEM			
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	4	16
- Operational Suitability	4	5	20
- Procurement Costs	3	1	3
- Life Cycle Costs	3	3	9
		SUMS>	56 12
		DEMAND:	7016130
		PROPORTIONAL WEIGHT (PW)	= 0.53
		GENERAL VALUE(PW*GEN SUM)	=29.67783
		GENERAL COSTS(PW*COSTS SUM)	=6.359535
SYSTEM			
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	4	16
- Operational Suitability	4	5	20
- Procurement Costs	3	2	6
- Life Cycle Costs	3	3	9
		SUMS>	56 15
		DEMAND:	30720
		PROPORTIONAL WEIGHT (PW)	= .00
		GENERAL VALUE(PW*GEN SUM)	=0.129943
		GENERAL COSTS(PW*COSTS SUM)	=0.034806
SYSTEM			
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	3	9
- Life Cycle Costs	3	4	12
		SUMS>	60 21
		DEMAND:	30000
		PROPORTIONAL WEIGHT (PW)	= .00
		GENERAL VALUE(PW*GEN SUM)	=0.135962
		GENERAL COSTS(PW*COSTS SUM)	=0.047586

SYSTEM			
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	1	3
- Life Cycle Costs	3	4	12
		SUMS>	60 15
		DEMAND:	78690
		PROPORTIONAL WEIGHT (PW)	= 0.01
		GENERAL VALUE(PW*GEN SUM)	=0.356629
		GENERAL COSTS(PW*COSTS SUM)	=0.089157

SYSTEM			
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	3	9
- Life Cycle Costs	3	4	12
		SUMS>	60 21
		DEMAND:	40900
		PROPORTIONAL WEIGHT (PW)	= .00
		GENERAL VALUE(PW*GEN SUM)	=0.185362
		GENERAL COSTS(PW*COSTS SUM)	=0.064876

SYSTEM			
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	4	12
- Life Cycle Costs	3	4	12
		SUMS>	60 24
		DEMAND:	118005
		PROPORTIONAL WEIGHT (PW)	= 0.01
		GENERAL VALUE(PW*GEN SUM)	=0.534808
		GENERAL COSTS(PW*COSTS SUM)	=0.213923

SYSTEM			
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	1	3
- Life Cycle Costs	3	4	12

```

:                                     : SUMS>          60      15 :
: DEMAND:          57639              :
: PROPORTIONAL WEIGHT (PW) = .00 :
: GENERAL VALUE(PW*GEN SUM) =0.261224 :
: GENERAL COSTS(PW*COSTS SUM)=0.065306 :
=====
: SYSTEM :
:
: SYSTEM CRITERIA      WEIGHTS : RATING  WEIGHT X RATING :
: - Technical Feasibility      4 :      5      20 :
: - Available Resources        4 :      5      20 :
: - Operational Suitability    4 :      5      20 :
: - Procurement Costs          3 :      4      12 :
: - Life Cycle Costs           3 :      4      12 :
=====
:                                     : SUMS>          60      24 :
: DEMAND:          4581793          :
: PROPORTIONAL WEIGHT (PW) = 0.35 :
: GENERAL VALUE(PW*GEN SUM) =20.76506 :
: GENERAL COSTS(PW*COSTS SUM)=8.306027 :
=====
: SYSTEM :
:
: SYSTEM CRITERIA      WEIGHTS : RATING  WEIGHT X RATING :
: - Technical Feasibility      4 :      5      20 :
: - Available Resources        4 :      5      20 :
: - Operational Suitability    4 :      5      20 :
: - Procurement Costs          3 :      5      15 :
: - Life Cycle Costs           3 :      5      15 :
=====
:                                     : SUMS>          60      30 :
: DEMAND:          1095805          :
: PROPORTIONAL WEIGHT (PW) = 0.08 :
: GENERAL VALUE(PW*GEN SUM) =4.966277 :
: GENERAL COSTS(PW*COSTS SUM)=2.483138 :
=====
: SYSTEM :
:
: SYSTEM CRITERIA      WEIGHTS : RATING  WEIGHT X RATING :
: - Technical Feasibility      4 :      5      20 :
: - Available Resources        4 :      2       8 :
: - Operational Suitability    4 :      5      20 :
: - Procurement Costs          3 :      5      15 :
: - Life Cycle Costs           3 :      5      15 :
=====
:                                     : SUMS>          48      30 :
: DEMAND:          186256          :
: PROPORTIONAL WEIGHT (PW) = 0.01 :
: GENERAL VALUE(PW*GEN SUM) =0.675301 :
: GENERAL COSTS(PW*COSTS SUM)=0.422063 :
=====

```

FAMILY EVALUATION FACTORS		RATING	WEIGHT	X RATING
- Family Costs	5	2	10	
- Fam Requirements Coverage	5	5	25	
SUM OF SYS PERFORMANCE VALUES		SUM GEN VALUES	57.68841	
SUM OF INDIVIDUAL SYSTEM COSTS		SUM SYS COSTS	18.08642	
THE FAMILY COST			10	
FAMILY REQUIREMENTS COVERAGE			25	
TOTAL FAMILY VALUE =			110.7748	

TABLE C.1.9
Evaluation Matrix
Basic Systems Family - Elimination by Demand - 9 Systems

SYSTEM CRITERIA		WEIGHTS	SYSTEM	RATING	WEIGHT X RATING
- Technical Feasibility	4			5	20
- Available Resources	4			4	16
- Operational Suitability	4		2	5	20
- Procurement Costs	3			1	3
- Life Cycle Costs	3			3	9
			SUMS>	56	12
			DEMAND: 7016130		
			PROPORTIONAL WEIGHT (PW) =	0.53	
			GENERAL VALUE(PW*GEN SUM) =	29.67783	
			GENERAL COSTS(PW*COSTS SUM)=	6.359535	
SYSTEM CRITERIA		WEIGHTS	SYSTEM	RATING	WEIGHT X RATING
- Technical Feasibility	4			5	20
- Available Resources	4			4	16
- Operational Suitability	4		3	5	20
- Procurement Costs	3			2	6
- Life Cycle Costs	3			3	9
			SUMS>	56	15
			DEMAND: 30720		
			PROPORTIONAL WEIGHT (PW) =	.00	
			GENERAL VALUE(PW*GEN SUM) =	0.129943	
			GENERAL COSTS(PW*COSTS SUM)=	0.034806	
SYSTEM CRITERIA		WEIGHTS	SYSTEM	RATING	WEIGHT X RATING
- Technical Feasibility	4			5	20
- Available Resources	4			5	20
- Operational Suitability	4		7	5	20
- Procurement Costs	3			1	3
- Life Cycle Costs	3			4	12
			SUMS>	60	15
			DEMAND: 78690		
			PROPORTIONAL WEIGHT (PW) =	0.01	
			GENERAL VALUE(PW*GEN SUM) =	0.356629	
			GENERAL COSTS(PW*COSTS SUM)=	0.089157	

		SYSTEM		
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4	9	5	20
- Available Resources	4		5	20
- Operational Suitability	4		5	20
- Procurement Costs	3		3	9
- Life Cycle Costs	3		4	12
			SUMS>	60 21
			DEMAND:	40900
			PROPORTIONAL WEIGHT (PW)	= .00
			GENERAL VALUE(PW*GEN SUM)	=0.185362
			GENERAL COSTS(PW*COSTS SUM)	=0.064876
		SYSTEM		
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4	12	5	20
- Available Resources	4		5	20
- Operational Suitability	4		5	20
- Procurement Costs	3		4	12
- Life Cycle Costs	3		4	12
			SUMS>	60 24
			DEMAND:	118005
			PROPORTIONAL WEIGHT (PW)	= 0.01
			GENERAL VALUE(PW*GEN SUM)	=0.534808
			GENERAL COSTS(PW*COSTS SUM)	=0.213923
		SYSTEM		
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4	13	5	20
- Available Resources	4		5	20
- Operational Suitability	4		5	20
- Procurement Costs	3		1	3
- Life Cycle Costs	3		4	12
			SUMS>	60 15
			DEMAND:	57639
			PROPORTIONAL WEIGHT (PW)	= .00
			GENERAL VALUE(PW*GEN SUM)	=0.261224
			GENERAL COSTS(PW*COSTS SUM)	=0.065306
		SYSTEM		
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4	14	5	20
- Available Resources	4		5	20
- Operational Suitability	4		5	20
- Procurement Costs	3		4	12
- Life Cycle Costs	3		4	12

```

: ::::::::::::::::::::SUMS> 60 24 ::
: DEMAND: 4581795 -----
: PROPORTIONAL WEIGHT (PW) = 0.35 ::
: GENERAL VALUE(PW*GEN SUM) =20.76506 ::
: GENERAL COSTS(PW*COSTS SUM)=8.306027 ::

```

```

: :: SYSTEM :
:
: SYSTEM CRITERIA WEIGHTS : RATING WEIGHT X RATING :
:
: - Technical Feasibility 4 : 5 20 :
: - Available Resources 4 : 5 20 :
: - Operational Suitability 4 : 16 5 20 :
: - Procurement Costs 3 : 5 15 :
: - Life Cycle Costs 3 : 5 15 :

```

```

: ::::::::::::::::::::SUMS> 60 30 ::
: DEMAND: 1095805 -----
: PROPORTIONAL WEIGHT (PW) = 0.08 ::
: GENERAL VALUE(PW*GEN SUM) =4.966277 ::
: GENERAL COSTS(PW*COSTS SUM)=2.483138 ::

```

```

: :: SYSTEM :
:
: SYSTEM CRITERIA WEIGHTS : RATING WEIGHT X RATING :
:
: - Technical Feasibility 4 : 5 20 :
: - Available Resources 4 : 2 8 :
: - Operational Suitability 4 : 17 5 20 :
: - Procurement Costs 3 : 5 15 :
: - Life Cycle Costs 3 : 5 15 :

```

```

: ::::::::::::::::::::SUMS> 48 30 ::
: DEMAND: 186256 -----
: PROPORTIONAL WEIGHT (PW) = 0.01 ::
: GENERAL VALUE(PW*GEN SUM) =0.675301 ::
: GENERAL COSTS(PW*COSTS SUM)=0.422063 ::

```

```

: FAMILY EVALUATION FACTORS : RATING WEIGHT X RATING :
: - Family Costs 5 : 3 15 :
: - Fam Requirements Coverage 5 : 5 25 :

```

```

: SUM OF SYS PERFORMANCE VALUES : SUM GEN VALUES 57.55244 :
: SUM OF INDIVIDUAL SYSTEM COSTS : SUM SYS COSTS 18.03883 :
: THE FAMILY COST : 15 :
: FAMILY REQUIREMENTS COVERAGE : 25 :

```

```

: :::::::::::::::::::: TOTAL FAMILY VALUE = : 115.5912 :

```

TABLE C.1.10
Evaluation Matrix
Basic Systems Family - Elimination by Demand - 8 Systems

SYSTEM		RATING		WEIGHT X RATING
SYSTEM CRITERIA	WEIGHTS			
- Technical Feasibility	4	5	20	
- Available Resources	4	4	16	
- Operational Suitability	4	5	20	
- Procurement Costs	3	1		3
- Life Cycle Costs	3	3		9
		SUMS>	56	12
		DEMAND:	7046850	
		PROPORTIONAL WEIGHT (PW)	=	0.53
		GENERAL VALUE(PW*GEN SUM)	=	29.80777
		GENERAL COSTS(PW*COSTS SUM)	=	6.387380
SYSTEM		RATING		WEIGHT X RATING
SYSTEM CRITERIA	WEIGHTS			
- Technical Feasibility	4	5	20	
- Available Resources	4	5	20	
- Operational Suitability	4	5	20	
- Procurement Costs	3	1		3
- Life Cycle Costs	3	4		12
		SUMS>	60	15
		DEMAND:	78690	
		PROPORTIONAL WEIGHT (PW)	=	0.01
		GENERAL VALUE(PW*GEN SUM)	=	0.356629
		GENERAL COSTS(PW*COSTS SUM)	=	0.089157
SYSTEM		RATING		WEIGHT X RATING
SYSTEM CRITERIA	WEIGHTS			
- Technical Feasibility	4	5	20	
- Available Resources	4	5	20	
- Operational Suitability	4	5	20	
- Procurement Costs	3	3		9
- Life Cycle Costs	3	4		12
		SUMS>	60	21
		DEMAND:	40900	
		PROPORTIONAL WEIGHT (PW)	=	.00
		GENERAL VALUE(PW*GEN SUM)	=	0.185362
		GENERAL COSTS(PW*COSTS SUM)	=	0.064876

SYSTEM			
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	4	12
- Life Cycle Costs	3	4	12
		SUMS>	60 24
		DEMAND:	118005
		PROPORTIONAL WEIGHT (PW)	= 0.01
		GENERAL VALUE(PW*GEN SUM)	=0.534808
		GENERAL COSTS(PW*COSTS SUM)	=0.213923
SYSTEM			
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	1	3
- Life Cycle Costs	3	4	12
		SUMS>	60 15
		DEMAND:	57639
		PROPORTIONAL WEIGHT (PW)	= .00
		GENERAL VALUE(PW*GEN SUM)	=0.261224
		GENERAL COSTS(PW*COSTS SUM)	=0.065306
SYSTEM			
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	4	12
- Life Cycle Costs	3	4	12
		SUMS>	60 24
		DEMAND:	4581795
		PROPORTIONAL WEIGHT (PW)	= 0.35
		GENERAL VALUE(PW*GEN SUM)	=20.76506
		GENERAL COSTS(PW*COSTS SUM)	=8.306027
SYSTEM			
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	5	15
- Life Cycle Costs	3	5	15

```

:                                     : SUMS\      60      30 :
: DEMAND: 1095805 ----- :
: PROPORTIONAL WEIGHT (PW) = 0.08 :
: GENERAL VALUE(PW*GEN SUM) =4.966277 :
: GENERAL COSTS(PW*COSTS SUM)=2.483138 :
=====

```

```

:                                     : SYSTEM :
:-----:-----:
: SYSTEM CRITERIA      WEIGHTS : RATING  WEIGHT X RATING :
:-----:-----:
: - Technical Feasibility      4 :      5      20 :
: - Available Resources        4 :      2       8 :
: - Operational Suitability    4 :    17      20 :
: - Procurement Costs          3 :      5      15 :
: - Life Cycle Costs           3 :      5      15 :
:-----:-----:
:                                     : SUMS>     48      30 :
: DEMAND: 186256 ----- :
: PROPORTIONAL WEIGHT (PW) = 0.01 :
: GENERAL VALUE(PW*GEN SUM) =0.675301 :
: GENERAL COSTS(PW*COSTS SUM)=0.422063 :
=====

```

```

=====
: FAMILY EVALUATION FACTORS      : RATING  WEIGHT X RATING :
: - Family Costs                  5 :      3      15 :
: - Fam Requirements Coverage     5 :      5      25 :
=====

```

```

=====
: SUM OF SYS PERFORMANCE VALUES : SUM GEN VALUES  57.55244 :
: SUM OF INDIVIDUAL SYSTEM COSTS : SUM SYS COSTS   18.03187 :
: THE FAMILY COST                  :      15 :
: FAMILY REQUIREMENTS COVERAGE    :      25 :
=====
: TOTAL FAMILY VALUE = : 115.5843 :
=====

```

TABLE C.1.11
Evaluation Matrix
Basic Systems Family - Elimination by Demand - 7 Systems

SYSTEM CRITERIA		WEIGHTS	SYSTEM	RATING	WEIGHT X RATING
- Technical Feasibility	4			5	20
- Available Resources	4			4	16
- Operational Suitability	4		2	5	20
- Procurement Costs	3			1	3
- Life Cycle Costs	3			3	9
			SUMS>	56	12
			DEMAND: 7046850		
			PROPORTIONAL WEIGHT (PW) =	0.53	
			GENERAL VALUE(PW*GEN SUM) =	29.80777	
			GENERAL COSTS(PW*COSTS SUM)=	6.387380	
SYSTEM CRITERIA		WEIGHTS	SYSTEM	RATING	WEIGHT X RATING
- Technical Feasibility	4			5	20
- Available Resources	4			5	20
- Operational Suitability	4		7	5	20
- Procurement Costs	3			1	3
- Life Cycle Costs	3			4	12
			SUMS>	60	15
			DEMAND: 119590		
			PROPORTIONAL WEIGHT (PW) =	0.01	
			GENERAL VALUE(PW*GEN SUM) =	0.541991	
			GENERAL COSTS(PW*COSTS SUM)=	0.135497	
SYSTEM CRITERIA		WEIGHTS	SYSTEM	RATING	WEIGHT X RATING
- Technical Feasibility	4			5	20
- Available Resources	4			5	20
- Operational Suitability	4		12	5	20
- Procurement Costs	3			4	12
- Life Cycle Costs	3			4	12
			SUMS>	60	24
			DEMAND: 118005		
			PROPORTIONAL WEIGHT (PW) =	0.01	
			GENERAL VALUE(PW*GEN SUM) =	0.534808	
			GENERAL COSTS(PW*COSTS SUM)=	0.213923	

		SYSTEM		
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4	13	5	20
- Available Resources	4		5	20
- Operational Suitability	4		5	20
- Procurement Costs	3		1	3
- Life Cycle Costs	3		4	12
			SUMS>	60 15
			DEMAND:	57639
			PROPORTIONAL WEIGHT (PW) =	.00
			GENERAL VALUE(PW*GEN SUM) =	0.261224
			GENERAL COSTS(PW*COSTS SUM)=	0.065306
		SYSTEM		
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4	14	5	20
- Available Resources	4		5	20
- Operational Suitability	4		5	20
- Procurement Costs	3		4	12
- Life Cycle Costs	3		4	12
			SUMS>	60 24
			DEMAND:	4581795
			PROPORTIONAL WEIGHT (PW) =	0.35
			GENERAL VALUE(PW*GEN SUM) =	20.76506
			GENERAL COSTS(PW*COSTS SUM)=	8.306027
		SYSTEM		
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4	16	5	20
- Available Resources	4		5	20
- Operational Suitability	4		5	20
- Procurement Costs	3		5	15
- Life Cycle Costs	3		5	15
			SUMS>	60 30
			DEMAND:	1095805
			PROPORTIONAL WEIGHT (PW) =	0.08
			GENERAL VALUE(PW*GEN SUM) =	4.966277
			GENERAL COSTS(PW*COSTS SUM)=	2.483138
		SYSTEM		
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4	17	5	20
- Available Resources	4		2	8
- Operational Suitability	4		5	20
- Procurement Costs	3		5	15
- Life Cycle Costs	3		5	15

```

:                                     :SUMS>      48      30 :
: DEMAND:      186256 ----- :
: PROPORTIONAL WEIGHT (PW) = 0.01 :
: GENERAL VALUE(PW*GEN SUM) =0.675301 :
: GENERAL COSTS(PW*COSTS SUM)=0.422063 :
=====

```

```

=====
: FAMILY EVALUATION FACTORS      ::      : RATING WEIGHT X RATING ::
: - Family Costs      5 ::      :      3      15      ::
: - Fam Requirements Coverage  5 ::      :      5      25      ::
=====

```

```

=====
:SUM OF SYS PERFORMANCE VALUES      ::SUM GEN VALUES      57.55244      ::
:SUM OF INDIVIDUAL SYSTEM COSTS      ::SUM SYS COSTS      18.01333      ::
:THE FAMILY COST      ::      15      ::
:FAMILY REQUIREMENTS COVERAGE      ::      25      ::
=====
:.....: TOTAL FAMILY VALUE = ::      115.5657      ::
=====

```

TABLE C.1.12
Evaluation Matrix
Basic Systems Family - Elimination by Demand - 6 Systems

SYSTEM		RATING		WEIGHT X RATING
SYSTEM CRITERIA	WEIGHTS			
- Technical Feasibility	4	5	20	
- Available Resources	4	4	16	
- Operational Suitability	4	5	20	
- Procurement Costs	3	1		3
- Life Cycle Costs	3	3		9
		SUMS>		56
		DEMAND: 6986800		12
		PROPORTIONAL WEIGHT (PW) =		0.53
		GENERAL VALUE (PW*GEN SUM) =		29.55376
		GENERAL COSTS (PW*GEN SUM) =		6.332949
SYSTEM		RATING		WEIGHT X RATING
SYSTEM CRITERIA	WEIGHTS			
- Technical Feasibility	4	5	20	
- Available Resources	4	5	20	
- Operational Suitability	4	5	20	
- Procurement Costs	3	1		3
- Life Cycle Costs	3	4		12
		SUMS>		60
		DEMAND: 75810		15
		PROPORTIONAL WEIGHT (PW) =		0.01
		GENERAL VALUE (PW*GEN SUM) =		0.343577
		GENERAL COSTS (PW*GEN SUM) =		0.085894
SYSTEM		RATING		WEIGHT X RATING
SYSTEM CRITERIA	WEIGHTS			
- Technical Feasibility	4	5	20	
- Available Resources	4	5	20	
- Operational Suitability	4	5	20	
- Procurement Costs	3	4		12
- Life Cycle Costs	3	4		12
		SUMS>		60
		DEMAND: 118005		24
		PROPORTIONAL WEIGHT (PW) =		0.01
		GENERAL VALUE (PW*GEN SUM) =		0.534808
		GENERAL COSTS (PW*GEN SUM) =		0.213923

		SYSTEM	
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	4	12
- Life Cycle Costs	3	4	12
		SUMS>	60 24
		DEMAND: 4580913	
		PROPORTIONAL WEIGHT (PW) =	0.35
		GENERAL VALUE(PW*GEN SUM) =	20.76107
		GENERAL COSTS(PW*COSTS SUM)=	8.304428
		=====	
		SYSTEM	
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	5	15
- Life Cycle Costs	3	5	15
		SUMS>	60 30
		DEMAND: 1095805	
		PROPORTIONAL WEIGHT (PW) =	0.08
		GENERAL VALUE(PW*GEN SUM) =	4.966277
		GENERAL COSTS(PW*COSTS SUM)=	2.483138
		=====	
		SYSTEM	
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	2	8
- Operational Suitability	4	5	20
- Procurement Costs	3	5	15
- Life Cycle Costs	3	5	15
		SUMS>	48 30
		DEMAND: 186256	
		PROPORTIONAL WEIGHT (PW) =	0.01
		GENERAL VALUE(PW*GEN SUM) =	0.675301
		GENERAL COSTS(PW*COSTS SUM)=	0.422063
		=====	

TABLE C.1.13
Evaluation Matrix
Basic Systems Family Elimination by Demand - 5 Systems

		SYSTEM		
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4	2	5	20
- Available Resources	4		4	16
- Operational Suitability	4		5	20
- Procurement Costs	3		1	3
- Life Cycle Costs	3		3	9
			SUMS>	56
			DEMAND: 7046850	12
			PROPORTIONAL WEIGHT (PW) =	0.53
			GENERAL VALUE(PW*GEN SUM) =	29.80777
			GENERAL COSTS(PW*COSTS SUM)=	6.387380
		SYSTEM		
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4	12	5	20
- Available Resources	4		5	20
- Operational Suitability	4		5	20
- Procurement Costs	3		4	12
- Life Cycle Costs	3		4	12
			SUMS>	60
			DEMAND: 118005	24
			PROPORTIONAL WEIGHT (PW) =	0.01
			GENERAL VALUE(PW*GEN SUM) =	0.534808
			GENERAL COSTS(PW*COSTS SUM)=	0.213923
		SYSTEM		
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4	14	5	20
- Available Resources	4		5	20
- Operational Suitability	4		5	20
- Procurement Costs	3		4	12
- Life Cycle Costs	3		4	12
			SUMS>	60
			DEMAND: 4581795	24
			PROPORTIONAL WEIGHT (PW) =	0.35
			GENERAL VALUE(PW*GEN SUM) =	20.76506
			GENERAL COSTS(PW*COSTS SUM)=	8.306027

TABLE C.1.14
Evaluation Matrix
Basic Systems Family - Elimination by Demand - 4 Systems

		SYSTEM		
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4	2	5	20
- Available Resources	4		4	16
- Operational Suitability	4		5	20
- Procurement Costs	3		1	3
- Life Cycle Costs	3		3	9
		SUMS>	56	12
		DEMAND: 7164855		
		PROPORTIONAL WEIGHT (PW) =	0.54	
		GENERAL VALUE(PW*GEN SUM) =	30.30692	
		GENERAL COSTS(PW*COSTS SUM)=	6.494341	

		SYSTEM		
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4	14	5	20
- Available Resources	4		5	20
- Operational Suitability	4		5	20
- Procurement Costs	3		4	12
- Life Cycle Costs	3		4	12
		SUMS>	60	24
		DEMAND: 4581795		
		PROPORTIONAL WEIGHT (PW) =	0.35	
		GENERAL VALUE(PW*GEN SUM) =	20.76506	
		GENERAL COSTS(PW*COSTS SUM)=	8.306027	

		SYSTEM		
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4	16	5	20
- Available Resources	4		5	20
- Operational Suitability	4		5	20
- Procurement Costs	3		5	15
- Life Cycle Costs	3		5	15
		SUMS>	60	30
		DEMAND: 1095805		
		PROPORTIONAL WEIGHT (PW) =	0.08	
		GENERAL VALUE(PW*GEN SUM) =	4.966277	
		GENERAL COSTS(PW*COSTS SUM)=	2.483138	

SYSTEM			
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	2	8
- Operational Suitability	4	5	20
- Procurement Costs	3	5	15
- Life Cycle Costs	3	5	15
		SUMS>	48 30
		DEMAND:	186256
		PROPORTIONAL WEIGHT (PW)	= 0.01
		GENERAL VALUE(PW*GEN SUM)	=0.675301
		GENERAL COSTS(PW*COSTS SUM)	=0.422063

FAMILY EVALUATION FACTORS		RATING WEIGHT X RATING	
- Family Costs	5	4	20
- Fee Requirements Coverage	5	5	25
SUM OF SYS PERFORMANCE VALUES	SUM GEN VALUES	56.71357	
SUM OF INDIVIDUAL SYSTEM COSTS	SUM SYS COSTS	17.70557	
THE FAMILY COST		20	
FAMILY REQUIREMENTS COVERAGE		25	
TOTAL FAMILY VALUE =		119.4191	

TABLE C.1.15
Evaluation Matrix
Basic Systems Family - Elimination by Demand - 3 Systems

SYSTEM		RATING		WEIGHT X RATING
SYSTEM CRITERIA	WEIGHTS			
- Technical Feasibility	4	5	20	
- Available Resources	4	4	16	
- Operational Suitability	4	5	20	
- Procurement Costs	3	1		3
- Life Cycle Costs	3	3		9
		SUMS>	56	12
		DEMAND: 7164855		
		PROPORTIONAL WEIGHT (PW) =	0.54	
		GENERAL VALUE(PW*GEN SUM) =	30.30692	
		GENERAL COSTS(PW*COSTS SUM)=	6.494341	
SYSTEM		RATING		WEIGHT X RATING
SYSTEM CRITERIA	WEIGHTS			
- Technical Feasibility	4	5	20	
- Available Resources	4	5	20	
- Operational Suitability	4	5	20	
- Procurement Costs	3	4		12
- Life Cycle Costs	3	4		12
		SUMS>	60	24
		DEMAND: 4581795		
		PROPORTIONAL WEIGHT (PW) =	0.35	
		GENERAL VALUE(PW*GEN SUM) =	20.76506	
		GENERAL COSTS(PW*COSTS SUM)=	8.306027	
SYSTEM		RATING		WEIGHT X RATING
SYSTEM CRITERIA	WEIGHTS			
- Technical Feasibility	4	5	20	
- Available Resources	4	5	20	
- Operational Suitability	4	5	20	
- Procurement Costs	3	5		15
- Life Cycle Costs	3	5		15
		SUMS>	60	30
		DEMAND: 1282061		
		PROPORTIONAL WEIGHT (PW) =	0.10	
		GENERAL VALUE(PW*GEN SUM) =	5.810405	
		GENERAL COSTS(PW*COSTS SUM)=	2.905202	

FAMILY EVALUATION FACTORS		RATING	WEIGHT	X RATING
- Family Costs	5	5	25	
- Fam Requirements Coverage	5	5	25	
SUM OF SYS PERFORMANCE VALUES		SUM GEN VALUES	56.88240	
SUM OF INDIVIDUAL SYSTEM COSTS		SUM SYS COSTS	17.70557	
THE FAMILY COST			25	
FAMILY REQUIREMENTS COVERAGE			25	
TOTAL FAMILY VALUE =			124.5879	

TABLE C.1.16
Evaluation Matrix
Basic Systems Family - Elimination by Demand - 2 Systems

		:: SYSTEM :			
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING	
- Technical Feasibility	4		5	20	
- Available Resources	4		4	16	
- Operational Suitability	4	2	5	20	
- Procurement Costs	3		1		3
- Life Cycle Costs	3		3		9
		:::SUMS>		56	12
		DEMAND: 7164855			
		PROPORTIONAL WEIGHT (PW) =		0.54	
		GENERAL VALUE(PW*GEN SUM) =		30.30692	
		GENERAL COSTS(PW*COSTS SUM) =		6.494341	
		:: SYSTEM :			
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING	
- Technical Feasibility	4		5	20	
- Available Resources	4		5	20	
- Operational Suitability	4	14	5	20	
- Procurement Costs	3		4		12
- Life Cycle Costs	3		4		12
		:::SUMS>		60	24
		DEMAND: 5863856			
		PROPORTIONAL WEIGHT (PW) =		0.44	
		GENERAL VALUE(PW*GEN SUM) =		26.57547	
		GENERAL COSTS(PW*COSTS SUM) =		10.63019	
		:::SUMS>		56.88240	
		SUM GEN VALUES		17.12453	
		SUM SYS COSTS		25	
		THE FAMILY COST		25	
		FAMILY REQUIREMENTS COVERAGE		25	
		TOTAL FAMILY VALUE =		124.0069	

TABLE C.1.17
Evaluation Matrix
Basic Systems Family - Elimination by Demand - 1 System

		SYSTEM			
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING	
- Technical Feasibility	4	2	5	20	
- Available Resources	4		4	16	
- Operational Suitability	4		5	20	
- Procurement Costs	3		1		3
- Life Cycle Costs	3		3		9
			SUMS>	56	12
			DEMAND: 13028711		
			PROPORTIONAL WEIGHT (PW) =	0.98	
			GENERAL VALUE(PW*GEN SUM) =	55.11070	
			GENERAL COSTS(PW*COSTS SUM)=	11.80943	

FAMILY EVALUATION FACTORS			RATING	WEIGHT X RATING	
- Family Costs	5		5	25	
- Fam Requirements Coverage	5		5	25	
SUM OF SYS PERFORMANCE VALUES		SUM GEN VALUES		55.11070	
SUM OF INDIVIDUAL SYSTEM COSTS		SUM SYS COSTS		11.80943	
THE FAMILY COST				25	
FAMILY REQUIREMENTS COVERAGE				25	
TOTAL FAMILY VALUE =				116.9201	

TABLE C.2.1
Evaluation Matrix
Basic Systems Family - Elimination by Units - 17 Systems

		:: SYSTEM ::			
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING	
- Technical Feasibility	4	1	5	20	
- Available Resources	4		4	16	
- Operational Suitability	4		5	20	
- Procurement Costs	3		1		3
- Life Cycle Costs	3		3		9
		SUMS>		56	12
		DEMAND:		4	
		PROPORTIONAL WEIGHT (PW) =		.00	
		GENERAL VALUE(PW*GEN SUM) =		0.013466	
		GENERAL COSTS(PW*COSTS SUM) =		0.002885	
		:: SYSTEM ::			
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING	
- Technical Feasibility	4	2	5	20	
- Available Resources	4		4	16	
- Operational Suitability	4		5	20	
- Procurement Costs	3		1		3
- Life Cycle Costs	3		3		9
		SUMS>		56	12
		DEMAND:		408	
		PROPORTIONAL WEIGHT (PW) =		0.02	
		GENERAL VALUE(PW*GEN SUM) =		1.373572	
		GENERAL COSTS(PW*COSTS SUM) =		0.294336	
		:: SYSTEM ::			
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING	
- Technical Feasibility	4	3	5	20	
- Available Resources	4		4	16	
- Operational Suitability	4		5	20	
- Procurement Costs	3		2		6
- Life Cycle Costs	3		3		9
		SUMS>		56	15
		DEMAND:		12	
		PROPORTIONAL WEIGHT (PW) =		.00	
		GENERAL VALUE(PW*GEN SUM) =		0.040399	
		GENERAL COSTS(PW*COSTS SUM) =		0.010821	

		:: SYSTEM :			
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING	
- Technical Feasibility	4		5	20	
- Available Resources	4		5	20	
- Operational Suitability	4	4	5	20	
- Procurement Costs	3		1		3
- Life Cycle Costs	3		4		12
		:::SUMS>		60	15
		DEMAND:		15	
		PROPORTIONAL WEIGHT (PW) =		.00	
		GENERAL VALUE(PW*GEN SUM) =		0.054106	
		GENERAL COSTS(PW*COSTS SUM)=		0.013526	
		:: SYSTEM :			
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING	
- Technical Feasibility	4		5	20	
- Available Resources	4		5	20	
- Operational Suitability	4	5	5	20	
- Procurement Costs	3		3		9
- Life Cycle Costs	3		4		12
		:::SUMS>		60	21
		DEMAND:		500	
		PROPORTIONAL WEIGHT (PW) =		0.03	
		GENERAL VALUE(PW*GEN SUM) =		1.803534	
		GENERAL COSTS(PW*COSTS SUM)=		0.631237	
		:: SYSTEM :			
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING	
- Technical Feasibility	4		5	20	
- Available Resources	4		5	20	
- Operational Suitability	4	6	5	20	
- Procurement Costs	3		3		9
- Life Cycle Costs	3		4		12
		:::SUMS>		60	21
		DEMAND:		2030	
		PROPORTIONAL WEIGHT (PW) =		0.12	
		GENERAL VALUE(PW*GEN SUM) =		7.322351	
		GENERAL COSTS(PW*COSTS SUM)=		2.562823	

		SYSTEM		
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4	7	5	20
- Available Resources	4		5	20
- Operational Suitability	4		5	20
- Procurement Costs	3		1	3
- Life Cycle Costs	3		4	12
			SUMS>	60 15
			DEMAND:	960
			PROPORTIONAL WEIGHT (PW) =	0.06
			GENERAL VALUE(PW*GEN SUM) =	3.462787
			GENERAL COSTS(PW*COSTS SUM)=	0.865696
		SYSTEM		
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4	8	5	20
- Available Resources	4		5	20
- Operational Suitability	4		5	20
- Procurement Costs	3		3	9
- Life Cycle Costs	3		4	12
			SUMS>	60 21
			DEMAND:	194
			PROPORTIONAL WEIGHT (PW) =	0.01
			GENERAL VALUE(PW*GEN SUM) =	0.699771
			GENERAL COSTS(PW*COSTS SUM)=	0.244920
		SYSTEM		
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4	9	5	20
- Available Resources	4		5	20
- Operational Suitability	4		5	20
- Procurement Costs	3		3	9
- Life Cycle Costs	3		4	12
			SUMS>	60 21
			DEMAND:	4
			PROPORTIONAL WEIGHT (PW) =	.00
			GENERAL VALUE(PW*GEN SUM) =	0.014428
			GENERAL COSTS(PW*COSTS SUM)=	0.005049
		SYSTEM		
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4	10	5	20
- Available Resources	4		5	20
- Operational Suitability	4		5	20
- Procurement Costs	3		1	3
- Life Cycle Costs	3		4	12

```

:                                     ::::::::::::::SUMS>      60      15 ::
:                                     :: DEMAND:      24      ----- ::
:                                     :: PROPORTIONAL WEIGHT (PW) = .00 ::
:                                     :: GENERAL VALUE(PW*GEN SUM) =0.086569 ::
:                                     :: GENERAL COSTS(PW*COSTS SUM)=0.021642 ::
:                                     ::::::::::::::::::::::::::::::::::::
:                                     :: SYSTEM ::
:
: SYSTEM CRITERIA      WEIGHTS      ::      RATING      WEIGHT X RATING      ::
: - Technical Feasibility      4 ::      5      20      ::
: - Available Resources      4 ::      5      20      ::
: - Operational Suitability      4 ::      11      20      ::
: - Procurement Costs      3 ::      4      12      ::
: - Life Cycle Costs      3 ::      4      12      ::
:                                     ::::::::::::::SUMS>      60      24 ::
:                                     :: DEMAND:      320      ----- ::
:                                     :: PROPORTIONAL WEIGHT (PW) = 0.02 ::
:                                     :: GENERAL VALUE(PW*GEN SUM) =1.154262 ::
:                                     :: GENERAL COSTS(PW*COSTS SUM)=0.461704 ::
:                                     ::::::::::::::::::::::::::::::::::::
:                                     :: SYSTEM ::
:
: SYSTEM CRITERIA      WEIGHTS      ::      RATING      WEIGHT X RATING      ::
: - Technical Feasibility      4 ::      5      20      ::
: - Available Resources      4 ::      5      20      ::
: - Operational Suitability      4 ::      12      20      ::
: - Procurement Costs      3 ::      4      12      ::
: - Life Cycle Costs      3 ::      4      12      ::
:                                     ::::::::::::::SUMS>      60      24 ::
:                                     :: DEMAND:      276      ----- ::
:                                     :: PROPORTIONAL WEIGHT (PW) = 0.02 ::
:                                     :: GENERAL VALUE(PW*GEN SUM) =0.995551 ::
:                                     :: GENERAL COSTS(PW*COSTS SUM)=0.398220 ::
:                                     ::::::::::::::::::::::::::::::::::::
:                                     :: SYSTEM ::
:
: SYSTEM CRITERIA      WEIGHTS      ::      RATING      WEIGHT X RATING      ::
: - Technical Feasibility      4 ::      5      20      ::
: - Available Resources      4 ::      5      20      ::
: - Operational Suitability      4 ::      13      20      ::
: - Procurement Costs      3 ::      1      3      ::
: - Life Cycle Costs      3 ::      4      12      ::
:                                     ::::::::::::::SUMS>      60      15 ::
:                                     :: DEMAND:      106      ----- ::
:                                     :: PROPORTIONAL WEIGHT (PW) = 0.01 ::
:                                     :: GENERAL VALUE(PW*GEN SUM) =0.382349 ::
:                                     :: GENERAL COSTS(PW*COSTS SUM)=0.095587 ::
:                                     ::::::::::::::::::::::::::::::::::::

```

SYSTEM			
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	4	12
- Life Cycle Costs	3	4	12
		SUMS>	60 24
		DEMAND:	5702
		PROPORTIONAL WEIGHT (PW)	= 0.34
		GENERAL VALUE(PW*GEN SUM)	=20.56751
		GENERAL COSTS(PW*COSTS SUM)	=8.227004

SYSTEM			
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	5	15
- Life Cycle Costs	3	5	15
		SUMS>	60 30
		DEMAND:	63
		PROPORTIONAL WEIGHT (PW)	= .00
		GENERAL VALUE(PW*GEN SUM)	=0.227245
		GENERAL COSTS(PW*COSTS SUM)	=0.113622

SYSTEM			
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	5	15
- Life Cycle Costs	3	5	15
		SUMS>	60 30
		DEMAND:	5976
		PROPORTIONAL WEIGHT (PW)	= 0.36
		GENERAL VALUE(PW*GEN SUM)	=21.55584
		GENERAL COSTS(PW*COSTS SUM)	=10.77792

SYSTEM			
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	2	8
- Operational Suitability	4	5	20
- Procurement Costs	3	5	15
- Life Cycle Costs	3	5	15

```

:                                     ::::::::::::::SUMS>      48      30 ::
:                                     :: DEMAND:      40      ----- ::
:                                     :: PROPORTIONAL WEIGHT (PW) =      .00 ::
:                                     :: GENERAL VALUE(PW*GEN SUM) =0.115426 ::
:                                     :: GENERAL COSTS(PW*COSTS SUM)=0.072141 ::
=====

```

```

=====
: FAMILY EVALUATION FACTORS           ::          : RATING  WEIGHT X RATING  ::
:   - Family Costs                     5 ::          :      1      5          ::
:   - Fam Requirements Coverage        5 ::          :      5     25          ::
=====

```

```

=====
:SUM OF SYS PERFORMANCE VALUES       ::SUM GEN VALUES      59.86918  ::
:SUM OF INDIVIDUAL SYSTEM COSTS       ::SUM SYS COSTS       24.79914  ::
:THE FAMILY COST                       ::                   5          ::
:FAMILY REQUIREMENTS COVERAGE         ::                   25          ::
=====

```

```

: :::::::::::::::::::: TOTAL FAMILY VALUE = ::          114.6683          ::
=====

```

TABLE C.2.2
Evaluation Matrix
Basic Systems Family - Elimination by Units - 16 Systems

		:: SYSTEM :			
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING	
- Technical Feasibility	4		5	20	
- Available Resources	4		4	16	
- Operational Suitability	4	2	5	20	
- Procurement Costs	3		1		3
- Life Cycle Costs	3		3		9
		:::SUMS>		56	12
		DEMAND:		408	
		PROPORTIONAL WEIGHT (PW) =		0.02	
		GENERAL VALUE(PW*GEN SUM) =		1.373572	
		GENERAL COSTS(PW*COSTS SUM)=		0.294336	
		:: SYSTEM :			
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING	
- Technical Feasibility	4		5	20	
- Available Resources	4		4	16	
- Operational Suitability	4	3	5	20	
- Procurement Costs	3		2		6
- Life Cycle Costs	3		3		9
		:::SUMS>		56	15
		DEMAND:		12	
		PROPORTIONAL WEIGHT (PW) =		.00	
		GENERAL VALUE(PW*GEN SUM) =		0.040399	
		GENERAL COSTS(PW*COSTS SUM)=		0.010821	
		:: SYSTEM :			
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING	
- Technical Feasibility	4		5	20	
- Available Resources	4		5	20	
- Operational Suitability	4	4	5	20	
- Procurement Costs	3		1		3
- Life Cycle Costs	3		4		12
		:::SUMS>		60	15
		DEMAND:		15	
		PROPORTIONAL WEIGHT (PW) =		.00	
		GENERAL VALUE(PW*GEN SUM) =		0.054106	
		GENERAL COSTS(PW*COSTS SUM)=		0.013526	

		SYSTEM		
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4	5	5	20
- Available Resources	4		5	20
- Operational Suitability	4		5	20
- Procurement Costs	3		3	9
- Life Cycle Costs	3		4	12
			SUMS>	60 21
			DEMAND:	500
			PROPORTIONAL WEIGHT (PW)	= 0.03
			GENERAL VALUE(PW*GEN SUM)	=1.803534
			GENERAL COSTS(PW*COSTS SUM)	=0.631237
		SYSTEM		
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4	6	5	20
- Available Resources	4		5	20
- Operational Suitability	4		5	20
- Procurement Costs	3		3	9
- Life Cycle Costs	3		4	12
			SUMS>	60 21
			DEMAND:	2030
			PROPORTIONAL WEIGHT (PW)	= 0.12
			GENERAL VALUE(PW*GEN SUM)	=7.322351
			GENERAL COSTS(PW*COSTS SUM)	=2.562823
		SYSTEM		
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4	7	5	20
- Available Resources	4		5	20
- Operational Suitability	4		5	20
- Procurement Costs	3		1	3
- Life Cycle Costs	3		4	12
			SUMS>	60 15
			DEMAND:	960
			PROPORTIONAL WEIGHT (PW)	= 0.06
			GENERAL VALUE(PW*GEN SUM)	=3.462787
			GENERAL COSTS(PW*COSTS SUM)	=0.865696
		SYSTEM		
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4	8	5	20
- Available Resources	4		5	20
- Operational Suitability	4		5	20
- Procurement Costs	3		3	9
- Life Cycle Costs	3		4	12

```

:                                     : SUMS>          60          21 :
: DEMAND:          194 ----- :
: PROPORTIONAL WEIGHT (PW) = 0.01 :
: GENERAL VALUE(PW*GEN SUM) =0.699771 :
: GENERAL COSTS(PW*COSTS SUM)=0.244920 :
=====
: SYSTEM :
:
: SYSTEM CRITERIA          WEIGHTS : RATING    WEIGHT X RATING :
: - Technical Feasibility      4 :          5          20 :
: - Available Resources        4 :          5          20 :
: - Operational Suitability    4 :          5          20 :
: - Procurement Costs          3 :          3           9 :
: - Life Cycle Costs           3 :          4          12 :
:
:                                     : SUMS>          60          21 :
: DEMAND:          4 ----- :
: PROPORTIONAL WEIGHT (PW) = .00 :
: GENERAL VALUE(PW*GEN SUM) =0.014428 :
: GENERAL COSTS(PW*COSTS SUM)=0.005049 :
=====
: SYSTEM :
:
: SYSTEM CRITERIA          WEIGHTS : RATING    WEIGHT X RATING :
: - Technical Feasibility      4 :          5          20 :
: - Available Resources        4 :          5          20 :
: - Operational Suitability    4 :          5          20 :
: - Procurement Costs          3 :          1           3 :
: - Life Cycle Costs           3 :          4          12 :
:
:                                     : SUMS>          60          15 :
: DEMAND:          24 ----- :
: PROPORTIONAL WEIGHT (PW) = .00 :
: GENERAL VALUE(PW*GEN SUM) =0.086569 :
: GENERAL COSTS(PW*COSTS SUM)=0.021642 :
=====
: SYSTEM :
:
: SYSTEM CRITERIA          WEIGHTS : RATING    WEIGHT X RATING :
: - Technical Feasibility      4 :          5          20 :
: - Available Resources        4 :          5          20 :
: - Operational Suitability    4 :          5          20 :
: - Procurement Costs          3 :          4          12 :
: - Life Cycle Costs           3 :          4          12 :
:
:                                     : SUMS>          60          24 :
: DEMAND:          320 ----- :
: PROPORTIONAL WEIGHT (PW) = 0.02 :
: GENERAL VALUE(PW*GEN SUM) =1.154262 :
: GENERAL COSTS(PW*COSTS SUM)=0.461704 :
=====

```

		SYSTEM		
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4	12	5	20
- Available Resources	4		5	20
- Operational Suitability	4		5	20
- Procurement Costs	3		4	12
- Life Cycle Costs	3		4	12
			SUMS>	60 24
			DEMAND:	276
			PROPORTIONAL WEIGHT (PW)	= 0.02
			GENERAL VALUE(PW*GEN SUM)	=0.995551
			GENERAL COSTS(PW*COSTS SUM)	=0.398220
		SYSTEM		
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4	13	5	20
- Available Resources	4		5	20
- Operational Suitability	4		5	20
- Procurement Costs	3		1	3
- Life Cycle Costs	3		4	12
			SUMS>	60 15
			DEMAND:	106
			PROPORTIONAL WEIGHT (PW)	= 0.01
			GENERAL VALUE(PW*GEN SUM)	=0.382349
			GENERAL COSTS(PW*COSTS SUM)	=0.095587
		SYSTEM		
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4	14	5	20
- Available Resources	4		5	20
- Operational Suitability	4		5	20
- Procurement Costs	3		4	12
- Life Cycle Costs	3		4	12
			SUMS>	60 24
			DEMAND:	5702
			PROPORTIONAL WEIGHT (PW)	= 0.34
			GENERAL VALUE(PW*GEN SUM)	=20.56751
			GENERAL COSTS(PW*COSTS SUM)	=8.227004
		SYSTEM		
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4	15	5	20
- Available Resources	4		5	20
- Operational Suitability	4		5	20
- Procurement Costs	3		5	15
- Life Cycle Costs	3		5	15

```

: ::::::::::::::SUMS> 60 30 ::
: DEMAND: 63 ::
: PROPORTIONAL WEIGHT (PW) = .00 ::
: GENERAL VALUE(PW*GEN SUM) =0.227245 ::
: GENERAL COSTS(PW*COSTS SUM)=0.113622 ::

```

```

: :: SYSTEM :

```

SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4		5	20
- Available Resources	4		5	20
- Operational Suitability	4	16	5	20
- Procurement Costs	3		5	15
- Life Cycle Costs	3		5	15

```

: ::::::::::::::SUMS> 60 30 ::
: DEMAND: 5976 ::
: PROPORTIONAL WEIGHT (PW) = 0.36 ::
: GENERAL VALUE(PW*GEN SUM) =21.55584 ::
: GENERAL COSTS(PW*COSTS SUM)=10.77792 ::

```

```

: :: SYSTEM :

```

SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4		5	20
- Available Resources	4		2	8
- Operational Suitability	4	17	5	20
- Procurement Costs	3		5	15
- Life Cycle Costs	3		5	15

```

: ::::::::::::::SUMS> 48 30 ::
: DEMAND: 40 ::
: PROPORTIONAL WEIGHT (PW) = .00 ::
: GENERAL VALUE(PW*GEN SUM) =0.115426 ::
: GENERAL COSTS(PW*COSTS SUM)=0.072141 ::

```

FAMILY EVALUATION FACTORS		RATING	WEIGHT X RATING
- Family Costs	5	1	5
- Fam Requirements Coverage	5	5	25

```

:SUM OF SYS PERFORMANCE VALUES ::SUM GEN VALUES 59.85571 ::
:SUM OF INDIVIDUAL SYSTEM COSTS ::SUM SYS COSTS 24.79626 ::
:THE FAMILY COST :: 5 ::
:FAMILY REQUIREMENTS COVERAGE :: 25 ::

```

```

: :::::::::::::: TOTAL FAMILY VALUE = :: 114.6519 ::

```

TABLE C.2.3
Evaluation Matrix
Basic Systems Family - Elimination by Units - 15 Systems

SYSTEM CRITERIA		WEIGHTS	SYSTEM	RATING	WEIGHT X RATING
- Technical Feasibility	4			5	20
- Available Resources	4			4	16
- Operational Suitability	4	2		5	20
- Procurement Costs	3			1	3
- Life Cycle Costs	3			3	9
			SUMS>	56	12
			DEMAND:	408	
			PROPORTIONAL WEIGHT (PW)	=	0.02
			GENERAL VALUE(PW*GEN SUM)	=	1.373572
			GENERAL COSTS(PW*COSTS SUM)	=	0.294336
SYSTEM CRITERIA		WEIGHTS	SYSTEM	RATING	WEIGHT X RATING
- Technical Feasibility	4			5	20
- Available Resources	4			4	16
- Operational Suitability	4	3		5	20
- Procurement Costs	3			2	6
- Life Cycle Costs	3			3	9
			SUMS>	56	15
			DEMAND:	12	
			PROPORTIONAL WEIGHT (PW)	=	.00
			GENERAL VALUE(PW*GEN SUM)	=	0.040399
			GENERAL COSTS(PW*COSTS SUM)	=	0.010821
SYSTEM CRITERIA		WEIGHTS	SYSTEM	RATING	WEIGHT X RATING
- Technical Feasibility	4			5	20
- Available Resources	4			5	20
- Operational Suitability	4	4		5	20
- Procurement Costs	3			1	3
- Life Cycle Costs	3			4	12
			SUMS>	60	15
			DEMAND:	15	
			PROPORTIONAL WEIGHT (PW)	=	.00
			GENERAL VALUE(PW*GEN SUM)	=	0.054106
			GENERAL COSTS(PW*COSTS SUM)	=	0.013526

		SYSTEM			
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING	
- Technical Feasibility	4	5	5	20	
- Available Resources	4		5	20	
- Operational Suitability	4		5	20	
- Procurement Costs	3		3		9
- Life Cycle Costs	3		4		12
		SUMS>		60	21
		DEMAND:		500	
		PROPORTIONAL WEIGHT (PW)		=	0.03
		GENERAL VALUE(PW*GEN SUM)		=	1.803534
		GENERAL COSTS(PW*COSTS SUM)		=	0.631237
		SYSTEM			
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING	
- Technical Feasibility	4	6	5	20	
- Available Resources	4		5	20	
- Operational Suitability	4		5	20	
- Procurement Costs	3		3		9
- Life Cycle Costs	3		4		12
		SUMS>		60	21
		DEMAND:		2034	
		PROPORTIONAL WEIGHT (PW)		=	0.12
		GENERAL VALUE(PW*GEN SUM)		=	7.336780
		GENERAL COSTS(PW*COSTS SUM)		=	2.567873
		SYSTEM			
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING	
- Technical Feasibility	4	7	5	20	
- Available Resources	4		5	20	
- Operational Suitability	4		5	20	
- Procurement Costs	3		1		3
- Life Cycle Costs	3		4		12
		SUMS>		60	15
		DEMAND:		960	
		PROPORTIONAL WEIGHT (PW)		=	0.06
		GENERAL VALUE(PW*GEN SUM)		=	3.462787
		GENERAL COSTS(PW*COSTS SUM)		=	0.865696
		SYSTEM			
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING	
- Technical Feasibility	4	8	5	20	
- Available Resources	4		5	20	
- Operational Suitability	4		5	20	
- Procurement Costs	3		3		9
- Life Cycle Costs	3		4		12

		SYSTEM	
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	1	3
- Life Cycle Costs	3	4	12
		SUMS>	60 15
		DEMAND:	106
		PROPORTIONAL WEIGHT (PW) =	0.01
		GENERAL VALUE(PW*GEN SUM) =	0.382349
		GENERAL COSTS(PW*COSTS SUM)=	0.095587
		=====	
		SYSTEM	
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	4	12
- Life Cycle Costs	3	4	12
		SUMS>	60 24
		DEMAND:	5702
		PROPORTIONAL WEIGHT (PW) =	0.34
		GENERAL VALUE(PW*GEN SUM) =	20.56751
		GENERAL COSTS(PW*COSTS SUM)=	8.227004
		=====	
		SYSTEM	
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	5	15
- Life Cycle Costs	3	5	15
		SUMS>	60 30
		DEMAND:	63
		PROPORTIONAL WEIGHT (PW) =	.00
		GENERAL VALUE(PW*GEN SUM) =	0.227245
		GENERAL COSTS(PW*COSTS SUM)=	0.113622
		=====	
		SYSTEM	
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	5	15
- Life Cycle Costs	3	5	15

```

:                                     :SUMS>      60      30 :
: DEMAND:      5976                  :
: PROPORTIONAL WEIGHT (PW) = 0.36 :
: GENERAL VALUE(PW*GEN SUM) =21.55584 :
: GENERAL COSTS(PW*COSTS SUM)=10.77792 :
=====

```

```

: SYSTEM :
=====
: SYSTEM CRITERIA      WEIGHTS : RATING  WEIGHT X RATING :
=====
: - Technical Feasibility      4 :      5      20 :
: - Available Resources        4 :      2       8 :
: - Operational Suitability    4 :      5      20 :
: - Procurement Costs          3 :      5      15 :
: - Life Cycle Costs           3 :      5      15 :
=====

```

```

:                                     :SUMS>      48      30 :
: DEMAND:      40                  :
: PROPORTIONAL WEIGHT (PW) = .00 :
: GENERAL VALUE(PW*GEN SUM) =0.115426 :
: GENERAL COSTS(PW*COSTS SUM)=0.072141 :
=====

```

```

=====
: FAMILY EVALUATION FACTORS : RATING  WEIGHT X RATING :
: - Family Costs            5 :      1       5 :
: - Fam Requirements Coverage 5 :      5      25 :
=====

```

```

=====
:SUM OF SYS PERFORMANCE VALUES :SUM GEN VALUES  59.85571 :
:SUM OF INDIVIDUAL SYSTEM COSTS  :SUM SYS COSTS   24.79626 :
:THE FAMILY COST                  :      5 :
:FAMILY REQUIREMENTS COVERAGE    :      25 :
=====

```

```

: TOTAL FAMILY VALUE = : 114.6519 :
=====

```

TABLE C.2.4
Evaluation Matrix
Basic Systems Family - Elimination by Units - 14 Systems

		SYSTEM		
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4	2	5	20
- Available Resources	4		4	16
- Operational Suitability	4		5	20
- Procurement Costs	3		1	3
- Life Cycle Costs	3		3	9
		SUMS>	56	12
		DEMAND:	420	
		PROPORTIONAL WEIGHT (PW)	= 0.03	
		GENERAL VALUE(PW*GEN SUM)	=1.413971	
		GENERAL COSTS(PW*COSTS SUM)	=0.302993	
		SYSTEM		
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4	4	5	20
- Available Resources	4		5	20
- Operational Suitability	4		5	20
- Procurement Costs	3		1	3
- Life Cycle Costs	3		4	12
		SUMS>	60	15
		DEMAND:	15	
		PROPORTIONAL WEIGHT (PW)	= .00	
		GENERAL VALUE(PW*GEN SUM)	=0.054106	
		GENERAL COSTS(PW*COSTS SUM)	=0.013526	
		SYSTEM		
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4	5	5	20
- Available Resources	4		5	20
- Operational Suitability	4		5	20
- Procurement Costs	3		3	9
- Life Cycle Costs	3		4	12
		SUMS>	60	21
		DEMAND:	500	
		PROPORTIONAL WEIGHT (PW)	= 0.03	
		GENERAL VALUE(PW*GEN SUM)	=1.803534	
		GENERAL COSTS(PW*COSTS SUM)	=0.631237	

		SYSTEM			
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING	
- Technical Feasibility	4	6	5	20	
- Available Resources	4		5	20	
- Operational Suitability	4		5	20	
- Procurement Costs	3		3		9
- Life Cycle Costs	3		4		12
		SUMS>		60	21
		DEMAND:		2034	
		PROPORTIONAL WEIGHT (PW)		= 0.12	
		GENERAL VALUE(PW*GEN SUM)		=7.336780	
		GENERAL COSTS(PW*COSTS SUM)		=2.567873	
		SYSTEM			
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING	
- Technical Feasibility	4	7	5	20	
- Available Resources	4		5	20	
- Operational Suitability	4		5	20	
- Procurement Costs	3		1		3
- Life Cycle Costs	3		4		12
		SUMS>		60	15
		DEMAND:		960	
		PROPORTIONAL WEIGHT (PW)		= 0.06	
		GENERAL VALUE(PW*GEN SUM)		=3.462787	
		GENERAL COSTS(PW*COSTS SUM)		=0.865696	
		SYSTEM			
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING	
- Technical Feasibility	4	8	5	20	
- Available Resources	4		5	20	
- Operational Suitability	4		5	20	
- Procurement Costs	3		3		9
- Life Cycle Costs	3		4		12
		SUMS>		60	21
		DEMAND:		194	
		PROPORTIONAL WEIGHT (PW)		= 0.01	
		GENERAL VALUE(PW*GEN SUM)		=0.699771	
		GENERAL COSTS(PW*COSTS SUM)		=0.244920	
		SYSTEM			
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING	
- Technical Feasibility	4	10	5	20	
- Available Resources	4		5	20	
- Operational Suitability	4		5	20	
- Procurement Costs	3		1		3
- Life Cycle Costs	3		4		12

```

:                                     : SUMS>          60      15 :
: DEMAND:                24      ----- :
: PROPORTIONAL WEIGHT (PW) = .00 :
: GENERAL VALUE(PW*GEN SUM) =0.086569 :
: GENERAL COSTS(PW*COSTS SUM)=0.021642 :
=====
: SYSTEM :
:
: SYSTEM CRITERIA          WEIGHTS : RATING    WEIGHT X RATING :
: - Technical Feasibility      4 :          5         20 :
: - Available Resources        4 :          5         20 :
: - Operational Suitability    4 :          5         20 :
: - Procurement Costs          3 :          4          12 :
: - Life Cycle Costs           3 :          4          12 :
:
:                                     : SUMS>          60      24 :
: DEMAND:                320      ----- :
: PROPORTIONAL WEIGHT (PW) = 0.02 :
: GENERAL VALUE(PW*GEN SUM) =1.154262 :
: GENERAL COSTS(PW*COSTS SUM)=0.461704 :
=====
: SYSTEM :
:
: SYSTEM CRITERIA          WEIGHTS : RATING    WEIGHT X RATING :
: - Technical Feasibility      4 :          5         20 :
: - Available Resources        4 :          5         20 :
: - Operational Suitability    4 :          5         20 :
: - Procurement Costs          3 :          4          12 :
: - Life Cycle Costs           3 :          4          12 :
:
:                                     : SUMS>          60      24 :
: DEMAND:                276      ----- :
: PROPORTIONAL WEIGHT (PW) = 0.02 :
: GENERAL VALUE(PW*GEN SUM) =0.995551 :
: GENERAL COSTS(PW*COSTS SUM)=0.398220 :
=====
: SYSTEM :
:
: SYSTEM CRITERIA          WEIGHTS : RATING    WEIGHT X RATING :
: - Technical Feasibility      4 :          5         20 :
: - Available Resources        4 :          5         20 :
: - Operational Suitability    4 :          5         20 :
: - Procurement Costs          3 :          1           3 :
: - Life Cycle Costs           3 :          4          12 :
:
:                                     : SUMS>          60      15 :
: DEMAND:                106      ----- :
: PROPORTIONAL WEIGHT (PW) = 0.01 :
: GENERAL VALUE(PW*GEN SUM) =0.382349 :
: GENERAL COSTS(PW*COSTS SUM)=0.095587 :
=====

```

		: : SYSTEM :			
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING	
- Technical Feasibility	4	14	5	20	
- Available Resources	4		5	20	
- Operational Suitability	4		5	20	
- Procurement Costs	3		4	12	
- Life Cycle Costs	3		4	12	
		: : : : : SUMS >		60	24
		: : DEMAND:		5702	
		: : PROPORTIONAL WEIGHT (PW) =		0.34	
		: : GENERAL VALUE (PW * GEN SUM) =		20.56751	
		: : GENERAL COSTS (PW * COSTS SUM) =		8.227004	
		=====			
		: : SYSTEM :			
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING	
- Technical Feasibility	4	15	5	20	
- Available Resources	4		5	20	
- Operational Suitability	4		5	20	
- Procurement Costs	3		5	15	
- Life Cycle Costs	3		5	15	
		: : : : : SUMS >		60	30
		: : DEMAND:		63	
		: : PROPORTIONAL WEIGHT (PW) =		.00	
		: : GENERAL VALUE (PW * GEN SUM) =		0.227245	
		: : GENERAL COSTS (PW * COSTS SUM) =		0.113622	
		=====			
		: : SYSTEM :			
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING	
- Technical Feasibility	4	16	5	20	
- Available Resources	4		5	20	
- Operational Suitability	4		5	20	
- Procurement Costs	3		5	15	
- Life Cycle Costs	3		5	15	
		: : : : : SUMS >		60	30
		: : DEMAND:		5976	
		: : PROPORTIONAL WEIGHT (PW) =		0.36	
		: : GENERAL VALUE (PW * GEN SUM) =		21.55584	
		: : GENERAL COSTS (PW * COSTS SUM) =		10.77792	
		=====			
		: : SYSTEM :			
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING	
- Technical Feasibility	4	17	5	20	
- Available Resources	4		2	8	
- Operational Suitability	4		5	20	
- Procurement Costs	3		5	15	
- Life Cycle Costs	3		5	15	

```

:                                     ::::::::::::::SUMS>          48          30 ::
:                                     :: DEMAND:          40          ----- ::
:                                     :: PROPORTIONAL WEIGHT (PW) =          .00 ::
:                                     :: GENERAL VALUE(PW*GEN SUM) =0.115426 ::
:                                     ::GENERAL COSTS(PW*COSTS SUM)=0.072141 ::
:                                     ::::::::::::::::::::::::::::::::::::::::::::
=====
: FAMILY EVALUATION FACTORS          ::          : RATING WEIGHT X RATING ::
:   - Family Costs                   5 ::          :      1      5      ::
:   - Fam Requirements Coverage      5 ::          :      5     25     ::
:                                     ::::::::::::::::::::::::::::::::::::::::::::
=====
:SUM OF SYS PERFORMANCE VALUES      ::SUM GEN VALUES      59.85571      ::
:SUM OF INDIVIDUAL SYSTEM COSTS      ::SUM SYS COSTS      24.79409      ::
:THE FAMILY COST                      ::                      5      ::
:FAMILY REQUIREMENTS COVERAGE        ::                      25     ::
:                                     ::::::::::::::::::::::::::::::::::::::::::::
: :::::::::::::::::::::: TOTAL FAMILY VALUE = ::          114.6498      ::
:                                     ::::::::::::::::::::::::::::::::::::::::::::

```

TABLE C.2.5
Evaluation Matrix
Basic Systems Family - Elimination by Units - 13 Systems

		SYSTEM		
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4	2	5	20
- Available Resources	4		4	16
- Operational Suitability	4		5	20
- Procurement Costs	3		1	3
- Life Cycle Costs	3		3	9
		SUMS>	56	12
		DEMAND:	420	
		PROPORTIONAL WEIGHT (PW) =	0.03	
		GENERAL VALUE(PW*GEN SUM) =	1.413971	
		GENERAL COSTS(PW*COSTS SUM)=	0.302993	

		SYSTEM		
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4	5	5	20
- Available Resources	4		5	20
- Operational Suitability	4		5	20
- Procurement Costs	3		3	9
- Life Cycle Costs	3		4	12
		SUMS>	60	21
		DEMAND:	500	
		PROPORTIONAL WEIGHT (PW) =	0.03	
		GENERAL VALUE(PW*GEN SUM) =	1.803534	
		GENERAL COSTS(PW*COSTS SUM)=	0.631237	

		SYSTEM		
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4	6	5	20
- Available Resources	4		5	20
- Operational Suitability	4		5	20
- Procurement Costs	3		3	9
- Life Cycle Costs	3		4	12
		SUMS>	60	21
		DEMAND:	2034	
		PROPORTIONAL WEIGHT (PW) =	0.12	
		GENERAL VALUE(PW*GEN SUM) =	7.336780	
		GENERAL COSTS(PW*COSTS SUM)=	2.567873	

SYSTEM			
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	1	3
- Life Cycle Costs	3	4	12
		SUMS>	60 15
		DEMAND:	960
		PROPORTIONAL WEIGHT (PW) =	0.06
		GENERAL VALUE (PW*GEN SUM) =	3.462787
		GENERAL COSTS (PW*COSTS SUM) =	0.865696

SYSTEM			
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	3	9
- Life Cycle Costs	3	4	12
		SUMS>	60 21
		DEMAND:	194
		PROPORTIONAL WEIGHT (PW) =	0.01
		GENERAL VALUE (PW*GEN SUM) =	0.699771
		GENERAL COSTS (PW*COSTS SUM) =	0.244920

SYSTEM			
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	1	3
- Life Cycle Costs	3	4	12
		SUMS>	60 15
		DEMAND:	24
		PROPORTIONAL WEIGHT (PW) =	.00
		GENERAL VALUE (PW*GEN SUM) =	0.086569
		GENERAL COSTS (PW*COSTS SUM) =	0.021642

SYSTEM			
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	4	12
- Life Cycle Costs	3	4	12

		SYSTEM			
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING	
- Technical Feasibility	4	15	5	20	
- Available Resources	4		5	20	
- Operational Suitability	4		5	20	
- Procurement Costs	3		5		15
- Life Cycle Costs	3		5		15
		SUMS>		60	30
		DEMAND:		63	
		PROPORTIONAL WEIGHT (PW) =		.00	
		GENERAL VALUE(PW*GEN SUM) =		0.227245	
		GENERAL COSTS(PW*COSTS SUM)=		0.113622	
		SYSTEM			
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING	
- Technical Feasibility	4	16	5	20	
- Available Resources	4		5	20	
- Operational Suitability	4		5	20	
- Procurement Costs	3		5		15
- Life Cycle Costs	3		5		15
		SUMS>		60	30
		DEMAND:		5976	
		PROPORTIONAL WEIGHT (PW) =		0.36	
		GENERAL VALUE(PW*GEN SUM) =		21.55584	
		GENERAL COSTS(PW*COSTS SUM)=		10.77792	
		SYSTEM			
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING	
- Technical Feasibility	4	17	5	20	
- Available Resources	4		2	8	
- Operational Suitability	4		5	20	
- Procurement Costs	3		5		15
- Life Cycle Costs	3		5		15
		SUMS>		48	30
		DEMAND:		40	
		PROPORTIONAL WEIGHT (PW) =		.00	
		GENERAL VALUE(PW*GEN SUM) =		0.115426	
		GENERAL COSTS(PW*COSTS SUM)=		0.072141	

FAMILY EVALUATION FACTORS		RATING	WEIGHT	X RATING
- Family Costs	5	1	5	
- Fam Requirements Coverage	5	5	25	
SUM OF SYS PERFORMANCE VALUES				
SUM OF INDIVIDUAL SYSTEM COSTS		SUM GEN VALUES	59.80161	
THE FAMILY COST		SUM SYS COSTS	24.78056	
FAMILY REQUIREMENTS COVERAGE			5	
			25	
TOTAL FAMILY VALUE =			114.5821	

TABLE C.2.6
Evaluation Matrix
Basic Systems Family - Elimination by Units - 12 Systems

		SYSTEM		
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4	2	5	20
- Available Resources	4		4	16
- Operational Suitability	4		5	20
- Procurement Costs	3		1	3
- Life Cycle Costs	3		3	9
		SUMS>	56	12
		DEMAND:	420	
		PROPORTIONAL WEIGHT (PW) =	0.03	
		GENERAL VALUE(PW*GEN SUM) =	1.413971	
		GENERAL COSTS(PW*COSTS SUM)=	0.302993	
		SYSTEM		
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4	5	5	20
- Available Resources	4		5	20
- Operational Suitability	4		5	20
- Procurement Costs	3		3	9
- Life Cycle Costs	3		4	12
		SUMS>	60	21
		DEMAND:	500	
		PROPORTIONAL WEIGHT (PW) =	0.03	
		GENERAL VALUE(PW*GEN SUM) =	1.803534	
		GENERAL COSTS(PW*COSTS SUM)=	0.631237	
		SYSTEM		
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4	6	5	20
- Available Resources	4		5	20
- Operational Suitability	4		5	20
- Procurement Costs	3		3	9
- Life Cycle Costs	3		4	12
		SUMS>	60	21
		DEMAND:	2034	
		PROPORTIONAL WEIGHT (PW) =	0.12	
		GENERAL VALUE(PW*GEN SUM) =	7.336780	
		GENERAL COSTS(PW*COSTS SUM)=	2.567873	

		SYSTEM	
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	1	3
- Life Cycle Costs	3	4	12
		SUMS>	60 15
		DEMAND:	984
		PROPORTIONAL WEIGHT (PW)	= 0.06
		GENERAL VALUE(PW*GEN SUM)	=3.549356
		GENERAL COSTS(PW*COSTS SUM)	=0.887339
		=====	
		SYSTEM	
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	3	9
- Life Cycle Costs	3	4	12
		SUMS>	60 21
		DEMAND:	194
		PROPORTIONAL WEIGHT (PW)	= 0.01
		GENERAL VALUE(PW*GEN SUM)	=0.699771
		GENERAL COSTS(PW*COSTS SUM)	=0.244920
		=====	
		SYSTEM	
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	4	12
- Life Cycle Costs	3	4	12
		SUMS>	60 24
		DEMAND:	320
		PROPORTIONAL WEIGHT (PW)	= 0.02
		GENERAL VALUE(PW*GEN SUM)	=1.154262
		GENERAL COSTS(PW*COSTS SUM)	=0.461704
		=====	
		SYSTEM	
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	4	12
- Life Cycle Costs	3	4	12

```

:                                     : SUMS>          60      24 :
: DEMAND:          276 ----- :
: PROPORTIONAL WEIGHT (PW) = 0.02 :
: GENERAL VALUE(PW*GEN SUM) =0.995551 :
: GENERAL COSTS(PW*COSTS SUM)=0.398220 :
=====
: SYSTEM :
:
: SYSTEM CRITERIA      WEIGHTS : RATING  WEIGHT X RATING :
: - Technical Feasibility      4 :      5      20 :
: - Available Resources        4 :      5      20 :
: - Operational Suitability    4 :      5      20 :
: - Procurement Costs          3 :      1      3 :
: - Life Cycle Costs           3 :      4     12 :
:
:                                     : SUMS>          60      15 :
: DEMAND:          106 ----- :
: PROPORTIONAL WEIGHT (PW) = 0.01 :
: GENERAL VALUE(PW*GEN SUM) =0.382349 :
: GENERAL COSTS(PW*COSTS SUM)=0.095587 :
=====
: SYSTEM :
:
: SYSTEM CRITERIA      WEIGHTS : RATING  WEIGHT X RATING :
: - Technical Feasibility      4 :      5      20 :
: - Available Resources        4 :      5      20 :
: - Operational Suitability    4 :      5      20 :
: - Procurement Costs          3 :      4     12 :
: - Life Cycle Costs           3 :      4     12 :
:
:                                     : SUMS>          60      24 :
: DEMAND:          5702 ----- :
: PROPORTIONAL WEIGHT (PW) = 0.34 :
: GENERAL VALUE(PW*GEN SUM) =20.56751 :
: GENERAL COSTS(PW*COSTS SUM)=8.227004 :
=====
: SYSTEM :
:
: SYSTEM CRITERIA      WEIGHTS : RATING  WEIGHT X RATING :
: - Technical Feasibility      4 :      5      20 :
: - Available Resources        4 :      5      20 :
: - Operational Suitability    4 :      5      20 :
: - Procurement Costs          3 :      5     15 :
: - Life Cycle Costs           3 :      5     15 :
:
:                                     : SUMS>          60      30 :
: DEMAND:           63 ----- :
: PROPORTIONAL WEIGHT (PW) = .00 :
: GENERAL VALUE(PW*GEN SUM) =0.227245 :
: GENERAL COSTS(PW*COSTS SUM)=0.113622 :
=====

```

		SYSTEM	
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	5	15
- Life Cycle Costs	3	5	15
		SUMS>	60
		DEMAND:	5976
		PROPORTIONAL WEIGHT (PW)	= 0.36
		GENERAL VALUE(PW*GEN SUM)	=21.55584
		GENERAL COSTS(PW*COSTS SUM)	=10.77792
		SYSTEM	
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	2	8
- Operational Suitability	4	5	20
- Procurement Costs	3	5	15
- Life Cycle Costs	3	5	15
		SUMS>	48
		DEMAND:	40
		PROPORTIONAL WEIGHT (PW)	= .00
		GENERAL VALUE(PW*GEN SUM)	=0.115426
		GENERAL COSTS(PW*COSTS SUM)	=0.072141
FAMILY EVALUATION FACTORS		RATING	WEIGHT X RATING
- Family Costs	5	2	10
- Fam Requirements Coverage	5	5	25
SUM OF SYS PERFORMANCE VALUES	SUM GEN VALUES	59.80161	
SUM OF INDIVIDUAL SYSTEM COSTS	SUM SYS COSTS	24.78056	
THE FAMILY COST		10	
FAMILY REQUIREMENTS COVERAGE		25	
		TOTAL FAMILY VALUE =	119.5821

TABLE C.2.7
Evaluation Matrix
Basic Systems Family - Elimination by Units - 11 Systems

		SYSTEM		
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4	2	5	20
- Available Resources	4		4	16
- Operational Suitability	4		5	20
- Procurement Costs	3		1	3
- Life Cycle Costs	3		3	9
		SUMS>	56	12
		DEMAND:	420	
		PROPORTIONAL WEIGHT (PW) =	0.03	
		GENERAL VALUE(PW*GEN SUM) =	1.413971	
		GENERAL COSTS(PW*COSTS SUM)=	0.302993	
		SYSTEM		
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4	5	5	20
- Available Resources	4		5	20
- Operational Suitability	4		5	20
- Procurement Costs	3		3	9
- Life Cycle Costs	3		4	12
		SUMS>	60	21
		DEMAND:	500	
		PROPORTIONAL WEIGHT (PW) =	0.03	
		GENERAL VALUE(PW*GEN SUM) =	1.803534	
		GENERAL COSTS(PW*COSTS SUM)=	0.631237	
		SYSTEM		
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4	6	5	20
- Available Resources	4		5	20
- Operational Suitability	4		5	20
- Procurement Costs	3		3	9
- Life Cycle Costs	3		4	12
		SUMS>	60	21
		DEMAND:	2034	
		PROPORTIONAL WEIGHT (PW) =	0.12	
		GENERAL VALUE(PW*GEN SUM) =	7.336780	
		GENERAL COSTS(PW*COSTS SUM)=	2.567873	

SYSTEM			
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	1	3
- Life Cycle Costs	3	4	12
		SUMS>	60 15
		DEMAND:	984
		PROPORTIONAL WEIGHT (PW)	= 0.06
		GENERAL VALUE(PW*GEN SUM)	=3.549356
		GENERAL COSTS(PW*COSTS SUM)	=0.887339

SYSTEM			
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	3	9
- Life Cycle Costs	3	4	12
		SUMS>	60 21
		DEMAND:	194
		PROPORTIONAL WEIGHT (PW)	= 0.01
		GENERAL VALUE(PW*GEN SUM)	=0.699771
		GENERAL COSTS(PW*COSTS SUM)	=0.244920

SYSTEM			
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	4	12
- Life Cycle Costs	3	4	12
		SUMS>	60 24
		DEMAND:	320
		PROPORTIONAL WEIGHT (PW)	= 0.02
		GENERAL VALUE(PW*GEN SUM)	=1.154262
		GENERAL COSTS(PW*COSTS SUM)	=0.461704

SYSTEM			
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	4	12
- Life Cycle Costs	3	4	12
		SUMS>	60 24
		DEMAND:	320
		PROPORTIONAL WEIGHT (PW)	= 0.02
		GENERAL VALUE(PW*GEN SUM)	=1.154262
		GENERAL COSTS(PW*COSTS SUM)	=0.461704

[illegible]

.....

.....

4	11	:	\$	20	:
---	----	---	----	----	---

- Procurement Costs	3.00	1	3.00
---------------------	------	---	------

DEMAND: 106

```

:: GENERAL VALUE(PH=GEN SUM) =0.393249

```

Available Resources	4	5	20
---------------------	---	---	----

Operational Sustainability	3	11	1	12
----------------------------	---	----	---	----

Life Cycle Costs 3 4 12 :

```

:                                     ::::::::::::::SUNS>          60          24 :

```

DEMAND: 3702

```

.. GENERAL VALUE (RUMEN SUM) := 30.56751 ..

```

```
..GENERAL COSTS(PW=COSTS SUM)=8.227004 :
```

11

```

:                                     :: SYSTEM :

```

.....

SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHTED RATING
1. SYSTEM CRITERIA			

Technical Feasibility	4	5	20
-----------------------	---	---	----

- Available Resources	4	:	:	5	20	:
-----------------------	---	---	---	---	----	---

4	15	5	20
- Operational Suitability			

:	- Procurement Costs	3	::	:		3		19	.
---	---------------------	---	----	---	--	---	--	----	---

- Life Cycle Costs

.....SUMS> 60 30 :

.. DEMAND: 63 -----;

∴ PROPORTIONAL WEIGHT (PW) = .00 :

$\therefore$ GENERAL VALUE (PRAGEN JUIT) = 0.227243 .
 GENERAL COST (PRAGEN JUIT) = 0.118183

Abstract

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.....

		SYSTEM	
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	5	15
- Life Cycle Costs	3	5	15
		SUMS>	60 30
		DEMAND:	6016
		PROPORTIONAL WEIGHT (PW)	= 0.36
		GENERAL VALUE(PW*GEN SUM)	=21.70013
		GENERAL COSTS(PW*COSTS SUM)	=10.85006

FAMILY EVALUATION FACTORS		RATING	WEIGHT X RATING
- Family Costs	5	2	10
- Fam Requirements Coverage	5	5	25
SUM OF SYS PERFORMANCE VALUES	SUM GEN VALUES	59.83046	
SUM OF INDIVIDUAL SYSTEM COSTS	SUM SYS COSTS	24.78056	
THE FAMILY COST		10	
FAMILY REQUIREMENTS COVERAGE		25	
TOTAL FAMILY VALUE =		119.6110	

TABLE C.2.8
Evaluation Matrix
Basic Systems Family - Elimination by Units - 10 Systems

		SYSTEM		
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4	2	5	20
- Available Resources	4		4	16
- Operational Suitability	4		5	20
- Procurement Costs	3		1	3
- Life Cycle Costs	3		3	9
		SUMS>	56	12
		DEMAND:	420	
		PROPORTIONAL WEIGHT (PW) =	0.03	
		GENERAL VALUE(PW*GEN SUM) =	1.413971	
		GENERAL COSTS(PW*COSTS SUM)=	0.302993	
		SYSTEM		
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4	5	5	20
- Available Resources	4		5	20
- Operational Suitability	4		5	20
- Procurement Costs	3		3	9
- Life Cycle Costs	3		4	12
		SUMS>	60	21
		DEMAND:	500	
		PROPORTIONAL WEIGHT (PW) =	0.03	
		GENERAL VALUE(PW*GEN SUM) =	1.803534	
		GENERAL COSTS(PW*COSTS SUM)=	0.631237	
		SYSTEM		
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4	6	5	20
- Available Resources	4		5	20
- Operational Suitability	4		5	20
- Procurement Costs	3		3	9
- Life Cycle Costs	3		4	12
		SUMS>	60	21
		DEMAND:	2034	
		PROPORTIONAL WEIGHT (PW) =	0.12	
		GENERAL VALUE(PW*GEN SUM) =	7.336780	
		GENERAL COSTS(PW*COSTS SUM)=	2.567873	

		SYSTEM	
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	1	3
- Life Cycle Costs	3	4	12
		SUMS>	60 15
		DEMAND:	384
		PROPORTIONAL WEIGHT (PW)	= 0.06
		GENERAL VALUE(PW*GEN SUM)	=3.549356
		GENERAL COSTS(PW*COSTS SUM)	=0.987339
		SYSTEM	
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	3	9
- Life Cycle Costs	3	4	12
		SUMS>	60 21
		DEMAND:	194
		PROPORTIONAL WEIGHT (PW)	= 0.01
		GENERAL VALUE(PW*GEN SUM)	=0.699771
		GENERAL COSTS(PW*COSTS SUM)	=0.244920
		SYSTEM	
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	4	12
- Life Cycle Costs	3	4	12
		SUMS>	60 24
		DEMAND:	320
		PROPORTIONAL WEIGHT (PW)	= 0.02
		GENERAL VALUE(PW*GEN SUM)	=1.154262
		GENERAL COSTS(PW*COSTS SUM)	=0.461704
		SYSTEM	
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	4	12
- Life Cycle Costs	3	4	12

```

: .....SUMS> 60 24 :
: DEMAND: 339 :
: PROPORTIONAL WEIGHT (PW) = 0.02 :
: GENERAL VALUE(PW*GEN SUM) =1.222796 :
: GENERAL COSTS(PW*COSTS SUM)=0.489118 :

```

```

: SYSTEM :
:-----:
: SYSTEM CRITERIA WEIGHTS : RATING WEIGHT X RATING :
:-----:
: - Technical Feasibility 4 : 5 20 :
: - Available Resources 4 : 5 20 :
: - Operational Suitability 4 : 13 5 20 :
: - Procurement Costs 3 : 1 3 :
: - Life Cycle Costs 3 : 4 12 :

```

```

: .....SUMS> 60 15 :
: DEMAND: 106 :
: PROPORTIONAL WEIGHT (PW) = 0.01 :
: GENERAL VALUE(PW*GEN SUM) =0.382349 :
: GENERAL COSTS(PW*COSTS SUM)=0.095587 :

```

```

: SYSTEM :
:-----:
: SYSTEM CRITERIA WEIGHTS : RATING WEIGHT X RATING :
:-----:
: - Technical Feasibility 4 : 5 20 :
: - Available Resources 4 : 5 20 :
: - Operational Suitability 4 : 14 5 20 :
: - Procurement Costs 3 : 4 12 :
: - Life Cycle Costs 3 : 4 12 :

```

```

: .....SUMS> 60 24 :
: DEMAND: 5702 :
: PROPORTIONAL WEIGHT (PW) = 0.34 :
: GENERAL VALUE(PW*GEN SUM) =20.56751 :
: GENERAL COSTS(PW*COSTS SUM)=8.227004 :

```

```

: SYSTEM :
:-----:
: SYSTEM CRITERIA WEIGHTS : RATING WEIGHT X RATING :
:-----:
: - Technical Feasibility 4 : 5 20 :
: - Available Resources 4 : 5 20 :
: - Operational Suitability 4 : 16 5 20 :
: - Procurement Costs 3 : 5 15 :
: - Life Cycle Costs 3 : 5 15 :

```

```

: .....SUMS> 60 30 :
: DEMAND: 6016 :
: PROPORTIONAL WEIGHT (PW) = 0.36 :
: GENERAL VALUE(PW*GEN SUM) =21.70013 :
: GENERAL COSTS(PW*COSTS SUM)=10.85006 :

```

```

=====
: FAMILY EVALUATION FACTORS      ::      : RATING WEIGHT X RATING  ::
:   - Family Costs              S ::      :      2      10      ::
:   - Fam Requirements Coverage S ::      :      5      25      ::
=====
:SUM OF SYS PERFORMANCE VALUES  ::SUM GEN VALUES    59.83046  ::
:SUM OF INDIVIDUAL SYSTEM COSTS  ::SUM SYS COSTS     24.75784  ::
:THE FAMILY COST                 ::                  10      ::
:FAMILY PEQUIREMENTS COVERAGE  ::                  25      ::
=====
:.....: TOTAL FAMILY VALUE = ::                  119.5883  ::
=====

```

TABLE C.2.9
Evaluation Matrix
Basic Systems Family - Elimination by Units - 9 Systems

SYSTEM			
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	4	16
- Operational Suitability	4	5	20
- Procurement Costs	3	1	3
- Life Cycle Costs	3	3	9
		SUMS>	56
		DEMAND:	420
		PROPORTIONAL WEIGHT (PW) =	0.03
		GENERAL VALUE(PW*GEN SUM) =	1.413971
		GENERAL COSTS(PW*COSTS SUM)=	0.302993
SYSTEM			
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	3	9
- Life Cycle Costs	3	4	12
		SUMS>	60
		DEMAND:	500
		PROPORTIONAL WEIGHT (PW) =	0.03
		GENERAL VALUE(PW*GEN SUM) =	1.803534
		GENERAL COSTS(PW*COSTS SUM)=	0.631237
SYSTEM			
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	3	9
- Life Cycle Costs	3	4	12
		SUMS>	60
		DEMAND:	2034
		PROPORTIONAL WEIGHT (PW) =	0.12
		GENERAL VALUE(PW*GEN SUM) =	7.336780
		GENERAL COSTS(PW*COSTS SUM)=	2.567873

		SYSTEM	
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	1	3
- Life Cycle Costs	3	4	12
		SUMS>	60 15
		DEMAND:	1090
		PROPORTIONAL WEIGHT (PW)	= 0.07
		GENERAL VALUE(PW*GEN SUM)	=3.931706
		GENERAL COSTS(PW*COSTS SUM)	=0.982926
		=====	
		SYSTEM	
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	3	9
- Life Cycle Costs	3	4	12
		SUMS>	60 21
		DEMAND:	194
		PROPORTIONAL WEIGHT (PW)	= 0.01
		GENERAL VALUE(PW*GEN SUM)	=0.699771
		GENERAL COSTS(PW*COSTS SUM)	=0.244920
		=====	
		SYSTEM	
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	4	12
- Life Cycle Costs	3	4	12
		SUMS>	60 24
		DEMAND:	320
		PROPORTIONAL WEIGHT (PW)	= 0.02
		GENERAL VALUE(PW*GEN SUM)	=1.154262
		GENERAL COSTS(PW*COSTS SUM)	=0.461704
		=====	
		SYSTEM	
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	4	12
- Life Cycle Costs	3	4	12

TABLE C.2.10
Evaluation Matrix
Basic Systems Family - Elimination by Units - 8 Systems

SYSTEM		RATING		WEIGHT X RATING	
SYSTEM CRITERIA	WEIGHTS				
- Technical Feasibility	4	5	20		
- Available Resources	4	4	16		
- Operational Suitability	4	5	20		
- Procurement Costs	3	1		3	
- Life Cycle Costs	3	3		9	
		SUMS>	56	12	
		DEMAND:	420		
		PROPORTIONAL WEIGHT (PW)	=	0.03	
		GENERAL VALUE(PW*GEN SUM)	=	1.413971	
		GENERAL COSTS(PW*COSTS SUM)	=	0.302993	
SYSTEM		RATING		WEIGHT X RATING	
SYSTEM CRITERIA	WEIGHTS				
- Technical Feasibility	4	5	20		
- Available Resources	4	5	20		
- Operational Suitability	4	5	20		
- Procurement Costs	3	3		9	
- Life Cycle Costs	3	4		12	
		SUMS>	60	21	
		DEMAND:	500		
		PROPORTIONAL WEIGHT (PW)	=	0.03	
		GENERAL VALUE(PW*GEN SUM)	=	1.803534	
		GENERAL COSTS(PW*COSTS SUM)	=	0.631237	
SYSTEM		RATING		WEIGHT X RATING	
SYSTEM CRITERIA	WEIGHTS				
- Technical Feasibility	4	5	20		
- Available Resources	4	5	20		
- Operational Suitability	4	5	20		
- Procurement Costs	3	3		9	
- Life Cycle Costs	3	4		12	
		SUMS>	60	21	
		DEMAND:	2228		
		PROPORTIONAL WEIGHT (PW)	=	0.13	
		GENERAL VALUE(PW*GEN SUM)	=	8.036551	
		GENERAL COSTS(PW*COSTS SUM)	=	2.812793	

		SYSTEM	
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	1	3
- Life Cycle Costs	3	4	12
		SUMS>	60 15
		DEMAND:	1090
		PROPORTIONAL WEIGHT (PW)	= 0.07
		GENERAL VALUE(PW*GEN SUM)	=3.931706
		GENERAL COSTS(PW*COSTS SUM)	=0.982926
		=====	
		SYSTEM	
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	4	12
- Life Cycle Costs	3	4	12
		SUMS>	60 24
		DEMAND:	320
		PROPORTIONAL WEIGHT (PW)	= 0.02
		GENERAL VALUE(PW*GEN SUM)	=1.154262
		GENERAL COSTS(PW*COSTS SUM)	=0.461704
		=====	
		SYSTEM	
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	4	12
- Life Cycle Costs	3	4	12
		SUMS>	60 24
		DEMAND:	339
		PROPORTIONAL WEIGHT (PW)	= 0.02
		GENERAL VALUE(PW*GEN SUM)	=1.222796
		GENERAL COSTS(PW*COSTS SUM)	=0.489118
		=====	
		SYSTEM	
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	4	12
- Life Cycle Costs	3	4	12
		SUMS>	60 24
		DEMAND:	339
		PROPORTIONAL WEIGHT (PW)	= 0.02
		GENERAL VALUE(PW*GEN SUM)	=1.222796
		GENERAL COSTS(PW*COSTS SUM)	=0.489118

```

: .....SUMS> 60 24 :
: DEMAND: 5702 :
: PROPORTIONAL WEIGHT (PW) = 0.34 :
: GENERAL VALUE(PW*GEN SUM) =20.56751 :
: GENERAL COSTS(PW*COSTS SUM)=9.227004 :
=====

```

```

: SYSTEM :
: SYSTEM CRITERIA WEIGHTS : RATING WEIGHT X RATING :
: - Technical Feasibility 4 : 5 20 :
: - Available Resources 4 : 5 20 :
: - Operational Suitability 4 : 16 5 20 :
: - Procurement Costs 3 : 5 15 :
: - Life Cycle Costs 3 : 5 15 :
=====

```

```

: .....SUMS> 60 30 :
: DEMAND: 6016 :
: PROPORTIONAL WEIGHT (PW) = 0.36 :
: GENERAL VALUE(PW*GEN SUM) =21.70013 :
: GENERAL COSTS(PW*COSTS SUM)=10.85006 :
=====

```

```

=====
: FAMILY EVALUATION FACTORS : RATING WEIGHT X RATING :
: - Family Costs 5 : 3 15 :
: - Fam Requirements Coverage 5 : 5 25 :
=====

```

```

: SUM OF SYS PERFORMANCE VALUES : SUM GEN VALUES 59.83046 :
: SUM OF INDIVIDUAL SYSTEM COSTS : SUM SYS COSTS 24.75784 :
: THE FAMILY COST : 15 :
: FAMILY REQUIREMENTS COVERAGE : 25 :
=====
: ..... TOTAL FAMILY VALUE = : 124.5883 :
=====

```

TABLE C.2.11
Evaluation Matrix
Basic Systems Family - Elimination by Units - 7 Systems

SYSTEM		RATING		WEIGHT X RATING	
SYSTEM CRITERIA	WEIGHTS				
- Technical Feasibility	4	5	20		
- Available Resources	4	4	16		
- Operational Suitability	4	5	20		
- Procurement Costs	3	1		3	
- Life Cycle Costs	3	3		9	
		SUMS>	56	12	
		DEMAND:	420		
		PROPORTIONAL WEIGHT (PW)	=	0.03	
		GENERAL VALUE(PW*GEN SUM)	=	1.413971	
		GENERAL COSTS(PW*COSTS SUM)	=	0.302993	
SYSTEM		RATING		WEIGHT X RATING	
SYSTEM CRITERIA	WEIGHTS				
- Technical Feasibility	4	5	20		
- Available Resources	4	5	20		
- Operational Suitability	4	5	20		
- Procurement Costs	3	3		9	
- Life Cycle Costs	3	4		12	
		SUMS>	60	21	
		DEMAND:	500		
		PROPORTIONAL WEIGHT (PW)	=	0.03	
		GENERAL VALUE(PW*GEN SUM)	=	1.803534	
		GENERAL COSTS(PW*COSTS SUM)	=	0.631237	
SYSTEM		RATING		WEIGHT X RATING	
SYSTEM CRITERIA	WEIGHTS				
- Technical Feasibility	4	5	20		
- Available Resources	4	5	20		
- Operational Suitability	4	5	20		
- Procurement Costs	3	3		9	
- Life Cycle Costs	3	4		12	
		SUMS>	60	21	
		DEMAND:	2567		
		PROPORTIONAL WEIGHT (PW)	=	0.15	
		GENERAL VALUE(PW*GEN SUM)	=	9.259348	
		GENERAL COSTS(PW*COSTS SUM)	=	3.240771	

		SYSTEM	
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	1	3
- Life Cycle Costs	3	4	12
		SUMS>	60 15
		DEMAND:	1090
		PROPORTIONAL WEIGHT (PW)	= 0.07
		GENERAL VALUE(PW*GEN SUM)	=3.931706
		GENERAL COSTS(PW*COSTS SUM)	=0.982926
		=====	
		SYSTEM	
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	4	12
- Life Cycle Costs	3	4	12
		SUMS>	60 24
		DEMAND:	320
		PROPORTIONAL WEIGHT (PW)	= 0.02
		GENERAL VALUE(PW*GEN SUM)	=1.154262
		GENERAL COSTS(PW*COSTS SUM)	=0.461704
		=====	
		SYSTEM	
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	4	12
- Life Cycle Costs	3	4	12
		SUMS>	60 24
		DEMAND:	5702
		PROPORTIONAL WEIGHT (PW)	= 0.34
		GENERAL VALUE(PW*GEN SUM)	=20.56751
		GENERAL COSTS(PW*COSTS SUM)	=8.227004
		=====	
		SYSTEM	
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	5	15
- Life Cycle Costs	3	5	15

```

:                                     :SUNS>      60      30 ::
:                                     : DEMAND:    6016      ----- ::
:                                     : PROPORTIONAL WEIGHT (PW) =    0.36 ::
:                                     : GENERAL VALUE(PW*GEN SUM) =21.70013 ::
:                                     : GENERAL COSTS(PW*COSTS SUM)=10.85006 ::
=====
: FAMILY EVALUATION FACTORS          ::          : RATING  WEIGHT X RATING  ::
:   - Family Costs                    S ::          :      3      15          ::
:   - Fam Requirements Coverage       S ::          :      5      25          ::
=====
:SUM OF SYS PERFORMANCE VALUES      ::SUM GEN VALUES    59.83046      ::
:SUM OF INDIVIDUAL SYSTEM COSTS      ::SUM SYS COSTS     24.69670      ::
:THE FAMILY COST                     ::                  15          ::
:FAMILY REQUIREMENTS COVERAGE        ::                  25          ::
=====
:TOTAL FAMILY VALUE = ::                  124.5271      ::
=====

```

TABLE C.2.12
Evaluation Matrix
Basic Systems Family - Elimination by Units - 6 Systems

SYSTEM CRITERIA		WEIGHTS	SYSTEM	RATING	WEIGHT X RATING
- Technical Feasibility	4			5	20
- Available Resources	4			4	16
- Operational Suitability	4		2	5	20
- Procurement Costs	3			1	3
- Life Cycle Costs	3			3	9
			SUMS>	56	12
			DEMAND:	420	
			PROPORTIONAL WEIGHT (PW)	=	0.03
			GENERAL VALUE(PW*GEN SUM)	=	1.413971
			GENERAL COSTS(PW*COSTS SUM)	=	0.302993
SYSTEM CRITERIA		WEIGHTS	SYSTEM	RATING	WEIGHT X RATING
- Technical Feasibility	4			5	20
- Available Resources	4			5	20
- Operational Suitability	4		5	5	20
- Procurement Costs	3			3	9
- Life Cycle Costs	3			4	12
			SUMS>	60	21
			DEMAND:	500	
			PROPORTIONAL WEIGHT (PW)	=	0.03
			GENERAL VALUE(PW*GEN SUM)	=	1.803534
			GENERAL COSTS(PW*COSTS SUM)	=	0.631237
SYSTEM CRITERIA		WEIGHTS	SYSTEM	RATING	WEIGHT X RATING
- Technical Feasibility	4			5	20
- Available Resources	4			5	20
- Operational Suitability	4		6	5	20
- Procurement Costs	3			3	9
- Life Cycle Costs	3			4	12
			SUMS>	60	21
			DEMAND:	2987	
			PROPORTIONAL WEIGHT (PW)	=	0.17
			GENERAL VALUE(PW*GEN SUM)	=	10.41361
			GENERAL COSTS(PW*COSTS SUM)	=	3.644763

		:: SYSTEM :	
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	1	3
- Life Cycle Costs	3	4	12
		SUMS>	60 15
		DEMAND:	1090
		PROPORTIONAL WEIGHT (PW)	= 0.07
		GENERAL VALUE(PW*GEN SUM)	=3.931706
		GENERAL COSTS(PW*COSTS SUM)	=0.982926
		=====	
		:: SYSTEM :	
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	4	12
- Life Cycle Costs	3	4	12
		SUMS>	60 24
		DEMAND:	5702
		PROPORTIONAL WEIGHT (PW)	= 0.34
		GENERAL VALUE(PW*GEN SUM)	=20.56751
		GENERAL COSTS(PW*COSTS SUM)	=8.227004
		=====	
		:: SYSTEM :	
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	5	15
- Life Cycle Costs	3	5	15
		SUMS>	60 30
		DEMAND:	6016
		PROPORTIONAL WEIGHT (PW)	= 0.36
		GENERAL VALUE(PW*GEN SUM)	=21.70013
		GENERAL COSTS(PW*COSTS SUM)	=10.85006
		=====	

=====			
: FAMILY EVALUATION FACTORS	::	: RATING	WEIGHT X RATING
: - Family Costs	5 ::	:	4 20
: - Fam Requirements Coverage	5 ::	:	5 25
=====			
: SUM OF SYS PERFORMANCE VALUES	::	SUM GEN VALUES	59.83046
: SUM OF INDIVIDUAL SYSTEM COSTS	::	SUM SYS COSTS	24.63899
: THE FAMILY COST	::		20
: FAMILY REQUIREMENTS COVERAGE	::		25
=====			
: TOTAL FAMILY VALUE =	::		129.4694
=====			

TABLE C.2.13
Evaluation Matrix
Basic Systems Family - Elimination by Units - 5 Systems

		SYSTEM	
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	3	9
- Life Cycle Costs	3	4	12
		SUMS>	60 21
		DEMAND:	500
		PROPORTIONAL WEIGHT (PW)	= 0.03
		GENERAL VALUE(PW*GEN SUM)	=1.803534
		GENERAL COSTS(PW*COSTS SUM)	=0.631237
		SYSTEM	
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	6	20
- Procurement Costs	3	3	9
- Life Cycle Costs	3	4	12
		SUMS>	60 21
		DEMAND:	2887
		PROPORTIONAL WEIGHT (PW)	= 0.17
		GENERAL VALUE(PW*GEN SUM)	=10.41361
		GENERAL COSTS(PW*COSTS SUM)	=3.644763
		SYSTEM	
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	7	20
- Procurement Costs	3	1	3
- Life Cycle Costs	3	4	12
		SUMS>	60 15
		DEMAND:	1090
		PROPORTIONAL WEIGHT (PW)	= 0.07
		GENERAL VALUE(PW*GEN SUM)	=3.931706
		GENERAL COSTS(PW*COSTS SUM)	=0.982926

		SYSTEM	
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	4	12
- Life Cycle Costs	3	4	12
		SUMS>	60 24
		DEMAND:	5702
		PROPORTIONAL WEIGHT (PW)	= 0.34
		GENERAL VALUE(PW*GEN SUM)	=20.56751
		GENERAL COSTS(PW*COSTS SUM)	=8.227004
		=====	
		SYSTEM	
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	5	15
- Life Cycle Costs	3	5	15
		SUMS>	60 30
		DEMAND:	6016
		PROPORTIONAL WEIGHT (PW)	= 0.36
		GENERAL VALUE(PW*GEN SUM)	=21.70013
		GENERAL COSTS(PW*COSTS SUM)	=10.85006
		=====	
FAMILY EVALUATION FACTORS		RATING	WEIGHT X RATING
- Family Costs	5	4	20
- Fam Requirements Coverage	5	5	25
		=====	
SUM OF SYS PERFORMANCE VALUES	SUM GEN VALUES	58.41649	
SUM OF INDIVIDUAL SYSTEM COSTS	SUM SYS COSTS	24.33599	
THE FAMILY COST		20	
FAMILY REQUIREMENTS COVERAGE		25	
		=====	
TOTAL FAMILY VALUE =		127.7524	

TABLE C.2.14
Evaluation Matrix
Basic Systems Family - Elimination by Units - 4 Systems

		SYSTEM		
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4	6	5	20
- Available Resources	4		5	20
- Operational Suitability	4		5	20
- Procurement Costs	3		3	9
- Life Cycle Costs	3		4	12
		SUMS>	60	21
		DEMAND:	2887	
		PROPORTIONAL WEIGHT (PW) =	0.17	
		GENERAL VALUE(PW*GEN SUM) =	10.41361	
		GENERAL COSTS(PW*COSTS SUM)=	3.644763	
		SYSTEM		
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4	7	5	20
- Available Resources	4		5	20
- Operational Suitability	4		5	20
- Procurement Costs	3		1	3
- Life Cycle Costs	3		4	12
		SUMS>	60	15
		DEMAND:	1090	
		PROPORTIONAL WEIGHT (PW) =	0.07	
		GENERAL VALUE(PW*GEN SUM) =	3.931706	
		GENERAL COSTS(PW*COSTS SUM)=	0.982926	
		SYSTEM		
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4	14	5	20
- Available Resources	4		5	20
- Operational Suitability	4		5	20
- Procurement Costs	3		4	12
- Life Cycle Costs	3		4	12
		SUMS>	60	24
		DEMAND:	5702	
		PROPORTIONAL WEIGHT (PW) =	0.34	
		GENERAL VALUE(PW*GEN SUM) =	20.56751	
		GENERAL COSTS(PW*COSTS SUM)=	8.227004	

		:: SYSTEM :			
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING	
- Technical Feasibility	4	16	5	20	
- Available Resources	4		5	20	
- Operational Suitability	4		5	20	
- Procurement Costs	3		5		15
- Life Cycle Costs	3		5		15
			SUMS>	60	30
			DEMAND:	6016	
			PROPORTIONAL WEIGHT (PW)	=	0.36
			GENERAL VALUE(PW*GEN SUM)	=	21.70013
			GENERAL COSTS(PW*COSTS SUM)	=	10.85006

FAMILY EVALUATION FACTORS		RATING		WEIGHT X RATING	
- Family Costs	5		4	20	
- Fam Requirements Coverage	5		5	25	
SUM OF SYS PERFORMANCE VALUES		SUM GEN VALUES		56.61296	
SUM OF INDIVIDUAL SYSTEM COSTS		SUM SYS COSTS		23.70476	
THE FAMILY COST				20	
FAMILY REQUIREMENTS COVERAGE				25	
TOTAL FAMILY VALUE =				125.3177	

TABLE C.2.15
Evaluation Matrix
Basic Systems Family - Elimination by Units - 3 Systems

		SYSTEM		
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4	6	5	20
- Available Resources	4		5	20
- Operational Suitability	4		5	20
- Procurement Costs	3		3	9
- Life Cycle Costs	3		4	12
		SUMS>	60	21
		DEMAND:	2887	
		PROPORTIONAL WEIGHT (PW) =	0.17	
		GENERAL VALUE(PW*GEN SUM) =	10.41361	
		GENERAL COSTS(PW*COSTS SUM)=	3.644763	
		SYSTEM		
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4	14	5	20
- Available Resources	4		5	20
- Operational Suitability	4		5	20
- Procurement Costs	3		4	12
- Life Cycle Costs	3		4	12
		SUMS>	60	24
		DEMAND:	5702	
		PROPORTIONAL WEIGHT (PW) =	0.34	
		GENERAL VALUE(PW*GEN SUM) =	20.56751	
		GENERAL COSTS(PW*COSTS SUM)=	8.227004	
		SYSTEM		
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4	16	5	20
- Available Resources	4		5	20
- Operational Suitability	4		5	20
- Procurement Costs	3		5	15
- Life Cycle Costs	3		5	15
		SUMS>	60	30
		DEMAND:	6016	
		PROPORTIONAL WEIGHT (PW) =	0.36	
		GENERAL VALUE(PW*GEN SUM) =	21.70013	
		GENERAL COSTS(PW*COSTS SUM)=	10.85006	

```

=====
: FAMILY EVALUATION FACTORS      ::      : RATING  WEIGHT X RATING  ::
:   - Family Costs               5 ::      :      5      25      ::
:   - Fam Requirements Coverage  5 ::      :      5      25      ::
=====
:SUM OF SYS PERFORMANCE VALUES  ::SUM GEN VALUES    52.68125  ::
:SUM OF INDIVIDUAL SYSTEM COSTS  ::SUM SYS COSTS     22.72183  ::
:THE FAMILY COST                 ::                  25      ::
:FAMILY REQUIREMENTS COVERAGE   ::                  25      ::
=====
:.....: TOTAL FAMILY VALUE = ::                  125.4030  ::
=====

```

TABLE C.2.16
Evaluation Matrix
Basic Systems Family - Elimination by Units - 2 Systems

		:: SYSTEM :			
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING	
- Technical Feasibility	4	14	5	20	
- Available Resources	4		5	20	
- Operational Suitability	4		5	20	
- Procurement Costs	3		4		12
- Life Cycle Costs	3		4		12
		::: SUMS >		60	24
		:: DEMAND:		5702	
		:: PROPORTIONAL WEIGHT (PW) =		0.34	
		:: GENERAL VALUE(PW*GEN SUM) =		20.56751	
		:: GENERAL COSTS(PW*COSTS SUM)=		8.227004	
		:: SYSTEM :			
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING	
- Technical Feasibility	4	16	5	20	
- Available Resources	4		5	20	
- Operational Suitability	4		5	20	
- Procurement Costs	3		5		15
- Life Cycle Costs	3		5		15
		::: SUMS >		60	30
		:: DEMAND:		6016	
		:: PROPORTIONAL WEIGHT (PW) =		0.36	
		:: GENERAL VALUE(PW*GEN SUM) =		21.70013	
		:: GENERAL COSTS(PW*COSTS SUM)=		10.85006	
		:: SYSTEM :			
FAMILY EVALUATION FACTORS			RATING	WEIGHT X RATING	
- Family Costs	5		5	25	
- Fam Requirements Coverage	5		4	20	
SUM OF SYS PERFORMANCE VALUES		SUM GEN VALUES		42.26764	
SUM OF INDIVIDUAL SYSTEM COSTS		SUM SYS COSTS		19.07707	
THE FAMILY COST				25	
FAMILY REQUIREMENTS COVERAGE				20	
		::: TOTAL FAMILY VALUE =		106.3447	

TABLE C.2.17
Evaluation Matrix
Basic Systems Family - Elimination by Units - 1 System

		: : SYSTEM :			
: SYSTEM CRITERIA	WEIGHTS	:	:	RATING	WEIGHT X RATING
- Technical Feasibility	4	:	:	5	20
- Available Resources	4	:	:	5	20
- Operational Suitability	4	:	16	5	20
- Procurement Costs	3	:	:	5	15
- Life Cycle Costs	3	:	:	5	15
				SUMS>	60 30
				DEMAND:	6016
				PROPORTIONAL WEIGHT (PW)	= 0.36
				GENERAL VALUE(PW*GEN SUM)	=21.70013
				GENERAL COSTS(PW* COSTS SUM)	=10.85006

: FAMILY EVALUATION FACTORS	:	:	RATING	WEIGHT X RATING	:
- Family Costs	5	:	5	25	:
- Fam Requirements Coverage	5	:	2	10	:
SUM OF SYS PERFORMANCE VALUES	:	SUM GEN VALUES	21.70013	:	:
SUM OF INDIVIDUAL SYSTEM COSTS	:	SUM SYS COSTS	10.85006	:	:
THE FAMILY COST	:		25	:	:
FAMILY REQUIREMENTS COVERAGE	:		10	:	:
				TOTAL FAMILY VALUE =	67.55019

TABLE C.3.1
Evaluation Matrix
CPU - Defined Systems Family
Elimination by Largest CPU - 4 Systems

		SYSTEM	FAMILY A	
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4		5	20
- Available Resources	4		4	16
- Operational Suitability	4	1	5	20
- Procurement Costs	3		1	3
- Life Cycle Costs	3		3	9
NOTES:		SUMS> 56 12		
		DEMAND: 7017530		
		PROPORTIONAL WEIGHT (PW) = 0.53		
		GENERAL VALUE(PW*GEN SUM) =29.68375		
		GENERAL COSTS(PW*COSTS SUM)=6.360804		
		SYSTEM	FAMILY A	
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4		5	20
- Available Resources	4		5	20
- Operational Suitability	4	4	5	20
- Procurement Costs	3		0	0
- Life Cycle Costs	3		3	9
NOTES:		SUMS> 60 9		
SYSTEM 4 WITH TEMPEST		DEMAND: 4938477		
		PROPORTIONAL WEIGHT (PW) = 0.37		
		GENERAL VALUE(PW*GEN SUM) =22.38158		
		GENERAL COSTS(PW*COSTS SUM)=3.357237		
		SYSTEM	FAMILY A	
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4		5	20
- Available Resources	4		5	20
- Operational Suitability	4	15	5	20
- Procurement Costs	3		5	15
- Life Cycle Costs	3		5	15
NOTES:		SUMS> 60 30		
		DEMAND: 1096687		
		PROPORTIONAL WEIGHT (PW) = 0.08		
		GENERAL VALUE(PW*GEN SUM) =4.970275		
		GENERAL COSTS(PW*COSTS SUM)=2.485137		

SYSTEM		FAMILY A	
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	2	8
- Operational Suitability	4	5	20
- Procurement Costs	3	5	15
- Life Cycle Costs	3	5	15

NOTES:

.....SUMS>	48	30
DEMAND:	186256	
PROPORTIONAL WEIGHT (PW) =	0.01	
GENERAL VALUE(PW*GEN SUM) =	0.675301	
GENERAL COSTS(PW*COSTS SUM)=	0.422063	

FAMILY EVALUATION FACTORS		RATING WEIGHT X RATING	
- Family Costs	5	4	20
- Fam Requirements Coverage	5	5	25

SUM OF SYS PERFORMANCE VALUES	SUM GEN VALUES	57.71091
SUM OF INDIVIDUAL SYSTEM COSTS	SUM SYS COSTS	12.62524
THE FAMILY COST		20
FAMILY REQUIREMENTS COVERAGE		25

..... TOTAL FAMILY VALUE = 115.3361

TABLE C.3.2
Evaluation Matrix
CPU - Defined Systems Family
Elimination by Largest CPU - 3 Systems

SYSTEM		FAMILY A	
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	0	0
- Life Cycle Costs	3	3	9
NOTES:		SUMS>	60
SYSTEM 4 WITH TEMPEST		DEMAND: 4938477	9
		PROPORTIONAL WEIGHT (PW) =	0.37
		GENERAL VALUE(PW*GEN SUM) =	22.38158
		GENERAL COSTS(PW*COSTS SUM)=	3.357237
SYSTEM		FAMILY A	
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	5	15
- Life Cycle Costs	3	5	15
NOTES:		SUMS>	60
		DEMAND: 1096687	30
		PROPORTIONAL WEIGHT (PW) =	0.08
		GENERAL VALUE(PW*GEN SUM) =	4.970275
		GENERAL COSTS(PW*COSTS SUM)=	2.485137
SYSTEM		FAMILY A	
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	2	8
- Operational Suitability	4	5	20
- Procurement Costs	3	5	15
- Life Cycle Costs	3	5	15
NOTES:		SUMS>	48
		DEMAND: 186256	30
		PROPORTIONAL WEIGHT (PW) =	0.01
		GENERAL VALUE(PW*GEN SUM) =	0.675301
		GENERAL COSTS(PW*COSTS SUM)=	0.422063

```

=====
: FAMILY EVALUATION FACTORS           ::      : RATING WEIGHT X RATING  ::
:   - Family Costs                     5 ::      :      5      25          ::
:   - Fam Requirements Coverage         5 ::      :      3      15          ::
=====
:SUM OF SYS PERFORMANCE VALUES       ::SUM GEN VALUES      28.02715      ::
:SUM OF INDIVIDUAL SYSTEM COSTS        ::SUM SYS COSTS       6.264438      ::
:THE FAMILY COST                       ::                    25          ::
:FAMILY REQUIREMENTS COVERAGE          ::                    15          ::
=====
:.....: TOTAL FAMILY VALUE = ::      74.29159      ::
=====

```

TABLE C.3.3
Evaluation Matrix
CPU - Defined Systems Family
Elimination by Largest CPU - 2 Systems

SYSTEM		FAMILY A	
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	5	15
- Life Cycle Costs	3	5	15
NOTES:		SUMS>	60 30
		DEMAND: 1096687	
		PROPORTIONAL WEIGHT (PW) =	0.08
		GENERAL VALUE(PW*GEN SUM) =	4.970275
		GENERAL COSTS(PW*COSTS SUM)=	2.485137

SYSTEM		FAMILY A	
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	2	8
- Operational Suitability	4	5	20
- Procurement Costs	3	5	15
- Life Cycle Costs	3	5	15
NOTES:		SUMS>	48 30
		DEMAND: 186256	
		PROPORTIONAL WEIGHT (PW) =	0.01
		GENERAL VALUE(PW*GEN SUM) =	0.675301
		GENERAL COSTS(PW*COSTS SUM)=	0.422063

FAMILY EVALUATION FACTORS		RATING		WEIGHT X RATING	
- Family Costs	5	5	25		
- Fam Requirements Coverage	5	1	5		
SUM OF SYS PERFORMANCE VALUES		SUM GEN VALUES		5.645577	
SUM OF INDIVIDUAL SYSTEM COSTS		SUM SYS COSTS		2.907201	
THE FAMILY COST				25	
FAMILY REQUIREMENTS COVERAGE				5	
TOTAL FAMILY VALUE =				38.55277	

TABLE C.3.4
Evaluation Matrix
CPU - Defined Systems Family
Elimination by Largest CPU - 1 System

		SYSTEM	FAMILY A	
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4	17	5	20
- Available Resources	4		2	8
- Operational Suitability	4		5	20
- Procurement Costs	3		5	15
- Life Cycle Costs	3		5	15
NOTES:		SUMS> 48 30		
		DEMAND: 186256		
		PROPORTIONAL WEIGHT (PW) = 0.01		
		GENERAL VALUE(PW*GEN SUM) =0.675301		
		GENERAL COSTS(PW*COSTS SUM)=0.422063		

FAMILY EVALUATION FACTORS			RATING	WEIGHT X RATING
- Family Costs	5		5	25
- Fam Requirements Coverage	5		1	5
SUM OF SYS PERFORMANCE VALUES		SUM GEN VALUES	0.675301	
SUM OF INDIVIDUAL SYSTEM COSTS		SUM SYS COSTS	0.422063	
THE FAMILY COST			25	
FAMILY REQUIREMENTS COVERAGE			5	
TOTAL FAMILY VALUE =			31.09736	

TABLE C.4.1
Evaluation Matrix
CPU - Defined Systems Family
Elimination by Smallest CPU - 4 Systems

SYSTEM		FAMILY A	
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	4	16
- Operational Suitability	4	5	20
- Procurement Costs	3	1	3
- Life Cycle Costs	3	3	9
NOTES:		SUMS>	56 12
		DEMAND: 7017530	
		PROPORTIONAL WEIGHT (PW) =	0.53
		GENERAL VALUE (PW*GEN SUM) =	29.68375
		GENERAL COSTS (PW*GEN SUM) =	6.360804
SYSTEM		FAMILY A	
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	0	0
- Life Cycle Costs	3	3	9
NOTES:		SUMS>	60 9
SYSTEM 4 WITH TEMPEST		DEMAND: 4938477	
		PROPORTIONAL WEIGHT (PW) =	0.37
		GENERAL VALUE (PW*GEN SUM) =	22.38158
		GENERAL COSTS (PW*GEN SUM) =	3.357237
SYSTEM		FAMILY A	
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	5	15
- Life Cycle Costs	3	5	15
NOTES:		SUMS>	60 30
		DEMAND: 1096687	
		PROPORTIONAL WEIGHT (PW) =	0.08
		GENERAL VALUE (PW*GEN SUM) =	4.970275
		GENERAL COSTS (PW*GEN SUM) =	2.485137

SYSTEM		FAMILY A	
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	2	8
- Operational Suitability	4	5	20
- Procurement Costs	3	5	15
- Life Cycle Costs	3	5	15
NOTES:		SUMS>	48 30
		DEMAND:	186256
		PROPORTIONAL WEIGHT (PW)	= 0.01
		GENERAL VALUE(PW*GEN SUM)	=0.675301
		GENERAL COSTS(PW*COSTS SUM)	=0.422063

FAMILY EVALUATION FACTORS		RATING	WEIGHT X RATING
- Family Costs	5	4	20
- Fam Requirements Coverage	5	5	25
SUM OF SYS PERFORMANCE VALUES	SUM GEN VALUES	57.71091	
SUM OF INDIVIDUAL SYSTEM COSTS	SUM SYS COSTS	12.62524	
THE FAMILY COST		20	
FAMILY REQUIREMENTS COVERAGE		25	
TOTAL FAMILY VALUE =		115.3361	

TABLE C.4.2
Evaluation Matrix
CPU - Defined Systems Family
Elimination by Smallest CPU - 3 Systems

SYSTEM		FAMILY A	
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	4	16
- Operational Suitability	4	5	20
- Procurement Costs	3	1	3
- Life Cycle Costs	3	3	9
NOTES:		SUMS>	56 12
		DEMAND: 7017530	
		PROPORTIONAL WEIGHT (PW) =	0.53
		GENERAL VALUE(PW*GEN SUM) =	29.68375
		GENERAL COSTS(PW*COSTS SUM)=	6.360804
SYSTEM		FAMILY A	
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	0	0
- Life Cycle Costs	3	3	9
NOTES:		SUMS>	60 9
SYSTEM 4 WITH TEMPEST		DEMAND: 4938477	
		PROPORTIONAL WEIGHT (PW) =	0.37
		GENERAL VALUE(PW*GEN SUM) =	22.38158
		GENERAL COSTS(PW*COSTS SUM)=	3.357237
SYSTEM		FAMILY A	
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	5	15
- Life Cycle Costs	3	5	15
NOTES:		SUMS>	60 30
		DEMAND: 1282943	
		PROPORTIONAL WEIGHT (PW) =	0.10
		GENERAL VALUE(PW*GEN SUM) =	5.814402
		GENERAL COSTS(PW*COSTS SUM)=	2.907201

```

=====
: FAMILY EVALUATION FACTORS      ::          : RATING  WEIGHT X RATING  ::
:   - Family Costs                5 ::          :      5      25          ::
:   - Fan Requirements Coverage    5 ::          :      5      25          ::
=====
:SUM OF SYS PERFORMANCE VALUES  ::SUM GEN VALUES  57.87973      ::
:SUM OF INDIVIDUAL SYSTEM COSTS  ::SUM SYS COSTS   12.62524      ::
:THE FAMILY COST                  ::                25          ::
:FAMILY REQUIREMENTS COVERAGE    ::                25          ::
=====
:.....: TOTAL FAMILY VALUE = ::                120.5049      ::
=====

```

TABLE C.4.3
Evaluation Matrix
CPU - Defined Systems Family
Elimination by Smallest CPU - 2 Systems

		SYSTEM		
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4		5	20
- Available Resources	4		4	16
- Operational Suitability	4	1	5	20
- Procurement Costs	3		1	3
- Life Cycle Costs	3		3	9
NOTES:		SUMS> 56 12		
		DEMAND: 7017530		
		PROPORTIONAL WEIGHT (PW) = 0.53		
		GENERAL VALUE(PW*GEN SUM) =29.68375		
		GENERAL COSTS(PW*COSTS SUM)=6.360804		
		SYSTEM		
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4		5	20
- Available Resources	4		5	20
- Operational Suitability	4	4	5	20
- Procurement Costs	3		0	0
- Life Cycle Costs	3		3	9
NOTES:		SUMS> 60 9		
SYSTEM 4 WITH TEMPEST		DEMAND: 6221420		
		PROPORTIONAL WEIGHT (PW) = 0.47		
		GENERAL VALUE(PW*GEN SUM) =28.19598		
		GENERAL COSTS(PW*COSTS SUM)=4.229397		
FAMILY EVALUATION FACTORS			RATING	WEIGHT X RATING
- Family Costs	5		5	25
- Fam Requirements Coverage	5		5	25
SUM OF SYS PERFORMANCE VALUES		SUM GEN VALUES	57.87973	
SUM OF INDIVIDUAL SYSTEM COSTS		SUM SYS COSTS	10.59020	
THE FAMILY COST			25	
FAMILY REQUIREMENTS COVERAGE			25	
TOTAL FAMILY VALUE =			118.4699	

TABLE C.4.4
Evaluation Matrix
CPU - Defined Systems Family
Elimination by Smallest CPU - 1 System

SYSTEM		FAMILY A	
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	4	16
- Operational Suitability	4	5	20
- Procurement Costs	3	1	3
- Life Cycle Costs	3	3	9
		SUMS>	56 12
		DEMAND: 13238940	
		PROPORTIONAL WEIGHT (PW) =	1.00
		GENERAL VALUE(PW*GEN SUM) =	55.99996
		GENERAL COSTS(PW*COSTS SUM)=	11.99999

FAMILY EVALUATION FACTORS		RATING	WEIGHT X RATING
- Family Costs	5	5	25
- Fam Requirements Coverage	5	5	25
SUM OF SYS PERFORMANCE VALUES	SUM GEN VALUES	55.99996	
SUM OF INDIVIDUAL SYSTEM COSTS	SUM SYS COSTS	11.99999	
THE FAMILY COST		25	
FAMILY REQUIREMENTS COVERAGE		25	
TOTAL FAMILY VALUE =		117.9999	

TABLE C.5.1
Evaluation Matrix
SSC Systems Family
Elimination by Demand - 5 Systems

		SYSTEM		
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4	1	5	20
- Available Resources	4		5	20
- Operational Suitability	4		5	20
- Procurement Costs	3		1	3
- Life Cycle Costs	3		3	9
:note:		SUMS>		60 12
16a, 2560k, math coprocessor		DEMAND: 105130		
tempest		PROPORTIONAL WEIGHT (PW) =		0.01
range:basic systems 6,7		GENERAL VALUE(PW*GEN SUM) =		0.476457
		GENERAL COSTS(PW*COSTS SUM)=		0.095291
		SYSTEM		
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4	2	5	20
- Available Resources	4		5	20
- Operational Suitability	4		5	20
- Procurement Costs	3		3	9
- Life Cycle Costs	3		4	12
:note:		SUMS>		60 21
16a, 640k, math coprocessor		DEMAND: 43790		
range:basic systems 8,9,10,11		PROPORTIONAL WEIGHT (PW) =		.00
		GENERAL VALUE(PW*GEN SUM) =		0.198459
		GENERAL COSTS(PW*COSTS SUM)=		0.069460
		SYSTEM		
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4	3	5	20
- Available Resources	4		5	20
- Operational Suitability	4		5	20
- Procurement Costs	3		1	3
- Life Cycle Costs	3		3	9
:note:		SUMS>		60 12
16a, 640k, math coprocessor		DEMAND: 57639		
tempest		PROPORTIONAL WEIGHT (PW) =		.00
range: basic system 13		GENERAL VALUE(PW*GEN SUM) =		0.261224
		GENERAL COSTS(PW*COSTS SUM)=		0.052244

SYSTEM			
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	4	12
- Life Cycle Costs	3	4	12

note: :::::::::::::::SUMS> 60 24 ::
 16a, 640k, math coprocessor :: DEMAND: 11800S ::
 range: basic system 12 :: PROPORTIONAL WEIGHT (PW) = 0.01 ::
 :: GENERAL VALUE(PW*GEN SUM) =0.534808 ::
 :: GENERAL COSTS(PW*COSTS SUM)=0.213923 ::

SYSTEM			
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	4	12
- Life Cycle Costs	3	4	12

note: :::::::::::::::SUMS> 60 24 ::
 16a, 640k :: DEMAND: 5863856 ::
 range: basic systems 14,15,16,17 :: PROPORTIONAL WEIGHT (PW) = 0.44 ::
 :: GENERAL VALUE(PW*GEN SUM) =26.57547 ::
 :: GENERAL COSTS(PW*COSTS SUM)=10.63019 ::

FAMILY EVALUATION FACTORS			
		RATING	WEIGHT X RATING
- Family Costs	5	4	20
- Fam Requirements Coverage	5	3	15

SUM OF SYS PERFORMANCE VALUES ::SUM GEN VALUES 28.04642 ::
 SUM OF INDIVIDUAL SYSTEM COSTS ::SUM SYS COSTS 11.06111 ::
 THE FAMILY COST :: 20 ::
 FAMILY REQUIREMENTS COVERAGE :: 15 ::
 ::::::::::::::: TOTAL FAMILY VALUE = :: 74.10753 ::

TABLE C.5.2
Evaluation Matrix
SSC Systems Family
Elimination by Demand - 4 Systems

SYSTEM			
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	1	3
- Life Cycle Costs	3	3	9
:note:		SUMS>	60 12
16a, 2560k, math coprocessor		DEMAND:	148920
tempest		PROPORTIONAL WEIGHT (PW)	= 0.01
range: basic systems 6,7		GENERAL VALUE(PW*GEN SUM)	=0.674917
		GENERAL COSTS(PW*COSTS SUM)	=0.134983
SYSTEM			
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	1	3
- Life Cycle Costs	3	3	9
:note:		SUMS>	60 12
16a, 640k, math coprocessor		DEMAND:	57639
tempest		PROPORTIONAL WEIGHT (PW)	= .00
range: basic system 13		GENERAL VALUE(PW*GEN SUM)	=0.261224
		GENERAL COSTS(PW*COSTS SUM)	=0.052244
SYSTEM			
SYSTEM CRITERIA	WEIGHTS	RATING	WEIGHT X RATING
- Technical Feasibility	4	5	20
- Available Resources	4	5	20
- Operational Suitability	4	5	20
- Procurement Costs	3	4	12
- Life Cycle Costs	3	4	12
:note:		SUMS>	60 24
16a, 640k, math coprocessor		DEMAND:	118005
range: basic system 12		PROPORTIONAL WEIGHT (PW)	= 0.01
		GENERAL VALUE(PW*GEN SUM)	=0.534808
		GENERAL COSTS(PW*COSTS SUM)	=0.213923

SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4		5	20
- Available Resources	4		5	20
- Operational Suitability	4	5	5	20
- Procurement Costs	3		4	12
- Life Cycle Costs	3		4	12
=====				
note:			SUMS>	60 24
16a, 640k			DEMAND: 5863856	
range: basic systems 14,15,16,17			PROPORTIONAL WEIGHT (PW) =	0.44
			GENERAL VALUE(PW*GEN SUM) =	26.57547
			GENERAL COSTS(PW*COSTS SUM) =	10.63019
=====				

FAMILY EVALUATION FACTORS		RATING	WEIGHT X RATING
- Family Costs	5	4	20
- Fam Requirements Coverage	5	3	15
=====			
SUM OF SYS PERFORMANCE VALUES	SUM GEN VALUES	28.04642	
SUM OF INDIVIDUAL SYSTEM COSTS	SUM SYS COSTS	11.03134	
THE FAMILY COST		20	
FAMILY REQUIREMENTS COVERAGE		15	
=====			
TOTAL FAMILY VALUE =		74.07776	
=====			

TABLE C.5.3
Evaluation Matrix
SSC Systems Family
Elimination by Demand - 3 Systems

		SYSTEM			
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING	
- Technical Feasibility	4	1	5	20	
- Available Resources	4		5	20	
- Operational Suitability	4		5	20	
- Procurement Costs	3		1		3
- Life Cycle Costs	3		3		9
:note:		SUMS>		60	12
16a, 2560k, math coprocessor		DEMAND: 206559			
tempest		PROPORTIONAL WEIGHT (PW) =		0.02	
range: basic systems 6,7		GENERAL VALUE(PW*GEN SUM) =		0.936142	
		GENERAL COSTS(PW*COSTS SUM) =		0.187228	
		SYSTEM			
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING	
- Technical Feasibility	4	4	5	20	
- Available Resources	4		5	20	
- Operational Suitability	4		5	20	
- Procurement Costs	3		4		12
- Life Cycle Costs	3		4		12
:note:		SUMS>		60	24
16a, 640k, math coprocessor		DEMAND: 118005			
range: basic system 12		PROPORTIONAL WEIGHT (PW) =		0.01	
		GENERAL VALUE(PW*GEN SUM) =		0.534808	
		GENERAL COSTS(PW*COSTS SUM) =		0.213923	
		SYSTEM			
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING	
- Technical Feasibility	4	5	5	20	
- Available Resources	4		5	20	
- Operational Suitability	4		5	20	
- Procurement Costs	3		4		12
- Life Cycle Costs	3		4		12
:note:		SUMS>		60	24
16a, 640k		DEMAND: 5863856			
range: basic systems 14,15,16,17		PROPORTIONAL WEIGHT (PW) =		0.44	
		GENERAL VALUE(PW*GEN SUM) =		26.57547	
		GENERAL COSTS(PW*COSTS SUM) =		10.63019	

FAMILY EVALUATION FACTORS		RATING	WEIGHT X RATING
- Family Costs	5	4	20
- Fam Requirements Coverage	5	3	15
SUM OF SYS PERFORMANCE VALUES	SUM GEN VALUES	28.04642	
SUM OF INDIVIDUAL SYSTEM COSTS	SUM SYS COSTS	11.03134	
THE FAMILY COST		20	
FAMILY REQUIREMENTS COVERAGE		15	
TOTAL FAMILY VALUE =		74.07776	

TABLE C.5.4
Evaluation Matrix
SSC Systems Family
Elimination by Demand - 2 Systems

		SYSTEM		
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4		5	20
- Available Resources	4		5	20
- Operational Suitability	4	4	5	20
- Procurement Costs	3		4	12
- Life Cycle Costs	3		4	12
:note:		SUMS>		60 24
16a, 640k, math coprocessor		DEMAND: 118005		
range: basic system 12		PROPORTIONAL WEIGHT (PW) = 0.01		
		GENERAL VALUE(PW*GEN SUM) =0.534808		
		GENERAL COSTS(PW*COSTS SUM)=0.213923		
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4		5	20
- Available Resources	4		5	20
- Operational Suitability	4	5	5	20
- Procurement Costs	3		4	12
- Life Cycle Costs	3		4	12
:note:		SUMS>		60 24
16a, 640k		DEMAND: 5863856		
range: basic systems 14,15,16,17		PROPORTIONAL WEIGHT (PW) = 0.44		
		GENERAL VALUE(PW*GEN SUM) =26.57547		
		GENERAL COSTS(PW*COSTS SUM)=10.63019		
FAMILY EVALUATION FACTORS			RATING	WEIGHT X RATING
- Family Costs	5		5	25
- Fam Requirements Coverage	5		3	15
SUM OF SYS PERFORMANCE VALUES		SUM GEN VALUES		27.11028
SUM OF INDIVIDUAL SYSTEM COSTS		SUM SYS COSTS		10.84411
THE FAMILY COST				25
FAMILY REQUIREMENTS COVERAGE				15
TOTAL FAMILY VALUE =				77.95439

TABLE C.5.5
Evaluation Matrix
SSC Systems Family
Elimination by Demand - 1 System

SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4		5	20
- Available Resources	4		5	20
- Operational Suitability	4	5	5	20
- Procurement Costs	3		4	12
- Life Cycle Costs	3		4	12
note:		SUMS>		60 24
16a, 640k		DEMAND:	5863856	
range: basic systems 14,15,16,17		PROPORTIONAL WEIGHT (PW) =	0.44	
		GENERAL VALUE(PW*GEN SUM) =	26.57547	
		GENERAL COSTS(PW*COSTS SUM) =	10.63019	

FAMILY EVALUATION FACTORS		RATING	WEIGHT X RATING
- Family Costs	5	5	25
- Fam Requirements Coverage	5	3	15
SUM OF SYS PERFORMANCE VALUES	SUM GEN VALUES	26.57547	
SUM OF INDIVIDUAL SYSTEM COSTS	SUM SYS COSTS	10.63019	
THE FAMILY COST		25	
FAMILY REQUIREMENTS COVERAGE		15	
TOTAL FAMILY VALUE =		77.20566	

TABLE C.6.1
Evaluation Matrix
SSC Systems Family
Elimination by Units - 5 Systems

SYSTEM CRITERIA		WEIGHTS	SYSTEM	RATING	WEIGHT X RATING
- Technical Feasibility	4			5	20
- Available Resources	4			5	20
- Operational Suitability	4		1	5	20
- Procurement Costs	3			1	3
- Life Cycle Costs	3			3	9
:note:				SUMS>	60 12
16a, 2560k, math coprocessor				DEMAND:	2990
tempest				PROPORTIONAL WEIGHT (PW)	= 0.18
range:basic systems 6,7				GENERAL VALUE(PW*GEN SUM)	=10.78513
				GENERAL COSTS(PW*GEN COSTS SUM)	=2.157027
SYSTEM CRITERIA		WEIGHTS	SYSTEM	RATING	WEIGHT X RATING
- Technical Feasibility	4			5	20
- Available Resources	4			5	20
- Operational Suitability	4		2	5	20
- Procurement Costs	3			3	9
- Life Cycle Costs	3			4	12
:note:				SUMS>	60 21
16a, 640k, math coprocessor				DEMAND:	542
range:basic systems 8,9,10,11				PROPORTIONAL WEIGHT (PW)	= 0.03
				GENERAL VALUE(PW*GEN SUM)	=1.955031
				GENERAL COSTS(PW*GEN COSTS SUM)	=0.684261
SYSTEM CRITERIA		WEIGHTS	SYSTEM	RATING	WEIGHT X RATING
- Technical Feasibility	4			5	20
- Available Resources	4			5	20
- Operational Suitability	4		3	5	20
- Procurement Costs	3			1	3
- Life Cycle Costs	3			3	9
:note:				SUMS>	60 12
16a, 640k, math coprocessor				DEMAND:	106
tempest				PROPORTIONAL WEIGHT (PW)	= 0.01
range: basic system 13				GENERAL VALUE(PW*GEN SUM)	=0.382349
				GENERAL COSTS(PW*GEN COSTS SUM)	=0.076469

		:: SYSTEM			
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING	
- Technical Feasibility	4		5	20	
- Available Resources	4		5	20	
- Operational Suitability	4	4	5	20	
- Procurement Costs	3		4		12
- Life Cycle Costs	3		4		12
:note:		:::SUMS>		60	24
16a, 640k, math coprocessor		:: DEMAND:		276	
range: basic system 12		:: PROPORTIONAL WEIGHT (PW) =		0.02	
		:: GENERAL VALUE(PW*GEN SUM) =		0.995551	
		:: GENERAL COSTS(PW*COSTS SUM)=		0.398220	

SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING	
- Technical Feasibility	4		5	20	
- Available Resources	4		5	20	
- Operational Suitability	4	5	5	20	
- Procurement Costs	3		4		12
- Life Cycle Costs	3		4		12
:note:		:::SUMS>		60	24
16a, 640k		:: DEMAND:		11781	
range: basic systems 14,15,16,17		:: PROPORTIONAL WEIGHT (PW) =		0.71	
		:: GENERAL VALUE(PW*GEN SUM) =		42.49488	
		:: GENERAL COSTS(PW*COSTS SUM)=		16.99795	

=====				
: FAMILY EVALUATION FACTORS	::	: RATING	WEIGHT X RATING	::
: - Family Costs	5 ::	:	4 20	::
: - Fam Requirements Coverage	5 ::	:	5 25	::
=====				
:::SUM OF SYS PERFORMANCE VALUES				
:::SUM GEN VALUES		56.61296	::	
:::SUM OF INDIVIDUAL SYSTEM COSTS				
:::SUM SYS COSTS		20.31393	:	
:::THE FAMILY COST		20	:	
:::FAMILY REQUIREMENTS COVERAGE		25	:	
=====				
:::TOTAL FAMILY VALUE =		121.9268	:	

TABLE C.6.2
Evaluation Matrix
SSC Systems Family
Elimination by Units - 4 Systems

SYSTEM		RATING		WEIGHT X RATING
SYSTEM CRITERIA	WEIGHTS			
- Technical Feasibility	4	5	20	
- Available Resources	4	5	20	
- Operational Suitability	4	5	20	
- Procurement Costs	3	1		3
- Life Cycle Costs	3	3		9
:note:		SUMS>	60	12
16a, 2560k, math coprocessor		DEMAND:	2990	
teapest		PROPORTIONAL WEIGHT (PW) =	0.18	
range:basic systems 6,7		GENERAL VALUE(PW*GEN SUM) =	10.78513	
		GENERAL COSTS(PW*COSTS SUM)=	2.157027	
SYSTEM		RATING		WEIGHT X RATING
SYSTEM CRITERIA	WEIGHTS			
- Technical Feasibility	4	5	20	
- Available Resources	4	5	20	
- Operational Suitability	4	5	20	
- Procurement Costs	3	3		9
- Life Cycle Costs	3	4		12
:note:		SUMS>	60	21
16a, 640k, math coprocessor		DEMAND:	648	
range:basic systems 8,9,10,11		PROPORTIONAL WEIGHT (PW) =	0.04	
		GENERAL VALUE(PW*GEN SUM) =	2.337381	
		GENERAL COSTS(PW*COSTS SUM)=	0.818083	
SYSTEM		RATING		WEIGHT X RATING
SYSTEM CRITERIA	WEIGHTS			
- Technical Feasibility	4	5	20	
- Available Resources	4	5	20	
- Operational Suitability	4	5	20	
- Procurement Costs	3	4		12
- Life Cycle Costs	3	4		12
:note:		SUMS>	60	24
16a, 640k, math coprocessor		DEMAND:	276	
range: basic system 12		PROPORTIONAL WEIGHT (PW) =	0.02	
		GENERAL VALUE(PW*GEN SUM) =	0.995551	
		GENERAL COSTS(PW*COSTS SUM)=	0.398220	

SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING
- Technical Feasibility	4		5	20
- Available Resources	4		5	20
- Operational Suitability	4	5	5	20
- Procurement Costs	3		4	12
- Life Cycle Costs	3		4	12
:note:			SUMS>	60 24
16a, 640k			DEMAND:	11781
range: basic systems 14,15,16,17			PROPORTIONAL WEIGHT (PW) =	0.71
			GENERAL VALUE(PW*GEN SUM) =	42.49488
			GENERAL COSTS(PW*COSTS SUM)=	16.99795

FAMILY EVALUATION FACTORS		RATING	WEIGHT X RATING
- Family Costs	5	4	20
- Fam Requirements Coverage	5	5	25
SUM OF SYS PERFORMANCE VALUES	SUM GEN VALUES	56.61296	
SUM OF INDIVIDUAL SYSTEM COSTS	SUM SYS COSTS	20.37128	
THE FAMILY COST		20	
FAMILY REQUIREMENTS COVERAGE		25	
TOTAL FAMILY VALUE =		121.9842	

TABLE C.6.3
Evaluation Matrix
SSC Systems Family
Elimination by Units - 3 Systems

SYSTEM CRITERIA		WEIGHTS	SYSTEM	RATING	WEIGHT X RATING
- Technical Feasibility	4			5	20
- Available Resources	4			5	20
- Operational Suitability	4	1		5	20
- Procurement Costs	3			1	3
- Life Cycle Costs	3			3	9
:note:			SUMS>	60	12
16a, 2560k, math coprocessor			DEMAND:	2990	
tempest			PROPORTIONAL WEIGHT (PW) =	0.18	
range:basic systems 6,7			GENERAL VALUE(PW*GEN SUM) =	10.78513	
			GENERAL COSTS(PW*COSTS SUM)=	2.157027	
SYSTEM CRITERIA		WEIGHTS	SYSTEM	RATING	WEIGHT X RATING
- Technical Feasibility	4			5	20
- Available Resources	4			5	20
- Operational Suitability	4	2		5	20
- Procurement Costs	3			3	9
- Life Cycle Costs	3			4	12
:note:			SUMS>	60	21
16a, 640k, math coprocessor			DEMAND:	924	
range:basic systems 8,9,10,11			PROPORTIONAL WEIGHT (PW) =	0.06	
			GENERAL VALUE(PW*GEN SUM) =	3.332932	
			GENERAL COSTS(PW*COSTS SUM)=	1.166526	
SYSTEM CRITERIA		WEIGHTS	SYSTEM	RATING	WEIGHT X RATING
- Technical Feasibility	4			5	20
- Available Resources	4			5	20
- Operational Suitability	4	5		5	20
- Procurement Costs	3			4	12
- Life Cycle Costs	3			4	12
:note:			SUMS>	60	24
16a, 640k			DEMAND:	11781	
range: basic systems 14,15,16,17			PROPORTIONAL WEIGHT (PW) =	0.71	
			GENERAL VALUE(PW*GEN SUM) =	42.49488	
			GENERAL COSTS(PW*COSTS SUM)=	16.99795	

: FAMILY EVALUATION FACTORS		::	: RATING	WEIGHT X RATING	::
: - Family Costs	5	::	: 5	25	::
: - Fam Requirements Coverage	5	::	: 5	25	::
=====					
:SUM OF SYS PERFORMANCE VALUES		::	SUM GEN VALUES	56.61296	::
:SUM OF INDIVIDUAL SYSTEM COSTS		::	SUM SYS COSTS	20.32151	::
:THE FAMILY COST		::		25	::
:FAMILY REQUIREMENTS COVERAGE		::		25	::
=====					
:.....: TOTAL FAMILY VALUE = :				126.9344	::

TABLE C.6.4
Evaluation Matrix
SSC Systems Family
Elimination by Units - 2 Systems

		:: SYSTEM ::			
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING	
- Technical Feasibility	4		5	20	
- Available Resources	4		5	20	
- Operational Suitability	4	1	5	20	
- Procurement Costs	3		1		3
- Life Cycle Costs	3		3		9
:note:		:::SUMS>		60	12
16a, 2560k, math coprocessor		:: DEMAND:		3914	
tempest		:: PROPORTIONAL WEIGHT (PW) =		0.24	
range:basic systems 6,7		:: GENERAL VALUE(PW*GEN SUM) =		14.11807	
		::GENERAL COSTS(PW*COSTS SUM)=		2.823614	
SYSTEM CRITERIA	WEIGHTS		RATING	WEIGHT X RATING	
- Technical Feasibility	4		5	20	
- Available Resources	4		5	20	
- Operational Suitability	4	5	5	20	
- Procurement Costs	3		4		12
- Life Cycle Costs	3		4		12
:note:		:::SUMS>		60	24
16a, 640k		:: DEMAND:		11781	
range: basic systems 14,15,16,17		:: PROPORTIONAL WEIGHT (PW) =		0.71	
		:: GENERAL VALUE(PW*GEN SUM) =		42.49488	
		::GENERAL COSTS(PW*COSTS SUM)=		16.99795	
FAMILY EVALUATION FACTORS			RATING	WEIGHT X RATING	
- Family Costs	5		5	25	
- Fam Requirements Coverage	5		5	25	
:SUM OF SYS PERFORMANCE VALUES		::SUM GEN VALUES		56.61296	
:SUM OF INDIVIDUAL SYSTEM COSTS		::SUM SYS COSTS		19.82157	
:THE FAMILY COST				25	
:FAMILY REQUIREMENTS COVERAGE				25	
:TOTAL FAMILY VALUE =				126.4345	

TABLE C.6.5
Evaluation Matrix
SSC Systems Family
Elimination by Units - 1 System

SYSTEM CRITERIA		WEIGHTS	SYSTEM	RATING	WEIGHT X RATING
- Technical Feasibility	4			5	20
- Available Resources	4			5	20
- Operational Suitability	4	1		5	20
- Procurement Costs	3			1	3
- Life Cycle Costs	3			3	9
note:				SUMS>	60
16a, 2560k, math coprocessor				DEMAND:	15695
tempest				PROPORTIONAL WEIGHT (PW)	= 0.94
range: basic systems 6,7				GENERAL VALUE(PW*GEN SUM)	=56.61296
				GENERAL COSTS(PW*COSTS SUM)	=11.32259

FAMILY EVALUATION FACTORS			RATING	WEIGHT X RATING
- Family Costs	5		5	25
- Fam Requirements Coverage	5		5	25
SUM OF SYS PERFORMANCE VALUES		SUM GEN VALUES		56.61296
SUM OF INDIVIDUAL SYSTEM COSTS		SUM SYS COSTS		11.32259
THE FAMILY COST				25
FAMILY REQUIREMENTS COVERAGE				25
TOTAL FAMILY VALUE =				117.9355

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