FINAL REPORT

Volume 2: Users' Manual for The Revised OAP Regional Econometric Model

THE OAP REGIONAL ECONOMETRIC MODEL: A REVISED VERSION

Prepared for:

Environmental Protection Agency
Office of Air Programs
Research Triangle Park
North Carolina

September 25, 1972

CONSAD Research Corporation

FINAL REPORT

CONTRACT NUMBER 68-04-0039

VOLUME 2: USERS' MANUAL

THE OAP REGIONAL ECONOMETRIC MODEL: A REVISED VERSION

Prepared for:

Environmental Protection Agency
Office of Air Programs
Research Triangle Park, North Carolina

Prepared by:

CONSAD Research Corporation
121 North Highland Avenue
Pittsburgh, Pennsylvania 15206

Fu-chen Lo and Kathryn Mason

September 25, 1972

TABLE OF CONTENTS

LIST OF FIGURES AND TABLES

1.0 USERS' GUIDE: A GENERAL DESCRIPTION

1.1 Introduction

This is a revised users' guide of the OAP Regional Econometric Model.* It is intended to facilitate an efficient simulation of various control strategies. As described and demonstrated in Volume 1, air pollution control strategies are first transformed into a set of appropriate model inputs.** The computer program accepts these inputs as "exogenous shocks" to the model system and generates as output, from the model system, measurements of the "changes" in the key economic variables in the Air Quality Control Regions (AQCRs) under study.

The computer simulation program of the OAP Regional Econometric Model includes three programs:

- Program RMS (Regional Model Simulation),
- Program IOA (Input-Output Analysis), and
- Program FBE (Feedback Effects).

As indicated in Volume 1, the input-output model and the interregional feedback effects were introduced in order to measure the external

---

*See CONSAD Research Corporation, OAP Regional Econometric Model: A Revised Version, Vol. 1, September 25, 1972.

**CONSAD Research Corporation, An Economic Model System for The Assessment of Effects of Air Pollution Abatement, Vol. II, User's Guide to the OAP Economic Model System, May 15, 1971. Also, see CONSAD, op. cit., Volume I, Development and Demonstration Phase.

market of an AQCR. The main part of the simulation program, consequently, is the Program RMS -- the simulation tool for the Regional Econometric Model.

Program RMS has been revised so that the growth rates by AQCRs could be included to provide economic projection of future years. In strategy simulation, cumulative effects over time of any given strategy are also included. At the same time, a new set of control costs which are the preliminary estimates corresponding to the control implied in the Federal Register of August 14, 1971, as promulgated by EPA. These estimates are termed as EPA cost estimates in the rest of the report.

1.2 A General Description

PROGRAM RMS

The Regional Econometric Model developed in Volume 1 consists of four major modules or blocks of equations, namely:

- manufacturing industry equations
- income and regional economy equations
- other industry equations
- labor market equations

In the development of the Program RMS, linkages between the modules have been rearranged in order to provide an efficient and broad range of strategy simulations. The arrangement of the modules (or block of equations) in the program provides a number of "simulation options" which are related to a number of control inputs corresponding to the control strategy under consideration.

At present, eight simulation options have been included, although additional simulation options can be added, depending upon the need of the user and the full exploration of the model capability. The currently available simulation options are as follows.

Option 1: Industry control cost.

This option takes direct control costs of the manufacturing industry in terms of reduction of profit and investment which increase the cost of production. Control cost data, at present, is the EPA cost estimates by AQCR by year.

Option 2: Benefit by AQCR.

This option takes regional benefits in terms of increase in the regional disposable income by AQCR, resulting from changes in property values, savings in health expenditures, etc., from cleaner air.

Option 3: Local taxation.

This option takes increases in local taxation for possible subsidies for industrial control costs in the implementation plan.

Option 4: Electricity price increase to industry.

This option takes the price increases for the electric power which is being passed to industries.

Option 5: Electricity price increase to the residents.

This option takes price increases for the electric power industry which are being passed to the residents as a reduction in their disposable income.

Option 6: Control cost by two-digit SIC.

This option takes control costs by two-digit SIC manufacturing industries rather than the aggregate control cost by AQCR used in option 1.

Option 7: Increase in property value (due to improved air quality).

This option takes a percentage increase in property value as control input.

Option 8: Feedback effects.

This option takes the output from Program FBE to measure the inter-regional feedback effects.

Each option consists of modules A, B, C, and D. However, depending upon whether aggregate or two-digit SIC manufacturing sectoring and other simulation specifications are available, ten blocks of

equations, each related to one module, were included in this Program RMS. A block flow chart for the simulation options available in Program RMS is shown in Figure 1.1, and Table 1.1 shows the relation between simulation option module of the Regional Econometric Model and equation blocks included in the block flow chart.

For example, in simulation option 1, the industry control costs are read in from EPA cost estimates control input data. This leads to a reduction in both profits and investment of the manufacturing industry, thus affecting the entire manufacturing industry module, and in turn regional income, consumption, government sector of module B and other industry of module C, and finally labor market of module D. If other simulation options were tried, the sequence will refer to corresponding blocks in the Program and "net" effects will be summarized in the program output. Usually each strategy simulation will involve more than one simulation option. An example of the simulation options involved in a given strategy will be included in Section 2.3.2 of this volume (preparation of parameter cards).

PROGRAM IOA

This program has the capability of aggregating a 100-sector United States input-output table to a desired number of sectors. Currently, a 42-sector I-O model has been used (see Appendix D, Volume 1 of the May 15 report). The program then provides a new I-O coefficient

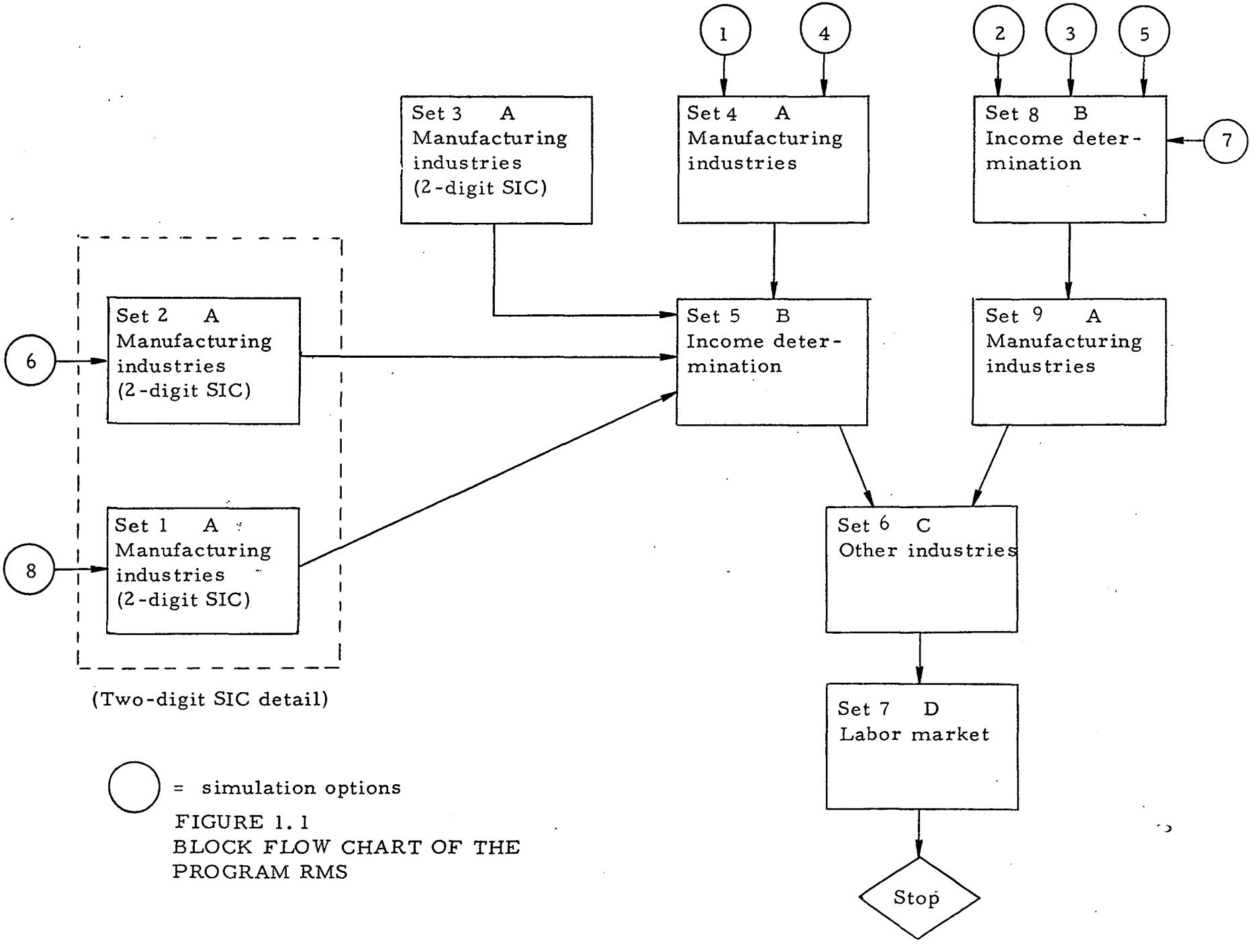


FIGURE 1.1
BLOCK FLOW CHART OF THE
PROGRAM RMS

Table 1.1. Relations between Simulation Option and Equation Blocks in Program RMS

Equation Blocks in Program RMS \ Simulation Option of Program RMS	1 Industry Control Cost	2 Benefit by AQCR	3 Local Taxation	4 Electricity price increase to industry	5 Electricity price increase to residentials	6 Control Cost by 2-digit SIC	7 Change in property value	8 Feedback effects
Block No. 1								A
Block No. 2						A		
Block No. 3								
Block No. 4	A			A				
Block No. 5	B			B		B		B
Block No. 6	C	C	C	C	C	C	C	C
Block No. 7	D	D	D	D	D	D	D	D
Block No. 8		B	B		B		B	
Block No. 9		A	A		A		A	

Module:

A Manufacturing Industry
B Income and Regional Economy
C Other Industry
D Labor Market

matrix and the corresponding Leontief inverse matrix with new sectoring. Finally, the program takes changes in final demand, either change by sector or change by average propensity to consume by sector and produces the change in gross domestic product by sector.

Thus, the changes in the final demand, both as a result of costs and benefits of air pollution control, will cause the changes in the gross domestic product (value of shipments by sector). Output from Program IOA becomes the input in the Program FBE for distribution.

PROGRAM FBE

This program takes the output from Program IOA and first transfers the value of shipment into value-added by sector and then distributes the feedback effect to each AQCR with the regional market share matrix. The output from Program FBE becomes the input deck for simulation option 8 in the Program RMS.

2.0 PROGRAM RMS (Regional Model Simulation)

2.1 Introduction

Program RMS is a large scale computer simulation program with a 2483 statement program which includes 13 subroutines to solve both linear and non-linear simultaneous equation system. For the non-linear system, an iterative algorithm--an extended Newton's method* has been introduced.

Since the program has been designed for a broad range of policy questions, the simulation of any given strategy requiring a proper preparation not only of control input (see Section 2.3) but also the choice of the simulation options appropriate to the strategy.

At the present state, EPA cost estimates by AQCR have been included as basic control input. **

Detailed specification of the program preparation is given in the following sections.

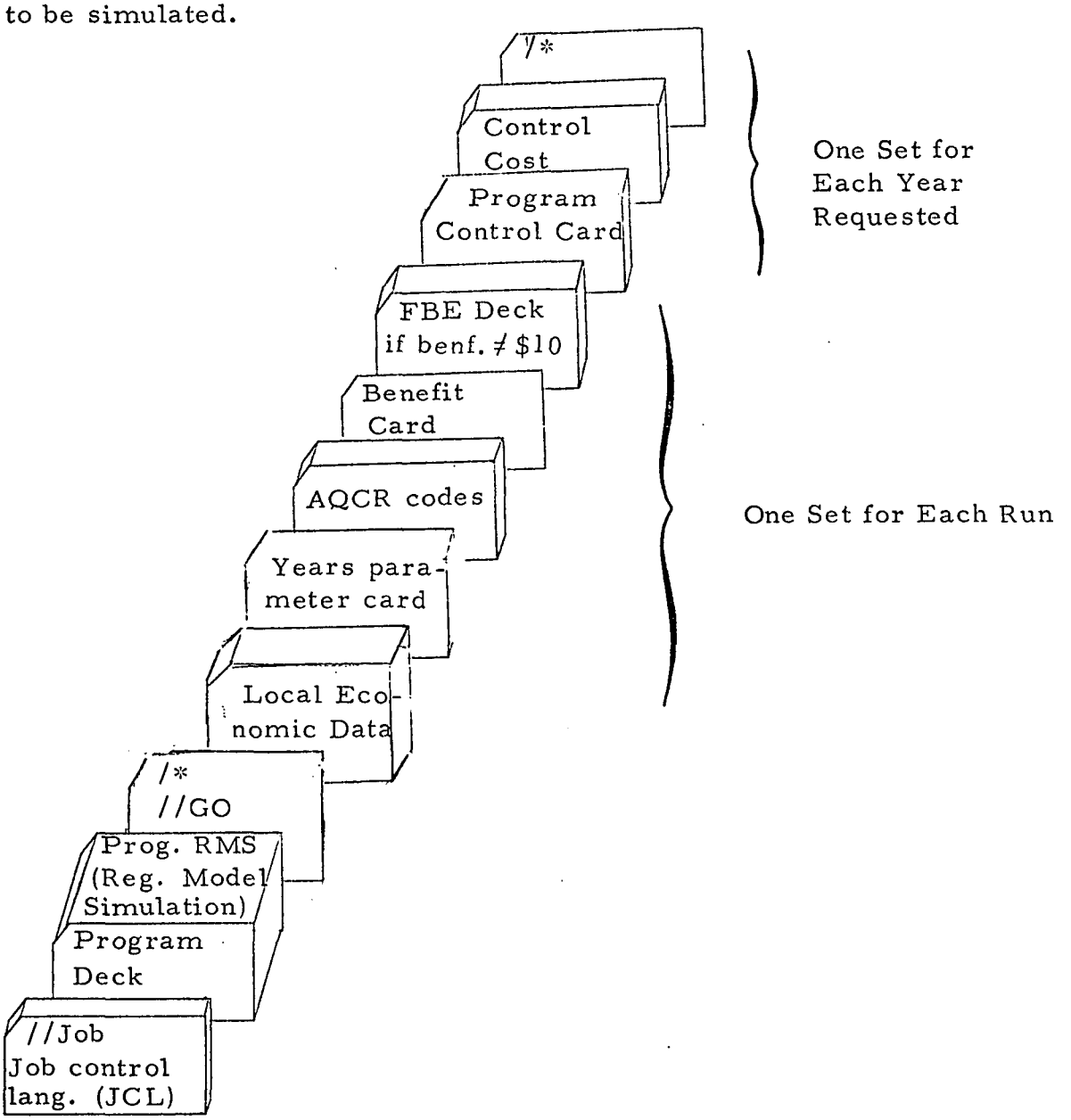
---

* See M. K. Evans and L. R. Klein, The Wharton Econometric Forecasting Model, University of Pennsylvania, 1967, Chapter IV.

** See Appendix.

2.2 Job Deck Set-Up

The Program RMS (Regional Model Simulation) is a 2,100 statement FORTRAN program which uses approximately 392K core and runs 80 seconds on an IBM 360/75, depending upon the scope of the strategy to be simulated.



2.3 Data Input Deck

The input section has undergone considerable modification. What was then referred to as the STANDARD DATA INPUT DECK, is now, after some reordering and a few additions, read from a tape. The data stored on this tape is needed for every RMS simulation regardless of strategies or options to be performed. A detailed description of the contents of the tape follows.

2.3.1 Standard Data Input Tape

The tape includes 14 sets of parameter and input data read from a total of 5,826 cards arranged in the following order.

1. Regional Model Coefficients: 20 cards, one card for each two-digit SIC and one for all manufacturing industries

Cols. 5-10	I5, two-digit SIC code
Cols. 11-20	F10.4, labor share from production function by industry
Cols. 21-30	F10.4 capital share by industry
Cols. 31-40	F10.4, depreciation rate by industry
Cols. 41-50	F10.4, the coefficient of profit in investment function by industry
Cols. 51-60	F10.4, ratio of value-added to capital by industry

2. AQCR Codes and Names: 92 label cards, one for each of the 91 AQCRs for which data was available and one which is the label card for the net effect over all AQCRs studied

Cols. 1-4	I4, AQCR code number (blank for the 92nd card)
Cols. 5-80	19A4, name of AQCR associated with the code in cols. 1-4

3. Relative Codes Used by the Program for the 100 AQCRs: 5 cards

Card 1	20I4, relative codes for AQCRs 1-20*
Card 2	20I4, relative codes for AQCRs 21-40*
Card 3	20I4, relative codes for AQCRs 41-60*
Card 4	20I4, relative codes for AQCRs 61-80*
Card 5	20I4, relative codes for AQCRs 81-100*

4. Fuel Submodel Coefficients: 58 cards

(a) Share coefficients from fuel equation by two-digit SIC (19 cards)

Cols. 9-10	I2, code of the two-digit SIC for which this data applies
Cols. 11-20	F10.5, coefficient of coal
Cols. 21-30	F10.5, coefficient of coke
Cols. 31-40	F10.5, coefficient of oil
Cols. 41-50	F10.5, coefficient of natural gas
Cols. 51-60	F10.5, coefficient of electricity

* Code is 0 if no data was available for a given AQCR.

(b) Miscellaneous fuel coefficients by two-digit SIC including one coefficient for all manufacturing industries (20 cards)

Cols. 9-10	I2, code of the two-digit SIC for which this data applies
Cols. 11-20	F10.5, constant determined in the investment equation
Cols. 21-30	F10.5, constant multiplier from the fuel equation
Cols. 31-40	F10.5, coefficient of the energy demand equation

(c) Coefficient relating consumption of electrical energy to value-added by two-digit SIC (19 cards)

Cols. 9-10	I2, code of the two-digit SIC for which this data applies
Cols. 11-20	F10.6, coefficient

5. AQCR Economic Data: 455 cards, five cards for each AQCR for which data was available

First Card:

Cols. 1-10	F10.1, labor force in each AQCR
Cols. 11-20	F10.3, unemployment rate in each AQCR
Cols. 74-76	I3, AQCR code

Second Card

Cols. 1-10	F10.1, 1967 employment in manufacturing industries in each AQCR
Cols. 11-20	F10.1, 1967 wage bill for manufacturing industries

Cols. 21-30	F10.1, 1967 value-added in manufacturing industries
Cols. 41-50	F10.1, 1967 investment in manufacturing industries
Cols. 74-76	I3, AQCR code

Third Card:

Cols. 1-10	F10.0, 1967 total regional personal income
Cols. 11-20	F10.0, 1967 local government revenue
Cols. 21-30	F10.0, 1967 local government expenditures
Cols. 74-76	I3, AQCR code

Fourth Card:

Cols. 1-10	F10.0, 1967 total personal consumption
Cols. 74-76	I3, AQCR code

Fifth Card:

Cols. 1-10	F10.1, 1963 number of employees in manufacturing industries
Cols. 11-20	F10.1, 1963 wage bill for manufacturing incomes
Cols. 21-30	F10.1, 1963 value-added for manufacturing industries
Cols. 74-76	I3, AQCR code

6. Electric Consumption (10 million KWH) by AQCR: 91 cards

Cols. 1-10	F10.0, total electric consumption in each AQCR
Cols. 11-20	F10.0, residential electric power consumptions
Cols. 21-30	F10.0, electric power consumed by manufacturing industries
Cols. 31-40	F10.0, electric power consumed in other industries
Cols. 74-76	I3, code number for the AQCR for which data applies

7. Detailed Two-Digit SIC Data by AQCR: 2,089 cards

(a) Data for 1963

Cols. 1-10	F10.1, number of employees
Cols. 11-20	F10.1, wage bill
Cols. 21-30	F10.1, value-added
Cols. 74-76	I3, AQCR code
Cols. 77-78	I2, two-digit SIC code

A "9's" card follows the 1963 data.

(b) Data for 1967

Cols. 1-10	F10.1, number of employees
Cols. 11-20	F10.1, wage bill
Cols. 21-30	F10.1, value-added
Cols. 41-50	F10.1, investment

Cols. 74-76	I3, AQCR code
Cols. 77-78	I2, two-digit SIC code

A "9's" card follows the 1967 data.

8. Detailed Fuel Information by Two-Digit SIC by AQCR
There are two cards for each AQCR/two-digit SIC combination (2,058 cards)

Card 1

Cols. 1-10	F10.0, total cost of fuel consumption (all types)
Cols. 21-30	F10.0, quantity of coal
Cols. 31-40	F10.0, cost of coal
Cols. 41-50	F10.0, quantity of coke
Cols. 51-60	F10.0, cost of coke
Cols. 74-76	I3, code of the AQCR for which this data applies
Cols. 77-78	I2, two-digit SIC code

Card 2

Cols. 1-10	F10.0, quantity of oil
Cols. 11-20	F10.0, cost of oil
Cols. 21-30	F10.0, quantity of natural gas
Cols. 31-40	F10.0, cost of natural gas
Cols. 41-50	F10.1, quantity of electricity
Cols. 51-60	F10.0, cost of electricity

Cols. 74-76 I3, AQCR code

A "9's" card follows the fuel data.

9. Feedback/Distribution Data by AQCR/Two-Digit SIC: 364 cards

(a) Feedback/distribution to manufacturing industries (3 cards per AQCR = 273 cards)

Card 1

Cols. 1-70 7F10.4, feedback/distribution to two-digit SICs 1-7

Cols. 74-76 I3, Code of the AQCR for which this data applies

Card 2

Cols. 1-70 7F10.4, feedback/distribution to SICs 8-14

Cols. 74-76 I3, code of the AQCR for which this data applies

Card 3

Cols. 1-70 5F10.4, feedback/distribution to SICs 15-19

Cols. 74-76 I3, code of the AQCR for which this data applies

(b) Non-manufacturing industries feedback/distribution by AQCR (91 cards)

Cols. 11-20 F10.3, feedback distribution

10. Growth rates for 1970: 104 cards, two cards for each of the 51 AQCR for which detailed two digit SIC growth rates were available and two codes for national average growth rates by two digit SIC

Card 1

Cols. 1-75	F5.0, growth rates for SIC 20 through SIC 35 (excluding SIC 21)
Cols. 78-80	I3, AQCR code

Card 2

Cols. 1-30	F5.0, growth rates for SIC 36 through SIC 39, plus the average growth rate for all manufacturing industries
Cols. 78-80	I3, AQCR code

11. Growth rates for 1975: 104 cards, same format as above.

12. Growth rates for 1980: 104 cards, same format as above.

13. Total personal income: 153 cards, three cards for each AQCR for which income data was available

Card 1

Cols. 11-20	F10.0, Total personal income for 1970
Cols. 78-80	I3, AQCR code

Card 2

Cols. 11-20	F10.0, total personal income for 1975
Cols. 78-80	I3, AQCR code

Card 3

Cols. 11-20	F10.0, total personal income for 1980
Cols. 78-80	I3, AQCR code

14. Total personal income: 38 cards, one card for each of the AQCRs with code greater than 54 for which no detailed OBE growth factors were available

Cols. 11-20	I10, AQCR code
Cols. 31-40	F10.2, total personal income growth rate, average for 1959-1968

This concludes the description of the nine data sets stored on tape required for any run of RMS.

2.3.2 Regional Economic Data and Coefficients

1. Population Growth Rates for 91 AQCRs (6 cards), Format: (16F5.2)

2. Local Economic Data (91 cards)

   Cols. 1-10 1967 Population (F10.0)

   Cols. 11-20 Local Taxation (F10.0)

   Cols. 21-30 Property Tax (per capita) (F10.0)

   Cols. 31-40 Property Valuation (F10.0)

   Cols. 76-78 AQCR Code (I3)

3. New Investment Equation Coefficients--one set for each industry (20 cards)

2.3.3 Input Parameter Cards

1. The Years Parameter Card, for the time series run (with constant modified switch)

   Cols. 1-4 Total number of years included

   Cols. 6-10 First year (I5)

   Cols. 11-15 Second year (I5)

   Cols. 16-20 Third year (I5)

   and so on until all the years have been stated, up to 11 years.

2. AQCR Codes

Cols. 1-5	I5, number of AQCRs for which updated data is needed
Cols. 6-10	I5, AQCR code for the first city
Cols. 11-15	I5, AQCR code for the next city

and so on in cols. of 5 until all the city codes required have been specified.

3. The Benefit Card

Cols. 1-10	F10.2, estimated national benefit from cleaner air in terms of change in total consumption expenditure; in the fast runs this number has been set to either $10 or $15 billion for both the 3 and 5 year runs (in millions on card)
Cols. 11-20	F10.2, estimated national benefit less compact of cost due to government assistance. If there is not government assistance, this number should equal the one in the previous ten columns (in millions)
Cols. 21-30	F10.2, normalizer: if benefit = $10 billion, it equals 2,000. If benefit = $15 billion, it equals 3,000.
Cols. 31-40	F10.2, percentage reduction in manufacturing costs resulting from government assistance

4. FBE Deck. The FBE deck (364 cards) is a set of output from Program FBE where changes in level of benefits were introduced through use of Programs IOA and FBE. This deck is needed only if benefit is not equal to $10 billion.

5. Input Parameter Card

All of the following cards are necessary for each year requested.

5. a.

Card Column	Variable Name	Description
1-4(I4)	INPT(1)	Information for aggregate manufacturing industries desired. (0 or 1) - control input data will be supplied. (0) - No (1) - Yes
5-8(I4)	NOPE	Number of simulation options to be pursued for aggregate manufacturing industries (0, 1, 2, 3, 4, 5).
9-12 + (NOPE - 1) * 4 [NOPE * I4]	LPARA(I), I=1, NOPE	Type of simulation options to be pursued in this run. Specify "NOPE" options. 0 - none 1 - Industry control cost 2 - Benefit by AQCR 3 - Change in local taxation 4 - Electricity-price increase to industry 5 - Electricity-price increase to residential users
N through N + 3	MCNT	If INPT(1) = 1, MCNT specifies the number of cities for which cost changes are given or if INPT(1) = 0, MCNT is specified as 1.

Card Column	Variable Name	Description
(N + 3) through (N + 7) [I4]	INPT(2)	Detailed two digit SIC information to be included (0 or 2) and simulated 0 - not wanted 2 - desired
(n + 8) through (N + 11) [I4]	NOPE1	Number of simulation options to be pursued for detailed two-digit SIC data (0, 1, 3)-
(N + 12) through (N + 15) [I4]	LPNT	= 1
(n + 16) through (n + 19) + (NOPE1 - 1) * 4 [NOPE1 * I4]	LPNT2(I)	Types of detailed two-digit SIC simulation options to be pursued, specify "NOPE1" options. 0 - none 1 - control cost by 2 digit SIC. This is simulation option number 6. 3 - national feedback/ distribution affect. This indicates simul simulation option number 8 is to be pursued.
M through (M + 3)	NUMCIT	The number of cities for which this control card specification applies.

Card Column	Variable Name	Description
		The next five variables control the printout options.
L through (L+3) [I4]	IPRN1	=0 312(A) summary table requested but delete printout of options 1, 4 & 5. =1 Print results of all strategies
(L+4) through (L+7) [I4]	IPRN2	=0 Do not print 312(A) table (i.e., summary table of 1st five strategies
(L+8) through (L+11) [I4]	IPRN3	=0 overrides all preceeding requests and prints out only the net summary tables for all options requested
(L+12) (L+15) [I4]	ISBUG	=1 Turns on debug printout patches =0 Skips option
(L+16) (L+19) I4	ISBUG2	=1 Detailed data tables per year are given =0 Skips option
(L+20) (L+23) [I4]	ICTAB	=1 Convergence tables for simultaneous systems design =0 Skips option

Card Column	Variable Name	Description
(L+24) (L+27) [I4]	IGOV	=1 Impact of costs with government assistance =0 Impact without government assistance

In addition to the above information, the user should realize that different simulation options may require different control input data.

AN EXAMPLE OF PARAMETER CARD SPECIFICATION

Card Column	Punch	Description
4	1	Aggregate control cost for manufacturing, etc.
8	2	Two simulation options are to be pursued in this strategy simulation for aggregate part of the model system.
12	4	Option 4 is chosen.
16	5	Option 5 is also chosen.
19-20	1	Control input data for 91 AQCR's is included.
24	2	The simulation is to pursue at least one option involving detailed two-digit SIC information.
28	1	1 - by each AQCR
32	1	One option to be pursued for detailed 2-digit SIC information.
36	3	Option 8 is to be pursued.
39-40	91	Two-digit SIC data available for 91 AQCR's.

AN EXAMPLE OF PARAMETER CARD SPECIFICATION

Card Column	Punch	Description
41-48	BLANK	The IPRNS1, IPRNZ printout options are bypassed
49-52	0	Final summary table requested
53-56	BLANK	No debugging switches needed
57-60	BLANK	Avoide update tables
61-64	BLANK	Delete convergence tables
65-68	1	Impact of cost with government assistance requested

5.b. Title Cards. On the next two cards, specify the heading for the final summary table. Example:

Card 1

Cols. 1-80	Five Year Extended Implementation

Card 2

Cols. 1-80	Without Government Assistance

5.c. Percentage Distribution of Benefit Card

Cols. 1-5	F5.0, percentage distribution of total benefit to first year in the time series
Cols. 6-10	F5.0, percentage distribution for the second year (example, 15. for 15%)
Cols. 11-15	F5.0, percentage distribution for the third year
.	.
.	.
.	.
Cols. 35-40	F5.0, total for all numbers in previous columns on this card

5.d. One Blank Card Necessary Here.

The initial parameter card required for each year makes it possible to request different simulation options. As a consequence, the input control data is subject to a corresponding variability. One of the most mechanical adjustments occurs if a limited number of AQCRs are requested in parameter card #1. On response, the control cost input deck should only include data for the specified number of AQCRs.

A more complicated problem results from the fact that the user must provide control cost data for seven of the eight possible options for each year of the run. Furthermore, most changes in option specification must be accompanied by modifications on the cost input sections of the program of which these are two: one for the regional cost options (one through six) and the other for the detailed SIC options (six through eight). These changes are left to the discretion and judgment of the user and are dependent on the type and form of the cost data that may become available. The one restriction is that the regional cost data must preceed the detailed cost data, as can be seen from the example that follows.

CONTROL COSTS DECK: The EPA cost estimates by AQCR has been assembled as input for this program. Two control decks exist:

1. The three year straight implementation deck (1973-75).
2. The five year extended cost distribution deck (1973-77).

This data was set up to accommodate the following options:

1. Manufacturing industries control costs (in the form of stationary combustion and solid waste).

4. Electric power price increase passed to manufacturing industries.

5. Residential price increased on electricity.

6. Industrial cost impact on high emission two-digit SIC.

8. National feedback effect to the region through detailed SICs.

Both the three and the five year cost decks have the following format for each AQCR.

Card 1 (necessary for regional options)

Cols. 1-10	F10.5, investment cost - stationary combustion
Cols. 11-20	F10.5, annual cost - stationary combustion
Cols. 21-30	F10.5, annual cost - solid waste
Cols. 71-73	I3, years (example - 72)
Cols. 74-76	I3, AQCR code

Card 2 (impact on detailed SIC-investment cost and necessary for option number six)

Cols. 1-10	F10.4, investment cost for SIC 20
Cols. 11-20	F10.4, investment cost for SIC 26
Cols. 21-30	F10.4, investment cost for SIC 28
Cols. 31-40	F10.4, investment cost for SIC 29
Cols. 41-50	F10.4, investment cost for SIC 32

Cols. 51-60	F10.4, investment for SIC 33
Cols. 61-70	F10.4, investment cost for all manufacturing industries
Cols. 71-73	I3, year
Cols. 74-76	I3, AQCR code

Card 3 (impact for detailed SICs - annual costs card, necessary for option number six)

Cols. 1-10	F10.4, annual cost for SIC 20
Cols. 11-20	F10.4, annual cost for SIC 26
Cols. 21-30	F10.4, annual cost for SIC 28
Cols. 31-40	F10.4, annual cost for SIC 29
Cols. 41-50	F10.4, annual cost for SIC 32
Cols. 51-60	F10.4, annual cost for SIC 33
Cols. 61-70	F10.4, annual cost for all manufacturing industries
Cols. 71-73	year
Cols. 74-76	AQCR code

Note that by changing the benefit card, one variable on the parameter card (IGOV =0 or 1), and the second title card. The program has been run with and without government assistance and with corresponding variations in national feedback effects.

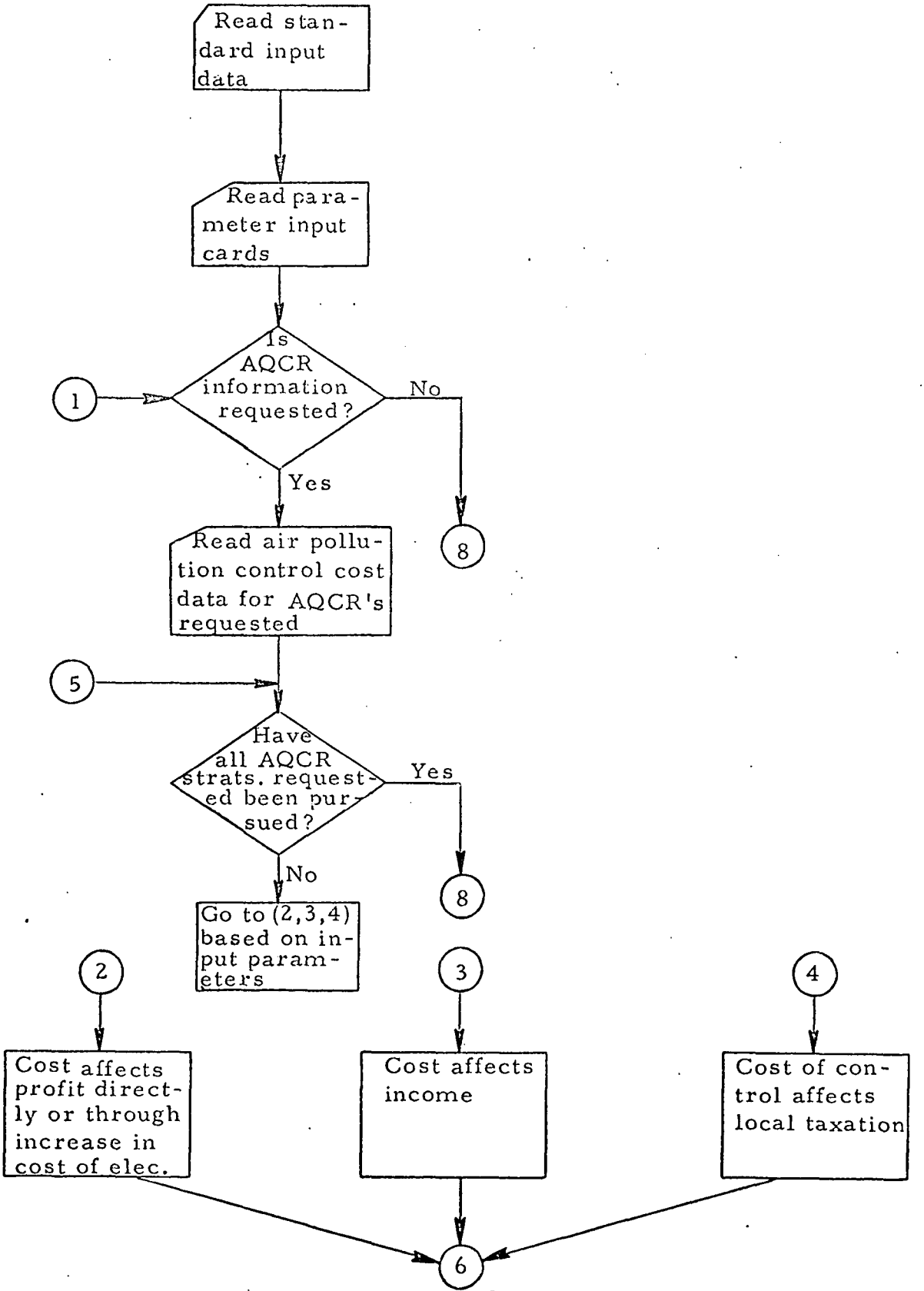
2.4 Description of the Program Deck

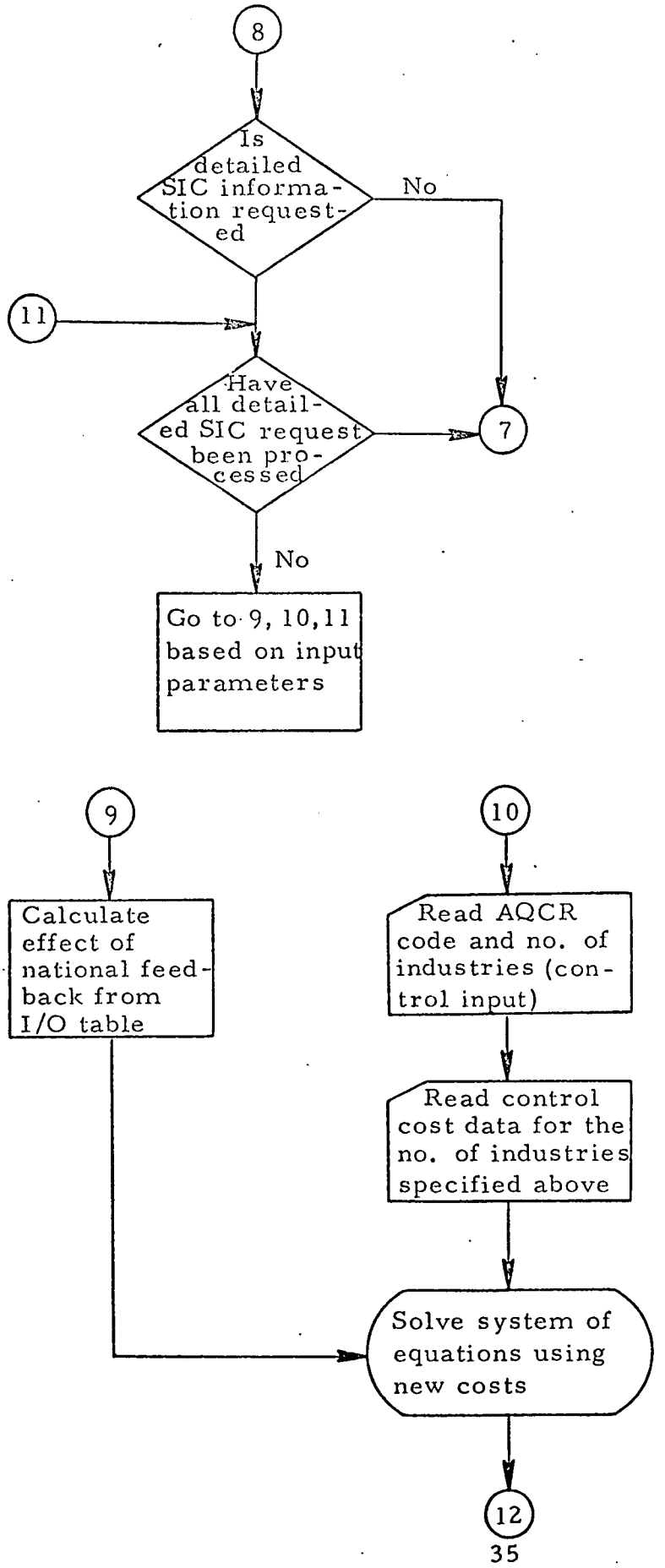
The program RMS consists of a MAINLINE and 13 subroutines, PRIN1, VALUE, VALUE1, VALUE2, VALUE3, VALUE4, SIMUL, GRADN and VERT, OLETS, PHELP, DEBUG, ABCD, a total of 2483 cards. The program cards are sequenced along the right-hand edge in columns 73-80 with the prefix RMS.

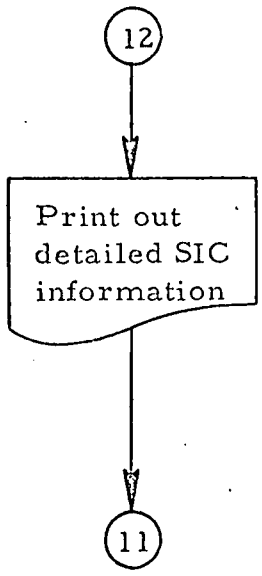
The program begins by reading the standard data input deck from tape and cards. The program parameters are then read from the input parameter card(s). The parameters specify to the program how many and which of the various simulation options have been chosen by the user. The program now reads from the control input deck any specialized data which may be required by the first simulation option which has been specified on the input parameter card(s). The program now develops the specifications for the equation sets which are required for this simulation option. Control is next transferred to subroutine SIMUL which controls the solution of the equation sets. SIMUL calls subroutine VALUE which determines which type of set of equations is to be solved and then calls for the appropriate subroutine (VALUE1, VALUE2, VALUE3 or VALUE4), which actually sets up the complete system of equations in the manner necessary for solution. Control is returned to SIMUL which now calls subroutines GRADN and VERT to

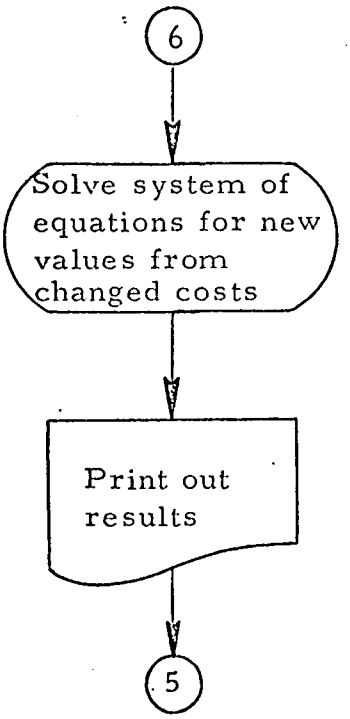
do the actual solving of the non-linear parts of the equation system. After the new values for the system have been determined, control is returned to the MAINLINE. The solution procedure involving subroutines SIMUL, VALUE, GRADN and VERT is repeated until all sets of equations needed to implement the desired simulation option have been solved. The program now calls subroutine PRIN1 which prints out the original values, the values after iteration and the percent change. If all of the simulation options specified by the user on the input parameter card(s) have been pursued, the program now prints out a table showing the total effect of the combined results of the simulation options and the program terminates or begins the next year's simulation. If all specified options have not been pursued, the program again reads from the control input deck any specialized data required for the next simulation option which has been specified and proceeds as above.

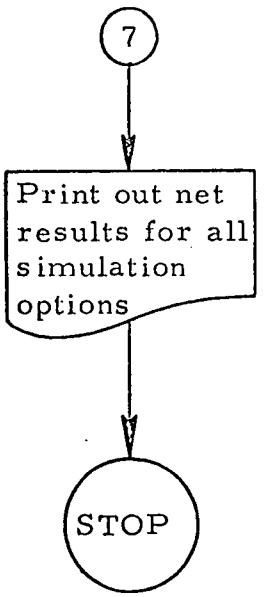
MACRO FLOWCHART
OF RMS




8
Is detailed SIC information requested
No
11
Have all detailed SIC request been processed
7
No
Go to 9, 10, 11 based on input parameters
9
10
Calculate effect of national feedback from I/O table
Read AQCR code and no. of industries (control input)
Read control cost data for the no. of industries specified above
Solve system of equations using new costs
12


12
Print out detailed SIC information
11


6
Solve system of equations for new values from changed costs
Print out results
5


7
Print out net results for all simulation options
STOP

2.5 Program RMS (Regional Model Simulation)

```
      COMPILER OPTIONS - NAME=MAIN,OPT=00,LINECNT=40,SIZE=0000K,
                         SOURCE,BCD,NOLIST,NODECK,LOAD,MAP,NOEDIT,NOID,NOXREF
C                                                                       RMS     1
C     ****************************************************************  RMS     2
C     *                                                              *  RMS     3
C     * A SIMULATION OF ECONOMIC EFFECTS OF AIR POLLUTION CONTROL    *  RMS     4
C     *                ON AIR QUALITY CONTROL REGIONS                *  RMS     5
C     *                        PROGRAM  RMS                          *  RMS     6
C     *          PREPARED BY CONSAD RESEARCH CORPORATION             *  RMS     7
C     *                  REVISED AUGUST 1972                         *  RMS     8
C     *                                                              *  RMS     9
C     ****************************************************************  RMS    10
C                                                                       RMS    11
ISN 0002            REAL KJNDX,LJNDX                                    RMS    12
ISN 0003            DIMENSION  A(20),          AB(91),          ALIT(20)  RMS    13
ISN 0004            DIMENSION  ALPHA(20),      B(91,20),        BETA(20)  RMS    14
ISN 0005            DIMENSION BEN(8)                                    RMS    15
ISN 0006            DIMENSION  C(92),          CD(92),          CN(92)    RMS    16
ISN 0007            DIMENSION COFI(91),COST(91,5)                       RMS    17
ISN 0008            DIMENSION D(20),D1(91)                              RMS    18
ISN 0009            DIMENSION  D2(91),         DELTC(91),       DNBAR(92) RMS    19
ISN 0010            DIMENSION  DNBARN(92),     DNR(91),         ED(91,5)  RMS    20
ISN 0011            DIMENSION EOLDH(91,20)                              RMS    21
ISN 0012            DIMENSION  EOLD(91,20,5),  G(92),           GAMA(20,5) RMS    22
ISN 0013            DIMENSION  GD(92),         GN(92),          HOLD(5)   RMS    23
ISN 0014            DIMENSION  IAQCR(92,20),   IND(20),         INDCI(92,20) RMS  24
ISN 0015            DIMENSION  INPT(2),        JKEEP(20),       KCITY(100) RMS    25
ISN 0016            DIMENSION  KEEP(5),        LABEL(10,20),    LKEEP(3,5) RMS    26
ISN 0017            DIMENSION  LPARA(10),      LPNT2(3),        MCITY(91) RMS    27
ISN 0018            DIMENSION  PDN(91),        PI(92,20),       PICOEF(20) RMS    28
ISN 0019            DIMENSION  PICON(20),      PID(92),         PIN(92)   RMS    29
ISN 0020            DIMENSION PPID(91)                                  RMS    30
ISN 0021            DIMENSION  PXD(91),        PXID(91),        PXKD(91)  RMS    31
ISN 0022            DIMENSION  PZD(91),        QBAR(92),        QBARD(92) RMS    32
ISN 0023            DIMENSION  QBARN(92),      QC(92),          QCD(92)   RMS    33
ISN 0024            DIMENSION  QCN(92),        QM(92),          QMD(92)   RMS    34
ISN 0025            DIMENSION  QMN(92),        QT(92),          QTD(92)   RMS    35
ISN 0026            DIMENSION  QTN(92),        RNET(91),        SUMN(92,20) RMS   36
```

```
                C                                                                       RMS   37
ISN 0027            DIMENSION QGIVEN(7)                                                 RMS   38
                C                                                                       RMS   39
ISN 0028            DIMENSION  SUMND(92),          SUMNN(92),          T(92)            RMS   40
ISN 0029            DIMENSION  TD(92),             TN(92),             TR(91)           RMS   41
ISN 0030            DIMENSION  U(92),              UD(92),             UN(92)           RMS   42
ISN 0031            DIMENSION  VK(20),             W(91,20),           WB(91,20)        RMS   43
ISN 0032            DIMENSION  WBD(91),            WD(91),             WN(92)           RMS   44
ISN 0033            DIMENSION  WT(91,20),          XD(92),             XDN(92)          RMS   45
ISN 0034            DIMENSION  XD1(91),            XI(92,20),          XID(92)          RMS   46
ISN 0035            DIMENSION  XIN(92),            XK(92,20),          XKD(92)          RMS   47
ISN 0036            DIMENSION  XKN(92),            XKT(91,20),         XL(92)           RMS   48
ISN 0037            DIMENSION  XLD(92),            XLN(92),            XND(92)          RMS   49
ISN 0038            DIMENSION  XNBAR(92),          XNN(92),            XNT(92)          RMS   50
ISN 0039            DIMENSION  XX(92,20),          XX63(91,20),        YR(91)           RMS   51
ISN 0040            DIMENSION  YY(92),             YYD(92),            YYN(92)          RMS   52
ISN 0041            DIMENSION YGROW(38)                                                 RMS   53
ISN 0042            DIMENSION ZERO(1932),ZZ(91,20)                                      RMS   54
                C                                                                       RMS   55
                C                                                                       RMS   56
                C                                                                       RMS   57
                C                                                                       RMS   58
ISN 0043            DIMENSION XLH(92),UH(92),SUMNH(92,20),WBH(92,20),XXH(92,20)         RMS   59
ISN 0044            DIMENSION XIH(92,20),YYH(92),TH(92),GH(92),CH(92),XNTH(92)          RMS   60
ISN 0045            DIMENSION XNBAH(92),QTH(92),QMH(92),QCH(92),QBARH(92),XINC(60,3)    RMS   61
ISN 0046            DIMENSION GRFAC(100,20,3),IYEAR(11),ICHO(91),XXT(92,20)             RMS   62
                C                                                                       RMS   63
                C                                                                       RMS   64
ISN 0047            DIMENSION SCC1(3),SCC2(5)                                           RMS   65
                C                                                                       RMS   66
                C                                                                       RMS   67
                C                                                                       RMS   68
                C                                                                       RMS   69
ISN 0048            DIMENSION HHI(7),HHA(7)                                             RMS   70
ISN 0049            DIMENSION ISPIN(7)                                                  RMS   71
ISN 0050            DIMENSION TITLE(20,2)                                               RMS   72
ISN 0051            DIMENSION DELTR(5)                                                  RMS   73
ISN 0052            DIMENSION DFUI(5),DFUA(5),FU(100,5),FUI(100,5)                      RMS   74
```

```
ISN 0053            DIMENSION PERUN 92 ,QIV(20,3),PIH(92,20 ,OZERO(1104)                RMS   75
ISN 0054            DIMENSION XKH(92,20)                                                RMS   76
ISN 0055            DIMENSION OTP(92),OTA(92),OTO(92),OPOP(92),OAPV(92)                 RMS   77
ISN 0056            DIMENSION TP(92),TO(92),TA(92),APV(92),POP(92),TPD(92),TOD(92)      RMS   78
ISN 0057            DIMENSION TAD(92),APVH(92),POPH(92),TPH(92),TOH(92),TAH(92)         RMS   79
ISN 0058            DIMENSION TON(92),TAN(92),TPN(92),POPGR(91)                         RMS   80
ISN 0059            DIMENSION APVD(92)                                                  RMS   81
                C                                                                       RMS   82
ISN 0060            COMMON / ZEROT / PIN,XIN,XKN,XDN,YYN,GN,TN,CN,DNBARN,XNN,XLN,WN,    RMS   83
                   1                 UN,SUMNN,QBARN,QMN,QCN,QTN                       RMS   84
                   2 ,TPN,TON,TAN                                                       RMS   85
                C                                                                       RMS   86
                C                                                                       RMS   87
ISN 0061            COMMON /FAT/ F(1000),LSTORE,KPIST,ARAB(10),LCHECK                   RMS   88
                C                                                                       RMS   89
ISN 0062            COMMON /SENS/ ICTAB,NBEFOR,NEWCIT                                   RMS   90
ISN 0063            COMMON /CAT/ Z(20,20)                                               RMS   91
                C                                                                       RMS   92
ISN 0064            COMMON /SIM/ M1,M2,MCASES,Y(1000),X(1000),MARK,LVAR,MKEEP           RMS   93
                C                                                                       RMS   94
ISN 0065            COMMON/ALET/PERXX,PERW,PERWB,PERSN,PERP,PERXI,PERXK,PERYY,PERNB,    RMS   95
                   1 PERT,PERG,PERC,PERQM,PERQB,PERQC,PERTP,PERTO,PERTA                 RMS   96
ISN 0066            COMMON / BUG / ISBUG,LREAD,LWRIT                                    RMS   97
ISN 0067            COMMON /BUGG/ IPRN1,IPRN2,IPRN3                                     RMS   98
                C                                                                       RMS   99
ISN 0068            COMMON/CPRIN/PXD,PXID,PXKD,PPID,PDN,EOLD,ED                         RMS  100
                C                                                                       RMS  101
ISN 0069            COMMON /APRIN/PI,PID,XI,XID,XK,XKD,XX,XD,C,CD,YY,YYD,SUMN,SUMND,    RMS  102
                   1              XNBAR,DNBAR,XNT,XND,U,UD,XL,XLD,G,GD,T,TD,QT         RMS  103
                   2             ,QTD,QC,QCD,QM,QMD,QBAR,QBARD                         RMS  104
                C                                                                       RMS  105
ISN 0070            COMMON /PRITT/ TITLE,BENGOV                                         RMS  106
ISN 0071            COMMON/NPRIN/ LABEL,MCITY,KCITY,      LSTRAT,INPT,IKSW,IHELP,IFEEDRMS  107
ISN 0072            COMMON / IPRIN /INTT,LPNTT  ,JYEAR,IAQCR,IJCIT,MIN,IA312            RMS  108
                C                                                                       RMS  109
ISN 0073            COMMON/EVERY/OWB(92),OW(92),OX(92),OI(92),OY(92),OT(92),OG(92),     RMS  110
                   1 OC(92),OXBAR(92),OQC(92),OQM(92),OQB(92),      GRFAC,XINC,VK,      RMS  111
                   2 YGROW,IZS                                                          RMS  112
```

```
                3 ,OTP,OTA,O'O,O>OP,OA>V,PO>GR                                  RMS     3
ISN 0074         COMMON/ WNEWW/ WAGECO(20,3)                                    RMS   114
          C                                                                     RMS   115
ISN 0075         COMMON /ATAX/ TP,TPD,TO,TOD,TA,TAD                             RMS   116
          C                                                                     RMS   117
ISN 0076         EQUIVALENCE (OZERO(1),OWB(1))                                  RMS   118
          C                                                                     RMS   119
ISN 0077         EQUIVALENCE (ZERO(1),PIN(1))                                   RMS   120
          C                                                                     RMS   121
          C                                                                     RMS   122
ISN 0078         EQUIVALENCE (INDCI(1),XX(1))                                   RMS   123
          C                                                                     RMS   124
          C                                                                     RMS   125
          C                                                                     RMS   126
ISN 0079         DATA LKEEP/ 3,1,1,4,3,2,5,4,3,0,5,4,0,0,5/                     RMS   127
ISN 0080         DATA SCC1/'   Y',' G',      '   C'/                           RMS   128
ISN 0081         DATA SCC2/' N-T','  L','   W','   U','SUMN'/                  RMS   129
          C                                                                     RMS   130
          C                                                                     RMS   131
ISN 0082         DATA ISPIN/20,26,28,29,32,33,40/                               RMS   132
          C                                                                     RMS   133
ISN 0083         DATA JKEEP/20*2/                                               RMS   134
          C                                                                     RMS   135
ISN 0084         ADJUST = 2000.                                                 RMS   136
ISN 0085         NOX = -1                                                       RMS   137
ISN 0086         LLLLL = 0                                                      RMS   138
ISN 0087         LLKKK = 0                                                      RMS   139
ISN 0088         LSTRAT = 1                                                     RMS   140
ISN 0089         IZS = 0                                                        RMS   141
ISN 0090         LPNTT = 0                                                      RMS   142
ISN 0091         INTT = 0                                                       RMS   143
ISN 0092         ICAN = 0                                                       RMS   144
          C                                                                     RMS   145
          C       BEWARE ... SIC AT A TIME WILL BE DIFF.                        RMS   146
          C                                                                     RMS   147
ISN 0093         DO 106 I = 1,1932                                              RMS   148
ISN 0094       106 ZERO(I) = 0.0                                                RMS   149
ISN 0095         ISBUG = 1                                                      RMS   150
```

```
 SN 0096              _READ) = 5                                                  RMS   15
ISN 0097              LWRIT = 6                                                   RMS   152
ISN 0098              AIA =    0./897.                                            RMS   153
ISN 0099              AAA = 960./1145.                                            RMS   154
ISN 0100              DO 407 I = 1,100                                            RMS   155
ISN 0101              DO 407 J = 1,5                                              RMS   156
ISN 0102              FU(I,J) = 0.0                                               RMS   157
ISN 0103              FUI(I,J) = 0.0                                              RMS   158
ISN 0104          407 CONTINUE                                                    RMS   159
ISN 0105              RIT=232.96                                                  RMS   160
ISN 0106              RAT = 105.6                                                 RMS   161
ISN 0107              DELTR(1)=(RIT*.05+RAT*.05)/683462.2                         RMS   162
ISN 0108              DELTR(2)=(RIT*.10+RAT*.15)/683462.2                         RMS   163
ISN 0109              DELTR(3)=(RIT*.35+RAT*.50)/683462.2                         RMS   164
ISN 0110              DELTR(4)=(RIT*.40+RAT*.90)/683462.2                         RMS   165
ISN 0111              DELTR(5)=(RIT*.10+RAT*1.00)/683462.2                        RMS   166
ISN 0112              OKY = 683462.2                                              RMS   167
ISN 0113              DFUI(1) = (RIT*.05)/OKY                                     RMS   168
ISN 0114              DFUI(2) = (RIT*.10)/OKY                                     RMS   169
ISN 0115              DFUI(3) = (RIT*.35)/OKY                                     RMS   170
ISN 0116              DFUI(4) = (RIT*.40)/OKY                                     RMS   171
ISN 0117              DFUI(5) = (RIT*.10)/OKY                                     RMS   172
ISN 0118              DFUA(1) = (RAT*.05)/OKY                                     RMS   173
ISN 0119              DFUA(2) = (RAT*.15)/OKY                                     RMS   174
ISN 0120              DFUA(3) = (RAT*.50)/OKY                                     RMS   175
ISN 0121              DFUA(4) = (RAT*.90)/OKY                                     RMS   176
ISN 0122              DFUA(5) = RAT/OKY                                           RMS   177
                  C                                                               RMS   178
ISN 0123              IIOC5 = 1                                                   RMS   179
ISN 0124              IIOC5 = 0                                                   RMS   180
                  C                                                               RMS   181
ISN 0125              ISBUG2 = 1                                                  RMS   182
ISN 0126              ISBUG2 = 0                                                  RMS   183
                  C                                                               RMS   184
ISN 0127              IA312 = 0                                                   RMS   185
ISN 0128              IA312 = 1                                                   RMS   186
                  C                                                               RMS   187
ISN 0129              IAPROP = 1                                                  RMS   188
```

```
 SN 0130            IAPROP = (                                                    RMS   189
ISN 0131            LTAPE = 9                                                    RMS   190
ISN 0132            JYEAR = -2                                                   RMS   191
ISN 0133            IDYEAR = 1971                                                RMS   192
ISN 0134            IFEED = 0                                                    RMS   193
ISN 0135          405 FORMAT(20A4)                                               RMS   194
ISN 0136          410 FORMAT(20I4)                                               RMS   195
ISN 0137          440 FORMAT(10X,5F10.4)                                         RMS   196
ISN 0138            DO 404 I = 1,91                                              RMS   197
ISN 0139            DO 404 J = 1,20                                              RMS   198
ISN 0140            XX(I,J) = 0.0                                                RMS   199
ISN 0141            XXH(I,J) = 0.0                                               RMS   200
ISN 0142            DO 61 K=1,5                                                  RMS   201
ISN 0143           61 EOLD(I,J,K) = 0.0                                          RMS   202
ISN 0144          404 CONTINUE                                                   RMS   203
                  C                                                              RMS   204
ISN 0145            DO 493 I = 1,1104                                            RMS   205
ISN 0146          493 OZERO(I) = 0.0                                             RMS   206
                  C                                                              RMS   207
                  C     GENERAL INPUT VARIABLES                                  RMS   208
                  C                                                              RMS   209
ISN 0147            READ (LREAD,178) (POPGR(I),I=1,91)                           RMS   210
ISN 0148          178 FORMAT (16F5.2)                                            RMS   211
ISN 0149            DO 166 I = 1,91                                              RMS   212
ISN 0150            READ (LREAD,177) POPH(I),TL,PTP,APVH(I)                      RMS   213
ISN 0151          177 FORMAT (4F10.0)                                            RMS   214
ISN 0152            TPH(I) = POPH(I)*PTP/1000.                                   RMS   215
ISN 0153            TOH(I) = TL-TPH(I)                                           RMS   216
ISN 0154            POPGR(I) = POPGR(I) / 100.                                   RMS   217
ISN 0155          166 CONTINUE                                                   RMS   218
ISN 0156            DO 5300 I = 1,20                                             RMS   219
ISN 0157         5300 READ (5,5305) (WAGECO(I,J),J=1,3)                          RMS   220
ISN 0158         5305 FORMAT (10X,3F10.3)                                        RMS   221
                  C                                                              RMS   222
ISN 0159            DO 430 I = 1,20                                              RMS   223
ISN 0160            READ (LTAPE,440) ALPHA(I),BETA(I),D(I),PICOEF(I),VK(I)       RMS   224
ISN 0161            IF (ISBUG) 430,430,420                                       RMS   225
ISN 0162          420 WRITE(LWRIT,440) ALPHA(I),BETA(I),D(I),PICOEF(I),VK(I)     RMS   226
```

```
 SN 0 63          430 CONTINUE                                                                    RMS  227
ISN 0164              DO 460 I = 1,92                                                            RMS  228
ISN 0165              READ(LTAPE,461)          (IAQCR(I,J),J=1,20)                               RMS  229
ISN 0166          458 FORMAT (1H1)                                                               RMS  230
ISN 0167          459 FORMAT(1H1,//1H  ,'AQCR S FOR WHICH DATA WAS AVAILABLE FOR THIS STRMS  231
                     1UDY',/)                                                                    RMS  232
ISN 0168          460 CONTINUE                                                                   RMS  233
ISN 0169          461 FORMAT (I4,19A4)                                                           RMS  234
ISN 0170              WRITE (LWRIT,459)                                                          RMS  235
ISN 0171              KITTY = 0                                                                  RMS  236
ISN 0172              DO 464 I = 1,91                                                            RMS  237
ISN 0173              WRITE (LWRIT,462) ( IAQCR(I,J),J=1,20)                                     RMS  238
ISN 0174              KITTY = KITTY + 1                                                          RMS  239
ISN 0175              IF (KITTY-31) 464,463,463                                                  RMS  240
ISN 0176          462 FORMAT(1H ,23X,I3,2X,19A4)                                                 RMS  241
ISN 0177          463 KITTY = 0                                                                  RMS  242
ISN 0178              WRITE (LWRIT,458)                                                          RMS  243
ISN 0179          464 CONTINUE                                                                   RMS  244
ISN 0180              WRITE (LWRIT,458)                                                          RMS  245
                  C                                                                              RMS  246
ISN 0181              READ(LTAPE,410) (KCITY(I),I=1,100)                                         RMS  247
ISN 0182              IF(LLKKK.EQ.1) GO TO 720                                                   RMS  248
ISN 0184              LLKKK = 1                                                                  RMS  249
ISN 0185              READ(LTAPE,490) ((GAMA(IKIT,JKIT), JKIT = 1,5), IKIT = 1,19)               RMS  250
ISN 0186          490 FORMAT(10X,5F10.5)                                                         RMS  251
ISN 0187              DO 492  KIT = 1,20                                                         RMS  252
ISN 0188              READ(LTAPE,491) PICON(KIT), A(KIT), ALIT(KIT)                              RMS  253
ISN 0189          491 FORMAT(10X,3F10.5)                                                         RMS  254
ISN 0190          492 CONTINUE                                                                   RMS  255
ISN 0191              DO 799 KIT = 1,19                                                          RMS  256
ISN 0192          799 READ(LTAPE,798) AB(KIT)                                                    RMS  257
ISN 0193          798 FORMAT(10X,F10.6)                                                          RMS  258
                  C                                                                              RMS  259
                  C       1970-1980 INPUT SEGMENT                                                RMS  260
                  C                                                                              RMS  261
                  C                                                                              RMS  262
ISN 0194              DO 450  I = 1,91                                                           RMS  263
ISN 0195              READ(LTAPE,445) XLH(I),UH(I),SUMNH(I,20),WBH(I,20),XXH(I,20),              RMS  264
```

```
                XIH   ,20),YYH(I),TH(I),G(   ,C(                                  RMS  265
ISN 0196        XKH(I,20) = XXH(I,20)/VK(20)                                      RMS  266
ISN 0197        W(I,20) = WBH(I,20)/SUMNH(I,20)                                   RMS  267
ISN 0198        PIH(I,20)=XXH(I,20)-WBH(I,20)                                     RMS  268
ISN 0199        TAH(I) = TH(I)-TPH(I) -TOH(I)                                     RMS  269
ISN 0200        IF (ISBUG) 447,447,444                                            RMS  270
ISN 0201     444 WRITE(LWRIT,446)XLH(I),UH(I),SUMNH(I,20),WBH(I,20),XXH(I,20),    RMS  271
               1  XIH(I,20),YYH(I),TH(I),GH(I),CH(I)                            RMS  272
ISN 0202     445 FORMAT(F10.1,F10.3,/,3F10.1,10X,F10.1,/,3F10.0,/,F10.0,/,80X)    RMS  273
ISN 0203     446 FORMAT(1H ,F10.1,1X,F10.3,1X,4(F10.1,1X),4(F10.0,1X))            RMS  274
ISN 0204     447 XNTH(I) = (1.0-UH(I))*XLH(I)                                     RMS  275
ISN 0205         XNBAH(I) = XNTH(I)-SUMNH(I,20)                                   RMS  276
ISN 0206     450 CONTINUE                                                         RMS  277
ISN 0207         DO 470  I = 1,91                                                 RMS  278
ISN 0208         READ(LTAPE,466) QTH(I),QCH(I),QMH(I),QBARH(I)                    RMS  279
ISN 0209         WRITE(LWRIT,466) QTH(I),QCH(I),QMH(I),QBARH(I)                   RMS  280
ISN 0210     465 FORMAT(1H ,20I5)                                                 RMS  281
ISN 0211     470 CONTINUE                                                         RMS  282
ISN 0212     466 FORMAT(4F10.0)                                                   RMS  283
ISN 0213    5993 READ(LTAPE,5994)  XKIT,KIND                                      RMS  284
ISN 0214    5994 FORMAT (F10.1,66X,I2)                                            RMS  285
ISN 0215         IF(KIND-99) 5993,5996,5996                                       RMS  286
ISN 0216    5996 READ(LTAPE,5997) XKIT,XKIT1,XKIT2,XKIT3,ICT,KIND                 RMS  287
ISN 0217    5997 FORMAT(3F10.1,10X,F10.1,23X,I3,I2)                               RMS  288
ISN 0218         IF (KIND-99) 5998,5999,5999                                      RMS  289
ISN 0219    5998 KIND = KIND-20+(20/KIND)                                         RMS  290
ISN 0220         ICITY = KCITY(ICT)                                               RMS  291
ISN 0221         IF (ICITY.EQ.0)  GO TO 5996                                      RMS  292
ISN 0223         WBH(ICITY,KIND)  = XKIT1                                         RMS  293
ISN 0224         SUMNH(ICITY,KIND) = XKIT                                         RMS  294
ISN 0225         XXH(ICITY,KIND) = XKIT2                                          RMS  295
ISN 0226         XIH(ICITY,KIND) = XKIT3                                          RMS  296
ISN 0227         W(ICITY,KIND) = WBH(ICITY,KIND)/SUMNH(ICITY,KIND)                RMS  297
ISN 0228         XKH(ICITY,KIND) = XXH(ICITY,KIND)/VK(KIND)                       RMS  298
ISN 0229         PIH(ICITY,KIND)=XXH(ICITY,KIND)-WBH(ICITY,KIND)                  RMS  299
ISN 0230         GO TO 5996                                                       RMS  300
               C                                                                  RMS  301
               C*****************************************************************RMS  302
```

```
                C    *****  EXTINCT  *****                                                    RMS  303
                C                                                                             RMS  304
                C       1967 INPUT SECTION                                                    RMS  305
                C                                                                             RMS  306
                C                                                                             RMS  307
                C                                                                             RMS  308
                C***********                                                                  RMS  309
                C    *****  EXTINCT  *****                                                   RMS  310
                C                                                                             RMS  311
ISN 0231         5999 CONTINUE                                                                RMS  312
ISN 0232              READ(LTAPE,6000) CT,(X(I),Y(I),I=1,2),ICT  ,KIND,(X(I),Y(I),I=3,5)RMS  313
ISN 0233              IF (KIND-99) 6002,6006,6006                                             RMS  314
ISN 0234         6002 KIND = KIND - 20 + (20 / KIND)                                          RMS  315
ISN 0235              ICITY = KCITY(ICT)                                                      RMS  316
ISN 0236              DO 6003 I = 1,5                                                         RMS  317
ISN 0237              EOLD(ICITY,KIND,I) = X(I)                                               RMS  318
ISN 0238         6000 FORMAT(F10.0,10X,4F10.0,13X,I3,I2,/,4F10.0,F10.1,F10.0)                 RMS  319
ISN 0239         6003 CONTINUE                                                                RMS  320
ISN 0240              GO TO 5999                                                              RMS  321
ISN 0241         6006 CONTINUE                                                                RMS  322
ISN 0242              DO 2350 ICK = 1,91                                                      RMS  323
ISN 0243              DO 2345 JNK = 1,19                                                      RMS  324
ISN 0244              KG = JKEEP(JNK)                                                         RMS  325
ISN 0245              DO 2340 KNK = 1,5                                                       RMS  326
ISN 0246              KGO = LKEEP(KG,KNK)                                                     RMS  327
ISN 0247              IF (KGO)  2345,2345,2310                                                RMS  328
ISN 0248         2310 IF (EOLD(ICK,JNK,KGO)) 2340,2325,2340                                   RMS  329
ISN 0249         2325 EOLD(ICK,JNK,KGO) = .001                                                RMS  330
ISN 0250         2340 CONTINUE                                                                RMS  331
ISN 0251         2345 CONTINUE                                                                RMS  332
ISN 0252         2350 CONTINUE                                                                RMS  333
                C    SAVE ORIGINAL DATA FOR LATER USE                                        RMS  334
ISN 0253              DO 800 I = 1,91                                                         RMS  335
ISN 0254              OW(I) = WBH(I,20)/SUMNH(I,20)                                           RMS  336
ISN 0255              OWB(I) = WBH(I,20)                                                      RMS  337
ISN 0256              OX(I) = XXH(I,20)                                                       RMS  338
ISN 0257              OI(I) = XIH(I,20)                                                       RMS  339
ISN 0258              OY(I) = YYH(I)                                                          RMS  340
```

```
ISN 0259            OT(I) = TH( )                                          RMS  341
ISN 0260            OG(I) = GH(I)                                          RMS  342
ISN 0261            OC(I) = CH(I)                                          RMS  343
ISN 0262            OXBAR(I) = XNBAH(I)                                    RMS  344
ISN 0263            OQC(I) = QCH(I)                                        RMS  345
ISN 0264            OQM(I) = QMH(I)                                        RMS  346
ISN 0265            OQB(I) = QBARH(I)                                      RMS  347
ISN 0266            OTP(I) = TPH(I)                                        RMS  348
ISN 0267            OTA(I) = TAH(I)                                        RMS  349
ISN 0268            OTO(I) = TOH(I)                                        RMS  350
ISN 0269            OPOP(I) = POPH(I)                                      RMS  351
ISN 0270            OAPV(I) = APVH(I)                                      RMS  352
ISN 0271            OW(92) = OW(92) + OW(I)                                RMS  353
ISN 0272            OWB(92) = OWB(92) + OWB(I)                             RMS  354
ISN 0273            OX(92) = OX(92) + OX(I)                                RMS  355
ISN 0274            OI(92) = OI(92) + OI(I)                                RMS  356
ISN 0275            OY(92) = OY(92) + OY(I)                                RMS  357
ISN 0276            OT(92) = OT(92) + OT(I)                                RMS  358
ISN 0277            OTP(92) = OTP(92) + OTP(I)                             RMS  359
ISN 0278            OTA(92) = OTA(92) + OTA(I)                             RMS  360
ISN 0279            OTO(92) = OTO(92) + OTO(I)                             RMS  361
ISN 0280            OPOP(92) = OPOP(92) + OPOP(I)                          RMS  362
ISN 0281            OAPV(92) = OAPV(92) + OAPV(I)                          RMS  363
ISN 0282            OG(92) = OG(92) + OG(I)                                RMS  364
ISN 0283            OC(92) = OC(92) + OC(I)                                RMS  365
ISN 0284            OXBAR(92) = OXBAR(92) + OXBAR(I)                       RMS  366
ISN 0285            OQC(92) = OQC(92) + OQC(I)                             RMS  367
ISN 0286            OQM(92) = OQM(92) + OQM(I)                             RMS  368
ISN 0287            OQB(92) = OQB(92) + OQB(I)                             RMS  369
ISN 0288         800 CONTINUE                                              RMS  370
ISN 0289            PERUN(92) = .04                                        RMS  371
ISN 0290            DO 201 I = 1,7                                         RMS  372
ISN 0291            READ (LTAPE,202) K,IK                                  RMS  373
ISN 0292            K = K - 20&(20/K)                                      RMS  374
ISN 0293         201 JKEEP (K) = IK                                        RMS  375
ISN 0294            DO 7008 I = 1,20                                       RMS  376
ISN 0295            READ (LREAD,7007) (QINV(I,J),J=1,3)                    RMS  377
ISN 0296        7008 CONTINUE                                              RMS  378
```

```
 S  0297       7007 FORMAT(10X,3F 0.3                                          RMS  379
ISN 0298        202 FORMAT (213)                                               RMS  380
ISN 0299            IF(LLLLL.EQ.1) GO TO  38                                   RMS  381
ISN 0301            LLLLL = 1                                                  RMS  382
ISN 0302            DO 5991 ICT = 1,91                                         RMS  383
ISN 0303            I = ICT                                                    RMS  384
ISN 0304            PERUN(I) = .04                                             RMS  385
ISN 0305            DO 5990 MJ=1,19                                            RMS  386
ISN 0306       5990 EOLDH(ICT,MJ) = EOLD(ICT,MJ,5)                             RMS  387
ISN 0307            EOLDH(ICT,20) = QTH(ICT)                                   RMS  388
ISN 0308            READ(LTAPE,5992) (B(I,J), J = 1,19)                        RMS  389
ISN 0309       5991 CONTINUE                                                   RMS  390
ISN 0310            DO 298 I = 1,91                                            RMS  391
ISN 0311            READ (LTAPE,299) RNET(I)                                   RMS  392
ISN 0312        298 CONTINUE                                                   RMS  393
ISN 0313            DO 401 I = 1,8                                             RMS  394
ISN 0314            READ(LTAPE,405)(LABEL(I,J), J = 1,20)                      RMS  395
ISN 0315        401 CONTINUE                                                   RMS  396
ISN 0316        299 FORMAT(20X,F10.3)                                          RMS  397
ISN 0317         38 CONTINUE                                                   RMS  398
ISN 0318            LPNTI = 0                                                  RMS  399
                C                                                              RMS  400
                C       GROWTH FACTOR CALCULATIONS FOR 1970-1980 ONLY          RMS  401
                C                                                              RMS  402
ISN 0319       7009 READ(LREAD,1070) INY,(IYEAR(JRK),JRK=1,INY)                RMS  403
ISN 0320            WRITE(6,1315)                                              RMS  404
ISN 0321            IF(ICAN.EQ.0) GO TO 6698                                   RMS  405
ISN 0323            DO 408 I = 1,100                                           RMS  406
ISN 0324            MYCITY = KCITY(I)                                          RMS  407
ISN 0325            IF (MYCITY .EQ.0) GO TO 408                                RMS  408
ISN 0327            WRITE(6,409) (FU(I,J),J=1,5),I                             RMS  409
ISN 0328            WRITE(7,409) (FU(I,J),J=1,5),I                             RMS  410
ISN 0329        409 FORMAT(1H ,F9.3,4F10.3,26X,I4)                             RMS  411
ISN 0330            WRITE(6,409) (FUI(I,J),J=1,5),I                            RMS  412
ISN 0331            WRITE(7,409) (FUI(I,J),J=1,5),I                            RMS  413
ISN 0332            CALL OLETS(MYCITY)                                         RMS  414
ISN 0333            IF (PERXX.EQ.0.0) GO TO 408                                RMS  415
ISN 0335            DIVINV = FUI(I,5)/PERXX                                    RMS  418
```

```
SN 0336            D VTOT=(FU  ,5)+FUI(I,5 )/PERXX                                  RMS  417
ISN 0337           IF (PERYY.EQ.0.0) GO TO 408                                      RMS  418
ISN 0339           YYINV=FUI(I,5)/PERYY                                             RMS  419
ISN 0340           YYTOT=(FU(I,5)+FUI(I,5))/PERYY                                   RMS  420
ISN 0341           WRITE(6,20) DIVINV,DIVTOT,YYINV,YYTOT,I                          RMS  421
ISN 0342           WRITE(7,20) DIVINV,DIVTOT,YYINV,YYTOT,I                          RMS  422
ISN 0343        20 FORMAT(1H F9.4,3F10.4,36X,I4)                                    RMS  423
ISN 0344       408 CONTINUE                                                         RMS  424
ISN 0345      6698 ICAN = 1                                                         RMS  425
ISN 0346           WRITE(LWRIT,1070) INY,(IYEAR(JRK),JRK=1,INY)                     RMS  426
ISN 0347           IMII = IYEAR(INY) - 1968 - IIOC5                                 RMS  427
ISN 0348      1070 FORMAT(I4,1X,12I5)                                               RMS  428
ISN 0349           IF (INY.EQ.0) STOP                                               RMS  429
ISN 0351           DO 1020 JRK = 1,54                                               RMS  430
ISN 0352           READ (LTAPE,7010) (GRFAC(JRK,KRK,1),KRK=1,20)                    RMS  431
ISN 0353      7010 FORMAT (14F5.0,/,6F5.0)                                          RMS  432
ISN 0354      7015 FORMAT(14F5.3,/,6F5.3)                                           RMS  433
ISN 0355      1020 CONTINUE                                                         RMS  434
ISN 0356           DO 1025 JRK = 1,54                                               RMS  435
ISN 0357           DO 1025 KRK = 1,20                                               RMS  436
ISN 0358           GRFAC(JRK,KRK,1) = GRFAC(JRK,KRK,1)/100.                         RMS  437
ISN 0359      1025 CONTINUE                                                         RMS  438
ISN 0360           DO 1030 JRK = 1,54                                               RMS  439
ISN 0361           READ(LTAPE,7015) (GRFAC(JRK,KRK,2),KRK=1,20)                     RMS  440
ISN 0362      1030 CONTINUE                                                         RMS  441
ISN 0363           DO 1040 JRK = 1,54                                               RMS  442
ISN 0364           READ(LTAPE,7015) (GRFAC(JRK ,KRK,3),KRK=1,20)                    RMS  443
ISN 0365      1040 CONTINUE                                                         RMS  444
ISN 0366           DO 1060 JRK = 1,54                                               RMS  445
ISN 0367           READ(LTAPE,1050)(XINC(JRK,KRK),KRK=1,3)                          RMS  446
ISN 0368      1050 FORMAT(10X,F10.0,/,10X,F10.0,/,10X,F10.0)                        RMS  447
ISN 0369      1060 CONTINUE                                                         RMS  448
                  C                                                                RMS  449
ISN 0370      7533 FORMAT(4F10.2)                                                   RMS  450
                  C                                                                RMS  451
                  C                                                                RMS  452
                  C                                                                RMS  453
                  C       FOR AQCRS NOT INCLUDED IN OBE REPORT (CODE GREATER THAN 54 )  RMS  454
```

```
                C                                                                       RMS   '55
                C                                                                       RMS   456
                C                                                                       RMS   457
                C                                                                       RMS   458
                C                                                                       RMS   459
ISN 0371              READ(LTAPE,1051) YGROW                                            RMS   460
ISN 0372         1051 FORMAT(30X,F10.2,40X)                                             RMS   461
ISN 0373         1310 FORMAT(1H ,I3,12F9.1,I5)                                          RMS   462
                C                                                                       RMS   463
                C                                                                       RMS   464
ISN 0374              DO 1054 JRK = 1,20                                                RMS   465
ISN 0375              DO 1054 KRK = 1,3                                                 RMS   466
ISN 0376              DO 1053 KC = 55,100                                               RMS   467
ISN 0377              LCITY = KCITY(KC)                                                 RMS   468
ISN 0378              IF(LCITY.EQ.0) GO TO 1052                                         RMS   469
ISN 0380              GRFAC(LCITY,JRK,KRK) = GRFAC(32,JRK,KRK)                          RMS   470
ISN 0381              GO TO 1053                                                        RMS   471
ISN 0382         1052 GRFAC(LCITY,JRK,KRK) = 0.0                                        RMS   472
ISN 0383         1053 CONTINUE                                                          RMS   473
ISN 0384         1054 CONTINUE                                                          RMS   474
                C                                                                       RMS   475
ISN 0385              DO 1055 IJ=1,38                                                   RMS   476
ISN 0386              WRITE(LWRIT,1070) IJ                                              RMS   477
ISN 0387         1055 YGROW(IJ) = YGROW(IJ)/100.                                        RMS   478
ISN 0388              READ(LREAD,1080) INC,(ICHO(JRK),JRK=1,INC)                        RMS   479
                C                                                                       RMS   480
ISN 0389              IF(IA312.EQ.0) GO TO 7213                                         RMS   481
ISN 0391              READ(LREAD,7211) BENGOV,BENEF,THIS1,P                             RMS   482
ISN 0392         7211 FORMAT(4F10.2)                                                    RMS   483
                C                                                                       RMS   484
                C    ***    OVERWRITES FEEDBACK MATRIX IF BENEFIT NOT EQ. $10 BILLION  **RMS   485
                C                                                                       RMS   486
ISN 0393              IF(BENGOV.EQ.10000.) GO TO 7213                                   RMS   487
ISN 0395              DO 7225 ICT = 1,91                                                RMS   488
ISN 0396              READ(LREAD,5992)(B(ICT,J),J=1,19)                                 RMS   489
ISN 0397              WRITE(LWRIT,5992)(B(ICT,J),J=1,19)                                RMS   490
ISN 0398         7225 CONTINUE                                                          RMS   491
                C                                                                       RMS   492
```

```
 S  0399      7213 CONTINUE                                                          R S  493
             C                                                                      RMS  494
             C                                                                      RMS  495
             C                                                                      RMS  496
             C       ELIMINATES REQUESTS FOR INFO. ABOUT CITIES FOR WHICH NO DATA IS RMS  497
             C       AVAILABLE (EXAMPLE - NO DATA FOR CITY NO. 13)                  RMS  498
             C                                                                      RMS  499
ISN 0400           NIL = INC                                                       RMS  500
ISN 0401           DO 1063 I=1,INC                                                 RMS  501
ISN 0402      1064 KIT = ICHO(I)                                                   RMS  502
ISN 0403           IAB = KCITY(KIT)                                                RMS  503
ISN 0404           IF(IAB) 1063,1061,1063                                          RMS  504
ISN 0405      1061 NIL = NIL - 1                                                   RMS  505
ISN 0406           DO 1062 NIPP = I,NIL                                            RMS  506
ISN 0407           ICHO(NIPP) = ICHO(NIPP + 1)                                     RMS  507
ISN 0408      1062 CONTINUE                                                        RMS  508
ISN 0409           WRITE(LWRIT,1065) KIT                                           RMS  509
ISN 0410           GO TO 1064                                                      RMS  510
ISN 0411      1063 CONTINUE                                                        RMS  511
ISN 0412           INC = NIL                                                       RMS  512
ISN 0413      1065 FORMAT(/'  NO DATA AVAILABLE FOR CITY NO. ',I2)                 RMS  513
             C                                                                      RMS  514
             C                                                                      RMS  515
ISN 0414      1080 FORMAT(16I5)                                                    RMS  516
ISN 0415           DO 1100 JG = 1,INY                                              RMS  517
ISN 0416      1100 IYEAR(JG) = IYEAR(JG)-1969                                      RMS  518
ISN 0417      1110 JYKNT = 0                                                       RMS  519
             C                                                                      RMS  520
             C                                                                      RMS  521
ISN 0418      1355 CONTINUE                                                        RMS  522
ISN 0419           IF(JYKNT.EQ.0) GO TO 1115                                       RMS  523
ISN 0421           U(92) = PERUN(92)                                               RMS  524
ISN 0422           UN(92) = -XNN(92)/XL(92)                                        RMS  525
ISN 0423           CALL PRINT (92)                                                 RMS  526
ISN 0424           DO 6699 I = 1,91                                                RMS  527
ISN 0425           XX(I,20)=XX(I,20)+XDN(I)                                        RMS  528
ISN 0426           PI(I,20) = PI(I,20) + PIN(I)                                    RMS  529
ISN 0427           XK(I,20) = XK(I,20) + XKN(I)                                    RMS  530
```

```
ISN 0428            X ( ,20) = X (I,20  + X N(I)                                RMS  531
ISN 0429            YY(I) = YY(I) + YYN(I)                                      RMS  532
ISN 0430            G(I) = G(I ) + GN(I)                                        RMS  533
ISN 0431            T(I) = T(I) + TN(I)                                         RMS  534
ISN 0432            TP(I) = TP(I) + TPN(I)                                      RMS  535
ISN 0433            TA(I) = TA(I) + TAN(I)                                      RMS  536
ISN 0434            TO(I) = TO(I) + TON(I)                                      RMS  537
ISN 0435             C(I) = C(I) + CN(I)                                        RMS  538
ISN 0436            XNBAR(I) = XNBAR(I) + DNBARN(I)                             RMS  539
ISN 0437            XNT(I) = XNT(I) + XNN(I)                                    RMS  540
ISN 0438            XL(I) = XL(I) + XLN(I)                                      RMS  541
ISN 0439            W(I,20) = W(I,20) + WN(I)                                   RMS  542
ISN 0440            SUMN(I,20) = SUMN(I,20) + SUMNN(I)                          RMS  543
ISN 0441            WB(I,20) = XX(I,20)-PI(I,20)                                RMS  544
ISN 0442            QBAR(I) = QBAR(I) + QBARN(I)                                RMS  545
ISN 0443            QM(I) = QM(I) + QMN(I)                                      RMS  546
ISN 0444            QC(I) = QC(I) + QCN(I)                                      RMS  547
ISN 0445            QT(I) = QT(I) + QTN(I)                                      RMS  548
ISN 0446      6699  CONTINUE                                                    RMS  549
ISN 0447            DO 1225 I=1,92                                              RMS  550
ISN 0448            DO 1220 J=1,20                                              RMS  551
ISN 0449            XXH(I,J) = XX(I,J)                                          RMS  552
ISN 0450            WBH(I,J) = WB(I,J)                                          RMS  553
ISN 0451            SUMNH(I,J) = SUMN(I,J)                                      RMS  554
ISN 0452            XIH(I,J) = XI(I,J)                                          RMS  555
ISN 0453            EOLDH(I,J) = EOLD(I,J,5)                                    RMS  556
ISN 0454            XKH(I,J) = XK(I,J)                                          RMS  557
ISN 0455            PIH (I,J) = PI(I,J)                                         RMS  558
ISN 0456      1220  CONTINUE                                                    RMS  559
ISN 0457            YYH(I) = YY(I)                                              RMS  560
ISN 0458            XNBAH(I)    = XNBAR(I)                                      RMS  561
ISN 0459            TH(I) = T(I)                                                RMS  562
ISN 0460                  TPH(I) = TP(I)                                        RMS  563
ISN 0461            TOH(I) = TO(I)                                              RMS  564
ISN 0462            TAH(I) = TA(I)                                              RMS  565
ISN 0463            POPH(I) = POP(I)                                            RMS  566
ISN 0464            APVH(I) = APV(I)                                            RMS  567
ISN 0465            GH(I) = G(I)                                                RMS  568
```

```
ISN 0466            C( ) = C( )                                          RMS  569
ISN 0467            QBARH(I) = QBAR(I)                                   RMS  570
ISN 0468            QCH(I) = QC(I)                                       RMS  571
ISN 0469            QMH(I) = QM(I)                                       RMS  572
ISN 0470            QTH(I) = QT(I)                                       RMS  573
ISN 0471     1225   CONTINUE                                             RMS  574
                    C                                                    RMS  575
                    C                                                    RMS  576
                    C                                                    RMS  577
                    C                                                    RMS  578
ISN 0472            DO 6106 I = 1,1932                                   RMS  579
ISN 0473     6106   ZERO(I) = 0.0                                        RMS  580
ISN 0474     1115   CONTINUE                                             RMS  581
ISN 0475            IF (JYKNT.EQ.INY)  GO TO 7009                        RMS  582
ISN 0477            JYKNT = JYKNT + 1                                    RMS  583
ISN 0478            JYEAR = IYEAR(JYKNT)                                 RMS  584
                    C                                                    RMS  585
                    C   *** TO GENERATE OC5 SET TEST TO 8 - 1977 - NOW 1978  ***  RMS  586
                    C                                                    RMS  587
ISN 0479            IF(JYEAR.EQ.IMII) GO TO 95                           RMS  588
                    C                                                    RMS  589
ISN 0481            KYY = JYEAR+1969                                     RMS  590
ISN 0482            XX(92,20) = 0.0                                      RMS  591
ISN 0483            PI(92,20) = 0.0                                      RMS  592
ISN 0484            XI(92,20) = 0.0                                      RMS  593
ISN 0485            XK(92,20) = 0.0                                      RMS  594
ISN 0486            SUMN(92,20) = 0.0                                    RMS  595
ISN 0487            XNBAR(92) = 0.0                                      RMS  596
ISN 0488            YY(92) = 0.0                                         RMS  597
ISN 0489            XNT(92) = 0.0                                        RMS  598
ISN 0490            C(92) = 0.0                                          RMS  599
ISN 0491            XL(92) = 0.0                                         RMS  600
ISN 0492            QT(92) = 0.0                                         RMS  601
ISN 0493            QM(92) = 0.0                                         RMS  602
ISN 0494            QBAR(92) = 0.0                                       RMS  603
ISN 0495            QC(92) = 0.0                                         RMS  604
ISN 0496            G(92) = 0.0                                          RMS  605
ISN 0497            T(92) = 0.0                                          RMS  606
```

```
ISN 0493            'P(92) = (.0                                                RMS  607
ISN 0499            TO(92) = 0.0                                                RMS  608
ISN 0500            TA(92) = 0.0                                                RMS  609
ISN 0501            POP(92) = 0.0                                               RMS  610
ISN 0502            APV(92) = 0.0                                               RMS  611
ISN 0503            IF (JYKNT.EQ.1) IEX=JYEAR+3                                 RMS  612
ISN 0505            IF(JYKNT.NE.1) IEX = 1                                      RMS  613
ISN 0507            IKX = JYEAR+2                                               RMS  614
ISN 0508            IRX = IEX                                                   RMS  615
ISN 0509            DO 310 MPCITY = 1,INC                                       RMS  616
ISN 0510            IEX = IRX                                                   RMS  617
ISN 0511            KIT = ICHO(MPCITY)                                          RMS  618
ISN 0512            LCITY = KCITY(KIT)                                          RMS  619
ISN 0513            IF (LCITY.GT.53) GO TO 1142                                 RMS  620
ISN 0515            IF (XINC(LCITY,1).EQ.0.0) GO TO 1144                        RMS  621
ISN 0517            YRAG1=XINC(LCITY,1)/YYH(LCITY)                              RMS  622
ISN 0518            YRAG2 = XINC(LCITY,2)/XINC(LCITY,1)                         RMS  623
ISN 0519            YRAG3 = XINC(LCITY,3)/XINC(LCITY,2)                         RMS  624
ISN 0520            YRAM1 = ALOG10(YRAG1)/3.                                    RMS  625
ISN 0521            YRAL1 = 10.**YRAM1                                          RMS  626
ISN 0522            YRAM2 = ALOG10(YRAG2)/5.                                    RMS  627
ISN 0523            YRAL2 = 10.**YRAM2                                          RMS  628
ISN 0524            YRAM3 = ALOG10(YRAG3)/5.                                    RMS  629
ISN 0525            YRAL3 = 10.**YRAM3                                          RMS  630
ISN 0526            GO TO 1143                                                  RMS  631
ISN 0527       1144 RATE = 0.0                                                  RMS  632
ISN 0528            IF (KIT.EQ.23) RATE = .0762                                 RMS  633
ISN 0530            IF (KIT.EQ.32) RATE = .0758                                 RMS  634
ISN 0532            IF (KIT.EQ.33) RATE = .0645                                 RMS  635
ISN 0534            YCATCH = (1.0+RATE)**IKX                                    RMS  636
ISN 0535            YRON = 1.0                                                  RMS  637
ISN 0536            YRAG1 = 1.0                                                 RMS  638
ISN 0537            YRAG2 = 1.0                                                 RMS  639
ISN 0538            YRAG3 = 1.0                                                 RMS  640
ISN 0539            GO TO 1143                                                  RMS  641
ISN 0540       1142 IKX = JYEAR+2                                               RMS  642
ISN 0541            YCATCH = (1.0+YGROW(LCITY-53))**IKX                         RMS  643
ISN 0542            YRON = 1.0                                                  RMS  644
```

```
 S  0543          YRAG  = 1.0                                                    RMS  645
ISN 0544          YRAG2 = 1.0                                                    RMS  646
ISN 0545          YRAG3 = 1.0                                                    RMS  647
ISN 0546       1143 DO 309 JGE = 1,20                                            RMS  648
ISN 0547          GRON = 1.0                                                     RMS  649
ISN 0548          IF (XXH(LCITY,JGE).EQ.0.0) GO TO 309                           RMS  650
ISN 0550          IF (GRFAC(LCITY,JGE,1).EQ.0.0) GO TO 309                       RMS  651
ISN 0552          IF (JYKNT.NE.1) GO TO 1237                                     RMS  652
ISN 0554          IF (JYKNT.EQ.1.AND.JYEAR.EQ.1) GO TO 1237                      RMS  653
ISN 0556          IF(GRFAC(LCITY,JGE,1).GT.0.0) AF1=ALOG10(GRFAC(LCITY,JGE,1))/3.RMS  654
ISN 0558          RAF1 = 10.**AF1                                                RMS  655
ISN 0559          IF(GRFAC(LCITY,JGE,1).GT.0.0.AND.GRFAC(LCITY,JGE,2.).GT.0.0)   RMS  656
                 1 AF2=(ALOG10(GRFAC(LCITY,JGE,2))-ALOG10(GRFAC(LCITY,JGE,1)))/5.RMS  657
ISN 0561          RAF2 = 10.**AF2                                                RMS  658
ISN 0562          ZYR = JYEAR-2                                                  RMS  659
ISN 0563          XCATCH = (RAF1**3.)*(RAF2**ZYR)                                RMS  660
ISN 0564          XXH(LCITY,JGE) = XXH(LCITY,JGE)*XCATCH                         RMS  661
ISN 0565          WBH(LCITY,JGE) = WBH(LCITY,JGE)*XCATCH                         RMS  662
ISN 0566          PIH(LCITY,JGE)=PIH(LCITY,JGE)*XCATCH                           RMS  663
ISN 0567          XIH(LCITY,JGE) = XIH(LCITY,JGE)*XCATCH                         RMS  664
ISN 0568          EOLDH(LCITY,JGE) = EOLDH(LCITY,JGE)*XCATCH                     RMS  665
ISN 0569       1237 GO TO (1120,1130,1130,1130,1130,1130,1140,1140,1140,1140,1140),RMS  666
                 1    JYEAR                                                     RMS  667
ISN 0570       1120 GRON = GRFAC(LCITY,JGE,1)                                    RMS  668
ISN 0571          YRON = YRAL1**3.                                               RMS  669
ISN 0572          KJNDX = 0                                                      RMS  670
ISN 0573          LJNDX = 0                                                      RMS  671
ISN 0574          GO TO 1150                                                     RMS  672
ISN 0575       1131 FORMAT (/,1H ,I5,5F10.3)                                     RMS  673
ISN 0576       1130 IF (GRFAC(LCITY,JGE,2)-GRFAC(LCITY,JGE,1).LE.0.0)GO TO 1133  RMS  674
ISN 0578          GRON1 = (ALOG10(GRFAC(LCITY,JGE,2))-ALOG10(GRFAC(LCITY,       RMS  675
                 1 JGE,1)))/5.                                                   RMS  676
ISN 0579          GRON = 10.**GRON1                                              RMS  677
ISN 0580          YRON = YRAL2                                                   RMS  678
ISN 0581          KJNDX = JYEAR-2                                                RMS  679
ISN 0582          LJNDX = 0                                                      RMS  680
ISN 0583          GO TO 1150                                                     RMS  681
ISN 0584       1133 WRITE(6,1131) LCITY,GRFAC(LCITY,JGE,2),GRFAC(LCITY,JGE,1)    RMS  682
```

```
ISN 0585            YRON = (YRAG2-1.)/5.0+1.                                    RMS  683
ISN 0586            GO TO 1150                                                  RMS  684
ISN 0587       1140 IF (GRFAC(LCITY,JGE,3)-GRFAC(LCITY,JGE,2).LE.0.0)GO TO 1141 RMS  685
ISN 0589            GRON1 = (ALOG10(GRFAC(LCITY,JGE,3))-ALOG10(GRFAC(LCITY,     RMS  686
                   1 JGE,2)))/5.                                                RMS  687
ISN 0590            GRON = 10.**GRON1                                           RMS  688
ISN 0591            YRON = YRAL3                                                RMS  689
ISN 0592            KJNDX = 5                                                   RMS  690
ISN 0593            LJNDX = JYEAR-7                                             RMS  691
ISN 0594            GO TO 1150                                                  RMS  692
ISN 0595       1141 WRITE(6,1131) LCITY,GRFAC(LCITY,JGE,3),GRFAC(LCITY,JGE,2)   RMS  693
ISN 0596            YRON = (YRAG3-1.0)/5.0+1.                                   RMS  694
ISN 0597       1150 IF (GRON.EQ.0.0) GO TO 309                                  RMS  695
ISN 0599       1160 XX(LCITY,JGE) = XXH(LCITY,JGE)*GRON                         RMS  696
ISN 0600            VFAC = GRON                                                 RMS  697
ISN 0601            DO 1161 JS = 1,IEX                                          RMS  698
ISN 0602       1161 W(LCITY,JGE) = W(LCITY,JGE) * 1.018                         RMS  699
ISN 0603            IF(SUMNH(LCITY,JGE).EQ.0.0.OR.W(LCITY,JGE).EQ.0.0)          RMS  700
                   1 WRITE(LWRIT,1770) KIT,JGE                                  RMS  701
ISN 0605       1770 FORMAT(1H1,4I5)                                             RMS  702
ISN 0606            PI(LCITY,JGE) = PIH(LCITY,JGE)*VFAC                         RMS  703
ISN 0607            WB(LCITY,JGE) = XX(LCITY,JGE)-PI(LCITY,JGE)                 RMS  704
ISN 0608            XI(LCITY,JGE) = XIH(LCITY,JGE)*VFAC                         RMS  705
ISN 0609            XK(LCITY,JGE) = XX(LCITY,JGE)/VK(JGE)                       RMS  706
ISN 0610            EOLD(LCITY,JGE,5) = EOLDH(LCITY,JGE) * VFAC                 RMS  707
ISN 0611            XXT(LCITY,JGE) = XXH(LCITY,JGE)                             RMS  708
ISN 0612            XKT(LCITY,JGE) = XKH(LCITY,JGE)                             RMS  709
ISN 0613            SUMN(LCITY,JGE) = WB(LCITY,JGE) / W(LCITY,JGE)              RMS  710
ISN 0614        309 CONTINUE                                                    RMS  711
ISN 0615            IF (JYKNT.EQ.1.AND.JYEAR.EQ.1)  GO TO 395                   RMS  712
ISN 0617            IF (JYKNT.NE.1) GO TO 395                                   RMS  713
ISN 0619            PCATCH = (1.+POPGR(LCITY))*3.                               RMS  714
ISN 0620            PCATCH = PCATCH+(1.+POPGR(LCITY))*KJNDX                     RMS  715
ISN 0621            PCATCH = PCATCH + (1.+POPGR(LCITY))*LJNDX                   RMS  716
ISN 0622            IF (LCITY.GT.53.OR.XINC(LCITY,1).EQ.0.0) GO TO 1151         RMS  717
ISN 0624            YCATCH =(YRAL1**3)*1.144                                    RMS  718
ISN 0625            IF(KJNDX.EQ.0.0) GO TO 1151                                 RMS  719
ISN 0627            YCATCH=YCATCH*YRAL2**(KJNDX)                                RMS  720
```

```
ISN 0628            IF(LJNDX.EQ.0.) GO TO   51                                  RMS  72
ISN 0630            YCATCH = YCATCH*YRAL3**LJNDX                                RMS  722
ISN 0631       1151 YYH(LCITY) = YYH(LCITY)*YCATCH                              RMS  723
ISN 0632            IRX = IEX                                                   RMS  724
ISN 0633            IEX = 1                                                     RMS  725
ISN 0634            XNBAH(LCITY) = XNBAH(LCITY)*(YYH(LCITY)-XXH(LCITY,20))/     RMS  726
                   1 ((YYH(LCITY)/YCATCH)-(XXH(LCITY,20)/XCATCH))               RMS  727
ISN 0635            TH(LCITY) = TH(LCITY)*YCATCH                                RMS  728
ISN 0636            POPH(LCITY) = POPH(LCITY)*PCATCH                            RMS  729
ISN 0637            TPH(LCITY) = TPH(LCITY)*YCATCH                              RMS  730
ISN 0638            APVH(LCITY) = APVH(LCITY) * YCATCH                          RMS  731
ISN 0639            TOH(LCITY) = TOH(LCITY) * YCATCH                            RMS  732
ISN 0640            TAH(LCITY) = TAH(LCITY) * YCATCH                            RMS  733
ISN 0641            GH(LCITY) = GH(LCITY)*YCATCH                                RMS  734
ISN 0642            CH(LCITY) = CH(LCITY)*YCATCH                                RMS  735
ISN 0643            QMH(LCITY) = QMH(LCITY)*XCATCH                              RMS  736
ISN 0644            QCH(LCITY) = QCH(LCITY)*YCATCH                              RMS  737
ISN 0645            QBARH(LCITY) =  QBARH(LCITY)*(YYH(LCITY)-XXH(LCITY,20))/    RMS  738
                   1((YYH(LCITY)/YCATCH)-(XXH(LCITY,20)/XCATCH))                RMS  739
ISN 0646        395 IF(LCITY.GT.53) GO TO 1204                                  RMS  740
ISN 0648            IF(XINC(LCITY,1).NE.0.0) GO TO 1205                         RMS  741
ISN 0650            RATE = 0.0                                                  RMS  742
ISN 0651            IF(KIT.EQ.23) RATE = .0762                                  RMS  743
ISN 0653            IF(KIT.EQ.32) RATE = .0758                                  RMS  744
ISN 0655            IF(KIT.EQ.33) RATE = .0645                                  RMS  745
ISN 0657            YY(LCITY) = YYH(LCITY)                                      RMS  746
ISN 0658            DO 1203 JS=1,IEX                                            RMS  747
ISN 0659       1203 YY(LCITY) = YY(LCITY) * (1.0 + RATE)                        RMS  748
ISN 0660            GO TO 1207                                                  RMS  749
ISN 0661       1204 YY(LCITY) = YYH(LCITY)                                      RMS  750
ISN 0662            DO 1206 LLJ = 1,IEX                                         RMS  751
ISN 0663       1206 YY(LCITY) = (YGROW(LCITY-53) + 1.0) * YY(LCITY)             RMS  752
ISN 0664            GO TO 1207                                                  RMS  753
ISN 0665       1205 CONTINUE                                                    RMS  754
ISN 0666            YY(LCITY) = YYH(LCITY)*YRON                                 RMS  755
ISN 0667       1207 YFAC = YY(LCITY) /YYH(LCITY)                                RMS  756
ISN 0668            XNBAR(LCITY) = XNBAH(LCITY)*(YY(LCITY)-XX(LCITY,20))/       RMS  757
                   1  (YYH(LCITY)-XXH(LCITY,20))                               RMS  758
```

```
 SN 0669            '(LC TY) = 'H(LCITY)*YFAC                                        RMS  759
ISN 0670            POP(LCITY ) = POPH(LCITY) *(1.+POPGR(LCITY))                     RMS  760
ISN 0671            TP(LCITY) = TPH(LCITY) * YFAC                                    RMS  761
ISN 0672            APV(LCITY) = APVH(LCITY) * YFAC                                  RMS  762
ISN 0673            TO(LCITY) = TOH(LCITY) * YFAC                                    RMS  763
ISN 0674            TA(LCITY) = TAH(LCITY) * YFAC                                    RMS  764
ISN 0675            G(LCITY) = GH(LCITY)*T(LCITY)/TH(LCITY)                          RMS  765
ISN 0676            C(LCITY) = CH(LCITY)*YFAC                                        RMS  766
ISN 0677            XNT(LCITY) = XNBAR(LCITY)+SUMN(LCITY,20)                         RMS  767
ISN 0678            U(LCITY) = .04                                                   RMS  768
ISN 0679            XL(LCITY) = XNT(LCITY)/(1.-U(LCITY))                             RMS  769
ISN 0680            QM(LCITY) = QMH(LCITY)*VFAC                                      RMS  770
ISN 0681            QBAR(LCITY) = QBARH(LCITY)*(YY(LCITY)-XX(LCITY,20))/             RMS  771
                   1   (YYH(LCITY)-XXH(LCITY,20))                                   RMS  772
ISN 0682            QC(LCITY) = QCH(LCITY)*C(LCITY)/CH(LCITY)                        RMS  773
ISN 0683            QT(LCITY) = QC(LCITY)+QBAR(LCITY)+QM(LCITY)                      RMS  774
ISN 0684          310 CONTINUE                                                       RMS  775
ISN 0685         1212 FORMAT(F10.3,60X,I5,I3)                                        RMS  776
                C                                                                   RMS  777
                C                                                                   RMS  778
                C                                                                   RMS  779
                C        DATA TABLES 1970-1780                                      RMS  780
                C                                                                   RMS  781
ISN 0686            IF(ISBUG2.EQ.0) GO TO 400                                       RMS  782
ISN 0688            DO 1350 JRKK = 1,INC                                            RMS  783
ISN 0689            JJRK = ICHO(JRKK)                                               RMS  784
ISN 0690            JRK = KCITY(JJRK)                                               RMS  785
ISN 0691            WRITE(LWRIT,1315)                                               RMS  786
ISN 0692            WRITE(LWRIT,1311) (IAQCR(JRK,KRK),KRK=1,20),KYY                 RMS  787
ISN 0693         1311 FORMAT(1H ,I4,19A4,'YEAR = ',I4,'= NOW (T)',/)                RMS  788
ISN 0694            WRITE(LWRIT,1312)                                               RMS  789
ISN 0695         1312 FORMAT(1H ,'IND  VA 1967    VA NOW VA (T-1)   EMP(M) EMP -NOW   INRMS  790
                   1V-67  INV NOW  WB 1967  WB NOW    PI NOW     Q-67    Q-NOW  AQCR')RMS  791
ISN 0696         1315 FORMAT (1H1)                                                  RMS  792
ISN 0697            DO 1340 KRK = 1,20                                              RMS  793
ISN 0698            IF (XXH(JRK,KRK).EQ.0.0)  GO TO 1340                            RMS  794
ISN 0700            WRITE(LWRIT,1310) KRK,XXH(JRK,KRK),XX(JRK,KRK),XXT(JRK,KRK),    RMS  795
                   1 SUMNH(JRK,KRK),SUMN(JRK,KRK),XIH(JRK,KRK),XI(JRK,KRK),         RMS  796
```

```
                2W3H JR( ,KR(),WB(JRK,KR(),P  JRK,KRK),                          RMS  797
                3  EOLDH(JRK,KRK)  ,EOLD(JRK,KRK,5),JRK                          RMS  798
ISN 0701       1320 FORMAT(1H ,10F10.1,2X,I3)                                    RMS  799
ISN 0702       1340 CONTINUE                                                     RMS  800
ISN 0703            IF(YYH(JRK),EQ,0.0) GO TO 1350                               RMS  801
ISN 0705            WRITE(LWRIT,1323)                                            RMS  802
ISN 0706       1323 FORMAT(1H ,/)                                                RMS  803
ISN 0707            WRITE(LWRIT,1321)                                            RMS  804
ISN 0708       1321 FORMAT(1H ,'  INC 1967  INC NOW  EMP(C)-67 EMP(C)NOW  REV 1967  RERMS  805
                1V NOW   EXP 1967  EXP NOW  CONSMP-67 CONSMP NOW  AQCR')         RMS  806
ISN 0709            WRITE(LWRIT,1320) YYH(JRK),YY(JRK),XNBAH(JRK),XNBAR(JRK),    RMS  807
                1 TH(JRK),T(JRK),GH(JRK),G(JRK),CH(JRK),C(JRK),JRK               RMS  808
ISN 0710            WRITE(LWRIT,1323)                                            RMS  809
ISN 0711            WRITE(LWRIT,1322)                                            RMS  810
ISN 0712       1322 FORMAT(1H ,' EMP(T)-67 EMP(T)NOW  LABOR-67 LABOR NOW  QM 1967   QRMS  811
                1M NOW   QC 1967   QC NOW  QBAR 1967  QBAR NOW   AQCR')          RMS  812
ISN 0713            WRITE(LWRIT,1320) XNTH(JRK),XNT(JRK),XLH(JRK),XL(JRK),QMH(JRK),  RMS  813
                1QM(JRK),QCH(JRK),QC(JRK),QBARH(JRK),QBAR(JRK),JRK               RMS  814
ISN 0714       1350 CONTINUE                                                     RMS  815
                C                                                                RMS  816
                C      MAKE OPTIONAL - ONLY DATA TABLES GIVEN                    RMS  817
                C      IF ISBUG2= 1 AS IT IS HERE                                RMS  818
                C                                                                RMS  819
                C     GO TO 1355                                                 RMS  820
ISN 0715         400 CONTINUE                                                    RMS  821
                C                                                                RMS  822
                C                                                                RMS  823
                C                                                                RMS  824
                C*****************************************************************RMS  825
                C                                                                RMS  826
                C      GENERAL PARAMETER CARD                                    RMS  827
                C                                                                RMS  828
                C      ISBUG2=1 DATA TABLES FOR 1970'S REQUESTED                 RMS  829
                C      ICTAB = 1 CONVERGENCE PROCESS FOR NEWTON RAPSON REQUESTED RMS  830
                C          IGOV = 1 FOR GOVERNMENT ASSISTANCE                    RMS  831
                C                                                                RMS  832
                C                                                                RMS  833
ISN 0716            READ(LREAD,410) INPT(1),NOPE,(LPARA(I), I=1,NOPE),           RMS  834
```

```
                MCN , NPT(2),NOPE1,LPNT1,(LPNT2(I),   = ,NOPE1),NUMCIT                RMS   835
               2  ,IPRN1,IPRN2        ,IPRN3 ,ISBUG          ,ISBUG2                 RMS   836
               3 ,ICTAB,IGOV                                                          RMS   837
             C                                                                        RMS   838
             C                                                                        RMS   839
             C*************************************************************************RMS   840
             C                                                                        RMS   841
ISN 0717           DO 7183 I= 1,2                                                     RMS   842
ISN 0718      7183 READ(LREAD,7184) (TITLE(J,I), J=1,20)                              RMS   843
ISN 0719      7184 FORMAT(20A4)                                                       RMS   844
             C                                                                        RMS   845
             C                                                                        RMS   846
             C       READ IN FIXED DELTC FOR 312(A) REPORT                            RMS   847
             C                                                                        RMS   848
ISN 0720           IF(IA312.EQ.0) GO TO 7175                                        RMS   849
ISN 0722           READ(LREAD,7212) BEN                                             RMS   850
ISN 0723      7212 FORMAT(8F5.0)                                                      RMS   851
ISN 0724           ADJUST = BENEF*(BEN(JYEAR-3)/BEN(8) )                            RMS   852
ISN 0725           READ(LREAD,7174) QGIVEN                                          RMS   853
ISN 0726      7174 FORMAT(7F10.4)                                                     RMS   854
ISN 0727      7175 CONTINUE                                                        61 RMS   855
ISN 0728           KPRN1 = IPRN1                                                    RMS   856
ISN 0729           KPRN2 = IPRN2                                                    RMS   857
ISN 0730           KPRN3 = IPRN3                                                    RMS   858
ISN 0731           KSBUG = ISBUG                                                    RMS   859
ISN 0732           IF(INPT(1)+INPT(2).EQ.0) STOP                                    RMS   860
ISN 0734           NOPEN = NOPE + NOPE1                                             RMS   861
ISN 0735           NUMCIT = NUMCIT + 1                                              RMS   862
ISN 0736           IHELP = 0                                                        RMS   863
ISN 0737       700 CONTINUE                                                         RMS   864
ISN 0738           NUMCIT = NUMCIT - 1                                              RMS   865
ISN 0739           NEWCIT = 1                                                       RMS   866
ISN 0740           NBEFOR = 0                                                       RMS   867
ISN 0741           NBEFO1 = 1                                                       RMS   868
ISN 0742           NBEFO3 = 0                                                       RMS   869
ISN 0743           NBEFO2 = 1                                                       RMS   870
ISN 0744           IPRN1 = KPRN1                                                    RMS   871
ISN 0745           IPRN2 = KPRN2                                                    RMS   872
```

```
ISN 0746            PRN3 = KPRN3                                                    RMS  873
ISN 0747           ISBUG = KSBUG                                                    RMS  874
ISN 0748           NOPE1 = NOPEN-NOPE                                               RMS  875
ISN 0749           NOK = NOPE                                                       RMS  876
ISN 0750           IHELL = 0                                                        RMS  877
ISN 0751       705 IHELP = IHELP + 1                                                RMS  878
ISN 0752           IF(IHELP.LT.3) GO TO 706                                         RMS  879
ISN 0754           IHELP = 1                                                        RMS  880
ISN 0755           IF (NOPEN.EQ.1)   GO TO 704                                      RMS  881
ISN 0757           LSTRAT = 8                                                       RMS  882
ISN 0758           IKSW = 1                                                         RMS  883
ISN 0759           DO 7999 K = 1,MCNT                                               RMS  884
ISN 0760           IK = MCITY(K)                                                    RMS  885
ISN 0761           I = KCITY(IK)                                                    RMS  886
ISN 0762           CALL PRIN1 (I)                                                   RMS  887
ISN 0763           XX(92,20) = XX(92,20) + XX(I,20)                                 RMS  888
ISN 0764           PI(92,20) = PI(92,20) + PI(I,20)                                 RMS  889
ISN 0765           XI(92,20) = XI(92,20) + XI(I,20)                                 RMS  890
ISN 0766           XK(92,20) = XK(92,20) + XK(I,20)                                 RMS  891
ISN 0767           SUMN(92,20) = SUMN(92,20) + SUMN(I,20)                           RMS  892
ISN 0768           XNBAR(92) = XNBAR(92) + XNBAR(I)                                 RMS  893
ISN 0769           YY(92) = YY(92) + YY(I)                                          RMS  894
ISN 0770           C(92) = C(92) + C(I)                                             RMS  895
ISN 0771           XNT(92) = XNT(92) + XNT(I)                                       RMS  896
ISN 0772           XL(92) = XL(92) + XL(I)                                          RMS  897
ISN 0773           QT(92) = QT(92) + QT(I)                                          RMS  898
ISN 0774           QM(92) = QM(92) + QM(I)                                          RMS  899
ISN 0775           QBAR(92) = QBAR(92) + QBAR(I)                                    RMS  900
ISN 0776           QC(92) = QC(92) + QC(I)                                          RMS  901
ISN 0777           G(92) = G(92) + G(I)                                             RMS  902
ISN 0778           T(92) = T(92) + T(I)                                             RMS  903
ISN 0779           TP(92) = TP(92) + TP(I)                                          RMS  904
ISN 0780           TO(92) = TO(92) + TO(I)                                          RMS  905
ISN 0781           TA(92) = TA(92) + TA(I)                                          RMS  906
ISN 0782           POP(92) = POP(92) + POP(I)                                       RMS  907
ISN 0783           APV(92) = APV(92) + APV(I)                                       RMS  908
                C                                                                   RMS  909
                C                                                                   RMS  910
```

```
                C                                                                       RMS   911
ISN 0784         7999 CONTINUE                                                          RMS   912
ISN 0785              IKSW = 0.0                                                        RMS   913
ISN 0786           704 IF(NUMCIT.LT.1.AND.IDYEAR.NE.1967) GO TO 1355                    RMS   914
ISN 0788              IF(NUMCIT.EQ.0) GO TO 400                                         RMS   915
ISN 0790           706 INTT = INPT(IHELP)                                               RMS   916
ISN 0791              IF(INTT.EQ.0) GO TO 705                                           RMS   917
ISN 0793              GO TO (481,10),INTT                                               RMS   918
                C                                                                       RMS   919
                C                                                                       RMS   920
                C                                                                       RMS   921
ISN 0794         6001 FORMAT(I10,5F10.2)                                                RMS   922
                C                                                                       RMS   923
                C                                                                       RMS   924
                C                                                                       RMS   925
                C                                                                       RMS   926
                C                                                                       RMS   927
                C          TWO DIGIT INDUSTRY INFORMATION .. TWO ALTERNATIVES...        RMS   928
                C               (1) DETAILED SIC INFORMATION ONE SMSA AT A TIME (LPNT1 = 1RMS   929
                C               (2) ONE TWO DIGIT SIC ( AT A TIME ) FOR ALL CITIES (LPNT1=RMS   930
                C          WITHIN EITHER CATEGORY, THE ECONOMY CAN BE AFFECTED IN ONE OF TRMS   931
                C          DEPENDING ON THE DATA GIVEN.                                 RMS   932
                C               (1) COST FIGURES ARE GIVEN DIRECTLY (LPNT2=1)           RMS   933
                C               (2) PRICE CHANGES FOR FUEL ARE GIVEN (LPNT2=2)          RMS   934
                C          NOX= NO. OF CITIES FOR WHICH TWO DIGIT SIC COST DATA IS GIVEN RMS   935
                C               (LPNT1=1)                                               RMS   936
                C                                                                       RMS   937
                C                                                                       RMS   938
                C                                                                       RMS   939
                C                                                                       RMS   940
                C                                                                       RMS   941
ISN 0795           10 CONTINUE                                                          RMS   942
ISN 0796         720 KOUNT = 0                                                          RMS   943
ISN 0797              IHELL = IHELL + 1                                                 RMS   944
ISN 0798              LPNTT = LPNT2(IHELL)                                              RMS   945
ISN 0799              LSTRAT = LPNTT + 5                                                RMS   946
                C                                                                       RMS   947
ISN 0800           55 DO 70 I=1,91                                                      RMS   948
```

```
 SN 0801            DNR( ) = 1.(                                                  RMS  949
ISN 0802            PDN(I) = 0.0                                                  RMS  950
ISN 0803            PPID(I) = 0.0                                                 RMS  951
ISN 0804            PXID(I) = 0.0                                                 RMS  952
ISN 0805            PXKD(I) = 0.0                                                 RMS  953
ISN 0806             PXD(I) = 0.0                                                 RMS  954
ISN 0807            ED(I,5) = 0.0                                                 RMS  955
ISN 0808            PID(I) = 0.0                                                  RMS  956
ISN 0809            WBD(I) = 0.0                                                  RMS  957
ISN 0810            XID(I) = 0.0                                                  RMS  958
ISN 0811            XKD(I) = 0.0                                                  RMS  959
ISN 0812            PDN(I) = 0.0                                                  RMS  960
ISN 0813         70 XD(I) = 0.0                                                   RMS  961
                C                                                                 RMS  962
                C       IF LPNT1 = 1 ... COST DATA FOR EACH CITY IS PRECEEDED BY THE  RMS  963
                C       ACTUAL CITY CODE NUMBER AND THE NO. OF IND. IN THAT CITY FOR  RMS  964
                C       WHICH COST DATA IS GIVEN.                                 RMS  965
                C                                                                 RMS  966
                C       IF LPNT1 = 2 COST DATA FOR EACH IND. IS PRECEEDED BY THE SIC CORMS  967
                C       NUMBER AND THE NO. OF  CITIES FOR WHICH THAT IND. EXISTS AND HARMS  968
                C       COST DATA.                                                RMS  969
                C                                                                 RMS  970
ISN 0814            MCNT = 1                                                      RMS  971
ISN 0815            II = 1                                                        RMS  972
ISN 0816            NOTE = 1                                                      RMS  973
ISN 0817            MAX = 0                                                       RMS  974
ISN 0818            IF (LPNTT .NE. 3) GO TO 54                                    RMS  975
                C                                                                 RMS  976
                C                                                                 RMS  977
                C        GENERAL FEEDBACK SEGMENT                                 RMS  978
                C        OPTION NUMBER EIGHT                                      RMS  979
                C                                                                 RMS  980
ISN 0820         5992 FORMAT(2(7F10.4,/),5F10.4,23X,I3)                           RMS  981
ISN 0821            KOUNT = KOUNT + 1                                             RMS  982
ISN 0822            NOI = 0                                                       RMS  983
ISN 0823            IFEED = 1                                                     RMS  984
ISN 0824            IK = MCITY(1)                                                 RMS  985
                C       IK = MMCITY(KOUNT)                                        RMS  986
```

```
S  0825            LCITY = KC  Y(I()                                                    RMS  987
ISN 0826           DO 56 I = 1,19                                                       RMS  988
ISN 0827           IF(INDCI(LCITY,I) .EQ. 0) GO TO 56                                   RMS  989
ISN 0829           NOI = NOI + 1                                                        RMS  990
ISN 0830           IND(NOI) = I                                                         RMS  991
ISN 0831        56 CONTINUE                                                             RMS  992
ISN 0832           IF(IGOV.EQ.1.AND.NOI.NE.0) GO TO 3659                                RMS  993
ISN 0834           IF(NOI.EQ.0.OR.ADJUST.EQ.0) GO TO 43                                 RMS  994
ISN 0836      3659 CONTINUE                                                             RMS  995
ISN 0837           MIN = NOI                                                            RMS  996
ISN 0838           MCITY(II) = IK                                                       RMS  997
ISN 0839           DO 42 I = 1,MIN                                                      RMS  998
ISN 0840           IND1 = IND(I)                                                        RMS  999
ISN 0841           IUN = IND1                                                           RMS 1000
ISN 0842           PXD(IUN) = B(LCITY,IND1) * ADJUST        / THIS1                     RMS 1001
ISN 0843           ED(IUN,5) = AB(IUN)*PXD(IUN)                                         RMS 1002
ISN 0844           PPID(IUN) = (1.- BETA(IND1))*PXD(IUN)                                RMS 1003
ISN 0845           QPOLD = PI(LCITY,IND1)                                               RMS 1004
ISN 0846           QPNEW =QPOLD + PPID(IUN)                                             RMS 1005
ISN 0847           QPAR = QINV(IND1,1)*(XIH(LCITY,IND1)-(D(IND1)*XKH(LCITY,IND1)))      RMS 1006
ISN 0848           QIOLD =QPAR+QINV(IND1,2)*(QPOLD-PIH(LCITY,IND1))+QINV(IND1,3)*       RMS 1007
                  1 XK(LCITY,IND1)                                                      RMS 1008
ISN 0849           QINEW =QPAR+QINV(IND1,2)*(QPNEW-PIH(LCITY,IND1))+QINV(IND1,3)*       RMS 1009
                  1 XK(LCITY,IND1)                                                      RMS 1010
ISN 0850           PXID(IUN) = QINEW-QIOLD                                              RMS 1011
ISN 0851        42 PXKD(IUN) = PXID(IUN)/(1. + D(IND1))                                 RMS 1012
ISN 0852           LSM = 42                                                             RMS 1013
ISN 0853           GO TO 17                                                             RMS 1014
ISN 0854        43 IFEED = 0                                                            RMS 1015
ISN 0855           IF(IPRN3.EQ.0) GO TO 5003                                            RMS 1016
ISN 0857           WRITE (LWRIT,930)                                                    RMS 1017
ISN 0858       930 FORMAT (//,1H ,'INTERREGIONAL FEEDBACK EFFECT NOT AVAILABLE FOR THRMS 1018
                  1IS AQCR')                                                           RMS 1019
ISN 0859           GO TO 5003                                                           RMS 1020
                C                                                                      RMS 1021
                C      312(A) COST DATA - INPUT FOR DETAILED SIC                       RMS 1022
                C                                                                      RMS 1023
ISN 0860        54 IF(IA312.EQ.1) GO TO 7151                                           RMS 1024
```

```
ISN 0862            REA) LREA), 410) JCITY,NOI                                  RMS 1025
ISN 0863            GO TO 7153                                                  RMS 1026
ISN 0864       7151 NOI = 6                                                     RMS 1027
ISN 0865            MIN = NOI                                                   RMS 1028
ISN 0866            READ(LREAD,7152) HHI,JCITY                                  RMS 1029
ISN 0867            LCITY = KCITY(JCITY)                                        RMS 1030
ISN 0868            MCITY(II) = JCITY                                           RMS 1031
ISN 0869            READ(LREAD,7152) HHA,JCITY                                  RMS 1032
ISN 0870            FUI(JCITY,JYEAR-3)=FUI(JCITY,JYEAR-3)+HHI(7)                RMS 1033
ISN 0871            FU(JCITY,JYEAR-3)=FU(JCITY,JYEAR-3)+HHA(7)                  RMS 1034
ISN 0872            DELTC(LCITY) = 0.0                                          RMS 1035
ISN 0873       7152 FORMAT(7F10.4,3X,I3)                                        RMS 1036
ISN 0874            GO TO 725                                                   RMS 1037
ISN 0875       7153 CONTINUE                                                    RMS 1038
               C                                                                RMS 1039
ISN 0876            LCITY = KCITY(JCITY)                                        RMS 1040
ISN 0877            IND1 = NOI -20 + (20/NOI)                                   RMS 1041
ISN 0878            IF(LPNT1.EQ.2) GO TO 1                                      RMS 1042
ISN 0880            MCITY(II) = JCITY                                           RMS 1043
ISN 0881            MIN = NOI                                                   RMS 1044
ISN 0882            GO TO 2                                                     RMS 1045
ISN 0883          1 MCNT = JCITY                                                RMS 1046
ISN 0884            MIN = JCITY                                                 RMS 1047
ISN 0885            MAX = JKEEP(IND1)                                           RMS 1048
               C                                                                RMS 1049
ISN 0886          2 ITT = 5                                                     RMS 1050
ISN 0887            IF(LPNTT.NE.1) GO TO 725                                    RMS 1051
ISN 0889            ITT = 1                                                     RMS 1052
ISN 0890            READ(LREAD,730) DELTC(LCITY)                                RMS 1053
ISN 0891            DELTC(LCITY) = DELTC(LCITY) / QT(LCITY)                     RMS 1054
ISN 0892        730 FORMAT(10X,F10.2)                                           RMS 1055
ISN 0893        725 CONTINUE                                                    RMS 1056
               C                                                                RMS 1057
ISN 0894            IH = 0                                                      RMS 1058
ISN 0895            J = 0                                                       RMS 1059
ISN 0896            DO 556 JJ=1,MIN                                             RMS 1060
ISN 0897            IF(IA312.EQ.1) GO TO 7154                                   RMS 1061
ISN 0899            READ (LREAD,6001)  IK                                       RMS 1062
```

```
 SN 0900            HOLD( ) = 0.0                                          RMS 1063
ISN 0901            HOLD(2) = 0.0                                          RMS 1064
ISN 0902            HOLD(3) = 0.0                                          RMS 1065
ISN 0903            HOLD(4) = 0.0                                          RMS 1066
ISN 0904            HOLD(5) = 0.0                                          RMS 1067
                C   NO MORE FUEL CALCULATION FOR HOLD(4)                   RMS 1068
                C     READ(LREAD,6001) IK,(HOLD(IS), IS=1,ITT)             RMS 1069
ISN 0905            IF(LPNT1.EQ.1) GO TO 3                                 RMS 1070
ISN 0907            IUN = KCITY(IK)                                        RMS 1071
ISN 0908            LCITY = IUN                                            RMS 1072
ISN 0909            MCITY(J) = IK                                          RMS 1073
ISN 0910            GO TO 40                                               RMS 1074
ISN 0911          3 IND1 = IK - 20 +(20/IK)                                RMS 1075
ISN 0912            NEXT = JKEEP(IND1)                                     RMS 1076
ISN 0913            IF (MAX.LT.NEXT) MAX = NEXT                            RMS 1077
ISN 0915            IUN = IND1                                             RMS 1078
ISN 0916            IND(J) = IND1                                          RMS 1079
ISN 0917         40 GO TO (41,4), LPNTT                                    RMS 1080
                C                                                          RMS 1081
ISN 0918       7154 IK = ISPIN(JJ)                                         RMS 1082
ISN 0919            IND1 = IK - 20 + (20/IK)                               RMS 1083
ISN 0920            HOLD(1) = HHA(JJ)                                      RMS 1084
ISN 0921            HOLD(2) = HHI(JJ)                                      RMS 1085
ISN 0922            IUN = IND1                                             RMS 1086
ISN 0923            IF(INDCI(LCITY,IND1).EQ.0) GO TO 7155                  RMS 1087
ISN 0925            J = J + 1                                              RMS 1088
ISN 0926            IND(J) = IND1                                          RMS 1089
ISN 0927            GO TO 41                                               RMS 1090
ISN 0928       7155 IH = IH + 1                                            RMS 1091
ISN 0929            GO TO 556                                              RMS 1092
                C                                                          RMS 1093
                C       LPNT2 = 1 ... COST FIGURES GIVEN DIRECTLY          RMS 1094
                C                                                          RMS 1095
ISN 0930         41 CONTINUE                                               RMS 1096
ISN 0931            LSM = 41                                               RMS 1097
                C     P = 1.                                               RMS 1098
ISN 0932            IF(IGOV.EQ.0) GO TO 3641                               RMS 1099
ISN 0934            HERE = HOLD(1)                                         RMS 1100
```

```
ISN 0935            HAHA = OLD(2)                                                    RMS 1101
ISN 0936            HOLD(1) = P * HERE                                               RMS 1102
ISN 0937            HOLD(2) = P * HAHA                                               RMS 1103
ISN 0938         3641 CONTINUE                                                       RMS 1104
ISN 0939            PPID(IUN) = -HOLD(1) - DELTC(LCITY) * EOLD(LCITY,IND1,5) * P     RMS 1105
ISN 0940            QPOLD = PI(LCITY,IND1)                                           RMS 1106
ISN 0941            QPNEW =QPOLD + PPID(IUN)                                         RMS 1107
ISN 0942            QPAR = QINV(IND1,1)*(XIH(LCITY,IND1)-(D(IND1)*XKH(LCITY,IND1)))  RMS 1108
ISN 0943            QIOLD =QPAR+QINV(IND1,2)*(QPOLD-PIH(LCITY,IND1))+QINV(IND1,3)*   RMS 1109
                   1 XK(LCITY,IND1)                                                  RMS 1110
ISN 0944            QINEW =QPAR+QINV(IND1,2)*(QPNEW-PIH(LCITY,IND1))+QINV(IND1,3)*   RMS 1111
                   1 XK(LCITY,IND1)  -HOLD(2)                                        RMS 1112
ISN 0945            PXID(IUN) = QINEW-QIOLD                                          RMS 1113
ISN 0946            PXKD(IUN) = PXID(IUN)/(1.+D(IND1))                               RMS 1114
ISN 0947            K = LCITY                                                        RMS 1115
ISN 0948            PXD(IUN) =-XX(LCITY,IND1)+XX(LCITY,IND1)*(PXKD(IUN)+XK(K,IND1))  RMS 1116
                   1 /XK(LCITY,IND1)                                                 RMS 1117
ISN 0949            ED(IUN,5) = AB(IUN)*PXD(IUN)                                     RMS 1118
ISN 0950            GO TO 556                                                        RMS 1119
ISN 0951          4 WRITE (LWRIT,5)                                                  RMS 1120
ISN 0952          5 FORMAT (1H1,'OOPS-TRIED TO ACCESS FUEL SECTION AT RMS00858',////) RMS 1121
ISN 0953        556 CONTINUE                                                       RMS 1122
ISN 0954            MIN = MIN - IH                                                   RMS 1123
ISN 0955            IF(MIN.EQ.0.AND.IA312.EQ.1) GO TO 5555                           RMS 1124
ISN 0957            LSM = 556                                                        RMS 1125
ISN 0958            IF(LPNT1.EQ.1) NOI = MIN                                         RMS 1126
ISN 0960            IF(LPNT1.EQ.2) JCITY = MIN                                       RMS 1127
ISN 0962            IF(LPNTT .EQ. 1) GO TO 17                                        RMS 1128
                C  *****  EXTINCT  *****                                           RMS 1129
                C                                                                  RMS 1130
                C        LPNT2 = 2 ... CHANGE IN FUEL PRICES GIVEN                 RMS 1131
                C                                                                  RMS 1132
                C        FOURTH RECURSIVE BLOCK - FUEL DATA                        RMS 1133
                C        TWO DIGIT SIC - 12 EQUATIONS                              RMS 1134
                C        ENDOGENOUS VARIABLES ARE...                               RMS 1135
                C             EOLD - QUATITY OF EACH TYPE OF FUEL USED BY A GIVEN IND. RMS 1136
                C             CTOT67 - TOTAL COST OF FUEL 1967                     RMS 1137
                C             XX - VALUE ADDED 1967                                RMS 1138
```

```
C              ZZ - TOTAL QUANTITY OF FUEL CONSUMED                                  RMS    39
C              XI,XK, AND PI                                                         RMS  1140
C         EXOGENOUS VARIABLES...                                                     RMS  1141
C              POLD - PRICE OF FUEL 1967                                             RMS  1142
C              PNEW - PROJECTED PRICE OF FUEL FOR 1967                               RMS  1143
C                     WITH POLUTION COSTS                                            RMS  1144
C              GAMA - FUEL EXPONENTS - CONSTANTS FOR 1967                            RMS  1145
C              XKT - 1963                                                            RMS  1146
C              A - THE COEF. OF THE FUEL FUNCTION                                    RMS  1147
C              ALIT - THE COEF. FROM THE FUNCTION Z=A*V                              RMS  1148
C              D,BETA,PICOEF, AND XX/XK                                              RMS  1149
C                                                                                    RMS  1150
C   *****  EXTINCT  *****                                                           RMS  1151
C                                                                                    RMS  1152
ISN 0964          WRITE(LWRIT,6)                                                     RMS  1153
ISN 0965        6 FORMAT(1H1,'OOPS-TRIED TO ACCESS FUEL SECTION AT RMS00917',/////) RMS  1154
C                                                                                    RMS  1155
ISN 0966       17 CONTINUE                                                          RMS  1156
ISN 0967          M = 0                                                             RMS  1157
ISN 0968          DO 22 IT = 1,MIN                                                  RMS  1158
ISN 0969          IF(LPNT1.EQ.2) GO TO 18                                           RMS  1159
ISN 0971          IND1 = IND(IT)                                                    RMS  1160
ISN 0972          IUN = IND1                                                        RMS  1161
ISN 0973          GO TO 19                                                          RMS  1162
ISN 0974       18 IK = MCITY(IT)                                                    RMS  1163
ISN 0975          LCITY = KCITY(IK)                                                 RMS  1164
ISN 0976          IUN = LCITY                                                       RMS  1165
ISN 0977       19 IF(LPNTT.EQ.1.OR.LPNTT.EQ.3) GO TO 21                             RMS  1166
ISN 0979          WRITE(LWRIT,23)                                                   RMS  1167
ISN 0980       23 FORMAT(1H1,'OOPS TRIED TO ACCESS FUEL SECTION AT RMS00998',////)  RMS  1168
ISN 0981       21 I = LCITY                                                         RMS  1169
ISN 0982          IF(W(I,IND1)*SUMN(I,20).EQ.0.0) GO TO 39                          RMS  1170
ISN 0984          PDN(IUN) = BETA(IND1)*PXD(IUN)/W(I,IND1)                          RMS  1171
ISN 0985          DNR(I) = DNR(I)      -(PDN(IUN)/SUMN(I,20))                       RMS  1172
ISN 0986       39 CONTINUE                                                          RMS  1173
ISN 0987       37 FORMAT(1H ,2I3,F12.1,F12.4)                                       RMS  1174
ISN 0988          PID(I) = PID(I) + PPID(IUN)                                       RMS  1175
ISN 0989          XID(I) = XID(I) + PXID(IUN)                                       RMS  1176
```

```
ISN 0990            XKD(I) = XK)( ) + PXKD(IUN)                                          RMS 1177
ISN 0991            XD(I) = XD(I) + PXD(IUN)                                             RMS 1178
ISN 0992            XD1(I) = XD(I)                                                       RMS 1179
ISN 0993            WBD(I) = WBD(I) + BETA(IND1)*PXD(IUN)                                RMS 1180
ISN 0994            D2(I) = WBD(I)                                                       RMS 1181
ISN 0995         22 CONTINUE                                                             RMS 1182
ISN 0996            NOTE = 1                                                             RMS 1183
ISN 0997            GO TO 5555                                                           RMS 1184
                 C                                                                       RMS 1185
                 C                                                                       RMS 1186
                 C                                                                       RMS 1187
                 C                                                                       RMS 1188
                 C                                                                       RMS 1189
                 C       INPT(2) = 1                                                     RMS 1190
                 C                                                                       RMS 1191
                 C                                                                       RMS 1192
                 C        ALL CITY INFO. FOR ALL IND. REQUESTED                          RMS 1193
                 C                                                                       RMS 1194
ISN 0998        481 CONTINUE                                                             RMS 1195
ISN 0999            NOTE = NOPE                                                          RMS 1196
                 C                                                                       RMS 1197
                 C      NOTE>>>ABOVE READ INDICATES THE TYPE OF CONTROL COST DATA GIVEN  RMS 1198
                 C       (1) NOPE> TYPES OF POLLUTION IMPACT TO BE EXAMINED FOR EACH CITY RMS 1199
                 C                         = 2>>INCOME CHANGE GIVEN                      RMS 1200
                 C                         = 4**ELECTRIC COST INCREASE GIVEN - PROFIT AFFECRMS 1201
                 C                         = 5**ELECTRIC COST INCREASE GIVE - INCOME AFFECTRMS 1202
                 C                         = 3>>TAX CHANGE GIVEN                         RMS 1203
                 C       (3) NUMBER OF CITIES FOR WHICH DATA IS GIVEN - MCNT            RMS 1204
                 C                                                                       RMS 1205
ISN 1000            IF (NOPE-5)  102,102,482                                             RMS 1206
ISN 1001        482 WRITE(LWRIT,483)  NOPE,(LPARA(I), I=1,NOPE)                          RMS 1207
ISN 1002        483 FORMAT(1H1,'BAD CONTROL COST PARAMETER CARD',414)                    RMS 1208
ISN 1003            STOP                                                                 RMS 1209
ISN 1004        102 DO 103 I=1,NOPE                                                      RMS 1210
ISN 1005            IF(LPARA(I).GT.5.OR.LPARA(I).LT.1) GO TO 482                         RMS 1211
ISN 1007            IF(I.EQ. NOPE) GO TO 103                                             RMS 1212
ISN 1009            IF (LPARA(I+1) .EQ. LPARA(I)) GO TO 482                              RMS 1213
ISN 1011        103 CONTINUE                                                             RMS 1214
```

```
                C                                                                RMS 12 5
                C ***** MAKE EASILY ADJUSTABLE READ                              RMS 1216
                C                                                                RMS 1217
                C 104 READ(LREAD,105) MCITY(I),(COST(J,I),J=1,5)                 RMS 1218
                C                                                                RMS 1219
ISN 1012              IKSW = 0                                                   RMS 1220
                C                                                                RMS 1221
                C      ZERO LOOP REMOVED FROM HERE                               RMS 1222
                C                                                                RMS 1223
ISN 1013              IF(IA312.EQ.1) GO TO 7100                                  RMS 1224
                C                                                                RMS 1225
                C                                                                RMS 1226
                C      COST INPUT FOR 1970-1980 SIMULATION                       RMS 1227
                C                                                                RMS 1228
                C                                                                RMS 1229
ISN 1015              DO 104 I=1,MCNT                                            RMS 1230
ISN 1016              SCIN = 0.0                                                 RMS 1231
ISN 1017              SRIN = 0.0                                                 RMS 1232
ISN 1018              SC = 0.0                                                   RMS 1233
ISN 1019              SR = 0.0                                                   RMS 1234
ISN 1020            109 READ(LREAD,105) RIN,R,CIN,CC,MCITY(I)                    RMS 1235
ISN 1021              RISUM = RIN + R + CIN + CC                                 RMS 1236
ISN 1022              IF(RISUM.EQ.0) GO TO 110                                   RMS 1237
ISN 1024              GO TO 111                                                  RMS 1238
ISN 1025            110 NUMCIT = NUMCIT - 1                                      RMS 1239
ISN 1026              NEWCIT = 1                                                 RMS 1240
ISN 1027              IF(NUMCIT.LT.1) GO TO 1355                                 RMS 1241
ISN 1029              GO TO 109                                                  RMS 1242
ISN 1030            111 CONTINUE                                                 RMS 1243
ISN 1031              KI = MCITY(I)                                              RMS 1244
ISN 1032              L = KCITY(KI)                                              RMS 1245
ISN 1033              IF(L.EQ.0) GO TO 104                                       RMS 1246
                C                                                                RMS 1247
                C      USED FOR COST STRAT NO. 3 ONLY                            RMS 1248
                C                                                                RMS 1249
                C     COST(4,I) = COST(4,I) *.5                                  RMS 1250
                C     COST(3,I) = 30.                                            RMS 1251
ISN 1035              COST(1,I) = CC-(R*.6)                                      RMS 1252
```

```
ISN 1036            COFI(I) = CIN-(RIN*.6)                                    RMS 1253
ISN 1037            COST(4,I) = R*.6+RIN*.6                                   RMS 1254
ISN 1038            COST(3,I) = 0.0                                           RMS 1255
ISN 1039            DELTC(I) = COST(4,I)/QT(L)                                RMS 1256
                C                                                             RMS 1257
                C     USED ONLY FOR COST STRAT. NO. 2 AND 3                   RMS 1258
                C                                                             RMS 1259
ISN 1040            COST(1,I) = COST(1,I)-(623.7*COST(1,I)/808.067 )          RMS 1260
                C                                                             RMS 1261
                C     USED FOR COST STRAT NO. 3 ONLY                          RMS 1262
                C                                                             RMS 1263
                C     COST(1,I) = COST(1,I) *.5                               RMS 1264
                C                                                             RMS 1265
                C     USED ONLY FOR COST STRAT. NO. 2 AND 3                   RMS 1266
                C                                                             RMS 1267
ISN 1041            COFI(I) = COFI(I)-(623.7*COFI(I)/808.067  )               RMS 1268
                C                                                             RMS 1269
                C     USED FOR COST STRAT NO. 3 ONLY                          RMS 1270
                C                                                             RMS 1271
                C     COFI(I) = COFI(I) *.5                                   RMS 1272
ISN 1042          105 FORMAT(20X,2F10.1/20X,2F10.1,33X,I3,4X)                 RMS 1273
ISN 1043          104 CONTINUE                                                RMS 1274
ISN 1044            GO TO 5555                                                RMS 1275
                C                                                             RMS 1276
                C     INPUT FOR 312(A) REPORT                                 RMS 1277
                C                                                             RMS 1278
ISN 1045         7100 DO 7104 I=1,MCNT                                        RMS 1279
ISN 1046            READ(LREAD,7101) CIN,SIN,RIR,R,MCITY(I)                   RMS 1280
ISN 1047         7101 FORMAT(4F10.5,33X,I3)                                   RMS 1281
ISN 1048         7111 CONTINUE                                                RMS 1282
ISN 1049            KI = MCITY(I)                                             RMS 1283
ISN 1050            L = KCITY(KI)                                             RMS 1284
ISN 1051            IF(L.EQ.0) GO TO 7104                                     RMS 1285
ISN 1053            COST(1,I) = SIN*(1.+AAA)*.4 +R                            RMS 1286
ISN 1054            DELTC(I) = .60*((CIN*(1.+AIA))+(SIN*(1.+AAA)))/QT(L)      RMS 1287
ISN 1055            COFI(I) = CIN*(1.+AIA)*.40  +RIR                          RMS 1288
ISN 1056            FUI(KI,JYEAR-3)=FUI(KI,JYEAR-3)+COFI(I)                   RMS 1289
ISN 1057             FU(KI,JYEAR-3)=FU(KI,JYEAR-3)+COST(1,I)+DELTC(I)*QT(L)   RMS 1290
```

```
ISN 1058              F(IGOV.EQ.0) GO TO 7 0'                                    RMS 1291
ISN 1060             HERE = COST(1,I)                                           RMS 1292
ISN 1061             HAHA = COFI(I)                                             RMS 1293
                C                                                               RMS 1294
                C*****************************************************************RMS 1295
                C                                                               RMS 1296
ISN 1062             DELTC(I) =  P  * DELTC(I)                                  RMS 1297
ISN 1063             COST(1,I) =  P  * HERE                                     RMS 1298
ISN 1064             COFI(I) =  P  * HAHA                                       RMS 1299
                C                                                               RMS 1300
                C                                                               RMS 1301
                C*****************************************************************RMS 1302
                C                                                               RMS 1303
ISN 1065             7104 CONTINUE                                              RMS 1304
                C    *****  EXTINCT  *****                                      RMS 1305
                C                                                               RMS 1306
                C                                                               RMS 1307
                C       COST INPUT FOR 1967 RUNS                                RMS 1308
                C                                                               RMS 1309
                C    *****  EXTINCT  *****                                      RMS 1310
                C                                                               RMS 1311
                C                                                               RMS 1312
ISN 1066             5555 CONTINUE                                              RMS 1313
ISN 1067             LSM = 5555                                                 RMS 1314
ISN 1068             DO 5000 III = 1,NOTE                                       RMS 1315
ISN 1069             II = 1                                                     RMS 1316
ISN 1070             IF(INTT.EQ.2.AND.MIN.EQ.0.AND.IA312.EQ.1) GO TO 1000       RMS 1317
ISN 1072             IF(INTT.EQ.2) GO TO 100                                    RMS 1318
ISN 1074             LSTRAT = LPARA(III)                                        RMS 1319
ISN 1075             II = LSTRAT                                                RMS 1320
ISN 1076             GO TO (1000,2000,3000,1000,2000),LSTRAT                    RMS 1321
                C                                                               RMS 1322
                C       ALL CITY INFORMATION  ALL IND.....EFFECT OF DIRECT REDUCTION  RMS 1323
                C       OF INDUSTRY'S PROFITS BY AIR PLOUTION CONTROL EQUIPMENT COSTS  RMS 1324
                C                                                               RMS 1325
                C            PID = CHANGE IN PROFIT                             RMS 1326
                C            XID = CHANGE IN INVESTMENT                         RMS 1327
                C            XKD = CHANGE IN CAP. STOCK                         RMS 1328
```

```
                C              XD = CHA GE IN VALUE ADDED                                          RMS 1329
                C              WBD = CHANGE IN WAGE BILL                                           RMS 1330
                C                                                                                  RMS 1331
                C                                                                                  RMS 1332
ISN 1077         1000 DO 1001 K=1,MCNT                                                             RMS 1333
ISN 1078              KI = MCITY(K)                                                                RMS 1334
ISN 1079              I = KCITY(KI)                                                                RMS 1335
ISN 1080              IF (I.EQ.0) GO TO 1001                                                       RMS 1336
ISN 1082              DNR(I) = 1.0                                                                 RMS 1337
ISN 1083              IF(INTT.EQ.2.AND.MIN.EQ.0.AND.IA312.EQ.1) GO TO 7192                         RMS 1338
ISN 1085              IF(LSTRAT-4) 311,300,300                                                     RMS 1339
ISN 1086           300 COST(II,K) = DELTC(K) * QM(I)                                               RMS 1340
ISN 1087              LSM = 300                                                                    RMS 1341
ISN 1088              COFI(K) = 0.0                                                                RMS 1342
ISN 1089              GO TO 311                                                                    RMS 1343
ISN 1090           7192 COST(II,K) = HHA(7)                                                        RMS 1344
ISN 1091              LSM = 7192                                                                   RMS 1345
ISN 1092              COFI(K) = HHI(7)                                                             RMS 1346
ISN 1093              LSTRAT = 1                                                                   RMS 1347
ISN 1094              IF(IGOV.EQ.0) GO TO 311                                                      RMS 1348
                C                                                                                  RMS 1349
                C*****************************************************************************RMS 1350
                C                                                                                  RMS 1351
ISN 1096              COST(II,K)  =  P*  COST(II,K)                                                RMS 1352
ISN 1097              COFI(K) =  P  * COFI(K)                                                      RMS 1353
                C*****************************************************************************RMS 1354
                C                                                                                  RMS 1355
ISN 1098           311 PID(I) =-COST(II,K)                                                         RMS 1356
ISN 1099              LSM = 311                                                                    RMS 1357
ISN 1100              QPOLD = PI(I,20)                                                             RMS 1358
ISN 1101              QPNEW = PI(I,20)+PID(I)                                                      RMS 1359
ISN 1102              QPAR =QINV(20,1)*(XIH(I,20)-(D(20)*XKH(I,20)))                               RMS 1360
ISN 1103              QIOLD =QPAR+QINV(20,2)*(QPOLD-PIH(I,20))+QINV(20,3)*XK(I,20)                 RMS 1361
ISN 1104              QINEW =QPAR+QINV(20,2)*(QPNEW-PIH(I,20))+QINV(20,3)*XK(I,20)                -RMS 1362
                     1 COFI(K)                                                                     RMS 1363
ISN 1105              XID(I) = QINEW-QIOLD                                                         RMS 1364
ISN 1106              XKD (I) = XID(I) /(1.+D(20))                                                 RMS 1365
ISN 1107              XD(I) = -XX(I,20) + XX(I,20) * ((XKD(I)+XK(I,20)) / XK(I,20))                RMS 1366
```

```
ISN 1108            XD1( ) = XD  )                                          RMS 1367
ISN 1109            WBD(I) =  BETA(20)*XD(I)                                RMS 1368
ISN 1110            D2(I) = WBD(I)                                          RMS 1369
ISN 1111         1001 CONTINUE                                              RMS 1370
                 C                                                          RMS 1371
                 C                                                          RMS 1372
                 C                                                          RMS 1373
                 C        FIRST SIMULTANEOUS SYSTEM (Y,G,T, AND C)          RMS 1374
                 C                                                          RMS 1375
                 C        WHERE THE ENDOGENOUS VAR. ARE...                  RMS 1376
                 C             YY - TOT. REGIONAL INCOME                    RMS 1377
                 C             T - GOVERNMENT REVENUE                       RMS 1378
                 C             C - CONSUMPTION (1967)                       RMS 1379
                 C        THE EXOGENOUS VAR. ARE ...                        RMS 1380
                 C             XX - VALUE ADDED (ACTUAL VALUE AND + DELTA)  RMS 1381
                 C             G - GOVERNMENT EXPENDITURE                   RMS 1382
                 C                                                          RMS 1383
ISN 1112           100 LCHECK = 0                                           RMS 1384
                 C     LVAR = 4                                             RMS 1385
                 C     MCASES = MCNT*4                                      RMS 1386
ISN 1113            LVAR = 3                                                RMS 1387
ISN 1114            MCASES = MCNT*LVAR                                      RMS 1388
ISN 1115           120 MM = 0                                               RMS 1389
ISN 1116            KPIST = 4                                               RMS 1390
ISN 1117            M = 0                                                   RMS 1391
ISN 1118            DO 1002 K=1,MCNT                                        RMS 1392
ISN 1119            KI = MCITY(K)                                           RMS 1393
ISN 1120            I = KCITY(KI)                                           RMS 1394
ISN 1121            IJCIT = I                                               RMS 1395
ISN 1122            IF (I.EQ.0) GO TO 1002                                  RMS 1396
ISN 1124            Y(M+1) = YY(I)                                          RMS 1397
ISN 1125            Y(M+2) = G(I)                                           RMS 1398
ISN 1126            Y(M+3) = C(I)                                           RMS 1399
ISN 1127            X(MM+1) = XX(I,20) + XD1(I)                             RMS 1400
ISN 1128            X(MM+2) = T(I)                                          RMS 1401
                 C     X(MM+3) = FUDGE(I,1)                                 RMS 1402
ISN 1129            X(MM+3) =0.0                                            RMS 1403
ISN 1130            X(MM+4) =0.0                                            RMS 1404
```

```
                C       X(MM+1) = FUDGE I,2)                                    RMS 1405
ISN 1131                M = M + 3                                               RMS 1406
ISN 1132                MM = MM + 4                                             RMS 1407
ISN 1133         1002   CONTINUE                                                RMS 1408
ISN 1134                LSM = 1002                                              RMS 1409
                C                                                               RMS 1410
ISN 1135                MARK = 1                                                RMS 1411
                C                                                               RMS 1412
ISN 1136                IF (ICTAB) 8015,8015,1014                               RMS 1413
ISN 1137         1014   DO 951 IM=1,LVAR                                        RMS 1414
ISN 1138          951   ARAB(IM) = SCC1(IM)                                     RMS 1415
ISN 1139         8015   CALL SIMUL                                              RMS 1416
                C                                                               RMS 1417
ISN 1140         1015   M = 0                                                   RMS 1418
ISN 1141                IF(LCHECK)1003,1003,4000                                RMS 1419
ISN 1142         1003   DO 1004 K=1,MCNT                                        RMS 1420
ISN 1143                KI = MCITY(K)                                           RMS 1421
ISN 1144                I = KCITY(KI)                                           RMS 1422
ISN 1145                IF (I.EQ.0) GO TO 1004                                  RMS 1423
ISN 1147                YYD(I) = Y(M+1)                                         RMS 1424
ISN 1148                GD(I) = Y(M+2)                                          RMS 1425
ISN 1149                CD(I) = Y(M+3)                                          RMS 1426
ISN 1150                XD1(I) = 0.0                                            RMS 1427
ISN 1151                M = M + 3                                               RMS 1428
ISN 1152         1004   CONTINUE                                                RMS 1429
ISN 1153                LCHECK = 1                                              RMS 1430
ISN 1154                NBEFOR = NBEF01                                         RMS 1431
ISN 1155                GO TO 120                                               RMS 1432
ISN 1156         4000   M = 0                                                   RMS 1433
ISN 1157                LSM = 4000                                              RMS 1434
ISN 1158                NEWCIT = 0                                              RMS 1435
ISN 1159                NBEF01 = 0                                              RMS 1436
ISN 1160                DO 1007 K=1,MCNT                                        RMS 1437
ISN 1161                KI = MCITY(K)                                           RMS 1438
ISN 1162                I = KCITY(KI)                                           RMS 1439
ISN 1163                IF (I.EQ.0) GO TO 1007                                  RMS 1440
ISN 1165                YYD(I) = YYD(I) - Y(M+1)                                RMS 1441
ISN 1166                GD(I) = GD(I) - Y(M+2)                                  RMS 1442
```

```
ISN 1167            CD(I) = CD I) - Y(M+3)                                          RMS 1'43
ISN 1168            M = M + LVAR                                                    RMS 1444
ISN 1169            APVD(I) = 0.0                                                   RMS 1445
ISN 1170            TPD(I) = .05608*APV(I)*APVD(I)                                  RMS 1446
ISN 1171            TOD(I) = .01223*YYD(I)                                          RMS 1447
ISN 1172            TAD(I) = .0471*YYD(I)                                           RMS 1448
ISN 1173            TD(I) = TPD(I)+TOD(I)+TAD(I)                                    RMS 1449
ISN 1174            QCD(I) = .04718 * CD(I)                                         RMS 1450
ISN 1175            QMD(I) = .19915 * XD(I)                                         RMS 1451
ISN 1176            QBARD(I) = .07947*(YYD(I)-XD(I))                                RMS 1452
ISN 1177            QTD(I) = QCD(I)+QMD(I)+QBARD(I)                                 RMS 1453
ISN 1178            XD1(I) = YYD(I)                                                 RMS 1454
ISN 1179            IF (LSTRAT-4) 320,330,330                                       RMS 1455
ISN 1180          320 DNBAR(I) = .103239*(YYD(I)-XD(I))                             RMS 1456
ISN 1181            D1(I) = DNBAR(I)                                                RMS 1457
ISN 1182            GO TO 1007                                                      RMS 1458
ISN 1183          330 DNBAR(I) = .103239 * (YYD(I)-XD(I) - DELTC(K) * QBARD(I))     RMS 1459
ISN 1184            D1(I) = DNBAR(I)                                                RMS 1460
ISN 1185         1007 CONTINUE                                                      RMS 1461
                 C                                                                  RMS 1462
ISN 1186            LSM = 1007                                                      RMS 1463
                 C                                                                  RMS 1464
ISN 1187            DO 1012 K=1,MCNT                                                RMS 1465
ISN 1188            KI = MCITY(K)                                                   RMS 1466
ISN 1189            I = KCITY(KI)                                                   RMS 1467
ISN 1190            IF (I.EQ.0) GO TO 1012                                          RMS 1468
ISN 1192            SUMND(I) = D2(I)/W(I,20)                                        RMS 1469
ISN 1193            XND(I) = DNR(I) * SUMND(I) + D1(I)                              RMS 1470
ISN 1194            XLD(I) = 1.03924 * XND(I)                                       RMS 1471
ISN 1195            XLL = XL(I) + XLD(I)                                            RMS 1472
ISN 1196            UD(I) =-(XND(I)/XLL)                                            RMS 1473
ISN 1197            D1(I) = 0.0                                                     RMS 1474
ISN 1198            D2(I) = 0.0                                                     RMS 1475
ISN 1199         1012 CONTINUE                                                      RMS 1476
ISN 1200         7348 FORMAT(3F10.3,F10.4,33X,I3)                                   RMS 1477
ISN 1201            IF(IPRN3)351,348,351                                            RMS 1478
ISN 1202          351 CONTINUE                                                      RMS 1479
ISN 1203            GO TO (343,344,344,343,343,344,344,344),LSTRAT                  RMS 1480
```

```
ISN 120'        343  F (IPRN1)  348,348,344                                RMS 1481
ISN 1205        344 DO 345 K = 1,MCNT                                      RMS 1482
ISN 1206            KI = MCITY(K)                                          RMS 1483
ISN 1207            I = KCITY(KI)                                          RMS 1484
ISN 1208            CALL PRIN1 (I)                                         RMS 1485
ISN 1209        345 CONTINUE                                               RMS 1486
ISN 1210        348 IF (NOPEN.EQ.1) GO TO 5001                             RMS 1487
ISN 1212            ISTOP = 0                                              RMS 1488
ISN 1213       3348 CONTINUE                                               RMS 1489
ISN 1214            ISTOP = ISTOP + 1                                      RMS 1490
ISN 1215            DO 1013 K = 1,MCNT                                     RMS 1491
ISN 1216            KI = MCITY(K)                                          RMS 1492
ISN 1217            I = KCITY(KI)                                          RMS 1493
ISN 1218            IF(ISTOP.EQ.1) M = 1                                   RMS 1494
ISN 1220            IF(ISTOP.EQ.2) M = 92                                  RMS 1495
ISN 1222            IF (I.EQ.0) GO TO 1013                                 RMS 1496
ISN 1224            PIN(M) = PIN(M) + PID(I)                               RMS 1497
ISN 1225            XIN(M ) = XIN(M) + XID(I)                              RMS 1498
ISN 1226            XKN(M) = XKN(M) + XKD(I)                               RMS 1499
ISN 1227            XDN(M) = XDN(M) + XD(I)                                RMS 1500
ISN 1228            YYN(M) = YYN(M) + YYD(I)                               RMS 1501
ISN 1229            GN(M) = GN(M) + GD(I)                                  RMS 1502
ISN 1230            TN(M) = TN(M) + TD(I)                                  RMS 1503
ISN 1231            TPN(M) = TPN(M) + TPD(I)                               RMS 1504
ISN 1232            TON(M) = TON(M) + TOD(I)                               RMS 1505
ISN 1233            TAN(M) = TAN(M) + TAD(I)                               RMS 1506
ISN 1234            CN(M) = CN(M) + CD(I)                                  RMS 1507
ISN 1235            DNBARN(M) = DNBARN(M) + DNBAR (I)                      RMS 1508
ISN 1236            XNN(M) = XNN(M) + XND(I)                               RMS 1509
ISN 1237            XLN(M) = XLN(M) + XLD(I)                               RMS 1510
ISN 1238            UN(M) = UN(M) + UD(I)                                  RMS 1511
ISN 1239            SUMNN(M) = SUMNN(M) + SUMND(I)                         RMS 1512
ISN 1240            QBARN(M) = QBARN(M) + QBARD(I)                         RMS 1513
ISN 1241            QTN(M) = QTN(M) + QTD(I)                               RMS 1514
ISN 1242            QCN(M) = QCN(M) + QCD(I)                               RMS 1515
ISN 1243            QMN(M) = QMN(M) + QMD(I)                               RMS 1516
ISN 1244       1013 CONTINUE                                               RMS 1517
ISN 1245            LSM = 1013                                             RMS 1518
```

```
ISN 1246            GO TO (3348,350) ,ISTOP                                          RMS 1519
ISN 1247         350 IF(IPRN3.EQ.0) GO TO 5001                                       RMS 1520
ISN 1249            IF (IPRN2)  5001,5001,346                                        RMS 1521
ISN 1250         346 IF (LSTRAT-5)  5001,347,5001                                    RMS 1522
ISN 1251         347 IKSW = 2                                                        RMS 1523
ISN 1252            DO 1347 K = 1,MCNT                                               RMS 1524
ISN 1253            KI = MCITY(K)                                                    RMS 1525
ISN 1254            I = KCITY(KI)                                                    RMS 1526
ISN 1255            CALL PRINT(I)                                                    RMS 1527
ISN 1256         1347 CONTINUE                                                       RMS 1528
ISN 1257            IKSW = 0                                                         RMS 1529
ISN 1258            GO TO 5001                                                       RMS 1530
                 C                                                                   RMS 1531
ISN 1259         2000 CONTINUE                                                       RMS 1532
ISN 1260            LSM = 2000                                                       RMS 1533
                 C                                                                   RMS 1534
                 C        CITY INFORMATION ( ALL-IND)                                RMS 1535
                 C                EFFECT                                             RMS 1536
                 C        ON ECONOMY THROUGH CHANGE IN REGIONAL INCOME               RMS 1537
                 C                                                                   RMS 1538
ISN 1261            DO 2001 K=1,MCNT                                                 RMS 1539
ISN 1262            KI = MCITY(K)                                                    RMS 1540
ISN 1263            I = KCITY(KI)                                                    RMS 1541
ISN 1264            IF (I.EQ.0) GO TO 2001                                           RMS 1542
ISN 1266            IF (LSTRAT-5) 2009,2008,2009                                     RMS 1543
ISN 1267         2008 COST(II,K)=-DELTC(K)*QC(I)-DELTR(JYEAR-3)*YY(I)                RMS 1544
ISN 1268            FUI(KI,JYEAR-3)=FUI(KI,JYEAR-3)+DFUI(JYEAR-3)*YY(I)              RMS 1545
ISN 1269            FU(KI,JYEAR-3)=FU(KI,JYEAR-3)+DFUA(JYEAR-3)*YY(I)                RMS 1546
ISN 1270            GO TO 377                                                        RMS 1547
ISN 1271         2009 COST(II,K) =-911.3 * ((YY(I) - XX(I,20)) / 366816.)*(BENEF/10000.)RMS 1548
                    1 -DELTR(JYEAR-3)*YY(I)                                         RMS 1549
ISN 1272          377 YR(I) = (YY(I)+COST(II,K))/YY(I)                              RMS 1550
ISN 1273            TR(I) = 1.0                                                      RMS 1551
ISN 1274            DNR(I) = 1.0                                                     RMS 1552
ISN 1275         2001 CONTINUE                                                       RMS 1553
ISN 1276            GO TO 3002                                                       RMS 1554
                 C                                                                   RMS 1555
                 C        CITY INFORMATION - ALL IND                                 RMS 1556
```

```
                C                                EFFECT                                  RMS 1557
                C          ON ECONOMY THROUGH INCREASED TAXATION                         RMS 1558
                C                                                                        RMS 1559
ISN 1277         3000 CONTINUE                                                          RMS 1560
ISN 1278              LSM = 3000                                                        RMS 1561
ISN 1279              DO 3001 K=1,MCNT                                                  RMS 1562
ISN 1280              KI = MCITY(K)                                                     RMS 1563
ISN 1281              I = KCITY(KI)                                                     RMS 1564
ISN 1282              IF (I.EQ.0) GO TO 3001                                            RMS 1565
ISN 1284              IF (IAPROP.EQ.1) GO TO 5050                                       RMS 1566
ISN 1286              TR(I) = (T(I) - COST(II,K))/T(I)                                  RMS 1567
ISN 1287              YR(I) = 1.0                                                       RMS 1568
ISN 1288              DNR(I) = 1.0                                                      RMS 1569
ISN 1289              GO TO 3001                                                        RMS 1570
ISN 1290         5050 TPD(I) = .05608*APVD(I)*APV(I)                                    RMS 1571
ISN 1291              TR(I) = (T(I)+TPD(I))/T(I)                                        RMS 1572
ISN 1292              YR(I) = 1.0                                                       RMS 1573
ISN 1293              DNR(I) = 1.0                                                      RMS 1574
ISN 1294         3001 CONTINUE                                                          RMS 1575
                C                                                                        RMS 1576
                C          THIRD SET OF SIMULTANEOUS EQUATIONS WHERE                     RMS 1577
                C               Y,G, AND C ARE ENDOGENOUS                                RMS 1578
                C               T AND X ARE EXOGENOUS                                    RMS 1579
                C                                                                        RMS 1580
ISN 1295         3002 MARK = 3                                                          RMS 1581
ISN 1296              LSM = 3002                                                        RMS 1582
ISN 1297              LVAR  = 3                                                         RMS 1583
ISN 1298              MCASES = MCNT * LVAR                                              RMS 1584
ISN 1299              LCHECK = 0                                                        RMS 1585
ISN 1300         2006 CONTINUE                                                          RMS 1586
ISN 1301              LSM = 2006                                                        RMS 1587
ISN 1302              KPIST = 6                                                         RMS 1588
ISN 1303              MM = 0                                                            RMS 1589
ISN 1304              M = 0                                                             RMS 1590
ISN 1305              DO 2002 K=1,MCNT                                                  RMS 1591
ISN 1306              KI = MCITY(K)                                                     RMS 1592
ISN 1307              I = KCITY(KI)                                                     RMS 1593
ISN 1308              IF (I.EQ.0) GO TO 2002                                            RMS 1594
```

```
ISN 1310            Y(M+1) = YY( )                                    RMS 1595
ISN 1311            Y(M+2) = G(I)                                     RMS 1596
ISN 1312            Y(M + 3) = C(I)                                   RMS 1597
ISN 1313            X(MM+1) = TR(I)                                   RMS 1598
ISN 1314            X(MM+2) = YR(I)                                   RMS 1599
ISN 1315            X(MM+3)= XX(I,20)                                 RMS 1600
ISN 1316            X(MM+4) = T(I)                                    RMS 1601
                C   X(MM+5) = FUDGE(I,1)                              RMS 1602
ISN 1317            X(MM+5) = 0.0                                     RMS 1603
                C   X(MM+6) = FUDGE(I,2)                              RMS 1604
ISN 1318            X(MM+6) = 0.0                                     RMS 1605
ISN 1319            M = M + 3                                         RMS 1606
ISN 1320            MM = MM + 6                                       RMS 1607
ISN 1321         2002 CONTINUE                                        RMS 1608
ISN 1322            LSM = 2002                                        RMS 1609
                C                                                     RMS 1610
ISN 1323            IF (ICTAB) 8019,8019,1018                         RMS 1611
ISN 1324         1018 DO 952 IM=1,LVAR                                RMS 1612
ISN 1325          952 ARAB(IM) = SCC1(IM)                             RMS 1613
                C                                                     RMS 1614
ISN 1326         8019 CALL SIMUL                                      RMS 1615
ISN 1327            LSM = 8019                                        RMS 1616
                C                                                     RMS 1617
ISN 1328         1019 M = 0                                           RMS 1618
ISN 1329            IF(LCHECK)2003,2003,2005                          RMS 1619
ISN 1330         2003 DO 2004 K=1,MCNT                                RMS 1620
ISN 1331            KI = MCITY(K)                                     RMS 1621
ISN 1332            I = KCITY(KI)                                     RMS 1622
ISN 1333            IF (I.EQ.0) GO TO 2004                            RMS 1623
ISN 1335            YYD(I) = Y(M+1)                                   RMS 1624
ISN 1336            GD(I) = Y(M+2)                                    RMS 1625
ISN 1337            CD(I) = Y(M+3)                                    RMS 1626
ISN 1338            TR(I) = 1.0                                       RMS 1627
ISN 1339            YR(I) = 1.0                                       RMS 1628
ISN 1340            M = M+3                                           RMS 1629
ISN 1341         2004 CONTINUE                                        RMS 1630
ISN 1342            LSM = 2004                                        RMS 1631
ISN 1343            LCHECK = 1                                        RMS 1632
```

```
ISN 1344            NBEFOR = NBEF03                                                                  RMS 1633
ISN 1345            GO TO 2006                                                                       RMS 1634
                  C                                                                                  RMS 1635
ISN 1346           2005 M = 0                                                                        RMS 1636
ISN 1347            NEWCIT = 0                                                                       RMS 1637
ISN 1348            LSM = 2005                                                                       RMS 1638
ISN 1349            NBEF03 = 0                                                                       RMS 1639
ISN 1350            DO 2007 K=1,MCNT                                                                 RMS 1640
ISN 1351            KI = MCITY(K)                                                                    RMS 1641
ISN 1352            I = KCITY(KI)                                                                    RMS 1642
ISN 1353            IF (I.EQ.0) GO TO 2007                                                           RMS 1643
ISN 1355            XD(I) = .34046*(YYD(I)-Y(M+1))                                                   RMS 1644
ISN 1356            M = M + 3                                                                        RMS 1645
ISN 1357            WBD(I) = ALPHA(20) *XD(I)                                                        RMS 1646
ISN 1358            PID(I) = XD(I) *(1.-BETA(20))                                                    RMS 1647
ISN 1359            QPOLD = PI(I,20)                                                                 RMS 1648
ISN 1360            QPNEW = PI(I,20)+PID(I)                                                          RMS 1649
ISN 1361            QPAR =QINV(20,1)*(XIH(I,20)-(D(20)*XKH(I,20)))                                   RMS 1650
ISN 1362            QIOLD =QPAR+QINV(20,2)*(QPOLD-PIH(I,20))+QINV(20,3)*XK(I,20)                     RMS 1651
ISN 1363            QINEW =QPAR+QINV(20,2)*(QPNEW-PIH(I,20))+QINV(20,3)*XK(I,20)                     RMS 1652
ISN 1364            XID(I) = QINEW-QIOLD                                                             RMS 1653
ISN 1365            XKD(I) = XID(I)/(1.+D(20))                                                       RMS 1654
ISN 1366            D2(I) = WBD(I)                                                                   RMS 1655
ISN 1367           2007 CONTINUE                                                                     RMS 1656
ISN 1368            LSM = 2007                                                                       RMS 1657
                  C                                                                                  RMS 1658
ISN 1369            GO TO 4000                                                                       RMS 1659
ISN 1370           5001 IF (INTT.EQ.1) NOK = NOK - 1                                                 RMS 1660
ISN 1372           5000 CONTINUE                                                                     RMS 1661
                  C                                                                                  RMS 1662
                  C                                                                                  RMS 1663
                  C                                                                                  RMS 1664
ISN 1373           5003 CONTINUE                                                                     RMS 1665
ISN 1374            IF (NOK.EQ.0) IHELP = IHELP + 1                                                  RMS 1666
ISN 1376            NOK = 1                                                                          RMS 1667
ISN 1377            IF(INPT(2).EQ.2) NOPE1 = NOPE1 - 1                                               RMS 1668
ISN 1379            ID = NOPE1 + INPT(1)                                                             RMS 1669
ISN 1380            IF(ID.EQ.0) GO TO 700                                                            RMS 1670
```

```
ISN 1382            INTT = INPT(2)                                                    RMS 1671
ISN 1383            GO TO 10                                                          RMS 1672
ISN 1384         95 I = 1000000                                                       RMS 1673
ISN 1385            IS = ICHO(I)                                                      RMS 1674
ISN 1386            STOP                                                              RMS 1675
ISN 1387       6004 FORMAT(1H1,' INDUSTRY-',I3,' DOES NOT EXIST FOR CITY-',I3)        RMS 1676
ISN 1388            END                                                               RMS 1677
```

```
        COMPILER OPTIONS - NAME=  MAIN,OPT=00,LINECNT=40,SIZE=0000K,
                           SOURCE,BCD,NOLIST,NODECK,LOAD,MAP,NOEDIT,NOID,NOXREF
ISN 0002            SUBROUTINE PHELP(XX,XD,XIP)                          RMS 1678
ISN 0003            IF(XX) 10,10,8                                       RMS 1679
ISN 0004          8 XIP = (XD/XX)*100.                                   RMS 1680
ISN 0005            RETURN                                               RMS 1681
ISN 0006         10 XIP = 0.0                                            RMS 1682
ISN 0007            RETURN                                               RMS 1683
ISN 0008            END                                                  RMS 1684
```

```
        COMPILER OPTIONS - NAME=  MAIN,OPT=00,LINECNT=40,SIZE=0000K,
                           SOURCE,BCD,NOLIST,NODECK,LOAD,MAP,NOEDIT,NOID,NOXREF
ISN 0002            SUBROUTINE PRIN1 (ICITY)                                        RMS 1685
                    C                                                               RMS 1686
                    C                                                               RMS 1687
                    C                                                               RMS 1688
ISN 0003            REAL KJNDX,LJNDX                                                RMS 1689
ISN 0004            DIMENSION  C(92),          CD(92),          CN(92)              RMS 1690
ISN 0005            DIMENSION DNBAR(92)                                             RMS 1691
ISN 0006            DIMENSION  DNBARN(92),     EOLD(91,20,5),   ED(91,5)            RMS 1692
ISN 0007            DIMENSION  G(92),          GD(92),          GN(92)              RMS 1693
ISN 0008            DIMENSION  IAQCR(92,20),   INDCI(92,20),    KCITY(100)          RMS 1694
ISN 0009            DIMENSION  LABEL(10,20),   MCITY(91),       PDN(91)             RMS 1695
ISN 0010            DIMENSION  PI(92,20),      PID(92),         PIN(92)             RMS 1696
ISN 0011            DIMENSION  PPID(91),       PXD(91),         PXID(91)            RMS 1697
ISN 0012            DIMENSION  PXKD(91),       QBAR(92),        QBARD(92)           RMS 1698
ISN 0013            DIMENSION  QBARN(92),      QC(92),          QCD(92)             RMS 1699
ISN 0014            DIMENSION  QCN(92),        QM(92),          QMD(92)             RMS 1700
ISN 0015            DIMENSION  QMN(92),        QT(92),          QTD(92)             RMS 1701
ISN 0016            DIMENSION  QTN(92),        SUMN(92,20),     SUMND(92)           RMS 1702
ISN 0017            DIMENSION  SUMNN(92),      T(92),           TD(92)              RMS 1703
ISN 0018            DIMENSION  TN(92),         U(92),           UD(92)              RMS 1704
ISN 0019            DIMENSION  UN(92),         WN(92),          XD(92)              RMS 1705
ISN 0020            DIMENSION  XDN(92),        XI(92,20),       XID(92)             RMS 1706
ISN 0021            DIMENSION  XIN(92),        XK(92,20),       XKD(92)             RMS 1707
ISN 0022            DIMENSION INPT(2)                                               RMS 1708
ISN 0023            DIMENSION  XKN(92),        XL(92),          XLD(92)             RMS 1709
ISN 0024            DIMENSION  XLN(92),        XNBAR(92),       XND(92)             RMS 1710
ISN 0025            DIMENSION  XNN(92),        XNT(92),         XX(92,20)           RMS 1711
ISN 0026            DIMENSION  YY(92),         YYD(92),         YYN(92)             RMS 1712
ISN 0027            DIMENSION TITLE(20,2)                                           RMS 1713
ISN 0028            DIMENSION PERUN(92)                                             RMS 1714
ISN 0029            DIMENSION TA(92),TAN(92),TAD(92),TO(92),TON(92),TOD(92),TP(92),  RMS 1715
                   1 TPN(92),TPD(92)                                                RMS 1716
ISN 0030            DIMENSION OTO(92),OTA(92),OTP(92),OAPV(92),OPOP(92),POPGR(91)   RMS 1717
                    C                                                               RMS 1718
                    C                                                               RMS 1719
                    C                                                               RMS 1720
```

```
 SN 0031            COMMON /A  AX/ T ,  PD,  O,TO),TA,  AD                                          RMS 1721
ISN 0032            COMMON/CPRIN/PXD,PXID,PXKD,PPID,PDN,EOLD,ED                                     RMS 1722
ISN 0033            COMMON/BUG/ISBUG,LREAD,LWRIT                                                    RMS 1723
ISN 0034            COMMON /APRIN/PI,PID,XI,XID,XK,XKD,XX,XD,C,CD,YY,YYD,SUMN,SUMND,                RMS 1724
                   1               XNBAR,DNBAR,XNT,XND,U,UD,XL,XLD,G,GD,T,TD,QT                     RMS 1725
                   2              ,QTD,QC,QCD,QM,QMD,QBAR,QBARD                                     RMS 1726
ISN 0035            COMMON / ZEROT / PIN,XIN,XKN,XDN,YYN,GN,TN,CN,DNBARN,XNN,XLN,WN,                RMS 1727
                   1                 UN,SUMNN,QBARN,QMN,QCN,QTN                                    RMS 1728
                   2 ,TPN,TON,TAN                                                                  RMS 1729
ISN 0036            COMMON/NPRIN/ LABEL,MCITY,KCITY,      LSTRAT,INPT,IKSW,IHELP,IFEEDRMS 1730
ISN 0037            COMMON /PRITT/ TITLE,BENEF                                                      RMS 1731
ISN 0038            COMMON / IPRIN /INTT,LPNTT  ,JYEAR,IAQCR,IJCIT,MIN,IA312                        RMS 1732
ISN 0039            COMMON/EVERY/OWB(92),OW(92),OX(92),OI(92),OY(92),OT(92),OG(92),                 RMS 1733
                   1 OC(92),OXBAR(92),OQC(92),OQM(92),OQB(92),      GRFAC,XINC,VK,                  RMS 1734
                   2 YGROW,IZS                                                                     RMS 1735
                   3 ,OTP,OTA,OTO,OPOP,OAPV,POPGR                                                  RMS 1736
ISN 0040            COMMON/ WNEWW/ WAGECO(20,3)                                                     RMS 1737
ISN 0041            COMMON/ALET/PERXX,PERW,PERWB,PERSN,PERP,PERXI,PERXK,PERYY,PERNB,                 RMS 1738
                   1 PERT,PERG,PERC,PERQM,PERQB,PERQC,PERTP,PERTO,PERTA                             RMS 1739
ISN 0042            EQUIVALENCE (INDCI(1),XX(1))                                                    RMS 1740
ISN 0043            I = ICITY                                                                       RMS 1741
ISN 0044            WRITE(LWRIT,100)                                                                RMS 1742
ISN 0045            LPYEAR = 1969 + JYEAR                                                           RMS 1743
ISN 0046            IF(ICITY.EQ.92) GO TO 760                                                       RMS 1744
ISN 0048            IF(IKSW-1) 1,750,750                                                            RMS 1745
ISN 0049           1 WRITE (LWRIT,110) LSTRAT,(LABEL(LSTRAT,J), J = 1,20)                           RMS 1746
ISN 0050            WRITE(LWRIT,120) (IAQCR(I,J),J = 1,20) ,LPYEAR                                  RMS 1747
ISN 0051            WRITE(LWRIT,130)                                                                RMS 1748
ISN 0052            WRITE(LWRIT,140)                                                                RMS 1749
ISN 0053            WRITE(LWRIT,150)                                                                RMS 1750
ISN 0054            WRITE(LWRIT,160)                                                                RMS 1751
                   C                                                                                RMS 1752
ISN 0055            CALL OLETS(I)                                                                   RMS 1753
ISN 0056            PERXN = PERSN + PERNB                                                           RMS 1754
ISN 0057            PERQT = PERQC + PERQM + PERQB                                                   RMS 1755
ISN 0058            PERXL = PERXN / .96                                                             RMS 1756
ISN 0059            CALL PHELP(PI(I,20),PID(I),PIP)                                                 RMS 1757
ISN 0060            CALL PHELP(XI(I,20),XID(I),XIP)                                                 RMS 1758
```

```
 SN 006            CALL PHELP X<(I,20),XKD(I),XKP)                                  RMS  759
ISN 0062           CALL PHELP(XX(I,20),XD(I),XXP)                                   RMS 1760
ISN 0063           CALL PHELP (C(I),CD(I),CP)                                       RMS 1761
ISN 0064           CALL PHELP(YY(I),YYD(I),YYP)                                     RMS 1762
ISN 0065           CALL PHELP(SUMN(I,20),SUMND(I),SUMNP)                            RMS 1763
ISN 0066           CALL PHELP(XNBAR(I),DNBAR(I),PNBAR)                              RMS 1764
ISN 0067           CALL PHELP(XNT(I),XND(I),XNP)                                    RMS 1765
ISN 0068           CALL PHELP(XL(I),XLD(I),XLP)                                     RMS 1766
ISN 0069           CALL PHELP(T(I),TD(I),TPQ)                                       RMS 1767
ISN 0070           CALL PHELP(TP(I),TPD(I),TPP)                                     RMS 1768
ISN 0071           CALL PHELP(TO(I),TOD(I),TOP)                                     RMS 1769
ISN 0072           CALL PHELP(TA(I),TAD(I),TAP)                                     RMS 1770
ISN 0073           CALL PHELP(QC(I),QCD(I),QCP)                                     RMS 1771
ISN 0074           CALL PHELP(G(I),GD(I),GP)                                        RMS 1772
ISN 0075           CALL PHELP(QM(I),QMD(I),QMP)                                     RMS 1773
ISN 0076           CALL PHELP(QBAR(I),QBARD(I),QBARP)                               RMS 1774
ISN 0077           CALL PHELP(QT(I),QTD(I),QTP)                                     RMS 1775
                C                                                                   RMS 1776
                C                                                                   RMS 1777
ISN 0078           IF(U(I)) 58,58,56                                                RMS 1778
ISN 0079        56 UP = UD(I) / U(I)                                                RMS 1779
ISN 0080           PERUX = 4.0                                                      RMS 1780
ISN 0081           GO TO 59                                                         RMS 1781
ISN 0082        58 PERUX = 4.0                                                      RMS 1782
ISN 0083           UP = 0.0                                                         RMS 1783
ISN 0084        59 CONTINUE                                                         RMS 1784
ISN 0085           UX = U(I)*100.                                                   RMS 1785
ISN 0086           UXD = UD(I)*100.                                                 RMS 1786
ISN 0087           WRITE(LWRIT,190) PERXX,XX(ICITY,20),XD(ICITY),XXP                RMS 1787
ISN 0088           WRITE(LWRIT,170) PERP ,PI(ICITY,20),PID(ICITY),PIP               RMS 1788
ISN 0089           WRITE(LWRIT,180) PERXI,XI(ICITY,20),XID(ICITY),XIP               RMS 1789
ISN 0090           WRITE(LWRIT,200) PERXK,XK(ICITY,20),XKD(ICITY),XKP               RMS 1790
ISN 0091           WRITE(LWRIT,210) PERSN,SUMN(ICITY,20),SUMND(ICITY),SUMNP         RMS 1791
ISN 0092           WRITE(LWRIT,160)                                                 RMS 1792
ISN 0093           WRITE(LWRIT,240)                                                 RMS 1793
ISN 0094           WRITE(LWRIT,160)                                                 RMS 1794
ISN 0095           WRITE(LWRIT,260) PERNB,XNBAR(ICITY),DNBAR(ICITY),PNBAR           RMS 1795
ISN 0096           WRITE(LWRIT,160)                                                 RMS 1796
```

```
ISN 0097            WRITE(LWR  ',300) PERYY,YY(IC  'Y),YYD( C  'Y),YY?                    RMS 1797
ISN 0098            WRITE(LWRIT,290) PERC,C(ICITY),CD(ICITY),CP                           RMS 1798
ISN 0099            WRITE(LWRIT,310) PERXN,XNT(ICITY),XND(ICITY),XNP                      RMS 1799
ISN 0100            WRITE(LWRIT,320) PERUX,UX,UXD,UP                                      RMS 1800
ISN 0101            WRITE(LWRIT,330) PERXL,XL(ICITY),XLD(ICITY),XLP                       RMS 1801
                C   WRITE(LWRIT,340) G(ICITY), GD(ICITY), GP                           RMS 1802
ISN 0102            WRITE(LWRIT,350) PERT,T(ICITY),TD(ICITY),TPQ                          RMS 1803
ISN 0103            WRITE(LWRIT,351) PERTP,TP(ICITY),TPD(ICITY),TPP                       RMS 1804
ISN 0104            WRITE(LWRIT,352) PERTO,TO(ICITY),TOD(ICITY),TOP                       RMS 1805
ISN 0105            WRITE(LWRIT,353) PERTA,TA(ICITY),TAD(ICITY),TAP                       RMS 1806
ISN 0106            WRITE (LWRIT,355)                                                     RMS 1807
ISN 0107            WRITE(LWRIT,360) PERQT,QT(ICITY),QTD(ICITY),QTP                       RMS 1808
ISN 0108            WRITE(LWRIT,220) PERQM,QM(ICITY),QMD(ICITY),QMP                       RMS 1809
ISN 0109            WRITE(LWRIT,270) PERQB,QBAR(ICITY),QBARD(ICITY),QBARP                 RMS 1810
ISN 0110            WRITE(LWRIT,370) PERQC,QC(ICITY),QCD(ICITY),QCP                       RMS 1811
ISN 0111          100 FORMAT(1H1)                                                         RMS 1812
ISN 0112          110 FORMAT(///1H ,'CONTROL STRATEGY NO. 'I1,' - ',20A4,/)               RMS 1813
ISN 0113          120 FORMAT(1H ,'AQCR ',I3,1X,19A4,3X,'  FOR ',I4)                       RMS 1814
ISN 0114          130 FORMAT(1H ,74X,'WITHOUT',7X,' WITH',7X,'NET',8X,'PERCENT')          RMS 1815
ISN 0115          140 FORMAT(1H ,74X,'CONTROL',7X,'(T-1)',6X,'CHANGE',6X,'CHANGE')        RMS 1816
ISN 0116          150 FORMAT(1H ,4X,'MANUFACTURING INDUSTRIES')                           RMS 1817
ISN 0117          160 FORMAT(1H )                                                         RMS 1818
ISN 0118          170 FORMAT(1H ,6X,'PROFIT (MILLIONS)',48X,1X,3(F10.3,2X),F10.4)         RMS 1819
ISN 0119          180 FORMAT(1H ,6X,'INVESTMENT (MILLIONS)',44X,1X,3(F10.3,2X),           RMS 1820
                  1801F10.4)                                                              RMS 1821
ISN 0120          190 FORMAT(1H ,6X,'VALUE ADDED (MILLIONS)',44X,3(F10.3,2X),F10.4)       RMS 1822
ISN 0121          200 FORMAT(1H ,6X,'CAPITAL STOCK (MILLIONS)',42X,3(F10.3,2X),F10.4)     RMS 1823
ISN 0122          210 FORMAT(1H ,6X,'EMPLOYMENT (1000 S)',46X,1X,3(F10.3,2X),F10.4)       RMS 1824
ISN 0123          220 FORMAT(1H ,6X,'ELECTRICITY USED BY MANUFACTURING INDUSTRIES (10 M   RMS 1825
                     1KWH)',11X,3(F10.3,2X),F10.4)                                      RMS 1826
ISN 0124          240 FORMAT(1H ,4X,'OTHER INDUSTRIES')                                   RMS 1827
ISN 0125          260 FORMAT(1H ,6X,'EMPLOYMENT (1000 S)',46X,1X,2(F10.2,2X),F10.3,2X,    RMS 1828
                     1  F10.4)                                                          RMS 1829
ISN 0126          270 FORMAT(1H ,6X,'ELECTRICITY USED BY OTHER INDUSTRIES (10 M KWH)',   RMS 1830
                     1  19X,3(F10.3,2X),F10.4)                                         RMS 1831
ISN 0127          290 FORMAT(1H ,4X,'REGIONAL CONSUMPTION (MILLIONS)',34X,1X,F12.3,2X,   RMS 1832
                  29012(F10.3,2X),F10.4)                                                  RMS 1833
ISN 0128          300 FORMAT(1H ,4X,'TOTAL PERSONAL INCOME FOR THE REGION (MILLIONS)'    RMS 1834
```

```
                300  9X,F 2.3,2X,2(F 0.3,2X),F 0.')                                    RMS 1835
ISN 0129        310 FORMAT(1H ,4X,'TOTAL REGIONAL EMPLOYMENT (1000 S)',33X,1X,3(F10.3,RMS 1836
                31012X),F10.4)                                                        RMS 1837
ISN 0130        320 FORMAT(1H ,4X,'REGIONAL UNEMPLOYMENT (PERCENT)',36X,1X,2(F10.3,2X)RMS 1838
                3201,F10.4,2X,F10.4)                                                  RMS 1839
ISN 0131        330 FORMAT(1H ,4X,'TOTAL LABOR FORCE (1000 S)',41X,1X,3(F10.3,2X),    RMS 1840
                3301F10.4)                                                            RMS 1841
ISN 0132        340 FORMAT(1H ,4X,'GOVERNMENT EXPENDITURE FOR THE REGION (MILLIONS)', RMS 1842
                340119X,1X,3(F10.3,2X),F10.4)                                         RMS 1843
ISN 0133        350 FORMAT(1H ,4X,'GOVERNMENT REVENUE FROM THE REGION (MILLIONS)',22X,RMS 1844
                35011X,3(F10.3,2X),F10.4)                                             RMS 1845
ISN 0134        351 FORMAT(1H ,4X,'GOVERNMENT REVENUE FROM PROPERTY TAXES (MILLIONS)',RMS 1846
                   118X,1X,3(F10.3,2X),F10.4)                                         RMS 1847
ISN 0135        352 FORMAT(1H ,4X,'GOVERNMENT REVENUE OTHER THAN PROPERTY TAX (MILLIONRMS 1848
                   1X)',14X,1X,3(F10.3,2X),F10.4)                                     RMS 1849
ISN 0136        353 FORMAT(1H ,4X,'INTRAGOVERNMENT AID TO THE REGION (MILLIONS)',23X, RMS 1850
                   1 1X,3(F10.3,2X),F10.4)                                            RMS 1851
ISN 0137        355 FORMAT (/,1H ,4X,'ELECTRIC POWER DEMAND' ,/)                      RMS 1852
ISN 0138        360 FORMAT(1H ,6X,'TOTAL ELECTRIC CONSUMPTION FOR THE REGION (10 M  KWRMS 1853
                3601S)',13X,3(F10.3,2X),F10.4)                                        RMS 1854
ISN 0139        370 FORMAT(1H ,6X,'RESIDENTIAL CONSUMPTION IN THE REGION (10 M  KWH)',RMS 1855
                370117X,3(F10.3,2X),F10.4)                                            RMS 1856
ISN 0140        380 FORMAT(1H ,'SIC DETAIL FOR MANUFACTURING INDUSTRIES ACTIVE IN THISRMS 1857
                3801 AQCR'/)                                                          RMS 1858
ISN 0141        400 FORMAT(1H ,'SIC DETAIL: NO DETAIL AVAILABLE FOR THIS AQCR')       RMS 1859
ISN 0142        451 FORMAT (1H ,'.....RMS 1860
                   1.....' )                                                          RMS 1861
ISN 0143        452 FORMAT (1H ,'.....          -VALUE ADDED-              .        -INRMS 1862
                   1VESTMENT-          .          -CAPITAL STOCK-          .' )      RMS 1863
ISN 0144        453 FORMAT (1H ,'. SIC.....RMS 1864
                   1.....' )                                                          RMS 1865
ISN 0145        454 FORMAT (1H ,'.CODE. NO CONTROL.    NET    . PERCENT . NO CONTROL. RMS 1866
                   1   NET    . PERCENT . NO CONTROL.    NET    . PERCENT .' )      RMS 1867
ISN 0146        455 FORMAT (1H ,'..... (MILLIONS). CHANGE  . CHANGE  . (MILLIONS). RMS 1868
                   1 CHANGE  . CHANGE  . (MILLIONS). CHANGE  . CHANGE  .' )          RMS 1869
ISN 0147        456 FORMAT (1H ,'.....              -PROFIT-              .       -NO. ORMS 1870
                   1F EMPLOYEES-         . -ELECTRIC POWER CONSUMPTION-   .' )      RMS 1871
ISN 0148        457 FORMAT (1H ,'..... (MILLIONS). CHANGE  . CHANGE  .  (1000 S) . RMS 1872
```

```
                  1 CHANGE  .  CHANGE  . ( O N (WH).  CHANGE  .  CHANGE  .' )        RMS 1873
ISN 0149           IF(INTT.EQ.2.AND.MIN.EQ.0,AND.IA312.EQ.1) GO TO 461               RMS 1874
ISN 0151           IF(INTT.EQ.2.AND.MIN.EQ.0) GO TO 460                              RMS 1875
ISN 0153           IF(IHELP.EQ.2) GO TO 500                                          RMS 1876
ISN 0155           RETURN                                                            RMS 1877
ISN 0156       460 WRITE (LWRIT,160)                                                 RMS 1878
ISN 0157           WRITE (LWRIT,160)                                                 RMS 1879
ISN 0158           WRITE (LWRIT,400)                                                 RMS 1880
ISN 0159           RETURN                                                            RMS 1881
ISN 0160       461 WRITE(LWRIT,462)                                                  RMS 1882
ISN 0161       462 FORMAT(//1H ,'NO DETAILED SIC AVAILABLE FOR THIS AQCR - TOTAL MANURMS 1883
                  1 COSTS USED INSTEAD'/' IMPACT TRANSFERED TO REGIONAL ANALYSIS')   RMS 1884
ISN 0162           RETURN                                                            RMS 1885
ISN 0163       500 WRITE (LWRIT,100)                                                 RMS 1886
ISN 0164           WRITE (LWRIT,160)                                                 RMS 1887
ISN 0165           WRITE (LWRIT,451)                                                 RMS 1888
ISN 0166           WRITE (LWRIT,452)                                                 RMS 1889
ISN 0167           WRITE (LWRIT,453)                                                 RMS 1890
ISN 0168           WRITE (LWRIT,454)                                                 RMS 1891
ISN 0169           WRITE (LWRIT,455)                                                 RMS 1892
ISN 0170           WRITE (LWRIT,451)                                                 RMS 1893
ISN 0171       530 FORMAT(1H ,1H.,I3,2H .,3(1X,F9.3,2H .,F9.3,2H .,F9.4,2H .))       RMS 1894
ISN 0172           DO 600 JND = 1,19                                                 RMS 1895
ISN 0173           IF (INDCI(I,JND))  510,600,510                                    RMS 1896
ISN 0174       510 INDI = JND+20-(1/JND)                                             RMS 1897
ISN 0175           XXP =(PXD(JND)  /XX(I,JND))*100.                                  RMS 1898
ISN 0176           IF (XI(I,JND))  515,515,520                                       RMS 1899
ISN 0177       515 XIP = 0.0                                                         RMS 1900
ISN 0178           GO TO 525                                                         RMS 1901
ISN 0179       520 XIP = (PXID(JND)  /XI(I,JND))*100.                                RMS 1902
ISN 0180       525 IF (XK(I,JND)) 527,527,535                                        RMS 1903
ISN 0181       527 XKP = 0.0                                                         RMS 1904
ISN 0182           GO TO 540                                                         RMS 1905
ISN 0183       535 XKP = (PXKD(JND)  /XK(I,JND))*100.                                RMS 1906
ISN 0184       540 WRITE (LWRIT,530) INDI,XX(I,JND),PXD(JND)  ,XXP,XI(I,JND),       RMS 1907
                  1PXID(JND)  , XIP,XK(I,JND),PXKD(JND)  ,XKP                       RMS 1908
ISN 0185       600 CONTINUE                                                          RMS 1909
ISN 0186           WRITE(LWRIT,100)                                                  RMS 1910
```

```
ISN 0187            WRITE(LWRIT,160)                                                    RMS 1911
ISN 0188            WRITE(LWRIT,451)                                                    RMS 1912
ISN 0189            WRITE(LWRIT,456)                                                    RMS 1913
ISN 0190            WRITE(LWRIT,453)                                                    RMS 1914
ISN 0191            WRITE(LWRIT,454)                                                    RMS 1915
ISN 0192            WRITE(LWRIT,457)                                                    RMS 1916
ISN 0193            WRITE(LWRIT,451)                                                    RMS 1917
ISN 0194            DO 700 JND = 1,19                                                   RMS 1918
ISN 0195            IF (INDCI(I,JND)) 610,700,610                                       RMS 1919
ISN 0196        610 INDI = JND*20-(1/JND)                                               RMS 1920
ISN 0197            IF (PI(I,JND)) 615,615,620                                          RMS 1921
ISN 0198        615 PIP = 0.0                                                           RMS 1922
ISN 0199            GO TO 625                                                           RMS 1923
ISN 0200        620 PIP = (PPID(JND)  /PI(I,JND))*100.                                  RMS 1924
ISN 0201        625 IF (EOLD(I,JND,5)) 635,630,635                                      RMS 1925
ISN 0202        630 PCT = 0.0                                                           RMS 1926
ISN 0203            GO TO 640                                                           RMS 1927
ISN 0204        635 PCT = (ED(JND,5)/EOLD(I,JND,5))*100.                                RMS 1928
ISN 0205        640 IF (SUMN(I,JND)) 645,645,650                                        RMS 1929
ISN 0206        645 SUMNP = 0.0                                                         RMS 1930
ISN 0207            GO TO 655                                                           RMS 1931
ISN 0208        650 SUMNP = (PDN(JND)  /SUMN(I,JND)) *100.                              RMS 1932
ISN 0209        655 WRITE (LWRIT,530) INDI,PI(I,JND),PPID(JND),PIP,SUMN(I,JND),         RMS 1933
                   1  PDN(JND),SUMNP,EOLD(I,JND,5),ED(JND,5),PCT                      RMS 1934
ISN 0210        700 CONTINUE                                                            RMS 1935
ISN 0211            IF (INTT.NE.2.OR.LPNTT.NE.2)  RETURN                                RMS 1936
ISN 0213            WRITE(LWRIT,701)                                                    RMS 1937
ISN 0214        701 FORMAT(1H1,'00PS-TRIED TO ACCESS FUEL PRINTOUT IN PRIN1,RMS01758')  RMS 1938
ISN 0215            RETURN                                                              RMS 1939
ISN 0216        750 GO TO (760,770),IKSW                                                RMS 1940
ISN 0217        760 BENT = BENEF/1000.                                                  RMS 1941
ISN 0218            WRITE(LWRIT,911)((TITLE(IMI,JMI),IMI=1,20),JMI=1,2)                 RMS 1942
ISN 0219            WRITE (LWRIT,900)                                                   RMS 1943
ISN 0220            GO TO 790                                                           RMS 1944
ISN 0221        770 WRITE (LWRIT,910)                                                   RMS 1945
ISN 0222        790 WRITE (LWRIT,120) (IAQCR(I,J),J=1,20) ,LPYEAR                       RMS 1946
ISN 0223            WRITE(LWRIT,130)                                                    RMS 1947
ISN 0224            WRITE(LWRIT,140)                                                    RMS 1948
```

```
ISN 0225            WR TE(LWRI', 50)                                          RMS 1949
ISN 0226            WRITE(LWRIT,160)                                          RMS 1950
                C                                                             RMS 1951
                C                                                             RMS 1952
ISN 0227            CALL OLETS(I)                                             RMS 1953
ISN 0228            PERXN = PERSN + PERNB                                     RMS 1954
ISN 0229            PERQT = PERQC + PERQM + PERQB                             RMS 1955
ISN 0230            PERXL = PERXN / .96                                       RMS 1956
ISN 0231            CALL PHELP(PI(I,20),PIN(I),PIP)                           RMS 1957
ISN 0232            CALL PHELP(XI(I,20),XIN(I),XIP)                           RMS 1958
ISN 0233            CALL PHELP(XK(I,20),XKN(I),XKP)                           RMS 1959
ISN 0234            CALL PHELP(XX(I,20),XDN(I),XXP)                           RMS 1960
ISN 0235            CALL PHELP (C(I),CN(I),CP)                                RMS 1961
ISN 0236            CALL PHELP(YY(I),YYN(I),YYP)                              RMS 1962
ISN 0237            CALL PHELP(SUMN(I,20),SUMNN(I),SUMNP)                     RMS 1963
ISN 0238            CALL PHELP(XNBAR(I),DNBARN(I),PNBAR)                      RMS 1964
ISN 0239            CALL PHELP(XNT(I),XNN(I),XNP)                             RMS 1965
ISN 0240            CALL PHELP(XL(I),XLN(I),XLP)                              RMS 1966
ISN 0241            CALL PHELP(G(I),GN(I),GP)                                 RMS 1967
ISN 0242            CALL PHELP(T(I),TN(I),TPQ)                                RMS 1968
ISN 0243            CALL PHELP(TP(I),TPN(I),TPP)                              RMS 1969
ISN 0244            CALL PHELP(TA(I),TAN(I),TAP)                              RMS 1970
ISN 0245            CALL PHELP(TO(I),TON(I),TOP)                              RMS 1971
ISN 0246            CALL PHELP(QC(I),QCN(I),QCP)                              RMS 1972
ISN 0247            CALL PHELP(QM(I),QMN(I),QMP)                              RMS 1973
ISN 0248            CALL PHELP(QBAR(I),QBARN(I),QBARP)                        RMS 1974
ISN 0249            CALL PHELP(QT(I),QTN(I),QTP)                              RMS 1975
                C                                                             RMS 1976
                C                                                             RMS 1977
ISN 0250          854 IF (U(I)) 858,858,856                                   RMS 1978
ISN 0251          856 UP = (UN(I) / U(I)) * 100.                              RMS 1979
ISN 0252            GO TO860                                                  RMS 1980
ISN 0253          858 UP = 0.0                                                RMS 1981
ISN 0254          860 CONTINUE                                                RMS 1982
ISN 0255            PERUN(I) = .04 * (1. + (UP/100.))                         RMS 1983
ISN 0256            PERUX = 4.0                                               RMS 1984
ISN 0257            UX = U(I)*100.                                            RMS 1985
ISN 0258            UXD = UN(I)*100.                                          RMS 1986
```

```
                C                                                                       RMS 1987
                C                                                                       RMS 1988
ISN 0259              WRITE(LWRIT,190) PERXX,XX(ICITY,20),XDN(ICITY),XXP                RMS 1989
ISN 0260              WRITE(LWRIT,170) PERP ,PI(ICITY,20),PIN(ICITY),PIP                RMS 1990
ISN 0261              WRITE(LWRIT,180) PERXI,XI(ICITY,20),XIN(ICITY),XIP                RMS 1991
ISN 0262              WRITE(LWRIT,200) PERXK,XK(ICITY,20),XKN(ICITY),XKP                RMS 1992
ISN 0263              WRITE(LWRIT,210) PERSN,SUMN(ICITY,20),SUMNN(ICITY),SUMNP          RMS 1993
ISN 0264              WRITE(LWRIT,160)                                                  RMS 1994
ISN 0265              WRITE(LWRIT,240)                                                  RMS 1995
ISN 0266              WRITE(LWRIT,160)                                                  RMS 1996
ISN 0267              WRITE(LWRIT,260) PERNB,XNBAR(ICITY),DNBARN(ICITY),PNBAR           RMS 1997
ISN 0268              WRITE(LWRIT,160)                                                  RMS 1998
ISN 0269              WRITE(LWRIT,300) PERYY,YY(ICITY),YYN(ICITY),YYP                   RMS 1999
ISN 0270              WRITE(LWRIT,290) PERC,C(ICITY),CN(ICITY),CP                       RMS 2000
ISN 0271              WRITE(LWRIT,310) PERXN,XNT(ICITY),XNN(ICITY),XNP                  RMS 2001
ISN 0272              WRITE(LWRIT,320) PERUX,UX,UXD,UP                                  RMS 2002
ISN 0273              WRITE(LWRIT,330) PERXL,XL(ICITY),XLN(ICITY),XLP                   RMS 2003
                C     WRITE(LWRIT,340) G(ICITY), GN(ICITY), GP                          RMS 2004
ISN 0274              WRITE(LWRIT,350) PERT,T(ICITY),TN(ICITY),TPQ                      RMS 2005
ISN 0275              WRITE(LWRIT,351) PERTP,TP(ICITY),TPN(ICITY),TPP                   RMS 2006
ISN 0276              WRITE(LWRIT,352) PERTO,TO(ICITY),TON(ICITY),TOP                   RMS 2007
ISN 0277              WRITE(LWRIT,353) PERTA,TA(ICITY),TAN(ICITY),TAP                   RMS 2008
ISN 0278              WRITE (LWRIT,355)                                                 RMS 2009
ISN 0279              WRITE(LWRIT,360) PERQT,QT(ICITY),QTN(ICITY),QTP                   RMS 2010
ISN 0280              WRITE(LWRIT,220) PERQM,QM(ICITY),QMN(ICITY),QMP                   RMS 2011
ISN 0281              WRITE(LWRIT,270) PERQB,QBAR(ICITY),QBARN(ICITY),QBARP             RMS 2012
ISN 0282              WRITE(LWRIT,370) PERQC,QC(ICITY),QCN(ICITY),QCP                   RMS 2013
                C                                                                       RMS 2014
                C                                                                       RMS 2015
ISN 0283        911 FORMAT(1H ,//2(20X,20A4,/))                                         RMS 2016
ISN 0284        900 FORMAT(///,1H ,'TOTAL NET EFFECT OF ALL CONTROL STRATEGIES PURSUEDRMS 2017
                   1 IN THIS RUN',/)                                                    RMS 2018
ISN 0285        910 FORMAT(///,1H ,      ' EFFECT OF 312(A) CONTROL COSTS',/)           RMS 2019
ISN 0286       1000 FORMAT (1H ,'......          -COST OF COAL-          .         -QUANRMS 2020
                   1TITY OF COAL-       .          -COST OF OIL-          .'  )       RMS 2021
ISN 0287       1005 FORMAT(1H ,'......($ PER TON).  CHANGE  .  CHANGE  .   (TONS)  .  RMS 2022
                   1CHANGE  .  CHANGE  .(PER M GAL).  CHANGE  .  CHANGE  .'  )        RMS 2023
ISN 0288       1010 FORMAT (1H ,'......        -QUANTITY OF OIL-          .          -CORMS 2024
```

```
      S' OF GAS-          .        -QUANTITY OF GAS-          .'  )        RMS 2025
ISN 0289      1015 FORMAT(1H ,'..... (1000 GAL). CHANGE . CHANGE .(PER CU.FT). RMS 2026
     1CHANGE . CHANGE .(1000CU.FT). CHANGE . CHANGE .'  )                    RMS 2027
ISN 0290      1020 FORMAT (1H ,'.....      -COST OF ELECTRICITY-      .          -CORMS 2028
     1ST OF COKE-          .        -QUANTITY OF COKE-          .'  )        RMS 2029
ISN 0291      1025 FORMAT(1H ,'.....(PER M KWH). CHANGE . CHANGE . (PER TON) . RMS 2030
     1CHANGE . CHANGE .  (TONS) . CHANGE . CHANGE .'  )                       RMS 2031
ISN 0292       RETURN                                                         RMS 2032
ISN 0293       END                                                            RMS 2033
```

```
        COMPILER OPTIONS - NAME=  MAIN,OPT=00,LINECNT=40,SIZE=0000K,
                           SOURCE,BCD,NOLIST,NODECK,LOAD,MAP,NOEDIT,NOID,NOXREF
ISN 0002            SUBROUTINE OLETS(I)                                          RMS 2034
ISN 0003            REAL KJNDX,LJNDX                                             RMS 2035
ISN 0004            DIMENSION GRFAC(100,20,3),XINC(60,3),VK(20),YGROW(38)        RMS 2036
ISN 0005            DIMENSION OTP(92),OTA(92),OTO(92),OPOP(92),OAPV(92)          RMS 2037
ISN 0006            COMMON/EVERY/OWB(92),OW(92),OX(92),OI(92),OY(92),OT(92),OG(92),  RMS 2038
                   1 OC(92),OXBAR(92),OQC(92),OQM(92),OQB(92),      GRFAC,XINC,VK,  RMS 2039
                   2 YGROW,IZS                                                    RMS 2040
                   3 ,OTP,OTA,OTO,OPOP,OAPV,POPGR                                 RMS 2041
ISN 0007            COMMON/ WNEWW/ WAGECO(20,3)                                  RMS 2042
ISN 0008            COMMON /IPRIN/ INTT,LPNTT,JYEAR                              RMS 2043
ISN 0009            COMMON/ALET/PERXX,PERW,PERWB,PERSN,PERP,PERXI,PERXK,PERYY,PERNB,  RMS 2044
                   1 PERT,PERG,PERC,PERQM,PERQB,PERQC,PERTP,PERTO,PERTA            RMS 2045
ISN 0010            IF (I.EQ.92) GO TO 2500                                      RMS 2046
ISN 0012            IF (IZS.EQ.0) GO TO 2600                                     RMS 2047
ISN 0014        200 LCITY = I                                                    RMS 2048
ISN 0015            IEX = JYEAR+3                                                RMS 2049
ISN 0016            IKX = JYEAR + 2                                              RMS 2050
ISN 0017            IF(OX(I).EQ.0.0) GO TO 1200                                  RMS 2051
ISN 0019            IF(GRFAC(LCITY,20 ,1).EQ.0.0) GO TO 1200                     RMS 2052
ISN 0021            GFAC1 = GRFAC(I,20,1)                                        RMS 2053
ISN 0022            GFAC2 = GRFAC(I,20,2)                                        RMS 2054
ISN 0023            GFACD = GFAC2 - GFAC1                                        RMS 2055
ISN 0024            IF(GFAC1.GT.0.0) AF1 = ALOG10(GFAC1)/3.                      RMS 2056
ISN 0026            RAF1 = 10.**AF1                                              RMS 2057
ISN 0027            IF (GFAC1.GT.0.0.AND.GFAC2.GT.0.0) AF2 = (ALOG10(GFAC2)-     RMS 2058
                   1 ALOG10(GFAC1))/5.                                           RMS 2059
ISN 0029            RAF2 = 10.**AF2                                              RMS 2060
ISN 0030            IF (GRFAC(LCITY,20,3).GT.0.0.AND.GFAC2.GT.0.0)               RMS 2061
                   1 AF3=(ALOG10(GRFAC(LCITY,20,3))-ALOG10(GFAC2))/5.            RMS 2062
ISN 0032            RAF3 = 10.**AF3                                              RMS 2063
ISN 0033            GO TO (1120,1130,1130,1130,1130,1130,1140,1140,1140,1140,1140),  RMS 2064
                   1     JYEAR                                                   RMS 2065
ISN 0034       1120 VFAC = RAF1**3.                                              RMS 2066
ISN 0035            GO TO 1150                                                   RMS 2067
ISN 0036       1130 KJNDX = JYEAR-1                                              RMS 2068
ISN 0037            LJNDX = 0                                                    RMS 2069
```

```
 SN 0038            VFAC = (RAF **3.)*(RAF2**KJNDX)                                  RMS 2070
ISN 0039            GO TO 1150                                                       RMS 2071
ISN 0040       1140 KJNDX = 5                                                        RMS 2072
ISN 0041            LJNDX = JYEAR-6                                                  RMS 2073
ISN 0042            VFAC = (RAF1**3.)*(RAF2**KJNDX)*(RAF3**LJNDX)                    RMS 2074
ISN 0043       1150 PERXX = OX(I)*VFAC                                               RMS 2075
ISN 0044            PERW = OW(I)                                                     RMS 2076
ISN 0045            DO 1161 JS = 1,IEX                                               RMS 2077
ISN 0046       1161 PERW = PERW*1.018                                                RMS 2078
ISN 0047            PERWB = OWB(I)*VFAC                                              RMS 2079
ISN 0048       2000 FORMAT(1H ,I4,5F10.2)                                            RMS 2080
ISN 0049            PERP = PERXX-PERWB                                               RMS 2081
ISN 0050            PERXI = OI(I)*VFAC                                               RMS 2082
ISN 0051            PERXK = PERXX/VK(20)                                             RMS 2083
ISN 0052              10 FORMAT (1H ,I4,3F10.3)                                      RMS 2084
ISN 0053            PERSN = PERWB/PERW                                               RMS 2085
ISN 0054       1770 FORMAT(1H1,4I5)                                                  RMS 2086
ISN 0055       1200 CONTINUE                                                         RMS 2087
ISN 0056            IF(LCITY.GT.53) GO TO 1204                                       RMS 2088
ISN 0058            IF(XINC(LCITY,1).NE.0.0) GO TO 1205                              RMS 2089
ISN 0060            RATE = 0.0                                                       RMS 2090
ISN 0061            IF(I.EQ.22) RATE=.0762                                           RMS 2091
ISN 0063            IF (I.EQ.31) RATE=.0758                                          RMS 2092
ISN 0065            IF(I.EQ.32) RATE=.0645                                           RMS 2093
ISN 0067            PERYY = OY(I)                                                    RMS 2094
ISN 0068            PERYY = PERYY*(1.0+RATE)**IEX                                    RMS 2095
ISN 0069            GO TO 1207                                                       RMS 2096
ISN 0070       1204 PERYY=OY(I)                                                      RMS 2097
ISN 0071            PERYY = PERYY*(YGROW(I-53)+1.0)**IEX                             RMS 2098
ISN 0072            GO TO 1207                                                       RMS 2099
ISN 0073       1205 CONTINUE                                                         RMS 2100
ISN 0074            YRAG1 = XINC(LCITY,1)/OY(I)                                      RMS 2101
ISN 0075            YRAG2 = XINC(LCITY,2)/XINC(LCITY,1)                              RMS 2102
ISN 0076            YRAG3 = XINC(LCITY,3)/XINC(LCITY,2)                              RMS 2103
ISN 0077            YRAM1 = ALOG10(YRAG1)/3.                                         RMS 2104
ISN 0078            YRAL1 = 10.**YRAM1                                               RMS 2105
ISN 0079            YRAM2 = ALOG10(YRAG2)/5.                                         RMS 2106
ISN 0080            YRAL2 = 10.**YRAM2                                               RMS 2107
```

```
ISN 0081          YRAM3 = ALOG 0(YRAG3)/5.                                    RMS 2108
ISN 0082          YRAL3 = 10.**YRAM3                                          RMS 2109
ISN 0083          PERYY = 0Y(I)*YRAL1**3                                      RMS 2110
ISN 0084          IF (KJNDX.EQ.0.) GO TO 1206                                 RMS 2111
ISN 0086          PERYY = PERYY*YRAL2**KJNDX                                  RMS 2112
ISN 0087          IF (LJNDX.EQ.0.) GO TO 1206                                 RMS 2113
ISN 0089          PERYY = PERYY *YRAL3**LJNDX                                 RMS 2114
ISN 0090     1206 PERYY = PERYY*1.144                                         RMS 2115
ISN 0091     1207 YFAC = PERYY/0Y(I)                                          RMS 2116
ISN 0092          PERNB = 0XBAR(I)*(PERYY-PERXX)/(0Y(I)-0X(I))                RMS 2117
ISN 0093          PERT = 0T(I)*YFAC                                           RMS 2118
ISN 0094          PERTP = 0TP(I)*YFAC                                         RMS 2119
ISN 0095          PERTO = 0TO(I) * YFAC                                       RMS 2120
ISN 0096          PERTA = 0TA(I) * YFAC                                       RMS 2121
ISN 0097          PERG = 0G(I)*YFAC                                           RMS 2122
ISN 0098          PERC = 0C(I)*YFAC                                           RMS 2123
ISN 0099          PERQM = 0QM(I)*VFAC                                         RMS 2124
ISN 0100          PERQB = 0QB(I)*(PERYY-PERXX)/(0Y(I)-0X(I))                  RMS 2125
ISN 0101          PERQC = 0QC(I)*YFAC                                         RMS 2126
ISN 0102     1210 CONTINUE                                                    RMS 2127
ISN 0103     1212 FORMAT(F10.3,60X,I5,I3)                                     RMS 2128
ISN 0104          ZERXX = ZERXX + PERXX                                       RMS 2129
ISN 0105          ZERW = ZERW + PERW                                          RMS 2130
ISN 0106          ZERWB = ZERWB + PERWB                                       RMS 2131
ISN 0107          ZERSN = ZERSN + PERSN                                       RMS 2132
ISN 0108          ZERP = ZERP + PERP                                          RMS 2133
ISN 0109          ZERXI = ZERXI + PERXI                                       RMS 2134
ISN 0110          ZERXK = ZERXK + PERXK                                       RMS 2135
ISN 0111          ZERYY = ZERYY + PERYY                                       RMS 2136
ISN 0112          ZERNB = ZERNB + PERNB                                       RMS 2137
ISN 0113          ZERT = ZERT + PERT                                          RMS 2138
ISN 0114          ZERTP = ZERTP + PERTP                                       RMS 2139
ISN 0115          ZERTO = ZERTO + PERTO                                       RMS 2140
ISN 0116          ZERTA = ZERTA + PERTA                                       RMS 2141
ISN 0117          ZERG = ZERG + PERG                                          RMS 2142
ISN 0118          ZERC = ZERC + PERC                                          RMS 2143
ISN 0119          ZERQM = ZERQM + PERQM                                       RMS 2144
ISN 0120          ZERQB = ZERQB + PERQB                                       RMS 2145
```

```
ISN 012              ZERQC = ZERQC + PERQC                                  RMS 2146
ISN 0122             RETURN                                                 RMS 2147
ISN 0123       2500  PERXX = ZERXX                                          RMS 2148
ISN 0124             PERW = ZERW                                            RMS 2149
ISN 0125             PERWB = ZERWB                                          RMS 2150
ISN 0126             PERSN = ZERSN                                          RMS 2151
ISN 0127             PERP = ZERP                                            RMS 2152
ISN 0128             PERXI = ZERXI                                          RMS 2153
ISN 0129             PERXK = ZERXK                                          RMS 2154
ISN 0130             PERYY = ZERYY                                          RMS 2155
ISN 0131             PERNB = ZERNB                                          RMS 2156
ISN 0132             PERT = ZERT                                            RMS 2157
ISN 0133             PERTP = ZERTP                                          RMS 2158
ISN 0134             PERTO = ZERTO                                          RMS 2159
ISN 0135             PERTA = ZERTA                                          RMS 2160
ISN 0136             PERG = ZERG                                            RMS 2161
ISN 0137             PERC = ZERC                                            RMS 2162
ISN 0138             PERQM = ZERQM                                          RMS 2163
ISN 0139             PERQB = ZERQB                                          RMS 2164
ISN 0140             PERQC = ZERQC                                          RMS 2165
ISN 0141       2600  ZERXX = 0.0                                            RMS 2166
ISN 0142             ZERW =0.0                                              RMS 2167
ISN 0143             ZERWB=0.0                                              RMS 2168
ISN 0144             ZERSN=0.0                                              RMS 2169
ISN 0145             ZERP =0.0                                              RMS 2170
ISN 0146             ZERXI=0.0                                              RMS 2171
ISN 0147             ZERXK=0.0                                              RMS 2172
ISN 0148             ZERYY=0.0                                              RMS 2173
ISN 0149             ZERNB=0.0                                              RMS 2174
ISN 0150             ZERT =0.0                                              RMS 2175
ISN 0151             ZERTA = 0.0                                            RMS 2176
ISN 0152             ZERTP = 0.0                                            RMS 2177
ISN 0153             ZERTO = 0.0                                            RMS 2178
ISN 0154             ZERG =0.0                                              RMS 2179
ISN 0155             ZERC =0.0                                              RMS 2180
ISN 0156             ZERQM=0.0                                              RMS 2181
ISN 0157             ZERQB=0.0                                              RMS 2182
ISN 0158             ZERQC=0.0                                              RMS 2183
```

```
ISN 0159              F (IZS.NE.0  RETURN                                RMS 2184
ISN 0161             IZS = 1                                            RMS 2185
ISN 0162             GO TO 200                                          RMS 2186
ISN 0163        2700 CONTINUE                                           RMS 2187
ISN 0164             RETURN                                             RMS 2188
ISN 0165             END                                                RMS 2189
```

```
      COMPILER OPTIONS - NAME= MAIN,OPT=00,LINECNT=40,SIZE=0000K,
                         SOURCE,BCD,NOLIST,NODECK,LOAD,MAP,NOEDIT,NOID,NOXREF
ISN 0002              SUBROUTINE VALUE                                    RMS 2199
ISN 0003              COMMON /SIM/ M1,M2,MCASES,Y(1000),X(1000)           RMS 2200
                     1 ,MARK,LVAR                                         RMS 2201
ISN 0004              GO TO(100,200,300,400,500) , MARK                   RMS 2202
ISN 0005            100 CALL VALUE1                                       RMS 2203
ISN 0006              GO TO 1000                                          RMS 2204
ISN 0007            200 CALL VALUE2                                       RMS 2205
ISN 0008              GO TO 1000                                          RMS 2206
ISN 0009            300 CALL VALUE3                                       RMS 2207
ISN 0010              GO TO 1000                                          RMS 2208
ISN 0011            400 CALL VALUE4                                       RMS 2209
ISN 0012              GO TO 1000                                          RMS 2210
ISN 0013            500 CALL VALUE5                                       RMS 2211
ISN 0014           1000 CONTINUE                                          RMS 2212
ISN 0015              RETURN                                              RMS 2213
ISN 0016              END                                                 RMS 2214
```

```
      COMPILER OPTIONS - NAME=  MAIN,OPT=00,LINECNT=60,SIZE=0000K,
                         SOURCE,BCD,NOLIST,NODECK,LOAD,MAP,NOEDIT,NOID,NOXREF
ISN 0002              SUBROUTINE VALUE1                                                  RMS 2215
                    C                                                                    RMS 2216
ISN 0003              COMMON /SIM/ M1,M2,MCASES,Y(1000),X(1000)                          RMS 2217
                     1  ,MARK,LVAR                                                       RMS 2218
ISN 0004              COMMON /FAT/ F(1000),LSTORE,KPIST                                  RMS 2219
ISN 0005              COMMON / BUG / ISBUG,LREAD,LWRIT                                   RMS 2220
                    C                                                                    RMS 2221
ISN 0006              J = LSTORE + 1                                                     RMS 2222
ISN 0007              DO 1  I=M1,M2,LVAR                                                 RMS 2223
ISN 0008              F(I) = -Y(I) + .42836*X(J) +      2.83038*Y(I+1) + .94812*Y(I+2)   RMS 2224
ISN 0009              F(I+1) = -Y(I+1) + 23.4227+ .94215*X(J+1)                          RMS 2225
                     1    + X(J+2)                                                      RMS 2226
ISN 0010              F(I+2) =-Y(I+2) +  137.9922 + .613256*Y(I)                         RMS 2227
                     1     + X(J+3)                                                     RMS 2228
ISN 0011            1 CONTINUE                                                         RMS 2229
ISN 0012              RETURN                                                             RMS 2230
ISN 0013              END                                                                RMS 2231
```

```
      COMPILER OPTIONS - NAME=  MAIN,OPT=00,LINECNT=40,SIZE=0000K,
                         SOURCE,BCD,NOLIST,NODECK,LOAD,MAP,NOEDIT,NOID,NOXREF
ISN 0002              SUBROUTINE VALUE2                                    RMS 2232
            C                                                              RMS 2233
ISN 0003              COMMON /SIM/ M1,M2,MCASES,Y(1000),X(1000)            RMS 2234
                     1 ,MARK,LVAR                                          RMS 2235
ISN 0004              COMMON /FAT/ F(1000),LSTORE,KPIST                    RMS 2236
ISN 0005              COMMON / BUG / ISBUG,LREAD,LWRIT                     RMS 2237
            C                                                              RMS 2238
ISN 0006              J = LSTORE                                           RMS 2239
ISN 0007              DO 1 I=M1,M2,LVAR                                    RMS 2240
ISN 0008              F(I) =-Y(I) + X(J+4)*Y(I+4) + X(J+1)                 RMS 2241
ISN 0009              F(I+1) = -Y(I+1)-13.95875 + 1.039245*Y(I)+ 361.374*Y(I+3)  RMS 2242
                     1    +X(J+7)                                          RMS 2243
ISN 0010              F(I+2) =-Y(I+2) + 1.8402 + ( .8377*X(J+3)) +(.1116*Y(I+3))  RMS 2244
                     1 +   X(J+6)                                          RMS 2245
ISN 0011              F(I+3) =-Y(I+3) + ((Y(I+1)-Y(I))/Y(I+1))             RMS 2246
ISN 0012              F(I+4) =-Y(I+4) + (X(J+2)/Y(I+2))                    RMS 2247
ISN 0013             1 CONTINUE                                            RMS 2248
ISN 0014              RETURN                                               RMS 2249
ISN 0015              END                                                  RMS 2250
```

```
        COMPI_ER O''ONS - NA1E=  MA N,O''=00,_ NECNT=40,SIZE=0000K,
                          SOURCE,BCD,NOLIST,NODECK,LOAD,MAP,NOEDIT,NOID,NOXREF
ISN 0002              SUBROUTINE VALUE3                                                  RMS 2251
            C                                                                            RMS 2252
ISN 0003              COMMON /SIM/ M1,M2,MCASES,Y(1000),X(1000)                          RMS 2253
                     1 ,MARK,LVAR                                                        RMS 2254
ISN 0004              COMMON /FAT/ F(1000),LSTORE                                        RMS 2255
ISN 0005              COMMON / BUG / ISBUG,LREAD,LWRIT                                   RMS 2256
            C                                                                            RMS 2257
            C                                                                            RMS 2258
ISN 0006              J = LSTORE                                                         RMS 2259
ISN 0007              DO 1 I=M1,M2,LVAR                                                  RMS 2260
ISN 0008              F(I) = -Y(I) + .42836*X(J+3)+     2.83038*Y(I+1) + .94812*Y(I+2)   RMS 2261
ISN 0009              F(I+1) = -Y(I+1) + 23.4227+ .94215*X(I+3)*X(J+1)                   RMS 2262
                     1    + X(J+4)                                                       RMS 2263
ISN 0010              F(I+2) =-Y(I+2) +  137.9922 + .613256*Y(I) *X(J+2)                 RMS 2264
                     1 + X(J+5)                                                          RMS 2265
ISN 0011            1 CONTINUE                                                           RMS 2266
ISN 0012              RETURN                                                             RMS 2267
ISN 0013              END                                                                RMS 2268
```

```
      COMPILER OPTIONS - NAME=  MAIN,OPT=00,LINECNT=40,SIZE=0000K,
                         SOURCE,BCD,NOLIST,NODECK,LOAD,MAP,NOEDIT,NOID,NOXREF
ISN 0002              SUBROUTINE VALUE4                                          RMS 2269
ISN 0003              DIMENSION A(4)                                             RMS 2270
                    C                                                            RMS 2271
ISN 0004              COMMON /SIM/ M1,M2,MCASES,Y(1000),X(1000),MARK,LVAR,MKEEP  RMS 2272
ISN 0005              COMMON /FAT/ F(1000),LSTORE                                RMS 2273
ISN 0006              MM = LSTORE + 1                                            RMS 2274
ISN 0007              MT = 5 - MKEEP                                             RMS 2275
ISN 0008              MT1 = 2*MT                                                 RMS 2276
ISN 0009              KD = MKEEP - 1                                             RMS 2277
ISN 0010              KD1 = KD*2 + 1                                             RMS 2278
ISN 0011              DO 20 I=M1,M2,LVAR                                         RMS 2279
ISN 0012              II = I-MT                                                  RMS 2280
ISN 0013              MR = MM - MT1                                              RMS 2281
ISN 0014              SUM = 0.0                                                  RMS 2282
ISN 0015              B = ALOG(Y(II+8)) - ALOG(X(MR+14))                         RMS 2283
ISN 0016              DO 10 KK=1,KD                                              RMS 2284
ISN 0017              K = KK - 1                                                 RMS 2285
ISN 0018              SUM = SUM + X(MM+K)*Y(I+K)                                 RMS 2286
ISN 0019              A(KK) = 1.0                                                RMS 2287
ISN 0020              IF(X(MM+9)*X(MM+K).EQ.0.0) GO TO 9                         RMS 2288
ISN 0022              A(KK) = (X(MM+KD)/X(MM+K))*(X(MM+K+MKEEP)/X(MM+KD1))       RMS 2289
ISN 0023            9 CONTINUE                                                   RMS 2290
ISN 0024              B = B - X(MM+K+MKEEP) * ALOG(A(KK))                        RMS 2291
ISN 0025           10 F(I+K) = -Y(I+K) + A(KK)*Y(II+4)                           RMS 2292
ISN 0026              F(II+6) = -Y(II+6) + SUM + X(MM+KD)*Y(I+KD)                RMS 2293
ISN 0027              MM = MM - MT1                                              RMS 2294
ISN 0028              F(II+4) =-Y(II+4) + EXP(B)                                 RMS 2295
ISN 0029              F(II+5) = -Y(II+5) + (X(MM+10)+Y(II+10))/(1.0+X(MM+11))    RMS 2296
ISN 0030              F(II+7) = -Y(II+7) + Y(II+5)*X(MM+16)                      RMS 2297
ISN 0031              F(II+8) =-Y(II+8)+X(MM+15)*Y(II+7)                         RMS 2298
ISN 0032              F(II+9) = -Y(II+9) + X(MM+12)*Y(II+7)                      RMS 2299
ISN 0033              F(II+10) = -Y(II+10) + X(MM+17)+ X(MM+13)*Y(II+9)          RMS 2300
ISN 0034           20 CONTINUE                                                   RMS 2301
ISN 0035              RETURN                                                     RMS 2302
ISN 0036              END                                                        RMS 2303
```

```
      COMPILER OPTIONS - NAME=  A N,OPT=00,LINECNT=40,SIZE=(000K,
                         SOURCE,BCD,NOLIST,NODECK,LOAD,MAP,NOEDIT,NOID,NOXREF
ISN 0002              SUBROUTINE VALUES                                          RMS 2304
ISN 0003              COMMON /SIM/ M1,M2,MCASES,Y(1000),X(1000)                  RMS 2305
                     1 ,MARK,LVAR                                                RMS 2306
ISN 0004              COMMON /FAT/ F(1000),LSTORE,KPIST                          RMS 2307
ISN 0005              COMMON / BUG / ISBUG,LREAD,LWRIT                           RMS 2308
ISN 0006              J = LSTORE                                                 RMS 2309
ISN 0007              DO 1 I = M1,M2,LVAR                                        RMS 2310
ISN 0008              F(I) = -Y(I)+.05608*X(J+1)                                 RMS 2311
ISN 0009              F(I+1) = -Y(I+1)-21.43+.01223*X(J+2)                       RMS 2312
ISN 0010              F(I+2) = -Y(I+2)+317.84-815.724*(Y(I)+Y(I+1))/Y(I+3)-      RMS 2313
                     1 .0272*X(J+2)/X(J+3)+1.055*(Y(I)+Y(I+1))/X(J+3)            RMS 2314
ISN 0011              F(I+3) = -Y(I+3)+Y(I+1)+Y(I+2)+Y(I)                        RMS 2315
ISN 0012             1 CONTINUE                                                  RMS 2316
ISN 0013              RETURN                                                     RMS 2317
ISN 0014              END                                                        RMS 2318
```

```
        COMPILER OPT ONS - NAME=  MAIN,OPT=00,L NECNT=40,S ZE=0000K,
                           SOURCE,BCD,NOLIST,NODECK,LOAD,MAP,NOEDIT,NOID,NOXREF
ISN 0002            SUBROUTINE DEBUG(Y,MCNT,LVAR)                          RMS 2319
ISN 0003            DIMENSION Y(1000)                                      RMS 2320
ISN 0004            WRITE(6,21)                                            RMS 2321
ISN 0005            MCASES = LVAR*MCNT                                     RMS 2322
ISN 0006            K = 0                                                  RMS 2323
ISN 0007            DO 10 I=1,MCASES,LVAR                                  RMS 2324
ISN 0008            K = K + LVAR                                           RMS 2325
ISN 0009         10 WRITE(6,20) (Y(J), J=I,K)                              RMS 2326
ISN 0010         20 FORMAT(1H ,10F11.1)                                    RMS 2327
ISN 0011         21 FORMAT(1H1)                                            RMS 2328
ISN 0012            RETURN                                                 RMS 2329
ISN 0013            END                                                    RMS 2330
```

```
      COMPILER OPTIONS - NAME=  MAIN,OPT=00,  NECNT=40,SIZE=0000K,
                         SOURCE,BCD,NOLIST,NODECK,LOAD,MAP,NOEDIT,NOID,NOXREF
ISN 0002              SUBROUTINE SIMUL                                          RMS 2331
                C                                                               RMS 2332
                C   MACRO MODEL SIMULATION PROGRAM I - MAINLINE                 RMS 2333
                C                                                               RMS 2334
ISN 0003              DIMENSION DEL(1000)                                       RMS 2335
ISN 0004              DIMENSION IAQCR(92,20)                                    RMS 2336
ISN 0005              COMMON /SIM/ M1,M2,MCASES,Y(1000),X(1000)                 RMS 2337
                     1 ,MARK,LVAR                                               RMS 2338
ISN 0006              COMMON /FAT/ F(1000),LSTORE,KPIST,ARAB(10),LCHECK         RMS 2339
ISN 0007              COMMON /CAT/ A(20,20)                                     RMS 2340
ISN 0008              COMMON /SENS/ ICTAB,NBEFOR,NEWCIT                         RMS 2341
ISN 0009              COMMON / IPRIN /INTT,LPNTT  ,JYEAR,IAQCR,IJCIT            RMS 2342
ISN 0010              COMMON / BUG / ISBUG,KRD,LPR                              RMS 2343
ISN 0011              LSTORE = 0                                                RMS 2344
ISN 0012              KREP = 0                                                  RMS 2345
ISN 0013            106 FORMAT(I4)                                              RMS 2346
ISN 0014              MCNT = MCASES/LVAR                                        RMS 2347
ISN 0015              LMN = LVAR                                                RMS 2348
ISN 0016              IMAX = 4                                                  RMS 2349
ISN 0017              LPYEAR = JYEAR + 1969                                     RMS 2350
ISN 0018              M1 = 1                                                    RMS 2351
ISN 0019              M2 = MIND(LMN,MCASES)                                     RMS 2352
ISN 0020             1 IT = 0                                                   RMS 2353
                C                                                               RMS 2354
ISN 0021              IX = ICTAB + LCHECK + NBEFOR                              RMS 2355
ISN 0022              IF(IX-3) 69,60,69                                         RMS 2356
ISN 0023             60 IF(NEWCIT) 71,70,71                                     RMS 2357
ISN 0024             71 I = IJCIT                                               RMS 2358
ISN 0025              WRITE(LPR,120) (IAQCR(I,J),  J=1,20),LPYEAR               RMS 2359
ISN 0026            120 FORMAT(1H1,////25X,'AQCR  ',I3,1X,19A4,5X,'FOR ',I4//25X,RMS 2360
                     1 'CONVERGENCE PROCESS FOR ESTIMATED VALUES WITHOUT POLLUTION CONTRRMS 2361
                    1OLS')                                                      RMS 2362
ISN 0027             70 CONTINUE                                                RMS 2363
ISN 0028              WRITE(LPR,50)  MARK                                       RMS 2364
ISN 0029              IF(MARK.EQ.2) GO TO 900                                   RMS 2365
ISN 0031             50 FORMAT(1H ,//4X,'**********************************************************RMS 2366
```

```
                1**********************************************************************RMS 2367
                2'/T5,'*',T120,'*'/T5,'*',25X,'SIMULTANEOUS SYSTEM NUMBER - ',I1,  RMS 2368
                3 T120,'*'/T5,'*',T120,'*')                                        RMS 2369
      C                                                                            RMS 2370
ISN 0032          2 WRITE(LPR,9) (ARAB(J),J=1,LVAR)                                RMS 2371
ISN 0033            WRITE(LPR,10) (Y(J), J=M1,M2)                                  RMS 2372
ISN 0034          9 FORMAT(1H ,T5,'*',5X,'ENDOGENOUS VAR.  ',3(5X,A4,'    CONV'),  RMS 2373
                  1 T120,'*')                                                      RMS 2374
ISN 0035         10 FORMAT(1H ,T5,'*',8X,'ACTUAL VALUE  ',3(F9.2,8X),T120,'*')     RMS 2375
ISN 0036         11 FORMAT(1H ,T5,'*',8X,'ITERATION-',I2,2X,3(F9.2,F8.5),T120,'*') RMS 2376
ISN 0037            GO TO 69                                                       RMS 2377
      C                                                                            RMS 2378
ISN 0038        900 CONTINUE                                                       RMS 2379
ISN 0039            WRITE(LPR,99)(ARAB(J),J=1,LVAR)                                RMS 2380
ISN 0040            WRITE(LPR,910)(Y(J), J=M1,M2)                                  RMS 2381
ISN 0041         99 FORMAT(1H ,T5,'*',5X,'ENDOGENOUS VAR.  ',5(5X,A4,'    CONV'),  RMS 2382
                  1 T120,'*')                                                      RMS 2383
ISN 0042        910 FORMAT(1H ,T5,'*',8X,'ACTUAL VALUE  ',5(F9.2,8X),T120,'*')     RMS 2384
ISN 0043        911 FORMAT(1H ,T5,'*',8X,'ITERATION-',I2,2X,5(F9.2,F8.5),T120,'*') RMS 2385
      C                                                                            RMS 2386
ISN 0044         69 IF (IT-IMAX)  5,690,690                                        RMS 2387
ISN 0045          5 IT = IT & 1                                                    RMS 2388
ISN 0046          3 CALL GRADN                                                     RMS 2389
ISN 0047            CALL VERT                                                      RMS 2390
ISN 0048            CALL VALUE                                                     RMS 2391
      C    COMPUTE NEW VALUES AND TEST FOR CONVERGENCE                             RMS 2392
ISN 0049          7 IAS = IT                                                       RMS 2393
ISN 0050            IT = IMAX                                                      RMS 2394
ISN 0051            NN = 0                                                         RMS 2395
ISN 0052            DO 4 I = M1,M2                                                 RMS 2396
ISN 0053            NN = NN + 1                                                    RMS 2397
ISN 0054            YY = Y(I)                                                      RMS 2398
ISN 0055            Y(I) = 0.0                                                     RMS 2399
ISN 0056             KK = 0                                                        RMS 2400
ISN 0057            DO 40 J= M1,M2                                                 RMS 2401
ISN 0058            KK = KK + 1                                                    RMS 2402
ISN 0059         40 Y(I) = Y(I) - A(NN,KK)*F(J)                                    RMS 2403
ISN 0060            Y(I) = YY&Y(I)                                                 RMS 2404
```

```
ISN 0061            YD S = ABS(Y( )/YY                                                    RMS 2405
ISN 0062            YDIS = ABS(YDIS-1.)                                                   RMS 2406
ISN 0063            DEL(I) = YDIS                                                         RMS 2407
ISN 0064            IF(YDIS.LT.0.009)GO TO 42                                             RMS 2408
ISN 0066            IT = IAS                                                              RMS 2409
ISN 0067         42 CONTINUE                                                              RMS 2410
ISN 0068          4 CONTINUE                                                              RMS 2411
ISN 0069            IF(IX.NE.3) GO TO 69                                                  RMS 2412
ISN 0071        688 CONTINUE                                                              RMS 2413
ISN 0072            IF(MARK.EQ.2) GO TO 673                                               RMS 2414
ISN 0074            WRITE(LPR,11) IAS,(Y(J),DEL(J), J=M1,M2)                              RMS 2415
ISN 0075            GO TO 69                                                              RMS 2416
ISN 0076        673 WRITE(LPR,911)IAS,(Y(J),DEL(J), J=M1,M2)                              RMS 2417
ISN 0077        689 GO TO 69                                                              RMS 2418
ISN 0078        690 IF(IX.NE.3) GO TO 692                                                 RMS 2419
ISN 0080        691 WRITE (LPR,105) IAS                                                   RMS 2420
ISN 0081        105 FORMAT(1H ,T5,'*',T120,'*',/T5,'*',4X,'ITERATIONS TO CONVERGE=',      RMS 2421
                   1 I2,T120,'*',/4X,'**********************************************************RMS 2422
                   2**********************************************************************RMS 2423
                   4**')                                                                  RMS 2424
ISN 0082        692 CONTINUE                                                              RMS 2425
ISN 0083            IF (M2 .EQ. MCASES) RETURN                                            RMS 2426
ISN 0085            M1 = M1 + LMN                                                         RMS 2427
ISN 0086            LSTORE = LSTORE + KPIST                                               RMS 2428
ISN 0087            M2 = MINO(M2+LMN,MCASES)                                              RMS 2429
ISN 0088            GO TO 1                                                               RMS 2430
ISN 0089            END                                                                   RMS 2431
```

```
      COMPILER OPTIONS - NAME= MAIN,OPT=00,LINECNT=40,SIZE=0000K,
                         SOURCE,BCD,NOLIST,NODECK,LOAD,MAP,NOEDIT,NOID,NOXREF
ISN 0002              SUBROUTINE GRADN                                    RMS 2432
                C                                                         RMS 2433
                C    MACRO SIMULATION I - GRADN                           RMS 2434
                C                                                         RMS 2435
ISN 0003              DIMENSION D(1000)                                   RMS 2436
ISN 0004              COMMON /SIM/ M1,M2,MCASES,Y(1000),X(1000)           RMS 2437
                     1 ,MARK,LVAR                                         RMS 2438
ISN 0005              COMMON /FAT/ F(1000),LSTORE                         RMS 2439
ISN 0006              COMMON /CAT/ A(20,20)                               RMS 2440
ISN 0007              COMMON / BUG / ISBUG,KRD,LPR                        RMS 2441
ISN 0008            106 FORMAT (1H ,I4)                                   RMS 2442
ISN 0009              NN = 0                                              RMS 2443
ISN 0010              DO 1 I = M1,M2                                      RMS 2444
ISN 0011              NN = NN + 1                                         RMS 2445
ISN 0012              XD = .00001*Y(I)                                    RMS 2446
ISN 0013              IF (XD-.00001) 4, 4, 5                              RMS 2447
ISN 0014            4 XD = .001                                           RMS 2448
ISN 0015            5 Y(I) =Y(I) & XD                                     RMS 2449
ISN 0016              CALL VALUE                                          RMS 2450
ISN 0017              DO 2 J = M1,M2                                      RMS 2451
ISN 0018            2 D(J) = F(J)                                         RMS 2452
ISN 0019              Y(I) = Y(I) - 2.0*XD                                RMS 2453
ISN 0020              CALL VALUE                                          RMS 2454
ISN 0021               KK = 0                                             RMS 2455
ISN 0022              DO 3 J = M1,M2                                      RMS 2456
ISN 0023              KK = KK + 1                                         RMS 2457
ISN 0024            3 A(KK,NN) = (D(J)-F(J))/(XD*2.)                      RMS 2458
ISN 0025            1 Y(I) = Y(I) & XD                                    RMS 2459
ISN 0026              RETURN                                              RMS 2460
ISN 0027              END                                                 RMS 2461
```

```
      COMPILER OPTIONS - NAME=  MAIN,OPT=00,  NECNT=40,SIZE=0000K,
                         SOURCE,BCD,NOLIST,NODECK,LOAD,MAP,NOEDIT,NOID,NOXREF
ISN 0002            SUBROUTINE VERT                                          RMS 2462
                    C                                                        RMS 2463
                    C   MACRO SIMULATION I - VERT                            RMS 2464
                    C                                                        RMS 2465
ISN 0003            COMMON /SIM/ M1,M2,MCASES,Y(1000),X(1000)                RMS 2466
                   1 ,MARK,LVAR                                              RMS 2467
ISN 0004            COMMON /CAT/ A(20,20)                                    RMS 2468
ISN 0005            COMMON / BUG / ISBUG,KRD,LPR                             RMS 2469
ISN 0006          7 DO 1 K=1,LVAR                                            RMS 2470
ISN 0007            R = 1.0/A(K,K)                                           RMS 2471
ISN 0008            A(K,K) = 1.0                                             RMS 2472
ISN 0009            DO 2 J=1,LVAR                                            RMS 2473
ISN 0010          2 A(K,J) = R*A(K,J)                                        RMS 2474
ISN 0011            DO 1 I=1,LVAR                                            RMS 2475
ISN 0012            IF (K-I) 3,1,3                                           RMS 2476
ISN 0013          3 AIK = A(I,K)                                             RMS 2477
ISN 0014            A(I,K) = 0.0                                             RMS 2478
ISN 0015            DO 4 J=1,LVAR                                            RMS 2479
ISN 0016          4 A(I,J) = A(I,J) - AIK*A(K,J)                             RMS 2480
ISN 0017          1 CONTINUE                                                 RMS 2481
ISN 0018            RETURN                                                   RMS 2482
ISN 0019            END                                                      RMS 2483
```

3.0 PROGRAM IOA (INPUT-OUTPUT ANALYSIS)

3.1 Introduction

Program IOA contains a 100 sector United States input-output flow table, and is designed to conduct the following functions:

- First of all, this input-output table can be aggregated into a new table according to the number of sectors desired by the user. The maximum number of the sectors after aggregation must not exceed 49. Then the program will estimate a new input-output coefficient table and the corresponding Leontief inverse matrix.

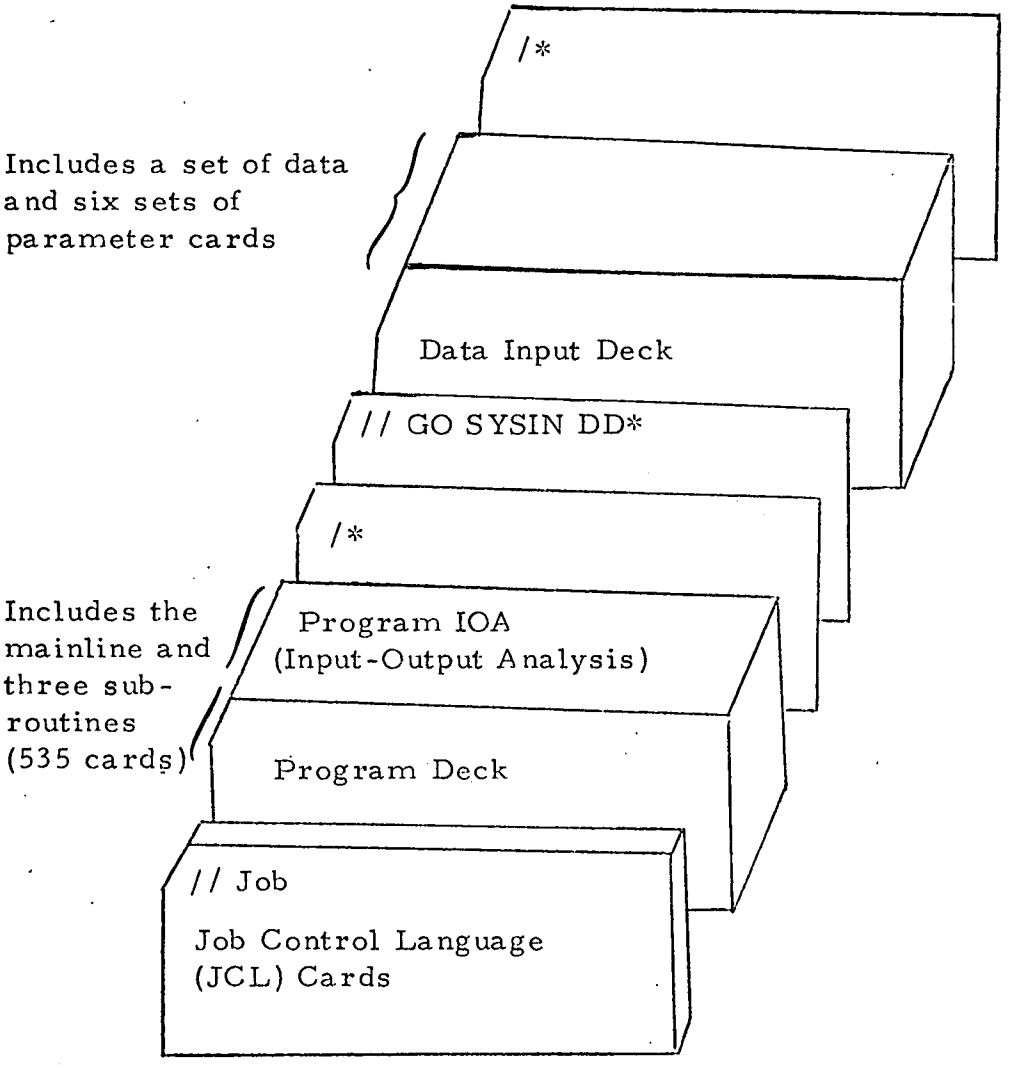
- Take changes in the final demand by sector as the input, and calculate the changes in the gross domestic products by sector (in terms of value of shipment).

- If change in the total consumption of the United States is given, the program will estimate changes in consumtpion by sector acccording to average propensity to consume by sector stored in the program and calculate changes in the gross domestic products by sector (in terms of value of shipments).

A detailed description of input preparations and the program is provided in the following sections.

3.2 Job Deck Setup

The Program IOA (Input-Output Analysis) is a 535 statement FORTRAN program which uses approximately 184K of core and 30 seconds on the IBM 360/75.



3.3 Data Input Deck

This deck includes seven sets of parameter and input data cards, a total of 1,391 cards* arranged in the following manner.

1. Original Input-Output Flow Table: 1,296 cards

   Flow table is arranged by reading the first 10 columns of the table, then the next 10 columns, etc.

Cols. 1-70	10F7.0, each card reads 10 fields, that is, first 10 columns of first row of the input-output table and then first 10 columns of second row of the table, and so on.
Cols. 73-75	I3, identification of the tenth of the column of the I-O flow table; for example, 10th, 20th, 30th, etc.
Cols. 78-80	I3, number of the row of the I-O flow table, i.e., 1, 2, 3, etc.

2. Dimension Card: 1 card

   This card specifies the matrix dimensions of the original and aggregated I-O tables.

Cols. 1-4	115, total number of columns in the original table
Cols. 5-8	108, total number of rows in the original table

   The original I-O table included a detailed final demand sector, aggregation of rows or columns and some misdevious sectors.

---

*Number of cards will be changed according to the sectoring specified by the user. At present, the data input deck is prepared for a 42 sector input-output table.

Cols. 9-12 — I4, total number of columns in the new I-O table. At present, it includes 42 sectors but column 43 is consumption, therefore, it is 43.

Cols. 13-16 — I4, total number of rows in the new I-O table. Again, row 43 is value-added by sector, therefore, it is 43.

3. Sector Specification Card(s): 3 cards (for 42 sector table)

Since the new I-O table is an aggregation of the original I-O table, each sector in the new table contains one or more than one sector(s) from the original table. These cards specify the number of sectors which will be aggregated into each "new" sector in the form of format (20I4). For example, if the first sector of the new table aggregates three sectors and the second sector contains two sectors from the old table, punch 3 on column 4 and 2 on column 8 and so on.

4. Sector Ordering Cards: 6 cards (for 42 sector table)

Sectors in the original table must be lined up according to the order of the sector specification cards in the form of format (20I4). For example, if sectors 1, 4, 7 of the original table will be aggregated into the first sector of the new table, punch 1 on column 4, 4 on column 8, 7 on column 12 and so on.

5. Label Cards: 42 cards, one card for each new sector (42 sectors)

Cols. 1-28 — Label of the sector

6. Change of United States Consumption Expenditures: 1 card

Cols. 1-6 — F6.1 Benefit from cleaner air in terms of change in total consumption expenditures by ($ million). It will be distributed by average propensity to consume by sector.

7. Change in Final Demand by Sector: 42 cards, one card for each sector in the new I-O table

Cols. 1-10	F10.2 Change in final demand by sector, if it is a decrease of the demand, add a negative sign ($ million).

3.4 Description of the Program Deck

The program consists of a mainline and three subroutines. The cards are sequenced along the right hand edge in columns 73-80 with the prefix IOA.

The program begins by reading the input-output table (100 sectors) from the cards. The program then immediately transfers control to subroutine AGGRE. The subroutine immediately reads in the first parameter card specifying the number of rows and columns in the original I-O table and the number of rows and columns which are to be in the aggregate matrix. Following this, cards are read in which tell AGGRE how many original sectors are to be aggregated in each of the new sectors and which of the original sectors are to be aggregated into which new sectors. AGGRE then proceeds to do the actual aggregation of old sectors into new sectors. When the aggregate sectors have been computed, control is returned to the main program.

The main program now reads and prints the labels for the sectors of the new I-O table calculated by AGGRE.

The program next tabulates and prints the new I-O flow table. Next, the new I-O coefficients table is generated and printed. The program now calls subroutine MINVR which calculates the Leontief inverse matrix of the I-O table. When control is returned from MINVR, the Leontief inverse matrix and its determinant are printed. The program now reads the estimated average consumption by sector, calculates and prints each sector's share of the increased consumption. Next, a series of cards, which contain the change in final demand by sector, are read. Changes in domestic products by sector due to the air pollution control are now calculated and the resultant cost and benefit to the structure of the national economy is printed, and the program terminates.

The flow chart of Program IOA is given in Figure 3.1 and the program listing is provided in Section 3.5.

FIGURE 3.1

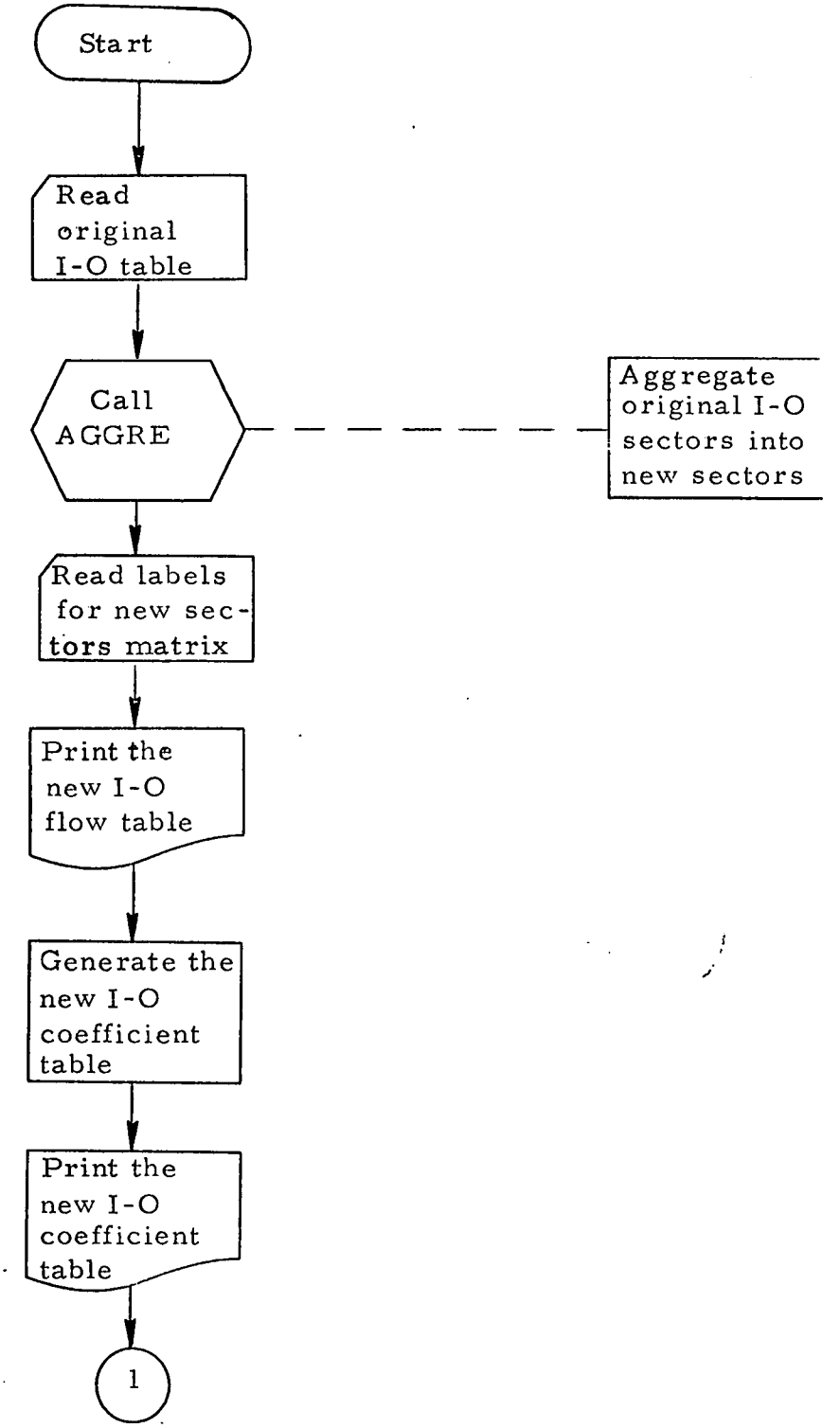
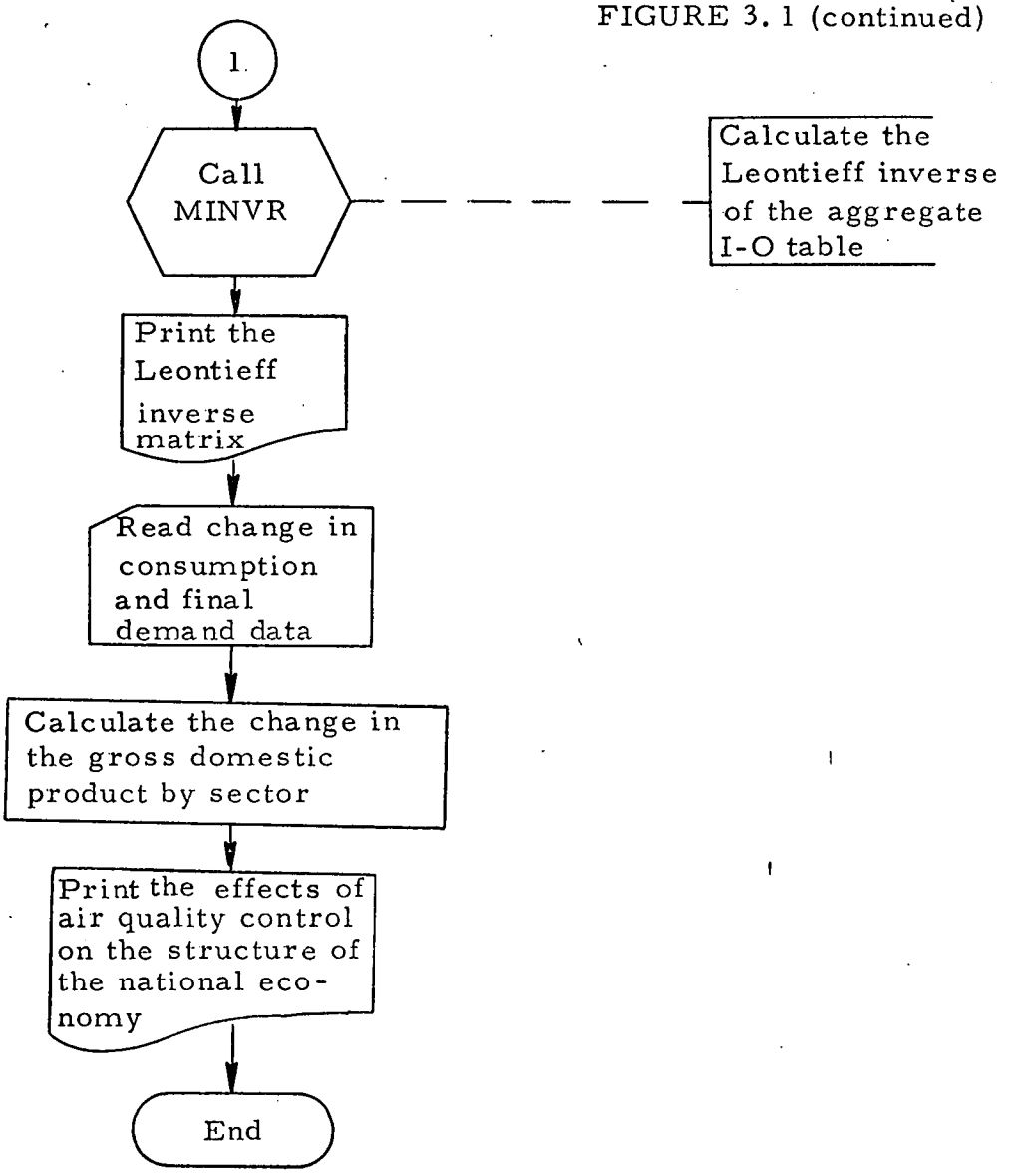

Start
Read original I-O table
Call AGGRE
Aggregate original I-O sectors into new sectors
Read labels for new sectors matrix
Print the new I-O flow table
Generate the new I-O coefficient table
Print the new I-O coefficient table
1

FIGURE 3.1 (continued)



3.5 Program IOA (Input-Output Analysis)

```
C**********************************************************      IOA  00
C*                                                        *      IOA  002
C*                      PROGRAM IOA                       *      IOA  003
C*          PREPARED BY CONSAD RESEARCH CORPORATION       *      IOA  004
C*                      APRIL 1971                        *      IOA  005
C*                                                        *      IOA  006
C*  THIS PROGRAM READS IN THE 100X100 INPUT/OUTPUT TABLE, *      IOA  007
C*            REDUCES IT TO A SMALLER MATRIX,             *      IOA  008
C*      CALCULATES THE NEW AGGREGATE I/O COEFFICIENTS      *      IOA  009
C*      AND THE CORRESPONDING LEONTIEF INVERSE MATRIX,     *      IOA  010
C*         GENERATES A MODIFIED CONSUMPTION VECTOR,        *      IOA  011
C*  AND ESTIMATES THE NET EFFECT OF AIR POLLUTION CONTROL  *      IOA  012
C*                ON THE NATIONAL ECONOMY                 *      IOA  013
C*                                                        *      IOA  014
C**********************************************************      IOA  015
                                                                  IOA  027
                                                                  IOA  028
  100 SECTORS INCLUDED IN THE INPUT-OUTPUT TABLE                  IOA  029
                                                                  IOA  030
      1 LIVESTOCK AND LIVESTOCK PRODUCTS                          IOA  031
      2 OTHER AGRICULTURAL PRODUCTS                               IOA  032
      3 FORESTRY AND FISHERY PRODUCTS                             IOA  033
      4 AGRICULTURAL, FORESTRY AND FISHERY SERVICES               IOA  034
      5 IRON AND FERROALLOY ORES MINING                           IOA  035
      6 NONFERROUS METAL ORES MINING                              IOA  036
      7 COAL MINING                                               IOA  037
      8 CRUDE PETROLEUM AND NATURAL GAS                           IOA  038
      9 STONE AND CLAY MINING AND QUARRYING                       IOA  039
     10 CHEMICAL AND FERTILIZER MINERAL MINING                    IOA  040
     11 RESIDENTIAL BUILDINGS                                     IOA  041
     12 PRIVATE INDUSTRIAL BUILDINGS                              IOA  042
     13 OTHER PRIVATE NON-RESIDENTIAL BUILDINGS                   IOA  043
     14 OTHER PRIVATE CONSTRUCTION                                IOA  044
     15 PUBLIC NON-RESIDENTIAL BUILDINGS                          IOA  045
     16 HIGHWAYS                                                  IOA  046
     17 ALL OTHER PUBLIC CONSTRUCTION                             IOA  047
     18 MAINTENANCE AND REPAIR CONSTRUCTION                       IOA  048
     19 ORDNANCE AND ACCESSORIES                                  IOA  049
     20 MEAT PRODUCTS                                             IOA  050
     21 DAIRY PRODUCTS                                            IOA  051
     22 CANNING, PRESERVING FRUITS, VEGETABLES, AND SEA FOODS     IOA  052
     23 GRAIN MILL PRODUCTS                                       IOA  053
     24 BAKERY PRODUCTS                                           IOA  054
     25 SUGAR                                                     IOA  055
     26 CONFECTIONERY AND RELATED PRODUCTS                        IOA  056
     27 BEVERAGE INDUSTRIES                                       IOA  057
     28 MISCELLANEOUS FOOD AND KINDRED PRODUCTS                   IOA  058
```

29	TOBACCO MAN FACTURES	IOA	059
30	BROAD AND NARROW FABR CS, YARN AND THREAD M _.S	IOA	060
31	MISC. TEXTILE GOODS AND FLOOR COVERINGS	IOA	061
32	APPAREL	IOA	062
33	MISC. FABRICATED TEXTILE PRODUCTS	IOA	063
34	LUMBER AND WOOD PRODUCTS, EXC. CONTAINERS	IOA	064
35	WOODEN CONTAINERS	IOA	065
36	HOUSEHOLD FURNITURE	IOA	066
37	OTHER FURNITURE AND FIXTURES	IOA	067
38	PAPER AND ALLIED PRODUCTS, EXC. CONTAINERS	IOA	068
39	PAPERBOARD CONTAINERS AND BOXES	IOA	069
40	PRINTING AND PUBLISHING	IOA	070
41	CHEMICALS AND SELECTED CHEMICAL PRODUCTS	IOA	071
42	PLASTICS AND SYNTHETIC MATERIALS	IOA	072
43	DRUGS, CLEANING, AND TOILET PREPARATIONS	IOA	073
44	PAINTS AND ALLIED PRODUCTS	IOA	074
45	PETROLEUM REFINING AND RELATED INDUSTRIES	IOA	075
46	RUBBER AND MISCELLANEOUS PLASTICS PRODUCTS	IOA	076
47	LEATHER TANNING AND INDUSTRIAL LEATHER PRODUCTS	IOA	077
48	FOOTWEAR AND OTHER LEATHER PRODUCTS	IOA	078
49	GLASS AND GLASS PRODUCTS	IOA	079
50	STONE AND CLAY PRODUCTS	IOA	080
51	PRIMARY IRON AND STEEL MANUFACTURING	IOA	081
52	COPPER MANUFACTURING	IOA	082
53	ALUMINUM MANUFACTURING	IOA	083
54	OTHER NONFERROUS METALS MANUFACTURING	IOA	084
55	METAL CONTAINERS	IOA	085
56	HEATING, PLUMBING AND STRUCTURAL METAL PRODUCTS	IOA	086
57	STAMPINGS, SCREW MACHINE PRODUCTS AND BOLTS	IOA	087
58	OTHER FABRICATED METAL PRODUCTS	IOA	088
59	ENGINES AND TURBINES	IOA	089
60	FARM MACHINERY AND EQUIPMENT	IOA	090
61	CONSTRUCTION, MINING, AND OIL FIELD MACHINERY	IOA	091
62	MATERIALS HANDLING MACHINERY AND EQUIPMENT	IOA	092
63	METALWORKING MACHINERY AND EQUIPMENT	IOA	093
64	SPECIAL INDUSTRY MACHINERY AND EQUIPMENT	IOA	094
65	GENERAL INDUSTRIAL MACHINERY AND EQUIPMENT	IOA	095
66	MACHINE SHOP PRODUCTS	IOA	096
67	OFFICE, COMPUTING AND ACCOUNTING MACHINES	IOA	097
68	SERVICE INDUSTRY MACHINES	IOA	098
69	ELECTRIC INDUSTRIAL EQUIPMENT AND APPARATUS	IOA	099
70	HOUSEHOLD APPLIANCES	IOA	100
71	ELECTRIC LIGHTING AND WIRING EQUIPMENT	IOA	101
72	RADIO, TV AND COMMUNICATION EQUIPMENT	IOA	102
73	ELECTRIC COMPONENTS AND ACCESSORIES	IOA	103
74	MISC. ELECTRICAL MACHINERY, EQUIPMENT AND SUPPLIES	IOA	104
75	MOTOR VEHICLES AND EQUIPMENT	IOA	105

```
      76 AIRCRAFT AND PARTS                                              IOA  106
      77 OTHER TRANSPORTATION EQUIPMENT                                   OA  107
      78 SCIENTIFIC AND CONTROLLING INSTRUMENTS                          IOA  108
      79 OPTICAL, OPHTHALMIC AND PHOTOGRAPHIC EQUIPMENT                  IOA  109
      80 MISCELLANEOUS MANUFACTURING                                     IOA  110
      81 TRANSPORTATION AND WAREHOUSING                                  IOA  111
      82 COMMUNICATIONS, EXC. RADIO AND TV BROADCASTING                  IOA  112
      83 RADIO AND TV BROADCASTING                                       IOA  113
      84 ELECTRIC UTILITIES                                              IOA  114
      85 GAS UTILITIES                                                   IOA  115
      86 WATER AND SANITARY SERVICES                                     IOA  116
      87 WHOLESALE AND RETAIL TRADE                                      IOA  117
      88 FINANCE AND INSURANCE                                           IOA  118
      89 REAL ESTATE AND RENTAL                                          IOA  119
      90 HOTELS, PERSONAL AND REPAIR SERVICES EXC. AUTO                  IOA  120
      91 BUSINESS SERVICES                                               IOA  121
      92 RESEARCH AND DEVELOPMENT                                        IOA  122
      93 AUTOMOBILE REPAIR AND SERVICES                                  IOA  123
      94 AMUSEMENTS                                                      IOA  124
      95 MEDICAL, EDUCATIONAL SERVICES, AND NONPROFIT ORG.               IOA  125
      96 FEDERAL GOVERNMENT ENTERPRISES                                  IOA  126
      97 STATE AND LOCAL GOVERNMENT ENTERPRISES                          IOA  127
      98 GROSS IMPORTS OF GOODS AND SERVICES                             IOA  128
      99 BUSINESS TRAVEL, ENTERTAINMENT, AND GIFTS                       IOA  129
     100 OFFICE SUPPLIES                                                 IOA  130
                                                                         IOA  131
    DIMENSION AK(150)                                                    IOA  016
    DIMENSION COLSU(10)                                                  IOA  017
    DIMENSION B(50,50),C(22,31),SUM(31)                                  IOA  018
    DIMENSION LABEL(10,50)                                               IOA  019
    DIMENSION STORE(50,3),P(50,50),S(50,50),VECTOR(50)                   IOA  020
    COMMON BK(108,150)                                                   IOA  021
    COMMON NARK,ITEST,IRO(50),IROW,STEP                                  IOA  022
    COMMON AIN(3000),A(120,150),NC,NR,IC,IR                              IOA  023
    COMMON KRD,LPR,KP                                                    IOA  024
    EQUIVALENCE (MN,IR),(S(1,1),A(1,1)),( AK(1),VECTOR(1)),              IOA  025
   1(BK(1,1),P(1,1)),(A(51,51),STORE(1,1))                               IOA  026
    KRD = 5                                                              IOA  132
    LPR = 6                                                              IOA  133
    KP = 7                                                               IOA  134
    STEP = 0.0                                                           IOA  135
    DO 10 I=1,50                                                         IOA  136
 10 IRO(I) = I                                                           IOA  137
    IREC=0                                                               IOA  138
    MULT=10                                                              IOA  139
    IADD=9                                                               IOA  140
    JMI=1000                                                             IOA  141
```

```
      DO 20 M=1,12                                                      IOA   42
      KK=0                                                              IOA   43
      IF (M-12) 21,22,22                                                IOA  144
   22 MULT=5                                                            IOA  145
      IADD=4                                                            IOA  146
      JHI=540                                                           IOA  147
   21 DO 25 J=1,108                                                     IOA  148
      ILO=(J-1)*MULT+1                                                  IOA  149
      IHI=ILO+IADD                                                      IOA  150
   25 READ (KRD,703)  (AIN(I),I=ILO,IHI)                               IOA  151
  703 FORMAT (10F7.1)                                                   IOA  152
      DO 65 I=1,10                                                      IOA  153
   65 COLSU(I) = 0.0                                                    IOA  154
      DO 61 MAD1=1,106                                                  IOA  155
      DO 60 MAD=1,MULT                                                  IOA  156
      KK=KK+1                                                           IOA  157
   60 COLSU(MAD) = COLSU(MAD)+AIN(KK)                                   IOA  158
   61 CONTINUE                                                          IOA  159
      WRITE (LPR,800) (COLSU(JJ),JJ=1,MULT)                             IOA  160
  800 FORMAT (1X,10F10.1)                                               IOA  161
      DO 30 IM=1,MULT                                                   IOA  162
      IREC=IREC+1                                                       IOA  163
      J=0                                                               IOA  164
      DO 50 I=IM,JHI,MULT                                               IOA  165
      J=J+1                                                             IOA  166
   50 A(IREC,J) = AIN(I)                                                IOA  167
   30 CONTINUE                                                          IOA  168
   20 CONTINUE                                                          IOA  169
                                                                        IOA  170
      AGGREGATES I/O MATRIX                                             IOA  171
                                                                        IOA  172
      CALL AGGRE                                                        IOA  173
      IR1=IR - 1                                                        IOA  174
      IR2 = IR + 1                                                      IOA  175
      IR3 = IR + 2                                                      IOA  176
      IC1 = IC - 1                                                      IOA  177
      WRITE (6,4)                                                       IOA  178
    4 FORMAT(1H1,25X,'THE INDUSTRIAL SECTORS REFERED TO BY NUMBER IN THEIOA  179
     1 GENERAL'/26X,'FLOW TABLE AND THE INPUT/OUTPUT TABLE ARE DEFINED'/IOA  180
     226X,'AS FOLLOWS...'//)                                            IOA  181
      DO 3 J=1,IR1                                                      IOA  182
      READ(5,1) (LABEL(I,J), I=1,7)                                     IOA  183
    3 WRITE(6,2) (LABEL(I,J), I=1,7),J                                  IOA  184
    1 FORMAT (7A4)                                                      IOA  185
    2 FORMAT(1H ,30X,7A4,3X,'- SECTOR',I3)                              IOA  186
      WRITE (LPR,116) IR1                                               IOA  187
  116 FORMAT(1H1,40X,'GENERAL FLOW TABLE (',I3,' - SECTORS )'//)        IOA  188
```

```
C                                                                       IOA   89
C    PRINTS OUT THE NEW GENERAL FLOW TABLE                              IOA   90
C                                                                       IOA   191
     M = 0                                                              IOA   192
 501 DO 601 I=1,IC                                                      IOA   193
     DO 602 J=1,IR                                                      IOA   194
     M = M + 1                                                          IOA   195
 602 B(I,J) = AIN(M)                                                    IOA   196
 601 CONTINUE                                                           IOA   197
C                                                                       IOA   198
C     TABULATES THE COLUMN SUMS                                         IOA   199
C                                                                       IOA   200
     DO 603 J = 1,IC                                                    IOA   201
     B(J,IR2) = 0.0                                                     IOA   202
     DO 603 I = 1,IR1                                                   IOA   203
 603 B(J,IR2) = B(J,IR2) + B(J,I)                                       IOA   204
     B(IC,IR) = 0.0                                                     IOA   205
C                                                                       IOA   206
     IROW = IR2                                                         IOA   207
     ITEST = IC                                                         IOA   208
     STEP = 0                                                           IOA   209
     CALL PRINT(B)                                                      IOA   210
C                                                                       IOA   211
C                                                                       IOA   212
C    GENERATES THE AGGREGATE I/O TABLE                                  IOA   213
C                                                                       IOA   214
     WRITE(LPR,655) IR1                                                 IOA   215
 655 FORMAT(1H1,35X,'INPUT/OUTPUT TABLE (',I2,' - SECTORS)'//)          IOA   216
     DO 606 N=1,IC                                                      IOA   217
     CON = B(N,IR) + B(N,IR2)                                           IOA   218
     B(N,IR3) = 0.0                                                     IOA   219
     IF(CON)6,606,6                                                     IOA   220
   6 DO 607 I=1,IR                                                      IOA   221
     B(N,I) = B(N,I)/CON                                                IOA   222
 627 B(N,IR3) = B(N,IR3) + B(N,I)                                       IOA   223
 607 CONTINUE                                                           IOA   224
     B(N,IR2) = B(N,IR2)/CON                                            IOA   225
 606 CONTINUE                                                           IOA   226
C                                                                       IOA   227
     IROW = IR3                                                         IOA   228
     ITEST = IC                                                         IOA   229
     STEP = 1                                                           IOA   230
     CALL PRINT (B)                                                     IOA   231
     WRITE(6,6666) IR1,IR1,IR1,IR1                                      IOA   232
6666 FORMAT(//45X, 'NOTE..ROW-',I2,'+1 = VALUE ADDED (PERCENTAGE)'      IOA   233
    1   /51X,'ROW-',I2,'+2 = INTERMEDIATE PRODUCT (PERCENTAGE, SUM OF RIOA   234
    2ROWS 1-',I2,')'/51X,'ROW-',I2,'+3 = TOTAL')                        IOA   235
```

```
                                                                      IOA  236
                                                                      IOA  237
      THE LEONTIEF INVERSE                                            IOA  238
                                                                      IOA  239
      WRITE(LPR,742) IR1                                              IOA  240
  742 FORMAT(1H1,21X,'THE LEONTIEF INVERSE MATRIX OF THE INPUT/OUTPUT TAIOA  241
     1BLE (',I3,' SECTORS )'//)                                       IOA  242
      DO 7701 I=1,IC1                                                 IOA  243
      DO 7702 J = 1,IC1                                               IOA  244
 7702 B(I,J) = -B(I,J)                                                IOA  245
 7701 B(I,I) = 1.0 & B(I,I)                                           IOA  246
                                                                      IOA  247
      MA = IC1                                                        IOA  248
      DETA = 0.0                                                      IOA  249
      CALL MINVR (B,MA,DETA)                                          IOA  250
      WRITE (LPR,773) DETA                                            IOA  251
  773 FORMAT(1H ,'DETERMINANT=',F12.10)                               IOA  252
      IROW = IC1                                                      IOA  253
      ITEST = IC1                                                     IOA  254
      STEP = 1.0                                                      IOA  255
      CALL PRINT(B)                                                   IOA  256
                                                                      IOA  257
      MODIFIED CONSUMPTION VECTOR                                     IOA  258
         CON = ESTIMATED MARGINAL INCREASE IN CONSUMPTION             IOA  259
         B(IC,2) = PERCENTAGE CONSUMPTION OF EACH SECTOR              IOA  260
         AK(I) = EACH SECTORS SHARE OF THE INCREASED CONSUMPTION      IOA  261
                                                                      IOA  262
  111 FORMAT(F6.1)                                                    IOA  263
      READ(KRD,111) CON                                               IOA  264
      WRITE(6,647) CON                                                IOA  265
  647 FORMAT(1H1,38X,' CONSUMPTION BY SECTOR'/25X,                    IOA  266
     1'BENEFIT - CHANGE IN CONSUMPTION '                              IOA  267
     1'=',F6.1,' MILLION DOLLARS'//35X,'PERCENT',7X,'MILLION DOLLARS',5XIOA  268
     2'SECTOR DEFINITION')                                            IOA  269
      DO 643 I=1,IR1                                                  IOA  270
      AK(I) = CON*B(IC,I)                                             IOA  271
  643 WRITE(6,644) I,B(IC,I),AK(I),(LABEL(J,I), J=1,7)                IOA  272
  644 FORMAT(18X,'SECTOR-',I2,F14.6,8X,F10.2,8X,7A4)                  IOA  273
                                                                      IOA  274
       MULTIPLIES THE LEONTIEF INVERSE BY                             IOA  275
         1. MODIFIED CONSUMPTION VECTOR                               IOA  276
         2. CONTROL COST VECTOR                                       IOA  277
                                                                      IOA  278
      MN = IR1                                                        IOA  279
      STEP = 2                                                        IOA  280
      IROW = IR                                                       IOA  281
      ITEST = IR                                                      IOA  282
```

```
                                                                      IOA  283
      MARK = 1                                                        IOA  284
      GO TO 444                                                       IOA  285
 1000 MARK = MARK + 1                                                 IOA  286
      WRITE(6,777)                                                    IOA  287
  777 FORMAT(1H1,25X,'AIR POLUTION CONTROL COST - CHANGE IN FINAL DEMANDIOA  288
     1'//)                                                            IOA  289
      READ(5,11) (VECTOR(J), J=1,MN)                                  IOA  290
   71 FORMAT(30X,'SECTOR-',I2,F11.3,4X,7A4)                           IOA  291
   11 FORMAT(F10.2,70X)                                               IOA  292
      DO 7777 J=1,MN                                                  IOA  293
      WRITE(6,71) J,VECTOR(J),(LABEL(I,J), I=1,7)                     IOA  294
 7777 CONTINUE                                                        IOA  295
  444 CONTINUE                                                        IOA  296
      DO 23 IK = 1,MN                                                 IOA  297
      STORE(IK,MARK) = 0.0                                            IOA  298
      DO 23 J=1,MN                                                    IOA  299
      S(J,IK) = B(J,IK) * VECTOR(J)                                   IOA  300
      STORE(IK,MARK) = STORE(IK,MARK) + S(J,IK)                       IOA  301
   23 CONTINUE                                                        IOA  302
      IF(MARK-1) 32,31,32                                             IOA  303
   32 WRITE(6,33)                                                     IOA  304
   33 FORMAT(1H1,20X,' AIR POLUTION CONTROL. EFFECT OF COST ON STRUCTUREIOA  305
     1 OF NATIONAL ECONOMY'//)                                        IOA  306
      GO TO 34                                                        IOA  307
                                                                      IOA  308
   31 WRITE(6,35)                                                     IOA  309
   35 FORMAT(1H1,20X,' AIR POLUTION CONTROL. BENEFICIAL EFFECT ON STRUCTIOA  310
     1URE  OF NATIONAL ECONOMY'//)                                    IOA  311
      DO 36 ICT = 1,MN                                                IOA  312
      DO 36 ICP = 1,MN                                                IOA  313
   36 P(ICT,ICP) = S(ICT,ICP)                                         IOA  314
   34 CALL PRINT (S)                                                  IOA  315
      IF(MARK-2) 1000,37,2000                                         IOA  316
   37 MARK = 3                                                        IOA  317
      DO 38 I=1,MN                                                    IOA  318
      STORE(I,3) = STORE(I,1) + STORE(I,2)                            IOA  319
      DO 38 J=1,MN                                                    IOA  320
   38 S(I,J) = P(I,J) + S(I,J)                                        IOA  321
      WRITE(6,330)                                                    IOA  322
  330 FORMAT(                  1H1,30X,' AIR POLUTION CONTROL. NET EFFECIOA  323
     1T ON STRUCTURE OF NATIONAL ECONOMY'//)                          IOA  324
      GO TO 34                                                        IOA  325
 2000 CONTINUE                                                        IOA  326
   81 FORMAT(1H1,20X,'SUMMARY OF EFFECT OF AIR POLUTION CONTROL ON STRUCIOA  327
     1TURE OF NATIONAL ECONOMY'/50X,'(IN MILLIONS)'//                 IOA  328
     2                    29X,21HX,'EFFECT OF',7X,'NET'/29X,          IOA  329
```

```
    23X,' BENEF  ',3X,'    C:S ',7X,'EFFECT'/                                  IOA  330
                                                                               IOA  331
      DO 2222 K=1,3                                                            IOA  332
2222  STORE(IR2,K) = 0.0                                                       IOA  333
      WRITE(6,81)                                                              IOA  334
      DO 222 I=1,MN                                                            IOA  335
      WRITE (6,44) I,(STORE(I,MARK),MARK=1,3),(LABEL(J,I),J=1,7)               IOA  336
      DO 222 K=1,3                                                             IOA  337
      STORE(IR2,K) = STORE(IR2,K) + STORE(I,K)                                 IOA  338
 222  CONTINUE                                                                 IOA  339
      WRITE(6,4444) (STORE(IR2,MARK),MARK=1,3)                                 IOA  340
  44  FORMAT(20X,'SECTOR-',I2,3F12.2,5X,7A4)                                   IOA  341
4444  FORMAT(24X,'TOTAL',3F12.2)                                               IOA  342
                                                                               IOA  343
      STOP                                                                     IOA  344
      END                                                                      IOA  345
      SUBROUTINE AGGRE                                                         IOA  346
      DIMENSION B(150),JCOM(100),KCOM(150)                                     IOA  347
      COMMON BK(108,150)                                                       IOA  348
      COMMON MARK,ITEST,IRO(50),IROW,STEP                                      IOA  349
      COMMON AIN(3000),A(120,150),NC,NR,IC,IR                                  IOA  350
      COMMON KRD,LPR,KP                                                        IOA  351
C     PROGRAM ASSUMES MATRIX TO BE AGGREGATED HAS BEEN READ IN AND STORED      IOA  352
C     BY COLUMNS ON DISK AND ALSO THAT THE DEFINE FILE CARDS                   IOA  353
C      IN THE MAIN PROGRAM ARE AS FOLLOWS                                      IOA  354
C     NC = TOTAL = OF COLUMNS IN INPUT MATRIX                                  IOA  355
C     NR = TOTAL = OF ROWS IN INPUT MATRIX                                     IOA  356
C     IC = TOTAL = OF COLUMNS IN OUTPUT MATRIX                                 IOA  357
C     IR = TOTAL = OF ROWS IN OUTPUT MATRIX                                    IOA  358
                                                                               IOA  359
C       ** WARNING ** THE LAST ROW IN THE OUTPUT MATRIX MUST BE                IOA  360
C                     108 (VALUE ADDED) IN THE INPUT TBL.  THE LAST COLUMN     IOA  361
C                     IN THE OUTPUT MATRIX MUST BE COLUMN 108                  IOA  362
C                     (CONSUMPTION) IN THE INPUT MATRIX.                       IOA  363
      READ (KRD,700)  NC,NR,IC,IR                                              IOA  364
      WRITE (LPR,700) NC,NR,IC,IR                                              IOA  365
      DO 5 I = 1,IC                                                            IOA  366
      DO 5 J = 1,NR                                                            IOA  367
      BK(I,J) = 0.0                                                            IOA  368
   5  CONTINUE                                                                 IOA  369
 700  FORMAT (20I4)                                                            IOA  370
      IF (IC-IR) 11,10,10                                                      IOA  371
  10  IMAX=IC                                                                  IOA  372
      NMAX=NC                                                                  IOA  373
      GO TO 12                                                                 IOA  374
  11  IMAX=IR                                                                  IOA  375
      NMAX=NR                                                                  IOA  376
```

```
   12 READ  KRD,700) (JCOM(I),I= .,IMAX                                  CA  377
      READ (KRD,700) (KCOM(I),I=1,NMAX                                   IOA  378
      K=0                                                                IOA  379
      DO 30 I=1,IC                                                       IOA  380
      JJ=JCOM(I)                                                         IOA  381
      DO 35 J=1,JJ                                                       IOA  382
      K=K+1                                                              IOA  383
      IREC=KCOM(K)                                                       IOA  384
      DO 36 L=1,NR                                                       IOA  385
   36 BK(I,L) = BK(I,L)&A(IREC,L)                                        IOA  386
   35 CONTINUE                                                           IOA  387
   30 CONTINUE                                                           IOA  388
      ITOP = IR*IC                                                       IOA  389
      DO 41 I=1,ITOP                                                     IOA  390
   41 AIN(I) = 0.0                                                       IOA  391
      M=0                                                                IOA  392
      DO 40 I=1,IC                                                       IOA  393
      K=0                                                                IOA  394
      DO 40 J=1,IR                                                       IOA  395
      JJ=JCOM(J)                                                         IOA  396
      M=M+1                                                              IOA  397
      DO 43 L=1,JJ                                                       IOA  398
      K=K+1                                                              IOA  399
      IF(K-109) 48,47,47                                                 IOA  400
   47 WRITE(6,49) K                                                      IOA  401
   49 FORMAT(1H1,'ERROR...TRIED TO ADD ROW-',I3,' AND THERE ARE ONLY 108IOA  402
     1'/1X,'MEANINGFUL ROWS IN THE INITIAL I/O TABLE'//)                 IOA  403
      STOP                                                               IOA  404
   48 CONTINUE                                                           IOA  405
      KK=KCOM(K)                                                         IOA  406
   43 AIN(M) = AIN(M)&BK(I,KK)                                           IOA  407
   40 CONTINUE                                                           IOA  408
   OUTPUT MATRIX ARRANGED IN AIN BY COLUMNS                              IOA  409
   RETURN TO MAIN PROGRAM TO WRITE  AGGREGATED MATRIX                    IOA  410
      RETURN                                                             IOA  411
      END                                                                IOA  412
      SUBROUTINE PRINT(B)                                                IOA  413
      DIMENSION B(50,50)                                                 IOA  414
      COMMON BK(108,150)                                                 IOA  415
      COMMON MARK,ITEST,IRO(50),IROW,STEP                                IOA  416
      COMMON AIN(3000),A(120,150),NC,NR,IC,IR                            IOA  417
      COMMON KRD,LPR,KP                                                  IOA  418
  700 FORMAT (1H ,7X,9(5X,'COL',I3)      )                               IOA  419
  702 FORMAT (1X,'ROW',I3,2X,10F11.0)                                    IOA  420
  705 FORMAT (1X,'ROW',I3,2X,10F11.4)                                    IOA  421
  703 FORMAT (1X,'ROW',I3,2X,10F11.7)                                    IOA  422
  704 FORMAT(10F8.6)                                                     IOA  423
```

```
      I< = 1                                                          CA  424
      MARK = (ITEST&8)/9                                              IOA  425
      DO 802 J=1,MARK                                                 IOA  426
      IJ = J*9                                                        IOA  427
      IF(IJ - ITEST)805,804,804                                       IOA  428
  804 IJ = ITEST                                                      IOA  429
  805 WRITE (LPR,700) (IRO(I),I=IK,IJ)                                IOA  430
      IF(STEP-1.0)333,332,334                                         IOA  431
  333 DO 801 M=1,IROW                                                 IOA  432
  801 WRITE (LPR,702) IRO(M),(B(I,M),I=IK,IJ)                         IOA  433
      GO TO 99                                                        IOA  434
  334 DO 822 M=1,IROW                                                 IOA  435
  822 WRITE(LPR,705) IRO(M),(B(I,M), I=IK,IJ)                         IOA  436
      GO TO 99                                                        IOA  437
  332 DO 811 M=1,IROW                                                 IOA  438
      WRITE (LPR,703) IRO(M),(B(I,M),I=IK,IJ)                         IOA  439
  811 CONTINUE                                                        IOA  440
   99 CONTINUE                                                        IOA  441
      IK = IJ & 1                                                     IOA  442
      WRITE (LPR,701)                                                 IOA  443
  802 CONTINUE                                                        IOA  444
  701 FORMAT(1H1)                                                     IOA  445
      RETURN                                                          IOA  446
      END                                                             IOA  447
      SUBROUTINE  MINVR (A,MA,DETA)                                   IOA  448
      DIMENSION A(50,50),IR(50),IC(50)                                IOA  449
      COMMON BK(108,150)                                              IOA  450
      COMMON MARK,ITEST,IRO(50),IROW,STEP                             IOA  451
      COMMON AIN(3000),D(120,150),NC,NR,ID,IK                         IOA  452
      COMMON KRD,LPR,KP                                               IOA  453
      DO1I=1,MA                                                       IOA  454
      IR(I)=0                                                         IOA  455
    1 IC(I)=0                                                         IOA  456
      DETA = 1.0                                                      IOA  457
      TOL = .000001                                                   IOA  458
      S=0.0                                                           IOA  459
      R=MA                                                            IOA  460
     *BEGIN*                                                          IOA  461
    2 I=0                                                             IOA  462
      J=0                                                             IOA  463
      TEST=0.0                                                        IOA  464
      DO 25 K=1,MA                                                    IOA  465
      IF(IR(K))25,39,25                                               IOA  466
   39 CONTINUE                                                        IOA  467
      DO 24 L=1,MA                                                    IOA  468
      IF(IC(L))24,38,24                                               IOA  469
   38 CONTINUE                                                        IOA  470
```

```
      X=ABS(A(K,L))                                                    CA  47
       =(X-TES  24,37,37                                               IOA 472
   37 CONTINUE                                                         IOA 473
      I=K                                                              IOA 474
      J=L                                                              IOA 475
      TEST=X                                                           IOA 476
   24 CONTINUE                                                         IOA 477
   25 CONTINUE                                                         IOA 478
                                                                       IOA 479
        THIS IS THE TEST FOR A DEPENDENT TOLERANCE                     IOA 480
                                                                       IOA 481
      IF(TOL)73,74,74                                                  IOA 482
   73 TOL=ABS(TOL*TEST)                                                IOA 483
   74 CONTINUE                                                         IOA 484
                                                                       IOA 485
$     *END* SUBMXS $$                                                  IOA 486
                                                                       IOA 487
      PIV=A(I,J)                                                       IOA 488
      DETA=PIV*DETA                                                    IOA 489
      IF(ABS(PIV)-TOL)17,17,35                                         IOA 490
   35 CONTINUE                                                         IOA 491
      IR(I)=J                                                          IOA 492
      IC(J)=I                                                          IOA 493
      PIV=1.0/PIV                                                      IOA 494
      A(I,J)=PIV                                                       IOA 495
      DO5K=1,MA                                                        IOA 496
      IF(K-J)36,5,36                                                   IOA 497
   36 A(I,K) = A(I,K)*PIV                                              IOA 498
    5 CONTINUE                                                         IOA 499
      DO9K=1,MA                                                        IOA 500
      IF(K-I)33,9,33                                                   IOA 501
   33 CONTINUE                                                         IOA 502
      PIV1=A(K,J)                                                      IOA 503
    6 DO8L=1,MA                                                        IOA 504
      IF(L-J)31,8,31                                                   IOA 505
   31 A(K,L) = A(K,L) - PIV1*A(I,L)                                    IOA 506
    8 CONTINUE                                                         IOA 507
    9 CONTINUE                                                         IOA 508
      DO11K=1,MA                                                       IOA 509
      IF(K-I)32,11,32                                                  IOA 510
   32 A(K,J) = -PIV*A(K,J)                                             IOA 511
   11 CONTINUE                                                         IOA 512
      S=S$1.0                                                          IOA 513
      IF(S-R)2,12,12                                                   IOA 514
   12 DO16I=1,MA                                                       IOA 515
      K=IC(I)                                                          IOA 516
      M=IR(I)                                                          IOA 517
```

```
      IF(K-I)41,6,4                                                    IOA  518
    4 CONTINUE                                                         IOA  519
      DETA=-DETA                                                       IOA  520
      DO14L=1,MA                                                       IOA  521
      TEMP=A(K,L)                                                      IOA  522
      A(K,L)=A(I,L)                                                    IOA  523
   14 A(I,L)=TEMP                                                      IOA  524
      DO15L=1,MA                                                       IOA  525
      TEMP=A(L,M)                                                      IOA  526
      A(L,M)=A(L,I)                                                    IOA  527
   15 A(L,I)=TEMP                                                      IOA  528
      IC(M)=K                                                          IOA  529
      IR(K)=M                                                          IOA  530
   16 CONTINUE                                                         IOA  531
      LEAVE WITH A WARNING OF ERROR                                    IOA  532
   17 INVER = S                                                        IOA  533
      RETURN                                                           IOA  534
      END                                                              IOA  535
```

4.0 PROGRAM FBE (Feedback Effects)

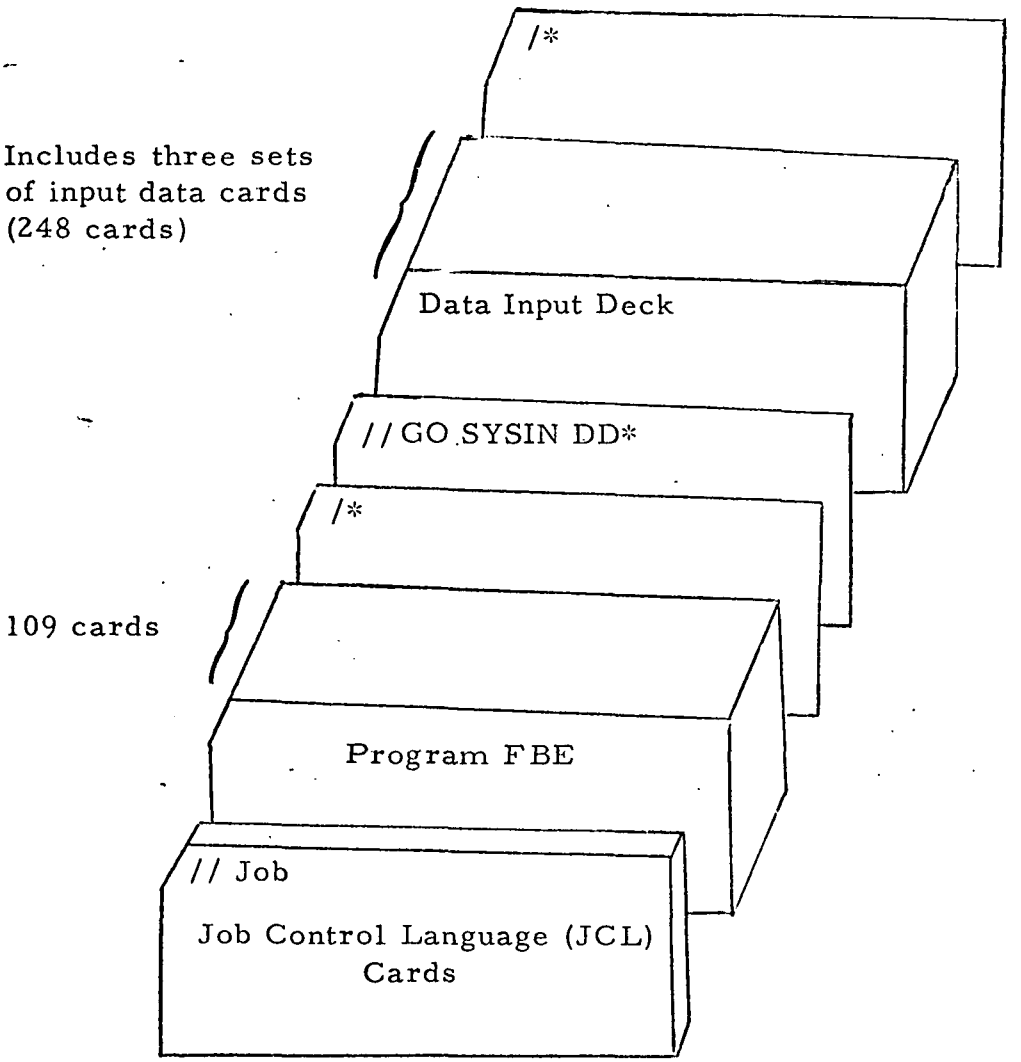
4.1 Introduction

Program FBE contains a regional market share matrix developed in Appendix D of Volume I of CONSAD's May 15 Report. The purpose of the program is to take the output from Program IOA and then distribute the interregional feedback to each AQCR. These interregional feedbacks are measured in terms of changes in value-added by two-digit SIC detail for manufacturing industries. Output from Program FBE also punches a deck of cards which will be part of input deck to the Program RMS to be used for simulation option 8 as described before.

Detailed specifications of the program preparation is given in the following sections.

4.2 Job Deck Set-Up

The Program FBE (Feedback Effect) is a 109 statement FORTRAN program which uses approximately 60K of core.



4.3 Data Input Deck

This deck includes three sets of input data cards, a total of 248 cards, arranged in the following manner.

1. The ratio of value-added/value of shipment by sector for 42 sectors under consideration (6 cards)

   Format: 8F10.4

2. Output from Program IOA, 42 cards, containing the cost and benefit effects of air quality control measured by changes in value of shipments by sector (one card/sector).

Cols. 1-10	F10.4, benefit effects
Cols. 11-20	F10.4, cost effects

3. The regional market share matrix, 200 cards, contains the share of national value-added by industry for each of the 100 AQCRs under consideration.

   First 100 cards contain market share of first 11 two-digit SICs by AQCR (SIC 20-30) (one card for each AQCR).

Cols. 1-5	I5, AQCR code
Cols. 6-10	F5.4, share for industry 20
Cols. 11-15	F5.4, share for industry 21
Cols. 16-20	F5.4, share for industry 22
Cols. 21-25	F5.4, share for industry 23
Cols. 26-30	F5.4, share for industry 24
Cols. 31-35	F5.4, share for industry 25
Cols. 36-40	F5.4, share for industry 26
Cols. 41-45	F5.4, share for industry 27
Cols. 46-50	F5.4, share for industry 28
Cols. 51-55	F5.4, share for industry 29
Cols. 56-60	F5.4, share for industry 30

   The second 100 cards contain market share of second nine two-digit SICs by AQCR (SIC 31-39) (one card for each AQCR)

Cols. 1-5	I5, AQCR code
Cols. 6-10	F5.4, share for industry 31
Cols. 11-15	F5.4, share for industry 32
Cols. 16-20	F5.4, share for industry 33
Cols. 21-25	F5.4, share for industry 34
Cols. 26-30	F5.4, share for industry 35
Cols. 31-35	F5.4, share for industry 36
Cols. 36-40	F5.4, share for industry 37
Cols. 41-45	F5.4, share for industry 38
Cols. 46-50	F5.4, share for industry 39

4.4 Description of the Program Deck

Program FBE is a FORTRAN program consisting of 109 statement cards. The cards are sequenced along the right hand edge (columns 73-80) with the prefix FBE.

The program begins by reading in data set one (the ratio of value-added/value of shipment). Immediately thereafter the cards produced by IOA (cost and benefit effects of air quality control) are read. The program then multiplies the cost and benefit for each sector by its respective ratio of value-added/shipment in order to convert the value of shipment by sector from Program IOA to value-added.

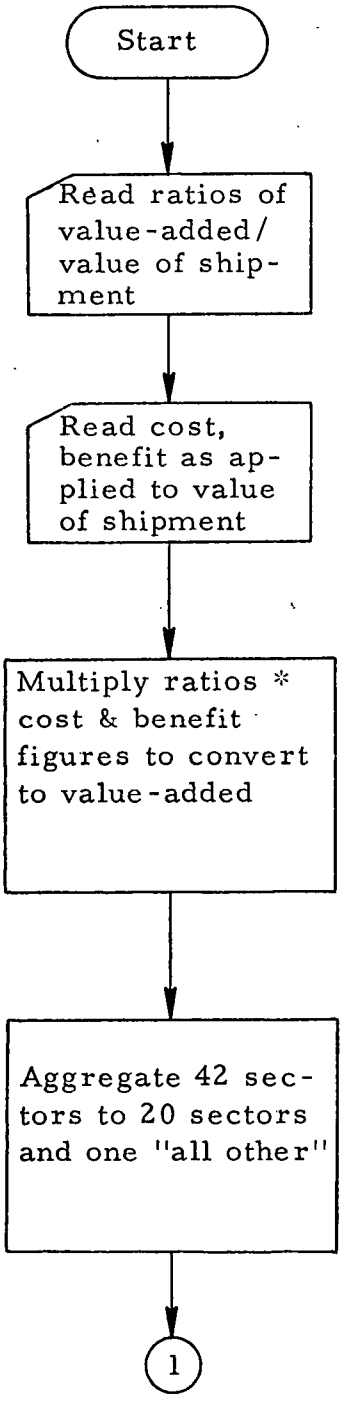
The next section of the program aggregates the 42 cost and benefit figures calculated above into 20 two-digit SICs and one "all other" industry classification. The program now punches and writes output cards containing (1) the benefit and cost to "all other" industries (1 card), and (2) the cost and benefit to the 20 two-digit SICs (20 cards).

Next the program reads in the regional market share matrix (data set 3). The program processes one AQCR at a time for the next set of calculations. For each AQCR, the cost and benefit for each two-digit SIC is multiplied by the share for that AQCR/SIC combination in order to determine the cost and/or benefit effect associated with industry in that AQCR. The net effect is calculated as the sum of the cost and benefit figures.

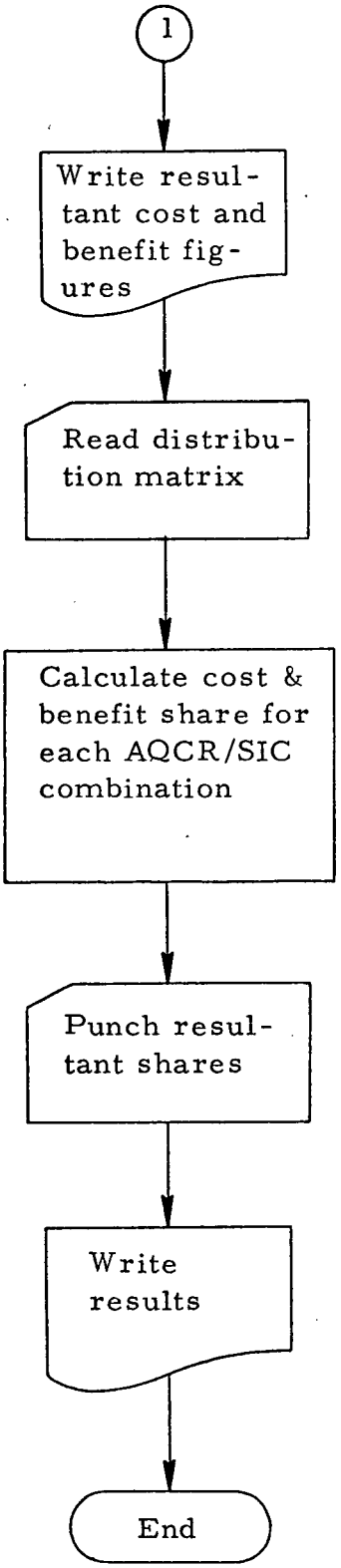
When all 100 AQCRs have been processed, the program punches card and writes output in three steps. First, the cost effect by AQCR is punched and written, seven two-digit SICs per card (or line) followed by the AQCR code. Thus, three cards are punched for each AQCR. The format used is (7F10.4, 3X, I3). (300 cards)

Second, a deck, identical in size and format, containing the benefit effect is punched and the output for benefit written. Finally, the deck containing the net figures is punched and written, and the program terminates.

FLOW CHART OF PROGRAM FBE



FLOW CHART OF PROGRAM FBE (continued)



4.5 Program FBE (Feedback Effect)

```
C*****************************************************************      FBE  001
C*                                                               *      FBE  002
C*                          PROGRAM FBE                          *      FBE  003
C*          PREPARED BY CONSAD RESEARCH CORPORATION              *      FBE  004
C*                          APRIL 1971                           *      FBE  005
C*                                                               *      FBE  006
C*    THIS PROGRAM CONTAINS A REGIONAL MARKET SHARE MATRIX       *      FBE  007
C*      AND CALCULATES THE INTERREGIONAL FEEDBACK EFFECT         *      FBE  008
C*                          TO 100 AOCR                          *      FBE  009
C*                                                               *      FBE  010
C*****************************************************************      FBE  011
      DIMENSION X(42), Y(42), Z(42), V(2), COST(20),BENE(20)             FBE  012
      DIMENSION DISTRB(100,20), DISTRA(100,20)                           FBE  013
      DATA COST, BENE / 20*0.0, 20*0.0 /                                 FBE  014
      DIMENSION DISTRC(100,20)                                           FBE  015
      DATA V / 2 * 0.0 /                                                 FBE  016
   10 FORMAT(8F10.4)                                                     FBE  017
      READ (5,10) (X(I), I = 1,42)                                       FBE  018
      DO 20 I = 1,42                                                     FBE  019
      READ(5,10) Y(I), Z(I)                                              FBE  020
      Y(I) = Y(I) * X(I)                                                 FBE  021
      Z(I) = Z(I) * X(I)                                                 FBE  022
   20 CONTINUE                                                           FBE  023
      DO 30 I = 1,9                                                      FBE  024
      V(1) = V(1) + Y(I)                                                 FBE  025
   30 V(2) = V(2) + Z(I)                                                 FBE  026
      COST(1) = Z(10)                                                    FBE  027
      BENE(1) = Y(10)                                                    FBE  028
      COST(2) = Z(11)                                                    FBE  029
      BENE(2) = Y(11)                                                    FBE  030
      COST(3) = .5 * Z(12)                                               FBE  031
      BENE(3) = .5 * Y(12)                                               FBE  032
      COST(4) = .5 * Z(12)                                               FBE  033
      BENE(4) = .5 * Y(12)                                               FBE  034
      DO 40 I = 13,21                                                    FBE  035
      J = I - 8                                                          FBE  036
      COST(J) = Z(I)                                                     FBE  037
      BENE(J) = Y(I)                                                     FBE  038
   40 CONTINUE                                                           FBE  039
      DO 50 I = 22,25                                                    FBE  040
      COST(14) = COST(14) + Z(I)                                         FBE  041
      BENE(14) = BENE(14) + Y(I)                                         FBE  042
   50 CONTINUE                                                           FBE  043
      DO 60 I = 26,29                                                    FBE  044
      J = I - 11                                                         FBE  045
      COST(J) = Z(I)                                                     FBE  046
      BENE(J) = Y(I)                                                     FBE  047
```

```
 60 CONTINUE                                                            FBE  048
    COST(19) = Z(29) + Z(30)                                            FBE  049
    BENE(19) = Y(29) + Y(30)                                            FBE  050
    DO 70 I = 31,32                                                     FBE  051
    J = I - 12                                                          FBE  052
    COST(J) = Z(I)                                                      FBE  053
    BENE(J) = Y(I)                                                      FBE  054
 70 CONTINUE                                                            FBE  055
    DO 80 I = 33,42                                                     FBE  056
    V(1) = V(1) + Y(I)                                                  FBE  057
    V(2) = V(2) + Z(I)                                                  FBE  058
 80 CONTINUE                                                            FBE  059
    WRITE (6,90) V                                                      FBE  060
 90 FORMAT(1H ,2F10.3)                                                  FBE  061
    DO 110 I = 1,20                                                     FBE  062
    J = I + 19                                                          FBE  063
    WRITE(7,100) COST(I),BENE(I), J                                     FBE  064
    WRITE(6,90) COST(I), BENE(I)                                        FBE  065
100 FORMAT(2F10.3,56X,I2)                                               FBE  066
110 CONTINUE                                                            FBE  067
    DO 120 I = 1,100                                                    FBE  068
    READ(5,115) (DISTRB(I,J), J = 1,11)                                 FBE  069
115 FORMAT(5X,11F5.4)                                                   FBE  070
120 CONTINUE                                                            FBE  071
    DO 130 I = 1,100                                                    FBE  072
    READ(5,115) (DISTRB(I,J), J = 12,20)                                FBE  073
    DO 125 J = 1,20                                                     FBE  074
    DISTRA(I,J) = DISTRB(I,J) * BENE(J)                                 FBE  075
    DISTRB(I,J) = DISTRB(I,J) * COST(J)                                 FBE  076
    DISTRC(I,J) = DISTRA(I,J) + DISTRB(I,J)                             FBE  077
125 CONTINUE                                                            FBE  078
130 CONTINUE                                                            FBE  079
    DO 150 I = 1,100                                                    FBE  080
    WRITE(6,140) DISTRB(I,1), (DISTRB(I,J), J = 3,8), I                 FBE  081
    WRITE(7,145) DISTRB(I,1), (DISTRB(I,J), J = 3,8), I                 FBE  082
    WRITE(6,140) (DISTRB(I,J), J = 9,15), I                             FBE  083
    WRITE(7,145)(DISTRB(I,J), J = 9,15), I                              FBE  084
    WRITE(6,142) (DISTRB(I,J), J = 16,20), I                            FBE  085
    WRITE(7,147) (DISTRB(I,J), J = 16,20), I                            FBE  086
150 CONTINUE                                                            FBE  087
    DO 160 I = 1,100                                                    FBE  088
    WRITE(6,140) DISTRA(I,1), (DISTRA(I,J), J = 3,8), I                 FBE  089
    WRITE(7,145) DISTRA(I,1), (DISTRA(I,J), J = 3,8), I                 FBE  090
    WRITE(6,140) (DISTRA(I,J), J = 9,15), I                             FBE  091
    WRITE(7,145) (DISTRA(I,J), J = 9,15), I                             FBE  092
    WRITE(6,142) (DISTRA(I,J), J = 16,20), I                            FBE  093
    WRITE(7,147) (DISTRA(I,J), J = 16,20), I                            FBE  094
```

```
160 CONTINUE                                                          FBE  095
    DO 170 I = 1,100                                                  FBE  096
    WRITE(6,140) DISTRC(I,1), (DISTRC(I,J), J = 3,8), I               FBE  097
    WRITE(7,145) DISTRC(I,1), (DISTRC(I,J), J = 3,8), I               FBE  098
    WRITE(6,140) (DISTRC(I,J), J = 9,15), I                           FBE  099
     WRITE(7,145)(DISTRC(I,J), J = 9,15), I                           FBE  100
    WRITE(6,142) (DISTRC(I,J), J = 16,20), I                          FBE  101
    WRITE(7,147) (DISTRC(I,J), J = 16,20), I                          FBE  102
170 CONTINUE                                                          FBE  103
140 FORMAT(1H ,7F10.4,3X,I3)                                          FBE  104
145 FORMAT(7F10.4,3X,I3)                                              FBE  105
142 FORMAT(1H ,5F10.4,23X,I3)                                         FBE  106
147 FORMAT(5F10.4,23X,I3)                                             FBE  107
    STOP                                                              FBE  108
    END                                                               FBE  109
```

APPENDIX

EPA CONTROL COST ESTIMATES

The control costs used in this report are the preliminary estimates corresponding to the control implied by Clean Air Amendment of 1970, provided by EPA for this study. These estimates are termed as EPA cost estimates in the report. However, the EPA cost estimates are given in the form of national estimates by industry category. The control costs by AQCR were then estimated by the production capacity of the corresponding industry and use of electricity in each AQCR in proportion to the national estimates of control costs.

The EPA cost estimates reflect the air pollution control of stationary sources for five pollutants, namely, particulates, oxides of sulfur, carbon monoxide, hydrocarbon, and oxides of nitrogen. The stationary sources covered in these estimates are: *

Industrial Process

Grain Milling and Handling	SIC2042
Kraft Pulp	SIC2611
Nitric Acid	
Sulfuric Acid	SIC2819
Phosphate	SIC2871
Petroleum Refining & Storage	SIC2911
Asphalt Batching	SIC2951
Cement	SIC3241
Gray Iron Foundries	SIC3321
Iron and Steel	SIC3323
Primary Copper	SIC3331
Primary Lead	SIC3332
Primary Zinc	SIC3333
Primary Aluminum	SIC3334
Secondary Non-ferrous Metals	SIC3341

Stationary Combustion
- Electric Power
- Other Stational Combustion

Solid Waste

* See Table 3.3, Volume I of this report.

Regional cost estimates are, in general, calculated by the production capacity of each four-digit SIC industrial categories in each AQCR in proportion to national production capacity of the corresponding industries. The measurement of regional production capacity is based on the value-added definitions of OBE.

Thus:

$$C_{ijt} = C^{N}_{jt} \cdot \frac{V_{ijt}}{V^{N}_{jt}}$$

where C_{ij_t} is control cost of industry j in year t in ith AQCR

C^{N}_{jt} is control cost of industry j in year t in the nation

V_{ijt} is the value-added of industry j in year t in ith AQCR

V^{N}_{jt} is the value-added of industry j in year t in the nation

Ideally, such cost estimates should be based on four-digit SIC industry categories. However, in some occasions, a three-digit or two-digit production capacity estimate (that is V_{ijt}/V^{N}_{jt}) has been used, because, in some AQCRs, 4- or 3-digit information is not available to the public. *

---

* There is a disclosure problem of making available any industrial data in the census publication unless at least 4 or more plants are located in the same geographic unit in order to protect each individual firm in the defined area.

Regional control costs of steam electricity were estimated by total usage of electricity in the region rather than production capacity Besides industrial usage, the residential use of electricity was also estimated in proportion to population.

Other stationary combusion and solid waste costs were allocated to each AQCR according to manufacturing production capacity to the nation.