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FORECASTING OUTCOMES OF MULTILATERAL NEGOTIATIONS: COMPUTER PROGRAMS
Guide for Users

CENTER FOR NAVAL ANALYSES
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The present Research Contribution is a companion publication to CNA Research Contribution 291, which describes the methodology developed and used by the Law of the Sea Study to forecast the outcomes of multilateral negotiations on issues in law of the sea. All of the mathematical models and most of the techniques were programmed for the computer, and it is this system of computer programs that is treated in this Research Contribution. Volume I directs the prospective user in

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their execution. Volume II describes their logic and dimensioned variables for the programmer and specifies the changes that must be made throughout the system when any program is changed.
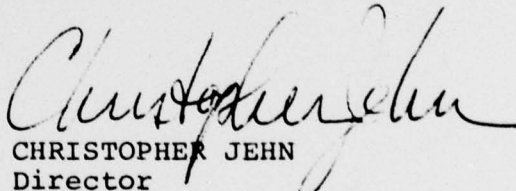
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PREFACE

This volume instructs the reader in how to proceed to execute the computer programs in the Law of the Sea Study's system (shown in figure 1). For each program it gives the preliminary steps to be taken, a list of inputs and outputs, a description of the card deck and the formats of the cards, and illustrative inputs and outputs.

It also includes a summary description of the research methods of the Study, a detailed description of the structure of the data and dictionary tapes, the list of independent variables used to characterize countries, and a glossary of terms used frequently in this and the programmers guide (volume II). If a more detailed discussion of techniques and models is wanted, the reader should refer to CNA RC 291, volume I. He may also want to refer to volume II of RC 291, the codebook. For the program listings, he should see volume II of this publication.
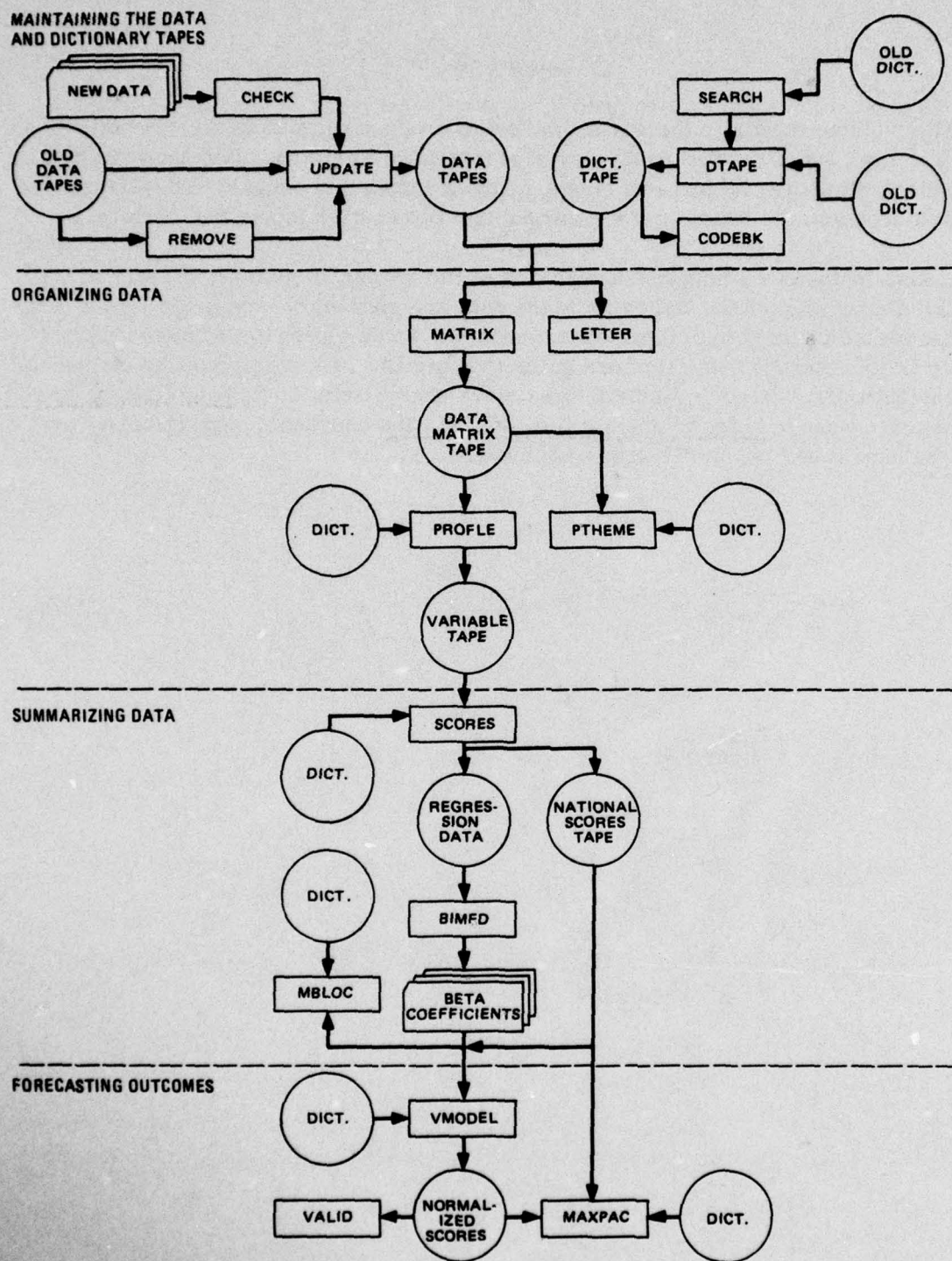
FIG. 1: FLOW CHART OF THE LOS SYSTEM OF PROGRAMS

DESCRIPTION OF THE RESEARCH METHODS

The research methods described here were developed specifically to deal with the problems of negotiating a multilateral law of the sea (LOS) treaty. They were designed to cope with complex and technical subject matter as well as a specific set of decision processes--those associated with parliamentary diplomacy. The methods were also designed to assist policy-makers by providing the widest possible range of products. These include descriptions of individual countries' perceptions of their national interests, analyses of these perceptions in terms of positions on law of the sea issues, and projections of outcomes on the issues based upon countries' interests and positions.

There are five steps in the basic methodology. The first two fall into the general category of data gathering and formulation. The remaining three form the computerized analysis that can be performed by the system of programs described later.

1. Gathering the data
2. Modelling the negotiations
3. Organizing the data for analysis
4. Summarizing countries' positions
5. Forecasting outcomes

GATHERING THE DATA

Data must be "created" from the raw material of the diplomatic record, that is, official United Nations summary records of Seabed Committee and LOS Conference proceedings (primary sources) and diplomatic cables (secondary sources). The data is extracted by a coder using thematic content analysis. A "theme" is a statement by an official representative expressing his country's preference on a particular question under negotiation.

A coder reads a country representative's speech and identifies the themes that are contained in it. Each theme is assigned a code number the first time it is identified in the record. By scanning an organized list of previously identified themes, the coder determines whether a new code number needs to be established. The appropriate code number is then written in the margin of the text next to the theme. When code numbers have been assigned to the themes in the speech, these numbers along with a code number for the country that is speaking and code numbers for the source documents are recorded and punched onto computer cards. This data is subsequently transferred to magnetic tape for permanent storage and future manipulation. Up to 10 percent of the data is re-coded by another researcher as a reliability check.

MODELLING THE NEGOTIATIONS

On each major topic under discussion--for example, territorial sea, straits transit, or the economic zone--negotiations tend to focus on a few central questions: what shall be the breadth of the territorial sea? what shall be the mode of transit through straits? Countries with different interests have different preferences on these questions. Their preferences are supported by some countries and opposed by others.

By scanning a list of themes organized by topic, the analyst can identify all stated preferences on a question. These themes can then be ordered along a generally-perceived dimension. The spectrum of stated preferences could be from narrow to broad limits, from national to international control, etc. The particular dimension used depends upon the question and how countries are addressing it. For example, we would order all six themes on delimitation of the territorial sea from narrow to broad as it is shown in table 1.

TABLE 1

DEMONSTRATION OF ORDERING OF THEMES

Theme (Preference)

For a narrow territorial sea (3 nautical miles)
For a 12 n.m. territorial sea
Might support a 12 n.m. territorial sea
For 25-30 n.m. territorial sea
For 100-130 n.m. territorial sea
For 200 n.m. territorial sea

National preferences for a new territorial sea have been ordered so as to form a continuum based on the breadth of limit proposed. The ordering is self-explanatory except perhaps the third entry, "might support 12 nautical miles". Although this theme may appear to be a concession on the part of a supporter of 3 nautical miles, individuals familiar with the negotiations know that it is a concession by the proponents of a wider limit. Thus it is placed between 12 nautical miles and the next wider limit rather than between 3 and 12 miles.

After the preferences or themes have been ordered, experts estimate the degree of difference between adjacent preferences. We call this "policy spacing". Experts begin by scanning the list of ordered themes and identifying two adjacent themes that have a minimal, yet meaningful, difference in terms of policy impact. This difference is defined as one policy unit and serves as the yardstick for assigning policy space in this continuum. Once a policy unit has been operationally defined, the experts begin by assigning a scale value of 1 (by convention) to the first theme in the continuum. They then proceed down the continuum assigning scale values to the other themes on the basis

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of the definition of one policy unit. For example, two adjacent themes that are believed to be two policy units apart are assigned scale values that are two whole numbers apart. If two or more themes are believed to be identical or have no difference in terms of operational impact, they can be assigned the same scale value. There is no predetermined scale length, but all scale values are, by convention, integers. Thus the ordered themes in table 1 would be assigned the scale values shown in table 2.

TABLE 2

DEMONSTRATION OF SCALING OF THEMES

Scale value	Theme (Preference)
1	For a narrow territorial sea (3 nautical miles)
3	For a 12 n.m. territorial sea
4	Might support 12 n.m. territorial sea
8	For 25-30 n.m. territorial sea
12	For 100-130 n.mi. territorial sea
20	For 200 n.m. territorial sea

In this example, the difference between "12 nautical miles" and "might support 12 nautical miles" was defined as one policy unit; thus their scale values are one number apart. The policy difference between the first two themes is twice this difference, etc.

The net result of this scaling procedure is the creation of a linear policy scale on which preferences or themes are spaced at varying intervals on the basis of differences in operational impact. The resulting scale is called an "issue-variable," because it is a conceptual framework along which the units of analysis (countries' positions) vary in their values.

The process described above is a special case of a technique called "artificial measurement", the assignment of numbers to items (in this case themes) that might have been thought unquantifiable. Obviously the single assignment of the number 3 to a 12 mile territorial sea is without operational meaning. However, in the context of our policy-spaced scale (variable), the assignment takes on meaning. A number of published papers[1] have investigated the effect of an omitted theme, the reversing of two adjacent themes, and various other transformations on the issue-variable. These

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[1] Moses, Lincoln, et al., "Scaling Data on Inter-Nation Action", Science, Volume 156, No. 3778, 26 May 1967. Also see Friedheim, R.L. and Kadane, J.B., "Quantitative Content Analyses of the U.N. Seabed Debate: Methodology and a Continental Shelf Case Study", International Organization, Volume XXIV, No. 3, 1970.

studies have demonstrated that such changes would have minor influence on our research findings. That is, somewhat different versions of a variable scaled by different scalers did not affect the results significantly. Some countries' scores changed, but no enough to alter general conclusions. However, arbitrary reordering of themes or any non-monotonic transformation of the variable could have drastic effects.

ORGANIZING THE DATA FOR ANALYSIS

With the thematic content analysis data and the policy spaced scales or variables placed on magnetic tapes, it is possible to produce descriptive products for our clients. For policy-makers desiring descriptive data on individual countries, country profiles can be produced. A country profile is an organized list of remarks a particular country has made during the negotiations. Country profiles can be organized by major/minor topics, by issue-variables, or merely by theme code number, listing all of a country's remarks in numerical order. It is also possible to produce a theme profile (a list of countries that have made a particular statement) or a retrieval document which allows the user to locate remarks in the original source document.

Although all of these descriptive products are valuable aids to policy-makers, the country profile organized by issue-variable is the only product which makes possible continued analysis. The remaining portions of the methodology use the issue-variable as the subject of analysis and the countries' positions on it as the unit of analysis.

SUMMARIZING COUNTRIES' POSITIONS

Scaling the various themes or preferences allows us to compute national scores for countries that have spoken out on an issue-variable. By combining all remarks a country has made on an issue into a single indicator of the country's position on a variable, it is possible to determine whether a country has changed its position over time and how its position differs from those of other countries. The following formula is used to calculate a national score for country j on issue-variable i:

$$Y_{ij} = \frac{\sum\limits_{k=1}^{m} V_k N_{jk}}{\sum\limits_{k=1}^{m} N_{jk}}$$

where

Y_{ij} = national score for country j on issue-variable i

k = themes assigned to issue-variable i

V_k = scale of theme k

N_{jk} = number of times theme k was mentioned by country j

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A national score represents the best single indicator of a country's position on an issue-variable based upon what it has said. It can be translated back into a position by referring to the appropriate issue-variable and locating the scale value closest to the score. That is, a national score of 3.2 on territorial sea is interpreted as support for a 12 mile terrritorial sea (scale value 3).

Ideally, a national score based on a large number of remarks would be derived for every country on each issue-variable. They are only available, however, for countries that have made remarks on a given issue-variable, and not all countries speak out. Those that do speak out, do so with varying frequency. This affects the reliability of the national score. As the number of remarks on which the national score is based declines, the probability increases that the remarks are not representative of the country's position or that the country's position is not firm and is thus susceptible to group pressures. To account for the problem of missing data and for potentially non-representative remarks, we use a linear regression model.

The regression model calculates the linear combination of independent, or explanatory, variables which best fits the dependent variable. The dependent variable in our case is a country's national score on a particular issue-variable; the independent variables are that country's interests, attributes, and affiliations. The affiliations are expressed as dichotomous variables, where a 1 indicates that the country belongs to the particular group and a 0 indicates that it does not. Structuring the regression in this form assumes that countries' affiliations are predictors of their positions on LOS issue-variables. It further assumes that the best predictor for a country with no remarks is the regression estimate of a country with the same affiliations which has spoken out. In short, we are assuming that a country will be influenced by the positions taken by other members of its groups.

A weighted regression model is used. The amount of influence each country has on other members of a group in the regression is directly proportional to the number of remarks it has made. The following regression model is used:

$$\hat{Y} = b_1 X_1 + b_2 X_2 + \ldots\ldots + b_n X_n$$

where

$\hat{Y}$ = national score

$b_{1\ldots n}$ = regression coefficients

$X_{1\ldots n}$ = group affiliations

An estimated score based on group pressures alone is calculated for every country on every issue-variable. Because the model uses dichotomous independent variables, this score is simply the sum of the regression coefficients of the independent variables to which the country "belongs". An estimated score is, therefore, a summary of the cross pressures on a country.

With estimated scores for all countries and national scores for some countries, on an issue-variable, a single measure of preferred position can be calculated for every country. The preferred position is a weighted average that utilizes all available information on a country's preference by combining the national score, if it exists, with the estimated influence of the groups to which it belongs. The formula below is used to calculate the preferred position of country j on issue-variable i :

$$M_{ij} = \frac{Y_{ij} N_{ij} + \hat{Y}_{ij}}{N_{ij} + 1}$$

where

M_{ij} = preferred position of country j on issue-variable i

Y_{ij} = national score for country j on issue-variable i

N_{ij} = number of remarks by country j on issue-variable i

$\hat{Y}_{ij}$ = estimated score for country j on issue-variable i

By giving the estimated score a weight of one, this calculation will only affect significantly the countries with limited data. A country with no data will receive the estimated score as its preferred position. A country with a large number of remarks will have a preferred position very close to its national score, but one with only a few remarks will have a preferred position between its estimated and national scores.

With summaries of all countries' preferences in the form of preferred positions, mean group or bloc preferences representing the average preferred position of the members of a group can be calculated. These average scores may then be compared to determine the similarities and differences between groups' preferences. For example, to determine whether the developing states (so-called "Group of 77") are united on an issue, one can compare the scores of the group's component parts, namely Latin America, Africa, and Asia. If the mean bloc preferences for these three groups are close to one another, then one can conclude that the "Group of 77" is united behind a common position. Dissonance within a group can also be assessed, by taking the ratio of the standard

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deviation of the members' scores to the mean score (i.e. a coefficient of variability). The larger the coefficient of variability, the more divergent or disunited the group. Comparisions between and within groups can also be made over time.

FORECASTING OUTCOMES

Five kinds of statistical analyses are used to forecast voting outcomes. For the analysis of individual issue-variables we use the median of the preferred positions, best and worst cases, and utility pairing. For multiple-issue analysis, we employ a package utility model and a vote maximization technique.

Formal voting theory indicates that the best single indicator of outcome on an issue-variable is the median of the preferred positions. We calculate three medians: (1) median of the national scores, (2) median of the estimated scores, and (3) median of the preferred positions. The three medians can be compared to gain further insight into the negotiations. If the median of the national scores is substantially different from the median of the preferred positions, one can conclude that the negotiations have been dominated by preferences that may not represent the preference of the voting body as a whole. This comparison illustrates the difference between what the vocal members are saying, which the casual observer might be tempted to believe is the preference of the entire body, and what the body as a whole prefers. The median of the preferred positions is the figure most frequently quoted in our findings.

Best/worst case analysis counts the number of states that might support a given proposal under the most optimistic and pessimistic circumstances. It relies heavily on expert assessment of the situation. Experts are asked to make two estimates: (1) the range of preferred positions on the issue-variable that encompasses definite supporters of a specific proposal (worst case) and (2) the range that encompasses potential supporters under the most optimistic assumptions (best case). The number of countries with preferred positions within these ranges is then tallied. The resulting figures may then be considered the minimum and maximum number of countries expected to support the proposal.

The third technique, a utility pairing model, is a more formal method of estimating votes on an issue-variable. Given a distribution of country positions on a particular issue-variable, it calculates the likely outcome if countries were forced to express a preference for one of two solutions. Although this does not entirely depict the voting situation at the UN, it does reflect an aspect of reality. It is well known that when a proposal is brought to a vote and it fails of adoption, the next proposal on the agenda will be brought to a vote. Thus a voter, at least in part, votes with the next proposal in mind.

The model determines the preference of each country by comparing the distance between a country's preferred position and the scale value of each of the alternative solutions. The model assumes that if the country must choose between the two, it will select the alternative closest to its preferred position. The following formula is used to derive a utility score (U) for country j on issue-variable i for a given pair of solutions:

$$U_{ij} = \left(V_{i1} - M_{ij}\right)^2 - \left(V_{i2} - M_{ij}\right)^2$$

where

V_{ik} = scale value on issue-variable i for solution k

M_{ij} = preferred position of country j on issue-variable i

For each of the two alternatives, we first calculate the difference between a country's preferred position and the scale value of the alternative. This determines the amount of policy distance between them. At this stage we are not concerned with the sign or direction of these differences, just the magnitude; therefore, we square them. Taking the absolute value would serve the same purpose, but squaring also has the desirable property of accentuating the larger differences and deemphasizing the small.

After these differences have been calculated and squared, their difference is taken. This becomes the utility score for a country on this variable with these alternatives. The sign of the utility score determines the alternative that the country prefers; the magnitude determines the intensity of its choice. A country with a negative utility score prefers solution 1 since that distance is smaller and a country with a positive score prefers solution 2. The larger the absolute utility score, the stronger the country's preference. The smaller the absolute score, the weaker the preference. Countries approach indifference as their score approaches zero.

Since most of the negotiations do not involve independent, issue-by-issue solutions, we must also forecast the outcome of multiple-issue packages. A package is a set of interrelated issues that will be decided on and adopted or rejected as a set. Two techniques have been developed -- a packaging analysis and a maximization technique.

Packaging analysis forecasts the outcome of many related problems simultaneously. Before any forecasts can be made on packages, however, two transformations must be made. Since one issue-variable may have a range of 20 and another a range of 15, the issue-variables must be standardized. Countries' preferred positions on the issue-variables in the package must be standardized as well. A single equation performs both transformations. The standardized preferred position (M') of country j on issue-variable i is calculated as follows:

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$$M'_{ij} = \frac{M_{ij} - \mu_i}{\sigma_i}$$

where

M_{ij} = preferred position of country j on issue-variable i

μ_i = mean of all countries' preferred positions on issue-variable i

σ_i = standard deviation of all countries' preferred positions on issue-variable i

The packaging model is a more complex form of the utility pairing model used for individual issue-variables. It forces countries to choose between two packages on the same issue-variables. The components of the package are expressed in terms of scale values, and the scale values are standardized by the formula above. The model determines the preference of each country by comparing the difference between a country's standardized preferred position and the standardized scale value for each of the components of the two packages. These differences are squared, then weighted by the appropriate salience,[1] and finally summed across variables to form a package utility *score for a given package.* The formula below is used to calculate the package utility score (U) for country j on two packages consisting of n issue-variables:

$$U_j = \frac{\sum_{i=1}^{n} S_{ij} \left[\left(V'_{i1} - M'_{ij} \right)^2 - \left(V'_{i2} - M'_{ij} \right)^2 \right]}{\sum_{i=1}^{n} S_{ij}}$$

where

i = issue-variable in the packages

S_{ij} = salience of country j on issue-variable i

V'_{ik} = standardized scale value of package k on issue-variable i

M'_{ij} = standardized preferred position of country j on issue-variable i

_____

[1] "Salience" is the term we use for the relative importance a country places on a successful solution to each of the components of the package. For each issue-variable it is measured by the number of remarks a country has made on that issue-variable. The more a country addresses a given issue relative to others, the more importance it is assumed to place on that issue. Salience is only used within-country and we believe it reflects a country's rank-ordering of issues according to importance.

This formula is used to calculate the number of countries that prefer each of the two alternative packages, to identify which package each country prefers, and to calculate how much more each country prefers his choice to the other package. As with the pairing model, the sign of the utility score determines the country's preference; the magnitude of the score, the intensity of choice.

The second multiple-issue forecasting model involves a vote maximization technique. It is important because it derives packages that have a better chance than the original package of achieving a consensus. Given a single package of issues, this model determines the direction that should be taken on the issue-variables to construct another package that a majority of countries would prefer to the original package. The model calculates the best direction and then we judge how far to move by determining what a package in the specified direction would look like and whether it would have the support of a substantial majority.

ORGANIZING THE DATA

Once the raw data and diction-
ary tapes have been created, the
data must be organized into a use-
ful, efficient form for analysis. To
perform this conversion process, two
programs - MATRIX and PROFLE -
are used.

The purpose of these two pro-
grams is to organize the raw data
into observations on analyzable issue-
variables. In the process the user
can obtain a retrieval document which
identifies the original source of all of
the observations and a country or theme
profile which displays these observa-
tions in a form that can be used by coders,
analysts and policy-makers.
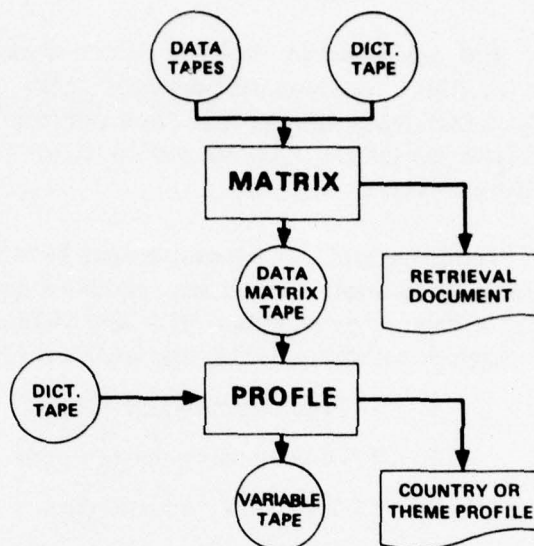
Program MATRIX converts the raw data into matrix form and produces a retrieval
document. Before it can be executed, the user must specify the time periods to be used
in the analysis, determine the type of retrieval document to be produced, and create
the necessary control cards.

Program PROFLE produces various types of country or theme profiles and can be
used to convert the matrix data into observations on analyzable issue-variables. Before
it can be executed, the user must specify the type of country or theme profile that is
needed and create the necessary control cards. If a country profile by issue-variable
is selected, the user must also specify the issue-variables to be analyzed.

The following sections describe the preliminary steps to be taken and the control
cards needed to execute program MATRIX and program PROFLE. Once the user be-
comes familiar with these, MATRIX and PROFLE can be run back to back in a job
sequence.

CONVERTING THE DATA TO MATRIX FORM

Specifying the Time Periods in the Analysis

The first step in setting up program MATRIX is to subdivide the raw data into one
or more time periods. The term "time period" is used loosely to mean any subset of

the data base which can be separated from the rest on the basis of the date the remarks were made and their classification. For example, all unclassified data from speeches given in 1974 could form a time period.

For any specific analysis of LOS issues, the user could easily create one time period which includes all pertinent data. Alternatively, the user could organize the data into a maximum of four time periods[1] which cover the current and anticipated analytic demands. The second approach is preferable, because it saves both user and computer time.

To illustrate, let's assume that 1974 through 1975 primary and secondary source data is to be analyzed. It may be necessary to separate the primary from the secondary source data or to separate 1974 and 1975 data. Instead of reorganizing the data base for each possible analysis, the user could subdivide this data into four time periods:

1. 1974 primary source data

2. 1974 secondary source data

3. 1975 primary source data

4. 1975 secondary source data

With only one pass through the data base and with the knowledge that these time periods can be merged in a later program, the user can produce numerous analyses. All of this data could be analyzed by merging the four time periods; the primary and secondary source data could be analyzed separately by combining time periods 1 and 3, or 2 and 4; 1974 primary source data could be analyzed; etc.

The user is strongly advised to produce as many time periods as are necessary to meet current and anticipated analyses. Once the analyst supplies the user with a description of the data to be analyzed, the user creates the time periods. The first step is to determine the finest data cut that will be necessary and to specify each of the resulting time periods in terms of date and source (e.g. 1974 primary source data). The second step is to transform each of the time periods into a range of document numbers. This is a straightforward procedure, since document numbers are assigned chronologically to source documents and the numbering systems for primary and secondary source documents are distinct. By referring to the LOS codebook (RC 291), the user can easily determine the range of document numbers that corresponds to each of the time periods being created. For example, all 1974 primary source data is contained in documents 446

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[1] A limit necessitated by the system under which these programs were created, not an intrinsic limitation. See volume II of this RC, if expansion is necessary.

to 569. If necessary, more than one range can be used for a single time period. The resulting ranges are entered in a time period file, which is described in the section entitled "Executing Program MATRIX".

Selecting the Form of the Retrieval Document

While the data base is being organized into time periods, the user has the option of simultaneously creating a retrieval document, which serves as a reference to the original source of each remark. The analyst must decide if such a massive product is necessary (could be 600 pages) and if it is, what form it should take. Three forms are available. (1) It can include only the remarks that were made during the time periods selected. (2) It can include all data, selected or not, that appears in the entire data base. (3) It can include only those remarks, selected or not, that are assigned to specified major topics.

The first two forms are commonly used during normal operations, since the resulting retrieval document serves as a general reference guide. The third form is reserved for clients that request data on a few topics of interest. To produce one of the first two forms, the user merely selects the appropriate option on the main problem card; to produce the third form, a special retrieval card is required. These control cards are described in the section below.

Executing Program MATRIX

To execute program MATRIX, the user must have a main problem card, a time period file, and special code cards. The user must also have a special retrieval document card, if retrieval option three is chosen. Depending upon the document numbers included in the time periods and the type of retrieval output desired, the program requires the primary or secondary data tapes, or both, as input.

Input:

        Primary and/or secondary data tapes
        Dictionary tape
        Control card deck:
            Main problem card
            Time period file
            Special retrieval document card (optional)
            Special code cards

Output:

        Data matrix tape
        Retrieval document, if requested

Main Problem Card

This card specifies the logical units of the input and output tapes as well as the selection criterion for data included on the matrix output tape and in the retrieval document printout. The following right-justified format is used:

CC	Format	Description
1-2	I2	Number of document range selection cards per time period (each time period must have the same number of cards)
3-4	I2	Data base inputs =1: primary or secondary data base* =2: primary and secondary data bases*
5-6	I2	Type of retrieval printout =0: no retrieval output =1: include data from the matrix tape's time period only =2: include all data but it can be restricted to certain major topics (see CC 13-14)
7-8	I2	Logical unit of the dictionary tape (=45)
9-10	I2	Logical unit of the matrix tape (=46)
11-12	I2	Logical unit of retrieval output** (=61 even if CC 5-6 = 0)
13-14	I2	Major topic selection, operable if CC 5-6 = 2 =0: no selection, all data on all major topics will be included =1: all data on selected topics will be included; a special retrieval document card is needed
15-16	I2	Number of time periods being created
17-32	2A8 (left justified)	Classification title to appear on each page of the retrieval output

* When one data base is used, it is placed on LU49; when two are used, they are placed on LUs 48 and 49.

** Although LU61 is normally the printer, the retrieval document can be written on an output tape by equipping LU61 to be a tape. This is particularly useful when multiple copies of the document are to be produced.

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Time Period File

This file consists of a series of cards that specify a range of document numbers for each of the time periods being created. All time periods must be defined by the same number of range cards. Normally one card is used for each time period, but it is possible to use more than one. When this is done, all other time periods must be defined with an equal number of cards. For example, if one time period includes data from documents 100 to 200 and 500 to 600 and the second time period includes data from 200 to 499, the range for the second time period must be split into two parts (e.g. 200 to 300 and 301 to 499). For each range, a separate document range card must be punched in the following right-justified format:

CC	Format	Description
1-5	I5	Smallest document number to be included in this range
6-10	I5	Largest document number to be included in this range

To form the time period file, all document range cards for the first time period must precede those for the second, etc., and each time period must have the same number of cards. The user is cautioned that the same document number cannot appear in more than one time period.

Special Retrieval Document Card

This card is only required when CC 13-14 of the main problem card is equal to 1. It allows all remarks on specified major topics to be included in the retrieval output, regardless of whether they fall into one of the time periods being created. The user should refer to the LOS codebook (RC 291) to determine the numbers of the major topics of interest. The following format is used:

CC	Format	Description
1-17	17I1	Each column (1-17) corresponds to a major topic number. A "1" in column X selects all data from topic X.

Special Code Cards

These two required cards allow the user to specify the type of remarks to be included in each of the time periods being created. Remarks can be regional or non-regional and lettered or non-lettered. A regional remark is one that is made for a country by another country; a lettered theme remark is one that was extracted from a U.N. proposed article rather than from a speech.

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Regional Selection Card. For each time period being created, the user must specify a regional remark option and enter it on a regional selection card in the following right-justified format:

CC	Format	Description
1-2	I2	Selection criterion for time period 1 =0: only non-regional remarks are included =1: only regional remarks are included =2: both regional and non-regional remarks are included
3-4	I2	Selection criterion for time period 2 =0, 1, or 2
5-6	I2	Selection criterion for time period 3 =0, 1, or 2
7-8	I2	Selection criterion for time period 4 =0, 1, or 2

Lettered Theme Selection Card. For each time period, the user must also specify a *lettered theme* remark option and enter it on a lettered theme selection card in the following right-justified format:

CC	Format	Description
1-2	I2	Selection criterion for time period 1 =1: only non-lettered remarks are included =2: lettered and non-lettered remarks are included =3: only letter remarks are included
3-4	I2	Selection criterion for time period 2 =1, 2, or 3
5-6	I2	Selection criterion for time period 3 =1, 2, or 3
7-8	I2	Selection criterion for time period 4 =1, 2, or 3

The regional selection card must precede the lettered theme selection card in the input deck.

Illustrative Input and Output

The following illustration shows a typical input deck and its resulting output. From the primary source data, a matrix tape is to be produced with four time periods, all of which will include only non-regional and non-lettered remarks. The document ranges are:

(1)   1-159
(2)   160-386
(3)   387-400, 430-432
(4)   433-569

The retrieval output is to include all primary source data from all major topics regardless of whether they were written on the matrix tape.

In the time period file, each time period must be expressed in terms of two document range cards since time period 3 requires two. (As an example, time period 1 could be split into 1 to 100 plus 101 to 159.) The following input deck is required to perform this job:

```
                                              1 1 1 1 1 1 1 1 1 1 2 2 2 2 2 2 2 2 2 2 3 3 3
Card Columns   1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2
Main Problem
   Card        0 2 0 1 0 2 4 5 4 6 6 1 0 0 0 4 * * U N C L A S S I F I E D * *
                          1       1 0 0
                  1 0 1           1 5 9
                  1 6 0           3 0 0
Time Period       3 0 1           3 8 6
   File           3 8 7           4 0 0
                  4 3 0           4 3 2
                  4 3 3           5 0 0
                  5 0 1           5 6 9
Special Code   0     0     0     0
   Cards        1     1     1     1
```

Figure 2 is a sample of the retrieval output that resulted. It is the beginning of the retrieval printout for Albania. The themes or remarks are listed in numerical order (if two tapes had been used, the remarks from the tape on LU49 would be listed first, followed by the remarks from the second tape). For each remark, classification, reliability and repetition codes[1] are listed. All codes are zero in this example, since only unclassified, primary source data were used. Each remark also appears with its document source number. These numbers correspond to those written on the actual UN source document, which can be retrieved from the study's document file. Note particularly the themes flagged with an asterisk. They signal remarks made by other countries for Albania, i.e., regional remarks. Note that regional and lettered remarks appear in this

_____

[1] See the section entitled "Creating New Data Cards/Records" in appendix A for a description of these codes.

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CCUNTRY PFCFILE FCP ALBANIA

CLASSIFICATION/ RELIABILITY/ REPETITICN	SOURCE	THEME NO.	THEME TITLE
0/0/3	459	3	INDIAN OCEAN SHOULD BE MADE A ZONE OF PEACE
0/0/3	459	5	IP IN ARCHIPELAGIC WATERS
0/0/3	573	8	CS RIGHT TO AUTHORIZE PASSAGE IN TS FOR WARSHIPS
0/0/3	573	28	STRAIT WITHIN TS FORMS INSEPARABLE PART OF TS
0/0/3	453	39	SUPPCRT LA CLAIMS OF 2C0 MI TS
0/0/3	535	39	SUPPORT LA CLAIMS OF 200 MI TS
0/0/3	581	39	SUPFORT LA CLAIMS OF 200 MI TS
0/0/0	543	55	LL + SL HAVE RIGHTS TO SHARE PROFITS FROM EXPLOT
0/0/3	500	58	LL SHOULD HAVE EQUAL RIGHTS ON HIGH SEA AND SB
0/0/0	523	65	PRIOR PERMISSION REQUIRED FOR WARSHIPS
0/0/0	514	65	PRICR PERMISSION REQUIRED FOR WARSHIPS
0/C/0	543	69	SOME PAST UN ACTICNS IGNORED LL
0/C/0	573	135	CLOSE OR NARROW ECONOMIC GAP TO HELP LDC
0/C/0	509	143A *	TRAINING SHOULD BE GIVEN TO LDC
0/C/3	509	186A *	ENTERPRISE SYSTEM
0/0/0	500	186	ENTERPRISE SYSTEM
0/C/0	586	194	PURE-INDUS EXPLOR DISTINCTION DIFCULT OR IMPOSS
3/0/0	562	293	CS RT TO SUPPRESS SR DATA/CONTROL PUBLICATION
0/C/0	500	211	COM HER MEANS PEACEFUL SB ACTIVITIES/NO MILITARY
0/C/0	562	294	CS RTS TO PARTIC+GET RESULTS FROM TS,SHELF.EZ SR
0/C/0	562	302	SCIENTIFIC RESEARCH W/CONSENT OF COASTAL STATE
0/0/0	535	302	SCIENTIFIC RESEARCH W/CONSENT OF COASTAL STATE
0/0/0	562	314	COASTAL STATES HAVE RIGHT TO CONTROL RESEARCH
3/0/0	586	314	COASTAL STATES HAVE RIGHT TO CONTROL RESEARCH
0/0/0	503	316 *	AUTH ENSURE LDC PARTICN IN EXPLT OF SB
0/C/0	562	359	FEAR MILITARY USE OF SCIENCE
0/0/3	586	358	FEAR MILITARY USE OF SCIENCE
0/C/0	586	364	COMPLETE CS RIGHT TO CONTROL SR IN TS
0/0/0	535	420	FOR 2C0 MILE EXCLUSIVE FISHING ZONE
3/0/3	500	430	SL + LL SHOULD BENEFIT FROM OCEAN FISHERIES
0/0/0	459	434	LL DEALT W/ON A REGIONAL/BILATERAL BASIS
0/C/0	543	434	LL DEALT W/ON A REGIONAL/BILATERAL BASIS
3/C/3	586	570	IP IN 12 MI TS
0/0/0	535	591	LL/SL RIGHT TO FISH IN EZ OF NEIGH CS-BIL/REGNL
0/0/0	535	649	FAVOR DISTANT CRITERION FOR SEABED DELIMITATION
3/C/3	514	653	200MILE RESOURCES ZONE
0/C/0	535	653	200MILE RESOURCES ZONE
3/C/3	459	675	FIX SB BORY BY NATURAL + GEOG CHARACTERISTICS
0/C/3	535	714	CS JURIS- 200MI OR EDGE OF MARG WHICH SEAWARD
0/0/0	503	759 *	EQUITABLE GEOGRAPHIC REPRESENTATION ON ALL ORGAN
0/C/0	503	765 *	ONE-STATE ONE-VOTE/NO VETO IN MACHINERY
0/C/3	503	781A *	ESTABLISH JOINT ENTERPRISES
3/C/3	509	781A *	ESTABLISH JOINT ENTERPRISES
0/0/0	535	786	CS REG FISHR IN EZ,INCL YLD,SEASN,TECHL MSRS

FIG. 2: RETRIEVAL DOCUMENT

printout even though they were deleted from the matrix tape by the special code cards. This retrieval output includes all data, whether written on the matrix tape or not.

This example ran in 12 minutes and produced 34,000 lines.

PRODUCING PROFILES OF THE DATA

Selecting the Type of Profile

Once the output tape from program MATRIX has been created, the user must decide what the next step should be. He can choose to continue the flow at once by selecting a specific option of program PROFLE which produces a printout and an output tape. Alternatively, he can choose to produce as many as six descriptive printouts which provide insight into the data and to postpone the analysis until after they have been examined. These printouts are produced by program PROFLE and two programs described in appendix C.

If the analysis is to be postponed, the user must select the type of descriptive printout that is most appropriate. The printouts fall into two general categories - a country profile, which lists the remarks a country has made, and a theme profile, which lists the countries that have made a remark. The following three types of country profiles and three types of theme profiles are available:

1. A country profile with theme frequency lists a country's remarks in numerical order. Although it is rarely used, it does produce the most compact country profile and it is especially useful when only a select number of themes are of interest.

2. A country profile by major/minor topic organizes a country's remarks into major/minor topics. This is the most massive country profile printout, but it readily identifies the subject matter that a country has and has not addressed itself to.

3. A country profile by issue-variable organizes a country's remarks into issue-variables. Since the issue-variable forms the foundation of an analysis, this profile is not only useful for the analyst, but essential for analysis. When this type of profile is selected, an issue-variable output tape can be produced to continue the flow.

4. A theme profile with frequency of mention identifies the number of times a theme has been addressed during each of the time periods created in program MATRIX. It does not identify individual countries, just the total number of references to a theme in each time period. This compact theme profile is useful when tracing the history of a theme (when it first and last appeared and when it was popular), when considering whether to retire it, and when evaluating its potential role (the amount of data it would supply) in an issue-variable.

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5. A theme profile with countries lists countries in alphabetical order which have used a specific theme. Next to each country is printed the number of times it made the remark over all of the time periods selected. This profile is not produced by program PROFLE, but by a special program, PTHEME, in appendix C.

6. A lettered theme profile with countries is a special case of the preceding one in that it lists countries in alphabetical order that have used specified lettered themes only. This profile is not produced by program PROFLE, but by a special program, LETTER, described in appendix C.

After selecting the profile to be produced, the user must decide whether a general or special purpose profile is preferable. Generally speaking, a general purpose profile is for internal use and a special purpose profile is designed to meet a particular client's need. A general purpose profile normally includes all of the time period data from the matrix tape for all countries on all major subjects under negotiation. A special purpose profile can be limited to information from specific time periods, and to specific countries, themes, major topics or issue-variables. When a special purpose profile is to be produced, the user must create selection cards which are described in the next section.

If the user decides to continue the flow, the country profile by issue-variable option must be selected and an output tape must be produced. When setting up program PROFLE under this option, the user is advised to include all time periods on the matrix tape and to select as many variables as are necessary to meet current and anticipated analytic demands. The user is limited to 45 variables, which at present does not constitute a major restriction but means that an issue-variable selection card must be created whenever this option is used. This card is described in the following section.

Executing Program PROFLE

To execute program PROFLE, the user must have a main problem card and a time period title card. When producing a country profile by issue-variable or any special purpose profile, selection cards are also required.

      Input:
            Data matrix tape (output from program MATRIX)
            Dictionary tape
            Control card deck:
                Main problem card
                Selection cards (optional)
                Time period title card

Output:

Issue-variable tape (only produced with a country profile by issue-variable option)

Country or theme profile

Note: For multiple copies of a profile, the output can be put on tape by so equipping LU61.

Main Problem Card

The main problem card specifies the input and output units as well as the type of profile and the data selection procedures. The following right-justified format is used:

CC	Format	Description
1-2	I2	Logical unit of the data matrix tape (=49)
3-4	I2	Logical unit of the dictionary tape (=48)
5-6	I2	Logical unit of the issue-variable tape (=46)
7-8	I2	Type of country profile =0: no country profile (CC 9-10 must be 1) =1: with theme frequency =2: by major/minor topic =3: by issue-variable (CC 15-16 must be 2)
9-10	I2	Type of theme profile =0: no theme profile =1: with frequency of mention Note: Both a country and a theme profile cannot be produced in the same run.
11-12	I2	Country range selection =0: no country selection (all countries are included) =X: number of country range selection cards
13-14	I2	Theme range selection =0: no theme selection (all themes are included) =X: number of theme range selection cards
15-16	I2	Major topic or issue-variable selection =0: no selection (all topics and issue-variables are included) =1: Major topic selection; a major topic selection card is required (CC 7-8 must be 2)

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CC	Format	Description
15-16 (Cont'd)		=2: issue-variable selection; an issue-variable selection card is required (CC 7-8 must be 3)
17-18	I2	Number of time periods on the data matrix tape = 1, 2, 3, or 4
19	I1	Time period 1 data =0: exclude from the printout =1: include in the profile printout
20	I1	Time period 2 data =0: exclude =1: include
21	I1	Time period 3 data =0: exclude =1: include
22	I1	Time period 4 data =0: exclude =1: include
23-38	2A8 (left justified)	Classification to be printed on each page of the profile printout

Country Range Selection Card

This card selects countries to be included in a special purpose country profile and is required whenever CC 11-12 of the main problem card is not zero. The countries that are to be included are expressed in terms of a range of country numbers (see the code-book). All countries within that range will be listed in the printout. If only country 100 is of interest, the range is expressed as 100 to 100. There is no limit to the number of country range selection cards that can be created, and they may appear in any order. Each range appears on a separate card in the following right-justified format:

CC	Format	Description
1-5	I5	Smallest country number to be included in this range
6-10	I5	Largest country number to be included in this range

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Theme Range Selection Card

This card selects themes to be included in a special purpose profile and is required whenever CC 13-14 of the main problem card is not zero. This selection procedure should only be used when producing a country profile with theme frequency or a theme profile with frequency of mentions. The themes to be included are expressed in terms of a range of theme numbers (see the codebook). All themes within that range will appear in the printout. There is no limit to the number of theme range selection cards that can be created, and they may appear in any order. Each range is placed on a separate card in the following right-justified format:

CC	Format	Description
1-5	I5	Smallest theme number to be included in this range
6-10	I5	Largest theme number to be included in this range

Major Topic Selection Card

This card is required whenever CC 15-16 is 1. It selects major topics to be included in a special purpose profile. This selection procedure can only be used with the country profile by major/minor topic option. (See the codebook to identify the major topic numbers of interest.) The following format is used:

CC	Format	Description
1-17	17I1	Each field (1-17) corresponds to a major topic number. A "1" punch in field X means that major topic X will be included.

Issue-Variable Selection Card

This card selects the issue-variables to be included in a country profile by issue-variable and is required whenever CC 15-16 is 2. A maximum of 45 variables can be selected in a single run. (See the codebook to identify the issue-variable numbers of interest.) The following format is used:

CC	Format	Description
1-70	70I1	Each field (1-70) represents a variable number. A "1" punch in field X selects variable X.

Time Period Title Card

This card contains the titles of all time periods on the matrix tape regardless of the time periods selected for this printout. All titles are left justified.

CC	Format	Description
1-8	A8	Title of 1st time period on the matrix tape
9-16	A8	Title of 2nd time period (if it exists)
17-24	A8	Title of 3rd time period (if it exists)
25-32	A8	Title of 4th time period (if it exists)

Illustrative Input and Output

Four examples are presented, one for each type of profile that can be requested with program PROFLE.

Country Profile with Theme Frequency

This example selects data from all four time periods on the matrix tape and selects the first 30 countries and the first 500 themes to be included in the printout. The input deck is as follows:

```
                              CARD COLUMNS
                                        11111111112222222222333333333
                              123456789012345678901234567890123455678
         Main Problem Card    494846010001010000041111**UNCLASSIFIED**
Country Range Selection Card     1   30
  Theme Range Selection Card     1  500
   Time Period Title Card      TIME 1  TIME 2  TIME 3  TIME 4
```

Figure 3 is the profile for Costa Rica. Note that only themes numbered 1 through 500 are listed. A line is printed whenever the country has mentioned a theme at least once in any of the time periods selected. The entries under each of the time period columns are the number of times Costa Rica has mentioned the theme during the period. The actual printout contained a profile for each of the first 30 countries. This example ran in 3 minutes and produced 3000 lines.

Country Profile by Major/Minor Topic

This example selects data from the second and third time periods of a four time period matrix tape, and selects major topics 5 and 8 to be listed in the printout. A profile is to be produced only for Mauritius (country 82). The input deck is as follows:

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COUNTRY PROFILE FOR COSTA RICA

THEME NO.	THEME TITLE	FREQUENCY					
		TIME 1	TIME 1	TIME 2	TIME 2	TIME 3	TIME
41	RETAIN SHELF DOCTRINE ALONG W/PATRIMONIAL SEA	0	0	0	0	1	
105	BENEFIT OF MANKIND	2	0	0	0	0	
118	PRO-INTERNATIONALIZATION	1	0	0	0	0	
123	CONSERVE RESOURCES	1	0	0	1	0	
126	PROTECT RIGHTS OF COASTAL STATES	3	0	0	0	0	
137	INCLUDE LANDLOCKED COUNTRIES	1	0	0	0	0	
137	BENEFIT MANKIND ESPECIALLY LDCs	1	0	0	0	1	
1-3	TRAINING SHOULD BE GIVEN TO LDC	0	0	0	0	1	
186	ENTERPRISE SYSTEM	0	0	0	0	1	
203	CS ET TO SUPPRESS SF DATA/CONTROL PUBLICATION	0	0	0	0	1	
294	CS ETS TO PARTIC+GET RESULTS FROM TS,SHELF,EZ SR	0	0	0	0	1	
302	SCIENTIFIC RESEARCH W/CONSENT OF COASTAL STATE	0	0	0	0	1	
317	COASTAL STATES HAVE RIGHT TO CONTROL RESEARCH	0	0	0	0	1	
316	AUTH ENSURE LDC PARTICN IN EXPLT OF S3	0	0	0	0	1	
319	REGIONAL INTL AGREEMENTS FOR TUNA	0	0	0	0	1	
348	CS OF ORIGIN HAS PREFL RIGHTS TO ANADROMOUS FISH	0	0	0	0	1	

FIG. 3: COUNTRY PROFILE WITH THEME FREQUENCIES

```
                        CARD COLUMNS
                                    1111111111222222222233333333
                                    12345678901234567890123456789012345678
            Main Problem Card  4948460200010001040110**UNCLASSIFIED**
    Country Range Selection Card      82    82
     Major Topic Selection Card        1     1
      Time Period Title Card  TIME 1    TIME 2   TIME 3   TIME 4
```

The entire output appears as figure 4. Below major topics 5 and 8 are their minor topics. Below each minor topic is a list of themes that Mauritius has uttered during the 2nd and 3rd time periods. A minor topic is listed whenever Mauritius has made at least one remark on it. Thus major topic 5, minor topic 5 is missing, because Mauritius never mentioned any of its themes during the 2nd or 3rd time periods. The entries under each time period are the number of times Mauritius has mentioned the themes during the time period. This example ran in 3 minutes and produced 100 lines.

```
        COUNTRY PROFILE FOR MAURITIUS

                                                      TIME 2    TIME 3

5  ARCHIPELAGO PROBLEMS
    1  BASIC CONCEPTS
          MODIFIED ARCH THEORY-ARCH WTRS NOT INTERNAL WTRS( 903)......  0        1
          ARCHIPELAGO THEORY                           ( 930)......  4        3
          ARCH WATERS W/IN BASELINE SUBJ TO SOVER CS   (1149)......  0        5
    2  TRANSIT THROUGH ARCHIPELAGOS
          IP IN ARCHIPELAGIC WATERS                    (   5)......  0        1
          ARCHIPELAGO STRAITS ARE NATL NOT INTL        ( 993)......  2        0
          I P THRU ARCHI WATERS VIA CORRIDORS          ( 998)......  6        9
          ARCH STATE GIVE DUE PUBLICITY TO SEALANES    (1196)......  0        7
          ARCH STATE REFRAIN FROM CLOSING SEALANES     (1187)......  0        5
          ARCH STATE DISAGREE ON MEANING OF IPTHRU ARCH WA(1188)....  0        1
          WARSHIPS VIOLATING IP THRU ARCH WATER LEAVE  (1196)......  0        4
          OPTIONAL CLAUSE  NOTIF FOR WS RS AND NS IN ARCHI(1233).....  0        1
          ARCH ST CAN DESIGNT SEALANES + TRAF SEPAR SCHEME(1463).....  0        8
    3  BASELINES AND DELIMITATION CRITE
          STRAIGHT BSLN CONNECT OUTRMST PTS OF OUTRMST ISL(   4)...... 0        2
          INTRINSIC GEOGRAPHIC UNITY CRITERION FOR ARCHIP (1170)......0        4
          TS IS ZONE OUTSIDE ARCH BASELINE             (1227)......  0        2
    4  ENFORCEMENT IN ARCHIPELAGOS
          ENFORCEMENT POWERS IN HANDS OF ARCH STATE    (1229)......  0        2
    6  COASTAL ARCHIPELAGOS
          OPPOSE ARCH THEORY FOR MIXED STATES          (1236)......  0        2

8  ISLANDS
    1  DELIMITING ISLAND OCEAN SPACE
          ISLAND ARTICLE NCT APPLY TO ARCH/ISLAND STATES (1224)......  0        2
          ISLAND OCEAN SPACE DETERMINED CASE BY CASE   (1247)......  0        1
```

FIG. 4: COUNTRY PROFILE BY MAJOR/MINOR TOPICS

Country Profile by Issue-Variable

The example selects all four time periods on the matrix tape. For all countries, variables 5, 9, 48, and 49 are selected to appear in the printout and resulting output tape. The input deck is as follows:

```
                CARD COLUMNS
                          11111111112222222222333353353334444444444.
                          12345678901234567890123456789312345678901234567B9
        Main Problem Card 49484603000003302041111**UNCLASSIFIED**
   Variable Selection Card     1    1                                    11
   Time Period Title Card TIME 1  TIME 2  TIME 3  TIME 4
```

Figure 5 is the profile for Australia. Only the themes Australia has uttered that were assigned to the four variables appear in the printout. The themes are listed with their scale values, titles, and the number of times mentioned in each time period. This sample printout indicates that Australia did not speak on "Scientific Research on the High Seas" during the four time periods and that all of its remarks on "Production Controls" occurred during the fourth period. The actual printout contained an equivalent profile for all 149 countries. This example ran in 6 minutes and produced 9000 lines.

Theme Profile with Frequency of Mention

This example selects data from all four time periods, but only the first 20 theme numbers are to be included for all countries. The input deck is as follows:

```
                CARD COLUMNS
                          111111111122222222223333333333
                          123456789012345678901234567890123456 78
        Main Problem Card 49484600010001000041111**UNCLASSIFIED**
  Theme Range Selection Card     1    20
   Time Period Title Card TIME 1  TIME 2  TIME 3  TIME 4
```

The entire output appears as figure 6. Each theme number appears on a separate line with its title. The entries under the time period columns are the number of times all countries mentioned the themes during the time period. This example ran in 3 minutes and produced 500 lines.

COUNTRY PROFILE FOR AUSTRALIA

		TIME 1	TIME 2	TIME 3	TIME 4
5	THE EXPLOITATION SYSTEM				
1	NO CONCESSION TO PRIVATE ENTERPRISE	2	1	0	0
1	DIRECT EXPLOITATION BY INTL AUTHTY	0	3	0	0
5	PRODN SYS ISRA CHOICE-PHASE OUT LIC,PHASE IN DIR	0	0	0	2
8	MIXED MACHINERY- DIRECT AND LEASE E+E	0	0	0	1
12	REQUIRE LAND-RELINQUISHMENT	1	0	0	0
14	INTL LICENSING SYSTEM	1	0	0	0
17	REGISTRY/FIRST COME FIRST SERVED	1	0	0	0
9	PRODUCTION CONTROLS				
1	PROTECT LAND BASED PRODUCERS	0	0	0	1
8	PRODN CONTR MUST CONSIDER INTS OF NON-PRODCG LCC	0	0	0	1
48	SR ON THE HIGH SEAS				
49	SR IN THE EZ				
8	SET TYPE RES DONE FREELY + THAT REQUIRNG CS CONS	0	0	0	1
12	POLLUTION NECESSITATES COASTAL STATE RES CONTROL	0	1	0	0
12	SCIENTIFIC RESEARCH W/CONSENT OF COASTAL STATE	0	2	0	0
14	COASTAL STATES HAVE RIGHT TO CONTROL RESEARCH	1	0	0	0

FIG. 5: COUNTRY PROFILE BY ISSUE-VARIABLES

THEME NO.	THEME TITLE	FREQUENCIES			
		TIME 1	TIME 2	TIME 3	TIME 4
1	EXCL FISHING ZONE---50MI OR EDGE OF SHELF	0	0	0	0
2	50 MILE TERRITORIAL SEA	0	0	1	0
3	INDIAN OCEAN SHOULD BE MADE A ZONE OF PEACE	0	0	4	0
4	STRAIGHT BSLN CONNECT OUTRMST PTS OF OUTRMST ISL	0	0	32	0
5	IP IN ARCHIPELAGIC WATERS	0	1	38	1
6	BILATERAL AGRMT ON TS IN SPEC CIRCUM(SEM+ENCL)	0	0	4	0
7	CS RIGHT TO REGULATE TRANSIT THRU TS (STRAITS)	0	0	0	1
8	CS RIGHT TC AUTHORIZE PASSAGE IN TS FOR WARSHIPS	0	0	2	1
9	IP FOR MERCHANT SHIPS IN LARGE TS	0	0	1	0
10	CS MAY SUSPEND SHIPS NOT ABIDING IP IN TS (STR)	0	0	3	0
11	CS MAY ESTAB SEALANES+TRAFFIC SEPAR SCHEMES	0	20	18	0
12	CS TO HAVE JURIS CVER ARTIF ISLS OR FACIL IN EZ	0	0	53	19
13	NO RESTRI CN REGNL AGRMT F EXPLT-FISH,POLL,SCI	0	0	0	0
14	APPLY MEDIAN LINE BET MAJ LAND MASSES ONLY-FLBK	0	1	0	0
15	MIGHT ACCEPT REASONABLE LL RIGHT TO SEA ACCESS	0	1	0	0
16	SUPPORT IMCO COMMITTEE FOR CS JURIS OVER ARCH	0	0	0	0
17	SPECIFIC/LIMTD CS PIGHTS OVER RES/POLL IN EZ	0	0	0	5
18	NATL JURIS OVR SHELF-DISREG FORGN ISLS	0	0	0	0
19	JOINT DEV OF NON-LIVG RSRCS IN SPECIAL CIRCUM	0	0	0	0
20	POSS SUP FT THRU STRAITS FOR SUP ON SHELF ISSUE	0	0	0	0

FIG. 6: THEME PROFILE WITH FREQUENCIES OF MENTION

SUMMARIZING COUNTRIES' POSITIONS

After the data have been organized into issue-variables by the country profile by issue-variable option of program PROFLE, these variables can be analyzed. This involves summarizing each country's data on an issue-variable into a single indicator of its preferred position. To do this, national scores are calculated for countries that have spoken on an issue and estimated scores are derived for those that have not. These scores are then converted into preferred positions by allowing a country's group affiliations to influence its position. With preferred positions for all countries on all of the issues being analyzed, a final report of group positions can be produced, which indicates how united or disunited a group is and identifies the vocal and deviant member countries.

To summarize countries' positions on the issues, three programs - SCORES, BIMED34, and MBLOC - are used.

Program SCORES computes the national scores of countries that have spoken on each of the issue-variables being analyzed. Before it can be executed, the user must specify the issue-variables to be analyzed in specific time periods, identify the themes that appear in more than one of the variables being analyzed, determine whether any data changes are to be made, and create the necessary control cards.

BIMED 34, a standard regression program, estimates the amount of influence group affiliations have on country positions. A series of control cards must be created for each issue-variable that is to be analyzed. A regression analysis can be done separately for each variable, or all variables can be done in a single run by stacking their control cards back to back.

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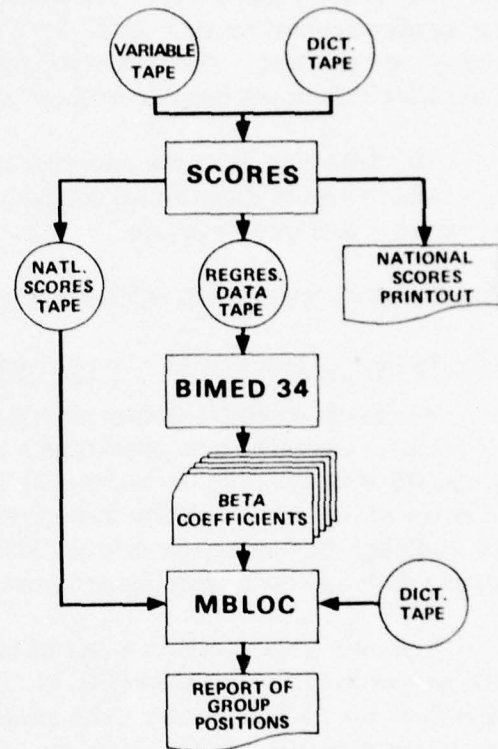
Program MBLOC calculates preferred positions for all countries on all of the variables being analyzed and produces a report of group positions. Before it can be executed, the user must organize the beta coefficient decks produced by BIMED34 and create the necessary control cards. If the user is not interested in group positions, this program should not be used. The forecasting programs described later also calculate preferred positions and do not require MBLOC as a prerequisite.

The following sections describe the preliminary steps to be taken and control cards needed to execute these three programs. The programs are presented in the order in which they are to be executed.

COMPUTING NATIONAL SCORES OF COUNTRIES WITH DATA

Identifying the Issues and Time Periods for Analysis

The issue-variable output tape from program PROFLE serves as input to program SCORES. This tape can contain data on up to 45 issue-variables during four time periods. Although it is possible to analyze all of this data at once, normal practice is to examine subsets of the issues and the time periods. These subsets are identified by the analyst by studying the country profile by issue-variable. Each subset is then analyzed separately through the remaining programs.

The user should obtain a list of issue-variables to be analyzed in a time period. All issues must be analyzable (i.e., have sufficient data) in the time period(s) specified and they must all be on the same issue-variable tape. All issues that will ultimately be packaged together are included in a single run. The issues selected are entered on an issue-variable selection card described later.

The user should also obtain a list of time periods to be used in the analysis and a positive integer weight for each. These weights identify how a particular time period's data is to be handled in the current analysis. These weights are then entered on a time period selection card described later.

Identifying Themes Used More Than Once

Before program SCORES can be executed, the user should obtain a list of themes that appear in more than one of the issue-variables being analyzed. A SEARCH print-out (see appendix B) is particularly useful for this purpose. The analyst supplies the user with a list of multiply used themes and identifies for each theme one of the issue-variables in the set that it has been assigned to. This list is produced so that the analyst can treat the observations on multiply used themes differently from other observations if the issues are ever packaged together. Although it must be created at this stage, it is not used until program MAXPAC is executed.

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Identifying the Data Changes

Occasionally it is necessary to modify some of the data on the issue-variable tape. This can occur when new information has been obtained about a country's position on an issue or when the analyst wants to test the effect of a shift in a country's position on its fellow group members or on the outcome on the issue. Although data is normally left unchanged, this option allows the analyst to test various scenarios.

Each change requires an analyst's judgment as to the position and salience (number of mentions) that a country should have on an issue in a particular analysis. The issue-variable input tape is not changed, but all output from this analysis reflects these modifications. All permanent changes must be made to the raw data tape as described in appendix A.

The position that a country is made to take depends upon the new information or the scenario. The salience it is given depends upon the purpose of the change, but it is normally the same as the total frequency of mentions in the time period(s) selected, as shown in the country profile by issue-variable. To obtain this salience, the total number of mentions by the country on all themes within the issue-variable should be tallied for each time period selected. These time period totals are then multiplied by the weight assigned to each time period and then summed. The positions and saliences that countries are given substitute for any of their existing data on the input tapes.

All new positions and saliences are entered in a change file described in the next section. The only potential difficulty in setting up this file is that all positions must be positive integers. If the analyst wants to assign a non-integer position to a country, the user must follow the procedure below so that the resulting value will approximate the one desired. With the knowledge that two or more positions entered in the change file for the same country on the same issue-variable will ultimately be averaged together, the following procedure can be used to produce the equivalent of a non-integer position:

(1) Identify the two integers between which the new position falls; i.e., 2.5 is between 2 and 3. One is the lower limit (LL) and the other the upper limit (UL).

(2) Substitute the new salience for S and the upper and lower limits in the following equation and solve for X and (S-X).

$$\text{New position} = \frac{(LL \times X) + (UL \times (S - X))}{S}$$

Example: If a new position of 2.4 with a salience of 10 is to be assigned, then this equation becomes

$$2.4 = \frac{2X + (3 \times (10 - X))}{10}$$

or

$$2.4 = \frac{30 - X}{10}$$. Thus X is 6 and $(S - X)$ is 4.

If X is an integer (as in the example), the new position will not be approximated; if it is a real number, then an approximate position will be obtained. When X is real, the user should round it to the closest integer value (i.e., 1.7 is closest to 2 and 5.3 is closest to 5) and then calculate S-X.

With this procedure, two entries are made in the change file -- one with the lower limit and X as the position and salience and the other with the upper limit and (S-X). In the example above, this would mean one entry of 2 and 6 and another of 3 and 4. The user should follow this procedure whenever the analyst requires that a country be assigned a non-integer position. The procedure should be adequate for all scenarios.

Executing Program SCORES

This program calculates national scores (weighted averages) for the states that have spoken on an issue-variable. It produces two output tapes that allow estimates to be calculated for the remaining states.

Input:

    Issue-variable tape
    Dictionary tape
    Control card deck:
        Main problem card
        Issue-variable selection card
        Time period selection card
        Multiply used theme file (optional)
        Change file (optional)

Output:

    Regression tape
    National scores tape
    National scores printout

Main Problem Card

The main problem card specifies the input and output units as well as the type of national scores printout to be produced. The following right-justified format is used:

CC	Format	Description
1-5	I5	Number of countries on the issue-variable tape (=149)
6-10	I5	Logical unit of the regression tape (=48)
11-15	I5	Logical unit of the issue-variable tape (=49)
16-20	I5	Logical unit of the national scores tape (=47)
21-25	I5	Logical unit of the dictionary tape (=45)
26-30	I5	Number of themes in the multiply used theme file
31-35	I5	Total number of data change cards in the change file
36-40	I5	Creating a regression tape? =0: no =1: yes (required, to obtain table of number of countries that is input to BIMED)
41-45	I5	Creating a national scores tape? =0: no =1: yes
46-50	I5	Print report by issue-variable? =0: no =1: yes
51-55	I5	Print report by country? =0: no =1: yes

Issue-Variable Selection Card

An issue-variable selection card identifies the list of issues to be analyzed in the same time period(s). A maximum of 45 issues can be selected, and all must appear on the same issue-variable tape. (See codebook to identify the issue-variable numbers of interest.) The following format is used:

CC	Format	Description
1-70	70I1	Each field (1-70) represents an issue-variable. A "1" punch in column X selects issue-variable X for analysis.

Time Period Selection Card

This card identifies the weight assigned to the data in each of the time periods on the issue-variable input tape. A time period to be excluded from the current analysis is given a weight of zero; a time period to be included is assigned a positive integer weight. A weight of 1 is most common. Assigning a weight of 2 has the effect of doubling the frequency of remarks made in the time period, which allows them to have greater effect on the national scores that result. Any positive integer can be selected as a weight. The following right-justified format is used:

CC	Format	Description
1-2	I2	Integer or zero weight assigned to the data in the first time period
3-4	I2	Weight assigned to the second time period, if it exists
5-6	I2	Weight assigned to the third time period, if it exists
7-8	I2	Weight assigned to the fourth time period, if it exists

Multiply Used Theme File

This optional file contains a list of themes that appear in two or more issue-variables that have been selected for analysis. Following each theme is the number of a selected issue-variable which contains that theme. The themes, with their issue-variable assignments, can be listed in any order, but placing them in numerical order reduces the possibility of error. The following right-justified format is used:

	CC	Format	Description
First	1-5	I5	Theme number of a multiply used theme
Theme	6-10	I5	Number of a selected issue-variable which contains that theme
Second	11-15	I5	Theme number
Theme	16-20	I5	One of its selected issue-variables

.
.
.
.

(Continue through CC 80 and on additional cards if necessary)

Change File

This optional file contains all of the changes to a country's positions and saliences. The positions and saliences appearing in this file substitute for a country's existing data on the issue-variable. Each change must be listed on a separate card, but the cards can be in any order. The following right-justified format is used for each card:

CC	Format	Description
1-5	I5	Country number
6-10	I5	Issue-variable number
11-15	I5	New position on this issue
16-20	I5	New salience (number of mentions)

Illustrative Input and Output

Let us assume that variables 5, 9, 48, and 49 are to be analyzed in all four time periods, but the data for the fourth time period is to have twice the weight of the others. In addition, two data changes are to be made - country 100 is to receive a new score of 1.0 with a salience of 10 on variable 5 and country 140 is to get a score of 2.0 with a salience of 20 on variable 9. There are no themes that appear in more than one issue being analyzed.

Let us further assume that both a regression tape and a national scores tape are to be produced and that the printout is to be organized by country and by issue-variable. The control card deck needed to produce this is as follows:

```
CARD COLUMNS
          111111111122222222223333333333444444444455555
 123456789012345678901234567890123456789012345678901234 5


        Main Problem Card   149   48    49    47    45    0     2     1     1    1      1
Issue-Variable Selection Card    1    1                                         11
   Time Period Selection Card 01010102
              Change File   100    5     1    10
                            140    9     2    20
```

Excerpts from the resulting printout appear as figures 7 and 8. Figure 7 contains the summary statistics for the issues being analyzed and the beginning of the national scores by country printout. The mean, standard deviation, and size (total number of observations) are printed for each selected issue-variable. Following these is a list of the number of countries with data on each of the issues. There are, for example, 142 states with data on variable 5. This list is essential for setting up the control cards for BIMED34, the next program in the system. The remaining portion of figure 7 displays the national scores for the first three countries on the four selected variables. Algeria, for example, has a national score of 1.857 on variable 9 based on 7 observations. This national score can be translated into a substantive position by locating scale values 1 and 2 on variable 9 in the codebook. Algeria's position falls between these two positions.

Figure 8 is the beginning of the national scores by issue-variable printout for variable 9. The countries with data are listed in order by country number. Note that Algeria appears with a score of 1.857 and with 7 observations as it did in figure 7.

This example ran in 3 minutes and produced 3000 lines.

VARIABLE	MEAN	STD	SIZE
5	4.74	4.27	3188
9	2.31	3.14	642
48	7.28	3.81	1236
49	11.18	4.65	1579

5	142
9	134
48	142
49	145

PROFILE FOR AFGHANISTAN

	NATIONAL SCORES	NO. OF OBSERVATIONS
5 THE EXPLOITATION SYSTEM	3.739	23.000
9 PRODUCTION CONTROLS	1.000	4.500
48 SR ON THE HIGH SEAS	10.000	6.000
49 SR IN THE EZ	13.667	6.000

PROFILE FOR ALBANIA

	NATIONAL SCORES	NO. OF OBSERVATIONS
5 THE EXPLOITATION SYSTEM	3.273	22.000
9 PRODUCTION CONTROLS	1.000	2.000
48 SR ON THE HIGH SEAS	10.000	4.000
49 SR IN THE EZ	13.250	8.000

PROFILE FOR ALGERIA

	NATIONAL SCORES	NO. OF OBSERVATIONS
5 THE EXPLOITATION SYSTEM	3.310	29.000
9 PRODUCTION CONTROLS	1.857	7.000
48 SR ON THE HIGH SEAS	10.000	6.000
49 SR IN THE EZ	13.900	10.000

FIG. 7: NATIONAL SCORES BY COUNTRY

VARIABLE 9   PRODUCTION CONTROLS

AFGHANISTAN	1.000	4
ALBANIA	1.000	2
ALGERIA	1.857	7
ARGENTINA	6.143	7
AUSTRALIA	4.500	4
AUSTRIA	1.000	1
BAHAMAS	1.000	2
BAHRAIN	1.000	2
BARBADOS	1.000	2
BELGIUM	1.000	2
BHUTAN	1.000	4
BOLIVIA	2.000	6
BOTSWANA	1.000	2
BRAZIL	1.000	14
BULGARIA	1.000	1
BURMA	1.000	2
BURUNDI	1.000	2
CAMBODIA	1.000	2
CAMEROON	1.000	2
CANADA	1.000	7
C AFRICAN REPU	1.000	2
CEYLON	1.550	20
CHAD	1.000	2
CHILE	1.000	37
CHINA (PR)	1.000	2
COLOMBIA	1.000	4
CONGO BRAZ	1.000	10
COSTA RICA	1.000	2
CUBA	1.000	10
CYPRUS	1.000	2
DAHOMEY	1.000	2
DENMARK	1.000	2
DOMINICAN REPU	5.500	4
ECUADOR	1.000	6
EL SALVADOR	1.010	5
EQUITORIAL GUI	1.000	2
ETHIOPIA	1.000	2
FIJI	2.750	8
FINLAND	1.000	1
FRANCE	4.857	14
GABON	1.000	3
GAMBIA	1.000	2
GHANA	5.667	6
GREECE	1.857	7
GUATEMALA	1.000	3
GUINEA	1.000	2
GUYANA	1.000	2
HAITI	1.000	2
HONDURAS	1.000	3
INDIA	1.600	10
INDONESIA	1.000	3
IRAN	1.000	3
IRAQ	1.000	9
IRELAND	10.000	2
ISRAEL	7.500	8
ITALY	1.000	1
IVORY COAST	1.000	2
JAMAICA	1.000	6

FIG. 8: NATIONAL SCORES BY ISSUE-VARIABLE

PRODUCING ESTIMATING EQUATIONS

BIMED34

After the national scores have been calculated for countries with data on each of the selected issue-variables, estimated scores must be derived for the remaining countries. Regression equations produced by BIMED34 make it possible to estimate these scores.

The regression tape produced by program SCORES serves as the input data tape for BIMED. The regression tape has 70 files, one for each issue-variable. Since the maximum number of variables that can be analyzed through the programs is 45, at least 25 files on this input tape will be empty during any run. With a 70-file tape, however, the user can be certain that if variable 5 was analyzed in program SCORES, then its data is in file 5.

The most important outputs from BIMED34 are the punched beta coefficient cards which serve as input to subsequent programs. Approximately 25 cards are punched for each issue regression.

> Input:
>   Regression tape (from program SCORES) on LU1
>   BIMED load-and-go tape (reel 115) on LU14
>   Control cards:

1st regression	Main problem card Variable name card(s) Variable format card Subproblem card Forcing mode card
2nd and all subsequent regressions	Main problem card Variable name card(s) Variable format card

Finish card

> Output:
>   Regression printout
>   Punched beta coefficient cards (approximately 25 per regression)

The control cards for BIMED34 are described in CNA Professional Paper No. 48 (1970). A typical study application of it requires only a limited number of options and cards and only those are described here. If a non-standard analysis is requested, the user should refer to the complete write-up.

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When performing more than one regression in a single job, the user is cautioned to stack the control cards back to back in numerical order by issue-variable. For example, if regressions are being run on variables 5, 9, 48, and 49, the first regression should be run on variable 5, the second on variable 9, and so forth. Control cards required for the third and subsequent regressions are the same as those required for the second.

Main Problem Card for the First Regression

This card is the first one in the input deck and it specifies the input and output options for the first regression. All entries are right-justified.

CC	Description
1	= $ (required)
7-11	Number of countries with national scores on the issue-variable being regressed (taken from the table at the front of program SCORES output)
12-13	Number of country characteristics (independent variables) (=36)
17-18	Index of country characteristics to be used as the weight (salience) (=36)
20	=1: records all specified subproblems following this main problem for use on later main problems
21	=1: forces the regression through the origin
25	=2: deletes covariance matrix
	=3: deletes correlation matrix
	=4: deletes both the correlation and covariance matrices
34	=1: logical unit of the input data tape
35-36	Number of files to be skipped on input tape before reading (if processing issue-variable 5 this value would be 4)
38	=1: reads input tape in BCD
41-70	Alphanumeric description of the problem

Variable Name Cards

These cards contain the names of the country characteristics (independent variables) that will be read off the input tape. The regression input tape contains the following independent variables: variable 1 is the national score, variables 2 through 35 are the dichotomous independent variables that are in the sixth dictionary file (see table B-1),

and variable 36 is the salience or number of observations by this country. The user must shorten names to 6 characters. The following format is used. Note that the names can be entered through card column 72. Additional cards may be necessary.

CC	Description
1-2	VN (required)
5-6	Index number of first variable named
7-12	Name of first variable (the national score)
15-16	Index of number of second variable named
17-22	Name of second variable
.	.
.	.
.	.
65-66	Index number of last variable named on this card
67-72	Name of last variable on this card

Variable Format Card

This card is used to read the 36 independent variables mentioned above from the regression tape produced by SCORES. The following left-justified format is required:

CC	Description
1-80	VF(F6.2, 34F3.1, F5.1)

Subproblem Card for First Regression

This card specifies the form of the regression and the type of output required. The following right-justified format is used:

CC	Description
1	=$ (required)
5-6	=1: index number of the national score (from variable name card)
7	=0: ANOVA table at last step only
8	=1: delete covariance matrix of coefficients
9	=2: residuals listed after the last step
10	=blank: lists and plots residuals =2: suppresses list of residuals

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CC	Description
13	=blank: beta coefficients not punched (trial run)
	=1: punches beta coefficients at the last step
20	=1: records the control cards for this sub-problem
21-22	=-1: deletes all variables not mentioned on the forcing mode card
41-42	=25: maximum number of steps allowed

Forcing Mode Card

This card contains the list of eligible independent variables that are either forced into the regression or are allowed to enter when they make a substantial contribution. A "+" serves as the control character for all independent variables that are free to enter. Any independent variable not mentioned on this card will never enter the regression equation.

A typical analysis forces in the regional groups (Africa, Asia, Latin America, WEO, and Eastern Europe) and three of the four geographic groups (usually, shelflocked, narrow shelf, and land-locked). The user cannot include all of the regional groups and all of the geographic groups, because this would have the effect of two constants (i.e., all states belong to one and only one group within each of these categories). Other independent variables that are typically excluded from the equations are the Major Western Powers, non-aligned states, the Group of 77, and the group of states with straits less than 6 miles wide. These are excluded because they are linear combinations of other variables. Variable 31 is also excluded because it is currently unused. All other variables are free to enter at the discretion of the regression model.

The forcing mode cards have the following right-justified format. Independent variables can be listed through card column 62 and can be listed in any order. Additional cards in the same format may be used.

CC	Description
1-2	FM (required)
4	Control character for the first independent variable (blank or +)
5-6	Index number of first variable
8	Control character for the second variable
9-10	Index number of second variable
.	.
.	.

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CC	Description
60	Control character of last variable on this card
61-62	Last index number on this card

Main Problem Card for Subsequent Regression

The entries on the main problem card for the second and subsequent regressions are the same as those specified for the first regression, with the following exceptions:

CC	Description
7-11	Number of countries with national scores on new issue-variable being regressed
20	=2: uses previously recorded subproblem cards on this main problem
35-36	Number of files to be skipped on the input tape to get from the file just read to the next issue-variable being regressed; equal to new file number minus the last file number read (if the first regression was on issue-variable 5 and the second on issue-variable 9, this entry is 4; i.e., 9-5); all issues run through BIMED34 must be placed in increasing order.
41-70	Alphanumeric description of this problem

Variable Name Cards for Subsequent Regressions

These cards are identical to those for the first regression.

Variable Format Card for Subsequent Regressions

This card is identical to the one used in the first regression.

Finish Card

To indicate the end of the job, a finish card is required before the end of file card. It consists of six dollar signs in the first six columns of a card. It should appear after the last set of control cards, whether one regression or dozens of regressions have been requested.

Illustrative Input

A typical BIMED34 control card deck appears as figure 9. This input deck will perform regressions on variables 5, 9, 48, and 49. The variables forced into the equation or left free to enter are the ones described earlier on the forcing mode card. The example ran in 1-1/2 minutes, produced 700 lines, and punched 100 cards.

```
CARD COLUMNS
          11111111112222222222333333333344444444445555555555666666666677777777778
 123456789012345678901234567890123456789012345678901234567890123456789012345678890


 $       14236    36 11    4        104 1  VAR 5
 VN  01SCORE    020FSHOR   03MAJOIL   04MAJMIN   05DSTFSH   06DCATCH   07LL
 VN  08SL       09NSHELF   10BSHELF   11STRAIT   12BWNAVY   13CNAVY    14MMERCH
 VN  15AFRICA   16ASIA     17LATIN    18-77-     19EEUROP   20WEO      21ARAB
 VN  22SCAND    23BIGRUP   24TREATY   25NAL      26EEC      27LTLGRP   28CARIB
 VN  29YAOUND   30OPEC     31BLANK    32STRLE6   330CNARC   34CSTARC   35SES
 VN  36WEIGHT
 VF(F6,2,34F3,1,F5,1)              .
 $    10122  1      1-1               25
 FM +01  02  03  04  05    06 +07 +08 +10   11   12   13   14 +15 +16
 FM +17 +19 +20  21  22    24  26  27  28   29   30   33   34   35
 $       13436    36 21    4        104 1  VAR 9
 VN  01SCORE    020FSHOR   03MAJOIL   04MAJMIN   05DSTFSH   06DCATCH   07LL
 VN  08SL       09NSHELF   10BSHELF   11STRAIT   12BWNAVY   13CNAVY    14MMERCH
 VN  15AFRICA   16ASIA     17LATIN    18-77-     19EEUROP   20WEO      21ARAB
 VN  22SCAND    23BIGRUP   24TREATY   25NAL      26EEC      27LTLGRP   28CARIB
 VN  29YAOUND   30OPEC     31BLANK    32STRLE6   330CNARC   34CSTARC   35SES
 VN  36WEIGHT
 VF(F6,2,34F3,1,F5,1)
 $       14236    36 21    4        139 1  VAR 48
 VN  01SCORE    020FSHOR   03MAJOIL   04MAJMIN   05DSTFSH   06DCATCH   07LL
 VN  08SL       09NSHELF   10BSHELF   11STRAIT   12BWNAVY   13CNAVY    14MMERCH
 VN  15AFRICA   16ASIA     17LATIN    18-77-     19EEUROP   20WFO      21ARAB
 VN  22SCAND    23BIGRUP   24TREATY   25NAL      26EEC      27LTLGRP   28CARIB
 VN  29YAOUND   30OPEC     31BLANK    32STRLE6   330CNARC   34CSTARC   35SES
 VN  36WEIGHT
 VF(F6,2,34F3,1,F5,1)
 $       14536    36 21    4        101 1  VAR 49
 VN  01SCORE    020FSHOR   03MAJOIL   04MAJMIN   05DSTFSH   06DCATCH   07LL
 VN  08SL       09NSHELF   10BSHELF   11STRAIT   12BWNAVY   13CNAVY    14MMERCH
 VN  15AFRICA   16ASIA     17LATIN    18-77-     19EEUROP   20WEO      21ARAB
 VN  22SCAND    23BIGRUP   24TREATY   25NAL      26EEC      27LTLGRP   28CARIB
 VN  29YAOUND   30OPEC     31BLANK    32STRLE6   330CNARC   34CSTARC   35SES
 VN  36WEIGHT
 VF(F6,2,34F3,1,F5,1)
 $$$$$$
```

FIG. 9: CONTROL CARDS FOR ILLUSTRATIVE RUN OF BIMED34

COMPUTING PREFERRED POSITIONS OF COUNTRIES AND GROUPS

Organizing the Beta Coefficient Cards

The beta coefficient cards punched by BIMED34 must be organized before MBLOC or any programs after MBLOC can be executed. The user must (1) separate the beta cards for each issue-variable, removing all cards that do not pertain to the independent variables (e.g., CNA accounting cards and cards with the dependent variable title SCORE in the first eight fields), (2) count the number of beta cards for each issue-variable, and (3) refer to the codebook for the maximum assigned scale value in each of the issue-variables. Once this procedure has been completed, the user can create the beta coefficient file described in the following paragraphs.

Executing Program MBLOC

MBLOC calculates estimated scores from the beta coefficients derived from BIMED34, calculates preferred positions from both estimated scores and national scores, and produces a final report of group positions for each issue run through BIMED. If the analyst is not interested in group positions, the user should create the beta coefficient file described here and then proceed to the forecasting programs.

This program produces two types of group reports - a summary table of group positions on an issue and a detailed report which identifies vocal and deviant members of each group. Owing to their size, the detailed reports should not be produced routinely.

Input:

National scores tape (output from program SCORES)
Dictionary tape
Control card deck:
   Main problem card
   Issue-variable selection card
   Beta coefficient file
   Group name file

Output:

Summary report of group positions for each selected issue-variable

Optional detailed report by group for each selected issue-variable

Main Problem Card

The main problem card specifies the input units and the form of the output. The following right-justified format is used:

CC	Format	Description
1-5	I5	Logical unit of the dictionary tape (=45)
6-10	I5	Logical unit of the national scores data tape (=49)
11-15	I5	Number of variables being run, not to exceed 45
16-20	I5	Number of countries (=149)
21-25	I5	Form of the output for each issue =0: summary table plus a detailed report by group =1: summary table only

Issue-Variable Selection Card

This card contains the list of issue-variable numbers that are being selected for this run. All of these issue-variables must be on the same national scores tape and have a set of beta cards in the beta coefficient file. The total number of variables must be equal to the value in CC 11-15 of the main problem card. The issue-variables must be in numerical order and in the following right-justified format:

CC	Format	Description
1-80	40I2	Issue-variable numbers for the issues selected in this run, listed in ascending order

An additional card in the same format is used when there are more than 40 variables.

Beta Coefficient File

This file contains the beta coefficient cards produced by BIMED34 for the issue-variables listed on the issue-variable selection card. For each selected issue-variable, a deck is created which consists of an issue-variable control card followed by all of its beta coefficient cards. The file is merely the set of resulting decks in numerical order by issue-variable. The issue-variable control card is in the following right-justified format:

CC	Format	Description
1-2	I2	Number of beta coefficient cards for this issue-variable that follow this card
3-7	F5.0	Maximum scale value in this variable

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Group Name File

This file consists of a set of cards containing the names of the 34 independent variables that could have been used in the regression analysis. The user should refer to the variable name cards used in the BIMED input deck for variables 2 through 35. These names can be expanded to 8 characters to increase readability, but need not be.

The group name file consists of cards written in 10A8 format with the groups entered in numerical order across each card; that is, in the same order in which they appeared on the variable name cards for BIMED34. Since there are typically 34 groups, four cards will be necessary (3 full and 1 partially filled).

Illustrative Input and Output

Continuing with the same example, assume that all four variables (5, 9, 48, and 49) are to be run through MBLOC and that a summary and a detailed group report is required. The input deck appears as figure 10.

Sample output is also presented (figures 11 and 12). Figure 11 contains the summary table for variable 5. It lists the mean and standard deviation of the 34 groups from their data alone, regression estimates alone, and preferred positions. The group appear in numerical order by preferred position. The summary table also includes the number of group members with known positions and the total number of group members.

Figure 12 is an example of the detailed group reports. It lists the group mean based on preferred positions and all of the group members with their national scores (if any), estimated scores and preferred positions. The members are listed in numerical order by preferred position.

The example ran in 2-1/2 minutes and produced 5500 lines.

```
CARD COLUMNS
          1111111111222222222233333333334444444444555555555566666666666777777777773
123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890


    43   44   4  149    0
05094849
2517.
OFSHOP 2-1.33570-001 3.51461-001-5.03517-002-1.31844-002     VAR 5        1- 1
MAJOIL 3 5.66353-001 4.25233-001 1.22200-001 2.82761-002     VAR 5        1- 1
MAJMIN 4 1.13257+000 4.67316-001 2.13637-001 4.33633-002     VAR 5        1- 1
DSTFSH 5-3.52893-001 5.05649-001-6.45860-002-1.56354-002     VAR 5        1- 1
DCATCH 6-4.32600-001 5.39865-001-7.38670-002-1.69495-002     VAR 5        1- 1
LL     7 5.44434-003 4.64033-001 1.03462-003 1.56961-004     VAR 5        1- 1
SL     8 6.76016-001 4.54727-001 1.33243-001 3.51234-002     VAR 5        1- 1
BSHELF10-6.45363-003 3.73046-001-1.59928-003-3.22203-004     VAR 5        1- 1
STRAIT11 3.30673-001 3.92230-001 9.16961-002 2.25021-002     VAR 5        1- 1
BWNAVY12-6.34541-001 6.90101-001-8.47067-002-2.43653-002     VAR 5        1- 1
CNAVY 13-5.05291-001 3.31457-001-1.21542-001-4.41394-002     VAR 5        1- 1
MMERCH14 8.89464-001 7.26375-001 1.12449-001 2.15375-002     VAR 5        1- 1
AFRICA15 3.50567+000 3.53120-001 6.76122-001 2.13536-001     VAR 5        1- 1
ASIA  16 3.29283+000 4.15057-001 5.91423-001 2.15135-001     VAR 5        1- 1
LATIN 17 3.11936+000 5.42948-001 4.69049-001 1.45237-001     VAR 5        1- 1
EEUROP19 7.45224+000 9.21945-001 5.93669-001 5.32226-002     VAR 5        1- 1
WEC   20 5.11895+000 7.75497-001 5.20915-001 1.47589-001     VAR 5        1- 1
ARAB  21-2.54196-001 4.74669-001-5.21473-002-4.33597-003     VAR 5        1- 1
SCAND 22-4.43813-001 9.74733-001-7.97773-002-5.35674-003     VAR 5        1- 1
TREATY24 1.51372+000 5.95254-001 2.26418-001 5.17485-002     VAR 5        1- 1
EEC   26 3.73396+000 7.55119-001 4.13944-001 5.03702-002     VAR 5        1- 1
LTLGRP27 4.54743+000 9.77710-001 3.95023-001 5.85374-002     VAR 5        1- 1
CARIB 28 3.47411-001 6.10363-001 5.25537-002 9.12050-003     VAR 5        1- 1
OCNARC33 2.66023-001 4.96239-001 4.93015-002 5.47098-003     VAR 5        1- 1
SES   35 5.24101-001 4.50925-001 1.07644-001 3.13253-002     VAR 5        1- 1
2512.
OFSHOR 2 3.37233-001 2.33483-001 1.13210-001 5.95560-002     VAR 9        2- 1
MAJOIL 3 9.83947-001 4.06443-001 2.27191-001 1.23313-001     VAR 9        2- 1
DSTFSH 5 2.76626-001 4.46207-001 5.92759-002 3.05091-002     VAR 9        2- 1
DCATCH 6-8.41442-001 3.71886-001-2.11864-001-1.05393-001     VAR 9        2- 1
LL     7 4.44710-002 4.87347-001 8.73028-003 1.52489-003     VAR 9        2- 1
SL     8-2.17622-001 3.83311-001-5.42967-002-1.82583-002     VAR 9        2- 1
BSHELF10 1.46908-001 3.66154-001 3.68352-002 1.64942-002     VAR 9        2- 1
STRAIT11 2.55430-001 2.95775-001 8.24359-002 4.45903-002     VAR 9        2- 1
CNAVY 13 9.56030-001 2.71056-001 2.98792-001 1.46281-001     VAR 9        2- 1
MMERCH14-5.41305-001 6.67750-001-7.74250-002-3.73643-002     VAR 9        2- 1
AFRICA15 1.11026+000 4.31095-001 2.39568-001 9.93134-002     VAR 9        2- 1
ASIA  16 9.33314-001 4.31557-001 2.29561-001 1.23187-001     VAR 9        2- 1
LATIN 17 1.25136+000 4.12973-001 2.78855-001 1.37232-001     VAR 9        2- 1
EEUROP19-1.43385+000 3.10229-001-1.55299-001-1.31943-002     VAR 9        2- 1
WEC   20 2.91623+000 4.36537-001 4.77370-001 2.75303-001     VAR 9        2- 1
ARAB  21-6.72335-001 4.59696-001-1.34733-001-3.73034-002     VAR 9        2- 1
SCAND 22-8.81696-001 1.03238+000-8.15297-002-5.95573-003     VAR 9        2- 1
TREATY24-4.86457-001 5.33444-001-8.70163-002-4.34496-002     VAR 9        2- 1
EEC   26-1.19304+000 6.33043-001-1.76496-001-2.75843-002     VAR 9        2- 1
LTLGRP27 7.10356+000 8.99816-001 6.07422-001 3.70097-001     VAR 9        2- 1
CARIB 28-4.75460-001 5.03369-001-8.91254-002-1.89968-002     VAR 9        2- 1
YAOUND29-4.45331-001 5.00224-001-8.49635-002-1.85820-002     VAR 9        2- 1
```

FIG. 10: CONTROL CARDS FOR ILLUSTRATIVE RUN OF PROGRAM MBLOC

```
OPEC   30-8.28239-001  5.39256-001-1.45540-001-4.03084-002        VAR 9       2- 1
OCNARC33 5.15165-001  5.07345-001  9.68022-002 1.83230-002        VAR 9       2- 1
CSTARC34-1.23136+000  5.74546-001-2.01166-001-7.58494-002        VAR 9       2- 1
2510.
OFSHOR 2 2.60764-001  4.07724-001  5.90241-002 1.13042-002        VAR 48      3- 1
MAJOIL 3-8.58065-001  5.15449-001-1.51997-001-3.04793-002        VAR 48      3- 1
MAJMIN 4-3.50270-001  5.02026-001-6.43698-002-1.13216-002        VAR 48      3- 1
DCATCH 6-5.90164-001  5.69039-001-9.54445-002-1.91411-002        VAR 48      3- 1
LL     7-1.63453+000  5.14291-001-2.81909-001-3.35317-002        VAR 48      3- 1
SL     8-1.33441-001  4.30621-001-2.86367-002-3.23114-003        VAR 48      3- 1
BSHELF10 4.43276-001  4.14446-001  9.84014-002 1.67403-002        VAR 48      3- 1
STRAIT11-3.47632-001  4.14561-001-7.65562-002-1.51743-002        VAR 48      3- 1
BWNAVY12 6.38324-001  7.44850-001  7.89867-002 2.00650-002        VAR 48      3- 1
CNAVY 13-3.92167-001  4.00518-001-9.01538-002-2.03085-002        VAR 48      3- 1
MMERCH14-1.68170+000  6.44302-001-2.34565-001-3.83523-002        VAR 48      3- 1
AFRICA15 9.27801+000  4.97136-001  6.65189-001 3.61720-001        VAR 48      3- 1
ASIA  16 9.41445+000  4.44552-001  8.30548-001 3.73314-001        VAR 48      3- 1
LATIN 17 9.14843+000  5.45215-001  8.22338-001 2.17457-001        VAR 48      3- 1
EEUROP19 4.57871+000  7.27366-001  5.02969-001 5.54345-002        VAR 48      3- 1
WEC   20 6.19556+000  6.23092-001  6.75870-001 1.41732-001        VAR 48      3- 1
ARAB  21 5.48954-001  5.10166-001  5.89865-002 9.09518-003        VAR 48      3- 1
TREATY24-4.95897-001  5.65969-001-8.07536-002-1.16772-002        VAR 48      3- 1
EEC   26-2.22320+000  7.29323-001-2.71251-001-1.35204-002        VAR 48      3- 1
LTLGRF27-1.93790+000  7.35737-001-2.43494-001-2.57421-002        VAR 48      3- 1
CARIB 28 3.26391-001  5.94824-001  4.33659-002 4.02401-003        VAR 48      3- 1
YAOUNC29 2.93153-001  5.45187-001  4.96501-002 4.83424-003        VAR 48      3- 1
OPEC  30 6.32633-001  6.67056-001  9.55564-002 8.00112-003        VAR 48      3- 1
OCNARC33-2.31109-001  5.85002-001-4.43810-002-3.15361-003        VAR 48      3- 1
CSTARC34 4.87619-001  6.58092-001  6.93416-002 8.82834-003        VAR 48      3- 1
2515.
OFSHOR 2-2.82801-001  3.78557-001-6.80390-002-9.09528-003        VAR 49      4- 1
MAJOIL 3-1.02500+000  5.12183-001-1.79862-001-2.49805-002        VAR 49      4- 1
DSTFSH 5-4.59174-001  5.06353-001-8.26615-002-9.17781-003        VAR 49      4- 1
DCATCH 6 4.28502-001  4.78855-001  8.14163-002 8.54043-003        VAR 49      4- 1
LL     7-1.30707+000  4.42874-001-2.60142-001-1.51713-002        VAR 49      4- 1
SL     8 1.98376-001  5.21198-001  3.47243-002 2.37005-003        VAR 49      4- 1
BSHELF10 7.88033-001  3.83127-001  1.84539-001 2.03375-002        VAR 49      4- 1
STRAIT11-4.58234-001  3.78128-001-1.09955-001-1.25061-002        VAR 49      4- 1
BWNAVY12 7.56448-001  5.91869-001  1.15885-001 1.47773-002        VAR 49      4- 1
MMERCH14-1.99450+000  6.05735-001-2.87870-001-2.47335-002        VAR 49      4- 1
AFRICA15 1.34735+001  3.00912-001  9.71352-001 3.82213-001        VAR 49      4- 1
ASIA  16 1.31951+001  4.13666-001  9.45782-001 2.95865-001        VAR 49      4- 1
LATIN 17 1.29412+001  4.59302-001  9.31902-001 2.42543-001        VAR 49      4- 1
EEUROP19 6.92662+000  7.73430-001  6.27416-001 4.32323-002        VAR 49      4- 1
WEC   20 8.40935+000  6.47597-001  7.64351-001 1.13801-001        VAR 49      4- 1
ARAB  21 7.77560-001  4.89566-001  1.43482-001 8.80543-003        VAR 49      4- 1
SCAND 22-1.18354+000  9.26933-001-1.14424-001-3.11244-003        VAR 49      4- 1
TREATY24-6.17263-001  5.50515-001-1.00025-001-8.70274-003        VAR 49      4- 1
EEC   26-2.73555-001  7.52951-001-3.31473-002-1.23815-003        VAR 49      4- 1
LTLGRP27-4.34029+000  3.25598-001-4.32665-001-2.83993-002        VAR 49      4- 1
CARIB 28 7.53991-001  6.13134-001  1.11558-001 6.51735-003        VAR 49      4- 1
OPEC  39 5.35961-001  6.24341-001  8.72423-002 4.51863-003        VAR 49      4- 1
OCNARC33-9.31338-001  5.54497-001-1.43940-001-5.32854-003        VAR 49      4- 1
CSTARC34 9.23122-001  6.21432-001  1.34375-001 1.02444-002        VAR 49      4- 1
SES   35-4.77152-001  4.41174-001-9.82538-002-1.04017-002        VAR 49      4- 1
```

```
OFFSHCFEOILPRODNMAJMINFLDISTFISHFSHCATCHLANDLOCKSHELFLOKN.SHELF B.SHELF STRAITS
BLUWATERCOASTAL MAJMERCHAFRICA  ASIA    LAT.AMEFGROUP 77EAST EUPNEO     ARAB
SCAND   BIG GRP TREATY  NOMALIND     EECLITL GRPCARIBEANYAOUNCE OPEC        UNUSED
STRAIT6 OCNARC  CSTARC  SES
```

FIG. 10: (Continued)

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THE FOLLOWING MEANS AND STANDARD DEVIATIONS BY BLOCS ARE FOR VARIABLE   5

NAME OF BLOC	DATA MEAN	DATA STD	EST MEAN	EST STD	SCORE MEAN	SCORE STD	DATA SS	UN SS
UNUSED	0.00	0.00	0.00	0.00	0.00	0.00	0	0
LAT.AMER	3.43	0.39	3.43	0.49	3.43	0.38	25	25
CARIBEAN	3.45	0.26	3.41	0.28	3.45	0.25	14	14
GROUP 77	3.60	0.53	3.72	0.69	3.61	0.52	109	110
AFRICA	3.63	0.49	3.66	0.60	3.63	0.47	41	42
VONALIND	3.65	0.59	3.74	0.64	3.66	0.58	73	74
YAOUNDE	3.69	0.51	3.67	0.74	3.69	0.50	18	18
ARAB	3.73	0.81	3.84	0.57	3.74	0.79	20	20
OPEC	3.78	0.99	4.01	0.69	3.79	0.97	12	12
ASIA	3.89	1.71	4.05	1.24	3.90	1.69	43	43
N.SHELF	4.17	2.42	4.18	1.76	4.17	2.30	59	59
LANDLOCK	4.55	3.08	4.38	1.67	4.64	2.68	24	28
COASTAL	4.93	3.18	4.51	1.91	4.83	2.87	57	58
SES	5.72	3.73	5.55	2.45	5.70	3.48	43	44
OILPRODN	5.89	4.01	5.56	2.82	5.74	3.70	31	31
SHELFLOK	6.02	3.95	5.87	2.43	6.00	3.70	26	27
B.SHELF	6.39	4.30	5.69	3.58	6.08	3.87	33	35
OFFSHORE	6.29	4.36	5.92	3.19	6.12	4.04	42	42
OCNARC	6.38	4.48	5.76	3.48	6.17	4.11	12	12
SCAND	6.47	3.51	6.59	1.81	6.54	3.30	5	5
STRAITS	6.86	4.61	6.60	3.68	6.78	4.35	36	36
MAJMINRL	6.99	4.59	6.70	3.39	6.80	4.22	24	25
STRAIT6	6.99	4.51	7.32	4.54	7.09	4.42	17	17
FSHCATCH	7.89	5.05	7.31	3.97	7.62	4.73	23	24
BLUWATER	8.12	5.02	7.94	3.87	8.04	4.72	24	24
CSTARC	8.80	5.14	7.98	3.88	8.11	4.61	12	14
NEO	8.91	4.34	7.88	3.12	8.21	3.90	25	30
DISTFISH	8.46	5.06	7.75	3.83	8.27	4.80	29	29
TREATY	8.71	4.85	8.44	3.37	8.65	4.58	24	24
EAST EUR	9.82	5.19	7.71	2.16	9.07	4.40	11	12
MAJMERCH	10.70	4.40	9.88	3.64	10.43	4.19	15	15
BIG GRP	11.45	3.41	11.07	3.06	11.42	3.37	12	12
EEC	12.46	1.28	11.56	2.40	12.37	1.33	9	9
LITL GRP	13.41	0.96	13.41	2.12	13.42	0.91	5	5

FIG. 11: PREFERRED POSITIONS OF GROUPS

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SCORES OF COUNTRIES ON VARIABLE 5

THAT BELONG TO THE BLOC   EEC

BLOC MEAN IS 12,37

COUNTRY	DATA	ESTIMATE	
IRELAND	9,500	8,341	9,268
ITALY	11,652	10,991	11,625
DENMARK	12,125	9,630	12,025
BELGIUM	12,444	10,709	12,353
LUXEMBOURG	13,200	10,369	12,943
GERMANY FRG	13,143	11,603	13,040
UK	13,123	14,837	13,152
NETHERLANDS	13,500	11,667	13,392
FRANCE	13,474	15,897	13,536

FIG. 12: PREFERRED POSITIONS OF COUNTRIES IN GROUPS

FORECASTING OUTCOMES

After the issue-variable data has been summarized into national scores for states with data and regression equations have been produced by running BIMED34, the most likely outcome of various voting situations can be forecast. To forecast outcomes, two programs - VMODEL and MAXPAC - are used.

Program VMODEL calculates the most likely outcome on individual issue-variables. Three methods are available: medians, best/worst case analysis, and voting alternative analysis. Before the last two can be executed, the user must obtain a list of best and worst cases and voting alternatives from the analyst and create the necessary control cards.

```
BETA              NATL.
COEFFICIENTS      SCORES
                  TAPE

DICT.    →    VMODEL
TAPE
                               OUTCOMES ON
                               INDIVIDUAL
NATL.        NORM.             VARIABLES
SCORES       DATA
TAPE         TAPE

             MAXPAC

DICT.        OUTCOMES ON
TAPE         PACKAGES OF
             VARIABLES
```
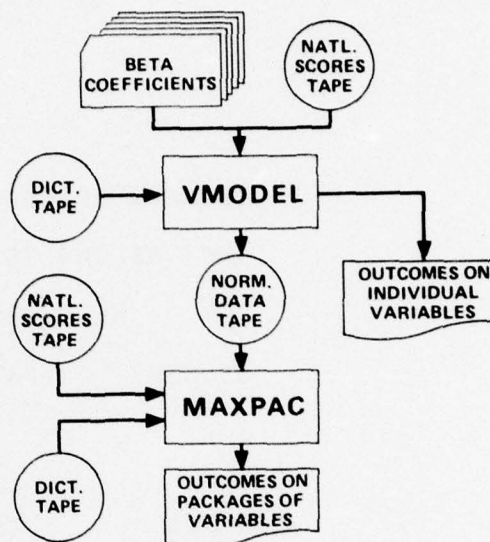
Program MAXPAC calculates the most likely outcomes on packages of issue-variables. A package is a set of issue-variables that will be voted on and adopted or rejected as a set. MAXPAC contains two models - a packaging model and a vote maximization model - which can be run independently or simultaneously. Before program MAXPAC can be executed, the user must determine which model(s) will be used, obtain a list of packages from the analyst that are to be run on them, ascertain whether multiply used themes or unclassified saliences are to be used, and create the necessary control cards.

The following sections describe the preliminary steps to be taken and the control cards needed to execute these two programs. The programs are presented in the order in which they are to be executed. If the analyst wants to test how similar the resulting forecasts are to outside forecasts, the user should refer to appendix C for a description of program VALID.

FORECASTING OUTCOMES OF VOTES ON INDIVIDUAL ISSUES

Identifying Voting Situations

Before program VMODEL can be executed, the user must determine the types of forecasts that are to be produced. If only median forecasts, the user so indicates on the main problem card. If best/worst case analyses or paired voting alternative analyses,

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then the user must create additional input cards. A best and a worst case consist of a range of scale values that the analyst believes reflects definite or potential support for a particular solution to an issue. Ranges of scale values are entered into the best/worst case file. Voting alternatives consist of two scale values that the analyst believes represent a real voting situation to the Conference participants. Voting alternatives are entered into the paired voting alternative file.

Executing Program VMODEL

This program produces the final report of outcomes on individual issue-variables. It also creates a tape which serves as input to the packaging and maximization program, MAXPAC.

> Input:
>> National scores tape (output from program SCORES)
>> Dictionary tape
>> Control card deck:
>>> Main problem card
>>> Issue-variable selection card
>>> Beta coefficient file
>>> Best/worst case file
>>> Paired voting alternative file

> Output:
>> Normalized issue tape (used as input to program MAXPAC) produced on LU46
>> Final report of outcomes on the individual issues

Main Problem Card

This card identifies the logical units of the input tapes and the type of output desired. The following right-justified format is used:

CC	Format	Description
1-2	I2	Number of issue-variables on the isssue-variable selection card
3-5	I3	Number of range cards in the best/worst case file (may equal 0)
6-8	I3	Number of cards in the paired voting alternative file (may equal 0)
9-10	I2	Logical unit of the dictionary tape (=45)
11-12	I2	Logical unit of the national scores tape (=49)

CC	Format	Description
13-14	I2	Preferred positions/median option =0: preferred positions and medians are printed =1: preferred positions and medians are not printed
15-16	I2	Voting alternative option (CC when 6-8≠0) =0: individual state scores are printed =1: only summary outcome table is printed
17-19	I3	Number of countries (=149)

Issue-Variable Selection Card

This required card identifies the issue-variables on which forecasts are to be made. The user is limited to those on the national scores tape which have also been run through BIMED34. Normal practice is to forecast outcomes on all of these issue-variables in a single run. If a subset is to be selected, the user must make certain that all issues that will ultimately be packaged together are included in a single run so that they will all appear on the same normalized output tape. (See the codebook to identify the issue-variable numbers of interest.) The selected issue-variables are entered on a card in the following format:

CC	Format	Description
1-70	70I1	Each column (1-70) corresponds to an issue-variable. A "1" punch in column "X" selects variable X.

Beta Coefficient File

This file contains the beta coefficient cards produced by BIMED34 for the issue-variables listed on the issue-variable selection card.[1] For each selected issue-variable, a deck is created which consists of an issue-variable control card followed by all of its beta coefficient cards. The file is merely the set of resulting decks organized in numerical order by variable. A complete description of the procedure was presented in "Organizing the Beta Coefficient Cards" earlier.

Best/Worst Case File

This optional file contains the best/worst case analyses to be performed on the issues listed on the issue-variable selection card. A best/worst case analysis determines

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[1] This file is identical to the one created for program MBLOC.

the number of countries with preferred positions within a specified range of scale values on an issue-variable. There is no limit to the number of ranges that can be specified and they may appear in any order. Each must appear on a separate card in the following right-justified format:

CC	Format	Description
1-2	I2	Issue-variable number
3-7	F5.0	Lower limit of the range (may equal 0 if the total number of preferred positions below the upper limit is desired)
8-12	F5.0	Upper limit of the range (may equal 0 if the total number of preferred positions above the lower limit is desired)

Paired Voting Alternative File

This optional file contains the voting alternatives to be tested on the issues listed on the issue-variable selection card. Voting alternatives consist of pairs of scale values on a given issue-variable. There is no limit to the number of voting alternatives that can be run on a given issue-variable and they can appear in any order. Each pair must appear on a separate card in the following right-justified format:

CC	Format	Description
1-2	I2	Issue-variable number
3-7	F5.0	Scale value of one alternative
8-12	F5.0	Scale value of the other alternative

Illustrative Input and Output

Continuing with the same example (i.e., analysis of variables 5, 9, 48, and 49), let us assume that all four issues are to be run. Best/worst case analyses and paired voting alternatives with individual states' preferences are to be produced only for issue-variable 5. The output is to include preferred positions and medians for all four issues. The input deck in figure 13 will produce the desired results.

A sample of the resulting output is presented. Figure 14 contains the preferred positions and medians for issue-variable 9. The national score (if it exists), estimated score, preferred position, salience (SS), and residual (i.e. national score minus estimated score) for each country are printed. The last line of this table contains the medians of the national scores, estimated scores, and preferred positions, as well as the average residual. The median of the preferred positions is the most likely outcome on the issue, but a comparison of the three medians is always informative. The actual printout

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```
CARD COLUMNS
         1111111111222222222233333333334444444444555555555566666666667777777777B
123456789012345673901234567890123456739012345678901234567890123456789012345673907890

04002001454900000149
    1    1                                                11
2517,
OFSHOR 2-1,93570-001 3,51461-001-5,08517-002-1,31844-002          VAR 5      1- 1
MAJOIL 3 5,66352-001 4,25233-001 1,22208-001 2,82761-002          VAR 5      1- 1
MAJMIN 4 1,13257+000 4,67316-001 2,18637-001 4,33639-002          VAR 5      1- 1
DSTFSH 5-3,52898-001 5,05669-001-5,43830-002-1,56354-002          VAR 5      1- 1
DCATCH 6-4,32600-001 5,39805-001-7,38870-002-1,69495-002          VAR 5      1- 1
LL     7 5,44404-003 4,64053-001 1,08462-003 1,55961-004          VAR 5      1- 1
SL     8 6,76016-001 4,64727-001 1,33283-001 2,51234-002          VAR 5      1- 1
BSHELF10-6,45363-003 3,73066-001-1,59928-003-3,22208-004          VAR 5      1- 1
STRAIT11 3,90678-001 3,92230-001 9,16961-002 2,25021-002          VAR 5      1- 1
BWNAVY12-6,34561-001 6,90101-001-8,47067-002-2,49683-002          VAR 5      1- 1
CNAVY 13-5,05291-001 3,81497-001-1,21542-001-4,40394-002          VAR 5      1- 1
MMERCH14 8,89464-001 7,26375-001 1,12489-001 2,15276-002          VAR 5      1- 1
AFRICA15 3,50567+000 3,53180-001 6,76122-001 2,19536-001          VAR 5      1- 1
ASIA  16 3,29283+000 4,15057-001 5,91423-001 2,15135-001          VAR 5      1- 1
LATIN 17 3,11906+000 5,42948-001 4,69049-001 1,46237-001          VAR 5      1- 1
EEUROP19 7,45224+000 9,21945-001 5,98609-001 5,32226-002          VAR 5      1- 1
WEO   20 5,11895+000 7,75497-001 5,20915-001 1,47588-001          VAR 5      1- 1
ARAB  21-2,68106-001 4,74609-001-5,21473-002-8,38597-003          VAR 5      1- 1
SCAND 22-8,43803-001 9,74753-001-7,97773-002-5,35674-003          VAR 5      1- 1
TREATY24 1,51072+000 5,95284-001 2,28418-001 5,17485-002          VAR 5      1- 1
EEC   26 3,73386+000 7,59119-001 4,13944-001 5,03702-002          VAR 5      1- 1
LTLGRP27 4,54743+000 9,77710-001 3,95023-001 5,80374-002          VAR 5      1- 1
CARIB 29 3,47411-001 6,10303-001 5,25537-002 9,12050-003          VAR 5      1- 1
OCNARC33 2,66023-001 4,93259-001 4,93015-002 5,47098-003          VAR 5      1- 1
SES   35 5,28101-001 4,53925-001 1,07644-001 3,13253-002          VAR 5      1- 1
2512,
OFSHOR 2 3,37233-001 2,83483-001 1,13210-001 5,95569-002          VAR 9      2- 1
MAJOIL 3 9,39947-001 4,06443-001 2,27191-001 1,25918-001          VAR 9      2- 1
DSTFSH 5 2,76526-001 4,46207-001 5,92753-002 3,05091-002          VAR 9      2- 1
DCATCH 6-3,41442-001 3,71836-001-2,11834-001-1,05898-001          VAR 9      2- 1
LL     7 4,44710-002 4,37867-001 8,73123-003 1,62488-003          VAR 9      2- 1
SL     8-2,17622-001 3,83311-001-5,42997-002-1,82589-002          VAR 9      2- 1
BSHELF10 1,40909-001 3,66154-001 3,58352-002 1,64942-002          VAR 9      2- 1
STRAIT11 2,55430-001 2,95775-001 3,24353-002 4,45903-002          VAR 9      2- 1
CNAVY 13 8,86030-001 2,71056-001 2,98792-001 1,46281-001          VAR 9      2- 1
MMERCH14-5,41395-001 6,67750-001-7,74250-002-3,73648-002          VAR 9      2- 1
AFRICA15 1,11026+000 4,31085-001 2,39508-001 9,99134-002          VAR 9      2- 1
ASIA  16 9,89314-001 4,01557-001 2,29561-001 1,23107-001          VAR 9      2- 1
LATIN 17 1,25196+000 4,12973-001 2,78855-001 1,37232-001          VAR 9      2- 1
EEUROP19-1,49385+000 9,10229-001-1,55289-001-1,81940-002          VAR 9      2- 1
WEO   20 2,91529+000 4,76557-001 4,77370-001 2,76309-001          VAR 9      2- 1
ARAB  21-6,72335-001 4,59596-001-1,38733-001-3,75034-002          VAR 9      2- 1
SCAND 22-8,91596-001 1,03258+000-8,15297-002-5,96579-003          VAR 9      2- 1
TREATY24-4,36467-001 5,33444-001-8,70153-002-4,34486-002          VAR 9      2- 1
EEC   26-1,19904+000 5,33083-001-1,78496-001-2,73684-002          VAR 9      2- 1
LTLGRP27 7,10354+000 3,89816-001 6,07422-001 3,70097-001          VAR 9      2- 1
CARIB 28-4,75360-001 5,09359-001-8,91254-002-1,89968-002          VAR 9      2- 1
YAOUND29-4,45331-001 5,70224-001-8,49653-002-1,86820-002          VAR 9      2- 1
```

FIG. 13: CONTROL CARDS FOR ILLUSTRATIVE RUN OF PROGRAM VMODEL

```
OPEC   30-3,28203-001 5,39256-001-1,45540-001-4,09084-002     VAR  9     2 - 1
OCNARC33 5,15165-001 5,07345-001 9,68022-002 1,89230-002      VAR  9     2 - 1
CSTARC34-1,23185+000 5,74546-001-2,01166-001-7,58494-002      VAR  9     2 - 1
2510,
OFSHOR 2 2,50764-001 4,37724-001 5,91241-002 1,19042-002      VAR  48    3 - 1
MAJOIL 3-3,58365-001 5,15840-001-1,51997-001-3,08799-002      VAR  48    3 - 1
MAJMIN 4-3,50270-001 5,02026-001-6,43698-002-1,15216-002      VAR  48    3 - 1
DCATCH 6-5,90164-001 5,69339-001-9,54445-002-1,91411-002      VAR  18    3 - 1
LL     7-1,63453+000 5,14291-001-2,31909-001-3,35873-002      VAR  48    3 - 1
SL     8-1,33441-001 4,30621-001-2,36367-002-3,25114-003      VAR  48    3 - 1
BSHELF10 4,13275-001 4,14446-001 9,84114-002 1,57403-002      VAR  48    3 - 1
STRAIT11-3,47032-001 4,18501-001-7,65582-002-1,51748-002      VAR  48    3 - 1
BWNAVY12 6,38321-001 7,44851-001 7,89807-002 2,09550-002      VAR  48    3 - 1
CNAVY 13-3,92167-001 4,00513-001-9,01533-002-2,09085-002      VAR  48    3 - 1
MMERCH14-1,58170+000 6,44322-001-2,34565-001-3,88528-002      VAR  48    3 - 1
AFRICA15 9,27801+000 4,27136-001 8,65189-001 3,61720-001      VAR  18    3 - 1
ASIA   15 9,41445+000 4,44582-001 8,90548-001 3,75314-001     VAR  48    3 - 1
LATIN  17 9,14343+000 5,85218-001 8,22338-001 2,17457-001     VAR  48    3 - 1
EEUROP19 4,57871+000 7,27366-001 5,02989-001 5,54346-002      VAR  48    3 - 1
NEO    20 6,18356+000 6,23092-001 6,75870-001 1,40732-001     VAR  48    3 - 1
ARAB   21 5,48954-001 5,10186-001 9,89866-002 9,03518-003     VAR  48    3 - 1
TREATY24-4,25897-001 5,65869-001-8,07536-002-1,16772-002      VAR  48    3 - 1
EEC    26-2,22321+000 7,29323-001-2,71251-001-1,85204-002     VAR  48    3 - 1
LTLGRP27-1,99790+000 7,35737-001-2,43494-001-2,57421-002      VAR  48    3 - 1
CARIB 28 3,26381-001 6,94924-001 4,33859-002 4,02401-003      VAR  48    3 - 1
YAOUND29 2,93153-001 5,95187-001 4,96501-002 4,88424-003      VAR  48    3 - 1
OPEC   30 6,92632-001 6,67056-001 9,55564-002 8,00112-003     VAR  48    3 - 1
OCNARC33-2,81109-001 5,85002-001-4,43810-002-3,15361-003      VAR  48    3 - 1
CSTARC34 4,87619-001 6,58092-001 6,83416-002 8,82834-003      VAR  48    3 - 1
2515,
OFSHOR 2-2,82801-001 3,78557-001-6,80383-002-9,09528-003      VAR  49    4 - 1
MAJOIL 3-1,02600+000 5,12163-001-1,79882-001-2,49805-002      VAR  49    4 - 1
DSTFSH 5-4,59174-001 5,05353-001-8,26615-002-9,17781-003      VAR  49    4 - 1
DCATCH 6 4,28502-001 4,78855-001 8,14169-002 8,54049-003      VAR  49    4 - 1
LL     7-1,50707+000 4,42674-001-2,60142-001-1,51718-002      VAR  49    4 - 1
SL     8 1,98376-001 5,21198-001 3,47243-002 2,37005-003      VAR  49    4 - 1
BSHELF10 7,88033-001 3,63127-001 1,84539-001 2,08376-002      VAR  49    4 - 1
STRAIT11-4,58234-001 3,78128-001-1,09955-001-1,22061-002      VAR  49    4 - 1
BWNAVY12 7,56448-001 5,91869-001 1,15885-001 1,47770-002      VAR  49    4 - 1
MMERCH14-1,99452+000 6,05735-001-2,87872-001-2,47335-002      VAR  49    4 - 1
AFRICA15 1,34735+001 3,00912-001 9,71352-001 3,82213-001      VAR  49    4 - 1
ASIA   16 1,31951+001 4,13666-001 9,45782-001 2,95865-001     VAR  49    4 - 1
LATIN  17 1,29412+001 4,59802-001 9,31902-001 2,42543-001     VAR  49    4 - 1
EEUROP19 6,82662+000 7,73430-001 6,27416-001 4,32923-002      VAR  49    4 - 1
NEO    20 8,40935+000 6,47597-001 7,64352-001 1,13801-001     VAR  49    4 - 1
ARAB   21 7,77566-001 4,89586-001 1,43482-001 8,60543-003     VAR  49    4 - 1
SCAND 22-1,16954+000 9,26963-001 1,14424-001-3,11244-003      VAR  49    4 - 1
TREATY24-6,17263-001 5,60515-001-1,00625-001-8,70274-003      VAR  49    4 - 1
EEC    26-2,73555-001 7,52951-001-3,31473-002-1,20816-003     VAR  49    4 - 1
LTLGRP27-4,34629+000 8,25598-001-4,32665-001-2,89993-002      VAR  49    4 - 1
CARIB 28 7,53991-001 6,13134-001 1,11558-001 6,61735-003      VAR  49    4 - 1
OPEC   30 5,28961-001 6,24341-001 8,72423-002 4,51063-003      VAR  49    4 - 1
OCNARC33-9,31398-001 5,44497-001-1,48940-001-6,32854-003      VAR  49    4 - 1
CSTARC34 9,23122-001 6,21432-001 1,34375-001 1,02448-002      VAR  49    4 - 1
SES    35-4,77152-001 4,41174-001-9,82538-002-1,04017-002     VAR  49    4 - 1
5   0   8
5   8   0
5   1   4
```

FIG. 13: (Continued)

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	REAL	ESTIMATE	COMBINED	SS	RESIDUAL	ON VARIABLE	9
AFGHANISTAN	12.000	11.595	11.797	1	0.405		
ALBANIA	0.000	10.221	10.221	0	0.000		
ALGERIA	11.000	9.970	10.794	4	1.030		
ARGENTINA	9.429	9.340	9.417	7	0.089		
AUSTRALIA	10.250	9.593	10.119	4	0.657		
AUSTRIA	12.000	7.173	9.587	1	4.827		
BAHAMAS	0.000	9.650	9.650	0	0.000		
BAHRAIN	0.000	10.801	10.801	0	0.000		
BARBADOS	0.000	10.995	10.995	0	0.000		
BELGIUM	12.000	3.819	9.273	2	8.181		
BHUTAN	12.000	11.595	11.797	1	0.405		
BOLIVIA	10.667	10.852	10.713	3	-0.185		
BOTSWANA	0.000	10.979	10.979	0	0.000		
BRAZIL	12.000	8.398	11.673	10	3.602		
BULGARIA	12.000	14.462	13.231	1	-2.462		
BURMA	0.000	9.149	9.149	0	0.000		
BURUNDI	0.000	10.979	10.979	0	0.000		
BYELORUSSIA	0.000	16.323	16.323	0	0.000		
CAMBODIA	0.000	8.540	8.540	0	0.000		
CAMEROON	0.000	11.122	11.122	0	0.000		
CANADA	8.333	11.078	8.608	9	-2.745		
C AFRICAN REPU	0.000	10.979	10.979	0	0.000		
CEYLON	11.353	9.714	11.262	17	1.639		
CHAD	0.000	10.979	10.979	0	0.000		
CHILE	12.000	12.281	12.009	32	-0.281		
CHINA (PR)	12.000	11.712	11.904	2	0.288		
COLOMBIA	12.000	5.257	9.752	2	6.743		
CONGO BRAZ	12.000	12.642	12.092	6	-0.642		
COSTA RICA	0.000	9.404	9.404	0	0.000		
CUBA	12.000	11.139	11.828	4	0.861		
CYPRUS	0.000	9.280	9.280	0	0.000		
CZECHOSLOVAKIA	0.000	18.368	18.368	0	0.000		
DAHOMEY	0.000	11.122	11.122	0	0.000		
DENMARK	12.000	18.903	14.301	2	-6.903		
DOMINICAN REPU	1.000	8.030	4.515	1	-7.030		
ECUADOR	12.000	15.345	12.669	4	-3.345		
EL SALVADOR	12.000	10.995	11.749	3	1.005		
EQUITORIAL GUI	0.000	11.122	11.122	0	0.000		
ETHIOPIA	0.000	10.531	10.531	0	0.000		
FIJI	9.667	10.392	9.848	3	-0.726		
FINLAND	12.000	13.352	12.676	1	-1.352		
FRANCE	9.545	2.235	8.936	11	7.311		
GABON	12.000	9.869	10.935	1	2.131		
GAMBIA	0.000	11.122	11.122	0	0.000		
GERMANY FRG	1.000	3.349	2.174	1	-2.349		
GERMANY EAST	0.000	13.722	13.722	0	0.000		
GHANA	5.000	8.158	6.053	2	-3.158		
GREECE	11.000	11.186	11.037	4	-0.186		
GUATEMALA	12.000	10.995	11.874	7	1.005		
GUINEA	0.000	8.533	8.533	0	0.000		
GUYANA	0.000	9.780	9.780	0	0.000		
HAITI	0.000	10.995	10.995	0	0.000		
HONDURAS	12.000	11.370	11.685	1	0.630		
HUNGARY	0.000	18.368	18.368	0	0.000		
ICELAND	0.000	17.692	17.692	0	0.000		
INDIA	11.333	9.685	11.098	6	1.648		
INDONESIA	12.000	13.954	12.977	1	-1.954		
IRAN	12.000	16.863	14.432	1	-4.863		
IRAQ	12.000	9.845	11.641	5	2.155		
IRELAND	1.000	3.412	2.206	1	-2.412		
ISRAEL	4.750	4.546	4.709	4	0.204		
ITALY	12.000	7.259	9.529	1	4.741		

FIG. 14: PREFERRED POSITIONS OF COUNTRIES, AND MEDIANS

IVORY COAST	0.000	8.158	8.158	0	0.000
JAMAICA	12.000	6.816	10.704	3	5.184
JAPAN	4.286	5.130	4.391	7	-0.844
JORDAN	0.000	12.995	12.995	0	0.000
KENYA	12.000	11.122	11.781	3	0.878
KUWAIT	12.000	14.330	12.111	20	-2.330
LAOS	0.000	11.595	11.595	0	0.000
LEBANON	0.000	12.794	12.794	0	0.000
LESOTHO	0.000	10.979	10.979	0	0.000
LIBERIA	12.000	10.116	11.058	1	1.884
LIBYA	12.000	11.490	11.872	3	0.510
LUXEMBOURG	0.000	8.465	8.465	0	0.000
MADAGASCAR	0.000	8.158	8.158	0	0.000
MALAWI	0.000	10.979	10.979	0	0.000
MALAYSIA	12.000	9.410	11.137	2	2.590
MALDIVE ISLAND	0.000	10.017	10.017	0	0.000
MALI	0.000	10.979	10.979	0	0.000
MALTA	8.500	6.102	8.020	4	2.398
MAURITANIA	12.000	11.672	11.934	4	0.328
MAURITIUS	0.000	9.777	9.777	0	0.000
MEXICO	12.000	7.153	9.577	1	4.847
MONGOLIA	0.000	14.982	14.982	0	0.000
MOROCCO	12.000	11.169	11.834	4	0.831
NEPAL	12.000	11.595	11.797	1	0.405
NETHERLANDS	12.000	6.519	10.173	2	5.481
NEW ZEALAND	0.000	7.134	7.134	0	0.000
NICARAGUA	0.000	11.370	11.370	0	0.000
NIGER	0.000	10.979	10.979	0	0.000
NIGERIA	12.000	10.434	11.217	1	1.566
NORWAY	0.000	20.125	20.125	0	0.000
OMAN	0.000	11.035	11.035	0	0.000
PAKISTAN	12.000	11.756	11.919	2	0.244
PANAMA	12.000	9.988	10.994	1	2.012
PARAGUAY	0.000	10.852	10.852	0	0.000
PERU	12.000	11.615	11.961	9	0.385
PHILIPPINES	12.000	14.561	13.280	1	-2.561
POLAND	12.000	13.722	12.574	2	-1.722
PORTUGAL	12.000	12.464	12.232	1	-0.464
QATAR	0.000	14.330	14.330	0	0.000
ROMANIA	12.000	11.689	11.922	3	0.311
RWANDA	12.000	10.979	11.490	1	1.021
SAUDI ARABIA	0.000	11.365	11.365	0	0.000
SENEGAL	0.000	6.567	6.567	0	0.000
SIERRA LEONE	0.000	11.122	11.122	0	0.000
SINGAPORE	9.667	7.890	9.222	3	1.777
SOMALIA	0.000	8.707	8.707	0	0.000
SOUTH AFRICA	10.000	9.057	9.686	2	0.943
SOUTHERN YEMEN	0.000	10.264	10.264	0	0.000
SPAIN	12.000	11.139	11.785	3	0.861
SUDAN	0.000	8.474	8.474	0	0.000
SWAZILAND	0.000	10.979	10.979	0	0.000
SWEDEN	12.000	12.000	12.000	2	-0.000
SYRIA	0.000	7.056	7.056	0	0.000
TANZANIA	12.000	9.099	11.033	2	2.901
THAILAND	12.000	11.620	11.924	4	0.380
TOGO	0.000	10.382	10.382	0	0.000
TRINIDAD TOBAG	10.364	8.901	10.242	11	1.463
TUNISIA	0.000	11.109	11.109	0	0.000
TURKEY	0.000	9.652	9.652	0	0.000
UGANDA	0.000	10.979	10.979	0	0.000
UKRAINE	0.000	18.588	18.588	0	0.000
USSR	12.000	10.885	11.628	2	1.115
UAE	0.000	13.823	13.823	0	0.000
UAR	12.000	10.147	11.382	2	1.853

FIG. 14: (Continued)

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UK	3.889	-0.232	3.477	9	4.121
USA	4.000	2.298	3.947	31	1.702
UPPER VOLTA	0.000	10.979	10.979	0	0.000
URUGUAY	12.000	8.406	11.101	3	3.594
VENEZUELA	12.000	11.247	11.812	3	0.753
YEMEN	0.000	10.030	10.030	0	0.000
YUGOSLAVIA	12.000	8.540	11.135	3	3.460
ZAIRE	12.000	11.902	11.993	14	0.098
ZAMBIA	12.000	10.979	11.796	4	1.021
BANGLADESH	12.000	12.113	12.057	1	-0.113
KOREA (NORTH)	0.000	9.280	9.280	0	0.000
KOREA (SOUTH)	12.000	11.070	11.535	1	0.930
LIECHTENSTEIN	0.000	7.173	7.173	0	0.000
MONACO	2.000	7.083	2.242	20	-5.083
NAURU	0.000	11.738	11.738	0	0.000
SAN MARINO	0.000	7.173	7.173	0	0.000
SWITZERLAND	0.000	7.173	7.173	0	0.000
TONGA	0.000	11.738	11.738	0	0.000
VATICAN	0.000	7.173	7.173	0	0.000
VIETNAM (N)	0.000	11.926	11.926	0	0.000
VIETNAM (S)	10.000	11.719	10.860	1	-1.719
WESTERN SAMOA	0.000	10.017	10.017	0	0.000
GUINEA-BISSAU	0.000	13.763	13.763	0	0.000
MEDIANS	12.000	10.979	11.033		2.061

FIG. 14: (Continued)

contains an equivalent table for each issue-variable on the issue-variable selection card.

One of the best/worst analyses for issue-variable 5 appears in figure 15. All of the states with preferred positions below 8 are listed with their positions, and the total number of such states is tallied. The actual printout includes a similar table for the other best/worst case range.

Figure 16 contains the outcome from the paired voting alternatives (scale value 1 versus scale value 4) on issue-variable 5. The countries that support each proposal are listed in decreasing order by utility score. The countries with positive scores prefer the second proposal (scale value 4); those with negative scores prefer the first proposal (scale value 1). This list of countries could have been deleted by entering a 1 in CC 15-16 of the main problem card.

This example ran in 2 minutes and produced 2500 lines.

THE FOLLOWING COUNTRIES HAVE SCORES BELOW 8.0 ONVARIABLE   5

BELGIUM	4.483
BULGARIA	6.220
BYELORUSSIA	5.868
CANADA	7.445
CZECHOSLOVAKIA	6.032
DENMARK	5.604
FRANCE	4.210
GERMANY FRG	4.816
GERMANY EAST	5.957
ITALY	4.776
IVORY COAST	6.632
JAPAN	4.060
LUXEMBOURG	4.937
MALTA	7.497
NETHERLANDS	4.819
NEW ZEALAND	5.888
PHILIPPINES	7.997
POLAND	6.705
PORTUGAL	2.152
UKRAINE	5.031
USSR	6.131
UK	4.531
USA	3.935

23 COUNTRIES ARE LISTED ABOVE

FIG. 15: COUNTRIES EXPECTED TO SUPPORT PROPOSAL
IN BEST/WORST CASE

ON VARIABLE   5 A COMPARISON BETWEEN RANK 1.0 AND RANK 4.0

   1 COUNTRIES PREFER   1
   0 COUNTRIES HAVE EQUAL PREFERENCE
 148 COUNTRIES PREFER   4

    GUINEA-BISSAU   6.823
    NICARAGUA   6.823
    HONDURAS   6.823
    HAITI   6.823
    GUINEA   6.823
    DOMINICAN REPU   6.823
    BARBADOS   6.823
    SOUTHERN YEMEN   6.791
    TUNISIA   6.547
    TOGO   6.537
    YEMEN   6.455
    SIERRA LEONE   6.431
    GAMBIA   6.431
    EQUITORIAL GUI   6.431
    DAHOMEY   6.431
    VIETNAM (S)   6.420
    BURMA   6.402
    MOROCCO   6.352
    BANGLADESH   6.343
    COSTA RICA   6.334
    JORDAN   6.286
    ECUADOR   6.274
    CHINA (PR)   6.273
    PERU   6.128
    SPAIN   6.094
    TONGA   6.088
    NAURU   6.088
    ALBANIA   6.084
    SOMALIA   6.077
    ZAMBIA   6.077
    UAE   6.036
    SENEGAL   5.994
    CHILE   5.960
    UPPER VOLTA   5.860
    CYPRUS   5.849
    SOUTH AFRICA   5.841
    KOREA (NORTH)   5.815
    BAHAMAS   5.802
    LIBERIA   5.767
    LIBYA   5.764
    CUBA   5.724
    URUGUAY   5.707
    OMAN   5.669
    IRAN   5.655
    LESOTHO   5.624
    QATAR   5.594
    NIGERIA   5.577

FIG. 16: OUTCOME AND COUNTRIES' UTILITY SCORES
        ON PAIRED VOTING ALTERNATIVES

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COLOMBIA	5.558	SWITZERLAND	3.776
THAILAND	5.536	IRELAND	3.749
MEXICO	5.495	ETHIOPIA	3.549
FINLAND	5.441	ISRAEL	3.472
SYRIA	5.396	SWEDEN	3.406
TURKEY	5.387	EL SALVADOR	3.353
VENEZUELA	5.375	KUWAIT	3.235
UGANDA	5.367	GABON	3.198
SWAZILAND	5.367	SUDAN	3.189
RWANDA	5.367	HUNGARY	3.178
NIGER	5.367	GREECE	3.134
MALI	5.367	INDONESIA	3.125
MALAWI	5.367	LEBANON	3.118
CHAD	5.367	CAMEROON	3.074
C AFRICAN REPU	5.367	ROMANIA	2.969
BURUNDI	5.367	PHILIPPINES	2.587
BOTSWANA	5.367	MALTA	2.351
ALGERIA	5.353	CANADA	2.327
BAHRAIN	5.333	POLAND	1.979
TRINIDAD TOBAG	5.298	IVORY COAST	1.944
MONACO	5.247	BULGARIA	1.751
NEPAL	5.240	USSR	1.708
MONGOLIA	5.227	CZECHOSLOVAKIA	1.662
UAR	5.205	GERMANY EAST	1.627
PAKISTAN	5.188	NEW ZEALAND	1.594
PANAMA	5.180	BYELORUSSIA	1.585
ZAIRE	5.143	DENMARK	1.460
PARAGUAY	5.125	UKRAINE	1.191
GUYANA	5.046	LUXEMBOURG	1.147
SINGAPORE	5.035	NETHERLANDS	1.091
AFGHANISTAN	5.033	GERMANY FRG	1.090
LAOS	5.024	ITALY	1.071
BHUTAN	5.024	UK	0.956
VIETNAM (N)	4.999	BELGIUM	0.895
YUGOSLAVIA	4.980	FRANCE	0.804
JAMAICA	4.964	JAPAN	0.734
KENYA	4.831	USA	0.675
FIJI	4.808	PORTUGAL	-0.164
AUSTRIA	4.800		
TANZANIA	4.738		
CAMBODIA	4.725		
KOREA (SOUTH)	4.705		
WESTERN SAMOA	4.705		
MALDIVE ISLAND	4.705		
CEYLON	4.683		
MALAYSIA	4.681		
INDIA	4.641		
ARGENTINA	4.570		
IRAQ	4.562		
MAURITANIA	4.538		
VATICAN	4.518		
SAN MARINO	4.518		
LIECHTENSTEIN	4.518		
CONGO BRAZ	4.478		
SAUDI ARABIA	4.431		
BRAZIL	4.398		
NORWAY	4.387		
GHANA	4.292		
MAURITIUS	4.274		
MADAGASCAR	4.260		
BOLIVIA	4.218		
AUSTRALIA	4.085		
GUATEMALA	3.823		
ICELAND	3.797		

FIG. 16: (Continued)

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FORECASTING OUTCOMES OF VOTES ON PACKAGES OF ISSUES

Identifying Voting Situations

Once a normalized data tape has been produced by program VMODEL, forecasts can be made on packages of issue-variables by executing program MAXPAC.

The packaging model in MAXPAC forces countries to choose between two alternative packages of issue-variables. If this model is to be used, the analyst must provide scale values for each issue-variable in each package. These values can be derived by referring to the codebook's list of issue-variables and finding the scale value that best represents the position that is to be included in the package. The scale values are entered in a paired voting alternative file described in the section entitled "Executing Program MAXPAC".

The maximization model in MAXPAC creates a series of packages that are more popular with the voting body as a whole (and the U.S. in particular) than the input package. If this forecasting model is to be used, the analyst must provide a list of packages that policy-makers would like to defeat (hereafter called base packages) and a list of intensities. Each base package must be expressed in terms of scale values that best represent its positions. The intensities are the amounts of policy difference the analyst wants between the model-derived packages and the base packages. The intensities and the scale values for the base packages are entered in a base package file described in the section entitled "Executing Program MAXPAC".

Determining Whether Special Data Is Needed

If unclassified saliences or multiply used themes are to be used in this analysis, the user must perform some additional preliminary steps before program MAXPAC can be executed.

Using Unclassified Saliences

When the normalized tape produced by VMODEL contains observations from both primary and secondary sources, it is often advisable to perform the packaging and maximization analyses with the saliences from the unclassified or primary data only. Secondary data may not reflect a state's interest in the subject matter, but merely a response to a direct question about the state's position on the issue. Thus the resulting salience (number of observations made by a country on an issue-variable) in secondary data may reflect the interests of the questioner more than the interests of the respondent. The primary data, on the other hand, represents what a state has said on its own initiative during its time on the floor. It can therefore be argued that the salience in primary data reflects purposive action on the part of a state while the salience in secondary data might

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not. Since the packaging and maximization models use salience as a measure of the relative importance of an issue to a country, the salience in primary data is often preferred.

If the analyst believes this to be a problem in the analysis, a special national scores tape run on primary data alone must be produced. This national scores tape must contain all the issue-variables on the normalized tape and all multiply used themes assigned to the issue-variable being packaged together (i.e. the user should include a multiply used theme file as input to SCORES when creating this tape). The preferred positions will be taken from the normalized tape; the saliences will be taken from this special national scores tape.

Using Multiply Used Themes

When any of the packages in the paired voting alternative file or the base package file include issue-variables that have themes in common, the analyst has the option to apportion observations on the themes among the issue-variables. This is done to avoid double-counting the observations in determining saliences on issue-variable. If this option is to be exercised, the user must obtain the appropriate national scores tape and create a frequency allocation file.

The national scores tape to be used depends on the saliences to be used. If saliences from the normalized tape are to be used, the national scores tape should be the same one used as input to VMODEL. If unclassified saliences are to be used as described above, the national scores tape should be the one with the unclassified saliences. The user should check to see whether the SCORES run that created the tape included a multiply used theme file as input; if it did not, the SCORES job must be rerun.

To create a frequency allocation file, the user must first extract the list of multiply used themes in the order in which they were entered into program SCORES. Then the list of issue-variables on the normalized tape should be extracted in numerical order (that is, the issue-variable numbers with 1's on the issue-variable selection card of VMODEL). At this point, the user should create a table for the analyst to fill in with appropriate proportions. The multiply used themes in order are placed across the top and the issue-variables in order are entered along the side. That is,

	1st multiply used theme	2nd	....	Last multiply used theme
1st variable on normalized tape				
. . .				
Last variable on normalized tape				

The analyst should fill in the table one theme (column) at a time, entering values only in relevant cells (that is, only those opposite an issue-variable which contains the theme in question). The user should flag these cells for the analyst by referring to a SEARCH printout (appendix B). The analyst must then decide the appropriate proportions to assign. A zero in a cell assigns no observations to the issue-variable; a 1 assigns all of them to the issue-variable; a fractional entry assigns that fraction of observations. The proportions need not add up to 1.0.

Once the analyst has filled in the relevant cells, the user should fill in all cells left blank with a -1.0; -1.0 flags a non-relevant cell. Once all remaining cells have been filled in this manner, a card is created for each issue-variable (row) across the ordered list of multiply used themes. These cards form the frequency allocation file described in the next section.

Executing Program MAXPAC

Input:
    Normalized tape (output from VMODEL)
    Dictionary tape
    National scores tape (optional)
    Control card deck:
        Main problem card
        Frequency allocation file (optional)
        Paired voting alternative file (optional)
        Base package file (optional)

Output: final report of outcomes on packages of issue-variables

Main Problem Card

This card specifies the input units and the types and number of packaging analyses to be performed. The following right-justified format is used:

CC	Format	Description
1-3	I3	Logical unit of the normalized data tape (=49)
4-6	I3	Logical unit of the dictionary tape (=48)
7-9	I3	Logical unit of the national scores tape that contains the unclassified saliences (=47)* =0 if no tape

---

*National scores tape is optional input. It is necessary when multiply used themes are involved or when the saliences on the normalized input tape are not being used. See the earlier section entitled "Determining Whether Special Data Is Needed" to determine what national scores tape is to be used.

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CC	Format	Description
10-12	I3	Logical unit of the national scores tape containing frequency of mention of the multiply used themes (=47)* =0 if no tape
13-15	I3	Number of multiply used themes on tape on LU47 =0 if no tape
16-18	I3	Packaging output option =0: summary outcome table only =1: summary table plus individual countries scores
19-21	I3	Number of paired voting alternatives in the input file
22-24	I3	Country number for the U.S. (=128)
25-27	I3	Number of base packages in the input file
28-30	I3	Number of intensity values to be run on each created package =0: if CC 25-27 is 0

Frequency Allocation File

This file can be created at the analyst's option whenever any of the packages being run include issue-variables with themes in common.

For every issue-variable on the normalized tape, the user must create one or more allocation cards. This card contains the proportion of observations on every multiply used theme listed in the multiply used theme file of program SCORES, that is to be assigned a given issue-variable. The multiply used themes must be in the same order in which they were listed in SCORES. (See the section entitled "Using Multiply Used Themes".)

The file consists of a series of these allocation cards ordered numerically by issue-variable. The following right-justified format is used:

---

*National scores tape is optional input. It is necessary when multiply used themes are involved or when the saliences on the normalized input tape are not being used. See the earlier section entitled "Determining Whether Special Data Is Needed" to determine what national scores tape is to be used.

CC	Format	Description
1-5	F5.1	Proportion of observations on the first multiply used theme to be assigned to this issue-variable
6-10	F5.1	Proportion of observations on the second theme to be assigned to this issue-variable
.	.	.
.	.	.
.	.	.

(continue through CC 76-80 and on additional cards, if necessary)

Paired Voting Alternative File

This optional file contains pairs of packages to be tested against each other with the packaging model. The file consists of sets of two types of cards, one set for each pair of packages to be tested. The first type of card in the set identifies the issue-variables in the two packages and the second type of card identifies the scale values assigned to the issue-variables. In any pairing, package A must deal with the same subset of issue-variables as package B and all the issue-variables must be on the same normalized tape.

There is no limit to the number of pairs that can be included in a single run, but the number must equal the value in CC 19-21 of the main problem card. There is no particular order for card sets. Within a set, however, the issue identification card must precede the package components card.

Issue Identification Card(s). This, the first type of card in the set, contains the issue-variables that are in the two packages that follow. The issue-variables should be listed in numerical order. All issue-variables to be packaged must be on a single normalized data tape. The following right-justified format is used:

CC	Format	Description
1-2	I2	Number of issue-variables in the packages
3-4	I2	Issue-variable number of first issue in the packages
5-6	I2	Issue-variable number of second issue in the packages
.	.	.
.	.	.
.	.	.

(continue through CC 79-80 and on additional cards in 40I2 format until all issue variables in the package have been entered)

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Package Components Card(s). This card specifies scale values to be assigned the issue-variables in the two packages. The order in which values are listed must correspond to the order in which issue-variables were listed on the issue identification card. The complete listing of values for package A precedes the listing for package B, in 40F2.0 format. To illustrate, if there are four issue-variables in the packages, the four scale values for package A would be placed in the first eight columns and the scale values for B in the next eight columns. If there are more than 20 issue-variables in the packages, more than one card will be needed.

Base Package File

This optional file contains one or more base packages to be run through the maximization model. The file consists of an intensity of difference card, followed by sets of two types of cards, one set for each base package to be tested. The first type of card in the set identifies the issue-variables in the base package; the second type of card identifies the scale values assigned the issue-variables. There is no limit to the number of base packages that can be included in a single run, but the number of sets must equal the value in CC 25-27 of the main problem card. There is no particular order for card sets.

Intensity of Difference Card(s). This is the first card in the file. It specifies how different the model-derived package should be in terms of policy difference from the base package. For each intensity listed, the model will derive a package that will beat the base package.

The intensity figures entered on this card are selected by the analyst. Typically, values between .5 and 5.0 are chosen. The intensity figures entered on a card in 16F5.0 format. If more than 16 intensity figures are used, additional cards in the same format can be created. The number of intensity figures entered must be equal to the number in CC 28-30 of the main problem card.

Issue Identification Card. This, the first type of card in each base package set, identifies the issue-variables in the base package that follows. The issue-variables should be listed in numerical order. All issue-variables in the package must be on the same normalized data tape. The following right-justified format is used:

CC	Format	Description
1-2	I2	Number of issue-variables
3-4	I2	Issue-variable number of first issue in the package
5-6	I2	Issue-variable number of second issue in the package

(continue through CC 79-80 and on additional cards in 40I2 format until all issue-variables in the package have been entered)

<u>Package Component Card</u>. This, the second type of card in each base package set, identifies the scale values of the base package. The order in which values are listed must correspond to the order in which issue-variables were listed on the issue identification card. The following right-justified format is used:

CC	Format	Description
1-2	F2.0	Scale value of the first issue-variable in the base package
3-4	F2.0	Scale value of the second issue-variable
$\vdots$	$\vdots$	$\vdots$

(continue through CC 79-80 and on an additional card if necessary)

Illustrative Input and Output

Continuing with the example from previous sections, let us assume that all four variables will be packaged together and that the following is requested:

(1) Normalized tape saliences will be used and there is no problem of multiply used themes.

(2) Three packages will be run against one another.

(3) One package is to be placed in the maximization model and the model is to derive two packages which will beat it (that is, two intensities of difference will be tested).

(4) Only summary tables will be produced.

The input deck is presented below:

```
                          CARD COLUMNS
                                   1111111111222222222223
                          12345678901234567890123456789 0


       Main Problem Card  49 48  0  0  0  0  3128  1  2
                         ⎡0405094849
Paired                   │0503020704020605
Voting Alternative File  │0405094849
                         │0503020703060103
                         │0405094849
                         ⎣0402060503060103
                         ⎡   .5  1.5
Base Package File        │0405094849
                         ⎣05080703
```

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The resulting output appears as figures 17 and 18. Figure 17 contains the entire results from the paired voting alternative analysis. The summary table specifies the scale values of the two packages and the number of strong and marginal supporters of each. The utility scores of the individual countries could have been listed by entering a 1 in CC 16-18 of the main problem card. If this had been done, the list would have been similar to the one in the VMODEL example.

Figure 18 contains the entire results from the base package file. Two summary tables were produced, one for each intensity of difference measure. Each summary table identifies the scale values of the base package and the model-derived package and indicates the number of strong and marginal supporters of each. The U.S. utility score is also listed. If it is positive, the U.S. would prefer the model-derived package to the base package.

This example ran in less than 2 minutes and produced less than 2000 lines.

```
----------
VARIABLES IN PACKAGES
            5     9    48    49
PACKAGE 1= 5.000 3.000 2.000 7.000
PACKAGE 2= 4.000 2.000 6.000 5.000


  87 COUNTRIES PREFER PACKAGE 1
  59 COUNTRIES MARGINALLY PREFER PACKAGE 1
   3 COUNTRIES MARGINALLY PREFER PACKAGE 2
   0 COUNTRIES PREFER PACKAGE 2




----------
VARIABLES IN PACKAGES
            5     9    48    49
PACKAGE 1= 5.000 3.000 2.000 7.000
PACKAGE 2= 3.000 6.000 1.000 3.000


  63 COUNTRIES PREFER PACKAGE 1
  30 COUNTRIES MARGINALLY PREFER PACKAGE 1
  44 COUNTRIES MARGINALLY PREFER PACKAGE 2
  12 COUNTRIES PREFER PACKAGE 2




----------
VARIABLES IN PACKAGES
            5     9    48    49
PACKAGE 1= 4.000 2.000 6.000 5.000
PACKAGE 2= 3.000 6.000 1.000 3.000


  26 COUNTRIES PREFER PACKAGE 1
  28 COUNTRIES MARGINALLY PREFER PACKAGE 1
  39 COUNTRIES MARGINALLY PREFER PACKAGE 2
  56 COUNTRIES PREFER PACKAGE 2
```

FIG. 17: SUMMARY OUTCOME ON PAIRS OF PACKAGES

PACKAGING ANALYSIS CONTAINS THE FOLLOWING COMPONENTS WHEN EPSILON IS   0.50

VAR NO.   BASE PACKAGE   MODEL PACKAGE

   5   5.00000   6.05234
   9   8.00000   8.22934
  48   7.00000   6.60072
  49   3.00000   4.25188

THE US UTILITY ON THESE PACKAGES IS   -0.11576

    0 COUNTRIES PREFER PACKAGE 1
    6 COUNTRIES MARGINALLY PREFER PACKAGE 1
   97 COUNTRIES MARGINALLY PREFER PACKAGE 2
   46 COUNTRIES PREFER PACKAGE 2

PACKAGING ANALYSIS CONTAINS THE FOLLOWING COMPONENTS WHEN EPSILON IS   1.50

VAR NO.   BASE PACKAGE   MODEL PACKAGE

   5   5.00000   8.15701
   9   8.00000   8.68802
  48   7.00000   5.80215
  49   3.00000   6.75565

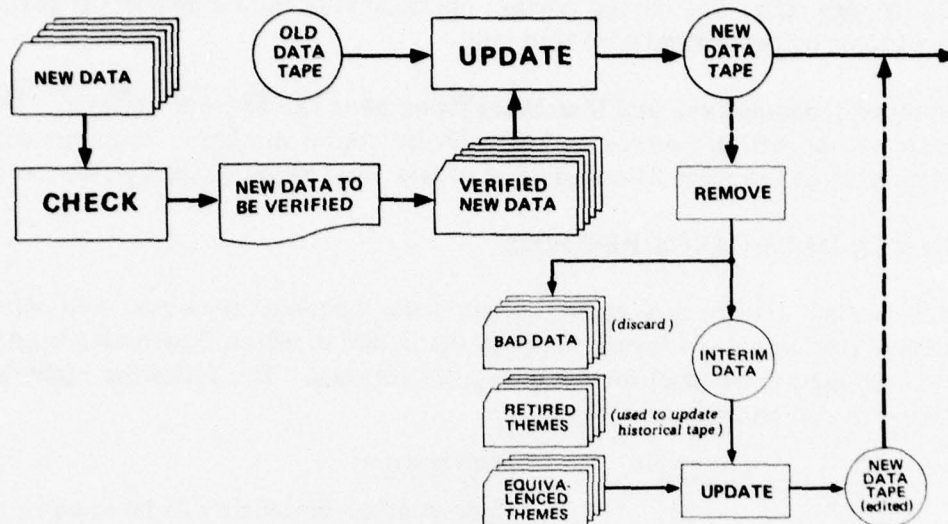THE US UTILITY ON THESE PACKAGES IS   -0.74580

    2 COUNTRIES PREFER PACKAGE 1
    8 COUNTRIES MARGINALLY PREFER PACKAGE 1
   19 COUNTRIES MARGINALLY PREFER PACKAGE 2
  120 COUNTRIES PREFER PACKAGE 2

FIG. 18: SUMMARY OUTCOME OF MAXIMIZATION MODEL

APPENDIX A

MAINTAINING THE DATA TAPES

APPENDIX A

MAINTAINING THE DATA TAPES

This appendix contains a description of the data base and the three programs that maintain it. Program CHECK is used during verification that new data have been accurately transcribed and keypunched. Program UPDATE adds and deletes observations from the data tapes. Program REMOVE extracts all data on specified theme numbers from the data tapes.

DESCRIPTION OF THE DATA BASE

The data base contains all codable remarks that have been extracted from our source documents. There are approximately 50,000 remarks, each of which constitutes a physical record. The data base is divided into an active and a historical data base.

The active data base is composed of two parts - a primary and a secondary data base. The two primary tapes contain all remarks that have been extracted from our primary sources, U.N. summary records. The secondary tape includes all remarks from our secondary source documents, diplomatic cables and liaison reports. The primary tapes have approximately 30,000 records or remarks, all of which are unclassified. The secondary tape has 12,000 records, most of which are classified.

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The historical data base is on one tape and contains all remarks that have been deleted from the active data base over the last five years. Remarks are deleted when they become dated or when the issue they address is resolved. This tape is useful for historical purposes only, and during normal operations of the computer programs, the user would not be concerned with this tape.

The primary, secondary, and historical tapes have the same structure. They are organized by country and within country numerically by theme number. Each record on the tape follows the format of the first 24 columns of a data card as described in the next section.

CREATING NEW DATA CARDS/RECORDS

A coder reads a source document, extracts the 'codable' remarks, and enters their code numbers on a card layout sheet in the order in which they occur in the document. One card is created for each codable remark. The following right-justified numbers are entered on each data card:

CC	Format	Description
1-3	I3	Code number of country to be assigned this remark (see the codebook for a list of these code numbers)*
5	I1	Regional remark flag =0: a non-regional or direct remark made by the individual country =1: a regional remark made for the individual country by a designated region or group representative Example: If Botswana claims to be making a remark for all African countries, it would get a 0 in CC 5 and all other Africans would get a 1.
6	I1	Repetition flag. Since our primary and secondary sources could be reporting the same UN meeting, a repetition flag is assigned to all remarks derived from secondary sources reporting on UN meetings. =0: no danger of repetition, given to all primary data and to secondary data not reporting on UN meetings =1: danger of repetition, given to all secondary data reporting or summarizing UN meetings

_____
*If the country or theme is not in the list, see appendix B of this guide, which explains how to create a code number for a new theme or country.

CC	Format	Description
7	I1	Classification of remark =0: unclassified =1: privileged =2: confidential =3: secret
8	I1	Reliability of remark =0: all primary data and any secondary data reporting a meeting or conversation at which the reporting official was present; first hand information. =1: any secondary data reporting a meeting or conversation at which the reporting offical was not present; second-hand information. =2: third-hand information (rarely used)
11-13	I3	Document code number: the number assigned to the document from which this remark was extracted (see the codebook for a list of existing document numbers)
20-23	I4	Theme number: the number assigned to this codable remark (see the codebook for a list of existing theme numbers)*
24	A1	Letter designating a theme derived from a formal UN proposed article, working paper, or UN code "L" document (see the codebook for a list of existing lettered themes)*
25	I1	Addition or deletion code =0 or blank: adds this remark to the data base =1: deletes this remark from the data base

---

*If the country or theme is not in the list, see appendix B of this guide, which explains how to create a code number for a new theme or country.

VERIFYING NEW DATA

Before new data is placed on a data tape, the user must verify that it has been transcribed correctly from the source document and keypunched correctly from the card layout sheets. Both procedures can be checked simultaneously by executing program CHECK with a dictionary tape and a card deck of new data that is ordered in the same way in which the observations were transcribed from the source document. Since the data is transcribed and then keypunched in the order in which the observations appear in the document, the resulting card deck should be in the appropriate order.

Executing Program CHECK

Program CHECK lists the card deck of new observations in a format ti . can be easily used to verify that the observations have been correctly transcribed and keypunched. The user compares the list of theme numbers in the printed output with those written in the margins of the source document. Any discrepancies should be resolved by making corrections to the card deck.

Input:
>Dictionary tape placed on LU1
>Ordered deck of new observations

Output: printed report of observations in source documents

Illustrative Output

Figure A-1 is a typical output from program CHECK. Observations in the example were extracted from document 582. Under the document header are the observations extracted from it. Whenever the document number changes, a new document header appears at the top of the page. In the sample document, only four countries made codable remarks. They are listed in the order in which they were made, next to each country. This data can be verified by comparing it with theme numbers written in the margin of document 582.

UPDATING THE DATA TAPES

After a deck of new observations has been verified and corrected, if necessary, it is used to update the primary and secondary data tapes. To produce updated tapes, the user must separate the primary and secondary source observations, reorder the two decks, and then execute program UPDATE with each deck.

Separating the Primary and Secondary Source Data

Since the primary and secondary data bases are updated separately with program UPDATE, the user must separate the card deck of new data into the observations that

```
THE FOLLOWING OBSERVATIONS ARE IN DOCUMENT  582

        ECUADOR              938A
                            1086A
                             864A
                              49A
                             865D
                             364B
                              12F
                            1520C
                             967A
                             361A
                             569B
                             454A
                             810A
                             611B
                              47B
                             908C
                             905A

        DENMARK              293

        UK                   570

        FIJI                 570
```

FIG. A-1: REPORT OF NEW DATA

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were extracted from primary source documents and those extracted from secondary source documents. The user should refer to the list of document codes in the codebook to determine which document numbers are categorized as primary and which as secondary.

Reordering the New Card Decks

The primary and secondary card decks must each be reordered. Each should be ordered by country number and within country by theme number. Furthermore, if the same theme number is to be added and deleted for the same country, the delete card must precede the add card in the reordered deck.

A mechanical sorter has generally been used to reorder the decks. To make sure that the deck is reordered correctly, the user should sort it first on the add/delete field (CC 25), then on the theme and letter fields (CC 20-24), and then on the country field (CC 1-3). When sorting on multiple fields, the user must begin with the least significant field (that is, when sorting on CC 20-24, the user should begin with CC 24, then go to CC 23, and so on).

Executing Program UPDATE

The principal function of this program is to create a new data tape by merging an existing tape with an ordered deck of deletions and additions. The primary and secondary tapes must be updated separately.

> Input:
>> Existing primary or secondary tape placed on LU1
>> Ordered deck of deletions and additions to that tape
> Output:
>> Updated primary or secondary tape produced on LU2
>> Detailed report of whether and how each change took place

Illustrative Input and Output

Let us assume that the following four changes are to be made to an existing data tape. (1) Country 57 has erroneously been assigned theme number 5 in document 170. Country 57 actually made this remark in document 171. Therefore, the user must first delete the observation from the tape and then add it in its correct form. (2) Country 110 was incorrectly assigned theme 1421C in document 581. Instead, country 73 should have been assigned this remark. This modification requires an add card for country 73 and a delete card for country 110. (3) An erroneous remark is to be deleted for country 95. (4) A new remark is to be added for country 112.

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An ordered card deck of these changes would be as follows:

Card Columns	0 1	0 2	0 3	0 4	0 5	0 6	0 7	0 8	0 9	1 0	1 1	1 2	1 3 ·····	2 0	2 1	2 2	2 3	2 4	2 5
		5	7		0	0	1	0			1	7	0		0	0	0	5		1
		5	7		0	0	1	0			1	7	1		0	0	0	5		0
		7	3		0	0	2	0			5	8	1		1	4	2	1	C	0
		9	5		0	1	2	1			7	3	1			8	3	7	B	1
	1	1	0		0	0	2	0			5	8	1		1	4	2	1	C	1
	1	1	2		0	1	1	1			3	7	3		1	4	2	5		0

The hypothetical output that could have resulted appears below.

```
     57 0010 170 0005 was deleted

Card  57 0010 171 0005 was placed before record 57 0011 183 0375

Card  73 0020 581 1421C was placed before record 73 0100 334 1423

****Card 95 0121 731 837B cannot be found on tape.

     110 0020 581 1421C was deleted

Card 112 0111 373 1425 was placed before record 112 0002 437 1453.
```

The user should scan the printed output to make sure that the desired changes were made correctly. The first two lines of the printout indicate that the document number change for country 57 was completed successfully. Note that the observation was added in the correct place, i.e., within country 57's data and before theme 375 (a theme number numerically greater than theme 5, which we are adding). The user must always verify that the additions were actually made in the appropriate country and theme location on the tape (a dump of the original tape is useful during verification). An addition placed incorrectly indicates that the update card deck was out of order, in which case it should be checked and reordered, and the update job rerun.

The third and fifth lines of the printout indicate that the erroneous assignment of theme 1421C to country 110, instead of to country 73, was corrected. Also, the sixth, or last, line shows that the new remark by country 112 was accurately placed on the tape.

Line 4, however, indicates a problem. There are two possible reasons why the observation to be deleted could not be found on the tape: (1) this deletion card was out of order in the input deck (which is not the case in our example), or (2) the observation as stated does not exist on the tape. When (2) is the case, the user should compare the observation, as punched, with a dump of the data tape and make the appropriate correction(s) to the deletion card. If the observation cannot be found in the dump, the observation may simply have been deleted in some previous run.

Note that the error message did not terminate the job. It is merely a flag to the user that one of the desired changes could not be accomplished. The user has the option of resubmitting the same job with the errors corrected or submitting a new update job (using the new data tape) with a reduced card deck consisting only of corrections to the remaining errors. Finally, it should be noted that this message occurs for deletions only. The user must check manually the placement of additions by referring to a data dump. If certain additions were not correctly placed, the entire job must be resubmitted with a reordered card deck.

REMOVING EXTRANEOUS AND OUTDATED DATA

When a manageable number of observations are to be removed from an active data tape, the user should create a deck of deletions and execute program UPDATE. However, when all data on a given theme is to be deleted, program REMOVE should be used.

There are three situations which may call for deleting all references to a theme or themes. First, themes may be outdated because the issue they address has been resolved or because they are too general to be of further use in analyzing increasingly detailed discussions. Such themes are removed from the active data base and placed on the historical data tape. Second, during coding two or more themes, identical but for their code numbers, may be created by coders working independently on similar material. To reduce duplication and possible confusion at a later date, all of the remarks should be consolidated under a single number and all references to the other, duplicate numbers removed from the data tape. Third, in rare instances a theme may have been used erroneously because coders misunderstood its meaning. When this occurs all data on the theme should be removed and the remarks recoded.

To remove all data on a given set of theme numbers, the user must create a retired theme deck or equivalent theme deck, execute program REMOVE, and then update the data tapes with the punched output.

Creating a Retired Theme Deck

This optional deck contains a list of all themes to be retired from the active data base because they are outdated or miscoded. There is no limit to the number of themes that can be included in the deck and they may be listed in any order.

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The user should obtain from the analyst a list of theme numbers to be retired. Lettered themes must be handled with care.[1] Let us assume that theme 5 has an A and a B variant in addition to its original non-lettered version. If the analyst wants to retire only 5B data, 5B must appear in this deck. If both lettered versions are to be retired but the non-lettered data is to be retained, both 5A and 5B must appear in this deck, but 5 must not. If all data is to be retired, that is 5, 5A, and 5B, 5 is the only entry necessary in the deck and the observations on all three will be removed. It is not possible to retire the non-lettered version and still retain the lettered variants in the data base.

The themes to be retired are entered into a retired theme deck as described in the section entitled "Executing Program REMOVE".

Creating an Equivalent Theme Deck

This optional deck contains pairs of themes to be equivalenced to one another. There is no limit to the number of pairs that can be included and the deck need not be in any particular order.

The user should obtain from the analyst pairs of themes to be equivalenced. A pair consists of a duplicate and a permanent theme number. The data with the duplicate theme number is to be removed and ultimately added back into the data base with the permanent number instead of the duplicate one. If more than one duplicate theme is being equivalenced to the same permanent number, each duplicate theme number must be listed with the permanent one, on a separate card.

Themes with lettered variants must be handled with care. The table below shows how pairs involving letters take on different meanings. (This is not a sample deck.)

Duplicate theme	Permanent theme	Meaning
1421	1522	All observations on 1421, whether lettered or non-lettered, are removed and become 1522 with their original letter designate, i.e., 1421C will be 1522C and 1421 will be 1522.

---

[1]

For a definition of a lettered theme, see appendix B, "File 5, Lettered Theme Dictionary."

Duplicate theme	Permanent theme	Meaning
1421B	1522	All observations on 1421B are removed and become 1522. All other 1421's will be left on the tape. Caution: If another version of 1421 appears in this deck, it cannot violate the 3 conditions below.
1421B	1522C	All the observations on 1421B are removed and become 1522C. All other 1421's will be left on the tape. Caution: If another version of 1421 appears in this deck, it cannot violate the 3 conditions below.
1421	1522C	Only non-lettered observations on 1421 are removed and become 1522C.

Any theme, lettered or non-lettered, can be equivalenced to any other as long as it does not violate any of these three conditions in a single deck:

(1) When equivalencing more than one lettered version of the same theme, the permanent number must be the same, but it can take on different lettered or non-lettered forms. For example, 1421B→1522A and 1421C→1522C can be done, but not 1421B→1522A and 1421C→1612C.

(2) When equivalencing a lettered theme, the permanent theme number cannot be the same number with a different letter. That is, one cannot equivalence 10A to 10B.

(3) When equivalencing a lettered version of a theme, it is not possible to equivalence its non-lettered version in the same deck. That is, one cannot equivalence 1421A on one card and 1421 on another.

The pairs of themes to be equivalenced are entered into an equivalent theme deck as described in the following section.

Executing Program REMOVE

The principal function of this program is to delete all observations on retired or duplicate themes from a data tape and punch the observations in the format appropriate for input to program UPDATE. The retired observations are punched as they exist; the observations with duplicate theme numbers are punched with their new permanent theme numbers.

This program extracts observations from one tape per run. The user is cautioned to submit the identical job deck for both the primary and secondary tapes.

Input:
    Existing primary or secondary tape placed on LU1
    Control card deck:
        Main control card
        Retired theme deck
        Equivalent theme deck
Output:
    Edited primary or secondary tape produced on LU2
    Punched deck of retired and equivalenced themes.

Main Control Card

This card specifies the number of cards in the retired and equivalent theme decks. The following right-justified format is used:

CC	Format	Description
1-5	I5	Number of cards in the retired theme deck (could be 0)
6-10	I5	Number of cards in the equivalent theme deck (could be 0)

Retired Theme Deck

The number of themes in this deck must equal the number in CC 1-5 of the main control card. Each theme is entered on a separate card, in the following right-justified format:

CC	Format	Description
1-4	I4	Theme number to be retired[1]
5	A1	Its letter designate, if any

Equivalent Theme Deck

The number of cards in this deck must equal the number in CC 6-10 of the main control card. Each pair (a duplicate and a permanent theme) must appear on a separate card in the following right-justified format:

---

[1] The user is cautioned that when themes are retired, they should also be removed from the theme or lettered theme dictionary. See appendix B for a description of how to delete entries in dictionary files 2 and 5.

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CC	Format	Description
1-4	I4	Duplicate theme number[1]
5	A1	Its letter designate, if any
6-9	I4	Permanent theme number[1]
10	A1	Its letter designate, if any

Illustrative Input

Let us assume that the following changes are to be made to the data tape: two themes--1422C and 618--are to be retired; and three equivalences--1390 to 654, 169B to 562C, and 169C to 562B are to be made.

The input deck would appear as follows:

```
Card Columns    0 0 0 0 0 0 0 0 0 1
                1 2 3 4 5 6 7 8 9 0

Main Problem Card         2         3
Retired Theme Deck  {1 4 2 2 C
                    { 6 1 8
                    {1 3 9 0     6 5 4
Equivalent Theme Deck| 1 6 9 B   5 6 2 C
                    { 1 6 9 C   5 6 2 B
```

This input deck will delete all observations on theme 1422C and all observations (lettered or non-lettered) on theme 618. The program will punch a card for each deleted observation. The deck will also delete all observations on theme 1390, with or without letters, and punch a card for each, with 654, followed by the observation's letter designate (if any), in the theme and letter fields respectively. All observations on 169B and 169C will also be deleted and punched with 562C and 562B, respectively.

The punched cards can be compared with the PTHEME and LETTER outputs (appendix C) to determine if all data has been deleted for the retired and equivalenced themes.

---

[1] The user is cautioned that when equivalencing themes, the duplicate theme numbers should be removed from the theme or lettered theme dictionary and any created through the equivalence should be added. See appendix B for a description of how to add and delete entries in files 2 and 5.

Updating the Data Tapes with the Punched Output

Once program REMOVE has been run on both the primary and secondary data bases, the entire punched output must be subdivided into data that was retired and data that was equivalenced. The retired data must be further divided into data from 'old' themes and data from 'bad' themes. All punched output on 'bad' themes should be discarded; the punched output on 'old' themes forms the deck used to update the historical data tape.

The equivalenced data must also be subdivided. Since the punched output will be used to update the active data bases, it is necessary to separate those observations that were extracted from primary sources from those extracted from secondary sources. The resulting decks are then added-back into the relevant active data tape. (See "Updating the Data Tapes".)

APPENDIX B

**MAINTAINING THE DICTIONARY FILES AND
PRODUCING A CODEBOOK**

APPENDIX B

MAINTAINING THE DICTIONARY FILES AND
PRODUCING A CODEBOOK
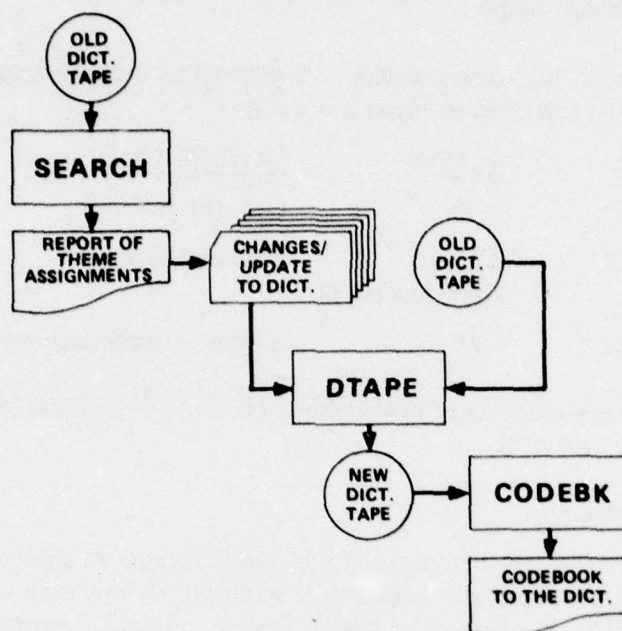
This appendix describes the structure of the six files on the dictionary tape, how to maintain any or all of them with programs SEARCH and DTAPE, and how to produce a codebook. Program SEARCH locates themes within the major/minor topic dictionary and the issue-variable dictionary to facilitate verification of changes to those files. Program DTAPE is used to completely revise a dictionary file or to make specified changes to it. Program CODEBK produces the codebook, an organized listing of the first five of these files.

STRUCTURE OF THE DICTIONARY TAPE

The dictionary tape used by all computer programs contains six files. Each program accesses the file(s) it requires. The six files are in the following order:

1. Country
2. Theme
3. Major/minor topic
4. Issue-variable
5. Lettered theme
6. Independent variable

File 1, Country Dictionary

This file contains the number, name, and international abbreviation of every country participating in the LOS Conference. It is organized by country number, which approximates alphabetical order.

There is one record for each country. A record is merely a card image in the following format (right-justified except as noted):

CC	Format	Description
1-3	I3	Country number
6-19	A8, A6 (left-justified)	Country name
20-22	A3	Standard international abbreviation

For a listing of this file, see the codebook (volume II of CNA 291). To update this file, use program DTAPE.

File 2, Theme Dictionary

This file contains the number and title of every theme on the active data tapes. It is organized by theme number. Because of periodic theme retirement (see program REMOVE in appendix A), the range of theme numbers usually exceeds the number of active themes.

There is one record for each theme. A record is equivalent to a card image in the following format:

CC	Format	Description
1-5	I5 (right-justified)	Theme number
6-53	6A8 (left-justified)	Theme title

The last record is blank, which flags the end of this file.

For a listing of this file, see the codebook. To update this file, use program DTAPE.

File 3, Major/Minor Topic Dictionary

This file contains the numbers and titles of all major and minor topics and the themes assigned to each minor topic. Every theme appearing in file 2 belongs to one

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and only one minor topic in file 3. The file is organized in outline form. The major topics are arranged in numerical order; following each major topic, its minor topics appear in numerical order; and following each minor topic, its themes are listed in numerical order. That is,

Major topic 1
    Minor topic 1
        Themes in major/minor 1, 1
    Minor topic 2
        Themes in major/minor 1, 2
    etc.
Major topic 2
    Minor topic 1
        Themes in major/minor 2, 1
    etc.

There are three types of records in this file - a major topic record, a minor topic record, and a record of themes within minor topic. They are written in the following formats (right-justified except as noted):

(1) Major topic record:

CC	Format	Description
1-5	I5	Major topic number
6-53	6A8 (left-justified)	Major topic title
59-60	I2	Total number of minor topics under this major topic

(2) Minor topic record:

CC	Format	Description
1-5	I5	Minor topic number
6-53	6A8 (left-justified)	Minor topic title
59-60	I2	Total number of themes assigned to this minor topic

(3) Record of themes assigned to minor topic

CC	Format	Description
1-4	I4	First theme number assigned to the minor topic
5-8	I4	Second theme number
.	.	.
.	.	.
.	.	.
77-70	I4	Twentieth theme number

(This format is continued on additional records, when necessary.)

If no themes are assigned, a blank card/record is inserted after the minor topic record.

For a listing of this file, see the codebook. That listing differs from the file proper in that each theme appears on a separate line with its theme title. To update this file, use program DTAPE.

File 4, Issue-Variable Dictionary

This file contains the numbers and titles of the issue-variables and the scale values, titles, and numbers of themes assigned to each. A theme may be assigned to more than one issue-variable or none at all. The issue-variables are listed in numerical order. Themes assigned to an issue-variable are listed in increasing order by scale value.

There are two types of records in this file - an issue-variable title record and a record of themes-within-variable. There is one title record and one or more themes-within-variable records for each issue-variable. They are written in the following formats (right-justified unless otherwise noted):

(1) Issue-variable title record:

CC	Format	Description
1-5	I5	Issue-variable number
6-53	6A8 (left-justified)	Issue-variable title or "OPEN" if the issue-variable is not used
58-60	I3	Total number of themes assigned to this issue-variable

(2) Themes-within-variable record:

CC	Format	Description
1-5	I5	Scale value
6-10	I5	Theme number assigned to this scale value
11-15	I5	Scale value
16-20	I5	Theme number assigned to this scale value
.	.	.
.	.	.
.	.	.

(This format is continued, with a scale value followed by a theme number, through CC 80. Additional records, in the identical format, will usually be necessary.)

There are often two or more themes with the same scale value. All themes assigned to the lowest scale value are entered before themes in the next highest value, etc.

If no themes are assigned, a blank record must be inserted. This occurs when the issue-variable is not used and CC 58-60 on the issue-variable title record is zero.

For a listing of this file, see the codebook. That listing differs from the file proper in that each theme appears on a separate line with its theme title. To update this file, use program DTAPE.

File 5, Lettered Theme Dictionary

This file contains the lettered variants of themes which appear in file 2. A lettered variant of a theme (32A is a variant of 32) is created to represent the specified wording contained in a formal proposal or working paper tabled during negotiations, which bears an "L" document code in the notation of the UN.

All variants which appear in this file must have an unlettered "parent" theme in file 2. Variants of a given theme are created in alphabetical order.

This file is organized by theme number and, within number, by letter.

There is one record for each lettered variant. A record is merely a card image in the following format (right-justified except as noted):

CC	Format	Description
1-5	I5	Theme number
6	A1	Letter designate
7-54	6A8 (left-justified)	Lettered theme title

For a listing of this file, see the codebook. To update this file, use program DTAPE.

File 6, Independent Variable Dictionary

This file contains a data base on country characteristics that are used at various stages of an analysis. It is organized by country number. For each country, there are 104 entries which fill seven records. The first record contains its country number and 34 dichotomous variables.[1] The remaining six records contain continuous variables. The seven records are written in the following format:

$$F4.0, 34F3.1, /, 5(12F10.1), 9F10.1$$

The 104 variables for each country appear in table B-1. For a list of the contents of this file, see the codebook. To update this file, use program DTAPE.

---

[1] A dichotomous variable has a value 0 or 1, where a 1 means that the country has that characteristic and a 0 means that it does not.

TABLE B-1: INDEPENDENT VARIABLES

VARIABLE NUMBER	DESCRIPTION
1	Country code number
2	Offshore hydrocarbon producer
3	Major oil producer
4	Major mineral producer of copper, nickel, manganese, or cobalt
5	Distant fishing state
6	Major fishing state in terms of nominal landed catch
7	Landlocked state[1]
8	Shelflocked state[1]
9	Narrow shelfed state[1]
10	Broad shelfed state[1]
11	States with straits
12	Blue water navy state
13	Coastal navy state
14	Major merchant fleet
15	Africa[2]
16	Asia[2]
17	Latin America[2]
18	Group of 77
19	Eastern Europe[2]
20	Western Europe and others[2]

VARIABLE NUMBER	DESCRIPTION
21	Arab League
22	Scandinavia
23	Major Western States
24	U.S. security treaty allies
25	Non-aligned states
26	European economic community
27	Major Powers
28	Caribbean Bloc
29	Yaounde conference attendees
30	Organization of petroleum exporting countries
31	--Unused--
32	States with straits < 6 miles wide
33	Oceanic archipelago states
34	Coastal archipelago states
35	States bordering semi-enclosed seas
36	Onshore natural gas production, billions of cubic meters
37	Offshore natural gas production, billions of cubic meters
38	Daily average per capita caloric intake, seafood only

VARIABLE NUMBER	DESCRIPTION
39	Daily average per capital caloric intake, all foods
40	Nominal fish catch annual, in thousands of metric tons
41	Nominal fish catch, distant fishing, in thousands of metric tons
42	Nominal fish catch, coastal fishing, in thousands of metric tons
43	Coastal seabed area to 3000-meter isobath, in square nautical miles
44	Area of 200 mile economic zone, in square nautical miles
45	Coastal seabed area to 200-meter isobath, in square nautical miles
46	Measure of disadvantaged[3]
47	Gross national product rank ordered 1-149 with 149 poorest state
48	--Unused--
49	--Unused--
50	--Unused--
51	Onshore oil production in millions of metric tons

VARIABLE NUMBER	DESCRIPTION
52	Offshore oil production in millions of metric tons
53	Shipborne exports of crude petroleum, thousands of metric tons
54	Shipborne exports of petroleum products, thousands of metric tons
55	Shipborne exports of dry cargo, thousands of metric tons
56	Shipborne imports of crude petroleum, thousands of metric tons
57	Shipborne imports of petroleum products, thousands of metric tons
58	Shipborne imports of dry cargo, thousands of metric tons
59	Onshore reserves of natural gas, 1972, billions of cubic meters
60	Offshore reserves of natural gas, 1972, billions of cubic meters
61	Onshore reserves of petroleum, 1972, millions of metric tons
62	Offshore reserves of petroleum, 1972, millions of metric tons
63	--Unused--
64	Ultimate recoverable reserves of natural gas, onshore

TABLE B-1: INDEPENDENT VARIABLES (Cont'd)

VARIABLE NUMBER	DESCRIPTION	VARIABLE NUMBER	DESCRIPTION	VARIABLE NUMBER	DESCRIPTION
65	Ultimate recoverable reserves of natural gas, offshore	82	Value of annual imports in millions of U.S. dollars	98	Total volume of shipping to and from country, thousands of metric tons[12]
66	Ultimate recoverable reserves of petroleum, onshore	83	--Unused--	99	Indirect measure of state's capacity to enforce its rules in a 200 mile EZ/square nautical miles per ship[13]
67	Ultimate recoverable reserves of petroleum, offshore	84	Number of scientists and engineers engaged in R&D	100	Measure of export dependence of economy[14]
68	Numbers of scientific research ships	85	Gross national product, 1972, in millions of U.S. dollars	101	Years to exhaustion of known recoverable onshore oil & gas reserves, at current production rates[15]
69	Gross registered tonnage of research ships	86	Annual copper production[4], thousands of metric tons	102	Measure of dependence on imported oil[16]
70	--Unused--	87	Annual nickel production[4], thousands of metric tons	103	Crude measure of fishing dependence of economy[17]
71	--Unused--	88	Annual manganese production[4], thousands of metric tons	104	Similar to Entry 99 with coastal patrol craft only policing economic zone[18]
72	--Unused--	89	Annual cobalt production[4], thousands of metric tons		
73	--Unused--	90	Number of blue-water-capable surface ship[5]		
74	Length of coastline, nautical miles	91	Number of submarines[6]		
75	Numbers of flag tankers	92	Number of coastal patrol craft[5]		
76	Gross registered tonnage of flag tankers	93	Average breadth of shelf[7]		
77	Numbers of flag cargo vessels	94	Normalized increase in a coastal state's offshore area due to establishment of 200 mile EZ[8]		
78	Gross registered tonnage of flag cargo vessels	95	Gross registered tons of flag shipping[9]		
79	--Unused--	96	Value of mineral production as proportion of GNP[10]		
80	--Unused--	97	Average breadth of margin[11]		
81	Value of annual exports in millions of U.S. dollars				

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TABLE B-1: INDEPENDENT VARIABLES (Cont'd)

Footnotes

1. Variables 7 through 10 are mutually exclusive and exhaustive.
2. Variables 15, 16, 17, 19, and 20 are mutually exclusive and exhaustive.
3. Measured in terms of the number of interest groups the country belongs to; the closer to 1, the more disadvantaged.
4. Metal content only.
5. Variables 90 and 92 are mutually exclusive.
6. Includes patrol, fleet, attack, and strategic missile submarines.
7. Calculated by dividing variable 45 by variable 74.
8. Calculated by dividing the difference between variable 44 and variable 45 by variable 45.
9. Sum of variables 76 and 78.
10. Mineral production was converted to dollar value per thousand metric tons: copper, 1.109; nickel, 2.794; manganese, .19; cobalt, 4.9. These values were summed and divided by GNP in ten of thousands of U.S. dollars.
11. Calculated by dividing the difference between variable 43 and 45 by variable 74.
12. Sum of variables 53 through 58.
13. Calculated by dividing the sum of variables 90 and 92 into variable 44.
14. Ratio of variable 81 to GNP in tens of thousands of U.S. dollars.
15. The average of the sum of the two ratios, variable 61/variable 51 and variable 59/variable 36.
16. Ratio: (variable 56 + 57)/ [(variable 51 + 52) - (variable 53 + 54) + (variable 56 + 57)].
17. Ratio of variable 40 to GNP in thousands of U.S. dollars.
18. Ratio of variable 44 to variable 92.

IDENTIFYING THEME ASSIGNMENTS

If the user intends to delete themes from the dictionary tape, they must first be found within the theme, lettered theme, major/minor, and issue-variable dictionary files. Although they are easily found in the numerical listings of the first two files, they are more difficult to find in files 3 and 4. But these files must be searched as well, since all references to the themes must be eliminated whenever they are being retired or equivalenced to other numbers.

Identifying theme assignments to topics and issue-variables is also important after every change to these files. After the dictionary tape has been updated, the user must verify that every theme belongs to one and only one minor topic and that the changes to that file and the issue-variable file have been made correctly.

Executing Program SEARCH

To find themes within files 3 and 4, the user should execute program SEARCH. This program will not eliminate the themes from these files. It will merely produce a list of the selected themes in numerical order with their assignments to minor topics and issue-variables. The program will produce an error message if a theme does not belong to one and only one minor topic.

>   Input:
>   Dictionary tape placed on LU1
>   Theme range selection deck
>   Output: printed report in two parts:
>   Major/minor assignments
>   Issue-variable assignments

The theme range selection deck consists of a series of cards, each one specifying the upper and lower bounds of a set of theme numbers to be searched. There is technically no limit to the number of cards in this deck; however, only 1000 themes can be processed in one run. The cards should be placed in the deck in numerically increasing order. The following right-justified format is used:

CC	Format	Description
1-5	I5	Lower bound of this theme range
6-10	I5	Upper bound of this theme range

For example, if themes 1 through 200 are to be processed, the user specifies 1 as the lower bound and 200 as the upper bound and the program will search the two dictionaries for all 200 themes. If a single theme number is to be processed, the upper and lower bounds are assigned the same number; i.e., 700 to 700 will process theme 700 only.

Illustrative Input and Output

Let us assume that the user wants to search the two dictionaries for themes 2 through 25, 401, and 420 through 423. The following theme range selection deck would be required:

```
card columns      0 0 0 0 0 0 0 0 0 1
                  1 2 3 4 5 6 7 8 9 0

                  ⎧       2         2 5
Theme Range       ⎨     4 0 1       4 0 1
Selection Deck    ⎩     4 2 0       4 2 3
```

Figures B-1 and B-2 contain the resulting output. Note particularly theme 21. It has not been assigned to a minor topic. If this theme is in file 2, the user must assign it to a topic and update the dictionary. Figure B-2 shows the issue-variable assignments of the selected theme numbers. Note that some themes belong to more than one issue-variable (e.g., 420) and others belong to none (e.g., 3). These are acceptable results, provided, of course, that a check proves them to be accurate.

This example ran in less than one minute.

THE FOLLOWING ARE THE MAJOR/MINOR ASSIGNMENTS FOR THE FOLLOWING THEMES

```
         2 IS IN MAJOR/MINOR   4   1
         3 IS IN MAJOR/MINOR  16   1
         4 IS IN MAJOR/MINOR   5   3
         5 IS IN MAJOR/MINOR   5   2
         6 IS IN MAJOR/MINOR   4   4
         7 IS IN MAJOR/MINOR   6   8
         8 IS IN MAJOR/MINOR   4   5
         9 IS IN MAJOR/MINOR   4   5
        10 IS IN MAJOR/MINOR   6   5
        11 IS IN MAJOR/MINOR   6   3
        12 IS IN MAJOR/MINOR   8   2
        13 IS IN MAJOR/MINOR   7  10
        14 IS IN MAJOR/MINOR   7  13
        15 IS IN MAJOR/MINOR  13   2
        16 IS IN MAJOR/MINOR   5   3
        17 IS IN MAJOR/MINOR  11   4
        18 IS IN MAJOR/MINOR   8   1
        19 IS IN MAJOR/MINOR   7   9
        20 IS IN MAJOR/MINOR  15   3
***     21 DOES NOT BELONG TO ANY TOPICS
        22 IS IN MAJOR/MINOR   6   1
        23 IS IN MAJOR/MINOR  16   2
        24 IS IN MAJOR/MINOR   4   8
        25 IS IN MAJOR/MINOR   9  14
       401 IS IN MAJOR/MINOR  11   5
       420 IS IN MAJOR/MINOR   9   1
       421 IS IN MAJOR/MINOR   9   4
       422 IS IN MAJOR/MINOR   9   7
       423 IS IN MAJOR/MINOR   9   2
```

FIG. B-1: REPORT OF THEME ASSIGNMENTS TO MAJOR AND MINOR TOPICS

THE FOLLOWING ARE THE VARIABLE ASSIGNMENTS FOR THE FOLLOWING THEMES

```
  2 IS IN VARIABLES    18
  3 IS IN VARIABLES
  4 IS IN VARIABLES    21
  5 IS IN VARIABLES    20
  6 IS IN VARIABLES
  7 IS IN VARIABLES    23
  8 IS IN VARIABLES    19
  9 IS IN VARIABLES    29
 10 IS IN VARIABLES    23
 11 IS IN VARIABLES    23
 12 IS IN VARIABLES
 13 IS IN VARIABLES    27   28
 14 IS IN VARIABLES    32
 15 IS IN VARIABLES    51
 16 IS IN VARIABLES
 17 IS IN VARIABLES    49
 18 IS IN VARIABLES
 19 IS IN VARIABLES    27   28
 20 IS IN VARIABLES    23
 21 IS IN VARIABLES
 22 IS IN VARIABLES    23
 23 IS IN VARIABLES    41   42
 24 IS IN VARIABLES
 25 IS IN VARIABLES    39   52
401 IS IN VARIABLES    49
420 IS IN VARIABLES    34   35   36   37   39
421 IS IN VARIABLES    34   35
422 IS IN VARIABLES    37
423 IS IN VARIABLES    35
```

FIG. B-2: REPORT OF THEME ASSIGNMENTS TO ISSUE-VARIABLES

UPDATING THE DICTIONARY TAPE

Before program DTAPE can be executed, the user must determine, for each file, whether it should be left unchanged, be completely revised, or have specified changes made (that is, additions, deletions, or corrections of an entry). For each file that is to be completely revised the user must create a new file deck in the same format as the existing file (see "Structure of the Dictionary Tape"). For each file that is to have specified changes made, the user must create a deck of the additions, deletions and corrections in the special format described on the following pages. For each file that is to be left unchanged, no additional input is needed.

Executing Program DTAPE

Input:
    Existing dictionary tape placed on LU1
    File change control card
    File change deck for each file being modified, with an EOF between decks

Output:
    Updated dictionary tape produced on LU2
    Detailed report of whether and how much change took place

File Change Control Card

This required control card specifies the type of change to be made to each of the six dictionary files. Three options are available for the first five files and two for the sixth file. The option chosen will determine whether a file change deck is needed and, if it is, what form it will take. The three options for files 1 through 5 are:

=0: leave the file unchanged. This option does not require a file change deck or an EOF card.

=1: completely update the file. This option requires an entire dictionary file to be submitted on cards and is particularly useful for large scale updates of files 1 through 5. The user should refer to the section entitled "Structure of the Dictionary Tape" for the format and order of these cards. This deck must be followed by an EOF card.

=2: specified changes are to be made to the file. This option allows the user to correct, add, and delete entire records or portions of records on the current file. The format and organization of this file change deck is presented on the following pages. The deck must be followed by an EOF card.

B-14

This card is written in the following format:

CC	Format	Description
1	I1	File 1 option
2	I1	File 2 option
3	I1	File 3 option
4	I1	File 4 option
5	I1	File 5 option
6	I1	File 6 option =0 or = 2 (Note: file six cannot be completely updated by a new card deck. Thus the =1 option cannot be used.)

File Change Decks

For each file that is being modified, a file change deck followed by an EOF card must be created. When a complete revision is made, the change deck is a complete revised dictionary file on cards in the same format and order as the existing file (see "Structure of the Dictionary Tape"). When specified changes are to be made, they must appear in the format discussed in the following six sections.

File 1, Country Dictionary. Changes are made to the country dictionary by creating a card that replaces a record in this file. The user cannot add or delete countries, since these changes would affect the normal operation of all programs. If new countries must be added or old ones deleted, the user should use option 1 and completely update the file, with programmer approval.

For each change, a card must be punched in the following format (right-justified except as noted):

CC	Format	Description
1-3	I3	Country number
6-19	A8, A6 (left justified)	Country name
20-22	A3	International abbreviation

The file 1 change deck is formed by ordering these replacement cards by country number and ending the deck with an EOF card.

File 2, Theme Dictionary. Changes are made to the theme dictionary by creating a card that corrects, adds, or deletes a theme. The only restriction is that when adding new themes, the theme number may not exceed 1599. If the list must be expanded beyond this point, the user should completely update the file, but only with programmer approval.

The user is cautioned that when adding a new theme, the theme must also be added to a minor topic (see file 3). Furthermore, when existing themes are deleted, the user must delete them from the major/minor, issue-variable, and lettered theme dictionaries as well. All data on the theme should also be removed from the data tapes (see appendix A).

For each change to this file, a card must be punched in the following format (right-justified except as noted):

CC	Format	Description
1-5	I5	Theme number
6-53	6A8 (left justified)	Theme title (leave blank if CC 80 is a minus)
80	A1	= blank if changing the title of an existing theme = - if deleting an existing theme (title not required) = + if adding a new theme with a number less than 1600

The file 2 change deck is formed by ordering these change cards by theme number and ending the deck with an EOF card.

File 3, Major/Minor Topic Dictionary. Changes are made to the major/minor dictionary by creating a card that changes the title of a major or minor topic or changes the assignment of themes to minor topic. Since normal operations of the programs could be affected, the user cannot add or delete major or minor topics. To do so would require completely updating the file and programmer approval.

The user is cautioned that, when deleting a theme from a minor topic, the theme must be added to another topic unless all data and dictionary references to it are being deleted. The user must make certain that, after the additions and deletions, every existing theme still belongs to one and only one minor topic.

B-16

For each change to a major topic title, a card must be punched in the following format (right-justified except as noted):

CC	Format	Description
1-5	I5	Major topic number
6-10	I5	=0 (flags a major topic title change)
16-63	6A8 (left-justified)	New major topic title

For each change to a minor topic title or for any change to the themes within a minor topic, a card must be punched in the following format (right-justified except as noted):

CC	Format	Description
1-5	I5	Major topic number
6-10	I5	Minor topic number
11	I1	=0 if not changing the minor topic title =1 if changing the minor topic title
12-15	I4	Number of themes to be changed in this minor topic (i.e., additions plus deletions) =0 if only changing the minor topic title
16-63	6A8 (left justified)	New title of minor topic to be used when CC 11 = 1; otherwise blank

If themes are being deleted from or added to the minor topic, another card specifying the changes must be punched. The total number of theme entries on the card(s) must be equal to the number in CC 12-15 of the minor topic card described above. The themes must be listed in numerical order and in the following right-justified format:

	CC	Format	Description
First theme change	1	A1	=+ if the following theme number is to be added = - if the following theme number is to to be deleted
	2-5	I4	Theme number
Second theme change	6	A1	=+ or - for following theme
	7-10	I4	Theme number

(continue through CC 80 and on additional cards if necessary)

B-17

The file 3 change deck is formed by ordering these three types of cards in the same outline form as the existing file. The major topic title cards, if any exist, are placed in numerical order. The minor topic cards are placed directly behind the appropriate major topic card, or where it would be placed if it existed. The theme changes to a minor topic are placed directly behind the appropriate minor topic card. The last card in the deck is an EOF card.

File 4, Issue-Variable Dictionary. Changes are made to the issue-variable dictionary by creating a card that changes the title of an existing issue-variable or that deletes or adds themes at specific scale values on the issue-variable. New issue-variables can be created as long as the number does not exceed 70. If more are needed, the user should completely update the file, with programmer approval.

When changing an issue-variable title or the themes and scale values in it, a card must be punched in the following format (right-justified except as noted):

CC	Format	Description
1-5	I5	Issue-variable number
6	I1	=0 if not changing the issue-variable title =1 if changing the issue-variable title
7-9	I3	Number of themes to be changed in this issue-variable (i.e., additions plus deletions) =0 if only changing the issue-variable title
10-57	6A8 (left justified)	New issue-variable title to be used when CC 6 = 1; otherwise blank

Whenever CC 7-9 are not zero, one or more additional cards listing the additions and deletions must be created. The total number of theme entries on the card(s) must be consistent with the number in that field. Eight theme changes fit on a card; more necessitate additional cards. The themes must be listed numerically by scale value, with all the deletions at a given scale value listed before any additions to it. If more than one theme is being deleted at a given scale value, the deletions must be in the order in which they appear in the file.

The following right-justified format is used:

B-18

	CC	Format	Description
First theme change	1-5	I5	Scale value of 1st theme
	6	A1	= + if the following theme is being added at this scale value = - if the following theme is being deleted from this scale value
	7-10	I4	Theme number
Second theme change	11-15	I5	Scale value of 2nd theme
	16	A1	= + or -
	17-20	I4	Theme number

.
.
.

(through CC 80 and on additional cards)

The file 4 change deck is ordered by issue-variable number. Following each issue-variable identification card is the ordered list of theme changes, if any, to the issue-variable. The deck is followed by an EOF card.

File 5, Lettered Theme Dictionary. Changes are made to the lettered theme dictionary by creating a card that changes the title of an existing lettered theme, deletes an existing lettered theme, or adds a new one. Each lettered variant of a theme number must be changed separately.

When adding a lettered theme the user must determine whether the non-lettered theme exists in file 2. If it does not, the user must add it to file 2 before the data on the lettered theme can be used. In addition, when deleting a lettered theme, the user must delete all data on it from the data tapes (see appendix A).

For each change to a lettered theme, a card must be punched in the following format (right-justified except as noted):

CC	Format	Description
1-5	I5	Theme number
6	A1	Letter designate
7-54	6A8 (left-justified)	Theme title (may be blank if deleting this lettered theme)
80	A1	=blank if changing the title of an existing theme =+ if this theme is being added =- if this theme is being deleted

B-19

The file 5 change deck is ordered by theme number. Within theme numbers, the deletions, in alphabetical order by letter designate, must procede any additions, also in alphabetical order. The deck is followed by an EOF card.

File 6, Independent Variable Dictionary. Changes are made to the independent variable dictionary by requesting a change to an entry in the file or by creating a new variable. If a new variable is created, it must be assigned one of the unused numbers (refer to table B-1). When doing so, the user is cautioned that there may be old data in some of the unused categories and therefore new data should be added for all countries even if the value of the data for some countries is zero. The user may not create a new variable beyond 104 without programmer approval. One card in the following right-justified format is required for each change:

CC	Format	Description
1-5	I5	Country number
6-10	I5	Independent variable number
11-30	F20.5	Value to be assigned

The file 6 change deck is ordered by country number. Within country, the independent variables can appear in any order. The deck is followed by an EOF card.

Illustrative Input and Output

Let us assume that all six files are to have specified entries changed. In particular,

> In file 1, the international abbreviation for country 101 is to be changed to QAT.

> In file 2, theme 161 is to be retitled, theme 162 added, and 193 deleted.

> In file 3, major topic 2 is to be retitled, its minor topic 4 is to be retitled, and four theme changes are to be made to it.

> In file 4, issue-variable 50 is to be retitled.

> In file 5, theme 4B is to be deleted, theme 4D is to be added, and 94A is to be retitled.

> In file 6, independent variables 31, 38, and 101 are to be changed for countries 31 and 104.

To perform these changes, the input deck in figure B-3 is required.

```
CARD COLUMNS
          1111111111222222222233333333334444444444555555555566666666667777777778
1234567890123456789012345678901234567890123456789012345678901234567890

222222
101 QATAR     QAT
END OF FILE CARD
161BENEFIT SHARING...
162MIGHT SUPPORT A 15 MILE TERRITORIAL SEA
193
END OF FILE CARD
2    0        DEEP SEABED
2    41   4EXPLOITATION
+ 187- 711+ 720+ 213
END OF FILE CARD
501 OI.O. SEA
END OF FILE CARD
48
40STRAIGHT BASELINE PROPOSED BY AFFICAN STATES
94ASTRICTER CONTRCL OVEF RESEAPCH
END OF FILE CARD
31   385.0
31   101583.44
104  101369.2
104  3142.359
END OF FILE CARD
```

FIG. B-3: CONTROL CARDS FOR ILLUSTRATIVE RUN OF PROGRAM DTAPE

The output that resulted appears as figure B-4. A heading is produced for each
file that is to be changed. Under the heading are the changes made by the program.
The user should verify that the changes were made correctly. If a card or an entry
on a card is out of order, an error message is produced which states that an error was
found and the printed changes to the affected file should be disregarded. Such an error
causes the file in question to be left entirely unchanged. The correct change must be
resubmitted in a new DTAPE run. No error occurred in the example that follows.

```
THE FOLLOWING CHANGES WERE MADE TO FILE   1
SUBSTITUTION...  101QATAR          QAT WAS ORIGINALLY 101QATAR          QUA

THE FOLLOWING CHANGES WERE MADE TO FILE   2
SUBSTITUTION...  161BENEFIT SHARING...          WAS ORIGINALLY 161BENEFIT SHAR DOESNT CONSIDER WRL
ADDED  162MIGHT SUPPORT A 15 MILE TERRITORIAL SEA     BEFORE RECORD  164NO STRINGS ATTACHED TO A STATE'S
DELETED 193

THE FOLLOWING CHANGES WERE MADE TO FILE   3
TITLE CHANGED FOR MAJOR    2 TO  DEEP SEABED
TITLE CHANGED FOR MINOR    4 TOEXPLOITATION
THEME   187 ADDED TO    2    4
THEME   711 WAS DELETED FROM MAJOR/MINOR    2    4
THEME   720 ADDED TO    2    4
THEME   213 ADDED TO    2    4

THE FOLLOWING CHANGES WERE MADE TO FILE   4
VARIABLE  50 WAS GIVEN A NEW TITLE I.O. SEA

THE FOLLOWING CHANGES WERE MADE TO FILE   5
DELETED  48
ADDED  40STRAIGHT BASELINE PROPOSED BY AFRICAN STATES     BEFORE RECORD  5AIP IN ARCHIPELAGIC MATER
SUBSTITUTION  94RESTRICTER CONTROL OVER RESEARCH          WAS ORIGINALLY  94RESTRICTR,NONDISCRIM CS RE

THE FOLLOWING CHANGES WERE MADE TO FILE   6
COUNTRY  31 ENTRY  38 WAS CHANGED TO      5.000 WAS     3.000
COUNTRY  31 ENTRY 101 WAS CHANGED TO    583.440 WAS     0.000
COUNTRY 104 ENTRY 101 WAS CHANGED TO   5369.260 WAS     3.000
COUNTRY 104 ENTRY  31 WAS CHANGED TO     42.359 WAS     0.000
```

B-23

FIG. B-4: REPORT OF CHANGES MADE TO DICTIONARY FILES

PRODUCING A CODEBOOK

After the dictionary tape has been updated, the user should produce the computerized portion of the codebook by executing program CODEBK. The codebook can be used to verify changes to the dictionaries.

The computerized part consists of the following seven sections:

1. Country dictionary (i.e., file 1)

2. Theme dictionary (i.e., file 2)

3. Major/minor topic dictionary (i.e., file 3)

4. Issue-variable dictionary (i.e., file 4)

5. Themes not assigned to any issue-variable

6. Lettered theme dictionary (i.e., file 5)

7. Numbers within the range of the theme dictionary to which themes are not currently assigned

To produce the computerized portion of a codebook, the only input needed is the dictionary tape. The output is the printed seven sections of the codebook. When multiple copies are needed, the codebook is written onto a tape and then can be listed numerous times. This can be done by equipping logical unit 61 (normally the printer) to be a tape.

A sample codebook is not presented here because a complete version - both the computerized and non-computerized portions - appears in volume II of CNA RC 291.

APPENDIX C

SPECIAL PURPOSE ANALYSIS

APPENDIX C

SPECIAL PURPOSE ANALYSIS

This appendix contains a description of three special purpose programs. Two programs, PTHEME and LETTER, produce theme profiles, which are organized lists of countries that have spoken on a given theme during the negotiations. The third program, VALID, is used to determine how similar Study forecasts are to outside forecasts.

ORGANIZING THE DATA BY THEME

Apart from the information that is gained by studying an individual idea or theme, a theme profile is also useful when checking the coding of a specific theme, deciding whether to retire the theme, or deciding whether it should be placed in an issue-variable. When the coding of a theme is suspect, theme profiles can greatly reduce the retrieval effort. The user need only search the retrieval printout (output from MATRIX) for the countries known to have the remark, rather than search through all countries.

Two types of theme profiles can be produced, a theme profile with countries and a lettered theme profile with countries. Both types indicate the number of times each country has made a remark and the latter type identifies the source document where the remark can be found. Program PTHEME produces the first type and program LETTER produces the second.

Executing Program PTHEME

Before program PTHEME can be executed, the user must create a series of control cards which specify the theme numbers and data to be included in the printout.

Input:
    Data matrix tape (output from MATRIX)
    Dictionary tape
    Control card deck:
        Main problem card
        Theme range selection card (optional)
        Major topic selection card (optional)
        Variable selection card (optional)
Output: theme profile with countries mentioning each theme

Main Problem Card

This card specifies all input and output units as well as the criteria for selecting themes and data. The following right-justified format is used:

CC	Format	Description
1-5	I5	Logical unit of the data matrix tape (=49)
6-10	I5	Logical unit of the output (=61)
11-15	I5	Logical unit of the dictionary tape (=45)
16-20	I5	=N: number of theme range selection cards included in this deck =0: no individual theme selection; selection by major topic or variable required
21-25	I5	Number of time periods on the data matrix input tape = 1, 2, 3, or 4
26	I1	Selection of data in period 1 =0: excludes data =1: includes data
27	I1	Selection of data in period 2 (if it exists) =0: excludes data =1: includes data
28	I1	Selection of data in period 3 (if it exists) =0: excludes data =1: includes data
29	I1	Selection of data in period 4 (if it exists) =0: excludes data =1: includes data (Note: Any combination of the four periods, represented by CC 26-29, may be selected. If more than one period is selected, the data is merged on the printout. When the data matrix tape contains a single period, there must be a 1 punch in CC 26.)
30-45	2A8	Classification, to appear on each page of the printout; required input
46-50	I5	Major topic selection =0: no selection =1: major topic selection to be specified on major topic selection card

CC	Format	Description
51-55	I5	Variable selection =0: no selection =1: variable selection to be specified on variable selection card (Note: It is possible to select theme ranges, major topics, and variables in the same run. If there is no theme range selection (CC 16-20 = 0), there must be major topic selection (CC 46-50 = 1) or variable selection (CC 51-55 = 1).

Theme Range Selection Card(s)

The total number of theme range selection cards must equal the value of CC 16-20 of the main problem card. A separate card is required for each theme range. A maximum of 600 themes can be selected in a single run. The following right-justified format is used:

CC	Format	Description
1-5	I5	Smallest theme number being selected, i.e., the lower bound of the theme range
6-10	I5	Largest theme number being selected, i.e., the upper bound of the theme range

Major Topic Selection Card

This card is required if CC 46-50 of the main problem card is 1. The following format is used:

CC	Format	Description
1-17	17I1	Major topics are numbered 1 through 17. A 1 punch in CC X selects the themes in major topic X.

Variable Selection Card

This card is required if CC 51-55 of the main problem card is 1. The following format is used:

CC	Format	Description
1-70	70I1	Variables are numbered 1 through 70. A 1 punch in CC X selects the themes in variable X.

C-3

Illustrative Input and Output

Let us assume that a theme profile is needed for themes 1 through 5, 300, and those in variable 22, and the profile is to include data from the second and fourth periods of a four-time-period data matrix tape.

The input deck would take the following form:

```
                              CARD COLUMNS

                  | 0000000000111111111122222222223333333333444444444455555555556
                  | 1234567890123456789012345678901234567890123456789012345678901234567890
Main Problem Card       49    61    45    02    040101**UNCLASSIFIED**  00      01
   Theme Range Cards  ⎡001   005
                      ⎣300   300
Variable Selection Card ⎡                          1
```

This deck produced figure C-1. The numbers next to the countries are the number of references to the theme that were made by them in the second and fourth periods combined. If the matrix tape included lettered and regional observations, this listing would also include such observations. This example ran in 3 minutes.

```
1  EXCL FISHING ZONE---50MI OR EDGE OF SHELF

2  50 MILE TERRITORIAL SEA

   NIGERIA               1
3  INDIAN OCEAN SHOULD BE MADE A ZONE OF PEACE

   ALBANIA               1
   MADAGASCAR            1
   SOMALIA               1
   SOUTHERN YEMEN        1
4  STRAIGHT BSLN CONNECT OUTRMST PTS OF OUTRMST ISL

   AUSTRALIA             1
   BAHAMAS               1
   BAHRAIN               1
   BURMA                 1
   CANADA                1
   CHILE                 1
   FIJI                  2
   ICELAND               1
   INDIA                 2
   INDONESIA             4
   LAOS                  1
   MAURITIUS             3
   MEXICO                1
   NEW ZEALAND           1
   NORWAY                1
   PAKISTAN              1
   PERU                  1
   PHILIPPINES           2
   PORTUGAL              2
   SIERRA LEONE          1
   BANGLADESH            1
   GUINEA-BISSAU         1
5  IP IN ARCHIPELAGIC WATERS

   ALBANIA               1
   AUSTRALIA             1
   BAHRAIN               1
   CANADA                2
   CHILE                 2
   FIJI                  2
   ICELAND               2
   INDIA                 2
   INDONESIA             7
   MAURITIUS             4
   MEXICO                2
   NEW ZEALAND           2
   NORWAY                2
   PAKISTAN              1
   PERU                  1
   PHILIPPINES           3
   PORTUGAL              1
   UAR                   1
   BANGLADESH            1
                                          **UNCLASSIFIED**
```

FIG. C-1: THEME PROFILE WITH COUNTRIES

```
 300   200 MI CS POLLUTION CONTROL ZONE

        ARGENTINA            1
        INDIA               1
        USSR                1
 822   CONTINENTAL ST CAN DRAW BSLNS AROUND OFFSHR ARCH

        ECUADOR             2
        HONDURAS            1
        PERU                1
1230   MIXED STS W/GE-1 ARCH IN NATL TERR TREAT AS ARCH

1236   OPPOSE ARCH THEORY FOR MIXED STATES

        ALGERIA             1
        BULGARIA            1
1314   ARCH ART APPLIES TO COASTAL ARCHIPELAGOES

        ARGENTINA           1
        CANADA              1
        CHILE               1
        COLOMBIA            1
        ECUADOR             1
        FRANCE              1
        GREECE              1
        HONDURAS            2
        ICELAND             1
        INDIA               2
        INDONESIA           1
        MAURITIUS           1
        MEXICO              1
        NEW ZEALAND         1
        NORWAY              1
        PERU                1
        PORTUGAL            2
        SPAIN               1
        BANGLADESH          1
1315   ARCH ART NOT APPLY NON-STATE/CSTL ARCIPELAGOES

        ALGERIA             1
        BURMA               1
        FIJI                1
        INDONESIA           2
        MALAYSIA            1
        MAURITANIA          1
        MAURITIUS           2
        PHILIPPINES         2
        THAILAND            1
        TUNISIA             1
        TURKEY              3
        USSR                1
        WESTERN SAMOA       1
1503   CS MAY NOT CONNECT CONTINENTAL COAST W/DIST ARCH

        ARGENTINA           1
```

UNCLASSIFIED

FIG. C-1: (Cont'd)

Executing Program LETTER

Before program LETTER can be executed, the user must create a series of control cards which specify the theme numbers and the range of document numbers (similar to program MATRIX input) to be included in the printout.

Input:
- Data tape
- Dictionary tape
- Control card deck:
    - Main problem card
    - Document range selection card

Output: theme profile with countries mentioning lettered theme variants

Main Problem Card

This card specifies the input and output units as well as the selection criteria. The following right-justified format is used:

CC	Format	Description
1-5	I5	Number of data tape inputs =1: primary or secondary =2: primary and secondary (Note: The first tape is assigned to logical unit 49 and the second, if used, to logical unit 48.)
6-10	I5	Minimum theme number to be processed. The program will automatically process the next 300 theme numbers encountered in the file. If more than 300 theme numbers exist in the file, a second job must be submitted beginning where this one ended.
11-15	I5	Number of document range selection cards (see next control card).
16-20	I5	Selection of regional vs. non-regional data =0: only non-regional remarks are included =1: only regional remarks are included =2: both regional and non-regional remarks are included
21-25	I5	Logical unit of the dictionary tape input (=47)
26-30	I5	Logical unit of the output (=61)
31-35	I5	Number of countries (=149)

<u>Document Range Selection Cards</u>

One or more of these cards are required. The number of cards must equal the value in CC 11-15 of the main problem card. A separate card is required for each document range specified. The following right-justified format is used:

<u>CC</u>	<u>Format</u>	<u>Description</u>
1-5	I5	Lower bound of this document range
6-10	I5	Upper bound of this document range

<u>Illustrative Input and Output</u>

Let us assume that the theme profile is to include both regional and non-regional data from one tape and list all themes beginning with 1. There is one document range selection card to be read and observations from documents 1 through 999 are to be included.

The input deck has the following form:

CARD COLUMNS

```
00000000011111111112222222222333333333 4
1234567890123456789012345678901234567890
```

Main Problem Card	1	1	1	2	47	61	149
Document Range Card	1	999					

This deck creates a printout of lettered theme observations for theme numbers 1 on. Since the lettered theme dictionary contains only a subset of themes (there are currently fewer than 300 theme numbers with lettered variants), a single run processed everything in the file.

Figure C-2 is the first page of the output. The numbers following the country names are the documents from which the lettered remarks were extracted. Note that, unlike program PTHEME output, each observation by a country is listed on a separate line. This example took 18 minutes and printed 6500 lines.

```
2A  50 MILE TERRITORIAL SEA
    NIGERIA            553

4A  STRAIGHT BSLN CONNECT OUTRMST PTS OF OUTRMST ISL
    AUSTRALIA          545
    CANADA             484
    CHILE              484
    ICELAND            484
    INDIA              484
    INDIA              545
    INDONESIA          484
    MAURITIUS          484
    MEXICO             484
    NEW ZEALAND        484
    NORWAY             484
    PORTUGAL           546
    BANGLADESH         532

4B  STRAIGHT BSLN CONNECT OUTMST PTS OF OUTMST ISL
    FIJI               553
    INDONESIA          553
    INDONESIA          545
    MAURITIUS          553
    MAURITIUS          546
    PAKISTAN           546
    PERU               546
    PHILIPPINES        553

4C  STRAIGHT BASLN CONECT OUTRMOST PTS OF OUTRMST IL
    BAHAMAS            553

5A  IP IN ARCHIPELAGIC WATERS
    AUSTRALIA          545
    CANADA             478
    CANADA             484
    CHILE              478
    CHILE              484
    ICELAND            478
    ICELAND            484
    INDIA              478
    INDIA              484
    INDONESIA          478
    INDONESIA          484
    MAURITIUS          478
    MAURITIUS          484
    MEXICO             478
    MEXICO             484
    NEW ZEALAND        478
    NEW ZEALAND        484
    NORWAY             478
    NORWAY             484
    PORTUGAL           546
    BANGLADESH         532

5B  IP IN ARCH WTRS
    FIJI               553
    INDONESIA          553
    INDONESIA          545
    MAURITIUS          553
    MAURITIUS          546
    PHILIPPINES        553
    UAR                546
```

FIG. C-2: LETTERED PROFILE WITH COUNTRIES

VALIDATING FORECASTS

The forecasting model calculates the most likely outcomes on issues on the basis of the preferred positions of the participants in the negotiations. When outside forecasts of likely outcomes are available, our forecasts can be compared with them. Such a comparison can be made by executing program VALID.

This program requires a normalized tape as input (output from VMODEL). It calculates the percentage of countries with preferred positions lower than the scale value corresponding to the outside forecast. Because we forecast the median preferred position on each issue-variable, the closer this percentage is to 50 percent, the closer our forecast is to the outside forecast. The program also produces a measure of similarity. The closer the measure is to zero, the more similar are the Study and outside forecasts.

Executing Program VALID

To execute program VALID, only one control card is necessary. It contains the outside forecasts on the issues being compared. Each outside forecast is assigned the scale value on the relevant issue closest to its substantive content.

Input:
    Normalized tape (output from VMODEL) placed on LU1
    Outside forecasts control card
Output: report on how close the outside forecast is to the Study
    forecast

The outside forecasts control card is written in the following right-justified format:

CC	Format	Description
1-2	F2.0	Scale value of 'outside' forecast for the first issue on the normalized input tape; blank if outside forecast is not available for this issue
3-4	F2.0	Scale value of outside forecast for the second issue on the normalized tape; blank if no outside forecast is available
.		
.		

(through CC 80 and on additional cards if necessary)

C-10

Illustrative Input and Output

Let us assume that the normalized tape has four issues on it and outside forecasts are available for all four. Let us further assume that the outside forecasts have scale values 2, 5, 5, and 4 respectively. The input deck would appear as follows:

```
Card Column      0 0 0 0 0 0 0 0
                 1 2 3 4 5 6 7 8

Outside Forecasts   0 2 0 5 0 5 0 4
```

The output that resulted from this input deck is presented below. The outside forecast for variable 48 is the closest to our forecast, but not very close (40.3 percent vs. 50 percent). Moreover, the similarity measure for variable 48 is closest to 0.0.

This example ran in less than 1 minute.

Variable no.	Outside forecast	Percent below forecast	Similiarity measure
5	2.0	0.007	4.9972
9	5.0	0.054	2.8693
48	5.0	0.403	0.3943
49	4.0	0.067	2.6319

APPENDIX D

GLOSSARY

APPENDIX D

GLOSSARY

Codebook. A general reference guide containing all existing codes assigned to countries, documents, and themes, organized in various ways, for use by the coder during the data gathering stage and by the analyst throughout the analytic process. It also includes a printout of the data on country characteristics.

Country number. A unique number assigned to each country participating in the negotiations.

Country profile. An organized list of remarks a particular country has made during the negotiations.

Document number. A number assigned in the Study to a document from which remarks are extracted.

Estimated score. A multiple regression estimate (Y); a single indicator of a country's position on an issue-variable as a function of group influences alone.

Group affiliations. A set of regional and interest groups with which countries are associated; synonomous with independent variables. See the list in table B-1.

Intensity. The difference (distance between) the base package and the package to be derived by the maximization model.

Issue. A central question under negotiation. Many can be policy-spaced into issue-variables.

Issue-variable. An interval scale on a single issue that has been policy spaced. It serves as a conceptual framework along which countries' positions vary in their values.

Lettered theme. A theme that has a number and letter associated with it (32A for example). The letter variant represents the specific wording contained in a formal proposal or working paper tabled during negotiations, which would bear an "L" document code in UN notation.

Major/minor topics. A subject index of LOS issues and subissues.

Multiply used theme. A theme assigned to more than one of the issue-variables being analyzed in a single run.

National score. A single indicator of a country's position on an issue-variable, based only on its remarks for the record.

Package. A set of interrelated issue-variables that will be voted on and adopted or rejected as a set.

Packaging analysis. A formal method of estimating votes on a package of issue-variables when countries are forced to choose between two alternative packages.

Policy spacing. Assigning scale values to adjacent themes in an ordered continuum, in a way that reflects the degree of policy difference between them.

Preferred position. A single indicator of a country's position on an issue-variable, based on a weighted average of its national and estimated scores.

Primary data. Themes extracted from UN public records.

Rank. See scale value.

Regional remark. A remark that is made for another country by a given country, i.e. Botswana stating that all African countries support a particular position.

Remark. See theme.

Retrieval document. A numerical listing of a country's remarks, which specifies the source document from which each remark was extracted and its reliability, repetition, and classification codes.

Salience. The relative importance a country places on the successful solution of an issue under negotiation. It is measured by the number of remarks a country has made on the relevant issue-variable relative to other issue-variables.

Scale value. The number assigned to a theme in an issue-variable as a result of policy spacing.

Secondary data. Themes extracted from diplomatic cables and liaison reports.

Theme. A statement by a country's official representative, expressing his country's preference on a particular substantive or procedural question under negotiation.

Theme number. A code number assigned to a theme.

Theme profile. An organized list of countries that have spoken on a given theme during the negotiations.

Time period. A chronological subdivision of the data base.

Utility pairing model. A formal method of estimating votes on a single issue-variable when countries are forced to choose between two alternative solutions.

Utility score. An indicator of a country's preference for one of the two alternative solutions offered in the utility pairing model or packaging model. The sign determines which alternative is preferred and the magnitude indicates how strong the preference is.

Variable. See issue-variable.