A COMPUTERIZED SYSTEM FOR GENERATING AND MAINTAINING ENTERPRISE BUDGETS

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1969

Submitted to the Faculty of the Graduate College
of the Oklahoma State University
in partial fulfillment of the requirements
for the Degree of
MASTER OF SCIENCE
May, 1972

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MAINTAINING ENTERPRISE BUDGETS

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ACKNOWLEDGMENTS

The research reported in this thesis was conducted in the Department of Agricultural Economics, Oklahoma State University. Sincere appreciation is extended to the Department of Agricultural Economics for all financial assistance received throughout my graduate program.

I wish to thank my major advisor, Dr. Darrel Kletke, for his extreme patience and guidance and for his prompt assistance, without which this study could not have been done. Thanks are also extended to the rest of my committee, Dr. V. R. Eidman and Dr. W. L. Brant.

Special appreciation is extended to Dr. V. R. Eidman and Dr. T. R. Nelson for their encouragement which led to the undertaking of a graduate program. Thanks are also extended to Mrs. Linda Dalton for her excellence in typing this manuscript.

Special recognition is given to my wife, Kitty, for her encouragement and untiring efforts during the entirety of my graduate study. Final thanks are given to my parents Mr. and Mrs. Leonard H. Walker to whom I am eternally grateful for all of their many sacrifices.

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CHAPTER I

INTRODUCTION

Researchers and extension personnel in the field of agricultural economics are generally familiar with the general concept of enterprise budgets. An enterprise budget is a listing of the physical resources used and the products produced, their prices, and the total value of each resource and product, per unit of the enterprise. Enterprise budgets can be constructed for both crops and livestock. However, this study concerns itself only with the crop budget. Enterprise budgets are frequently used in whole farm planning, partial budgeting, minimum resource models, linear programming applications and firm growth studies. The accuracy of the results of such economic analyses is dependent upon the accuracy of the enterprise budgets.

One of the objectives of the agricultural production economist as outlined by Heady is "to determine and outline the conditions which give the optimum use of capital, labor, land, and management in the production of primary crops and livestock."[1] Of the three tangible factors of production, land, labor, and capital, capital is the most variable in form. Capital includes such items as seed, fertilizer, insecticide, and machinery. The purpose of a budget is to specify the necessary

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[1] Earl O. Heady, Economics of Agricultural Production and Resource Use (Englewood Cliffs, 1952), p. 12.

capital allocation to various inputs required for producing a specified level of output.

The data necessary to define the relationship between enterprise output and the inputs required for production of that output may come from several sources. Test plots which vary the levels of some inputs and hold others constant may be used to furnish data. The data collected from these experiments can then be assimilated into the proper form and regression analysis applied to estimate an input-output relationship.

This relationship, commonly referred to as a production function, describes in a fixed manner the output forthcoming from various levels and combinations of inputs. It also establishes which factors of production are held constant. The production surface described by the production function is made up of an infinite number of possible production alternatives. It is possible to construct an enterprise budget for each point on this surface using information from the production function. By solving the production function for maximum profit under various resource restrictions, budgets can be constructed reflecting maximum profit under alternative assumptions.

Another source of data is the technique of surveying farms and observing the combination and level of inputs farmers are using and their corresponding quantities and qualities of production. Farm records and farm management specialists can also furnish data to reflect quantities and levels of inputs and production. Data furnished from farm records and farm management specialists yield insight as to what practices farmers are using in the production of crops and livestock. On the other hand, data gathered from an experimental environment can

be used to reflect what possible practices can be employed in the production of crops and livestock. Regardless of the data source, physical information needed to develop a budget consists of production quantities, the combination and levels of inputs required, and machinery practices. In addition the prices paid and received for all inputs and outputs are required.

The Problem

After the data for a budget has been gathered, the income received from production items and input costs must be allocated. Then it must be organized such that enterprise receipts can be compared with the costs of inputs used in the production process. Included in the costs of production are the variable and fixed costs associated with the machinery operations. To develop a budget which accurately portrays per acre costs associated with owning and operating machinery, one must perform a number of time consuming computational steps. These steps, some difficult, may result in significant computational errors.

Additional computational difficulties are encountered when computing the annual capital associated with an enterprise. After cost and returns, machinery cost, and annual capital computations have been performed the data must be assembled in a form acceptable for publication and printing. Throughout this long and involved process of building enterprise budgets many possibilities for computational and clerical errors arise.

Budgets are typically prepared for a specific size or scale of farm. Therefore, once a budget is completed it is necessary to recompute machinery costs and annual capital requirements if a similar

budget is needed for a different size farm. During the time elapse between the initial gathering of data and publication and use of the budget, the budget may well be outdated, either because of change in product prices, input prices, or technology.

Other problems arise when one attempts to use budgets prepared by others. Often assumptions and methods of calculations are not clear. If an acceptable, standardized, computational procedure can be established, many of the problems and time delays can be eliminated. Most of the problems occurring in the construction and use of budgets are associated with the following statements.

(1) Number of calculations.

(2) Accuracy of calculations.

(3) Time required to perform calculations.

(4) Variation in assumptions.

(5) Obsolesence of budgets when completed.

(6) Clerical errors in typing for publication.

Purpose of Study

The purpose of this study is to develop a computerized routine that will alleviate some if not all of the above problems. Desirable features of such a system are: (1) procedures for data input which are easy to use, yet contain all relevant information necessary to the budget, (2) an internal algorithm for the computation of machinery costs and annual capital requirements. (3) several alternative methods of printing the budget and other relevant information associated with the budget, and (4) a convenient method of storing the budget to make for fast retrieval, updating, and printing. The system should also be

flexible enough to allow specification of various additional output formats and the inclusion of additional related information.

Outline of Following Chapters

The computer program developed in this study is explained in Chapter II. Presented are the program functions of: (1) data input, (2) budget storage, retrieval, and updating, (3) computing the necessary input cost, machinery costs, and net returns, and (4) printing the budget along with related information. An input form was designed for the coding of budget data prior to processing. The input form along with instructions for completing are presented in Chapter III. The data requirements for processing budgets are also presented in Chapter III. The control cards necessary to process budgets are explained in Chapter IV, along with several examples of how additional subroutines can be incorporated into the basic model. These examples are included to demonstrate the versatility and flexibility of the model. Possible future uses and applications are discussed in Chapter V along with several suggestions for improvements. The appendices contain additional information on installation and use of the program.

CHAPTER II

THE BUDGET GENERATING PROGRAM

The purpose of this chapter is to introduce and explain the computer routine used to process budgets. The budget generating program is a computer model which provides a means of inputing basic budget data, performing the necessary computations, printing this information in a readable form, and storing the budget in a permanent file for future reference and retrieval. This chapter includes a discussion of the main program and each subroutine as well as an explanation of the control or agenda cards necessary to operate the program.

The computer program is written in FORTRAN IV language for processing by an IBM 360 Model 65 computer. A card listing of the program is included in Table I of Appendix A. The program requires 120,832 bytes of storage in the central processor. Four data files are required while processing budgets, three of which must reside on a direct access device. The contents and maintenance of these four files are discussed in detail in Appendix G.

The MAIN Program

The MAIN program of the budget generating program is responsible for the inputing of data, the processing of user control or agenda cards and the calling of subroutines. Before processing a budget the MAIN program loads the basic input data necessary for processing budgets

from the data files mentioned above. These data items are discussed in detail in Appendix G. After loading the basic input data the agenda card processor is invoked.

The Agenda Card Processor

The agenda card processor is a block of statements in the MAIN program that reads each agendum card.[1] The agenda cards indicate the steps the user desires to be taken in processing a budget or series of budgets. Through a matching procedure the processor determines which agendum has been encountered and transfers control of the program to that block of statements which performs the appropriate data processing.

The remainder of the discussion of the MAIN program centers around explaining the function of each agendum and how that function is performed. The agenda are discussed in the order in which the cards normally appear in the data input stream. The formats of the agenda cards are presented in Appendix B.

The HEAD Agendum

The HEAD agendum requires one data card containing a unique number identifying the particular budget being processed and the month for computing annual capital. There are several possible uses for the HEAD agendum, therefore, this agendum is usually the first one specified. In the first use the number read in, referred to as the budget identification number, can be used to assign an identification number to a

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[1]The block of statements which contain the agenda card processor are MAIN 0440 through MAIN 0520. This notation refers to the fortran sequence field, columns 73-80 of the card. A source listing of the program is contained in Table I.

budget being processed for the first time (a new budget). In a second capability the HEAD agendum can be used to specify the identification number of a budget the user wishes to load from the budget file. So that the program knows which budget to load, the identification number should be specified prior to asking for a budget to be loaded from the budget file. In the third capability the HEAD agendum can be used to change the identification number of a budget. For instance, suppose the file contains a budget for wheat on sandy soils and the user wishes to generate a budget for wheat on clay soils. This is accomplished by using the HEAD agendum twice. First the ID number for the sandy soil wheat budget to be loaded from the budget file is specified. The HEAD agendum is used again after the sandy soil wheat budget has been loaded to enter an appropriate number for the new clay soil wheat budget.

The second data item read by the HEAD agendum is the base month for computing annual capital. The base month is that month in which all ordinary expenses would be paid if it were assumed that the cash for paying all operating expenses had been borrowed. This is normally assumed to be the month in which the main crop produced by this enterprise is harvested.

The VECT Agendum

The VECT agendum reads one data card containing the number of the price vector to be used while processing a budget or a series of budgets. Price vector number one will be used unless the VECT agendum is used to specify a different price vector. Consequently, if the user wishes to use price vector one, he need not use the VECT agendum. However, if the user wishes to invoke any other price vector, the VECT

agendum should be used. The details of how to use individual prices contained in a price vector are explained in Chapter III.

The TITL Agendum

The TITL agendum reads three data cards containing the budget title. This agendum must be used if the budget is being processed entirely from input forms. The TITL agendum can also be used to modify the title of an old budget residing in the budget file. Another use is to enter the title for a new budget being created from a budget on file. For a more detailed explanation of creating new budgets from budgets on file, see Chapter IV.

The FOOT Agendum

The FOOT agendum reads three data cards containing a footnote to the budget. As in the TITL agendum, the FOOT agendum must be used if the budget is being processed for the first time. The FOOT agendum can also be used to modify the footnote of a previously stored budget in the budget file. It can also be used to enter footnotes to a new budget being created from one on file.

The BUD Agendum

The BUD agendum allows the user to enter the production coefficients, input requirements, machinery operations, hours other labor required, and the acre inches of irrigation water required. This information is entered on the input form (see Appendix C). The information necessary to complete the input form is contained in Chapter III. The BUD agendum is used when a new budget is being processed and

all of the budget coefficients are being entered via the input form. The BUD agendum should not be used to modify or update previously stored budgets or create new budgets from previously stored budgets. When the BUD agendum is encountered, subroutine INIT is called and the array which contains the budget coefficients is set to zero along with other variables. A card with 'END*' must follow the last data card read by this agendum.

The LOAD Agendum

The LOAD agendum is used when the user wishes to load a budget from the file. The LOAD agendum is used for one of three reasons. (1) A previously stored budget can be loaded with the intention of simply performing the necessary computations to determine net returns and have the budget printed. (2) A budget can be loaded for the purpose of updating some or all of the data which make up the budget including the title and footnote. (3) A budget on file can be loaded to provide a base set of data which can be modified and stored as a new budget. This procedure allows retention of the original budget and the storing of a new budget. The data making up the title, footnote, and budget coefficients may come from two possible sources; input forms or a previously stored budget.

Either the BUD or the LOAD agendum should be used to enter budget data but not both. The BUD agendum is used when all of the budget data is to come from the input forms. The LOAD agendum is used when part or all of the data is to come from the budget file. The LOAD and BUD agenda should follow the HEAD agendum. When using the LOAD agendum, if the title and/or footnote is to be modified, the FOOT or TITL agendum

should follow the LOAD agendum. If budget coefficients are to be changed, the following BCHG agendum should be used.

The BCHG Agendum

The BCHG agendum is used to modify budget coefficients obtained from a previously stored budget by using the LOAD agendum. The BCHG agendum is used under the following three circumstances. (1) The BCHG agendum can be used for updating previously stored budgets on file. After using the BCHG agendum, the source budget may be replaced with the modified or updated budget. (2) The BCHG agendum can be used to modify a budget on file which is then to be stored as a new budget. (3) A budget on file can be modified with the purpose of simply performing the necessary computations and printing the budget without storing the modified budget. The BCHG agendum is used following the LOAD agendum and prior to the MCPH agendum.

The STOR Agendum

The STOR agendum is used to store a new budget in the budget file. The STOR agendum should <u>not</u> be used to update or replace a budget in the file. All data for the new budget to be stored should be entered prior to using the STOR agendum. The stored data includes the budget identification number, the title, the footnote, and all data entered using the BUD and BCHG agenda.

The budget identification number read by the last HEAD agendum encountered in the data input stream is the number under which the budget is stored. A record should be kept of the budget identification numbers for all budgets stored so that the budgets can be retrieved in

the future. If a budget is being entered entirely from input forms, the STOR agendum should follow the HEAD, TITL, FOOT, and BUD agenda. If the budget being stored is an altered previously stored budget, the STOR agendum follows TITL, FOOT, BCHG, and a HEAD agenda. The STOR agenda should only be used if the user wishes to place the budget on the disk file.

The REPL Agendum

The REPL agendum is used to update or replace an existing budget in the budget file. The REPL agendum should not be used when the intention is to save the original budget and also save the new budget created from the original budget. The REPL agendum should be used after the updated coefficients have been entered using the BCHG agendum and also after the TITL and/or FOOT agenda if they are used to modify the title and/or footnote of a budget on file.

The preceding agenda are used for creating and storing new budgets, updating old budgets, creating new budgets, and the entering of budget data upon which calculations are performed in order to print the budget. The following agenda are used only if printed output is desired.

The PARM Agendum

The PARM agendum is used to modify the values of the basic parameters which are used to perform computations at various points in the program. The PARM agendum should precede any of the following agenda. The PARM agendum should be used only if the user does not wish to use

the default values of the basic parameters listed in part 5 of the input form. The PARM agendum should preceed the MCPH agendum.

The IRIG Agendum

The IRIG agendum reads one data card containing certain specific cost information concerning the irrigation system used by the enterprise. This agendum should be used if the budget is irrigated and the irrigation water is not a purchased input.

The cost per acre inch of irrigation water for depreciation, interest, insurance, taxes, total ownership cost (sum of depreciation, insurance, and taxes), repairs, fuel, lubricants, and total operating (sum of repairs, fuel, and lubricants) areinput data. These costs must be computed externally and read in as data because the current routine does not include an algorithm to compute these costs. If the enterprise is dryland this agendum should not be used.

The MCOM Agendum

The MCOM agendum reads one data card containing the number of the machinery complement that is to be loaded. Machinery complement number three is loaded if this agendum is not used. Therefore, this agendum is necessary only if the user wishes to specify a machinery complement other than number three. The elements of a machinery complement are discussed in a later chapter. The machinery complement furnishes the program with coefficients used in computing hourly machine costs required by the budget. This agendum should be used prior to the MCHG agendum.

The MCHG Agendum

The MCHG agendum reads one or more data cards containing changes in user wishes to make in the machinery complement previously loaded using the MCOM agendum. If the user is unwilling to accept the assumed coefficients for any or all of the machines in the complement, this agendum allows him to change these coefficients. If used, this agendum should be included after the optional MCOM agendum and before the MCPH agendum. The MCHG agendum is not needed unless changes are specified in the machinery complement.

The MCPH Agendum

The MCPH agendum invokes the calling of the MCPH subroutine. This subroutine computes the fixed costs (depreciation, interest, insurance, and taxes) per hour, variable costs (repairs, fuel, and lubricants) per hour, and the performance rate (hours per acre) for the machines required by the budget. The coefficients used by this subroutine are furnished by the machinery complement. Therefore, this agendum should be used after the optional loading of a machinery complement (MCOM) and after making any changes in the coefficients in the machinery complement (MCHG) which is also optional. The MCPH should be used prior to the MCPA agendum. The details of the equations are explained in the discussion of the MCPH subroutine later in this chapter.

The MACH Agendum

The MACH agendum reads one or more data cards containing the individual components of fixed and variable costs for the machines required by the enterprise. If the user is unwilling to accept the

machinery costs that are computed by the program, this agendum allows the user to enter his own machinery costs per hour for the machines used by the budget. This agendum can be used as a substitute for the MCPH agendum.

One data card should be included for each machine used by the budget and should contain the following: (1) code of machine, (2) depreciation cost per hour, (3) interest cost per hour, (4) insurance cost per hour, (5) cost of taxes per hour, (6) ownership cost per hour (2+4+5), (7) repair cost per hour, (8) fuel cost per hour, (9) lubricant cost per hour, (10) operating cost per hour (7+8+9), and (11) hours per acre (number of hours the machine must be operated in order to cover one acre). This agendum should precede the MCPH agendum.

The MCPA Agendum

The MCPA agendum invokes the calling of the MCPA subroutine. This subroutine computes the number of hours each machine is used by the enterprise. Hours of use are multiplied by the machinery cost per hour, either previously computed by the MCPH agendum or read in by the MACH agendum, to compute machinery costs per acre. This agendum should follow either the MCPH agendum or the MACH agendum and precede the GRET agendum. The mechanics of this subroutine are explained later in this chapter.

The GRET Agendum

The GRET agendum invokes the calling of the GRET subroutine. This subroutine computes total receipts, total costs, and various returns

required by the output agenda. This agendum should follow the MCPA agendum. The mechanics of this subroutine are explained later in this chapter.

The DEFL Agendum

The DEFL agendum is used to restore default values for the basic parameters. This agendum also invokes calling of the INIT subroutine which prepares the variables in the program for the processing of another budget. If modifications have been made in the default parameters using the PARM agendum the default values can be restored using the DEFL agendum. The DEFL agendum should not be included unless a user wishes to restore default values for the basic parameters.

The OUTPUT Agendum

Sample output is included in Appendix E. The heading on the output page contains the agendum name that produced the output.

Two agenda OUT1 and OT12 are required to produce the general budget. The detailed budget produced by OUT3 lists a monthly distribution of the individual components of production and operating inputs. A monthly distribution of machinery, capital, and labor requirements is accomplished by using the OT13 agendum. The OUT2 agendum prints a table containing an hourly cost summary for the machines used by the budget. A table containing the various components of machinery fixed and variable costs per hour is produced by the OUT5 agendum. A complete machinery complement listing is obtained by use of the OUT4 agendum.

The preceding discussion has presented each agendum in the program in the approximate order that it should be used. These agenda are

processed by the MAIN program. Several subroutines were mentioned in the discussion. These subroutines are discussed below.

The INIT Subroutine

The purpose of this subroutine is to prepare the program for processing another budget. This is accomplished by initializing many variables in the same program to zero. A complete list of the variables being set to zero is given in the listing of the INIT subroutine in Appendix A. This subroutine is called each time the BUD, LOAD, or DEFL agenda are used.

The MCPH Subroutine

The MCPH subroutine is called when the MCPH agendum card is encountered in the data input stream. The MCPH subroutine is responsible for computing machinery cost per hour for the machines used by the budget being processed. Costs are not computed for each machine in the machinery complement, only those used by the budget.

The data used to compute hourly machine costs are taken from the machinery complement listed in Table VIII of Appendix E. The coefficients obtained from the machinery complement table are used as parameters in the equations used to compute hourly machine cost.

Fixed Costs Per Hour

Fixed costs are those costs which do not vary with usage over a given time span. The fixed costs considered in the program are depreciation, interest, insurance, and taxes.

Depreciation. There are several methods generally acceptable for computing depreciation. However, for planning purposes, depreciation should reflect the actual decline in value incurred by the operator. Bowers uses a modified double declining balance method to represent this relation.[2] The major modification is the addition of a factor which yields a very high first year depreciation. Salvage value is obtained from the following equation:

$$SALV + RFV1 \times XLP \times RFV2^{years} \qquad (2\text{-}1)$$

where SALV = salvage value,

RFV1 = remaining farm value coefficient 1,

RFV2 = remaining farm value coefficient 2,

XLP = initial list price, and

years = number of years the machine is expected to be owned.

The values of the two remaining farm value parameters have been estimated by Bowers for many machines. For a more detailed explanation of the salvage value formula see the publication by Bowers.

After obtaining the salvage value of the machine in (2-1) above, depreciation cost per hour of usage is computed using equation (2-2).

$$\text{Depreciation Cost Per Hour} = \frac{(PURCH - SALV)}{(HRSUSD \times YEARS)} \qquad (2\text{-}2)$$

where PURCH = the purchase price of the machine,

SALV = salvage value,

HRSUSD = hours of annual use, and

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[2] Wendell Bowers, Costs of Owning and Operating Farm Machinery, Oklahoma State University, January, 1971, p. 35.

Years = the number of years the machine is expected to be owned.

Interest Cost Per Hour. The interest charge for machines used by the enterprise is based on the average amount of capital invested over the ownership period. Interest cost per hour is computed according to the following equation:

$$\text{Interest Cost Per Hour} = \frac{(\text{PURCH} + \text{SALV}) \times \text{XIRATE}}{2 \times \text{HRSUSD}} \qquad (2\text{-}3)$$

where PURCH = the purchase price of the machine,

SALV = salvage value,

XIRATE = interest rate, and

HRSUSD = annual hours use.

The interest rate in the above equation is specified in the parameter section of the input form.

Insurance Cost Per Hour. The computed insurance cost per hour is also based on the average amount of capital invested. The formula for hourly insurance cost is:

$$\text{Insurance Cost Per Hour} = \frac{(\text{PURCH} + \text{SALV}) \times \text{XINSRT})}{2 \times \text{HRSUSD}} \qquad (2\text{-}40$$

where PURCH = purchase price of the machine,

SALV = salvage value,

XINSRT = the insurance rate per dollar invested, and

HRSUSD = annual hours of use.

Tax Cost Per Hour. The cost of taxes per hour is based on the purchase price of the machine. Hourly tax costs are computed using the following equation:

$$\text{Tax Cost Per Hour} = \frac{\text{PURCH} \times \text{TAXRAT}}{\text{HRSUSD}} \qquad (2\text{-}5)$$

where PURCH = purchase price of the machine,

TAXRAT = tax rate per dollar of purchase price, and

HRSUSD = annual hours used.

Total Ownership Cost Per Hour. Total ownership cost per hour is the sum of depreciation cost per hour, insurance cost per hour, and tax cost per hour. Interest cost per hour is excluded because the interest may represent an opportunity cost rather than a direct cost incurred by ownership.

Variable Costs

The variable costs associated with the operation of machinery are those costs which vary directly with usage. If a machine is not used, variable costs will not be incurred. Variable costs are computed for repairs, fuel, and lubricants.

Repair Cost. Repairs are usually the most variable component of machinery costs. Repair costs are influenced by a number of items including: (1) management, (2) maintenance level, (3) machine variability, (4) variability in local costs for parts and labor, and (5) the effects of climate and soils.[2] However, in the study conducted by Bowers, a set of equations were developed to estimate repairs.[3] The equations relate repairs to the age of a machine and its initial

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[2]Wendell Bowers, Costs of Owning and Operating Farm Machinery, Oklahoma State University, January, 1971, p. 35.

[3]Wendell Bowers, Modern Concepts of Farm Machinery Management (Champaign, Illinois, 1968), p. 32.

list price. Equation (2-6) is the general equation used by the subroutine to estimate the total accumulated repairs for the number of years the machine is expected to be owned.

$$TAR = XLP \times RC1 \times RC2 \times XL^{RC3} \qquad (2\text{-}6)$$

where TAR = total accumulated repairs,

XLP = initial list price,

RC1 = a repair cost constant computed as the ratio of total expected life time repairs to the initial list price of the machine.

RC2 and RC3 = repair cost constants that together indicate the general shape of the accumulated repair cost curve, and

XL = percent of machine life at the point where accumulated repairs are to be measured.

The constants RC1, RC2, and RC3 are discussed in detail in the publication by Bowers.

Repair cost per hour is computed using equation (2-7).

$$\text{Repair Cost Per Hour} = \frac{TAR}{(HRSUSD \times YEARS} \qquad (2\text{-}7)$$

where TAR = total accumulated repairs computed in (2-6) above,

HRSUSD = the number of hours that the machine is used annually, and

YEARS = the number of years the machine is expected to be owned.

Fuel Cost. The equation used to compute fuel cost per hour is also taken from Bowers.[4] The equation relates fuel consumption to the initial list price of the motorized machine. Since horsepower is highly correlated with the initial list price of the power unit or

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[4]Wendell Bowers, Modern Concepts of Farm Machinery Management (Champaign, Illinois, 1968), p. 26.

tractor, initial list price is used as a parameter for computing fuel cost. Fuel cost per hour is computed according to equation (2-8).

$$\text{Fuel Cost Per Hour} = \frac{\text{XLP}}{1000.} \times \text{FMULT} \times \text{FPRICE} \qquad (2\text{-}8)$$

where XLP = initial list price of the tractor or power unit,

FMULT = the fuel consumption factor, and

FPRICE = the price of fuel per gallon.

The fuel consumption factor is used with the initial list price of the power unit or tractor to estimate average fuel consumption in gallons per hour. Table XIV of Appendix G contains the fuel multipliers for the tractors and power units in the machinery complement.

There are three fuel types (gasoline, LPgas, and diesel), consequently, there are three fuel multipliers for each implement that has a motor. The fuel type coefficient is in column 14 of the machinery complement matrix.

Lubricant Cost. Lubricant cost is assumed to be 15 percent of the cost of fuel. Equation (2-9) is used to estimate the cost of lubricants.

$$\text{Lubricant Cost Per Hour} = .15 \times \text{FCOST} \qquad (2\text{-}9)$$

where FCOST = the fuel cost per hour estimated in (2-8).

The cost of fuel and lubricants is computed only for machines with motors. For machines without motors, lubricant costs are included in repair costs.

Capacities of Machines

Before computing machinery cost per acre one additional item is needed for each implement. That is the number of hours the machine must be operated in order to cover one acre (hours/time over). Equation (2-10) is used to compute this value for the pull type implements (machine codes 29-100) and some engine type machines (machine codes 12-29).

$$\text{Hours Per Acre} = \frac{1.0}{(\text{SPEED} \times \text{WIDTH} \times \text{EFF})/8.25} \qquad (2\text{-}10)$$

where SPEED = the speed the machine travels over the acre expressed in miles per hour,

WIDTH = the number of feet covered by the implement, and

EFF = the field efficiency of the machine.

Field efficiency is the ratio of the actual capacity of a machine to its theoretical capacity.[5]

Summarizing, the MCPH subroutine computes the components of fixed costs (depreciation, interest, insurance, and taxes), variable costs (fuel, lubricants, and repairs), and the hours per acre for each implement required by the enterprise.

The MCPA Subroutine

The MCPA subroutine is called when the MCPA agendum card is encountered in the data input stream. The MCPA subroutine uses the fixed and variable costs per hour computed in the MCPH subroutine to compute

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[5]Wendell Bowers, Modern Concepts of Farm Machinery Management (Champaign, Illinois, 1968), p. 15.

the fixed and variable cost per acre. To compute the machinery costs per acre the number of hours per acre each machine is used must be computed.

Machinery Hours Used

The number of hours per acre each machine is used is computed by multiplying the hours per acre coefficient computed in equation (2-10) of the MCPH subroutine by the times over per acre for each machine specified on the input form. Hours for a particular power unit are computed by multiplying the number of hours of implements (machine codes 30-100) are used by a factor of 1.1 to reflect turning time and traveling to and from the field. Total tractor hours for an enterprise are computed by summing the number of hours machines one through nine are used.

Variable Machine Costs Per Acre

After computing the number of hours that each machine is used, the MCPA subroutine then computes the cost of fuel, lubricant, and repair cost per acre for self-propelled (machine codes 1-29) and the cost of lubricants and repairs per acre for equipment (machine codes 30-100). This is accomplished by multiplying the variable costs per hour computed in the MCPH subroutine by the number of hours each machine is used.

Fixed Costs Per Acre

The fixed cost per acre for tractors (machine codes 1-9) and equipment (machine codes 10-100) are categorized into ownership cost

(depreciation, insurance, and taxes) and capital cost (interest cost). The ownership cost and interest cost per hour were computed in the MCPA subroutine. The amount of capital per hour for each machine is computed by dividing the interest cost per hour by the interest rate. To get these items (ownership cost and capital cost) on a per acre basis, ownership and capital costs per hour are multiplied by the number of hours that each machine is used on an acre.

Hours of Machinery Labor

The hours of labor required to operate the machinery is computed by multiplying total tractor hours by a factor of 1.1. This factor is used to reflect time required for adjusting equipment, lubrication, maintenance, etc.

Irrigation Cost Per Acre

If the budget is for an irrigated enterprise, variable and fixed cost per acre for the irrigation system must be computed. The acre inch costs for fuel, lubricants, repairs, depreciation, interest, insurance, and taxes, are entered on the input form. Also these acre inch costs are multiplied by the number of acre inches of irrigation water used, entered on the input form, to arrive at the irrigation fuel, lubricants, repairs, ownership, and capital costs per acre.

Irrigation Labor

If the budget is for an irrigated enterprise the program computes the number of hours of irrigation labor required by multiplying the number of acre inches of irrigation water used by .15 hours of labor

per acre inch. This labor factor was obtained from an inter-agency report on irrigation systems. The factor is for a surface system with underground and gated pipe.[6]

Summarizing, the MCPA subroutine computes the variable and fixed cost of machinery and the hours of labor required for operation of the machinery.

The GRET Subroutine

The GRET subroutine is called when the GRET agendum card is encountered in the data input stream. The GRET subroutine computes the gross receipts, total cost and net returns for the budget. The annual and total capital requirements are computed along with the cost of labor.

Value of Production

The total quantity of production is computed for each item produced by the enterprise. These quantities are multiplied by the appropriate prices to arrive at a value. Gross receipts is computed by summing the value of production for each individual item. Gross receipts is computed as a total and also by months for cash flow purposes.

Operating Cost

Total operating cost includes the variable components of tractor and equipment cost per acre (fuel, lubricants, and repairs) in

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[6]USDA Inter-Agency Ad Hoc Committee Report, Guidelines for Application of Center-Pivot Sprinkler Irrigation Systems in Western Oklahoma, Oklahoma State University Extension, 1971.

addition to the cost of the operating inputs entered on the input form. The quantities of these inputs are multiplied by their respective prices to arrive at total operating cost and a monthly distribution of costs for cash flow purposes.

Net Returns

The return to land, labor, capital, machinery, overhead, risk, and management is then computed by deducting total cost from gross receipts.

Total and Annual Capital

Total capital represents the total cash operating expenses (total cost). Total capital requirements are computed for each of the 12 months, which represent simply the value of operating inputs used during that month. An algorithm is included for computation of annual capital for each month. This algorithm is presented in equation (2-11).

$$\text{Annual Capital for Month} = \frac{\text{TOTCAP} \times \text{XMON}}{12} \qquad (2\text{-}11)$$

where XMON = the number of months the total capital has been used, and

TOTCAP = the total cash operating expenses for the month.

The number of months a cash operating expense has been invested is computed by determining the number of months elapsed from the time operating inputs were used and the month in which it was assumed the capital was recovered (usually the harvest month). The month used to compute annual capital is read by the HEAD agendum.

Total Capital Cost

The amounts of tractor and equipment capital computed in the MCPA subroutine are added to the total annual capital to arrive at total capital required for the budget. The total capital requirement is multiplied by the interest rate to obtain total capital cost. A return to land, labor, machinery, overhead, risk and management is obtained by deducting the total capital cost from the net returns to land, labor, capital, machinery, overhead, risk and management obtained above.

Ownership Cost

The total ownership cost for the machinery operations (depreciation, insurance, and taxes) computed in the MCPA subroutine is deducted from the net returns to land, labor, machinery overhead, risk and management to obtain net returns to land, labor, overhead, risk and management.

Labor Cost

The hours of machinery labor computed in the MCPA subroutine are multiplied by the specified price of machinery labor to obtain the cost of machinery labor. Similarly, the hours of irrigation labor required as computed by the MCPA subroutine are multiplied by the specified price of irrigation labor to yield the total cost of irrigation labor. The number of hours of "other" labor entered on the input form are multiplied by the price specified for other labor to obtain the total cost of "other" labor. The cost of machinery labor, irrigation labor, and other labor are totaled yielding a total labor cost. The total labor cost is deducted from the net returns to land, labor, overhead,

risk and management to obtain a returns to land, overhead, risk and management.

Summarizing, the GRET subroutine computes the various costs and returns figures needed by the output subroutines.

The OUT1 and OUT12 Subroutines

These subroutines are called when the OUT1 and OT12 agenda cards are detected in the data input stream. They produce the output shown in Table IV of Appendix E. The OUT1 subroutine prints a general budget output containing the total production and value for each item produced, total quantity and cost of each input item required, and the net returns to land, labor, capital, machinery, overhead, risk and management. The OUT12 subroutine prints capital requirements, capital cost, and returns to land, labor, machinery, overhead, risk, and management, followed by a printing of the machinery ownership costs and returns to land, labor, overhead, risk and management. The final items printed by the OUT12 subroutine are the costs of machinery, irrigation, and other labor and returns to land, overhead, risk, and management.

The OUT3 Subroutine

The OUT3 subroutine is called when the OUT3 agendum is encountered in the data input stream. The OUT3 subroutine produces the output shown in Table VII of Appendix E. This detailed budget is a printing of the monthly distribution of items produced and their values, a monthly distribution of quantities of input items and their costs, a monthly

distribution of total cost, and a return to land, labor, capital, machinery, overhead, risk and management.

The OUT13 Subroutine

The OUT13 subroutine is called when the OT13 agendum card is encountered in the data input stream. This subroutine produces the output shown in Table V of Appendix E. This output lists the monthly capital, labor, and machine hour requirements. Annual totals are also printed.

The OUT2 Subroutine

The OUT2 subroutine is called when the OUT2 agendum card is encountered in the data input stream. This subroutine produces the hourly cost summary for machinery and power units shown in Table VI of Appendix E. This output lists the following items for each machine: (1) purchase price, (2) size, (3) purchase price, (4) salvage value. (5) years expected to be owned, (6) annual hours of use, (7) depreciation cost per hour, (8) interest cost per hour, (9) insurance cost per hour, (10) cost of taxes per hour, (11) ownership cost per hour, (12) operating cost per hour, and (13) the hours required to cover one acre.

The OUT5 Subroutine

The OUT5 subroutine is called when the OUT5 agendum card is encountered in the data input stream. This subroutine produces the individual components of machinery fixed cost (depreciation, interest, insurance, and taxes), total ownership cost, the components of machinery

variable cost (repairs, fuel, and lubricants), total operating cost, and hours per acre. These detailed cost items are printed for each machine used by the budget. An example of this output is contained in Table IX of Appendix E.

The OUT4 Subroutine

The OUT4 subroutine is called when the OUT4 agendum card is encountered in the data input stream. This subroutine produces the output shown in Table VIII of Appendix E. This output is a complete listing of the machinery complement matrix currently loaded including any modification made using the MCHG agendum.

Summary

This chapter has presented the basic concepts underlying the budget generating program and its operation. In the discussion, the agenda cards that can be used to control the processing of the budget were presented and explained. Each subroutine of the program was discussed so as to furnish the reader with an understanding of the functions performed by the program. The proper arrangement of agenda cards for situations discussed in the text is presented in Appendix B. Table I of Appendix A contains a card listing of the program and Appendix F contains a dictionary of variables and their dimensions to aid the reader who wishes to add his own subroutines. Appendix G discusses the content and manipulation of the four basic data files mentioned in this chapter. Preparation of the data for the budget generating program is discussed in the following chapter.

CHAPTER III

DATA FOR THE BUDGET GENERATOR

The purpose of this chapter is to explain the data requirements for application of the budget generating program. A sample set of data is presented and the process of coding this data on the input form is discussed.

The budget generating program is capable of performing several tasks. Among these are:

(1) Developing a new budget and placint it in a permanent budget file,

(2) Developing a new budget from a budget on file,

(3) Updating a budget,

(4) Computing fixed and variable costs associated with implements used in the enterprise,

(5) Computing capital requirements, labor requirements, and net returns for an enterprise, and

(6) Printing budgets and associated supplementary data.

Accomplishing the above tasks requires storage of relevant data. Information stored is: (1) three 80 character lines that make up the budget title, (2) three 80 character lines that make up the budget footnote, (3) a number which identifies the budget, and (4) the basic budget coefficients coded in part 7 of the budget input form.

Only information from input form parts 2, 3, 4, and 7 is stored. This means the parameter changes in part 5, the machinery complement changes in part 8, the hourly machinery changes in part 9, and the costs per acre inch of water in part 10, are not stored. Through this procedure a uniform set of data is stored and any set of budgets obtained from the data file has the same machinery complement assumptions and parameter assumptions. If all data from input form parts 5, 8, 9, and 10 were stored, each set of budgets prepared would have to be closely checked to see if the same assumptions had been used.

In processing budgets the user should view the budget generating program as a blackboard with three 80 character lines for the budget title, three 80 character lines for the footnote, a table resembling part 7 of the input form, and a line for the budget identification number.

Initially the title and footnote are completely blank lines. The table contains all zeros and the budget ID number contains zeros, therefore, to store a budget in the budget file the user must furnish the above items for each budget to be processed.

There are two ways data may be placed on the blackboard. The user may furnish all four items by completing input parts 2, 3, 4, and 7 of the input form or a budget residing in the budget file (old budget) may be placed on the blackboard to obtain data. If the user is providing the information the budget can be stored. However, if the data was obtained from an old budget the user can, if he desires, modify the title, footnote and/or the budget coefficients by completing input form parts 3, 4, and 7.

At this point the budget used to furnish the budget data still resides in its original form on the budget file. The user has the options of:

(1) Replacing (updating) the old budget with the budget that is now on the blackboard,

(2) Leaving the old budget as it was and storing the budget currently on the blackboard as a new budget (creating a new budget from an old budget), or

(3) Leaving the old budget as it was and not storing the budget currently on the blackboard (modifying an old budget and printing the modified budget without storing).

Processing System Selection

Part 1 of the input form contained in Appendix C should be completed so that data preparation clerks can determine the user's objectives and prepare the proper agenda cards. In addition, preparation of this section indicates other parts of the form to be completed.

(a) (Budget Completely From Forms) This box should be checked if the budget to be prepared will come entirely from the input form with no data coming from a previously stored budget. Parts 2, 3, 4, and 7 of the input form should be completed.

(b) (Budget Will Be Prepared From An Old Budget) Check this box if a budget previously stored will be used either without modification or as a base for a new budget.

(c) (Old Budget Number _ _ _ _ _ _ _ _ _ _ _ _ _ _ _) If the box on line "b" is marked, place the number of the budget previously stored on this line.

(d) (Month To Compute Annual Capital) If the box on line "b" is marked, place the month for computing annual capital on this line. The harvest month is the usual time for computing annual capital.

(e) (Title Will Change) If the box on line "b" is marked and the user wishes to change the title of the previously stored budget this line should be marked and input form part 3 completed.

(f) (Footnote Will Change) If the box on line "b" is marked and the user wishes to change the footnote of the previously stored budget this line should be marked and input form part 4 completed.

(g) (Coefficients Will Change) If the box on line "b" is marked and the user wishes to change the coefficients of the previously stored budget, line "g" should be marked and all changes to be made in the budget should be listed in the appropriate blocks of input form part 7.

(h) (Parameters Will Change) If the user plans to change any parameters listed on part 5 of the input form, this line should be marked and the appropriate entries made in part 5.

(i) (Price Vector #_____) Price vectors containing prices for items listed in the identification code can be used if desired. Several alternative vectors may be available, if no entry is made on line i, price vector number 1 is used.

Procedures for implementing the price vector are given in the discussion of input form part 7.

(j) (Completely New Budget To Be Stored On File) If line "a" is marked and the user wishes to store the newly developed budget in the data file, this line should be marked.

(k) (Old Source Budget To Be Replaced On File) If line "b" is marked and the previously stored budget is to be replaced with the new budget, this line should be marked.

(l) (Altered Old Budget Stored As New Budget On File) If line "b" is marked and the altered old budget is to be stored as a new budget, this line should be marked and part 2 of the input form completed.

(m) (Hourly Machine Cost Entry) If the user desires to enter implement costs per hour directly rather than allowing the computer program to estimate the costs, this line should be marked and part 9 of the input form completed.

(n) (Per Acre Irrigation Cost Entry) If irrigation is used this line should be marked and part 10 of the input form completed.

(o) Machinery Complement #_____) Alternative machinery complements are available to the user. The complement number to be used should be entered on this line. If no entry is made, default complement 3 is used. Complements differ primarily in the size of tractor to which the implements are fitted.

(p) (Changes In Machinery Complement) If the user desires to change any of the coefficients in the machinery complement matrix, this line should be marked and the changes to be made should be given in part 8 of the input form.

(q) (Complete Part 6) Part 6 of the input form is used to select the type of output the user desires. Only if no printed or punched output is desired should part 6 not be completed.

Budget Identification Number

The budget identification number is composed of the nine categories and thirteen digits shown on part 2 of the input form. The code numbers from which selections are made are included in Appendix D. The ID number is used to provide each budget a unique number so that it can be stored and retrieved.

Assume an ID number is to be coded for a grain sorghum budget. The numbers are taken from the sample input form in Appendix D.

(a) (Enterprise Code) The enterprise code for grain sorghum is 73. Therefore, item "a", enterprise code, has as its entry the number 73 (Appendix D, Part a).

(b) (Area And County Codes) The area and county codes for Oklahoma are given on the map in Appendix D. The first digit of the code is for the area of the state and the second digit is to identify the county within the area. The appropriate entry for Kiowa County would be 6 for Southwest Oklahoma, and 7 for the county within the area (Appendix D, Figure 1).

(c) (Irrigation Level) The code numbers and their corresponding ranges of irrigation water are given in Appendix D. For this budget the entry for irrigation level would be 0, indicating a dryland budget (Appendix D, Part c).

(d) (Land Class) The land class codes separate land into three basic types, namely, clay, loam, and sand. Further

classification includes a, b, and c which denote quality of soil. "a" being best and "c" being the poorest quality. The example budget is for grain entry for land class 7 (Appendix D, Part d).

(e) (Grazing Code) The grazing code is used only when the "enterprise code", entered above, is 89. Under these circumstances further identification is needed to classify the type of grazing produced. Since grazing is not the principle product of this enterprise the appropriate entry is 0 (Appendix D, Part e).

(f) (Machinery Complement) These codes are given in Appendix D. Several machinery complements are available for use. The code denotes which basic machinery complement is to be used. Grain sorghum uses the 90-109 horsepower complement. The corresponding entry is 03 for machinery complement (Appendix D, Part f).

(g) (Irrigation System) This code is used to indicate which type of irrigation system the enterprise uses. Since the enterprise being prepared is dryland the appropriate entry is 0 (Appendix D, Part g).

(h) (Price Vector) The program is designed to accomodate a price vector for each area within the state to reflect differences in prices farmers receive and pay for production and input items. Currently only one price vector, vector 1, is available for the entire state. Therefore, the corresponding entry for price vector is 1 (Appendix D, Part h).

(i) (Individual Number) The individual number is a two digit number for further classification. If all other digits are duplicated for two budgets, the individual number can be used to make them unique. This number may also be used to identify the author of the budget. For this budget an entry of 01 is made.

The identification number of the grain sorghum budget is: 7367070030101.

Title

Three 80 character lines are used for the title of a budget. The title is printed on budgets exactly as coded, and is stored as a permanent part of the budget. The title is entered on part 3 of the input form in Appendix C.

Footnote

Three 80 character lines can be used for a footnote to the budget. The footnote will also be printed and stored with the budget. All information helping to clarify the budget should be included in the footnote. The footnote is entered on part 4 of the input form.

Parameters

On the second page of the input form, the basic parameters, used in various computations throughout the program, are given. Changes in any or all of these items can be made by entering the appropriate values. If no entry is made the given default values will be used. Parameter changes are entered on part 5 of the input form.

Output Selection

Examples of the types of output available are given in Appendix E. Indicate the types of output desired with checkmarks in the appropriate blocks of part 6. A brief discussion of each type of output follows.

(a) (General Budget) Returns and costs are presented on an item basis. No information is presented on a monthly basis. By subtracting the total operating cost from the total receipts, returns to land, labor, machinery, overhead, risk, and management are obtained. This returns figure is broken down by making charges for capital, machinery ownership, and labor. The result is returns to land, overhead, risk, and management.

(b) (Detailed Budget) The costs and returns figures of the general budget above are presented on a monthly basis. This budget can be used to obtain cash flow information.

(c) (Machinery, Capital And Labor Requirements By Months) Monthly labor and capital requirements are presented. In addition the total hours per month each implement is used by the enterprise is given.

(d) (Hourly Cost Summary For Machinery And Power Units) Cost information and assumptions concerning the implements used by the enterprise are presented. Depreciation, interest, insurance, taxes, and operating costs are given on an hourly basis.

(e) (Machinery Fixed And Variable Costs Per Hour) All machinery costs components for the enterprise are presented on an hourly basis. These then are aggregated to total fixed and total variable costs per hour.

(f) (Machinery Complement Listing) The machinery complement specified is presented. All machines in the basic complement are included. Any changes introduced by the user for this particular budget are also included. Data includes all items necessary to compute machinery costs.

(g) (Punched Cards For LPFARM) Three punched cards in the correct form for utilization by LPFARM are produced. These cards can then be used as input in the LPFARM program. The LPFARM program is a linear programming model designed for ease of data input and an output format of a very readible nature.

Production, Inputs, and Machinery Requirements

Production, operating inputs, and machinery usage are coded in part 7 of the input form. This section of the table can be viewed as a matrix with 50 rows and 16 columns.

The first twelve columns of the input form represent the twelve months of the year. The thirteenth column is used for the price of the item; the fourteenth column is not used; the fifteenth column is used to code the appropriate units of measurement; and the sixteenth column is used to enter the item code.

The first ten rows of the table are used to code production. Lines 11 through 37 are used to code inputs used. Rows 38 through 48 are used to code the number of times each implement is used. If irrigation water is used, row 49 is used to indicate the number of acre inches of water used each month. If labor is required for other than

machinery or irrigation, line 50 permits entering the hours used per acre.

A detailed presentation of data preparation for part 7 follows. The examples are taken from the completed input from for a grain sorghum budget in Appendix C.

Production Data

The first ten rows of part 7 of the input form are for products produced by the enterprise, such as grazing, grain and hay. In the grain sorghum example, suppose 24 hundredweight of grain sorghum are produced in the month of September. The appropriate entries for line 1 are:

Line No.	Col 9. Sept	Col 13. Price	Col 15. Unit Code	Col 16. Item Code
(1) Grain Sorghum	24.	1.93	16.	73.

(a) A 24. in the September column indicates that 24. units of grain sorghum are produced in September.

(b) A 1.93 in the Price column to denote that grain sorghum is priced at $1.93 per unit.

(c) A 16. in the Unit Code column. Information in Appendix A, Table III indicate the code number for hundredweight is 16. Thus the Unit Code column entry is 16.

(d) A 73. in the Item Code column. In Table II of Appendix A the item code for grain sorghum is 73. This code is required to produce budgets with uniform names and if the price vector is being used it indicates which price is to be used.

For this example there is no production in the January through August or October through December, therefore, these columns are left blank. Lines 2 throu 10 are left blank because grain sorghum is the only item being produced. However, if other items were produced by this enterprise, such as grazing, entries could be made on lines 2 through 10 following the same procedure as used to code line 1. Several production item lines may be used to code budgets where rotations are being used, or if multiple crops are being produced.

A price vector has been established which can be used as a source of prices for all production and input items. To use a price vector value enter a -1.0 in the price column. This will cause the program to substitute the price vector value for the -1.0.

Operating Inputs

Lines 11 through 37 are used to code all operating inputs used by the enterprise (i.e., seed, fertilizer, crop insurance, chemicals, etc.). Included in this section are all custom hire operations. However, all owned machinery operating costs can be computed by the program.

The coding procedure for operating inputs is the same as previously used for production. Referring again to the example, suppose six pounds of seed is used in the month of May at a price of $.21 per pound. The appropriate entries for coding this information on line (11) are:

Line No.	Col 5. May	Col 13. Price	Col 15. Unit Code	Col 16. Item Code
(11) Seed	6.	.21	11.	173.

(a) A 6.0 in the May column to denote that 6 units of seed are used in May.

(b) A .21 in the Price column, denoting a price of $.21 per pound.

(c) A 11. in the Units column to indicate that the measurement unit is pounds.

(d) A 173. in column 16 indicating the appropriate code for grain sorghum seed. (Note that seed codes are 100 plus the production code.)

The coding technique for the remainder of the input items follow the same procedure described above. The next section illustrates the procedure necessary to code machine usage.

Machinery Usage

Rows 38-48 are used to code machinery requirements for the enterprise. If the program is used to compute machinery ownership and operating costs, this section of the form should be completed. All custom hire operations should be listed in the operating inputs section above. Costs computed are variable costs (fuel, lubricant, and repairs) and fixed costs (taxes, depreciation, interest and insurance).

The input is coded much as production and operating inputs. Several differences are: (1) no price is required in column thirteen, (2) appropriate entries in the monthly columns are times the acre is covered by that implement during the month, and (3) the units column, fifteen, is used to denote the power unit used to pull the implement. All self powered machines (listed 1 through 29 in Table VIII of Appendix E) can be used to pull implements.

In the grain sorghum example, a stalk shredder covers the acre once in February. The one time over means the budget is being prepared assuming that every February each acre of grain sorghum is covered by the stalk shredder pulled by a 95 H.P. tractor. Appropriate entries for this operation are:

Line No.	Col 2. Feb	Col 15. Unit Code	Col 16. Item Code
(38) Stalk Shredder	1.0	3.0	80.

(a) A 1.0 in the February column to denote that the machine is used 1 time over in the month of February.

(b) A 3.0 in the Unit Code column to indicate that tractor (3), line 3 of the machinery complement (Appendix A, Table IV), is used to pull the machine.

(c) A 80. in the Item Code column to denote that the name of the machine is stalk shredder. Note that this is on line 80 of the machinery complement table in Table VIII of Appendix E.

To illustrate more fully the potential use of the machinery input procedure, skip to line 40 of the example. In the grain sorghum example, suppose a farmer moldboards in March, one year out of three. Therefore, to allocate the cost of this operation on a yearly basis, the appropriate entries are:

Line No.	Col 3. Mar	Col 15. Unit Code	Col 16. Item Code
(40) Moldboard Plow	.33	3.0	41.

(a) A .33 in the March column to allocate the cost of plowing one year out of three.

(b) A 3.0 in the Unit Code column signifies that tractor (3) is used to pull the plow.

(c) A 41. in the Item Code column indicates that the machine is a moldboard plow with the attributes listed on line 41 of the machinery complement.

Line 44 of the example illustrates that the operator cultivates twice, once in July and once in August. Appropriate entries are:

Line No.	Col 7. Jul	Col 8. Aug	Col 15. Unit Code	Col 16. Item Code
(44) Cultivator	1.0	1.0	3.0	57.

(a) A 1.0 in the July column to show cultivation of the acre during the month of July.

(b) A 1.0 in the August column to show cultivation of the acre during the month of August.

(c) A 3.0 in the Unit Code colume to indicate that tractor (3) is used to pull the implement.

(d) A 57. in the Item Code column to indicate that the machine is a cultivator with the characteristics given on line 57 of the machinery complement.

Irrigation Water

The acre inches of water applied on irrigated enterprises is entered on line 49 of part 7. Assume, for example, that an enterprise uses a total of 24 acre inches of water per year and that eight inches of

water are applied in each of the three months, June, July, and August. The appropriate entries on the input form are:

Line No.		Col 6. Jun	Col 7. Jul	Col 8. Aug
(49)	Irrigation Water	8.0	8.0	8.0

(a) A 8.0 in the June column to show that 8 inches of irrigation water are used in the month of June.

(b) A 8.0 in the July column to show that 8 inches of irrigation water are used in the month of July.

(c) A 8.0 in the August column to show that 8 inches of irrigation water are used in the month of August.

Note that columns 13 through 16 are not used for lines 49 and 50. If a dryland budget is being coded line 49 should be ignored.

Other Labor

Other labor is that labor used by the enterprise over and above that used to apply irrigation water and to operate machinery. Machinery and irrigation labor requirements are computed by the program. For example, assume that a farmer spends 120 hours per year keeping records for his 1,200 acre crop farm. If he wishes to allocate this time to the crop enterprise he may decide to include .1 of an hour of the total per acre for record keeping purposes. If the record keeping is performed in September and October for the particular enterprise being considered, the appropriate entry is:

Line No.		Col 9. Sep	Col 10. Oct
(50)	Other Labor	.05	.05

(a) A .05 in the September column to show that .05 hours of labor is used in the month of September for duties other than those associated with machinery and irrigation jobs.

(b) A .05 in the October column to show that .05 hours of labor is used in the month of October for duties other than those associated with machinery and irrigation jobs.

Machinery Complement Changes

The model as is, consists of five different machinery complements. A machinery complement is made up of 100 machines, the first 29 of which are self propelled machines and the last 71 of which are pull type implements. The machinery complement may be viewed as a matrix of 100 rows and fifteen columns. The coefficients are used to compute the individual components of fixed and variable costs.

The first column of the matrix is the code number of the machine. The code is sequential, that is, the first machine code is the number 1, the second 2, and the last machine's code is 100. The first nine machines in the matrix are always the tractors associated with the complement. The second column is the swath or width in feet that the machine covers except for the tractors and their "widths" are expressed as horsepower. The third column is the initial list price of the machine. Initial list price is the factory recommended selling price, not the purchase price of the machine. The fourth column is the average speed the machine travels in the field when performing its task, expressed in miles per hour. Column number 5 contains the field efficiency of the machine, that is, the ratio of the actual effectiveness of a machine to its theoretical effectiveness, expressed as a

decimal fraction. Columns 6, 7, and 8 contain the repair cost coefficients, RC1, RC2, and RC3, which are used to compute repair cost per hour for a given machine. The annual hours the machine is used is in column 9 and the number of years the machine is expected to be owned is in column 10. Columns 11 and 12 contain two remaining farm value coefficients, RFV1 and RFV2, which are used to compute the salvage value of a machine. Column 13 contains the purchase price of the machine. This value represents the total cash plus any trade-in that is paid for the machine. The fuel type code is entered in column 14 (1 = gas, 2 = LPGas, 3 = Diesel). Column 15 contains the total hours of life of the machine before complete wear out. An example of a machinery complement matrix is shown on Table VIII of Appendix .

Any of the coefficients in the machinery complement matrix may be changed while processing budgets within the program by addressing the proper row and column. Part 8 of the input form is used to make modifications in the assumptions about the machinery complement. All 15 coefficients for a machine may be changed. However, caution should be exercised when altering columns 6, 7, 8, and 15 for these are the coefficients used in the repair equation. Care should also be taken when modifying the RFV1 and RFV2 coefficients (columns 11 and 12).

Assume that the machinery complement is to be modified by substituting a chisel plow that covers only six feet for the listed 12, that its purchase price is $450.00 rather than $650.00 and its initial list price is $517.50 instead of $750.00. To make these modifications the appropriate entry is:

	Col 1. Code	Col 2. Width	Col 3. Initial List Price	Col 13. Purchase Price
Chisel	49.	6.0	517.50	450.

(a) A 49. in the Code column to indicate which machine in the machinery complement table the modifications are applicable to.

(b) A 6.0 in the Width column to change the width of the chisel plow from 12 feet to 6 feet.

(c) A 517.50 in the Initial List Price column to change the initial list price of the chisel from $750.00 to $517.50.

(d) A 450. in the Purchase Price column to change the purchase price of the chisel plow from 650. to 450.

These coefficients replace the original values in the machinery complement. Columns 4 through 12 and columns 14 and 15 would remain unchanged. Only the coefficients in row 49 of the machinery complement are altered. These coefficients would remain usable until changed again or a computer run is completed.

Machinery Costs Per Hour

As discussed previously the computer program uses a series of equations to compute variable (fuel, lubricants, and repairs) and fixed (depreciation, interest, insurance, and taxes) machinery costs per hour. However, if the user does not wish to have these costs computed by the program, he can enter these data directly. Part 9 of the input forms is used for inputing machine cost per hour directly. This section of the input forms consists of several rows and eleven columns. After

deciding what machinery operations are to be used by the enterprise, one line must be completely coded for each machine used. The machines to be used should be selected from those in the machinery complement table (Appendix E, Table VIII). For example if in preparing the grain sorghum budget it is decided to input machine costs per hour directly instead of having to estimate them the following entries are necessary on part 9 of the input form. For columns 2 through 10 the unit of measurement is dollars per hour, for the Hours/Acre columns. The final column is the number of hours it takes the machine to cover one acre. For machine codes 1-11 this should be 0.0.

(a) The code of the machine must be specified in the Code column of part 9. For tractor (3) this would be 3.0.

(b) The depreciation cost per hour is entered in the second column of part 9. An appropriate entry for tractor (3) might be $.85 per hour.

(c) The interest cost per hour is entered in the Interest column. An appropriate entry for tractor (3) may be $.60 per hour.

(d) The insurance cost per hour is entered in the Insurance column. An appropriate entry for tractor (3) may be $1.05 per hour.

(e) The tax cost per hour is entered in the Tax column. An appropriate entry for tractor (3) might be $.12 per hour.

(f) The sum of depreciation, insurance, and taxes per hour (second, fourth, and fifth columns) should be entered in the Total Fixed Cost Per Hour column. For tractor (3) this would be $1.02 per hour.

(g) The repair cost per hour is entered in the seventh column. An appropriate entry for tractor (3) is $.55 per hour.

(h) The fuel cost per hour is entered in the eighth column. This may be zero for pull type implements. For tractor (3) the appropriate entry is $.40.

(i) The cost of lubricants per hour is entered in the ninth column. An appropriate entry for tractor (3) is $.05.

(j) The sum of the seventh, eighth, and ninth columns (repairs, fuel, and lubricants) is entered in the Total Variable Cost Per Hour column. For tractor (3) this is $1.00.

(k) The Hours/Acre required by the machine to cover one acre is entered in the final column. For a tractor the appropriate entry is 0.0.

The above information must be entered for all machines used by the enterprise, including power units. The code numbers must be the same as those in the machinery complement table.

Irrigation Costs Per Hour

The present computer program does not have the capability of computing the various variable and fixed costs per acre inch of irrigation water. Therefore, these data must be entered directly using the same procedure as discussed above in the machinery costs section. Part 10 of the input form is used to input the various costs per acre inch of irrigation water. The code column is used to select the type of system. The irrigation system codes are found in item g of Appendix D. The column headings for inputing per acre inch irrigation costs are the same as for entering machinery costs per hour, except that entries are

made on an acre inch basis. Part 10 may be ignored if the budget is dryland.

Special Techniques

When coding actual farm data special situations often arise which at first glance appear to prevent use of the generator. Farmers typically have more than one tractor and usually these are of different sizes. With large power units, more than one implement is often pulled. The program has been structured to handle these and similar problems. Not all situations can be covered but hopefully the examples given will illustrate techniques which can be used to handle many of the problems which may arise.

In the machinery usage section it is pointed out that the Unit Code column is used to identify which of the 29 possible power units is used to pull a particular implement. In the machinery complement table found in Appendix E, Table VIII, only the first five lines contain tractors. This means it is possible to use pickups, trucks, combines, or any of the other 29 power units to pull implements. The purpose of the entry in the Unit column is to allow specification of what power unit "pulls" each implement. Any code number between 1 and 29 is a valid power unit number, providing of course, that all of the 15 coefficients in the machinery complement table for that machine are nonzero. Lines 6 to 9 and 17 to 29 are left blank for future expansion. Therefore, entries of these numbers as power unit codes would be invalid.

Referring to the sample coded budget in Appendix C suppose that line 38 of the input form indicates that a 55 H.P. tractor used to pull

the stalk shredder instead of a 95 H.P. tractor then the entry for this operation is:

Line No.	Col 3. Mar	Col 15. Unit Code	Col 16. Item Code
(38) Stalk Shredder	1.0	1.0	80.

(a) A 1.0 in the March column to show that the machine was used to cover the acre once in the month of March.

(b) A 1.0 in the Unit Code column to indicate that tractor (1) is used to pull the stalk shredder.

(c) A 80. in the Item Code column to denote that the machine is a stalk shredder and that it is on line 80 of the machinery complement table.

If the stalk shredder was pulled by say, tractor (5) the entry in the Unit Code column would be a 5.0.

Multiple Hitches

To illustrate a technique of coding multiple hitches, assume the following: The operator uses a 135 horsepower tractor and pulls three stalk shredders side by side. The width covered ty this multiple machine hookup is 36 feet instead of 12. The tractor covers one acre in one-third of the time required when pulling only one stalk shredder and each stalk shredder covers only one-third as much ground. With this information, the appropriate entries in the machinery section of part 4 are:

Line No.		Col 2. Feb	Col 15. Unit Code	Col 16. Item Code
(38)	Stalk Shredder	.33	5.0	80.
(45)	Stalk Shredder	.33	0.0	80.
(46)	Stalk Shredder	.33	0.0	80.

Row 38:

(a) A .33 in the February column to denote the usage of this machine for coverage of 1/3 an acre.

(b) A 5.0 in the Unit Code column to denote that the tractor (5) was used to pull the implement.

(c) A 80.0 in the Item Code column to indicate that the implement is a stalk shredder and that it is on line 80 of the machinery complement table.

Row 45 and 46:

(a) Same as above.

(b) A 0.0 in the Unit Code column to indicate that no power unit time is required for this operation. An entry of 0.0 is made in the Unit Code column to instruct the program to bypass computations on the hours and variable and fixed costs for the power unit. This is the correct entry since the amount of tractor time for this operation is the same as that for the stalk shredder in line 38. If a 5.0 were entered in column 15 for lines 45 and 46, three times the correct amount of tractor time would have been computed.

(c) Save as above.

Assume a farmer discs and springtooths twice each year in June pulling the spring tooth behind the disc each time. If the 115 H.P. tractor is used, the appropriate entry is:

Line No.		Col 6. Jun	Col 15. Unit Code	Col 16. Item Code
(46)	Disc	2.0	4.0	43.
(47)	Spring Tooth	2.0	0.0	46.

Disc:

(a) The 2.0 in the June column signifies that the implement covers the acre twice in the month of June.

(b) The 4.0 in the Unit Code column indicates that tractor (4) is used to pull the machine both times.

(c) The 43. in the Item column denotes that the machine is a disc and that the required attributes of a dsic are on line 43 of the machinery complement table.

Spring Tooth:

(a) A 2.0 in the June column indicates the spring tooth is used two times over in the month of June.

(b) Â 0.0 in the Unit Code column signifies that no tractor or power unit time is to be computed for this machine, since it pulled with the disc.

(c) A 46. in the Item Code column indicates that the machine is a spring tooth and that its characteristics can be found on line 46 of the machinery complement table.

Allocating Power Unit Time

Sometimes power units are used in addition to pulling implements. Since the width or size specification in column 2 of the machinery complement table has little meaning when referring to machines 1 through 11 one other special technique needs to be discussed. Five times over

means little when referring to a tractor or pickup by itself, therefore, when a tractor, truck, or pickup is coded as a machinery operation it is assumed that the numbers entered in columns 1 through 12 (month columns) are expressed as hours rather than times over. It should be remembered at this point that power unit time is computed automatically by the program when a machine code of 1 to 29 is entered in the Unit Code column on a machinery operation such as discussed in the section labeled Machinery Usage. However, power unit overhead time can be entered as discussed below.

Assume a farmer uses his pickup 480 hours per year on a farm of 2,000 acres. Therefore, on the average .24 of an hour should be allocated to each acre. Assuming he decides to allocate the use uniformly throughout the year the following entry allocates the pickup time to the enterprise.

Col 1. Jan	Col 2. Feb	Col 3. Mar	Col 4. Apr	Col 5. May	Col 6. Jun	Col 7. Jul	Col 8. Aug	Col 9. Sep	Col 10. Oct	Col 11. Nov	Col 12. Dec	Col 15. Unit Code	Col 16. Item Code
.02	.02	.02	.02	.02	.02	.02 Pickup	.02	.02	.02	.02	.02	--	11.

(a) The January through December columns contain .02 in order to evenly distribute the .24 (12 x .02 hour/month = .24) hours. However, if the pickup is used for this enterprise primarily in the months June through September a use of .06 hour should be listed for each of these months.

(b) A 11. in the Item Code column indicates that the machine is a pickup found on line 11 of the machinery complement table.

No entry is made in the Unit Code column because the power unit was being used directly.

Summary

An input form was presented in this chapter along with a discussion of the steps and techniques necessary to complete the input form. The minimum amount of input data required for a budget is: (1) the identification number to distinguish it from other budgets, (2) title and footnote, and (3) the basic input-output coefficients. The additional information needed to prepare budgets, machinery complements, and basic parameters is stored with the program, but can be altered or derived by the user. A sample budget was prepared with examples of special techniques, illustrating the process of preparing budgets. Chapter IV outlines the procedure necessary to prepare data for the program.

CHAPTER IV

APPLICATIONS

The purpose of this chapter is to explain how to organize and group the agenda cards discussed in Chapter II. Through various combinations of cards, new budgets can be stored and created, old budgets can be modified and updated, costs and returns can be computed and finally, the budgets and related information can be printed.

General Description

Table XVIII of Appendix G is included as an aid in determing when to use certain agenda and their proper sequence. The agenda are arranged in five categories. The three columns included in Table XVIII indicate the agenda card order for creating new budgets, updating and modifying previously stored budgets and creating new budgets from budgets on file. All agenda not declared optional should be included. The storage category is required if the data input is to be stored in the budget file. The data for computations category is optional. If the agenda in this section are omitted, the default data described earlier are used. If the MACH agendum is used MCOM and MCHG are not needed. In the computations category, the MCPH agendum is needed if the MACH agendum is <u>not</u> used in the previous category. The remaining agenda (MCPA and GRET) are required. All output agenda are optional. However, if a certain type of output is desired, the agendum card

necessary for that output must be included. All card references in the following discussion refer to Table XVIII.

Creating and Storing a New Budget

Table XIX contains a computer listing of the data input stream that generated the budgets and related information contained in Tables IV and IX. These data items were punched from the completed sample input form in Appendix C. When creating a new budget the data are assumed to come completely from the input form. None of the data items required for a budget are being furnished by an old budget in the budget file. Therefore, the HEAD agendum is needed to assign a budget ID number and an annual capital month. This information is punched on card 2, immediately following the HEAD card. A title and footnote must be assigned to the new budget by use of the TITL and FOOT agenda. The BUD agendum card is used to enter the budget input-output coefficients contained on cards 12 through 26 of Table XIX. An END* card is used to mark the end of the input-output coefficients. The information required for storage of a budget (identification number, title, footnote, and input-output coefficients) is now complete (see Table XVIII). Card 28 (STOR agendum) enters the budget into the budget file. The MCPH card instructs the program to compute machinery cost per hour for the machines required by this budget. The MCPA card instructs the program to compute the machine costs per acre and the GRET card instructs the program to compute the return values for the budget. Cards 32 and 33 invoke the printing of the output contained in Table IV. Cards 34 through 38 invoke the printing of the output pages contained in Tables V through IX respectively.

Updating a Previously Stored Budget

Cards 39 through 50 of Table XIX illustrate the necessary cards to load a previously stored budget (cards 39 through 41), change the yield of grain sorghum to 20 cwt. (cards 42 through 44), replace the old budget with the updated version (card 45), compute machinery cost per hour (card 46), compute machinery cost per acre (card 47), compute costs and returns (card 48) and print the budget (cards 49 through 50).

Creating a New Budget From an Old Budget

This feature allows the user to use an old budget as a starting point to furnish the basic data required for the budget ID number, title, footnote, input-output coefficients, and then alter the ID number and optionally the title, footnote, and input-output coefficients and keep the old budget in its original form and optionally keep the new budget (see Table XVIII). Cards 51 through 63 demonstrate this feature. Cards 51 and 52 identify the old budget which furnishes the starting point. The task is to create and store a grain sorghum budget exactly like the one previously stored except the new budget produces .5 AUMS of grazing in October at a price of $3.50 per AUM. The operating inputs and machinery operations are exactly the same as the old grain sorghum budget. After entering the ID number of the base budget, card 53 loads the budget. Cards 55 through 55 enter the coefficients necessary to add the grazing produced. Since this is a new budget, cards 57 and 58 enter a new ID number and card 59 stores this new budget in the budget file. Both the old base budget and the new budget are now stored in the budget file. Cards 60 and 61 invoke the computation of machinery cost per hour and machinery cost per acre, and card

62 computes the cost and returns for the budget. Cards 63 and 64 print the budget contained in Table XI. Cards 65 through 68 are explained later in the chapter.

Changing Default Parameters

If the default values of the basic parameter are to be changed in the first budget processed, the PARM agendum card followed by the card(s) with the change(s) to be made in the parameters followed by an END* card should be placed after the STOR card (card 28).

Loading a Machinery Complement

If a machinery complement is to be used other than machinery complement 3 (the default complement) the MCOM agendum card followed by a data card containing the number of the complement to be loaded should be placed after card 28 but prior to card 29.

Entering Changes in the Machinery Complement

If changes in the machinery complement coefficients are to be made, the MCHG agendum card followed by the data card(s) containing the change(s), followed by an END* card should be placed prior to the MCPH card (card 29) but after the optional MCOM agendum card and its data card.

Irrigated Budgets

If the budget is for an irrigated enterprise the IRIG agendum card followed by a data card containing the various irrigation costs per hour, followed by an END* card should be placed before the MCPH card (card 29).

Entering Machinery Cost Per Hour Directly

If it is desired to enter machinery cost per hour directly rather than use the MCPH agendum card followed by the data cards containing the machinery costs per hour for the machines used by the budget, followed by an END* card should precede the MCPA card (card 30).

Processing Budgets in a Series

More than one budget can be processed in one computer run. To accomplish this, the set of cards for the first budget is followed by the set of cards for the second budget, etc. In the example three budgets were processed, cards 31 through 38 represent the first budget, cards 39 through 50 the second and cards 51 through 68 the third budget. When processing a series of budgets, basic parameter changes and/or machinery complement changes that are made in the first budget remain changed until another PARM and MCHG agendum card is encountered. Therefore, if the basic parameter changes and/or machinery complement changes that are made in the first budget hold for the following budget these changes need not be made again. If the user wishes to return to the basic parameter between budgets the DEFL agendum will restore machinery complement 3 and the default values of the basic parameters. An example use of the DEFL agenda is between budgets for two different farms. It is not likely that the same machinery and parameter assumptions would apply for two different farms.

Incorporating Additional Agenda and Subroutines

Outline of Procedure

The budget generating program is structured such that the incorporation of additional agenda and/or subroutines is easily accomplished by modifying only a few statements in the main program. A dictionary of variables used throughout the program is contained in Appendix F. The dictionary should aid in developing new subroutines. Five steps are necessary to add a subroutine and an agendum name that invokes the calling of that subroutine to the budget generating program. The five steps are:

Step 1: The array AGENDA contains the names of all agenda that the program recognizes. This array is dimensioned (30). Therefore, if 30 names have already been used, the array must be enlarged to accomodate the additional agendum names. Statement MAIN0110 (columns 73 through 80) contains the dimension of the array AGENDA.

Step 2: The name of the agendum to be added must be initialized into the array AGENDA. Cards MAIN0130-MAIN0160 initialize the array to contain the agenda names. The new name to be added must be inserted after the last agendum name present.

Step 3: A computed GO TO statement is used to transfer execution of the program to the set of statements that calls the subroutine invoked by the agendum name encountered. A fortran statement number must be inserted after the last statement number present in the computed GO TO statement

(MAIN0500-MAIN0510). This statement number is the statement number assigned to the call subroutine statement explained in Step 4.

Step 4: Two cards must be inserted immediately before MAIN1893. The first card contains a statement number that has not been used in the MAIN program and call XXXXXXXX, where XXXXXXXX is the name of the subroutine to be added. The second card contains the statement 'GO to 1' in columns 7 through 13.

Step 5: Insert the subroutine to be added in the source program after the last subroutine in the deck.

Example of Incorporating a Subroutine and Agendum

A subroutine to print the budget ID number, the title, the budget input-output coefficients and the footnote is listed in Table XX of Appendix G. The five steps necessary to incorporate this subroutine into the budget generating program are outlined below.

Step 1: It was not necessary to enlarge the array AGENDA because this is the 29th agendum name.

Stpe 2: The agendum name that was chosen was 'OTBD'. The following change was made in card (MAIN0160) to initialize OTBD into the array AGENDA.

(Old Card) 3TOP, 4HVECT, 4HREPL MAIN0160

(New Card) 3TOP, 4HVECT, 4HREPL, 4HOTBD MAIN0160

Note that agenda names must be no greater than four characters in length.

Step 3: Statement 47 had not been used, so 47 was the statement number assigned to the statement that would call the additional subroutine. The following changes were made in the card (MAIN0510).

Step 4: The old card order before entering the two additional cards was:

```
    STOP                          MAIN1890
48  STOP                          MAIN1893
    END                           MAIN1900
```

The new card order after adding the call XXXXXXXX card and the 90 to 1 card is:

```
    STOP                          MAIN1890
47  CALL BUDOUT                   MAIN1891
    GO TO 1                       MAIN1892
48  STOP                          MAIN1893
    END                           MAIN1900
```

Note that the statement number 47 appears on the call statement and also that the name of the subroutine is BUDOUT.

Step 5: A listing of the subroutine is contained in Table XX of Appendix G.

The output generated by this subroutine is contained in Table XII. The use of the agendum card is shown by card 65 of the sample data cards on Table XIX.

Additional Uses of the Budget Generating Program

Crop budgets are frequently used as activities in linear programming models. The Oklahoma State University Extension staff is currently using a linear programming model to aid farmers in their farm organization decisions. The card format and data requirements for

these crop activities are used to write a subroutine to search the file, locate the particular budget desired, and punch the required data cards for use in this linear programming model. This subroutine is listed on Table XXI and the output is shown on Table XIII. The subroutine LPFARM was then added to the budget generator and an agendum name included to invoke the calling of the subroutine. This subroutine reads one data card containing the following information.

	Card Columns
Name of Activity	1-30
'1' if the crop is a soil conserving crop	31
'1' if the crop can be counted as fallowing	32
'1' if the crop is grazing out of wheat	33

The subroutine incorporated data from the above data card with a summary of the budget and prepares the following three cards for use by the LPFARM program.

First Card	Card Columns
Enterprise Code	1-2
Area and County Code	3-4
Irrigation Level Code	5
Land Class Code	6
'1'	10
Name of activity read from data card	11-40
Total Capital required, (total operating cost + tractor investment + equipment investment + irrigation system investment)	41-45
Annual Capital required	46-50

First Card (Continued)	Card Columns
AUM's of grazing (item code 89) produced June-September	51-55
AUM's of grazing (item code 89) produced October-January	56-60
AUM's of grazing (item code 89) produced February-May	61-65
AUM's of native type grazing (item code 85) produced	66-70
Production of main product (units/acre)	71-75
Units the production is expressed in (Bu, Cwt, etc)	76-79

Second Card	Card Columns
Same as first card	1-9
'2'	10
Price/unit of main harvested product	11-15
Other income (the sum of the values of all other items produced by crop except grazing and main harvested product)	16-20
Seed cost per acre (sum of value of input items 100-199)	21-25
Fertilizer and chemical cost per acre (sum of value of input items 200-299)	26-30
Custom Hire cost per acre (sum of value of input items 300-399)	31-35
Machinery Operating expense (sum of tractor, equipment, irrigation system, fuel, lube, and repairs)	36-40
No entry	41-45
Miscellaneous expense per acre (sum of value of input items 400-499)	46-50
Ownership cost per acre (sum of tractor depreciation, equipment depreciation, irrigation system depreciation, insurance, and taxes)	51-55

Second Card (Continued)	Card Columns
'1' if crop is a soil conserving crop (read from data card)	56
'1' if crop can be counted as fallowing (read from data card)	57
'1' if crop is grazing-out of wheat (read from data card)	58
Third Card	**Card Columns**
Same as first card	1-9
'3'	10
Hours of labor required in January-March	11-15
Hours of total labor required in April-June	16-20
Hours of total labor required in July-September	21-25
Hours of total labor required in October-December	26-30
Acre inches of irrigation water required in Apr.	31-35
Acre inches of irrigation water required in May	36-40
Acre inches of irrigation water required in June	41-45
Acre inches of irrigation water required in July	46-50
Acre inches of irrigation water required in Aug.	51-55
Acre inches of irrigation water required in Sept.	56-60
Acre inches of irrigation water required in Oct.	61-65
Acre inches of irrigation water required in Nov.-Mar.	66-70

Summary

This chapter has discussed the use and order of the agenda cards presented in Chapter II. The agenda cards give the program its flexibility. Additional flexibility was demonstrated by two examples of incorporating additional subroutines and agenda. These and other

features can be easily added to the budget generating program by following the procedures outlined in this chapter.

CHAPTER V

SUMMARY

The objective of this study was to develop a computerized system of processing crop enterprise budgets which would alleviate many of the problems encountered in preparing, using, and updating budgets. The computer program written consists of several subroutines. These subroutines can be classified according to their functions: data input, machinery cost computations, costs and returns calculation for the budget, budget storage and retrieval, and the printing budgets and related information.

Two problems associated with hand budget preparation are the time required to perform the large number of calculations and the errors which occur in performing these calculations. The development of standardized computational procedures for determining annual capital, fixed and variable machinery costs, and the final cost and returns summary of the budget, reduces the chance for error. The value of the computer calculations is, of course, dependent upon the validity of the initial budget input-output coefficients. The computer program as written eliminates the need for hand calculations but the user is still responsible for inputing valid data. Because all computations are performed by the computer, the time required to produce usable budgets is minimized.

Problems associated with the varying assumptions made in budget construction by different individuals can be eliminated. By using a computer program requiring fixed algorithms and uniformly defined data, all budget production assumptions should be readily understood. The defined data consist of several machinery complement coefficient matrices used in the computation of machine cost, several price vectors, and a set of parameters basic to budget construction. Because the equations used to compute annual capital, machinery costs, and the costs and returns associated with a budget are a permanent part of the program these computations are performed with a well defined, consistent procedure. These procedural assumptions have been made explicit through the thesis.

The problem of budgets becoming obsolete is not solved by computerization of the budget building process. However, features for updating prices, input-output coefficients and reprinting the budgets were incorporated into the computer model. Due to the speed with which the computer can perform these tasks it becomes much easier and faster to update and print the revised budgets. Providing the input data is accurate there will be no normally expected clerical errors involved in the process of generating budgets.

Before a computer program can be readily used, steps for preparing input must be explicit. An input form has been prepared for this program which simplifies the process of preparing data. In addition, the form is designed to assist key punch operators in data deck preparation. These features provide for minimum administrative time in transferring the form from the user to the key punch operator.

The problems associated with modifying budgets for different sizes of farms were attacked by using a computer file for storing budgets, once the basic input-output data for the budgets has been prepared. The machinery costs for an enterprise can be recomputed and compared by simply using a different set of equipment (larger or smaller). Repeating the process several times leads to an economies of machinery size relationship for this enterprise.

Future Use of the Budget Generator

The main purpose of the budget generator is to build enterprise budgets. However, budgets can be used in many different ways. Building budgets to conduct economies of size studies in the past has often been avoided due to the amount of computational time required. However, with the development of the budget generator, budgets for varying farm size can be made by modifying the size and use of the machinery complement, input prices, and other coefficients. The budget generator can also be used to reflect the differences in production costs for machine ownership versus the custom hiring of those machines. The ease with which these analyses can be made should significantly expedite research in this area.

The budget generating program can also be used for cash flow analyses. By incorporating an additional subroutine which could allow the entry of the farm organization and enterprise levels, both cash flow and total input usage could be generated. This would be a very interesting area to investigate. Short run capital requirements and inventory analysis studies could also be developed which would use the budget building program as a base.

Some aspects of present day pollution and pesticide problems can be analyzed more rapidly by generating costs and returns for alternative methods of weed, insect, and disease control using the budget generator.

Limitations and Need for Further Work

Although the budget generator is built to handle only crop enterprises, the capability exists for the addition of livestock budgets. The addition of a routine to handle livestock depreciation, livestock machinery practices, and additional item names of inputs and production could easily be incorporated into the program.

A routine to compute the variable and fixed costs of irrigation water would also add to the usability of the program.

Although up to now the discussion has been limited to application in the micro economic area, budgets of a macro nature could be generated and used to estimate national production and total quantities of inputs needed. The flexible nature of the budget generating program lends itself to the areas of application discussed above and many others that have not been mentioned.

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APPENDIX A

A LISTING OF THE PROGRAM

TABLE I

A LISTING OF THE PROGRAM

80/80 LIST

```
     00000000011111111112222222222333333333344444444445555555555666666666677777777778
     12345678901234567890123456789012345678901234567890123456789012345678901234567890
CARD
0001 C* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *MAIN0000
0002 C* * * * * * * * THIS PROGRAM WAS WRITTEN BY RODNEY L. WALKER  * * * *MAIN0000
0003 C* * * * * * * * AT OKLAHOMA STATE UNIVERSITY                  * * * *MAIN0000
0004 C* * * * * * * * STILLWATER, OKLAHOMA.  FORTRAN IV LANGUAGE    * * * *MAIN0000
0005 C* * * * * * * * WAS USED TO WRITE THE PROGRAM.                * * * *MAIN0000
0006 C* * * * * * * * COPIES OF THE SOURCE PROGRAM AND DATA MAY     * * * *MAIN0000
0007 C* * * * * * * * BE OBTAINED BY ADDRESSING REQUESTS TO         * * * *MAIN0000
0008 C* * * * * * * * DR. DARREL KLETKE                             * * * *MAIN0000
0009 C* * * * * * * * DEPARTMENT OF AGRICULTURAL ECONOMICS          * * * *MAIN0000
0010 C* * * * * * * * OKLAHOMA STATE UNIVERSITY                     * * * *MAIN0000
0011 C* * * * * * * * STILLWATER, OKLAHOMA,ZIP 74074                * * * *MAIN0000
0012 C* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *MAIN0000
0013       COMMON ANCAP(12),BUD(50,18),CAP,CAP1,CAP2,CAP3,CAP4,COST,CPCST,CPCMAIN0010
0014      1ST1,CPCST2,CPCST3,CPCST4,EFUEL(12),EFUELT,ELUBE(12),ELUBET,EREP(12MAIN0020
0015      2),EREPT,EXP(37),FMULT(30,3),FOOT(3,20),FPRICE(5),GROSS,HMONTH,HOURMAIN0030
0016      3S(100,13),IREAD,IRR,ITYPE,IWRIT,MACDAT(100,16),MACH(100,10),MCNAMEMAIN0040
0017      4(100,4),MCOMP,NAME(500,4),OWN,OWN2,OWN3,OWN4,PRICE(500),QUAN(5D),RMAIN0050
0018      5ECEIT(12),TFUEL(12),TFUELT,THOURS,TITLE(3,20),TLUBE(12),TLUBET,TOTMAIN0060
0019      6AL(12),TOTCAP(12),TREP(12),TREPT,TWATER,UNIT(25),VALUE(10),X(25), MAIN0070
0020      7XIRDAT(5,10),XIREP(12),XIREPT,XIRFU(12),XIRFUT,XIRLU(12),XIRLUT,XLMAIN0080
0021      8ABOR(4,13),XLCST,XLCST1,XLCST2,XLCST3,XNET,XNET1,XNET2,XNET3,     MAIN0090
0022      9IDCODE(10)                                                       MAIN0091
0023       REAL*4 MACDAT,MACH                                               MAIN0100
0024       DIMENSION AGENDA(30),IDTEST(10),JCOL(5),TEMP(10)                 MAIN0110
0025       DEFINE FILE 8(9,2004,L,IREC1),9(100,4176,L,IREC2),10(5,6404,L,IRECMAIN0120
0026      13)                                                               MAIN0121
0027       DATA AGENDA /4HT1TL,4HFOOT,4H8UD ,4HSTOR,4HLOAD,4HMCOM,4HMCHG,   MAIN0130
0028      14HMACH,4HIRIG,4HEND*,4HPARM,4HDEFL,4HHEAD,4HBCHG,4HMCPH,4HMCPA,  MAIN0140
0029      24HGRET,4HOUT1,4HOT12,4HOT13,4HOUT2,4HOUT3,4HOUT4,4HOUT5,4HLPFM,4HSMAIN0150
0030      3TOP,4HVECT,4HREPL,4HOTBO/                                        MAIN0160
0031   100 FORMAT(A4)                                                       MAIN0170
0032   200 FORMAT(20A4)                                                     MAIN0180
0033   300 FORMAT(A4,I2,5(I2,F10.0))                                        MAIN0190
0034   400 FORMAT(1X,'THERE IS NO SPACE AVAILABLE IN THE DATA BANK FOR THIS',MAIN0200
0035      1' BUDGET.')                                                      MAIN0210
0036   401 FORMAT(A4,I2,10F7.0)                                             MAIN0211
0037   500 FORMAT(1X,'BUDGET NO.',3(I2,1X),3(I1,1X),I2,1X,2(I1,1X),I2,'IS NOTMAIN0220
0038      1 IN THE DATA BANK.')                                             MAIN0230
0039   501 FORMAT(1X,'NO STOP CARD ENCOUNTERED ENDFILE FOR CARD READER.')   MAIN0231
0040   502 FORMAT(1X,'AGENDUM NAME NOT FOUND. MISSING END* CARD OR AGENDUM ',MAIN0232
0041      1'NAME IS MISSPELLED.')                                           MAIN0233
0042   600 FORMAT(A4,I2,2X,F10.0)                                           MAIN0240
0043   700 FORMAT(312,3I1,I2,2I1,2I2)                                       MAIN0250
0044   800 FORMAT(4X,I2)                                                    MAIN0260
0045   900 FORMAT(1X,'MACHINERY COMPLEMENT NO.',I7,2X,'IS NOT IN THE FILE') MAIN0270
0046       IRR=0                                                            MAIN0280
0047       HMONTH=6.0                                                       MAIN0281
0048       IREAD=5                                                          MAIN0290
0049       IWRIT=6                                                          MAIN0300
0050       ITRIG=0                                                          MAIN0301
0051       READ(8'1) PRICE                                                  MAIN0310
0052    99 CALL INIT                                                        MAIN0330
0053       MCOMP=3                                                          MAIN0331
0054       READ(10'3) MACDAT                                                MAIN0340
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80/80 LIST

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     00000000011111111112222222222333333333344444444445555555555666666666677777777778
     12345678901234567890123456789012345678901234567890123456789012345678901234567890
CARD
0055    98 CONTINUE                                                         MAIN0350
0056       READ(11) X,FMULT,UNIT,NAME,MCNAME                                MAIN0370
0057       REWIND 11                                                        MAIN0371
0058       DO 97 I=1,100                                                    MAIN0390
0059       DO 96 J=1,10                                                     MAIN0400
0060       MACH(I,J)=0.0                                                    MAIN0410
0061    96 CONTINUE                                                         MAIN0420
0062    97 CONTINUE                                                         MAIN0430
0063     1 READ(IREAD,100,END=95) SG                                        MAIN0440
0064       DO 2 I=1,30                                                      MAIN0450
0065       L=I                                                              MAIN0460
0066       IF(SG.EQ.AGENDA(I)) GO TO 3                                      MAIN0470
0067     2 CONTINUE                                                         MAIN0480
0068       WRITE(IWRIT,502)                                                 MAIN0490
0069       STOP                                                             MAIN0491
0070    95 WRITE(IWRIT,501)                                                 MAIN0492
0071       STOP                                                             MAIN0493
0072     3 GO TO (4,6,8,10,14,18,21,22,24,1,26,99,27,9,28,29,30,31,32,33,34,MAIN0500
0073      135,36,37,38,39,40,43,47),L                                       MAIN0510
0074     4 DO 5 I=1,3                                                       MAIN0520
0075       READ(IREAD,200)(TITLE(I,K),K=1,20)                               MAIN0530
0076     5 CONTINUE                                                         MAIN0540
0077       GO TO 1                                                          MAIN0550
0078     6 DO 7 I=1,3                                                       MAIN0560
0079       READ(IREAD,200)(FOOT(I,K),K=1,20)                                MAIN0570
0080     7 CONTINUE                                                         MAIN0580
0081       GO TO 1                                                          MAIN059
0082     8 CALL INIT                                                        MAIN0600
0083       ITRIG=1                                                          MAIN0601
0084     9 READ(IREAD,300) SG,I,(JCOL(L),TEMP(L),L=1,5)                     MAIN0610
0085       IF(SG.EQ.AGENDA(1Q)) GO TO 102                                   MAIN0620
0086       DO 101 L=1,5                                                     MAIN0630
0087       IF(JCOL(L).EQ.0) GO TO 101                                       MAIN0640
0088       M=JCOL(L)                                                        MAIN0660
0089       BUD(I,M)=TEMP(L)                                                 MAIN0670
0090   101 CONTINUE                                                         MAIN0680
0091       GO TO 9                                                          MAIN0690
0092   102 DO 103 I=1,37                                                    MAIN0700
0093       INDEX=BUD(I,16)                                                  MAIN0710
0094       IF(INDEX.EQ.0) GO TO 103                                         MAIN0720
0095       IF(BUD(I,13).EQ.-1.0) BUD(I,13)=PRICE(INDEX)                     MAIN0730
0096   103 CONTINUE                                                         MAIN0750
0097       GO TO 1                                                          MAIN0760
0098    10 WRITE(9'100) IDCODE,TITLE,FOOT,BUD                               MAIN0770
0099       IBUD=0                                                           MAIN0780
0100    11 IBUD=IBUD+1                                                      MAIN0790
0101       READ(9'IBUD) IDCODE,TITLE,FOOT,BUD                               MAIN0800
0102       IF(IBUD.EQ.100) GO TO 13                                         MAIN0810
0103       DO 12 I=1,10                                                     MAIN0820
0104       IF(IDCODE(I).NE.0) GO TO 11                                      MAIN0830
0105    12 CONTINUE                                                         MAIN0840
0106       READ(9'100) IDCODE,TITLE,FOOT,BUD                                MAIN0850
0107       WRITE(9'IBUD) IDCODE,TITLE,FOOT,BUD                              MAIN0860
0108       GO TO 1                                                          MAIN0870
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TABLE I (Continued)

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                                                80/80 LIST

     0000000001111111111222222222233333333334444444444555555555566666666667777777778
     1234567890123456789012345678901234567890123456789012345678901234567890123456789
CARD
0109     13 CONTINUE                                                          MAIN0880
0110        WRITE(IWRIT,400)                                                  MAIN0890
0111        STOP                                                              MAIN0900
0112     14 CALL INIT                                                         MAIN0910
0113        IBUD=0                                                            MAIN0920
0114     15 IBUD=IBUD+1                                                       MAIN0930
0115        READ(9'IBUD) IDTEST,TITLE,FOOT,BUD                               MAIN0940
0116        IF(IBUD.EQ.100) GO TO 17                                          MAIN0950
0117        DO 16 I=1,10                                                      MAIN0960
0118        IF(IDTEST(I).NE.IDCODE(I)) GO TO 15                               MAIN0970
0119     16 CONTINUE                                                          MAIN0980
0120        GO TO 1                                                           MAIN0990
0121     17 WRITE(IWRIT,500) IDTEST                                           MAIN1000
0122        STOP                                                              MAIN1010
0123     18 READ(IREAD,800) MCOMP                                             MAIN1020
0124     19 READ(10'MCOMP) MACDAT                                             MAIN1030
0125        GO TO 1                                                           MAIN1080
0126     21 READ(IREAD,300) SG,I,(JCOL(L),TEMP(L),L=1,5)                      MAIN1120
0127        IF(SG.EQ.AGENDA(10)) GO TO 1                                      MAIN1130
0128        DO 104 L=1,5                                                      MAIN1140
0129        IF(JCOL(L).EQ.0) GO TO 104                                        MAIN1150
0130        M=JCOL(L)                                                         MAIN1160
0131        MACDAT(I,M)=TEMP(L)                                               MAIN1170
0132    104 CONTINUE                                                         MAIN1180
0133        GO TO 21                                                          MAIN1190
0134     22 READ(IREAD,401) SG,I,(TEMP(J),J=1,10)                             MAIN1200
0135        IF(SG.EQ.AGENDA(10)) GO TO 1                                      MAIN1210
0136        DO 23 J=1,10                                                      MAIN1220
0137        MACH(I,J)=TEMP(J)                                                 MAIN1230
0138     23 CONTINUE                                                          MAIN1240
0139        GO TO 22                                                          MAIN1250
0140     24 READ(IREAD,401) SG,1,(TEMP(J),J=1,10)                             MAIN1260
0141        IF(SG.EQ.AGENDA(10)) GO TO 1                                      MAIN1270
0142        DO 25 J=1,10                                                      MAIN1300
0143        XIRDAT(I,J)=TEMP(J)                                               MAIN1310
0144     25 CONTINUE                                                          MAIN1320
0145        GO TO 24                                                          MAIN1330
0146     26 READ(IREAD,600) SG,I,DATA                                         MAIN1340
0147        IF(SG.EQ.AGENDA(10)) GO TO 1                                      MAIN1350
0148        X(1)=DATA                                                         MAIN1360
0149        GO TO 26                                                          MAIN1370
0150     27 READ(IREAD,700)(IDCODE(J),J=1,10),IMONTH                          MAIN1380
0151        HMONTH=IMONTH                                                     MAIN1381
0152        IF(HMONTH.EQ.0.0) HMONTH=6.0                                      MAIN1390
0153        IRR=IDCODE(8)                                                     MAIN1410
0154        GO TO 1                                                           MAIN1430
0155     28 CALL MCPH                                                         MAIN1440
0156        GO TO 1                                                           MAIN1450
0157     29 CALL MCPA                                                         MAIN1460
0158        GO TO 1                                                           MAIN1470
0159     30 CALL GRET                                                         MAIN1480
0160        GO TO 1                                                           MAIN1490
0161     31 CALL OUT1                                                         MAIN1500
0162        GO TO 1                                                           MAIN1510
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                                                80/80 LIST

     0000000001111111111222222222233333333334444444444555555555566666666667777777778
     1234567890123456789012345678901234567890123456789012345678901234567890123456789
CARD
0163     32 CALL OUT12                                                        MAIN1520
0164        GO TO 1                                                           MAIN1530
0165     33 CALL OUT13                                                        MAIN1540
0166        GO TO 1                                                           MAIN1550
0167     34 CALL OUT2                                                         MAIN1560
0168        GO TO 1                                                           MAIN1570
0169     35 CALL OUT3                                                         MAIN1580
0170        GO TO 1                                                           MAIN1590
0171     36 CALL OUT4                                                         MAIN1600
0172        GO TO 1                                                           MAIN1610
0173     37 CALL OUT5                                                         MAIN1620
0174        GO TO 1                                                           MAIN1630
0175     38 CALL LPFARM                                                       MAIN1640
0176        GO TO 1                                                           MAIN1650
0177     39 STOP                                                              MAIN1660
0178     40 READ(IREAD,800) IVECT                                             MAIN1670
0179     41 READ(8'IVECT) PRICE                                               MAIN1680
0180        GO TO 1                                                           MAIN1690
0181     43 WRITE(9'100) IDCODE,TITLE,FOOT,BUD                                MAIN1770
0182        IBUD=0                                                            MAIN1780
0183     44 IBUD=IBUD+1                                                       MAIN1790
0184        IF(IBUD.EQ.100) GO TO 46                                          MAIN1800
0185        READ(9'IBUD) IDTEST,TITLE,FOOT,BUD                                MAIN1810
0186        DO 45 I=1,10                                                      MAIN1820
0187        IF(IDTEST(I).NE.IDCODE(I)) GO TO 44                               MAIN1830
0188     45 CONTINUE                                                          MAIN1840
0189        READ(9'100) IDCODE,TITLE,FOOT,BUD                                 MAIN1850
0190        WRITE(9'IBUD) IDCODE,TITLE,FOOT,BUD                               MAIN1860
0191        GO TO 1                                                           MAIN1870
0192     46 WRITE(IWRIT,500) IDCODE                                           MAIN1880
0193        STOP                                                              MAIN1890
0194     47 CALL BUDOUT                                                       MAIN1891
0195        GO TO 1                                                           MAIN1892
0196     48 STOP                                                              MAIN1893
0197        END                                                               MAIN1900
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TABLE I (Continued)

80/80 LIST

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      0000000001111111111222222222233333333334444444444555555555566666666667777777778
      1234567890123456789012345678901234567890123456789012345678901234567890123456789
CARD
0001        SUBROUTINE INIT                                                    INIT0010
0002        COMMON ANCAP(12),BUO(50,18),CAP,CAP1,CAP2,CAP3,CAP4,COST,CPCST,CPCMAIN0020
0003       1ST1,CPCST2,CPCST3,CPCST4,EFUEL(12),EFUELT,ELUBE(12),ELUBET,EREP(12INIT0030
0004       2),EREPT,EXP(37),FMULT(30,3),FOOT(3,20),FPRICE(5),GROSS,HMONTH,HOURINIT0040
0005       3S(100,13),IREAD,IRR,ITYPE,IWRIT,MACDAT(100,16),MACH(100,10),MCNAMEINIT0050
0006       4(100,4),MCOMP,NAME(500,4),OWN,OWN2,OWN3,OWN4,PRICE(500),QUAN(50),RINIT0060
0007       5ECEIT(12),TFUEL(12),TFUELT,THOURS,TITLE(3,20),TLUBE(12),TLUBET,TOTINIT0070
0008       6AL(12),TOTCAP(12),TREP(12),TREPT,TWATER,UNIT(25),VALUE(10),X(25),  INIT0080
0009       7XIRDAT(5,10),XIREP(12),XIREPT,XIRFU(12),XIRFUT,XIRLU(12),XIRLUT,XLINIT0090
0010       8ABOR(4,13),XLCST,XLCST1,XLCST2,XLCST3,XNET,XNET1,XNET2,XNET3,      INIT0100
0011       9IDCODE(10)                                                        INIT0101
0012        REAL*4 MACOAT,MACH                                                INIT0110
0013        CAP=0.0                                                           INIT0120
0014        CAP1=0.0                                                          INIT0130
0015        CAP2=0.0                                                          INIT0140
0016        CAP3=0.0                                                          INIT0150
0017        CAP4=0.0                                                          INIT0160
0018        CPCST=0.0                                                         INIT0170
0019        CPCST1=0.0                                                        INIT0180
0020        CPCST2=0.0                                                        INIT0190
0021        CPCST3=0.0                                                        INIT0200
0022        CPCST4=0.0                                                        INIT0210
0023        COST=0.0                                                          INIT0220
0024        EFUELT=0.0                                                        INIT0230
0025        ELUBET=0.0                                                        INIT0240
0026        EREPT=0.0                                                         INIT0250
0027        GROSS=0.0                                                         INIT0260
0028        OWN=0.0                                                           INIT0270
0029        OWN2=0.0                                                          INIT0280
0030        OWN3=0.0                                                          INIT0290
0031        OWN4=0.0                                                          INIT0300
0032        TFUELT=0.0                                                        INIT0310
0033        THOURS=0.0                                                        INIT0320
0034        TLUBET=0.0                                                        INIT0330
0035        TREPT=0.0                                                         INIT0340
0036        TWATER=0.0                                                        INIT0350
0037        XIRFUT=0.0                                                        INIT0360
0038        XIRLUT=0.0                                                        INIT0370
0039        XIREPT=0.0                                                        INIT0380
0040        XLCST=0.0                                                         INIT0390
0041        XLCST1=0.0                                                        INIT0400
0042        XLCST2=0.0                                                        INIT0410
0043        XLCST3=0.0                                                        INIT0420
0044        XLCST4=0.0                                                        INIT0430
0045        XNET=0.0                                                          INIT0440
0046        XNET1=0.0                                                         INIT0450
0047        XNET2=0.0                                                         INIT0460
0048        XNET3=0.0                                                         INIT0470
0049        DO 10 I=1,12                                                      INIT0480
0050        ANCAP(I)=0.0                                                      INIT0490
0051        EFUEL(I)=0.0                                                      INIT0500
0052        ELUBE(I)=0.0                                                      INIT0510
0053        EREP(I)=0.0                                                       INIT0520
0054        RECEIT(I)=0.0                                                     INIT0530
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80/80 LIST

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      0000000001111111111222222222233333333334444444444555555555566666666667777777778
      1234567890123456789012345678901234567890123456789012345678901234567890123456789
CARD
0055        TFUEL(I)=0.0                                                      INIT0540
0056        TLUBE(I)=0.0                                                      INIT0550
0057        TOTAL(I)=0.0                                                      INIT0560
0058        TOTCAP(I)=0.0                                                     INIT0570
0059        TREP(I)=0.0                                                       INIT0580
0060        XIRFU(1)=0.0                                                      INIT0590
0061        XIRLU(I)=0.0                                                      INIT0600
0062        XIREP(I)=0.0                                                      INIT0610
0063     10 CONTINUE                                                          INIT0620
0064        DO 14 I=1,50                                                      INIT0630
0065        DO 15 J=1,18                                                      INIT0640
0066        BUO(I,J)=0.0                                                      INIT0650
0067     15 CONTINUE                                                          INIT0660
0068        QUAN(I)=0.0                                                       INIT0670
0069     14 CONTINUE                                                          INIT0680
0070        DO 11 I=1,100                                                     INIT0690
0071        DO 12 J=1,13                                                      INIT0700
0072        HOURS(I,J)=0.0                                                    INIT0710
0073     12 CONTINUE                                                          INIT0720
0074     11 CONTINUE                                                          INIT0730
0075        DO 13 I=1,37                                                      INIT0740
0076        EXP(I)=0.0                                                        INIT0750
0077     13 CONTINUE                                                          INIT0760
0078        DO 16 I=1,10                                                      INIT0770
0079        VALUE(I)=0.0                                                      INIT0780
0080     16 CONTINUE                                                          INIT0790
0081        DO 18 I=1,4                                                       INIT0800
0082        DO 17 J=1,13                                                      INIT0810
0083        XLABOR(I,J)=0.0                                                   INIT0820
0084     17 CONTINUE                                                          INIT0830
0085     18 CONTINUE                                                          INIT0840
0086        RETURN                                                            INIT0850
0087        END                                                               MAIN0860
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TABLE I (Continued)

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                                                80/80 LIST

      0000000001111111111222222222233333333334444444444555555555566666666667777777778
      1234567890123456789012345678901234567890123456789012345678901234567890123456789
CARD
0001        SUBROUTINE MCPH                                                          MCPH0010
0002        COMMON ANCAP(12),BUD(50,18),CAP,CAP1,CAP2,CAP3,CAP4,COST,CPCST,CPC MCPH0020
0003       1ST1,CPCST2,CPCST3,CPCST4,EFUEL(12),EFUELT,ELUBE(12),ELUBET,EREP(12MCPH0030
0004       2),EREPT,EXP(37),FMULT(30,3),FOOT(3,20),FPRICE(5),GRDSS,HMONTH,HOURMCPH0040
0005       3S(100,13),IREAD,IRR,ITYPE,IWRIT,MACDAT(100,16),MACH(100,10),MCNAMEMCPH0050
0006       4(100,4),MCOMP,NAME(500,4),OWN,OWN2,OWN3,OWN4,PRICE(500),QUAN(50),RMCPH0060
0007       5ECEIT(12),TFUEL(12),TFUELT,THOURS,TITLE(3,20),TLUBE(12),TLUBET,TOTMCPH0070
0008       6AL(12),TOTCAP(12),TREP(12),TREPT,TWATER,UNIT(25),VALUE(10),X(25),  MCPH0080
0009       7XIRDAT(5,10),XIREP(12),XIREPT,XIRFU(12),XIRFUT,XIRLU(12),XIRLUT,XLMCPH0090
0010       8ABOR(4,13),XLCST,XLCST1,XLCST2,XLCST3,XNET,XNET1,XNET2,XNET3,       MCPH0100
0011       9IDCODE(10)                                                          MCPH0101
0012        REAL*4 MACDAT,MACH                                                  MCPH0110
0013        DIMENSION TAG(30)                                                   MCPH0120
0014        DO 5 I=1,30                                                         MCPH0130
0015        TAG(I)=0.0                                                          MCPH0140
0016      5 CONTINUE                                                            MCPH0150
0017        DO 15 I=1,5                                                         MCPH0160
0018        FPRICE(I)=X(I)                                                      MCPH0170
0019     15 CONTINUE                                                            MCPH0180
0020        XIRATE=X(6)                                                         MCPH0190
0021        XINSRT=X(7)                                                         MCPH0200
0022        TAXRAT=X(8)                                                         MCPH0210
0023      8 DO 12 I=38,48                                                       MCPH0220
0024        INDEX=BUD(I,16)                                                     MCPH0230
0025        IF(INDEX.EQ.0) GO TO 12                                             MCPH0240
0026        IF(INDEX.LE.29) GO TO 11                                            MCPH0250
0027      9 CONTINUE                                                            MCPH0260
0028        MACH(INDEX,5)=0.0                                                   MCPH0270
0029        MACH(INDEX,9)=0.0                                                   MCPH0280
0030        WIDTH=MACDAT(INDEX,2)                                               MCPH0290
0031        XLP=MACDAT(INDEX,3)                                                 MCPH0300
0032        SPEED=MACDAT(INDEX,4)                                               MCPH0310
0033        EFF=MACDAT(INDEX,5)                                                 MCPH0320
0034        RC1=MACDAT(INDEX,6)                                                 MCPH0330
0035        RC2=MACDAT(INDEX,7)                                                 MCPH0340
0036        RC3=MACDAT(INDEX,8)                                                 MCPH0350
0037        HRSUSD=MACDAT(INDEX,9)                                              MCPH0360
0038        YEARS=MACDAT(INDEX,10)                                              MCPH0370
0039        RFV1=MACDAT(INDEX,11)                                               MCPH0380
0040        RFV2=MACDAT(INDEX,12)                                               MCPH0390
0041        PURCH=MACDAT(INDEX,13)                                              MCPH0400
0042        ITYPE=MACDAT(INDEX,14)                                              MCPH0410
0043        HRSLFE=MACDAT(INDEX,15)                                             MCPH0420
0044        SALV=RFV1*XLP*(RFV2**YEARS)                                         MCPH0430
0045        MACDAT(INDEX,16)=SALV                                               MCPH0440
0046        IF(INDEX.LE.12) MACH(INDEX,10)=1.0                                  MCPH0450
0047        IF(INDEX.GT.12) MACH(INDEX,10)=1.0/(SPEED*WIDTH*EFF/8.25)           MCPH0460
0048        MACH(INDEX,1)=(PURCH-SALV)/(HRSUSD*YEARS)                           MCPH0470
0049        MACH(INDEX,2)=(((PURCH+SALV)/2.0)*XIRATE)/HRSUSD                    MCPH0480
0050        MACH(INDEX,3)=(((PURCH+SALV)/2.0)*XINSRT)/HRSUSD                    MCPH0490
0051        MACH(INDEX,4)=(PURCH*TAXRAT)/HRSUSD                                 MCPH0500
0052        MACH(INDEX,5)=MACH(INDEX,1)+MACH(INDEX,3)+MACH(INDEX,4)             MCPH0510
0053        XL=((HRSUSD*YEARS)/HRSLFE)*100.0                                    MCPH0520
0054        TAR=XLP*RC1*RC2*(XL**RC3)                                           MCPH0530
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                                                80/80 LIST

      0000000001111111111222222222233333333334444444444555555555566666666667777777778
      1234567890123456789012345678901234567890123456789012345678901234567890123456789
CARD
0055        MACH(INDEX,6)=TAR/(HRSUSD*YEARS)                                    MCPH0540
0056        MACH(INDEX,9)=MACH(INDEX,6)                                         MCPH0550
0057        IF(MACDAT(INDEX,14).EQ.0.0) GO TO 11                                MCPH0560
0058        IDEX=INDEX                                                          MCPH0561
0059        IF(INDEX.GT.29) IDEX=1                                              MCPH0562
0060        MACH(INDEX,7)=(XLP/1000.0)*FMULT(IDEX,ITYPE)*FPRICE(ITYPE)          MCPH0570
0061        MACH(INDEX,8)=.15*MACH(INDEX,7)                                     MCPH0580
0062        MACH(INDEX,9)=MACH(INDEX,7)+MACH(INDEX,8)+MACH(INDEX,9)             MCPH0590
0063        GO TO 12                                                            MCPH0600
0064     11 IUNIT=BUD(I,15)                                                     MCPH0610
0065        IF((INDEX.GT.29).AND.(IUNIT.EQ.0)) GO TO 12                         MCPH0620
0066        IF(IUNIT.EQ.0) IUNIT=INDEX                                          MCPH0621
0067        IF(TAG(IUNIT).GT.0.0) GO TO 12                                      MCPH0630
0068        INDEX=IUNIT                                                         MCPH0640
0069        TAG(IUNIT)=1.0                                                      MCPH0650
0070        GO TO 9                                                             MCPH0660
0071     12 CONTINUE                                                            MCPH0670
0072        RETURN                                                              MCPH0680
0073        END                                                                 MCPH0690
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TABLE I (Continued)

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                                                80/80 LIST

      00000000011111111112222222222333333333344444444445555555555666666666677777777778
      12345678901234567890123456789012345678901234567890123456789012345678901234567890
CARD
0001        SUBROUTINE MCPA                                                    MCPA0010
0002        COMMON ANCAP(12),BUD(50,18),CAP,CAP1,CAP2,CAP3,CAP4,COST,CPCST,CPCMCPA0020
0003       1ST1,CPCST2,CPCST3,CPCST4,EFUEL(12),EFUELT,ELUBE(12),ELUBET,EREP(12MCPA0030
0004       2),EREPT,EXP(37),FMULT(30,3),FOOT(3,20),FPRICE(5),GROSS,HMONTH,HOURMCPA0040
0005       3S(100,13),IREAD,IRR,ITYPE,IWRIT,MACDAT(100,16),MACH(100,10),MCNAMEMCPA0050
0006       4(100,4),MCOMP,NAME(500,4),OWN,OWN2,OWN3,OWN4,PRICE(500),QUAN(50),RMCPA0060
0007       5ECEIT(12),TFUEL(12),TFUELT,THOURS,TITLE(3,20),TLUBE(12),TLUBET,TOTMCPA0070
0008       6AL(12),TOTCAP(12),TREP(12),TREPT,TWATER,UNIT(25),VALUE(10),X(25),  MCPA0080
0009       7XIRDAT(5,10),XIREP(12),XIREPT,XIRFU(12),XIRFUT,XIRLU(12),XIRLUT,XLMCPA0090
0010       8ABOR(4,13),XLCST,XLCST1,XLCST2,XLCST3,XNET,XNET1,XNET2,XNET3,      MCPA0100
0011       9IDCODE(10)                                                        MCPA0101
0012        REAL*4 MACDAT,MACH                                                MCPA0110
0013        XIRATE=X(6)                                                       MCPA0120
0014        DO 11 I= 38,48                                                    MCPA0130
0015        INDEX=BUD(I,16)                                                   MCPA0140
0016        IF(INDEX.EQ.0) GO TO 11                                           MCPA0150
0017        IUNIT=BUD(I,15)                                                   MCPA0160
0018        IF(INDEX.LT.29) IUNIT=INDEX                                       MCPA0170
0019        IF(IUNIT.EQ.0) GO TO 9                                            MCPA0180
0020        DO 8 J=1,12                                                       MCPA0190
0021        HOURS(IUNIT,J)= HOURS(IUNIT,J)+ BUD(I,J)*MACH(INDEX,1D)           MCPA0200
0022      8 CONTINUE                                                          MCPA0210
0023        IF(INDEX.LT.29) GO TO 11                                          MCPA0230
0024      9 DO 10 J=1,12                                                      MCPA0240
0025        HOURS(INDEX,J)=HOURS(INDEX,J)+ BUD(I,J)*MACH(INDEX,10)            MCPA0250
0026     1D CONTINUE                                                          MCPA0260
0027     11 CONTINUE                                                         MCPA0270
0028        DO 13 I=1,9                                                       MCPA0280
0029        DO 12 J=1,12                                                      MCPA0290
0030        INDEX=I                                                           MCPA0300
0031        HOURS(I,J)=HOURS(I,J)*1.1                                         MCPA0310
0032        HOURS(I,13)=HOURS(I,13)+HOURS(I,J)                                MCPA0320
0033        THOURS=THOURS+HOURS(INDEX,J)                                      MCPA0330
0034        TFUEL(J)=TFUEL(J)+HOURS(INDEX,J)*MACH(INDEX,7)                    MCPA0340
0035        TREP(J) =TREP(J)+HOURS(INDEX,J)*MACH(INDEX,6)                     MCPA0350
0036        TLUBE(J) =TLUBE(J)+HOURS(INDEX,J)*MACH(INDEX,8)                   MCPA0360
0037        OWN2 = OWN2+HOURS(INDEX,J)*MACH(INDEX,5)                          MCPA0370
0038        CPCST2 = CPCST2+HOURS(INDEX,J)*MACH(INDEX,2)                      MCPA0380
0039        XLABOR(1,J) =XLABOR(1,J)+HOURS(INDEX,J)*1.2                       MCPA0390
0040     12 CONTINUE                                                          MCPA0400
0041     13 CONTINUE                                                         MCPA 410
0042        DO 18 I=38,48                                                     MCPA0420
0043        INDEX=BUD(I,16)                                                   MCPA0421
0044        IF(INDEX.LE.29) GO TO 18                                          MCPA0422
0045        IF(HOURS(INDEX,13).GT.0.0) GO TO 16                               MCPA0423
0046        DO 14 J=1,12                                                      MCPA0430
0047        HOURS(INDEX,13)=HOURS(INDEX,13)+HOURS(INDEX,J)                    MCPA0460
0048     14 CONTINUE                                                          MCPA0470
0049     16 DO 17 J=1,12                                                      MCPA0480
0050        EFUEL(J) =EFUEL(J)+HOURS(INDEX,J)*MACH(INDEX,7)                   MCPA0490
0051        EREP(J)=EREP(J)+HOURS(INDEX,J)*MACH(INDEX,6)                      MCPA0500
0052        ELUBE(J)=ELUBE(J)+HOURS(INDEX,J)*MACH(INDEX,8)                    MCPA0510
0053        CPCST3 =CPCST3+HOURS(INDEX,J)*MACH(INDEX,2)                       MCPA0520
0054        OWN3 =OWN3+HOURS(INDEX,J)*MACH(INDEX,5)                           MCPA0530
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                                                80/80 LIST

      00000000011111111112222222222333333333344444444445555555555666666666677777777778
      12345678901234567890123456789012345678901234567890123456789012345678901234567890
CARD
0055     17 CONTINUE                                                         MCPA0540
0056     18 CONTINUE                                                         MCPA0550
0057        DO 23 I=10,29                                                    MCPA0560
0058        DO 21 J=1,12                                                     MCPA0570
0059        HOURS(I,13)=HOURS(I,13)+HOURS(I,J)                               MCPA0580
0060     21 CONTINUE                                                         MCPA0590
0061        IF(HOURS(I,13).EQ.0.0) GO TO 23                                  MCPA0600
0062        DO 22 J=1,12                                                     MCPA0610
0063        EFUEL(J)=EFUEL(J)+HOURS(1,J)*MACH(I,7)                           MCPA0620
0064        EREP(J)=EREP(J)+HOURS(I,J)*MACH(I,6)                             MCPA0630
0065        ELUBE(J)=ELUBE(J)+HOURS(I,J)*MACH(I,8)                           MCPA0640
0066        CPCST3=CPCST3+HOURS(1,J)*MACH(I,2)                               MCPA0650
0067        OWN3=OWN3+HOURS(I,J)*MACH(1,5)                                   MCPA0660
0068        XLABOR(1,J)=XLABOR(1,J)+HOURS(I,J)*1.2                           MCPA0670
0069     22 CONTINUE                                                         MCPA0680
0070     23 CONTINUE                                                         MCPA0690
0071        DO 20 J=1,12                                                     MCPA0700
0072        IF(IRR.EQ.0) GO TO 19                                            MCPA0710
0073        XIRFU(J)= XIRDAT(IRR,7)*BUD(49,J)                                MCPA0720
0074        XIRLU(J) =XIRDAT(IRR,8)*BUD(49,J)                                MCPA0730
0075        XIREP(J)= XIRDAT(IRR,6)*BUD(49,J)                                MCPA0740
0076        CPCST4 =CPCST4+XIRDAT(IRR,2)*BUD(49,J)                           MCPA0750
0077        OWN4= OWN4+XIRDAT(IRR,5)*BUD(49,J)                               MCPA0760
0078        XIRFUT= XIRFUT+XIRFU(J)                                          MCPA0770
0079        XIRLUT= XIRLUT+XIRLU(J)                                          MCPA0780
0080        XIREPT= XIREPT+XIREP(J)                                          MCPA0790
0081        TWATER=TWATER+BUD(49,J)                                          MCPA0800
0082        XLABOR(3,J)=BUD(49,J)*0.13975                                    MCPA0810
0083     19 TFUELT= TFUELT+TFUEL(J)                                          MCPA0820
0084        TREPT= TREPT+TREP(J)                                             MCPA0830
0085        TLUBET= TLUBET+TLUBE(J)                                          MCPA0840
0086        EFUELT= EFUELT+EFUEL(J)                                          MCPA0850
0087        ELUBET= ELUBET+ELUBE(J)                                          MCPA0860
0088        EREPT= EREPT+EREP(J)                                             MCPA0870
0089     20 CONTINUE                                                         MCPA0880
0090        OWN=OWN2+OWN3+OWN4                                               MCPA0890
0091        CAP2=CPCST2/XIRATE                                               MCPA0900
0092        CAP3=CPCST3/XIRATE                                               MCPA0910
0093        CAP4= CPCST4/XIRATE                                              MCPA0920
0094        RETURN                                                           MCPA0930
0095        END                                                              MCPA0940
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TABLE I (Continued)

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                                                80/80 LIST

      00000000011111111112222222222333333333344444444445555555555666666666677777777778
      12345678901234567890123456789012345678901234567890123456789012345678901234567890
CARD
0001        SUBROUTINE GRET                                                        GRET0010
0002        COMMON ANCAP(12),BUD(50,18),CAP,CAP1,CAP2,CAP3,CAP4,COST,CPCST,CPCGRET0020
0003       1ST1,CPCST2,CPCST3,CPCST4,EFUEL(12),EFUELT,ELUBE(12),ELUBET,EREP(12GRET0030
0004       2),EREPT,EXP(37),FMULT(30,3),FOOT(3,20),FPRICE(5),GROSS,HMONTH,HOURGRET0040
0005       3S(100,13),IREAD,IRR,ITYPE,IWRIT,MACDAT(100,16),MACH(100,10),MCNAMEGRET0050
0006       4(100,4),MCOMP,NAME(500,4),OWN,OWN2,OWN3,OWN4,PRICE(500),QUAN(50),RGRET0060
0007       5ECEIT(12),TFUEL(12),TFUELT,THOURS,TITLE(3,20),TLUBE(12),TLUBET,TOTGRET0070
0008       6AL(12),TOTCAP(12),TREP(12),TREPT,TWATER,UNIT(25),VALUE(10),X(25),  GRET0080
0009       7XIROAT(5,10),XIREP(12),XIREPT,XIRFU(12),XIRFUT,XIRLU(12),XIRLUT,XLGRET0090
0010       8ABOR(4,13),XLCST,XLCST1,XLCST2,XLCST3,XNET,XNET1,XNET2,XNET3,      GRET0100
0011       9IDCODE(10)                                                          GRET0101
0012        REAL*4 MACDAT,MACH                                                  GRET0110
0013        XIRATE=X(6)                                                         GRET0120
0014        DO 9 I=1,37                                                         GRET0130
0015        II=BUD(I,16)                                                        GRET0140
0016        IF(BUD(I,16).EQ.0.0) GO TO 9                                        GRET0150
0017        IF(BUD(I,13).EQ.0.0) BUD(I,13)=PRICE(II)                            GRET0160
0018      9 CONTINUE                                                            GRET0170
0019        DO 11 I=1,10                                                        GRET0180
0020        DO 10 J=1,12                                                        GRET0190
0021        RECEIT(J)=RECEIT(J)+BUD(I,J)*BUD(I,13)                              GRET0200
0022        QUAN(I)=QUAN(I)+BUD(I,J)                                            GRET0210
0023        VALUE(I)=VALUE(I)+BUD(I,J)*BUD(I,13)                                GRET0220
0024     10 CONTINUE                                                            GRET0230
0025        GROSS=GROSS+VALUE(I)                                                GRET0240
0026     11 CONTINUE                                                            GRET0250
0027        DO 13 I=11,37                                                       GRET0260
0028        DO 12 J=1,12                                                        GRET0270
0029        TOTCAP(J)=TOTCAP(J)+BUD(I,J)*BUD(I,13)                              GRET0280
0030        EXP(I)=EXP(I)+BUD(I,J)*BUD(I,13)                                    GRET0290
0031        QUAN(I)=QUAN(I)+BUD(I,J)                                            GRET0300
0032     12 CONTINUE                                                            GRET0310
0033        COST=COST+EXP(I)                                                    GRET0320
0034     13 CONTINUE                                                            GRET0330
0035        COST=COST+TFUELT+TREPT+TLUBET+EFUELT+ELUBET+EREPT+XIRFUT+XIRLUT+XIGRET0340
0036       1REPT                                                                GRET0350
0037        XNET=GROSS-COST                                                     GRET0360
0038        DO 19 J=1,12                                                        GRET0370
0039     14 TOTCAP(J)=TOTCAP(J)+TFUEL(J)+TREP(J)+TLUBE(J)+EFUEL(J)+ELUBE(J)+ERGRET0380
0040       1EP(J)+XIRFU(J)+XIRLU(J)+XIREP(J)                                    GRET0390
0041        XJ=J                                                                GRET0400
0042        XMON=HMONTH-XJ                                                      GRET0410
0043        IF(HMONTH.LT.XJ) XMON=12.0-XJ+HMONTH                                GRET0420
0044        ANCAP(J)=TOTCAP(J)*XMON/12.0                                        GRET0430
0045        CAP1=CAP1+ANCAP(J)                                                  GRET0440
0046     19 CONTINUE                                                            GRET0450
0047        CPCST1=CAP1*XIRATE                                                  GRET0460
0048        CAP=CAP1+CAP2+CAP3+CAP4                                             GRET0470
0049        CPCST=CPCST1+CPCST2+CPCST3+CPCST4                                   GRET0480
0050        DO 16 J=1,12                                                        GRET0490
0051        XLABOR(2,J)=BUD(50,J)                                               GRET0500
0052        XLABOR(1,13)=XLABOR(1,J)+XLABOR(1,13)                               GRET0510
0053        XLABOR(2,13)=XLABOR(2,J)+XLABOR(2,13)                               GRET0520
0054        XLABOR(3,13)=XLABOR(3,J)+XLABOR(3,13)                               GRET0530
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                                                80/80 LIST

      00000000011111111112222222222333333333344444444445555555555666666666677777777778
      12345678901234567890123456789012345678901234567890123456789012345678901234567890
CARD
0055        XLABOR(4,J)=XLABOR(1,J)+XLABOR(2,J)+XLABOR(3,J)                      GRET0540
0056     16 CONTINUE                                                            GRET0550
0057        XLABOR(4,13)=XLABOR(1,13)+XLABOR(2,13)+XLABOR(3,13)                 GRET5660
0058        XLCST1=XLABOR(1,13)*X(10)                                           GRET0570
0059        XLCST2=XLABOR(2,13)*X(11)                                           GRET0580
0060        XLCST3=XLABOR(3,13)*X(12)                                           GRET0590
0061        XLCST=XLCST1+XLCST2+XLCST3                                          GRET0600
0062        DO 18 I=38,50                                                       GRET0610
0063        DO 17 J=1,12                                                        GRET0620
0064        QUAN(I)=QUAN(I)+BUD(I,J)                                            GRET0630
0065     17 CONTINUE                                                            GRET0640
0066     18 CONTINUE                                                            GRET0650
0067        RETURN                                                              GRET0660
0068        END                                                                 GRET0670
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TABLE I (Continued)

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                                                80/80 LIST

      00000000011111111112222222222333333333344444444445555555555666666666677777777778
      12345678901234567890123456789012345678901234567890123456789012345678901234567890
CARD
0001        SUBROUTINE OUT1                                                        OUT10010
0002        COMMON ANCAP(12),BUO(50,18),CAP,CAP1,CAP2,CAP3,CAP4,CGST,CPCST,CPCOUT10020
     1ST1,CPCST2,CPCST3,CPCST4,EFUEL(12),EFUELT,ELUBE(12),ELUBET,EREP(12OUT10030
     2),EREPT,EXP(37),FMULT(30,3),FOOT(3,20),FPRICE(5),GROSS,HMONTH,HOUROUT10040
     3S(100,13),IREAD,IRR,ITYPE,IWRIT,MACOAT(100,16),MACH(100,10),MCNAMEOUT10050
     4(100,4),MCOMP,NAME(500,4),OWN,OWN2,OWN3,OWN4,PRICE(500),QUAN(501,ROUT10060
     5ECEIT(12),TFUEL(12),TFUELT,THOURS,TITLE(3,20),TLUBE(12),TLUBET,TOTOUT10070
     6AL(12),TOTCAP(12),TREP(12),TREPT,TWATER,UNIT(25),VALUE(10),X(25), OUT10080
     7XIROAT(5,10),XIREP(12),XIREPT,XIRFU(12),XIRFUT,XIRLU(12),XIRLUT,XLOUT10090
     8ABOR(4,13),XLCST,XLCST1,XLCST2,XLCST3,XNET,XNET1,XNET2,XNET3,          OUT10100
     9IDCODE(10)                                                            OUT10101
      REAL*4 MACOAT,MACH                                                    OUT10110
  100 FORMAT(1H1)                                                           OUT10120
  200 FORMAT(1X,20A4)                                                       OUT10130
  300 FORMAT(1H0)                                                           OUT10140
  400 FORMAT(1X,'CATEGORY',33X,'UNITS',6X,'PRICE',3X,'QUANTITY',3X,'VALUOUT10150
     1E')                                                                   OUT10160
  500 FORMAT(1X,'PRODUCTION:')                                              OUT10170
  600 FORMAT(3X,4A4,23X,A4,3X,2F10.3,F10.2)                                 OUT10180
  700 FORMAT(1X,'TOTAL RECEIPTS',54X,F10.2)                                 OUT10190
  800 FORMAT(1X,'OPERATING INPUTS:')                                        OUT10200
  801 FORMAT(3X,'TRACTOR FUEL COST',22X,'ACRE',23X,F10.2)                   OUT10210
  802 FORMAT(3X,'TRACTOR LUBE COST',22X,'ACRE',23X,F10.2)                   OUT10220
  803 FORMAT(3X,'TRACT REPAIR COST',22X,'ACRE',23X,F10.2)                   OUT10230
  804 FORMAT(3X,'EQUIP   FUEL COST',22X,'ACRE',23X,F10.2)                   OUT10240
  805 FORMAT(3X,'EQUIP   LUBE COST',22X,'ACRE',23X,F10.2)                   OUT10250
  806 FORMAT(3X,'EQUIP REPAIR COST',22X,'ACRE',23X,F10.2)                   OUT10260
  807 FORMAT(3X,'IRRIG   FUEL COST',22X,'ACRE',23X,F10.2)                   OUT10270
  808 FORMAT(3X,'IRRIG   LUBE COST',22X,'ACRE',23X,F10.2)                   OUT10280
  809 FORMAT(3X,'IRRIG REPAIR COST',22X,'ACRE',23X,F10.2)                   OUT10290
  810 FORMAT(1X,'TOTAL OPERATING COST',48X,F10.2)                           OUT10300
  811 FORMAT(1X,'RETURNS TO LAND,LABOR,CAPITAL,MACHINERY,')                 OUT10310
  812 FORMAT(5X,'OVERHEAD,RISK,AND MANAGEMENT',36X,F10.2)                   OUT10320
  999 FORMAT(1X,'----------------------------------------------------------OUT10330
     1----------')                                                          OUT10340
      WRITE(6,100)                                                          OUT10350
      DO 10 I=1,3                                                           OUT10360
      WRITE(IWRIT,200)(TITLE(I,J),J=1,20)                                   OUT10370
   10 CONTINUE                                                              OUT10380
      WRITE(6,300)                                                          OUT10390
      WRITE(IWRIT,400)                                                      OUT10400
      WRITE(IWRIT,999)                                                      OUT10410
      WRITE(IWRIT,500)                                                      OUT10420
      DO 12 I=1,10                                                          OUT10430
      IF(QUAN(I).EQ.0.0) GO TO 12                                           OUT10440
      IUCODE=BUD(I,15)                                                      OUT10450
      II=BUO(I,16)                                                          OUT10460
      WRITE(IWRIT,600)(NAME(II,J),J=1,4),UNIT(IUCODE),BUD(I,13),QUAN(I),OUT10470
     1VALUE(I)                                                              OUT10480
   12 CONTINUE                                                              OUT10490
      WRITE(IWRIT,700) GROSS                                                OUT10500
      WRITE(IWRIT,999)                                                      OUT10510
   13 CONTINUE                                                              OUT10520
      WRITE(IWRIT,800)                                                      OUT10530
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                                                80/80 LIST

      00000000011111111112222222222333333333344444444445555555555666666666677777777778
      12345678901234567890123456789012345678901234567890123456789012345678901234567890
CARD
0055        DO 14 I=11,37                                                          OUT10540
0056        IF(QUAN(I).EQ.0.0) GO TO 14                                            OUT10550
0057        IUCODE=BUO(I,15)                                                       OUT10560
0058        II=BUO(I,16)                                                           OUT10570
0059        WRITE(IWRIT,600)(NAME(II,J),J=1,4),UNIT(IUCODE),BUD(I,13),QUAN(I),OUT10580
     1EXP(I)                                                                     OUT10590
0061     14 CONTINUE                                                            OUT10600
0062        IF(TFUELT.NE.0.0) WRITE(IWRIT,801) TFUELT                           OUT10610
0063        IF(TREPT .NE.0.0) WRITE(IWRIT,803) TREPT                            OUT10620
0064        IF(TLUBET.NE.0.0) WRITE(IWRIT,802) TLUBET                           OUT10630
0065        IF(EFUELT.NE.0.0) WRITE(IWRIT,804) EFUELT                           OUT10640
0066        IF(ELURET.NE.0.0) WRITE(IWRIT,805) ELUBET                           OUT10650
0067        IF(EREPT.NE.0.0) WRITE(IWRIT,806) EREPT                             OUT10660
0068        IF(XIRFUT.NE.0.0) WRITE(IWRIT,807) XIRFUT                           OUT10670
0069        IF(XIRLUT.NE.0.0) WRITE(IWRIT,808) XIRLUT                           OUT10680
0070        IF(XIREPT.NE.0.0) WRITE(IWRIT,809) XIREPT                           OUT10690
0071        WRITE(IWRIT,810) COST                                               OUT10700
0072        WRITE(IWRIT,999)                                                    OUT10710
0073        WRITE(IWRIT,811)                                                    OUT10720
0074        WRITE(IWRIT,812) XNET                                               OUT10730
0075        WRITE(IWRIT,999)                                                    OUT10740
0076        RETURN                                                              OUT10750
0077        END                                                                 OUT10760
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TABLE I (Continued)

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                                                80/80 LIST

     00000000011111111112222222222333333333344444444445555555555666666666677777777778
     12345678901234567890123456789012345678901234567890123456789012345678901234567890
CARD
0001        SUBROUTINE OUT2                                                    OUT20010
0002        COMMON ANCAP(12),BUD(50,18),CAP,CAP1,CAP2,CAP3,CAP4,COST,CPCST,CPCOUT20020
0003       1ST1,CPCST2,CPCST3,CPCST4,EFUEL(12),EFUELT,ELUBE(12),ELUBET,EREP(12OUT20030
0004       2),EREPT,EXP(37),FMULT(30,3),FOOT(3,20),FPRICE(5),GROSS,HMONTH,HOUROUT20040
0005       3S(100,13),IREAD,IRR,ITYPE,IWRIT,MACOAT(100,16),MACH(100,10),MCNAMEOUT20050
0006       4(100,4),MCOMP,NAME(500,4),OWN,OWN2,OWN3,OWN4,PRICE(500),QUAN(50),ROUT20060
0007       5ECEIT(12),TFUEL(12),TFUELT,THOURS,TITLE(3,20),TLUBE(12),TLUBET,TOTOUT20070
0008       6AL(12),TOTCAP(12),TREP(12),TREPT,TWATER,UNIT(25),VALUE(10),X(25),  OUT20080
0009       7XIRDAT(5,10),XIREP(12),XIREPT,XIRFU(12),XIRFUT,XIRLU(12),XIRLUT,XLOUT20090
0010       8ABOR(4,13),XLCST,XLCST1,XLCST2,XLCST3,XNET,XNET1,XNET2,XNET3,      OUT20100
0011       9IDCODE(10)                                                        OUT20101
0012        REAL*4 MACOAT,MACH                                                OUT20110
0013     100 FORMAT(1H1)                                                      OUT20120
0014     101 FORMAT(20X,'HOURLY COST SUMMARY FOR IMPLEMENTS AND POWER UNITS',  OUT20130
0015        12X,'BUDGET IDENTIFICATION NUMBER---',2I2,3I1,I2,2I1,I2)          OUT20131
0016     102 FORMAT(1HO)                                                      OUT20140
0017     200 FORMAT(1X,//,110X,'TOTAL',3X,'PERFORM',2X,'OP.')                 OUT20150
0018     300 FORMAT(1HO,1X, 4A4,1X,F6.2,5X,F6.0,4X,F6.0,6X,F3.0,6X,F5.0,6X,F6.3OUT20160
0019        1,4X,F6.3,4X,F6.3,2X,F6.3,4X,F6.3,2X,F6.3,2X,F6.3)                OUT20170
0020     400 FORMAT(61X,'ANNUAL',43X,'OWNER',4X,'RATE',4X,'COST')             OUT20180
0021     500 FORMAT(30X,'PURCHASE',3X,'SALVAGE',4X,'YEARS',5X,'HOURS',5X,'DEPR.OUT20190
0022        1/',2X,'INTEREST/',3X,'INS./',3X,'TAXES/',4X,'SHIP/',4X,'HOUR/',3X,OUT20200
0023        2'PER')                                                           OUT20210
0024     600 FORMAT(5X,'MACHINE',10X,'SIZE',5X,'PRICE',5X,'VALUE',6X,'OWNED',5XOUT20220
0025        1,'USED',6X,'HOUR',5X,'HOUR',7X,'HOUR',4X,'HOUR',6X,'HOUR',5X,'ACREOUT20230
0026        2',4X,'HOUR')                                                     OUT20240
0027         WRITE(6,100)                                                     OUT20250
0028         WRITE(6,102)                                                     OUT20260
0029         WRITE(IWRIT,101) (IDCODE(K),K=2,10)                              OUT20270
0030         WRITE(6,102)                                                     OUT20280
0031         WRITE(IWRIT,200)                                                 OUT20290
0032         WRITE(IWRIT,400)                                                 OUT20300
0033         WRITE(IWRIT,500)                                                 OUT20310
0034         WRITE(IWRIT,600)                                                 OUT20320
0035         DO 10 J=1,29                                                     OUT20330
0036         IF(HOURS(J,13).EQ.0.0) GO TO 10                                  OUT20340
0037         WRITE(IWRIT,300)(MCNAME(J,K),K=1,4),MACOAT(J,2),MACOAT(J,13),    OUT20350
0038        1MACOAT(J,16),MACOAT(J,10),MACOAT(J,9),(MACH(J,L),L=1,5),MACH(J,10)OUT20360
0039        2,MACH(J,9)                                                       OUT20370
0040      10 CONTINUE                                                         OUT20380
0041         DO 11 I=38,48                                                    OUT20390
0042         J=BUD(1,16)                                                      OUT20400
0043         IF(J.LE.29) GO TO 11                                             OUT20410
0044      12 WRITE(IWRIT,300)(MCNAME(J,K),K=1,4),MACOAT(J,2),MACOAT(J,13),    OUT20420
0045        1MACOAT(J,16),MACOAT(J,10),MACOAT(J,9),(MACH(J,L),L=1,5),MACH(J,10)OUT20430
0046        2,MACH(J,9)                                                       OUT20440
0047      11 CONTINUE                                                         OUT20450
0048      13 RETURN                                                           OUT20460
0049         END                                                              OUT20470
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                                                80/80 LIST

     00000000011111111112222222222333333333344444444445555555555666666666677777777778
     12345678901234567890123456789012345678901234567890123456789012345678901234567890
CARD
0001        SUBROUTINE OUT4                                                    OUT40010
0002        COMMON ANCAP(12),BUD(50,18),CAP,CAP1,CAP2,CAP3,CAP4,COST,CPCST,CPCOUT40020
0003       1ST1,CPCST2,CPCST3,CPCST4,EFUEL(12),EFUELT,ELUBE(12),ELUBET,EREP(12OUT40030
0004       2),EREPT,EXP(37),FMULT(30,3),FOOT(3,20),FPRICE(5),GROSS,HMONTH,HOUROUT40040
0005       3S(100,13),IREAD,IRR,ITYPE,IWRIT,MACOAT(100,16),MACH(100,10),MCNAMEOUT40050
0006       4(100,4),MCOMP,NAME(500,4),OWN,OWN2,OWN3,OWN4,PRICE(500),QUAN(50),ROUT40060
0007       5ECEIT(12),TFUEL(12),TFUELT,THOURS,TITLE(3,20),TLUBE(12),TLUBET,TOTOUT40070
0008       6AL(12),TOTCAP(12),TREP(12),TREPT,TWATER,UNIT(25),VALUE(10),X(25),  OUT40080
0009       7XIRDAT(5,10),XIREP(12),XIREPT,XIRFU(12),XIRFUT,XIRLU(12),XIRLUT,XLOUT40090
0010       8ABOR(4,13),XLCST,XLCST1,XLCST2,XLCST3,XNET,XNET1,XNET2,XNET3,      OUT40100
0011       9IDCODE(10)                                                        OUT40101
0012        REAL*4 MACOAT,MACH                                                OUT40110
0013     100 FORMAT(1H1)                                                      OUT40120
0014     200 FORMAT(9X,'MACHINERY COMPLEMENT(',I2,')',10X,'BUDGET IDENTIFICATIOOUT40130
0015        1N NUMBER---',2X,2I2,3I1,I2,2I1,I2)                               OUT40131
0016     300 FORMAT(1HO)                                                      OUT40140
0017     400 FORMAT(9X,'COLUMN',5X,I1,5X,I1,7X,I1,7X,I1,6X,I1,5X,I1,7X,I1,7X,I1OUT40150
0018        1,6X,I1,5X,I2,6X,I2,5X,I2,6X,I2,6X,I2,6X,I2,4X,I2)               OUT40160
0019     500 FORMAT(1X,'NAME OF MACHINE',2X,'CODE',2X,'WIDTH',2X,'INITIAL',2X,'OUT40170
0020        1SPEED',2X,'FIELD',2X,'RC1',5X,'RC2',5X,'RC3',3X,'HOURS',2X,'YEARS'OUT40180
0021        2,3X,'RFV1',3X,'RFV2',2X,'PURCHASE',2X,'FUEL',2X,'HOURS')         OUT40190
0022     600 FORMAT(24X,'(FEET)',3X,'LIST',3X,'(MPH)',2X,'EFFIC-',23X,'USED',3XOUT40200
0023        1,'OWNED',17X,'PRICE',4X,'TYPE',3X,'OF')                          OUT40210
0024     601 FORMAT(32X,'PRICE',10X,'ENCY',23X,'ANNUALLY',38X,'LIFE')         OUT40220
0025     700 FORMAT(1X,4A4,1X,F4.0,2X,F5.1,3X,F6.0,3X,F4.1,2X,F4.2,3X,F4.2,2X, OUT40230
0026        1F8.6,2X,F4.2,2X,F5.0,2X,F4.1,3X,F5.3,2X,F5.3,3X,F6.0,4X,F2.0,3X,F6OUT40240
0027        2.0)                                                              OUT40250
0028         PASS=0.0                                                         OUT40260
0029         LL=1                                                             OUT40270
0030         LLL=50                                                           OUT40280
0031       1 WRITE(6,100)                                                     OUT40290
0032         WRITE(IWRIT,200) MCOMP,(IDCODE(K),K=2,10)                        OUT40300
0033         WRITE(6,300)                                                     OUT40310
0034         WRITE(IWRIT,400)(I,I=1,15)                                       OUT40320
0035         WRITE(IWRIT,500)                                                 OUT40330
0036         WRITE(IWRIT,600)                                                 OUT40340
0037         WRITE(IWRIT,601)                                                 OUT40350
0038         DO 10 I=LL,LLL                                                   OUT40360
0039         WRITE(IWRIT,700)(MCNAME(I,J),J=1,4),(MACOAT(I,M),M=1,15)         OUT40370
0040      10 CONTINUE                                                         OUT40380
0041         LL=51                                                            OUT40390
0042         LLL=100                                                          OUT40400
0043         PASS=PASS+1                                                      OUT40410
0044         IF(PASS.EQ.1.0) GO TO 1                                          OUT40420
0045         WRITE(6,300)                                                     OUT40430
0046         RETURN                                                           OUT40440
0047         END                                                              OUT40450
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TABLE I (Continued)

80/80 LIST

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      0000000001111111111222222222233333333334444444444555555555566666666667777777778
      1234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890
CARD
0001        SUBROUTINE OUT3                                                          OUT30010
0002        COMMON ANCAP(12),BUD(50,18),CAP,CAP1,CAP2,CAP3,CAP4,COST,CPCST,CPCOUT30020
0003       1ST1,CPCST2,CPCST3,CPCST4,EFUEL(12),EFUELT,ELUBE(12),ELUBET,EREP(12OUT30030
0004       2),EREPT,EXP(37),FMULT(30,3),FOOT(3,20),FPRICE(5),GROSS,HMONTH,HOUROUT30040
0005       3S(100,13),IREAD,IRR,ITYPE,IWRIT,MACDAT(100,16),MACH(100,10),MCNAMEOUT30050
0006       4(100,4),MCOMP,NAME(500,4),OWN,OWN2,OWN3,OWN4,PRICE(500),QUAN(50),ROUT30060
0007       5ECEIT(12),TFUEL(12),TFUELT,THOURS,TITLE(3,20),TLUBE(12),TLUBET,TOTOUT30070
0008       6AL(12),TOTCAP(12),TREP(12),TREPT,TWATER,UNIT(25),VALUE(10),X(25), OUT30080
0009       7XIRDAT(5,10),XIREP(12),XIREPT,XIRFU(12),XIRFUT,XIRLU(12),XIRLUT,XLOUT30090
0010       8ABOR(4,13),XLCST,XLCST1,XLCST2,XLCST3,XNET,XNET1,XNET2,XNET3,       OUT30100
0011       9IOCODE(10)                                                          OUT30101
0012        REAL*4 MACDAT,MACH                                                  OUT30110
0013     100 FORMAT(1H1)                                                        OUT30120
0014     200 FORMAT(22X,20A4)                                                   OUT30130
0015     300 FORMAT(1HO)                                                        OUT30140
0016     400 FORMAT(8X,'CATEGORY',6X,'UNIT',4X,'JAN',4X,'FEB',4X,'MAR',4X,'APR'OUT30150
0017        1,4X,'MAY',4X,'JUN',4X,'JUL',4X,'AUG',4X,'SEP',4X,'OCT',4X,'NOV',4XOUT30160
0018        2,'DEC',2X,'PRICE',2X,'TOTAL',1X,'VALUE')                           OUT30170
0019     500 FORMAT(1X,'PRODUCTION:')                                           OUT30180
0020     600 FORMAT(4X,4A4,2X,A4,2X,14(F6.2,1X),F6.2)                           OUT30190
0021     700 FORMAT(1X,'TOTAL RECEIPTS',7X,'ACRE',2X,12(F6.2,1X),14X,F6.2)      OUT30200
0022     800 FORMAT(1X,'OPERATING INPUTS:')                                     OUT30210
0023     801 FORMAT(4X,'TRACTOR FUEL COST',1X,'ACRE',2X,12(F6.2,1X),14X,F6.2)   OUT30220
0024     802 FORMAT(4X,'TRACTOR LUBE COST',1X,'ACRE',2X,12(F6.2,1X),14X,F6.2)   OUT30230
0025     803 FORMAT(4X,'TRACT REPAIR COST',1X,'ACRE',2X,12(F6.2,1X),14X,F6.2)   OUT30240
0026     804 FORMAT(4X,'EQUIP    FUEL COST',1X,'ACRE',2X,12(F6.2,1X),14X,F6.2)  OUT30250
0027     805 FORMAT(4X,'EQUIP    LUBE COST',1X,'ACRE',2X,12(F6.2,1X),14X,F6.2)  OUT30260
0028     806 FORMAT(4X,'EQUIP REPAIR COST',1X,'ACRE',2X,12(F6.2,1X),14X,F6.2)   OUT30270
0029     807 FORMAT(4X,'IRRIG    FUEL COST',1X,'ACRE',2X,12(F6.2,1X),14X,F6.2)  OUT30280
0030     808 FORMAT(4X,'IRRIG    LUBE COST',1X,'ACRE',2X,12(F6.2,1X),14X,F6.2)  OUT30290
0031     809 FORMAT(4X,'IRRIG REPAIR COST',1X,'ACRE',2X,12(F6.2,1X),14X,F6.2)   OUT30300
0032     810 FORMAT(1X,'TOTAL COST',11X,'ACRE',2X,12(F6.2,1X),14X,F6.2)         OUT30310
0033     811 FORMAT(1X,'RETURNS TO LAND,LABOR,CAPITAL,MACHINERY,')              OUT30320
0034     812 FORMAT(8X,'OVERHEAD,RISK,AND MANAGEMENT',90X,F6.2)                 OUT30330
0035     813 FORMAT(27X,'MONTHLY SUMMARY OF RETURNS AND EXPENSES')              OUT30340
0036     814 FORMAT(1X,20A4)                                                    OUT30341
0037     815 FORMAT(1X,'BUDGET IDENTIFICATION NUMBER---',2X,212,3I1,I2,2I1,I2)  OUT30342
0038     999 FORMAT(1X,'----------------------------------------------------------OUT30350
0039        1----------------------------------------------------------------------OUT30360
0040        2----------')                                                        OUT30370
0041         WRITE(6,100)                                                       OUT30380
0042         DO 10 I=1,3                                                        OUT30390
0043         WRITE(IWRIT,200)(TITLE(I,J),J=1,20)                                OUT30400
0044      10 CONTINUE                                                           OUT30410
0045         WRITE(6,300)                                                       OUT30420
0046         WRITE(IWRIT,813)                                                   OUT30430
0047         WRITE(IWRIT,400)                                                   OUT30440
0048         WRITE(IWRIT,999)                                                   OUT30450
0049         WRITE(IWRIT,500)                                                   OUT30460
0050         DO 12 I=1,10                                                       OUT30470
0051         IF(QUAN(I).EQ.0.0) GO TO 12                                        OUT30480
0052         IUCODE=BUD(I,15)                                                   OUT30490
0053         II=BUD(I,16)                                                       OUT30500
0054         WRITE(IWRIT,600)(NAME(II,J),J=1,4),UNIT(IUCODE),(BUD(I,K),K=1,13),OUT30510
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80/80 LIST

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      0000000001111111111222222222233333333334444444444555555555566666666667777777778
      1234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890
CARD
0055        1QUAN(I),VALUE(I)                                                    OUT30520
0056     12 CONTINUE                                                           OUT30530
0057        WRITE(IWRIT,999)                                                   OUT30540
0058        WRITE(IWRIT,700)(RECEIT(I),I=1,12),GROSS                           OUT30550
0059        WRITE(IWRIT,999)                                                   OUT30560
0060     13 WRITE(6,300)                                                       OUT30570
0061        WRITE(IWRIT,800)                                                   OUT30580
0062        DO 14 I=11,37                                                      OUT30590
0063        IF(QUAN(I).EQ.0.0) GO TO 14                                        OUT30600
0064        IUCODE=BUD(I,15)                                                   OUT30610
0065        II=BUD(I,16)                                                       OUT30620
0066        WRITE(IWRIT,600)(NAME(II,J),J=1,4),UNIT(IUCODE),(BUD(I,K),K=1,13),OUT30630
0067       1QUAN(I),EXP(I)                                                     OUT30640
0068     14 CONTINUE                                                           OUT30650
0069        IF(TFUELT.NE.0.0) WRITE(IWRIT,801)(TFUEL(I),I=1,12),TFUELT         OUT30660
0070        IF(TREPT.NE.0.0) WRITE(IWRIT,803)(TREP(I),I=1,12),TREPT            OUT30670
0071        IF(TLUBET.NE.0.0) WRITE(IWRIT,802)(TLUBE(I),I=1,12),TLUBET         OUT30680
0072        IF(EFUELT.NE.0.0) WRITE(IWRIT,804)(EFUEL(I),I=1,12),EFUELT         OUT30690
0073        IF(ELUBET.NE.0.0) WRITE(IWRIT,805)(ELUBE(I),I=1,12),ELUBET         OUT30700
0074        IF(EREPT.NE.0.0) WRITE(IWRIT,806)(EREP(I),I=1,12),EREPT            OUT30710
0075        IF(XIRFUT.NE.0.0) WRITE(IWRIT,807)(XIRFU(I),I=1,12),XIRFUT         OUT30720
0076        IF(XIRLUT.NE.0.0) WRITE(IWRIT,808)(XIRLU(I),I=1,12),XIRLUT         OUT30730
0077        IF(XIREPT.NE.0.0) WRITE(IWRIT,809)(XIREP(I),I=1,12),XIREPT         OUT30740
0078        WRITE(IWRIT,999)                                                   OUT30750
0079        WRITE(IWRIT,810)(TOTCAP(I),I=1,12),COST                            OUT30760
0080        WRITE(IWRIT,999)                                                   OUT30770
0081        WRITE(6,300)                                                       OUT30780
0082        WRITE(IWRIT,811)                                                   OUT30790
0083        WRITE(IWRIT,812) XNET                                              OUT30800
0084        WRITE(6,300)                                                       OUT30801
0085        DO 15 I=1,3                                                        OUT30802
0086        WRITE(IWRIT,814)(FOOT(I,J),J=1,20)                                 OUT30803
0087     15 CONTINUE                                                           OUT30804
0088        WRITE(IWRIT,815)(IDCODE(K),K=2,10)                                 OUT30805
0089        RETURN                                                             OUT30810
0090        END                                                                OUT30820
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TABLE I (Continued)

80/80 LIST

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      0000000001111111111222222222233333333334444444444555555555566666666667777777778
      1234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890
CARD
0001        SUBROUTINE OUT12                                                    OT120010
0002        COMMON ANCAP(12),BUD(50,18),CAP,CAP1,CAP2,CAP3,CAP4,COST,CPCST,CPCOT120020
0003       1ST1,CPCST2,CPCST3,CPCST4,EFUEL(12),EFUELT,ELU8E(12),ELUBET,EREP(12OT120030
0004       2),EREPT,EXP(37),FMULT(30,3),FOOT(3,20),FPRICE(5),GROSS,HMONTH,HOUROT120040
0005       3S(100,13),IREAD,IRR,ITYPE,IWRIT,MACDAT(100,16),MACH(100,10),MCNAMEOT120050
0006       4(100,4),MCOMP,NAME(500,4),OWN,OWN2,OWN3,OWN4,PRICE(500),QUAN(50),ROT120060
0007       5ECEIT(12),TFUEL(12),TFUELT,THOURS,TITLE(3,20),TLUBE(12),TLUBET,TOTOT120070
0008       6AL(12),TOTCAP(12),TREP(12),TREPT,TWATER,UNIT(25),VALUE(10),X(25), OT120080
0009       7XIROAT(5,10),XIREP(12),XIREPT,XIRFU(12),XIRFUT,XIRLU(12),XIRLUT,XLOT120090
0010       8ABOR(4,13),XLCST,XLCST1,XLCST2,XLCST3,XNET,XNET1,XNET2,XNET3,      OT120100
0011       9IDCODE(10)                                                         OT120101
0012        REAL*4 MACDAT,MACH                                                 OT120110
0013    100 FORMAT(1H1)                                                        OT120120
0014    200 FORMAT(1HO)                                                        OT120130
0015    300 FORMAT(1X,'CAPITAL COST:')                                         OT120140
0016    301 FORMAT(3X,'ANNUAL OPERATING CAPITAL',22X,2F10.3,F10.2)             OT120150
0017    302 FORMAT(3X,'TRACTOR INVESTMENT       ',22X,2F10.3,F10.2)            OT120160
0018    303 FORMAT(3X,'EQUIPMENT INVESTMENT     ',22X,2F10.3,F10.2)            OT120170
0019    304 FORMAT(3X,'IRRIGATION SYSTEM INVESTMENT',18X,2F10.3,F10.2)         OT120180
0020    305 FORMAT(1X,'TOTAL CAPITAL COST',50X,F10.2)                          OT120190
0021    306 FORMAT(1X,'RETURNS TO LAND, LABOR, MACHINERY,')                    OT120200
0022    307 FORMAT(5X,'OVERHEAD, RISK AND MANAGEMENT',35X,F10.2)               OT120210
0023    400 FORMAT(1X,'OWNERSHIP COST: (DEPRECIATION,')                        OT120220
0024    401 FORMAT(1X,'TAXES, INSURANCE)')                                     OT120230
0025    402 FORMAT(3X,'TRACTOR',32X,'DOL.',23X,F10.2)                          OT120240
0026    403 FORMAT(3X,'EQUIPMENT',30X,'DOL.',23X,F10.2)                        OT120250
0027    404 FORMAT(3X,'IRRIGATION SYSTEM',22X,'DOL.',23X,F10.2)                OT120260
0028    405 FORMAT(1X,'TOTAL OWNERSHIP COST',48X,F10.2)                        OT120270
0029    406 FORMAT(1X,'RETURNS TO LAND, LABOR, OVERHEAD,')                     OT120280
0030    407 FORMAT(5X,'RISK AND MANAGEMENT',45X,F10.2)                         OT120290
0031    500 FORMAT(1X,'LABOR COST:')                                           OT120300
0032    501 FORMAT(3X,'MACHINERY LABOR',24X,'HR. ',3X,2F10.3,F10.2)            OT120310
0033    503 FORMAT(3X,'IRRIGATION LABOR',23X,'HR. ',3X,2F10.3,F10.2)           OT120320
0034    502 FORMAT(3X,'OTHER LABOR',28X,'HR. ',3X,2F10.3,F10.2)                OT120330
0035    504 FORMAT(1X,'TOTAL LABOR COST',52X,F10.2)                            OT120340
0036    505 FORMAT(1X,'RETURNS TO LAND, OVERHEAD,')                            OT120350
0037    506 FORMAT(5X,'RISK AND MANAGEMENT',45X,F10.2)                         OT120360
0038    507 FORMAT(1X,20A4)                                                    OT120370
0039    813 FORMAT(1X,'BUDGET IDENTIFICATION NUMBER ---',2X,2I2,3I1,12,2I1,I2)OT120371
0040    814 FORMAT(1X,'ANNUAL CAPITAL MONTH:',I2)                              OT120372
0041    999 FORMAT(1X,'-------------------------------------------------------OT120380
0042       1-----------------------')                                          OT120390
0043        XIRATE=X(6)                                                        OT120400
0044        XNET1=XNET-CPCST                                                   OT120410
0045        XNET2=XNET1-OWN                                                    OT120420
0046        XNET3=XNET2-XLCST                                                  OT120430
0047        WRITE(IWRIT,300)                                                   OT120440
0048        WRITE(IWRIT,301)XIRATE,CAP1,CPCST1                                 OT120450
0049        WRITE(IWRIT,302)XIRATE,CAP2,CPCST2                                 OT120460
0050        WRITE(IWRIT,303)XIRATE,CAP3,CPCST3                                 OT120470
0051        IF(CPCST4.NE.0.0) WRITE(IWRIT,304)XIRATE,CAP4,CPCST4               OT120480
0052        WRITE(IWRIT,305)CPCST                                              OT120490
0053        WRITE(IWRIT,999)                                                   OT120500
0054        WRITE(IWRIT,306)                                                   OT120510
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80/80 LIST

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      0000000001111111111222222222233333333334444444444555555555566666666667777777778
      1234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890
CARD
0055        WRITE(IWRIT,307)XNET1                                              OT120520
0056        WRITE(IWRIT,999)                                                   OT120530
0057        WRITE(IWRIT,400)                                                   OT120540
0058        WRITE(IWRIT,401)                                                   OT120550
0059        WRITE(IWRIT,402) OWN2                                              OT120560
0060        WRITE(IWRIT,403)OWN3                                               OT120570
0061        IF(OWN4.NE.0.0) WRITE(IWRIT,404)OWN4                               OT120580
0062        WRITE(IWRIT,405)OWN                                                OT120590
0063        WRITE(IWRIT,999)                                                   OT120600
0064        WRITE(IWRIT,406)                                                   OT120610
0065        WRITE(IWRIT,407)XNET2                                              OT120620
0066        WRITE(IWRIT,999)                                                   OT120630
0067        WRITE(IWRIT,500)                                                   OT120640
0068        WRITE(IWRIT,501)X(10),XLABOR(1,13),XLCST1                          OT120650
0069        IF(XLCST2.NE.0.0)WRITE(IWRIT,502)X(11),XLABOR(2,13),XLCST2         OT120660
0070        IF(XLCST3.NE.0.0)WRITE(IWRIT,503)X(12),XLABOR(3,13),XLCST3         OT120670
0071        WRITE(IWRIT,504)XLCST                                              OT120680
0072        WRITE(IWRIT,999)                                                   OT120690
0073        WRITE(IWRIT,505)                                                   OT120700
0074        WRITE(IWRIT,506)XNET3                                              OT120710
0075        WRITE(IWRIT,999)                                                   OT120720
0076        WRITE(6,200)                                                       OT120730
0077        DO 10 I=1,3                                                        OT120740
0078        WRITE(IWRIT,507)(FOOT(I,J),J=1,20)                                 OT120750
0079    10 CONTINUE                                                            OT120760
0080        WRITE(IWRIT,813)(IDCODE(K),K=2,10)                                 OT120762
0081        IMONTH=HMONTH                                                      OT120763
0082        WRITE(IWRIT,814) IMONTH                                            OT120764
0083        RETURN                                                             OT120770
0084        END                                                                OT120780
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TABLE I (Continued)

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                                                80/80 LIST

     00000000011111111112222222222333333333344444444445555555555666666666677777777778
     12345678901234567890123456789012345678901234567890123456789012345678901234567890
CARD
0001       SUBROUTINE OUT13                                                    OT130010
0002       COMMON ANCAP(12),BUD(50,18),CAP,CAP1,CAP2,CAP3,CAP4,COST,CPCST,CPCOT130020
0003      1ST1,CPCST2,CPCST3,CPCST4,EFUEL(12),EFUELT,ELUBE(12),ELUBET,EREP(12OT130030
0004      2),EREPT,EXP(37),FMULT(30,3),FOOT(3,20),FPRICE(5),GROSS,HMONTH,HOUROT130040
0005      3S(100,13),IREAD,IRR,ITYPE,IWRIT,MACDAT(100,16),MACH(100,10),MCNAMEOT130050
0006      4(100,4),MCOMP,NAME(500,4),OWN,OWN2,OWN3,OWN4,PRICE(500),QUAN(50),ROT130060
0007      5ECEIT(12),TFUEL(12),TFUELT,THOURS,TITLE(3,20),TLUBE(12),TLUBET,TOTOT130070
0008      6AL(12),TOTCAP(12),TREP(12),TREPT,TWATER,UNIT(25),VALUE(10),X(25),  OT130080
0009      7XIRDAT(5,10),XIREP(12),XIREPT,XIRFU(12),XIRFUT,XIRLU(12),XIRLUT,XLOT130090
0010      8A8OR(4,13),XLCST,XLCST1,XLCST2,XLCST3,XNET,XNET1,XNET2,XNET3,      OT130100
0011      9IDCODE(10)                                                         OT130101
0012       REAL*4 MACDAT,MACH                                                 OT130200
0013       DIMENSION TEMP(13)                                                 OT130201
0014   100 FORMAT(1H1)                                                        OT130120
0015   200 FORMAT(1HO)                                                        OT130130
0016   300 FORMAT(20X,'CAPITAL AND LABOR REQUIREMENTS BY MONTH',5X,'BUDGET  IOT130140
0017      1DENTIFICATION NUMBER---',2X,2I2,3I1,I2,2I1,I2)                     OT130141
0018   400 FORMAT(1X,'PERIOD',25X,'UNITS',4X,'JAN',4X,'FEB',4X,'MAR',4X,'APR'OT130150
0019      1,4X,'MAY',4X,'JUN',4X,'JUL',4X,'AUG',4X,'SEP',4X,'OCT',4X,'NOV',4XOT130160
0020      2,'DEC',2X,'TOTAL')                                                 OT130170
0021   500 FORMAT(1X,'MACHINERY LABOR',16X,'HR. ',2X,12(F6.2,1X),F6.2)        OT130180
0022   600 FORMAT(1X,'OTHER LABOR',20X,'HR. ',2X,12(F6.2,1X),F6.2)            OT130190
0023   700 FORMAT(1X,'IRRIGATION LABOR',15X,'HR. ',2X,12(F6.2,1X),F6.2)       OT130200
0024   701 FORMAT(1X,'TOTAL LABOR',20X,'HR. ',2X,12(F6.2,1X),F6.2)            OT130210
0025   800 FORMAT(1X,'TOTAL CAPITAL',18X,'DOL.',2X,12(F6.2,1X),F6.2)          OT130220
0026   900 FORMAT(1X,'ANNUAL CAPITAL',17X,'DOL.',2X,12(F6.2,1X),F6.2)         OT130230
0027   901 FORMAT(1X,'IRRIGATION WATER',15X,'ACIN',2X,12(F6.2,1X),F6.2)       OT130240
0028   902 FORMAT(1X,4A4,15X,'HR. ',2X,12(F6.2,1X),F6.2)                      OT130250
0029   903 FORMAT(1X,4A4,5X,'(',F4.1,')',4X,'HR. ',2X,12(F6.2,1X),F6.2)       OT130260
0030   904 FORMAT(1X,'THE NUMBERS IN PARENTHESES ARE TOTAL TIMES OVER FOR THAOT130270
0031      1T MACHINE.')                                                       OT130280
0032   905 FORMAT(32X,'MACHINERY REQUIREMENTS BY MONTH')                      OT130290
0033       WRITE(6,100)                                                       OT130300
0034       WRITE(6,200)                                                       OT130310
0035       WRITE(IWRIT,300)(IDCODE(K),K=2,10)                                 OT130320
0036       WRITE(6,200)                                                       OT130330
0037       WRITE(IWRIT,400)                                                   OT130340
0038       WRITE(6,200)                                                       OT130350
0039       WRITE(IWRIT,500)(XLABOR(1,J),J=1,13)                               OT130360
0040       IF(XLABOR(2,13).NE.0.0)WRITE(IWRIT,600)(XLABOR(2,J),J=1,13)        OT130370
0041       IF(XLABOR(3,13).NE.0.0)WRITE(IWRIT,700)(XLABOR(3,J),J=1,13)        OT130380
0042       IF(XLABOR(4,13).GT.XLABOR(1,13))WRITE(IWRIT,701)(XLABOR(4,J),J=1,1OT130390
0043      13)                                                                 OT130400
0044       WRITE(IWRIT,800)(TOTCAP(J),J=1,12),COST                            OT130410
0045       WRITE(IWRIT,900)(ANCAP(J),J=1,12),CAP1                             OT130420
0046       IF(TWATER.NE.0.0)WRITE(IWRIT,901)(BUD(49,J),J=1,12),TWATER         OT130430
0047       WRITE(6,200)                                                       OT130440
0048       WRITE(IWRIT,905)                                                   OT130450
0049       WRITE(6,200)                                                       OT130460
0050       DO 9 I=1,29                                                        OT130470
0051       IF(HOURS(I,13).EQ.0.0) GO TO 9                                     OT130480
0052       WRITE(IWRIT,902)(MCNAME(I,J),J=1,4),(HOURS(I,J),J=1,13)            OT130490
0053     9 CONTINUE                                                           OT130500
0054       DO 10 I=38,48                                                      OT130510
```

```
                                                80/80 LIST

     00000000011111111112222222222333333333344444444445555555555666666666677777777778
     12345678901234567890123456789012345678901234567890123456789012345678901234567890
CARD
0055       INDEX=BUD(I,16)                                                    OT130520
0056       IF(INDEX.LE.29) GO TO 10                                           OT130530
0057       TEMP(13)=0.0                                                       OT130511
0058       DO 11 J=1,12                                                       OT130531
0059       TEMP(J)=BUD(I,J)*MACH(INDEX,10)                                    OT130532
0060       TEMP(13)=TEMP(13)+TEMP(J)                                          OT130533
0061    11 CONTINUE                                                           OT130534
0062       WRITE(IWRIT,903)(MCNAME(INDEX,J),J=1,4),QUAN(I),(TEMP(K),K=1,13)  OT130540
0063    10 CONTINUE                                                           OT130560
0064       WRITE(6,200)                                                       OT130570
0065       WRITE(IWRIT,904)                                                   OT130580
0066       RETURN                                                             OT130590
0067       END                                                                OT130600
```

TABLE I (Continued)

```
                                                    80/80 LIST

     0000000011111111112222222222333333333344444444445555555556666666667777777778
     1234567890123456789012345678901234567890123456789012345678901234567890123456789
CARD
0001          SUBROUTINE OUT5                                                        OUT50010
0002          COMMON ANCAP(12),BUD(50,18),CAP,CAP1,CAP2,CAP3,CAP4,COST,CPCST,CPCOUT50020
0003         1ST1,CPCST2,CPCST3,CPCST4,EFUEL(12),EFUELT,ELUBE(12),ELUBET,EREP(12OUT50030
0004         2),EREPT,EXP(37),FMULT(30,3),FOOT(3,20),FPRICE(5),GROSS,HMONTH,HOUROUT50040
0005         3S(100,13),IREAD,IRR,ITYPE,IWRIT,MACDAT(100,16),MACH(100,10),MCNAMEOUT50050
0006         4(100,4),MCOMP,NAME(500,4),OWN,OWN2,OWN3,OWN4,PRICE(500),QUAN(50),ROUT50060
0007         5ECEIPT(12),TFUEL(12),TFUELT,THOURS,TITLE(3,20),TLUBE(12),TLUBET,TOTOUT50070
0008         6AL(12),TOTCAP(12),TREP(12),TREPT,TWATER,UNIT(25),VALUE(10),X(25),  OUT50080
0009         7XIRDAT(5,10),XIREP(12),XIREPT,XIRFU(12),XIRFUT,XIRLU(12),XIRLUT,XLOUT50090
0010         8ABOR(4,13),XLCST,XLCST1,XLCST2,XLCST3,XNET,XNET1,XNET2,XNET3,      OUT50100
0011         9IDCODE(10)                                                            OUT50101
0012          REAL*4 MACDAT,MACH                                                    OUT50110
0013        100 FORMAT(1H1)                                                         OUT50120
0014        200 FORMAT(4X,'MACHINE',7X,'CODE',2X,'DEPRECIATION INTEREST INSURANCE OUT50130
0015           1  TAX',4X,'TOTAL FIXED',4X,'REPAIR',5X,'FUEL',3X,'LUBRICANT',2X,'TOUT50140
0016           2OTAL VARIABLE',4X,'HOURS'/25X,'COST PER',4X,'COST PER COST PER COSOUT50150
0017           3T PER  COST PER',5X,'COST PER',2X,'COST PER',2X,'COST PER',5X,'COSOUT50160
0018           4T PER',8X,'PER'/28X,'HOUR',7X,'HOUR',6X,'HOUR',4X,'HOUR',7X,'HOUR'OUT50170
0019           5,8X,'HOUR',6X,'HOUR',6X,'HOUR',9X,'HOUR',9X,'ACRE')                OUT50180
0020        300 FORMAT(1HO)                                                         OUT50190
0021            WRITE(6,100)                                                        OUT50191
0022            WRITE(6,300)                                                        OUT50192
0023            WRITE(IWRIT,500)(IDCODE(K),K=2,10)                                  OUT50200
0024            WRITE(6,300)                                                        OUT50210
0025        400 FORMAT(1X,4A4,2X,I2,5X,F6.3,5X,F6.3,4X,F6.3,2X,F6.3,5X,F6.3,6X,F6.OUT50220
0026           13,4X,F6.3,4X,F6.3,7X,F6.3,7X,F6.3)                                  OUT50221
0027        500 FORMAT(20X,'MACHINERY FIXED AND VARIABLE COSTS PER HOUR',10X,'BUDGOUT50230
0028           1ET IDENTIFICATION NUMBER---',2X,212,3I1,I2,2I1,I2)                  OUT50231
0029            WRITE(IWRIT,200)                                                    OUT50260
0030            DO 9 I=1,29                                                         OUT5027C
0031            IF(HOURS(I,13).EQ.0.0) GO TO 9                                      OUT50280
0032            II=I                                                                OUT50290
0033            WRITE(IWRIT,400)(MCNAME(II,K),K=1,4),II,(MACH(II,J),J=1,10)         OUT50300
0034          9 CONTINUE                                                            OUT50310
0035            DO 10 I=38,48                                                       OUT50320
0036            II=BUD(I,16)                                                        OUT50330
0037            IF(II.LE.29) GO TO 10                                               OUT50340
0038            WRITE(IWRIT,400)(MCNAME(II,K),K=1,4),II,(MACH(II,J),J=1,10)         OUT50350
0039         10 CONTINUE                                                            OUT50360
0040            RETURN                                                              OUT50370
0041            END                                                                 OUT50380
```

APPENDIX B

FORMAT OF AGENDA CARDS AND DATA CARDS

APPENDIX B

FORMAT OF AGENDA CARDS AND DATA CARDS

The purpose of this Appendix is to describe the control cards (or agendum cards) necessary to process a budget and the card formats for the data cards they require.

The HEAD Agendum

Purpose

This agendum reads in the budget identification number and the month used to compute annual capital for the budget processed. These data items are specified using part 2 of the input form.

Format and Organization of Data Cards

		Card Columns
First Card	'HEAD'	1-4
Second Card	ID Number	2-15
	Harvest Month	16-17

The VECT Agendum

Purpose

This agendum instructs the program to load a particular price vector for use. This data item is specified using part 1 of the input form.

Format and Organization of Data Cards

		Card Columns
First Card	'VECT'	1-4
Second Card	Number of vector to be loaded	1

The TITL Agendum

Purpose

The TITL agendum reads in three data cards which contain the title of a budget or changes to the title of an old budget. The title is specified using part 3 of the input form.

Format and Organization of Data Cards

		Card Columns
First Card	'TITL'	1-4
Second Card	1st 80 characters of title	1-80
Third Card	2nd 80 characters of title	1-80
Fourth Card	3rd 80 characters of title	1-80

Although only one data card might be sufficient to contain the title information, all three title cards must be included even though the last two cards are blank.

The FOOT Agendum

Purpose

The FOOT agendum reads in three data cards which contain the footnote of a budget or changes to the footnote of an old budget. The

footnote may be found on part 4 of the input form.

Format and Organization of Data Cards

		Card Columns
First Card	'FOOT'	1-4
Second Card	1st 80 characters of footnote	1-80
Third Card	2nd 80 characters of footnote	1-80
Fourth Card	3rd 80 characters of footnote	1-80

Although only one data card might be sufficient to contain the footnote information, all three footnote cards must be included even though the last two cards are blank.

The BUD Agendum

Purpose

This agendum reads in the production coefficients, input requirements, machinery operations, other labor, and irrigation water requirements. This information is specified on part 7 of the input form.

Format and Organization of Data Cards

		Card Columns
First Card	'BUD'	1-3
Second and each additional data card needed	Row number of item(s)	5-6 (right justified no decimal)
	Column number of 1st item	7-8 (right justified no decimal)
	Value of 1st item	9-18 (decimal punched)

	Card Columns
Column number of 2nd item	19-20 (right justified no decimal)
Value of 2nd item	21-30 (decimal punched)
Column number of 3rd item	31-32 (right justified no decimal)
Value of 3rd item	33-42 (decimal punched)
Column number of 4th item	43-44 (right justified no decimal)
Value of 4th item	45-54 (decimal punched)
Column number of 5th item	55-56 (right justified no decimal)
Value of 5th item	57-63 (decimal punched)

If there are more than five entries on a particular line, use as many cards as are necessary to punch the entries. However, under no circumstances should entries from two different lines appear on the same card. It is permissible to punch less than five items per card. Use as many cards as are necessary to punch the information. A card with 'END*' must follow the last data card.

The LOAD Agendum

Purpose

The LOAD agendum reads an old budget currently residing in the budget file into the program.

Format and Organization of Data Cards

		Card Columns
First Card	'LOAD'	1-4

No further data cards are required for implementing this agendum.

The DEFL Agendum

Purpose

The purpose of the DEFL agendum is to restore all of the default values to the basic parameters.

Format and Organization of Data Cards

		Card Columns
Agendum Card	'DEFL'	1-4

No data cards are required for this agendum.

The STOR Agendum

Purpose

This agendum enters a new budget into the budget file.

Format and Organization of Data Cards

		Card Columns
First Card	'STOR'	1-4

No further cards are required for this agendum.

The BCHG Agendum

Purpose

This agendum reads in changes to an old budget previously loaded with the LOAD agendum. These data may be found on part 7 of the input form.

Format and Organization of Data Cards

		Card Columns
First Card	'BCHG'	1-4
Second and each additional data card needed	Same format as that used in the BUD agendum	

The REPL Agendum

Purpose

The REPL agendum replaces an old budget in the budget file with an updated version of the old budget.

Format and Organization of Data Cards

		Card Columns
First Card	'REPL'	1-4

No further data cards are required for this agendum.

The PARM Agendum

Purpose

The purpose of this agendum is to make modifications in the default values of the basic parameters listed on part 5 of the input form.

Format and Organization of Data Cards

		Card Columns
Agendum Card	'PARM'	1-4
First Data Card	Blank	1-4

		Card Columns
	Row number of parameters to be changed	5-6 (right justified no decimal)
	Blank	7-8
	Value of parameter	9-18 (decimal punched)

Only the rows in which a data item has been entered in the column of 'your values' needs to be punched. A card with 'END*' in columns 1-4 must follow the last data card.

The MCAH Agendum

Purpose

The purpose of the MACH agendum is to read in the machinery cost per hour coefficients for the machines used by the budget processed. These data are entered on part 9 of the input form.

Format and Organization of Data Cards

		Card Columns
First Card	'MACH'	1-4
Second and each additional card needed	Code number of machine	5-6 (right justified no decimal)
	Depreciation cost per hour	7-13 (decimal punched)
	Interest cost per hour	14-20 (decimal punched)
	Insurance cost per hour	21-27 (decimal punched)
	Tax cost per hour	28-34 (decimal punched)
	Total fixed cost per hour	35-41 (decimal punched)
	Repair cost per hour	42-48 (decimal punched)
	Fuel cost per hour	49-55 (decimal punched)
	Lube cost per hour	56-62 (decimal punched)

	Card Columns
Total variable cost per hour	63-69 (decimal punched)
Hours per acre	70-76 (decimal punched)

Prepare one card for each machine used by the budget. Use as many cards as necessary to enter machines cost. A card with 'END*' in columns 1-4 must follow the last data card.

The MCOM Agendum

Purpose

The MCOM agendum loads one of the machinery complements into the computer. This input item may be specified using part 1 of the input form.

Format and Organization of Data Cards

		Card Columns
First Card	'MCOM'	1-4
Second Card	Machinery complement number to be loaded	5-6 (right justified no decimal)

The MCHG Agendum

Purpose

The purpose of the MCHG agendum is to make changes in the coefficients of the previously loaded machinery complement. These data are entered on part 8 of the input form.

Format and Organization of Data Cards

		Card Columns
First Card	'MCHG'	1-4
Second and each additional card needed	Row number of items being changed	5-6 (right justified no decimal)
	Column number of 1st item to be changed	7-8 (right justified no decimal)
	Value of 1st item	9-18 (decimal punched)
	Column number of 2nd item to be changed	19-20 (right justified no decimal)
	Value of 2nd item	21-30 (decimal punched)
	Column number of 3rd item to be changed	31-32 (right justified no decimal)
	Value of 3rd item	33-42 (decimal punched)
	Column number of 4th item to be changed	43-44 (right justified no decimal)
	Value of 4th item	45-54 (decimal punched)
	Column number of 5th item to be changed	55-56 (right justified no decimal)
	Value of 5th item	57-63 (decimal punched)

If there are more than five entries on a particular line, use as many cards as are necessary to punch all the entries. However, no card should contain entries from two different lines. It is permissible to punch less than five items per card. Use as many cards as necessary to prepare the information. A card with 'END*' must follow the last data card.

The MCPH Agendum

Purpose

This agendum instructs the program to compute machinery cost per hour for the machines used by the budget being processed.

Format and Organization of Data Cards

		Card Columns
First Card	'MCPH'	1-4

No further data cards are required for this agendum.

The IRIG Agendum

Purpose

The purpose of this agendum is to read the components of variable and fixed irrigation costs per acre inch of water used. These data may be found on part 10 of the input form.

Format and Organization of Data Cards

		Card Columns
First Card	'IRIG'	1-4
Second Card	Same format and items that are used for the MACH agendum. All entries are per acre inch rather than per acre.	

A card with 'END*' in columns 1-4 must follow the second card.

The MCPA Agendum

Purpose

This agendum instructs the program to compute the machinery costs per acre for the budget being processed.

Format and Organization of Data Cards

		Card Columns
First Card	'MCPA'	1-4

No further data cards are required for this agendum.

The GRET Agendum

Purpose

This agendum instructs the program to compute the costs and returns data for the budget.

Format and Organization of Data Cards

		Card Columns
First Card	'GRET'	1-4

No further data cards are required for this agendum.

The Output Agenda

The following agenda produces the output described at the right of the agendum name. The only data card necessary to invoke each agendum is one card with the agendum name in the first four columns of the card. Any or all of these agenda may appear in the deck but must follow the

GRET agendum. The order of appearance determines the order in which output will be printed.

Agendum	Output
(OUT1, OT12)	General Budget
OT13	Machinery, Capital, and Labor Requirements by Month
OUT2	Detailed Budget
OUT3	Hourly Cost Summary for Machinery and Power Units
OUT4	Machinery Complement Listing
OUT5	Machinery Fixed and Variable Costs Per Hour
OTBD	Basic Budget Data

The LPFM Agendum

Purpose

The purpose of this agendum is to output the budget information in the format that the LPFARM program will accept. This agendum will punch the three data cards per crop activity as required by the LPFARM program.

Format and Organization of Data Cards

		Card Columns
First Card	'LPFM'	1-4
Second Card	Description of enterprise and resource situation	1-30
	'1' if crop is a soil conserving crop	31
	'1' if crop can be counted as fallow	32
	'1' if the activity is grazing-out of wheat	33

The STOP Agendum

Purpose

This agendum indicates that there are no more budgets to be processed.

Format and Organization of Data Cards

		Card Columns
First Card	'STOP'	1-4

No further data cards are required for this agendum.

This must be the last agendum card appearing in the data deck.

APPENDIX C

SAMPLE INPUT FORM, UNITS OF MEASUREMENT CODES, AND PRODUCTION AND OPERATING INPUT ITEM CODES

Form 1 of 3
Name _____

OKLAHOMA STATE UNIVERSITY
BUDGET PREPARATION FORM
Department of Agricultural Economics

Date 7/25/71

PART (2) Budget Identification Number

a. Enterprise Code	7 3
b. Area and County Code	6 1
c. Irrigation Level	0
d. Land Class Code	7
e. Grazing Code	0
f. Machinery Complement	0 3
g. Irrigation System	0
h. Price Vector	1
i. Individual number	0 5
Month of Computing Annual Capital (harvest month) (Default is June)	10

PART (1) Processing System Selection

Complete Blanks and Check Boxes of all Relevant Processes

a. Budget completely from forms	/X/	(HEAD,TITL,FOOT,BUD)
b. Budget will be prepared from old budget	/ /	
c. Old budget number _____		(HEAD,LOAD)
d. Month to compute annual capital _____		
e. Title will change	/ /	(TITL)
f. Footnote will change	/ /	(FOOT)
g. Coefficients will change	/ /	(BCHG)
h. Parameters will change	/ /	(PARM)
i. Price vector # _____ (default 1)		(VECT)
j. Completely new budget storage on file	/X/	(STOR)
k. Old source budget to be replaced on file	/ /	(REPL)
l. Altered old budget stored as new budget on file	/ /	(HEAD,STOR)
m. Hourly machine costs entry	/ /	(MACH)
n. Per acre irrigation costs entry	/ /	(IRGI)
o. Machinery complement # _____ (default 3)		(MCOM) } (MCPH)
p. Changes in Machinery Complement	/ /	(MCHG) } (MCPH)
q. Complete part (6)	/X/	(MCPA,GRET)

*If block in line is checked, complete input form part listed on left.

PART (3) Title
(TITL)
Grain sorghum: Production costs and returns per acre, sandy soils. This is a sample budget prepared to illustrate the use of the budget generating program and use of agenda cards.

PART (4) Footnote
(FOOT)
The footnote cards can be used to clarify any parts of the budget.

PART (5) Parameters

(PARM) Row Number	Your Value	Default Value
1. Price per gallon of gasoline	.____	.23
2. Price per gallon of L.P. gas	.____	.087
3. Price per gallon of diesel	.____	.15
4. Price per kilowat hour of electricity	.____	.0169
5. Price for first 1000 cu. ft. of natural gas	_.____	1.50
6. Interest rate	.____	.07
7. Insurance rate (price/dol. of average investment insured)	.____	.006
8. Tax rate (price/dol. of purchase value)	.____	.01
9. Variable transmitted to user written subroutine	_.____	0.0
10. Price of machinery labor/hour	_.____	1.50
11. Price of other labor/hour	_.____	1.50
12. Price of irrigation labor/hour	_.____	2.00

PART (4) Output Selection
Check Items Desired

General Budget	/X/	(OUT1,OT12)
Detailed Budget	/X/	(OUT3)
Machinery, Capital, and Labor Requirements by Month	/X/	(OT13)
Hourly Cost Summary for Machinery and Power Units	/X/	(OUT2)
Machinery Fixed and Variable Costs Per Hour	/X/	(OUT5)
Machinery Complement Listing	/X/	(OUT4)
Punched Cards for L.P. Farm	/ /	(LPFm)
Listing of Stored Budget	/ /	(OTBD)

PART (7) Production, Inputs, and Machinery Requirements

(BUD,BCHG)

LINE	PRODUCTION	COL 1 JAN	COL 2 FEB	COL 3 MAR	COL 4 APR	COL 5 MAY	COL 6 JUN	COL 7 JUL	COL 8 AUG	COL 9 SEP	COL 10 OCT	COL 11 NOV	COL 12 DEC	COL 13 PRICE	COL 14	COL 15 UNIT CODE	COL 16 ITEM CODE
1.	Grain Sorghum									24.				1.43		16.	73.
2.																	
3.																	
4.																	
5.																	
6.																	
7.																	
8.																	
9.																	
10.																	
	OPERATING INPUTS																
11.	Seed					6.								.21		11.	173.
12.	Nitrogen				40.									.10		11.	201.
13.	Phosphate				20.									.08		11.	204.
14.	Potash				10.									.05		11.	206.
15.	Rent Fert. Spread				1.									.15		7.	361.
16.	Combining									1.				3.50		7.	305.
17.	Hauling									24.				.10		16.	302.
18.																	
19.																	
20.																	
21.																	
22.																	
23.																	
24.																	
25.																	

LINE	OPERATING INPUTS (CONT.)	COL 1 JAN	COL 2 FEB	COL 3 MAR	COL 4 APR	COL 5 MAY	COL 6 JUN	COL 7 JUL	COL 8 AUG	COL 9 SEP	COL 10 OCT	COL 11 NOV	COL 12 DEC	COL 13 PRICE	COL 14	COL 15 UNIT CODE	COL 16 ITEM CODE
26.																	
27.																	
28.																	
29.																	
30.																	
31.																	
32.																	
33.																	
34.																	
35.																	
36.																	
37.																	
	TIMES OVER MACHINERY REQUIREMENTS															POWER UNIT	
38.	Stalk Shredder		1.													3.	91.
39.	Disc			1.												3.	43.
40.	Moldboard Plow			.33												3.	41.
41.	Chisel			1.4												3.	49.
42.	Springtooth				1.											3.	46.
43.	Planter					1.										3.	52.
44.	Cultivator						1.	1.								3.	57.
45.																	
46.																	
47.																	
48.																	
49.	AC. IN IRRG. WATER																
50.	HRS LABOR REQUIRED																

PART (9) Machinery Costs Per Hour
(MACH)

ITEM	CODE	DEPRECIATION COST PER	INTEREST COST PER	INSURANCE COST PER	TAXES COST PER	TOTAL FIXED COST PER	REPAIRS COST PER	FUEL COST PER	LUBE COST PER	TOTAL VARIABLE COST PER	HOURS PER
UNIT	LINE NO.	HOUR	HOUR	HOUR	HOUR	HOUR	HOUR	HOUR	HOUR	HOUR	ACRE
MACHINE NAME 1.											
2.											
3.											
4.											
5.											
6.											
7.											
8.											
9.											
10.											
11.											
12.											
13.											
14.											
15.											

PART (10) Irrigation Costs Per Acre
(IRIG)

UNIT	CODE	ACRE INCH	ACRE INCH	ACRE INCH	ACRE INCH	ACRE INCH	ACRE INCH	ACRE INCH	ACRE INCH	ACRE INCH	ACRE INCH
IRRIGATION SYSTEM											

TABLE II

UNITS CODE

Code	Units
1	HD.
2	BU.
3	TN.
4	DZ.
5	GAL.
6	BL.
7	ACRE
8	HR.
9	DAYS
10	AUMS
11	ACIN
12	LBS.
13	PT.
14	QT.
15	DOL.
16	CWT.
17	OZ.

TABLE III

PRODUCTION AND OPERATING INPUT ITEM CODE

Crop Enterprise Codes (1-47)	Crop Enterprise Codes (48-94)	
1	48	
2	49	
3	50	
4	51	
5	52	
6	53	
7	54	
8	55	
9	56	
10	57	
11	58	
12	59	
13	60	
14	61	
15	62	
16	63	
17	64	
18	65	
19	66	
20	67	
21	68	
22	69	
23	70	Grain
24	71	Barley
25	72	Corn
26	73	Milo
27	74	Oats
28	75	Rye
29	76	Wheat
30	77	
31	78	
32	79	
33	80	Hay
34	81	Alfalfa
35	82	Brome
36	83	Bermuda
37	84	Forage Sorghum
38	85	Native
39	86	Silage
40	87	Sudan
41	88	Straw
42	89	Grazing
43	90	Cash Crops
44	91	Broomcorn
45	92	Cowpeas
46	93	Cotton Lint
47	94	Cotton Seed

TABLE III (Continued)

Crop Enterprise Codes (95-99)		Crop Seed Codes (142-190)	
95	Peanuts	142	
96	Vetch	143	
97	Clover	144	
98	Soybeans	145	
99		146	
Crop Seed Codes (100-141)		147	
		148	
100		149	
101		150	
102		151	
103		152	
104		153	
105		154	
106		155	
107		156	
108		157	
109		158	
110		159	
111		160	
112		161	
113		162	
114		163	
115		164	
116		165	
117		166	
118		167	
119		168	
120		169	
121		170	Grain Seed
122		171	Barley Seed
123		172	Corn Seed
124		173	Milo Seed
125		174	Oat Seed
126		175	Rye Seed
127		176	Wheat Seed
128		177	
129		178	
130		179	
131		180	Hay Seed
132		181	Alfalfa Seed
133		182	Brome Seed
134		183	Bermuda Seed
135		184	Sorghum Seed
136		185	Native Pasture Seed
137		186	Silage Seed
138		187	Sudan Seed
139		188	
140		189	
141		190	Seed

TABLE III (Continued)

Crop Seed Codes (191-199)	
191	Broom Corn Seed
192	Cowpeas Seed
193	
194	Cotton Seed
195	Peanut Seed
196	Vetch Seed
197	Clover Seed
198	Soybean Seed
199	

Fertilizer Lime & Chemical Codes (200-236)	
200	
201	
202	
203	
204	
205	
206	
207	
208	
209	
210	Fertilizer
211	Nitrogen
212	N & K
213	N & P & K
214	Phosphate
215	P & K
216	Potash
217	Complete Fert
218	
219	
220	Trace Elements
221	Boron
222	Cobalt
223	Iron
224	Sulfer
225	Zinc
226	
227	
228	
229	
230	Lime & Gypsum
231	Lime
232	Gypsum
233	
234	
235	
236	

Fertilizer Lime & Chemical Codes (237-284)	
237	
238	
239	
240	Insecticide
241	DDT
242	Methoxychlor
243	Malathion
244	Parathion
245	
246	
247	
248	
249	
250	Herbicide
251	2-4-D
252	Broad Leaf Herb
253	Grass Killer
254	Pre-Merge Herb
255	Soil Sterilant
256	
257	
258	
259	
260	Chemicals
261	Fumigant
262	Seed Treatment
263	Rodent Control
264	
265	
266	
267	
268	
269	
270	Soil Test
271	
272	
273	
274	
275	
276	
277	
278	
279	
280	Bags, Tags, etc.
281	
282	
283	
284	

TABLE III (Continued)

Fertilizer Lime & Chemical Codes (285-299)

285
286
287
288
289
290
291
292
293
294
295
296
297
298
299

Custom Hire Operation Codes (300-330)

300 Machine Hire
301 Car Rental
302 Truct Hire
303 Tractor Hire
304 Power Unit Hire
305 Custom Combine
306
307
308
309
310 Livestock Fed Equip
311 Feeders
312 Waterers
313 Grinder
314 Hammer Mill
315 Roller
316 Pelleter
317 Grinder Mixer
318 Feed Wagon
320 Other Livestock Equip
321 Milker
322 Bulk Tank
323 Milk Equipment
324 Branding Equipment
325 Vet Equipment
326 Separator
327 Chutes
328 Saddles, Bridles
329 Scales
330 Materials Handling

Custom Hire Operation Codes (331-379)

331 Elevator
332 Auger
333 Blower
334
335 Manure Loader
336 Manure Spreader
337 Gradr-Land Plane
338 Posthole Digger
339
340 Till Machinery
341 Plow
342 Oneway
343 Disk
344 Rod Weeder
345 Spike Harrow
346 Spring Tooth
347 Sweep
348 Rotary Hoe
349 Subsoiler-Chisel
350 Plant & Cultivate
351 Drill
352 2-Row Planter
353 4-Row Planter
354 6-Row Planter
355 Lister
356 G-Devil
357 2-Row Cultivator
358 4-Row Cultivator
359 6-Row Cultivator
360 Irrig. & Chem Appl.
361 Fert. Spreader
362 Liquid Fert. Spreader
363 Anhydrows Appl.
364 Sprayer
365 Irrigation Well
366 Irrigation Pump
367 Irrigation Pipe
368 Irrig. Dams, Tubes
369 Irrig. Ditcher
370 Harvest Equip.
371 Combine, Pull Type
372 Silage Cutter
373 Cornpicker
375 Shaker
376 Digger
377
378
379

TABLE III (Continued)

Custom Hire Operation Codes (380-399)

380 Haying Equipment
381 Sickle Mower
382 Rotary Mower
383 Cond.-Crimper
384 Rake
385 Windrower
386 Sweep
387 Stacker
388 Baler
389 Bale-Loader
390 Store & Proc. Equipment
391
392
393
394
395
396
397
398
399

Miscellaneous Codes (400-426)

400 Miscellaneous Expense
401 Accounting
402 Checking Chgs.
403 Other Bank Charges
404 Legal Fees
405 Sales Comm.
406 Papers & Regis.
407 Testing
408 Farm Magazines
409 Organizations
410 Vet Medicine
411 Vet Service
412 Medicine
413 Vaccine
414 Equipment
415 Vet Supplies
416
417
418
419
420 Gas, Fuel
421 Gasoline
422 Diesel
424 Kerosene
425 Nat. Gas Irr. & Pwr.
426 Grease

Miscellaneous Codes (427-475)

427 Oil
428 Filters, etc.
429 Antifreeze, add.
430 Storage
431 Warehousing
432 Bailments
433 Cold Storage
434 Brokerage
435 Custom Kill
436
437
438
439
440 Taxes
441 Real Estate Tax
442 Personal Taxes
443 Licenses
444 Permits
445 Sales Tax
446
447
448
449
450 Insurance Premiums
451 Hail Insurance
452 Crop Insurance
453 Livestock Insurance
454 Vehicle Insurance
455 Equipment Insurance
456 Building Insurance
457 Liability Insurance
458
459
460 Utilities
461 Phone
462 Telegraph
463 Radio-Two-Way
464 Electricity
465 Nat. Gas from Pl.
466 Water
467 Sewer & Waste Disp.
468
469
470 Rent Paid Out
471 Beef Rental
472 Dairy Rental
473 Sheep Rental
474 Swine Rental
475 Other Livestock Rental

TABLE III (Continued)

Miscellaneous Codes (476-487)		Miscellaneous Codes (488-499)	
476	Vehicle & Motor Rent	488	
477	Machinery Rent	489	
478	Building Rent	490	Conservation Expense
479	Land Rent	491	Terracing
480	Trucking & Travel	492	Waterways
481	Trucking	493	Leveling
482	Freight	494	Seeds
483	Advertising	495	Trees
484	Travel Tickets	496	Dams
485	Travel Tickets	497	Brush Clearing
486	Lodging	498	
487	Meeting Fees	499	

APPENDIX D

CODES FOR DETERMINING BUDGET IDENTIFICATION NUMBER

APPENDIX D

CODES FOR DETERMINING BUDGET IDENTIFICATION NUMBER

a. Enterprise Code

70 Grain
71 Barley
72 Corn
73 Grain Sorghum
74 Oats
75 Rye
76 Wheat
77-79 Other Grains
80 Hay & Forage
81 Alfalfa
82 Brome
83 Bermuda
84 Grass, Tame
85 Native Pasture
86 Silage
87 Sudan
88 Forage Sorghum
89 Graze-Out Small Grain
90 Cash Crops
91 Broomcorn
92 Cowpeas & Mungbeans (Pulse Crops)
93 Cotton
94 Guar (Mucilage Crops)
95 Peanuts
96 Pecans & Other Tree Nuts
97 Fruits, Melons, Berries
98 Soybeans
99 Vegetables

b. Area & County Codes

(See map on following page)

c. Irrigation Level (Acre Inches)

0 Dryland
1 1-4
2 5-8
3 9-12
4 13-16
5 17-20
6 21-24
7 25-28
8 29-32
9 Greater than 33

d. Land Class Code

1 Ca
2 Cb
3 Cc
4 La
5 Lb
6 Lc
7 Sa
8 Sb
9 Sc

e. Grazing Code

1. Barley
2. Corn Stubble
3. Grain Sorghum Stubble
4. Oats
5. Rye
6. Wheat
7. Sudan
8. Alfalfa
9. Native

f. Machinery Complement

1. Less than 70 horsepower
2. 70-89 horsepower
3. 90-109 horsepower
4. 110-129 horsepower
5. More than 130 horsepower

g. Irrigation System

1. Hand Move
2. Side Move

g. Irrigation System (Cont.)

3. Side Move Tow
4. Self Propelled
5. Surface

h. Price Vector

1. State Price Vector
2.-9. Other Price Vectors

i. Individual Number

Individuals can use this two digit number to further identify budgets. If all other numbers are identical this number can be used to make them unique.

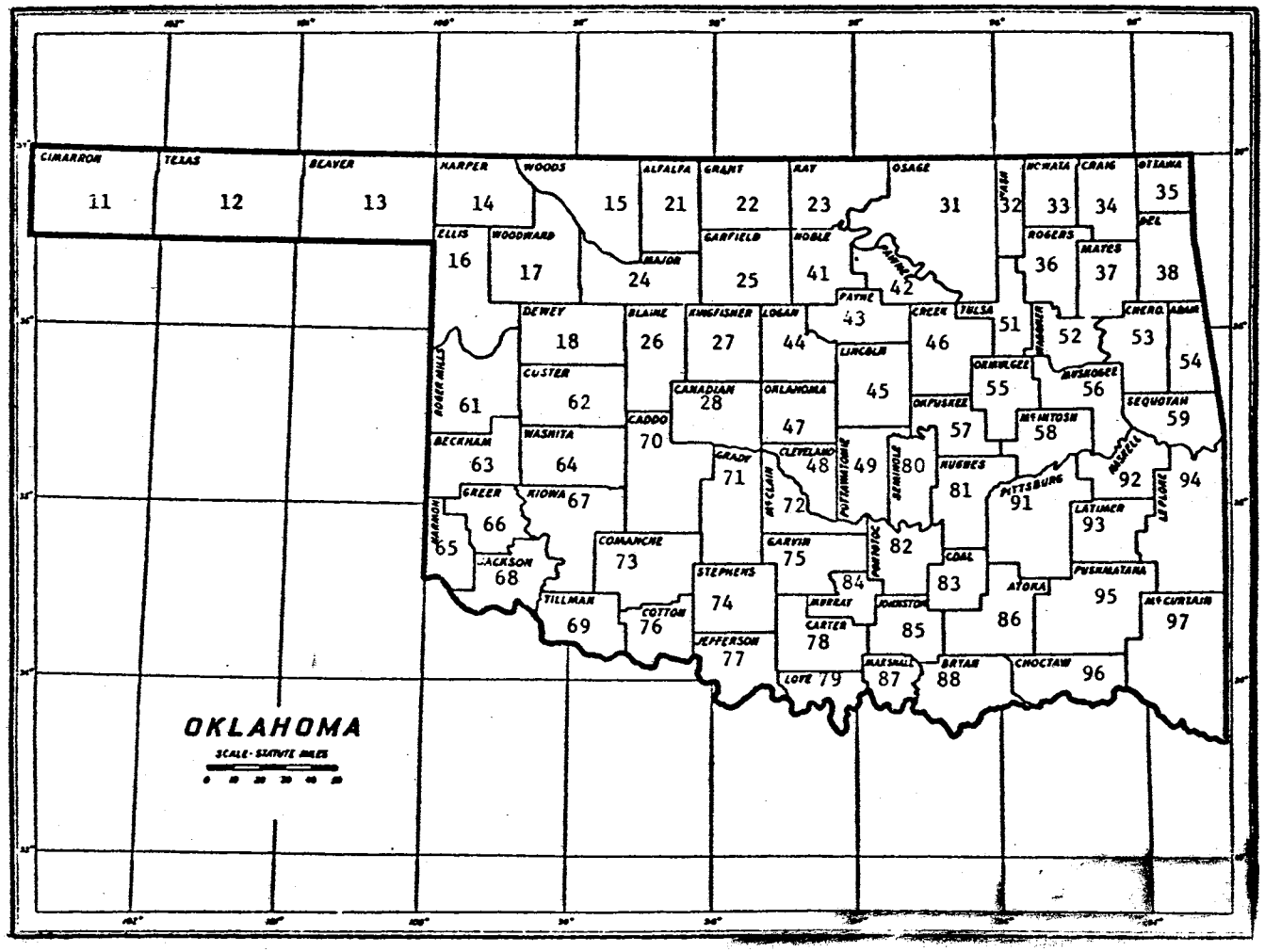

Figure 1. Map of Oklahoma Showing Area and County Codes.

APPENDIX E

SAMPLE OUTPUT

TABLE IV

GENERAL BUDGET PRODUCED BY THE OUT1 AND OT12 AGENDA CARDS

GRAIN SORGHUM: PRODUCTION COSTS AND RETURNS PER ACRE, SANDY SOILS
THIS IS A SAMPLE BUDGET PREPARED TO ILLUSTRATE
THE USE OF THE BUDGET GENERATING PROGRAM AND USE OF AGENDA CARDS

CATEGORY	UNITS	PRICE	QUANTITY	VALUE
PRODUCTION:				
MILO	CWT.	1.930	24.000	46.32
TOTAL RECEIPTS				46.32
OPERATING INPUTS:				
MILO SEED	LBS.	0.210	6.000	1.26
NITROGEN	LBS.	0.100	40.000	4.00
PHOSPHATE	LBS.	0.080	20.000	1.60
POTASH	LBS.	0.050	10.000	0.50
FERT. SPREADER	ACRE	0.150	1.000	0.15
CUSTOM COMBINE	ACRE	3.500	1.000	3.50
TRUCK HIRE	CWT.	0.100	24.000	2.40
TRACTOR FUEL COST	ACRE			0.71
TRACT REPAIR COST	ACRE			1.01
TRACTOR LUBE COST	ACRE			0.11
EQUIP REPAIR COST	ACRE			0.38
TOTAL OPERATING COST				15.61
RETURNS TO LAND,LABOR,CAPITAL,MACHINERY, OVERHEAD,RISK,AND MANAGEMENT				30.71
CAPITAL COST:				
ANNUAL OPERATING CAPITAL		0.070	5.182	0.36
TRACTOR INVESTMENT		0.070	14.858	1.04
EQUIPMENT INVESTMENT		0.070	7.644	0.54
TOTAL CAPITAL COST				1.94
RETURNS TO LAND, LABOR, MACHINERY, OVERHEAD, RISK AND MANAGEMENT				28.78
OWNERSHIP COST: (DEPRECIATION, TAXES, INSURANCE)				
TRACTOR	DOL.			1.78
EQUIPMENT	DOL.			1.19
TOTAL OWNERSHIP COST				2.96
RETURNS TO LAND, LABOR, OVERHEAD, RISK AND MANAGEMENT				25.81
LABOR COST:				
MACHINERY LABOR	HR.	1.500	2.068	3.10
TOTAL LABOR COST				3.10
RETURNS TO LAND, OVERHEAD, RISK AND MANAGEMENT				22.71

THE FOOTNOTE CARDS CAN BE
USED TO CLARIFY
ANY PARTS OF THE BUDGET
BUDGET IDENTIFICATION NUMBER --- 7361070 301 5
ANNUAL CAPITAL MONTH:10

TABLE V

MACHINERY, CAPITAL, AND LABOR REQUIREMENTS BY MONTH PRODUCED BY THE OT13 AGENDUM

CAPITAL AND LABOR REQUIREMENTS BY MONTH BUDGET IDENTIFICATION NUMBER--- 7361070 301 5

PERIOD		UNITS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
MACHINERY LABOR		HR.	0.0	0.23	0.79	0.15	0.27	0.31	0.31	0.0	0.0	0.0	0.0	0.0	2.07
TOTAL CAPITAL		DOL.	0.0	0.26	0.79	6.39	1.59	0.34	0.34	0.0	5.90	0.0	0.0	0.0	15.61
ANNUAL CAPITAL		DOL.	0.0	0.18	0.46	3.20	0.66	0.11	0.08	0.0	0.49	0.0	0.0	0.0	5.18
		MACHINERY REQUIREMENTS BY MONTH													
TRACTOR(3)		HR.	0.0	0.19	0.66	0.12	0.23	0.26	0.26	0.0	0.0	0.0	0.0	0.0	1.72
STALK SHREDDER	(1.0)	HR.	0.0	0.18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.18
TANDEM DISK	(1.0)	HR.	0.0	0.0	0.15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.15
M.B. PLOW	(0.3)	HR.	0.0	0.0	0.16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.16
CHISEL	(1.4)	HR.	0.0	0.0	0.29	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.29
SPRING TOOTH	(1.0)	HR.	0.0	0.0	0.0	0.11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.11
PLANTER	(1.0)	HR.	0.0	0.0	0.0	0.0	0.21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.21
ROW CULTIVATOR	(2.0)	HR.	0.0	0.0	0.0	0.0	0.0	0.24	0.24	0.0	0.0	0.0	0.0	0.0	0.48

THE NUMBERS IN PARENTHESES ARE TOTAL TIMES OVER FOR THAT MACHINE.

TABLE VI

HOURLY COST SUMMARY FOR MACHINERY AND POWER UNITS PRODUCED BY THE OUT2 AGENDUM

HOURLY COST SUMMARY FOR IMPLEMENTS AND POWER UNITS BUDGET IDENTIFICATION NUMBER---7361OTO 301 5

MACHINE	SIZE	PURCHASE PRICE	SALVAGE VALUE	YEARS OWNED	ANNUAL HOURS USED	DEPR./ HOUR	INTEREST/ HOUR	INS./ HOUR	TAXES/ HOUR	TOTAL OWNER SHIP/ HOUR	PERFORM RATE HOUR/ ACRE	OP. COST PER HOUR
TRACTOR(3)	95.00	7724.	2624.	10.	600.	0.850	0.604	0.052	0.129	1.031	1.000	1.057
STALK SHREDDER	12.00	500.	121.	8.	80.	0.592	0.272	0.023	0.062	0.678	0.177	0.327
TANDEM DISK	14.00	1135.	230.	10.	100.	0.905	0.478	0.041	0.113	1.060	0.148	0.242
M.B. PLOW	5.33	910.	101.	15.	167.	0.323	0.212	0.018	0.054	0.396	0.472	0.112
CHISEL	12.00	650.	133.	10.	100.	0.517	0.274	0.023	0.065	0.606	0.210	0.140
SPRING TOOTH	20.00	488.	99.	10.	100.	0.389	0.205	0.018	0.049	0.455	0.111	0.104
PLANTER	12.00	900.	183.	10.	60.	1.195	0.632	0.054	0.150	1.399	0.205	0.455
ROW CULTIVATOR	12.00	750.	153.	10.	100.	0.597	0.316	0.027	0.075	0.699	0.238	0.248

TABLE VII

DETAILED BUDGET PRODUCED BY THE OUT3 AGENDUM

GRAIN SORGHUM: PRODUCTION COSTS AND RETURNS PER ACRE, SANDY SOILS
THIS IS A SAMPLE BUDGET PREPARED TO ILLUSTRATE
THE USE OF THE BUDGET GENERATING PROGRAM AND USE OF AGENDA CARDS

MONTHLY SUMMARY OF RETURNS AND EXPENSES

CATEGORY	UNIT	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	PRICE	TOTAL VALUE	
PRODUCTION:																
MILO	CWT.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24.00	0.0	0.0	0.0	1.93	24.00	46.32
TOTAL RECEIPTS	ACRE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	46.32	0.0	0.0	0.0			46.32
OPERATING INPUTS:																
MILO SEED	LBS.	0.0	0.0	0.0	0.0	6.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.21	6.00	1.26
NITROGEN	LBS.	0.0	0.0	0.0	40.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.10	40.00	4.00
PHOSPHATE	LBS.	0.0	0.0	0.0	20.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.08	20.00	1.60
POTASH	LBS.	0.0	0.0	0.0	10.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.05	10.00	0.50
FERT. SPREADER	ACRE	0.0	0.0	0.0	1.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.15	1.00	0.15
CUSTOM COMBINE	ACRE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.00	0.0	0.0	0.0	3.50	1.00	3.50
TRUCK HIRE	CWT.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24.00	0.0	0.0	0.0	0.10	24.00	2.40
TRACTOR FUEL COST	ACRE	0.0	0.08	0.27	0.05	0.09	0.11	0.11	0.0	0.0	0.0	0.0	0.0			0.71
TRACT REPAIR COST	ACRE	0.0	0.11	0.38	0.07	0.13	0.15	0.15	0.0	0.0	0.0	0.0	0.0			1.01
TRACTOR LUBE COST	ACRE	0.0	0.01	0.04	0.01	0.01	0.02	0.02	0.0	0.0	0.0	0.0	0.0			0.11
EQUIP REPAIR COST	ACRE	0.0	0.06	0.09	0.01	0.09	0.06	0.06	0.0	0.0	0.0	0.0	0.0			0.38
TOTAL COST	ACRE	0.0	0.26	0.79	6.39	1.59	0.34	0.34	0.0	5.90	0.0	0.0	0.0			15.61

RETURNS TO LAND, LABOR, CAPITAL, MACHINERY, OVERHEAD, RISK, AND MANAGEMENT 30.71

THE FOOTNOTE CARDS CAN BE
USED TO CLARIFY
ANY PARTS OF THE BUDGET
BUDGET IDENTIFICATION NUMBER---- 7361070 301 5

TABLE VIII

MACHINERY COMPLEMENT LISTING PRODUCED BY THE OUT4 AGENDUM

MACHINERY COMPLEMENT(3) BUDGET IDENTIFICATION NUMBER--- 7361070 301 5

COLUMN / NAME OF MACHINE	1 CODE	2 WIDTH (FEET)	3 INITIAL LIST PRICE	4 SPEED (MPH)	5 FIELD EFFIC-ENCY	6 RC1	7 RC2	8 RC3	9 HOURS USED ANNUALLY	10 YEARS OWNED	11 RFV1	12 RFV2	13 PURCHASE PRICE	14 FUEL TYPE	15 HOURS OF LIFE
TRACTOR(1)	1.	55.0	4980.	4.5	0.88	1.20	0.000631	1.60	600.	10.0	0.680	0.920	4331.	3.	12000.
TRACTOR(2)	2.	75.0	7603.	4.5	0.88	1.20	0.000631	1.60	600.	10.0	0.680	0.920	6612.	3.	12000.
TRACTOR(3)	3.	95.0	8882.	4.5	0.88	1.20	0.000631	1.60	600.	10.0	0.680	0.920	7724.	3.	12000.
TRACTOR(4)	4.	115.0	10960.	4.5	0.88	1.20	0.000631	1.60	600.	10.0	0.680	0.920	9531.	3.	12000.
TRACTOR(5)	5.	135.0	13117.	4.5	0.88	1.20	0.000631	1.60	600.	10.0	0.680	0.920	11406.	3.	12000.
	6.	0.0	0.	0.0	0.0	0.0	0.0	0.0	0.	0.0	0.0	0.0	0.	0.	0.
	7.	0.0	0.	0.0	0.0	0.0	0.0	0.0	0.	0.0	0.0	0.0	0.	0.	0.
	8.	0.0	0.	0.0	0.0	0.0	0.0	0.0	0.	0.0	0.0	0.0	0.	0.	0.
	9.	0.0	0.	0.0	0.0	0.0	0.0	0.0	0.	0.0	0.0	0.0	0.	0.	0.
TRUCK	10.	2.0	0.	20.0	0.88	0.80	0.000631	1.40	500.	8.0	0.670	0.860	5100.	1.	4000.
PICKUP	11.	0.5	3000.	20.0	0.88	0.60	0.000631	1.40	500.	8.0	0.600	0.885	2550.	1.	4000.
S.P. COMBINE	12.	16.0	10350.	3.0	0.67	0.33	0.000251	1.80	100.	10.0	0.635	0.895	9000.	3.	2000.
FORAGE HARVESTOR	13.	6.0	6000.	4.0	0.60	1.20	0.002510	1.30	75.	10.0	0.560	0.885	5100.	3.	1500.
S.P. SWATHER	14.	12.0	4320.	5.4	0.77	1.00	0.002510	1.30	75.	10.0	0.660	0.880	3672.	3.	1500.
S.P. BALER	15.	12.0	4500.	3.0	0.74	0.85	0.002510	1.30	100.	10.0	0.560	0.885	3800.	3.	2000.
COTTON PICKER	16.	6.0	19500.	3.0	0.63	0.75	0.000251	1.80	75.	15.0	0.585	0.875	16575.	3.	2500.
	17.	0.0	0.	0.0	0.0	0.0	0.0	0.0	0.	0.0	0.0	0.0	0.	0.	0.
	18.	0.0	0.	0.0	0.0	0.0	0.0	0.0	0.	0.0	0.0	0.0	0.	0.	0.
	19.	0.0	0.	0.0	0.0	0.0	0.0	0.0	0.	0.0	0.0	0.0	0.	0.	0.
	20.	0.0	0.	0.0	0.0	0.0	0.0	0.0	0.	0.0	0.0	0.0	0.	0.	0.
	21.	0.0	0.	0.0	0.0	0.0	0.0	0.0	0.	0.0	0.0	0.0	0.	0.	0.
	22.	0.0	0.	0.0	0.0	0.0	0.0	0.0	0.	0.0	0.0	0.0	0.	0.	0.
	23.	0.0	0.	0.0	0.0	0.0	0.0	0.0	0.	0.0	0.0	0.0	0.	0.	0.
	24.	0.0	0.	0.0	0.0	0.0	0.0	0.0	0.	0.0	0.0	0.0	0.	0.	0.
	25.	0.0	0.	0.0	0.0	0.0	0.0	0.0	0.	0.0	0.0	0.0	0.	0.	0.
	26.	0.0	0.	0.0	0.0	0.0	0.0	0.0	0.	0.0	0.0	0.0	0.	0.	0.
	27.	0.0	0.	0.0	0.0	0.0	0.0	0.0	0.	0.0	0.0	0.0	0.	0.	0.
	28.	0.0	0.	0.0	0.0	0.0	0.0	0.0	0.	0.0	0.0	0.0	0.	0.	0.
	29.	0.0	0.	0.0	0.0	0.0	0.0	0.0	0.	0.0	0.0	0.0	0.	0.	0.
	30.	0.0	0.	0.0	0.0	0.0	0.0	0.0	0.	0.0	0.0	0.0	0.	0.	0.
	31.	0.0	0.	0.0	0.0	0.0	0.0	0.0	0.	0.0	0.0	0.0	0.	0.	0.
	32.	0.0	0.	0.0	0.0	0.0	0.0	0.0	0.	0.0	0.0	0.0	0.	0.	0.
	33.	0.0	0.	0.0	0.0	0.0	0.0	0.0	0.	0.0	0.0	0.0	0.	0.	0.
	34.	0.0	0.	0.0	0.0	0.0	0.0	0.0	0.	0.0	0.0	0.0	0.	0.	0.
	35.	0.0	0.	0.0	0.0	0.0	0.0	0.0	0.	0.0	0.0	0.0	0.	0.	0.
	36.	0.0	0.	0.0	0.0	0.0	0.0	0.0	0.	0.0	0.0	0.0	0.	0.	0.
	37.	0.0	0.	0.0	0.0	0.0	0.0	0.0	0.	0.0	0.0	0.0	0.	0.	0.
	38.	0.0	0.	0.0	0.0	0.0	0.0	0.0	0.	0.0	0.0	0.0	0.	0.	0.
	39.	0.0	0.	0.0	0.0	0.0	0.0	0.0	0.	0.0	0.0	0.0	0.	0.	0.
	40.	0.0	0.	0.0	0.0	0.0	0.0	0.0	0.	0.0	0.0	0.0	0.	0.	0.
M.B. PLOW	41.	5.3	1050.	4.1	0.80	2.00	0.000251	1.30	167.	15.0	0.600	0.885	910.	0.	2000.
ONEWAY	42.	12.0	1265.	4.8	0.83	0.65	0.000251	1.80	100.	10.0	0.600	0.885	650.	0.	2000.
TANDEM DISK	43.	14.0	1300.	4.8	0.83	0.65	0.000251	1.80	100.	10.0	0.600	0.885	1135.	0.	2000.
ROD WEEDER	44.	22.0	1150.	4.8	0.83	0.65	0.000251	1.80	100.	10.0	0.600	0.885	1000.	0.	2000.
SPIKE HARROW	45.	20.0	560.	5.3	0.70	0.65	0.000251	1.80	100.	10.0	0.600	0.885	488.	0.	2000.
SPRING TOOTH	46.	20.0	560.	5.3	0.70	0.65	0.000251	1.80	100.	10.0	0.600	0.885	488.	0.	2000.
SWEEP	47.	12.0	575.	3.8	0.76	1.00	0.000251	1.80	50.	20.0	0.600	0.885	500.	0.	2000.
ROTARY HOE	48.	14.0	690.	5.0	0.76	1.00	0.002510	1.80	100.	10.0	0.600	0.885	600.	0.	2000.
CHISEL	49.	12.0	750.	4.1	0.80	0.65	0.000251	1.80	100.	10.0	0.600	0.885	650.	0.	2000.
OFFSET DISK	50.	14.0	1300.	4.8	0.83	0.65	0.000251	1.80	100.	10.0	0.600	0.885	1135.	0.	2000.

TABLE VIII (Continued)

MACHINERY COMPLEMENT(3) BUDGET IDENTIFICATION NUMBER--- 7361070 301 5

COLUMN NAME OF MACHINE	1 CODE	2 WIDTH (FEET)	3 INITIAL LIST PRICE	4 SPEED (MPH)	5 FIELD EFFIC-ENCY	6 RC1	7 RC2	8 RC3	9 HOURS USED ANNUALLY	10 YEARS OWNED	11 RFV1	12 RFV2	13 PURCHASE PRICE	14 FUEL TYPE	15 HOURS OF LIFE
DRILL	51.	16.0	1190.	4.0	0.72	0.65	0.000251	1.80	50.	10.0	0.600	0.885	1033.	0.	1000.
PLANTER	52.	12.0	1035.	5.0	0.67	0.80	0.000631	1.60	60.	10.0	0.600	0.885	900.	0.	1200.
	53.	0.0	0.	0.0	0.0	0.0	0.0	0.0	0.	0.0	0.0	0.0	0.	0.	0.
FLOAT	54.	10.0	575.	3.0	0.83	2.00	0.000251	1.30	50.	10.0	0.600	0.885	500.	0.	2000.
LISTER	55.	12.0	1035.	4.0	0.67	0.80	0.000631	1.60	60.	10.0	0.600	0.885	900.	0.	1200.
	56.	0.0	0.	0.0	0.0	0.0	0.0	0.0	0.	0.0	0.0	0.0	0.	0.	0.
ROW CULTIVATOR	57.	12.0	865.	3.8	0.76	1.00	0.000251	1.80	100.	10.0	0.600	0.885	750.	0.	2000.
FIELD CULTIVATOR	58.	12.0	865.	3.8	0.76	1.00	0.000251	1.80	100.	10.0	0.600	0.885	750.	0.	2000.
HILLER	59.	12.0	900.	4.0	0.67	0.80	0.000631	1.60	60.	10.0	0.600	0.885	765.	0.	1200.
	60.	0.0	0.	0.0	0.0	0.0	0.0	0.0	0.	0.0	0.0	0.0	0.	0.	0.
DRY FERT SPREAD	61.	25.0	500.	5.3	0.67	0.65	0.000251	1.80	50.	10.0	0.560	0.885	425.	0.	1000.
LIQUID FERT SPRD	62.	25.0	500.	5.3	0.67	0.65	0.000251	1.80	50.	10.0	0.560	0.885	425.	0.	1000.
ANHYDROUS APPLIC	63.	12.0	500.	4.0	0.67	0.65	0.000631	1.60	60.	10.0	0.600	0.885	425.	0.	1000.
SPRAYER	64.	12.0	300.	3.8	0.60	0.65	0.000251	1.80	50.	10.0	0.600	0.885	255.	0.	1000.
	65.	0.0	0.	0.0	0.0	0.0	0.0	0.0	0.	0.0	0.0	0.0	0.	0.	0.
	66.	0.0	0.	0.0	0.0	0.0	0.0	0.0	0.	0.0	0.0	0.0	0.	0.	0.
	67.	0.0	0.	0.0	0.0	0.0	0.0	0.0	0.	0.0	0.0	0.0	0.	0.	0.
	68.	0.0	0.	0.0	0.0	0.0	0.0	0.0	0.	0.0	0.0	0.0	0.	0.	0.
	69.	0.0	0.	0.0	0.0	0.0	0.0	0.0	0.	0.0	0.0	0.0	0.	0.	0.
	70.	0.0	0.	0.0	0.0	0.0	0.0	0.0	0.	0.0	0.0	0.0	0.	0.	0.
PULL COMBINE	71.	8.0	2300.	3.0	0.67	0.33	0.000251	1.80	100.	10.0	0.635	0.895	2000.	0.	2000.
SILAGE CUTTER	72.	3.0	2000.	4.0	0.60	1.20	0.002510	1.30	75.	10.0	0.560	0.885	1700.	0.	1500.
STRIPPER	73.	6.0	8500.	3.0	0.63	0.75	0.000251	1.80	75.	15.0	0.600	0.885	7225.	0.	2500.
CORN PICKER	74.	6.0	3500.	3.0	0.63	0.50	0.000631	1.60	75.	10.0	0.600	0.885	2975.	0.	1500.
SHAKER-DIGGER	75.	6.0	690.	3.0	0.76	1.00	0.002510	1.80	100.	10.0	0.600	0.885	600.	0.	1500.
	76.	0.0	0.	0.0	0.0	0.0	0.0	0.0	0.	0.0	0.0	0.0	0.	0.	0.
CORNHEAD	77.	13.3	4950.	3.0	0.67	0.33	0.000251	1.80	100.	10.0	0.635	0.895	4296.	0.	2000.
GRAINHEAD	78.	16.0	1500.	3.0	0.67	0.33	0.000251	1.80	100.	10.0	0.635	0.895	1025.	0.	2000.
	79.	0.0	0.	0.0	0.0	0.0	0.0	0.0	0.	0.0	0.0	0.0	0.	0.	0.
	80.	0.0	0.	0.0	0.0	0.0	0.0	0.0	0.	0.0	0.0	0.0	0.	0.	0.
SICKLE MOWER	81.	7.0	443.	4.3	0.81	1.80	0.002510	1.30	50.	10.0	0.600	0.885	385.	0.	1000.
ROTARY MOWER	82.	6.0	575.	4.8	0.81	0.65	0.002510	1.30	50.	10.0	0.560	0.885	500.	0.	1000.
CRIMPER	83.	7.0	980.	4.3	0.77	1.00	0.002510	1.30	80.	8.0	0.560	0.885	850.	0.	1000.
RAKE	84.	8.0	665.	5.4	0.75	1.00	0.002510	1.30	80.	8.0	0.600	0.885	575.	0.	1000.
WINDROWER	85.	8.0	1380.	5.4	0.77	1.00	0.002510	1.30	80.	8.0	0.560	0.885	1200.	0.	1500.
	86.	0.0	0.	0.0	0.0	0.0	0.0	0.0	0.	0.0	0.0	0.0	0.	0.	0.
	87.	0.0	0.	0.0	0.0	0.0	0.0	0.0	0.	0.0	0.0	0.0	0.	0.	0.
PTO BALER	88.	6.0	2750.	3.0	0.67	0.85	0.002510	1.30	100.	8.0	0.560	0.885	2300.	0.	2000.
	89.	0.0	0.	0.0	0.0	0.0	0.0	0.0	0.	0.0	0.0	0.0	0.	0.	0.
	90.	0.0	0.	0.0	0.0	0.0	0.0	0.0	0.	0.0	0.0	0.0	0.	0.	0.
STALK SHREDDER	91.	12.0	575.	4.8	0.81	0.65	0.002510	1.30	80.	8.0	0.560	0.885	500.	0.	1000.
	92.	0.0	0.	0.0	0.0	0.0	0.0	0.0	0.	0.0	0.0	0.0	0.	0.	0.
	93.	0.0	0.	0.0	0.0	0.0	0.0	0.0	0.	0.0	0.0	0.0	0.	0.	0.
	94.	0.0	0.	0.0	0.0	0.0	0.0	0.0	0.	0.0	0.0	0.0	0.	0.	0.
	95.	0.0	0.	0.0	0.0	0.0	0.0	0.0	0.	0.0	0.0	0.0	0.	0.	0.
	96.	0.0	0.	0.0	0.0	0.0	0.0	0.0	0.	0.0	0.0	0.0	0.	0.	0.
	97.	0.0	0.	0.0	0.0	0.0	0.0	0.0	0.	0.0	0.0	0.0	0.	0.	0.
	98.	0.0	0.	0.0	0.0	0.0	0.0	0.0	0.	0.0	0.0	0.0	0.	0.	0.
	99.	0.0	0.	0.0	0.0	0.0	0.0	0.0	0.	0.0	0.0	0.0	0.	0.	0.
	100.	0.0	0.	0.0	0.0	0.0	0.0	0.0	0.	0.0	0.0	0.0	0.	0.	0.

TABLE IX

MACHINERY FIXED AND VARIABLE COSTS PER HOUR PRODUCED BY THE OUT5 AGENDUM

MACHINERY FIXED AND VARIABLE COSTS PER HOUR — BUDGET IDENTIFICATION NUMBER--- 7361070 301 5

MACHINE	CODE	DEPRECIATION COST PER HOUR	INTEREST COST PER HOUR	INSURANCE COST PER HOUR	TAX COST PER HOUR	TOTAL FIXED COST PER HOUR	REPAIR COST PER HOUR	FUEL COST PER HOUR	LUBRICANT COST PER HOUR	TOTAL VARIABLE COST PER HOUR	HOURS PER ACRE
TRACTOR(3)	3	0.850	0.604	0.052	0.129	1.031	0.586	0.410	0.061	1.057	1.000
STALK SHREDDER	91	0.592	0.272	0.023	0.062	0.678	0.327	0.0	0.0	0.327	0.177
TANDEM DISK	43	0.905	0.478	0.041	0.113	1.060	0.242	0.0	0.0	0.242	0.148
M.B. PLOW	41	0.323	0.212	0.018	0.054	0.396	0.112	0.0	0.0	0.112	0.472
CHISEL	49	0.517	0.274	0.023	0.065	0.606	0.140	0.0	0.0	0.140	0.210
SPRING TOOTH	46	0.389	0.205	0.018	0.049	0.455	0.104	0.0	0.0	0.104	0.111
PLANTER	52	1.195	0.632	0.054	0.150	1.399	0.455	0.0	0.0	0.455	0.205
ROW CULTIVATOR	57	0.597	0.316	0.027	0.075	0.699	0.248	0.0	0.0	0.248	0.238

TABLE X

UPDATED GRAIN SORGHUM BUDGET PRODUCED BY MODIFYING THE GRAIN SORGHUM BUDGET GIVEN IN TABLE IV

GRAIN SORGHUM: PRODUCTION COSTS AND RETURNS PER ACRE, SANDY SOILS
THIS IS A SAMPLE BUDGET PREPARED TO ILLUSTRATE
THE USE OF THE BUDGET GENERATING PROGRAM AND USE OF AGENDA CARDS

CATEGORY	UNITS	PRICE	QUANTITY	VALUE
PRODUCTION:				
MILO	CWT.	1.930	20.000	38.60
TOTAL RECEIPTS				38.60
OPERATING INPUTS:				
MILO SEED	LBS.	0.210	6.000	1.26
NITROGEN	LBS.	0.100	40.000	4.00
PHOSPHATE	LBS.	0.080	20.000	1.60
POTASH	LBS.	0.050	10.000	0.50
FERT. SPREADER	ACRE	0.150	1.000	0.15
CUSTOM COMBINE	ACRE	3.500	1.000	3.50
TRUCK HIRE	CWT.	0.100	24.000	2.40
TRACTOR FUEL COST	ACRE			0.71
TRACT REPAIR COST	ACRE			1.01
TRACTOR LUBE COST	ACRE			0.11
EQUIP REPAIR COST	ACRE			0.38
TOTAL OPERATING COST				15.61
RETURNS TO LAND,LABOR,CAPITAL,MACHINERY, OVERHEAD,RISK,AND MANAGEMENT				22.99
CAPITAL COST:				
ANNUAL OPERATING CAPITAL		0.070	5.182	0.36
TRACTOR INVESTMENT		0.070	14.858	1.04
EQUIPMENT INVESTMENT		0.070	7.644	0.54
TOTAL CAPITAL COST				1.94
RETURNS TO LAND, LABOR, MACHINERY, OVERHEAD, RISK AND MANAGEMENT				21.06
OWNERSHIP COST: (DEPRECIATION, TAXES, INSURANCE)				
TRACTOR	DOL.			1.78
EQUIPMENT	DOL.			1.19
TOTAL OWNERSHIP COST				2.96
RETURNS TO LAND, LABOR, OVERHEAD, RISK AND MANAGEMENT				18.09
LABOR COST:				
MACHINERY LABOR	HR.	1.500	2.068	3.10
TOTAL LABOR COST				3.10
RETURNS TO LAND, OVERHEAD, RISK AND MANAGEMENT				14.99

THE FOOTNOTE CAROS CAN BE
USED TO CLARIFY
ANY PARTS OF THE BUDGET
BUDGET IDENTIFICATION NUMBER --- 7361070 301 5
ANNUAL CAPITAL MONTH:10

TABLE XI

NEW GRAIN SORGHUM BUDGET PRODUCED BY MODIFYING THE BUDGET IN TABLE X TO INCLUDE GRAZING

GRAIN SORGHUM: PRODUCTION COSTS AND RETURNS PER ACRE, SANDY SOILS
THIS IS A SAMPLE BUDGET PREPARED TO ILLUSTRATE
THE USE OF THE BUDGET GENERATING PROGRAM AND USE OF AGENDA CARDS

CATEGORY	UNITS	PRICE	QUANTITY	VALUE
PRODUCTION:				
MILO	CWT.	1.930	20.000	38.60
GRAZING	AUMS	3.500	0.500	1.75
TOTAL RECEIPTS				40.35
OPERATING INPUTS:				
MILO SEED	LBS.	0.210	6.000	1.26
NITROGEN	LBS.	0.100	40.000	4.00
PHOSPHATE	LBS.	0.080	20.000	1.60
POTASH	LBS.	0.050	10.000	0.50
FERT. SPREADER	ACRE	0.150	1.000	0.15
CUSTOM COMBINE	ACRE	3.500	1.000	3.50
TRUCK HIRE	CWT.	0.100	24.000	2.40
TRACTOR FUEL COST	ACRE			0.71
TRACT REPAIR COST	ACRE			1.01
TRACTOR LUBE COST	ACRE			0.11
EQUIP REPAIR COST	ACRE			0.38
TOTAL OPERATING COST				15.61
RETURNS TO LAND,LABOR,CAPITAL,MACHINERY, OVERHEAD,RISK,AND MANAGEMENT				24.74
CAPITAL COST:				
ANNUAL OPERATING CAPITAL		0.070	5.182	0.36
TRACTOR INVESTMENT		0.070	14.858	1.04
EQUIPMENT INVESTMENT		0.070	7.644	0.54
TOTAL CAPITAL COST				1.94
RETURNS TO LAND, LABOR, MACHINERY, OVERHEAD, RISK AND MANAGEMENT				22.81
OWNERSHIP COST: (DEPRECIATION, TAXES, INSURANCE)				
TRACTOR	DOL.			1.78
EQUIPMENT	DOL.			1.19
TOTAL OWNERSHIP COST				2.96
RETURNS TO LAND, LABOR, OVERHEAD, RISK AND MANAGEMENT				19.84
LABOR COST:				
MACHINERY LABOR	HR.	1.500	2.068	3.10
TOTAL LABOR COST				3.10
RETURNS TO LAND, OVERHEAD, RISK AND MANAGEMENT				16.74

THE FOOTNOTE CARDS CAN BE
USED TO CLARIFY
ANY PARTS OF THE BUDGET
BUDGET IDENTIFICATION NUMBER --- 7361070 301 6
ANNUAL CAPITAL MONTH=10

TABLE XII

SAMPLE GRAIN SORGHUM OUTPUT OF THE BUDOUT SUBROUTINE PRODUCED BY THE OTBD AGENDUM

BUDGET IDENTIFICATION NUMBER: 7361070 301 6

GRAIN SORGHUM: PRODUCTION COSTS AND RETURNS PER ACRE, SANDY SOILS
THIS IS A SAMPLE BUDGET PREPARED TO ILLUSTRATE
THE USE OF THE BUDGET GENERATING PROGRAM AND USE OF AGENDA CARDS

	COLUMN NUMBER														
LINE	1 JAN	2 FEB	3 MAR	4 APR	5 MAY	6 JUN	7 JUL	8 AUG	9 SEP	10 OCT	11 NOV	12 DEC	13 PRICE	15 UNIT CODE	16 ITEM CODE
PRODUCTION															
1 MILO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.00	0.0	0.0	0.0	1.930	16.	73.
2 GRAZING	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.50	0.0	0.0	3.500	10.	89.
OPERATING INPUTS															
11 MILO SEED	0.0	0.0	0.0	0.0	6.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.210	12.	173.
12 NITROGEN	0.0	0.0	0.0	40.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.100	12.	211.
13 PHOSPHATE	0.0	0.0	0.0	20.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.080	12.	214.
14 POTASH	0.0	0.0	0.0	10.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.050	12.	216.
15 FERT. SPREADER	0.0	0.0	0.0	1.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.150	7.	361.
16 CUSTOM COMBINE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.00	0.0	0.0	0.0	3.500	7.	305.
17 TRUCK HIRE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24.00	0.0	0.0	0.0	0.100	16.	302.
MACHINERY REQUIREMENTS--TIMES OVER															
38 STALK SHREDDER	0.0	1.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.	91.
39 TANDEM DISK	0.0	0.0	1.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.	43.
40 M.B. PLOW	0.0	0.0	0.33	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.	41.
41 CHISEL	0.0	0.0	1.40	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.	49.
42 SPRING TOOTH	0.0	0.0	0.0	1.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.	46.
43 PLANTER	0.0	0.0	0.0	0.0	1.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.	52.
44 ROW CULTIVATOR	0.0	0.0	0.0	0.0	0.0	1.00	1.00	0.0	0.0	0.0	0.0	0.0	0.0	3.	57.

THE FOOTNOTE CARDS CAN BE
USED TO CLARIFY
ANY PARTS OF THE BUDGET

TABLE XIII

CARD IMAGES OF THE OUTPUT PRODUCED BY THE LPFARM SUBROUTINE

```
736107   1OUTPUT FROM THE LPFM AGENDUM  38.11 5.18 0.0  0.50 0.0  0.0 20.00CWT.
736107   2 1.93 0.0  1.26 6.10 6.05 2.20 0.0  0.76 0.0
736107   3 1.02 0.73 0.31 0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
```

APPENDIX F

DICTIONARY OF VARIABLES USED IN THE BUDGET GENERATING PROGRAM

APPENDIX F

DICTIONARY OF VARIABLES USED IN THE BUDGET GENERATING PROGRAM

Variables in Common

ANCAP(12)	Array of annual capital requirements by month.
BUD(50,18)	Array of budget input-output coefficients entered on part 7 of the input form.
CAP	Sum of total annual capital, tractor capital, equipment capital, and irrigation system capital.
CAP1	Total annual capital required.
CAP2	Total tractor capital (interest cost per acre)/interest rate.
CAP3	Total equipment capital (interest cost per acre)/ interest rate.
CAP4	Total irrigation system capital (interest cost per acre)/ interest rate.
CPCST1	Annual capital cost per acre.
CPCST2	Tractor capital cost per acre.
CPCST3	Equipment capital cost per acre.
CPCST4	Irrigation system capital cost per acre.
EFUEL(12)	Equipment fuel cost per month.
EFUELT	Total equipment fuel cost.
ELUBE(12)	Equipment lubricant cost per month.
ELUBET	Total lubricant cost for equipment.
EREP(12)	Repair cost per month for equipment.

EREPT	Total repair cost per month for equipment.
EXP(37)	Row 1-10 not used, rows 11-37 contain the cost of inputs entered on lines 11-37 of part 7 of the input form.
FMULT(30,3)	Contains the fuel multipliers for self-propelled machines.
FOOT(3,20)	Array containing the footnote.
FPRICE(5)	Contains the price for each of the five kines of fuel (basic parameters 1-5).
GROSS	Total value of production.
HMONTH	Annual capital month.
HOURS(100,13)	Array of hours each machine is used per month, total hours is in column 13.
IREAD	Fortran unit number for card reader.
IRR	Irrigation system code number.
ITYPE	Type of fuel a machine uses.
IWRIT	Fortran unit number for line printer.
MACDAT(100,10)	Array of machinery complement coefficients.
MACH(100,10)	Array of machinery costs per hour.
MCNAME(100,4)	Array of machinery names.
MCOMP	Machinery complement number.
NAME(500,4)	Array of names of production and operating inputs.
OWN	Total machinery ownership cost.
OWN2	Total tractor ownership cost.
OWN3	Total equipment ownership cost.
OWN4	Total irrigation system ownership cost.
PRICE (500)	Array containing price vector for production and operating input items.
QUAN(50)	Array of total quantities for lines 1-50 of part 7 of the input form.
RECEIT(12)	Total value of production by month.

TFUEL(12)	Fuel cost by month for tractors.
TFUELT	Total fuel cost for tractors.
THOURS	Total hours of use for tractors.
TITLE(3,20)	Array containing the title of the budget.
TLUBE(12)	Cost of lubricants by month for tractors.
TLUBET	Total cost of lubricants for tractor.
TOTAL(12)	Total tractor hours by month.
TOTCAP(12)	Total cost per month for budget.
TREP(12)	Cost of repairs by month for tractors.
TREPT	Total cost of repairs for tractors.
TWATER	Total acre inches of irrigation water used.
UNIT(25)	Array of units of measurement names.
VALUE(10)	Array of total values of items produced by line number.
X(25)	Values of basic parameters.
XIRDAT(5,10)	Array of irrigation cost per acre-inch by type of system.
XIREP(12)	Cost of repairs by month for irrigation system.
XIREPT	Total cost of repairs for irrigation system.
XIRFU(12)	Cost of fuel by month for irrigation system.
XIRFUT	Total cost of fuel for irrigation system.
XIRLU(12)	Cost of lubricants by month for irrigation system.
XIRLUT	Total cost of lubricants for irrigation system.
XLABOR(4,13)	Array of hours of labor required by month for (1) machinery labor, (2) other labor, (3) irrigation water, and (4) total labor. Column 13 is the total labor per year for each type.
XLCST	Total labor cost.
XLCST1	Total cost for machinery labor.
XLCST2	Total cost for other labor.
XLCST3	Total cost for irrigation labor.

XNET	Total value of production minus total operating cost, returns to land, labor, capital, machinery, overhead, risk and management.
XNET1	XNET minus capital cost, returns to land, labor, machinery, overhead, risk and management.
XNET2	XNET1 minus machinery ownership cost, returns to land, labor, overhead, risk and management.
XNET3	XNET2 minus labor cost, returns to land, overhead, risk and management.
IDCODE(10)	Array containing budget identification number.

Variables Not in Common Used in Main Program

AGENDA(30)	Array containing names of agenda.
IDTEST(10)	Temporary array containing budget identification number.
JCOL(5)	Temporary array used to read column numbers from cards.
TEMP(10)	Miscellaneous temporary array.
IBUD	Sequential number of budget in budget file.
SG	Agendum name read from card.

Variables Used in MCPH Subroutine

TAG(30)	Array set to 1 if machine cost has been computed.
XIRATE	Interest rate.
XINSRT	Insurance rate.
TAXRAT	Tax rate.
WIDTH	Width of machine.
XLP	Initial list price of machine.
SPEED	Miles per hour machine is pulled.
EFF	Field efficiency of machine.
RC1	Repair cost coefficient 1.
RC2	Repair cost coefficient 2.

RC3	Repair cost coefficient 3.
HRSUSD	Hours machine is used annually.
YEARS	Number of years machine is expected to be owned.
RFV1	Salvage value coefficient 1.
RFV2	Salvage value coefficient 2.
PURCH	Purchase price of machine.
ITYPE	Fuel type of machine.
HRSLFE	Hours of life of machine.
SALV	Salvage value of machine.
XL	Percent of machine life.
TAR	Total accumulated repairs.
IUNIT	Power unit number.

Variables Used in LPFARM Subroutine

LPFILE	File on which LPFARM cards are punched - printed.
XTITLE	Title for activity.
AUM(4)	1 = Total AUMs of item 89 for June-September. 2 = Total AUMs of item 89 for October-December. 3 = Total AUMs of item 84 for January-March. 4 = Total AUMs of item 85 for January-December.
OTLINC	Total value of production other than on Line 1 of part 7 of the input form and other than value of grazing.
PRC	Price of item produced on Line 1, part 7 of the input form.
QN	Quantity of item produced on Line 1, part 7 of the input form.
UN	Name of units of measurement of item produced on Line 1 of the input form.
SEED	Total seed cost, item codes 100-199.
FERT	Total chemical cost, item codes 200-299.
CUST	Total custom hire cost, item codes 300-399.

XMIS	Total miscellaneous cost, item codes 400-499.
TCAP	Total capital required = total cash cost, tractor capital, equipment capital, irrigation system capital.
OPCOST	Total variable cost for machinery (fuel, lube, repairs).
QUAR(4)	Total labor required by quarter.

APPENDIX G

CREATING AND MAINTAINING THE DATA FILES

APPENDIX G

CREATING AND MAINTAINING THE DATA FILES

As mentioned in Chapter II, four data files are required by the budget generating program for budget processing. The purpose of this appendix is to explain how to prepare the data cards required by each of these files and how to enter and update the data file. The discussion of each file is broken into two parts. The file contents are listed along with the array name assigned to each portion of the file. Formats for data input are presented in the second part of each file discussion.

The Parmfile

Contents

		Array
(1)	Default values of the basic parameters. - These values are given in Table XV.	X
(2)	Values of the fuel multiplier constants used in computing fuel cost per hour. - Fuel multipliers are presented in Table XIV.	FMULT
(3)	Names of the units of measurement. - The current set is given in Table II.	NAMES
(4)	Names of the production and operating input items. - The current list is contained in Table III.	

(5) Names of the machines contained in the machinery complements. - See the left hand column of Table VIII.

Format of Data Cards

(1) The default values of the basic parameters are punched one value per card.

	Card Columns
Row number of parameter	5-6 (right justified, no decimal)
Value of parameter	9-18 (decimal punched)

(2) One set of fuel multipliers are punched for each self-propelled machine in the machinery complement. Three multipliers are included in each set, one for each fuel type, gasoline, LP gas and diesel.

	Card Columns
Code number of machine	5-6 (right justified, no decimal)
Value of gasoline multiplier	9-18 (decimal punched)
Value of LP gas multiplier	19-28 (decimal punched)
Value of diesel multiplier	29-38 (decimal punched)

(3) The units of measurement names are punched one name per card. Each name can be no greater than 4 characters in length.

	Card Columns
Unit code number	5-6
Unit name	9-12

(4) The production and operating input names are punched one name per card. Each name can consist of up to 16 characters.

	Card Columns
Item code number	5-6
Name of item	9-24

(5) The machinery complement names are punched one name per card. The name must be no greater than 16 characters in length.

	Card Columns
Code name of machine	5-6
Name of machine	9-24

The Machinery Complement File

Contents

The machinery complement file, MACDAT consists of up to five machinery complements. A complement contains 100 machines and 15 associated coefficients. Data contained in a machinery complement file is given in Table VIII. A description of these 15 coefficients is contained in the discussion of machinery complement changes in Chapter III. An explanation of their use is given in the discussion of the MCPH subroutine in Chapter II. Two data cards are required for each machine.

Format of Data Cards

	Card Columns
Card 1	
Code number of machine	5-6 (right justified, no decimal)
Width	8-16 (decimal punched)
Initial list price	17-25 (decimal punched)
Speed	26-34 (decimal punched)

	Card Columns
Field efficiency	35-43 (decimal punched)
RC1	44-52 (decimal punched)
RC2	53-61 (decimal punched)
RC3	62-70 (decimal punched)
Hours used annually	71-79 (decimal punched)
Card 2	
Years owned	8-16 (decimal punched)
RFV1	17-25 (decimal punched)
RFV2	26-34 (decimal punched)
Purchase price	35-43 (decimal punched)
Fuel type	44-52 (decimal punched)
Hours of life	53-61 (decimal punched)

The Price Vector File

Contents

The price vector file, PRICE, contains nine price vectors. Prices in the price vector are associated on a one-to-one basis with the production and operating input item names and codes given in Table III. Prices are punched one price per card.

Format of Data Cards

	Card Columns
Code number of item	5-6 (right justified, no decimal)
Price of item	8-17 (decimal punched)

The Budget File

The budget file, BUD, contains all budgets that are stored by the budget generating program. Data input requirements for this file are satisfied by the main program.

Entering Data Into the Files

Before initially loading data into the files, the files must first be created by the sample program listed in Table XVI. A second program contained in Table XVII is used to enter data into the files. This utility program can be used to initially load the data required by the files mentioned above and also to make changes in or additions to the data once it has been initially loaded.

Default Values for Basic Parameters

To enter default values for the basic parameters a card with 'PARM' punched in columns 1-4 of the card must precede the data card(s) which contain the default values. A card with 'END*' in columns 1-4 must follow the last data card.

Fuel Multiplier Constants

To enter fuel multiplier constants a card with 'FMLT' in columns 1-4 must precede the data card(s) which contain the constants. A card with 'END*' in columns 1-4 must follow the last data card.

Names of the Units of Measurement

To enter the names of the units of measurement a card with 'UNFI' in columns 1-4 must precede the data cards and a card with 'END*' must follow the last data card.

Names of the Production and Operating Inputs

To enter these data items a card with 'NAME' in columns 1-4 must precede the data card(s) and a card with 'END*' must follow the last data card.

Names of Machines

To enter names of machines a card with 'MCNM' must precede the data cards and a card with 'END*' must follow the last data card.

Price Vector

To enter prices into the price vectors a card with 'PRCE' in columns 1-4, the number of the price vector must be punched in columns 5-6, right justified with no decimal point, must precede the data cards. A card with 'END*' must follow the last data card.

Machinery Complements

To enter coefficients into the machinery complements a card with 'COMP' in columns 1-4, the number of the machinery complement in columns 5-6, right justified with no decimal point, must precede the data cards. A card with 'END*' must follow the last data card.

Order of Control Cards

The preceding discussion has explained that in order to enter a particular kind of data, price vector prices, machinery names, fuel multipliers, etc., a control card must precede the data cards and a card with 'END*' must follow the last data card for that particular kind of data. The order of the above data blocks in the input stream is not important. That is, it is permissible to have as block (1), a PRCE control card followed by prices and an END* card, and then immediately following the END* card a PARM control card followed by a set of default values for the basic parameters. As many blocks as needed may be included in one "run" through the computer. However, after the last END* card, a card with 'STOP' in columns 1-4 must be included to indicate that there are no more blocks of data to follow. See the sample set of data input in Table XIX.

Updating the Files

Suppose machine 44 in machinery complement 3 has a speed of four miles per hour and we wish to permanently change this to 3.5 M.P.H. To do this, the sample program in Table XVII must be used with five data cards. The first card is the control card with 'COMP' in columns 1-4, and 03 in columns 5-6. To indicate that machinery complement coefficients are to be entered in machinery complement number three. The second and third cards contain all 15 of the coefficients necessary for the machine. Although only one coefficient is being modified all 15 must be included. The fourth card is a card with 'END*' in columns 1-4 and the fifth card is a card with 'STOP' in columns 1-4. When

entering changes in the fuel multipliers for a given machine all three multipliers must be reentered.

Entering data for making changes in the data files after they have been initially created follows the same procedure and formats as was used to initially enter the data. All data contained on a row of any arrays must be completely reentered when making changes to that row. The only arrays that contain more than one data item per row are the fuel multiplier array (FMULT) and the array which holds the machinery complement (MACDAT).

TABLE XIV

FUEL MULTIPLIERS

Machine	Code	Gasoline	L.P. Gas	Diesel
Tractor (1)	1	.69	.76	.44
Tractor (2)	2	.69	.76	.44
Tractor (3)	3	.69	.76	.44
Tractor (4)	4	.69	.76	.44
Tractor (5)	5	.69	.76	.44
Truck	10	.69	.76	.44
Pickup	11	.69	.76	.44
Combine	12	.69	.76	.44
Forage Harvester	13	.46	.53	.31
Swather	14	.69	.76	.44
Baler	15	.69	.76	.44
Cotton Picker	16	.23	.27	.16

TABLE XV

BASIC PARAMETERS

Row Number		Default Values
1.	Price per gallon of gasoline	.23
2.	Price per gallon of L.P. gas	.08
3.	Price per gallon of diesel	.15
4.	Price per kilowatt hour of electricity	.0169
5.	Price for first 1000 cu. ft. of natural gas	1.50
6.	Interest rate	.07
7.	Insurance rate (price/dol. of average investment insured)	.006
8.	Tax rate (price/dol. of purchase value)	.01
9.	Variable transmitted to user written subroutine	0.0
10.	Price of machinery labor/hour	1.50
11.	Price of other labor/hour	1.50
12.	Price of irrigation labor/hour	2.00

TABLE XVI

SAMPLE PROGRAM USED TO CREATE THE FOUR DATA FILES

```
                                        80/80 LIST

      00000000011111111112222222222333333333344444444455555555556666666666777777777 8
      12345678901234567890123456789012345678901234567890123456789012345678901234567890
CARD
0001        DIMENSION MACDAT(100,16),PRICE(500),BUD(50,18),IDCODE(10),FOOT(3,2
0002       10),TITLE(3,20),X(25),FMULT(30,3),UNIT(25),NAME(500,4),MCNAME(100,4
0003       1)
0004        REAL*4 MACDAT
0005        DATA MACDAT/1600*0.0/,PRICE/500*0.0/,BUD/900*0.0/,IDCODE/10*0/,
0006       1FOOT/60*4H     /,TITLE/60*4H     / ,X/25*0.0/,UNIT/25*4H     /,
0007       2FMULT/90*0.0/,NAME/2000*4H     /,MCNAME/400*4H     /
0008        DEFINE FILE 8(9,2004,L,IREC1),9(100,4176,L,IREC2),10(5,6404,L,IREC
0009       13)
0010        DO 10 I=1,9
0011        K=I
0012        WRITE(8'K) PRICE
0013     10 CONTINUE
0014        DO 20 I=1,100
0015        K=I
0016        WRITE(9'K) IDCODE,TITLE,FOOT,BUD
0017     20 CONTINUE
0018        DO 30 I=1,5
0019        K=I
0020        WRITE(10'K) MACDAT
0021     30 CONTINUE
0022        WRITE(11) X,FMULT,UNIT,NAME,MCNAME
0023        STOP
0024        END
```

TABLE XVII

SAMPLE PROGRAM USED TO ENTER AND MODIFY THE BASIC DATA FILES

```
                                                                80/80 LIST

     00000000011111111112222222222333333333344444444445555555555666666666677777777778
     12345678901234567890123456789012345678901234567890123456789012345678901234567890
CARD
0001        DIMENSION X(25),UNIT(25),NAME(500,4),PRICE(500),MCNAME(100,4),
0002       1FMULT(30,3),AGENDA(10),MACDAT(100,16),TEMP(15)
0003        REAL*4 MACDAT
0004        DEFINE FILE 8(9,2004,L,IREC1),10(5,6404,L,IREC3)
0005        DATA AGENDA/4HPRCE,4HCOMP,4HUNIT,4HNAME,4HPARM,4HFMLT,4HMCNM,4HEND
0006       1*,4HSTOP/
0007      100 FORMAT(A4,I2)
0008      200 FORMAT(A4,I3,1X,F10.0)
0009      300 FORMAT(A4,I3,1X,A4)
0010      400 FORMAT(A4,I3,1X,4A4)
0011      500 FORMAT(A4,I3,8F9.0/,7X,6F9.0)
0012      600 FORMAT(A4,I3,3F10.0)
0013        READ(11) X,FMULT,UNIT,NAME,MCNAME
0014        REWIND 11
0015        1 READ(5,100,END=99) SG,ITEM
0016          DO 10 I=1,10
0017          L=I
0018          IF(SG.EQ.AGENDA(I)) GO TO 2
0019         10 CONTINUE
0020          GO TO 1
0021          2 GO TO (3,6,9,11,13,14,15,I,99),L
0022          3 READ(8'ITEM) PRICE
0023          4 READ(5,200) SG,I,DATA
0024            IF(SG.EQ.AGENDA(8)) GO TO 5
0025            PRICE(I)=DATA
0026            GO TO 4
0027          5 WRITE(8'ITEM) PRICE
0028            GO TO 1
0029          6 READ(10'ITEM) MACDAT
0030          7 READ(5,500) SG,I,(TEMP(K),K=2,15)
0031            IF(SG.EQ.AGENDA(8)) GO TO 8
0032            TEMP(1)=I
0033            DO 8 K=1,15
0034            MACDAT(I,K)=TEMP(K)
0035          8 CONTINUE
0036            WRITE(10'ITEM) MACDAT
0037            GO TO 1
0038          9 READ(5,300) SG,I,DATA
0039            IF(SG.EQ.AGENDA(8)) GO TO 1
0040            UNIT(I)=DATA
0041            GO TO 9
0042         11 READ(5,400) SG,I,(TEMP(L),L=1,4)
0043            IF(SG.EQ.AGENDA(8)) GO TO 1
0044            DO 12 L=1,4
0045            NAME(I,L)=TEMP(L)
0046         12 CONTINUE
0047            GO TO 11
0048         13 READ(5,200) SG,I,DATA
0049            IF(SG.EQ.AGENDA(8)) GO TO 1
0050            X(I)=DATA
0051            GO TO 13
0052         14 READ(5,600) SG,I,(TEMP(J),J=1,3)
0053            IF(SG.EQ.AGENDA(8)) GO TO 1
0054            DO 17 K=1,3
```

```
                                                                80/80 LIST

     00000000011111111112222222222333333333344444444445555555555666666666677777777778
     12345678901234567890123456789012345678901234567890123456789012345678901234567890
CARD
0055            FMULT(I,K)=TEMP(K)
0056         17 CONTINUE
0057            GO TO 14
0058         15 READ(5,400) SG,I,(TEMP(L),L=1,4)
0059            IF(SG.EQ.AGENDA(8)) GO TO 1
0060            DO 16 L=1,4
0061            MCNAME(I,L)=TEMP(L)
0062         16 CONTINUE
0063            GO TO 15
0064         99 WRITE(11) X,FMULT,UNIT,NAME,MCNAME
0065            REWIND 11
0066            STOP
0067            END
```

TABLE XVIII

PROPER SEQUENCING OF AGENDA CARDS

	Create a New Budget	Update an Old Budget	Create a New Budget from an Old Budget
Data Input	HEAD VECT TITL FOOT BUD	HEAD VECT LOAD TITL (optional) FOOT (optional) BCHG (optional)	HEAD VECT LOAD TITL (optional) FOOT (optional) BCHG (optional)
Storage	STOR (optional)	REPL (optional)	HEAD (optional) STOR (optional)
Data for Computations		PARM (optional) MCOM (optional) MCHG (optional) MACH (optional)	
Computations		MCPH (optional if MACH is used) MCPA GRET	
Output	OUT1 OUT2 OUT3 OUT4 OUT5 OT13 OTBD LPFM OT12 (output agenda all optional)		

TABLE XIX

LISTING OF SAMPLE DATA USED TO GENERATE THE PRECEDING OUTPUT TABLES

80/80 LIST

```
      0000000001111111111222222222233333333334444444444555555555566666666667777777778
      1234567890123456789012345678901234567890123456789012345678901234567890123456789
CARD
0001  HEAD
0002    736107003010510
0003  TITL
0004  GRAIN SORGHUM: PRODUCTION COSTS AND RETURNS PER ACRE, SANDY SOILS
0005  THIS IS A SAMPLE BUDGET PREPARED TO ILLUSTRATE
0006  THE USE OF THE BUDGET GENERATING PROGRAM AND USE OF AGENDA CARDS
0007  FOOT
0008  THE FOOTNOTE CARDS CAN BE
0009  USED TO CLARIFY
0010  ANY PARTS OF THE BUDGET
0011  BUD
0012       0109 24.       13 1.93       15 16.       16 73.
0013       1105 6.        13 .21        15 12.       16 173.
0014       1204 40.       13 .10        15 12.       16 211.
0015       1304 20.       13 .08        15 12.       16 214.
0016       1404 10.       13 .05        15 12.       16 216.
0017       1504 1.0       13 .15        15 7.0       16 361.
0018       1609 1.0       13 3.50       15 7.0       16 305.
0019       1709 24.       13 .10        15 16.       16 302.
0020       3802 1.0       15 3.0        16 91.
0021       3903 1.0       15 3.0        16 43.
0022       4003 .33       15 3.0        16 41.
0023       4103 1.4       15 3.0        16 49.
0024       4204 1.0       15 3.0        16 46.
0025       4305 1.0       15 3.0        16 52.
0026       4406 1.0       07 1.0        15 3.0       16 57.
0027  END*
0028  STOR
0029  MCPH
0030  MCPA
0031  GRET
0032  OUT1
0033  OT12
0034  OT13
0035  OUT2
0036  OUT3
0037  OUT4
0038  OUT5
0039  HEAD
0040    736107003010510
0041  LOAD
0042  BCHG
0043       0109 20.
0044  END*
0045  REPL
0046  MCPH
0047  MCPA
0048  GRET
0049  OUT1
0050  OT12
0051  HEAD
0052    736107003010510
0053  LOAD
0054  TITL
```

80/80 LIST

```
      0000000001111111111222222222233333333334444444444555555555566666666667777777778
      1234567890123456789012345678901234567890123456789012345678901234567890123456789
CARD
0055  GRAIN SORGHUM: PRODUCTION COSTS AND RETURNS PER ACRE, SANDY SOILS
0056  THIS IS A SAMPLE BUDGET PREPARED TO ILLUSTRATE
0057  THE USE OF THE BUDGET GENERATING PROGRAM AND USE OF AGENDA CARDS
0058  BCHG
0059       0210 .5        13 3.50       15 10.       16 89.
0060  END*
0061  HEAD
0062    736107003010610
0063  STOR
0064  MCPH
0065  MCPA
0066  GRET
0067  OUT1
0068  OT12
0069  OTBD
0070  LPFM
0071  OUTPUT FROM THE LPFM AGENDUM
0072  STOP
```

TABLE XX

LISTING OF THE BUDOUT SUBROUTINE

```
                                                80/80 LIST

     00000000011111111112222222222333333333344444444455555555556666666666777777777778
     12345678901234567890123456789012345678901234567890123456789012345678901234567890
CARD
0001          SUBROUTINE BUDOUT
0002          COMMON ANCAP(12),BUD(50,18),CAP,CAP1,CAP2,CAP3,CAP4,COST,CPCST,CPC
0003         1ST1,CPCST2,CPCST3,CPCST4,EFUEL(12),EFUELT,ELUBE(12),ELUBET,EREP(12
0004         2),EREPT,EXP(37),FMULT(30,3),FOOT(3,20),FPRICE(5),GROSS,HMONTH,HOUR
0005         3S(100,13),IREAD,IRR,ITYPE,IWRIT,MACDAT(100,16),MACH(100,10),MCNAME
0006         4(100,4),MCOMP,NAME(500,4),OWN,OWN2,OWN3,OWN4,PRICE(500),QUAN(50),R
0007         5ECEIT(12),TFUEL(12),TFUELT,THOURS,TITLE(3,20),TLUBE(12),TLUBET,TOT
0008         6AL(12),TOTCAP(12),TREP(12),TREPT,TWATER,UNIT(25),VALUE(10),X(25),
0009         7XIRDAT(5,10),XIREP(12),XIREPT,XIRFU(12),XIRFUT,XIRLU(12),XIRLUT,XL
0010         8ABOR(4,13),XLCST,XLCST1,XLCST2,XLCST3,XNET,XNET1,XNET2,XNET3,
0011         9IDCODE(10)                                                          1
0012          REAL*4 MACDAT,MACH
0013        100 FORMAT(1H1)
0014        300 FORMAT(1HO)
0015        400 FORMAT(1HO,10X,'BUDGET IDENTIFICATION NUMBER: ',2I2,3I1,I2,2I1,I2)
0016        450 FORMAT(1H ,20X,20A4)
0017        410 FORMAT(1HO,50X,'COLUMN NUMBER')
0018        420 FORMAT(1H ,20X,13(I4,3X),2X,'15      16')
0019        430 FORMAT(1H ,2X,                  20X,'JAN    FEB    MAR    APR    M
0020           1AY    JUN    JUL    AUG    SEP    OCT    NOV    DEC   PRICE    UNI
0021           2T   ITEM')
0022        440 FORMAT(1H ,'LINE',16X,94X,'CODE   CODE')
0023        460 FORMAT(1H ,'PRODUCTION')
0024        470 FORMAT(1H ,I2,1X,4A4,1X,12F7.2,F8.3,3X,F4.0,3X,F4.0)
0025        480 FORMAT(1HO,'OPERATING INPUTS')
0026        490 FORMAT(1HO,'MACHINERY REQUIREMENTS--TIMES OVER')
0027        500 FORMAT(1H ,'49 AC. IN. IRRG. WATER',F5.2,11F7.2)
0028        510 FORMAT(1H ,'50 HRS LABOR REQUIRED',F6.2,11F7.2)
0029            WRITE(6,100)
0030            WRITE(6,400)(IDCODE(J),J=2,10)
0031            WRITE(6,300)
0032            WRITE(6,450)((TITLE(I,K),K=1,20),I=1,3)
0033            WRITE(6,410)
0034            WRITE(6,420)(I,I=1,13)
0035            WRITE(6,430)
0036            WRITE(6,440)
0037            WRITE(6,460)
0038            DO 5 IC = 1,10
0039            IF(BUD(IC,16).LE.0.0) GO TO 5
0040            IN=BUD(IC,16)
0041            WRITE(6,470)IC,(NAME(IN,J),J=1,4),(BUD(IC,K),K=1,13),BUD(IC,15),BU
0042           1D(IC,16)
0043          5 CONTINUE
0044            WRITE(6,480)
0045            DO 8 IC=11,37
0046            IF(BUD(IC,16).LE.0.0) GO TO 8
0047            IN=BUD(IC,16)
0048            WRITE(6,470)IC,(NAME(IN,J),J=1,4),(BUD(IC,K),K=1,13),BUD(IC,15),BU
0049           1D(IC,16)
0050          8 CONTINUE
0051            WRITE(6,490)
0052            DO 11 IC = 38,48
0053            IF(BUD(IC,16).LE.0.0) GO TO 11
0054            IN=BUD(IC,16)
```

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                                                80/80 LIST

     00000000011111111112222222222333333333344444444455555559555666666666777777777778
     12345678901234567890123456789012345678901234567890123456789012345678901234567890
CARD
0055            WRITE(6,470)IC,(MCNAME(IN,J),J=1,4),(BUD(IC,K),K=1,13),BUD(IC,15),
0056           1BUD(IC,16)
0057         11 CONTINUE
0058            DO 12 I=1,12
0059            IF(BUD(49,I).NE.0.0)GO TO 13
0060         12 CONTINUE
0061            GO TO 14
0062         13 CONTINUE
0063            WRITE(6,300)
0064            WRITE(6,500)(BUD(49,I),I=1,12)
0065         14 CONTINUE
0066            DO 16 I=1,12
0067            IF(BUD(50,I).NE.0.0) GO TO 15
0068         16 CONTINUE
0069            GO TO 17
0070         15 WRITE(6,510)(BUD(50,I),I=1,12)
0071         17 CONTINUE
0072            WRITE(6,300)
0073            WRITE(6,450)((FOOT(I,K),K=1,20),I=1,3)
0074         18 RETURN
0075            END
```

TABLE XXI

LISTING OF THE LPFARM SUBROUTINE

80/80 LIST

```
     0000000001111111111222222222233333333344444444445555555555666666666677777777778
     1234567890123456789012345678901234567890123456789012345678901234567890123456789
CARD
0001        SUBROUTINE LPFARM                                                  LPFM0010
0002        COMMON ANCAP(12),BUD(50,18),CAP,CAP1,CAP2,CAP3,CAP4,COST,CPCST,CPCLPFM0020
0003       1ST1,CPCST2,CPCST3,CPCST4,EFUEL(12),EFUELT,ELUBE(12),ELUBET,EREP(12LPFM0030
0004       2),EREPT,EXP(37),FMULT(30,3),FOOT(3,20),FPRICE(5),GROSS,HMONTH,HOURLPFM0040
0005       3S(100,13),IREAD,IRR,ITYPE,IWRIT,MACDAT(100,16),MACH(100,10),MCNAMELPFM0050
0006       4(100,4),MCOMP,NAME(500,4),OWN,OWN2,OWN3,OWN4,PRICE(500),QUAN(50),RLPFM0060
0007       5ECEIT(12),TFUEL(12),TFUELT,THOURS,TITLE(3,20),TLUBE(12),TLUBET,TOTLPFM0070
0008       6AL(12),TOTCAP(12),TREP(12),TREPT,TWATER,UNIT(25),VALUE(10),X(25),  LPFM0080
0009       7XIROAT(5,10),XIREP(12),XIREPT,XIRFU(12),XIRFUT,XIRLU(12),XIRLUT,XLLPFM0090
0010       8ABOR(4,13),XLCST,XLCST1,XLCST2,XLCST3,XNET,XNET1,XNET2,XNET3,      LPFM0100
0011       9IDCODE(10)                                                        LPFM0101
0012        REAL*4 MACDAT,MACH                                                LPFM0110
0013        DATA DUMN/4H    /                                                 LPFM0111
0014        KK=2                                                              LPFM0112
0015    100 FORMAT(1X,2I2,2I1,3X,'1',7A4,A2,7F5.2,A4)                        LPFM0120
0016    199 FORMAT(1H1)                                                       LPFM0121
0017    200 FORMAT(1X,2I2,2I1,3X,'2',9F5.2,I3)                               LPFM0130
0018    300 FORMAT(1X,2I2,2I1,3X,'3',12F5.2)                                 LPFM0140
0019    400 FORMAT(7A4,A2,I3)                                                 LPFM0150
0020        DIMENSION AUM(4),QUAR(4),XTITLE(8)                                LPFM0160
0021        IREAD=5                                                           LPFM0161
0022        WRITE(6,199)                                                      LPFM0162
0023        LPFILE=X(25)                                                      LPFM0170
0024        IF(LPFILE.EQ.0) LPFILE=6                                          LPFM0171
0025        READ(IREAD,400)(XTITLE(K),K=1,8),IPROG                            LPFM0171
0026        DO 9 I=1,4                                                        LPFM0180
0027        AUM(I)=0.0                                                        LPFM0190
0028      9 CONTINUE                                                          LPFM0200
0029        OTHINC=0.0                                                        LPFM0210
0030        PRC=0.0                                                           LPFM0211
0031        QN=0.0                                                            LPFM0212
0032        UN=DUMN                                                           LPFM0213
0033        SEED=0.0                                                          LPFM0220
0034        FERT=0.0                                                          LPFM0230
0035        CUST=0.0                                                          LPFM0240
0036        XMIS=0.0                                                          LPFM0250
0037        IF((BUD(1,16).EQ.89.0).OR.(BUD(1,16).EQ.86.0)) KK=1               LPFM0251
0038        IF(KK.EQ.1) GO TO 8                                               LPFM0252
0039        IUNIT=BUD(1,15)                                                   LPFM0253
0040        QN=QUAN(1)                                                        LPFM0254
0041        UN=UNIT(IUNIT)                                                    LPFM0255
0042        PRC=BUD(1,13)                                                     LPFM0256
0043      8 DO 10 I=KK,9                                                      LPFM0260
0044        INDEX=BUD(I,16)                                                   LPFM0270
0045        IF(INDEX.EQ.89) GO TO 1                                           LPFM0280
0046        IF(INDEX.EQ.85) GO TO 3                                           LPFM0290
0047        OTHINC=OTHINC+VALUE(I)                                            LPFM0300
0048        GO TO 10                                                          LPFM0310
0049      1 DO 2 J=6,9                                                        LPFM0320
0050        AUM(1)=AUM(1)+BUD(I,J)                                            LPFM0330
0051      2 CONTINUE                                                          LPFM0340
0052        AUM(3)=AUM(3)+BUD(I,3)+BUD(I,4)+BUD(I,5)                          LPFM0350
0053        AUM(2)=AUM(2)+BUD(I,1)+BUD(I,2)+BUD(I,10)+BUD(I,11)+BUD(I,12)     LPFM0360
0054        GO TO 10                                                          LPFM0370
```

80/80 LIST

```
     0000000001111111111222222222233333333344444444445555555555666666666677777777778
     1234567890123456789012345678901234567890123456789012345678901234567890123456789
CARD
0055      3 DO 4 J=1,12                                                       LPFM0380
0056        AUM(4)=AUM(4)+BUD(I,J)                                            LPFM0390
0057      4 CONTINUE                                                          LPFM0400
0058     10 CONTINUE                                                          LPFM0410
0059        TCAP=COST+CAP2+CAP3+CAP4                                          LPFM0420
0060        WRITE(LPFILE,100)(IDCODE(J),J=2,5),(XTITLE(K),K=1,8),TCAP,CAP1,(AULPFM0440
0061       1M(L),L=1,4),QN,UN                                                 LPFM0450
0062        DO 20 I=11,37                                                     LPFM0460
0063        INDEX=BUD(I,16)                                                   LPFM0470
0064        IF(INDEX.EQ.0) GO TO 20                                           LPFM0480
0065        IF(INDEX.LE.199) GO TO 11                                         LPFM0490
0066        IF(INDEX.LE.299) GO TO 12                                         LPFM0500
0067        IF(INDEX.LE.399) GO TO 13                                         LPFM0510
0068        XMIS=XMIS+EXP(I)                                                  LPFM0520
0069        GO TO 20                                                          LPFM0530
0070     11 SEED=SEED+EXP(I)                                                  LPFM0540
0071        GO TO 20                                                          LPFM0550
0072     12 FERT=FERT+EXP(I)                                                  LPFM0560
0073        GO TO 20                                                          LPFM0570
0074     13 CUST=CUST+EXP(I)                                                  LPFM0580
0075     20 CONTINUE                                                          LPFM0590
0076        OPCOST=TFUELT+TLUBET+TREPT+EFUELT+EREPT+ELUBET+XIRFUT+XIRLUT+XIREPLPFM0610
0077       1T                                                                 LPFM0620
0078        WRITE(LPFILE,200)(IDCODE(J),J=2,5),PRC,OTHINC,SEED,FERT,CUST,OPCOSLPFM0640
0079       1T,XMIS,FIXMAC,IPROG                                               LPFM0650
0080        QUAR(1)=XLABOR(4,1)+XLABOR(4,2)+XLABOR(4,3)                       LPFM0660
0081        QUAR(2)=XLABOR(4,4)+XLABOR(4,5)+XLABOR(4,6)                       LPFM0670
0082        QUAR(3)=XLABOR(4,7)+XLABOR(4,8)+XLABOR(4,9)                       LPFM0680
0083        QUAR(4)=XLABOR(4,10)+XLABOR(4,11)+XLABOR(4,12)                    LPFM0690
0084        XNM=BUD(49,1)+BUD(49,2)+BUD(49,3)+BUD(49,11)+BUD(49,12)           LPFM0700
0085        WRITE(LPFILE,300)(IDCODE(J),J=2,5),(QUAR(L),L=1,4),(BUD(49,M),M=4,LPFM0710
0086       1I0),XNM                                                           LPFM0720
0087        RETURN                                                            LPFM0730
0088        END                                                               LPFM0740
```

VITA 1

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Master of Science

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